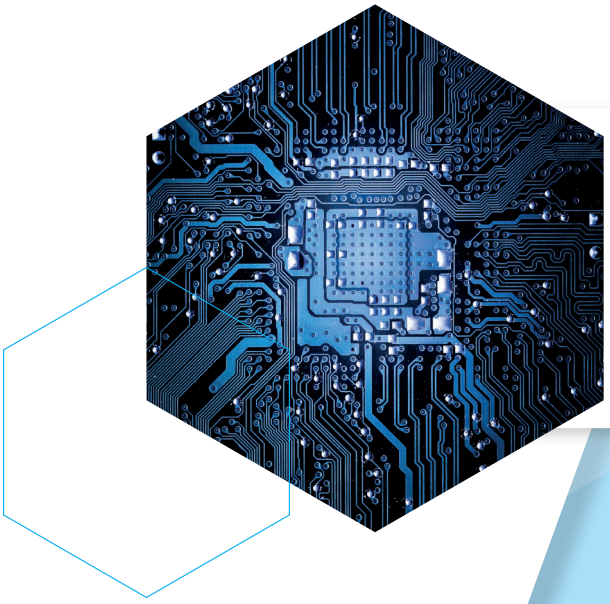

CCS
CREATING CUSTOMER SATISFACTION
2023
LIGHTING SOLUTION
WORLD'S HIGHEST STANDARD OF LED LIGHTING TECHNOLOGY
LET OUR EXPERTISE WORK FOR YOU

SOLUTIONS IN
MACHINE VISION LIGHTING



SOLUTION & TECHNOLOGY

CCS has a high focus on solution - our customers are continuously assured the best technology, enabling them to operate at optimum performance levels and to compete at the leading edge.

R&D

- Extensive research facilities including the CCS Lighting Institute and AI Laboratories; more than 50 R&D engineers and over 245 global patents

Technology Leadership

- Innovative technology covering all aspects of machine vision lighting from core photonics and spectral illumination, OLED, natural LED (full spectrum), through to specialized lighting control and integration to imaging systems

WORLD-CLASS QUALITY

CCS set the standard for excellence in illumination; consistently developed over 26 years, our quality and manufacturing processes ensure optimum performance, uniformity, accuracy and repeatability.

Manufacturing & Quality

- ISO9001 Quality Management and the optimum in manufacturing processes; CCS products have full compliance with International standards and environmental regulations such as CE, PSE, RoHS, REACH

Customisation

- In addition to an extensive standard line-up, CCS also accepts custom orders - whether that be for a specific application or bespoke machine requirements. We listen to your needs and create the “optimal, custom light” for you

MARKET-LEADING PRODUCTS

Industry's largest range of illumination for machine vision, addressing all solution types - including the Precision, Flood (Plug & Play) and Specialist sectors.

Precision

- Industry's widest product range with over 3,284 models covering Area, Linescan and Specialised precision illumination requirements; includes FASTUS Intelligent Lighting with consistent intensity and Industry 4.0 compatibility

Flood

- Comprehensive Plug & Play lighting systems including built-in power supplies, controllers and IP rating. Wide range of spectral options, easy set-up and connectivity to Industrial and Smart Cameras

Specialist

- Advanced lighting systems incorporating emerging technologies such as Hyperspectral, high power SWIR, 3D Structured Light projectors, and illumination systems for Computational (multi-shot) imaging

INTERNATIONAL SUPPORT

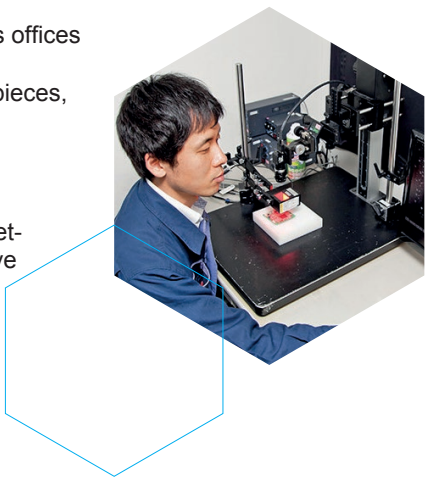
CCS has the global infrastructure and localized services to ensure support for machine vision projects, systems and machines - wherever it is needed.

Support Services

- Providing support reassurance with 15 global sales offices and 25 testing rooms throughout Asia, Europe and America. Services include free testing of your work-pieces, and efficient trial & loan systems

Application Knowhow

- Centralised and local customer access to advice from experienced application engineers; CCS illumination is set-up with typical camera and software configurations to prove realistic solutions for customers



QUALITY / SOLUTION / SUPPORT

New Products BRAND-NEW

Diffused Bar Lights LB Series

NEW

- Irradiates uniform diffused light which is used for specular reflection and backlighting
- Standard type is available in emitting widths of 50/100/150 mm and high-power type is available in an emitting width of 50 mm
- High-power type with overdrive is up to 6.5 times brighter than standard type*

For details, refer to P.77

Total of 338 Models

Emitting Width 3 Types (50/100/150 mm) × Color 4 Types (Red/White/Blue/IR) × Size 26 Types (Light emitting surface length 200 mm to 2700 mm)

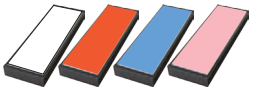
Standard type 312 Models | High-power type 26 Models*1

*1 High power type is only available in emitting width 50 mm, white.

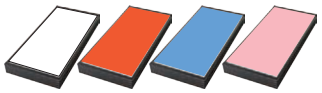
* Measurement conditions: LWD 50 mm, irradiance comparison between LB-300X50SW and LB-H-300X50SW
Overdrive is only available for high power type sizes 200 to 700.

LB-H-300X50 (High Power Type)

LB-300X50



LB-300X100



LB-300X150

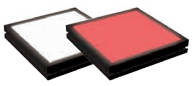
High-Power Strobe Lights PF Series

Expanded Lineup

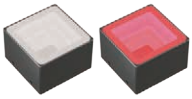
- High-power strobe light for high-speed inspection line
- Added 4 new shapes and small bar lights and diffused ring lights
- Total of 10 series with 76 models to suit various imaging environments

For details, refer to P.143

LFXV-PF-100



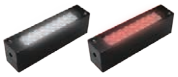
TH-PF-100X100



FPQ-PF-48

LFV-G-PF-35

HPR-PF-50



LDL-PF-33X8

High-Power Light Sources PFBR-600SW2 Series

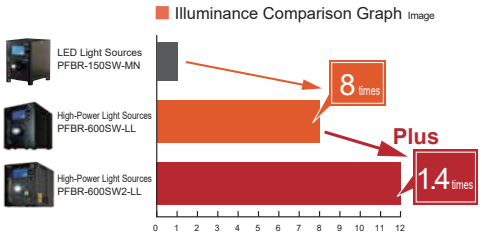
NEW

- Renewal of next-generation light source with high output and fast response
- 1.4 times brighter*, 23,000 hour life span, new function added *Compared to the conventional product PFBR-600SW-LL
- Filter changer equipped model is also available

For details, refer to P.197

PFBR-600SW2-LLCF (Filter Changer Model)

PFBR-600SW2-LL



Note: Comparison of actual measurement values with intensity of 100%, a bundle diameter of Ø8 mm, a straight light guide with a total length of 1,000 mm installed, and at a position 50 mm away from the fiber output edge. (Results may vary for individual units.)

Digital Control Unit PD4 Series

NEW

- Digital power supply with enhanced lighting control functions such as sequence control, trigger output, recipe function, etc.
- Available in 60W: 2-channel/4-channel, 120W: 2-channel/4-channel light unit output type
- Ethernet / parallel external control

For details, refer to P.309

PD4-6024 Series

PD4-12024 Series

The data included is for reference only. Actual values may vary.

NEW APPLICATION

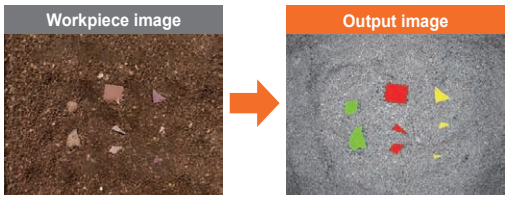
Multi-Band Light

For details, refer to P.381

Imaging solution with 8 types of wavelength

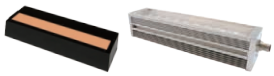
By acquiring and processing images at multiple wavelengths, it is possible to detect fine differences in color, which are difficult to identify with a single wavelength, and foreign objects, which are difficult for human eyes to detect.

Imaging picture (inspection of contaminants in coffee)



[Red] Paper [Green] Cookie [Yellow] Film

Hyperspectral Imaging Light

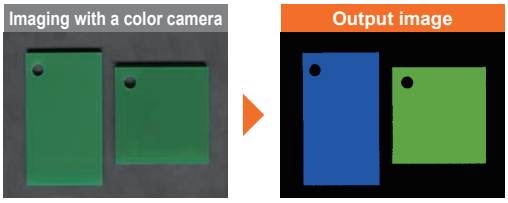


For details, refer to P.383

Visualize subtle differences in color and materials

When used with a hyperspectral camera that can capture images with high wavelength resolution, it is possible to perform inspections that are difficult to achieve with normal cameras, such as component analysis, foreign object detection, and color identification.

Imaging picture (resin color plate)



Imaging with a hyperspectral camera (400 to 900 nm)

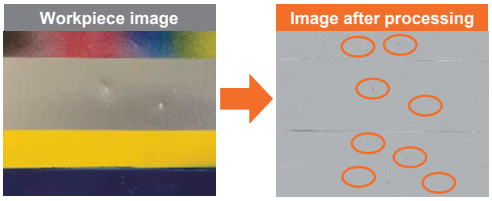
Line Scan Camera + Photometric Stereo

For details, refer to P.384

4-directional lighting in one stage

Highlight wrinkles and uneven surfaces in a single stage by imaging light effects from 4 directions and removing patterns on the workpiece. It can be used for the inspection of sheet materials such as film.

Imaging picture (inspection of blowholes and dents in metal plates)



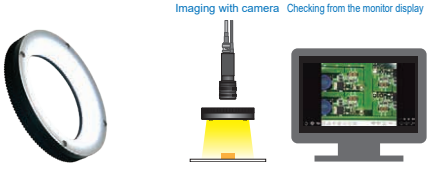
Visual Inspection Improvement Solution

For details, refer to P.385

Improves accuracy and efficiency for visual inspection

- We offer suitable imaging equipment based on the inspection
- We offer various tools for visual inspection via monitor

Natural Light LED Light

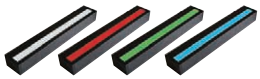


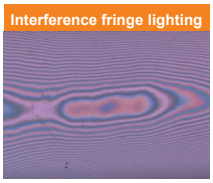
Lights for Fringe Interference Inspection

For details, refer to P.386

Visualizes hard-to-see unevenness in coatings, thin films, and laminations gaps

- Lights built with special optical system
- Compatible with both camera and visual inspections





Lights for fringe interference inspection can show uneven adhesion

Innovation in Illumination Technologies

CCS Group Synergy

The CCS Group continuously strives to deliver *best in class* technology for all sectors of Illumination solutions for Machine Vision - from industry leading Precision lighting to innovative Flood and Specialist systems. This is underpinned by high performance lighting control, networking, and integration of lighting within Imaging software. Each area of CCS Group technology is fully complementary - resulting in users having the industry's widest choice, performance and quality for their Machine Vision illumination needs.

CCS

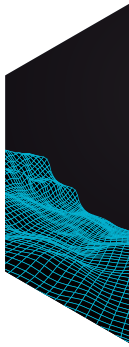
Precision Illumination & Photonics

Leading the industry for precision illumination & optimum quality, and solution in core spectral technology and photonics

Effilux

Flood Lighting, Plug & Play

Comprehensive range of Flood illumination which combines both performance and flexibility within plug & play format, including built-in control



CCS Fastus

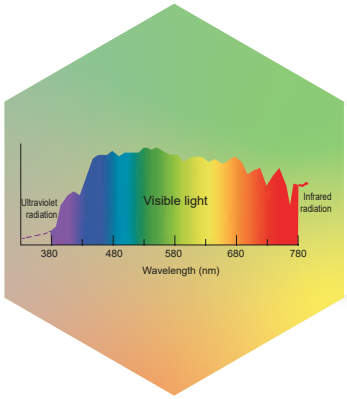
Specialist Illumination

For applications which demand the highest levels of illumination control, with guaranteed intensity through unique lighting feedback

triniti

Intelligent Lighting Control & Networking

Industry 4.0 compatible lighting control system - based on GenICam, constant-current controllers and easy to set-up lighting with lifetime recording



SPECTRAL

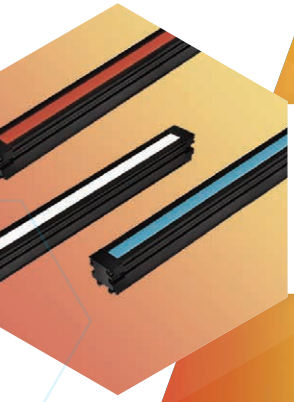
Significant advances in Spectral developments include novel, tuneable, single LED illumination source for visible-NIR hyperspectral, unique high power SWIR, and Natural Light LED

P.7

OLED

Measuring only 3mm in thickness, the newly developed OLED technology enables a multi-layer design for flat lights - providing unique intensity and uniformity

P.265



LINESCAN

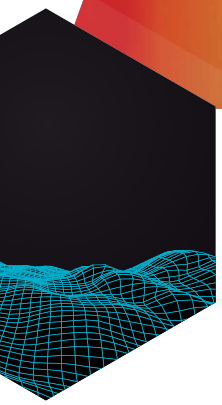
CCS offers a broad selection of unique line light series, which are available in a wide range of different wavelengths and can be manufactured at longer lengths to suit your application needs

P.205

INDUSTRY 4.0

GigE Vision/GenICam compatible lighting systems which provide plug and play set-up and easy integration with Imaging software, along with lighting data for Industry 4.0

P.15



3D STRUCTURED PROJECTORS

Includes EFFILUX structured LED lighting - designed for 3D reconstruction, stereovision and alignment applications. It projects powerful and accurate patterns such as : line, cross, cloud of dots

P.292

COMPUTATIONAL ILLUMINATION

Computational Illumination from CCS provides lighting in a structured and open-architecture format - enabling high quality multi-shot image capture in a controlled fashion

P.279

Hyperspectral & SWIR

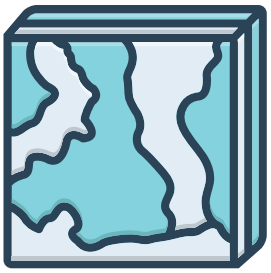
Innovations in Spectral Illumination Technologies

The CCS Group is combining their extensive expertise to develop leading edge technologies. This has led to significant advances in Hyperspectral land Short-Wave InfraRed (SWIR) Illumination that will expand the application possibilities for these two rapidly-growing technologies.

Novel illumination for visible-NIR Hyperspectral Imaging

New developments from the CCS Group address issues of lighting for Hyperspectral Imaging in the form of a proprietary, tuneable single LED illumination source that overcomes the limitations of halogen or multiple LED based Hyperspectral Illumination solutions. The LED is a single point source, providing exceptional spatial and spectral uniformity, and enables light sources to be produced in any form factor, including projector, bar, ring, and back lights. This will allow for an enormous range of new applications for Hyperspectral Imaging in the visible and near infrared (NIR) region of the spectrum.

The benefits of Hyperspectral Illumination



Hyperspectral Imaging is a powerful approach that combines conventional imaging with spectroscopy. Organic materials selectively absorb light at specific wavelengths depending on their composition. These distinctive ‘fingerprints’ can be used to uniquely identify them. In Hyperspectral Imaging, a series of images can be acquired by sequentially allowing narrow wavelength bands of light from the sample to fall on the camera sensor.

By selecting the appropriate wavelengths, Hyperspectral Imaging allows the assessment of product quality, and the detection of contaminants and foreign material based on chemical composition, which is not possible using traditional machine vision. Another major benefit of Hyperspectral Imaging is that packaging materials are usually transparent to NIR light, meaning that the technique can be used to examine products inside their packaging.

Hyperspectral Illumination requirements

As with all machine vision techniques, using an appropriate illumination source is absolutely critical in delivering high quality results. The key requirement for Hyperspectral Illumination is to have as homogeneous of emission as possible over the entire wavelength range of interest from a point source to ensure that all wavelengths are generated from the same physical location.

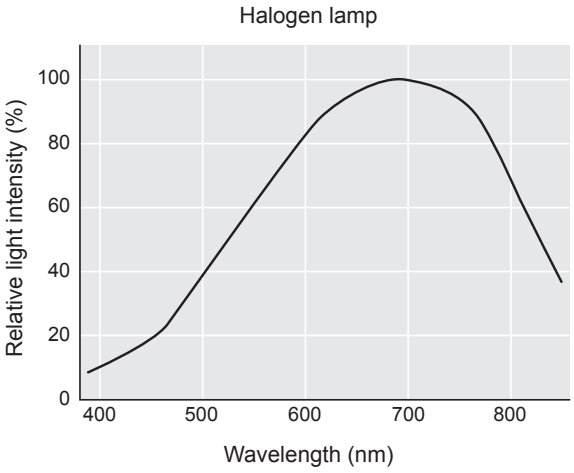


Figure 1 - Sample Spectrums for Tungsten Halogen

For visible-NIR Hyperspectral Imaging the wavelength range is 400 to 900 nm. The ideal illumination source would be sunlight, but this is not a practical solution for machine vision, so a black body radiation source in the form of a tungsten halogen light source has been the most commonly used solution to date. While this generally has good uniformity of emission over the wavelengths of interest, it has a relatively poor emission in the blue spectral range (Figure 1).

However, a large proportion of the energy emitted lies outside the wavelength region of interest. This energy is wasted and generates excessive heat, which means the lamps must be cooled or equipped with suitable heat sinks. This adds cost, complexity and can lead to significant integration challenges in production line applications due to the bulky size of the enclosures. There are also issues related to stability, an essential requirement for reproducibility of measurements in machine vision, and short lifetimes which have implications on operating and maintenance costs. In addition, EU environmental regulations may result in these types of lamps being banned going forward. Many industrial imaging applications also require the illumination to be strobed to eliminate the effects of product movement, but halogen lamps cannot be pulsed.

LED Hyperspectral Imaging

LED illumination has largely replaced any other illumination method in most machine vision applications, but for hyperspectral imaging, the source must cover the entire spectrum between 400 and 900 nm and provide uniform illumination across the wavelength range. Although white light LEDs are available, they have a large peak in the blue region of the spectrum, a 'hole' around 480 nm and only operate up to just over 700 nm, as shown in Figure 2.

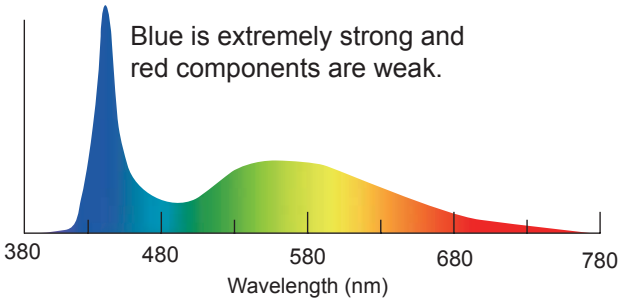


Figure 2 – Spectrum for Conventional White Light LED

This offers neither the uniformity required nor the full wavelength range to utilize the sensitivity up to 1000 nm provided by the CMOS camera sensors used in Visible NIR Hyperspectral Imaging.

An alternative approach is to use multiple monochromatic LEDs in a single illuminator to cover the required wavelength range. Dealing with multiple LED sources, however, always brings a compromise between spectrum and uniformity because the bandwidths of classic monochromatic LEDs are narrow, making it nearly impossible to produce a homogeneous high performance area hyperspectral light using the number of narrow band LEDs required. In fact, this is actually just a multispectral solution, where the available wavelengths are limited to those of the LEDs chosen. Until now, the only practical way to integrate enough LEDs for hyperspectral lighting was to combine them into a line scan illuminator. This, however, creates spatial inhomogeneity since the light from the individual LEDs arrives at the sample from different angles, depending on the position of the LED in the line.

The new LED solution

CCS Group has addressed these issues in the form of a proprietary, tuneable single LED illumination source that overcomes the limitations of halogen or multiple LED based hyperspectral lighting solutions. It provides a nearly flat spectrum between 400 and 900 nm, as shown in Figure 3.

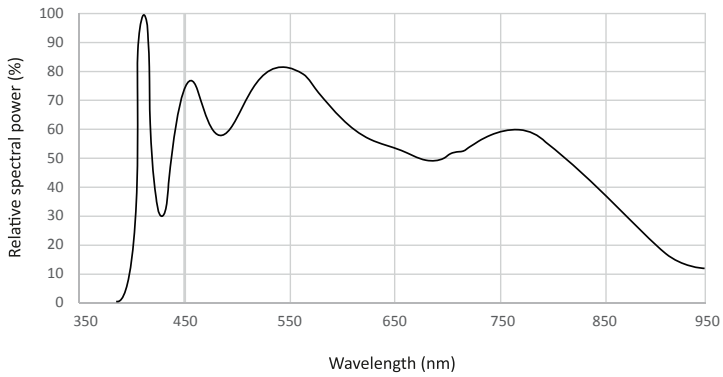


Figure 3 - Spectrum of the proprietary Hyperspectral LED

This innovative new approach provides spatial and spectral uniformity in a point source hyperspectral illuminator. These illuminators are based on a single broadband LED that was both developed and is manufactured in-house. They are therefore completely compatible with existing mechanical enclosures, meaning that any of the company's standard products can be produced in a hyperspectral imaging format.

Users can benefit both from unlimited form factors, including bar lights, line lights, back lights, ring lights, projectors, etc. to suit their particular application, and from greatly simplified integration into existing inspection processes. As a single point source, all wavelengths come from the same spatial origin of the LED, meaning there are no wavelength dependent angular absorption effects.

Crucially, for added versatility, the spectrum can be tuned within the available spectral range in order to tailor the light output to the specific application requirements – the system is not limited to fixed output wavelengths as is the case for Multispectral Imaging. In addition, the hyperspectral LED can be strobed if required and multiple LEDs can be mounted on a single PCB if increased output intensity is needed. Of course, another major benefit is the longevity associated with LEDs.

Extending the wavelength range

Many organic materials have unique absorption and reflection properties across the electromagnetic spectrum. More importantly, these properties offer a unique fingerprint for organic material, especially in the NIR region of the electromagnetic spectrum, which holds important information regarding the material. CMOS sensors used in the Machine Vision Industry are sensitive up to about 1000nm, making it possible to capture information in an image based on these unique properties.

Light output from the new hyperspectral LED diminishes rapidly after 900nm (Figure 3), as does the sensitivity of CMOS sensors, which affects the signal-to-noise ratio. However, this can be compensated by adding two additional LEDs with a peak wavelength of respectively 930nm and 970nm. By doing so, the intensity of the light source between 900nm and 1000nm, as shown in Figure 4, can be increased significantly, allowing for better signal-to-noise ratio.

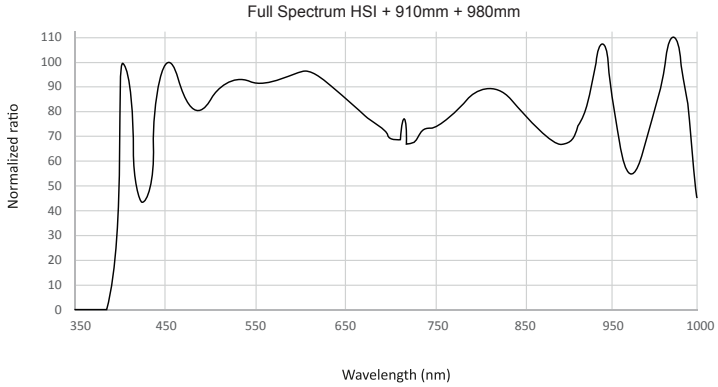
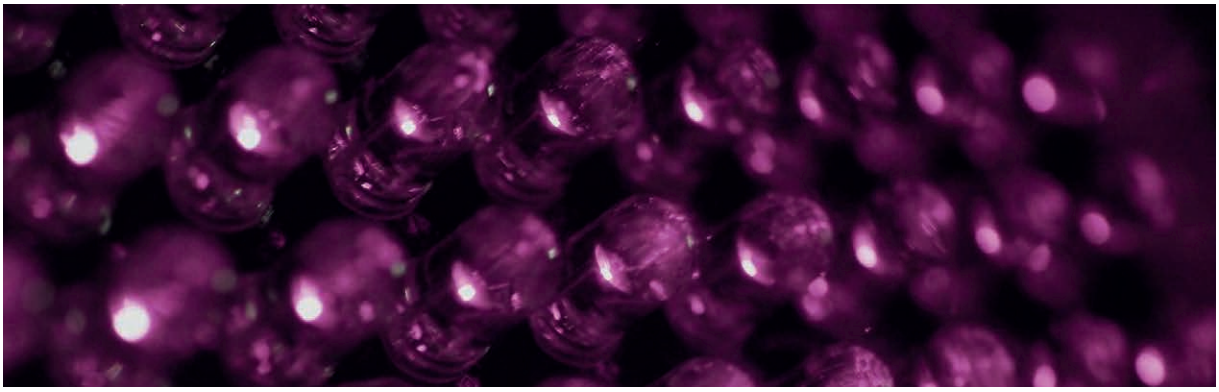


Figure 4 - Extended Range Visible-NIR Hyperspectral Solution



Practical applications

Since existing tungsten halogen Hyperspectral Illumination sources have considerable operational challenges, such as heat dissipation, poor energy efficiency and continuous only output, together with difficulty in achieving high spatial uniformity due to lamp size and optics, it is often not possible to build these lights in the form factors most frequently needed for automated hyperspectral imaging.

The availability of the new hyperspectral LEDs in a variety of form factors will open up new opportunities across many applications and industries, including medical imaging and diagnostics, environmental monitoring, forensics, food and pharmaceutical analysis, food sorting and quality grading, biotechnology, recycling, bank note inspection and chemical analysis.

Furthermore, the CCS Group offers a broad selection of light sources with different peak wavelengths in the SWIR region. This allows light sources to be deployed in numerous SWIR or multi-spectral applications where the workpiece's absorption properties in the infrared range are key in solving the application. As an example, the specific absorption properties of organic materials and water through the near infrared and short-wave infrared regions from 750nm up to 1700nm allows the detection of defects and contamination due to foreign matter, mold, disease and pests in harvested produce such as fruit, vegetables, rice, corn, nuts, soybeans, coffee, and many more.

The new SWIR LED lighting range is available in six form factors: ring, bar, flat, dome, line, and spot light. These light sources are all available with peak wavelengths of 1050, 1200, 1300, 1450, 1550, 1650nm. The shape and size of these light sources can be customized accordingly to the specifications of the application. Please refer to P.181 and P.177 for further information about the hyperspectral product range and for the SWIR product range from CCS Group.

Unique Light Source for High-Power SWIR Illumination

CCS's subsidiary, EFFILUX, developed a novel LED SWIR source - SWIR H.O.P. (High Optical Power) Technology, based on a proprietary material that emits SWIR light, which is designed to deliver high output power. This technology leads the way to new applications in machine vision and scientific imaging.

Emerging SWIR imaging for machine vision

Machine vision is currently dominated by visible imaging. Indeed, similarities with the human eye perception and the technological advances in lighting power, camera resolution, and computer processing have made these technologies inevitable. However, there is an intrinsic and impassable limit: the visibility itself! Only what can be seen by the naked eye is visible.

In this context, a new generation of sensors has emerged in the machine vision market: Short-Wave InfraRed (or SWIR) cameras.

Occupying the boundary between visible and thermal imaging, this light field has the capability to reveal phenomena and elements invisible to standard CMOS/CCD cameras. The SWIR imaging market is rapidly growing due to the range of applications made possible using SWIR-range wavelengths:

- See through opaque materials (plastics, silicon, glass, etc.)
- Reveal chemical elements (water, lipids, collagen, etc.)
- Offer visibility in harsh conditions (through smoke, dust, etc.)

Until now, SWIR imaging has been severely limited by the illumination. With the exception of halogen sources, there are no light sources powerful enough for most applications in the SWIR spectrum. However, halogen sources for SWIR imaging have many drawbacks, such as high radiated heat, very short lifetime, low efficiency and non-tunable spectrum, and they are difficult to couple with optics to control coverage area and power density.

Using laser sources is also a possible solution, but only for applications which require point sources. Managing the luminous flux of a laser source is complicated and brings an undesirable speckle effect. Furthermore, it is not easy to integrate into a machine vision system and is very dangerous for eyes.

About SWIR H.O.P. Technology

The H.O.P. (High Optical Power) Technology from EFFILUX changes the SWIR market, providing high output power and the ability to address a new class of applications. H.O.P. is more than just a good integration of LEDs − it is a new type of powerful light source, based on a proprietary material that emits its own SWIR light, making it possible to reveal invisible phenomena to SWIR cameras that usual LED systems could not.

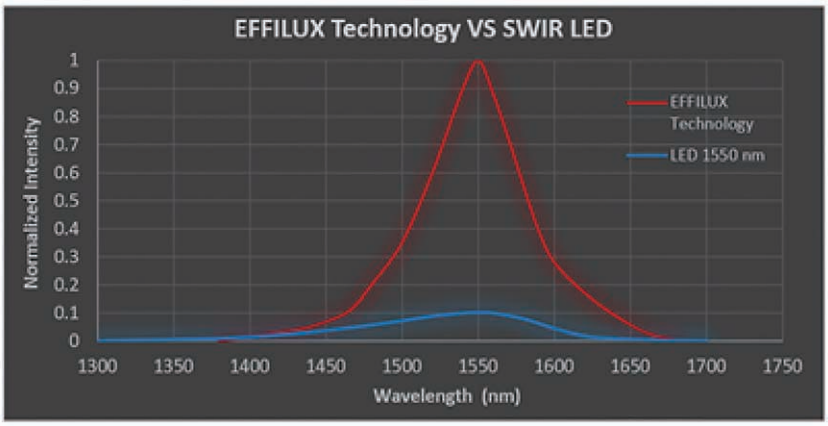


Figure 6 – Intensity comparison between EFFILUX technology and SWIR LED 1550 nm

Now, there is no need to drastically increase the camera's integration time to get a good image. This combination of SWIR sensor and the EFFILUX H.O.P. Technology provides greatly enhanced contrast – the key in all machine vision applications, even for high-speed inspection tasks.

Better yet, to achieve the same output power, many expensive SWIR LEDs can be replaced by a single H.O.P. "chip", resulting in lower costs for system builders using SWIR illumination.

Advantages of H.O.P. Technology

The H.O.P. Technology retains all the advantages of LEDs compared to halogen or laser sources, with a huge improvement in power and the flexibility to create both highly focused SWIR beams as well as large area uniform SWIR illumination. In fact, one “chip” of the H.O.P. Technology emits a luminous flux comparable to a 50 W halogen source.

These properties make it very easy and convenient to integrate into a machine vision system:

- This technology has a great lifetime, around 50000 hours
- No excessive warm up
- Using an adequate cooling system, the H.O.P. Technology offers a perfect stability and reliability, which is crucial for repetitive tasks and measurements, and especially for calibration systems.
- Its LED-based technology makes this source speckle-free
- Quick pulse is also possible thanks to its quick response time, unlike the long wait needed to switch the light on again with halogen sources
- This technology is very compact - so it can be integrated into very compact products
- Its energy efficiency allows a low power consumption
- Fully safe for human eyes
- Adjustable to extreme conditions: thermal, vibration, humidity…

Although conventional SWIR LEDs still offer the benefits of LED technology, they are usually weaker and can only achieve output power in the mW range. Increasing the number of LEDs is a potential solution but is expensive and still does not compare to halogen in terms of power.

Practical applications

SWIR illumination is an emerging technology that requires different thinking than for visible light sources. A thorough understanding of the fundamental optical challenges and new methods for developing effective light sources, including the use of novel materials and processes, is essential.
The H.O.P. Technology can be integrated into all EFFILUX standard illumination systems, offering an extensive range of SWIR lighting solutions, including area & line scan imaging, backlight, dome light, ring light, bar light, and any other LED lighting systems commonly used in SWIR camera applications.
As one example, this powerful SWIR light engine has been combined into a complex optical projector, resulting in the most powerful, sharp and homogenous SWIR pattern projector on the market.

Figure 7 – SWIR H.O.P. pattern projector

This is a very unique product because of its optical performance and its flexibility. Users can project any pattern they want and illuminate objects from short working distances (focused light) to far working distances (5 meters).

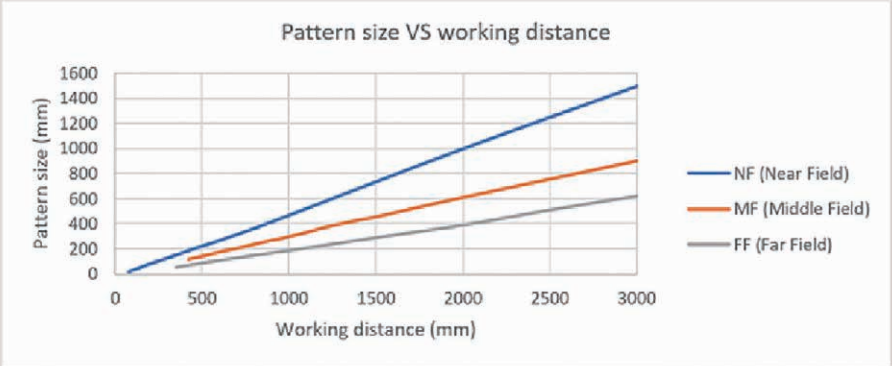


Figure 8 – Spot pattern size and related working distance

Here is a comparison between a projector with a standard LED and H.O.P. Technology. This clearly demonstrates the advantages of the H.O.P. Technology vs. any design based around SWIR LEDs only.

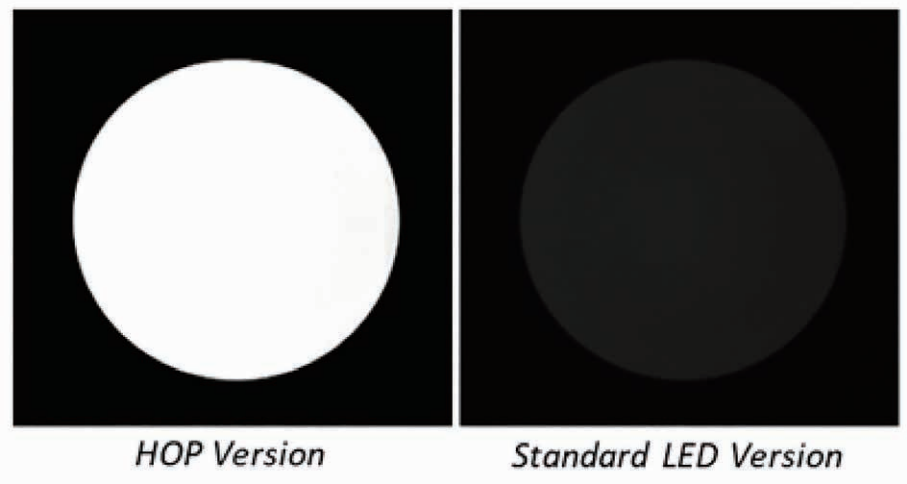


Figure 9 – Comparison of spot pattern based on H.O.P. Technology, made with an InGaAs Camera at the same exposure time

This novel technology opens up new opportunities across many applications and industries, including: Water detection for agriculture, F&B, medical and biotech industry, opaque materials inspection (plastics, silicon, solar cells etc), fill level, security, imaging in harsh environments such as smoke, fog, and dust, and many more.

For further information on H.O.P. Technology, please contact your local CCS representative.

INTELLIGENT LIGHTING FOR INDUSTRY 4.0

Intelligent lighting (smart lighting) brings benefits to various machine vision applications by enabling lighting, cameras and imaging software to be integrated within an easy, plug & play platform and process. They also provide the necessary lighting data which is important for Industry 4.0 systems - indicating factors such as lighting status, performance and lifetime information.
Thanks to advanced CCS technology, lighting solutions for machine vision image processing have become even simpler, flexible and efficient. Allowing for the significant variety of different application demands in machine vision, CCS has developed levels of intelligent lighting functions from which users can choose - from easy connection to automation systems for basic lighting connectivity and data, through to GenICam compatible systems with intensity feedback for high precision applications.

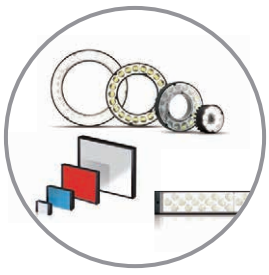
Why use Intelligent Lighting?

Intelligent lighting functionality provides the essential ease of use for the implementation and development of lighting within machine vision systems. Along with the need for machine vision systems to offer ever increasing inspection performance, the demands on lighting technology are also developing at a rapid pace – in parallel to this, intelligent lighting functions are making the use of this increased illumination capability very accessible and straightforward to implement. The key advantages of intelligent lighting can therefore be summarised as:

- **Integration of camera and lighting within one machine vision environment**
  One environment, with open technology, for set-up and development of Lighting, Cameras and Imaging Software
- **Ease of use, Plug & Play**
  Easy connectivity and safe implementation of advanced lighting control functions such as strobing and overdriving
- **Lighting data for Industry 4.0**
  Essential lighting data such as intensity levels and lifetime for predictive maintenance and diagnostics

One development environment for Lighting, Cameras and Imaging

Open network standards for ease and flexibility of implementation



Easy connectivity of lighting and safe development of advanced control

3 levels of lighting integration from CCS
aligned to users application requirements

01 **CCS Fastus**
GenICam compatible illumination with intensity feedback for high precision applications

02 **triniti**
Open protocol lighting & control system for easy camera and software integration

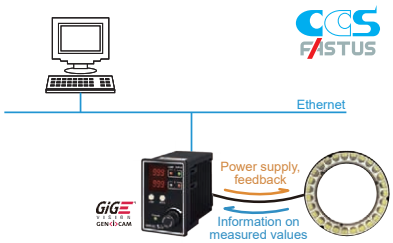
03 **CN Series**
Easy connection in automation systems for lighting setup, control and maintenance

CCS FASTUS

GenICam compatible illumination with intensity feedback for high precision applications

For specialist applications requiring guaranteed illumination levels, CCS FASTUS technology offers a whole new level of machine vision lighting solutions with sensing, monitoring and feedback functions - realizing stable and reliable inspection. It also guarantees lighting intensity and integrates with GenICam for Industry 4.0 maintenance and performance data.

- **Optimum uniformity**
- **Precise accuracy & stability**
- **Consistent intensity over time**

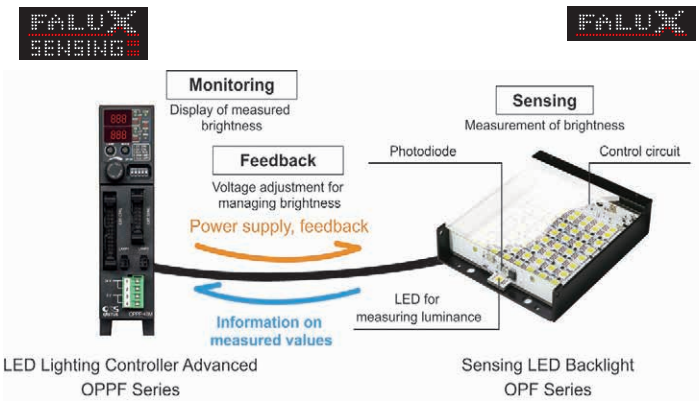


This technology is ideal for applications which demand minimal variance in illumination levels over time, for example in the Glass, Semiconductor, Pharmaceutical and Microscopy sectors. Brightness can be monitored using the built-in photodiodes by connecting a CCS FASTUS Series LED lighting controller, and this allows for accurate measurement of LED brightness even with short period illumination (monitoring of internal temperatures is also possible) - all information being seamlessly available via GenICam for integration with Cameras, Imaging Software and diagnostic systems.

How CCS FASTUS intelligent lighting technology delivers guaranteed illumination intensity

At the heart of CCS FASTUS intelligent LED lighting is FALUX and FALUX Sensing technology – unique, patented lighting control and illumination feedback functions which provide the necessary intelligence to drive the high performance, accuracy and stability of CCS FASTUS illumination systems for Machine Vision.

- **Feedback-Brightness maintenance**
  Brightness is automatically adjusted to maintain initial settings.



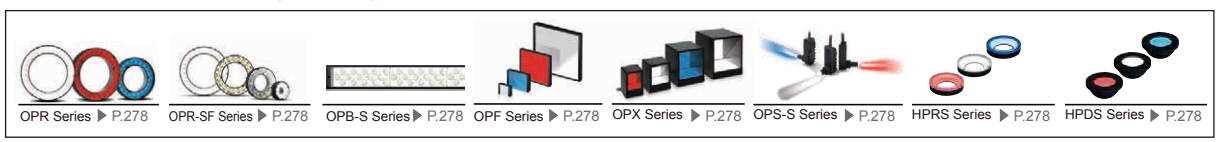
Built-in FALUX circuit to correct variations in brightness

Using constant current circuitry dependent on the input voltage, variations in the forward current of individual LEDs are corrected for uniform brightness. Meanwhile, the temperature compensation circuit compensates for fluctuations in brightness due to increases in operational or ambient temperature.

Equipped with FALUX Sensing for monitoring light brightness and temperature

LED brightness sensing is performed using multiple built-in photodiodes. This allows for accurate measurement of LED brightness not only during continuous illumination but also with short period illumination.

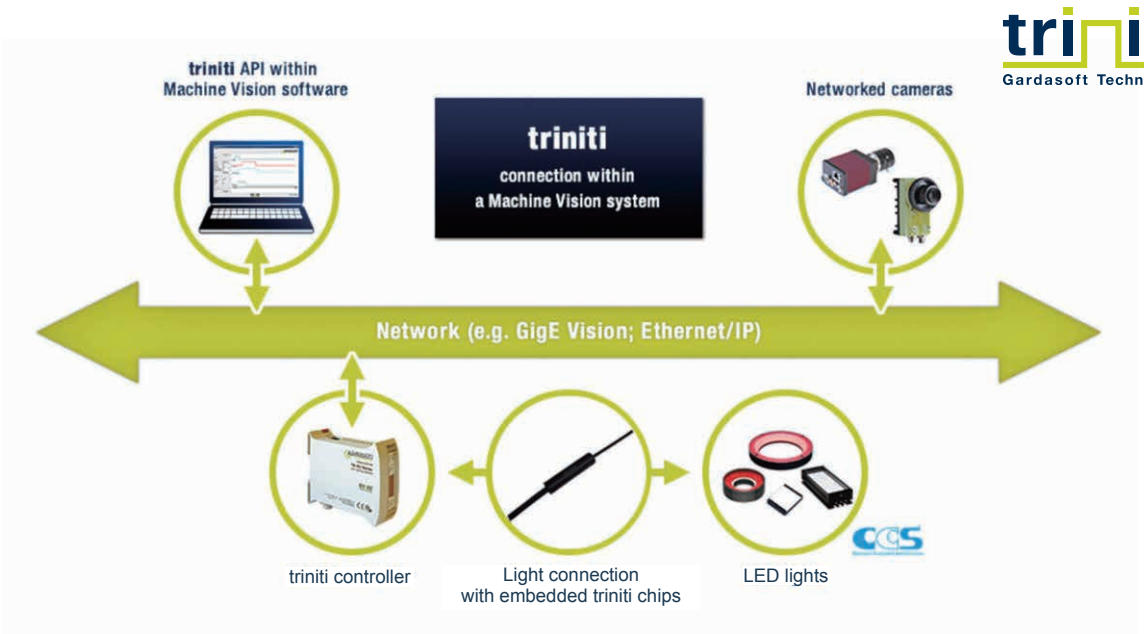
CCS FASTUS lighting models



triniti

Open protocol lighting & control system for easy camera and software integration

For high precision lighting applications, triniti™ is a new, enabling technology from our group company Gardasoft, which provides expert control, operational intelligence and full integration of Machine Vision Lighting, all within a 'plug-&-play' environment.
With triniti, Machine Vision systems with LED Lighting are now much easier to create, configure and commission, while at the same time offering increased functionality. This is because complex control techniques have now been made very easy to implement.



Key benefits at a glance:
- **Enables non-expert users to use expert Machine Vision lighting techniques**
- **Revolutionises the integration of lighting parameters right through to application level software**
- **Addresses the industry's identified need for a highly flexible system that is also readily 'plug-&-play'**
- **Provides a long-term stability of brightness that helps to enhance the reliability of Machine Vision systems over many years**

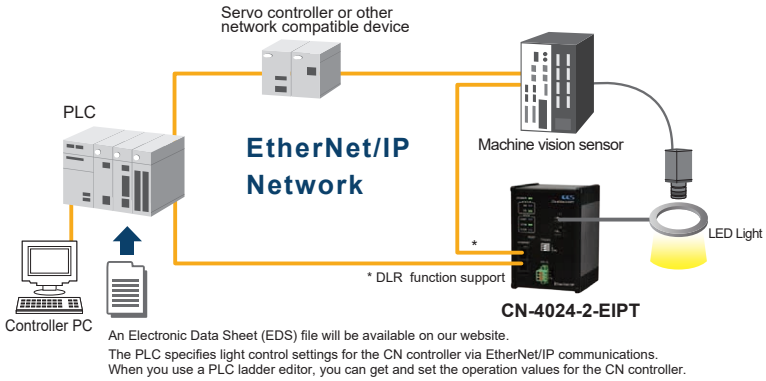
Compatible CCS lighting models for triniti

CCS Intelligent Lighting systems can be easily selected. The following CCS lighting ranges have the triniti Intelligent Lighting functionality available as standard (other CCS models can have this added as a 'custom fit' option).

CN Controllers

Easy connection in automation systems via Ethernet/IP for lighting set-up, control and maintenance

Where the user requires easy connection between their automation and inspection systems, the CCS CN controllers provide the ideal connectivity via EtherNet/IP networks. Conforming to ODVA Composite Conformance Test Revision CT15, these controllers provide a true smart device for the IoT era.
The following lighting values are available via the Ethernet/IP network for either set-up, operational or diagnostic purposes:



An Electronic Data Sheet (EDS) file will be available on our website.
The PLC specifies light control settings for the CN controller via EtherNet/IP communications.
When you use a PLC ladder editor, you can get and set the operation values for the CN controller.

Accumulated trigger count, accumulated lighting duration, and error status
In addition, users can set and check the following values:

- Lighting mode, trigger logic, ON/OFF setting for the light unit, light intensity, strobe time, and lighting delay

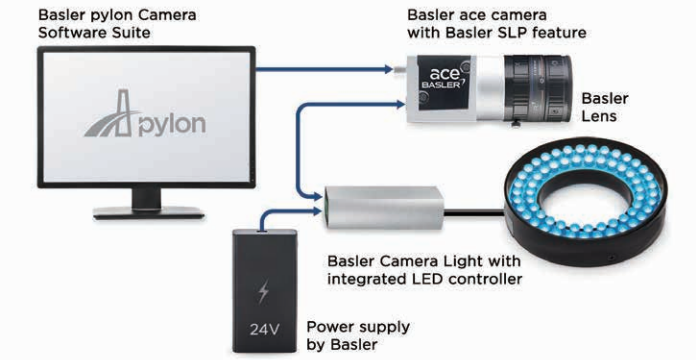
The CN controller also provides TCP/IP commands for the same operations.

CameraLight

OEM plug & play system for easy integration of lighting and cameras in one environment

The Basler Camera Light system is a new intelligent lighting system, powered by CCS. It provides easy camera synchronization, light strobing and overdrive.

BASLER powered by CCS



Simple and cost-optimized

- **Ease of use**
- Plug & Play thanks to harmonized components (camera + light + cables)
- 1 software for configuration via Basler pylon Camera Software Suite
- 1 power supply only
- **Illumination inclusive LED controller**
- Communication between lighting and camera via **Basler SLP feature**
- Parameterization of light and camera via just one interface
- Automatic timing for strobing operation

It consists of a comprehensive series of lighting which is compatible with the Basler SLP intelligent lighting concept. Jointly developed by both Basler and CCS, the world's leading camera and lighting manufacturer for machine vision applications, it offers the maximum ease of use and great cost performance.
In addition, the Basler pylon Camera Software Suite provides one configuration environment for both camera and lighting, and all parameterization of lights and camera is done via just one interface - including automatic timing for strobing and overdriving.

M12 Connector and Flying Leads Light Unit Cables Are Now Available

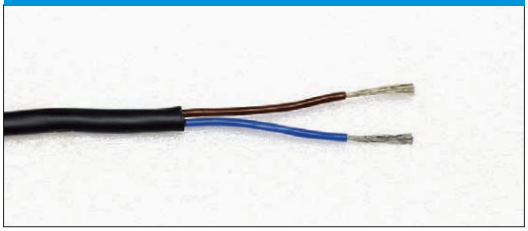
SM connectors are used for the light unit cables of CCS's standard light unit.

Now You can choose

4-pin M12 Socket Connectors

Note: This connector cannot be used for the light units with a power consumption of more than 65 W.

Flying Leads



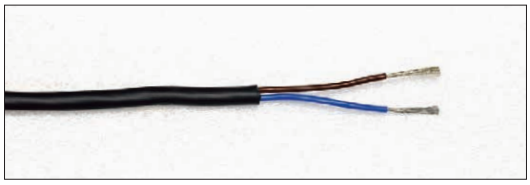
These specifications are provided for custom production. Please order with the model name notation given below.

Specifications

4-pin M12 Socket Connectors

Model	Standard model name + " **-M12** "
Cable Length	300 mm
Polarity & Signal	1: (+ 24 VDC) 2: No Connection 3: (- GND) 4: No Connection

Flying Leads



Model	Standard model name + " **-FL** "
Cable Length	2,000 mm
Polarity & Signal	Anode(+)Brown / Cathode(-)Blue

For example, to order LDR2-32RD2 with an **M12** connector attached, specify the model name as "LDR2-32RD2-**M12**".

Applicable Products

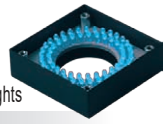
These specifications are applicable to the standard products shown below.

▶P.31
Ring Lights
LDR2

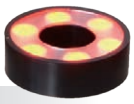
▶P.35
Low-angle Ring Lights
LDR2-LA

▶P.39
Low-angle Ring Lights
LDR-LA1

▶P.43 ▶P.44
Ring Lights / Low-angle Ring Lights
SQR / SQR-TP

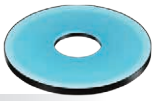


▶P.45
Ring Lights
HLDR3



▶P.47
Ring Lights
HPR2

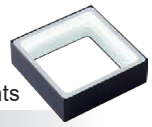
▶P.51
Ring Lights
LFR



▶P.53
Ring Lights
LKR

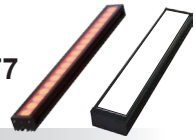
▶P.55
Low-angle Ring Lights
FPR

▶P.57
Low-angle Square Lights
FPQ3

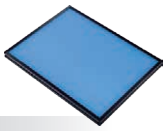


▶P.61
Bar Lights
LDL2

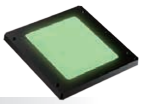
▶P.73 ▶P.77
Bar Lights
HLDL3 / LB



▶P.85
Flat Lights
TH2



▶P.101
Flat Lights
LFL



▶P.105
Dome Lights
HPD2

▶P.109
Dome Lights
LDM2

▶P.111
Dome Lights
LAV

▶P.112
Dome Lights
PDM

▶P.113 ▶P.119 ▶P.125
Flat Dome Lights
LFXV / LFX3 / LFX3-PT

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LFV3

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IR Series Over 1000-nm Type

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▶P.192
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▶P.223
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LN / LN-HK

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LND2

▶P.237
Line Coaxial Lights
LNV

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LED Lights

Direct Lighting

LED color: ● Red, ○ white, ● blue, ● green, ● violet, ● UV, ● IR

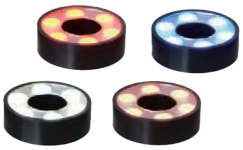
Does not include made-to-order models. The features and applications listed do not apply to certain models.

LED Lights

Convergent Lighting

Ring Lights
Ring lights using condenser lens suitable for long-distance illumination
P.45

HLDR3 Series
For wide-area, long-distance, and robot picking inspections
- Applications: Exterior inspection of circular workpieces, metal parts, etc.
- 12 models
- LED colors: ● ○ ● ●



Diffused Lighting

Ring Lights
Achieves a uniform region with a high degree of freedom by using a unique illuminating mechanism
P.47

HPR2 Series
For inspection for damage or stains, visual inspection, and color determining inspection
- Applications: High angle uniform illumination and inspection via feature extraction on low-angle, etc.
- 28 models
- LED colors: ● ○ ● (Full color: ● ● ●)

Ring Lights
Diffused illumination from a flat emitting surface
P.51

LFR Series
For character recognition, text inspection, and color determining inspection
- Applications: Inspection for parts mounted on circuit boards and surface inspection for metal parts, etc.
- 23 models
- LED colors: ● ○ ● ●

Ring Lights
Provides diffused light from an angled emitting surface
P.53

LKR Series
For character recognition and inspection for stains or dents
- Applications: Soldering inspection, product identification inspection in color determination, and inspection for stains on a glossy surface, etc.
- 12 models
- LED colors: ● ○ ● ●

Low-Angle Ring Lights
Provides diffused light at a low angle from an angled emitting surface
P.55

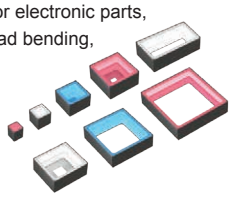
FPR Series
For edge extraction, inspection for engraved characters, and character recognition
- Applications: Edge extraction of metal parts and character recognition on electronic parts, etc.
- 12 models
- LED colors: ● ○ ● ●

LED Lights

Diffused Lighting

Low-Angle Square Lights
Provides diffused light at a low angle from four directions
P.57

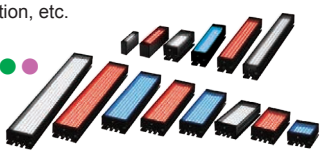
FPQ3 Series
For visual inspection, character recognition, and inspection for fragments or stains
- Applications: Visual inspection for electronic parts, character recognition, pin and lead bending, and inspection for stains, etc.
- 24 models
- LED colors: ● ○ ●



Direct Lighting / Convergent Lighting

Bar Lights
Provides direct light from an emitting part equipped with LEDs in straight lines
P.61

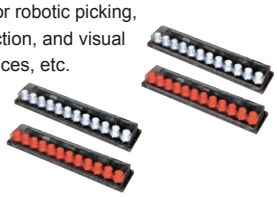
LDL2 Series
For damage and visual inspection, and text reading
- Applications: Damage inspection of metal with hairline finishing, and foreign material and detection inspection, etc.
- 141 models
- LED colors: ● ○ ● ● ●



Bar Lights
Bar light with built-in controller, perfect even for large workpieces
P.69

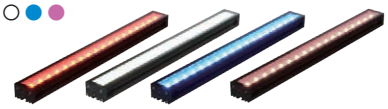
LDLB Series
<Lineup with Waterproof Types>

For product identification inspection, and visual inspection
- Applications: Light source for robotic picking, product identification inspection, and visual inspection for large workpieces, etc.
- 4 models
- LED colors: ● ○



Bar Lights
Robust lineup of bar lights suitable for long-distance illumination
P.73

HLDL3 Series
For product identification inspection, visual inspection, and dimension measuring
- Applications: Large workpiece exterior inspection, etc.
- 144 models
- LED colors: ● ○ ● ●

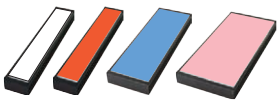


Diffused Lighting

Diffused Bar Lights
Produces uniform diffuse light that can be used for backlighting and direct reflected light observation
P.77

LB Series
New

For visual inspection, damage, or dent inspection, foreign material inspection, Liquid surface inspection
- Applications:
  Inspection of uneven surface, foreign material inspection, Backlight inspection, etc.
- 338 models
- LED colors: ● ○ ● ●



LED color: ● Red, ○ white, ● blue, ● green, ● violet, ● UV, ● IR

Does not include made-to-order models. The features and applications listed do not apply to certain models.

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LED Lights

Diffused Lighting

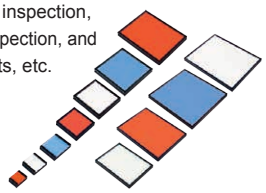
Flat Lights
Diffused illumination from a flat emitting surface

P.85

TH2 Series High-Luminance Type

For dimension measuring and foreign material inspection

- Applications: Liquid surface inspection, pinhole inspection, visual inspection, and burr inspection for metal parts, etc.
- 33 models
- LED colors: ● ○ ●



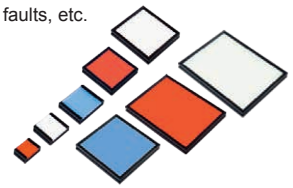
Flat Lights
Provides a diffused light of high-directivity

P.89

TH2-PM Series High-Directivity Type

For dimension measuring and visual inspection

- Applications: Dimension measuring, visual inspection, and inspection for stains and faults, etc.
- 24 models
- LED colors: ● ○ ●



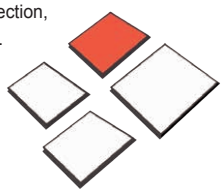
Flat Lights
Flat light suitable for large workpieces

P.93

TH2 Series Large Type

For visual inspection and foreign material inspection

- Applications: Inspection of liquid surface level in large workpiece, visual inspection, and foreign material inspection, etc.
- 8 models
- LED colors: ● ○



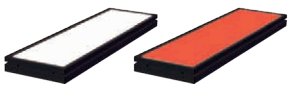
Flat Lights
Applicable to inspection of rectangular workpieces and imaging with a line sensor camera

P.95

TH2 Series Rectangular Type

For visual inspection and foreign material inspection

- Applications: Visual inspection of rectangular and fault inspection of sheet-shaped workpieces, etc.
- 2 models
- LED colors: ● ○



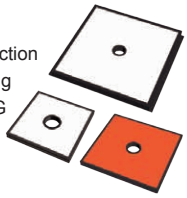
Flat Lights
A flat emitting surface provides a light from the same axis as the camera

P.97

TH2-CR Series Camera-Window Type

For visual inspection and foreign material inspection

- Applications: Visual inspection, inspection for foreign material and stains, reading engraved text, and inspection of FIPG material on metal components, etc.
- 6 models
- LED colors: ● ○



LED Lights

Diffused Lighting

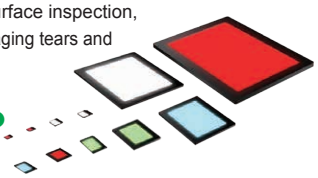
Flat Lights
Diffused illumination from a flat emitting surface

P.101

LFL Series

For dimension measuring, visual inspection, and foreign material inspection

- Applications: Liquid surface inspection, visual inspection, packaging tears and stain inspection, etc.
- 43 models
- LED colors: ● ○ ● ●



Dome Lights
Provides diffused light evenly through the dome-shaped reflective panel

P.105

HPD2 Series

For visual inspection, color determination inspection, and inspection for stains

- Applications: Visual inspection for glossy surfaces, curved surfaces or uneven surfaces, text inspection, color determination inspection, engraved character inspection, inspection for damage or stains, etc.
- 30 models
- LED colors: ● ○ ● ● (Full color: ● ● ●)

Dome Lights
Provides diffused light from a cone-shaped emitting surface

P.109

LDM2 Series

For visual inspection, color determination inspection, and text inspection

- Applications: Visual inspection for glossy surfaces, curved surfaces or uneven surfaces, text inspection, color determination inspection, soldering inspection, etc.
- 8 models
- LED colors: ● ○ ● ●

Dome Lights
Provides diffused light evenly using a mechanism that combines a diffused lighting and a coaxial lighting

P.111

LAV Series

For character recognition, text inspection, and dimension measuring

- Applications: Inspection for faulty plating, inspection of a sealed target, and inspection for foreign material attached to a glossy surface
- 4 models
- LED colors: ● ○ ● ●

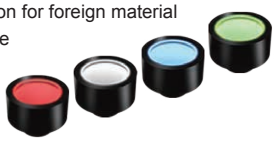
Dome Lights
Mechanism that combines a diffused lighting, coaxial lighting, and low-angle lighting

P.112

PDM Series

For character recognition, text inspection, and dimension measuring

- Applications: Inspection for faulty plating, inspection of a sealed target, and inspection for foreign material attached to a glossy surface
- 4 models
- LED colors: ● ○ ● ●



LED color: ● Red, ○ white, ● blue, ● green, ● violet, ● UV, ● IR

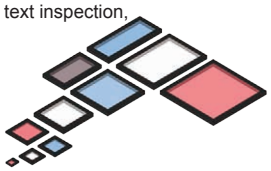
Does not include made-to-order models. The features and applications listed do not apply to certain models.

LED Lights

Diffused Lighting

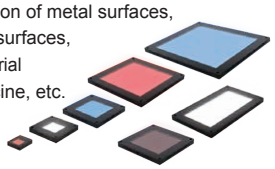
Flat Dome Lights
Recreates the effect of a Dome Light with a thin case design P.113

LFXV Series
For visual inspection, text inspection, foreign material inspection, and character recognition
- Applications: Visual inspection of metal surfaces, curved surfaces or uneven surfaces, text inspection, foreign material inspection of food and medicine, etc.
- 40 models
- LED colors: ● ○ ● ●



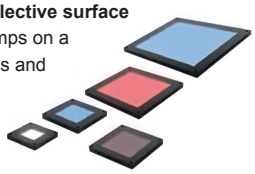
Flat Dome Lights
Recreates the effect of a Dome Light with a thin case design P.119

LFX3 Series
For visual inspection, text inspection, foreign material inspection, and character recognition
- Applications: Visual inspection of metal surfaces, curved surfaces or uneven surfaces, text inspection, foreign material inspection of food and medicine, etc.
- 28 models
- LED colors: ● ○ ● ●



Line Pattern Lights
A cutting-edge method for inspecting bumps on a reflective surface P.125

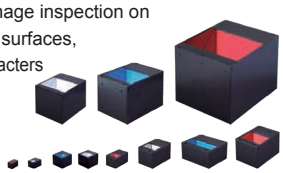
LFX3-PT Series
For inspecting bumps on a reflective surface
- Applications: Inspection for bumps on a mirror, metal sheets, films, glass and liquid crystal, etc.
- 40 models
- LED colors: ● ○ ● ●



Diffused Lighting

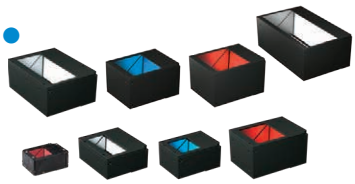
Coaxial Lights
Provides diffused light evenly from the same axis as the camera P.127

LFV3 Series
For faults or damage inspection, engraved character inspection, and dimension measuring
- Applications: Faults or damage inspection on glossy surfaces and mirror surfaces, inspection for engraved characters and dents, etc.
- 33 models
- LED colors: ● ○ ●



Coaxial Lights
Equipped with a slim half mirror to support imaging using high-resolution cameras P.133

LFV3-G Series
For faults or damage inspection, engraved character inspection, and dimension measuring
- Applications: Faults or damage inspection on glossy surfaces and mirror surfaces, inspection for engraved characters and dents, etc.
- 24 models
- LED colors: ● ○ ●

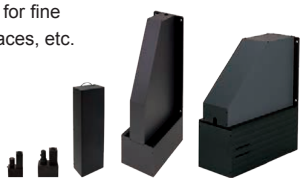


LED Lights

Collimated Lighting

Coaxial Lights
Provides diffused light with high parallelism using original lighting technology P.137

MSU Series
For damage inspection, character recognition, inspection for dents or stain
- Applications: Inspection for fine damage on glossy surfaces, etc.
- 13 models
- LED colors: ● ○ ● ●



Coaxial Lights
Provides diffused light with high parallelism using original lighting technology P.141

MFU Series
For visual inspection and dimension measuring
- Applications: Detailed visual inspection and dimension measuring, etc.
- 4 models
- LED color: ●

Strobe Lighting

High Power Strobe Lights
Extremely powerful strobe lighting P.143

PF Series
New

For inspection of fast moving production lines
- Applications: Visual inspection using extremely powerful strobe lighting for minuscule chip components, etc.
- 76 models
- LED colors: ● ○

Waterproof

IP67 Lights (Waterproof Type)
Waterproof Lights for use in harsh environment P.155

HLDR-IP Series
For fault inspection and visual inspection
- Applications: Fault inspection for metal parts, visual inspection for rubber parts, and adhesive application inspection (UV), etc.
- 7 models
- LED colors: ● ○ ● ●

HSL-PCL Series
For fault inspection and visual inspection
- Applications: Fault inspection and visual inspection, etc.
- 4 models
- LED colors: ● ○ ● ●

LED color: ● Red, ○ white, ● blue, ● green, ● violet, ● UV, ● IR

Does not include made-to-order models. The features and applications listed do not apply to certain models.

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LED Lights

Other Products

Small COB Lights
The unique optical design achieves space-saving lighting
P.160

CBT Series
For narrow spaces and auxiliary light sources
- Applications: Various visual inspections, auxiliary light sources, etc.
- 8 models
- LED colors: ○ ● ● ●

*This is a custom order product.

Ultraviolet / Violet Lighting

Ultraviolet / Violet Lights
High-power ultraviolet / violet lights with four wavelengths for use in a wide range of applications
P.161

UV3 / VL3 Series
For fluorescent observation
- Applications: Special ink observation, deep magnetic particle scratch inspection, etc.
- 68 models
- LED colors: ● ●

Ultraviolet Lights
Varied Light Unit lineup using original UV-LEDs
P.167

UV Series
For fluorescent observation
- Applications: Reading invisible codes, etc.
- 31 models
- LED color: ●

Ultraviolet / Violet Line Lights
High-power ultraviolet / violet line lights with four wavelengths for use in a wide range of applications
P.169

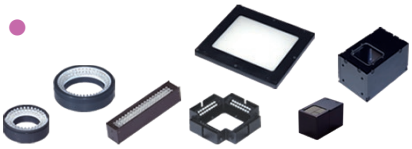
LNSP-UV3 / VL3-FN Series
For fluorescent observation
- Applications: Inspection for detecting seal material through fluorescent excitation, etc.
- 24 models
- LED colors: ● ●

LED Lights

Infrared Lighting

Infrared Lights (Under 1000-nm Type)
Varied Light Unit lineup using IR-LEDs
P.171

IR2 Series
For visual inspection and foreign material inspection
- Applications: Inspection of targets through liquid, etc.
- 36 models
- LED color: ●



Infrared Light (Over 1000-nm Type)
Diverse lineup of lights that uses high-power infrared LEDs
P.177

IR Series
Lineup of 6 wavelengths: 1050 nm, 1200 nm, 1300 nm, 1450 nm, 1550 nm, 1650 nm
- Applications: Internal observation by transmission, water content inspection, etc.
- 48 models
- LED color: ●

Near infrared / Hyperspectral imaging light
High-power light compatible with near-infrared and hyperspectral cameras
P.181

CIR Series
For visual inspection, foreign matter inspection, and imaging using a hyperspectral camera
- Applications: Internal observation by transmission, water content inspection, etc.
- 3 models

*This is a custom order product.

Intensity Control

Light Units with Intensity Control Unit
Light intensity and light ON/OFF control can be performed without an external controller
P.183

IU Series
For fault inspection and visual inspection
- Applications: Fault inspection and visual inspection, etc.
- 117 models
- LED colors: ● ○

LED color: ● Red, ○ white, ● blue, ● green, ● violet, ● UV, ● IR

Does not include made-to-order models. The features and applications listed do not apply to certain models.

Spot Lighting, Etc.

Spot Light
Provides high output spot lighting using an original optical design
P.185

HLV3 Series
As a light source for telecentric lenses, etc.
- Applications: Light source for dimension measuring and light source for spot lights, etc.
- 45 models
- LED colors: ● ○ ● ● ●

Spot Lights
Provides spot lighting using original converging technology
P.191

LV Series
As a light source for a telecentric lens
- Applications: Light source for dimension measuring and light source for spot lights, etc.
- 4 models
- LED colors: ● ○ ● ●

Spot Lights
Provides spot lighting from an emitting surface of Φ33 mm
P.192

LSP Series
For character recognition, visual inspection, and position inspection
- Applications: Light source for spot lights, etc.
- 1 model
- LED color: ●

Micro Fiber Heads
LED fiber light system that uses original converging technology
P.193

HFS / HFR Series
For visual inspection, character recognition, and dimension measuring
- Applications: Alignment mark imaging, etc.
- 1 model (straight) / 3 models (ring type)
- LED color: Depends on the light source color

Micro Fiber Head Dedicated Light Sources
Provides high output spot lighting using an original optical design
P.195

HLV3-22-4-NR Series
Allows for easy installation and removal
- Usage: Dedicated light source for the micro fiber head
- 4 models
- LED colors: ● ○ ● ●

Spot Lighting, Etc.

Micro Fiber Head Dedicated Light Sources
Provides high-output spot lighting using an original optical design and converging technology
P.196

HLV3-3M-RGB-4
Can perform stepless independent intensity control for red, blue, and green light sources
- Usage: Dedicated light source for the micro fiber head
- 1 model
- LED color: Depends on the light source color

High-Power Light Sources

High-Power Light Sources
Next-generation light sources delivering high output and a fast response
P.197

PFBR-600 Series
New

LED light source that can replace a xenon flash light source
- Applications: Used connected to various light guides
- 6 models
- LED color: ○

Table of Contents

LED color: ● Red, ○ white, ● blue, ● green, ● violet, ● UV, ● IR

Does not include made-to-order models. The features and applications listed do not apply to certain models.

LED Lights

LED Light Sources and Light Guides

LED Light Sources
Provides light output that exceeds that of a 250 W metal halide light source

P.201

PFBR-150 Series
LED light source that can replace a 250 W metal halide light source
- Applications: Used connected to various light guides
- 1 model
- LED color: ○

LED Light Sources
Provides light output that exceeds that of a 100 W halogen light source

P.203

PFB3(A) Series
LED light source that can replace a 100 W halogen light source
- Applications: Used connected to various light guides
- 64 models
- LED color: ○

Convergent Lighting

Line Lights
Over 1,000,000 lx illuminance and fan-less cooling design

P.207

LNLP Series
For visual inspection, damage or dent inspection, and foreign material inspection
- 30 models
- Emitting surface: Up to 3,000 mm in 100 mm units.
- LED color: ○

Line Lights
Light unit design optimized for inspection site

P.211

LNSP2 Series
For visual inspection, scratch inspection, foreign material inspection, and stain inspection
- 60 models
- Emitting surface: Up to 3,000 mm in 100 mm units.
- LED color: ○

LNSP2 Dedicated Coaxial Units
Used as a Coaxial Light installed to the Line Light

P.217

CU-LNSP2 Series
Dedicated Coaxial Units those are designed for use with the LNSP2 Series
- 5 models
- Emitting surface: Up to 500 mm in 100 mm units.

LED Lights

Convergent Lighting

Line Lights
Uses original converging technology to achieve illumination with reduced diffusion

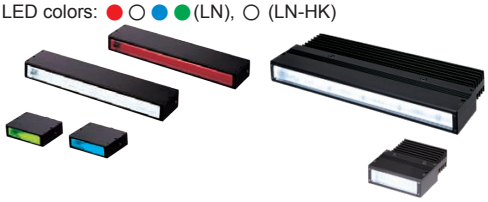
P.219

LNSP-FN Series
For visual inspection, scratch inspection, and alignment inspection
- 30 models
- Emitting surface: Up to 3,000 mm in 100 mm units.
- LED color: ○

Line Lights
Uses original converging technology to achieve illumination with reduced diffusion

P.223

LN / LN-HK Series
For visual inspection and fault inspection
- 8 models (LN), 2 models (LN-HK)
- Emitting surface: 60 mm, 200 mm
- LED colors: ● ○ ● ● (LN), ○ (LN-HK)



LED color: ● Red, ○ white, ● blue, ● green, ● violet, ● UV, ● IR

Does not include made-to-order models. The features and applications listed do not apply to certain models.

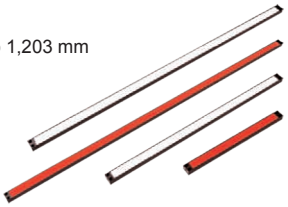
Diffused Lighting

Line Lights
Provides diffused light from an emitting surface equipped with LEDs in a straight line
P.225

LNSD Series (High luminance and high uniformity types)
For fish eye, damage, or dent inspection, foreign material inspection, and stain inspection
- 180 models
- Emitting surface: Up to 3,000 mm in 100 mm units.
- LED colors: ● ○ ●

Line Lights
Provides diffused light from an emitting surface equipped with LEDs in straight lines
P.229

LND2 Series
For damage or dent inspection, and foreign material inspection
- 24 models
- Emitting surface: Up to 1,203 mm in 100 mm units.
- LED colors: ● ○



Line Lights
Provides diffused light evenly using an original optical design
P.233

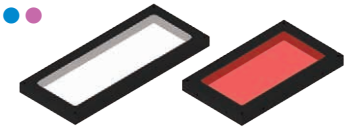
LT Series
For fish eye inspection and scratch inspection
- 18 models
- Emitting surface: Up to 1,800 mm in 100 mm units.
- LED color: ○

Line Coaxial Lights
Provides diffused light from the same axis as the camera
P.237

LNV Series
For fault inspection and stain inspection
- 4 models
- Emitting surface: 300 mm
- LED colors: ● ○ ● ●

Flat Dome Lights
Flat enclosure recreates the dome light effect
P.238

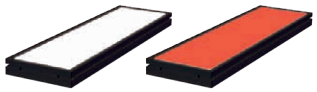
LFXV Series Rectangular Type
For exterior inspections and stain inspections
- Applications: Stain inspections for glossy surfaces, non-woven fabric, etc.
- 8 models
- LED colors: ● ○ ● ●



Diffused Lighting

Flat Lights
Flat lights compatible with line sensor camera applications
P.239

TH2 Series Rectangular Type
For dimension measuring and foreign material inspection
- Applications: Rectangular workpiece exterior inspection, sheet-shaped workpiece defect inspection, etc.
- 2 models
- LED colors: ● ○



Oblique Angled Lighting

Line Lights (Oblique Angled Light)
Achieves angled illumination using an original optical design
P.241

LNDG Series
Vertical wrinkles or striations inspection, folding and bumps inspection, and moving-direction scratch inspection
- 28 models
- Emitting surface: Up to 3,000 mm in 100 mm units.
- LED color: ○

Line Lights (Bi-Directional Angled Light)
Achieves bi-directional angled illumination using an original optical design
P.245

LNIS2 Series
Streak inspection, scratch inspection, and moving-direction scratch inspection
- 10 models
- Emitting surface: Up to 1,000 mm in 100 mm units.
- LED color: ○

Line Lights (Bi-Directional Angled Light)
Achieves bi-directional angled illumination using an original optical design
P.249

LNIS Series
Streak inspection, scratch inspection, and moving-direction scratch inspection
- 10 models
- Emitting surface: Up to 1,000 mm in 100 mm units.
- LED color: ○

Line Lights (Bi-Directional Angled Light)
Best for finding moving-direction scratches
P.253

LNIS-FN Series
Streak inspection, scratch inspection, and moving-direction scratch inspection
- 15 models
- Emitting surface: Up to 1,500 mm in 100 mm units.
- LED color: ○

LED color: ● Red, ○ white, ● blue, ● green, ● violet, ● UV, ● IR

Does not include made-to-order models. The features and applications listed do not apply to certain models.

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LED Lights

Computational Imaging

Computational Imaging
Digital image capture and processing techniques that combine computation and optical encoding.
P.279

Computational Imaging
We describe the principle of operation, product information, and application examples including the following:

Computational Imaging

- High resolution color (RGB)
- Extended Depth of Field (EDOF)
- Bright field + dark field
- High Dynamic Range (HDR)
- Photometric Stereo (PMS)

triniti-enabled LED Lights

triniti-enabled LED Lights
Users benefit from having expert control techniques for their lighting systems readily available.
P.301

triniti-enabled LED Lights
For fault inspection and visual inspection

- Applications: Fault inspection and visual inspection, etc.
- 65 models
- LED colors: ● ○ ●

triniti™ Gardasoft Technology CCS Creating Customer Satisfaction

Lenses

Lenses

High-Resolution Telecentric Lenses
SE-65-M / SE-110-M Series
» P.257

Telecentric Lenses
SE-65 / SE-110 Series
» P.261

Macro Lenses
SE-16 / SE-18 Series
» P.263

Control Units / Controllers

Control Units / Controllers

New
Digital Control Units
PD4 Series
» P.309

Digital Control Units
PD3 Series
» P.317

Digital Control Units
PD2 Series
» P.325

Strobe Overdrive Control Units
POD Series
» P.329

Strobe Overdrive Control Units
PTU2 Series
» P.333

High Power Strobe Control Units
PF Series
» P.335

PoE Enabled Controller
CN-EPOE Series
» P.339

Controller with EtherNet/IP™ Interface
CN-4024-2-EIPT
» P.341

"EtherNet/IP" is a trademark of ODVA, Inc.

Analog Controller
PB-2430-1
» P.343

Compact Controller
CC-ST-1024
» P.345

LED color: ● Red, ○ white, ● blue, ● green, ● violet, ● UV, ● IR

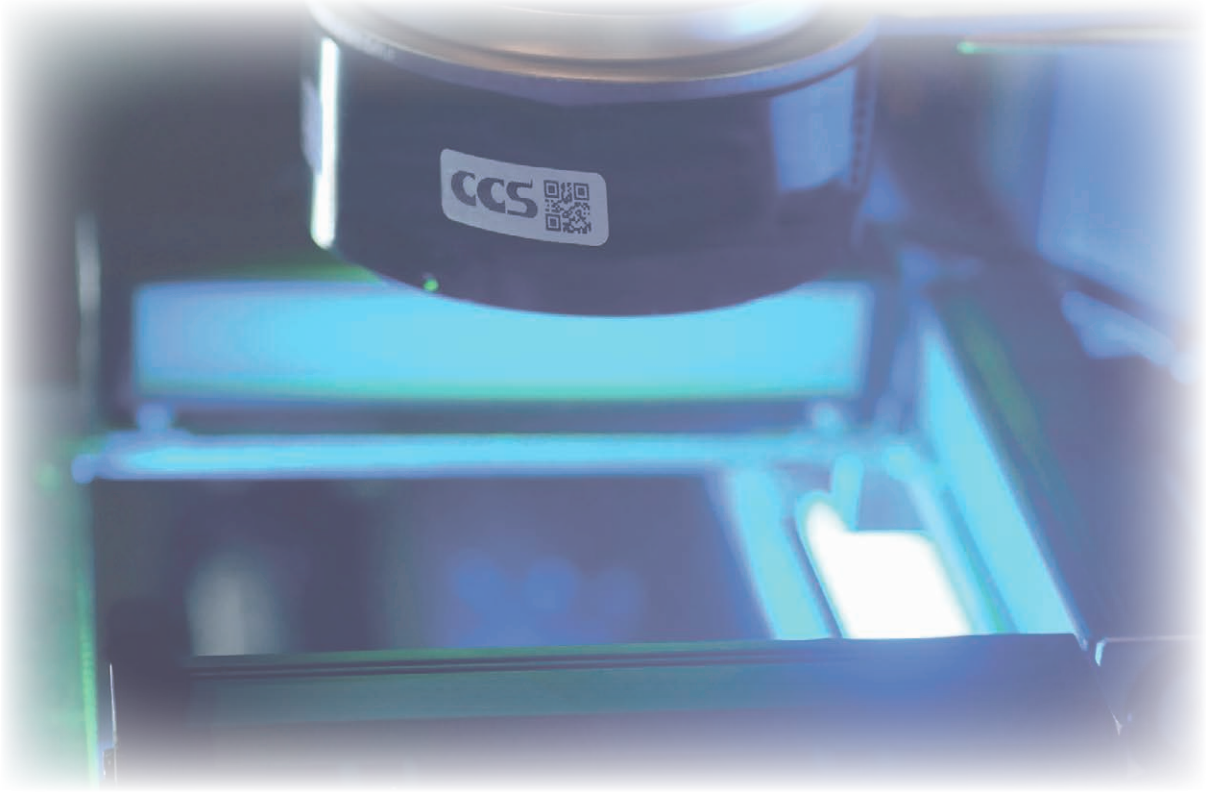
Does not include made-to-order models. The features and applications listed do not apply to certain models.

Control Units / Controllers

Control Units / Controllers

Options

Options



LDR2 Series

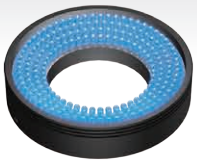
Refer to our website for product details.

CCS LDR2 ▶ Search

Provides direct light from an angled emitting part

LDR2-120SW2

LDR2-90-30RD2



LDR2-90BL2

LDR2-70RD2

LDR2-50GR2

LDR2-42SW2

LDR2-32RD2

Applications	Character recognition, visual inspection, inspections for damage or stains, reading 2-dimensional code, inspecting parts on boards, etc.

Standard Ring Lights

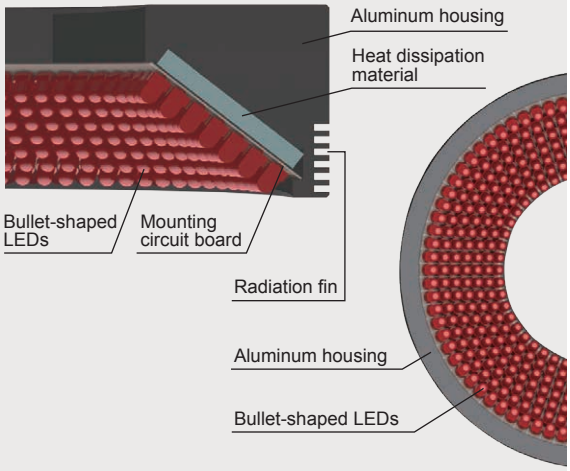
Uses a flexible circuit board to achieve the functions needed for a Ring Light. It can illuminate workpieces at an angle and can illuminate the whole workpiece. This alleviates the influence of slight position or inclination deviations in the workpiece and enables stable imaging.

Flexible circuit board

Succeeds in Greatly Reducing LED's Heat

Heat dissipation material is used between the board and the aluminum housing, absorbing heat produced by the LEDs. This succeeds in greatly reducing the creation of heat, which causes the LEDs to deteriorate.

Cross-section image of the LDR2-120

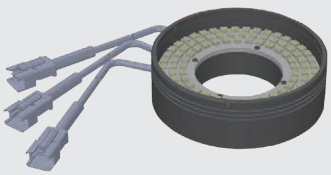


Custom Order Example

Please contact your CCS sales representative.

E.g.: Different color

Wavelength/ Color — Creating a full color (RGB) light unit



Customizable items

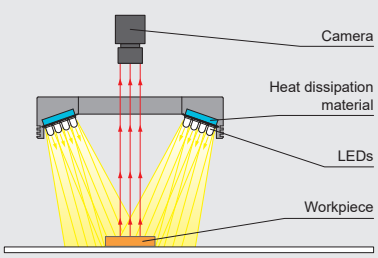
External/internal diameter | Wavelength/ Color | Increase output | Cable length | Illuminating angle | Format/ material | Connector format | Installation/ mounting

Etc.

Example Configuration

Bend the flexible circuit board to any shape necessary and mount LEDs with high density. Illuminates the workpiece so that direct light is concentrated in the center.

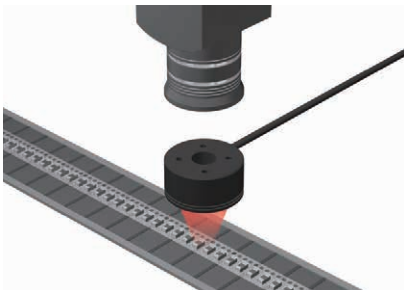
LDR2-90



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Imaging Example: Imaging Electrodes of Electronic Parts

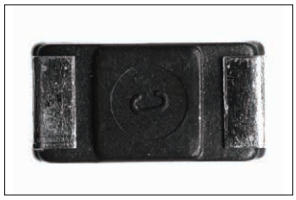


Description	Visual inspection
Workpiece	Electronic parts
Conventional lighting	LED Bar Light
New lighting	LDR2-32RD2
Result	Improved uniformity

■ Workpiece image

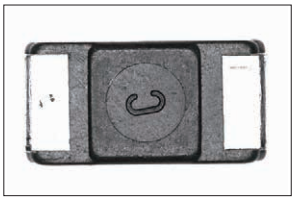
Electronic parts

■ LED Bar Light



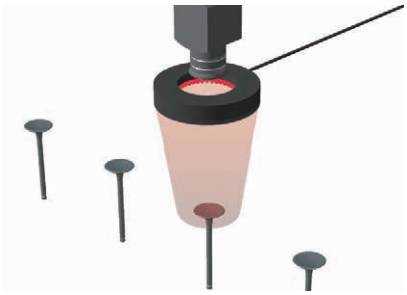
It's difficult to make an image of the electrode part using a Bar Light.

■ LDR2-32RD2



A Ring Light can illuminate the electrode part evenly and make an image.

Imaging Example: Imaging Text on Intake Valves



Description	Character recognition
Workpiece	Intake valves (automobile parts)
Conventional lighting	LED Ring Light
New lighting	LDR2-50RD2
Result	Emphasized characters

■ Workpiece image

Intake valves

■ LED Ring Light

It's difficult to clearly recognize the text due to the inner indentation.

■ LDR2-50RD2

Allows for image that makes the character edges stand out.

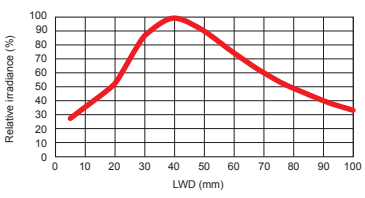
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

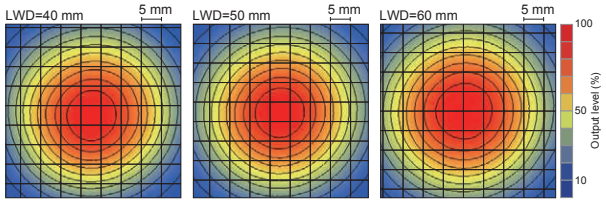
LDR2-50RD2

Relative irradiance graph (LWD characteristics) *1 *2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



LDR2 Series

Refer to our website for product details.

CCS LDR2 ▶ Search

Introduction to Half Ring Lights (Custom Order Example)

LDR2-HF Series

It has a space-saving design that can be installed and used in a limited space

- The contrast can be increased by illuminating only the required parts
- Can be installed in a device with limited space and illuminates the area to be observed in pinpoint
- Can be customized according to the application such as emission color and size

LDR2-50SW2-HF

Custom order products The warranty period of the custom order product is different from that of the CCS standard products. Contact our local sales office for details.

Lineup

End of the model name: -WD: Wide type

Classification	Model Name *1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	GR (Green)	Options	Extension Cables	Recommended Control Units	Weight
Standard products	LDR2-32 □□ 2	24 V	1.6 W	1.9 W	1.9 W	1.9 W	Diffusion Plate, Polarizing Plate, Adapter, Lens attachment ring	FCB*4 Straight Cable, FCB-W*5 2-Branch Cable, FCB-F 4-Branch Cable, FRCB Robot Cable	PD4, PD3, CC-ST-1024, POD*2	30 g
	LDR2-42 □□ 2	24 V	2.1 W	2.7 W	2.7 W	2.7 W	Diffusion Plate, Polarizing Plate, Adapter			50 g
	LDR2-50 □□ 2	24 V	3.1 W	3.8 W	3.8 W	3.8 W	Diffusion Plate, Polarizing Plate, Adapter, Lens attachment ring			50 g
	LDR2-50RD2-WD	24 V	3.1 W	–	–	–				
	LDR2-70 □□ 2	24 V	6.1 W	7.6 W	7.6 W	7.6 W	Diffusion Plate, Polarizing Plate			120 g *RD is 110 g
	LDR2-70RD2-WD	24 V	6.1 W	–	–	–				110 g
	LDR2-90 □□ 2	24 V	11 W	14 W	14 W	14 W	Diffusion Plate, Polarizing Plate, Adapter		PD4, PD3, POD*2	170 g
	LDR2-90RD2-WD	24 V	11 W	–	–	–				
	LDR2-90-30 □□ 2	24 V	14 W	18 W	17 W	17 W				220 g
	LDR2-120 □□ 2	24 V	–	28 W	26 W	26 W				500 g
	LDR2-120RD2-WD	24 V	24 W	–	–	–				510 g
Custom order products	LDR2-32 □□ 2-HF	24 V	*3	1.2 W	*3	*3	*3		PD4, PD3, CC-ST-1024, POD	*3
	LDR2-50 □□ 2-HF	24 V	*3	1.9 W	1.9 W	*3				
	LDR2-70 □□ 2-HF	24 V	*3	3.5 W	3.5 W	*3				

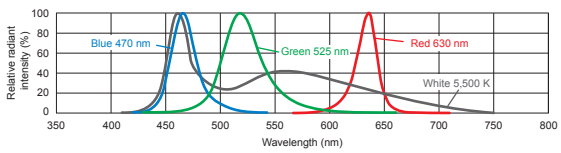
*4 The cables with a model name that ends with "-ME7","-EL2", "-PF", or "-PF-EL9" are not included.
*5 The cables with a model name that ends with "-EL2" are not included.

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, GR: Green)
*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod
*3 This product is custom-made. Contact our local sales office for details.

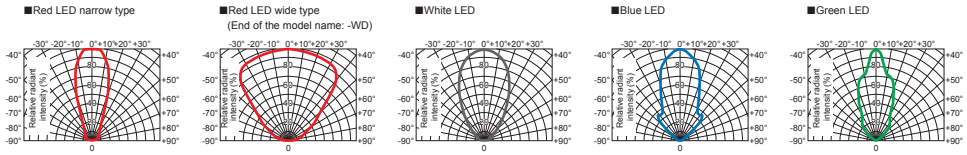
LED Properties

Spectral distribution



Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Directional characteristics



Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Options

Can prevent glare, which is a problem when making images of glossy workpieces.

Diffusion plate

An adapter is required when installing a diffusion plate.

Model name	Applicable Light Unit (Common for all colors)
DF-LDR-32	LDR2-32
DF-LDR-42	LDR2-42
DF-LDR-50	LDR2-50
DF-LDR-70*1	LDR2-70
DF-LDR-90	LDR2-90
DF-LDR-90-H28*2	LDR2-90-30
DF-LDR-120-45	LDR2-120

*1 DF-LDR-70 does not require an adapter. It is fixed to direct lighting.
*2 This is a custom order product. Contact our local sales office for details.

P.363

Use with a polarizing filter to remove the light's surface reflection.

Polarizing plate

An adapter is required when installing a polarizing plate.

Model name	Applicable Light Unit (Common for all colors)
PL-LDR-32	LDR2-32
PL-LDR-42	LDR2-42
PL-LDR-50	LDR2-50
PL-LDR2-70*1	LDR2-70
PL-LDR-90	LDR2-90
PL-LDR-90-H28*2	LDR2-90-30
PL-LDR-120-40	LDR2-12

*1 PL-LDR2-70 comes with a mounting adapter.
*2 This is a custom order product. Contact our local sales office for details.

P.365

Use when installing a diffusion plate or polarizing plate to the light unit.

Adapter

Model name	Applicable Light Unit (Common for all colors)
AD-LDR-32	LDR2-32
AD-LDR-42	LDR2-42
AD-LDR-50	LDR2-50
AD-LDR-90	LDR2-90 LDR2-90-30
AD-LDR-120	LDR2-120

P.368

Light can be directly mounted to the filter thread of the lens. Suitable for environments with limited installation space.

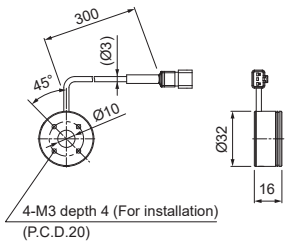
Lens attachment ring

Model name	Note	Applicable Light Unit (Common for all colors)
MR-LDR-32-M25	M25.5 P0.5	LDR2-32
MR-LDR-32-M27	M27.0 P0.5	
MR-LDR-32-M30	M30.5 P0.5	
MR-LDR-50-M25	M25.5 P0.5	LDR2-50
MR-LDR-50-M27	M27.0 P0.5	
MR-LDR-50-M30	M30.5 P0.5	

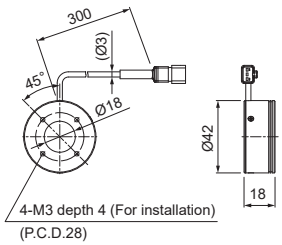
P.368

Dimensions (mm)

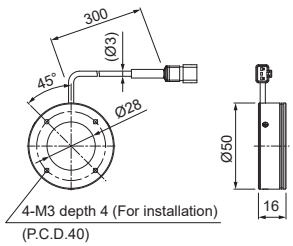
LDR2-32RD2/SW2/BL2/GR2



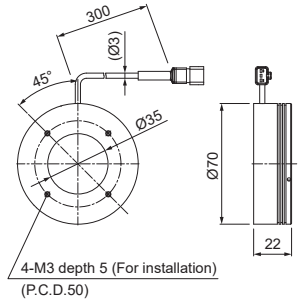
LDR2-42RD2/SW2/BL2/GR2



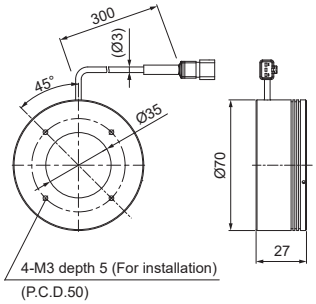
LDR2-50RD2/RD2-WD/SW2/BL2/GR2



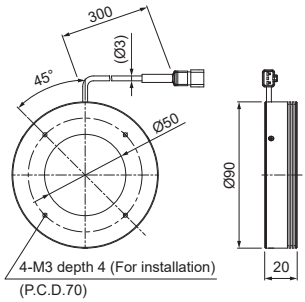
LDR2-70RD2/RD2-WD



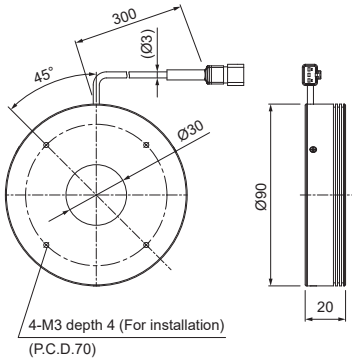
LDR2-70SW2/BL2/GR2



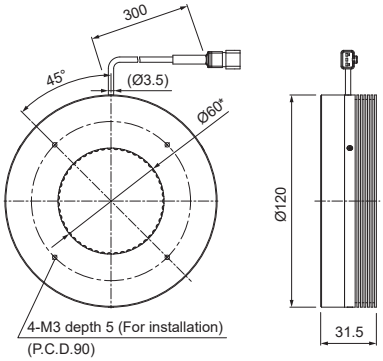
LDR2-90RD2/RD2-WD/SW2/BL2/GR2



LDR2-90-30RD2/SW2/BL2/GR2



LDR2-120RD2-WD/SW2/BL2/GR2



The cable diameter of LDR2-90-30SW2/BL2/GR2 is Ø3.5.

* The inside diameter will be around Ø56 mm due to the protruding LED.

You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Direct Lighting

Low-Angle Ring Lights

LDR2-LA Series

Refer to our website for product details.

CCS LDR2-LA ▶ Search

Provides direct light at a low angle from an angled emitting part


LDR2-208SW2-LA


LDR2-170BL2-LA


LDR2-132RD2-LA


LDR2-74GR2-LA


LDR2-100RD2-LA

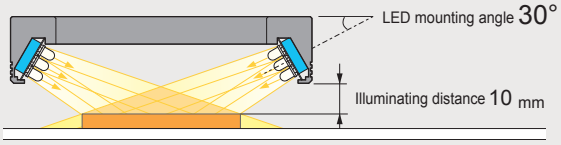

LDR2-48SW2-LA

Applications Inspection for engraving, damage, or stains on metal surfaces; edge extraction; foreign material inspection of medicine; inspection for damage to glass edges; visual inspection for O-rings; etc.

Extraction of Uneven Damage or Engravings

Providing direct light from a low angle to the center section allows for an image that emphasizes the workpiece's characteristic features.

Imaging example for the LDR2-100RD2-LA: Imaging the appearance of coins



LDR2-90RD2


Edge extraction is difficult with illumination from a high angle.

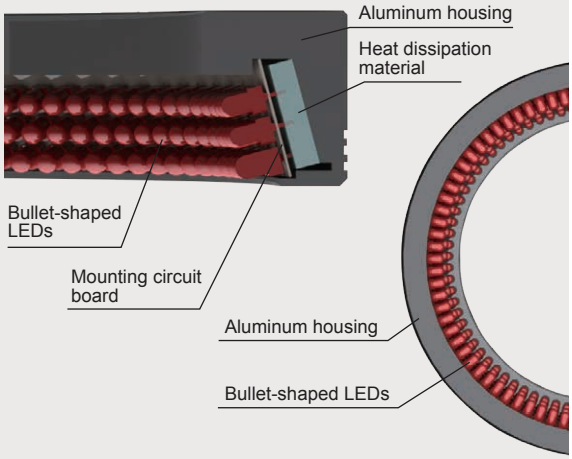
LDR2-100RD2-LA


Illuminating from a low angle allows for imaging that emphasizes the edges.

Illuminating from a Low-Angle at a Steep Slope

By mounting LEDs on a flexible circuit board in a steep angle, it becomes possible to converge light in the center section from a low position.

Cross-section image of the LDR2-132-LA



Custom Order Example

Please contact your CCS sales representative.

E.g.: Different shape

Format/ material

Changed the format to a semicircle

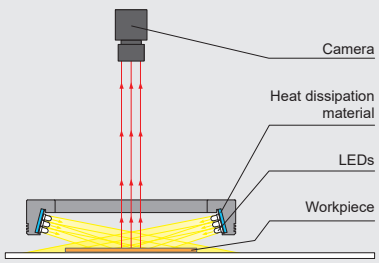
Customizable items

External/internal diameter | Wavelength/ Color | Increase output | Cable length | Illuminating angle | Format/ material | Connector format | Installation/ mounting | Etc.

Example Configuration

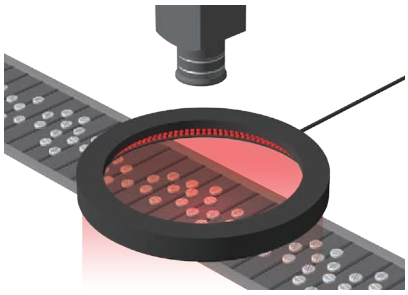
Using a flexible circuit board to create any angle needed. Emits direct light to the center of the workpiece from a low angle.

LDR2-132-LA



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Imaging Example: Imaging Text on Tablets and Their Appearance



Description	Text, visual inspection
Workpiece	Tablets
Conventional lighting	Interior lamp
New lighting	LDR2-170RD2-LA
Result	Emphasizes text and edge of the exterior

Workpiece image

Tablets

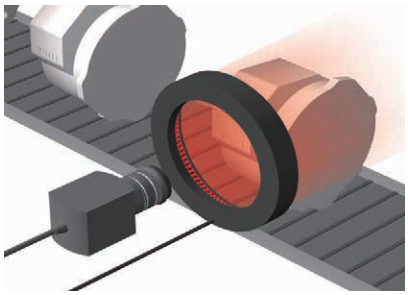
Interior lamp

It is difficult to take an image that emphasizes the text or exterior.

LDR2-170RD2-LA

Possible to take an image that emphasizes the text or exterior.

Imaging Example : Imaging Engraved Text on Metal Blocks (Stain Finishing)



Description	Character recognition
Workpiece	Metal blocks
Conventional lighting	LED Dome Light
New lighting	LDR2-132RD2-LA
Result	Extracts only the engraved text

Workpiece image

Metal blocks (stain finishing)

LED Dome Light

The whole thing is illuminated, making it difficult to emphasize only the characters.

LDR2-132RD2-LA

Reduces effects from the stain finishing, making it possible to emphasize the characters.

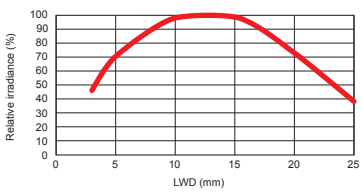
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

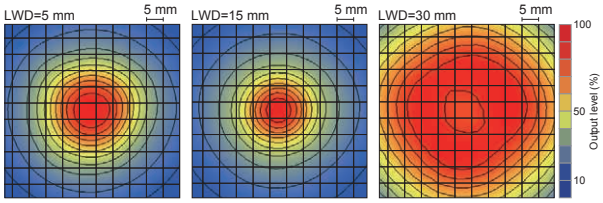
LDR2-74RD2-LA

Relative irradiance graph (LWD characteristics)*1*2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



You can inquire using our website.

Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products

Inquire on our website here.
https://www.ccs-grp.com/contact/

Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent / Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

LDR2-LA Series

Refer to our website for product details.

CCS LDR2-LA ▶ Search

Introduction to Half Ring Lights (Custom Order Example)

LDR2-LA-HF Series

It has a space-saving design that can be installed and used in a limited space

- The contrast can be increased by illuminating only the required parts
- Can be installed in a device with limited space and illuminates the area to be observed in pinpoint
- Can be customized according to the application such as emission color and size

LDR2-100SW2-LA-HF

Custom order products The warranty period of the custom order product is different from that of the CCS standard products. Contact our local sales office for details.

Lineup

Classification	Model Name *1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	GR (Green)	Options	Extension Cables	Recommended Control Units	Weight
Standard products	LDR2-48□□2-LA	24 V	2.1 W	3.1 W	3.1 W	3.1 W	Diffusion Plate, Bracket	FCB*4 Straight Cable, FCB-W*5 2-Branch Cable, FCB-F 4-Branch Cable, FRCB Robot Cable	PD4, PD3, CC-ST-1024, POD*2	50 g
	LDR2-74□□2-LA	24 V	4.6 W	5.7 W	5.7 W	5.7 W				90 g
	LDR2-100□□2-LA	24 V	9.1 W	12 W	12 W	12 W				170 g
	LDR2-132□□2-LA	24 V	13 W	16 W	16 W	16 W			PD4, PD3, POD*2	270 g
	LDR2-170□□2-LA	24 V	18 W	22 W	22 W	22 W				350 g
	LDR2-208□□2-LA	24 V	22 W	28 W	28 W	28 W				380 g
Custom order products	LDR2-74□□2-LAHF	24 V	*3	2.7 W	*3	*3	*3		PD4, PD3, CC-ST-1024, POD	*3
	LDR2-100□□2-LAHF	24 V	4.6 W	5.7 W	5.7 W	*3				

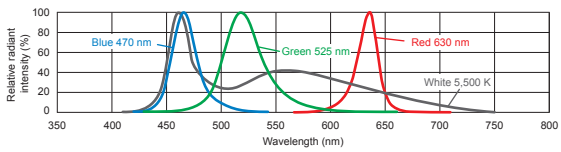
*4 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*5 The cables with a model name that ends with "-EL2" are not included.

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 □□ in the model name contains the LED color.
(RD: Red, SW: White, BL: Blue, GR: Green)
*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod
*3 This product is custom-made. Contact our local sales office for details.

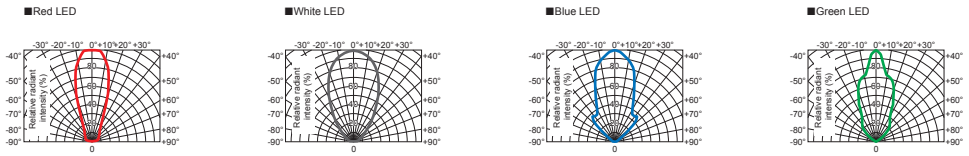
LED Properties

Spectral distribution



Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Directional characteristics



Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

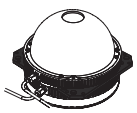
Options

Can prevent glare, which is a problem when making images of glossy workpieces.

Diffusion plate

Model name	Applicable Light Unit (Common for all colors)
DF-LDR-48LA	LDR2-48-LA
DF-LDR-74LA	LDR2-74-LA
DF-LDR-100LA	LDR2-100-LA
DF-LDR-132LA	LDR2-132-LA
DF-LDR-170LA	LDR2-170-LA
DF-LDR-208LA	LDR2-208-LA

▶ P.363



Combine with the Dome Light HPD2 Series to achieve imaging by light switching and simultaneous lighting.

Light joint bracket

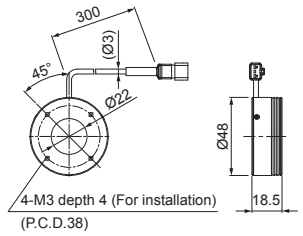
Model name	Applicable Light Unit 1 (Common for all colors)	Applicable Light Unit 2 (Common for all colors)
BK-75-JO	LDR2-100-LA	HPD2-75
BK-100-JO	LDR2-132-LA	HPD2-100
BK-150-JO	LDR2-170-LA	HPD2-150
BK-200-JO	LDR2-208-LA	HPD2-200

▶ P.370

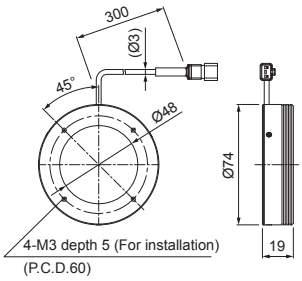
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Dimensions (mm)

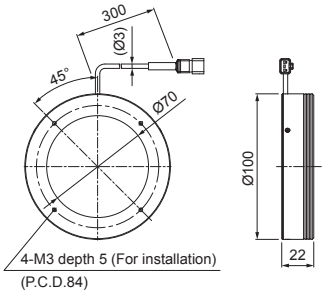
LDR2-48RD2-LA / SW2-LA / BL2-LA / GR2-LA



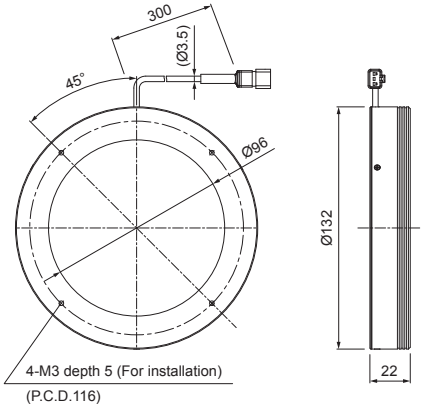
LDR2-74RD2-LA / SW2-LA / BL2-LA / GR2-LA



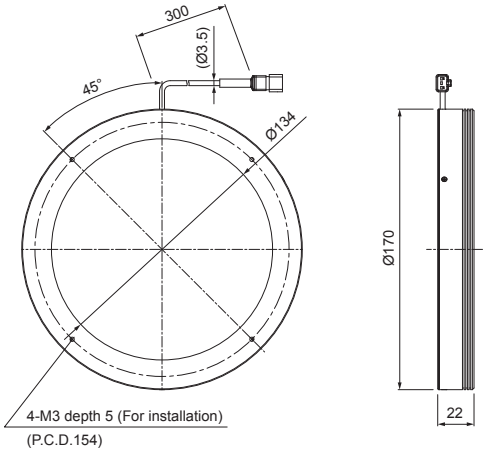
LDR2-100RD2-LA / SW2-LA / BL2-LA / GR2-LA



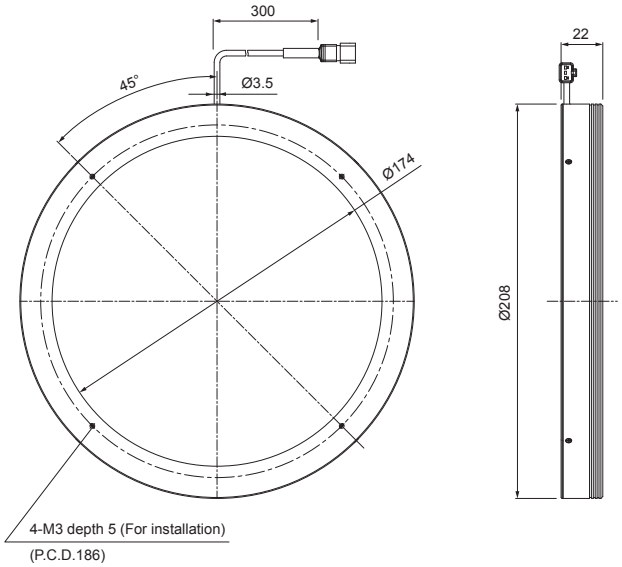
LDR2-132RD2-LA / SW2-LA / BL2-LA / GR2-LA



LDR2-170RD2-LA / SW2-LA / BL2-LA / GR2-LA



LDR2-208RD2-LA / SW2-LA / BL2-LA / GR2-LA



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Direct Lighting

Low-Angle Ring Lights

LDR-LA1 Series

Refer to our website for product details.

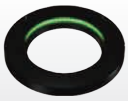
CCS LDR-LA1 ▶ Search

Provides direct light at a low angle from an emitting part directed horizontally

LDR-206SW2-LA1

LDR-176BL2-LA1

LDR-146RD2-LA1



LDR-96GR2-LA1

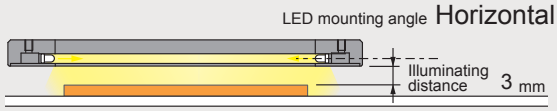
LDR-75RD2-LA1

Applications Edge detection; inspection for engraving, damage, or stains on metal surfaces; inspection for foreign material on wafers; inspection of bonding on shrink film; engraved character recognition for rubber; etc.

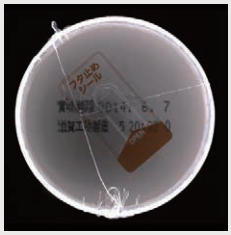
Illuminating Closest to the Workpiece

It's capable of illuminating the workpiece from a shorter distance than the LDR2-LA Series. Suitable for imaging fine unevenness, scratches and engraved letters.

Imaging example for the LDR-206SW2-LA1: Imaging the appearance of food containers

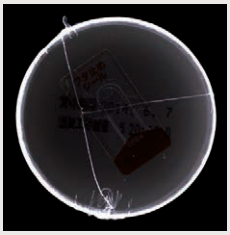


LDR2-208SW2-LA



The seal and engraved text affect the image, and the shrink seal cannot be sufficiently detected.

LDR-206SW2-LA1

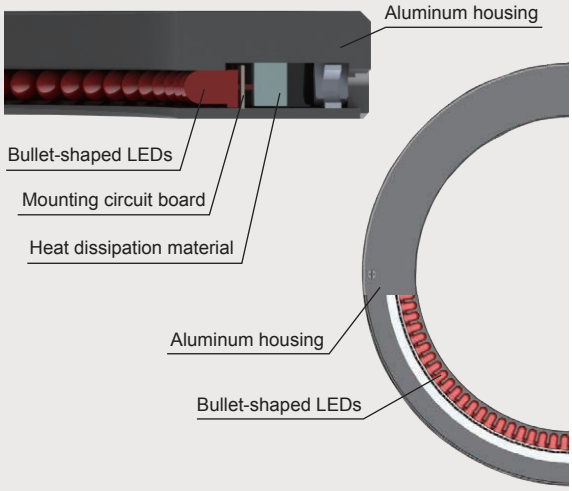


Only the shrink seal clearly stands out.

LEDs Mounted Horizontally

Achieved a thin device that is 10 mm thick by mounting LEDs horizontally in one line. Helps save space because it can be installed near the workpiece.

Cross-section image of the LDR-146-LA1



Custom Order Example

Please contact your CCS sales representative.

E.g.: Changed the format to take measures against interference with the device

Format/ material

Created a light unit with a shape to match the purpose

Cut to match the purpose

Customizable items

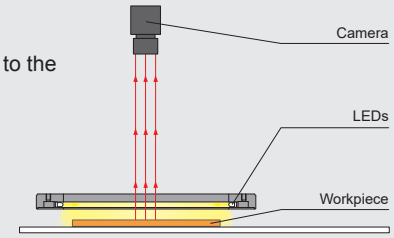
External/internal diameter | Wavelength/ Color | Increase output | Cable length | Illuminating angle | Format/ material | Connector format | Installation/ mounting

Etc.

Example Configuration

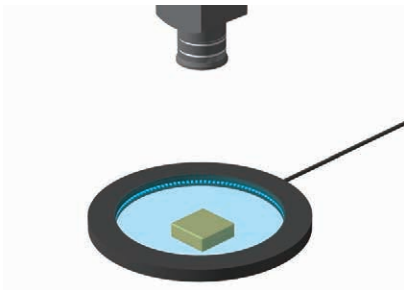
LEDs are arranged facing horizontally in a ring shape. It can be used extremely close to the workpiece.

LDR-146-LA1



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Imaging Example: Imaging the Appearance of Plastic Case Surfaces



Description	Visual inspection
Workpiece	Plastic cases
Conventional lighting	Interior lamp
New lighting	LDR-146BL2-LA1
Result	Extracting the damage

■ Workpiece image

Plastic cases

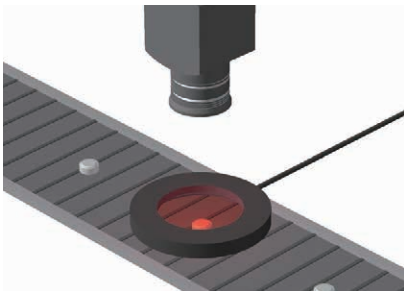
■ Interior lamp

The whole thing is evenly illuminated, making it difficult to detect the damage.

■ LDR-146BL2-LA1

It is possible to clearly get an image of the outside and damage on the surface.

Imaging Example: Imaging the Appearance of Button Cell Batteries

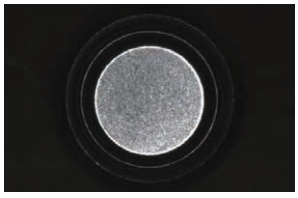


Description	Visual inspection
Workpiece	Button cell batteries
Conventional lighting	LED Ring Light
New lighting	LDR-75RD2-LA1
Result	Extracting the damage

■ Workpiece image

Button cell batteries

■ LED Ring Light



It is difficult to get an image of the button cell battery outside or damage on the surface.

■ LDR-75RD2-LA1

It is possible to clearly get an image of the outside and damage on the surface.

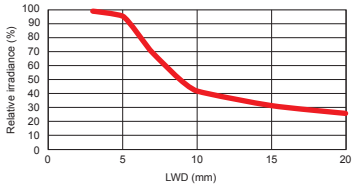
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only and does not guarantee the quality of this product.

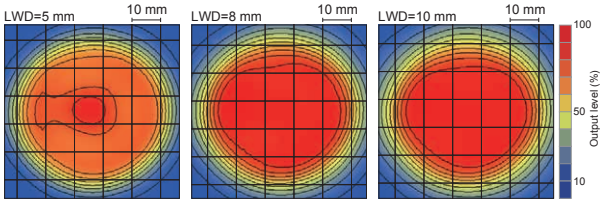
LDR-75RD2-LA1

Relative irradiance graph (LWD characteristics) *1 *2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



You can inquire using our website.

Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products

Inquire on our website here.
https://www.ccs-grp.com/contact/

LDR-LA1 Series

Refer to our website for product details.

CCS LDR-LA1 ▶ Search

Lineup

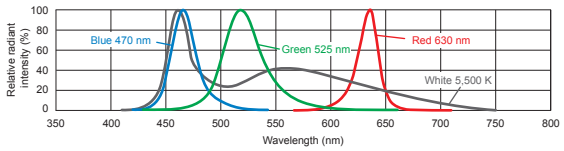
Model Name*1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	GR (Green)	Options	Extension Cables	Recommended Control Units	Weight
LDR-75□□2-LA1	24 V	2.6 W	3.8 W	3.8 W	3.8 W	Bracket	FCB*3 Straight Cable FCB-W*4 2-Branch Cable FCB-F 4-Branch Cable FRCB Robot Cable *3 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included. *4 The cables with a model name that ends with "-EL2" are not included.	PD4 PD3 CC-ST-1024 POD*2	55 g
LDR-96□□2-LA1	24 V	3.1 W	3.8 W	3.8 W	3.8 W				100 g
LDR-146□□2-LA1	24 V	4.6 W	6.0 W	6.1 W	6.1 W				160 g *RD is 170 g
LDR-176□□2-LA1	24 V	6.1 W	7.6 W	7.6 W	7.6 W				205 g *RD is 210 g
LDR-206□□2-LA1	24 V	7.1 W	9.1 W	9.1 W	9.1 W				220 g *RD is 250 g

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, GR: Green)
*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

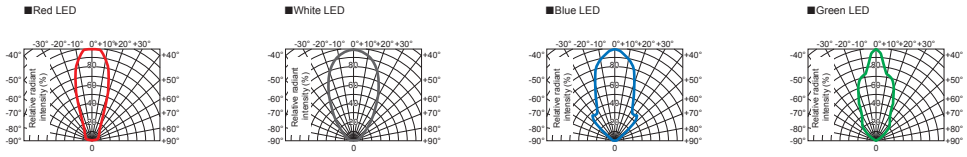
LED Properties

Spectral distribution



Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Directional characteristics



Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Options

Combine with the Dome Light HPD2 Series to achieve imaging by light switching and simultaneous lighting.

Light joint bracket

Model name	Applicable Light Unit 1 (Common for all colors)	Applicable Light Unit 2 (Common for all colors)
BK-75-JO	LDR-96-LA1	HPD2-75
BK-100-JO	LDR-146-LA1	HPD2-100
BK-150-JO	LDR-176-LA1	HPD2-150
BK-200-JO	LDR-206-LA1	HPD2-200

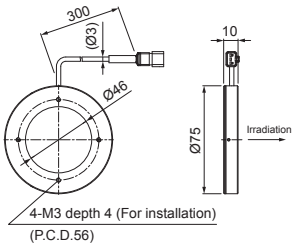
▶ P.370

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

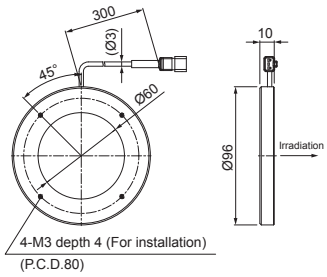
Register to use them.

Dimensions (mm)

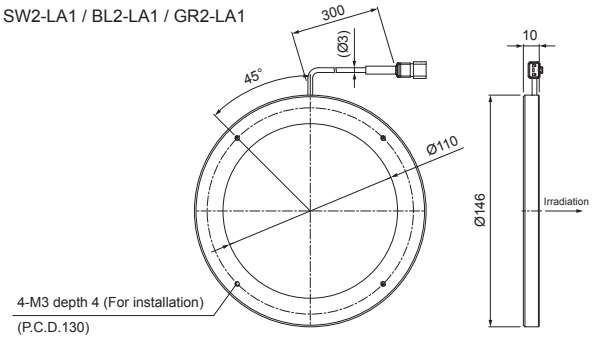
LDR-75RD2-LA1 / SW2-LA1 / BL2-LA1 / GR2-LA1



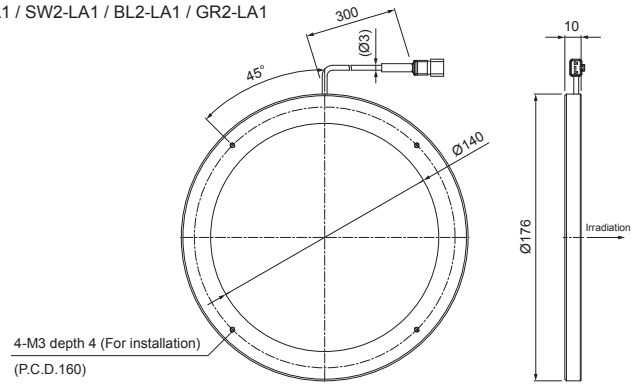
LDR-96RD2-LA1 / SW2-LA1 / BL2-LA1 / GR2-LA1



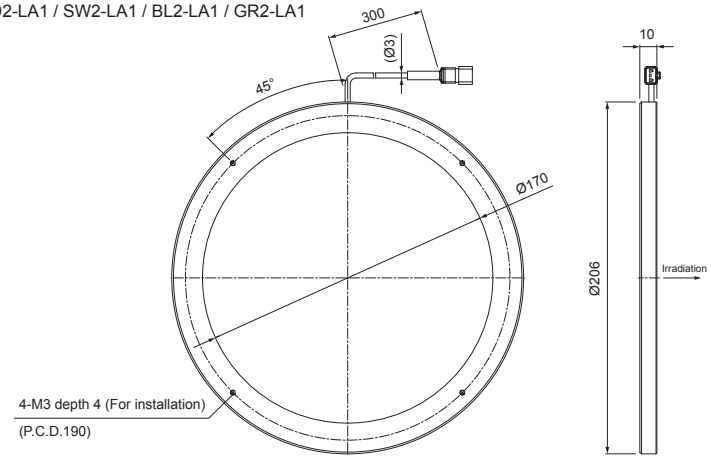
LDR-146RD2-LA1 / SW2-LA1 / BL2-LA1 / GR2-LA1



LDR-176RD2-LA1 / SW2-LA1 / BL2-LA1 / GR2-LA1

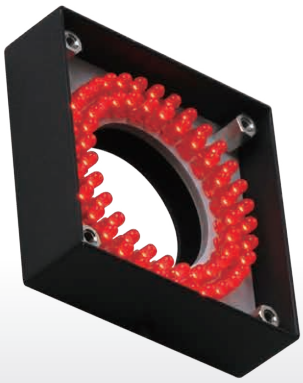


LDR-206RD2-LA1 / SW2-LA1 / BL2-LA1 / GR2-LA1



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

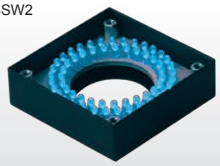
Provides direct light from the upper section



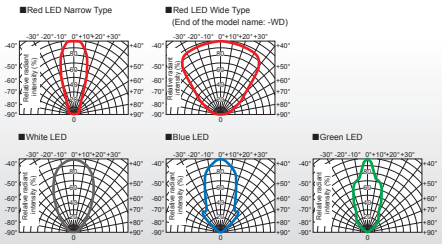
SQR-56SW2

SQR-56GR2

SQR-56RD2



SQR-56BL2



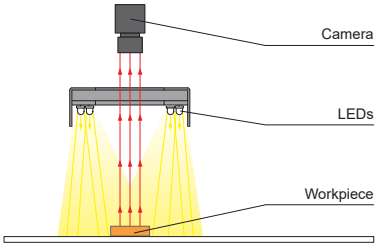
Applications Character recognition, visual inspection, inspections for damage or stains, reading 2-dimensional code, inspecting parts on boards, etc.

Features

Rings of bullet-shaped LEDs mounted on a square case.
LEDs are mounted on a flat circuit board and emit direct light onto the workpiece from above.

We accept custom orders. Please feel free to inquire.
- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

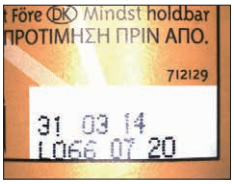
Example configuration (SQR-56)



Imaging example: Imaging text on paper labels

Workpiece: Beverage bottles

■LED Ring Light



Converged light in the center interferes with stable inspection.

■SQR-56SW2

The whole thing is evenly and brightly illuminated, making it possible to take an image of the label text.

Lineup

End of the model name: -WD: Wide type

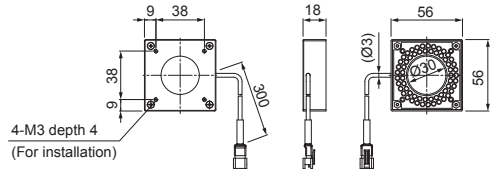
Model Name	LED Color	Power Consumption	Peak Wavelength / Correlated Color Temperature	Options	Extension Cables	Recommended Control Units	Weight
SQR-56RD2	Red	24 V / 3.1 W	630 nm	Diffusion plate Polarizing plate	FCB*2 Straight Cable FCB-W*3 2-branch Cable FCB-F 4-branch Cable FRCB Robot Cable	PD4 PD3 CC-ST-1024 POD*1	75 g
SQR-56RD2-WD							
SQR-56SW2	White	24 V / 3.8 W	5,500 K				
SQR-56BL2	Blue		470 nm				
SQR-56GR2	Green		525 nm				

LED Properties: Spectral Distribution ▶ P.396 | Options ▶ P.359 | Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

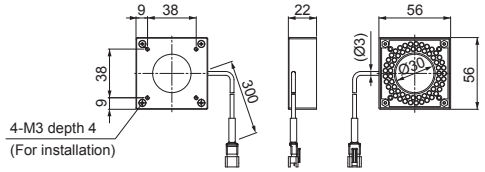
*1 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod
*2 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*3 The cables with a model name that ends with "-EL2" are not included.

Dimensions (mm)

SQR-56RD2 / RD2-WD



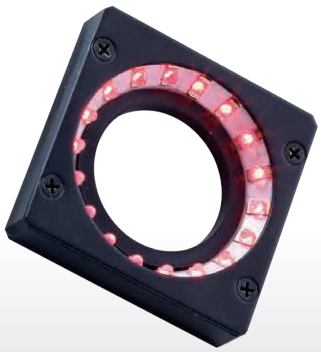
SQR-56SW2 / BL2 / GR2



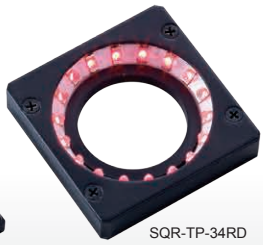
You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

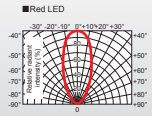
Provides direct light at a low angle from an angled emitting part



SQR-TP-28RD



SQR-TP-34RD



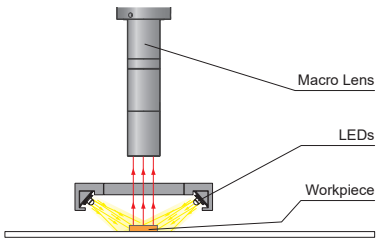
Applications Visual inspections for metal parts; inspection for damage or stains on electronic parts; inspection for damage to resin parts; inspection for damage to glass edges; inspection for damage to stain finishing; etc.

Features

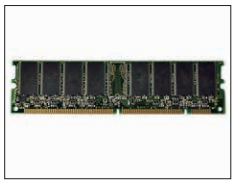
Rings of surface-mounted LEDs mounted on a square case.
Provides direct light at a low angle from an angled emitting part.

We accept custom orders. Please feel free to inquire.
- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

Example configuration (SQR-TP-34RD)



Imaging example: Imaging text on circuit boards



Workpiece: circuit boards

Macro lens + LED Spot Light

It is difficult to recognize the surface status using coaxial illumination.

SQR-TP-34RD

Can make an image of the text on the chip, and the soldering plating.

Lineup

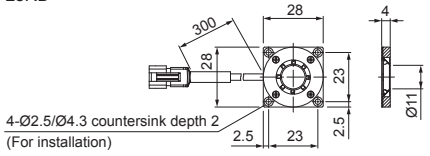
Model Name	LED Color	Power Consumption	Peak Wavelength	Options	Extension Cables	Recommended Control Units	Weight
SQR-TP-28RD	Red	24 V / 0.5 W	638 nm	–	FCB*2 Straight Cable FCB-W*3 2-branch Cable FCB-F 4-branch Cable FRCB Robot Cable	PD4 / PD3 CC-ST-1024 / POD*1	15 g
SQR-TP-34RD		24 V / 0.9 W					16 g

LED Properties: Spectral Distribution ▶ P.396 | Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

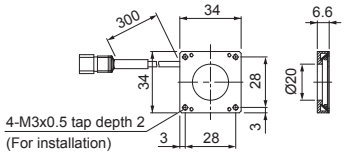
*1 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod
*2 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*3 The cables with a model name that ends with "-EL2" are not included.

Dimensions (mm)

SQR-TP-28RD



SQR-TP-34RD



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Convergent Lighting

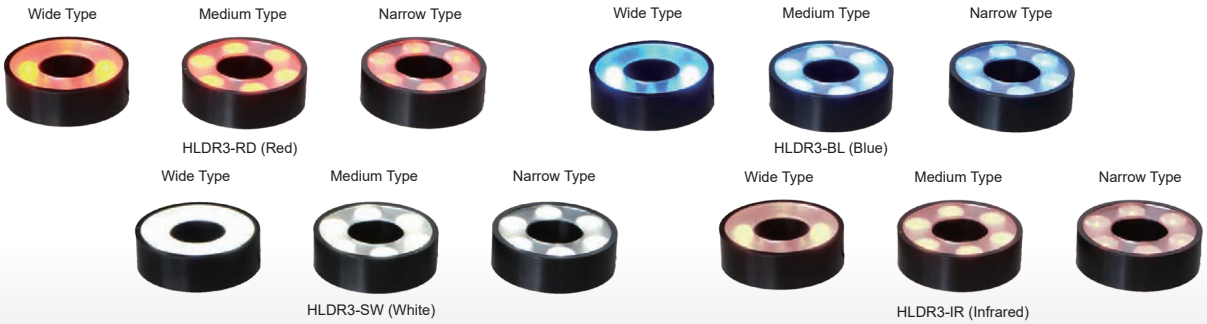
Ring Lights

HLDR3 Series

Refer to our website for product details.

CCS HLDR3 ▶ Search

Convergent lighting suitable for long-distance illumination

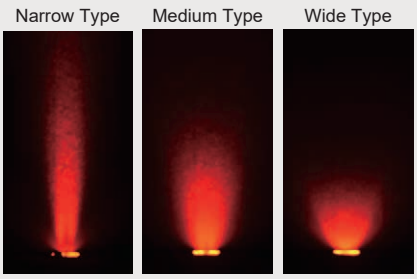


Applications Light source for robot picking; Part sorting, inspection for model mixing; Exterior inspection of various parts; etc.

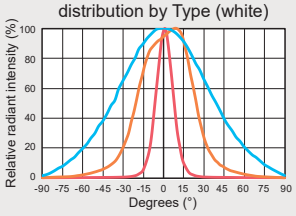
Three Types of Light Directivity

The data included is for reference only. Actual values may vary.

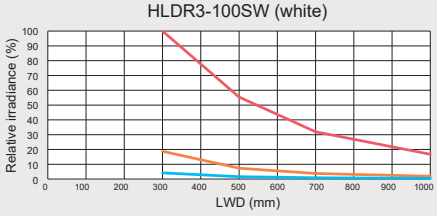
We have a lineup of Narrow Type that emits condensed illumination, Wide Type that diffuses illumination over a wide range, and Medium Type that has intermediate light distribution characteristics.



Relative radiant intensity distribution by Type (white)



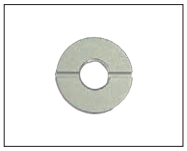
Comparative graph of relative irradiance by Type HLDR3-100SW (white)



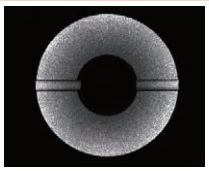
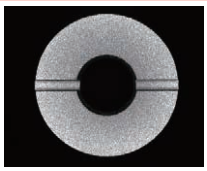
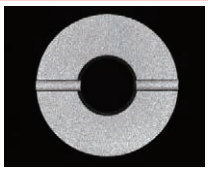
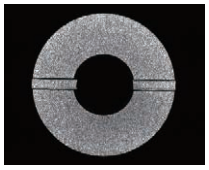
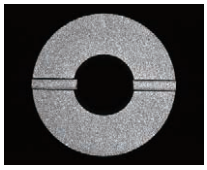
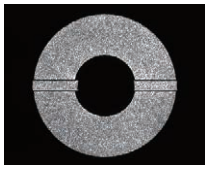
Imaging Comparison (External observation of textured metal part)

* The shutter speed is changed to suit imaging. The shutter speed can be adjusted to brighten imaging of dark images.
* Field of view: 41 mm (H) x 33 mm (V)

■ Workpiece image



Textured metal part

	Narrow Type HLDR3-100SW-DF-N	Medium Type HLDR3-100SW-DF-M	Wide Type HLDR3-100SW-DF-W
LWD 75 mm	 Shutter Speed: 800 µs. Dark in the center.	 Shutter Speed: 650 µs. More widely illuminated than the narrow Type, but not sufficiently uniform.	 Shutter Speed: 2200 µs. Uniformly illuminated in the entire FOV.
LWD 150 mm	 Shutter Speed: 180 µs. More widely illuminated.	 Shutter Speed: 280 µs. Uniformly illuminated in the entire FOV.	 Shutter Speed: 280 µs. Insufficient quantity of light.
LWD 750 mm	 Shutter Speed: 800 µs. Uniformly illuminated in the entire FOV.	 Shutter Speed: 800 µs. Insufficient quantity of light.	 Shutter Speed: 800 µs. Insufficient quantity of light.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

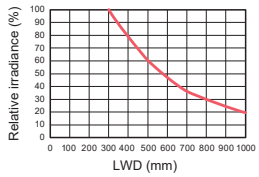
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

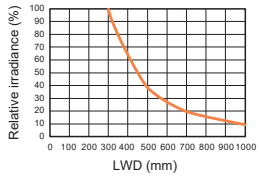
Relative irradiance graph (LWD characteristics) *1 *2

*1 Irradiation strength on the optical axis
*2 Illuminating distance from the light unit to the workpiece

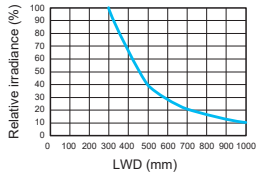
HLDR3-100SW-DF-N (Narrow Type)



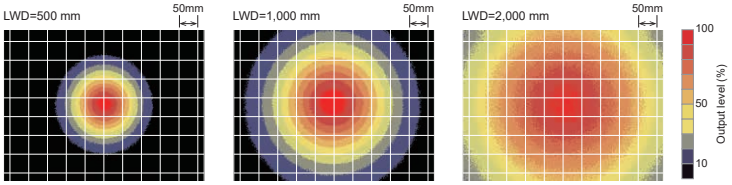
HLDR3-100SW-DF-M (Medium Type)

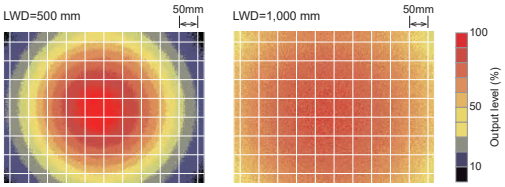


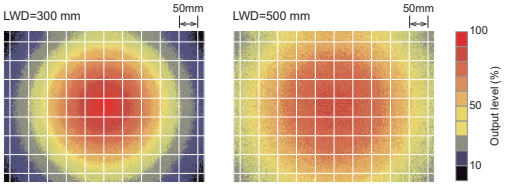
HLDR3-100SW-DF-W (Wide Type)



Uniformity (Relative irradiance)







Lineup

Model Name Endings: Narrow Type, -M: Medium Type, -W: Wide Type

Model Name *1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	IR (Infrared)	Options	Extension Cables	Recommended Control Units	Weight
HLDR3-100☐☐-DF-N	24 V	15 W				—	FCB *2 Straight Cable FCB-W *3 2-Branch Cable FCB-F 4-Branch Cable FRCB Robot Cable	PD4 PD3	340 g
HLDR3-100☐☐-DF-M									340 g
HLDR3-100☐☐-DF-W									310 g

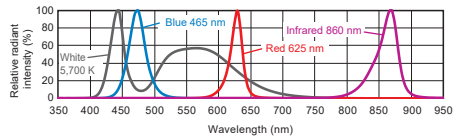
Note: Please inquire if you would like to use in combination with a strobe control unit (overdrive Type)

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 ☐☐ in the model name contains the LED color.
(RD: Red, SW: White, BL: Blue, IR: Infrared)
*2 Cables with a model name that ends with "-ME7","-EL2", "-PF", or "-PF-EL9" are not included.
*3 Cables with a model name that ends with "-EL2" are not included.

LED Properties

Spectral distribution

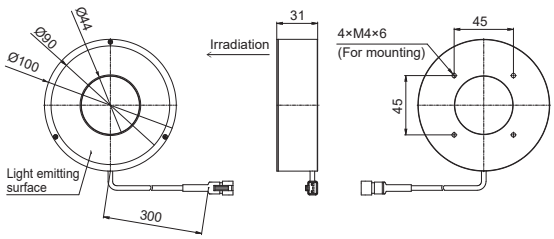


Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Dimensions (mm)

HLDR3-100☐☐DF-N / -M / -W (common dimensions)
(☐☐=RD, SW, BL, IR)



You can inquire using our website. Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products

Inquire on our website here.
https://www.ccs-grp.com/contact/

Diffused Lighting

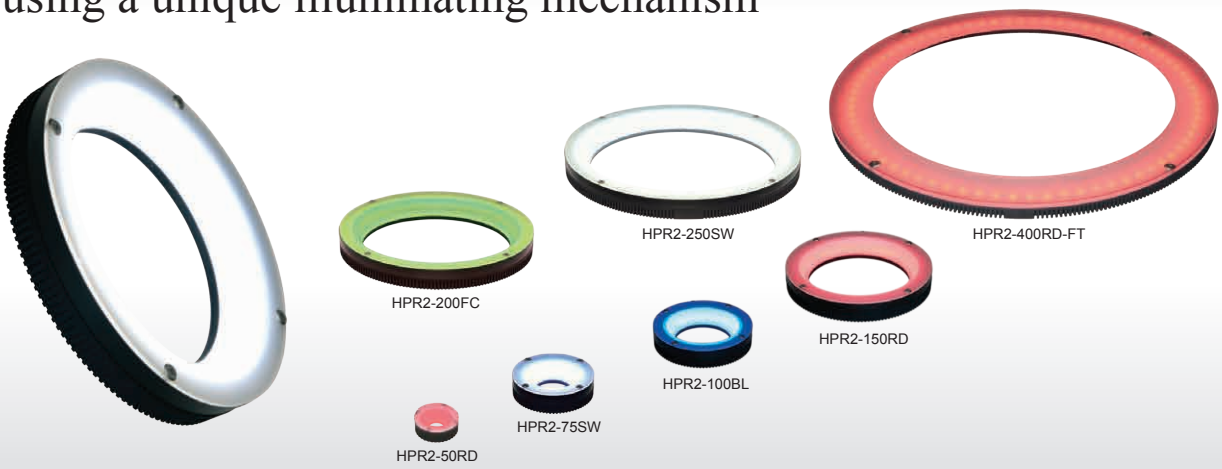
Ring Lights

HPR2 Series

Refer to our website for product details.

CCS HPR2 ▶ Search

Achieves a uniform region with a high degree of freedom by using a unique illuminating mechanism

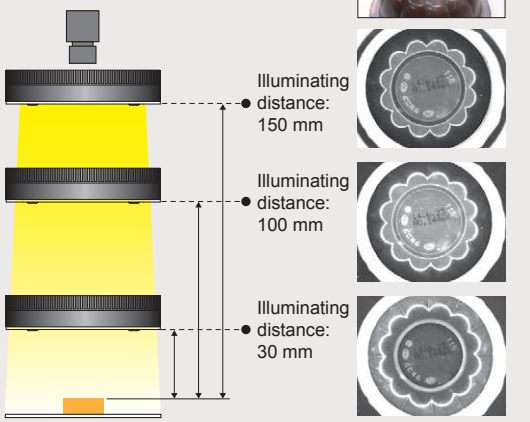


Applications Inspection for damage or stains, visual and color determination inspections, character recognition, text inspection, high angle uniform illumination, characteristic extraction at low angle, etc.

Supports from Low Angles to High Angles

Provides diffused light from the LEDs without waste using a unique illuminating mechanism. Even if the distance from the workpiece to the light unit is changed, there is little variation in the uniform region and it can therefore be used for a wide variety of uses.

Achieves a uniform region with a high degree of freedom

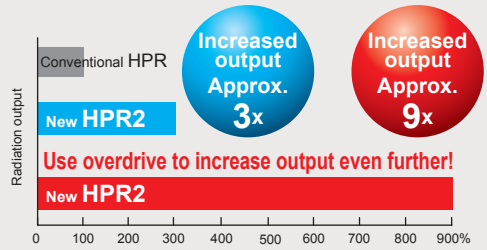


Provides Diffused Light at High Output

It achieves uniform illumination of diffused light at high output using surface-mounted LEDs and a specially processed diffusion plate.

Achieved higher output than the conventional product

■ Output comparison with the conventional product



- This is a comparison between the HPR-100 and HPR2-100 light units, using red and white colors.
- It can be combined with a strobe control unit for even brighter emission than continuous emission. *Cannot use a full color (RGB) type.
- The data included is for reference only. Actual values may vary.

Added two sizes and a full color (RGB) type

We added the HPR2-75 and HPR2-200 models. Also, we added a full color (RGB) type to the lineup as variation for wavelengths, increasing the applications of our products.

Custom Order Example

Please contact your CCS sales representative.

E.g.: Different shape

Format/ material

Changed the format to a semicircle to match the workpiece.

Customizable items

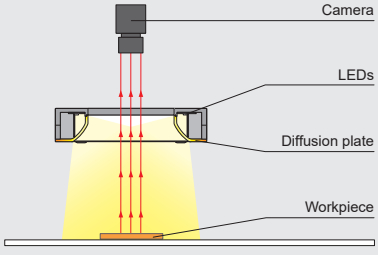
External/internal diameter | Wavelength/ Color | Increase output | Cable length | Illuminating angle | Format/ material | Connector format | Installation/ mounting

Etc.

Example Configuration

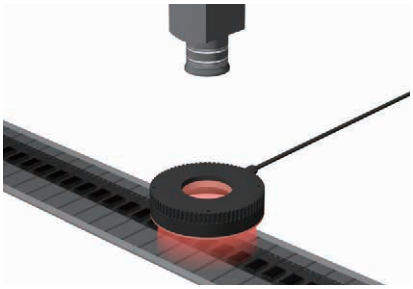
Uses a unique illuminating mechanism and emits diffused light at high output.

HPR2-100



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Imaging Example: Imaging Text on Electronic Parts

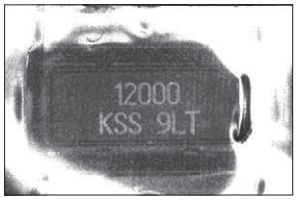


Description	Printing inspection
Workpiece	Electronics parts in embossed tapes
Conventional lighting	LED Ring Light
New lighting	HPR2-75RD
Result	Improved uniformity

Workpiece image

Electronics parts in embossed tapes

LED Ring Light



Stable inspection is difficult due to surface reflection.

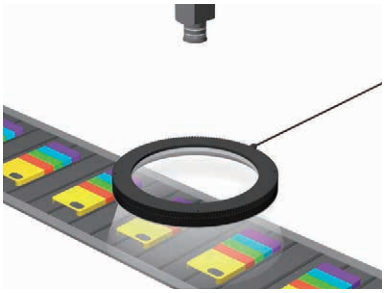
HPR2-75RD

Surface reflection is reduced and an image of the text can be made.

Imaging Example: Imaging the Appearance of Multi-Colored Workpieces

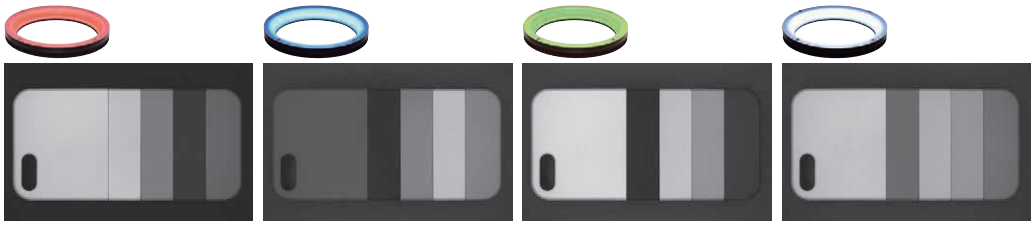
Workpiece image

Smartphone cases



Description	Visual inspection
Workpiece	Smartphone cases
Conventional lighting	–
New lighting	HPR2-200FC: full color (RGB) type
Result	Allows for color determination.

HPR2-200FC: full color (RGB) type



Imaging with red illumination | Imaging with blue illumination | Imaging with green illumination | Imaging with white illumination

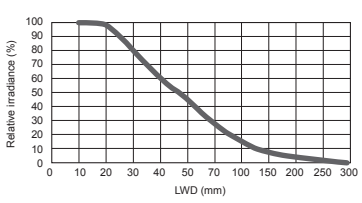
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

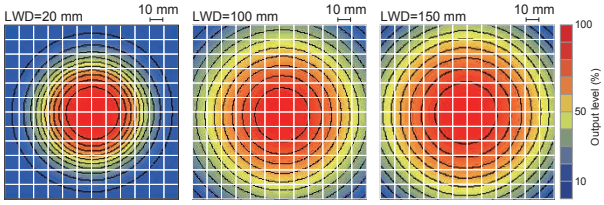
HPR2-75SW

Relative irradiance graph[*1] (LWD characteristics)[*2]

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent/Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

HPR2 Series

Refer to our website for product details.

CCS HPR2 ▶ Search

Introduction to Half Ring Lights (Custom Order Example)

HPR2-HFCT Series

It has a space-saving design that can be installed and used in a limited space

- The contrast can be increased by illuminating only the required parts
- Can be installed in a device with limited space and illuminates the area to be observed in pinpoint
- Can be customized according to the application such as emission color and size

HPR2-100SW-HFCT

Custom order products The warranty period of the custom order product is different from that of the CCS standard products. Contact our local sales office for details.

Lineup

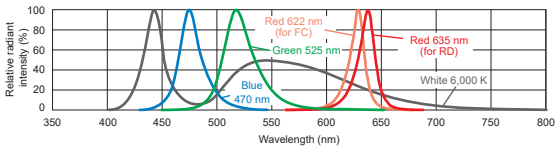
Classification	Model Name *1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	FC*4 (Red/Green/Blue)	Options	Extension Cables	Recommended Control Units *4	Weight
Standard products	HPR2-50□□	24 V	7.6 W	9.1 W	9.1 W	3.8 W*4	Bracket	FCB*5 Straight Cable; FCB-W*6 2-Branch Cable; FCB-F 4-Branch Cable; FRCB Robot Cable	PD4, PD3, CC-ST-1024, POD*2	46 g
	HPR2-75□□	24 V	17 W	16 W	16 W	6.0 W*4				160 g
	HPR2-100□□	24 V	17 W	23 W	23 W	11 W*4				170 g
	HPR2-150□□	24 V	27 W	27 W	27 W	15 W*4			PD4, PD3, POD*2	250 g
	HPR2-200□□	24 V	34 W	41 W	41 W	19 W*4				380 g
	HPR2-250□□	24 V	45 W	46 W	46 W	24 W*4				510 g
	HPR2-400□□-FT	24 V	45 W	46 W	46 W	30 W*4	–			1,050 g
Custom order products	HPR2-50□□-HFCT	24 V	*3	4.6 W	*3	*3	*3	*5 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included. *6 The cables with a model name that ends with "-EL2" are not included.	PD4, PD3, CC-ST-1024, POD	*3
	HPR2-75□□-HFCT	24 V	*3	7.6 W	*3	*3				
	HPR2-100□□-HFCT	24 V	*3	12 W	*3	*3			PD4, PD3, POD	
	HPR2-150□□-HFCT	24 V	*3	14 W	*3	*3				

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, FC: Red/Green/Blue)
*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod
*3 This product is custom-made. Contact our local sales office for details.
*4 For the full color (RGB) type control unit, use the PD3 3-channel specification. Cannot be used with the strobe control unit (overdrive mode).

LED Properties

Spectral distribution

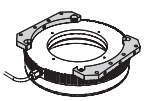


Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Options

Combine with the Dome Light HPD2 Series to achieve imaging by light switching and simultaneous lighting.



Achieves installation using installation holes with a larger gap than the light unit body installation holes, or installation on a vertical surface.

Light joint bracket

Model name	Applicable Light Unit 1 (Common for all colors)	Applicable Light Unit 2 (Common for all colors)
BK-75-JO	HPR2-75 Series	HPD2-75 Series
BK-100-JO	HPR2-100 Series	HPD2-100 Series
BK-150-JO	HPR2-150 Series	HPD2-150 Series
BK-200-JO	HPR2-200 Series	HPD2-200 Series
BK-250-JO	HPR2-250 Series	HPD2-250 Series

▶ P.370

Expansion mounting bracket

Model name	Applicable Light Unit (Common for all colors)
BK-50-CI	HPR2-50 Series
BK-75-CI	HPR2-75 Series
BK-100-CI	HPR2-100 Series
BK-150-CI	HPR2-150 Series
BK-200-CI	HPR2-200 Series
BK-250-CI	HPR2-250 Series

▶ P.370

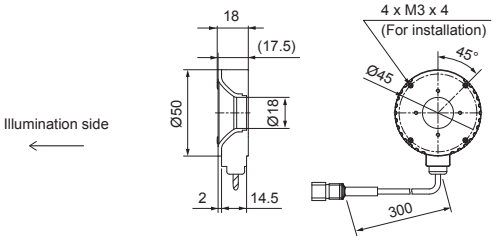
- Example of the expansion mounting bracket in use

Ring Light: Image of usage with the HPR2-200RD

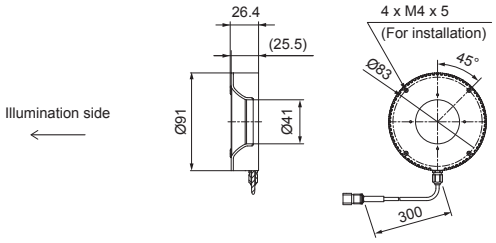
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Dimensions (mm)

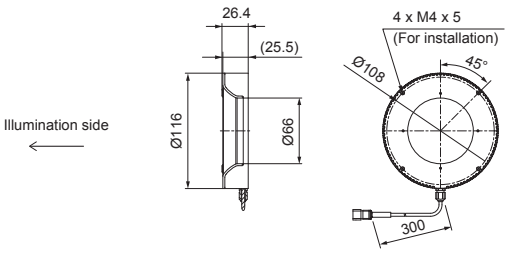
HPR2-50RD/SW/BL/FC



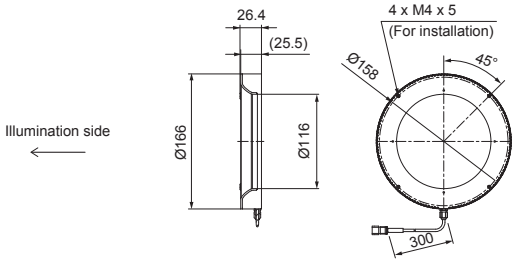
HPR2-75RD/SW/BL/FC



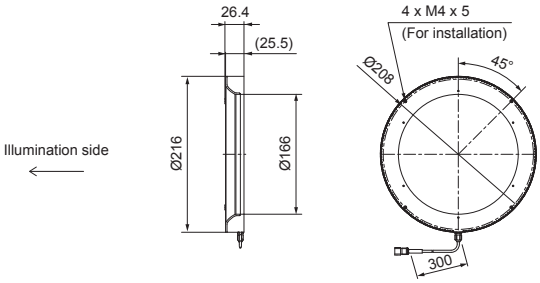
HPR2-100RD/SW/BL/FC



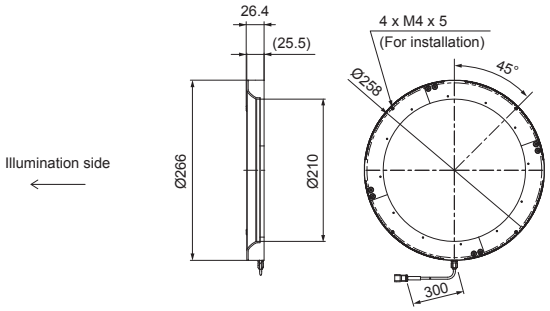
HPR2-150RD/SW/BL/FC



HPR2-200RD/SW/BL/FC

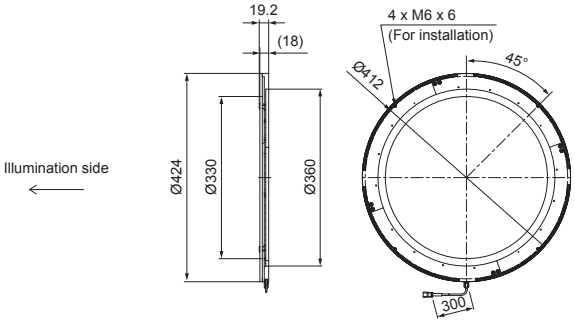


HPR2-250RD/SW/BL/FC

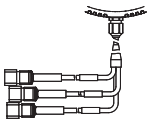


The HPR2-250 model has a curved diffusion plate.
Be aware this differs from the conventional product.

HPR2-400RD-FT / SW-FT / BL-FT / FC-FT



The HPR2-400-FT has a flat diffusion plate.



The full color type (HPR2-☐☐FC, HPR2-400FC-FT) has three connectors.
Use a 3-channel control unit if controlling intensity separately for each color.

You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Diffused Lighting

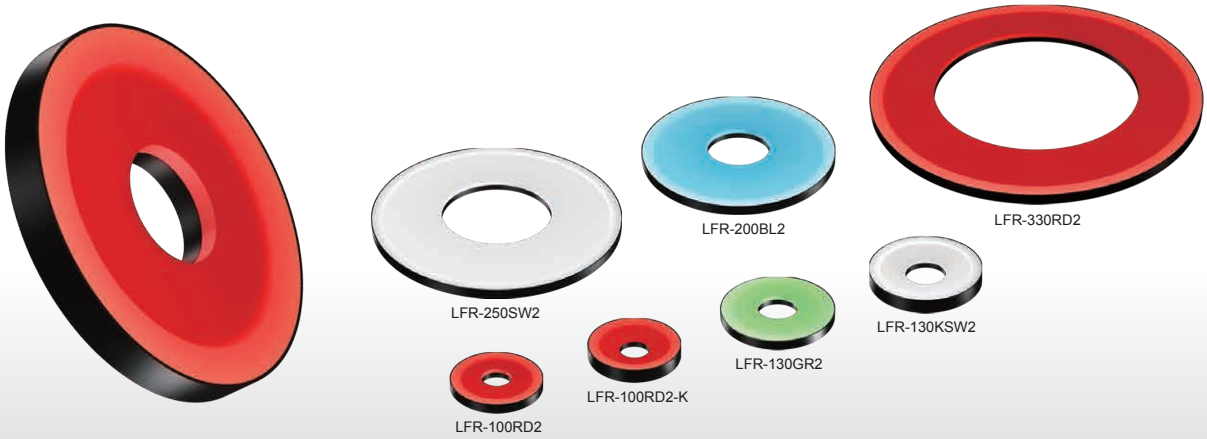
Ring Lights

LFR Series

Refer to our website for product details.

CCS LFR ▶ Search

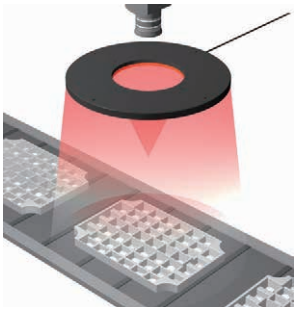
Diffused illumination from a flat emitting surface



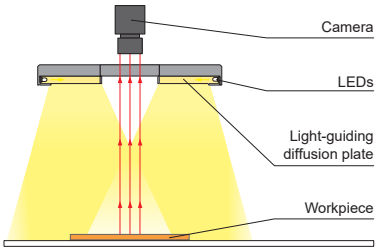
Applications Inspection for parts mounted on circuit boards, surface inspection for metal parts, inspection for faults on bottle tops, character recognition, text inspection, printing inspection, color determination inspection, etc.

Features

LEDs embedded around a circular light-guiding diffusion plate.
Uniformly diffused light emitted from a flat emitting surface.



Example configuration (LFR-100)



We accept custom orders.
Please feel free to inquire.

- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

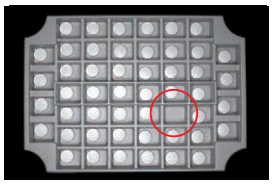
Imaging example: Imaging for detecting content in trays

Workpiece: Content in trays

■LED Ring Light

Converged light in the center interferes with stable inspection.

■LFR-250RD2



The whole thing is illuminated evenly, allowing for detection of present contents.

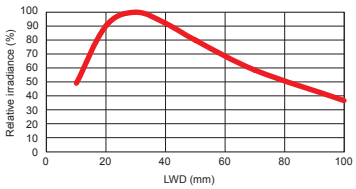
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

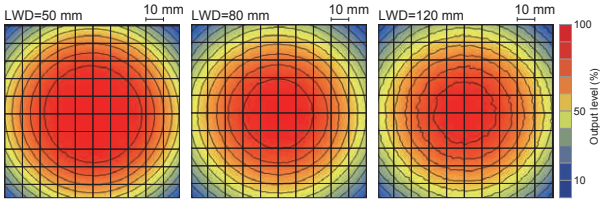
LFR-130RD2

Relative irradiance graph (LWD characteristics) *2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Lineup

End of the model name: -K: Type with angled emitting surface

Model Name*1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	GR (Green)	Options	Extension Cables	Recommended Control Units	Weight
LFR-100□□2	24 V	3.6 W	4.6 W	4.6 W	4.6 W	–	FCB*5 Straight Cable FCB-W*6 2-Branch Cable FCB-F 4-Branch Cable FRCB Robot Cable	PD4 PD3 CC-ST-1024 POD*2	120 g *RD is 170 g
LFR-100□□2-K*3	24 V	3.6 W	4.6 W	4.6 W	4.5 W				190 g *RD, SW are 140 g
LFR-130□□2	24 V	4.6 W	5.7 W	5.7 W	5.7 W				250 g
LFR-130□□2-K*3	24 V	4.6 W	5.7 W	5.7 W	5.7 W				190 g *SW is 200 g
LFR-200□□2	24 V	8.1 W	11 W	11 W	–			PD4 PD3 CC-ST-1024*4 POD*2 *4 Can only use red.	490 g
LFR-250□□2	24 V	11 W	13 W	13 W	–			PD4 PD3 POD*2	1,080 g *SW is 1,090 g
LFR-330RD2	24 V	14 W	–	–	–				1,500 g

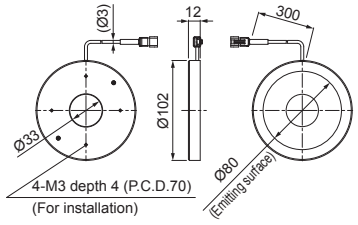
*5 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*6 The cables with a model name that ends with "-EL2" are not included.

LED Properties: Spectral Distribution ▶ P.396 | Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, GR: Green) (LFR-200 and LFR-250 are only available in red, white and blue.)
*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod
*3 Only the white models have the names LFR-100KSW2 and LFR-130KSW2.

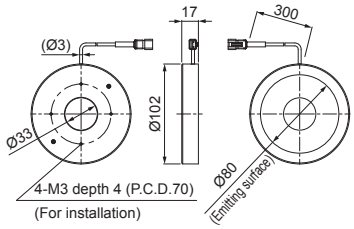
Dimensions (mm)

LFR-100RD2/SW2/BL2/GR2



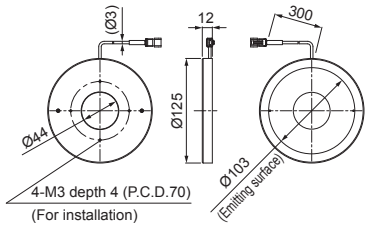
The emitting surface for the LFR-100SW2/BL2/GR2 is Ø77.

LFR-100RD2-K / KSW2 / BL2-K / GR2-K

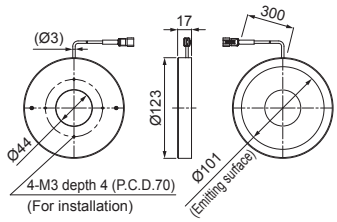


The emitting surface for the LFR-100KSW2/BL2/GR2 is Ø78.

LFR-130RD2/SW2/BL2/GR2

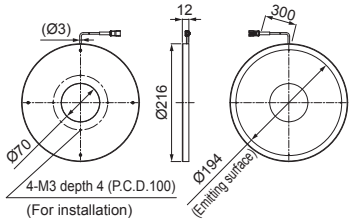


LFR-130RD2-K / KSW2 / BL2-K / GR2-K



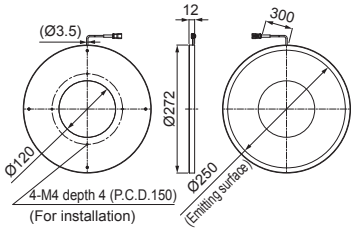
The emitting surface for the LFR-130KSW2 is Ø99.

LFR-200RD2/SW2/BL2



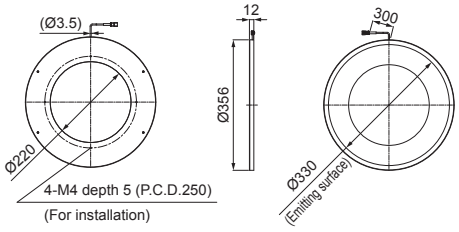
The emitting surface for the LFR-200SW2/BL2 is Ø193.

LFR-250RD2/SW2/BL2



The emitting surface for the LFR-250SW2/BL2 is Ø246.

LFR-330RD2



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Diffused Lighting

Ring Lights

LKR Series

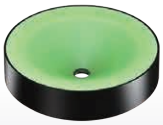
Refer to our website for product details.

CCS LKR ▶ Search

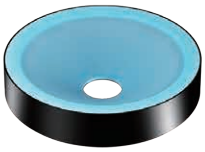
Provides diffused light from an angled emitting surface

LKR-70RD2

LKR-70SW2



LKR-70-8GR2



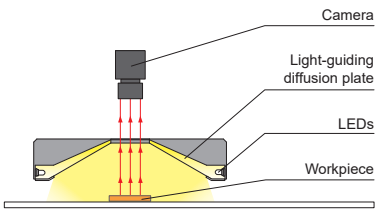
LKR-125BL2

Applications Soldering inspection, parts identification with color, inspection for stains on glossy surfaces, character recognition on metal parts, dent inspection on metal parts, etc.

Features

LEDs embedded around a circular light-guiding diffusion plate.
Uniformly diffused light from an emitting surface angled with respect to the workpiece.

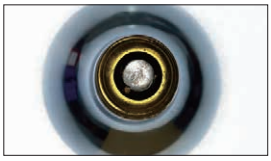
Example configuration (LKR-125)



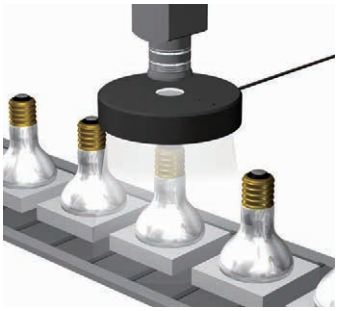
We accept custom orders.
Please feel free to inquire.

- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

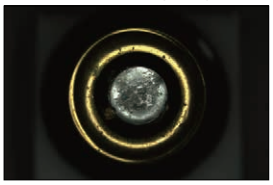
Imaging example: Imaging soldering parts on the cap of light bulbs



Workpiece: Light bulbs



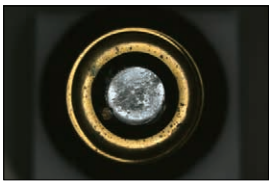
■LED Diffused Lighting



It is difficult to evenly illuminate the whole solder.

⇒

■LKR-125SW2



It is possible to evenly illuminate the whole solder, including the cap.

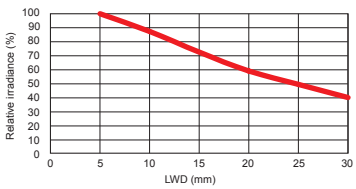
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

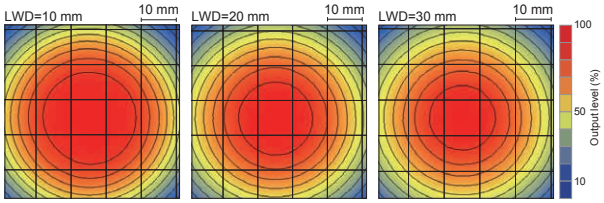
LKR-70RD2

Relative irradiance graph (LWD characteristics) *2 *1

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Lineup

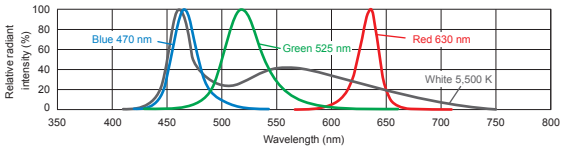
Model Name *1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	GR (Green)	Options	Extension Cables	Recommended Control Units	Weight
LKR-70□□2	24 V	2.6 W	3.8 W	3.8 W	3.8 W	–	FCB*3 Straight Cable FCB-W*4 2-Branch Cable FCB-F 4-Branch Cable FRCB Robot Cable *3 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included. *4 The cables with a model name that ends with "-EL2" are not included.	PD4 PD3 CC-ST-1024 POD*2	125 g *SW is 130 g
LKR-70-8□□2	24 V	2.6 W	3.8 W	3.8 W	3.8 W				140 g
LKR-125□□2	24 V	4.6 W	5.7 W	5.7 W	6.7 W				490 g *RD is 295 g, SW is 300 g

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, GR: Green)
*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

LED Properties

Spectral distribution

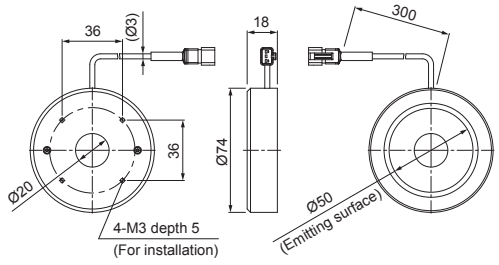


Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

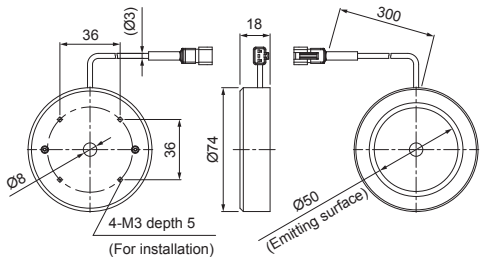
Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Dimensions (mm)

LKR-70RD2/SW2/BL2/GR2

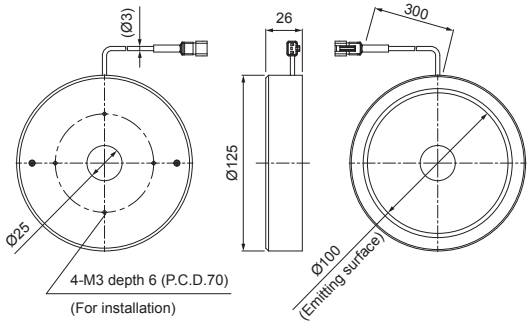


LKR-70-8RD2/SW2/BL2/GR2



The emitting surface for the LKR-70-8SW2/BL2/GR2 is Ø49.2.

LKR-125RD2/SW2/BL2/GR2



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Diffused Lighting

Low-Angle Ring Lights

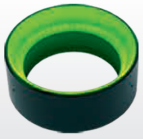
FPR Series

Refer to our website for product details.

CCS FPR ▶ Search

Provides diffused light at a low angle from an angled emitting surface

FPR-100RD2



FPR-100GR2

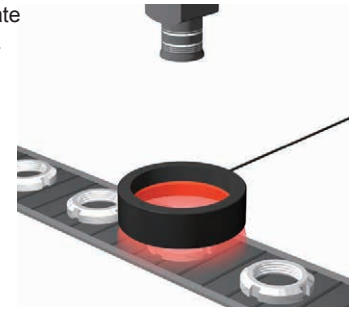
FPR-136BL2

FPR-180SW2

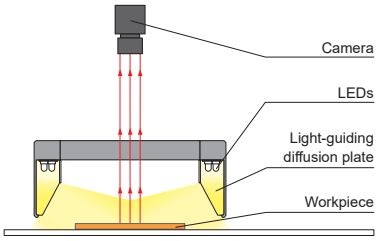
Applications Edge extraction of metal parts, character recognition for electronic parts, inspection for parts on circuit boards, label inspections, imaging of alignment marks, etc.

Features

Light from the vertically-arranged LEDs is transmitted through the light-guiding diffusion plate and uniformly diffused light is concentrated on the center of the workpiece from a low angle.



Example configuration (FPR-100)



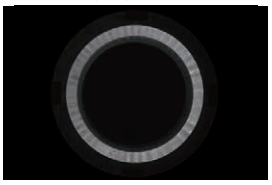
We accept custom orders.
Please feel free to inquire.

- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

Imaging example: Imaging the appearance of metal parts

Workpiece: Nut for bearings

■LED Ring Light



It is difficult to evenly illuminate the slanted exterior.

⇒

■FPR-136RD2

It is possible to evenly illuminate the slanted exterior.

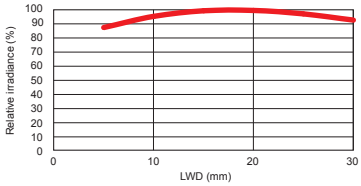
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

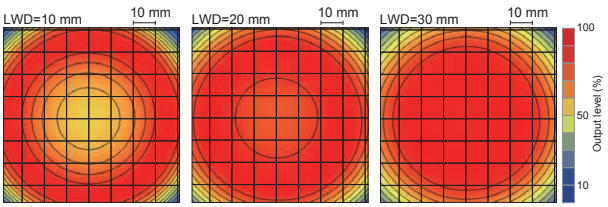
FPR-100RD2

Relative irradiance graph (LWD characteristics) *1 *2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Lineup

Model Name*1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	GR (Green)	Options	Extension Cables	Recommended Control Units	Weight
FPR-100□□2	24 V	6.1 W	7.6 W	7.6 W	7.6 W	–	FCB*4 Straight Cable FCB-W*5 2-Branch Cable FCB-F 4-Branch Cable FRCB Robot Cable	PD4 PD3 CC-ST-1024 POD*2	220 g
FPR-136□□2	24 V	9.1 W	12 W	12 W	12 W			PD4 PD3 CC-ST-1024*3 POD*2 *3 Can only use red.	300 g *SW is 280 g
FPR-180□□2	24 V	13 W	16 W	16 W	16 W			PD4 PD3 POD*2	400 g *SW is 380 g

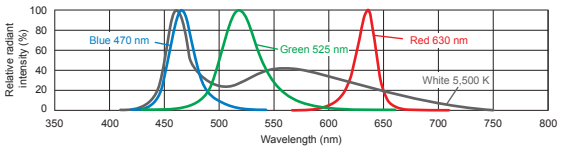
*4 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*5 The cables with a model name that ends with "-EL2" are not included.

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, GR: Green)
*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

LED Properties

Spectral distribution

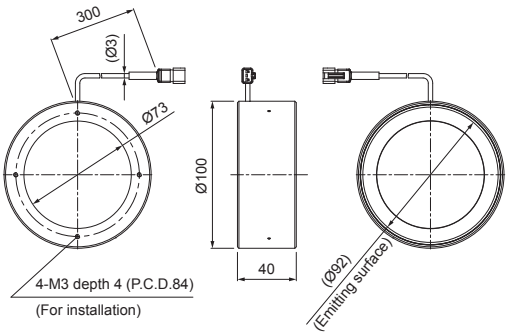


Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359

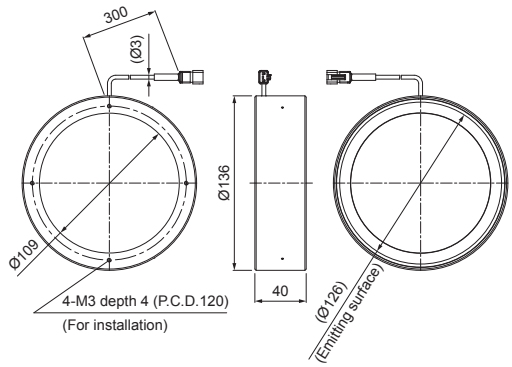
Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Dimensions (mm)

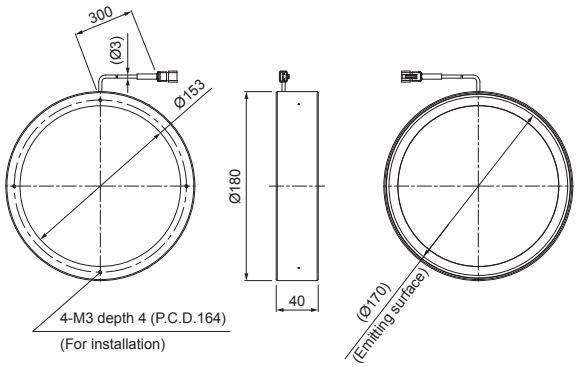
FPR-100RD2/SW2/BL2/GR2



FPR-136RD2/SW2/BL2/GR2



FPR-180RD2/SW2/BL2/GR2



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Diffused Lighting

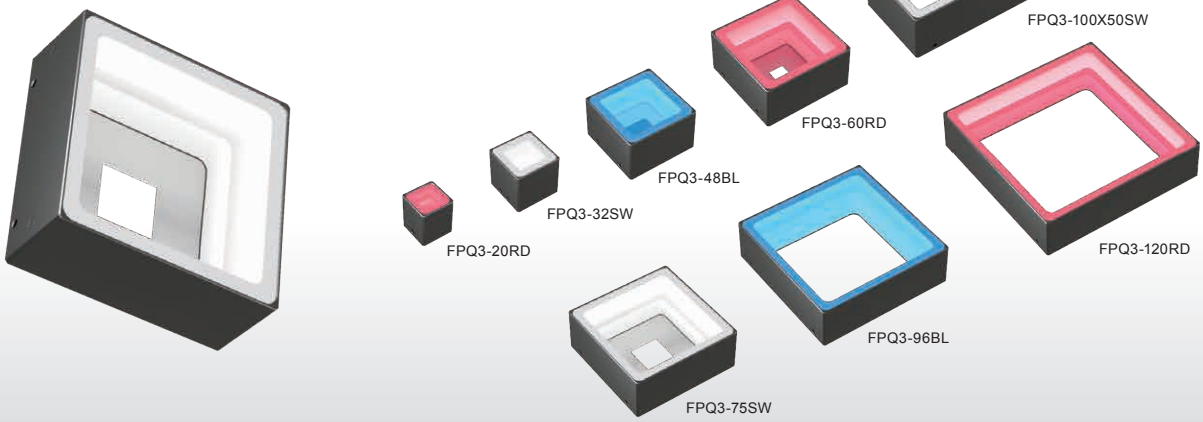
Low-Angle Square Lights

FPQ3 Series

Refer to our website for product details.

CCS FPQ3 ▶ Search

Provides diffused light at a low angle from four directions

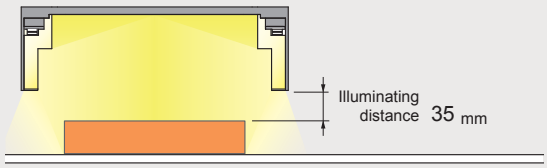


Applications Visual inspection for electronic parts; character recognition; inspection for bending, slipping, and staining of pins or leads; visual and pattern inspections for circuit boards; fault inspection for LCDs; IC lead inspection; etc.

Effective for quadrangular workpieces

The FPQ3 Series is a low angle light suitable for rectangular workpieces. It prevents the detection of contours at four corners and reflection, which is difficult with a ring light.

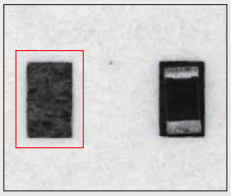
Imaging example for the FPQ3-48RD: Imaging for detecting electronics parts



LED Ring Light

There is glare from the surface film and it is difficult to determine if the part is there.

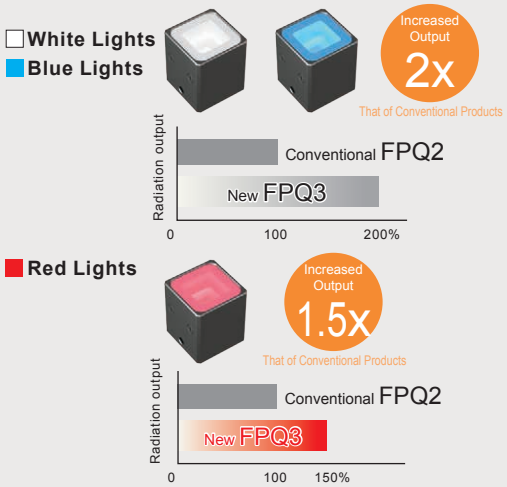
FPQ3-48RD



Film glare is removed, making it possible to determine if the part is there.

High-Output, 2x Conventional Products

Output has been increased by 2x for white and blue, 1.5x for red light units. Furthermore, output is more than doubled when used with a POD Series strobe overdrive control unit

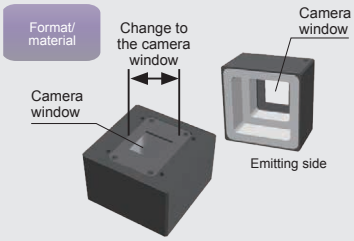


Comparison of the conventional products of the same color.
The data included is for reference only. Actual values may vary.

Custom Order Example

Please contact your CCS sales representative.

E.g.: Changed format so that the light unit does not overlap with the field of view.



Customizable items

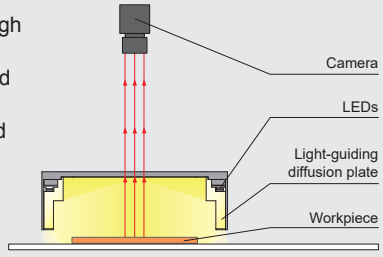
- External/internal diameter
- Wavelength/ color
- Increase output
- Cable length
- Illuminating angle
- Format/ material
- Connector format
- Installation/ mounting

Etc.

Example Configuration

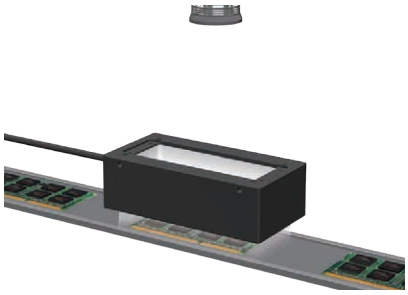
Light illuminated from the LEDs is transmitted through the light-guiding diffusion plate and uniform diffused light is illuminated centrally on the workpiece from a low angle.

FPQ3-96



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Imaging Example: Imaging the Appearance of PC Memory Boards

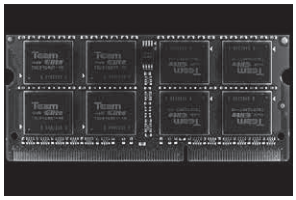


Description	Visual inspection
Workpiece	PC memory boards
Conventional lighting	FPQ2-120SW
New lighting	FPQ3-100X50SW
Result	Improved uniformity

■ Workpiece image

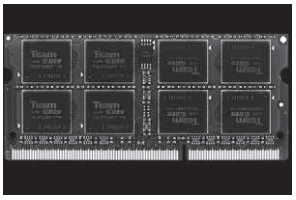
PC memory boards

■ FPQ2-120SW



It is difficult to evenly illuminate and capture the apperance of the memory boards.

■ FPQ3-100X50SW



It is possible to evenly illuminate and capture the apperance of the memory boards.

Imaging Example: Imaging the Appearance of Electronic Components

Description	Visual inspection
Workpiece	Electronic components
Conventional lighting	Without reflection panel
New lighting	With a reflection panel
Result	Improved uniformity

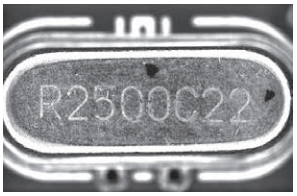
■ Workpiece image

Electronic components

■ Without Reflection Plate

Illuminating from a low angle allows you to observe the engraved characters.

■ With a Reflection Plate



Illuminating from above and a low angle allows you to observe the characters and blots.

Data: Relative Irradiance Graph and Uniformity (Representative Example)

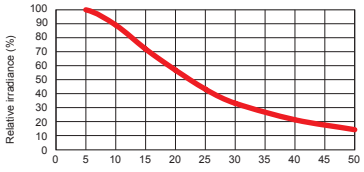
The data included is for reference only. Actual values may vary.

FPQ3-48RD

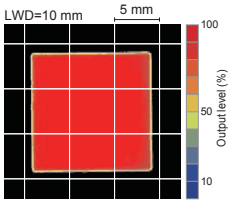
Relative irradiance graph[*1] (LWD characteristics)[*2]

*1 Irradiance on the optical axis

*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)

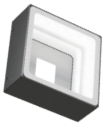


You can inquire using our website.

Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products

Inquire on our website here.
https://www.ccs-grp.com/contact/

FPQ3 Series



Refer to our website for product details.

CCS FPQ3 ▶ Search

Lineup

Model Name*1	Input Voltage	Power Consumption RD (Red)	Power Consumption SW (White)	Power Consumption BL (Blue)	Options	Extension Cables	Recommended Control Units	Weight
FPQ3-20□□	24 V	1.3 W	3.1 W	2.6 W	–	FCB*5 Straight Cable FCB-W*6 2-Branch Cable FCB-F 4-Branch Cable FRCB Robot Cable	PD4 PD3 CC-ST-1024 POD*2	25 g
FPQ3-32□□	24 V	3.8 W	7.1 W	5.1 W	Reflective plate			50 g
FPQ3-48□□	24 V	5.1 W	11 W	7.6 W	–		PD4 PD3 CC-ST-1024*3 POD*2 *3 Can only use red and blue.	90 g
FPQ3-60□□	24 V	7.6 W	15 W	11 W			PD4 PD3 CC-ST-1024*4 POD*2 *4 Can only use red.	120 g
FPQ3-75□□	24 V	12 W	22 W	16 W				155 g
FPQ3-96□□	24 V	13 W	25 W	18 W	Reflective plate		PD4 PD3 POD*2	170 g
FPQ3-120□□	24 V	16 W	27 W	21 W				220 g
FPQ3-100×50□□	24 V	11 W	18 W	13 W				135 g

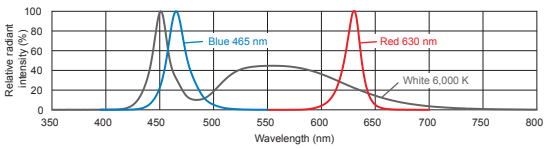
*5 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*6 The cables with a model name that ends with "-EL2" are not included.

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue)
*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

LED Properties

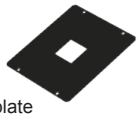
Spectral distribution



Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Options



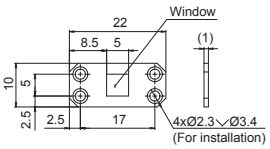
Reflection plate

Installing the reflection plate on the light unit enhances the dome effect, which enables highly-uniform and diffused illumination.

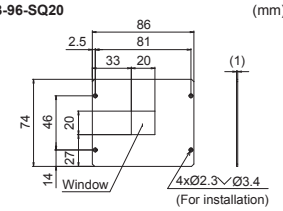
Model name	Applicable Light Unit (Common for all colors)
RP-FPQ3-32-SQ5	FPQ3-32
RP-FPQ3-96-SQ20	FPQ3-96
RP-FPQ3-120-SQ20	FPQ3-120
RP-FPQ3-100X50-SQ10	FPQ3-100X50

Accessories: Flat countersunk head screws, JCIS #0 type 1, M2 (4 mm) x 5 pieces
The FPQ3-48-, FPQ3-60-, and FPQ3-75 Series light units have a factory-installed reflection plate.

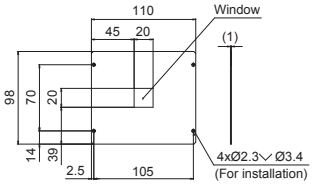
RP-FPQ3-32-SQ5



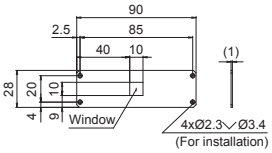
RP-FPQ3-96-SQ20 (mm)



RP-FPQ3-120-SQ20



RP-FPQ3-100X50-SQ10

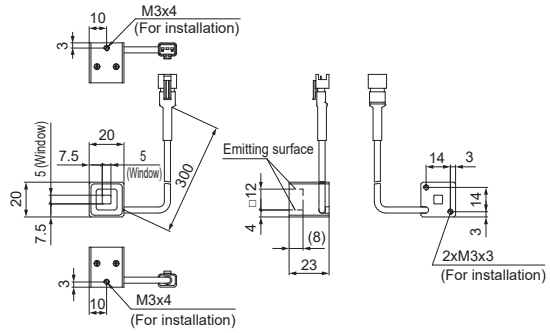


Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

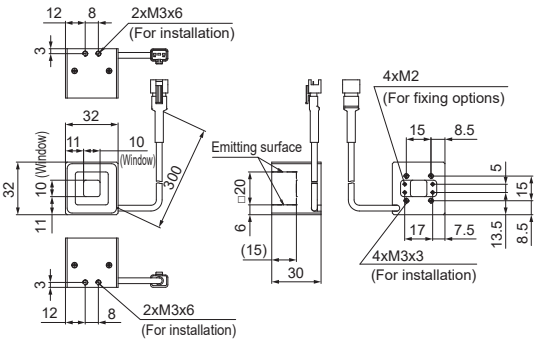
Register to use them.

Dimensions (mm)

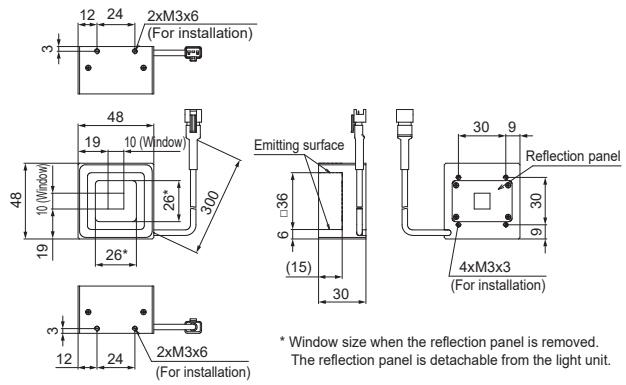
FPQ3-20RD/SW/BL



FPQ3-32RD/SW/BL

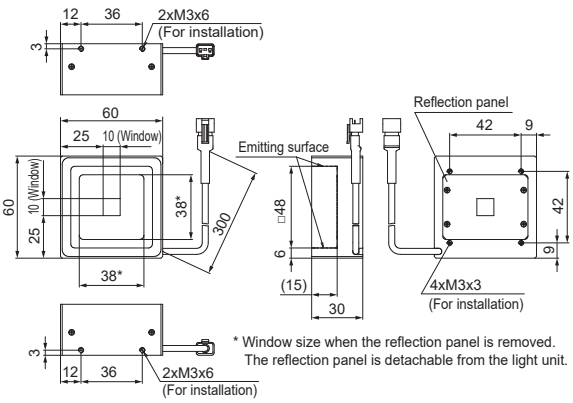


FPQ3-48RD/SW/BL



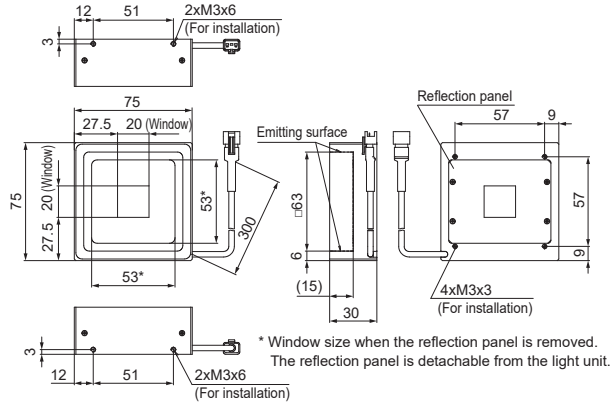
* Window size when the reflection panel is removed.
The reflection panel is detachable from the light unit.

FPQ3-60RD/SW/BL



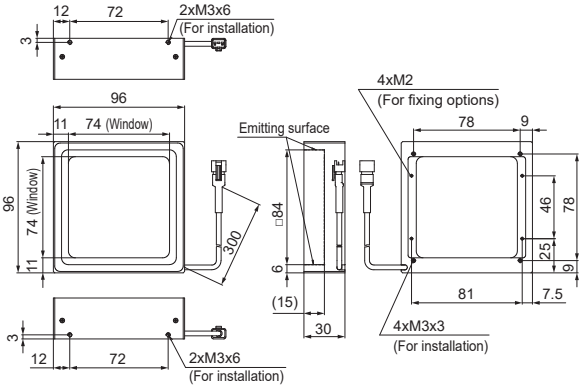
* Window size when the reflection panel is removed.
The reflection panel is detachable from the light unit.

FPQ3-75RD/SW/BL

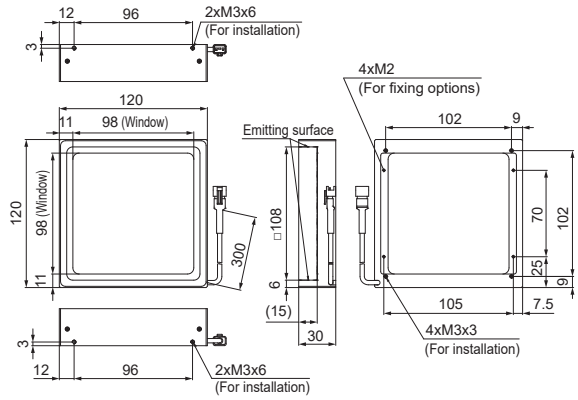


* Window size when the reflection panel is removed.
The reflection panel is detachable from the light unit.

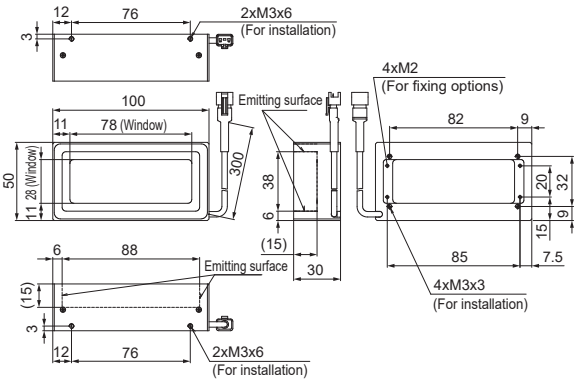
FPQ3-96RD/SW/BL



FPQ3-120RD/SW/BL



FPQ3-100×50RD/SW/BL



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Direct Lighting

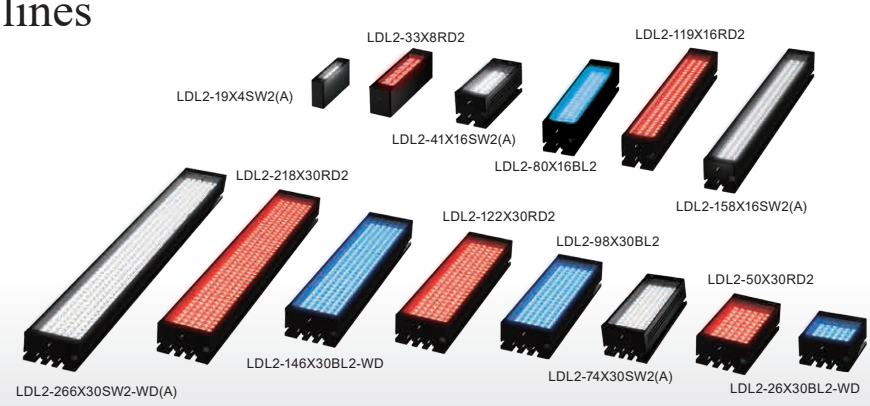
Bar Lights

LDL2 Series

Refer to our website for product details.

CCS LDL2 ▶ Search

Provides direct light from an emitting part equipped with LEDs in straight lines



Applications Various inspections for reading text, visual inspection for damage on long and thin workpieces, damage inspection for metal with hairline finishing, light source for a line sensor camera, various inspections to detect foreign material, etc.

Rich Lineup with 141 Models*

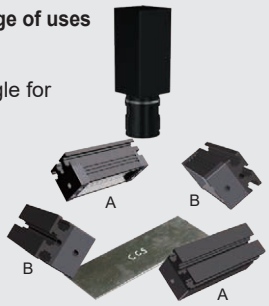
We have a lineup of 141 models*, such as combinations of the size and emitting width of the emitting surface, directional characteristics, and the emitted color.

* Total number of models of the conventional products and high-power type products.

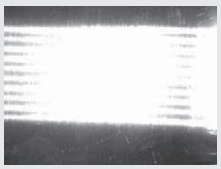
Compatible with a wide range of uses

You can freely adjust the illuminating direction and angle for use in a wide range of uses.

Bar lights allow the illumination direction and angle to be freely adjusted, enabling imaging according to the workpiece.



Illuminating image from direction A



Illuminating image from direction B

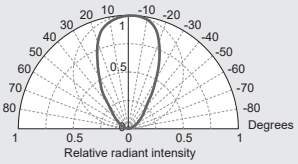
Bar Lights That Use Surface-Mounted LEDs

These are Bar Lights that use surface-mounted LEDs. We provide the narrow type, which performs convergent illumination for a narrow space, and the wide type (-WD) which illuminates a wide space.

Select the directional characteristics of a narrow type or wide type

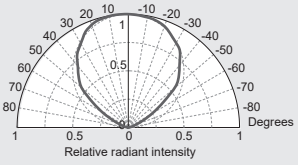
■ Directional characteristics of the Narrow Type (White)

Zoomed-in view of the emitting surface



■ Directional characteristics of the Wide Type (White)

Zoomed-in view of the emitting surface

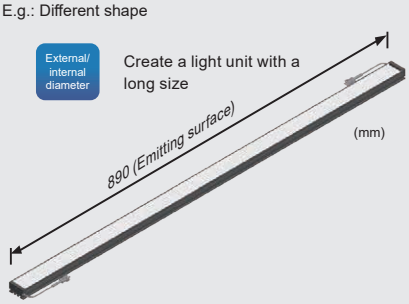


Custom Order Example

E.g.: Different shape

External/ internal diameter

Create a light unit with a long size



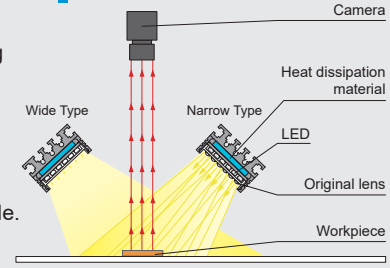
External/ internal diameter | Wavelength/ color
Increase output | Cable length
Illuminating angle | Format/ material
Connector format | Installation/ mounting
Etc.

Contact us for any inquiries.

Example Configuration

Achieved light with a narrow directionality using the original lens located in front of the LEDs. Illuminates direct light from any angle.

LDL2-74X30



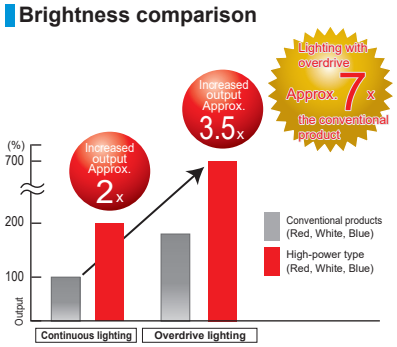
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

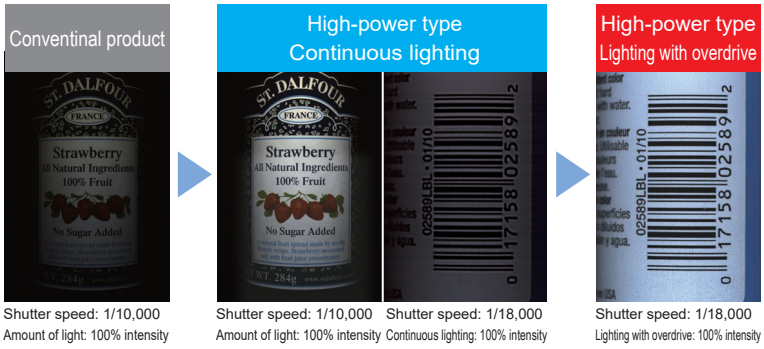
Increased Brightness and Rich Variety of Sizes

For detailed information on the overdrive, refer to P.393.

The data included is for reference only. Actual values may vary.

Brightness comparison





Shutter speed: 1/10,000
Amount of light: 100% intensity

Shutter speed: 1/10,000
Amount of light: 100% intensity

Shutter speed: 1/18,000
Continuous lighting: 100% intensity

Shutter speed: 1/18,000
Lighting with overdrive: 100% intensity

*Comparison of LDL2-74X30SW and LDL2-74X30SW2. Comparison of LDL2-74X30SW2 on continuous lighting and overdrive lighting.

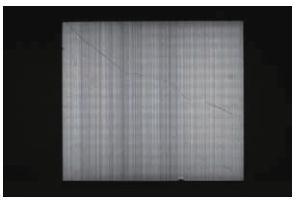
Imaging Example: Imaging of Damage in Sheet Metals (Hairline Finishing)

Description	Visual inspection
Workpiece	Aluminum sheets (hairline finishing)
Before the proposal	LED Bar Light
After the proposal	LDL2-74X30RD Precise illumination angle and direction
Result	Extracts only the damage

Workpiece image

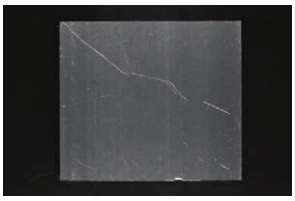
Aluminum sheets (hairline finishing)

LED Bar Light



Due to reflection from the hairline finishing surface, it is difficult to form an image of the damage.

LDL2-74X30RD



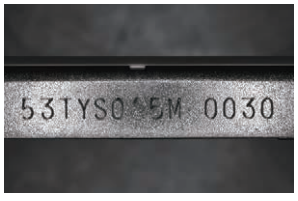
Surface reflection is reduced and a clear image of the damage can be made.

Imaging Example: Imaging Engraved Characters on Plastic Surfaces

Workpiece image

Digital video cassettes

LED Ring Light + Diffusion plate



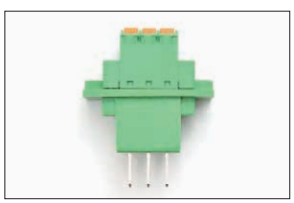
It is difficult to observe the engraved characters due to uneven illumination.

LDL2-80X16RD2 + Diffusion plate

When you attach the diffusion plate to the Bar Light and illuminate the workpiece, the engraved characters are evenly and brightly captured.

Imaging Example: Imaging the Appearance of Connector Pins

Workpiece image

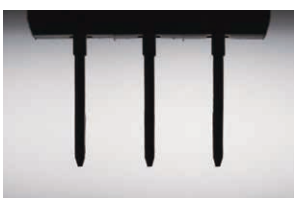


Connectors

LDL2-74X30SW2-WD

Illumination from the front of the workpiece allows you to observe the surface state of the connector.

LDL2-74X30SW2-WD + Diffusion plate



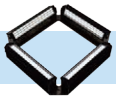
Illumination using a diffusion plate from behind the workpiece allows you to observe the appearance of the connector.

LDL2 Series

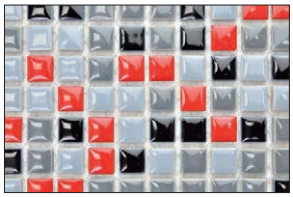
Refer to our website for product details.

CCS LDL2 ▶ Search

Imaging Example: Imaging the Surface and Appearance of Tiles

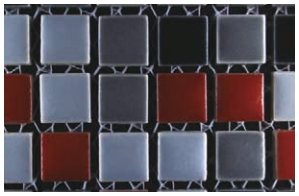


Workpiece image



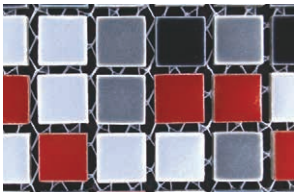
Tiles

LDL2-119X16SW2 (double use)



It is difficult to observe the surface and appearance of the tiles with a double use of the Bar Lights due to uneven illumination.

LDL2-119X16SW2 (quadruple use) + bracket



The Bar Lights which are mounted on the four sides of the bracket illuminate the surface and appearance of the tiles, so that they are captured brightly and evenly.

Data: Relative Irradiance Graph/Uniformity (Representative Example)

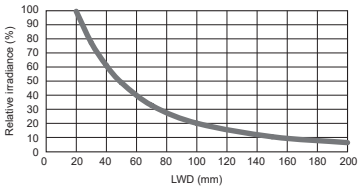
The data included is for reference only. Actual values may vary.

Conventional products

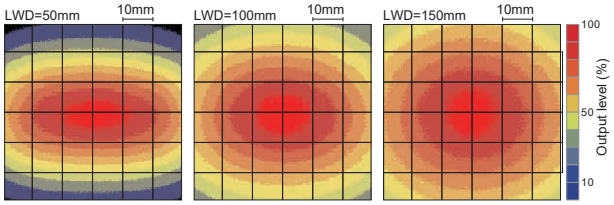
LDL2-74X30SW (Narrow type)

Relative irradiance graph*1 (LWD characteristics)*2

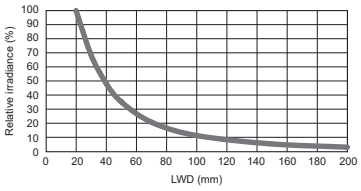
*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece

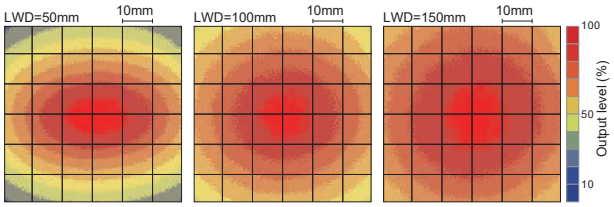


Uniformity (Relative irradiance)



LDL2-74X30SW-WD (Wide type)



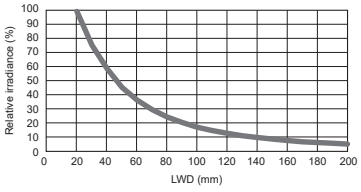


New products

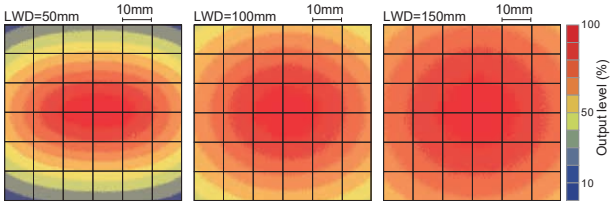
LDL2-74X30SW2(A) (Narrow type)

Relative irradiance graph*1 (LWD characteristics)*2

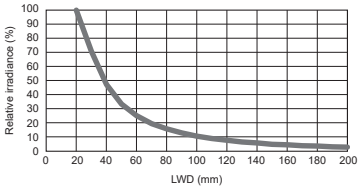
*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece

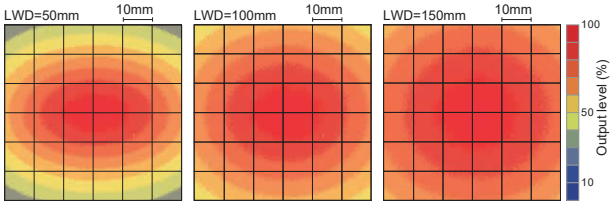


Uniformity (Relative irradiance)



LDL2-74X30SW2-WD(A) (Wide type)

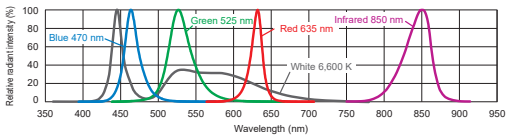
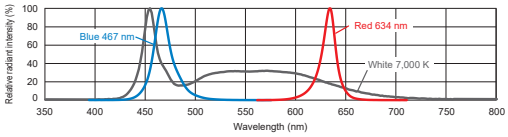
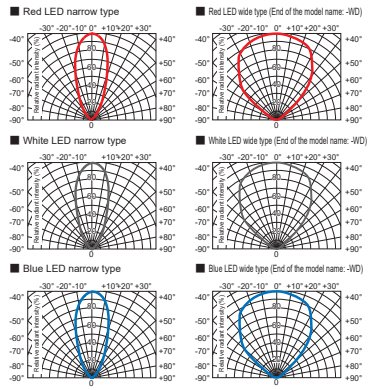
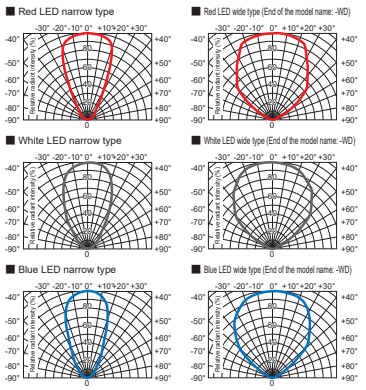




Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

LED Properties

	Conventional products	High-power type
Spectral distribution		
	Lens filters suitable for each wavelength are available. For details about the lens filter, refer to P.359.	
Directional characteristics (Typical examples)		

Be sure to read the User Manual included with the product before use and observe cautionary information. The data included is for reference only. Actual values may vary.

Differences between conventional products and high-power types

Differences between conventional products and high-power types

Changes	Conventional product	High-power type
Peak emitting wavelength	Red 635 nm / Blue 470 nm	Red 634 nm / Blue 467 nm
Correlated color	White 6,600 K	White 7,000 K
Power consumption	Refer to the Lineup table. (P.65 to 66)	
Spectral distribution	Refer to the LED properties. (P.64)	
Directional characteristics		

Model name

Conventional product	High-power type
(Example) LDL2-41X16SW LDL2-41X16SW-WD LDL2-41X16RD LDL2-41X16RD-WD	(Example) LDL2-41X16SW2(A) LDL2-41X16SW2-WD(A) LDL2-41X16RD2 LDL2-41X16RD2-WD

Change in model names

"(A)" is added to the end of SW2 model names only
e.g. LDL2-41X16SW2 → LDL2-41X16SW2(A)
LDL2-41X16SW2-WD → LDL2-41X16SW2-WD(A)

Reason	Impact on functions and performance
LEDs have been changed due to the discontinuation of the LEDs used.	Lower correlated color temperature (more yellow) Conventional product: 7800 K New product: 7000 K

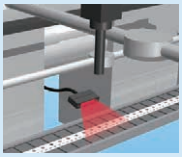
Power consumption differs between the conventional product and the high output type. Make sure that the total power consumption is within the output power of the control unit of the product before use.
Optional items are the same as for the conventional product. For optional items of newly added sizes, refer to the lineup of each item.

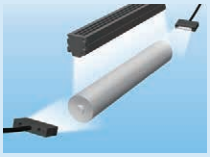
Shortest Bar Light in the Series

LDL2-19X4 Series

Applications:
Visual inspection of extremely small parts, etc.

Use it for installations in narrow devices or to save space on your manufacturing line.


Narrow spaces inside devices


As assistance lighting for other lights

LDL2 Series

Refer to our website for product details.

CCS LDL2 ▶ Search

Lineup (Conventional Products) "-WD" at the end of the model name: Wide type

Emitting width	Model Name *1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	GR (Green)	IR850 (Infrared)	Option	Extension Cables	Recommended Control Units	Weight
8 mm	LDL2-33X8□□*2	24 V	1.3 W	0.8 W	0.8 W	0.8 W	1.3 W *3	Diffusion Plate, Polarizing Plate, Bracket			20 g
16 mm	LDL2-41X16□□(-WD)	24 V	1.9 W	1.9 W	1.9 W	1.9 W	—			PD4, PD3	50 g
	LDL2-80X16□□(-WD)	24 V	3.8 W	3.8 W	3.8 W	3.8 W	—			CC-ST-1024, POD*3*4	75 g
	LDL2-119X16□□(-WD)	24 V	5.7 W	5.7 W	5.7 W	5.7 W	—			*3 Cannot use infrared.	95 g
	LDL2-158 X16□□(-WD)	24 V	7.6 W	7.6 W	7.6 W	7.6 W	—				120 g
	LDL2-197X16□□(-WD)	24 V	9.5 W	9.5 W	9.5 W	9.5 W	—				145 g
	LDL2-236X16□□(-WD)	24 V	12 W	12 W	12 W	12 W	—				170 g
	LDL2-275X16□□(-WD)	24 V	14 W	14 W	14 W	14 W	—				195 g
	LDL2-314X16□□(-WD)	24 V	16 W	16 W	16 W	16 W	—				220 g
	LDL2-353X16□□(-WD)	24 V	18 W	18 W	18 W	18 W	—		FCB*5 Straight Cable	PD4, PD3	245 g
	LDL2-392X16□□(-WD)	24 V	19 W	19 W	19 W	19 W	—			POD*4	270 g
	LDL2-431X16□□(-WD)	24 V	21 W	21 W	21 W	21 W	—		FCB-W*6 2-Branch Cable		295 g
	LDL2-470X16□□(-WD)	24 V	23 W	23 W	23 W	23 W	—				320 g
	LDL2-509X16□□(-WD)	24 V	25 W	25 W	25 W	25 W	—		FCB-F 4-Branch Cable		345 g
30 mm	LDL2-26X30□□(-WD)	24 V	1.9 W	1.9 W	1.9 W	1.9 W	—				55 g
	LDL2-50X30□□(-WD)	24 V	3.8 W	3.8 W	3.8 W	3.8 W	—		FRCB Robot Cable		80 g
	LDL2-74X30□□(-WD)	24 V	5.7 W	5.7 W	5.7 W	5.7 W	—			PD4, PD3	100 g
	LDL2-98X30□□(-WD)	24 V	7.6 W	7.6 W	7.6 W	7.6 W	—	Diffusion Plate, Polarizing Plate, Protective Plate, Bracket	*5 The cables with a model name that ends with -ME7/-EL2/-PF/-PF-EL9 are not included. *6 The cables with a model name that ends with -EL2 are not included.	CC-ST-1024, POD*4	125 g
	LDL2-122X30□□(-WD)	24 V	9.5 W	9.5 W	9.5 W	9.5 W	—				150 g
	LDL2-146X30□□(-WD)	24 V	12 W	12 W	12 W	12 W	—				170 g
	LDL2-170X30□□(-WD)	24 V	14 W	14 W	14 W	14 W	—				200 g
	LDL2-194X30□□(-WD)	24 V	16 W	16 W	16 W	16 W	—				225 g
	LDL2-218X30□□(-WD)	24 V	18 W	18 W	18 W	18 W	—				240 g
	LDL2-242X30□□(-WD)	24 V	19 W	19 W	19 W	19 W	—				275 g
	LDL2-266X30□□(-WD)	24 V	21 W	21 W	21 W	21 W	—				280 g
	LDL2-290X30□□(-WD)	24 V	23 W	23 W	23 W	23 W	—				325 g
	LDL2-314X30□□(-WD)	24 V	25 W	25 W	25 W	25 W	—			PD4, PD3	350 g
	LDL2-338X30□□(-WD)	24 V	27 W	27 W	27 W	27 W	—			POD*4	375 g
	LDL2-362X30□□(-WD)	24 V	29 W	29 W	29 W	29 W	—				400 g
	LDL2-386X30□□(-WD)	24 V	31 W	31 W	31 W	31 W	—				425 g
	LDL2-410X30□□(-WD)	24 V	33 W	33 W	33 W	33 W	—				450 g
	LDL2-434X30□□(-WD)	24 V	35 W	35 W	35 W	35 W	—				475 g
	LDL2-458X30□□(-WD)	24 V	37 W	37 W	37 W	37 W	—				500 g
	LDL2-482X30□□(-WD)	24 V	38 W	38 W	38 W	38 W	—				525 g
	LDL2-506X30□□(-WD)	24 V	40 W	40 W	40 W	40 W	—				550 g

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

* For the peak wavelength / correlated color temperature, refer to the spectral distribution on P.64 "LED Properties".

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, GR: Green, IR850: Infrared)
*2 All LEDs of the LDL2-33X8 have wide type directional characteristics.
*3 Infrared lighting cannot be used in combination with a strobe control unit (overdrive specification type). Please contact us if you would like to request a custom order.
*4 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

Lineup (High-Power Type)

"-WD" at the end of the model name: Wide type

Emitting width	Model Name *1	Input Voltage	Power Consumption RD (Red)	Power Consumption SW*2 (White)	Power Consumption BL (Blue)	Option	Extension Cables	Recommended Control Units	Weight
4 mm	LDL2-19X4□□2*4	24 V	1.3 W	1.3 W	1.1 W	Diffusion Plate, Polarizing Plate, Bracket*5 (*5 Available as custom order)			12 g
8 mm	LDL2-33X8□□2*4	24 V	2.6 W	2.1 W	1.5 W	Diffusion Plate, Polarizing Plate, Bracket		PD4, PD3, CC-ST-1024, POD*5	20 g
16 mm	LDL2-41X16□□2(-WD)	24 V	3.8 W	3.8 W	3.8 W				50 g
	LDL2-80X16□□2(-WD)	24 V	7.6 W	7.6 W	7.6 W				75 g
	LDL2-119X16□□2(-WD)	24 V	12 W	12 W	12 W				95 g
	LDL2-158X16□□2(-WD)	24 V	16 W	16 W	16 W		FCB*6 Straight Cable		120 g
	LDL2-197X16□□2(-WD)	24 V	19 W	19 W	19 W		FCB-W*7 2-Branch Cable		145 g
	LDL2-236X16□□2(-WD)	24 V	23 W	23 W	23 W				170 g
	LDL2-275X16□□2(-WD)	24 V	27 W	27 W	27 W		FCB-F 4-Branch Cable	PD4, PD3, POD*5	195 g
	LDL2-314X16□□2(-WD)	24 V	31 W	31 W	31 W				220 g
	LDL2-353X16□□2(-WD)	24 V	35 W	35 W	35 W		FRCB Robot Cable		245 g
	LDL2-392X16□□2(-WD)	24 V	38 W	38 W	38 W				270 g
	LDL2-431X16□□2(-WD)	24 V	42 W	42 W	42 W				295 g
	LDL2-470X16□□2(-WD)	24 V	46 W	46 W	46 W				320 g
	LDL2-509X16□□2(-WD)	24 V	50 W	50 W	50 W				345 g
30 mm	LDL2-26X30□□2(-WD)	24 V	3.8 W	3.8 W	3.8 W			PD4, PD3	55 g
	LDL2-50X30□□2(-WD)	24 V	7.6 W	7.6 W	7.6 W			CC-ST-1024, POD*5	80 g
	LDL2-74X30□□2(-WD)	24 V	12 W	12 W	12 W				100 g
	LDL2-98X30□□2(-WD)	24 V	16 W	16 W	16 W	Diffusion Plate, Polarizing Plate, Protective Plate, Bracket			125 g
	LDL2-122X30□□2(-WD)	24 V	19 W	19 W	19 W				150 g
	LDL2-146X30□□2(-WD)	24 V	23 W	23 W	23 W				170 g
	LDL2-170X30□□2(-WD)	24 V	27 W	27 W	27 W				200 g
	LDL2-194X30□□2(-WD)	24 V	31 W	31 W	31 W				225 g
	LDL2-218X30□□2(-WD)	24 V	35 W	35 W	35 W				240 g
	LDL2-266X30□□2(-WD)	24 V	42 W	42 W	42 W				280 g
	LDL2-242X30□□2(-WD)	24 V	38 W	38 W	38 W				275 g
	LDL2-290X30□□2(-WD)	24 V	46 W	46 W	46 W			PD4, PD3, POD*5	325 g
	LDL2-314X30□□2(-WD)	24 V	50 W	50 W	50 W				350 g
	LDL2-338X30□□2(-WD)	24 V	53 W	53 W	53 W				375 g
	LDL2-362X30□□2(-WD)	24 V	57 W	57 W	57 W				400 g
	LDL2-386X30□□2(-WD)*3	24 V	61 W	61 W	61 W		FCB-EL2 Straight Cable		425 g
	LDL2-410X30□□2(-WD)*3	24 V	65 W	65 W	65 W				450 g
	LDL2-434X30□□2(-WD)*3	24 V	69 W	69 W	69 W		FCB-W-EL2 2-Branch Cable		475 g
	LDL2-458X30□□2(-WD)*3	24 V	72 W	72 W	72 W				500 g
	LDL2-482X30□□2(-WD)*3	24 V	76 W	76 W	76 W		FCB-EL2 Straight Cable		525 g
	LDL2-506X30□□2(-WD)*3	24 V	80 W	80 W	80 W				550 g

*6 The cables with a model name that ends with -ME7/-EL2/-PF/-PF-EL9 are not included.
*7 The cables with a model name that ends with -EL2 are not included.

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

* For the peak wavelength / correlated color temperature, refer to the spectral distribution on P.64 "LED Properties".

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue)
*2 SW: (A) is added to the end of the model name only for white color.
Example: LDL2-41X16SW2(A), LDL2-41X16SW2-WD(A)
*3 The connector is an EL connector (ELP-02V ①: + ②: brown, - blue).
Please use a power supply with EL connectors when using this product.
*4 All LEDs of the LDL2-19X4 and LDL2-33X8 have wide type directional characteristics.
*5 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

Change in model names

"(A)" is added to the end of SW2 model names only
e.g. LDL2-41X16SW2 → LDL2-41X16SW2(A)
LDL2-41X16SW2-WD → LDL2-41X16SW2-WD(A)

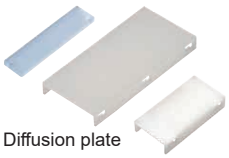
Reason	Impact on functions and performance
LEDs have been changed due to the discontinuation of the LEDs used.	Lower correlated color temperature (more yellow) Conventional product: 7800 K New product: 7000 K

LDL2 Series

Refer to our website for product details.

CCS LDL2 ▶ Search

Option



Diffusion plate

Can prevent glare, which is a problem when making images of glossy workpieces.

Model name	Applicable Light Unit (Conventional product / High-power type) (Common for all colors)
DF-LDL2-19X4	LDL2-19X4
DF-LDL2-33X8	LDL2-33X8
DF-LDL2-41X16	LDL2-41X16(-WD)
DF-LDL2-80X16	LDL2-80X16(-WD)
DF-LDL2-119X16	LDL2-119X16(-WD)
DF-LDL2-158X16	LDL2-158X16(-WD)
DF-LDL2-26X30	LDL2-26X30(-WD)
DF-LDL2-50X30	LDL2-50X30(-WD)
DF-LDL2-74X30	LDL2-74X30(-WD)
DF-LDL2-98X30	LDL2-98X30(-WD)
DF-LDL2-122X30	LDL2-122X30(-WD)
DF-LDL2-146X30	LDL2-146X30(-WD)
DF-LDL2-218X30	LDL2-218X30(-WD)
DF-LDL2-266X30	LDL2-266X30(-WD)

▶ P.363

Polarizing plate

Use with a polarizing filter to remove the light's surface reflection.

Model name	Applicable Light Unit (Conventional product / High-power type) (Common for all colors)
PL-LDL2-19X4-HO	LDL2-19X4
PL-LDL2-19X4-VE	
PL-LDL2-33X8-HO	LDL2-33X8
PL-LDL2-33X8-VE	
PL-LDL2-41X16	LDL2-41X16(-WD)
PL-LDL2-41X16-VE	
PL-LDL2-80X16	LDL2-80X16(-WD)
PL-LDL2-80X16-VE	
PL-LDL2-119X16	LDL2-119X16(-WD)
PL-LDL2-119X16-VE	
PL-LDL2-158X16	LDL2-158X16(-WD)
PL-LDL2-158X16-VE	

▶ P.365

There are two kinds of polarizing plates: the HO and the VE. For details, refer to P. 365.

Model name	Applicable Light Unit (Conventional product / High-power type) (Common for all colors)
PL-LDL2-26X30	LDL2-26X30(-WD)
PL-LDL2-26X30-VE	
PL-LDL2-50X30	LDL2-50X30(-WD)
PL-LDL2-50X30-VE	
PL-LDL2-74X30	LDL2-74X30(-WD)
PL-LDL2-74X30-VE	
PL-LDL2-98X30	LDL2-98X30(-WD)
PL-LDL2-98X30-VE	
PL-LDL2-122X30	LDL2-122X30(-WD)
PL-LDL2-122X30-VE	
PL-LDL2-146X30	LDL2-146X30(-WD)
PL-LDL2-146X30-VE	
PL-LDL2-218X30	LDL2-218X30(-WD)
PL-LDL2-218X30-VE	
PL-LDL2-266X30	LDL2-266X30(-WD)
PL-LDL2-266X30-VE	

Protective plate

Protects the emitting part of the light unit.

Not intended to protect against dust or water.

Model name	Applicable Light Unit (Conventional product / High-power type) (Common for all colors)
CV-LDL2-41X16	LDL2-41X16(-WD)
CV-LDL2-80X16	LDL2-80X16(-WD)
CV-LDL2-119X16	LDL2-119X16(-WD)
CV-LDL2-158X16	LDL2-158X16(-WD)
CV-LDL2-26X30	LDL2-26X30(-WD)
CV-LDL2-50X30	LDL2-50X30(-WD)
CV-LDL2-74X30	LDL2-74X30(-WD)
CV-LDL2-98X30	LDL2-98X30(-WD)
CV-LDL2-122X30	LDL2-122X30(-WD)
CV-LDL2-146X30	LDL2-146X30(-WD)
CV-LDL2-218X30	LDL2-218X30(-WD)
CV-LDL2-266X30	LDL2-266X30(-WD)

Not applicable for the LDL2-19X4 and LDL2-33X8 Series.

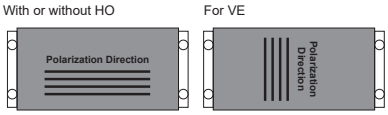
▶ P.368

When the model number ends with or without HO

As shown in the figure, the polarization direction is **horizontal** with respect to the long side of the polarizing plate.

When the model number ends with VE

As shown in the figure, the polarization direction is **perpendicular** with respect to the long side of the polarizing plate.



Refer to the Technical Guide Page for polarization. ▶ P.401

Bracket

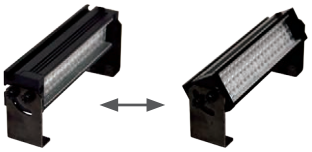
You can freely adjust the illuminating angle when affixing the Bar Light. Various kinds of illumination are possible depending on the affixing method, such as illumination from two or four directions.

Model name	Note (Conventional product / High-power type)
BK-LDL2	Angle adjustment bracket common for the LDL2 Series (x2)

Not applicable for the LDL2-19X4 and LDL2-33X8 Series.

▶ P.369

Usage example of the BK-LDL2



Adjustable illuminating angle between 0 to 90°

Bracket

You can freely adjust the illuminating angle when affixing the Bar Light. Various kinds of illumination are possible depending on the affixing method, such as illumination from two or four directions.

Model name	Note (Conventional product / High-power type)
BK-LDQ2-33X8	Bracket that can install four of the Bar Lights.

▶ P.369

We accept custom orders for the brackets that are applicable for the following products.
Contact your CCS sales representative for details.

Applicable Light Unit (High-power type)	BK-LDQ2
LDL2-19X4	Bracket that can install four Bar Lights. (Custom orders)
LDL2-26X30	
LDL2-50X30	

Bracket

You can freely adjust the illuminating angle when affixing the Bar Light. Various kinds of illumination are possible depending on the affixing method, such as illumination from two or four directions.

Model name	Note (Conventional product / High-power type)
BK-LDQ2-41X16	Bracket that can install four of the Bar Lights.
BK-LDQ2-80X16	
BK-LDQ2-119X16	
BK-LDQ2-158X16	
BK-LDQ2-74X30	
BK-LDQ2-98X30	
BK-LDQ2-122X30	
BK-LDQ2-146X30	
BK-LDQ2-218X30	
BK-LDQ2-266X30	

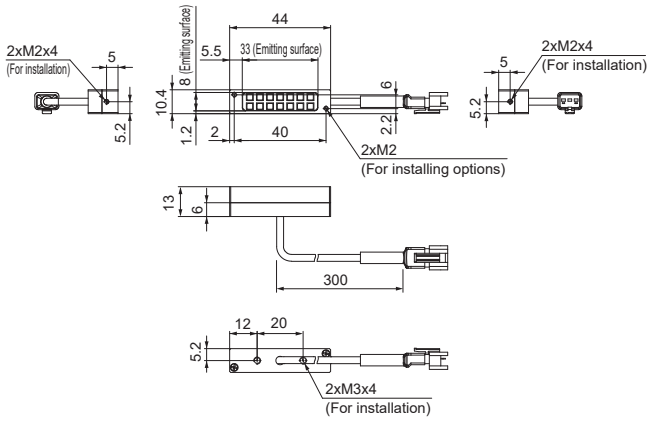
▶ P.369

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

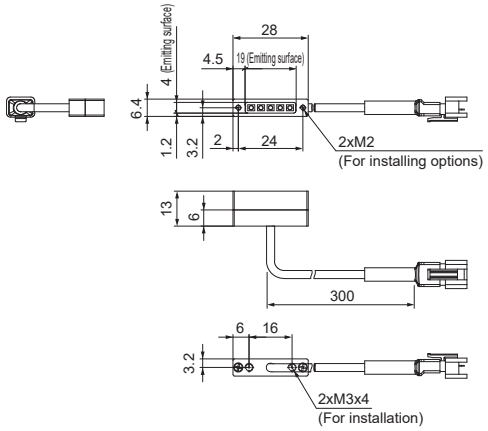
Register to use them.

Dimensions (mm)

LDL2-33X8 Standard products (Conventional products / High-power type) (Common for all colors)



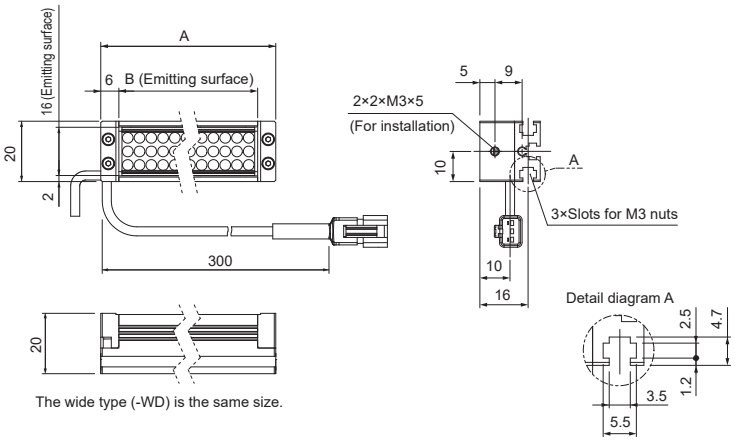
LDL2-19X4 Standard products (High-power type) (Common for all colors)



LDL2-nnnX16 Standard products (Conventional products / High-power type) Special orders (Conventional products / High-power type)

nnn= B (Emitting surface)

(Common for all colors)



The wide type (-WD) is the same size.

Standard products (Conventional products / High-power type)

Applicable Light Unit	A	B
LDL2-41X16(-WD)	53	41
LDL2-80X16(-WD)	92	80
LDL2-119X16(-WD)	131	119
LDL2-158X16(-WD)	170	158

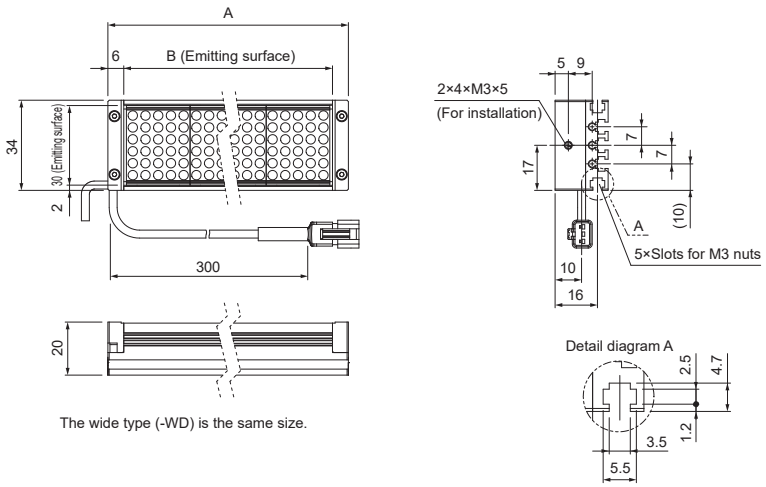
Special orders (Conventional products / High-power type)

Applicable Light Unit	A	B
LDL2-197X16(-WD)	209	197
LDL2-236X16(-WD)	248	236
LDL2-275X16(-WD)	287	275
LDL2-314X16(-WD)	326	314
LDL2-353X16(-WD)	365	353
LDL2-392X16(-WD)	404	392
LDL2-431X16(-WD)	443	431
LDL2-470X16(-WD)	482	470
LDL2-509X16(-WD)	521	509

LDL2-nnnX30 Standard products (Conventional products / High-power type) Special orders (Conventional products / High-power type)

nnn= B (Emitting surface)

(Common for all colors)



The wide type (-WD) is the same size.

Standard products (Conventional products / High-power type)

Applicable Light Unit	A	B
LDL2-26X30(-WD)	38	26
LDL2-50X30(-WD)	62	50
LDL2-74X30(-WD)	86	74
LDL2-98X30(-WD)	110	98
LDL2-122X30(-WD)	134	122
LDL2-146X30(-WD)	158	146
LDL2-218X30(-WD)	230	218
LDL2-266X30(-WD)	278	266

Special orders (Conventional products / High-power type)

Applicable Light Unit	A	B
LDL2-170X30(-WD)	182	170
LDL2-194X30(-WD)	206	194
LDL2-242X30(-WD)	254	242
LDL2-290X30(-WD)	302	290
LDL2-314X30(-WD)	326	314
LDL2-338X30(-WD)	350	338
LDL2-362X30(-WD)	374	362
LDL2-386X30(-WD)*1	398	386
LDL2-410X30(-WD)*1	422	410
LDL2-434X30(-WD)*1	446	434
LDL2-458X30(-WD)*1	470	458
LDL2-482X30(-WD)*1	494	482
LDL2-506X30(-WD)*1	518	506

*1 For the conventional products: SM connector (SMR-03V-B, 1: +Brown, 2: NC, 3: -Blue)
For the high-power type: EL connector (ELP-02V, 1: +Brown, 2: -Blue).
Use the control unit which has EL connectors.

You can inquire using our website.

Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products

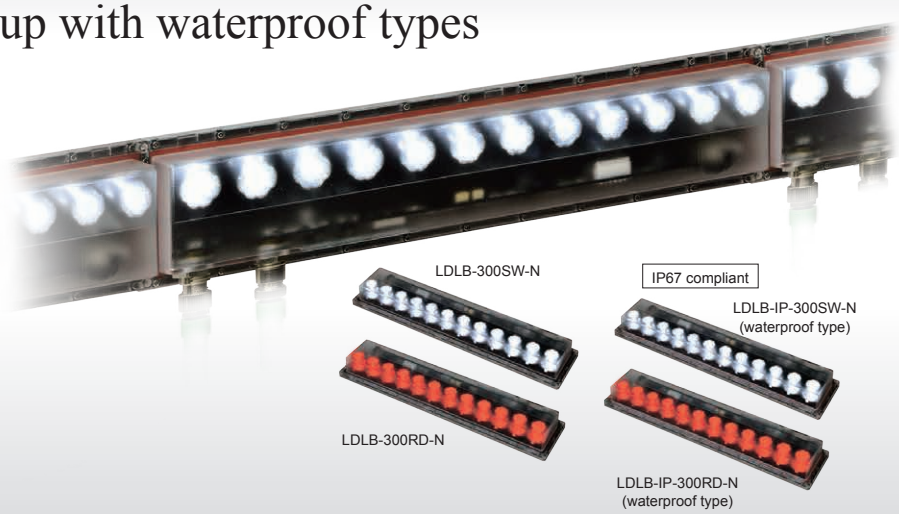
Inquire on our website here.
https://www.ccs-grp.com/contact/

LDR2
LDR2-LA
LDR-LA1
SQR
SQR-TP
Ring (Direct)
HLDR3
HPR2
LFR
LKR
FPR
Ring (Convergent / Diffused)
FPQ3
Square
LDL2
LDLB
HLDL3
LB
Bar
TH2 (5 types)
LFL
Flat
HPD2
LDM2
LAV
PDM
LFXV
LFX3
LFX3-PT
Dome
LFV3
LFV3-G
Coaxial
MSU
MFU
Coaxial
PF
Strobe
HLDR-IP
HSL-PCL
Water-proof
Small COB Lights
COB
UV3/VL3
UV
LNSP-UV3-FN
UV / Violet
IR2 (Under 1000-nm Type)
IR (Over 1000-nm Type)
CIR
Infrared
IU
Intensity Control
HLV3
LV
LSP
HFS/HFR
HLV3-22-4-NR
HLV3-3M-RGB-4
PFBR-600SW2
PFBR-150
PFB3
Spot, Etc.
LNLP
LNSP2
Coaxial Units
LNSP-FN
LN/LN-HK
Line (Convergent)
LNSD
LND2
LT
LNV
LFXV (Rectangular Type)
TH2 (Rectangular Type)
Line (Diffused)
LNDG
LNIS2
LNIS
LNIS-FN
Line (Oblique Angled)
Telecentric Lens
Macro Lens
Lenses

Refer to our website for product details.
CCS LDLB ▶ Search

Bar Light with built-in controller and lineup with waterproof types

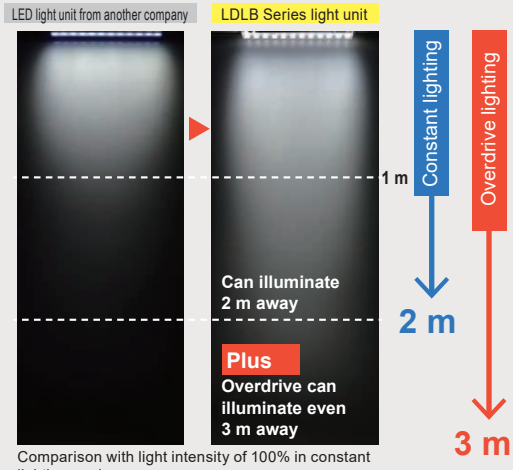
Overdrive Specifications



Applications Light source for robotic picking, visual inspection for beverage packages, product identification inspection for various parts, inspection for missing mounted parts, visual inspection for large workpieces, etc.

Overdrive Can Illuminate Even 3 m Away

Just one light unit provides both constant lighting and overdrive lighting.



Comparison with light intensity of 100% in constant lighting mode

Built-In Controller, 24 VDC Input

The controller is built-in, so you don't need a control unit for light control. You can set intensity values and switch modes by panel operations.

Light intensity setting

+: Increases the light intensity.
-: Decreases the light intensity.
You can set the light intensity to any of 100 levels.

or

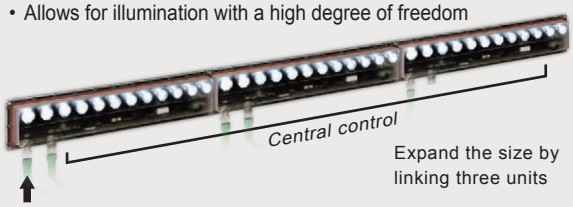
Mode switching

Constant lighting mode | Overdrive mode

Hold down two buttons to change the operating mode between constant lighting and overdrive lighting.

Can Be Connected in a Daisy-Chain

- Connect up to three units
- Centrally control the chain externally
- Allows for illumination with a high degree of freedom



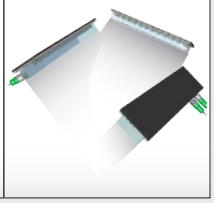
Expand the size by linking three units

- 24 VDC input
- External signal input

Example connection 1
Simultaneous illumination with 2 units

For robot picking

Example connection 2
Simultaneous illumination with 3 units

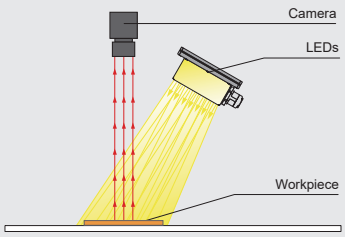


(Conceptual image)

Example Configuration

Bar light with built-in controller. Enables long-distance illumination of large workpieces. Even brighter with the overdrive switching.

LDLB Series

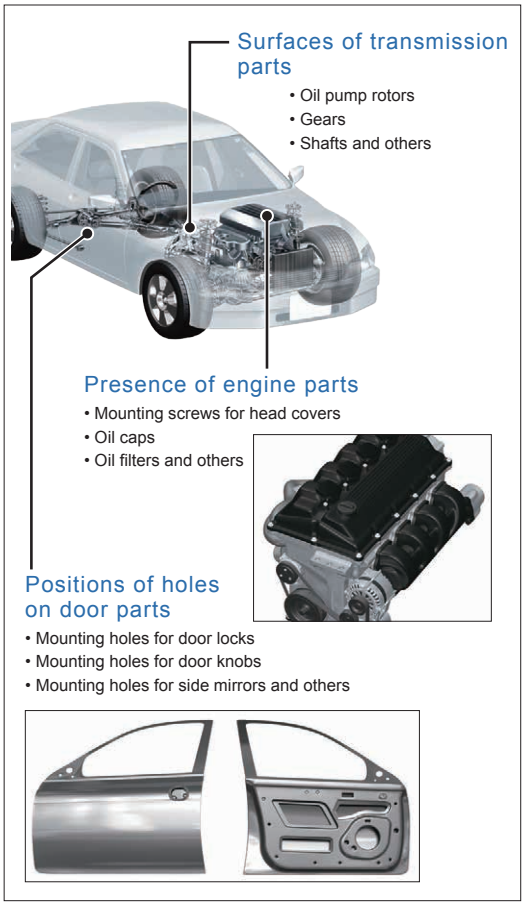


Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

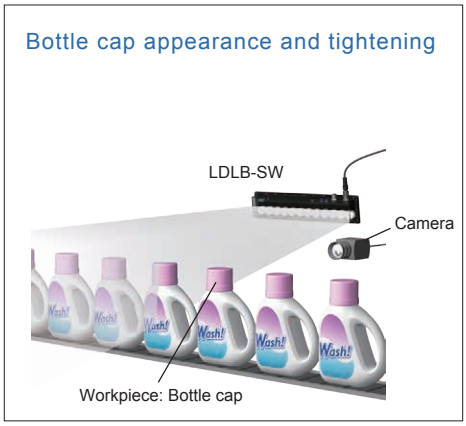
Register to use them.

Applications

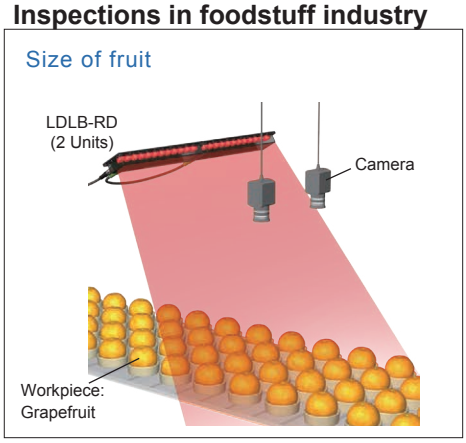
Inspections in automotive industry



Inspections in packaging industry



Inspections in foodstuff industry



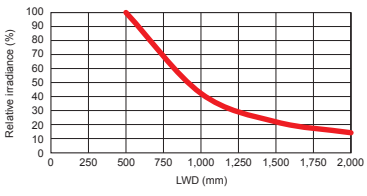
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

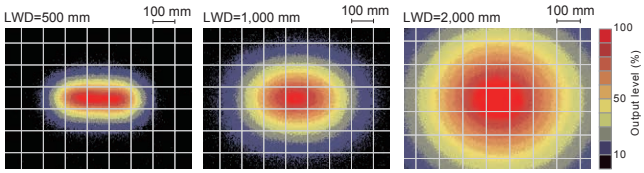
LDLB-300RD-N (Red)

Relative irradiance graph (LWD characteristics) *2

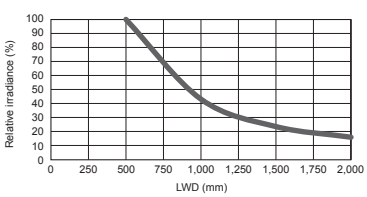
*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece

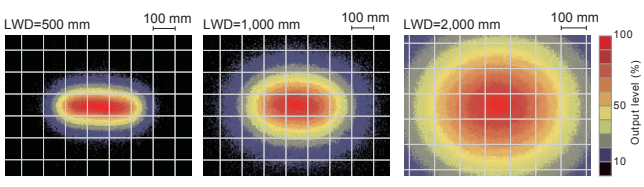


Uniformity (Relative irradiance)



LDLB-300SW-N (White)





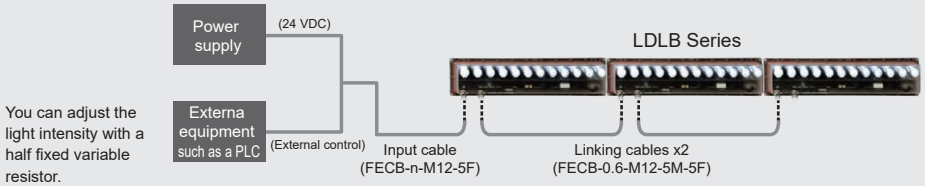
LDLB Series

Refer to our website for product details.

CCS LDLB ▶ Search

System Configuration Example

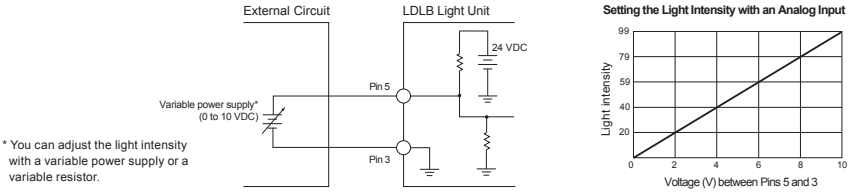
Example: Daisy-chaining three light units



Connection Example

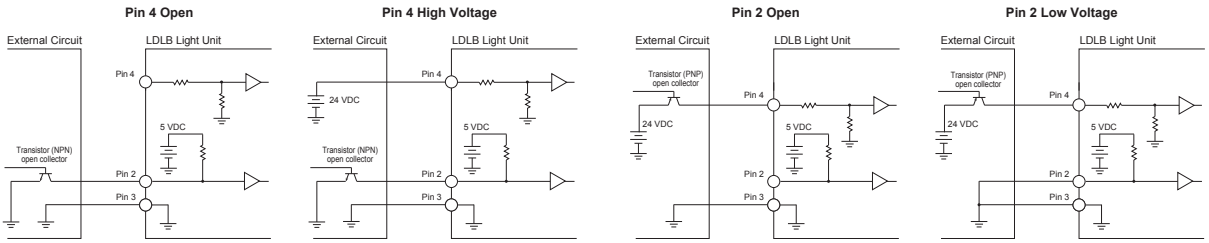
Refer to the User Manual for details.

External control of light intensity



ON/OFF Inputs

With these light units, you can use a sink type input (NPN) or a source type input (PNP).



Logic Table

Logic switching	Pin 4	Open		High voltage	
Signal input	Pin 2 (NPN)	Open	Low voltage	Open	Low voltage
Operating mode	Constant Lighting Mode	Lit.	Not lit.	Not lit.	Lit.
	Overdrive Mode	Not lit.	Lit.	Lit.	Not lit.

Refer to the following table for the low and high voltages.

Pin	Signal input status	Range
Pin 2 (NPN)	Low voltage	0 to 1.1 VDC
Pin 4	High voltage	20.7 to 26.4 VDC

Logic Table

Logic switching	Pin 2	Open		Low voltage	
Signal input	Pin 4 (PNP)	Open	High voltage	Open	High voltage
Operating mode	Constant Lighting Mode	Lit.	Not lit.	Not lit.	Lit.
	Overdrive Mode	Not lit.	Lit.	Lit.	Not lit.

Refer to the following table for the low and high voltages.

Pin	Signal input status	Range
Pin 2	Low voltage	0 to 1.1 VDC
Pin 4 (PNP)	High voltage	20.7 to 26.4 VDC

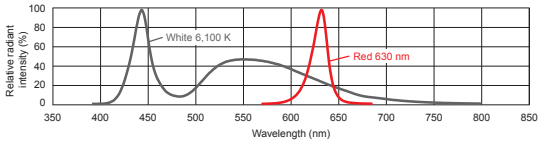
Lineup

Model Name	Protective Structure	LED Color	Power Consumption	Input Voltage (rated)	Input Voltage (range)	Peak Wavelength / Correlated Color Temperature	Input/Output Connectors	Optional Cables	Weight
LDLB-300RD-N	—	Red	24 W	24 VDC	22.8 to 26.4 VDC	630 nm	M12 connector	FECB-M12-5F Input Cable FECB-0.6-M12-5F Link Cable	500 g
LDLB-300SW-N		White	31 W			6,100 K			
LDLB-IP-300RD-N	IP67 compliant (JIS C 0920)	Red	24 W			630 nm			
LDLB-IP-300SW-N		White	31 W			6,100 K			

Optional Cables ▶ P.72

Common Specifications

Spectral distribution

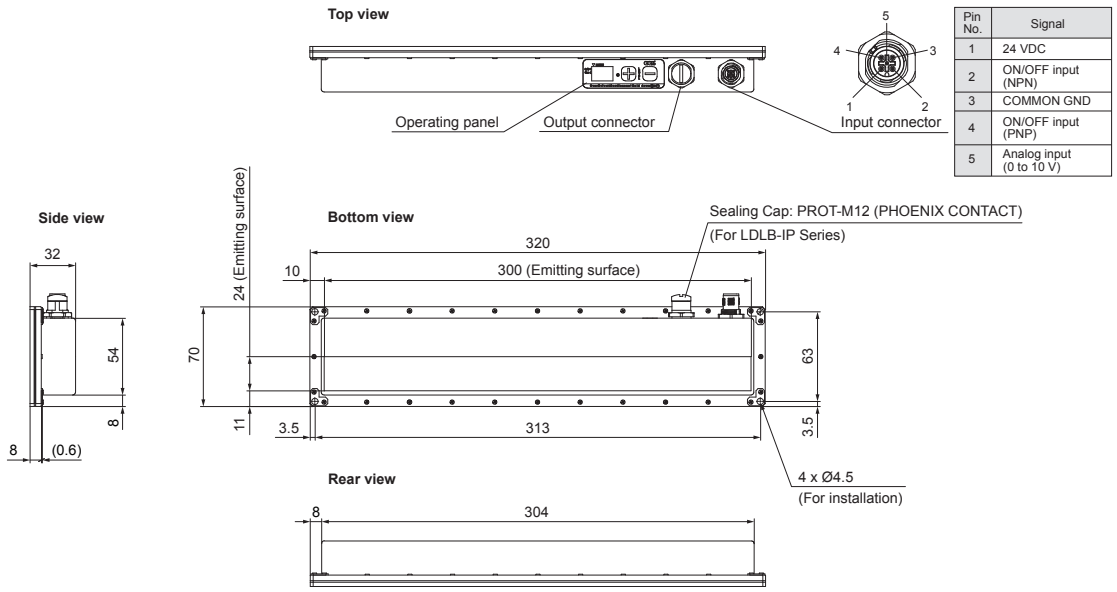


Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Dimensions (mm)



Pin No.	Signal
1	24 VDC
2	ON/OFF input (NPN)
3	COMMON GND
4	ON/OFF input (PNP)
5	Analog input (0 to 10 V)

Optional Cables

Input cable

Model Name	Length	Weight
FECB-1-M12-5F	1 m	55 g
FECB-2-M12-5F	2 m	90 g
FECB-3-M12-5F	3 m	130 g
FECB-5-M12-5F	5 m	210 g

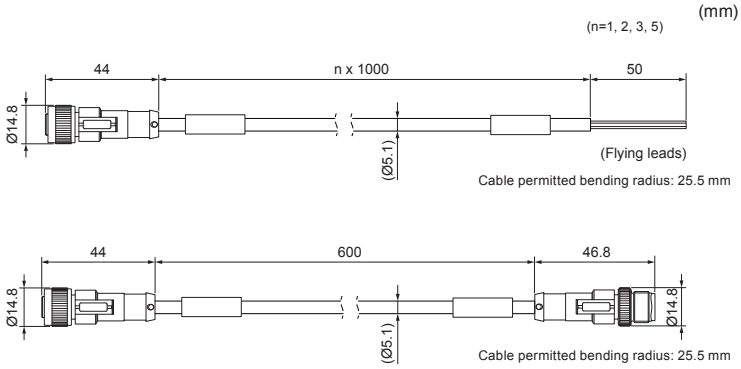
This cable supplies power to the light unit and inputs signals for light intensity control or to turn the light ON and OFF.

Link cable

Model Name	Length	Weight
FECB-0.6-M12-5M-5F	0.6 m	50 g

This cable is used to daisy-chain light units.

(mm)



The above cable permitted bending radii are reference values. Actual values may vary.

Maximum Length of Optional Cables

Number of light units connected in Constant Lighting Mode		
1	2	3
10 m	7 m	4.5 m

Number of light units connected in Overdrive Mode		
1	2	3
3 m	1 m	Cannot be used.

Number of light units	1	The table gives the maximum length of the input cable.
	2 or 3	The table gives the maximum total length of the input cable and link cables.

The wire diameter is AWG 22 for the optional cables.
If the maximum length given above is exceeded, shorten the input cable or contact CCS. For details, refer to the User Manual.

Cautionary Information regarding Waterproofing

- Handle the light unit and connectors with care. Do not deform or damage the connectors.
- Connect the cables correctly to the light units.
- Connect a Sealing Cap to any output connectors to which a cable is not connected to maintain water resistance. The Sealing Cap is connected to the output connector when the light unit is shipped.
- If the light unit is not used for a long period of time with the cable disconnected, attach the Cap to the connector.
- After cleaning manufacturing lines, be sure to wipe away any moisture remaining on the emitting surface. Imaging can be affected by moisture on the emitting surface.
- Use water to wash away any cleaning agent adhered to this product.
- Use water to wash away any oils or chemicals adhered to this product.

Note

"IP67" indicates the level of protection against foreign material entering electrical instruments

The 1st numeral "6" indicates the following level of protection:

- No dust inside the instrument. (dustproof)

The 2nd numeral "7" indicates the following level of protection:

- No damage when submerged in water at the rated pressure for the rated time. (watertight type)
- Can be submerged in water to a depth of 1 m (for instruments with a height of less than 850 mm) for 30 minutes.

You can inquire using our website.
Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products
Inquire on our website here.
https://www.ccs-grp.com/contact/

Convergent Lighting

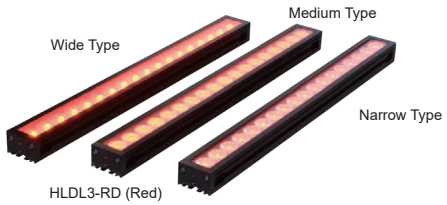
Bar Lights

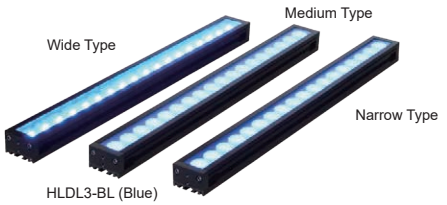
HLDL3 Series

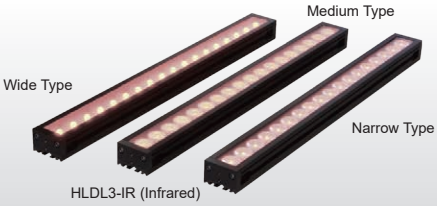
Refer to our website for product details.

CCS HLDL3 ▶ Search

The best-suited choice for long-distance illumination
Robust lineup expands possible applications







Applications	Light source for robot picking; Model mixing inspection of various parts; Inspection for unmounted parts; Exterior inspection of large workpieces; Measurement of pressed parts punch dimensions; etc.

Robust Lineup

Light emitting surface length	150 to 1,800 mm (150 mm units, 12 sizes)

×

LED color	Red, White, Blue, Infrared

×

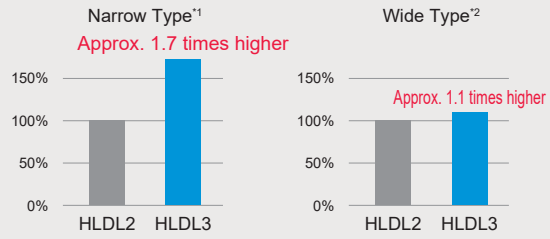
Light directivity	Narrow Type, Medium Type, Wide Type

=

Total of 144 models in the lineup!

Increased Brightness

Comparison with conventional products (Size 300, White)



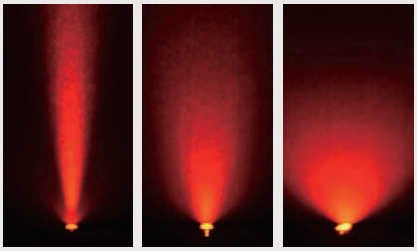
*1 Comparison between HLDL3-300X28SW-DF-N and HLDL2-300X45SW-DF-N for LWD 1,000 mm.
*2 Comparison between HLDL3-300X28SW-DF-W and HLDL2-300X45SW-DF-W for LWD 300 mm.

Three Types of Light Directivity

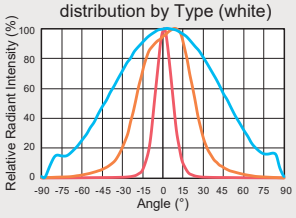
The data included is for reference only. Actual values may vary.

In addition to the Narrow Type that emits condensed illumination, and Wide Type that diffuses illumination over a wide range, a Medium Type that has intermediate light distribution characteristics has been newly added.

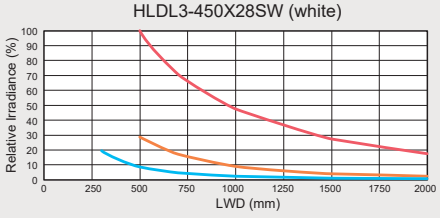
Narrow Type | Medium Type | Wide Type



Relative radiant intensity distribution by Type (white)



Comparative graph of relative irradiance by Type HLDL3-450X28SW (white)



Narrow Type — Medium Type — Wide Type

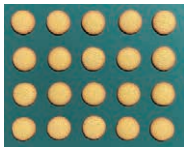
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

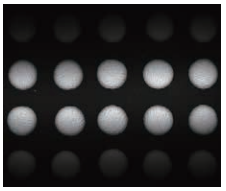
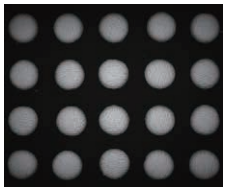
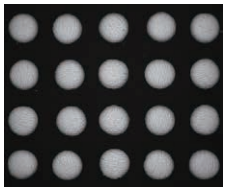
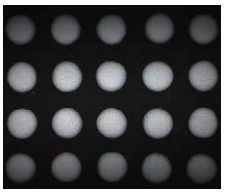
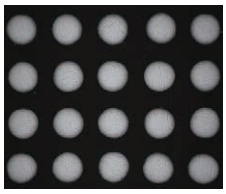
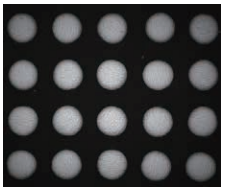
Imaging Comparison (Light source for pastry picking)

* The shutter speed is changed to suit imaging. The shutter speed can be adjusted to brighten imaging of dark images.
* Field of view: 380 mm (H) × 317 mm (V)

Workpiece image



Baked pastries

	Narrow Type	Medium Type	Wide Type
LWD 500 mm	 Shutter Speed: 180µs Only central part of FOV illuminated.	 Shutter Speed: 550µs More widely illuminated than the narrow Type, but still dark at the edge of FOV.	 Shutter Speed: 2,000µs Uniformly illuminated in the entire FOV.
LWD 1,000 mm	 Shutter Speed: 550µs More widely illuminated but still dark at the edge of FOV.	 Shutter Speed: 2,800µs Uniformly illuminated.	 Shutter Speed: 2,800µs Insuffiicient quantity of light.
LWD 2,000 mm	 Shutter Speed: 900µs Uniformly illuminated in the entire FOV.	 Shutter Speed: 900µs Insuffiicient quantity of light.	 Shutter Speed: 900µs Insuffiicient quantity of light.

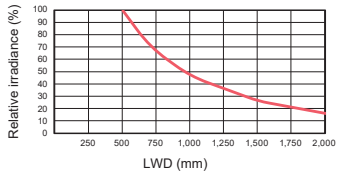
Data: Relative Irradiance Graph/Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

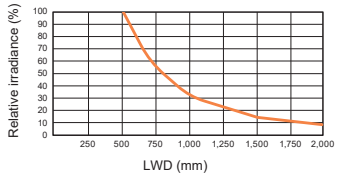
Relative irradiance graph *1 (LWD characteristics) *2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece

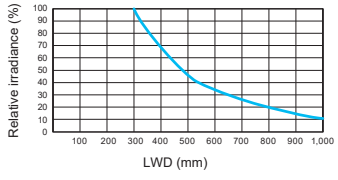
HLDL3-450X28SW-DF-N (Narrow Type)



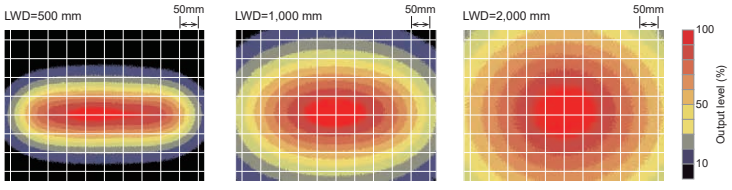
HLDL3-450X28SW-DF-M (Medium Type)

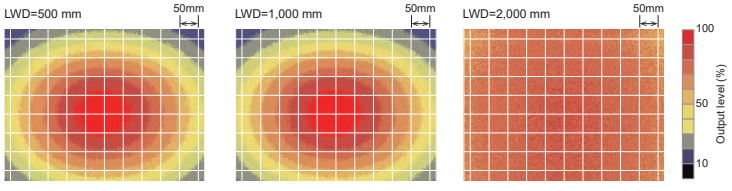


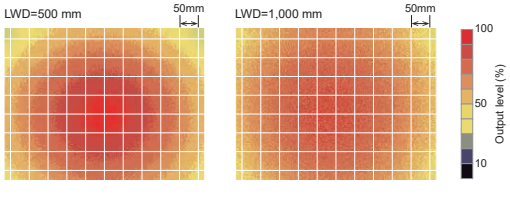
HLDL3-450X28SW-DF-W (Wide Type)



Uniformity (Relative irradiance)

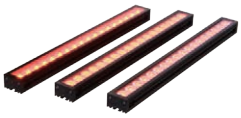






Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent / Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

HLDL3 Series



Refer to our website for product details.

CCS HLDL3 ▶ Search

Lineup

Model Name Endings: -N: Narrow Type, -M: Medium Type, -W: Wide Type

Model Name*1	Input Voltage	Power Consumption RD (Red)	Power Consumption SW (White)	Power Consumption BL (Blue)	Power Consumption IR (Infrared)	Options	Extension Cables	Recommended Control Units	Weight
HLDL3-150X28□□-DF-N	24 V	15 W				Diffusion Plate, Polarizing Plate*4, Bracket (*4 Excluding infrared)	FCB*2 Straight Cable, FRCB Robot Cable	PD4, PD3	350 g
HLDL3-150X28□□-DF-M									350 g
HLDL3-150X28□□-DF-W									370 g
HLDL3-300X28□□-DF-N	24 V	30 W							600 g
HLDL3-300X28□□-DF-M									600 g
HLDL3-300X28□□-DF-W									620 g
HLDL3-450X28□□-DF-N	24 V	44 W							910 g
HLDL3-450X28□□-DF-M									910 g
HLDL3-450X28□□-DF-W									940 g
HLDL3-600X28□□-DF-N	24 V	59 W							1,200 g
HLDL3-600X28□□-DF-M									1,200 g
HLDL3-600X28□□-DF-W									1,240 g
HLDL3-750X28□□-DF-N	24 V	74 W					FCB-EL2 Straight Cable	PD4-12024, PD3-10024-8, PSB4	1,510 g
HLDL3-750X28□□-DF-M									1,510 g
HLDL3-750X28□□-DF-W									1,560 g
HLDL3-900X28□□-DF-N	24 V	88 W							1,800 g
HLDL3-900X28□□-DF-M									1,800 g
HLDL3-900X28□□-DF-W									1,860 g
HLDL3-1050X28□□-DF-N	24 V	103 W						PD4-12024, PSB4	2,110 g
HLDL3-1050X28□□-DF-M									2,110 g
HLDL3-1050X28□□-DF-W									2,180 g
HLDL3-1200X28□□-DF-N	24 V	117 W							2,400 g
HLDL3-1200X28□□-DF-M									2,400 g
HLDL3-1200X28□□-DF-W									2,480 g
HLDL3-1350X28□□-DF-N	24 V	132 W					FCB-EL2 Straight Cable × 2 pcs *3	PSB4	2,710 g
HLDL3-1350X28□□-DF-M									2,710 g
HLDL3-1350X28□□-DF-W									2,800 g
HLDL3-1500X28□□-DF-N	24 V	147 W							3,000 g
HLDL3-1500X28□□-DF-M									3,000 g
HLDL3-1500X28□□-DF-W									3,100 g
HLDL3-1650X28□□-DF-N	24 V	161 W							3,310 g
HLDL3-1650X28□□-DF-M									3,310 g
HLDL3-1650X28□□-DF-W									3,420 g
HLDL3-1800X28□□-DF-N	24 V	176 W							3,600 g
HLDL3-1800X28□□-DF-M									3,600 g
HLDL3-1800X28□□-DF-W									3,720 g

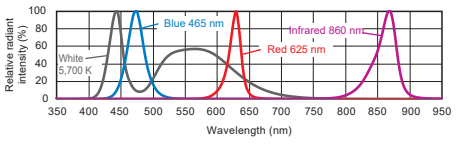
Please inquire if you would like to use in combination with a strobe control unit (overdrive Type)

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 □□ in the model name contains the LED color.
(RD: Red, SW: White, BL: Blue, IR: Infrared)
*2 Cables with a model name that ends with "-ME7","-EL2", "-PF", or "-PF-EL9" are not included.
*3 Use two extension cables of the same length. If the two extension cables are of different lengths, the different cable specs may lead to uneven light emission.

LED Properties

Spectral distribution

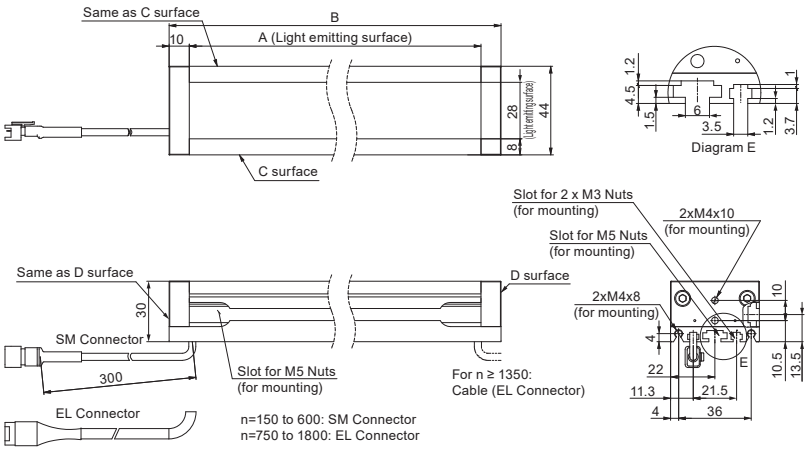


Lens filters suitable for each wavelength are available. For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Dimensions (mm)

HLDL3-nX28□□-DF-N / -M / -W (common dimensions) (n = 150 to 1800, □□ = RD, SW, BL, IR)



n	Size A	Size B
150	150	170
300	300	320
450	450	470
600	600	620
750	750	770
900	900	920
1050	1050	1070
1200	1200	1220
1350	1350	1370
1500	1500	1520
1650	1650	1670
1800	1800	1820

Options

Diffusion Plate

Prevents glare that arises when imaging glossy workpieces.

* The light unit is shipped with a low-uniformity, high-transmittance diffusion plate installed. A white wide-Type light unit is shipped with the DF-HLDL3 Series diffusion plate installed.

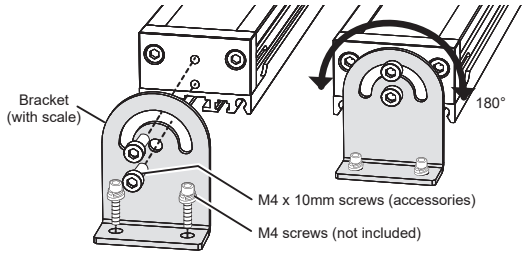
Series Name	Uniformity	Transmittance	Remarks
DF-HLDL3 Series	Medium	Medium	Refer to the pages on optional products. (P.363)
DF-HLDL3-HU Series	High	Low	

Installation Bracket

The illumination angle can be freely adjusted when fixing HLDL3 Series light units.

Model Name	Remarks
BK-HLDL3	Angle Adjustment Bracket (2 pcs) common for HLDL3 Series types. Refer to the pages on optional products. (P.369)

* For a longer light unit, please give an additional support to central part.
* This is not intended for use together with a mounting compatibility bracket.



Polarizing Plate

The surface reflection of the workpiece can be removed when used in combination with a polarizing filter.

* Remove the diffusion plate to mount the polarizing plate. If you want to use both the polarizing plate and diffusion plate, contact us for custom orders.

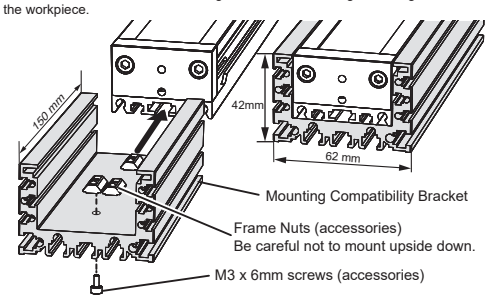
Series Name	Polarization Direction	Remarks
PL-HLDL3-HO Series	Horizontal	Refer to the pages on optional products. (P.7365)
PL-HLDL3-VE Series	Vertical	

Mounting Compatibility Bracket

This bracket is used to install HLDL3 Series lighting (unit width: 44 mm) with the same method as HLDL2 Series lighting (unit width: 62 mm).

Model Name	Remarks
AD-HLDL3	HLDL2 Series Mounting Compatibility Bracket common for HLDL3 Series types. Refer to the pages on optional products. (P.369)

* The height of the HLDL2 Series wide Type is 26 mm. Using the HLDL3 wide Type light unit with an HLDL3 bracket increases the height to 42 mm, so the light emitting surface will be closer to the workpiece.



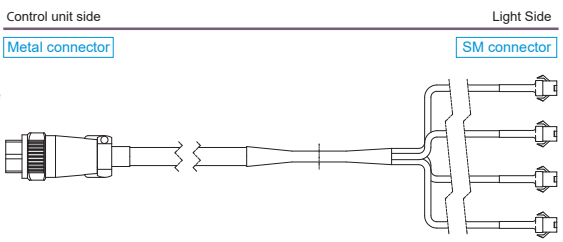
Extension Cables (custom example)

Cables can be custom ordered according to customer requests. Please contact your local sales representative for a custom order.

Example: FCB-F-n-ME7-SM3-OC

4-branch cable which can connect a PSB4 power source and four HLDL3 light units (SM connectors).

Custom orders are available as needed for number of branches, connector type, length changes, and so on.



Diffused Lighting

Bar Lights

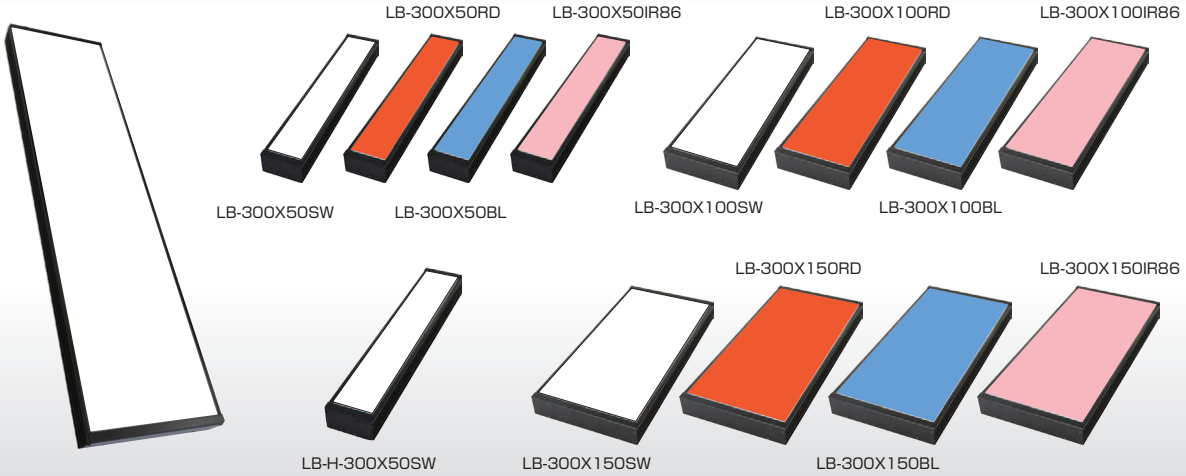
LB Series

Refer to our website for product details.

CCS LB ▶ Search

Wide emitting surface uniform diffused lighting

NEW



Applications Inspection of the appearance of square-shaped workpieces / Inspection of satin surface / Inspection of liquid level in cylindrical containers / Inspection of transparent containers / Inspection of uneven surface etc.

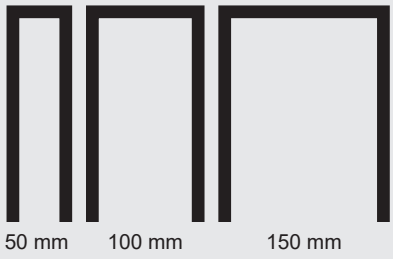
Total of 338 Models Wide Lineup

An extensive lineup of 338 models is available in combinations of light emitting surface size, emitting width, color, etc. The product can be used in a variety of configurations to suit your inspection needs.

	Emitting Width		LED Colors		Size		
Standard Type	3 Types (50 / 100 / 150 mm)	×	4 Types (Red/White/Blue/Infrared)	×	26 Types (Light emitting surface length 200 mm to 2700 mm)	=	312 Models
High Power Type	1 Type (50 mm)	×	1 Type (White)	×	26 Types (Light emitting surface length 200 mm to 2700 mm)	=	26*1 Models

*1 High power type is only available in emitting width 50 mm, white.

Choose from 3 Emitting Widths

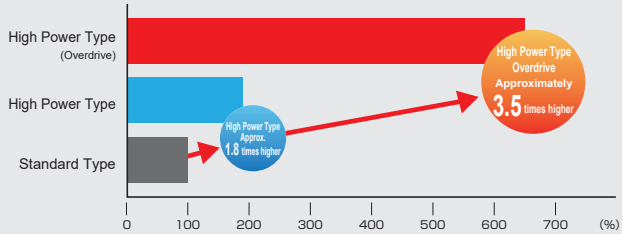


*High power type is only available with an emitting width of 50 mm.

High Power Type with Overdrive Also Available

LB-H-300X50SW

Brightness Comparison



Measurement conditions: 100% intensity, LWD 50 mm, irradiance comparison between LB-300X50SW and LB-H-300X50SW
Overdrive is only available for high power type sizes 200 to 700.
Model: LB-H-□□X50SW [□□=200 to 700]
For information on the combination of light units and POD Series control units, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

The data included is for reference only. Actual values may vary.

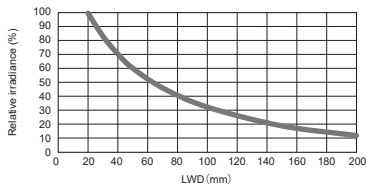
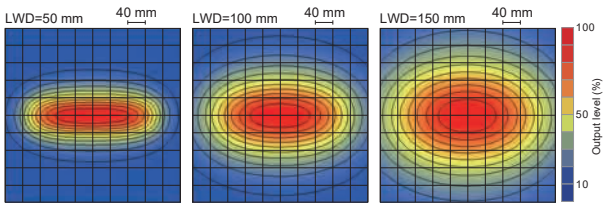
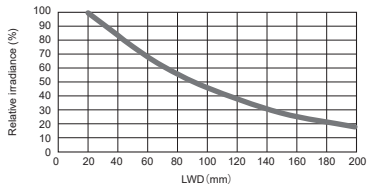
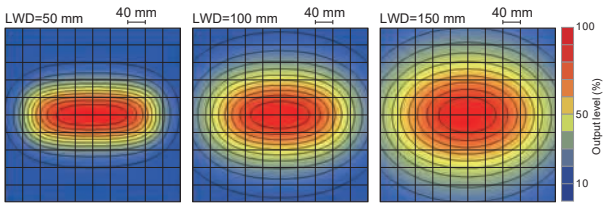
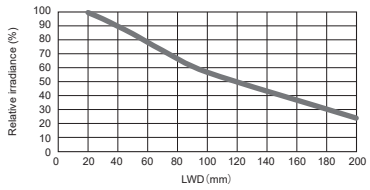
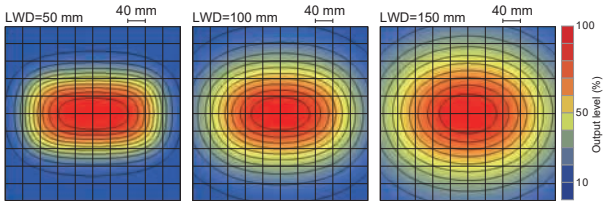
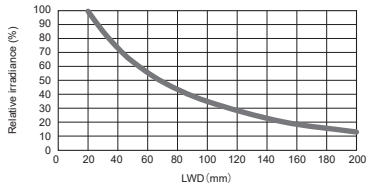
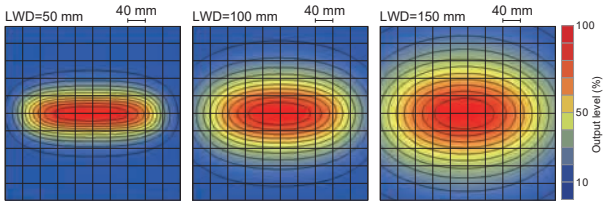
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Data: Relative Irradiance Graph and Uniformity (Representative Example)

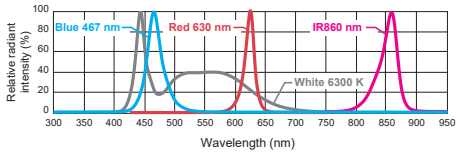
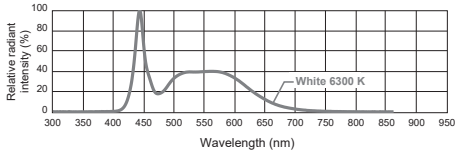
The data included is for reference only. Actual values may vary.

Relative irradiance*1 graph (LWD*2 characteristics) | Uniformity (Relative irradiance)

*1 Irradiance on the optical axis
*2 Illuminating distance between the light unit and the workpiece

	Relative irradiance*1 graph (LWD*2 characteristics)	Uniformity (Relative irradiance)
LB-300X50SW Standard Type Emitting Width 50 mm		
LB-300X100SW Standard Type Emitting Width 100 mm		
LB-300X150SW Standard Type Emitting Width 150 mm		
LB-H-300X50SW High Power Type Emitting Width 50 mm		

LED Properties

	Standard Type	High Power Type
Spectral distribution		

Lens filters suitable for each wavelength are available. For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

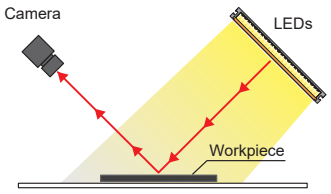
LB Series

Refer to our website for product details.

CCS LB ▶ Search

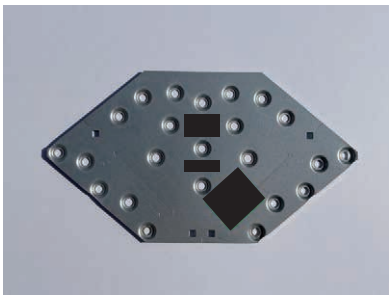
Imaging Example: Bright Field Satin Metal Sheet ID Mark Inspection

Example Configuration



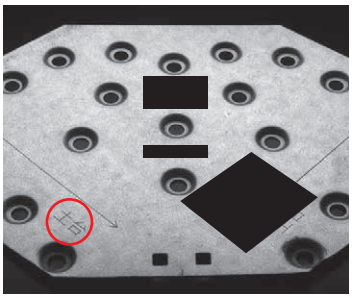
Diffused lighting is illuminated from an angle, and the specular reflection light is observed. Light emitting surface width can be selected to match the workpiece and characteristics.

Workpiece



Satin metal plate

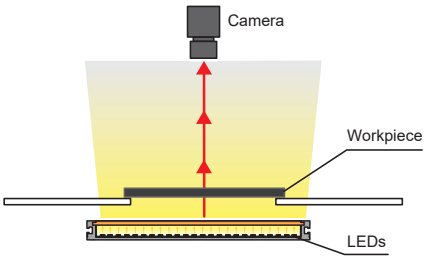
LB-300X150SW



Uniform illumination of wide satin surfaces for clear ID mark imaging.

Imaging Example: Backlight Transparent Container Stain Inspection

Example Configuration

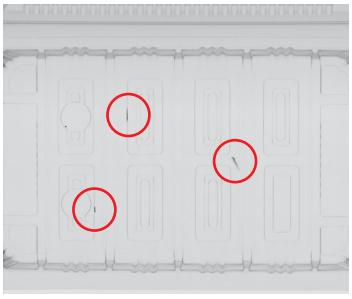


Diffused lighting is illuminated from the back of the workpiece. Suitable for translucent container foreign contamination inspection, liquid level inspection, silhouette inspection, etc.

Workpiece

Transparent container

LB-300X150SW



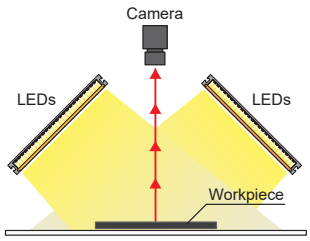
Uniform diffused lighting illumination from a wide light emitting surface minimizes the effect of unevenness and clearly images stains.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

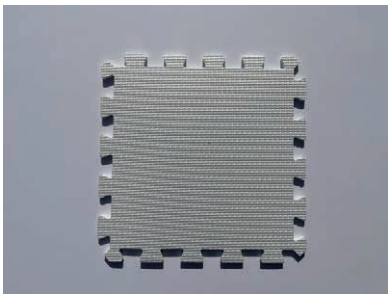
Imaging Example: Diffused Dome Illumination　Scratch Inspection of Uneven Mats

Example Configuration



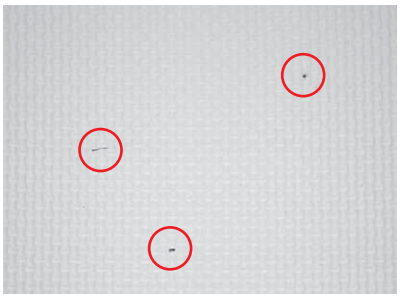
Uniform diffused lighting is illuminated from 2 directions to reproduce the dome effect. Images can be captured with minimal shading and halation effects on uneven surfaces.

Workpiece



Joint mat

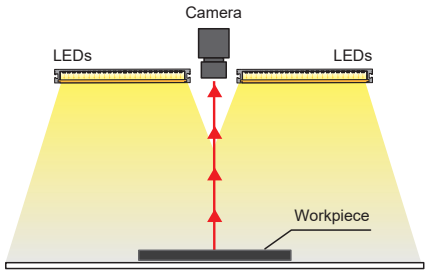
LB-600X150SW × 2 units



Clear imaging of scratches by suppressing shadows on uneven surfaces.

Imaging Example: Wide-range Uniform Illumination　Foreign Contamination Inspection of Non-Woven Fabrics

Example Configuration

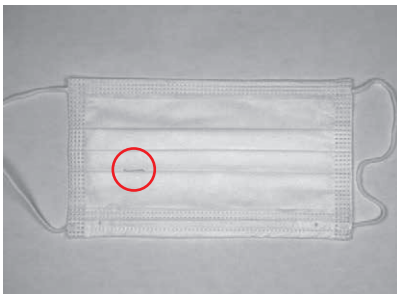


Uniform diffused lighting is illuminated on the same axis as the camera. Also effective for wide-area imaging, such as wide workpieces, etc.

Workpiece

Mask

LB-300X150SW × 2 units



Clear imaging of foreign contamination that overlaps the shadows of the seams.

LB Series

Refer to our website for product details.

CCS LB ▶ Search

Lineup (Standard Type)

Emitting Width	Model Name*1	Power Consumption RD (Red)	Power Consumption SW (White)	Power Consumption BL (Blue)	Power Consumption IR86 (Infrared)	Options	Extension Cables	Recommended Control Units	Weight
50 mm	LB-200X50□□		18 W		10 W				470 g
	LB-300X50□□		27 W		15 W				610 g
	LB-400X50□□		36 W		20 W				750 g
	LB-500X50□□		45 W		24 W				890 g
	LB-600X50□□		54 W		29 W			PD4 / PD3	1,030 g
	LB-700X50□□		63 W		34 W				1,170 g
	LB-800X50□□		72 W		39 W				1,310 g
	LB-900X50□□		81 W		44 W		FCB-EL2		1,450 g
	LB-1000X50□□		90 W		48 W				1,590 g
	LB-1100X50□□		99 W		53 W			PD4 / PD3*3 (*3 Can only use infrared.)	1,730 g
	LB-1200X50□□		108 W		58 W				1,870 g
	LB-1300X50□□		117 W		63 W				2,010 g
	LB-1400X50□□		125 W		68 W				2,150 g
	LB-1500X50□□		134 W		72 W			PD4*3 / PD3*3	2,290 g
	LB-1600X50□□		143 W		77 W				2,430 g
	LB-1700X50□□		152 W		82 W			PSB4 (*3 Can only use infrared.)	2,570 g
	LB-1800X50□□		161 W		87 W				2,710 g
	LB-1900X50□□		170 W		92 W				2,850 g
	LB-2000X50□□		179 W		96 W		FCB-EL2*3 / FCB-1.25SQ-ME7*4 / FCB-20-2.0SQ-ME7*4 (*3 Can only use infrared. *4 Excluding infrared.)		2,990 g
	LB-2100X50□□		188 W		101 W				3,130 g
	LB-2200X50□□		197 W		106 W				3,270 g
	LB-2300X50□□		206 W		111 W			PD4*3 / PSB4 (*3 Can only use infrared.)	3,410 g
	LB-2400X50□□		215 W		116 W				3,550 g
	LB-2500X50□□		224 W		120 W				3,690 g
	LB-2600X50□□		233 W		125 W				3,830 g
	LB-2700X50□□		242 W		130 W	Diffusion Plates / Polarizing Plates / Protective Plates			3,970 g
100 mm	LB-200X100□□		36 W		20 W				770 g
	LB-300X100□□		54 W		29 W			PD4 / PD3	1,010 g
	LB-400X100□□		72 W		39 W				1,250 g
	LB-500X100□□		90 W		48 W		FCB-EL2		1,490 g
	LB-600X100□□		108 W		58 W			PD4 / PD3*3 (*3 Can only use infrared.)	1,730 g
	LB-700X100□□		125 W		68 W				1,970 g
	LB-800X100□□		143 W		77 W			PD4*3 / PD3*3 / PSB4 (*3 Can only use infrared.)	2,210 g
	LB-900X100□□		161 W		87 W				2,450 g
	LB-1000X100□□		179 W		96 W				2,690 g
	LB-1100X100□□		197 W		106 W		FCB-EL2*3 / FCB-1.25SQ-ME7*4 / FCB-20-2.0SQ-ME7*4 (*3 Can only use infrared. *4 Excluding infrared.)	PD4*3 / PSB4 (*3 Can only use infrared.)	2,930 g
	LB-1200X100□□		215 W		116 W				3,170 g
	LB-1300X100□□		233 W		125 W				3,410 g
	LB-1400X100□□		250 W		135 W				3,650 g
	LB-1500X100□□		268 W		144 W				3,890 g
	LB-1600X100□□		286 W		154 W		FCB-1.25SQ-ME7 / FCB-20-2.0SQ-ME7		4,130 g
	LB-1700X100□□		304 W		164 W				4,370 g
	LB-1800X100□□		322 W		173 W				4,610 g
	LB-1900X100□□		340 W		183 W			PSB4	4,850 g
	LB-2000X100□□		358 W		192 W				5,090 g
	LB-2100X100□□		375 W		202 W		FCB-1.25SQ-ME7 / FCB-20-2.0SQ-ME7 (*2 Requires 2 cables. (Excluding infrared))		5,330 g
	LB-2200X100□□		393 W		212 W				5,570 g
	LB-2300X100□□		411 W		221 W				5,810 g
	LB-2400X100□□		429 W		231 W				6,050 g
	LB-2500X100□□		447 W		240 W				6,290 g
	LB-2600X100□□		465 W		250 W				6,530 g
	LB-2700X100□□		483 W		260 W				6,770 g

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, IR86: Infrared)

*2 Connect these connectors to the two output connectors that power the lighting on the same channel of the control unit. For example, for PSB4 Series control units, connect to the L1-1 and L1-2 output connectors. Use 2 extension cables of the same length. If the two extension cables are of different lengths, the different cable specs may lead to uneven light emission.

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

Lineup (Standard Type)

Emitting Width	Model Name*1	Power Consumption RD (Red)	SW (White)	BL (Blue)	IR86 (Infrared)	Options	Extension Cables	Recommended Control Units	Weight
150 mm	LB-200X150□□	54 W			29 W	Diffusion Plates / Polarizing Plates / Protective Plates	FCB-EL2	PD4 / PD3	1,030 g
	LB-300X150□□	81 W			44 W				1,350 g
	LB-400X150□□	108 W			58 W			PD4*4 / PD3*4	1,670 g
	LB-500X150□□	134 W			72 W			PSB4	1,990 g
	LB-600X150□□	161 W			87 W		FCB-EL2*4	*4 Can only use infrared.	2,310 g
	LB-700X150□□	188 W			101 W		FCB-1.25SQ-ME7*5	PD4*4 / PSB4	2,630 g
	LB-800X150□□	215 W			116 W		FCB-20-2.0SQ-ME7*5	*4 Can only use infrared.	2,950 g
	LB-900X150□□	242 W			130 W				3,270 g
	LB-1000X150□□	268 W			144 W		*4 Can only use infrared. *5 Excluding infrared.		3,590 g
	LB-1100X150□□	295 W			159 W		FCB-1.25SQ-ME7 / FCB-20-2.0SQ-ME7		3,910 g
	LB-1200X150□□	322 W			173 W				4,230 g
	LB-1300X150□□	349 W			188 W				4,550 g
	LB-1400X150□□	375 W			202 W				4,870 g
	LB-1500X150□□	402 W			216 W		FCB-1.25SQ-ME7 / FCB-20-2.0SQ-ME7	PSB4	5,190 g
	LB-1600X150□□	429 W			231 W				5,510 g
	LB-1700X150□□	456 W			245 W		*2 Requires 2 cables. (Excluding infrared)		5,830 g
	LB-1800X150□□	483 W			260 W				6,150 g
	LB-1900X150□□	509 W			274 W				6,470 g
	LB-2000X150□□	536 W			288 W				6,790 g
	LB-2100X150□□	563 W			303 W		FCB-1.25SQ-ME7 / FCB-20-2.0SQ-ME7		7,110 g
	LB-2200X150□□	590 W			317 W		*2 Requires 2 cables.		7,430 g
	LB-2300X150□□	617 W			332 W		FCB-1.25SQ-ME7 / FCB-20-2.0SQ-ME7	PSB4*4	7,750 g
	LB-2400X150□□	643 W			346 W				8,070 g
	LB-2500X150□□	670 W			360 W		*2 Requires 2 cables. *3 Please contact us for control units with red, white, and blue light emitting colors.	*3 Please contact us for control units with red, white, and blue light emitting colors. *4 Can only use infrared.	8,390 g
	LB-2600X150□□	697 W			375 W				8,710 g
	LB-2700X150□□	724 W			389 W				9,030 g

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, IR86: Infrared)
*2 Connect these connectors to the two output connectors that power the lighting on the same channel of the control unit. For example, for PSB4 Series control units, connect to the L1-1 and L1-2 output connectors. Use 2 extension cables of the same length. If the two extension cables are of different lengths, the different cable specs may lead to uneven light emission.
*3 For extension cables and control units for LB-2300/2400/2500/2600/2700X150 (excluding infrared), please contact our sales representative.

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

Lineup (High Power Type)

Emitting Width	Model Name	LED Emitting Color	Power Consumption	Options	Extension Cables	Recommended Control Units	Weight
50 mm	LB-H-200X50SW	White	28 W	Diffusion Plates / Polarizing Plates / Protective Plates	FCB-EL2	PD4 / PD3 / POD	470 g
	LB-H-300X50SW		42 W				610 g
	LB-H-400X50SW		56 W				750 g
	LB-H-500X50SW		70 W				890 g
	LB-H-600X50SW		84 W				1,030 g
	LB-H-700X50SW		98 W			PD4 / PSB4 / POD	1,170 g
	LB-H-800X50SW		112 W			PD4 / PSB4	1,310 g
	LB-H-900X50SW		126 W				1,450 g
	LB-H-1000X50SW		140 W				1,590 g
	LB-H-1100X50SW		154 W		FCB-1.25SQ-ME7 / FCB-20-2.0SQ-ME7		1,730 g
	LB-H-1200X50SW		168 W				1,870 g
	LB-H-1300X50SW		181 W				2,010 g
	LB-H-1400X50SW		195 W				2,150 g
	LB-H-1500X50SW		209 W				2,290 g
	LB-H-1600X50SW		223 W				2,430 g
	LB-H-1700X50SW		237 W				2,570 g
	LB-H-1800X50SW		251 W			PSB4	2,710 g
	LB-H-1900X50SW		265 W				2,850 g
	LB-H-2000X50SW		279 W				2,990 g
	LB-H-2100X50SW		293 W				3,130 g
	LB-H-2200X50SW		307 W				3,270 g
	LB-H-2300X50SW		321 W		FCB-1.25SQ-ME7 / FCB-20-2.0SQ-ME7		3,410 g
	LB-H-2400X50SW		335 W				3,550 g
	LB-H-2500X50SW		348 W				3,690 g
	LB-H-2600X50SW		362 W		*1 Requires 2 cables.		3,830 g
	LB-H-2700X50SW		376 W				3,970 g

*1 Connect these connectors to the two output connectors that power the lighting on the same channel of the control unit. For example, for PSB4 Series control units, connect to the L1-1 and L1-2 output connectors. Use 2 extension cables of the same length.
If the two extension cables are of different lengths, the different cable specs may lead to uneven light emission.

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

LB Series

Refer to our website for product details.

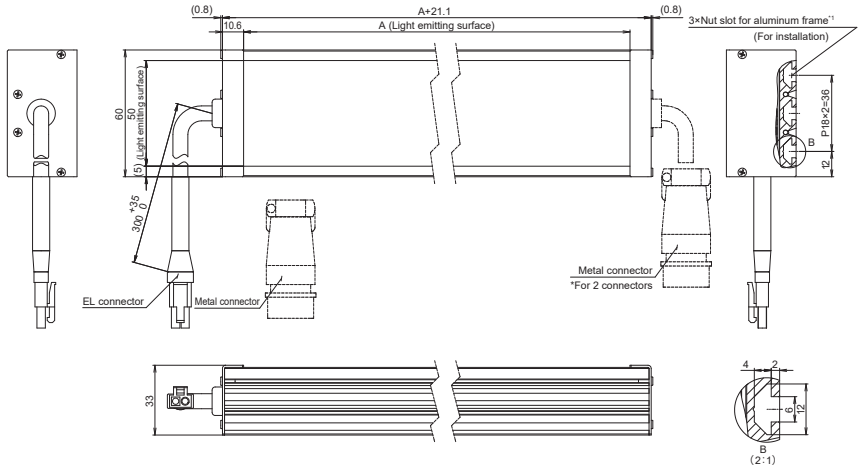
CCS LB ▶ Search

Dimensions (mm)

Emitting Width 50 mm　Standard Type (for all wavelengths) / High Power Type

LB-H-nX50SW（n=200 to 2700）

LB-nX50□□（n=200 to 2700, □□=RD, SW, BL, IR86）



LB-H-nX50SW

n Dimensions	Connector Type
200 to 1,000	EL connector
1,100 to 2,100	Metal connector
2,200 to 2,700	Metal connector×2*

LB-nX50RD/SW/BL

n Dimensions	Connector Type
200 to 1,600	EL connector
1,700 to 2,700	Metal connector

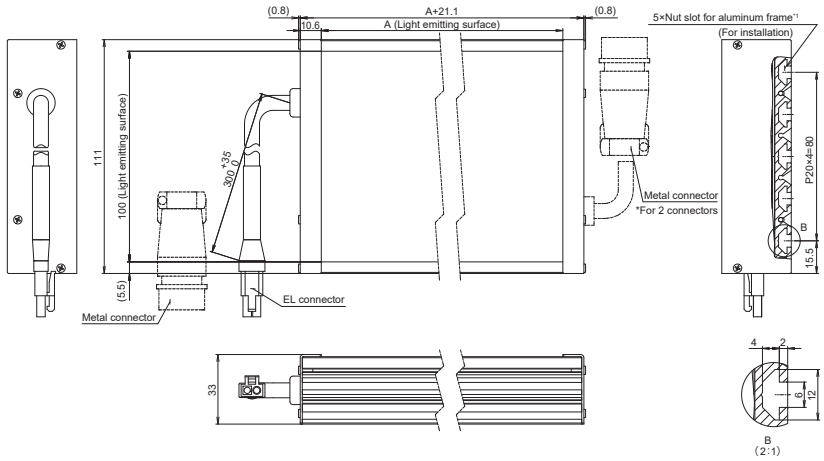
LB-nX50IR86

n Dimensions	Connector Type
200 to 2,700	EL connector

*1 Nuts can be installed by using post-installation nuts or by removing the side panels.

Emitting Width 100 mm　Standard Type (for all wavelengths)

LB-nX100□□（n=200 to 2700, □□=RD, SW, BL, IR86）



LB-nX100RD/SW/BL

n Dimensions	Connector Type
200 to 800	EL connector
900 to 1,600	Metal connector
1,700 to 2,700	Metal connector×2*

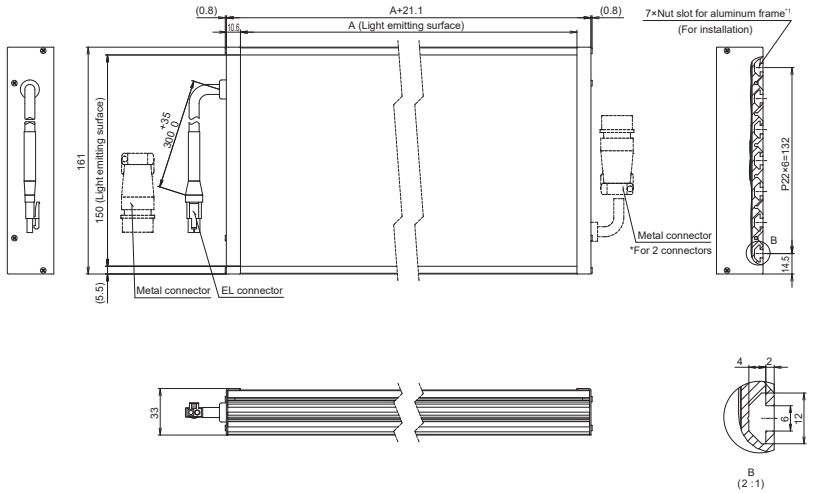
LB-nX100IR86

n Dimensions	Connector Type
200 to 1,500	EL connector
1,600 to 2,700	Metal connector

*1 Nuts can be installed by using post-installation nuts or by removing the side panels.

Emitting Width 150 mm　Standard Type (for all wavelengths)

LB-nX150□□（n=200 to 2700, □□=RD, SW, BL, IR86）



LB-nX150RD/SW/BL

n Dimensions	Connector Type
200 to 500	EL connector
600 to 1,100	Metal connector
1,200 to 2,700	Metal connector×2*

LB-nX150IR86

n Dimensions	Connector Type
200 to 1,000	EL connector
1,100 to 2,000	Metal connector
2,100 to 2,700	Metal connector×2*

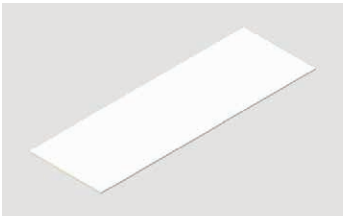
*1 Nuts can be installed by using post-installation nuts or by removing the side panels.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Options

Diffusion Plates



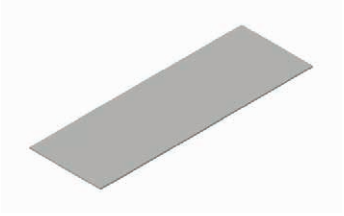
Light characteristics can be changed by changing the diffusion plate.
The DF-LB Series diffusion plates have lower uniformity and higher transmissivity than the standard type diffusion plates installed at the time of shipment.

Model Name (n=200 to 2700)	Applicable Light Unit (Common for all colors)
DF-LB-nX50	LB-nX50 Series
DF-LB-nX100	LB-nX100 Series
DF-LB-nX150	LB-nX150 Series

*For high power type lighting, DF-LB Series diffusion plates are installed at the time of shipment.

▶ P.363

Polarizing Plates



These are used together with a polarizing filter attached to the camera lens to eliminate surface glare.

Model Name (n=200 to 2700)	Applicable Light Unit (Excluding infrared)
PL-LB-nX50-HO*	LB-H-nX50 Series LB-nX50 Series
PL-LB-nX50-VE*	
PL-LB-nX100-HO*	LB-nX100 Series
PL-LB-nX100-VE*	
PL-LB-nX150-HO*	LB-nX150 Series
PL-LB-nX150-VE*	

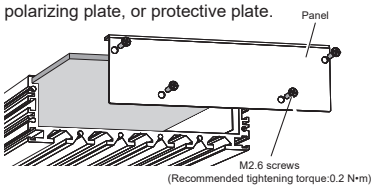
* HO: Light is polarized parallel to the longer edge of the plate.
VE: Light is polarized parallel to the shorter edge of the plate.
* Remove the diffusion plate to mount the polarizing plate. If you would like to use both the polarizing plate and diffusion plate, please contact us for custom orders.

▶ P.365

●Installation Method

Diffusion Plates | Polarizing Plates | Protective Plates

Loosen the M2.6 screws and remove the panel, and then replace the diffusion plate, polarizing plate, or protective plate.



- For light units that have one light cable, remove the panel on the side without the light cable.
- For light units that have two light cables, remove either one of the panels and replace the plate, being careful not to apply excessive force to the wires connected to the internal board.

Protective plate

Protects the emitting part of the light unit. It is not intended to protect against dust or water.

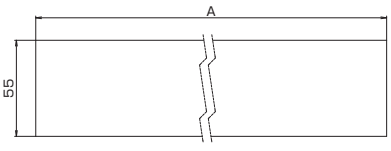
Model Name	Applicable Light Unit (Common for all colors)	Size A
PR-LB-200X50	LB-200X50/LB-H200X50	214
PR-LB-300X50	LB-300X50/LB-H300X50	314
PR-LB-400X50	LB-400X50/LB-H400X50	414
PR-LB-500X50	LB-500X50/LB-H500X50	514
PR-LB-600X50	LB-600X50/LB-H600X50	614
PR-LB-700X50	LB-700X50/LB-H700X50	714
PR-LB-800X50	LB-800X50/LB-H800X50	814
PR-LB-900X50	LB-900X50/LB-H900X50	914
PR-LB-1000X50	LB-1000X50/LB-H1000X50	1014
PR-LB-1100X50	LB-1100X50/LB-H1100X50	1114
PR-LB-1200X50	LB-1200X50/LB-H1200X50	1214
PR-LB-1300X50	LB-1300X50/LB-H1300X50	1312
PR-LB-1400X50	LB-1400X50/LB-H1400X50	1412
PR-LB-1500X50	LB-1500X50/LB-H1500X50	1512
PR-LB-1600X50	LB-1600X50/LB-H1600X50	1612
PR-LB-1700X50	LB-1700X50/LB-H1700X50	1712
PR-LB-1800X50	LB-1800X50/LB-H1800X50	1812
PR-LB-1900X50	LB-1900X50/LB-H1900X50	1912
PR-LB-2000X50	LB-2000X50/LB-H2000X50	2012
PR-LB-2100X50	LB-2100X50/LB-H2100X50	2111
PR-LB-2200X50	LB-2200X50/LB-H2200X50	2211
PR-LB-2300X50	LB-2300X50/LB-H2300X50	2311
PR-LB-2400X50	LB-2400X50/LB-H2400X50	2411
PR-LB-2500X50	LB-2500X50/LB-H2500X50	2510.5
PR-LB-2600X50	LB-2600X50/LB-H2600X50	2610.5
PR-LB-2700X50	LB-2700X50/LB-H2700X50	2710.5

Model Name	Applicable Light Unit (Common for all colors)	Size A
PR-LB-200X100	LB-200X100	214
PR-LB-300X100	LB-300X100	314
PR-LB-400X100	LB-400X100	414
PR-LB-500X100	LB-500X100	514
PR-LB-600X100	LB-600X100	614
PR-LB-700X100	LB-700X100	714
PR-LB-800X100	LB-800X100	814
PR-LB-900X100	LB-900X100	914
PR-LB-1000X100	LB-1000X100	1014
PR-LB-1100X100	LB-1100X100	1114
PR-LB-1200X100	LB-1200X100	1214
PR-LB-1300X100	LB-1300X100	1312
PR-LB-1400X100	LB-1400X100	1412
PR-LB-1500X100	LB-1500X100	1512
PR-LB-1600X100	LB-1600X100	1612
PR-LB-1700X100	LB-1700X100	1712
PR-LB-1800X100	LB-1800X100	1812
PR-LB-1900X100	LB-1900X100	1912
PR-LB-2000X100	LB-2000X100	2012
PR-LB-2100X100	LB-2100X100	2111
PR-LB-2200X100	LB-2200X100	2211
PR-LB-2300X100	LB-2300X100	2311
PR-LB-2400X100	LB-2400X100	2411
PR-LB-2500X100	LB-2500X100	2510.5
PR-LB-2600X100	LB-2600X100	2610.5
PR-LB-2700X100	LB-2700X100	2710.5

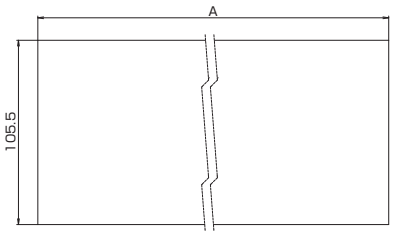
Model Name	Applicable Light Unit (Common for all colors)	Size A
PR-LB-200X150	LB-200X150	214
PR-LB-300X150	LB-300X150	314
PR-LB-400X150	LB-400X150	414
PR-LB-500X150	LB-500X150	514
PR-LB-600X150	LB-600X150	614
PR-LB-700X150	LB-700X150	714
PR-LB-800X150	LB-800X150	814
PR-LB-900X150	LB-900X150	914
PR-LB-1000X150	LB-1000X150	1014
PR-LB-1100X150	LB-1100X150	1114
PR-LB-1200X150	LB-1200X150	1214
PR-LB-1300X150	LB-1300X150	1312
PR-LB-1400X150	LB-1400X150	1412
PR-LB-1500X150	LB-1500X150	1512
PR-LB-1600X150	LB-1600X150	1612
PR-LB-1700X150	LB-1700X150	1712
PR-LB-1800X150	LB-1800X150	1812
PR-LB-1900X150	LB-1900X150	1912
PR-LB-2000X150	LB-2000X150	2012
PR-LB-2100X150	LB-2100X150	2111
PR-LB-2200X150	LB-2200X150	2211
PR-LB-2300X150	LB-2300X150	2311
PR-LB-2400X150	LB-2400X150	2411
PR-LB-2500X150	LB-2500X150	2510.5
PR-LB-2600X150	LB-2600X150	2610.5
PR-LB-2700X150	LB-2700X150	2710.5

● Dimensions (mm)

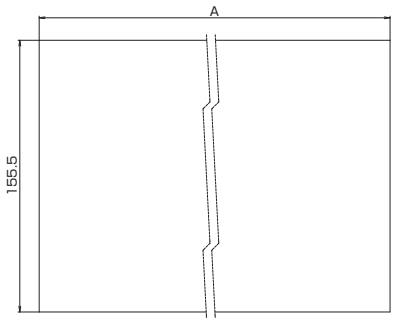
PR-LB-nX50(n=200 to 2700)



PR-LB-nX100(n=200 to 2700)



PR-LB-nX150(n=200 to 2700)



Diffused Lighting

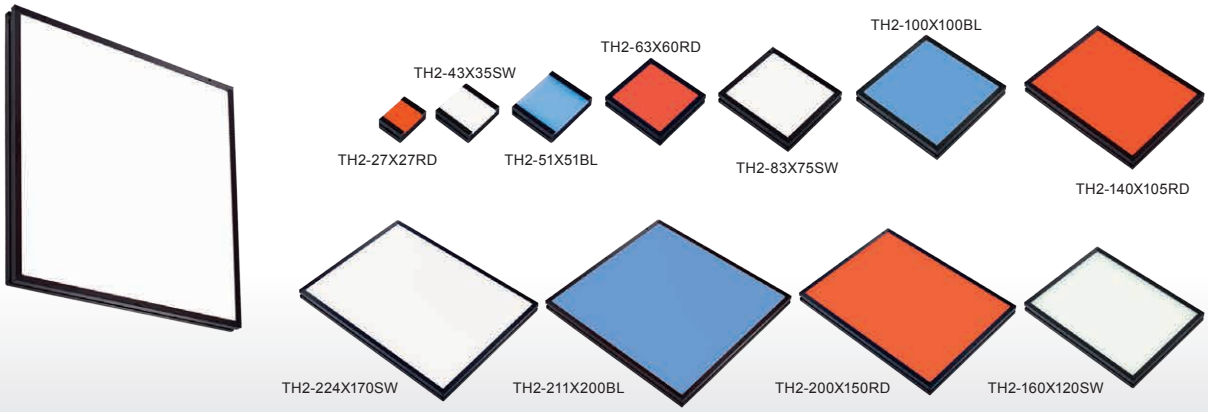
Flat Lights

TH2 Series High-Luminance Type

Refer to our website for product details.

CCS TH2 ▶ Search

Diffuse illumination from a flat emitting surface



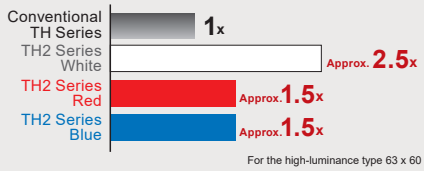
Applications Inspection of liquid surface level in PET bottles, inspection of the appearance of electronic or automobile components, inspection of pinholes, inspection for burr of metal components, etc.

Achieved Further-Higher Luminance

With their increased brightness, these Flat Lights are available at high-speed production lines.

Increased output greater than that of the conventional products

Graph of the radiance comparison

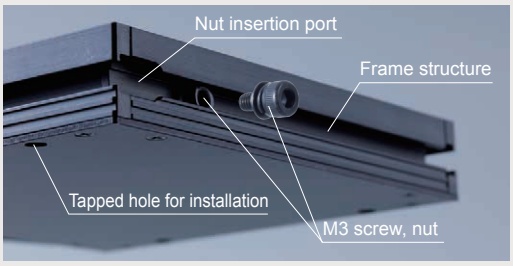


For the high-luminance type 63 x 60 models

The data included is for reference only. Actual values may vary.

Install freely to match your environment

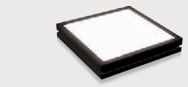
Uses installation method by frame structure. Tapped holes for installation are included not only on the unit side but also on the bottom.



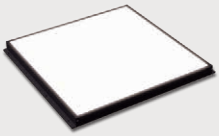
Rich Product Lineup

Our abundant product lineup can meet a wide range of needs. A total of 73 models of different types of Flat Lights.

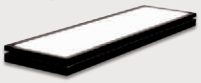
For transmission purpose



High-directivity type ▶ P.89
High light directivity and effective for dimensional measurement.

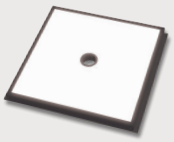


Large type ▶ P.93
Suitable for large workpieces.
Secures a large inspection area.



Rectangular type ▶ P.95
Supports sheet-shaped workpieces.
Recommended for line sensor camera applications.

For reflection purpose

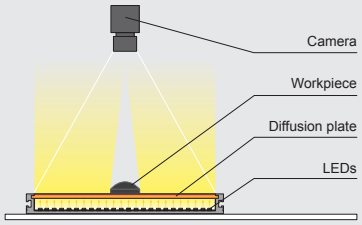


Camera-window type ▶ P.97
Provide a light from the same axis as the camera and a wide range of uniform illumination.
Available for reflection purpose.

Example Configuration

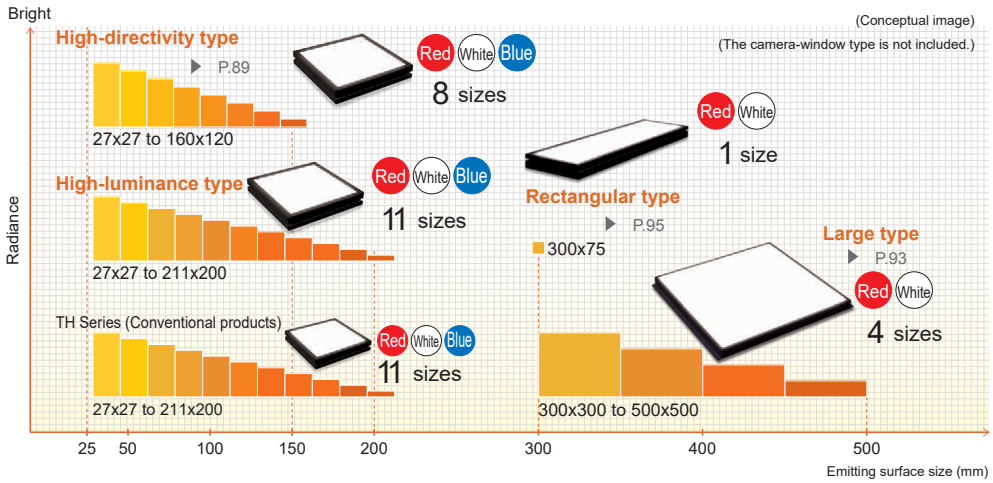
Achieved high output with a flat shape. Light from the LEDs is transmitted through the diffusion panel and illuminated on the rear of the workpiece.

TH2-140X105

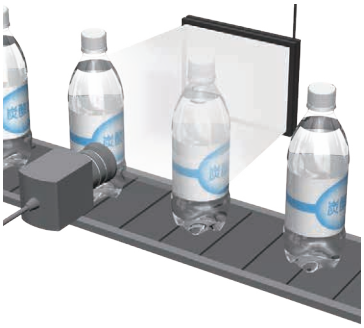


Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Brightness and Size of Each Light Unit Type



Imaging Example: Imaging the Liquid Surface Level in PET Bottles



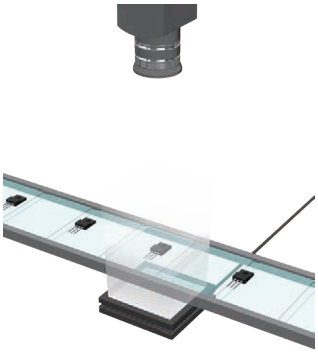
Workpiece image

PET bottles

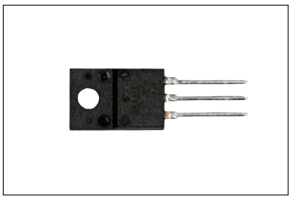
TH2-140X105SW

Liquid surface level and the printed text are clearly imaged.

Imaging Example: Imaging the Appearance of Electronic Components

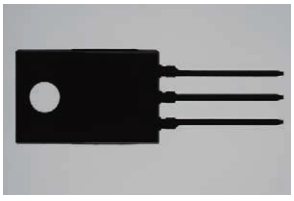


Workpiece image



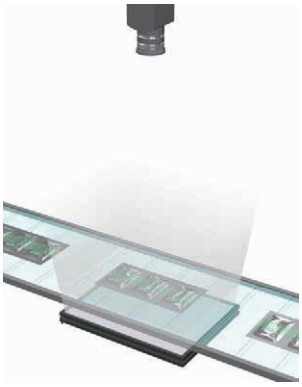
Electronic components

TH2-63X60SW



The appearance of the resin part and pins are clearly imaged.

Imaging Example: Imaging the Appearance of Medicines (Individual Packaging)



Workpiece image

Medicines (individual packaging)

TH2-200X150SW

The state of the cutting edge and perforations are clearly recognized.

TH2 Series

High-Luminance Type

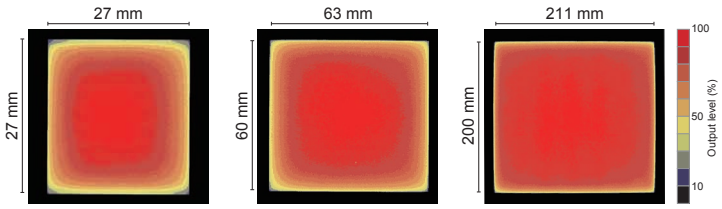
Refer to our website for product details.

CCS TH2 ▶ Search

Data: Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

Uniformity (Relative radiance)



TH2-27X27SW　TH2-63X60SW　TH2-211X200SW

Lineup

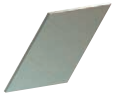
Model Name*1	Input Voltage	Power Consumption RD (Red)	Power Consumption SW (White)	Power Consumption BL (Blue)	Options	Extension Cables	Recommended Control Units	Weight
TH2-27X27□□	24 V	2.3 W	2.9 W	2.7 W	Light control film, Bracket	FCB*3 Straight Cable, FCB-W*4 2-Branch Cable, FCB-F 4-Branch Cable, FRCB Robot Cable	PD4, PD3, CC-ST-1024, POD*2	30 g
TH2-43X35□□	24 V	4.9 W	4.8 W	4.8 W				40 g
TH2-51X51□□	24 V	6.5 W	8.2 W	8.2 W				60 g
TH2-63X60□□	24 V	9.9 W	9.7 W	9.7 W				100 g
TH2-83X75□□	24 V	15 W	16 W	16 W				140 g
TH2-100X100□□	24 V	26 W	25 W	25 W				200 g
TH2-140X105□□	24 V	28 W	28 W	28 W			PD4, PD3, POD*2	260 g
TH2-160X120□□	24 V	35 W	35 W	35 W				310 g
TH2-200X150□□	24 V	45 W	44 W	44 W				440 g
TH2-224X170□□	24 V	66 W	66 W	66 W		FCB-EL2 Straight Cable	PD4-10024, PD3-10024-8, POD-22024-4-PEI*2, PSB4	540 g
TH2-211X200□□	24 V	67 W	65 W	65 W		FCB-W-EL2 2-Branch Cable		580 g

*3 The cables with a model name that ends with "-ME7","-EL2", "-PF", or "-PF-EL9" are not included.
*4 The cables with a model name that ends with "-EL2" are not included.

LED Properties: Light Spectrum ▶ P.396　Extension Cables ▶ P.371　Control Unit Selection Guide ▶ P.305　List of Control Unit Specifications ▶ P.307

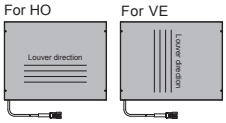
*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue)
*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

Options



In this plastic film are fine louvers with extremely narrow gaps between them. It reduces light diffusion in a particular direction and increases parallelism.

For HO　For VE



Light control film

There are two types of light control films: the HO and the VE. For details, refer to P.367.

Model name	Applicable Light Unit (Common for all colors)
LC-TH-27X27-HO	TH2-27X27
LC-TH-27X27-VE	
LC-TH-43X35-HO	TH2-43X35
LC-TH-43X35-VE	
LC-TH-51X51-HO	TH2-51X51
LC-TH-51X51-VE	
LC-TH-63X60-HO	TH2-63X60
LC-TH-63X60-VE	

Model name	Applicable Light Unit (Common for all colors)
LC-TH-83X75-HO	TH2-83X75
LC-TH-83X75-VE	
LC-TH-100X100-HO	TH2-100X100
LC-TH-100X100-VE	
LC-TH-140X105-HO	TH2-140X105
LC-TH-140X105-VE	
LC-TH-160X120-HO	TH2-160X120
LC-TH-160X120-VE	

Model name	Applicable Light Unit (Common for all colors)
LC-TH-200X150-HO	TH2-200X150
LC-TH-200X150-VE	
LC-TH-224X170-HO	TH2-224X170
LC-TH-224X170-VE	
LC-TH-211X200-HO	TH2-211X200
LC-TH-211X200-VE	

▶ P.367

This is a dedicated bracket for affixing the TH2 Series light units. The TH2 Series can be affixed in four points.

Bracket

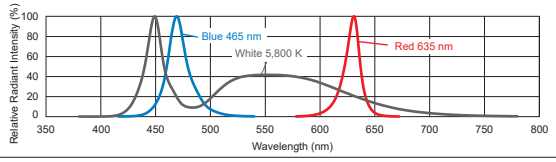
Model name	Applicable Light Unit (Common for all colors)
BK-TH-LE12	Installation bracket common to all TH2 models (includes 4)

▶ P.369

LED Properties

The data included is for reference only. Actual values may vary.

Spectral distribution



Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

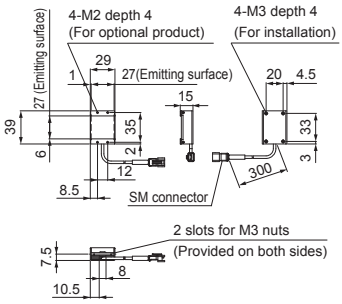
Before using the product, be sure to read the User Manual attached to the product and follow the usage precautions.
* For both TH2 (current product) and TH (former product), the correlated color temperature as a light is 5800K, and the correlated color temperature for the LED alone is 6600K, yielding no difference.
The data included is for reference only. Actual values may vary.

Various technical documents available. PDF Drawings　DXF Drawings　Product Brochures　Instruction Guides　3D CAD　Data Sheets　Imaging Examples　Digital Catalogs　Register to use them.

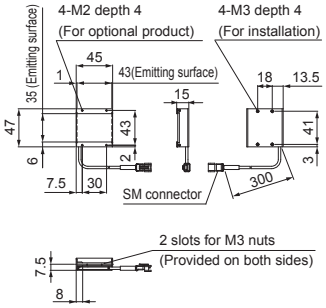
Dimensions (mm)

Even for the light units of the same emitting surface size, the thickness and other dimensions of the product differ between the high-luminance and high-directivity type light units. Be sure to check the dimension diagrams before installing the light units.

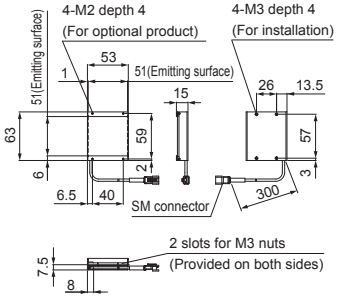
TH2-27X27RD/SW/BL



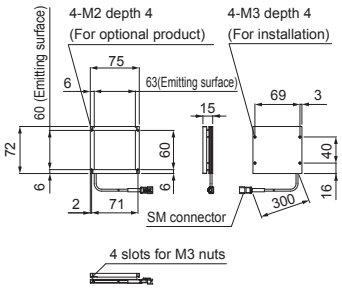
TH2-43X35RD/SW/BL



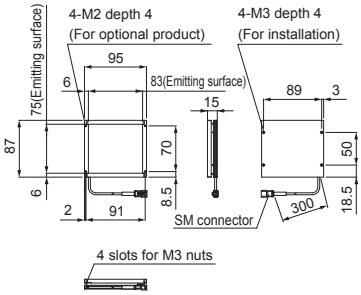
TH2-51X51RD/SW/BL



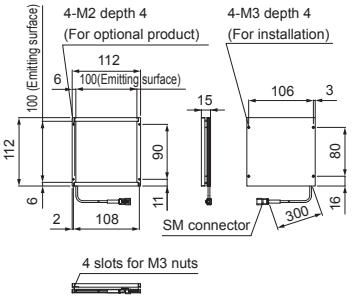
TH2-63X60RD/SW/BL



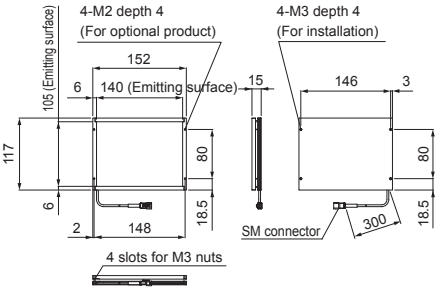
TH2-83X75RD/SW/BL



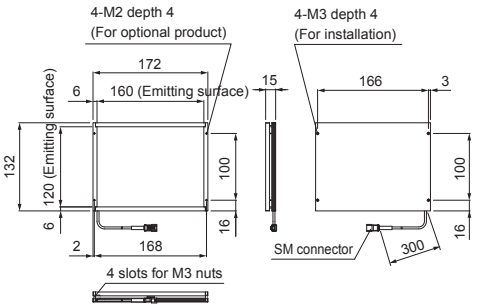
TH2-100X100RD/SW/BL



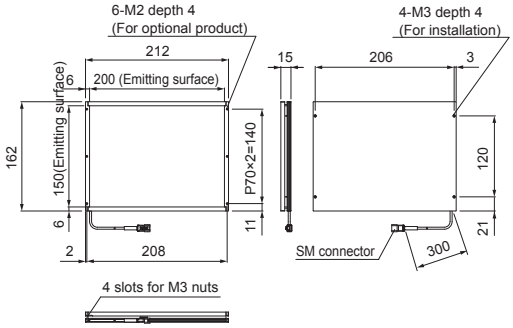
TH2-140X105RD/SW/BL



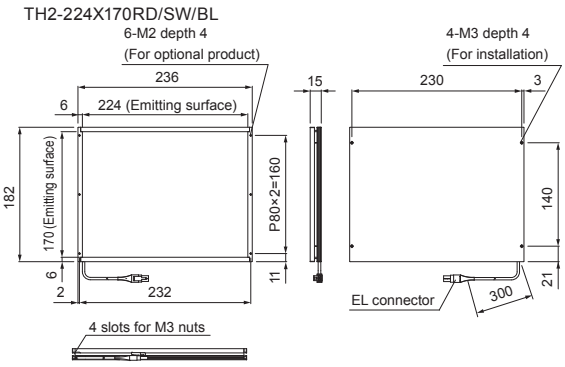
TH2-160X120RD/SW/BL



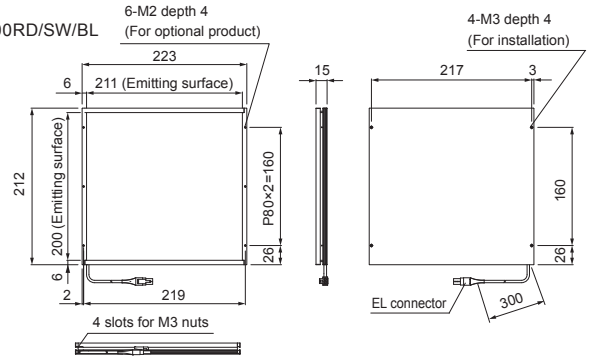
TH2-200X150RD/SW/BL



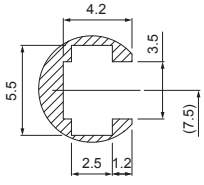
TH2-224X170RD/SW/BL



TH2-211X200RD/SW/BL



Nut slot detail diagram



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Diffused Lighting

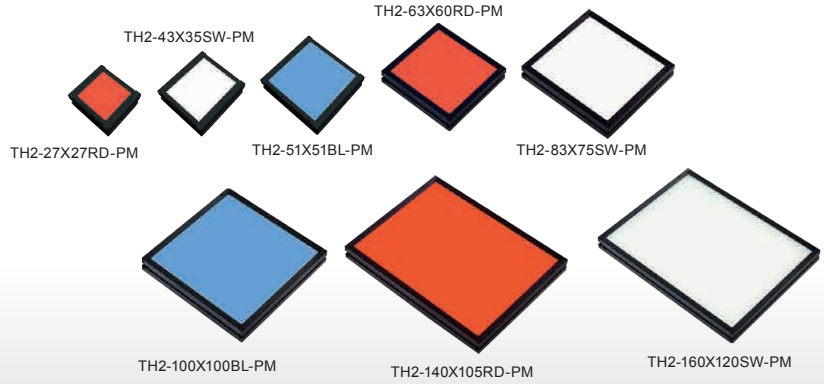
Flat Lights

TH2-PM Series High-Directivity Type

Refer to our website for product details.

CCS TH2 ▶ Search

Provides a light of high-directivity



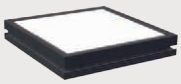
Applications Inspection of the appearance of screws; dimension measurement of automobile components, end mills, and other objects; inspection of the appearance of pillar-shaped objects; etc.

Achieved High Directivity of Light

High-power flat lights with enhanced light directivity. Suitable for inspections that require contour extraction of workpieces such as dimensional measurement.

Comparison of light directivity

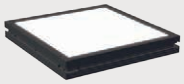
High-directivity type



TH2-100X100SW-PM

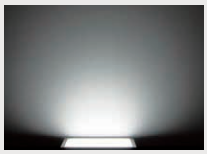
Illuminates with high directivity.

High-luminance type



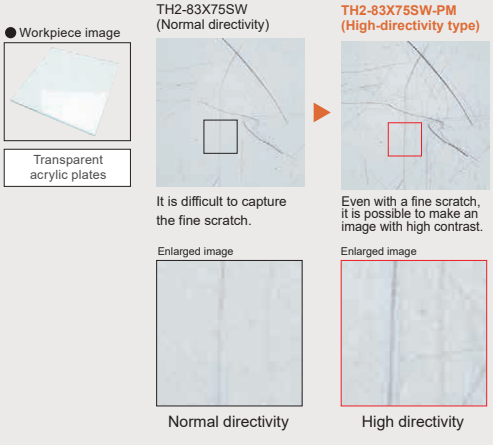
TH2-100X100SW

▶ P.85



Illuminates a wide space. (normal directivity)

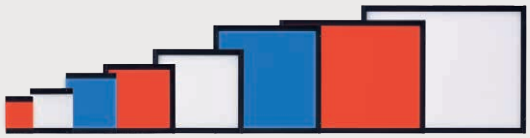
Comparison of images



Abundant Emitting Surface Sizes

Available in a wide variety of sizes. The size can be selected according to the workpiece.

Emitting surface size (mm)



27x27, 43x35, 51x51, 63x60, 83x75, 100x100, 140x105, and 160x120

LED colors

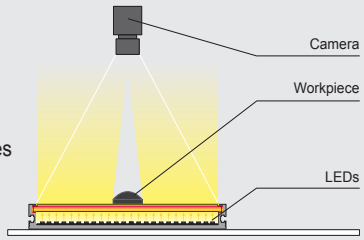
The product lineup includes white, red, and blue light units, which can deal with a wide variety of inspection contents.

The rich lineup consists of 24 models, with 8 sizes in each color.

Example Configuration

These high-output Flat light units are equipped with improved light directivity. Suitable for inspections that require contour extraction of workpieces such as dimensional measurement.

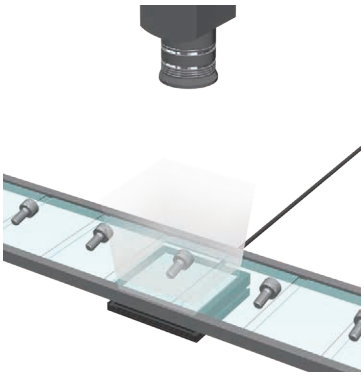
TH2-140X105-PM



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

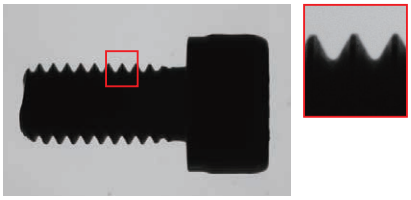
Imaging Example: Imaging the Appearance of Screws



Workpiece image

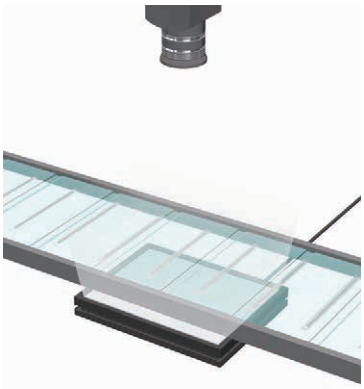
Screws

TH2-63X60SW-PM

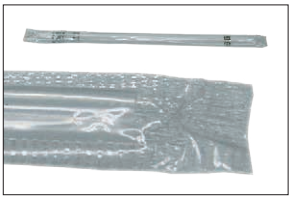


The outline of the screw threads is clearly imaged.

Imaging Example: Imaging the Appearance of Transparent Straw Bags

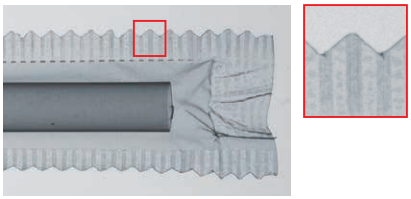


Workpiece image



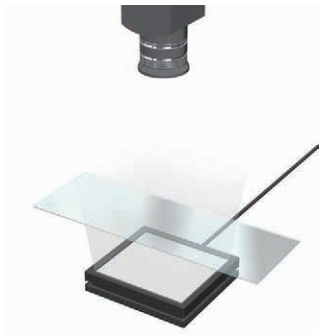
Straws

TH2-140X105SW-PM

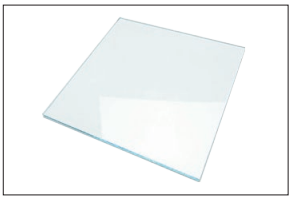


The glued portions are clearly imaged.

Imaging Example: Imaging the Appearance of Acrylic Plates



Workpiece image



Transparent acrylic plates

TH2-83X75SW-PM

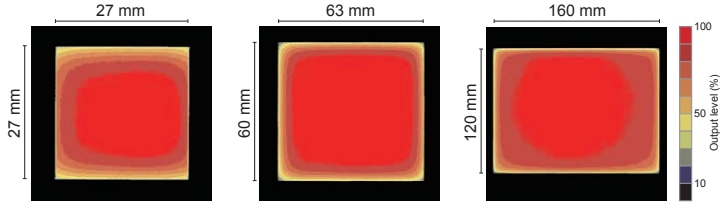
Even with a fine scratch, it is possible to make an image with high contrast.

This workpiece was processed by CCS for sample imaging.

Data: Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

Uniformity (Relative radiance)



TH2-27X27SW-PM TH2-63X60SW-PM TH2-160X120SW-PM

Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent / Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

TH2-PM Series

High-Directivity Type

Refer to our website for product details.

CCS TH2 ▶ Search

Lineup

Model Name*1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	Options	Extension Cables	Recommended Control Units	Weight
TH2-27X27□□-PM	24 V	2.5 W	3.1 W	3.1 W	Bracket	FCB*3 Straight Cable FCB-W*4 2-Branch Cable FCB-F 4-Branch Cable FRCB Robot Cable	PD4, PD3, CC-ST-1024, POD*2	40 g
TH2-43X35□□-PM	24 V	5.7 W	5.5 W	5.5 W				60 g
TH2-51X51□□-PM	24 V	7.3 W	9.9 W	9.9 W				80 g
TH2-63X60□□-PM	24 V	9.9 W	9.7 W	9.7 W				120 g
TH2-83X75□□-PM	24 V	15 W	16 W	16 W				170 g
TH2-100X100□□-PM	24 V	26 W	25 W	25 W			PD4, PD3, POD*2	240 g
TH2-140X105□□-PM	24 V	28 W	28 W	28 W				320 g
TH2-160X120□□-PM	24 V	34 W	35 W	35 W				390 g

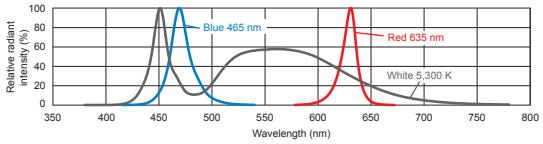
*3 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*4 The cables with a model name that ends with "-EL2" are not included.

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue)
*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

LED Properties

Spectral distribution



Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Options

This is a dedicated bracket for affixing the TH2 Series light units. The TH2 Series can be affixed in four points.

Bracket

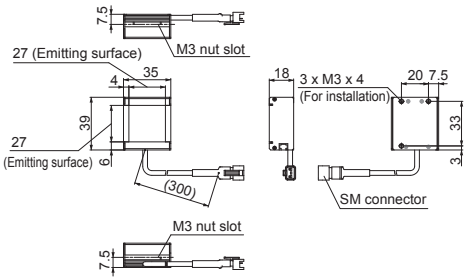
Model name	Applicable Light Unit (Common for all colors)
BK-TH-LE12	Installation bracket common to all TH2 models (includes 4)

▶ P.369

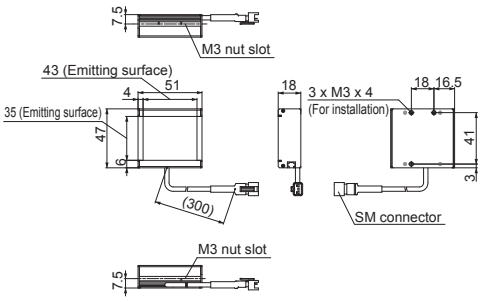
Dimensions (mm)

Even for the light units of the same emitting surface size, the thickness and other dimensions of the product differ between the high-luminance and high-directivity type light units. Be sure to check the dimension diagrams before installing the light units.

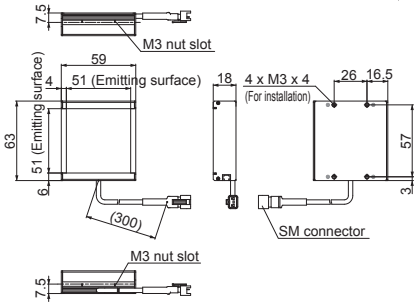
TH2-27X27RD-PM / SW-PM / BL-PM



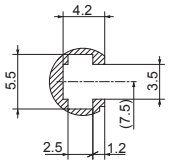
TH2-43X35RD-PM / SW-PM / BL-PM



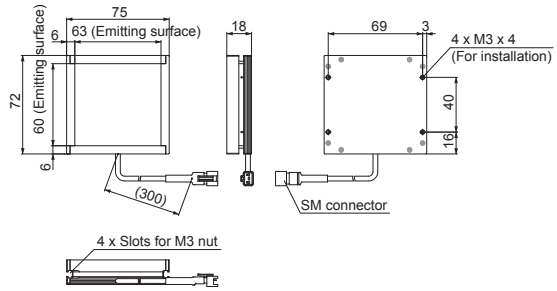
TH2-51X51RD-PM / SW-PM / BL-PM



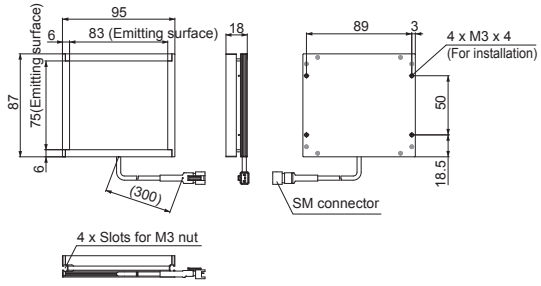
Nut slot detail diagram



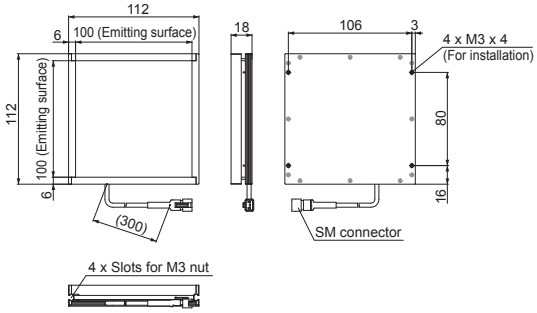
TH2-63X60RD-PM / SW-PM / BL-PM



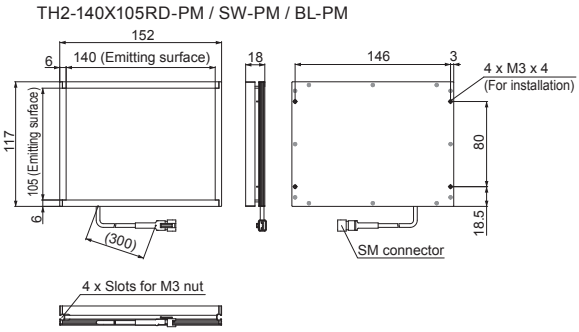
TH2-83X75RD-PM / SW-PM / BL-PM



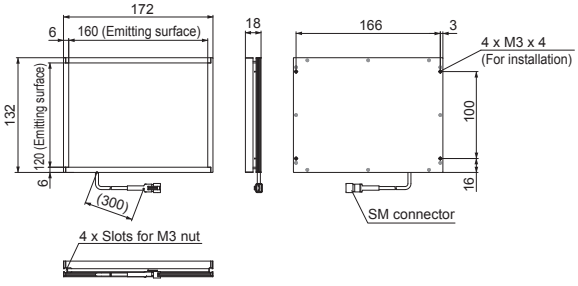
TH2-100X100RD-PM / SW-PM / BL-PM



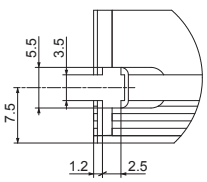
TH2-140X105RD-PM / SW-PM / BL-PM



TH2-160X120RD-PM / SW-PM / BL-PM



Nut slot detail diagram



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Diffused Lighting

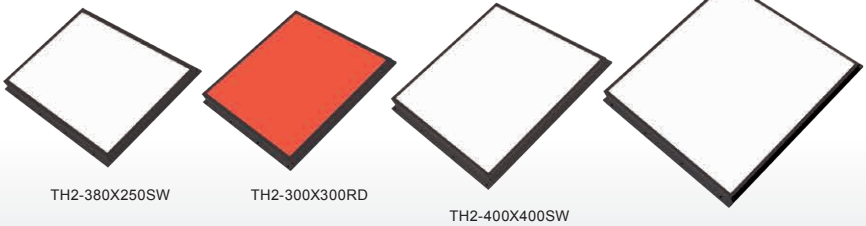
Flat Lights

TH2 Series — Large Type

Refer to our website for product details.

CCS TH2 ▶ Search

Flat light suitable for large workpieces



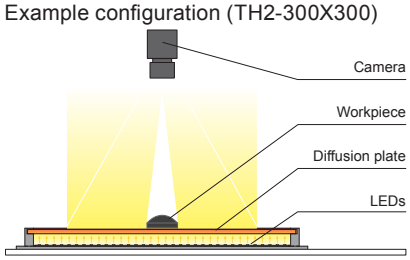
TH2-380X250SW　TH2-300X300RD　TH2-400X400SW　TH2-500X500SW

Applications Inspection of liquid surface level in large bottles and infusion bags, inspection of the appearance of wafers and automobile components, light source embedded in conveyors, etc.

Features

Flat light units with an emitting surface of up to 500 x 500 mm.
Supports large workpieces. Secures a large inspection area.

Example configuration (TH2-300X300)



We accept custom orders. Please feel free to inquire.
- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

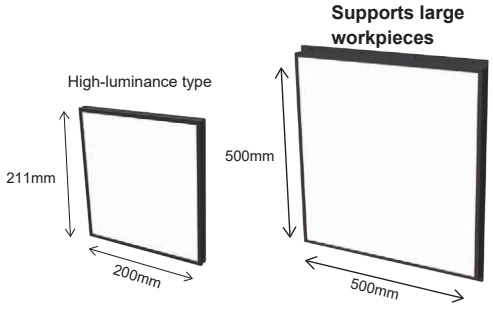
Imaging example: Imaging the liquid surface level in large bottles

Height: 400 mm
Capacity: 1.8 L

TH2-500X500SW

The liquid surface level and the label position are clearly imaged.

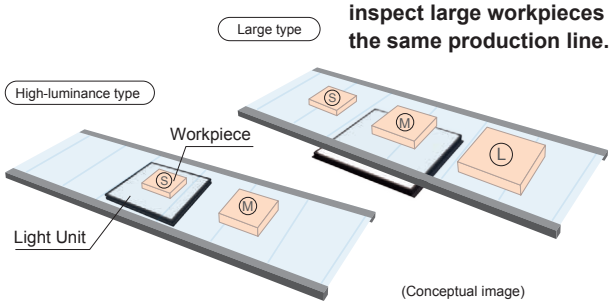
Comparison of Emitting Surface Sizes



TH2-211X200SW
The emitting surface size is up to 211 x 200 mm.
▶ P.85

TH2-500X500SW
Sizes up to 500 x 500 mm are available.

Comparison of the maximum workpiece size in a production line



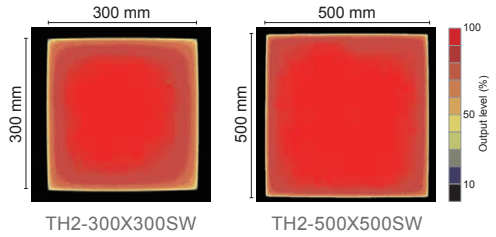
(Conceptual image)

The large type lets you expand the inspection region so that you can inspect large workpieces in the same production line.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Data (Representative Example)

Uniformity (Relative radiance)

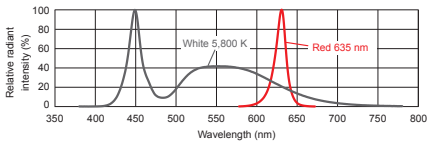


TH2-300X300SW TH2-500X500SW

The data included is for reference only. Actual values may vary.

LED Properties

Spectral distribution



Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Lineup

Model Name	LED Color	Power Consumption	Peak Wavelength / Correlated Color Temperature	Options	Extension Cables	Recommended Control Units	Weight
TH2-300X300RD	Red	24 V / 85 W	635 nm	—	FCB-EL2 Straight Cable	PD4-12024 PD3-10024-8 POD-22024-4-PEI*1 PSB4	2,700 g
TH2-300X300SW	White	24 V / 86 W	5,800 K				
TH2-380X250RD	Red	24 V / 90 W	635 nm				2,900 g
TH2-380X250SW	White	24 V / 93 W	5,800 K				
TH2-400X400RD	Red	24 V / 130 W	635 nm		FCB-1.25SQ-ME7 FCB-20-2.0SQ-ME7	PSB4	5,400 g
TH2-400X400SW	White	24 V / 153 W	5,800 K				
TH2-500X500RD	Red	24 V / 202 W	635 nm				7,800 g
TH2-500X500SW	White	24 V / 239 W	5,800 K				

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

Extension Cables (Metal Connectors)

It is required when connecting the light and recommended control unit PSB4 Series.

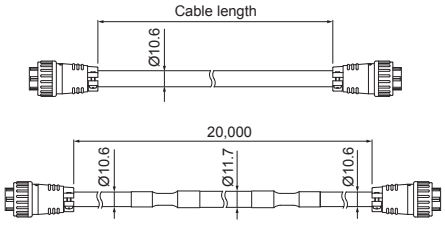
FCB-1.25SQ-ME7

Model name	Cable length	Weight
FCB-2-1.25SQ-ME7	2 m	430 g
FCB-3-1.25SQ-ME7	3 m	580 g
FCB-5-1.25SQ-ME7	5 m	1,000 g
FCB-10-1.25SQ-ME7	10 m	2,000 g

FCB-20-2.0SQ-ME7

Model name	Cable length	Weight
FCB-20-2.0SQ-ME7	20 m	5,000 g

(mm)



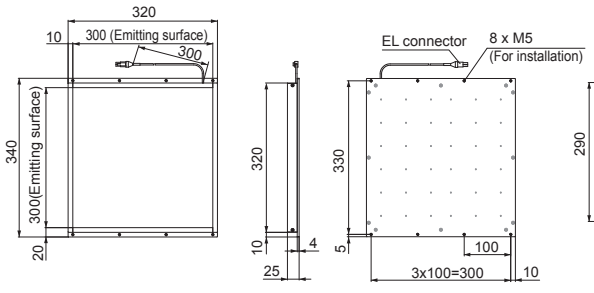
Cable permitted bending radius: 63.6 mm

Cable permitted bending radius: 63.6 mm

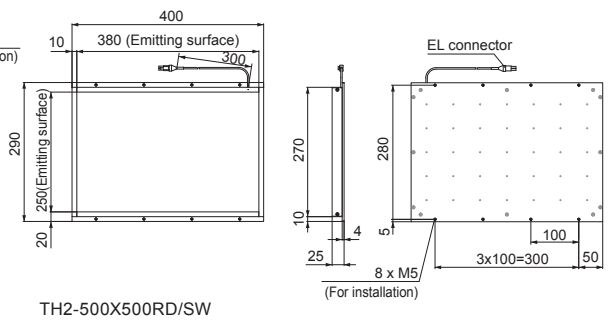
The above cable permitted bending radii are reference values. Actual values may vary.

Dimensions (mm)

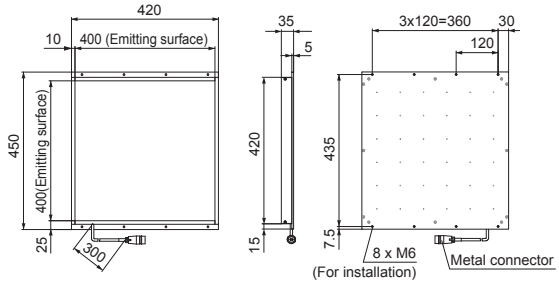
TH2-300X300RD/SW



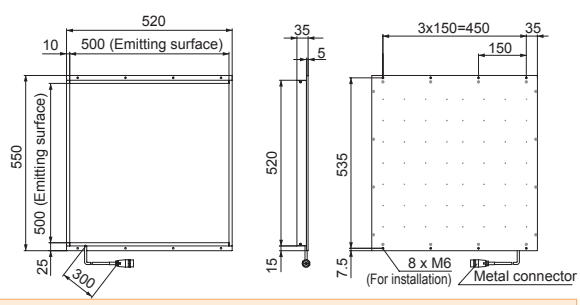
TH2-380X250RD/SW



TH2-400X400RD/SW



TH2-500X500RD/SW



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

You can inquire using our website. Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products

Inquire on our website here.
https://www.ccs-grp.com/contact/

Diffused Lighting

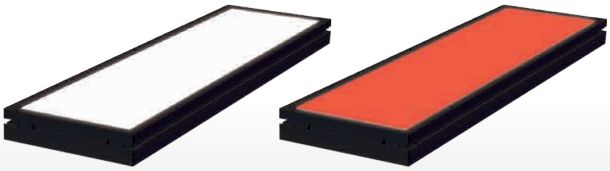
Flat Lights

TH2 Series — Rectangular Type

Refer to our website for product details.

CCS TH2 ▶ Search

Flat light units with a 300 x 75 mm emitting surface. Applicable to inspection of rectangular workpieces and imaging with a line sensor camera.



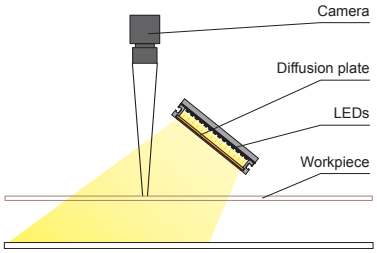
TH2-300X75SW　　TH2-300X75RD

Applications Inspection of the appearance of cylindrical containers or square-shaped workpieces, inspection for stains and foreign material on non woven fabrics, fault inspection of films, inspection of the appearance of glass, etc.

Features

Flat light suitable for rectangular workpieces.
Also applicable to inspections with a line sensor camera.

Example configuration (TH2-300X75)

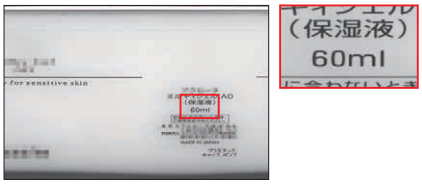


Inspection with a line sensor camera

Imaging example: Imaging the appearance of a cylindrical container

Workpiece:
Cylindrical container
(cosmetics)

TH2-300X75SW

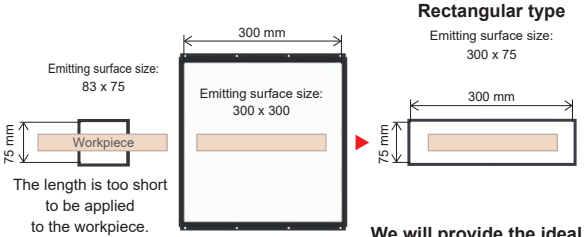


The state of the surface can be images. Also the printed text is clearly recognized.

Comparison of Emitting Surface Sizes

Supports rectangular workpieces

(For use with area sensor cameras)

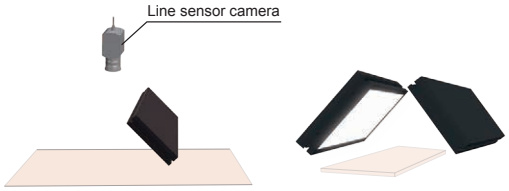


The length is too short to be applied to the workpiece.

The length is suitable, but there are large unused areas.

We will provide the ideal size for the workpiece to help you save space.

Also applicable to inspection with a line sensor camera



Sheet-shaped workpieces which are easy to flap

Reproducing the effect of Dome Lights

Can be used for a wide range of applications.

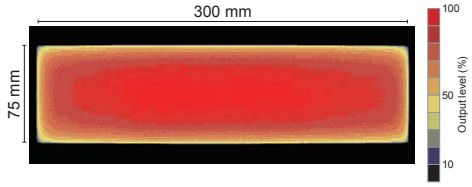
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Data (Representative Example)

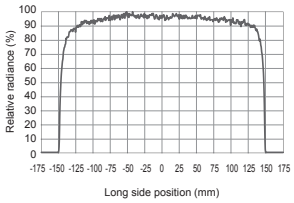
The data included is for reference only. Actual values may vary.

TH2-300X75SW

Uniformity (Relative radiance)

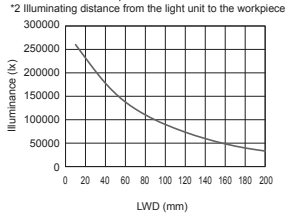


Relative radiance distribution

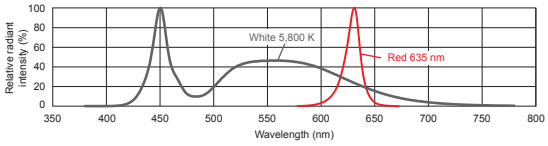


Illuminance graph (LWD characteristics)

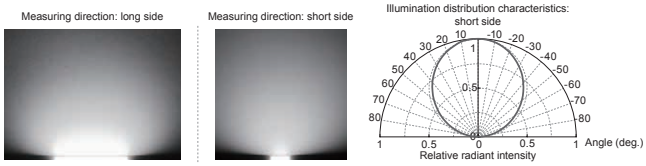
*1 Illuminance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Spectral distribution



Characteristic of the illumination distribution



Lens filters suitable for each wavelength are available.

For details about the lens filter, refer to P.359.

Lineup

Model Name	LED Color	Power Consumption	Peak Wavelength / Correlated Color Temperature	Options	Extension Cables	Recommended Control Units	Weight
TH2-300X75RD	Red	24 V / 54 W	635 nm	–	FCB-EL2 Straight Cable FCB-W-EL2 2-branch Cable	PD4*1 PD3-10024-8 POD-22024-4-PEI*2 PSB4 *1 PD4-6024 is not available in white color.	650 g
TH2-300X75SW	White	24 V / 68 W	5,800 K				

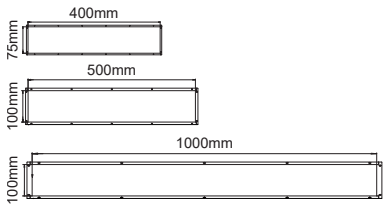
Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

Custom Order Example

Outer Diameter Size Change

Manufactured with a light size that matches the workpiece



■ Production results (example)

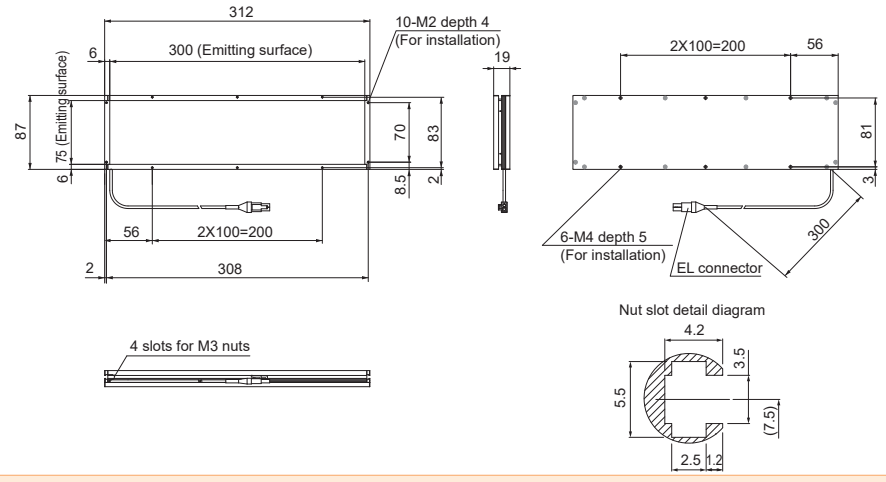
TH2-400X75 □□
TH2-500X100 □□
TH2-1000X100 □□ -ME
TH2-1760X60 □□ -ME
TH2-2000X100 □□ -ME

Wavelength / Color Temperature Change | High Output | Cable Length Change | Format/ Material Change | Connector format change | Installation/ mounting change | etc.

Contact us for any inquiries.

Dimensions (mm)

TH2-300X75RD/SW



Nut slot detail diagram

You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

You can inquire using our website. Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products

Inquire on our website here.
https://www.ccs-grp.com/contact/

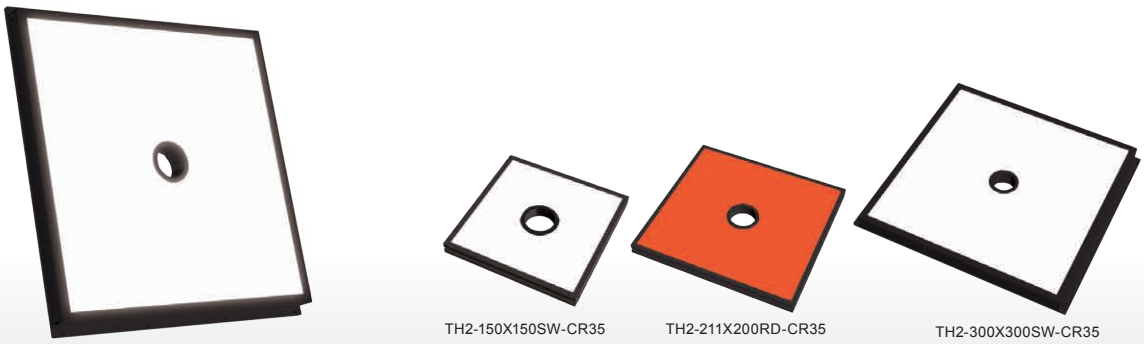
Diffused Lighting

Flat Lights

TH2-CR Series Camera-Window Type

Refer to our website for product details.
CCS TH2 ▶ Search

Provide a light from the same axis as the camera

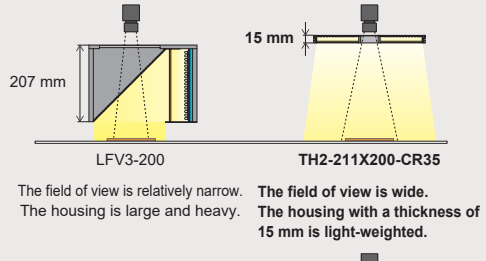


Applications Inspection of FIPG sealing material on metal components, inspection for stains and foreign materials in disposable diapers, reading engraved text on piston ring, robot picking, etc.

Illumination from the Same Axis as the Camera

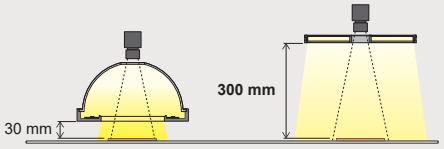
Flat lights with a camera window at the center of the emitting surface. They do not serve as a back light but provide a light from the same axis as the camera in the way the dome lights and coaxial lights do.

Comparison of structures



The field of view is relatively narrow. The housing is large and heavy.

The field of view is wide. The housing with a thickness of 15 mm is light-weighted.



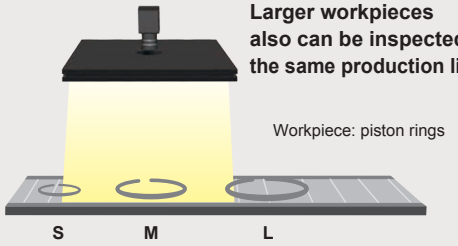
The narrow space between the light unit and the workpiece interferes with picking by robots.

The ample space between the light unit and the workpiece do not interfere with picking by robots.

Uniform Illumination of a Wide Range

These light units have a wider emitting surface compared to that of the coaxial lights and dome lights. This enables uniform illumination of a wide range.

Applicable to a wide range of workpiece sizes



Larger workpieces also can be inspected in the same production line.

Product lineup

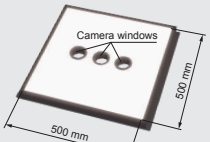
The available LED color is white or red.
Three sizes of emitting surface: 150 x 150 mm, 211 x 200 mm, and 300 x 300 mm.
These light units can deal with a wide variety of inspection contents.

Custom Order Example

Please contact your CCS sales representative.

E.g.: Large size of 500 x 500 mm

Format/ material — Creating a large size light unit



Other customizable items
- Changes in the shape of the camera window
- Changes in the LED color (blue, infrared, or other color)

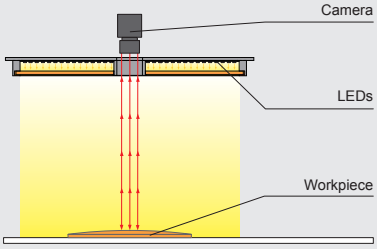
Customizable items

External/internal diameter | Wavelength/ Color
Increase output | Cable length
Illuminating angle | Format/ material
Connector format | Installation/ mounting
Etc.

Example Configuration

Flat Lights with a camera window at the center of the emitting surface. They provide a light from the same axis as the camera.

TH2-300X300-CR35

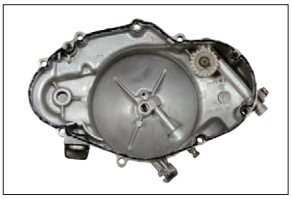


Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Imaging Example: Imaging FIPG Sealing Material on Metal Components

Workpiece image



FIPG sealing material on metal components

TH2-300X300SW-CR35

The state of FIPG sealing material can be imaged.

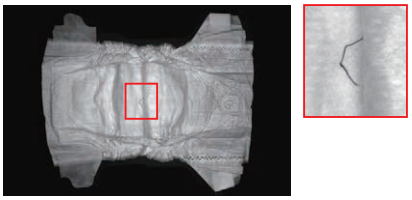
The above sample workpiece has been made specifically for sample imaging and is not the one for actual inspection.

Imaging Example: Imaging Stains and Foreign Materials in Disposable Diapers

Workpiece image

Disposable diapers

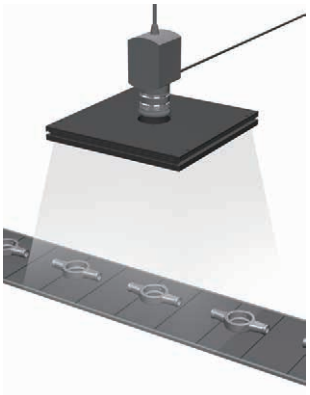
TH2-300X300SW-CR35



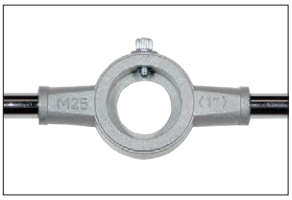
The foreign material on the surface is imaged.

The above sample workpiece has been made specifically for sample imaging.

Imaging Example: Imaging Engraved Text on Textured Metal Surfaces



Workpiece image



Textured metal

TH2-150X150SW-CR35

The engraved text is clearly imaged.

Data: Relative Irradiance Graph and Uniformity (Representative Example)

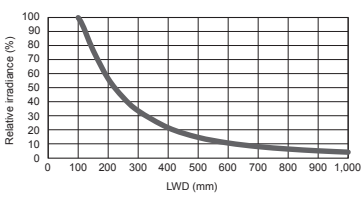
The data included is for reference only. Actual values may vary.

TH2-300X300SW-CR35

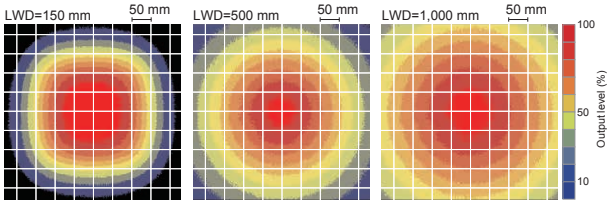
Relative irradiance graph (LWD characteristics) *1 *2

*1 Irradiance on the optical axis

*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent / Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

TH2-CR Series

Camera-Window Type

Refer to our website for product details.

CCS TH2 ▶ Search

Lineup

Model Name	LED Color	Power Consumption	Peak Wavelength / Correlated Color Temperature	Options	Extension Cables	Recommended Control Units	Weight
TH2-150X150RD-CR35	Red	24 V / 30 W	635 nm	Bracket	FCB*2 Straight Cable FCB-W*3 2-branch Cable FCB-F 4-branch Cable FRCB Robot Cable	PD4 PD3 POD*1	350 g
TH2-150X150SW-CR35	White	24 V / 30 W	5,800 K				
TH2-211X200RD-CR35	Red	24 V / 63 W	635 nm		FCB-EL2 Straight Cable FCB-W-EL2 2-branch Cable	PD4-12024 PD3-10024-8 POD-22024-4-PEI*1 PSB4	550 g
TH2-211X200SW-CR35	White	24 V / 62 W	5,800 K				
TH2-300X300RD-CR35	Red	24 V / 83 W	635 nm	–			2,700 g
TH2-300X300SW-CR35	White	24 V / 84 W	5,800 K				

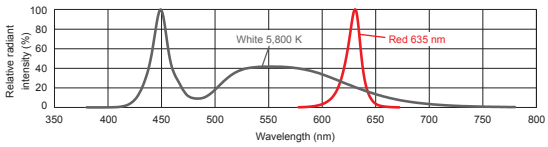
Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod
*2 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*3 The cables with a model name that ends with "-EL2" are not included.

Light units with a 500 x 500 mm emitting surface are available for custom orders.
We also accept custom orders for the size of the camera window, LED color (blue, infrared, or other color), etc.
Please feel free to contact your CCS sales representative for details.

LED Properties

Spectral distribution



Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Options

This is a dedicated bracket for affixing the TH2 Series light units. The TH2 Series can be affixed in four points.

Bracket

Model name	Applicable Light Unit (Common for all colors)
BK-TH-LE12	Installation bracket common to all TH2 models (includes 4)

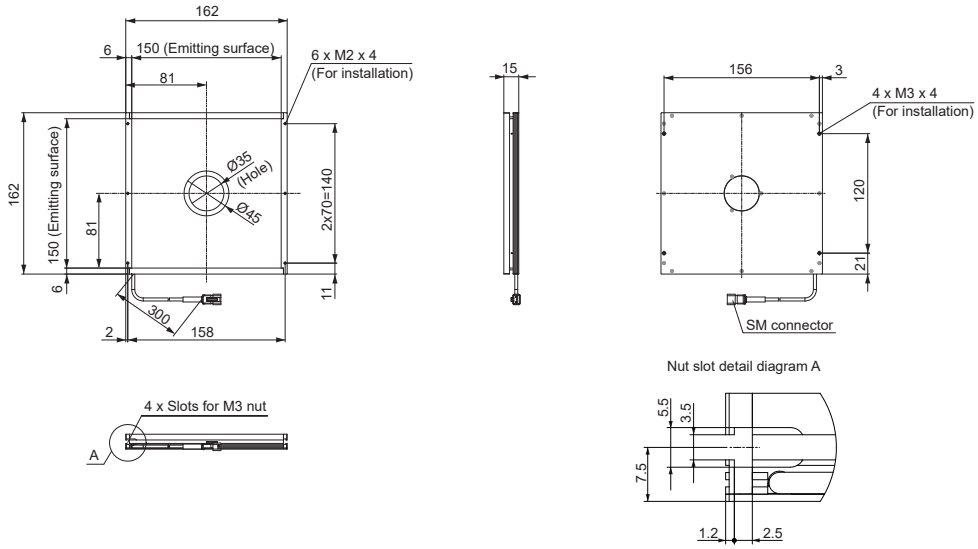
▶ P.369

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

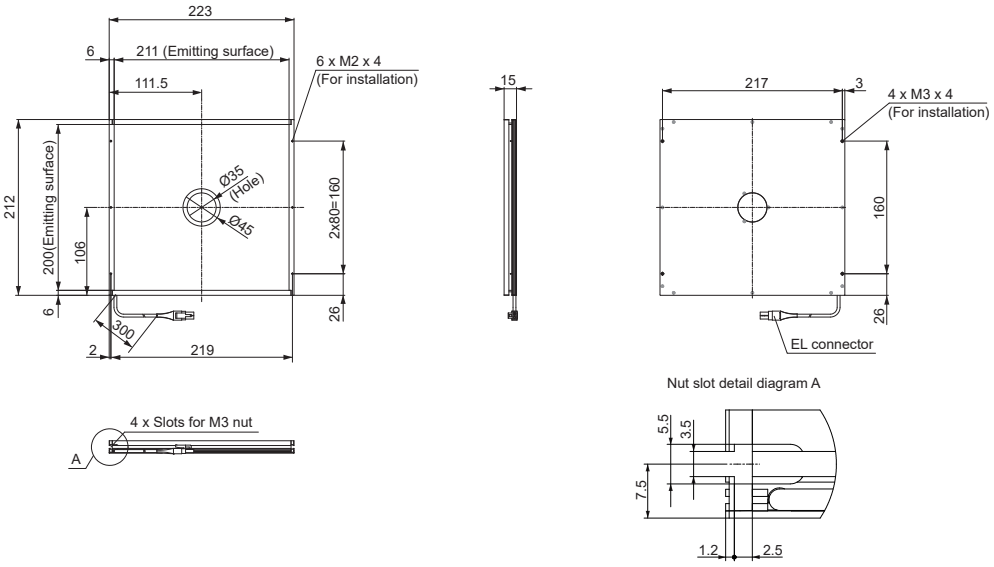
Register to use them.

Dimensions (mm)

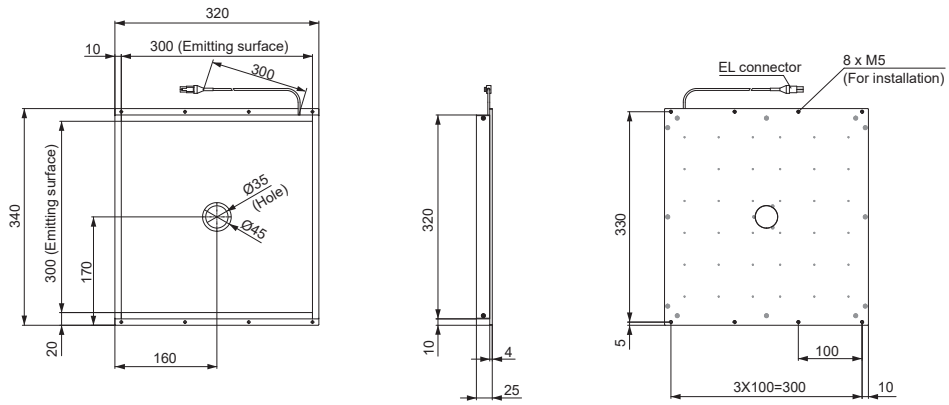
TH2-150X150RD-CR35 / SW-CR35



TH2-211X200RD-CR35 / SW-CR35



TH2-300X300RD-CR35 / SW-CR35



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

You can inquire using our website.

Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products

Inquire on our website here.
https://www.ccs-grp.com/contact/

Diffused Lighting

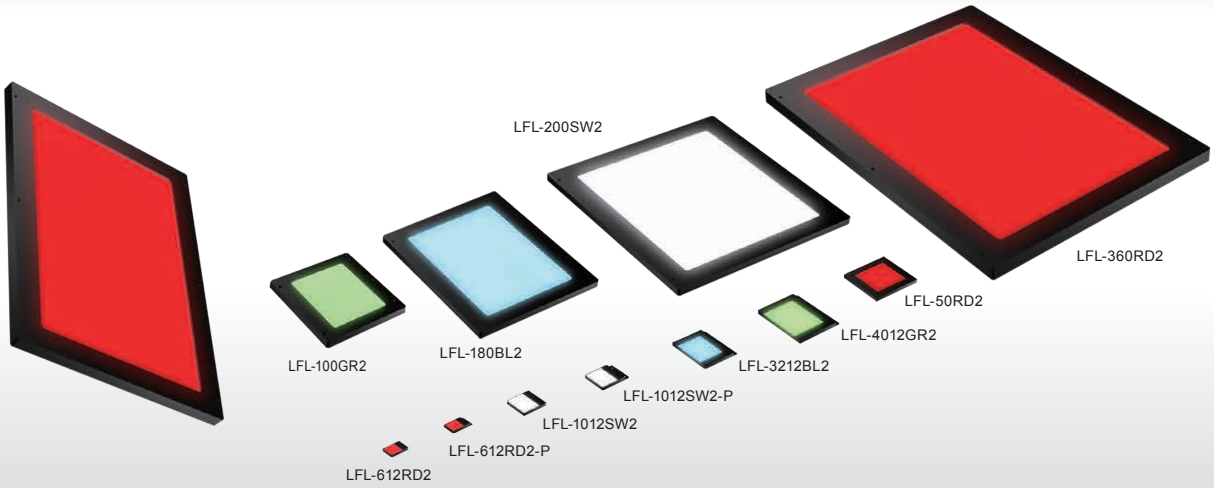
Flat Lights

LFL Series

Refer to our website for product details.

CCS LFL ▶ Search

Diffused illumination from a flat emitting surface



Applications Dimension measuring, visual inspection, foreign material inspections, liquid level inspection, burr inspection of metal parts, inspection for tears or stains on packaging, etc.

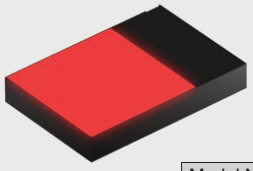
Rich Lineup with 43 Models

Rich lineup

The lineup consists of 35 models, with 9 sizes of emitting surfaces from 25 x 25 mm to 360 x 250 mm in each color. The rich lineup has a total of 43 models, including the LFL-612-P and LFL-1012-P, which add a plate for installation to the housing.

Energy-saving type that is light-weight and thin

The light unit's thin design, with a minimum thickness of 6 mm, allows for space-saving installation.

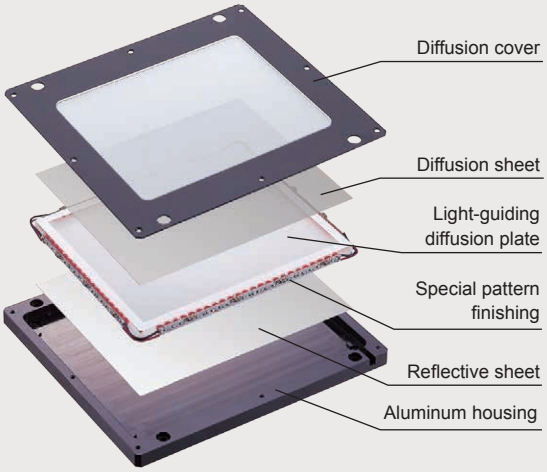


Model Name	LFL-612RD2
Power Consumption	24 V / 0.6 W
Weight	25 g

Uses a Unique Method of Light Guidance

LEDs are placed around the light-guiding diffusion plate. The special pattern finishing achieves illumination with even greater diffusion.

Cross-section image of the LFL-100



Custom Order Example

Please contact your CCS sales representative.

E.g.: Different shape

Format/ material

Allows you to create a light unit with a hole in it and pass things through the center

Can also be used as a camera window

Customizable items

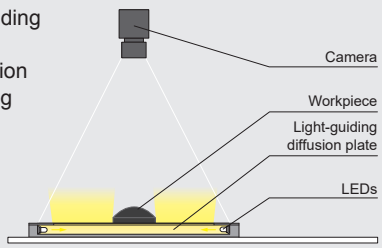
External/internal diameter | Wavelength/ color | Increase output | Cable length | Illuminating angle | Format/ material | Connector format | Installation/ mounting

Etc.

Example Configuration

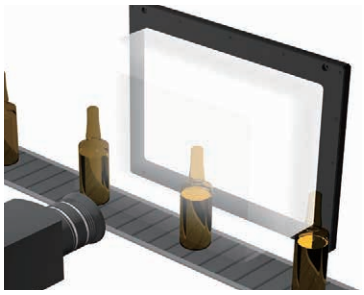
LEDs embedded around the outside of a square light-guiding diffusion plate. Diffused illumination from a flat emitting surface.

LFL-100



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Imaging Example: Imaging the Liquid Level in Glass Containers



Description	Liquid volume inspection
Workpiece	Glass containers
Conventional lighting	LED Ring Light
New lighting	LFL-180SW2
Result	Emphasizes the level of the liquid

■ Workpiece image

Glass containers

■ LED Ring Light

It is difficult to form an image of the liquid level due to surface reflection.

■ LFL-180SW2

It is possible to form an image of the liquid level without surface reflection.

Imaging Example: Imaging the Liquid Level in Plastic Containers

Description	Liquid volume inspection
Workpiece	Plastic containers
Conventional lighting	LED Ring Light
New lighting	LFL-180SW2
Result	Emphasizes the level of the liquid

■ Workpiece image

Plastic containers

■ LED Ring Light

It is difficult to form an image of the liquid level due to surface reflection.

■ LFL-180SW2

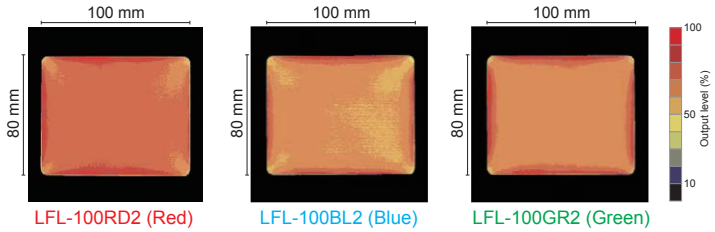
It is possible to form an image of the liquid level without surface reflection.

Data: Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

LFL-100

Uniformity (Relative radiance)



LFL-100RD2 (Red) LFL-100BL2 (Blue) LFL-100GR2 (Green)

You can inquire using our website.

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Inquire on our website here.
https://www.ccs-grp.com/contact/

LFL Series

Refer to our website for product details.

CCS LFL ▶ Search

Lineup

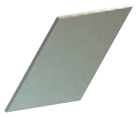
"-P" at the end of the model name: Type with an affixing plate

Model Name*1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	GR (Green)	Options	Extension Cables	Recommended Control Units	Weight
LFL-612□□2*2	24 V	0.6 W	0.4 W	0.4 W	0.4 W	–	FCB*4 Straight Cable FCB-W*5 2-Branch Cable FCB-F 4-Branch Cable FRCB Robot Cable *4 The cables with a model name that ends with "-ME7","-EL2", "-PF", or "-PF-EL9" are not included. *5 The cables with a model name that ends with "-EL2" are not included.	PD4, PD3*2, CC-ST-1024, POD*3	25 g *SW is 20 g
LFL-612□□2-P*2	24 V	0.6 W	0.4 W	0.4 W	0.4 W				25 g
LFL-1012□□2	24 V	0.6 W	0.8 W	0.8 W	0.8 W			PD4, PD3, CC-ST-1024, POD*3	35 g *SW is 30 g
LFL-1012□□2-P	24 V	0.6 W	0.8 W	0.8 W	0.8 W				35 g *SW is 30 g
LFL-3212□□2	24 V	1.6 W	2.3 W	2.3 W	2.3 W				80 g
LFL-4012□□2	24 V	2.1 W	2.7 W	2.7 W	2.7 W				105 g *SW is 110 g
LFL-50□□2	24 V	2.1 W	3.1 W	3.0 W	3.0 W				50 g
LFL-100□□2	24 V	5.1 W	5.3 W	5.3 W	5.3 W	Light control film			215 g *SW is 220 g
LFL-180□□2	24 V	7.1 W	9.1 W	9.1 W	9.1 W				375 g *SW is 370 g
LFL-200□□2	24 V	12 W	12 W	12 W	12 W			PD4, PD3, POD*3	500 g *BL, GR are 495 g
LFL-360□□2	24 V	30 W	37 W	38 W	–	–			2,320 g *RD is 2,360 g

LED Properties: Spectral Distribution ▶ P.396 | Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, GR: Green)
*2 These red lights cannot be used with the PD3-5024-4-SI or PD3-5024-4-ET control unit.
*3 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

Options



In this plastic film are fine louvers with extremely narrow gaps between them. It reduces light diffusion in a particular direction and increases parallelism.

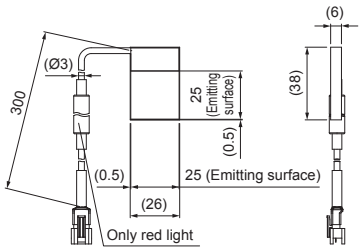
Light control film

Model Name	Applicable Light Unit (Common for all colors)
LC-LFL-100	LFL-100
LC-LFL-180	LFL-180
LC-LFL-200	LFL-200

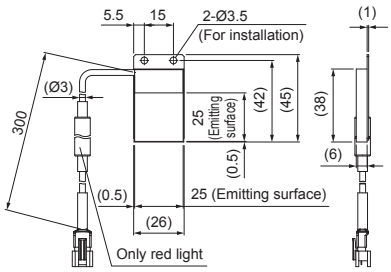
▶ P.367

Dimensions (mm)

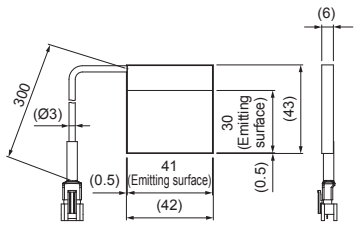
LFL-612RD2/SW2/BL2/GR2



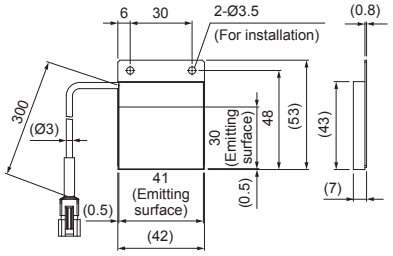
LFL-612RD2-P / SW2-P / BL2-P / GR2-P



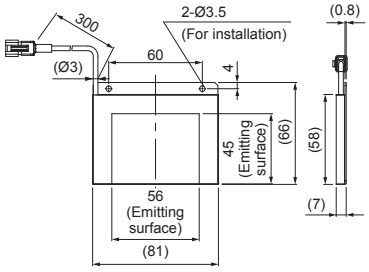
LFL-1012RD2/SW2/BL2/GR2



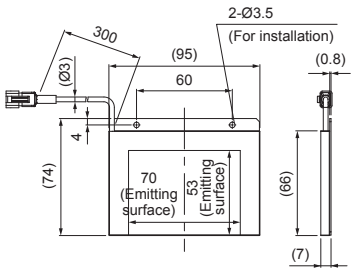
LFL-1012RD2-P / SW2-P / BL2-P / GR2-P



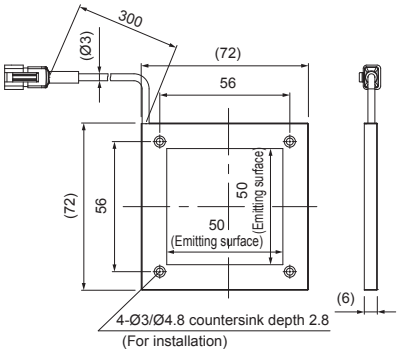
LFL-3212RD2/SW2/BL2/GR2



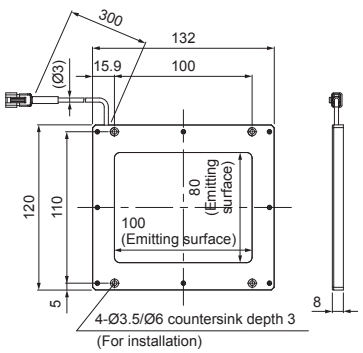
LFL-4012RD2/SW2/BL2/GR2



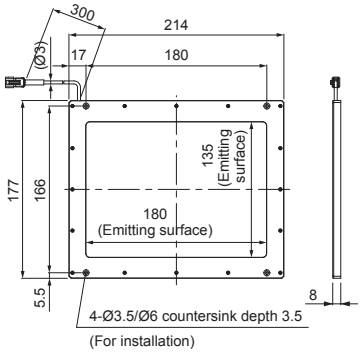
LFL-50RD2/SW2/BL2/GR2



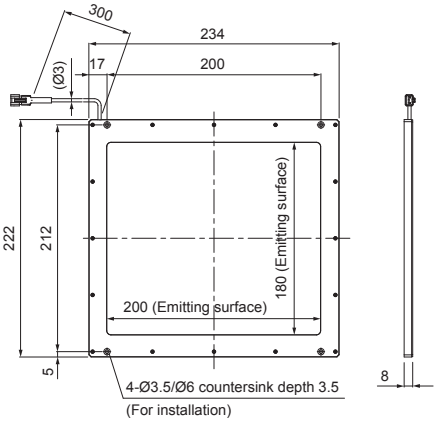
LFL-100RD2/SW2/BL2/GR2



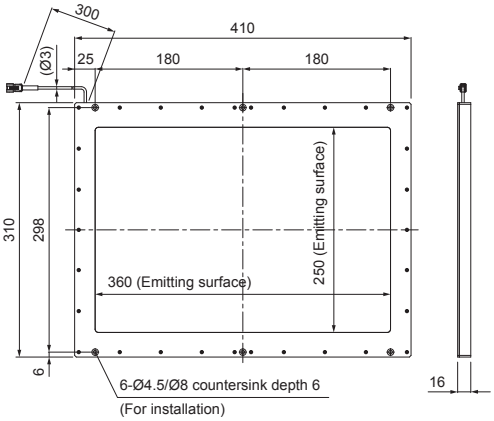
LFL-180RD2/SW2/BL2/GR2



LFL-200RD2/SW2/BL2/GR2



LFL-360RD2/SW2/BL2



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Diffused Lighting

Dome Lights

HPD2 Series

Refer to our website for product details.

CCS HPD2 ▶ Search

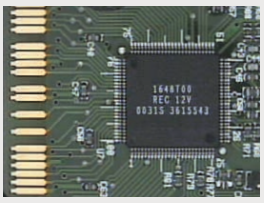
Provides diffused light evenly through the dome-shaped reflective panel

Applications Visual, text, or color determination inspections on glossy surfaces, curved surfaces, or uneven surfaces; inspection for engraving, damage, or stains on stain finishing; visual inspection of metal with hairline finishing; inspection of parts on circuit boards; etc.

Applicable to a Wide Variety of Industries

It is bright and even if the distance from the workpiece to the light unit is changed, there is little change in the uniform region. Therefore, it can be used in a wide range of industries.

Semiconductor industry (Circuit board)



HPD2-100SW (White)

Electronic parts industry (Capacitor)

HPD2-150SW (White)

Food industry (Chocolate)

HPD2-250SW (White)

Packaging industry (Top of a drink container)

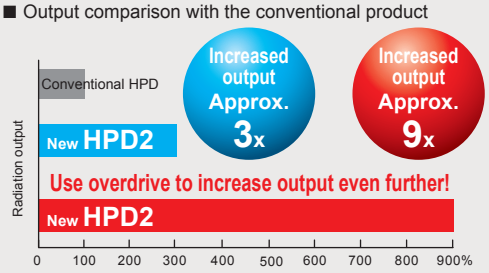
HPD2-150SW (White)

Diffused Light at High Output

Light from the surface-mounted LEDs is diffused inside the dome-shaped reflective panel. This uniformly illuminates a wide range of region.

Achieved higher output than the conventional product

■ Output comparison with the conventional product



- This is a comparison between the HPD-100 and HPD2-100 light units, using red and white colors.
- It can be combined with a Strobe control unit for even brighter emission than continuous emission. *Cannot use a full color (RGB) type.
- The data included is for reference only. Actual values may vary.

Added two sizes and an infrared and full color (RGB) type

We added the HPD2-75 and HPD2-200 models. Also, we added infrared (860 nm) and full color (RGB) types to the lineup as variation for wavelengths, increasing the applications of our products.

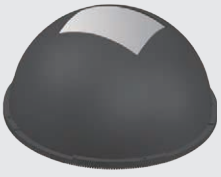
Custom Order Example

Please contact your CCS sales representative.

E.g.: Different shape

Format/ material

Changed the camera aperture to a rectangle



Customizable items

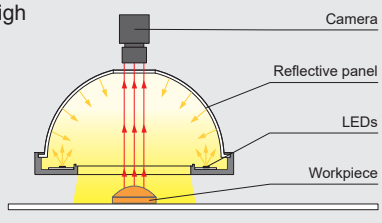
External/internal diameter | Wavelength/ color | Increase output | Cable length | Illuminating angle | Format/ material | Connector format | Installation/ mounting

Etc.

Example Configuration

Uses a unique illuminating mechanism and emits diffused light at high output.

HPD2-150



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

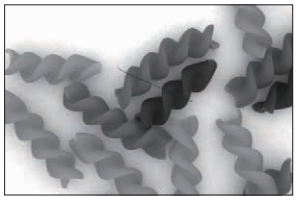
Imaging Example: Imaging Foreign Materials Mixed in Food

Description	Foreign material inspection
Workpiece	Macaroni
Conventional lighting	HPD2-200SW
New lighting	HPD2-200IR860: Infrared type
Result	Emphasizes the foreign material

■ Workpiece image

Macaroni

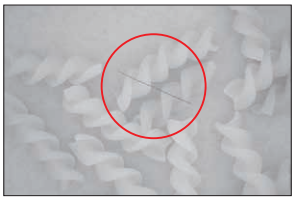
■ HPD2-200SW



It is difficult to form an image of the foreign material using white light.

⇒

■ HPD2-200IR860



It is possible to form an image of the foreign material using infrared light.

This workpiece was processed by CCS for sample imaging.

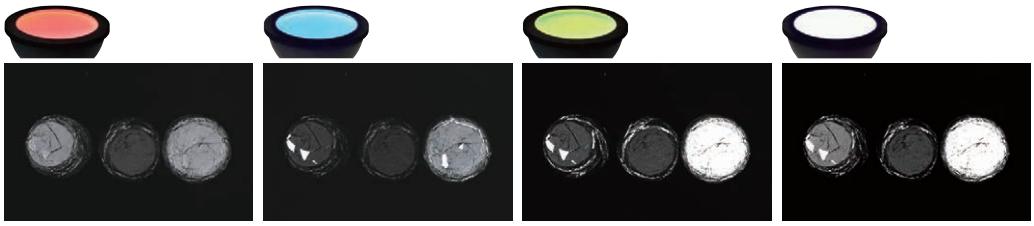
Imaging Example: Imaging the Appearance of Multi-Colored Workpieces for Color Determination

■ Workpiece image

Chocolate

Description	Visual inspection
Workpiece	Chocolate
Conventional lighting	–
New lighting	HPD2-200FC: Full color (RGB) type
Result	Allows for multi-color determination

■ HPD2-200FC: Full color (RGB) type



Imaging with red illumination | Imaging with blue illumination | Imaging with green illumination | Imaging with white illumination

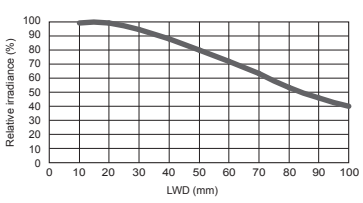
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

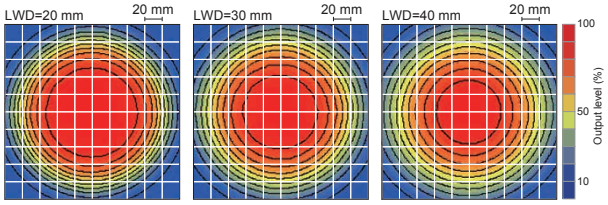
HPD2-200SW

Relative irradiance graph (LWD characteristics) *1 *2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



HPD2 Series

Refer to our website for product details.

CCS HPD2 ▶ Search

Lineup

Model Name*1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	IR860 (Infrared)	FC (Red/Green/Blue)	Options	Extension Cables	Recommended Control Units*2	Weight
HPD2-75□□	24 V	17 W	16 W	16 W	12 W	6.0 W*2	Bracket	FCB*5 Straight Cable; FCB-W*6 2-Branch Cable; FCB-F 4-Branch Cable; FRCB Robot Cable	PD4, PD3, POD*3	140 g
HPD2-100□□	24 V	17 W	23 W	23 W	23 W	11 W*2				160 g
HPD2-150□□	24 V	27 W	27 W	27 W	35 W	15 W*2				285 g
HPD2-200□□	24 V	34 W	41 W	41 W	46 W	19 W*2				460 g
HPD2-250□□	24 V	45 W	46 W	46 W	46 W	24 W*2				650 g
HPD2-400□□	24 V	45 W	46 W	46 W	46 W	30 W*2	–			1,300 g

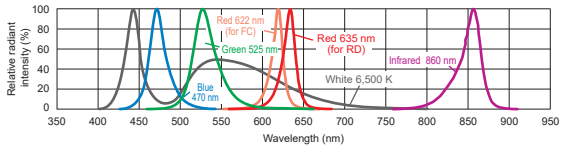
*5 The cables with a model name that ends with "-ME7","-EL2", "-PF", or "-PF-EL9" are not included.
*6 The cables with a model name that ends with "-EL2" are not included.

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue IR860: Infrared, FC: Red/Green/Blue)
*2 For the full color (RGB) type control unit, use the PD3 3-channel specification. Cannot be used with the strobe control unit (overdrive mode).
*3 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

LED Properties

Spectral distribution



Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

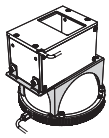
Options

Combine with a ring light to achieve imaging by light switching and simultaneous lighting.

Light joint bracket

Model Name	Applicable Light Unit 1 (Common for all colors)	Applicable Light Unit 2 (Common for all colors)		
BK-75-JO	HPD2-75	HPR2-75	LDR2-100-LA	LDR-96-LA1
BK-100-JO	HPD2-100	HPR2-100	LDR2-132-LA	LDR-146-LA1
BK-150-JO	HPD2-150	HPR2-150	LDR2-170-LA	LDR-176-LA1
BK-200-JO	HPD2-200	HPR2-200	LDR2-208-LA	LDR-206-LA1
BK-250-JO	HPD2-250	HPR2-250	–	–

▶ P.370



Combine with a coaxial light to solve uneven illumination and achieve uniform illumination from all directions.

Coaxial light joint bracket

Model Name	Applicable Light Unit 1 (Common for all colors)	Applicable Light Unit 2 (Common for all colors)
BK-HPD2-75-LFV	HPD2-75	LFV3-35
BK-HPD2-100-LFV	HPD2-100	LFV3-50
BK-HPD2-150-LFV	HPD2-150	
BK-HPD2-200-LFV	HPD2-200	LFV3-70
BK-HPD2-250-LFV	HPD2-250	

▶ P.370

Achieves installation using installation holes with a larger gap than the light unit body installation holes, or installation on a vertical surface.

Expansion mounting bracket

Model Name	Applicable Light Unit (Common for all colors)
BK-75-CI	HPD2-75
BK-100-CI	HPD2-100
BK-150-CI	HPD2-150
BK-200-CI	HPD2-200
BK-250-CI	HPD2-250

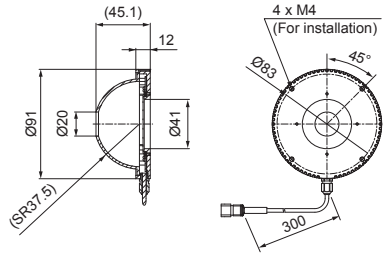
▶ P.370

Transparent acrylic protective plates (PR Series) with AR (anti-reflective) coatings are available to protect the light emission surface from scratches and dirt. Contact our local sales office for details.

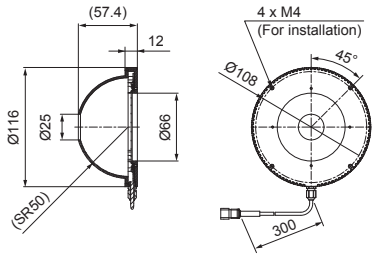
Dimensions (mm)

M4 and M6 installation holes are tapped and perforated holes.

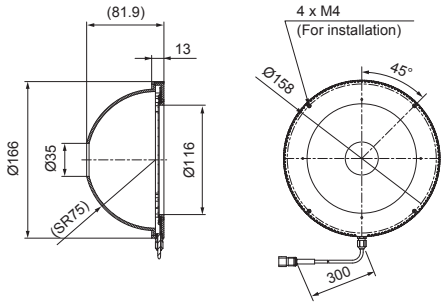
HPD2-75RD/SW/BL/FC/IR860



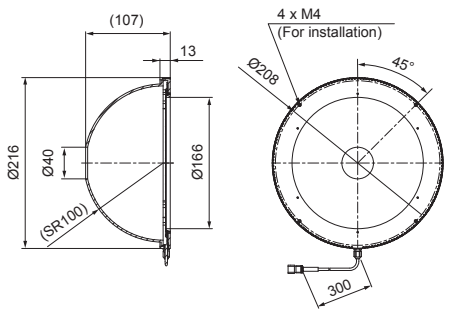
HPD2-100RD/SW/BL/FC/IR860



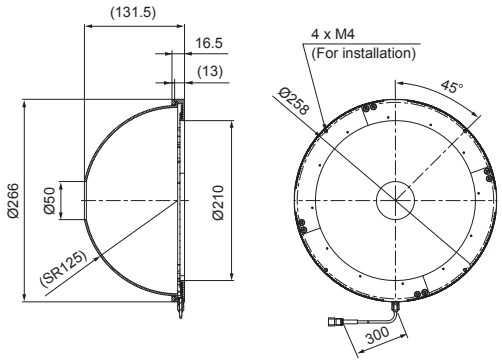
HPD2-150RD/SW/BL/FC/IR860



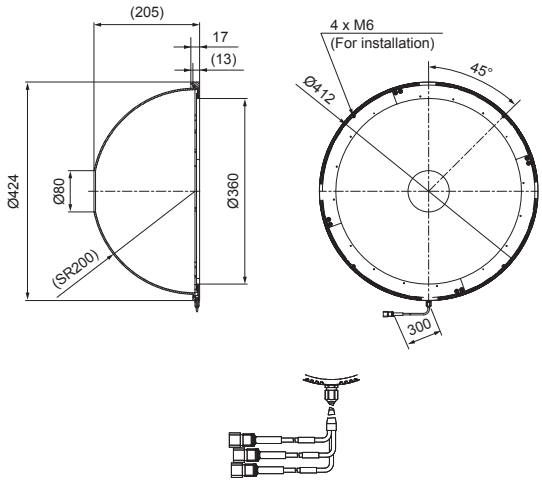
HPD2-200RD/SW/BL/FC/IR860



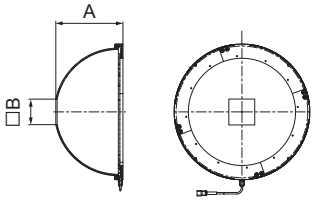
HPD2-250RD/SW/BL/FC/IR860



HPD2-400RD/SW/BL/FC/IR860



- The camera aperture can be changed to a square.



- Special order

Model	Dimension A	Dimension B
HPD2-75□-SQ20	45.1	20
HPD2-100□-SQ30	56.7	30
HPD2-150□-SQ40	81.3	40
HPD2-200□-SQ50	105.8	50
HPD2-250□-SQ60	130.3	60
HPD2-400□-SQ80	205	80

□ is a placeholder for letters that indicate the color of the emitted light.
Dimensions are subject to change.

The full color type (HPD2-□□FC) has three connectors. Use a 3-channel control unit if controlling intensity separately for each color.

You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Diffused Lighting

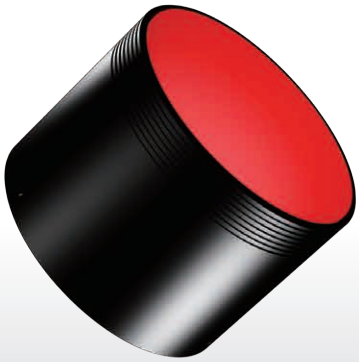
Dome Lights

LDM2 Series

Refer to our website for product details.

CCS LDM2 ▶ Search

Provides diffused light from a cone-shaped emitting surface



LDM2-50RD2

LDM2-50SW2

LDM2-90BL2

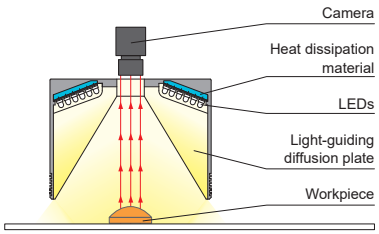
LDM2-90GR2

Applications Inspection for the visual, text, or color determination on glossy surfaces, curved surfaces, or uneven surfaces; soldering inspection; surface inspection for metal parts; text inspection for can bottoms; character recognition for glossy workpieces; etc.

Features

Light emitted from the LEDs is transmitted through the light-guiding diffusion plate and the uniformly diffused light from a wide emitting surface surrounds the whole workpiece.

Example configuration (LDM2-90)



We accept custom orders.
Please feel free to inquire.

- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

Imaging example: Imaging text on aluminum bottle cans

Workpiece: Aluminum bottle cans

■LED Bar Light

It is difficult to form an image of the text due to the influence of uneven illumination.

⇒

■LDM2-90RD2

It is possible to illuminate the whole thing evenly to form an image of the text.

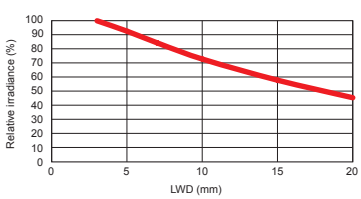
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

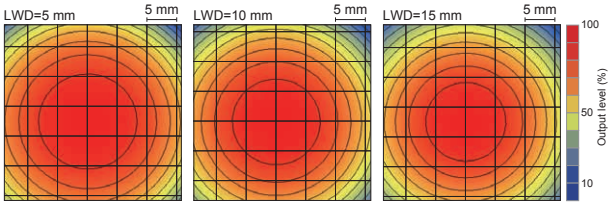
LDM2-50RD2

Relative irradiance graph (LWD characteristics) *2 *1

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Lineup

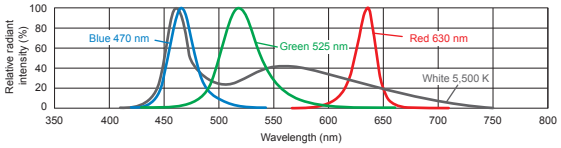
Model Name*1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	GR (Green)	Options	Extension Cables	Recommended Control Units	Weight
LDM2-50□□2	24 V	3.6 W	5.0 W	5.0 W	5.0 W	–	FCB*3 Straight Cable FCB-W*4 2-Branch Cable FCB-F 4-Branch Cable FRCB Robot Cable	PD4 PD3 CC-ST-1024 POD*2	100 g
LDM2-90□□2	24 V	14 W	18 W	18 W	18 W			PD4 PD3 POD*2	500 g

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, GR: Green)
*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod
*3 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*4 The cables with a model name that ends with "-EL2" are not included.

LED Properties

Spectral distribution

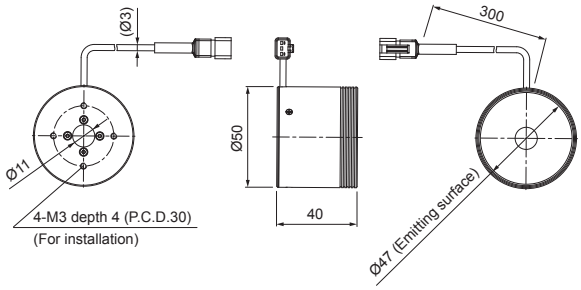


Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.361.

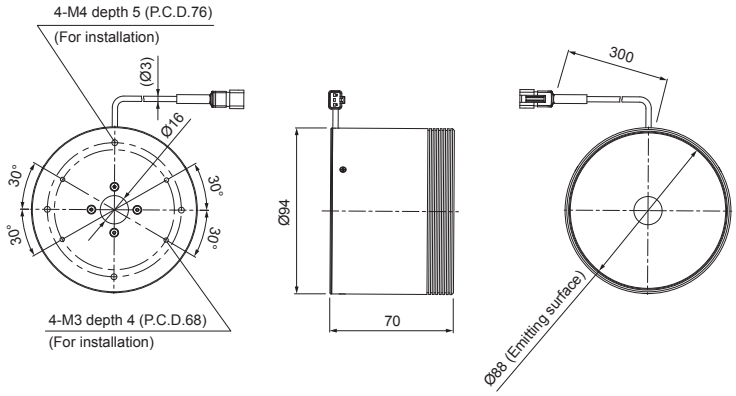
Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Dimensions (mm)

LDM2-50RD2/SW2/BL2/GR2



LDM2-90RD2/SW2/BL2/GR2



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Diffused Lighting
Dome Lights
LAV Series

Refer to our website for product details.
CCS LAV ▶ Search

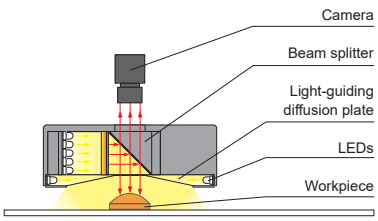
Provides diffused light evenly using a mechanism that combines a diffused lighting and a coaxial lighting

Applications Faulty plating inspection, inspection of a sealed target, inspection for foreign material attached to a glossy surface, character recognition and text inspection of glossy surfaces, dimension measuring of electronic parts, etc.

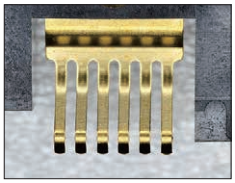
Features

Combines diffused lighting and a coaxial lighting. Used for uniformly illuminating glossy, curved workpieces.

Example configuration (LAV-80)



Imaging example: Imaging the appearance of connector pins



Workpiece: Connector pins

■LED Ring Light

It is difficult to illuminate the whole thing evenly to form an image of the exterior.

■LAV-80RD2

It is possible to illuminate the whole thing evenly to form an image of the exterior.

Lineup

Classification	Model Name*1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	GR (Green)	Options	Extension Cables	Recommended Control Units	Weight
Standard products	LAV-80□□2	24 V	3.6 W	5.0 W	5.0 W	5.0 W	–	FCB*3 Straight Cable / FCB-F 4-Branch Cable	PD4 / PD3	190 g
Custom order products	LAV-93□□2-CR25	24 V	6.7 W	6.9 W	6.9 W	*5		FCB-W*4 2-Branch Cable / FRCB Robot Cable	POD*2	*5

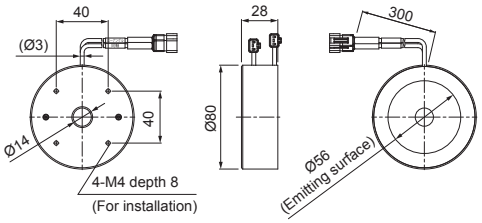
Use a 2-channel control unit.

LED Properties: Spectral Distribution ▶ P.396 | Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

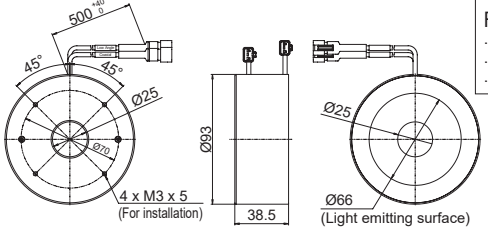
*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, GR: Green)
*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod
*3 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*4 The cables with a model name that ends with "-EL2" are not included.
*5 This product is custom-made. Contact our local sales office for details.

Dimensions (mm)

LAV-80RD2/SW2/BL2/GR2



LAV-93RD2/SW2/BL2/-CR25



It can be custom ordered. Feel free to contact us.
· Changing the shape
· Increased brightness
· Changing the wavelength, etc.

You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

The emitting surface for the LAV-80SW2/BL2/GR2 is Ø54.

Illumination part	Power consumption
Coaxial illumination part	Red: 1.0 W White/Blue/Green: 1.6 W
Diffused illumination part	Red: 2.6 W White/Blue/Green: 3.4 W

Illumination part	Power consumption
Coaxial illumination part	Red: 3.6 W White/Blue: 2.7 W
Diffused illumination part	Red: 3.1 W White/Blue: 4.2 W

If adjusting the intensity for each part separately, use a 2-channel control unit.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Provides diffused light evenly using a mechanism that combines a diffused lighting, coaxial lighting, and low-angle lighting

PDM-150-15RD2

PDM-150-15SW2

PDM-150-15BL2

PDM-150-15GR2

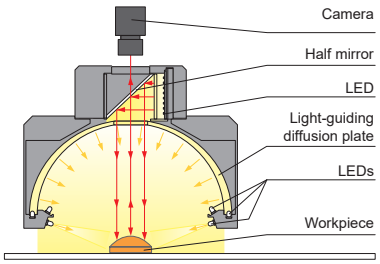
Applications Faulty plating inspection, inspection of a sealed target, inspection for foreign material attached to a glossy surface, character recognition and text inspection of glossy surfaces, dimension measuring of electronic parts, etc.

Features

This light unit combines the three types: dome lighting, low-angle lighting, and coaxial lighting. It illuminates the workpiece with uniform diffused light.

We accept custom orders. Please feel free to inquire.
- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

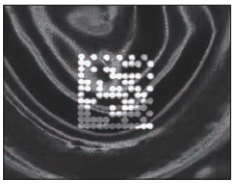
Example configuration (PDM-150-15)



Imaging example: Imaging 2-D codes

Workpiece: Contact lens packages

■LED Ring Light



It is difficult to determine the 2-D code due to the glossy and wavy surface.

■PDM-150-15RD2

It is possible to determine the 2-D code by evenly illuminating the surface.

Lineup

Model Name	LED Color	Power Consumption	Peak Wavelength / Correlated Color Temperature	Options	Extension Cables	Recommended Control Unit	Weight
PDM-150-15RD2	Red	24 V / 18 W	630 nm	–	FCB*1 Straight Cable / FCB-F 4-branch Cable / FCB-W*2 2-branch Cable / FRCB Robot Cable	PD4 / PD3	1,140 g
PDM-150-15SW2	White	24 V / 22 W	5,500 K				1,170 g
PDM-150-15BL2	Blue		470 nm				1,140 g
PDM-150-15GR2	Green		525 nm				

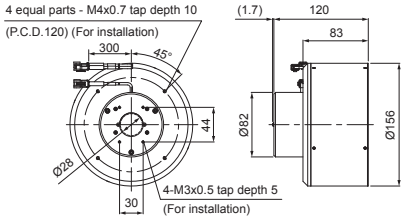
Use a 3-channel control unit.

LED Properties: Spectral Distribution ▶ P.396 | Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*2 The cables with a model name that ends with "-EL2" are not included.

Dimensions (mm)

PDM-150-15RD2/SW2/BL2/GR2



Illumination part	Power consumption
Coaxial illumination part	Red: 3.1 W, White: 2.2 W, Blue/Green: 2.7 W
Dome illumination part	Red: 10.2 W, White: 14 W, Blue/Green: 13 W
Low-angle illumination part	Red: 4.6 W, White/Blue/Green: 6.1 W

If adjusting the intensity for each part separately, use a 3-channel control unit.

You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Diffused Lighting

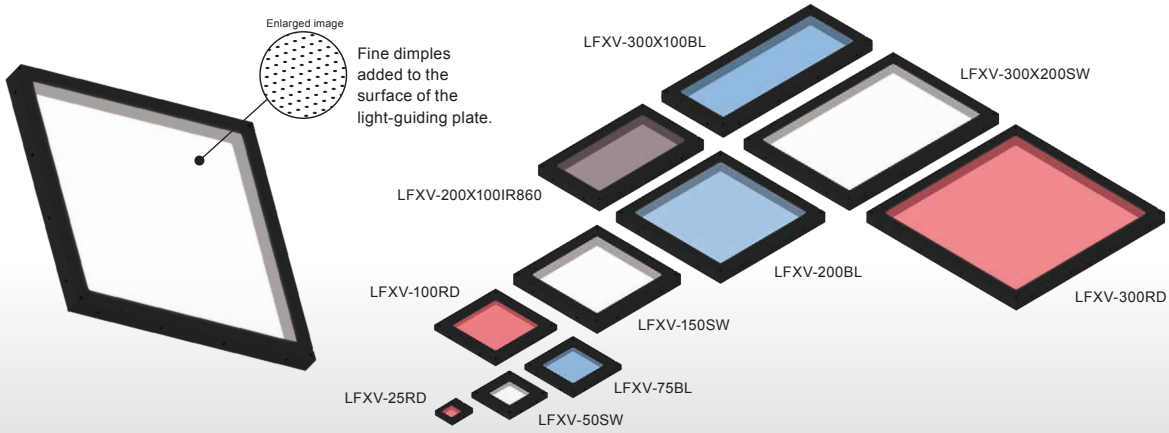
Flat Dome Lights

LFXV Series

Refer to our website for product details.

CCS LFXV ▶ Search

Recreates the effect of dome lights using thin case design

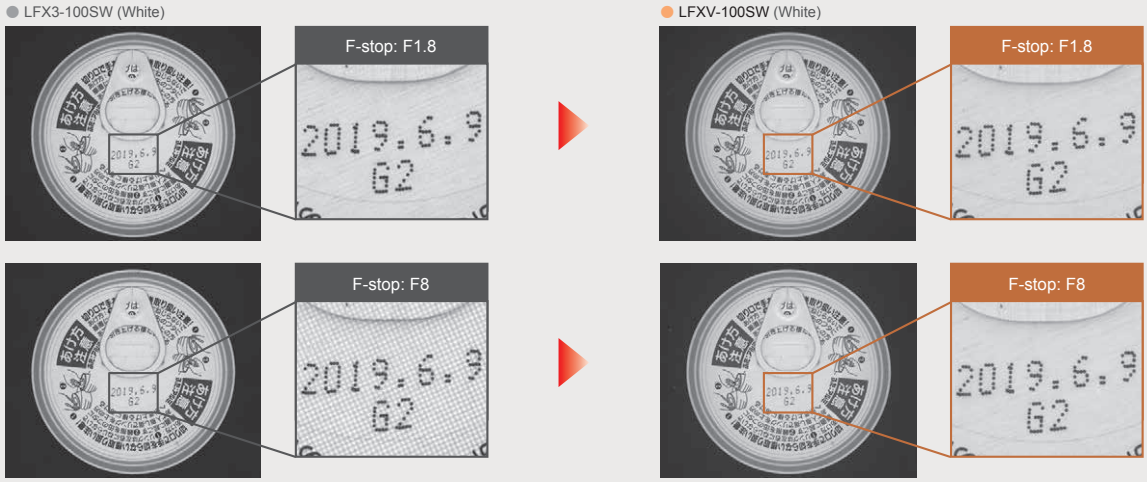


Applications Appearance or text inspection on metal surfaces, curved surfaces, or uneven surfaces; foreign material inspection of food and medicine; character recognition of packaging; inspection of text on can surfaces; etc.

Bright and Clear Field of View Using New Light-Guiding Plate

Reduces image irregularities and moire due to the surface dot pattern.

For details on “Image irregularities due to the surface dot pattern”, refer to P.120 “Using LFX3 -Obtaining appropriate images-”.



Note: Image irregularities and moire may occur, depending on the capture conditions and the type of the image processing.

Imaging environment: 5-megapixel camera (effective pixels: 2448x2048, 3.45x3.45 µm, 2/3 inch), 5M-compatible lens (focal length: 25 mm, F1.8-16), Distance between the camera and the workpiece: 290 mm, Distance between the light unit and the workpiece: 20 mm
The data included is for reference only. Actual values may vary.

Spots of light may appear due to foreign objects in the light-guiding plate, but this falls within our testing standards and is not a product defect.

Custom Order Example

E.g: Different shape

Format/ material — Created a light unit that has an enlarged emitting surface.

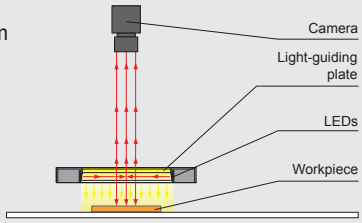
External/ internal diameter | Wavelength/ color | Increase output | Cable length | Illuminating angle | Format/ material | Connector format | Installation/ mounting | Etc.

Please contact your CCS sales representative.

Example Configuration

Fine dimples added to the surface of the light-guiding plate enable the uniform illumination of workpieces.

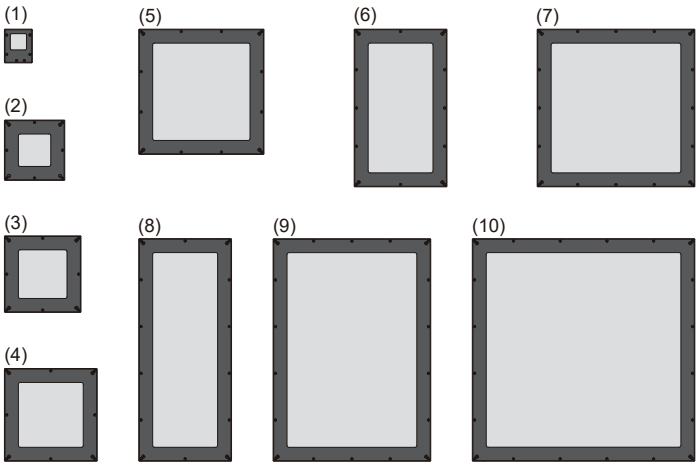
LFXV-100



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Total of 40 Models in 10 Different Sizes

Total of 40 models with a lineup of four different light colors in 10 different light emitting surface sizes.
Large sizes and rectangular sizes now available.



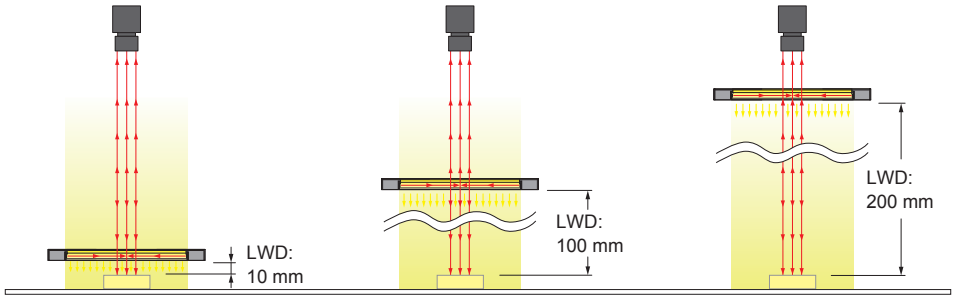
NO.	Series	Light emitting surface size (mm)	LED color
(1)	LFXV-25	25x25	Red/White/ Blue/Infrared
(2)	LFXV-50	50x50	
(3)	LFXV-75	75x75	
(4)	LFXV-100	100x100	
(5)	LFXV-150	150x150	
(6)	LFXV-200X100	200x100	
(7)	LFXV-200	200x200	
(8)	LFXV-300X100	300x100	
(9)	LFXV-300X200	300x200	
(10)	LFXV-300	300x300	

Suitable for a Wide Range of Applications

Recreates the effect of Dome Lights when used close to the workpiece.
Recreates the effect of Coaxial Lights when used further from the workpiece.

Imaging Comparison

Changing the distance between the light and the workpiece (LWD) highlights different parts of the workpiece.



Workpiece

Cans

At LWD of 10 mm, the whole surface of the workpiece is illuminated uniformly. The bumps are eliminated from the image.

At LWD of 100 mm, the bumps and pull tab are captured.

At LWD of 200 mm, the bumps and pull tab are emphasized.

Workpiece

Plastic containers

At LWD of 10 mm, the whole surface of the workpiece is illuminated uniformly. This allows the outer edge of the container and the printed text to be imaged.

At LWD of 100 mm, the printed text and shrink film are captured.

At LWD of 200 mm, the shrink film is emphasized.

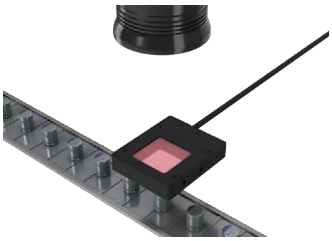
LWD is the distance between the lighting fixture and the workpiece. The data included is for reference only. Actual values may vary.

LFXV Series

Refer to our website for product details.

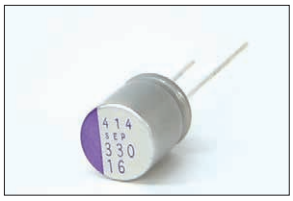
CCS LFXV ▶ Search

Imaging Example: Imaging the Appearance of Capacitors



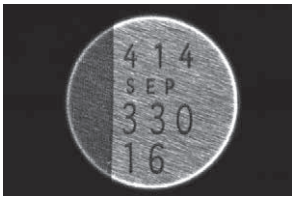
Description	Visual inspection
Workpiece	Capacitors
Conventional light	LED Diffusion Ring Light
New light	LFXV-25RD
Result	Improves the uniformity

Workpiece image



Capacitors

LED Diffusion Ring Light



Hairline finishing on the surface makes it difficult to read the printed text.

LFXV-25RD

The hairline finishing is no longer visible, making it possible to read the printed text.

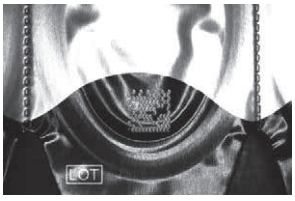
Imaging Example: Imaging the Appearance of Contact Lens Packages

Description	Visual inspection
Workpiece	Contact lens packages
Conventional light	LED Ring Light
New light	LFXV-50RD
Result	Improves the uniformity

Workpiece image

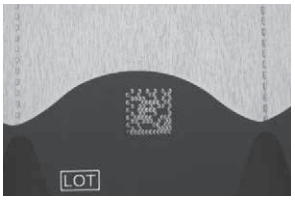
Contact lens packages

LED Ring Light



It is difficult to determine the 2-D code due to the glossy and wavy surface.

LFXV-50RD



It is possible to determine the 2-D code by evenly illuminating the surface.

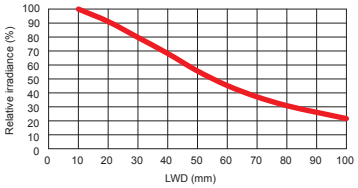
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

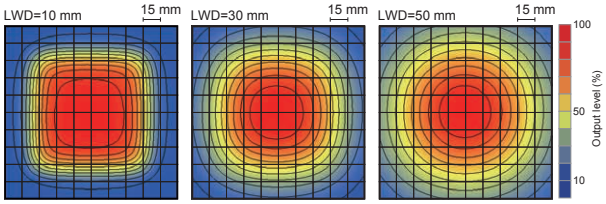
LFXV-100RD

Relative irradiance graph (LWD characteristics) *2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



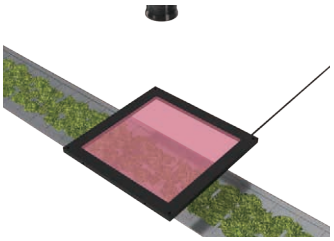
Uniformity (Relative irradiance)



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Imaging Example: Imaging of Foreign Materials in Tea Leaves



Description	Foreign materials inspection
Workpiece	Tea leaves
Conventional light	LED Dome Light
New light	LFXV-200IR860: Infrared Type
Result	Emphasizes foreign material

Workpiece image

Tea leaves

LED Dome Light

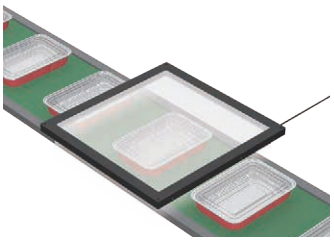
It is difficult to image foreign objects using white light.

LFXV-200IR860

Foreign objects can be imaged using infrared light.

The foreign object was intentionally added for image sampling purposes.

Imaging Example: Imaging the Appearance of Food Packages



Description	Visual inspection
Workpiece	Food package
Conventional light	LED Dome Light
New light	LFXV-300SW
Result	Improves the uniformity

Workpiece image

Food packages

LED Dome Light

Shadows from the lighting aperture obscure the center of the container, making imaging difficult.

LFXV-300SW (White)

Uniformly lights the container all the way to the bottom, enabling imaging of the container appearance.

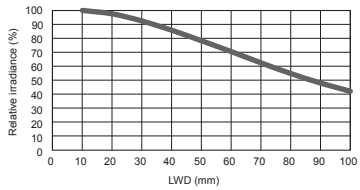
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

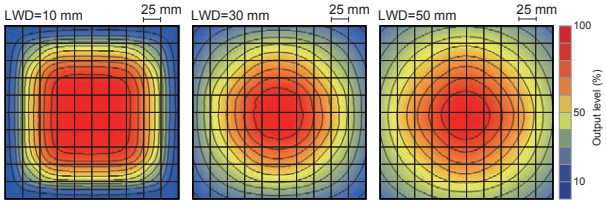
LFXV-200SW

Relative irradiance graph (LWD characteristics) *2 *1

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent / Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

LFXV Series

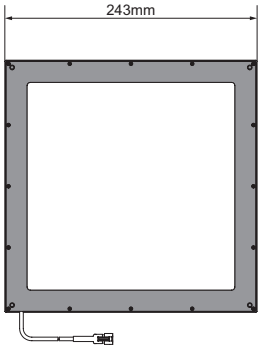
Refer to our website for product details.
CCS LFXV ▶ Search

Introduction to LFXV Series 2-sided Type (Custom Order Example)

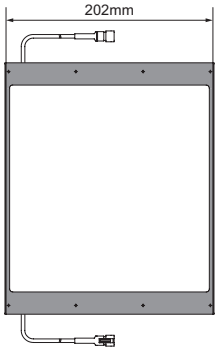
Saves space without lowering uniformity by installing LEDs on only two sides.

Helps save space

LFXV-200SW

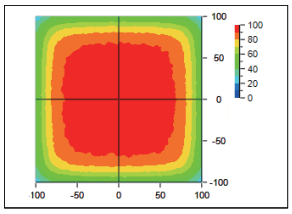


LFXV-200SW-SP (2-sided type)

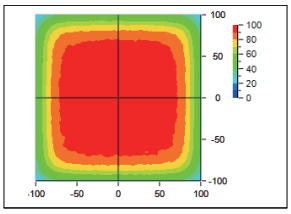


Comparison of the uniformity (relative irradiance) (simulation)

LFXV-200SW



LFXV-200SW-SP (2-sided type)



Note: Above is simulation data.
Actual uniformity depends on the customer's operating environment. Contact our local sales office for details.
The central irradiance of the 2-sided type is about 50% lower than the original model.

Custom order products The warranty period of the custom order product is different from that of the CCS standard products. Contact our local sales office for details.

Lineup

Model Name*1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	IR860 (Infrared)	Options	Extension Cables	Recommended Control Units	Weight
LFXV-25□□	24 V	1.2 W	1.3 W	1.2 W	1.2 W	–	FCB*3 Straight Cable	PD4, PD3, CC-ST-1024, POD*2	80 g
LFXV-50□□		9.1 W	9.9 W	9.3 W	5.7 W	Protective Plate	FCB-W*4 2-Branch Cable		190 g
LFXV-75□□		14 W	15 W	14 W	12 W		FCB-F 4-Branch Cable		290 g
LFXV-100□□		16 W	20 W	19 W	12 W		FRCB Robot Cable		400 g
LFXV-150□□		28 W	30 W	28 W	17 W				870 g
LFXV-200X100□□		23 W	30 W	28 W	17 W			PD4, PD3, POD*2	870 g
LFXV-200□□		31 W	40 W	38 W	23 W				1,300 g
LFXV-300X100□□		31 W	40 W	38 W	23 W	–			1,300 g
LFXV-300X200□□		38 W	50 W	47 W	29 W				1,600 g
LFXV-300□□		46 W	60 W	56 W	34 W				2,000 g

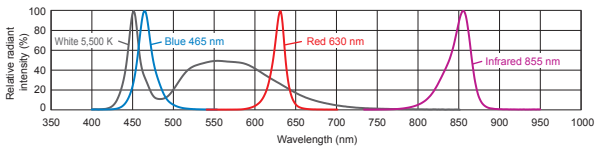
*3 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*4 The cables with a model name that ends with "-EL2" are not included.

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, IR860: Infrared)
*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

LED Properties

Spectral distribution



Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use. The data included is for reference only. Actual values may vary.

Options

Protective Plate

Protects the light-guiding dispersion plate. (It is not intended to prevent dust, water droplets, etc.)

Model Name	Applicable Light Unit
PR-LFXV-50	LFXV-50
PR-LFXV-75	LFXV-75
PR-LFXV-100	LFXV-100, LFXV-PF-100
PR-LFXV-150	LFXV-150
PR-LFXV-200X100	LFXV-200X100
PR-LFXV-200	LFXV-200

*Protective plates of sizes other than the above can be custom ordered. Contact our local sales office for details.

Precautions for Use

Imaging may be affected by dirt or dust on the light unit's surface.

Be careful when handling the emitting surface and do not let dirt, dust, or fingerprints get on the light unit.

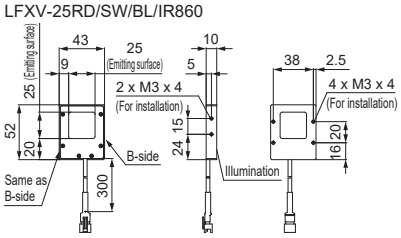
- Do not touch dirt or dust by hand. Remove by blowing air.
- If finger prints get on the light unit, wipe them off using a fine soft cloth.
- If the light unit is very dirty, use a diluted neutral cleaner and a fine soft cloth to lightly wipe it down.
- Do not use chemicals such as alcohol to wipe the emitting surface.

Transparent acrylic protective plates (PR Series) with AR (anti-reflective) coatings are available to protect the light emission surface from scratches and dirt. Contact our local sales office for details.

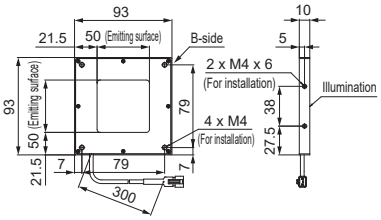
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Dimensions (mm)

LFXV-25RD/SW/BL/IR860

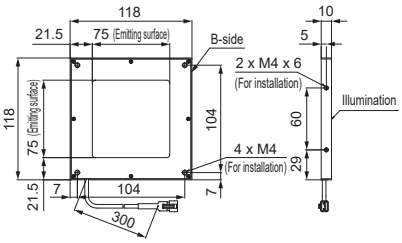


LFXV-50RD/SW/BL/IR860



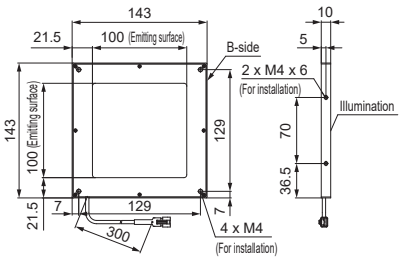
*All sides are the same as B-side.

LFXV-75RD/SW/BL/IR860



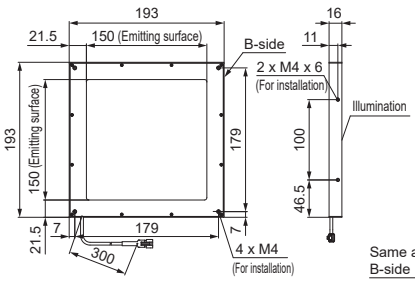
*All sides are the same as B-side.

LFXV-100RD/SW/BL/IR860



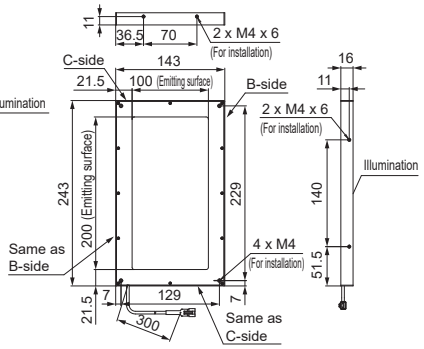
*All sides are the same as B-side.

LFXV-150RD/SW/BL/IR860

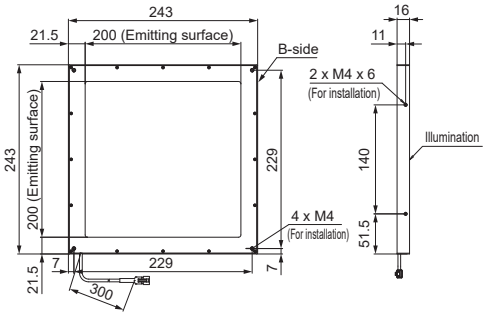


*All sides are the same as B-side.

LFXV-200X100RD/SW/BL/IR860

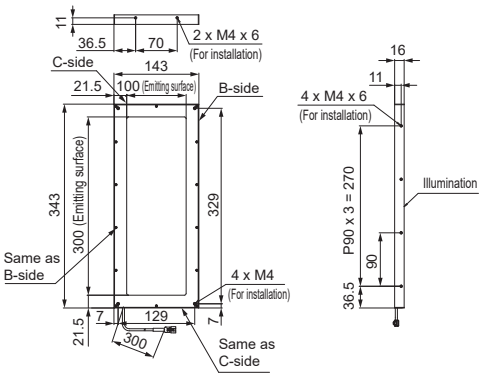


LFXV-200RD/SW/BL/IR860

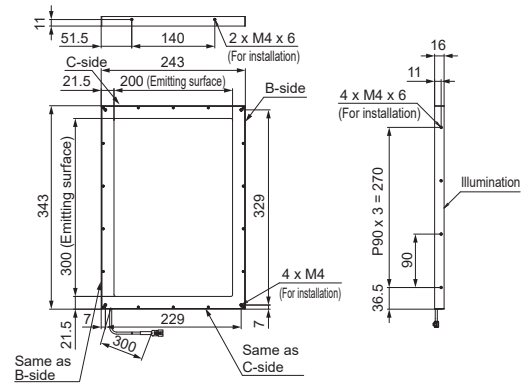


*All sides are the same as B-side.

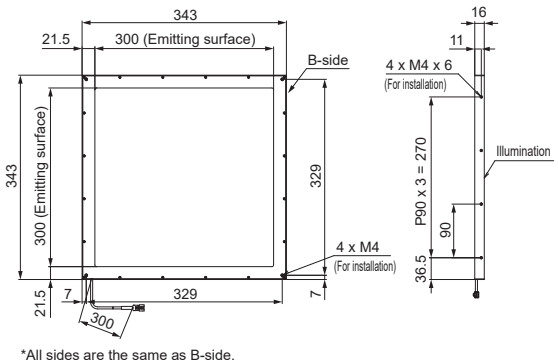
LFXV-300X100RD/SW/BL/IR860



LFXV-300X200RD/SW/BL/IR860

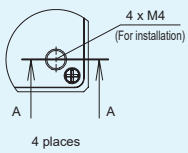


LFXV-300RD/SW/BL/IR860

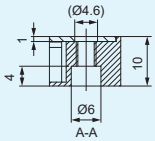


*All sides are the same as B-side.

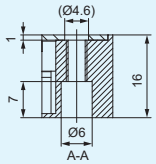
■ Diagrams for 4 x M4 Installation Holes



● LFXV-50/75/100



● LFXV-150/200X100/200/300X100/300X200/300*



* Use together with the M4 mounting holes on the sides if securing a heavy lighting fixture.

Diffused Lighting

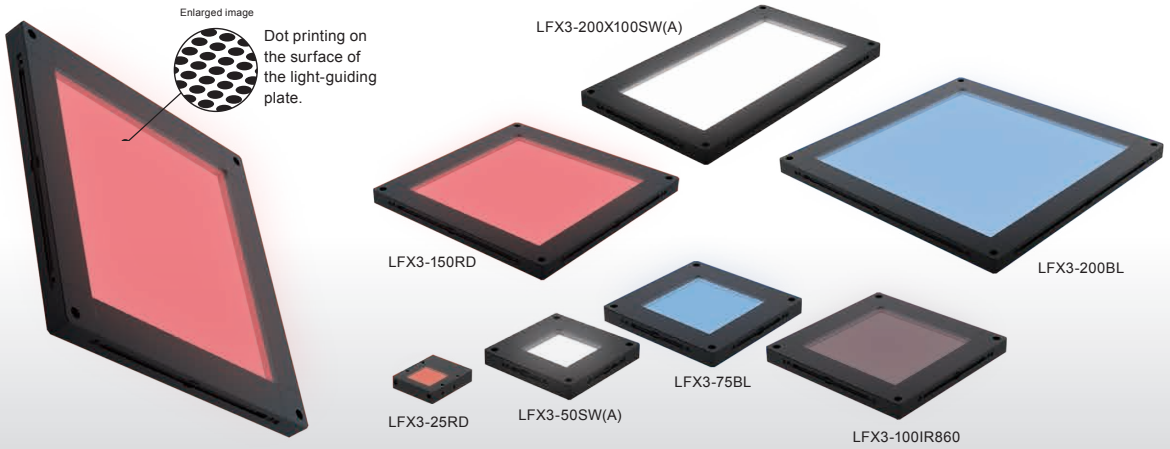
Flat Dome Lights

LFX3 Series

Refer to our website for product details.

CCS LFX3 ▶ Search

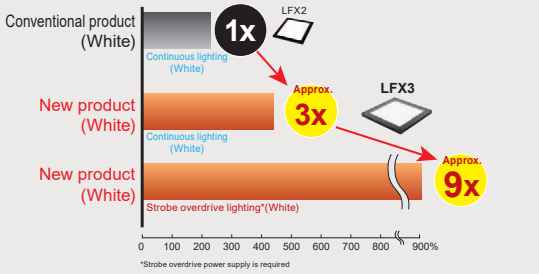
Recreates the effect of a Dome Light with a thin case design



Applications Appearance or text inspection on metal surfaces, curved surfaces, or uneven surfaces; foreign material inspection of food and medicine; character recognition of packaging; inspection of text on can surfaces; etc.

High Output to Match High-Speed Inspection

The LFX3 Series light units are high-power flat dome lights perfect for fast-moving production lines. The brightness of the white lights has been tripled.



Shutter speed: 1/24,000

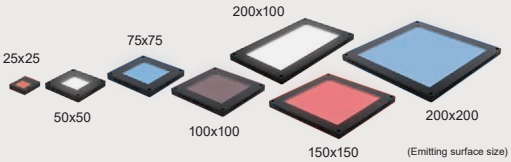
Measurement condition: Intensity setting: 100%

Brightness comparison between the LFX2-100SW and LFX3-100SW(A) light units.

The data included is for reference only. Actual values may vary.

Expanded Product Lineup: 28 Models in Total

The light unit is available in 7 sizes and 4 LED colors: red, white, blue, and infrared.



Series	Emitting surface size (mm)	LED color
LFX3-25 Series	25 x 25	Red/White/Blue/IR
LFX3-50 Series	50 x 50	
LFX3-75 Series	75 x 75	
LFX3-100 Series	100 x 100	
LFX3-150 Series	150 x 150	
LFX3-200X100 Series	200 x 100	
LFX3-200 Series	200 x 200	

Designed to prevent falling screws

No worries of screws* loosening and falling. Cover screws are not used on the light projection side of the light unit.

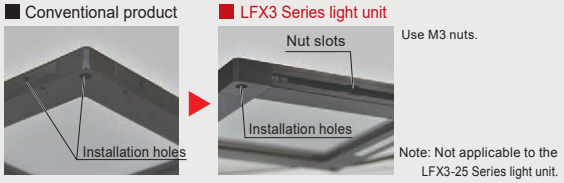
* The screws that are used to install the light unit are not considered.

Light projection side

Cover screws are not used on this surface.

Installation Using Nut Slots

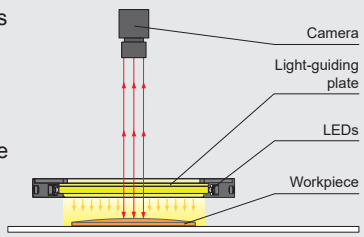
Nut Slots are provided on the sides of the light unit for a high degree of freedom in installation to match the environment.



Example Configuration

The dot pattern on the surface of the light-guiding plate controls the diffusion and transmission of light, making it possible to emit uniformly diffused light onto the workpiece.

LFX3-100



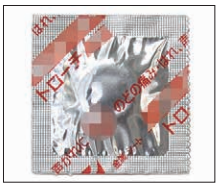
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

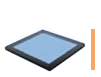
Light-Weight Compact Design, Space-Saving Installation, and Wide Field of View

Comparison of images of printed text

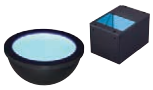
Workpiece: Medicine (Individual packaging)



Flat Dome Light LFX3-200BL

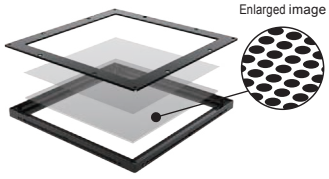


Dome Light HPD2-250BL + **Coaxial Light** LFV3-70BL



Comparison of structures

Flat Dome Light (LFX3-200)



Enlarged image

The dot pattern on the surface of the light-guiding plate controls the diffusion and transmission of light.

Conceptual image of the structure

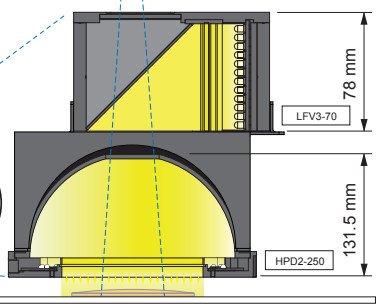
Weight **910g**

13.1 mm

Field of view **Wide**

Dome Light (HPD2-250) + Coaxial Light (LFV3-70)

Field of view **Narrow**



Total weight **1,800g** Including bracket

Recreating the effect of Dome Lights with a thin case design

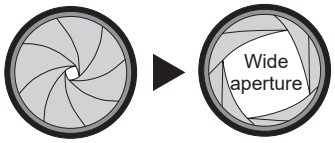
Achieving proper imaging

Uneven imaging may occur due to the dot pattern on the emitting surface

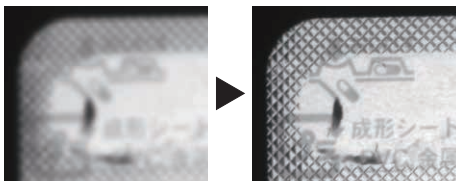
Workpiece: Pharmaceutical product (Blister pack)

Reducing image unevenness caused by the dot pattern

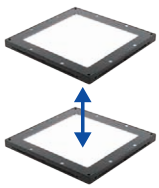
1. Widen the lens aperture slightly more than usual.

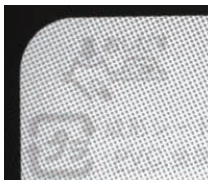


2. Focus the lens on the target workpiece.



3. If the dot pattern is visible, adjust the position of the light unit.





An example of the dot pattern in an image

4. Finely adjust the light intensity.

Complete!

If there is too much light, increase the camera's shutter speed.

Ambient light may reflect off the light unit surface or workpiece surface, affecting the imaging

To prevent effects from ambient light:

- Equip a lens filter to the lens.
- Prevent ambient light from entering with a hood or cover.
- Increase the shutter speed, or slightly increase the light intensity.

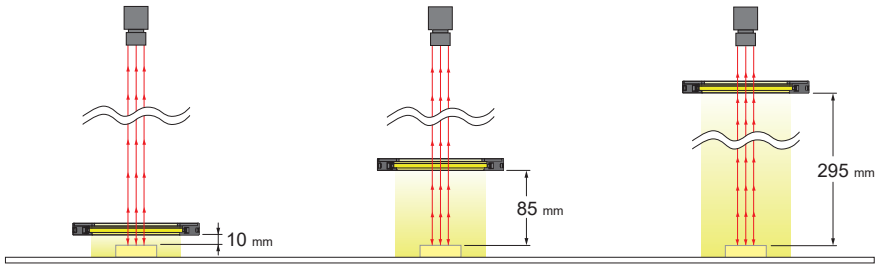
LFX3 Series

Refer to our website for product details.

CCS LFX3 ▶ Search

Supports a Wide Variety of Applications from Low Angles to High Angles

Imaging comparison: top of a can
Changing the distance between the light unit and the workpiece (LWD) allows for imaging to fit your purpose.



■ Workpiece image

Canned food

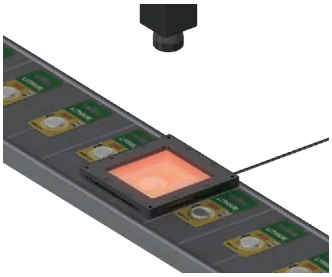
With illumination from LWD 10 mm, the whole surface of the workpiece can be illuminated evenly and the bumps are erased from the image.

With illumination from LWD 85 mm, the bumps of the pull tab alone can be emphasized in the image.

With illumination from LWD 295 mm, all of the bumps on the workpiece surface can be emphasized in the image.

Imaging environment: LFX3-100RD, f25 lens, WD 365 mm, field of view: 69 mm

Imaging Example: Imaging Characters on Button Cell Batteries



Description	Character recognition
Workpiece	Button cell batteries
Conventional lighting	LED Dome Light
New lighting	LFX3-100RD
Result	Emphasizes the characters

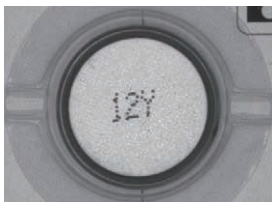
■ Workpiece image

Button cell batteries

■ LED Dome Light

The textured surface makes it impossible to read the printed characters.

■ LFX3-100RD

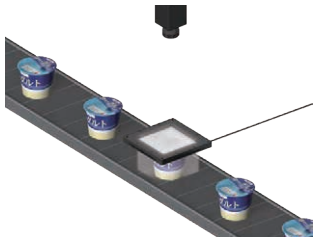


Effects from the textured surface are suppressed so that the characters stand out clearly.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Imaging Example: Imaging the Appearance of Containers



Description	Visual inspection
Workpiece	Food (Yogurt containers)
Conventional lighting	LED Ring Light
New lighting	LFX3-100SW(A)
Result	Improves the uniformity

Workpiece image

Food containers

LED Ring Light

It is difficult to image the surface evenly.

LFX3-100SW(A)

The printed patterns on the surface are clearly captured.

Imaging Example: Imaging the Appearance of Cans (Top Surface)

Workpiece image

Cans (Top surface)

LED Flat Dome Light (Blue)

It is difficult to capture the texture of the top surface.

LFX3-100IR860 (Infrared)

The printed ink transmits infrared light so that the texture of the top surface is evenly captured.

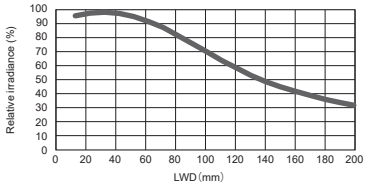
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

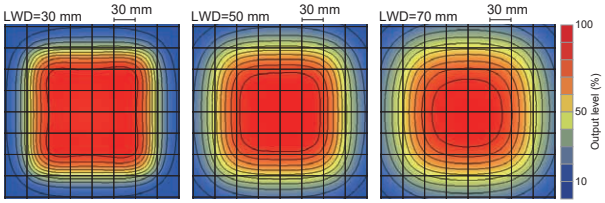
LFX3-200SW(A)

Relative irradiance graph (LWD characteristics) *1 *2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



LFX3 Series

Refer to our website for product details.

CCS LFX3 ▶ Search

Lineup

Model Name*1	Input Voltage	Power Consumption RD (Red)	SW*2 (White)	BL (Blue)	IR860 (Infrared)	Options	Extension Cables	Recommended Control Units	Weight
LFX3-25□□	24 V	1.6 W	1.5 W	0.8 W	1.4 W	–	FCB*6 Straight Cable FCB-W*7 2-Branch Cable FCB-F 4-Branch Cable FRCB Robot Cable	PD4 PD3 CC-ST-1024 POD*3	80 g
LFX3-50□□	24 V	13 W	12 W	6.1 W	6.6 W			PD4 PD3 CC-ST-1024*4 POD*3 *4 Can only use blue and infrared.	230 g
LFX3-75□□	24 V	13 W	18 W	9.1 W	14 W			PD4 PD3 CC-ST-1024*5 POD*3 *5 Can only use blue.	320 g
LFX3-100□□	24 V	19 W	23 W	13 W	14 W				400 g
LFX3-150□□	24 V	25 W	35 W	19 W	20 W			PD4 PD3 POD*3	620 g
LFX3-200X100□□	24 V	28 W	35 W	19 W	20 W				620 g
LFX3-200□□	24 V	37 W	46 W	25 W	27 W				910 g

*6 The cables with a model name that ends with "-ME7","-EL2", "-PF", or "-PF-EL9" are not included.
*7 The cables with a model name that ends with "-EL2" are not included.

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, IR860: Infrared)
*2 (A) is added only to the model name that ends with SW.
*3 For information on the combination of light units and POD Series control unit, please refer to our website.
https://www.ccs-grp.com/lnk/qr/pod

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

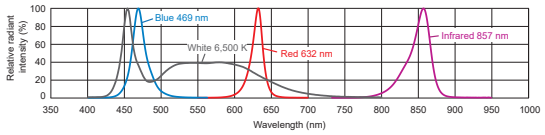
Change in model names

"(A)" is added to the end of select model names e.g. LFX3-25SW → LFX3-25SW(A)

Reason	Effect on functions and performance
LEDs have been changed due to the discontinuation of the LEDs used.	Lower correlated color temperature (more yellow) Conventional product: 6800 K New product: 6500 K

LED Properties

Spectral distribution



Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Precautions for Use

Imaging may be affected by dirt or dust on the light unit's surface

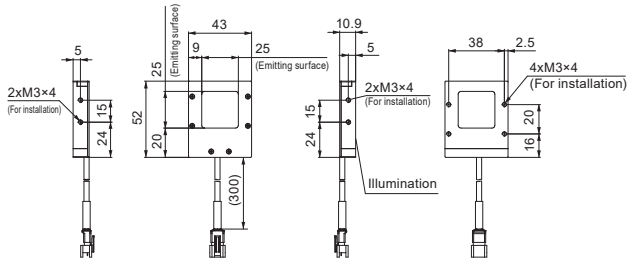
Be careful when handling the emitting surface and do not let dirt, dust, or fingerprints get on the light unit.

- Do not touch dirt or dust by hand. Remove by blowing air.
- If finger prints get on the light unit, wipe them off using a fine soft cloth.
- If the light unit is very dirty, use a diluted neutral cleaner and a fine soft cloth to lightly wipe it down.
- Do not use chemicals such as alcohol to wipe the emitting surface.

Transparent acrylic protective plates (PR Series) with AR (anti-reflective) coatings are available to protect the light emission surface from scratches and dirt. Contact our local sales office for details.

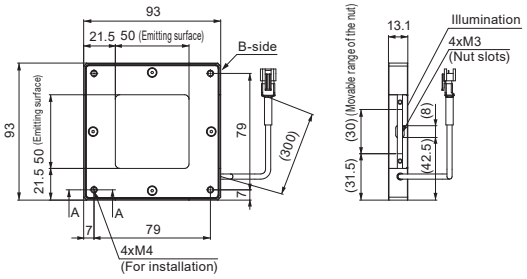
Dimensions (mm)

LFX3-25RD/SW(A)/BL/IR860



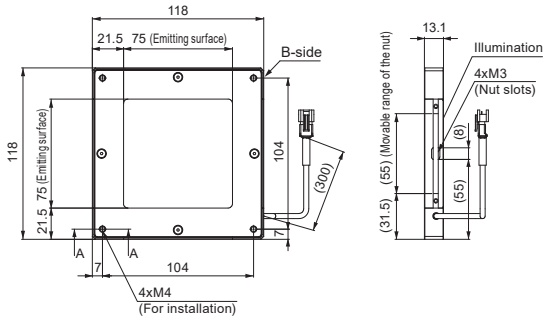
The holes for installation are on the light projection side surface of the light unit.
The LFX3-25 Series light units do not have nut slots.

LFX3-50RD/SW(A)/BL/IR860



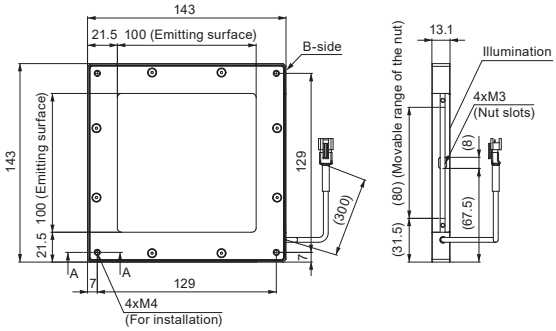
*All sides are the same as side B.

LFX3-75RD/SW(A)/BL/IR860



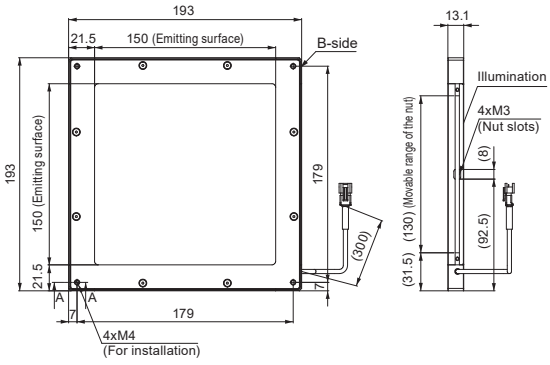
*All sides are the same as side B.

LFX3-100RD/SW(A)/BL/IR860



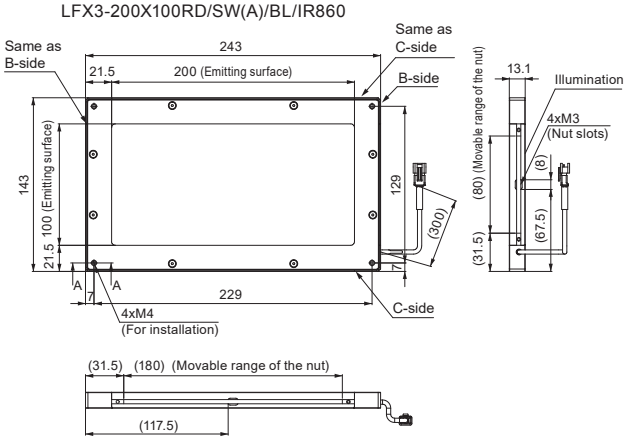
*All sides are the same as side B.

LFX3-150RD/SW(A)/BL/IR860

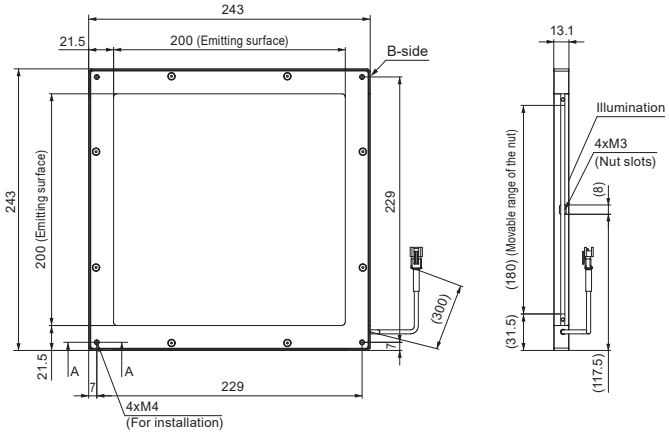


*All sides are the same as side B.

LFX3-200X100RD/SW(A)/BL/IR860

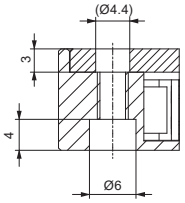


LFX3-200RD/SW(A)/BL/IR860

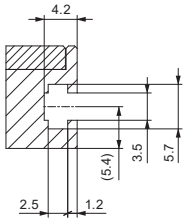


*All sides are the same as side B.

Detail Diagram for the A-A Surface



Detail Diagram for the M3 Nut Slot



Note: These detail diagrams are not applicable to the LFX3-25 Series light units.

You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Diffused Lighting

Line Pattern Lights

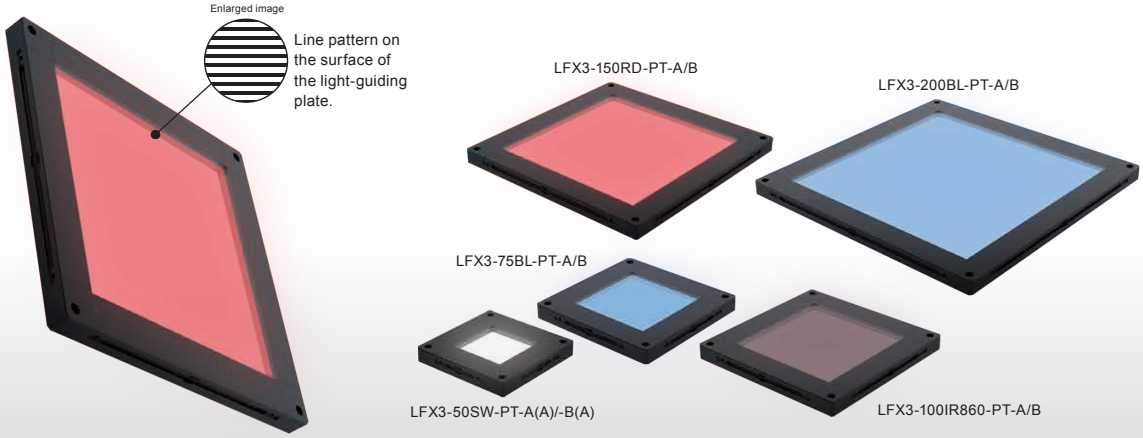
LFX3-PT Series

Refer to our website for product details.

CCS LFX3 Line Pattern ▶ Search

A cutting-edge method for inspecting bumps on a reflective surface

Special Order Products



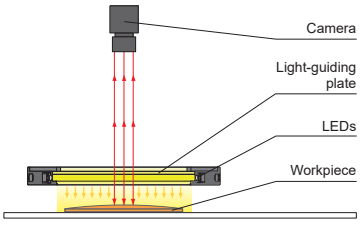
Applications Inspection for bumps on a reflective surface such as mirrors, metal sheets, films, glass parts, liquid crystal parts, etc.

Features

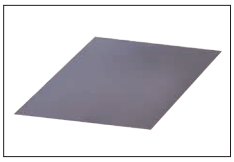
We altered the dot printings on the light-guiding plate surface to a line pattern. This makes it possible to detect gentle bumps on reflective surfaces which are hard to find with coaxial lights.

We accept custom orders. Please feel free to inquire.
- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

Example configuration (LFX3-100-PT)



Imaging example: Imaging the appearance of metal plates

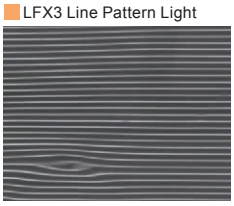


Workpiece: Metal plates

■LED Coaxial Light

Coaxial lights illuminate the whole surface evenly, making it difficult to detect the bumps.

■LFX3 Line Pattern Light

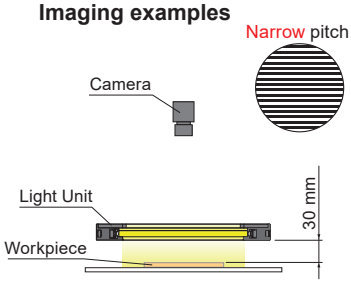


Line pattern lights highlight the bumps as curved lines.

Two Types of Line Patterns Available

Select one to match your inspection conditions.

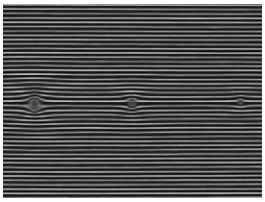
Imaging examples



The distance from the light unit to the workpiece is short.

1 mm type

LFX3-PT-A Series

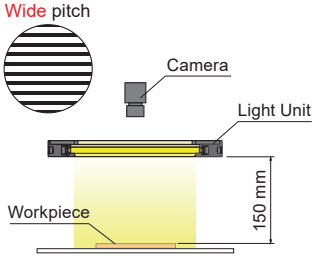


Distance: 30 mm

2 mm type

LFX3-PT-B Series

Distance: 150 mm



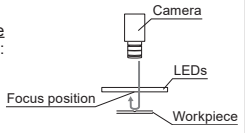
The distance from the light unit to the workpiece is long.

Achieving proper imaging

Install the LFX3-PT Series light unit so that it projects the line pattern onto the inspection object surface. When using this light unit, please adjust the focus to the line pattern reflected on the object surface. If the captured image has interference fringes, adjust the settings as follows:

- Open the camera aperture
- Increase the light working distance

Imaging conditions (distance between the camera and the inspection object, focus position, aperture, etc.) and light position differ depending on the inspection. The above explanation is only a guide for adjustment.



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

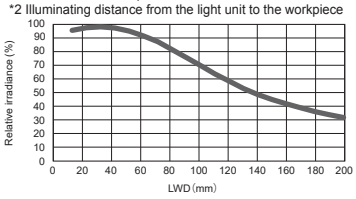
Register to use them.

Data: Relative Irradiance Graph (Representative Example)

LFX3-200SW-PT-A(A)

Relative irradiance graph (LWD Characteristics)*2

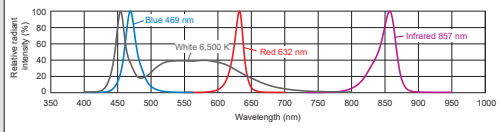
*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



The graph included is for reference only. Results for individual products may vary.

LED Properties

Spectral distribution



Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Lineup

	Model Name*1	Type	Input Voltage	Power Consumption RD (Red)	Power Consumption SW*2 (White)	Power Consumption BL (Blue)	Power Consumption IR860 (Infrared)	Extension Cables	Recommended Control Units	Weight
Special order	LFX3-50□□-PT-A/-B	1 mm type (Model ends with: -A) / 2 mm type (Model ends with: -B)	24 V	13 W	12 W	6.1 W	6.6 W	FCB*6 Straight Cable FCB-W*7 2-Branch Cable FCB-F 4-Branch Cable FRCB Robot Cable	PD4 PD3 CC-ST-1024*4 POD*3 *4 Can only use blue and infrared.	230 g
	LFX3-75□□-PT-A/-B		24 V	13 W	18 W	9.1 W	14 W		PD4 PD3 CC-ST-1024*5 POD*3 *5 Can only use blue.	320 g
	LFX3-100□□-PT-A/-B		24 V	19 W	23 W	13 W	14 W			400 g
	LFX3-150□□-PT-A/-B		24 V	25 W	35 W	19 W	20 W		PD4 PD3 POD*3	620 g
	LFX3-200□□-PT-A/-B		24 V	37 W	46 W	25 W	27 W			910 g

*6 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*7 The cables with a model name that ends with "-EL2" are not included.

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, IR860: Infrared)
*2 "(A)" is added to the end of SW model names only.
*3 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

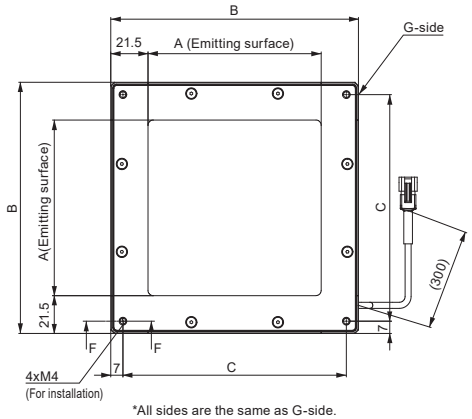
Change in model names

*"(A)" is added to the end of SW2 model names only e.g. LFX3-50SW-PT-A → LFX3-50SW-PT-A(A)

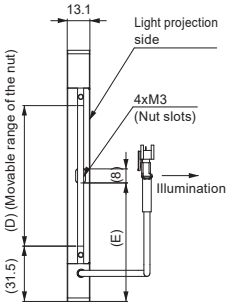
Reason	Effect on functions and performance
LEDs have been changed due to the discontinuation of the LEDs used.	Lower correlated color temperature (more yellow). Conventional product: 6800 K New product: 6500 K

Dimensions (mm)

LFX3-PT-A/-B Series (Common for all colors)



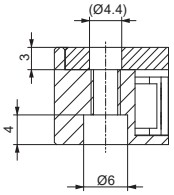
*All sides are the same as G-side.



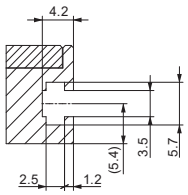
Dimensions by size (mm)

Emitting surface size	A	B	C	D	E
50x50	50	93	79	30	42.5
75x75	75	118	104	55	55
100x100	100	143	129	80	67.5
150x150	150	193	179	130	92.5
200x200	200	243	229	180	117.5

Detail Diagram for the F-F Surface



Detail Diagram for the M3 Nut Slot



- If the light unit is very dirty, use a diluted neutral cleaner and a fine soft cloth to lightly wipe it down.
- Do not use chemicals such as alcohol to wipe the emitting surface.

Imaging may be affected by dirt or dust on the light unit's surface. Be careful when handling the emitting surface and do not let dirt, dust, or fingerprints get on the light unit.
- Do not touch dirt or dust by hand. Remove by blowing air.
- If finger prints get on the light unit, wipe them off using a fine soft cloth.

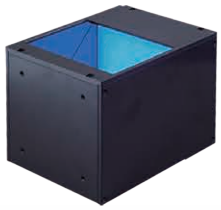
You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

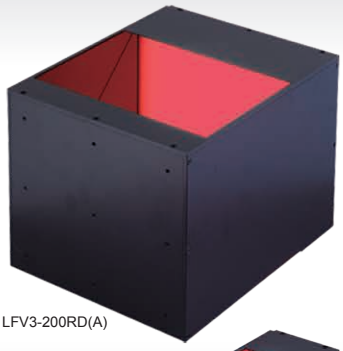
Diffused Lighting
Coaxial Lights
LFV3 Series

Refer to our website for product details.
CCS LFV3 ▶ Search

Provides diffused light evenly from the same axis as the camera


LFV3-100SW(A)


LFV3-130BL(A)


LFV3-200RD(A)


LFV3-CP-13RD

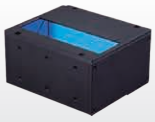
LFV3-CP-18SW


LFV3-34BL(A)

LFV3-40SW(A)


LFV3-35RD(A)


LFV3-50SW(A)


LFV3-50X100BL(A)


LFV3-70RD(A)

For information on change in model names, refer to P.129.

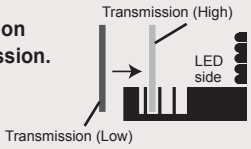
Applications Inspection for fault, damage, scratches, or dents on glossy surfaces or mirrors; pattern inspection on printed circuit boards; dimension measuring of glass; inspection for damage and dents on resin molded products; etc.

Freely Customize the Diffusion

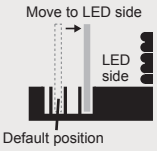
Customize the diffusion

Diffusion plate status	Result
Change the transmission from (high) to (low)	Increased uniformity
Change the installation position to the LED side	Emphasized directionality

1) Prepared two types of diffusion plates with different transmission.
Replace the diffusion plate to change the transmission.



2) The installation position of the diffusion plate can be adjusted.
Change the position to achieve various imaging effects.



LFV3-CP Series

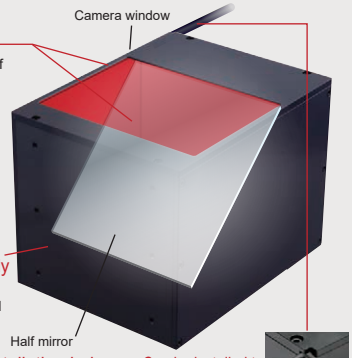
Replacing the half-mirror with a beam splitter increased accuracy. Suitable for imaging small workpieces and environments with limited installation space.


LFV3-CP-13SW

Supports High-Resolution Cameras

Highly-accurate optical glass is used for the camera window and the half-mirror. This allows for stable imaging when using high-resolution cameras.

LFV3 Series, a Coaxial Light with improved quality



Uses optical glass
The camera window and half mirror are made of optical glass.

Expanded area for the camera window
By making the camera window wider, we ensured a larger field of vision.

Used an aluminum body
Used aluminum alloy to improve heat dissipation and achieve a durable body.

Increased light unit installation holes
We increased the number of installation holes for the light unit.
Various installation directions are supported.

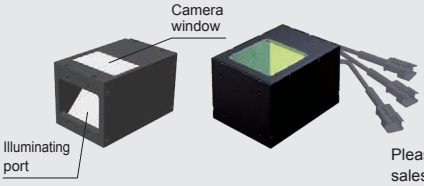
Can be installed to the cable surface
The cable can be bent flat in relation to the installation surface.

This description excludes the LFV3-CP-13 Series and the LFV3-CP-18 Series.

Custom Order Example

E.g.: Different shape

Format/ material — Created a light unit that changed the illuminating port from vertical to horizontal



E.g.: Different color

Wavelength/ color — Creating a full color (RGB) light unit

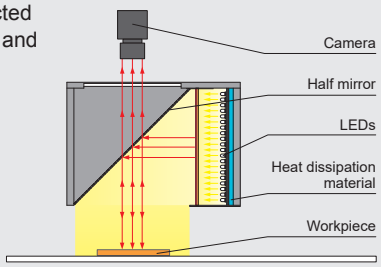
External/ internal diameter | Wavelength/ color | Increase output | Cable length | Illuminating angle | Format/ material | Connector format | Installation/ mounting | Etc.

Please contact your CCS sales representative.

Example Configuration

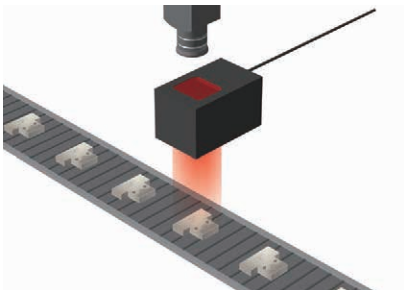
Diffused light from the LEDs is reflected on the half mirror and directed vertically downward on the same axis as the camera axis.

LFV3-100



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs
Register to use them.

Imaging Example: Imaging Engraved Text on Metal Connector Hoods



Description	Character recognition
Workpiece	Connector hoods
Conventional lighting	LED bar light
New lighting	LFV3-50RD(A)
Result	Emphasizes the engraved text

Workpiece image

Metal connector hoods

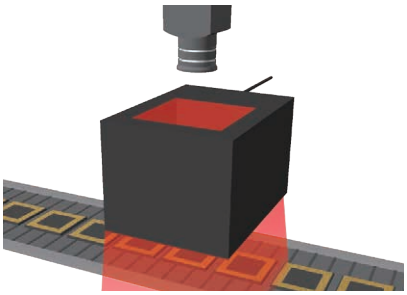
LED Bar Light

It is difficult to read the text engraved on the surface.

LFV3-50RD(A)

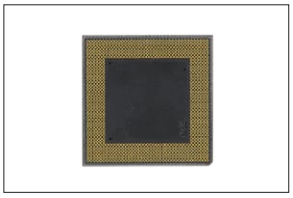
Effect from the surface unevenness is reduced and a clear image of the engraved text can be made.

Imaging Example: Imaging Through-Holes on Circuit Boards



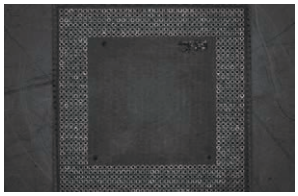
Description	Visual inspection
Workpiece	Circuit boards
Conventional lighting	LED ring light
New lighting	LFV3-100RD(A)
Result	Improved uniformity

Workpiece image



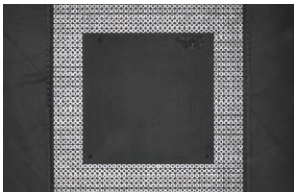
Circuit boards

LED Ring Light



With a ring light, it is difficult to form an image of the difference between the foundation and the through hole.

LFV3-100RD(A)



It is possible to form a clear image of the difference between the foundation and the through hole.

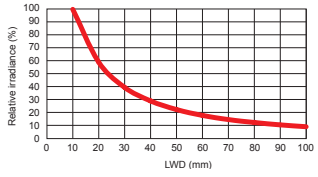
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

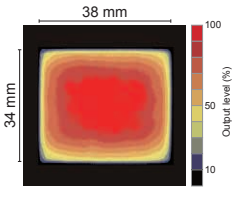
LFV3-35RD(A)

Relative irradiance graph (LWD characteristics) *1 *2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



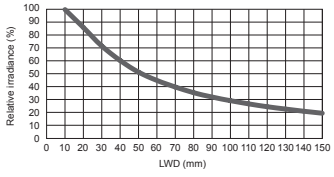
Uniformity (Relative radiance)



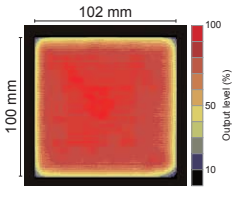
LFV3-100SW(A)

Relative irradiance graph (LWD characteristics) *1 *2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative radiance)



You can inquire using our website.

Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products

Inquire on our website here.
https://www.ccs-grp.com/contact/

LFV3 Series

Refer to our website for product details.

CCS LFV3 ▶ Search

Introduction to Illumination Port Position Change Type (Custom Order Example)

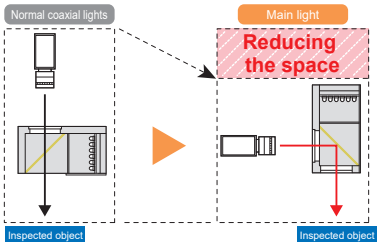
LFV3-RA Series

LFV3-35SW-RA24

The position of the illumination port of normal coaxial light can be changed by 90°. Suitable for the transportation system of the inspected objects and for environments where there are restrictions in the installation conditions of the camera.

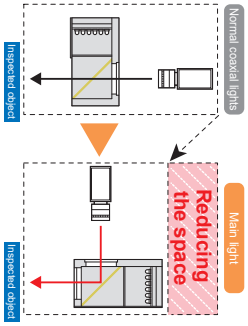
* The captured image is inverted.

1. Reducing the installation space in the vertical direction



Compared to normal coaxial lights, this light helps reduce the installation space in the vertical direction.

2. Reducing the installation space in the horizontal direction



Compared to normal coaxial lights, this light helps reduce the installation space in the horizontal direction.

Custom order products The warranty period of the custom order product is different from that of the CCS standard products. Contact our local sales office for details.

Lineup

Classification	Model Name*1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	Options	Extension Cables	Recommended Control Units	Weight
Standard products	LFV3-34□□ (A)	24 V	3.7 W	3.2 W	3.2 W	–	FCB*4 Straight Cable; FCB-W*5 2-Branch Cable; FCB-F 4-Branch Cable; FRCB Robot Cable	PD4, PD3, CC-ST-1024, POD*2	80 g
	LFV3-35□□ (A)	24 V	3.1 W	3.7 W	3.1 W	Diffusion Plate, Polarizing Plate, Protective Plate, LC film, Bracket			175 g
	LFV3-40□□ (A)	24 V	4.6 W	4.6 W	4.6 W	–			100 g
	LFV3-50□□ (A)	24 V	8.1 W	11 W	9.1 W	Diffusion Plate, Polarizing Plate, Protective Plate, LC film, Bracket		PD4, PD3, CC-ST-1024*3, POD*2 *3 Can only use red and blue.	335 g
	LFV3-50X100□□ (A)	24 V	17 W	20 W	17 W	Diffusion Plate, Polarizing Plate, Protective Plate, LC film			530 g
	LFV3-70□□ (A)	24 V	13 W	19 W	16 W	Diffusion Plate, Polarizing Plate, Protective Plate, LC film, Bracket		PD4, PD3, POD*2	620 g
	LFV3-100□□ (A)	24 V	22 W	27 W	27 W				1,060 g
	LFV3-130□□ (A)	24 V	31 W	46 W	38 W	Diffusion Plate, Polarizing Plate, Protective Plate, LC film			1,750 g
	LFV3-200□□ (A)	24 V	43 W	60 W	53 W				4,350 g
	LFV3-CP-13□□	24 V	2.1 W	2.3 W	1.3 W	–		PD4, PD3, CC-ST-1024, POD*2	37 g
	LFV3-CP-18□□	24 V	3.3 W	4.1 W	3.4 W				70 g
Custom order products	LFV3-35□□-RA (A)	24 V	3.1 W	3.7 W	3.1 W	Contact us for details.		PD4, PD3, CC-ST-1024, POD*2	*6
	LFV3-50□□-RA (A)	24 V	8.1 W	11 W	9.1 W			PD4, PD3, CC-ST-1024*3, POD*2 *3 Can only use red and blue.	
	LFV3-50X100□□-RA (A)	24 V	17 W	20 W	17 W				
	LFV3-70□□-RA (A)	24 V	13 W	19 W	16 W			PD4, PD3, POD*2	
	LFV3-100□□-RA (A)	24 V	22 W	27 W	27 W				
	LFV3-130□□-RA (A)	24 V	*6	46 W	*6				

*4 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*5 The cables with a model name that ends with "-EL2" are not included.

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue)
*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod
*6 This product is custom-made. Contact our local sales office for details.

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

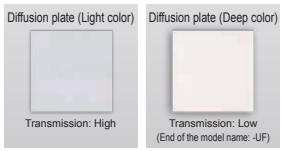
Change in model names

The suffix "(A)" has been added to the end of several model names, e.g. "LFV3-34RD" has been changed to "LFV3-34RD(A)".

Reason	Effect on functions and performance	Relevant models (applicable to all colors)
Due to part manufacturer's circumstances, some optical parts were expected to become difficult to obtain. CCS has changed these parts with those of comparable performance.	The functions and performance of the light units have not been affected.	LFV3-34(A) / LFV3-35(A) / LFV3-40(A) / LFV3-50(A) / LFV3-50X100(A) / LFV3-70(A) / LFV3-100(A) / LFV3-130(A) / LFV3-200(A)

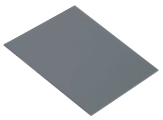
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Options

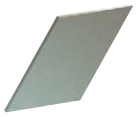


Replace the default diffusion plate to change the transmission.

When selecting, be aware that the default diffusion plate varies based on the emitted color.



Use with a polarizing filter to remove the light's surface reflection.



In this plastic film are fine louvers with extremely narrow gaps between them.
It reduces light diffusion in a particular direction and increases parallelism.

Diffusion plate

Model Name	Applicable Light Unit (Common for all colors)
DF-LFV3-35	LFV3-35(A)
DF-LFV3-50	LFV3-50(A)
DF-LFV3-50X100	LFV3-50X100(A)
DF-LFV3-70	LFV3-70(A)
DF-LFV3-100	LFV3-100(A)
DF-LFV3-130	LFV3-130(A)
DF-LFV3-200	LFV3-200(A)

Model Name	Applicable Light Unit (Common for all colors)
DF-LFV3-35-UF	LFV3-35(A)
DF-LFV3-50-UF	LFV3-50(A)
DF-LFV3-50X100-UF	LFV3-50X100(A)
DF-LFV3-70-UF	LFV3-70(A)
DF-LFV3-100-UF	LFV3-100(A)
DF-LFV3-130-UF	LFV3-130(A)
DF-LFV3-200-UF	LFV3-200(A)

▶ P.364

Polarizing plate

Model Name	Applicable Light Unit (Common for all colors)
PL-LFV3-35	LFV3-35(A)
PL-LFV3-50	LFV3-50(A)
PL-LFV3-50X100	LFV3-50X100(A)
PL-LFV3-70	LFV3-70(A)
PL-LFV3-100	LFV3-100(A)
PL-LFV3-130	LFV3-130(A)
PL-LFV3-200	LFV3-200(A)

▶ P.366

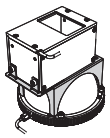
Light Control (LC) Film

Model Name	Applicable Light Unit (Common for all colors)
LC-LFV3-35	LFV3-35(A)
LC-LFV3-50	LFV3-50(A)
LC-LFV3-50X100	LFV3-50X100(A)
LC-LFV3-70	LFV3-70(A)
LC-LFV3-100	LFV3-100(A)
LC-LFV3-130	LFV3-130(A)
LC-LFV3-200	LFV3-200(A)

▶ P.367

Coaxial Light joint bracket

Model Name	Applicable Light Unit 1 (Common for all colors)	Applicable Light Unit 2 (Common for all colors)
BK-HPD2-75-LFV	LFV3-35	HPD2-75
BK-HPD2-100-LFV	LFV3-50	HPD2-100
BK-HPD2-150-LFV		HPD2-150
BK-HPD2-200-LFV	LFV3-70	HPD2-200
BK-HPD2-250-LFV		HPD2-250



Combine with a Dome Light to solve uneven illumination and achieve uniform illumination from all directions.

▶ P.370

Transparent acrylic protective plates (PR Series) with AR (anti-reflective) coatings are available to protect the light emission surface from scratches and dirt. Contact our local sales office for details.

Regarding Changing the Diffusion Plate and Adjusting the Position

Models that support replacing the diffusion plate

Model (Common for all colors)
LFV3-35 / 50 / 50X100 / 70 / 100 / 130 / 200

LFV3-34 / 40 / CP-13 / CP-18 does not support this feature.

Models that support adjusting the position of the diffusion plate

Model (Common for all colors)
LFV3-50 / 50X100 / 70 / 100 / 130 / 200

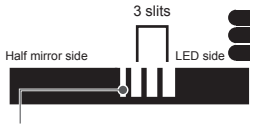
LFV3-34 / 35 / 40 / CP-13 / CP-18 does not support this feature.

Regarding the default diffusion plate

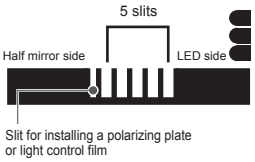
LFV3-35 / 50 / 50X100 / 70 / 100 / 130 / 200	
Red light, white light	Blue light
Diffusion plate (Light color) is default	Diffusion plate (Deep color) is default
Transmission: High	Transmission: Low (End of the model name: -UF)

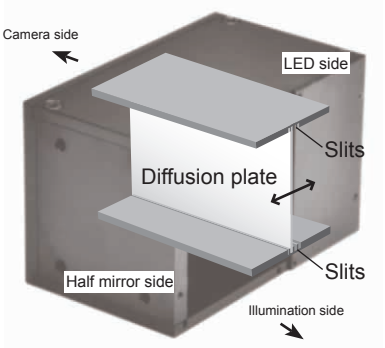
Position adjustment slit

For LFV3-50 / 50X100 / 70



For LFV3-100 / 130 / 200





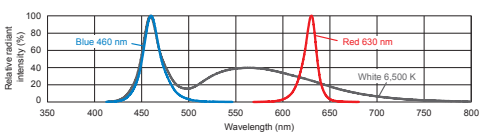
Conceptual image

For details about replacing the diffusion plate or adjusting the position, refer to the User Manual included with the product.

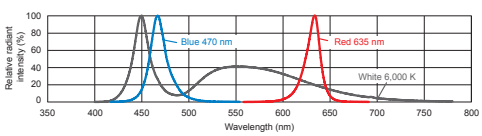
LED Properties

Spectral distribution

Supported models: LFV3-35 / 50 / 50X100 / 70 / 100 / 130 / 200



Supported models: LFV3-34 / 40 / CP-13 / CP-18



Lens filters suitable for each wavelength are available. For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

For details on the effective field of view when using coaxial lights, see “Effective Field of View of Coaxial Lights” on P. 393.

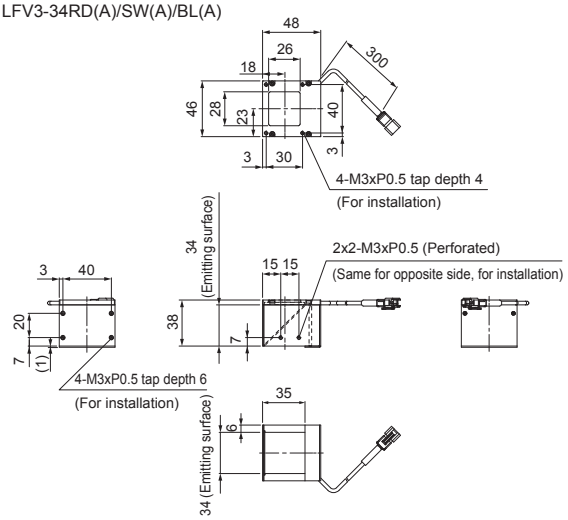
LFV3 Series

Refer to our website for product details.

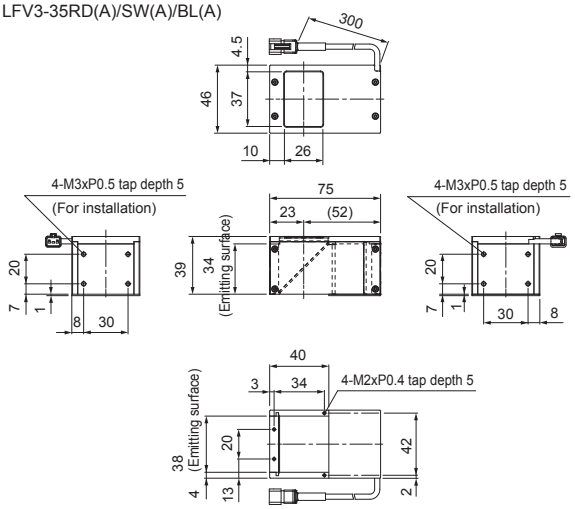
CCS LFV3 ▶ Search

Dimensions (mm)

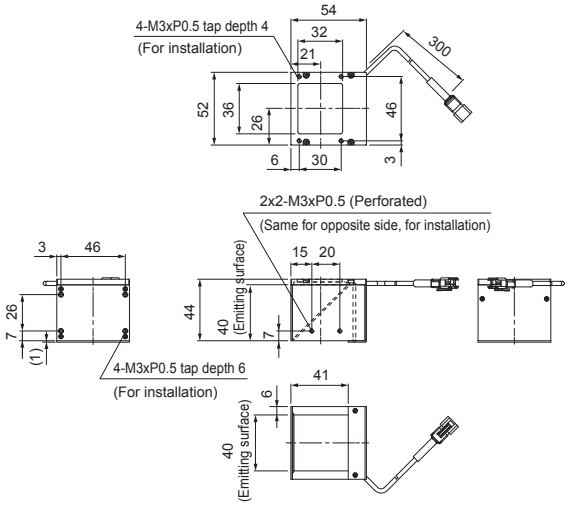
LFV3-34RD(A)/SW(A)/BL(A)



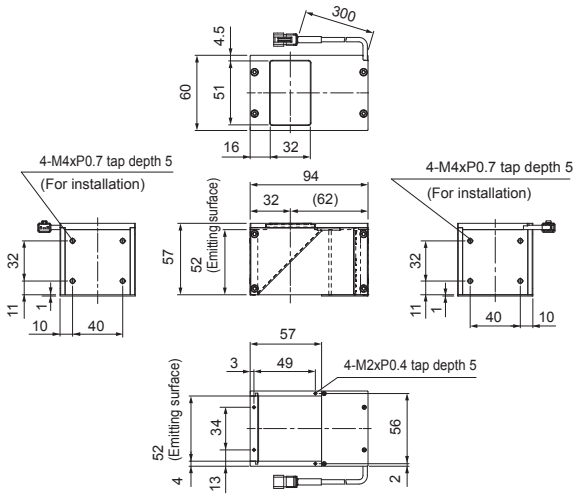
LFV3-35RD(A)/SW(A)/BL(A)



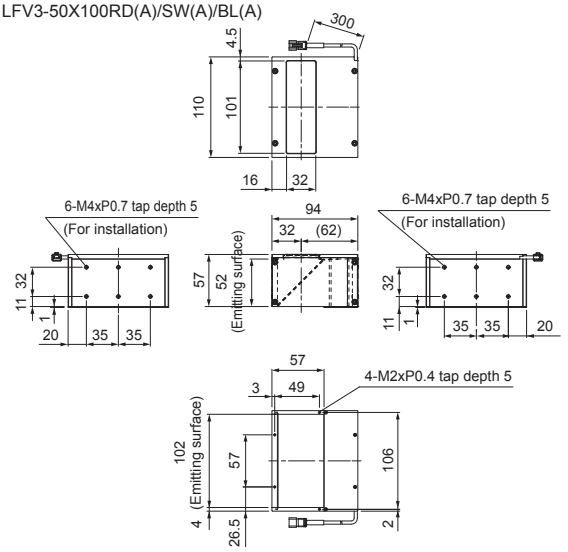
LFV3-40RD(A)/SW(A)/BL(A)



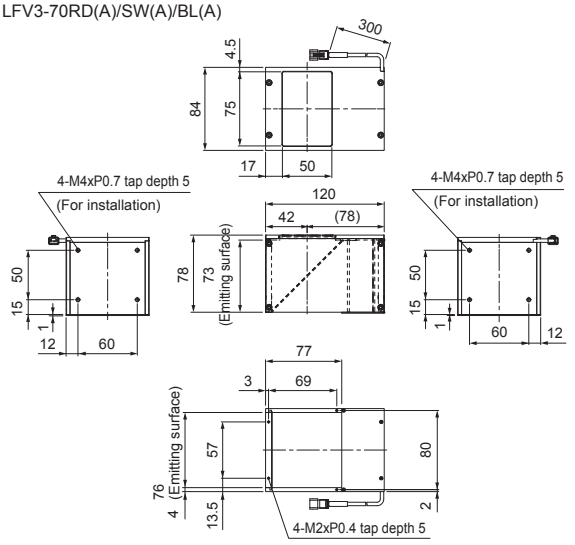
LFV3-50RD(A)/SW(A)/BL(A)



LFV3-50X100RD(A)/SW(A)/BL(A)



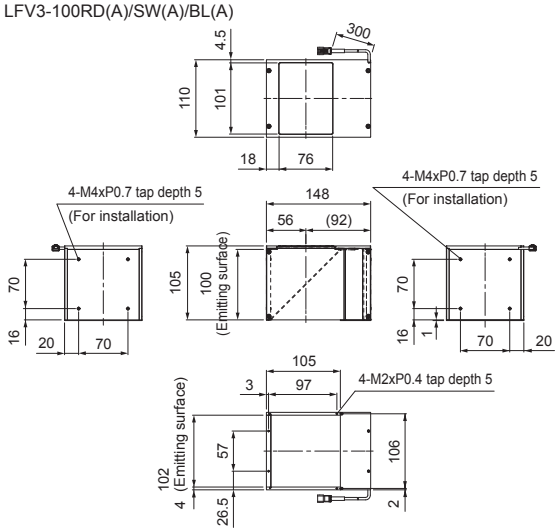
LFV3-70RD(A)/SW(A)/BL(A)



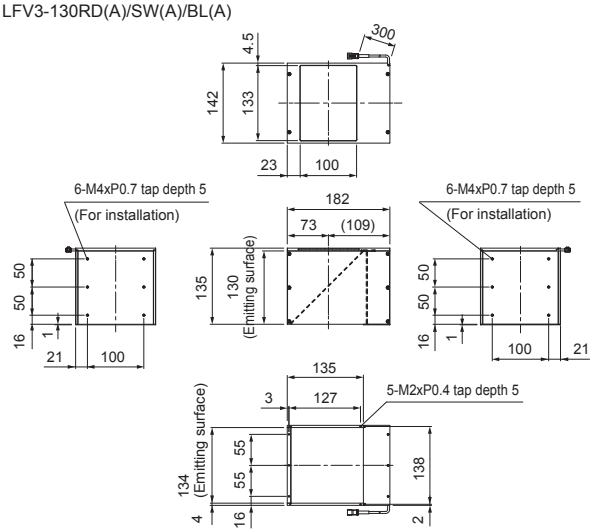
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

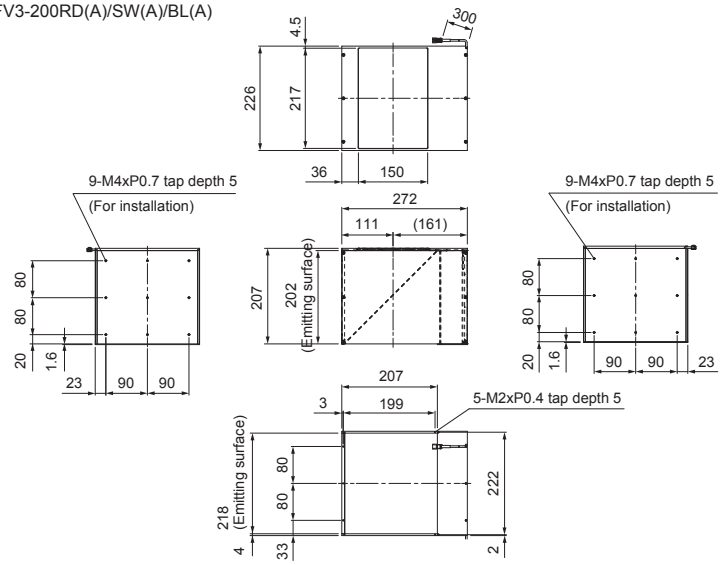
LFV3-100RD(A)/SW(A)/BL(A)



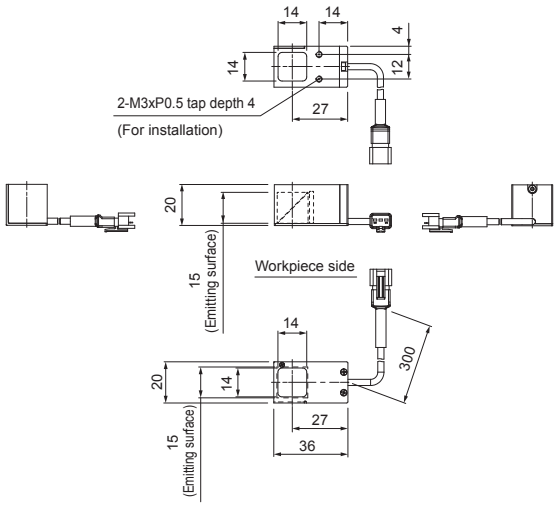
LFV3-130RD(A)/SW(A)/BL(A)



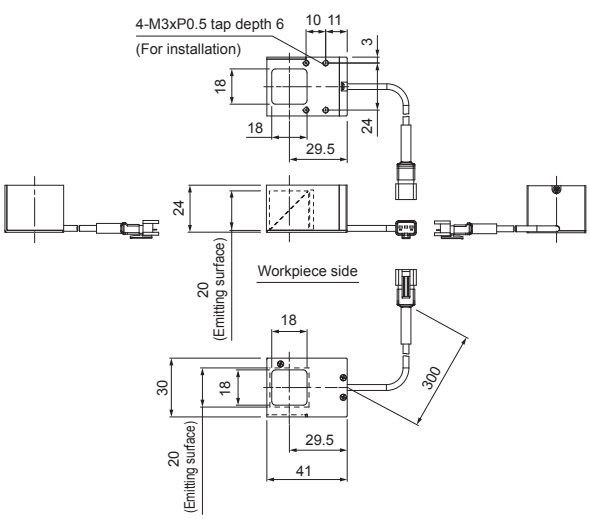
LFV3-200RD(A)/SW(A)/BL(A)



LFV3-CP-13RD/SW/BL



LFV3-CP-18RD/SW/BL



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Diffused Lighting

Coaxial Lights

LFV3-G Series

Refer to our website for product details.

CCS LFV3-G ▶ Search

Equipped with a slim half mirror to support imaging using high-resolution cameras

LFV3-G-50X100SW

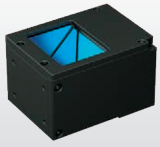
LFV3-G-70BL

LFV3-G-100RD

LFV3-G-100X200SW

LFV3-G-27RD

LFV3-G-30X60SW



LFV3-G-35BL

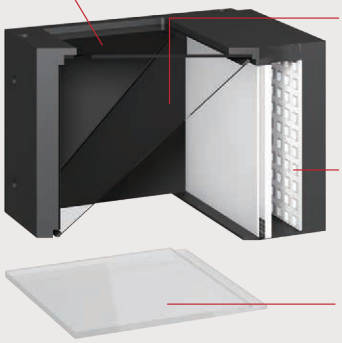
LFV3-G-50RD

Applications Inspection for damage, scratches, or dents on glossy surfaces or mirrors; pattern inspection on printed circuit boards; dimension measuring of glass; inspection for damage and dents on resin molded products; etc.

Prevents ghost images and achieves higher resolution imaging than conventional products.

LFV3-G Series structure (example)

Uses optical glass
The camera window and half mirror use optical glass.

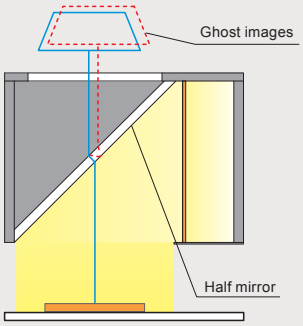


Slim half mirror
Uses a slim half-mirror to achieve high-resolution imaging.

Flat light source with narrow directionality
A narrow beam angle controls the spread of light, resulting in highly directional illumination.

Protective plate (Optional)
Uses 2 mm thick, transparent acrylic with an anti-reflective (AR) coating.

Causes of ghost images (example)



A thick half mirror causes deviations in the light path, generating ghost images. Using a thinner mirror reduces the deviation of the ghost images, enabling high-resolution imaging.

Custom Order Example

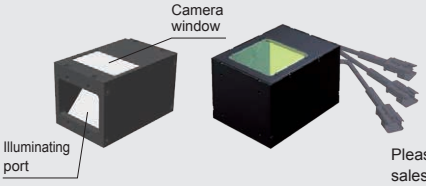
E.g.: Different shape

Format/ material — Change the illuminating port from vertical to horizontal

E.g.: Different color

Wavelength/ color — Full color (RGB) light unit

External/ internal diameter | Wavelength/ color | Increase output | Cable length | Illuminating angle | Format/ material | Connector format | Installation/ mounting | Etc.

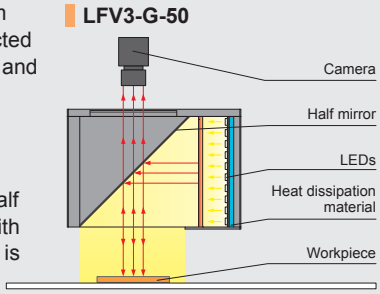


Please contact your CCS sales representative.

Example Configuration

Diffused light from the LEDs is reflected on the half mirror and directed vertically downward on the same axis as the camera axis.
By using a slim half mirror, imaging with reduced ghosting is possible.

LFV3-G-50

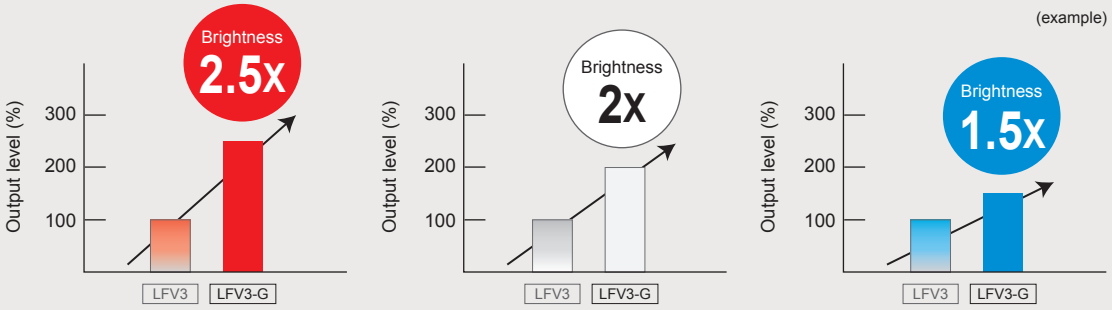


Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Achieves up to 2.5 Times Higher Output Compared to LFV3

Can be combined with the strobe overdrive power supply POD Series to further increase the brightness several times more.

(example)



In comparison with light colors of the LFV3 Series. (These values are for reference only and are not guaranteed values.)

Strobe Overdrive Power Supply
POD Series

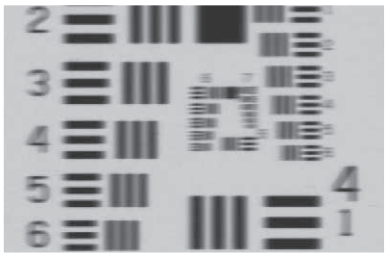
▶ P.329

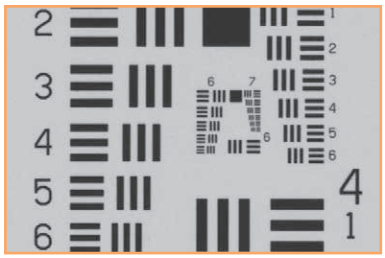
Imaging Example: Imaging Comparison of Resolution Evaluation Chart

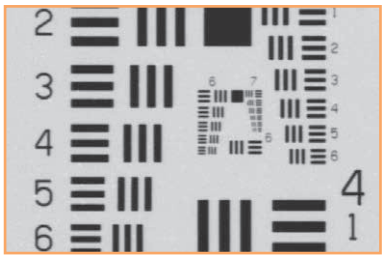
LFV3-50SW (A)

LFV3-G-27SW

LFV3-G-50X100SW







[Imaging conditions] Camera: 2448x2048 3.45 µm monochrome camera, Lens: 2x telecentric lens, Field of view: 4.2 x 3.5 mm (the image is a cutout of about 1.3 x 1.0 mm at the center), Resolution: 1.7 µm/pixel , WD: 110 mm, LWD: 25 mm. * The shutter speed and light intensity are adjusted for each image.

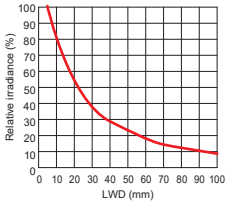
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

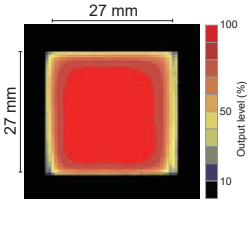
LFV3-G-27RD

Relative irradiance graph (LWD characteristics) *1 *2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



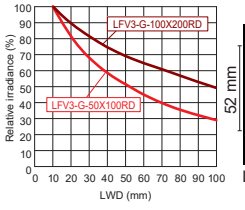
Uniformity (Relative radiance)



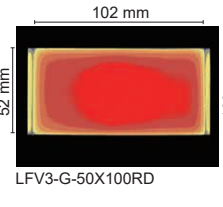
LFV3-G-50X100RD (Red) / 100X200RD (Red)

Relative Irradiance Graph (LWD characteristics) *1 *2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece

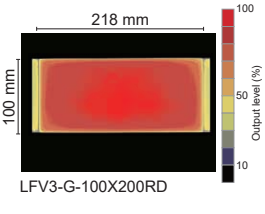


Uniformity (Relative radiance)



LFV3-G-50X100RD

Uniformity (Relative radiance)



LFV3-G-100X200RD

You can inquire using our website.
Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products
Inquire on our website here.
https://www.ccs-grp.com/contact/

Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent / Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

LFV3-G Series

Refer to our website for product details.

CCS LFV3-G ▶ Search

Lineup

Model Name*1	Input Voltage	Power Consumption RD (Red)	Power Consumption SW (White)	Power Consumption BL (Blue)	Options*2	Extension Cables	Recommended Control Units	Weight
LFV3-G-27□□	24 V	5.0 W	5.0 W	5.0 W	Protective Plate	FCB*5 Straight Cable / FCB-W*6 2-Branch Cable / FCB-F 4-Branch Cable / FRCB Robot Cable	PD4, PD3, CC-ST-1024, POD*3	110 g
LFV3-G-30X60□□	24 V	12 W	11 W	8.1 W			PD4, PD3, CC-ST-1024*4, POD*3 (*4 Can only use blue.)	165 g
LFV3-G-35□□	24 V	8.4 W	8.3 W	7.1 W			PD4, PD3, CC-ST-1024, POD*3	140 g
LFV3-G-50□□	24 V	17 W	17 W	15 W				285 g
LFV3-G-50X100□□	24 V	34 W	34 W	29 W			PD4, PD3, POD*3	445 g
LFV3-G-70□□	24 V	28 W	25 W	22 W				570 g
LFV3-G-100□□	24 V	40 W	37 W	32 W				990 g
LFV3-G-100X200□□	24 V	59 W	59 W	59 W				1,730 g

*5 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*6 The cables with a model name that ends with "-EL2" are not included.

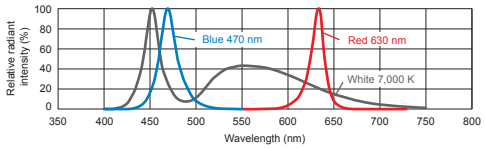
Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue)
*2 If you need to replace the diffusion plate or install a polarizing plate, we can do so as a custom-order.
*3 For information on the combination of the LFV3-G and POD Series, please refer to the CCS website. https://www.ccs-grp.com/lnk/qr/pod

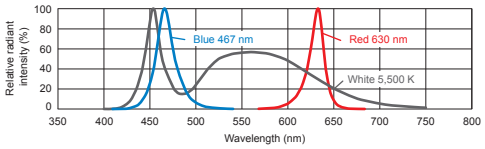
LED Properties

Spectral distribution

Supported models: LFV3-G-27



Supported models: LFV3-G-30X60 / 35 / 50 / 50X100 / 70 / 100 / 100X200

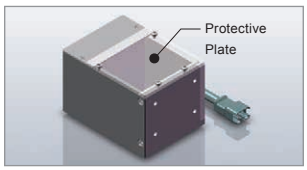


Lens filters suitable for each wavelength are available. For details about the lens filter, refer to P.361.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

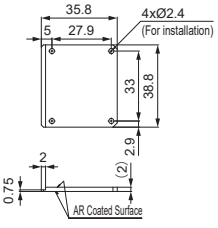
For details on the effective field of view when using coaxial lights, see “Effective Field of View of Coaxial Lights” on P. 393.

Options

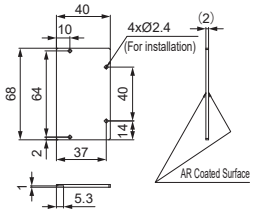


Protective plates are available to prevent any reductions in performance due to intrusion of foreign matter into the lights. Anti-reflective (AR coating) has been applied.
* Be aware that installing a protective plate may reduce image resolution.

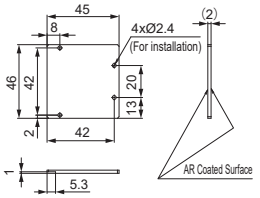
PR-LFV3-27



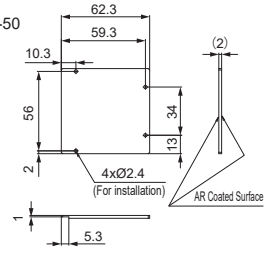
PR-LFV3-30X60



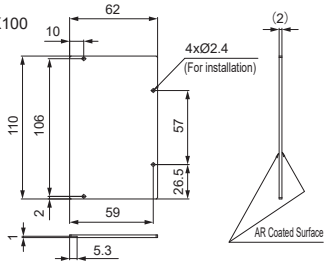
PR-LFV3-35



PR-LFV3-50



PR-LFV3-50X100



Protective Plate

Accessories: Pan Head Screws x 5

Model Name	Applicable Light Unit (Common for all colors)
PR-LFV3-27	LFV3-G-27
PR-LFV3-30X60	LFV3-G-30X60
PR-LFV3-35	LFV3-G-35, LFV3-35(A), LFV-G-PF-35
PR-LFV3-50	LFV3-G-50, LFV3-50(A)
PR-LFV3-50X100	LFV3-G-50X100, LFV3-50X100(A)
PR-LFV3-70	LFV3-G-70, LFV3-70(A)
PR-LFV3-100	LFV3-G-100, LFV3-100(A)
PR-LFV3-100X200	LFV3-G-100X200

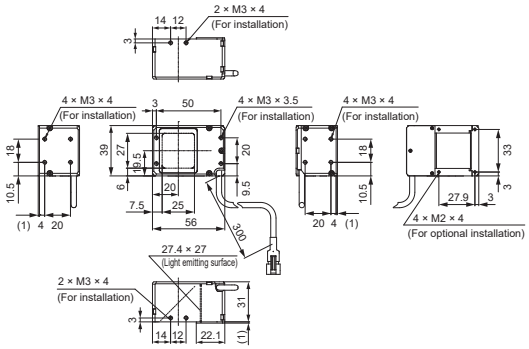
* Protective plates for products other than the applicable light units listed above are available by custom order.

Refer to our website for other external dimensions. https://www.ccs-grp.com/products/series/318

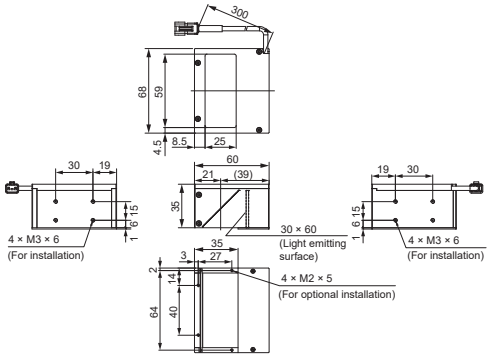
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Dimensions (mm)

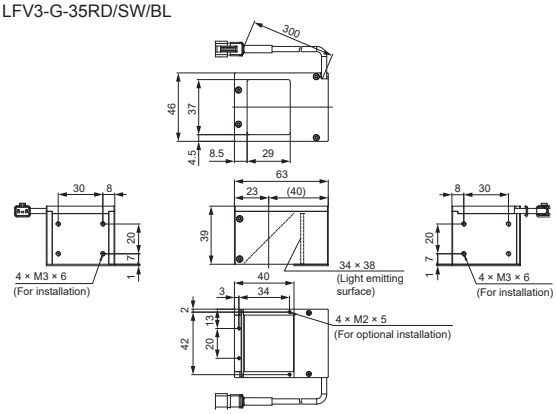
LFV3-G-27RD/SW/BL



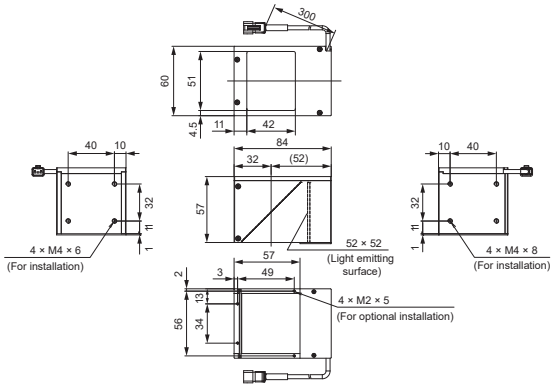
LFV3-G-30X60RD/SW/BL



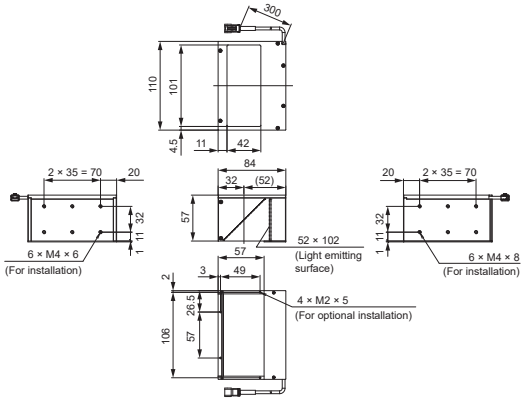
LFV3-G-35RD/SW/BL



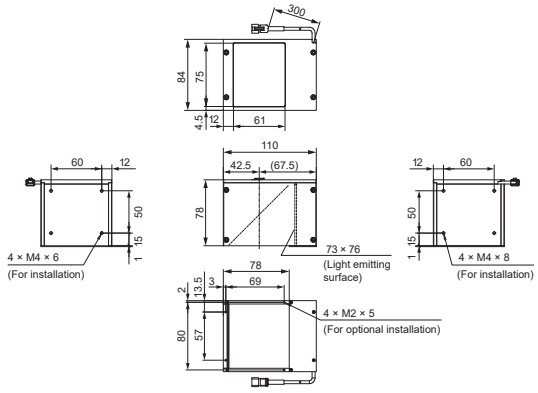
LFV3-G-50RD/SW/BL



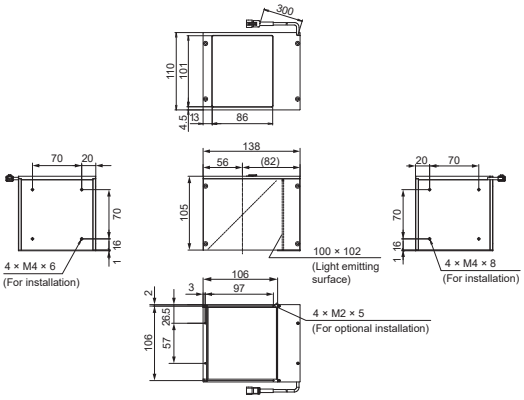
LFV3-G-50X100RD/SW/BL



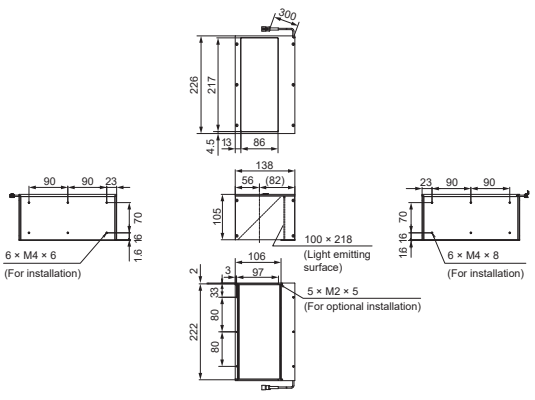
LFV3-G-70RD/SW/BL



LFV3-G-100RD/SW/BL



LFV3-G-100X200RD/SW/BL



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Collimated Lighting

Coaxial Lights

MSU Series

Refer to our website for product details.

CCS MSU ▶ Search

Provides light with high parallelism using original lighting technology

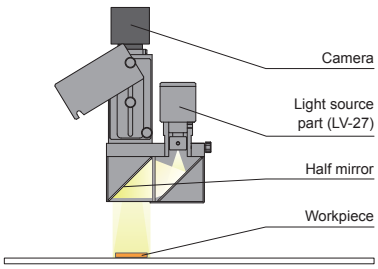
Applications Inspection for fine damage on glossy surfaces, character recognition on glossy surfaces, etc.

Features

Provides collimated lighting created using a special lens. Suitable for extracting minute scratches, dents and depressions on glossy surfaces. The attached lens can be used to condense light.

We accept custom orders. Please feel free to inquire.
- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

Example configuration (MSU-10)



Imaging example: Imaging button cell batteries

Workpiece: Button cell batteries

■LED Coaxial Light

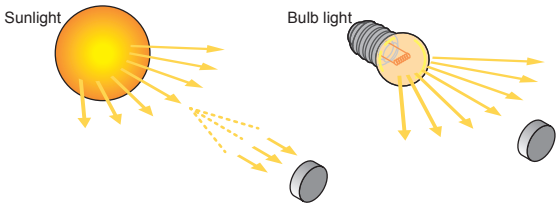
With the Coaxial Light, it is possible to reduce surface reflection and form an image of the engraved text.

■MSU-30X20RD2

Not only is the image of the engraved text more clear than with the Coaxial Light, fine differences in the surface can also be imaged.

Collimated Light Optical Unit MSU Series

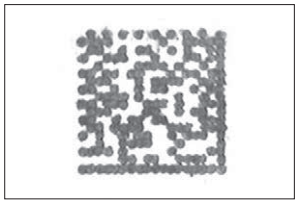
Light emitted from a normal light source moves in a straight line while radially diffusing. Collimated light refers to light where one point of light emitted from a source at infinitely far distance, such as the sun, hits any surface from the same angle. The MSU Series is an optical unit developed by applying the principle of collimated light.



Extracts Damage, Scratches, and Dents on Mirror Objects

This optical unit is effective for inspections that were difficult using conventional image processing, such as extracting shallow and tiny scratches, damage and dents, and reading barcodes on mirror workpieces.

Imaging of 2-dimensional code



Using an LED Light allows for high performance, stable, and low-cost imaging. This is an applied product that melds lighting technology design with optical design.

For details about the procedure for usage, refer to the material "MSU Series Operating Procedures" on our website. You can download this information from the product website page.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Lineup

Model Name*1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	GR (Green)	Options	Extension Cables	Recommended Control Units	Weight
MSU-10□□2	24 V	0.8 W	0.4 W	0.4 W	—	—	FCB*4 Straight Cable FCB-W*5 2-Branch Cable FCB-F 4-Branch Cable FRCB Robot Cable	PD4 PD3 CC-ST-1024 POD*3	275 g
MSU-30□□2	24 V	0.8 W	—	0.4 W	—				2,000 g
MSU-30X20□□2*2	24 V	0.8 W	0.5 W	0.5 W	0.5 W				540 g
MSU-100□□2	24 V	0.8 W	0.4 W	—	—				9,920 g
MSU-130RD2	24 V	0.8 W	—	—	—				12,700 g
MSU-130SW2-CL*3	24 V	—	0.4 W/ 4.6 W	—	—			PD4 PD3 POD*3	13,000 g

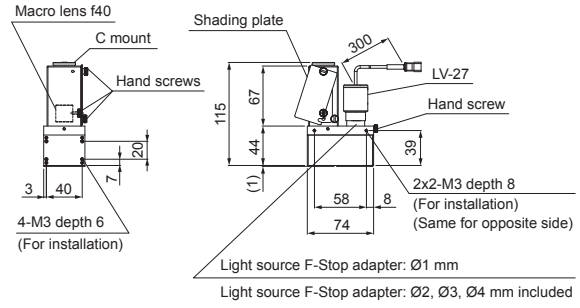
*4 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*5 The cables with a model name that ends with "-EL2" are not included.

LED Properties: Spectral Distribution ▶ P.396 | Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

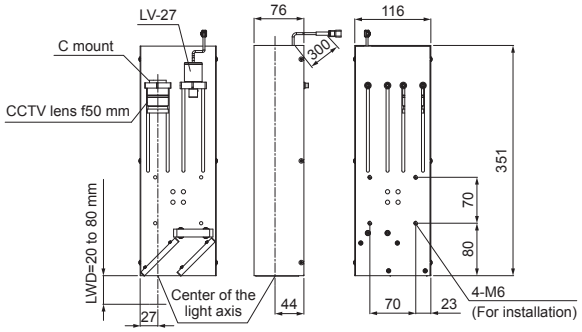
*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, GR: Green)
*2 The MSU-130SW2-CL is equipped with two light units. Use a 2-channel control unit.
*3 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

Dimensions (mm)

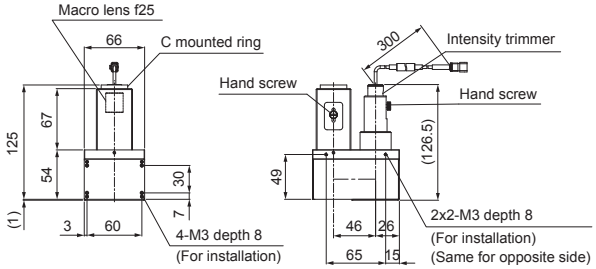
MSU-10RD2/SW2/BL2



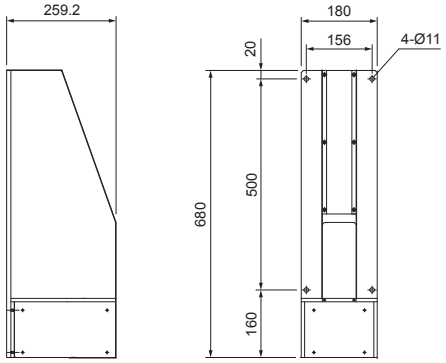
MSU-30RD2/BL2



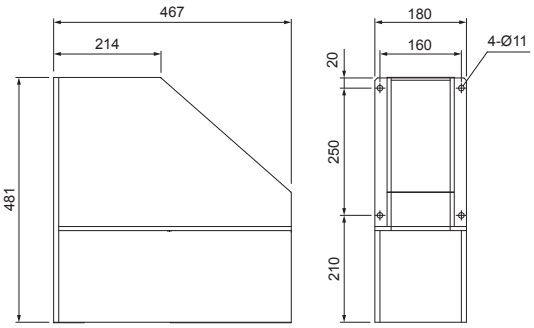
MSU-30X20RD2/SW2/BL2/GR2



MSU-100RD2/SW2



MSU-130RD2/SW2-CL



Reference chart for the field of vision (Estimate)
Using a 1/3 inch sensor camera

Model Name	Field of vision	WD
MSU-10	7.5 mm	58 mm
MSU-30	18.7 mm	50 mm
MSU-30X20	15 mm	24 mm
MSU-100	60 mm	50 mm

Regarding reference field of vision
This is an estimate to help you select a light unit, and individual units may vary from the data listed above depending on your imaging conditions.

You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

You can inquire using our website. Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products
Inquire on our website here. https://www.ccs-grp.com/contact/

Collimated Lighting

Lens-integrated Parallelism-variable Coaxial Lights

MSU Series

Integrated lens for easy light source and camera optical axis adjustment

Built to order

This is a made-to-order product. For queries and details, contact your CCS sales representative.

MSU-47X34SW+TH2SP

Custom order products: The warranty period of the custom order product is different from that of the CCS standard products. Contact our local sales office for details.

Applications: Imaging where the degree of extraction of minor scratches, dents, and dents on the glossy surface is adjusted / Imaging that improves the reproducibility of verification conditions, etc.

Features

- Lens-integrated coaxial lights with the light source built into the telecentric lens
- The NA of the light source side and imaging side can be adjusted
- The parallelism of the light can be changed by adjusting the aperture on the lens side and light side
- Enables easy light source and camera optical axis adjustment
- A unique optical design that achieves a compact housing
- Compatible with high-megapixel cameras such as 2/3-type 5 MP and 1-type 9 MP

Light Aperture Adjustment Example

- Imaging the Appearance of Button Battery

Workpiece: Button battery

Light aperture status

Light aperture status

Light aperture status

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Lineup

Model Name	Input Voltage	Power Consumption	LED Color	Correlated Color Temperature	Options	Extension Cables	Recommended Control Units
MSU-47X34SW+TH2SP	24 V	2.9 W	White	5800 K	-	FCB*2 Straight Cable / FCB-F 2-Branch Cable / FCB-W*3 4-Branch Cable / FRCB Robot Cable	PD4 / PD3 / CC-ST-1024 / POD

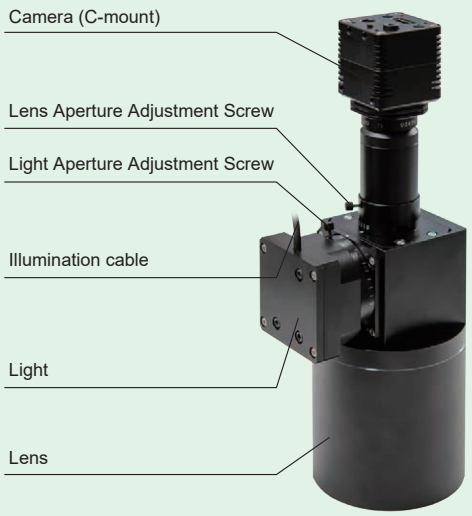
*2 The cables with a model name that ends with "-ME7","-EL2", "-PF", or "-PF-EL9" are not included.
*3 The cables with a model name that ends with "-EL2" are not included.

*1 This product is custom-made. Contact our local sales office for details.

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

Parts/Usage

● Parts



● Usage

(1) Camera installation
The field of view changes by the sensor size of the mounted camera.
Select and install the camera according to the workpiece.

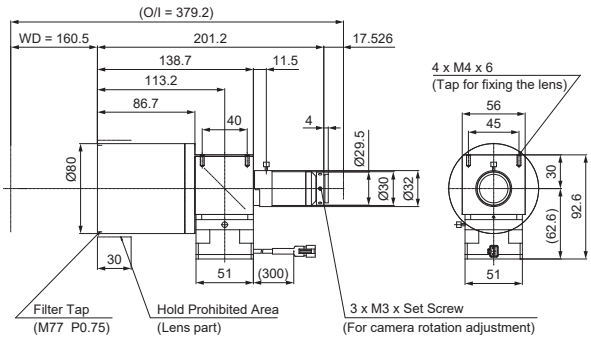
(2) Installing the main body
Secure the main body so that the working distance (WD) is around 160 mm.

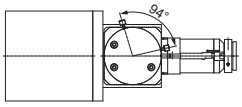
(3) Adjusting the optical axis
The camera's optical axis and the workpiece must be vertically aligned.
Use a mirror for easier adjustment of the optical axis alignment.
We recommend dimming the light while adjusting the alignment.
Align the optical axis by adjusting the tilt of the light unit or the brightness to evenly illuminate the entire field of view.

(4) Imaging the workpiece
Slide the "light aperture adjustment screw" and observe the change in the workpiece.
Fix the light aperture adjustment screw near where appropriate images can be obtained.
If it is necessary to obtain depth of field, slide the lens aperture adjustment screw and fix it near the appropriate depth of field.

(5) Setting the light intensity
Adjust the light brightness and the exposure time of the camera to set the appropriate brightness.

Dimensions (mm)





Specifications

Model Name	MSU-47X34SW+TH2SP
Lens Shape	Object-side Telecentric Lens Fixed Magnification Lens
Optical Magnification	0.3x ±5%
Working Distance (WD)	(160.5 ±5)mm
Depth of Field	4.44 to 33.3 mm *Calculated with a permissible confusion circle diameter of 40 µm
Resolution	11.2-83.9 µm *Theoretical resolution at a wavelength of 550 nm
NA	0.03 to 0.004 (design value)
Effective F Value (Fe)	5 to 34.7 (design value)
TV Distortion	-0.01% (design value)
Weight	Approx. 1.1 kg
Filter Diameter	M77 P0.75
Mount	C mount
Applicable Image Size*	10.3 x 14.1 mm (diagonal 17.6 mm, 1.1 type)
Field of View (VxH)	1/3 type: 12 x 16 mm, 1/2 type: 16 x 21.3 mm, 1/1.8 type: 18.0 x 23.6 mm, 2/3 type: 23.6 x 28.3 mm, 1 type: 34 x 42.6 mm, 1.1 type: 34.5 x 47.1 mm
Light Model Name	TH2-27X27SW (LED color: white, correlated color temperature: 5800 K)
Light Input Voltage (max.)	24 VDC
Light Power Consumption (typ.)	2.9 W
Distance Between Objects (O/I)	379.2 mm (design value)
Focal Length	475.5 mm (design value)
Exit Pupil Position	-142.7 mm
Operating environment humidity	Temperature: 0 to 40°C, Humidity: 20 to 80% RH (with no condensation)
Storage temperature/humidity	Temperature: -10 to 50°C, Humidity: 20 to 80% RH (with no condensation)

*As the image size is in inches, the field of view is an approximation.

Collimated Lighting
Coaxial Lights
MFU Series

Refer to our website for product details.
CCS MFU ▶ Search

Provides light with high parallelism using original lighting technology

MFU-34X30BL2-12/-24

MFU-54X40BL2-12/-24

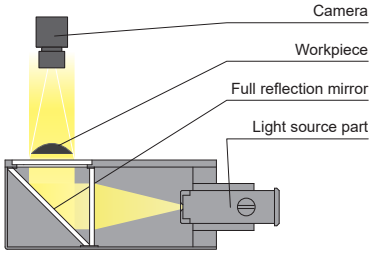
Applications Dimension measuring, dimension measuring of cylindrical objects, inspection for fine burrs, etc.

Features

Our unique optical design achieves highly accurate imaging that prevents light from wrapping around the workpiece.
Light convergence can be adjusted according to the lens on the imaging side.

We accept custom orders. Please feel free to inquire.
- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

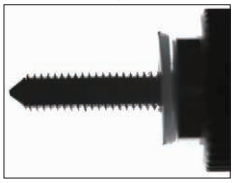
Example configuration (MFU-34×30)



Imaging example: Imaging the appearance of screws

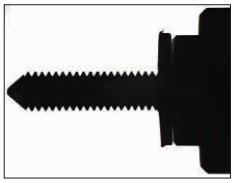
Workpiece: Knurled screws

■LED Flat Light



With a Flat Light, the emitted light wraps around the workpieces, making it difficult to emphasize the edges.

■MFU-34X30BL2



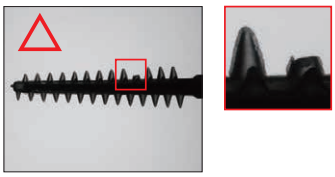
It prevents the emitted light from wrapping around, allowing for the edges to be emphasized.

Comparison of Imaging with a Flat Light and Collimated Light

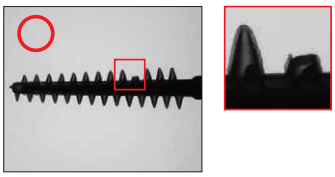
Inspection of the appearance of interdental brush

■Normal light

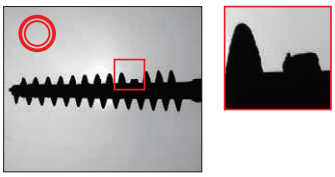
■Flat Light (High Brightness Type) TH2-27X27BL



■Flat Light (High Directivity Type) TH2-27X27BL-PM



■MFU-34X30BL2



Flat lights make it difficult to emphasize the edges of the silhouette because the light wraps around the workpiece

With the MFU-34X30BL2, it is possible to emphasize the edges of the silhouette by preventing light from wrapping around the workpiece.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Lineup

Model Name	LED Color	Input Voltage	Power Consumption	Extension Cables	Recommended Control Units	Weight
MFU-34X30BL2-12	Blue	12 VDC	0.9 W	CB Straight Cable / CB-F 4-branch Cable / CB-W 2-branch Cable / RCB Robot Cable	PD2*1	200 g
MFU-54X40BL2-12						400 g
MFU-34X30BL2-24		24 VDC	1.7 W	FCB*2 Straight Cable / FCB-F 4-branch Cable / FCB-W*3 2-branch Cable / FRCB Robot Cable	PD4 / PD3 / CC-ST-1024	200 g
MFU-54X40BL2-24						400 g

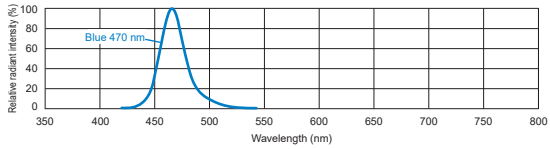
The MFU Series cannot be used with the strobe control unit (overdrive mode).

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 This product is made for 12V input voltage. Please select a control unit with a 12V output voltage.
*2 Excluding products with model numbers ending in -ME7, -EL2, -PF, or -PF-EL9.
*3 Excluding products with model numbers ending in -EL2.

LED Properties

Spectral distribution



Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Usage Instructions

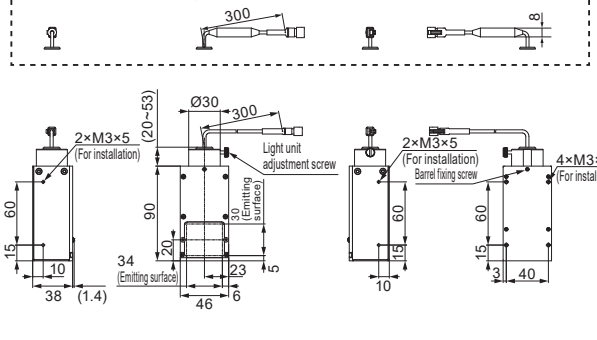
1) Set the item to be inspected and determine the imaging range.
2) Set this product and determine the distance between the lens and the camera (WD).
3) Align this product's light axis with the center of the imaging field of vision.
4) Adjust intensity.

For details about the procedure for usage, refer to the material "MFU Series Operating Procedures" on our website.
You can download this information from the product website page.

Dimensions (mm)

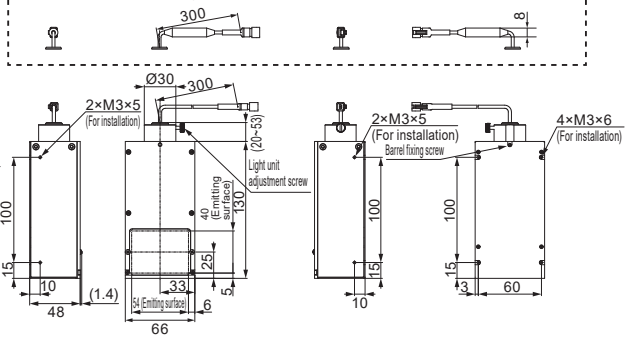
MFU-34X30BL2-12/-24

In the case of 24V Type



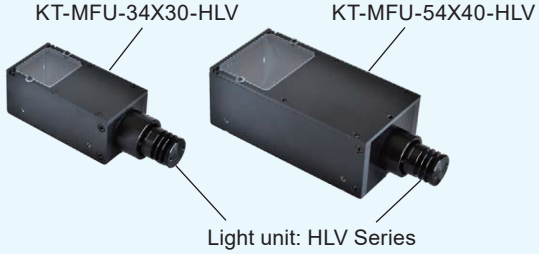
MFU-54X40BL2-12/-24

In the case of 24V Type



KT-MFU Series (Spot lighting equipment for light units is sold separately)

KT-MFU Series are collimated backlight units that can be used in combination with the HLV Series.
They are capable of higher power light emission than MFU Series.



Model Name	Weight
KT-MFU-34X30-HLV	200 g
KT-MFU-54X40-HLV	400 g

■ Compatible Lights: HLV3-22-1C/ -2C/ -4C Series
* HLV3 (L-shape Type) and HLV3-22-2C-1220 are not compatible with the KT-MFU Series.
* Please use the recommended light units for each HLV product.

Strobe Lighting

High Power Strobe Lights PF Series

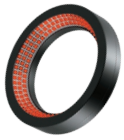
Refer to our website for product details.

CCS High Power Strobe Lights ▶ Search

Ultra-high power strobe light units

■ **Ring Type**
LDR-PF Series

■ **Low-Angle Ring Type**
LDR-PF-LA Series



■ **Diffused Ring Type**
HPR-PF Series

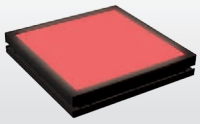
■ **Low-Angle Square Type**
FPQ-PF Series

NEW

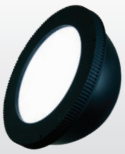
■ **Bar Type**
LDL-PF Series

■ **Flat Type**
TH-PF Series

NEW

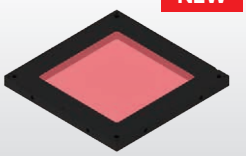


■ **Dome Type**
HPD-PF Series



■ **Flat Dome Type**
LFXV-PF Series

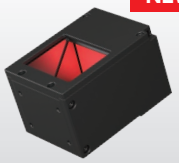
NEW



■ **Coaxial Type**
LFV-PF Series

■ **Coaxial Type (High-Resolution)**
LFV-G-PF Series

NEW



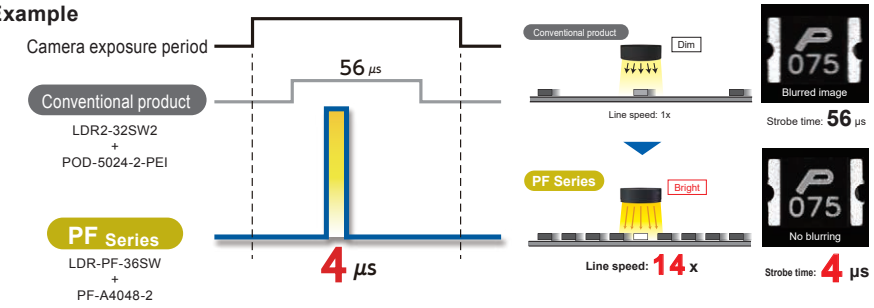
Applications Inspections for damage or stains, visual and color determination inspections, printed character inspection, appearance inspection for food or medicines, etc.

"Extreme Power" Strobe Lights

The High Power Strobe Lights PF Series enables extreme power strobe lighting. The PF Series light units are dedicatedly designed for strobe lighting to achieve further large output power than that of the conventional products when used with the dedicated control units.
This makes them applicable to fast inspection lines and a wide range of applications improving productivity.

Comparison of images with the conventional product

Example



Conventional product
Long strobe time due to lack of brightness leads to image blurring.

PF Series
High power emission enables instantaneous imaging.

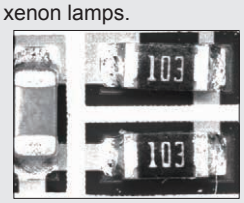
Wide Variety of Available Light Units

Flat type, flat dome type, low-angle square type, and coaxial (high-resolution) type have been added. A total of 10 series with 76 models are available to meet your inspection needs.

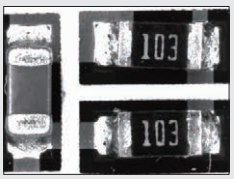
We accept custom orders. Please feel free to inquire.
- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

Brightness Comparable to Xenon Flash Lamps

Achieved the same inspection speed made possible by xenon lamps.



15 W xenon flash lamp
Strobe time: 1.75 µs
(measured value)



High power strobe light unit
Strobe time: 15 µs

The data included is for reference only. Actual values may vary.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Shorten Emission Time for Faster Inspection Lines

Inspection lines can be faster as clear images can be captured even with a short light emission time.

Imaging Example

■ Workpiece

Can

■ LFXV-100SW + POD Control Unit

Light emission time: 300 µs

■ LFXV-PF-100SW + PF Control Unit

Light emission time: 30 µs

* Imaging at LWD 10 mm

Shorten emission time to approx. 1/10 of conventional products on overdrive.

No Blur at High Speed

Horizontal Blur

Conventional product

Long exposure period and insufficient brightness result in image blur.

■ LDR2-32SW2+POD Control Unit

The image is blurred in fast moving production lines.

PF Series

High brightness allows for short exposure time and reduces blur.

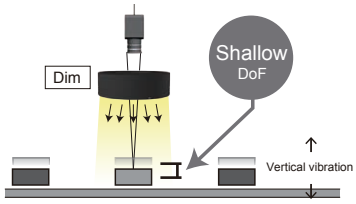
■ LDR2-PF-36SW+PF Control Unit

Applicable to fast moving production lines.

Vertical Blur

Conventional product

Adjusting aperture to compensate for dim lighting reduces depth of field.



Vibration causes image blur.

PF Series

High brightness allows for smaller aperture and increased depth of field.

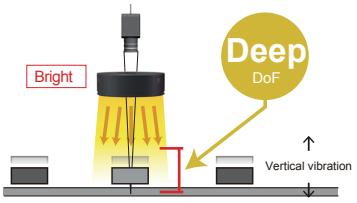


Image unaffected by vibration.

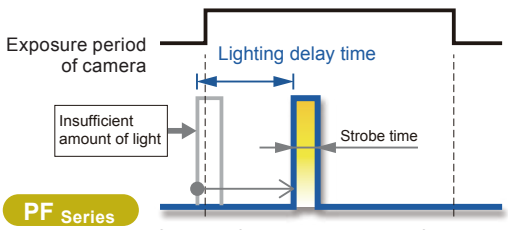
Freely Adjustable Flash Timing

You can use the lighting delay time setting of the control unit to adjust the timing of the flash to be within the exposure period of the camera.

Dedicated Control Units PF-A4048-2 and PF-A16048-4

Maximize performance of the high power strobe light units.

For more information on the dedicated control units ▶ P.335



Strobing before the exposure period of the camera leads to an insufficient amount of light.

Delaying the timing of the flash enables strobing within the exposure period of the camera.

PF Series

Refer to our website for product details.

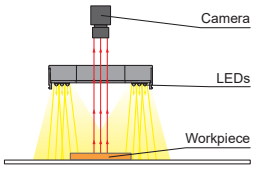
CCS High Power Strobe Lights ▶ Search

Features of Each Series

Ring Type LDR-PF Series

Strong direct light from the LEDs mounted on the flat board illuminates the workpiece from above.

Example configuration (LDR-PF-75)

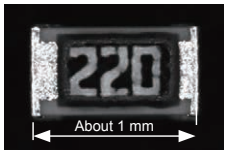


Imaging example: Imaging the external appearance of chip components

Workpiece

Chip component

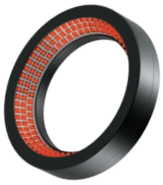
LDR-PF-36SW



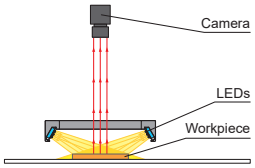
The appearance of the chip component is captured.

Low-Angle Ring Type LDR-PF-LA Series

Provides extremely strong direct light from a low angle to the center.



Example configuration (LDR-PF-75-LA)



Imaging example: Imaging the appearance of medicine tablets with imprinted text

Workpiece

Medicine tablets

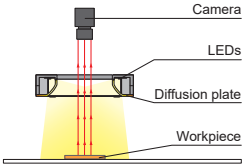
LDR-PF-100SW-LA

Strobe light allows you to capture the imprinted text and theappearance of the workpiece.

Diffused Ring Type HPR-PF Series

The diffusion plate transmits light from LEDs and provides strong and uniform diffused light.

Example configuration (HPR-PF-100)



Imaging example: Imaging the appearance of beverage containers

Workpiece

Beverage container

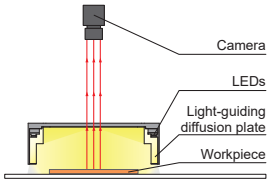
HPR-PF-100SW

Condition of container bottom and text are clearly imaged.

Low-Angle Square Type FPQ-PF Series NEW

Low-angle diffuse illumination from 4 directions

Example configuration (FPQ-PF-48)



Imaging example: Exterior imaging of electronic components

Workpiece

Electronic components

This workpiece was processed by CCS for sample imaging.

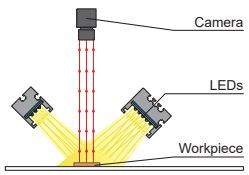
FPQ-PF-48SW

Clearly image print and cracked areas on electronic components.

Bar Type LDL-PF Series

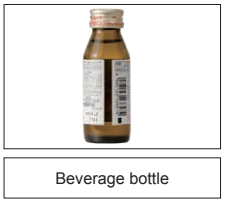
The diffusion plate transmits light from LEDs and provides uniform diffused light on the whole workpiece from its wide emitting surface.

Example configuration (LDL-PF-102X18/102X30)



Imaging example: Imaging the paper label of beverage bottles

Workpiece



Beverage bottle

LDL-PF-102X18SW

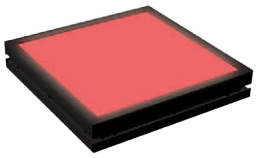
Captured image of a paper label and barcode.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

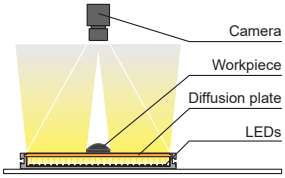
Register to use them.

Flat Type TH-PF Series NEW

Uniform diffuse light for backlight illumination



Example configuration (TH-PF-100X100)



Imaging example: liquid level testing for disinfectant solution

Workpiece

Disinfectant solution

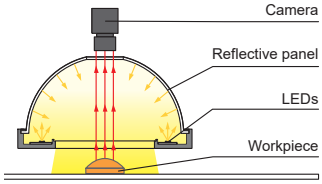
TH-PF-100X100SW/RD

Accurately detect liquid level and label position.

Dome Type HPD-PF Series

Light from the LEDs is diffused inside the dome-shaped reflective panel. The whole surface of the workpiece is illuminated with diffused light uniformly.

Example configuration (HPD-PF-150)



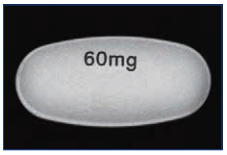
Imaging example: Imaging the surface of medicine tablets

Workpiece

Medicine tablet

This workpiece was processed by CCS for sample imaging.

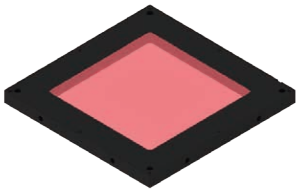
HPD-PF-75SW



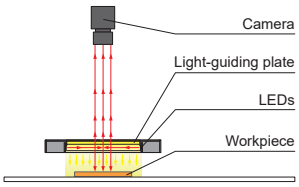
Condition of tablet surface and text are clearly imaged.

Flat Dome Type LFXV-PF Series NEW

Dome light effect in a flat design



Example configuration (LFXV-PF-100)



Imaging example: Print inspection on food cans

Workpiece

Food cans

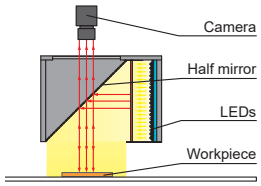
LFXV-PF-100SW

Print is clear and readable.

Coaxial Type LFV-PF Series

Diffused light from the LEDs is reflected on the half mirror and directed vertically downward on the same axis as the camera axis.

Example configuration (LFV-PF-100)



Imaging example: Imaging the appearance of cans

Workpiece

Can

This workpiece was processed by CCS for sample imaging.

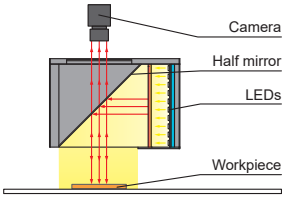
LFV-PF-100SW

Condition and the appearance of can are clearly imaged.

Coaxial Type (High-Resolution) LFV-G-PF Series NEW

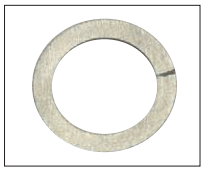
Thin half-mirror prevents ghost images

Example configuration (LFV-G-PF-35)



Imaging example: Exterior inspection of drain gasket

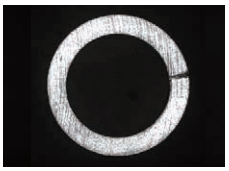
Workpiece



Drain gasket

This workpiece was processed by CCS for sample imaging.

LFV-G-PF-35SW



Clearly image gasket chipping.

PF Series

Refer to our website for product details.

CCS High Power Strobe Lights ▶ Search

Data: Illuminance Graph and Uniformity (Representative Example)

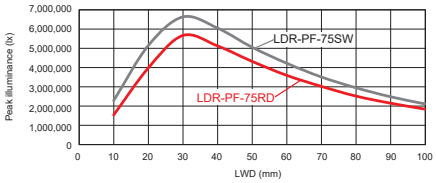
The data included is for reference only. Actual values may vary.

Ring Type LDR-PF Series

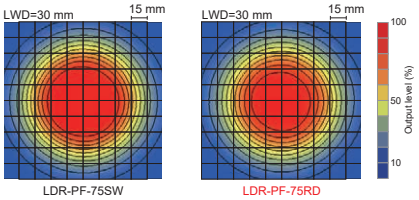
LDR-PF-75SW/RD

Illuminance graph*1(LWD characteristics)*2

*1 Illuminance on the optical axis *2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)

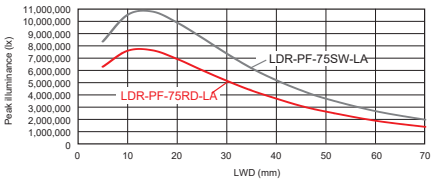


Low-Angle Ring Type LDR-PF-LA Series

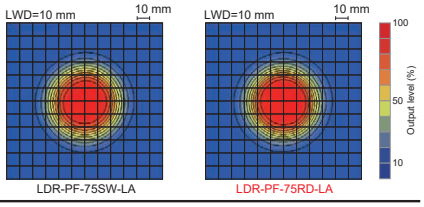
LDR-PF-75SW/RD-LA

Illuminance graph*1(LWD characteristics)*2

*1 Illuminance on the optical axis *2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)

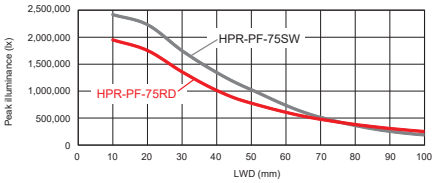


Diffused Ring Type HPR-PF Series

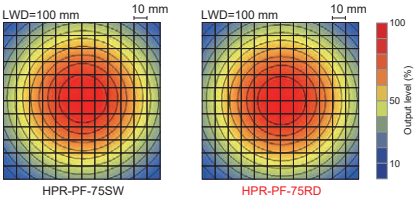
HPR-PF-75SW/RD

Illuminance graph*1(LWD characteristics)*2

*1 Illuminance on the optical axis *2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)

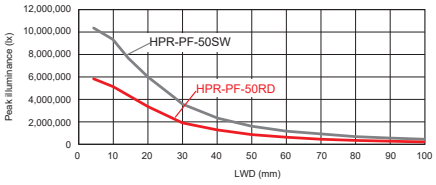


NEW

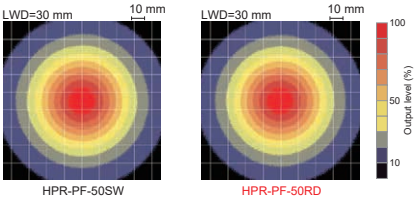
HPR-PF-50SW/RD

Illuminance graph*1(LWD characteristics)*2

*1 Illuminance on the optical axis *2 Illuminating distance from the light unit to the workpiece

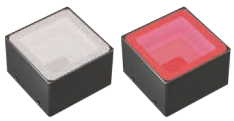


Uniformity (Relative irradiance)



Low-Angle Square Type FPQ-PF Series

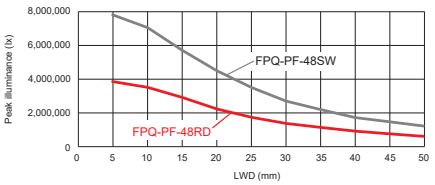
NEW



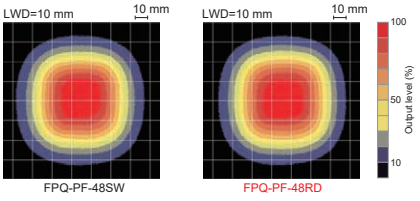
FPQ-PF-48SW/RD

Illuminance graph*1(LWD characteristics)*2

*1 Illuminance on the optical axis *2 Illuminating distance from the light unit to the workpiece

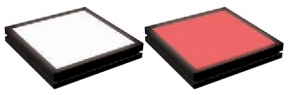


Uniformity (Relative irradiance)



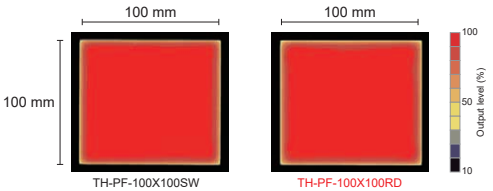
Flat Type TH-PF Series

NEW



TH-PF-100X100SW/RD

Uniformity (Relative radiance)



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

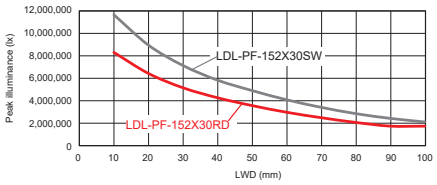
Register to use them.

Bar Type LDL-PF Series

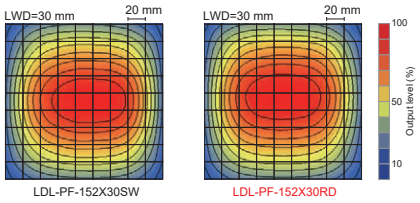
LDL-PF-152X30SW/RD

Illuminance graph*1(LWD characteristics)*2

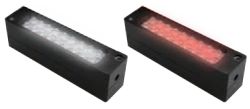
*1 Illuminance on the optical axis *2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



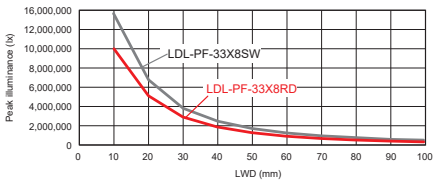
NEW



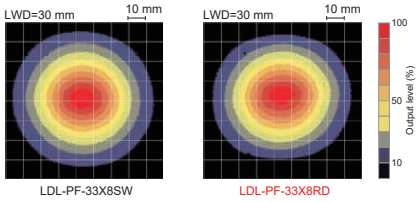
LDL-PF-33X8SW/RD

Illuminance graph*1(LWD characteristics)*2

*1 Illuminance on the optical axis *2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)

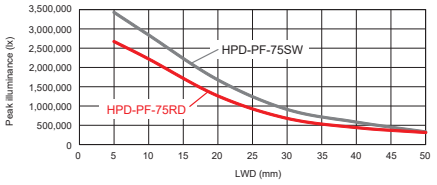


Dome Type HPD-PF Series

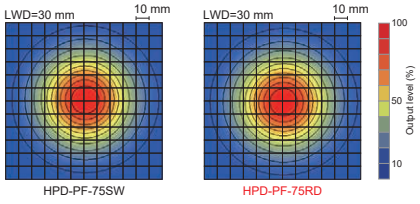
HPD-PF-75SW/RD

Illuminance graph*1(LWD characteristics)*2

*1 Illuminance on the optical axis *2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



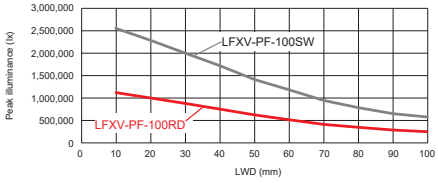
Flat Dome Type LFXV-PF Series

NEW

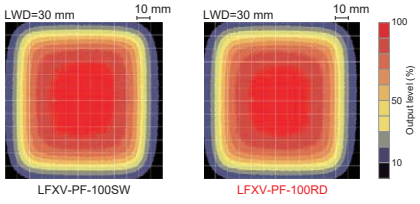
LFXV-PF-100SW/RD

Illuminance graph*1(LWD characteristics)*2

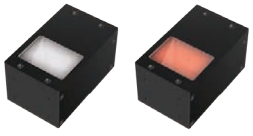
*1 Illuminance on the optical axis *2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



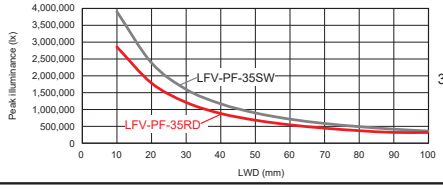
Coaxial Type LFV-PF Series



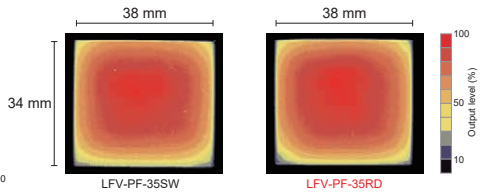
LFV-PF-35SW/RD

Illuminance graph*1(LWD characteristics)*2

*1 Illuminance on the optical axis *2 Illuminating distance from the light unit to the workpiece

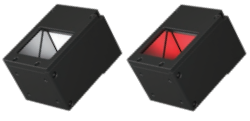


Uniformity (Relative radiance)



Coaxial Type (High-Resolution) LFV-G-PF Series

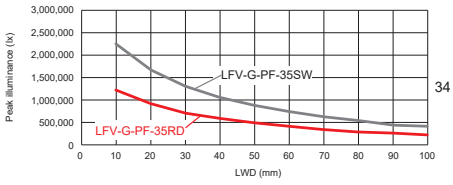
NEW



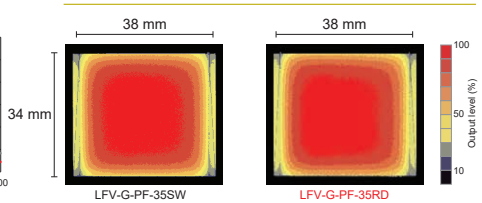
LFV-G-PF-35SW/RD

Illuminance graph*1(LWD characteristics)*2

*1 Illuminance on the optical axis *2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative radiance)



PF Series

Refer to our website for product details.

CCS High Power Strobe Lights ▶ Search

Lineup

Type		Model Name *1	Peak Current RD (Red)	Peak Current SW (White)	Options	Extension Cables	Dedicated Control Units	Weight
Ring		LDR-PF-36□□	5.4 A		Diffusion plate	FCB-PF Straight Cable (Dedicated Cable)	PF-A4048-2	70 g
		LDR-PF-54□□	10.8 A		Polarizing plate			110 g
		LDR-PF-75□□	18 A	21.6 A	Adapter			150 g
Low-Angle Ring		LDR-PF-75□□-LA	16.2 A		Diffusion plate	FCB-PF Straight Cable (Dedicated Cable)		125 g
		LDR-PF-100□□-LA	28.8 A		Adapter	FCB-PF-EL9 Straight Cable (Dedicated Cable)		200 g
		LDR-PF-150□□-LA	42 A				PF-A16048-4	350 g
Diffused Ring		HPR-PF-50□□ NEW	6 A		Brackets	FCB-PF Straight Cable (Dedicated Cable)	PF-A4048-2	50 g
		HPR-PF-75□□	12 A					170 g
		HPR-PF-100□□	21.6 A					180 g
		HPR-PF-150□□	36 A			FCB-PF-EL9 Straight Cable (Dedicated Cable)		270 g
		HPR-PF-200□□	43.2 A				PF-A16048-4	400 g
Low-Angle Square		FPQ-PF-32□□ NEW (Custom)	*2		Reflective plate	FCB-PF Straight Cable (Dedicated Cable)	PF-A4048-2	*2
		FPQ-PF-48□□ NEW	14 A		-			90 g
Bar	Emitting width 4 mm	LDL-PF-19X4□□ NEW (Custom)	*2		Diffusion plate Polarizing plate Brackets	FCB-PF Straight Cable (Dedicated Cable)		*2
	Emitting width 8 mm	LDL-PF-33X8□□ NEW	4 A					22 g
	Emitting width 18 mm	LDL-PF-52X18□□	5.4 A					140 g
		LDL-PF-102X18□□	10.8 A					210 g
		LDL-PF-152X18□□	16.2 A					290 g
	Emitting width 30 mm	LDL-PF-52X30□□	9 A					180 g
		LDL-PF-102X30□□	18 A					270 g
		LDL-PF-152X30□□	27 A			FCB-PF × 2 *3		380 g
Flat		TH-PF-27X27□□ NEW (Custom)	*2		Light control film Brackets	*2		*2
		TH-PF-51X51□□ NEW (Custom)	*2					*2
		TH-PF-100X100□□ NEW	41 A			FCB-PF-EL9 Straight Cable (Dedicated Cable)	PF-A16048-4	200 g
Dome		HPD-PF-75□□	12 A		Brackets	FCB-PF Straight Cable (Dedicated Cable)	PF-A4048-2	150 g
		HPD-PF-100□□	21.6 A					170 g
		HPD-PF-150□□	36 A			FCB-PF-EL9 Straight Cable (Dedicated Cable)		310 g
		HPD-PF-200□□	43.2 A				PF-A16048-4	480 g
Flat Dome		LFXV-PF-25□□ NEW (Custom)	*2		-	*2		*2
		LFXV-PF-50□□ NEW (Custom)	*2		Protective plate			*2
		LFXV-PF-75□□ NEW (Custom)	*2					*2
		LFXV-PF-100□□ NEW	26 A	36 A		FCB-PF-EL9 Straight Cable (Dedicated Cable)	PF-A4048-2	440 g
Coaxial		LFV-PF-35□□	10.8 A	14.4 A	Diffusion plate Polarizing plate Light control film Brackets	FCB-PF Straight Cable (Dedicated Cable)		230 g
		LFV-PF-50□□	18.0 A	21.6 A				400 g
		LFV-PF-70□□	37.8 A			FCB-PF-EL9 Straight Cable (Dedicated Cable)		800 g
		LFV-PF-100□□	48.6 A	64.8 A	Diffusion plate Polarizing plate Light control film		PF-A16048-4	1400 g
Coaxial (High-Resolution)		LFV-G-PF-27□□ NEW (Custom)	*2		Protective plate	FCB-PF	PF-A4048-2	*2
		LFV-G-PF-35□□ NEW	8 A					150 g

*1 □□ in the model name contains the LED color. (RD: Red, SW: White)
*2 Contact our local sales office for details.
*3 Light unit has two connectors. Use two extension cables of the same length to connect the light unit. Using cables of different lengths may cause uneven light emission due to voltage drop caused by the DC resistance of the cable.

Extension Cables ▶ P.150 Dedicated power supply ▶ P.335

We accept custom orders. Please feel free to inquire.
- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

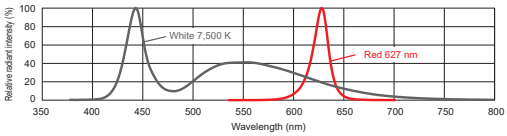
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

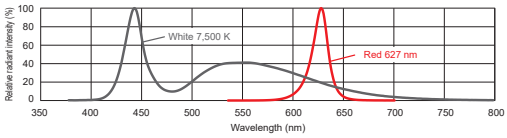
LED Properties

Spectral distribution

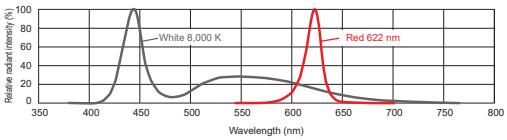
■ LDR-PF Series



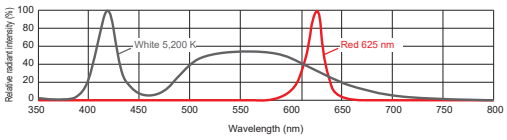
■ LDL-PF Series



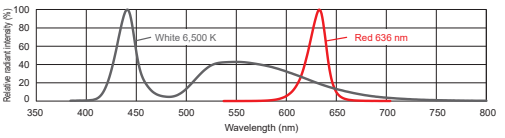
■ LDR-PF-LA Series



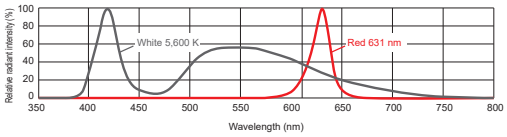
■ TH-PF Series



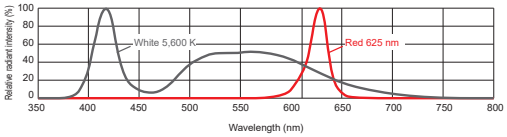
■ HPR-PF/ HPD-PF Series *Excluding HPR-PF-50



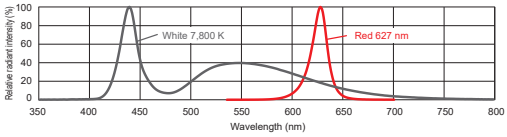
■ LFXV-PF Series



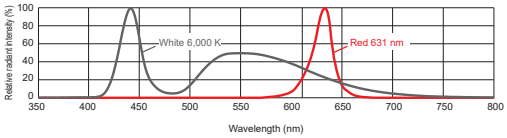
■ HPR-PF-50SW/RD



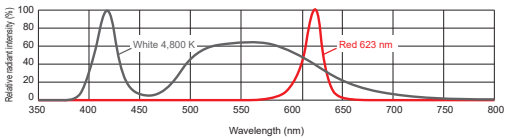
■ LFV-PF Series



■ FPQ-PF Series



■ LFV-G-PF Series

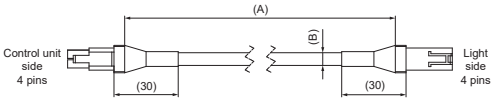


Lens filters suitable for each wavelength are available. For details about the lens filter, refer to P.359
Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Extension Cables

FCB-PF

(mm)

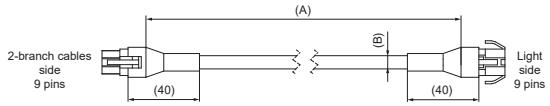


Model Name	Dimension A	Dimension B	Permitted bending radius *	Weight
FCB-1-PF	1 m	Ø5.9	35.4 mm	100 g
FCB-2-PF	2 m			150 g
FCB-3-PF	3 m			200 g
FCB-5-PF	5 m	Ø7.0	42.0 mm	450 g

*The allowable cable bend radius is for reference only. It is not a guaranteed value.
Refer to the user manual for extension cable connection method.

FCB-PF-EL9

(mm)



Model Name	Dimension A	Dimension B	Permitted bending radius *	Weight
FCB-1-PF-EL9	1 m	Ø7.4	44.4 mm	100 g
FCB-2-PF-EL9	2 m			190 g
FCB-3-PF-EL9	3 m			270 g
FCB-5-PF-EL9	5 m	Ø9.1	54.6 mm	680 g

*The allowable cable bend radius is for reference only. It is not a guaranteed value.
Refer to the user manual for extension cable connection method.

PF Series

Refer to our website for product details.

CCS High Power Strobe Lights ▶ Search

Options

Diffusion Plates

Ring type units	Bar type units	Coaxial type units

Reduces glare, especially problematic in the imaging of glossy workpieces.

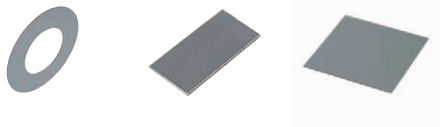
Model Name*1	Applicable Light Unit
DF-LDR-PF-○○	LDR-PF Series*2
DF-LDR-PF-○○-LA	LDR-PF-LA Series*2
DF-LDL-PF-○○	LDL-PF Series
DF-LDL2-33X8	LDL-PF-33X3
DF-LFV3-○○ (Transmission: High) *3	LFV-PF Series
DF-LFV3-○○ -UF (Transmission: Low)	

*1 ○○ in the model name contains the light size.
*2 An adapter is needed for attachment to the light unit.
*3 It is the same diffusion plate as the standard equipment.

▶ P.363

Polarizing Plates

Ring type units	Bar type units	Coaxial type units



Reduces glare when used in combination with a polarizing filter on the camera.

Model Name*1	Applicable Light Unit
PL-LDR-PF-○○	LDR-PF Series*2
PL-LDL-PF-○○ -HO/VE*3	LDL-PF Series
PL-LDL2-33X8-HO/VE	LDL-PF-33X
PL-LFV3-○○	LFV-PF Series

*1 ○○ in the model name contains the light size.
*2 An adapter is needed for attachment to the light unit.
*3 HO: Light is polarized parallel to the longer edge of the plate.
VE: Light is polarized parallel to the shorter edge of the plate.

▶ P.365

Adapters

Ring type units

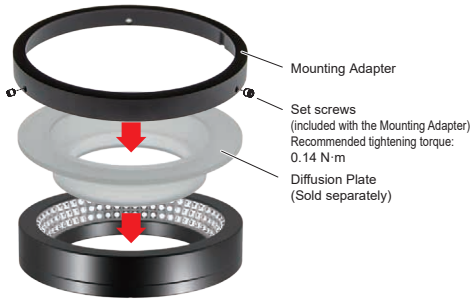
For attaching a diffusion plate or polarizing plate to the light unit.

Model Name*1	Applicable Light Unit
AD-LDR-PF-○○	LDR-PF Series
AD-LDR-PF-○○ -LA	LDR-PF-LA Series

*1 ○○ in the model name contains the light size.

▶ P.368

How to Install the Diffusion Plate



Protective Plates

Coaxial type units	Flat Dome type units

Protects the emitting part of the light unit.

Model Name*1	Applicable Light Unit
PR-LFV3-○○	LFV-G-PF Series
PR-LFXV-○○	LFXV-PF Series

*1 ○○ in the model name contains the light size.

PR-LFV3 Series ▶ P.135
PR-LFXV Series ▶ P.117

Light Control Films

Flat type units/Coaxial type units

Improves parallelism of light to reduce light diffraction.

Model Name*1	Applicable Light Unit
LC-LFV3-○○	LFV-PF Series
LC-TH2-○○-HO/VE*2	TH-PF Series

*1 ○○ in the model name contains the light size.
*2 Model suffix -HO/VE has a different louver direction.
HO: When installed with the cable outlet directly below, the louver direction is horizontal.
VE: When installed with the cable outlet directly below, the louver direction is vertical.

▶ P.367

Brackets

Bar type units	Flat type units

Secures light units.

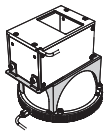
Model Name	Applicable Light Unit
BK-LDL-PF	LDL-PF Series
BK-TH-LE12	TH-PF Series

▶ P.369

Light Joint Brackets

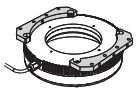
Model Name	Applicable Light Unit 1 (Common for all colors)	Applicable Light Unit 2 (Common for all colors)
BK-75-JO	HPD-PF-75	HPR-PF-75
BK-100-JO	HPD-PF-100	HPR-PF-100
BK-150-JO	HPD-PF-150	HPR-PF-150
BK-200-JO	HPD-PF-200	HPR-PF-200

Coaxial Light Joint Brackets



Model Name	Applicable Light Unit 1 (Common for all colors)	Applicable Light Unit 2 (Common for all colors)
BK-HPD2-75-LFV	HPD-PF-75	LFV-PF-35
BK-HPD2-100-LFV	HPD-PF-100	LFV-PF-50
BK-HPD2-150-LFV	HPD-PF-150	
BK-HPD2-200-LFV	HPD-PF-200	LFV-PF-70

Expansion Mounting Brackets



Model Name	Applicable Light Unit (Common for all colors)
BK-75-CI	HPD-PF-75 / HPR-PF-75
BK-100-CI	HPD-PF-100 / HPR-PF-100
BK-150-CI	HPD-PF-150 / HPR-PF-150
BK-200-CI	HPD-PF-200 / HPR-PF-200

▶ P.370

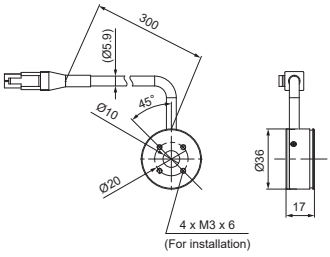
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

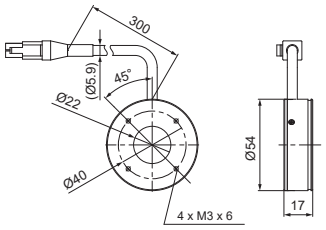
Dimensions (mm)

Ring Type
LDR-PF Series

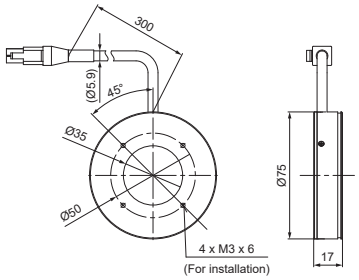
LDR-PF-36SW/RD



LDR-PF-54SW/RD

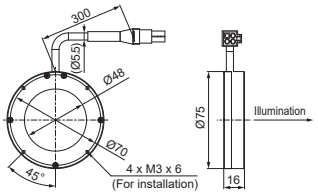


LDR-PF-75SW/RD

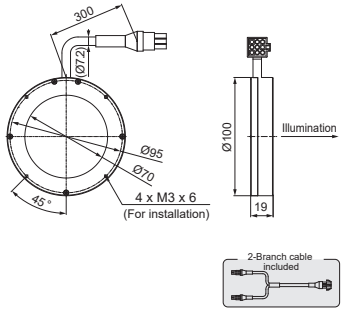


Low-Angle Ring Type
LDR-PF-LA Series

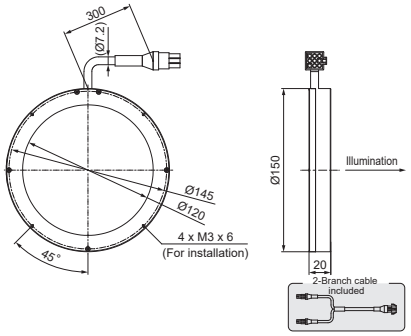
LDR-PF-75RD-LA / SW-LA



LDR-PF-100RD-LA / SW-LA

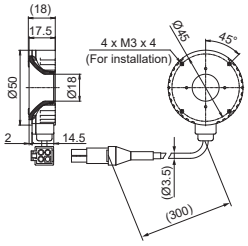


LDR-PF-150RD-LA / SW-LA

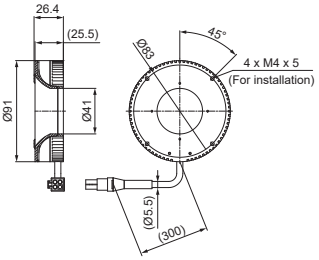


Diffused Ring Type
HPR-PF Series

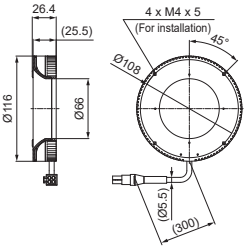
NEW HPR-PF-50SW/RD



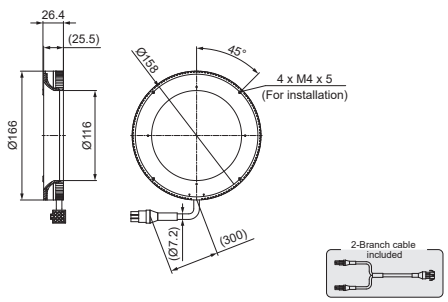
HPR-PF-75SW/RD



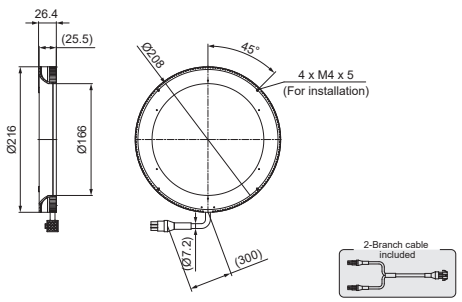
HPR-PF-100SW/RD



HPR-PF-150SW/RD



HPR-PF-200SW/RD



LDR2
LDR2-LA
LDR-LA1
SQR
SQR-TP
Ring (Direct)

HLDR3
HPR2
LFR
LKR
FPR
Ring (Convergent / Diffused)

FPQ3
Square

LDL2
LDLB
HLDL3
LB
Bar

TH2 (5 types)
LFL
Flat

HPD2
LDM2
LAV
PDM
LFXV
LFX3
LFX3-PT
Dome

LFV3
LFV3-G
Coaxial

MSU
MFU
Coaxial

PF
Strobe

HLDR-IP
HSL-PCL
Water-proof

Small COB Lights
COB

UV3/VL3
UV
LNSP-UV3-FN
UV / Violet

IR2 (Under 1000-nm Type)
IR (Over 1000-nm Type)
CIR
Infrared

IU
Intensity Control

HLV3
LV
LSP
HFS/HFR
HLV3-22-4-NR
HLV3-3M-RGB-4
PFBR-600SW2
PFBR-150
PFB3
Spot, Etc.

LNLP
LNSP2
Coaxial Units
LNSP-FN
LN/LN-HK
Line (Convergent)

LNSD
LND2
LT
LNV
LFXV (Rectangular Type)
TH2 (Rectangular Type)
Line (Diffused)

LNDG
LNIS2
LNIS
LNIS-FN
Line (Oblique Angled)

Telecentric Lens
Macro Lens
Lenses

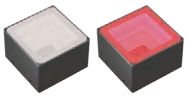
PF Series

Refer to our website for product details.

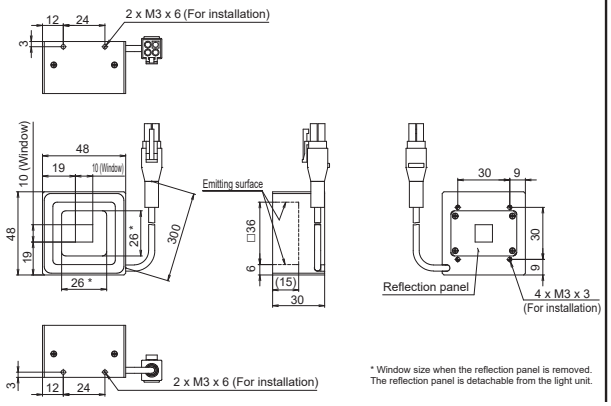
CCS High Power Strobe Lights ▶ Search

Dimensions (mm)

Low-Angle Square Type FPQ-PF Series

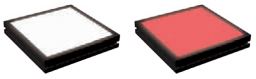


NEW FPQ-PF-48SW/RD

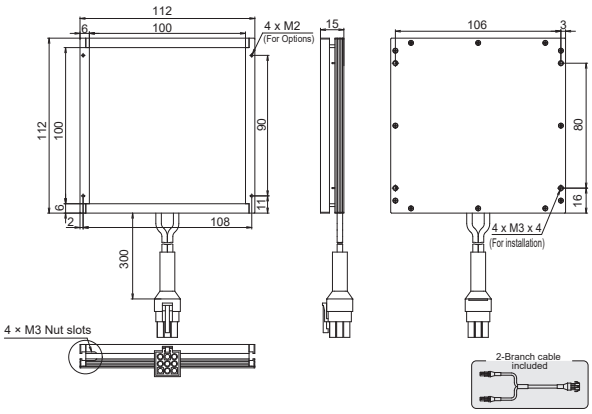


* Window size when the reflection panel is removed. The reflection panel is detachable from the light unit.

Flat Type TH-PF Series

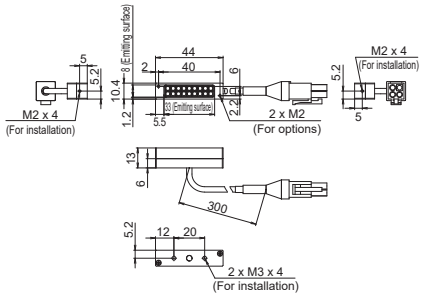


NEW TH-PF-100X100SW/RD



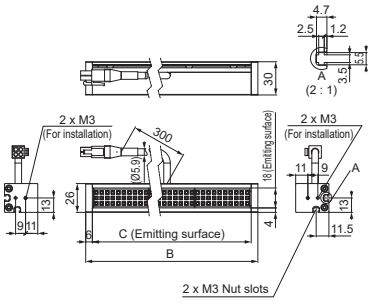
Bar Type LDL-PF Series

NEW **Emitting width 8 mm**



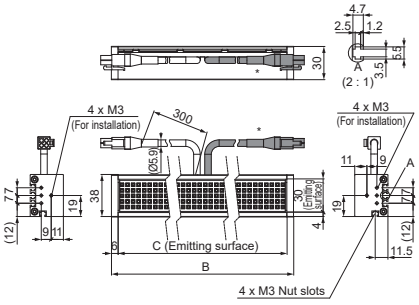
Model Name
LDL-PF-33X8SW/RD

Emitting width 18 mm



Model Name	B	C
LDL-PF-52X18SW / RD	64	52
LDL-PF-102X18SW / RD	114	102
LDL-PF-152X18SW / RD	164	152

Emitting width 30 mm

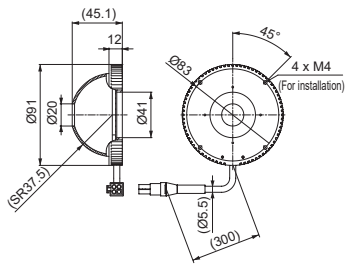


* The LDL-PF-152X30SW/RD light unit has two connectors.

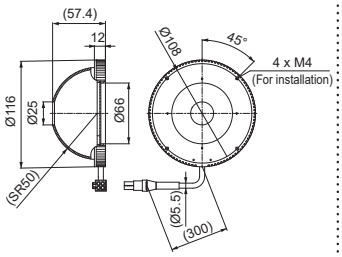
Model Name	B	C
LDL-PF-52X30SW / RD	64	52
LDL-PF-102X30SW / RD	114	102
LDL-PF-152X30SW / RD	164	152

Dome Type HPD-PF Series

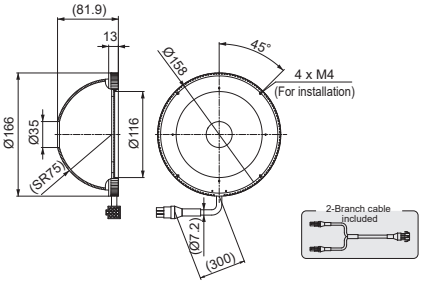
HPD-PF-75SW/RD



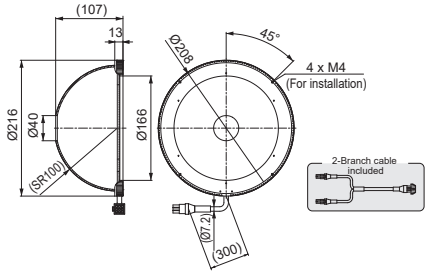
HPD-PF-100SW/RD



HPD-PF-150SW/RD



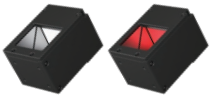
HPD-PF-200SW/RD



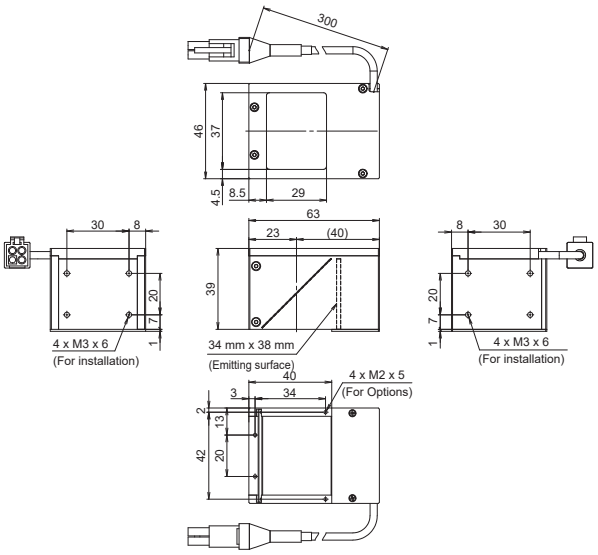
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Coaxial Type (High-Resolution) LFV-G-PF Series

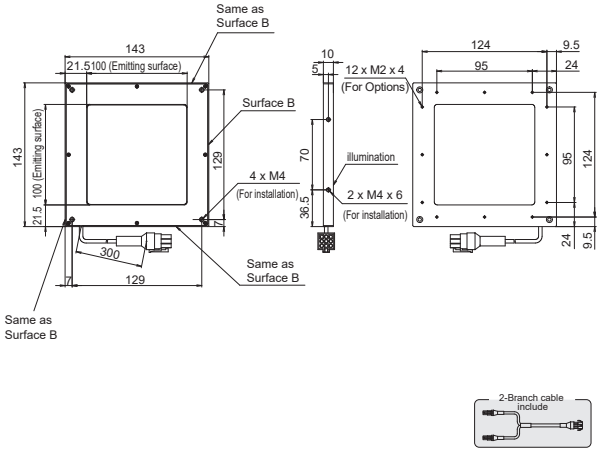


NEW **LFV-G-PF-35SW/RD**

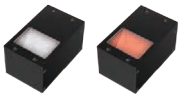


Flat Dome Type LFXV-PF Series

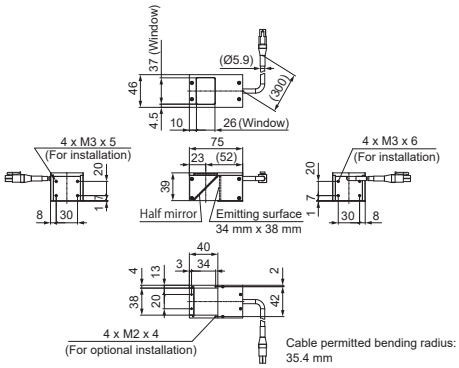
NEW **LFXV-PF-100SW/RD**



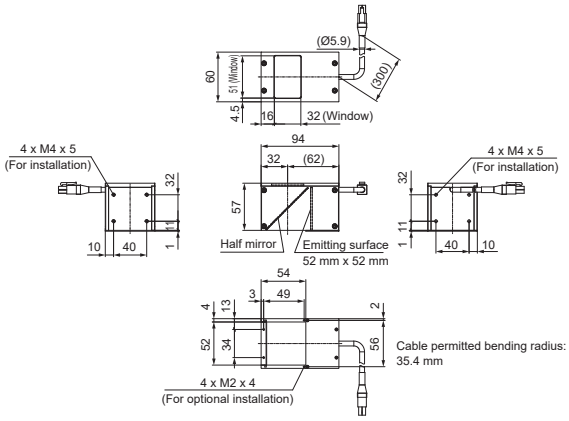
Coaxial Type LFV-PF Series



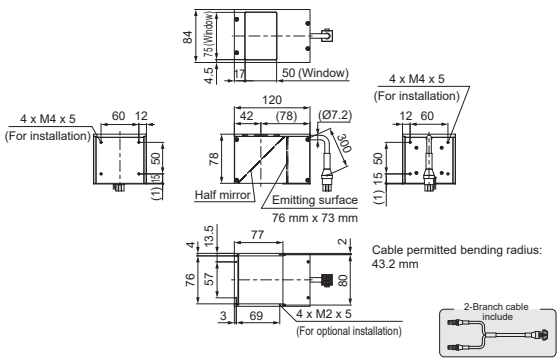
LFV-PF-35SW/RD



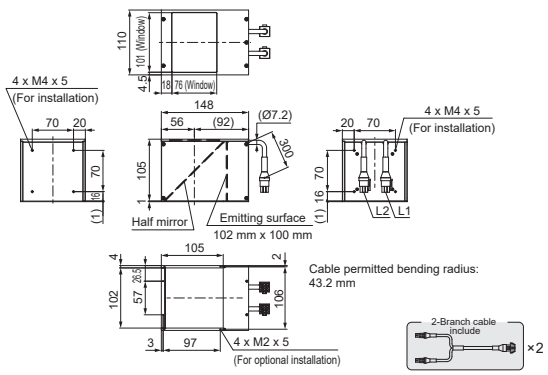
LFV-PF-50SW/RD



LFV-PF-70SW/RD



LFV-PF-100SW/RD



Refer to our website for product details.

CCS HLDR-IP ▶ Search

HLDR-IP Series

Provides diffused light converged by a lens

HLDR-IP67-100RD

HLDR-IP67-100SW

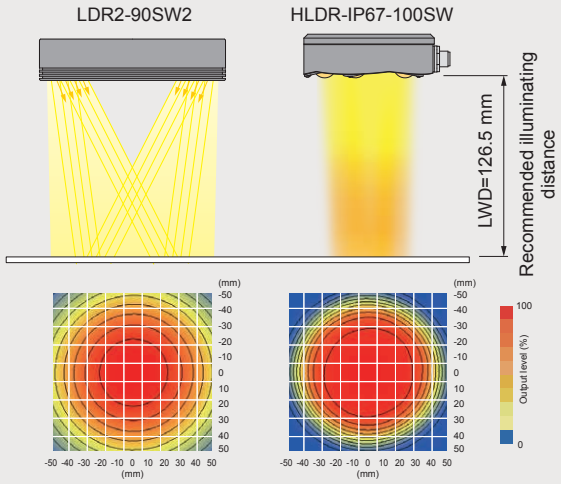
HLDR-IP67-100UV3/VL3

Applications Fault inspection for metal parts, visual inspection for rubber parts, visual inspection for resin parts, adhesive application inspection for food containers (UV), etc.

Achieves Convergent Illumination

The HLDR-IP Series features convergent ring lights that ensure brightness with a convergent lens.

Comparison of illumination between a ring light and the HLDR-IP Series



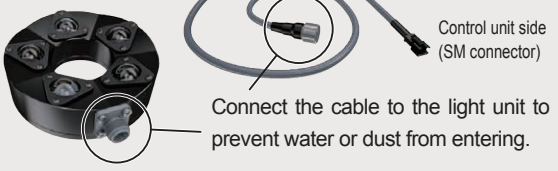
IP67 Compliant

It has a waterproof and rustproof structure for use in harsh environments. Optimal for sites where manufacturing lines must be cleaned, such as for food and chemicals.

Waterproof Ring Light HLDR-IP Series

- Convergent ring light
- Emitted color: Red, white, UV (365 nm)
- IP67 compliant
- Uses an M12 connector

Uses an M12 connector



Connect the cable to the light unit to prevent water or dust from entering.

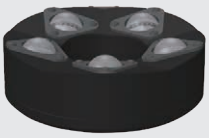
Custom Order Example

Please contact your CCS sales representative.

E.g.: Changed the illuminating angle

Illuminating angle

Creating a light unit with a changed converging distance



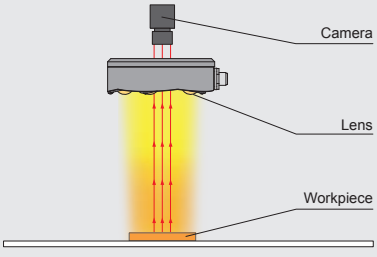
Customizable items

External/internal diameter | Wavelength/ color | Increase output | Cable length | Illuminating angle | Format/ material | Connector format | Installation/ mounting | Etc.

Example Configuration

Convergent waterproof ring light that ensures brightness with a convergent lens.

HLDR-IP67-100



Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent / Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

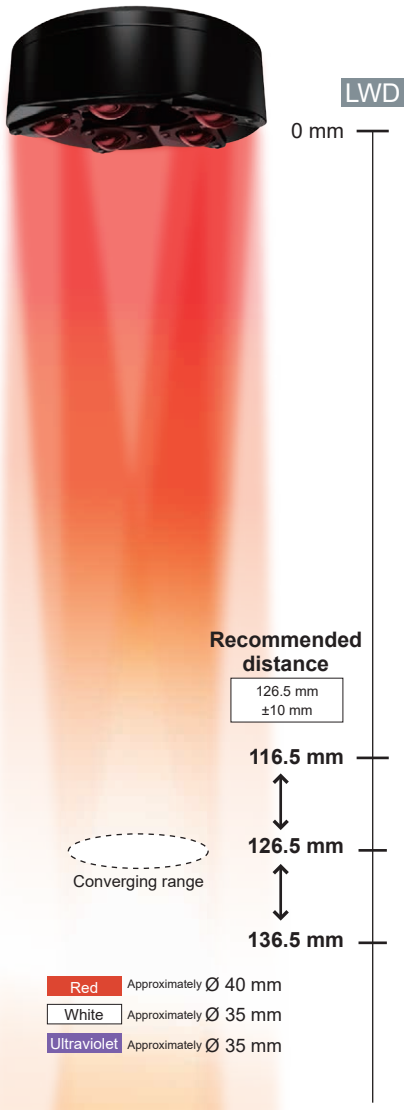
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Regarding Recommended Distance

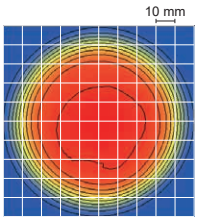
The data included is for reference only. Actual values may vary.

Convergent illumination image

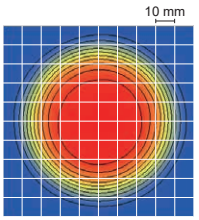


LWD=116.5 mm

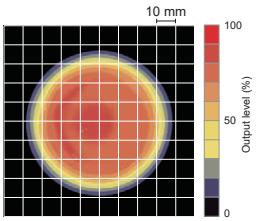
Illuminance Approximately **59,000** lx — Red



Illuminance Approximately **138,000** lx — White

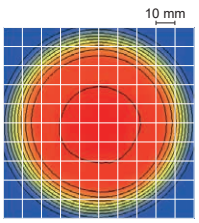


Ultraviolet (HLDR-IP67-100UV3-365)

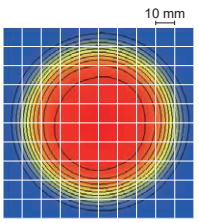


LWD=126.5 mm

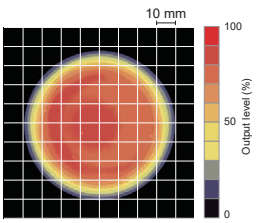
Illuminance Approximately **53,000** lx — Red



Illuminance Approximately **124,000** lx — White

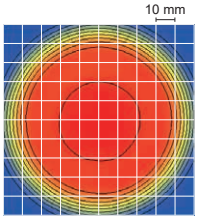


Ultraviolet (HLDR-IP67-100UV3-365)

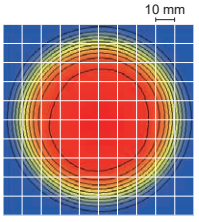


LWD=136.5 mm

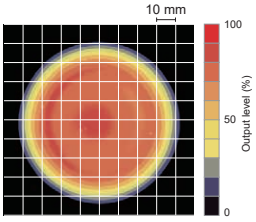
Illuminance Approximately **47,000** lx — Red

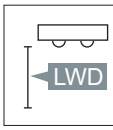


Illuminance Approximately **113,000** lx — White



Ultraviolet (HLDR-IP67-100UV3-365)





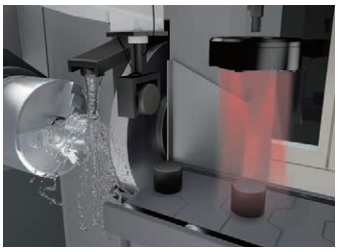
- Converged near LWD=126.5 mm.
- If the recommended range (126.5 mm±10 mm) is exceeded, the uniformity may change and the imaging may be affected.
- LWD is the distance from the light unit to the workpiece.

Safe to Use When Washing Manufacturing Lines

■ When washing manufacturing lines

Food, chemicals, etc.

■ For manufacturing lines that use water



Automotive parts, etc.

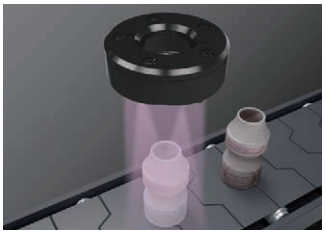
You can inquire using our website.
Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products
Inquire on our website here.
https://www.ccs-grp.com/contact/

HLDR-IP Series

Refer to our website for product details.

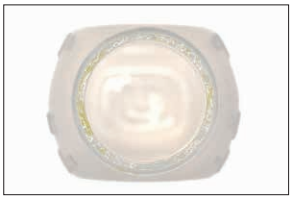
CCS HLDR-IP ▶ Search

Imaging Example: Fluorescent Observation of Adhesive on Plastic Containers



Description	Application inspection for adhesive
Workpiece	Plastic containers
Conventional lighting	LED visible light lighting
New lighting	HLDR-IP67-100UV3-365
Result	Only detects the adhesive

Workpiece image

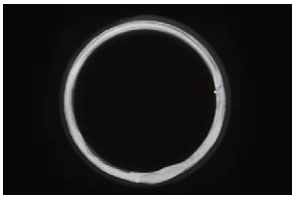


Plastic containers

LED visible light lighting

It was difficult to detect the application of the adhesive using visible light lighting.

HLDR-IP67-100UV3-365



Only the adhesive causes fluorescent scattering, allowing for an image of the application status.

Lineup

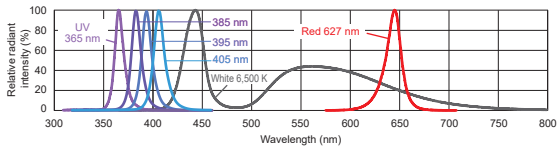
Model Name	LED Color	Power Consumption	Peak Wavelength / Correlated Color Temperature	Dedicated Cables	Recommended Control Units	Weight
HLDR-IP67-100RD	Red	24 V / 18 W	627 nm	FCB-M12 Straight Cable ▶ P.158	PD4, PD3	420 g
HLDR-IP67-100SW	White		6,500 K			
HLDR-IP67-100UV3-365	Ultraviolet		365 nm			
HLDR-IP67-100VL3-□ *1	Violet		385/395/405 nm			

*1 □ in the model name contains the wavelength (385, 395, or 405). This is a special order.
Please inquire if you would like to use in combination with a strobe control unit (overdrive type).

Dedicated Cables ▶P.158 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

LED Properties

Spectral distribution



CCS offers you the most suitable lens filter for each wavelength.
For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Options

Transmits light with wavelength range of 290 nm to 365 nm. (Transmission of 90% min.)

Band-pass filter
F-BP324

Model Name	Size
F-BP324	25 sizes (Refer to the pages on optional products.)

▶ P.359

Other various band-pass filters used for different wavelengths are available. For details, refer to the pages on optional lens filters.

▶ P.359

Blocks light with a wavelength of 420 nm or lower, transmits light with a longer wavelength.

Ultraviolet cutting filter
L42 Series

Model Name	Size
L42-25	M25.5 P0.5
L42-27	M27.0 P0.5
L42-30	M30.5 P0.5
L42-40	M40.5 P0.5
L42-46	M46.0 P0.75

▶ P.362

Transmits light in a wavelength range from approximately 280 to 380 nm centered on 340 nm.

Ultraviolet transmission filter
U340 Series

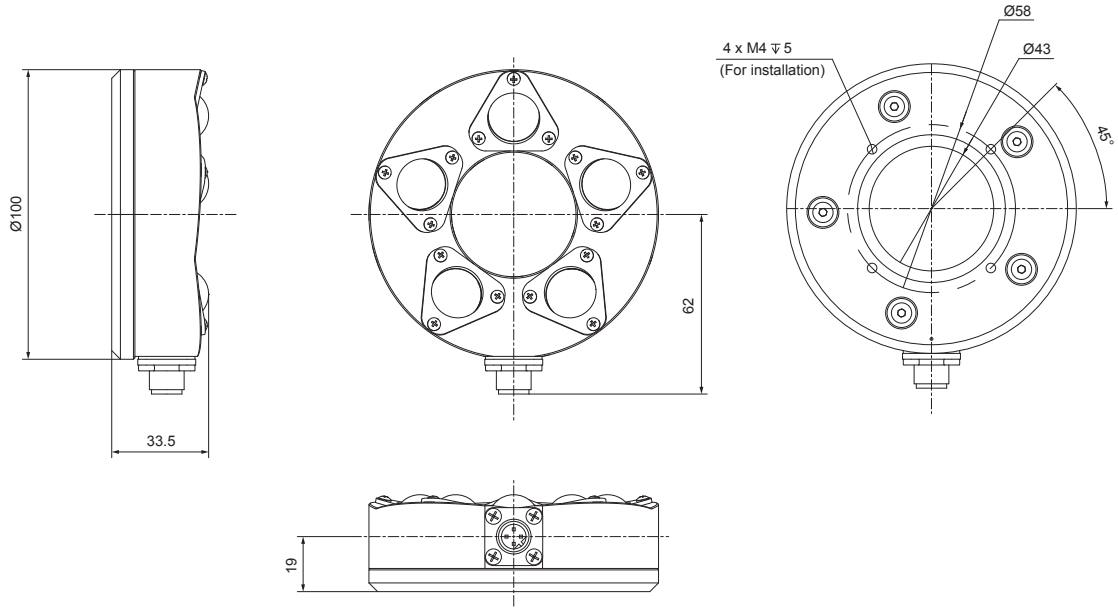
Model Name	Size
U340-25	M25.5 P0.5
U340-27	M27.0 P0.5
U340-30	M30.5 P0.5
U340-40	M40.5 P0.5
U340-46	M46.0 P0.75

▶ P.362

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

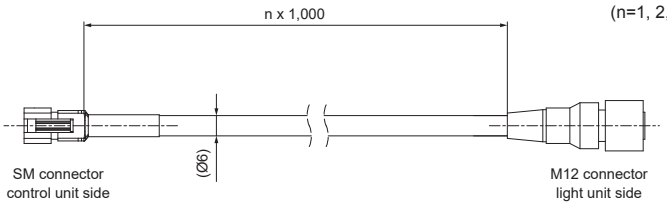
Dimensions (mm)

HLDR-IP67-100 (same for all colors)



Dedicated Cable

Model Name	Cable Length	Weight
FCB-1-M12	1 m	70 g
FCB-2-M12	2 m	125 g
FCB-3-M12	3 m	180 g
FCB-5-M12	5 m	305 g



SM connectors are not waterproof.

Cable permitted bending radius: 40 mm
The above cable permitted bending radius is a reference value. Actual value may vary.

Regarding Case Materials

	LED Light (Common for all colors)	Dedicated cable
Case material	Body: aluminum alloy (black anodized) Screws: SUS Washers: SUS, elastomer (TPE) Connectors: PA resin Lens: silicone	Light unit side connector: soft PBT Cable: PVC Control unit side connector: nylon

Indicates the details for materials only regarding the external parts.

Note

"IP67" indicates the level of protection against foreign material entering electrical instruments

The 1st numeral "6" indicates the following level of protection:

- No dust inside the instrument. (dustproof)

The 2nd numeral "7" indicates the following level of protection:

- No damage when submerged in water at the rated pressure for the rated time. (watertight type)
- Can be submerged in water to a depth of 1 m (for instruments with a height of less than 850 mm) for 30 minutes.

Cautionary Information regarding Waterproofing

- After cleaning manufacturing lines, be sure to wipe away any moisture remaining on the lens.
  Imaging can be affected by moisture on the lens.
- Use water to wash away any cleaning agent adhered to this product.
- Use water to wash away any oils or chemicals adhered to this product.
- The control unit connectors (SM connectors) on dedicated cables are not waterproof.

Cautionary Information regarding UV Products

- Do not expose your eyes or skin to direct UV irradiation.
- When using an UV illumination, be sure to wear UV blocking eye wear and avoid looking at irradiating parts (emitting parts).
- Do not turn on UV-LED irradiating parts (emitting parts) if they are facing someone's eyes.
- Wear long sleeves and gloves to protect your skin from UV irradiation.
- Thoroughly educate all those involved near the product about the dangers of UV LEDs.

E.g.: UV blocking eye wear

Refer to our website for product details.

CCS HSL-PCL ▶ Search

HSL-PCL Series

High-Power Spot Lights

HSL-58RD-D300PCL

HSL-58SW-D300PCL

HSL-58BL-D300PCL

HSL-58GR-D300PCL

CE

Note: These products are sold only outside Japan.

Features

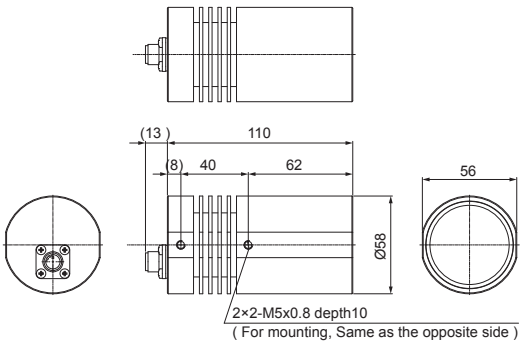
- For replacement of halogen
- Long lifetime
- Low power consumption
- High uniformity
- IP67 Compliant

Model name	LED color
HSL-58RD-D300PCL	Red
HSL-58SW-D300PCL	White
HSL-58BL-D300PCL	Blue
HSL-58GR-D300PCL	Green

Common Specifications

LED color	Red, White, Blue, Green
Peak wavelength	Red: 645 nm typ., Blue: 470 nm typ., Green: 520 nm typ.
Power consumption	2.8 W max.
Polarity & signal	1: (+), 2: no connection, 3: (-), 4: (R)
Housing material	Aluminum
Cooling method	Natural air cooling
Recommended LWD	2,000 mm or less
Operating temperature and humidity	Temperature: 0 to 40°C, Humidity: 20% to 85%RH (with no condensation)
Storage temperature and humidity	Temperature: -20 to 60°C, Humidity: 20% to 85%RH (with no condensation)
Weight	400 g
Recommended controller	CC-PJ Series *Refer to P.351 for more details.

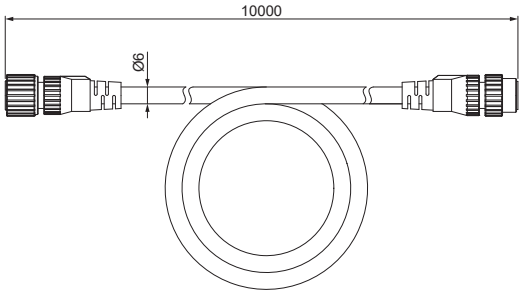
Dimensions (mm)

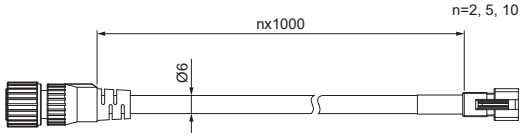


HSL-PCL Cables

Dimensions (mm)

Extension cable





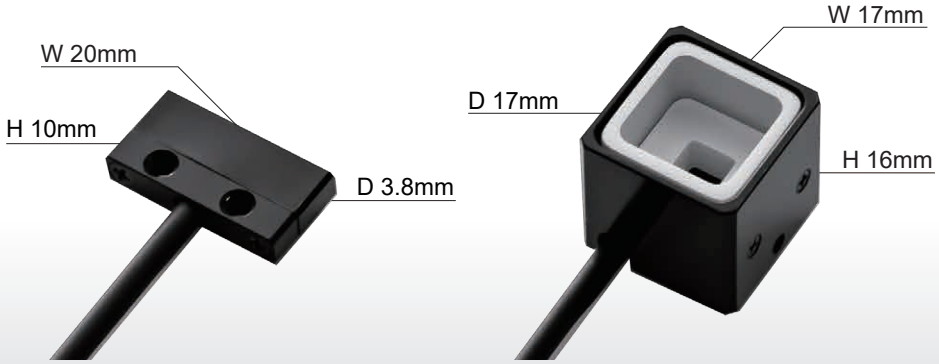
2 m	FCB-2-HSL-SM
5 m	FCB-5-HSL-SM
10 m	FCB-10-HSL-SM
10 m	FCB-EX10-HSL (Extension cable)

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Helps save space and can be used in narrow installation space

Built to order
This is a made-to-order product. For queries and details, contact your CCS sales representative.



Custom order products: The warranty period of the custom order product is different from that of the CCS standard products. Contact our local sales office for details.

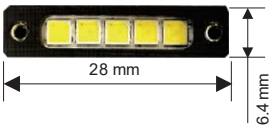
Applications For lighting in a narrow space / Auxiliary light source for robot hands and robot arms / Lighting when adding inspection items

COB types are adopted for a smaller product

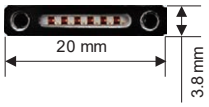
COB (chip-on-board) type LEDs are used to make the unit even smaller.

Comparison with Standard Products

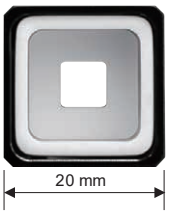
LDL2-19X4



LDL2-11X1-CBTSP



FPQ3-20



FPQ3-17-CBTSP

Lineup

Classification	Series	Model Name *1	Light Emitting Surface Size	Power Consumption RD (Red)	SW (White)	BL (Blue)	IR85 (Infrared)	Recommended Control Units		Weight
Custom order products	LDL2	LDL2-11×1 □□ -CBTSP	11.4×1.4mm	0.8 W				PD4	PD3	10 g
	FPQ3	FPQ3-17 □□ -CBTSP	12 ×12mm	1.6 W			1.1 W	CC-ST-1024	POD	20 g

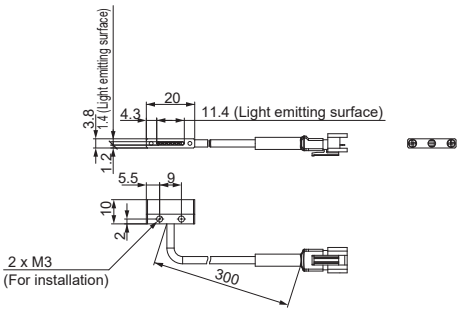
*1 □□ in the model name contains the LED color.
(RD: Red, SW: White, BL: Blue, IR85: Infrared)

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

Peak wavelength / correlated color temperature
- LDL2: Red 621 nm, White 6000 K, Blue 460 nm, Infrared 855 nm
- FPQ3: Red 621 nm, White 5200 K, Blue 460 nm, Infrared 855 nm

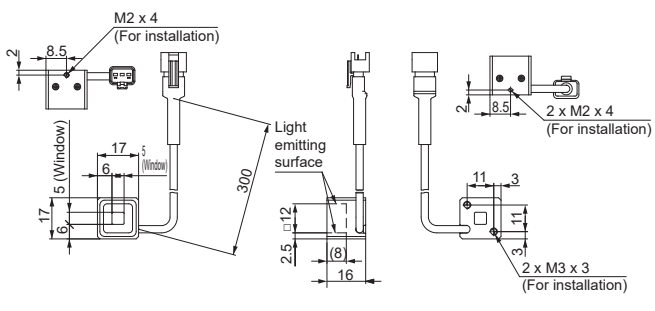
Dimensions (mm)

LDL2-11X1-CBTSP



Note: This product does not have a structure that prevents the cable from being disconnected

FPQ3-17-CBTSP



Note: This product does not have a structure that prevents the cable from being disconnected

UV3/VL3 Series

Refer to our website for product details.

CCS UV3/VL3 ▶ Search

Increased range of applications with high output and 4 wavelengths

LDR2-60UV3/VL3-N
(Narrow Type)

LDL-71X12UV3/VL3-N
(Narrow Type)

LN-61UV3/VL3

LDR2-60UV3/VL3-W
(Wide Type)

LDL-71X12UV3/VL3-W
(Wide Type)

HLDR-IP67-100UV3/VL3

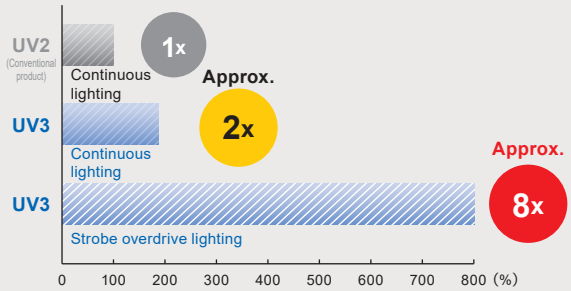
HLV2-24UV3/VL3

* 365 nm wavelength for ultraviolet light UV3 Series. 385 nm, 395 nm, and 405 nm wavelengths for violet light VL3 Series.

Applications Special ink observation, deep magnetic particle scratch inspection, adhesive coating inspection, deep penetration scratch inspection, coating inspection, etc.

Increased Brightness When Overdriving

Comparison with a conventional product (LDR2-60UV3-365-N)



* Comparison between the LDR2-60UV3-365-N and LDR2-60UV2-365-N at 100 mm LWD. The increase in brightness varies depending on model.(These values are for reference only and are not guaranteed values.)

Imaging special ink on can

Example of imaging with UV2
(Continuous lighting)

A lack of brightness makes it difficult to perform fluorescence observation for special inks.

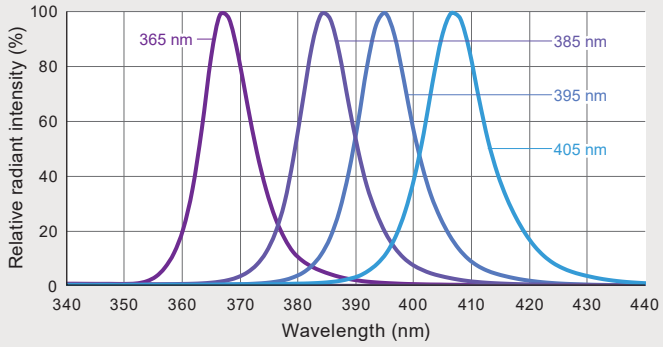
Example of imaging with UV3
(Strobe overdrive lighting)

Enables fluorescence observation for special inks even with faster shutter speed.

* Comparison of imaging at 1ms shutter speed

4 Wavelengths (365/386/395/405 nm) Expand Possible Applications

Spectral distribution



* 365 nm wavelength for ultraviolet light UV3 Series. 385 nm, 395 nm, and 405 nm wavelengths for violet light VL3 Series.

Cautionary Information regarding UV Products

- Do not expose your eyes or skin to direct UV irradiation.
- When using UV illumination, be sure to wear UV blocking eye wear and avoid looking at irradiating parts (emitting parts).
- Do not turn on UV-LED irradiating parts (emitting parts) if they are facing someone's eyes.
- Wear long sleeves and gloves to protect your skin from UV irradiation.
- Thoroughly educate all those involved near the product about the dangers of UV LEDs.

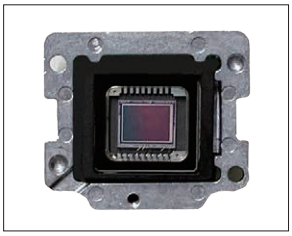
E.g.:
UV blocking eye wear

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Imaging Example: Imaging Adhesive on an Imaging Sensor Substrate

Workpiece image

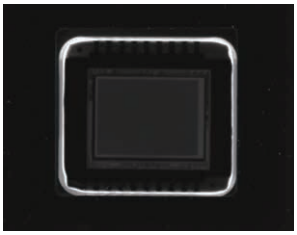


Imaging sensor substrate

White LED lighting (LDR2-90-30SW2)

It is difficult to capture the adhesive with white LED lighting.

UV-LED lighting (LDR2-100UV3-365-W)



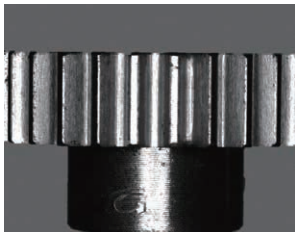
With UV light, the adhesive can be observed because of emitted fluorescent light.

Imaging Example: Imaging of Grease Applied on a Gear Part

Workpiece image

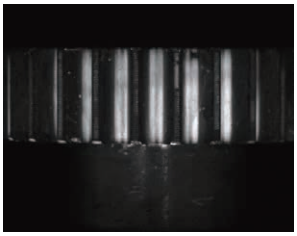
Gear part

White LED lighting (LDR2-90SW2)



With white light, it is difficult to capture the application of the grease on the uneven surface.

UV-LED lighting (LDL-138X12UV3-365-W)



With UV light, the application of the grease can be observed because of emitted fluorescent light.

Data: Relative Irradiance Graph and Uniformity (Representative Example)

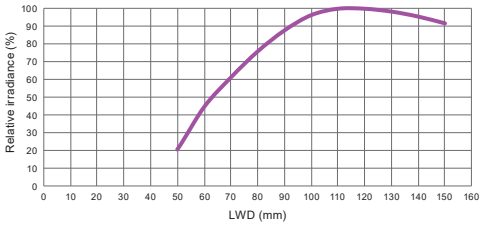
The data included is for reference only. Actual values may vary.

LDR2-100UV3-365-N (Narrow Type)

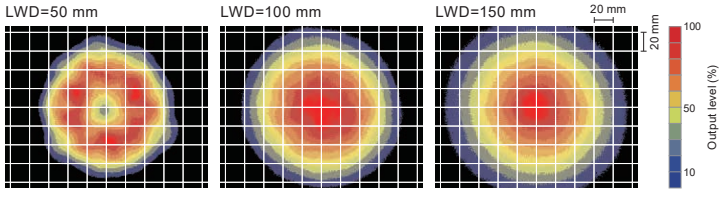
Relative irradiance graph*1 (LWD characteristics)*2

*1 Irradiance on the optical axis

*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



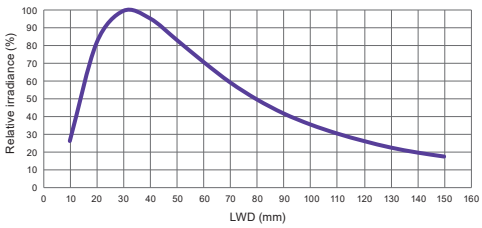
* At short distances, uniformity of irradiation from narrow type light units is reduced. This may affect imaging depending on the type of workpiece.

LDR2-100UV3-365-W (Wide Type)

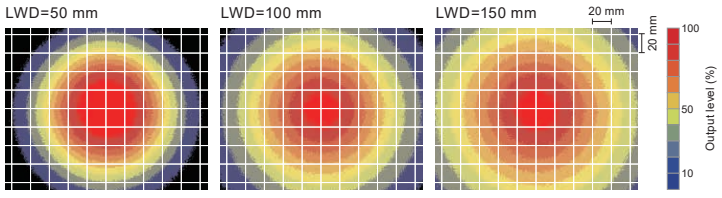
Relative irradiance graph*1 (LWD characteristics)*2

*1 Irradiance on the optical axis

*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



UV3/VL3 Series

Refer to our website for product details.

CCS UV3/VL3 ▶ Search

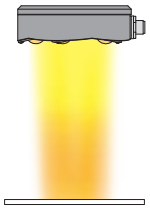
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only.
Actualvalues may vary.

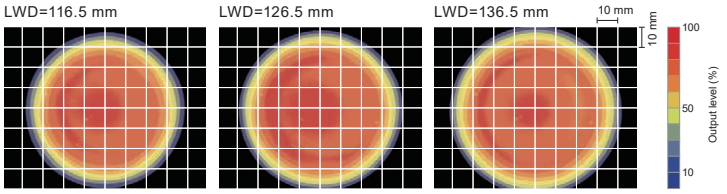
HLDR-IP67-100UV3-365

Regarding recommended distance

Recommended illuminating distance
(126.5 mm±10 mm)
If distance is exceeded, the uniformity may change and the imaging may be affected.



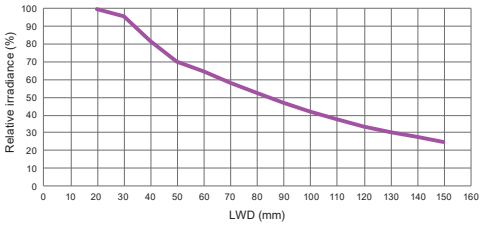
Uniformity (Relative irradiance)



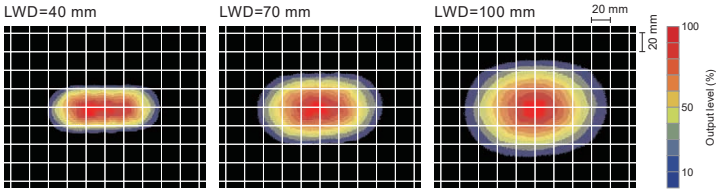
LDL-71X12UV3-365-N (Narrow Type)

Relative irradiance graph*1 (LWD characteristics)*2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)

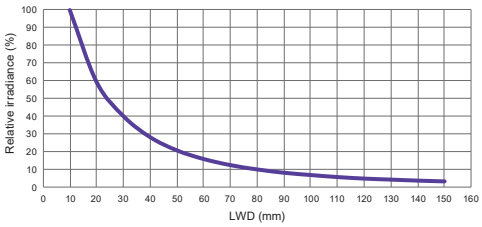


* At short distances, uniformity of irradiation from narrow type light units is reduced. This may affect imaging depending on the type of workpiece.

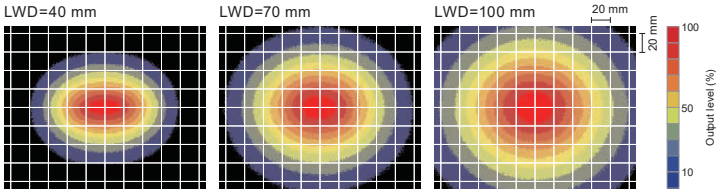
LDL-71X12UV3-365-W (Wide Type)

Relative irradiance graph*1 (LWD characteristics)*2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



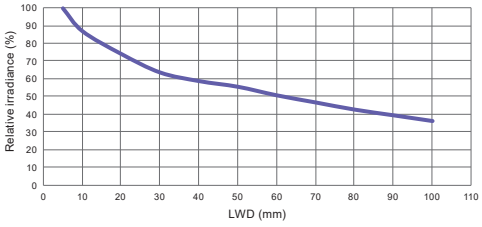
Uniformity (Relative irradiance)



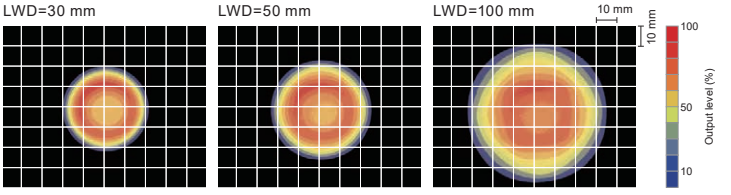
HLV2-24UV3-365

Relative irradiance graph*1 (LWD characteristics)*2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



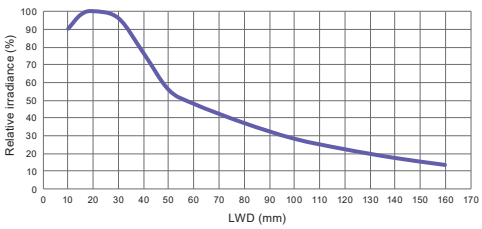
Uniformity (Relative irradiance)



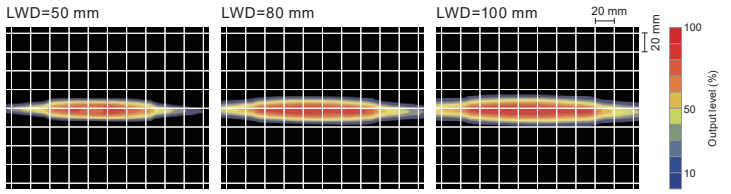
LN-61UV3-365

Relative irradiance graph*1 (LWD characteristics)*2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Lineup End of the model name -N: Narrow Type / -W: Wide Type

Wavelength 385/395/405 nm will be manufactured on a built-to-order system.

Model Name*1	LED Color	Power Consumption	Extension Cables	Recommended Control Units	Weight
LDR2-60UV3-365-N/-W	Ultraviolet	24 V / 7.6 W	FCB*2 Straight Cable FCB-W*3 2-branch Cable FCB-F 4-branch Cable FRCB Robot Cable	PD4 PD3 CC-ST-1024 POD*4	End of the model name -N: 80g End of the model name -W: 85g
LDR2-60VL3-□-N/-W	Violet				
LDR2-100UV3-365-N/-W	Ultraviolet	24 V / 23 W		PD4 PD3 POD*4	End of the model name -N: 210g End of the model name -W: 240g
LDR2-100VL3-□-N/-W	Violet				
LDL-71X12UV3-365-N/-W	Ultraviolet	24 V / 7.6 W		PD4 PD3 CC-ST-1024 POD*4	270 g
LDL-71X12VL3-□-N/-W	Violet				
LDL-138X12UV3-365-N/-W	Ultraviolet	24 V / 16 W			450 g
LDL-138X12VL3-□-N/-W	Violet				
LDL-205X12UV3-365-N/-W	Ultraviolet	24 V / 23 W		PD4 PD3 POD*4	600 g
LDL-205X12VL3-□-N/-W	Violet				
LDL-339X12UV3-365-N/-W	Ultraviolet	24 V / 38 W			950 g
LDL-339X12VL3-□-N/-W	Violet				
LN-61UV3-365	Ultraviolet	24 V / 7.6 W		PD4 PD3 CC-ST-1024 POD*4	430 g
LN-61VL3-□	Violet				
LN-128UV3-365	Ultraviolet	24 V / 16 W			700 g
LN-128VL3-□	Violet				
LN-195UV3-365	Ultraviolet	24 V / 23 W		PD4 PD3	970 g
LN-195VL3-□	Violet				
HLDR-IP67-100UV3-365	Ultraviolet	24 V / 18 W	FCB-M12 Straight Cable (Dedicated cables)	PD4 PD3 POD*4	420 g
HLDR-IP67-100VL3-□	Violet				
HLV2-24UV3-365	Ultraviolet	0.7 A / 2.8 W	FCB*2 Straight Cable FRCB Robot Cable	PD3 CC-PJ-0707 PJ PJ2	50 g
HLV2-24VL3-□	Violet				

*1 □ in the model name contains the wavelength 385/395/405.
*2 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*3 The cables with a model name that ends with "-EL2" are not included.
*4 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

Note: Models without POD as the recommended control unit cannot be used in combination with the strobe overdrive control unit. Please contact us if you would like to make a special order for the combination.

About HLDR-IP67

Case Material

	LED Light	Dedicated Cables
Case Material	Body: aluminum alloy (black anodized) Screws: SUS Washers: SUS, elastomer (TPE) Connectors: PA resin Lens: silicone	Light unit side connector: soft PBT Cable: PVC Control unit side connector: nylon

Note

The 1st numeral "6" indicates the following level of protection:
- No dust inside the instrument. (dustproof)

The 2nd numeral "7" indicates the following level of protection:
- No damage when submerged in water at the rated pressure for the rated time. (watertight type)
- Can be submerged in water to a depth of 1 m (for instruments with a height of less than 850 mm) for 30 minutes.

Cautionary Information regarding Waterproofing

- After cleaning manufacturing lines, be sure to wipe away any moisture remaining on the lens. Imaging can be affected by moisture on the lens.
- Use water to wash away any cleaning agent adhered to this product.
- Use water to wash away any oils or chemicals adhered to this product.
- The control unit connectors (SM connectors) on dedicated cables are not waterproof.

UV3/VL3 Series

Refer to our website for product details.

CCS UV3/VL3 ▶ Search

Options

Blocks light with a wavelength of 420 nm or lower, transmits light with a longer wavelength.

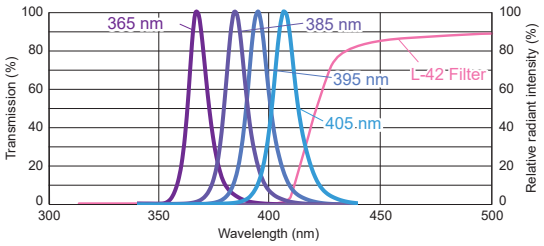
Ultraviolet cutting filter
L42 Series

Model Name	Size
L42-25	M25.5 P0.5
L42-27	M27.0 P0.5
L42-30	M30.5 P0.5
L42-40	M40.5 P0.5
L42-46	M46.0 P0.75

▶ P.362

* Y48 filters to absorb wavelengths 480 nm or smaller are available for VL3 Series. Contact our local sales office for details.

Filter Characteristics and UV-LED Spectral Distribution

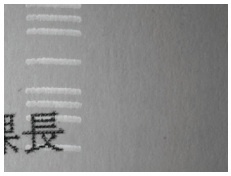


Imaging Examples

Workpiece

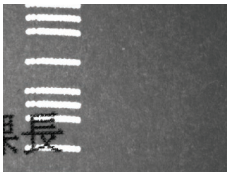
Postcard

Without ultraviolet cutting filter



Without a filter, both UV and visible light are captured.

With ultraviolet cutting filter



By using a UV cut filter, only the excited scattering light from the ink will be captured.

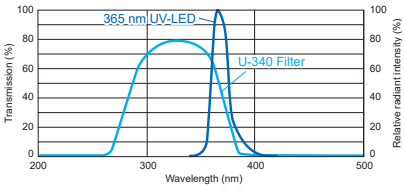
Transmits light with wavelength range of approx. 280 nm to 380 nm, centered around 340 nm.

Ultraviolet transmission filter
U340 Series

Model Name	Size
U340-25	M25.5 P0.5
U340-27	M27.0 P0.5
U340-30	M30.5 P0.5
U340-40	M40.5 P0.5
U340-46	M46.0 P0.75

▶ P.362

Characteristics of UV Transmission Filter and UV-LED Spectral Distribution



Transmits light with a specific range of wavelength and is available for a wide range of fluorescent wavelengths

Band-pass filter
F-BP Series

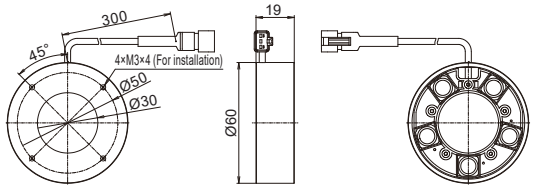
- High transmittance at 90% or greater
- Hard coated filter with high durability
- Twelve-product lineup available for a wide range of wavelengths

▶ P.359

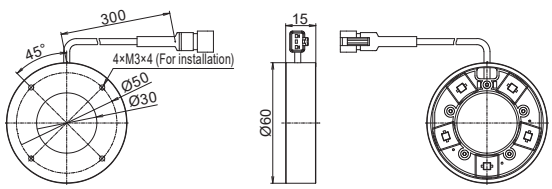
Dimensions (mm)

Ring Lights

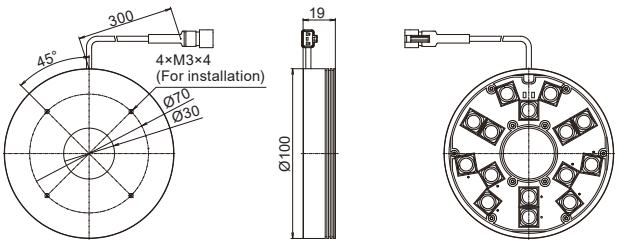
LDR2-60UV3/VL3-N (Narrow Type)



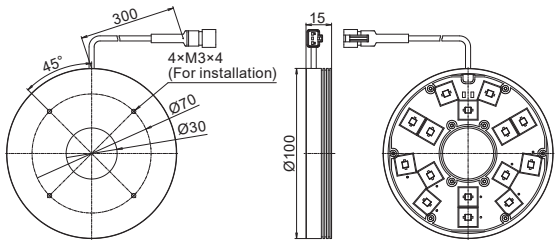
LDR2-60UV3/VL3-W (Wide Type)



LDR2-100UV3/VL3-N (Narrow Type)



LDR2-100UV3/VL3-W (Wide Type)



Various technical documents available.

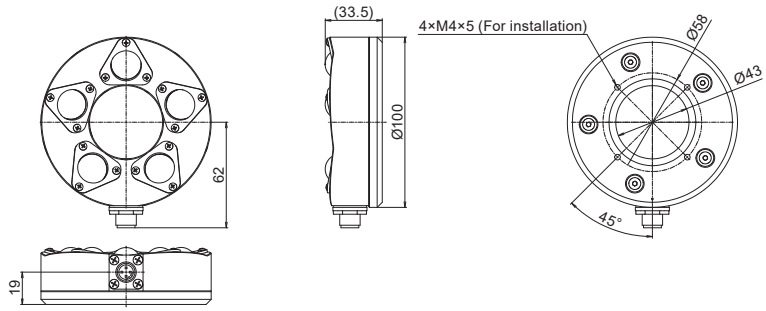
PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Dimensions (mm)

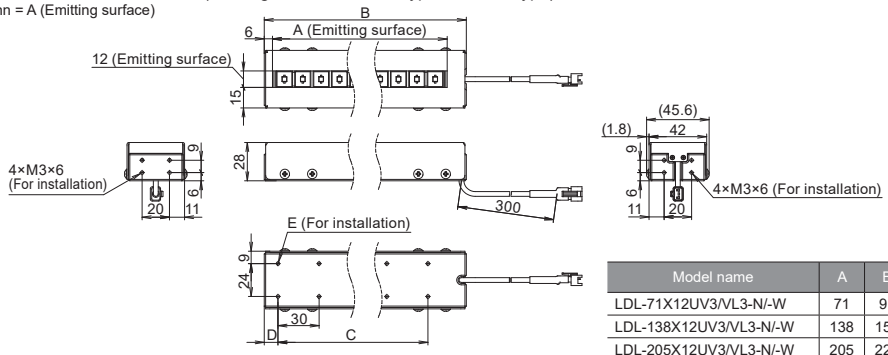
Ring Lights (Waterproof Type)

HLDR-IP67-100UV3/VL3



Bar Lights

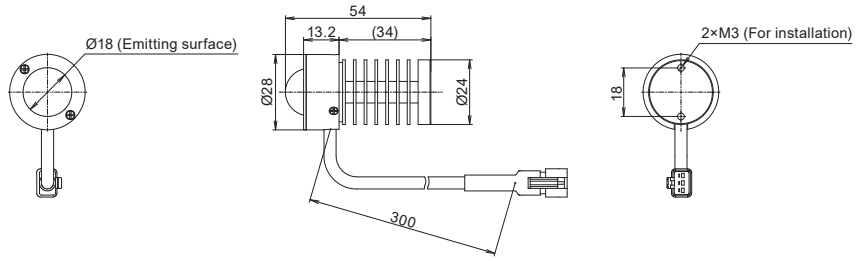
LDL-nnnX12UV3/VL3-N/-W (drawings for both narrow type and wide type)
nnn = A (Emitting surface)



Model name	A	B	C	D	E
LDL-71X12UV3/VL3-N/-W	71	91	P30×2=60	10	6×M3×6
LDL-138X12UV3/VL3-N/-W	138	158	P30×4=120	10	10×M3×6
LDL-205X12UV3/VL3-N/-W	205	225	P30×6=180	20	14×M3×6
LDL-339X12UV3/VL3-N/-W	339	359	P30×10=300	29.5	22×M3×6

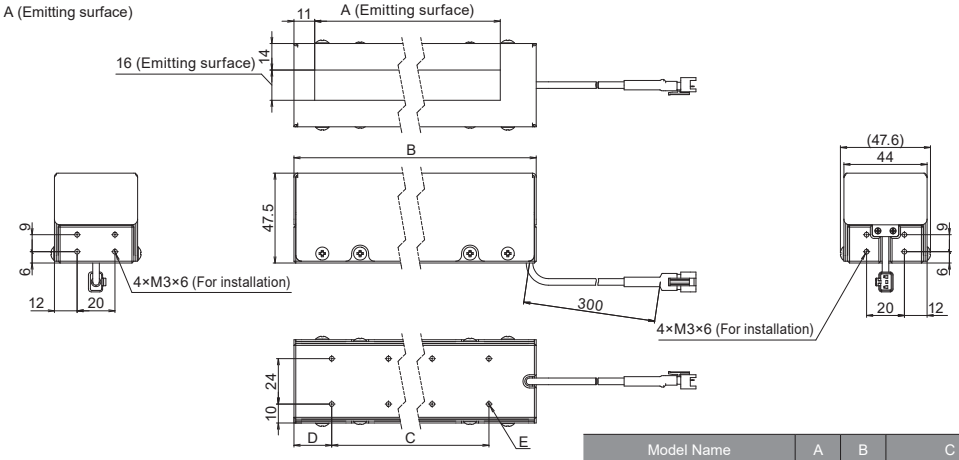
Spot Lights

HLV2-24UV3/VL3



Line Lights

LN-nnnUV3/VL3
nnn = A (Emitting surface)



Model Name	A	B	C	D	E
LN-61UV3/VL3	61	91	P30×2=60	10	6×M3×6
LN-128UV3/VL3	128	158	P30×4=120	10	10×M3×6
LN-195UV3/VL3	195	225	P30×6=180	20	14×M3×6

Ultraviolet Lighting

Ultraviolet Lights

UV Series

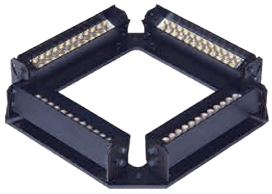
Refer to our website for product details.

CCS UV ▶ Search

Varied light unit lineup using original UV-LEDs


LDR2-100UV365-LA


LDR2-90UV365


LDQ-100UV365


LN-200UV365


LDR-75UV365-LA-1


SQR-56UV365


LDL-82X15UV365


LDL-42X15UV365


LSP-41UV365

Applications Detecting seal material through fluorescent excitation, reading invisible code, inspections using differences in spectral reflectivity, inspections using differences in scattering rates, etc.

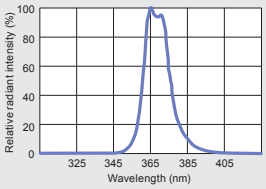
Uses Original UV-LEDs

Uses LEDs with our unique spark prevention mechanism

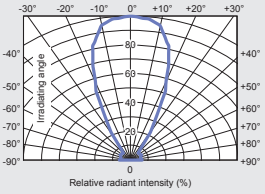
Because they have a steel alloy cap, many ultraviolet LEDs are susceptible to static electricity or impact. In particular, dead LEDs due to sparks occurring from contact with metal shards have been a major issue. Our company's original ultraviolet LEDs successfully solved this problem through our unique spark prevention mechanism. Compared to the conventional products, we significantly increased our "safety" and "reliability."

Peak Wavelength of 365 nm, Directional Characteristics of ±20°

Light spectrum of the UV-LED



Directional characteristics



Our original ultraviolet LEDs have a peak wavelength of 365 nm and directional characteristics of ±20°. Using the mono-wavelength, a characteristic of LEDs, allows for stable imaging over a long period of time that captures the workpiece's characteristics more accurately than using a black light. Our extensive lineup provides appropriate lights according to the inspected object, inspection environment and optical system.

Lineup

Model Name	LED Color	Power Consumption *1		Peak Wavelength	Options	Extension Cables	Recommended Control Units	Weight	Dimensions
		June 2014 or earlier	July 2014 or later						
LDR2-32UV365	Ultraviolet	24 V / 0.4 W	24 V / 0.3 W	365 nm	Band-pass filter ▶P.359 Ultraviolet cutting filter Ultraviolet transmission filter ▶P.362	FCB*4 Straight Cable FCB-W*5 2-branch Cable FCB-F 4-branch Cable FRCB Robot Cable *4 The cables with a model name that ends with "-ME7" or "-EL2" are not included. *5 The cables with a model name that ends with "-EL2" are not included.	PD4 PD3 CC-ST-1024*3 POD*2 *3 Cannot be used with LDR2-208UV365-LA that was manufactured in July 2014 or earlier.	30 g	1
LDR2-42UV365		24 V / 0.8 W	24 V / 0.6 W					50 g	
LDR2-50UV365		24 V / 1.2 W	24 V / 0.9 W					50 g	
LDR2-70UV365		24 V / 3.1 W	24 V / 2.3 W					130 g	2
LDR2-90UV365		24 V / 3.8 W	24 V / 2.8 W					170 g	1
LDR2-90-30UV365		24 V / 6.1 W	24 V / 4.5 W					220 g	
LDR2-120UV365		24 V / 9.5 W	24 V / 7.0 W					510 g	3
LDR2-74UV365-LA	Ultraviolet	24 V / 1.9 W	24 V / 1.4 W	365 nm				90 g	4
LDR2-100UV365-LA		24 V / 4.6 W	24 V / 3.4 W					170 g	5
LDR2-132UV365-LA		24 V / 6.9 W	24 V / 5.0 W					270 g	
LDR2-170UV365-LA		24 V / 9.9 W	24 V / 7.3 W					350 g	
LDR2-208UV365-LA		24 V / 12 W	24 V / 8.4 W					380 g	
LDR-75UV365-LA-1	Ultraviolet	24 V / 1.6 W	24 V / 1.2 W	365 nm				70 g	6
LDR-96UV365-LA-1		24 V / 2.3 W	24 V / 1.7 W					100 g	7
LDR-146UV365-LA-1		24 V / 3.1 W	24 V / 2.3 W					160 g	
LDR-176UV365-LA-1		24 V / 3.8 W	24 V / 2.8 W					200 g	
LDR-206UV365-LA-1		24 V / 4.6 W	24 V / 3.4 W					220 g	

*1 The power consumption varies according to the production date. Refer to the power consumption given by the label tag of the product.

Extension Cables ▶P.371 | Control Unit Selection Guide ▶P.305 | List of Control Unit Specifications ▶P.307

*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

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Register to use them.

Model Name	LED Color	Power Consumption*1		Peak Wavelength	Options	Extension Cables	Recommended Control Units		Weight	Dimensions
		June 2014 or earlier	July 2014 or later							
SQR-56UV365	Ultraviolet	24 V / 1.6 W	24 V / 1.2 W	365 nm	Band-pass filter ▶P.359 Ultraviolet cutting filter Ultraviolet transmission filter ▶P.362	FCB*3 Straight Cable FCB-W*4 2-branch Cable FCB-F 4-branch Cable FRCB Robot Cable	PD4	PD3	80 g	8
LDL-34X8UV365	Ultraviolet	24 V / 0.4 W	24 V / 0.3 W	365 nm					15 g	9
LDL-42X15UV365		24 V / 0.8 W	24 V / 0.6 W						30 g	10
LDL-74X27UV365		24 V / 3.1 W	24 V / 2.3 W						95 g	11
LDL-82X15UV365		24 V / 1.6 W	24 V / 1.2 W						45 g	12
LDL-130X15UV365		24 V / 2.3 W	24 V / 1.7 W						85 g	
LDL-180X16UV365		24 V / 3.8 W	24 V / 2.8 W						110 g	
LDQ-60-25UV365	Ultraviolet	24 V / 1.6 W	24 V / 1.2 W	365 nm			CC-ST-1024	POD*2	60 g	13
LDQ-78UV365		24 V / 1.6 W	24 V / 1.2 W						100 g	14
LDQ-100UV365		24 V / 3.1 W	24 V / 2.3 W						330 g	15
LDQ-150UV365		24 V / 6.1 W	24 V / 4.5 W						490 g	16
LDQ-200UV365		24 V / 9.1 W	24 V / 6.7 W						790 g	17
LN-200UV365	Ultraviolet	24 V / 1.9 W	24 V / 1.4 W	365 nm					400 g	18
LSP-41UV365	Ultraviolet	24 V / 1.2 W	24 V / 0.9 W	365 nm					115 g	19

*3 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*4 The cables with a model name that ends with "-EL2" are not included.

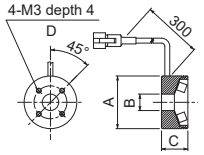
*1 The power consumption varies according to the production date. Refer to the power consumption given by the label tag of the product.

Extension Cables ▶P.371 | Control Unit Selection Guide ▶P.305 | List of Control Unit Specifications ▶P.307

*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

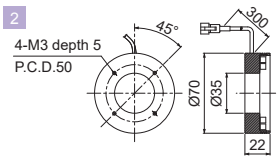
Dimensions (mm)

1



Model Name	A	B	C	D
LDR2-32UV365	Ø32	Ø10	16	P.C.D.20
LDR2-42UV365	Ø42	Ø18	18	P.C.D.28
LDR2-50UV365	Ø50	Ø28	16	P.C.D.40
LDR2-90UV365	Ø90	Ø50	20	P.C.D.70
LDR2-90-30UV365	Ø90	Ø30	20	P.C.D.70

2



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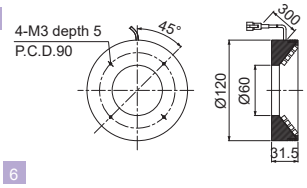

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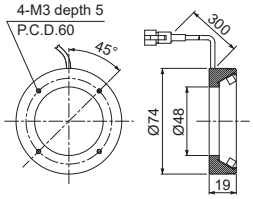
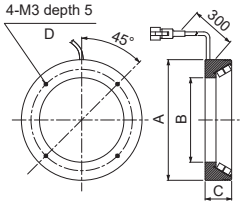
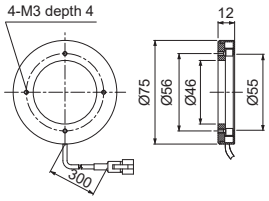


5



Model Name	A	B	C	D
LDR2-100UV365-LA	Ø100	Ø70	22	P.C.D.84
LDR2-132UV365-LA	Ø132	Ø96	22	P.C.D.116
LDR2-170UV365-LA	Ø170	Ø134	22	P.C.D.154
LDR2-208UV365-LA	Ø208	Ø174	22	P.C.D.186

6



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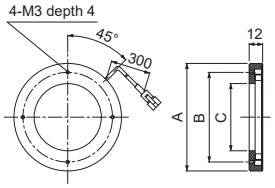
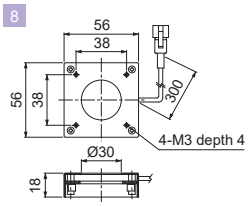


Model Name	A	B	C
LDR-96UV365-LA-1	Ø96	Ø80	Ø60
LDR-146UV365-LA-1	Ø146	Ø130	Ø110
LDR-176UV365-LA-1	Ø176	Ø160	Ø140
LDR-206UV365-LA-1	Ø206	Ø190	Ø170

8



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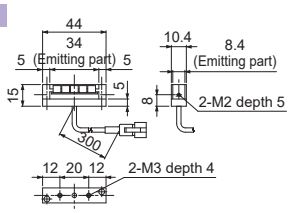

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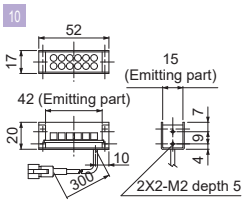

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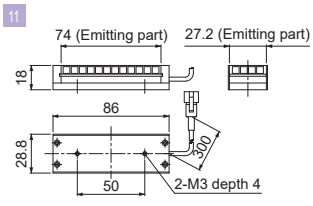

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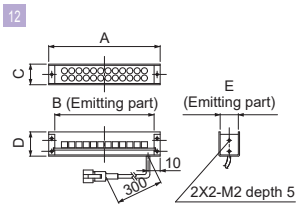
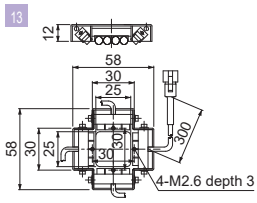


Model Name	A	B	C	D	E
LDL-82X15UV365	92	82	17	20	15
LDL-130X15UV365	140	130	17	21	15
LDL-180X16UV365	191.4	181.4	18	21	16

13



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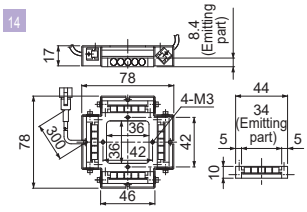

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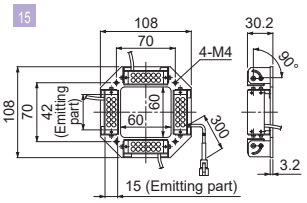

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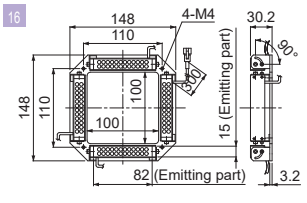

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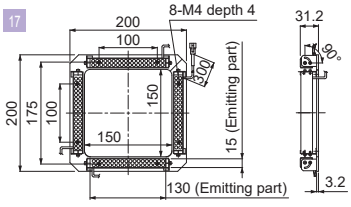

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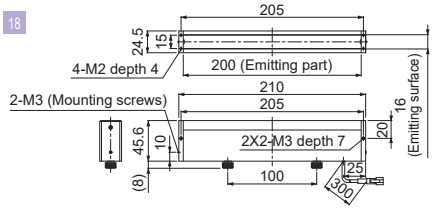

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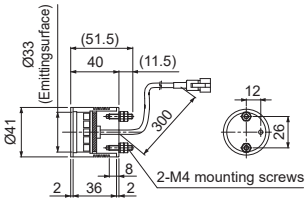


You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

You can inquire using our website.

Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products

Inquire on our website here.
https://www.ccs-grp.com/contact/

Ultraviolet/Violet

Ultraviolet/Violet Line Lights

LNSP-UV3/VL3-FN Series

Refer to our website for product details.
CCS LNSP-UV3 ▶ Search

Increased range of applications with high output and 4 wavelengths

LNSP-300UV3/VL3-FN
(Narrow Type)

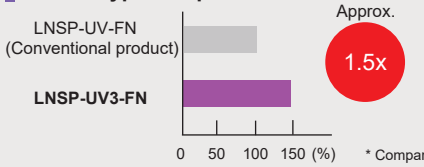
LNSP-300UV3/VL3-FN
(Wide Type)

* 365 nm wavelength for ultraviolet light UV3 Series. 385 nm, 395 nm, and 405 nm wavelengths for violet light VL3 Series.

Applications Seal material presence inspection using fluorescence excitation, various inspections using different spectral reflectance, various inspections using scattering rate differences

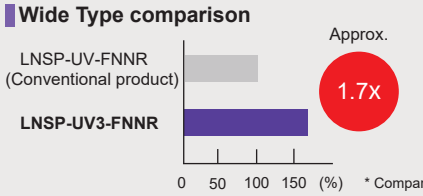
Increased brightness compared with conventional products

Narrow Type comparison



* Comparison with LWD10 mm

Wide Type comparison



* Comparison with LWD10 mm

The light distribution angle can be selected based on the application

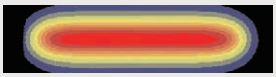
Two types are available. The narrow type can focus illumination on a narrow area using a rod lens, while the wide type offers wider illumination.

Narrow Type

Uniformity graph

Wide Type

Uniformity graph



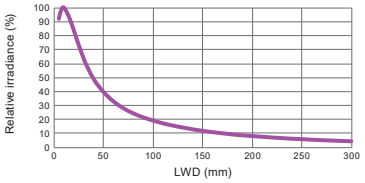
Data: Relative Irradiance Graph and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

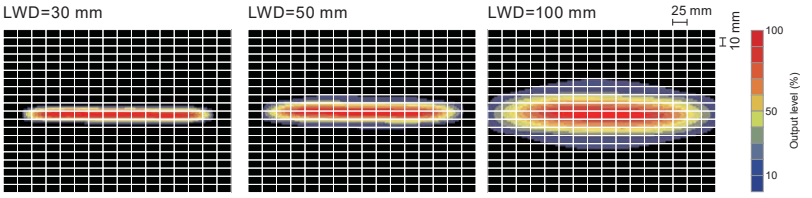
LNSP-300UV3-365-FN  (Narrow Type)

Relative irradiance graph*1 (LWD characteristics)*2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



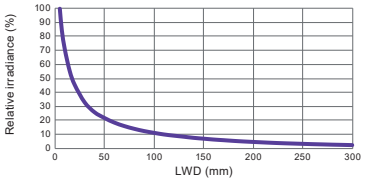
Uniformity (Relative irradiance)



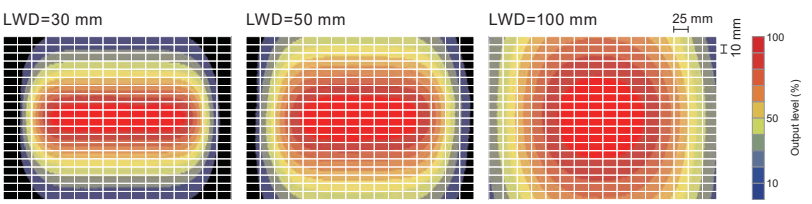
LNSP-300UV3-365-FNNR  (Wide Type)

Relative irradiance graph*1 (LWD characteristics)*2

*1 Irradiance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Uniformity (Relative irradiance)



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Lineup End of the model name -FN: Narrow Type / -FNNR: Wide Type

Wavelength 385/395/405 nm will be manufactured on a built-to-order system.

Model Name*1	LED Color	Power Consumption*2	Extension Cables	Recommended Control Units	Weight
LNSP-100UV3-365-FN	Ultraviolet	36 W	QCBM QCB	PSCC-30048 (A) PSCC-60048 (A)	900 g
LNSP-100VL3-□-FN	Violet				
LNSP-100UV3-365-FNNR	Ultraviolet				700 g
LNSP-100VL3-□-FNNR	Violet				
LNSP-200UV3-365-FN	Ultraviolet	70 W			1,300 g
LNSP-200VL3-□-FN	Violet				
LNSP-200UV3-365-FNNR	Ultraviolet				1,000 g
LNSP-200VL3-□-FNNR	Violet				
LNSP-300UV3-365-FN	Ultraviolet	103 W			1,700 g
LNSP-300VL3-□-FN	Violet	104 W			
LNSP-300UV3-365-FNNR	Ultraviolet	103 W			1,300 g
LNSP-300VL3-□-FNNR	Violet	104 W			

*1 □ in the model name contains the wavelength 385/395/405.
*2 Power consumption includes the cooling fan.

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

Options

Blocks light with a wavelength of 420 nm or lower, transmits light with a longer wavelength.

Ultraviolet cutting filter L42 Series

Model Name	Size
L42-25	M25.5 P0.5
L42-27	M27.0 P0.5
L42-30	M30.5 P0.5
L42-40	M40.5 P0.5
L42-46	M46.0 P0.75

▶ P.362

Transmits light with wavelength range of approx. 280 nm to 380 nm, centered around 340 nm.

Ultraviolet transmission filter U340 Series

Model Name	Size
U340-25	M25.5 P0.5
U340-27	M27.0 P0.5
U340-30	M30.5 P0.5
U340-40	M40.5 P0.5
U340-46	M46.0 P0.75

▶ P.362

Transmits light with a specific range of wavelength and is available for a wide range of fluorescent wavelengths

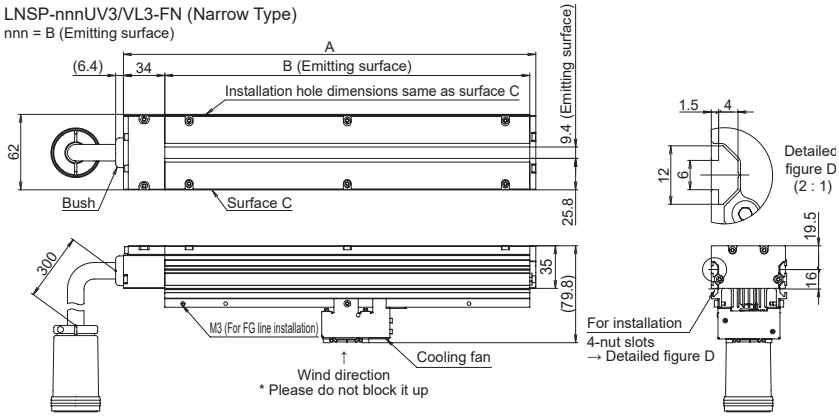
Band-pass filter
F-BP Series

- High transmittance at 90% or greater
- Hard coated filter with high durability
- Twelve-product lineup available for a wide range of wavelengths

▶ P.359

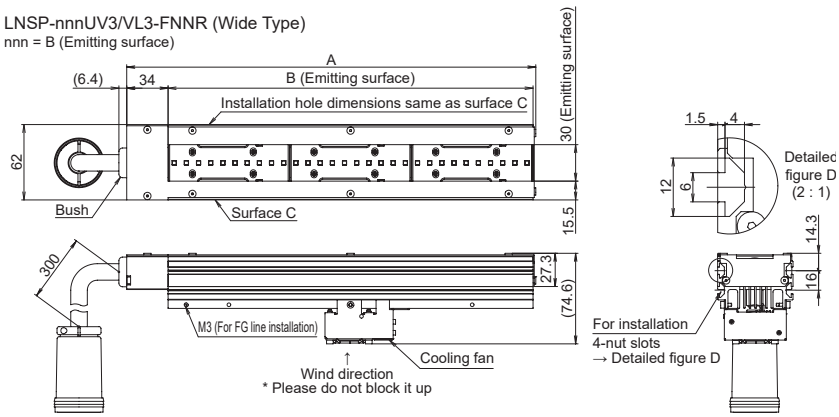
Dimensions (mm)

LNSP-nnnUV3/VL3-FN (Narrow Type)
nnn = B (Emitting surface)



Model Name	A	B
LNSP-100UV3/VL3-FN	139	100
LNSP-200UV3/VL3-FN	239	200
LNSP-300UV3/VL3-FN	339	300

LNSP-nnnUV3/VL3-FNNR (Wide Type)
nnn = B (Emitting surface)



Model Name	A	B
LNSP-100UV3/VL3-FNNR	136.3	100
LNSP-200UV3/VL3-FNNR	236.3	200
LNSP-300UV3/VL3-FNNR	336.3	300

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https://www.ccs-grp.com/contact/

Infrared Lighting

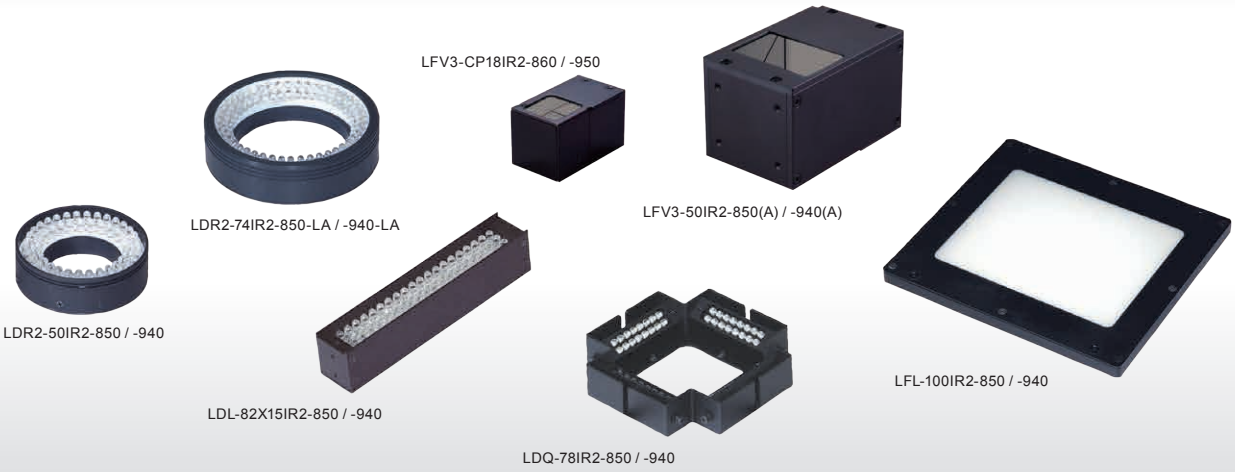
Infrared Lights (Under 1000-nm Type)

IR2 Series

Refer to our website for product details.

CCS IR2 ▶ Search

Varied light unit lineup using IR-LEDs



Applications Visual inspection that cancels the surface pattern, inspection penetrating liquid for foreign material inside, inspections using differences in spectral reflectivity, inspection for the inside of packaged food, etc.

What Is Infrared Light?

Infrared light is light that has a wavelength longer than that of visible red light and cannot be seen by the human eye. Compared to visible red light, infrared light has a low scattering rate and high transmission, and therefore is used in imaging which penetrates printed patterns or liquids.

Comparison of visible light and infrared imaging

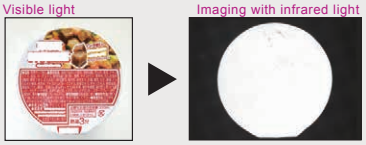
Features (1)

Penetration

Infrared irradiation penetrates the liquid to make inside visible.

Features (2)

Cancellation

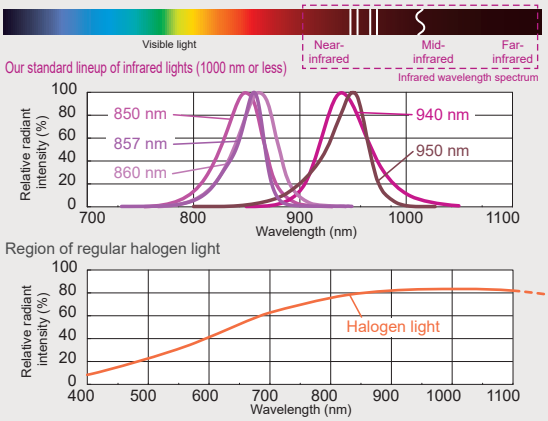


Infrared irradiation cancels out the printing to image the surface evenly.

Merits

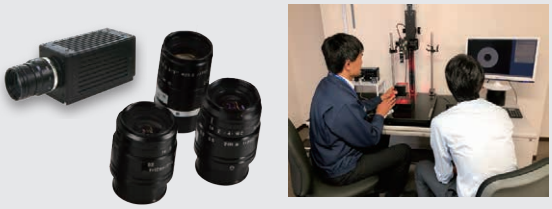
Irradiation of the Infrared LED includes only the energy of specific region of wavelength, so that the irradiation heat is extremely low compared to the halogen lights and gives less damage on the workpiece.

	Infrared LED	Regular halogen light
Irradiation heat	Extremely low	Heat-generating
Influence on the workpiece	Small heat damage	Huge heat damage



We also provide infrared-compatible cameras and lenses

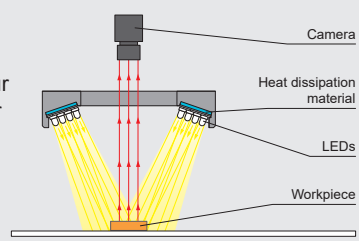
In our testing room, imaging experiments can be conducted with infrared cameras and lenses. Our dedicated staff will recommend a lighting solution that achieves proper images.



Example Configuration

Ring Lights that use infrared LEDs. Bar types and coaxial types are also available. Select your format to match your needs.

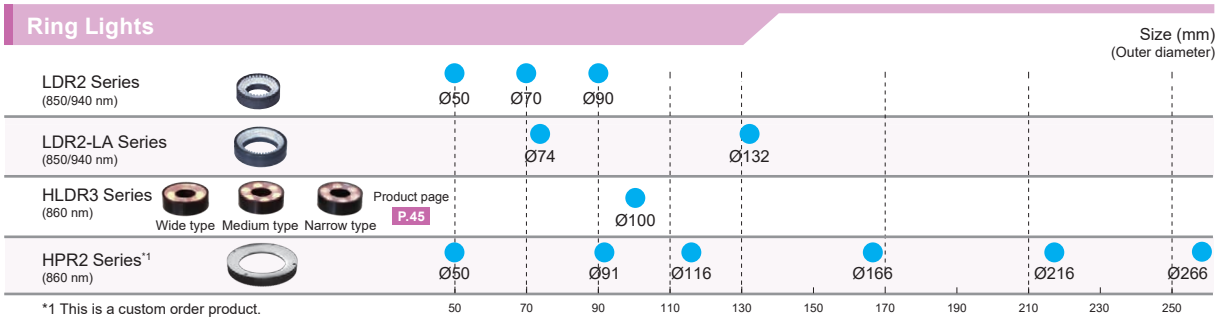
LDR2-90IR2-850/940



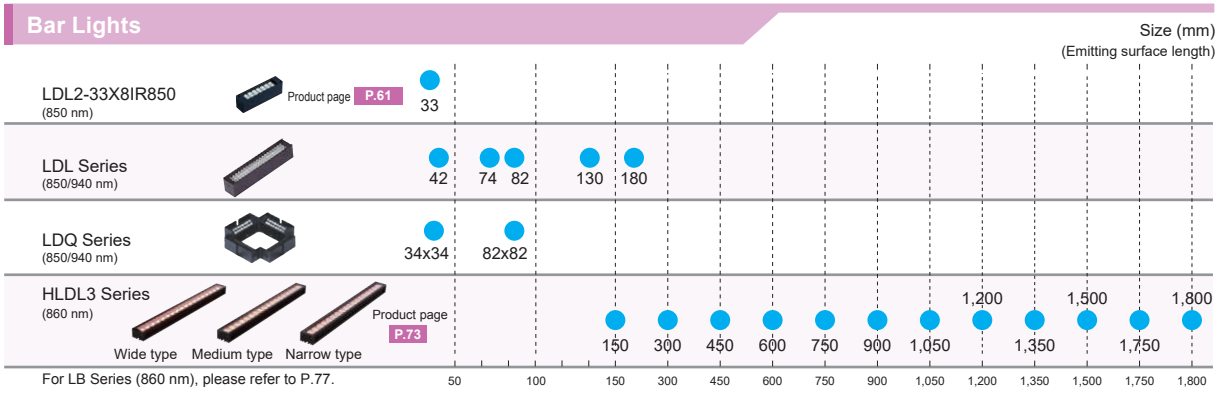
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Extensive Lineup of Infrared Lights

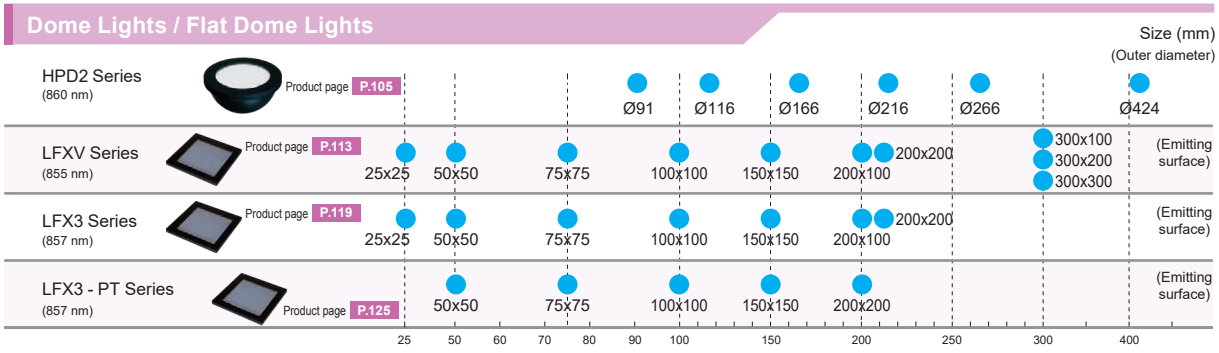
Ring Lights



Bar Lights

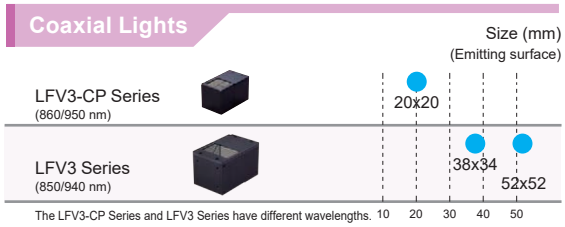


Dome Lights / Flat Dome Lights



Flat Lights

Coaxial Lights



The size, wavelength and shape can be changed in custom orders. Feel free to contact us.

Refer to P.177 for the product lineup with wavelengths of 1000 nm or more.

Precautions Regarding Infrared Products

- This product uses infrared LEDs. The brightness will not be visually noticeable, but the lit LEDs emit infrared radiation.
- The peak wavelength range corresponds to IR-A (780 to 1400 nm).
- Do not direct infrared radiation into the eyes.

IR2 Series

Refer to our website for product details.

CCS IR2 ▶ Search

Imaging Example

Imaging for Foreign Materials in Disinfectant Products

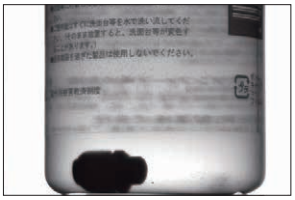
Workpiece image

Disinfectant products

LED visible light lighting

It is difficult to check the inside with visible light imaging.

LFL-100IR2-940



Imaging with infrared light penetrates the liquid and captures the foreign materials.

This workpiece was processed by CCS for sample imaging.

Imaging the Appearance of Leatherware

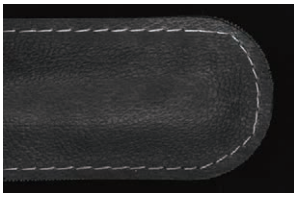
Workpiece image

Leatherware

LED visible light lighting

The leather and the threads are of the same color, so that it is difficult to capture the stitching.

LDR2-132IR2-850-LA



Infrared light penetrates the dye to highlight the threads and captures the stitching.

Lineup

Shape	Series	Model Name	LED Color	Power Consumption	Peak Wavelength	Options	Extension Cables	Recommended Control Units	Weight
Ring Lights	LDR2	LDR2-50IR2-850/-940	Infrared	24 V / 3.8 W	850 nm / 940 nm	–	FCB*5 Straight Cable; FCB-W*6 2-Branch Cable; FCB-F 4-Branch Cable; FRCB Robot Cable	PD4 PD3 POD*4	50 g
		LDR2-70IR2-850/-940		24 V / 7.6 W	850 nm / 940 nm				130 g
		LDR2-90IR2-850/-940		24 V / 14 W	850 nm / 940 nm				170 g
	LDR2-LA	LDR2-74IR2-850-LA/-940-LA	Infrared	24 V / 6.9 W	850 nm / 940 nm				90 g
		LDR2-132IR2-850-LA/-940-LA		24 V / 16 W	850 nm / 940 nm				270 g
	HPR2	HPR2-50IR860*1	Infrared	24 V / 9.1 W	860 nm	Bracket		PD4 PD3	–
		HPR2-75IR860*1		24 V / 12 W					–
		HPR2-100IR860*1		24 V / 23 W					–
		HPR2-150IR860*1		24 V / 35 W					–
		HPR2-200IR860*1		24 V / 46 W					–
		HPR2-250IR86*1		24 V / 46 W					–
Bar Lights	LDL	LDL2-33X8IR850*2	Infrared	24 V / 1.3 W	850 nm	–			40 g
		LDL-42X15IR2-850/-940		24 V / 2.3 W	850 nm / 940 nm				40 g
		LDL-74X27IR2-850/-940		24 V / 6.9 W	850 nm / 940 nm			PD4 PD3 POD*4	80 g
		LDL-82X15IR2-850/-940		24 V / 3.8 W	850 nm / 940 nm				60 g
		LDL-130X15IR2-850/-940		24 V / 6.1 W	850 nm / 940 nm				90 g
		LDL-180X15IR2-850/-940		24 V / 8.4 W	850 nm / 940 nm				110 g
	LDQ	LDQ-78IR2-850/-940	Infrared	24 V / 6.1 W	850 nm / 940 nm			PD4*3 PD3*3 POD*3*4	110 g
		LDQ-150IR2-850/-940		24 V / 16 W	850 nm / 940 nm				530 g

*5 The cables with a model name that ends with "-ME7","-EL2", "-PF", or "-PF-EL9" are not included.
*6 The cables with a model name that ends with "-EL2" are not included.

*1 The warranty period of custom order products is different from that of standard products. Contact our local sales office for details.

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*2 Cannot be used in combination with a strobe control unit (overdrive specification type). Contact us for custom orders.
*3 The LDQ Series is equipped with four lights. If individual dimming is required, select the 4-channel control unit.
*4 For information on the combination of LED units and POD Series control units, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

Please refer to the following pages for HLDL3 Series and LB Series infrared lights.
HLDL3 Series P.73 / LB Series P.77

Lineup

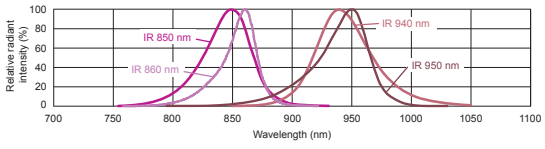
Shape	Series	Model Name	LED Color	Power Consumption	Peak Wavelength	Options	Extension Cables	Recommended Control Units	Weight
Dome Lights	HPD2	HPD2-75IR860	Infrared	24 V / 12 W	860 nm	Bracket	FCB*4 Straight Cable FCB-W*5 2-Branch Cable FCB-F 4-Branch Cable FRCB Robot Cable *4 The cables with a model name that ends with "-ME7","-EL2", "-PF", or "-PF-EL9" are not included. *5 The cables with a model name that ends with "-EL2" are not included.	PD4 PD3 POD*1	140 g
		HPD2-100IR860		24 V / 23 W	860 nm				160 g
		HPD2-150IR860		24 V / 35 W	860 nm				285 g
		HPD2-200IR860		24 V / 46 W	860 nm				460 g
		HPD2-250IR860		24 V / 46 W	860 nm				650 g
		HPD2-400IR860		24 V / 46 W	860 nm	–			1,300 g
Flat Dome Lights	LFXV	LFXV-25IR860	Infrared	24 V / 1.2 W	855 nm	Protective Plate * Protective plates for LFXV-25, 300X100, and 300 are available as custom orders.		PD4 PD3 POD*1	80 g
		LFXV-50IR860		24 V / 5.7 W	855 nm				190 g
		LFXV-75IR860		24 V / 12 W	855 nm				290 g
		LFXV-100IR860		24 V / 12 W	855 nm				400 g
		LFXV-150IR860		24 V / 17 W	855 nm				870 g
		LFXV-200X100IR860		24 V / 17 W	855 nm				870 g
		LFXV-200IR860		24 V / 23 W	855 nm				1,300 g
		LFXV-300X100IR860		24 V / 23 W	855 nm				1,300 g
		LFXV-300X200IR860		24 V / 29 W	855 nm				1,600 g
		LFXV-300IR860		24 V / 34 W	855 nm				2,000g
	LFX3	LFX3-25IR860	Infrared	24 V / 1.4 W	857 nm	–			80 g
		LFX3-50IR860		24 V / 6.6 W	857 nm				230 g
		LFX3-75IR860		24 V / 14 W	857 nm				320 g
		LFX3-100IR860		24 V / 14 W	857 nm				400 g
		LFX3-150IR860		24 V / 20 W	857 nm				620 g
		LFX3-200X100IR860		24 V / 20 W	857 nm				620 g
		LFX3-200IR860		24 V / 27 W	857 nm				910 g
	LFX3-PT	LFX3-50IR860-PT-A/-B*2	Infrared	24 V / 6.6 W	857 nm				230 g
		LFX3-75IR860-PT-A/-B*2		24 V / 14 W	857 nm			PD4 PD3 POD*1	230 g
		LFX3-100IR860-PT-A/-B*2		24 V / 14 W	857 nm				230 g
		LFX3-150IR860-PT-A/-B*2		24 V / 20 W	857 nm				230 g
		LFX3-200IR860-PT-A/-B*2		24 V / 27 W	857 nm				230 g
Flat Lights	LDL	LDL-60X60IR2-850/-940	Infrared	24 V / 7.6 W	850 nm / 940 nm				140 g
		LDL-100X100IR2-850/-940		24 V / 21 W	850 nm / 940 nm				650 g
	LFL	LFL-100IR2-850/-940	Infrared	24 V / 7.6 W	850 nm / 940 nm				220 g
Coaxial Lights	LFV3-CP	LFV3-CP18IR2-860/-950	Infrared	24 V / 2.6 W	860 nm / 950 nm				70 g
	LFV3	LFV3-35IR2-850(A)/-940(A)*3	Infrared	24 V / 3.1 W	850 nm / 940 nm				175 g
		LFV3-50IR2-850(A)/-940(A)*3		24 V / 9.1 W	850 nm / 940 nm				335 g

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 For information on the combination of LED units and POD Series control units, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod
*2 1 mm type (Model ends with: -A) / 2 mm type (Model ends with: -B)
*3 Model changes
Reason: Since it may be difficult to obtain parts from optical parts manufacturers, they have been changed to equivalent optical parts.
Impact on functionality and performance: No impact on the functionality or performance.
[Add (A) to the end of the model] Example: LFV3-35IR2-850 → LFV3-35IR2-850(A)

LED Properties

Spectral distribution



Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

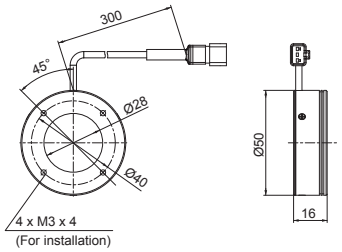
IR2 Series

Refer to our website for product details.

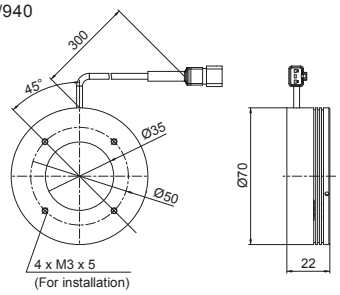
CCS IR2 ▶ Search

Dimensions (mm)

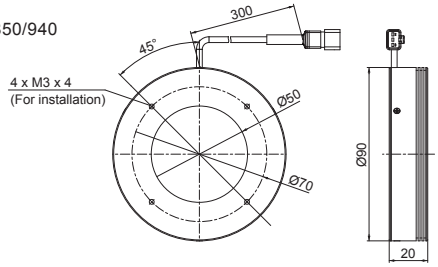
LDR2-50IR2-850/940



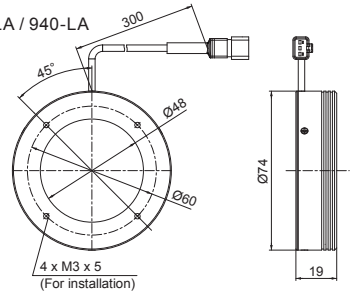
LDR2-70IR2-850/940



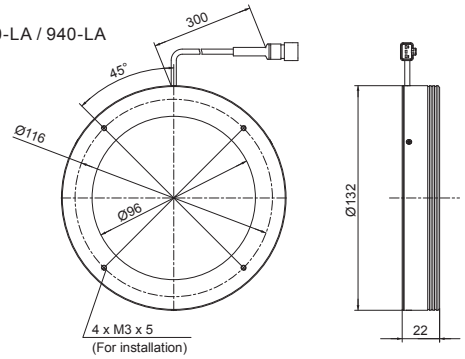
LDR2-90IR2-850/940



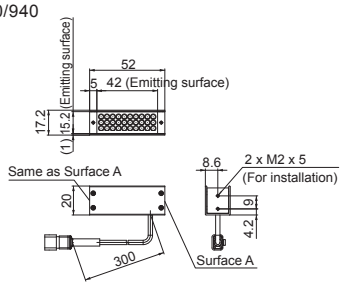
LDR2-74IR2-850-LA / 940-LA



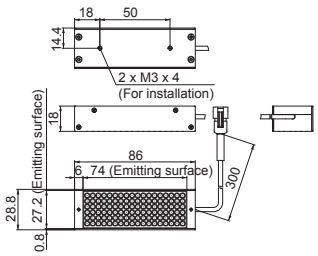
LDR2-132IR2-850-LA / 940-LA



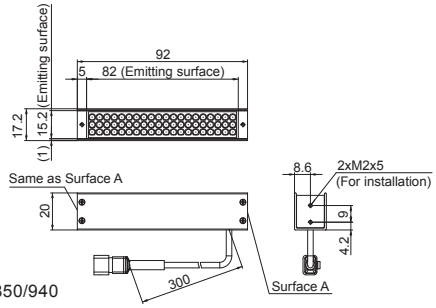
LDL-42X15IR2-850/940



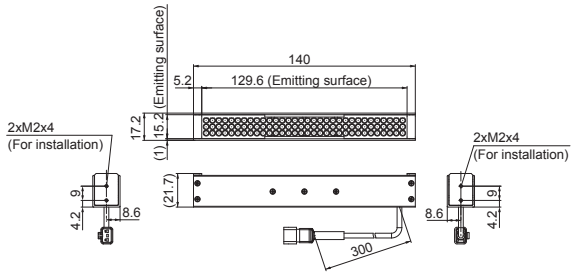
LDL-74X27IR2-850/940



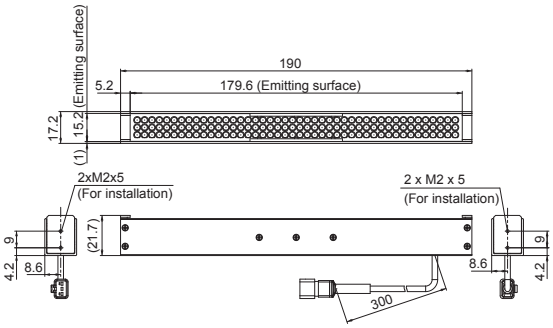
LDL-82X15IR2-850/940



LDL-130X15IR2-850/940



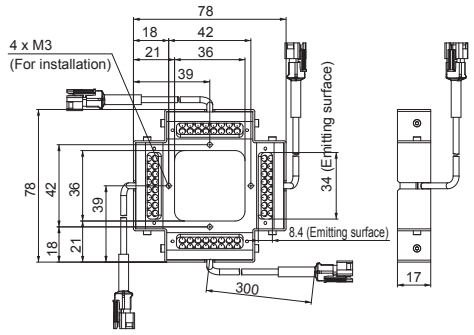
LDL-180X15IR2-850/940



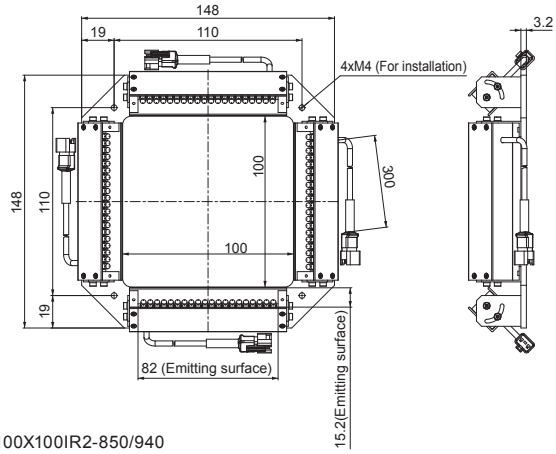
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

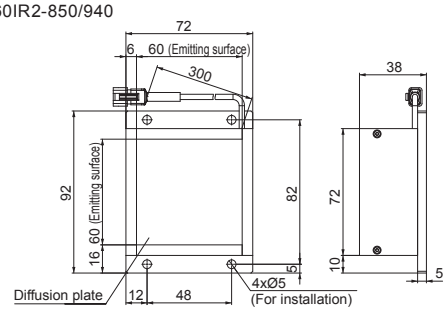
LDQ-78IR2-850/940



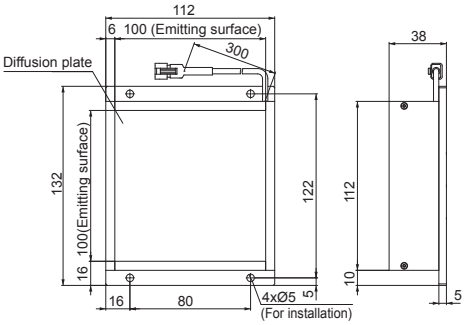
LDQ-150IR2-850/940



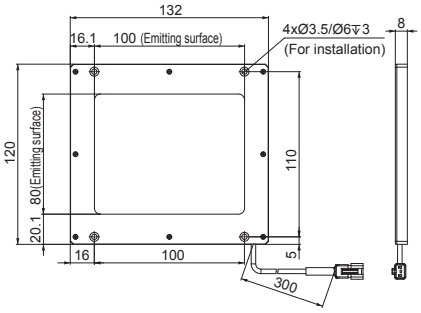
LDL-60X60IR2-850/940



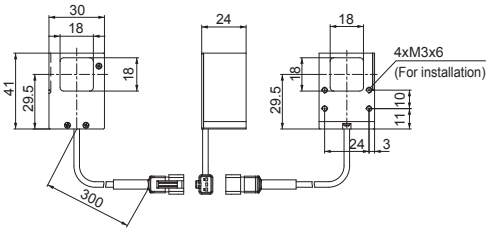
LDL-100X100IR2-850/940



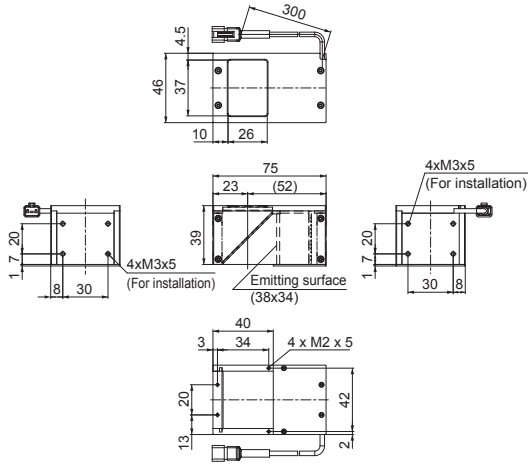
LFL-100IR2-850/940



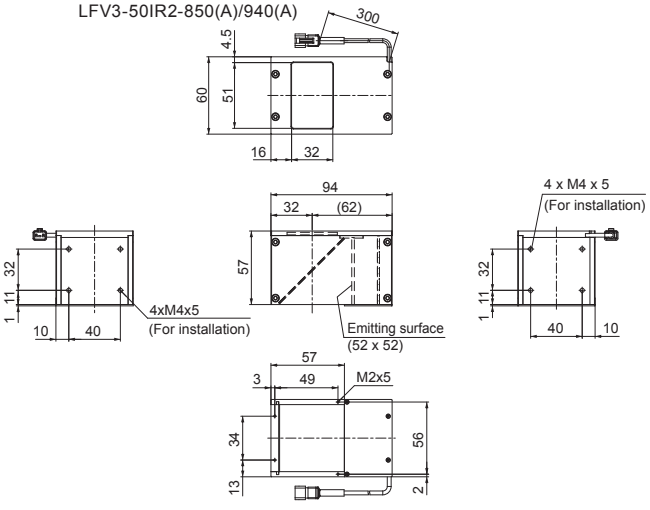
LFV3-CP18IR2-860/950



LFV3-35IR2-850(A)/940(A)



LFV3-50IR2-850(A)/940(A)



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

External dimensions other than the above can be found on the series page or on the website.
https://www.ccs-grp.com/product/vision/

Infrared Lighting

Infrared Lights (Over 1000-nm Type)

IR Series (SWIR)

Refer to our website for product details.

CCS Over 1000-nm Type ▶ Search

The power to “see” what “cannot be seen”
Diverse lineup of lights that uses high-power infrared LEDs


LDL2-74X30IR


HLV-22IR


LN-60IR-HK


TH2-100X100IR


HPR2-100IR


HPD2-100IR

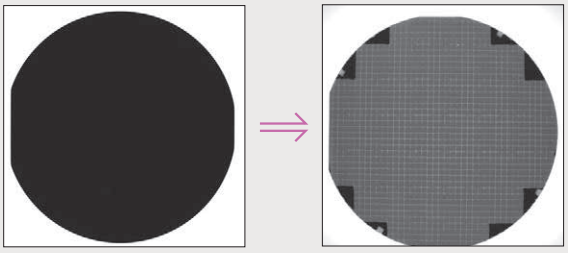
Applications Visual inspection with the surface pattern canceled / Inspection of foreign matters inside the liquid by transmission / Various inspections using different spectral reflectance / Inspection of the contents of packed food, etc.

Imaging example of Infrared Lights (Over 1000-nm Type)

Infrared light has different light transmission and reflection properties for workpieces than visible light, which makes it possible to observe features that cannot be imaged with visible light.

Wafer transmission inspection

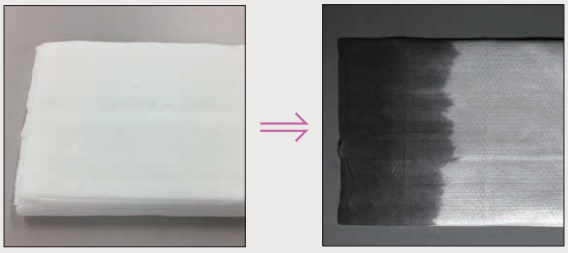
■ BEFORE (visible light) ■ AFTER (infrared 1200 nm)



Enables observation by transmission, which is not possible with visible light.

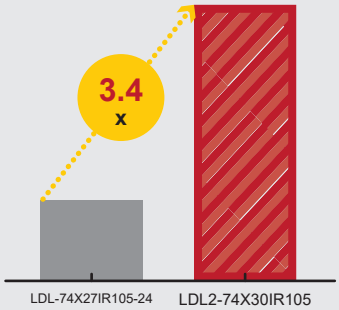
Wet sheet water content inspection

■ BEFORE (visible light) ■ AFTER (infrared 1450 nm)



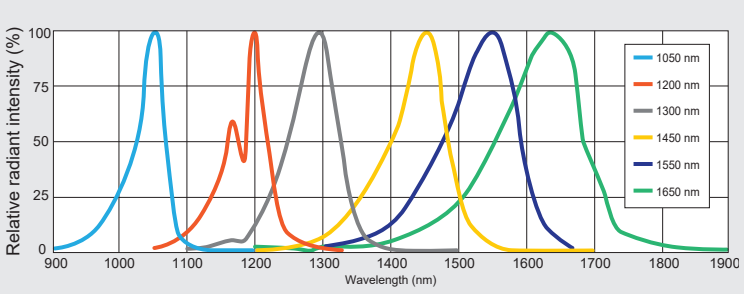
Water absorbs wavelengths above 1450 nm, so if it contains water, the image will be black.

3.4 times higher output than conventional products



*Comparison of irradiance with LWD20mm.

Lineup of 6 wavelengths



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Lineup (Model ending with -WD: Wide type)

Series	Model Name *1	Input Voltage	Power Consumption 1050 nm	1200 nm	1300 nm	1450 nm	1550 nm	1650 nm	Options	Extension Cables	Recommended Control Units	Weight
HPR2	HPR2-100IR □□	24 V	13 W	11 W	10 W	8.6 W	8.6 W	8.6 W	Bracket	FCB*3 Straight Cable FCB-W*4 2-Branch Cable FCB-F 4-Branch Cable FRCB Robot Cable	PD4 PD3 CC-ST-1024*5 POD*2 *5 1050 nm and 1200 nm cannot be used.	170 g
	HPR2-150IR □□		19 W	16 W	15 W	13 W	13 W	13 W			PD4 PD3 POD*2	250 g
LDL2	LDL2-74X30IR □□ (-WD)		8.4 W	5.7 W	5.7 W	5.7 W	5.3 W	5.3 W	Bracket Polarizing Plate		PD4 PD3 CC-ST-1024 POD*2	100 g
TH2	TH2-100X100IR □□		16 W	13 W	13 W	12 W	12 W	12 W	Bracket Polarizing Plate		PD4 PD3 POD*2	300 g
HPD2	HPD2-100IR □□		13 W	11 W	10 W	8.6 W	8.6 W	8.6 W	Bracket		PD4 PD3 CC-ST-1024*5 POD*2 *5 1050 nm and 1200 nm cannot be used.	160 g
	HPD2-150IR □□		19 W	16 W	15 W	13 W	13 W	13 W			PD4 PD3 POD*2	285 g
LN-HK	LN-60IR □□ -HK		11 W	7.1 W	7.1 W	6.6 W	6.6 W	6.6 W	Polarizing Plate		PD4 PD3 CC-ST-1024*6 POD*2 *6 1050 nm Cannot be used.	222 g

Series	Model Name *1	Input current (max.)	Power Consumption 1050 nm	1200 nm	1300 nm	1450 nm	1550 nm	1650 nm	Options	Extension Cables	Recommended Control Units	Weight
HLV	HLV-22IR □□	700 mA	1.2 W	1.2 W	1.1 W	1.1 W	1.1 W	1.1 W	—	FCB*3 Straight Cable FRCB Robot Cable	PD3 CC-PJ-0707 PJ PJ2	32 g

*1 □□ is the corresponding wavelength. Model 105: 1050 nm, 120: 1200 nm, 130: 1300 nm, 145: 1450 nm, 155: 1550 nm, 165: 1650 nm

Extension Cables ▶ P.371 Control Unit Selection Guide ▶ P.305 List of Control Unit Specifications ▶ P.307

*2 For information on the combination of light units and POD Series control unit, please refer to our website.
https://www.ccs-grp.com/lnk/qr/pod

*3 The cables with a model name that ends with "-ME7","-EL2", "-PF", or "-PF-EL9" are not included.

*4 The cables with a model name that ends with "-EL2" are not included.

It can be custom ordered in sizes, shapes and wavelengths other than the above. Feel free to contact us.

SWIR System consultation (lights + camera + lens)

CCS offers free testing for machine vision applications including SWIR imaging.
Our expert staff will recommend the optimal lighting solution for your application.

You can inquire using our website. Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products

Inquire on our website here.
https://www.ccs-grp.com/contact/

IR Series Over 1000-nm Type

Refer to our website for product details.

CCS Over 1000-nm Type ▶ Search

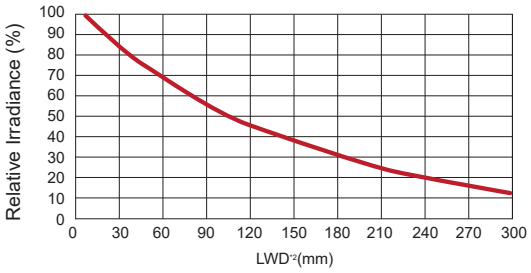
Data (Representative Examples)

The data included is for reference only. Actual values may vary.

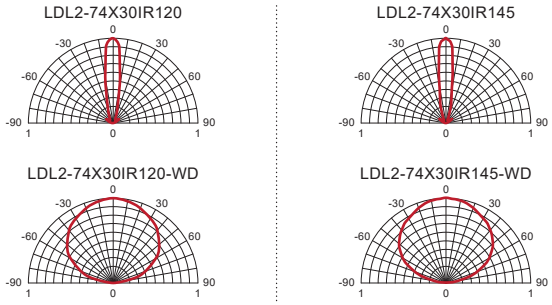
LDL2-74X30IR105 (narrow type)

Relative Irradiance Graph (LWD Characteristics)*1*2

*1 Irradiance on the optical axis *2 Illuminating distance between the light unit and the workpiece



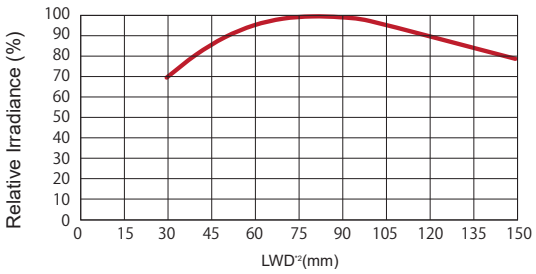
Directional Characteristics



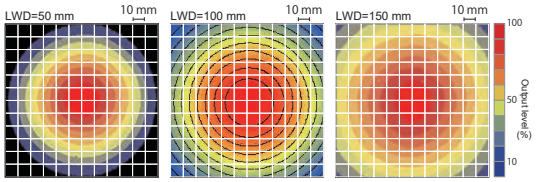
HPR2-100IR105

Relative Irradiance Graph (LWD Characteristics)*1*2

*1 Irradiance on the optical axis *2 Illuminating distance between the light unit and the workpiece



Uniformity (Relative Irradiance)



Options

● Polarizing Plates

Use with a polarizing filter to remove the light's surface reflection.

Model Name	Applicable Light Unit
PL-LDL2-74X30-WGFHO	LDL2-74X30IR
PL-LDL2-74X30-WGFVE	
PL-TH-100X100-WGFHO	TH2-100X100IR
PL-LN-60-WGFHO	LN-60IR-HK

● Brackets

Bar Lights

The angle of illumination can be adjusted as you desire when securing the light unit.

Model Name	Note
BK-LDL2	Angle adjustment brackets (x2)

▶ P.369

Flat Lights

This is a dedicated bracket for affixing the TH2 Series light units.
The TH2 Series can be affixed in four points.

Model Name	Note
BK-TH-LE12	Installation brackets common BK-TH-LE12 to all TH2 models (includes 4)

▶ P.369

● Light Joint Brackets

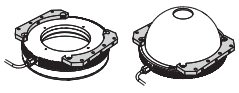
Combine a dome and ring light to achieve imaging by light switching and simultaneous lighting.

Model Name	Applicable Light Unit 1	Applicable Light Unit 2
BK-100-JO	HPR2-100IR	HPD2-100IR
BK-150-JO	HPR2-150IR	HPD2-150IR

▶ P.370

● Expansion Mounting Brackets

Achieves installation using installation holes with a larger gap than the light unit body installation holes, or installation on a vertical surface.



Model Name	Applicable Light Unit
BK-100-CI	HPR2-100IR, HPD2-100IR
BK-150-CI	HPR2-150IR, HPD2-150IR

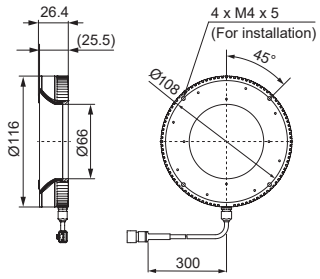
▶ P.370

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

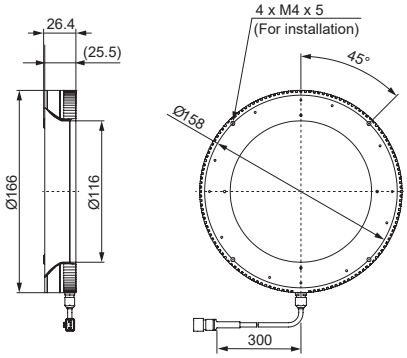
Register to use them.

Dimensions (mm)

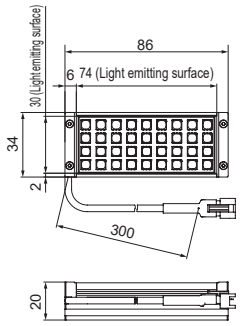
HPR2-100IR (common for all wavelengths)



HPR2-150IR (common for all wavelengths)

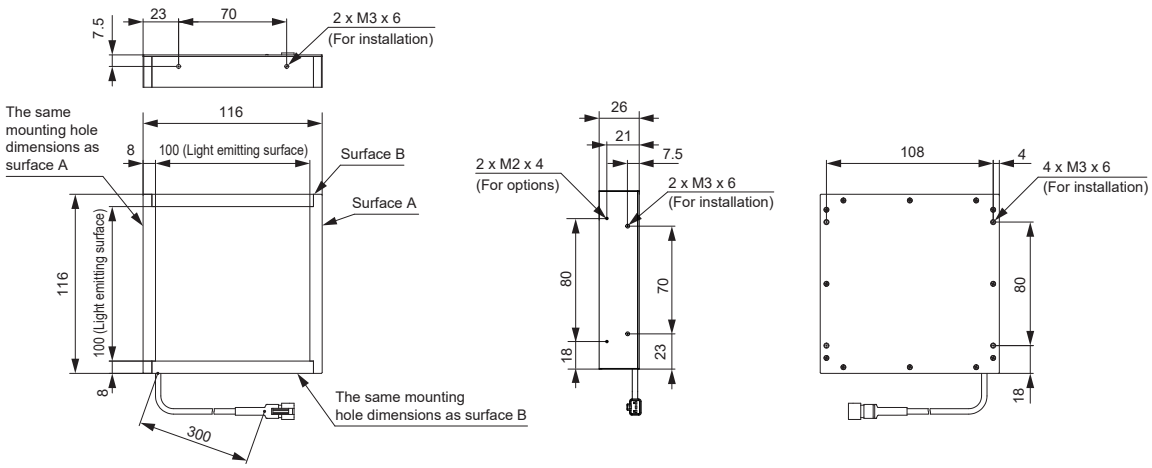


LDL2-74X30IR (common for all wavelengths)

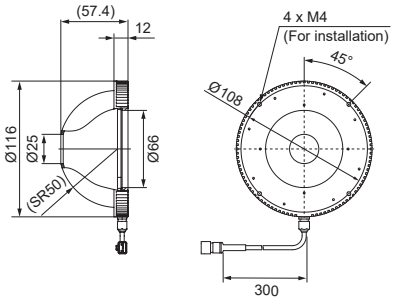


The wide type (-WD) has the same size.

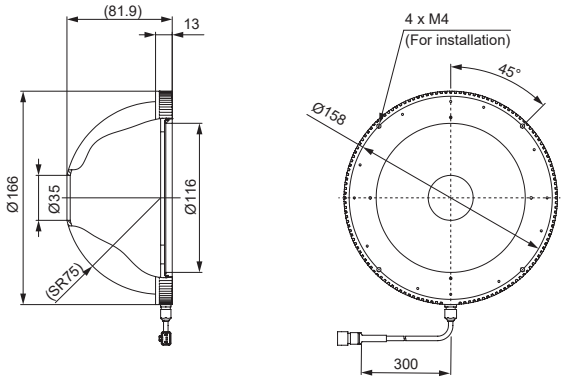
TH2-100X100IR (common for all wavelengths)



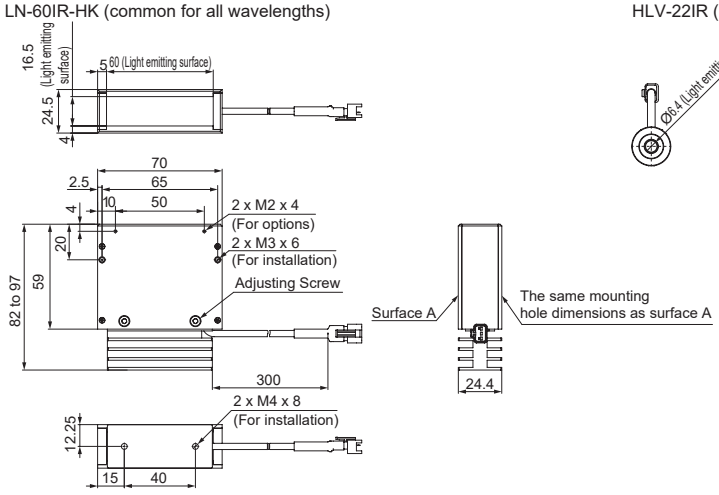
HPD2-100IR (common for all wavelengths)



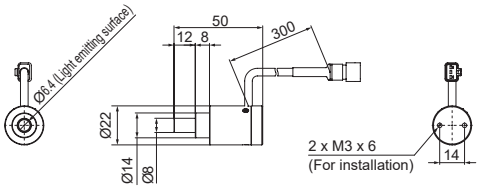
HPD2-150IR (common for all wavelengths)



LN-60IR-HK (common for all wavelengths)



HLV-22IR (common for all wavelengths)

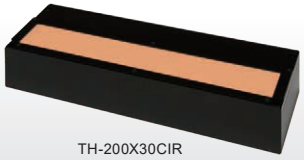


High Intensity Light Source for Hyperspectral & SWIR Cameras

Built to order

This is a made-to-order product. For queries and details, contact your CCS sales representative.

LN-200CIR



TH-200X30CIR

LDL-222x42CIR
(Convergent Type)

LDL-222x42CIR-LACL
(Diffused Type)

Custom order products: The warranty period of the custom order product is different from that of the CCS standard products. Contact our local sales office for details.

Applications Observation of transmission, absorption and reflection of an object by illuminating a specific wavelength in the near-infrared region / Imaging using a hyperspectral camera

Features

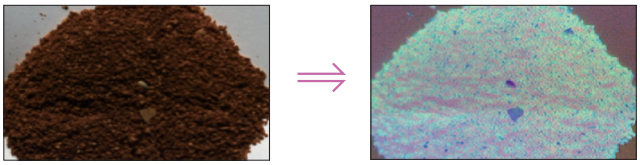
- We propose a wide range of applications with wavelength characteristics from visible light to near infrared (around 2500 nm).
- The special halogen lamp achieves long life. * TH-200X30CIR/LN-200CIR only. Warranty period is one year or cumulative lighting hours up to 8,000 hours.
- The unique optical design suppresses heat rays and minimizes damage to the inspected object.
- We can manufacture lights of various shapes and sizes according to customer requests.
- For imaging with a hyperspectral camera that requires high output. *LDL-222X42CIR (-LACL) only.

Hyperspectral Imaging Light

LDL-222X42CIR

The condensing lamp enables high-power illumination.
Especially useful for imaging with a hyperspectral camera that requires high output and infrared camera projects that require high-speed inspection.

■ Imaged with visible light LED light ■ Imaged with a hyperspectral camera



Imaging of foreign matters in coffee powder at 400 nm to 900 nm

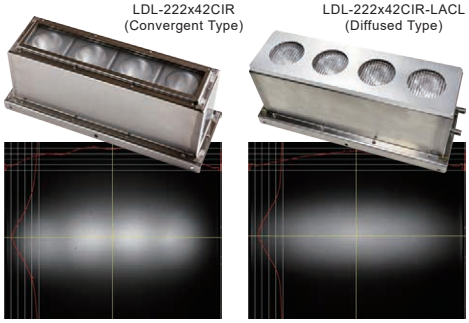


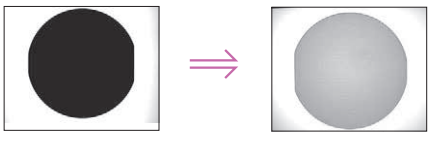
Image of the illumination

Diffused Type

TH-200X30CIR

Achieves uniform light emission with a special infrared-compatible diffuser.
For wide-range illumination and transmission imaging.

■ Imaged with visible light LED light ■ Imaged with diffused infrared light



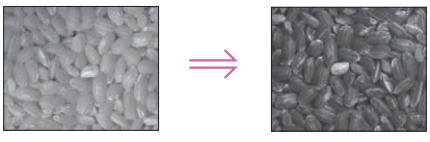
Imaged with a wafer at 1200 nm

Convergent Type

LN-200CIR

The rod lens converges irradiation for imaging with an infrared line sensor.

■ Imaged with visible light LED light ■ Imaged with convergent infrared light

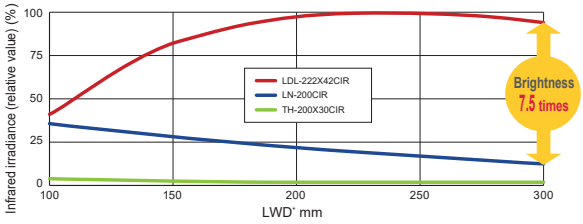


Imaged rice with different water content at 1450 nm

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Data

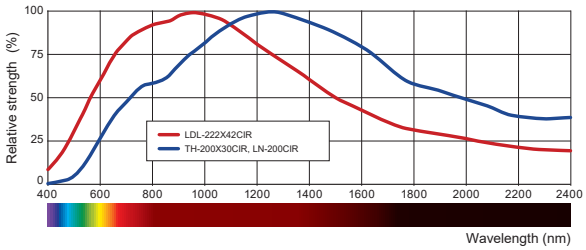
Infrared irradiance graph



*Illuminating distance between the light unit and the workpiece Note: Not guaranteed values.

The data for LDL-222X42CIR(-LACL) is the average of LDL-222X42CIR and LDL-222X42CIR-LACL.

Spectral distribution



Specifications

LDL-222X42CIR(-LACL)

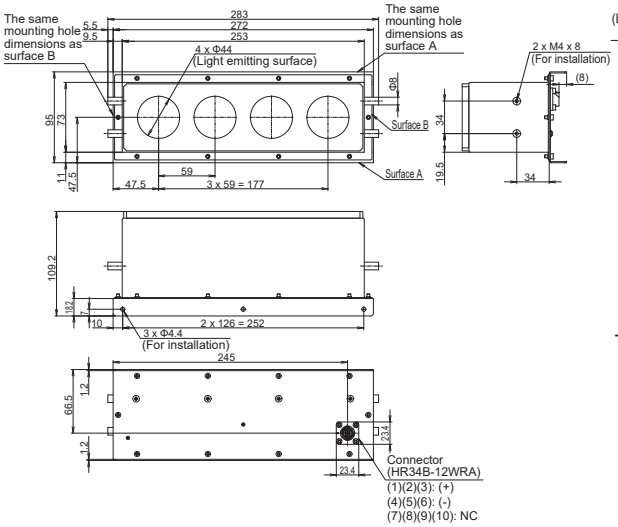
Input Voltage (Rated)	12 VDC
Input Voltage (Range)	11.4 to 12 VDC
Power Consumption	87 W max.
Connector	HR34B-12WRA-10P
Cooling method	Natural air-cooling
Operating environment (indoors only)	Temperature: 0 to 40°C, Humidity: 20 to 85% RH (with no condensation)
Storage environment	Temperature: -20 to 60°C, Humidity: 20 to 70% RH (with no condensation)
CE mark	Safety standard: Conforms to EN62471
Environmental regulations	RoHS compliant
Case material	SUS
Weight	1740 g max.
Accessories	User Manual

TH-200X30CIR/LN-200CIR

Input Voltage (Rated)	5.2 VDC typ.
Input Voltage (Range)	5.0 to 5.2 VDC
Power Consumption	46 W max.
Connector	HR34B-12WRA-10P
Cooling method	Natural air-cooling
Operating environment (indoors only)	Temperature: 0 to 40°C, Humidity: 20 to 85% RH (with no condensation)
Storage environment	Temperature: -20 to 45°C, Humidity: 20 to 70% RH (with no condensation)
CE mark	Safety standard: Conforms to EN62471
Environmental regulations	RoHS compliant
Case material	Aluminum alloy
Weight	720 g max.
Accessories	User Manual

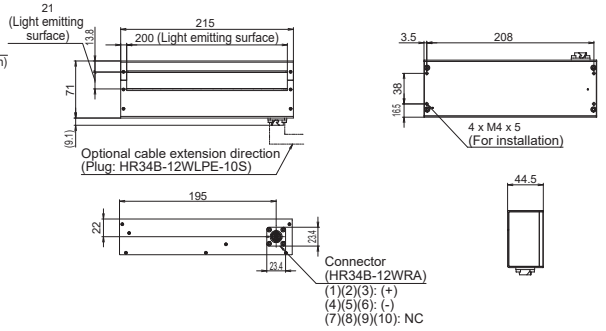
Dimensions (mm)

LDL-222X42CIR-LACL

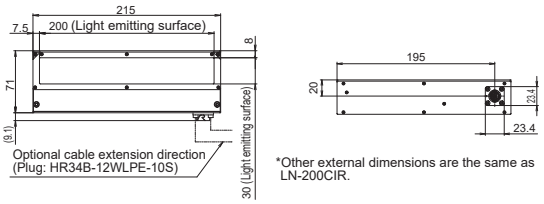


*Please see our website for LDL-222X42CIR dimensions.

LN-200CIR



TH-200X30CIR

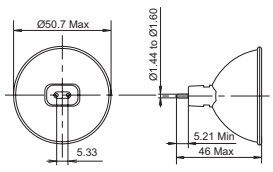


*Other external dimensions are the same as LN-200CIR.

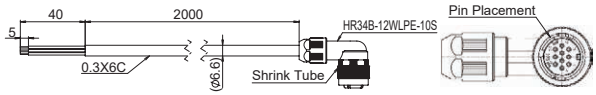
Option (mm)

For LDL-222X42CIR(-LACL) only

Replacement Lamp



Common optional cable FCB-2-NC6HR10



SWIR System consultation (lights + camera + lens)

CCS offers free testing for machine vision applications including SWIR imaging.
Our expert staff will recommend the optimal lighting solution for your application.

Intensity Control

Light Units with Intensity Control Unit

IU Series

Refer to our website for product details.
CCS IU ▶ Search

Light intensity and light ON/OFF control can be performed without an external controller.

The light intensity can be set to any of 126 levels by adjusting the intensity control unit.

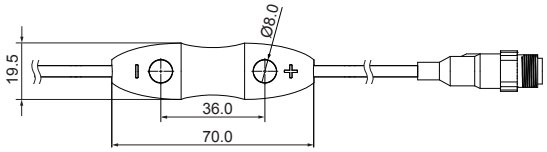
An M12 input connector, to which you can connect **Smart Cameras** and other devices to supply power.

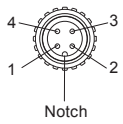
Note: These products are sold only outside Japan.

Common Specifications

Lighting method	Continuous lighting
Drive method	Constant-voltage system
Intensity control method	PWM control
PWM frequency	125 kHz
Input voltage (rating)	24 VDC
Input voltage (range)	21.6 to 24 VDC
Input connector	M12 (4 pins, male)
Cable length	670 mm (including the intensity control unit)

Dimensions (mm)





Pin No.	Signal
1	24 VDC*1
2	NC
3	COMMON GND
4	ON/OFF input (+24 V)*2

*1 Voltage rating: 24 VDC, Voltage range: 21.6 to 24 VDC
- The brightness of the light unit will be lower when the input voltage is less than 24 VDC.
- Use a stable power source with an output voltage that does not fluctuate.

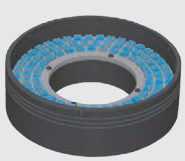
*2 Voltage rating: 24 VDC, Voltage range: 20 to 26.4 VDC

Custom Order Example

Please contact your CCS sales representative.

E.g.: Different color

Wavelength/ Color — Creating a blue LED light unit



Customizable items

External/internal diameter | Wavelength/ Color | Increase output | Cable length | Illuminating angle | Format/ material | Connector format | Installation/ mounting | Etc.

Optional Accessories

■ Extension Cable

Model name: **FRCB-n-M12-4M-4F** (n=1, 2, 3)
This robot cable is used to extend the light unit cable length.
Cable length: 1, 2, 3 m

■ Continuous Lighting Adapter

Model name: **FRCB-0.5-M12-AL-4M4F**
This Adapter is used to continuously turn ON the light unit. A robot cable is used.
(Pins 1 and 4 are internally connected.)
Cable length: 0.5 m

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Lineup

Ring Lights

	Model name	Power consumption (typ.)
HPR2	HPR2-50RD-IU	8.1 W
	HPR2-50SW-IU	9.6 W
	HPR2-75RD-IU	11 W
	HPR2-75SW-IU	11 W
	HPR2-100RD-IU	11 W
	HPR2-100SW-IU	11 W
	HPR2-150RD-IU	11 W
	HPR2-150SW-IU	11 W
LDR2	LDR2-32RD2-IU	2.0 W
	LDR2-32SW2-IU	2.4 W
	LDR2-42RD2-IU	2.5 W
	LDR2-42SW2-IU	3.2 W
	LDR2-50RD2-IU	3.6 W
	LDR2-50SW2-IU	4.3 W
	LDR2-70RD2-IU	6.6 W
	LDR2-70SW2-IU	8.1 W
	LDR2-90RD2-IU	11 W
	LDR2-90SW2-IU	11 W
	LDR2-50RD2-WD-IU	3.6 W
	LDR2-70RD2-WD-IU	6.6 W
	LDR2-90RD2-WD-IU	11 W
LFR	LFR-100RD2-IU	4.1 W
	LFR-100SW2-IU	5.1 W
	LFR-130RD2-IU	5.1 W
	LFR-130SW2-IU	6.2 W
LKR	LKR-70RD2-IU	3.0 W
	LKR-70SW2-IU	4.3 W
LDR-LA1	LDR-75RD2-LA1-IU	3.0 W
	LDR-75SW2-LA1-IU	4.3 W
	LDR-96RD2-LA1-IU	3.6 W
	LDR-96SW2-LA1-IU	4.3 W
	LDR-146RD2-LA1-IU	5.1 W
	LDR-146SW2-LA1-IU	6.6 W
	LDR-176RD2-LA1-IU	6.6 W
	LDR-176SW2-LA1-IU	8.1 W
	LDR-206RD2-LA1-IU	7.6 W
	LDR-206SW2-LA1-IU	9.6 W
LDR2-LA	LDR2-48RD2-LA-IU	2.5 W
	LDR2-48SW2-LA-IU	3.6 W
	LDR2-74RD2-LA-IU	5.1 W
	LDR2-74SW2-LA-IU	6.2 W
	LDR2-100RD2-LA-IU	9.6 W
	LDR2-100SW2-LA-IU	11 W
	LDR2-132RD2-LA-IU	11 W
	LDR2-132SW2-LA-IU	11 W

Bar Lights

	Model name	Power consumption (typ.)
LDL2	LDL2-33X8RD2-IU	3.0 W
	LDL2-33X8SW2-IU	2.5 W
	LDL2-41X16RD2-IU	4.3 W
	LDL2-41X16SW2-IU	4.3 W
	LDL2-41X16RD2-WD-IU	4.3 W
	LDL2-41X16SW2-WD-IU	4.3 W
	LDL2-80X16RD2-IU	8.1 W
	LDL2-80X16SW2-IU	8.1 W
	LDL2-80X16RD2-WD-IU	8.1 W
	LDL2-80X16SW2-WD-IU	8.1 W
	LDL2-119X16RD2-IU	11 W
	LDL2-119X16SW2-IU	11 W
	LDL2-119X16RD2-WD-IU	11 W
	LDL2-119X16SW2-WD-IU	11 W
	LDL2-74X30RD2-IU	11 W
	LDL2-74X30SW2-IU	11 W
	LDL2-74X30RD2-WD-IU	11 W
	LDL2-74X30SW2-WD-IU	11 W

Square Lights

	Model name	Power consumption (typ.)
FPQ3	FPQ3-32RD-IU	4.3 W
	FPQ3-32SW-IU	7.6 W
	FPQ3-48RD-IU	5.6 W
	FPQ3-48SW-IU	11 W

Back Lights

	Model name	Power consumption (typ.)
TH2	TH2-27X27RD-IU	2.8 W
	TH2-27X27SW-IU	3.4 W
	TH2-43X35RD-IU	5.4 W
	TH2-43X35SW-IU	5.3 W
	TH2-51X51RD-IU	7.0 W
	TH2-51X51SW-IU	8.7 W
	TH2-63X60RD-IU	10.4 W
	TH2-63X60SW-IU	10.2 W
	TH2-83X75RD-IU	11 W
	TH2-83X75SW-IU	11 W

Back Lights (Continued)

	Model name	Power consumption (typ.)
LFL	LFL-612RD2-P-IU	1.0 W
	LFL-612SW2-P-IU	0.9 W
	LFL-1012RD2-IU	1.0 W
	LFL-1012SW2-IU	1.3 W
	LFL-1012RD2-P-IU	1.0 W
	LFL-1012SW2-P-IU	1.3 W
	LFL-3212RD2-IU	2.0 W
	LFL-3212SW2-IU	2.8 W
	LFL-4012RD2-IU	2.5 W
	LFL-4012SW2-IU	3.2 W
	LFL-50RD2-IU	3.0 W
	LFL-50SW2-IU	3.6 W
	LFL-100RD2-IU	5.6 W
	LFL-100SW2-IU	5.8 W

Dome Lights

	Model name	Power consumption (typ.)
HPD2	HPD2-75RD-IU	11 W
	HPD2-75SW-IU	11 W
	HPD2-100RD-IU	11 W
	HPD2-100SW-IU	11 W
	HPD2-150RD-IU	11 W
	HPD2-150SW-IU	11 W

Flat Dome Lights

	Model name	Power consumption (typ.)
LFX3	LFX3-50RD-IU	11 W
	LFX3-50SW-IU	11 W
	LFX3-75RD-IU	11 W
	LFX3-75SW-IU	11 W
	LFX3-100RD-IU	11 W
	LFX3-100SW-IU	11 W

Coaxial Lights

	Model name	Power consumption (typ.)
LFV3	LFV3-34RD-IU (A)	4.2 W
	LFV3-34SW-IU (A)	3.7 W
	LFV3-35RD-IU (A)	3.6 W
	LFV3-35SW-IU (A)	4.2 W
	LFV3-40RD-IU (A)	5.1 W
	LFV3-40SW-IU (A)	5.1 W
	LFV3-50RD-IU (A)	8.6 W
	LFV3-50SW-IU (A)	11 W
	LFV3-70RD-IU (A)	11 W
	LFV3-70SW-IU (A)	11 W
	LFV3-CP-13RD-IU	2.5 W
	LFV3-CP-13SW-IU	2.8 W
	LFV3-CP-18RD-IU	3.8 W
	LFV3-CP-18SW-IU	4.6 W

Note: For information on the LED color, wavelength, and other specifications, refer to those of the light unit that does not have "-IU" at the end of the model name.

Spot Lighting

Spot Lights

HLV3 Series

Refer to our website for product details.

CCS HLV3 ▶ Search

Provides high output and uniform spot lighting using an original optical design
Lineup of shapes selectable according to the installation space

L-Type

HLV3-14 / HLV3-14-HU

HLV3-22-1 / HLV3-22-2

Cylindrical Type

HLV3-22-1C

HLV3-22-2C / HLV3-22-4C

HLV3-22-2-1220

HLV3-22-4S / HLV3-22-4M

HLV3-22IR860

HLV3-22-2C-1220

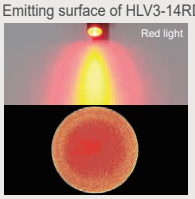
Applications As a light source for a telecentric lens, light source for alignment of LCDs or circuit boards, light source for dimension measuring, light source for spot illumination, etc.

Lineup with Selection to Match Your Needs

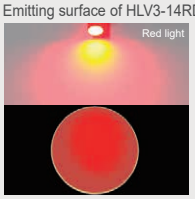
Compact and Lightweight Models HLV3-14/-HU

- **Standard type and high-uniformity type (-HU) are available**

Emitting surface of HLV3-14RD



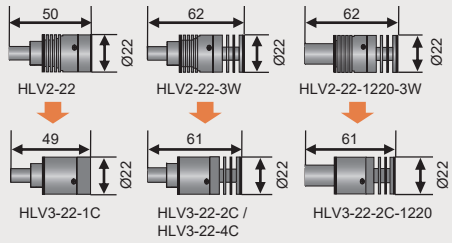
Emitting surface of HLV3-14RD-HU



Note) Comparison using our measurement conditions.
The data included is for reference only and the results for individual products may vary.

Cylindrical Type HLV3-C Series

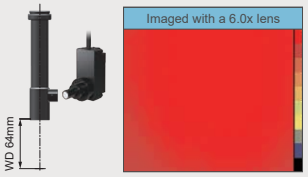
- **Housing design suitable for changing from HLV2**



High Output Models HLV3-22-4S/-4C

- **Optimized for high-magnification telecentric lenses**

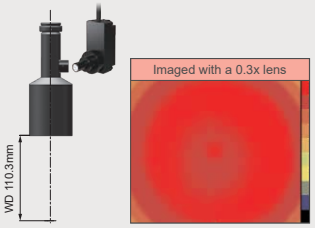
Spot Light, White
HLV3-22SW-4S/-4C
+
Telecentric Lens
6x WD65 mm
SE-65VT60-M



High Uniformity Models HLV3-22-4M

- **Optimized for low-magnification telecentric lenses**

Spot Light, White
HLV3-22SW-4M
+
Telecentric Lens
0.3x WD110 mm
SE-110VT03-5M

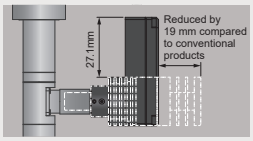


Note) Each color represents the brightness in steps of 10% the maximum value.
The results for individual products may vary.

L-Type Standard Model HLV3-22-1/-2

- **The housing design of the conventional product (HLV2) has been revised to save more space**

An L-Type housing is adopted to secure a space in the horizontal direction

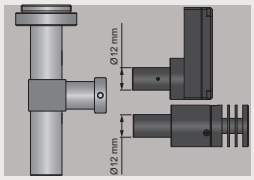


Mounting holes on rear of Spot Light enable flexible installation.
(See external dimensions)

Emission tip diameter is Ø12 mm HLV3-22-2-1220/-2C-1220

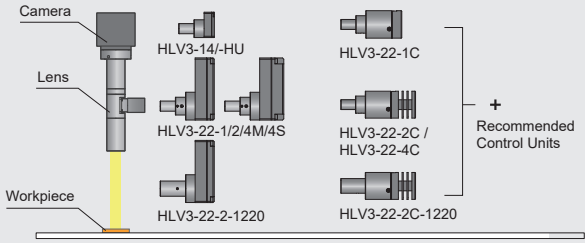
- **Lens light mounting cap size compatible with Ø12 mm**

Replacing with a straight light guide is also safe



Example Configuration

Spot light that achieves high output, high uniformity and high quality.



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Lineup that can be selected according to the application

HLV3 (L-Type)

Model Name	Compared to the brightness of conventional lighting*1				Compared to the brightness of HLV3 Series units*2				Uniformity	Compact design	Reduced individual brightness differences	Recommended magnification for telecentric lenses*3
	RD (red)	SW (white)	BL (blue)	GR (green)	RD (red)	SW (white)	BL (blue)	GR (green)				
HLV3-14	1.7x	1.1x	3.0x	1.3x	—	—	—	—	○	◎	—	1.0 <
HLV3-14-HU	0.9x	1.1x	1.0x	1.7x	—	—	—	—	◎	◎	—	1.0 <
HLV3-22-1	1.2x	1.4x	1.5x	1.2x	1.0x	1.0x	1.0x	1.0x	◎	○	○	1.0 <
HLV3-22-2	1.1x	1.5x	1.5x	1.2x	1.8x	1.7x	1.6x	1.5x	◎	○	○	1.0 <
HLV3-22-2-1220	1.1x	1.5x	1.5x	1.2x	1.8x	1.7x	1.6x	1.5x	◎	○	○	—
HLV3-22-4M	1.0x	1.3x	1.2x	1.0x	1.6x	1.4x	1.3x	1.3x	◎	△	○	0.8 >
HLV3-22-4S	1.6x	1.9x	2.0x	1.6x	2.5x	2.2x	2.1x	2.0x	◎	△	○	1.0 <
HLV3-22IR860	—	—	—	—	—	—	—	—	—	△	—	—

*1 When comparing conventional lighting brightness, the comparison for HLV3-14 is with HLV2-14 of the same color, HLV3-14-HU is with HLV2-14HU of the same color, HLV3-22-1 is with HLV2-22 of the same color, and HLV3-22-2/-2-1220/-4M/-4S are with HLV2-22-3W of the same color.
*2 When comparing the brightness of the HLV3 Series, the comparison uses HLV3-22-1 standard values for each emission color. HLV3-14, HLV3-14-HU and HLV3-22IR860 have individual differences and are thus not used for the comparison.
*3 Recommended magnification for our telecentric lenses.
Note: Comparison using our measurement conditions.
The data included is for reference only and the results for individual products may vary.

HLV3 (Cylindrical)

Model Name	Comparison of brightness with conventional HLV2*1				Comparison of brightness within HLV3*2				Reduced individual brightness differences	Recommended magnification for telecentric lenses*3
	RD (red)	SW (white)	BL (blue)	GR (green)	RD (red)	SW (white)	BL (blue)	GR (green)		
HLV3-22-1C	1.6x	1.8x	1.4x	1.4x	1.0x	1.0x	1.0x	1.0x	—	1.0 <
HLV3-22-2C	1.6x	1.9x	1.5x	1.5x	1.7x	1.6x	1.6x	1.6x	—	1.0 <
HLV3-22-2C-1220	1.6x	1.9x	1.5x	1.5x	1.7x	1.6x	1.6x	1.6x	—	1.0 <
HLV3-22-4C	2.1x	2.5x	1.9x	1.9x	2.4x	2.2x	2.1x	2.0x	—	1.0 <

*1 When comparing conventional lighting brightness, the comparison for HLV3-22-1C is with HLV2-22 of the same color, and HLV3-22-2C/-2C-1220/-4C are with HLV2-22-3W of the same color.
*2 When comparing the brightness of the HLV3 Series, the comparison uses HLV3-22-1C standard values for each emission color.
*3 Recommended magnification for our telecentric lenses.
Note) Comparison using our measurement conditions.
The data included is for reference only and the results for individual products may vary.

Reduced Individual Differences

(Excluding HLV3-14/-14-HU,HLV3-22IR860,HLV3-22-1C/-2C/-2C-1220, and -4C)

The HLV3 Series (L-Type) uses a new design that allows the brightness to be adjusted within the standard values determined for each model.
In the production process, the brightness of each HLV3 Series spot light is measured and adjusted to the standard value established for each model. This allows us to produce high-quality spot lights with minimal variations in brightness between units of the same model.
The HLV3 Series helps reduce labor time to install, maintain, and adjust brightness of spot lights and helps reduce time required on site.

Optimized for the Optical System of CCS High-Resolution Telecentric Lenses

We recommend lights suitable for the magnification of telecentric lenses. A high-uniformity type is available for low-magnification lenses, and a high-output type for high-magnification lenses.
Spot lights use an original lens to maintain high quality with minimal deviation in the optical axis.
Use spot lights with our original telecentric lenses (coaxial type) to create a stable imaging environment.

Recommended Magnification of Our Telecentric Lenses

	Magnification / WD	0.3	0.5	0.8	1.0	1.5	2.0	3.0	4.0	6.0
Telecentric lens	65 mm		SE-65 VT05-M	SE-65 VT08-M	SE-65 VT10-M		SE-65 VT20-M		SE-65 VT40-M	SE-65 VT60-M
	110 mm	SE-110 VT03-5M	SE-110 VT05-M	SE-110 VT08-M	SE-110 VT10-M	SE-110 VT15-M	SE-110 VT20-M	SE-110 VT30-M	SE-110 VT40-M	

Recommendation based on the test results using our measurement conditions.

Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent / Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

HLV3 Series

Refer to our website for product details.

CCS HLV3 ▶ Search

Lineup

Shape	Model Name*1	Input Current (max.)	Power Consumption (max.) RD (Red)	SW (White)	BL (Blue)	GR (Green)	IR (Infrared)	Options	Extension Cables	Recommended Control Units	Weight (max.)
L-Type	HLV3-14□□ (-HU)	275 mA	0.7 W	0.9 W	0.9 W	1.1 W	–	–	FCB*3 Straight Cable / FRCB Robot Cable / FCB-HLV3-10*5 Straight Cable / FRCB-HLV3-10*5 Robot cable (*5 Only PJ2 can be used.)	PD3*2 / CC-PJ-0707 / PJ / PJ2	18 g
	HLV3-22□□-1	385 mA	1.1 W	1.4 W	1.5 W	1.5 W	–	Condenser lens			46 g
	HLV3-22□□-2	700 mA	2.1 W	2.5 W	2.7 W	2.8 W	–				
	HLV3-22□□-2-1220		2.1 W	2.5 W	2.7 W	2.8 W	–	–			47 g
	HLV3-22□□-4M	1000 mA	3.2 W	3.7 W	4.0 W	4.1 W	–	Condenser lens		PJ2	53 g
	HLV3-22□□-4S		3.2 W	3.7 W	4.0 W	4.1 W	–				
	HLV3-22IR860		–	–	–	–	4.1 W				
	HLV3-22IR950-SP*4		–	–	–	–	3.4 W				
Cylindrical type	HLV3-22□□-1C	385 mA	1.1 W	1.3 W	1.4 W	1.4 W	–	Condenser lens		PD3*2 / CC-PJ-0707 / PJ / PJ2	34 g
	HLV3-22□□-2C	700 mA	2.0 W	2.4 W	2.6 W	2.7 W	–				39 g
	HLV3-22□□-2C-1220	700 mA	2.0 W	2.4 W	2.6 W	2.7 W	–	–			40 g
	HLV3-22□□-4C	1000 mA	3.0 W	3.5 W	3.8 W	4.0 W	–	Condenser lens		PJ2	39 g

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, GR: Green)
*2 The PD3-3024-3 and PD3-5024-3 Series are not applicable to these products.
*3 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*4 The warranty period of the custom order product is different from that of the CCS standard products. Contact our local sales office for details.

Increase HLV3 Series brightness by 2.4x for high-speed lighting

Combine the power adapter and strobe overdrive control unit to suit the imaging environment.

• Spot Lighting
HLV3-22-4M/4S/4C Series emission colors (red, white, blue, green), HLV3-22IR860 (infrared)

• Straight Cable
FCB-1/-2/-3/-5

• Robot Cable
FRCB-1/-2/-3/-5

* Branch cables cannot be used.

• Power Adapter
RB-16.4-48-HK
Special order

* This is an adapter for using the HLV3 Series with a strobe overdrive control unit or constant voltage control unit.

• Strobe Overdrive Control Unit
POD-5024-2-PEI / POD-22024-4-PEI

(2 channel) (4 channel)

▶ P.329

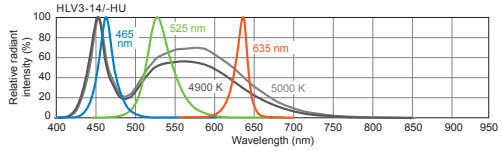
Light and power adapter compatibility table (example)

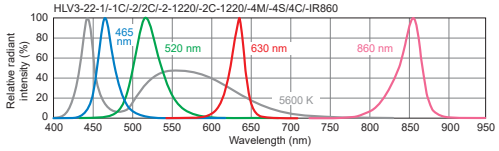
Light Model Name	Emitting Color					Power Adapter Model Name (custom order) Constant Voltage Control Unit PD2, PD3	Strobe Overdrive Control Unit PTU2, POD
HLV3-14	RD	-	-	GR	-	RB-82-24-15SP Quantity of light: 0.9x, Power consumption: 7.3 W*1	RB-56-48-W15 Quantity of light: 2.5x, Peak current: 0.86A
	-	SW	BL	-	-		RB-33-48-W15 Quantity of light: 4.8x, Peak current: 1.5 A
HLV3-22-1 / -1C	RD	SW	BL	GR	-	RB-56-24 Quantity of light: 0.8x, Power consumption: 11W*1	RB-22-48-HK Quantity of light: 4.6x, Peak current: 2.2 A
HLV3-22-2 / -2C	RD	SW	BL	GR	-	RB-33-24-HKTK Quantity of light: 0.8x, Power consumption: 18 W*1	RB-22-48-HK Quantity of light: 2.5x, Peak current: 2.2 A
HLV3-22-4S / 4M /-4C HLV3-22-NR-4 HLV3-22IR860	RD	SW	BL	GR	IR	RB-24-24-HK Quantity of light: 0.7x, Power consumption: 25 W*1	RB-16.4-48-HK Quantity of light: 2.4x, Peak current: 2.9 A

*1 Power consumption is the total value of the applicable light and power adapter. Note: The quantity of light may decrease depending on the combination. Contact our local sales office for details.

LED Properties

Spectral distribution



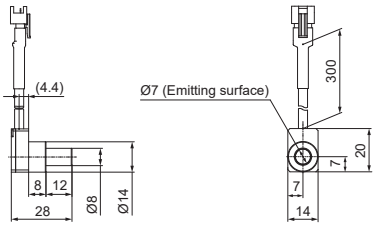


Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary. See P.359 for details about lens filters.

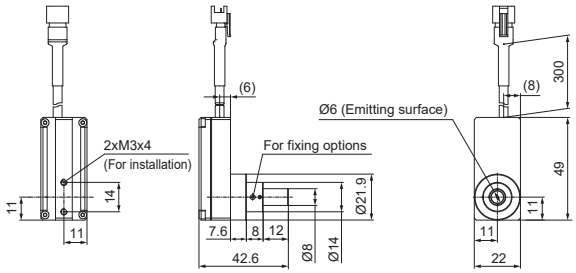
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Dimensions (mm)

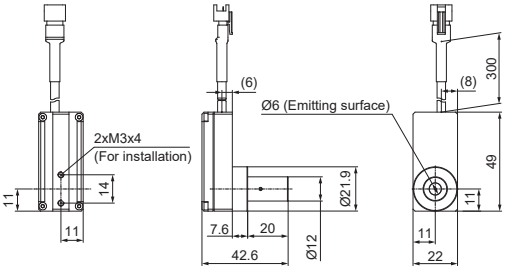
Compact Model HLV3-14 (-HU)



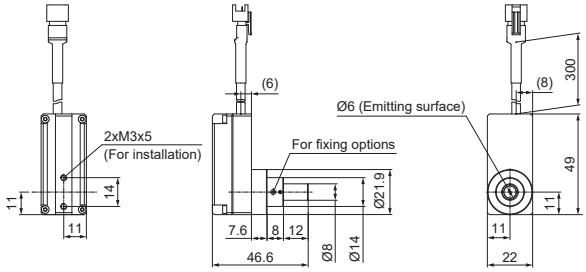
Standard Model HLV3-22-1 / -2



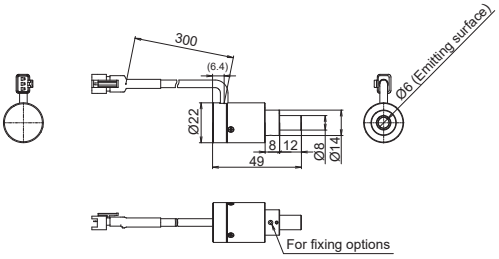
Ø12-mm Light Emitting Tip HLV3-22-2-1220



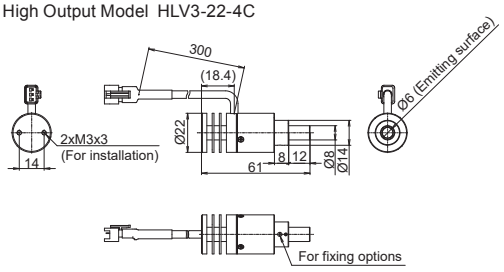
High Output Model HLV3-22-4S/4M
Infrared Model HLV3-22IR860



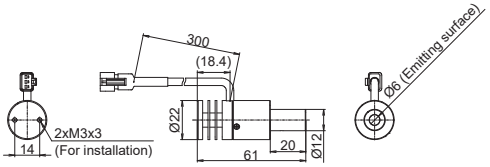
Standard Model HLV3-22-1C



Standard Model HLV3-22-2C
High Output Model HLV3-22-4C



Ø12-mm Light Emitting Tip HLV3-22-2C-1220



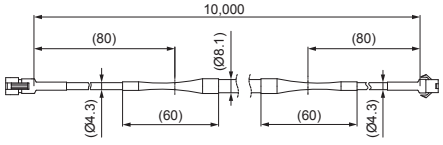
Optional Cables (Sold Separately)

	Straight Cables	Robot Cables
Extension Cables	FCB-1/-2/-3/-5 (1 m / 2 m / 3 m / 5 m)	FRCB-1/-2/-3/-5 (1 m / 2 m / 3 m / 5 m)
	FCB-HLV3-10 (10 m) *	FRCB-HLV3-10 (10 m)*

Notes	
	• The total length of the FCB-1/-2/-3/-5 and FRCB-1/-2/-3/-5 extension cables must be no longer than 5 m. • Branch cables are not available for the HLV3 spot lights.

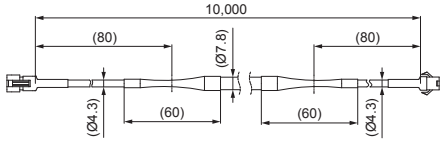
* These 10-m extension cables connect the HLV3 Series spot light and the PJ2 Series control unit.

FCB-HLV3-10
Straight Cable
(Unit: mm)



Weight: 1,200 g max., Cable permitted bending radius: 65 mm

FRCB-HLV3-10
Robot Cable
(Unit: mm)



Weight: 1,200 g max., Cable permitted bending radius: 35 mm

HLV3 Series

Refer to our website for product details.

CCS HLV3 ▶ Search

Introduction to Condenser Lenses

Even in an imaging environment where there is a long distance from the workpiece, illumination suitable for the imaging conditions can be achieved by selecting a condenser lens according to the illumination distance, range and uniform area.

Recommended models for installation	HLV3-22 model *Excludes HLV3-22-2(C)-1220 and HLV3-22-NR

HL2-25-P

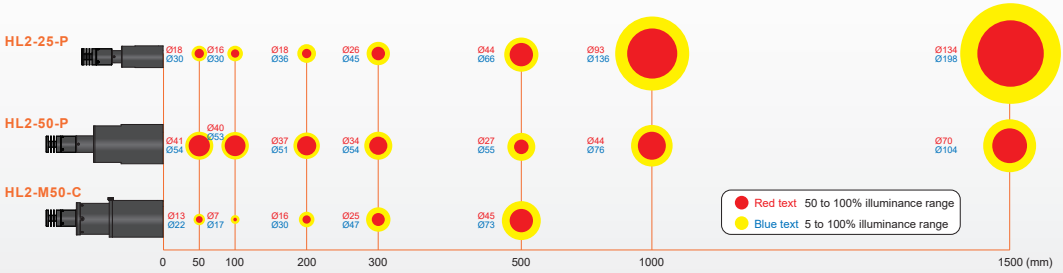
Compact condenser lens for spot illumination with high parallelism.

HL2-50-P

Condenser lens for spot illumination with high parallelism.

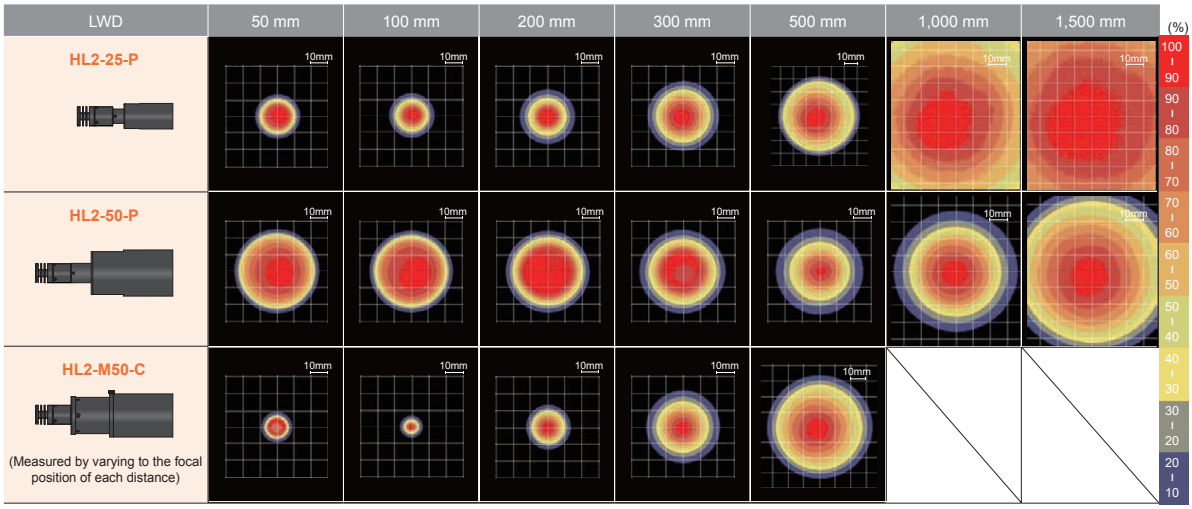
HL2-M50-C

Condenser lens with variable lens barrel length that allows adjustment of irradiation distance and irradiation range.



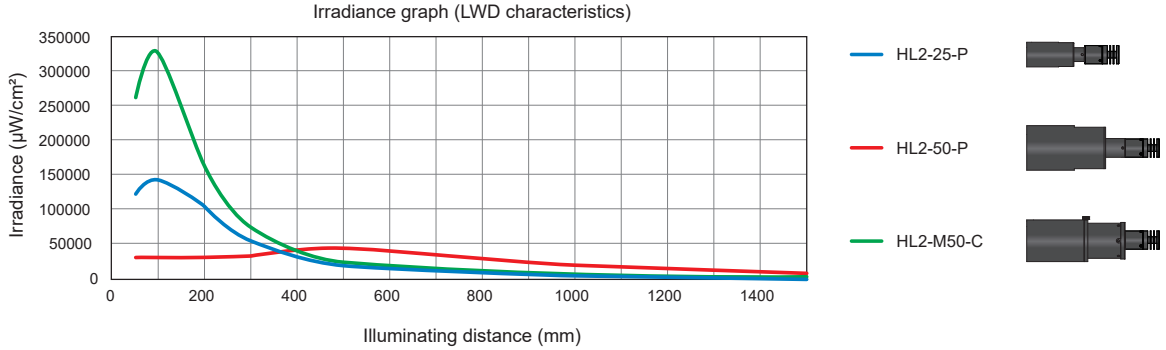
Measured when HLV3-22SW-4C (white) is mounted on the lens. Comparison using our measurement conditions.
The data included is for reference only and the results for individual products may vary.

Illuminance Distributions (LWD Characteristics)



Measured values are in steps of 10%, where the maximum illuminance within the range is expressed as 100%, using our measurement conditions.
Measured when HLV3-22SW-4S (white) is mounted on the lens. Results for individual products may vary.

Data: Irradiance Comparison Graph



Measurement when HLV3-22SW-4C (white) is mounted on the lens. Measured values using our measurement conditions. Results for individual products may vary.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

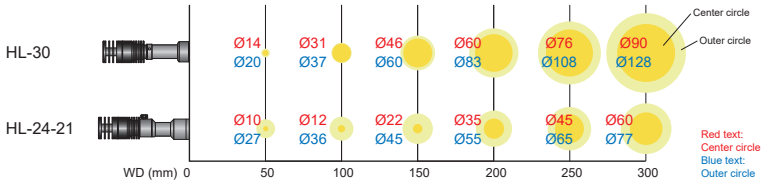
Condenser Lens (HL Series)

Dedicated condenser lens for HLV3-22 (L-shaped/cylindrical)

HL-30/HL-24-21

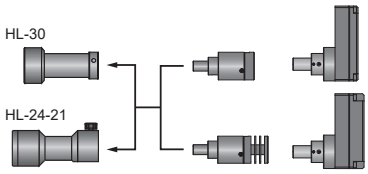
Cannot be used with HLV3-14/HLV3-22-2-1220/HLV3-22-2C-1220/ HLV3-22-4-NR Series.

HL-30/HL-24-21 illumination range



When connected with HLV2-22-3W. Data listed here represents actual measurement values. Not a guaranteed value.

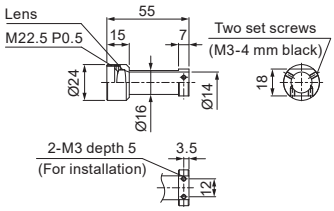
Mounting to HLV3-22



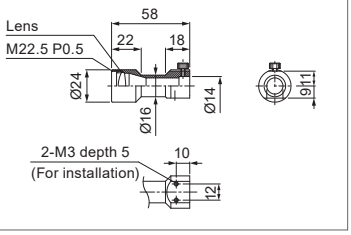
Compatible models
HLV3-22-1/1C/2/2C/4M/4S/4C Series

Dimensions (mm)

HL-30

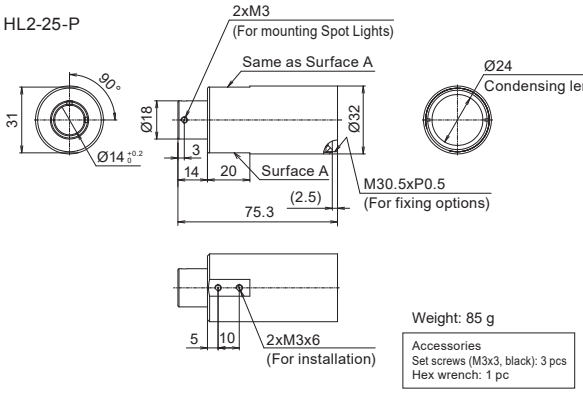


HL-24-21



Condenser Lens Dimensions (mm)

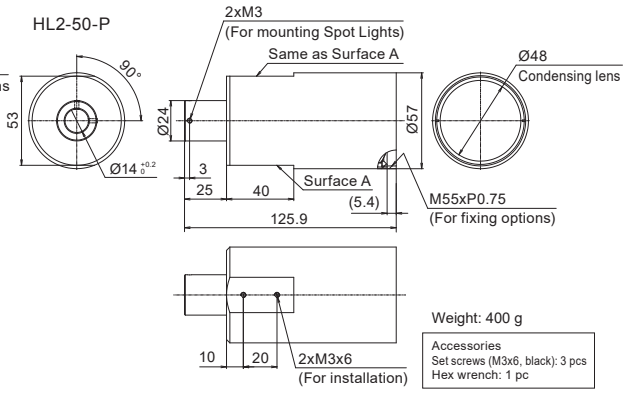
HL2-25-P



Weight: 85 g

Accessories
Set screws (M3x3, black): 3 pcs
Hex wrench: 1 pc

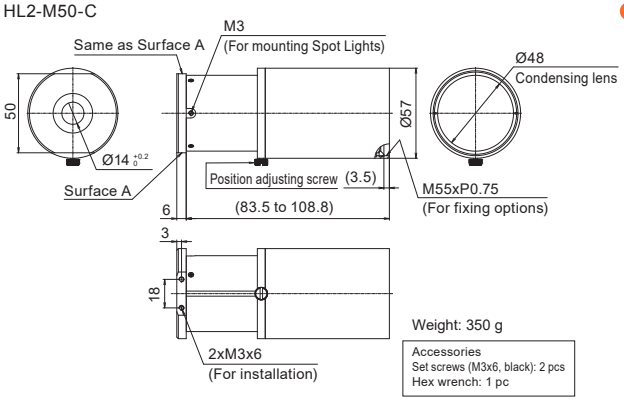
HL2-50-P



Weight: 400 g

Accessories
Set screws (M3x6, black): 3 pcs
Hex wrench: 1 pc

HL2-M50-C

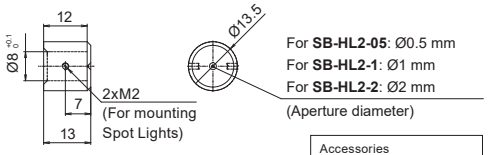


Weight: 350 g

Accessories
Set screws (M3x6, black): 2 pcs
Hex wrench: 1 pc

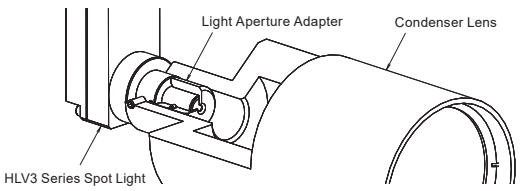
Light aperture adapter (sold separately)

Attach the light aperture adapter to the HLV3 Series spot light to change the directivity of emitted light.
When combined with a condenser lens, use the light aperture adapter to make fine adjustments to the illuminating distance and range.



Accessories
Set screws (M2x2, black): 3 pcs
Hex wrench: 1 pc

Put the Light Aperture Adapter and Condenser Lens all the way onto the tip of the Spot Light.



Polarizing filter (sold separately)

Many sizes available for condenser lens.
Use in combination with another one installed on the camera lens.

- For HL2-25-P
  Model: PL-30/PL-30-NL (with a screw to lock the polarizing direction)
- For HL2-50-P/HL2-M50-C
  Model: PL2-55-NL (with a screw to lock the polarizing direction)
- For HL-30/-24-21
  Model: PL-22-NL (with screw lock) * This is a custom-order product. Contact our sales representative for details.

Provides spot lighting using original converging technology

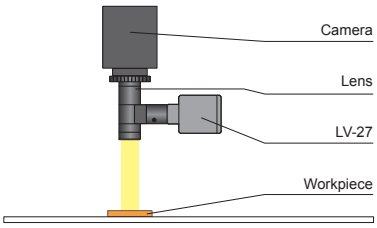
Applications As a light source for a telecentric lens, light source for inspecting alignment of LCDs or circuit boards, light source for dimension measuring, light source for spot illumination, etc.

Features

Spot Light with tip radius of Ø8 mm and emitting surface of Ø6 mm. Can be used embedded into the coaxial illuminating section of a telecentric lens or macro lens.

We accept custom orders. Please feel free to inquire.
- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

Example configuration (LV-27)



Lightweight, compact design

It has a lightweight and compact design and is suitable for saving space.

Spot Light with low power consumption

The LV Series consumes 0.8 W (for red) of power, and can be used for saving energy.

Lineup

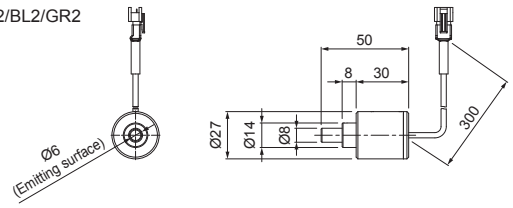
Model Name	LED Color	Power Consumption	Peak Wavelength / Correlated Color Temperature	Options	Extension Cables	Recommended Control Units	Weight
LV-27RD2	Red	24 V / 0.8 W	630 nm	–	FCB*2 Straight Cable FCB-W*3 2-branch Cable FCB-F 4-branch Cable FRCB Robot Cable	PD4, PD3, CC-ST-1024, POD*1	40 g
LV-27SW2	White	24 V / 0.4 W	5,500 K				
LV-27BL2	Blue	24 V / 0.4 W	470 nm				
LV-27GR2	Green	24 V / 0.6 W	525 nm				

LED Properties: Spectral Distribution ▶ P.396 | Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 For information on the combination of light units and POD series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod
*2 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*3 The cables with a model name that ends with "-EL2" are not included.

Dimensions (mm)

LV-27RD2/SW2/BL2/GR2



You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Note
- Use as a Spot Light for directly illuminating the workpiece.
- In addition to light units with a tip radius of Ø8 mm, we also offer Ø10 mm and Ø12 mm as custom orders.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Super-Uniform Spotlight for wide variety of applications

LSP-41RD

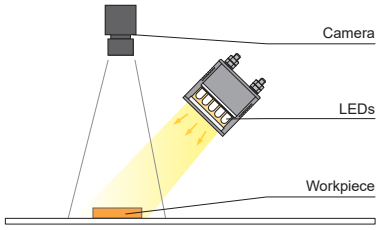
Applications Character recognition, visual inspection for electronic parts, visual and position inspections for circuit boards, light source for spot lights, etc.

Features

High luminance Spot Lights LSP Series is suited for limited and long working distance from 300 mm to 500 mm, with a compact design—Ø41 mm diameter housing.

We accept custom orders. Please feel free to inquire. • Changes in length, etc.

Example configuration (LSP-41RD)



Examples of Light Images

Reading bar code
Light used: LSP-41RD

Reading QR code
Light used: LSP-41RD

Inspecting dot-marked characters on pipe
Light used: LSP-41RD

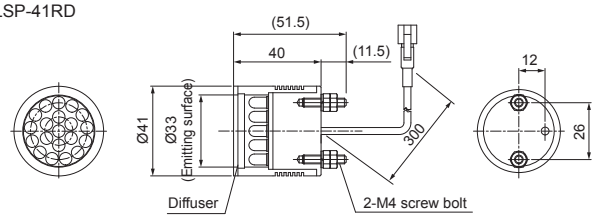
Lineup

Model Name	LED Color	Power Consumption	Peak Wavelength / Correlated Color Temperature	Options	Extension Cables	Recommended Control Units	Weight
LSP-41RD	Red	12V / 2.0 W	660 nm	Polarizing plate	CB Straight Cable CB-W 2-branch Cable CB-F 4-branch Cable RCB Robot Cable	PD2 PTU2	115 g

Options ▶ P.365 | Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

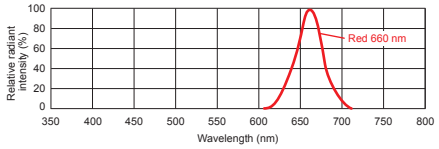
Dimensions (mm)

LSP-41RD



LED Properties

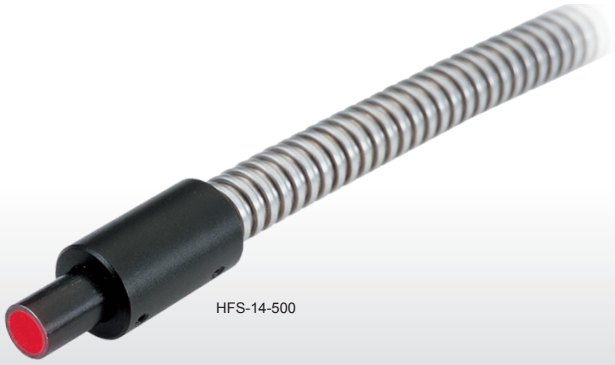
Light spectrum



Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

LED fiber light (straight) that uses original converging technology



Model name	HFS-14-500
Fiber material	Multicomponent glass
Case material	Aluminum alloy
Flexible tube material	SUS
Strand diameter (μm)	50
Fiber arrangement	Random
Numerical aperture (NA)	0.56
Receiving angle (°)	68
Transmitted wavelength (nm)	300 to 1,300
Minimum bending radius (mm)	50

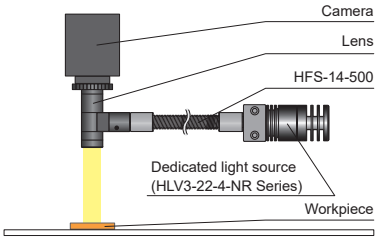
Applications As a light source for a telecentric lens, visual inspection for chips, alignment mark imaging, etc. (Common for the HFS and HFR Series)

Features

This is a unique light unit system that melds the strengths of both LEDs and fibers. The HFS Series, a straight type, is lightweight, compact, and easy to manage, and therefore can be used in a variety of applications.

We accept custom orders. Please feel free to inquire.
• Changes in length, etc.

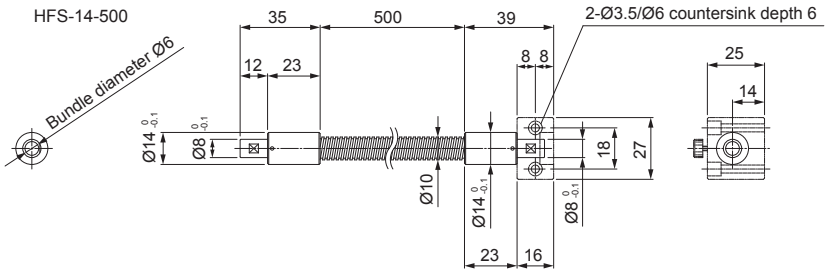
Example configuration (HFS-14-500)



It can be used in a variety of situations

Dedicated Light Source (HLV3-22-4-NR Series) Product Page► P.195

Dimensions (mm)



Common Specifications for the HFS/HFR Series

Model Name	Operating Temperature and Humidity	Storage Temperature and Humidity	Weight
HFS-14-500	Temperature: 0 to 40°C, Humidity: 20% to 70%RH (with no condensation)	Temperature: -10 to 60°C, Humidity: 20% to 70%RH (with no condensation)	115 g
HFR-25-10			60 g
HFR-25-30			
HFR-40-20			250 g

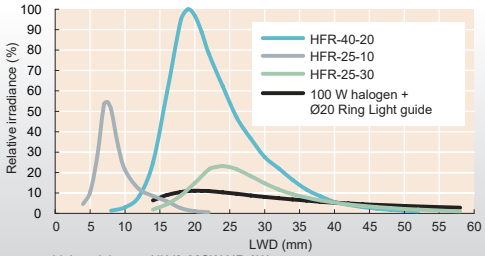
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

LED fiber light (ring type) that uses original converging technology

Three dedicated light sources are required for use.
Dedicated light source (HLV3-22-4-NR Series)
Product Page ▶ P.195

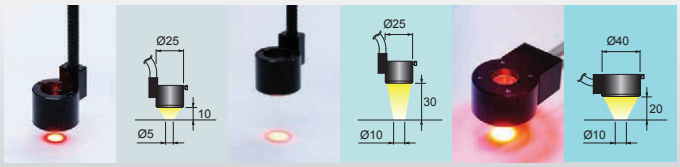
Model name	HFR-25-10/30 HFR-40-20
Fiber material	Plastic
Case material	Aluminum alloy
Flexible tube material	SUS
Strand diameter (μm)	500
Fiber arrangement	–
Numerical aperture (NA)	0.5
Receiving angle (°)	60
Transmitted wavelength (nm)	400 to 700
Minimum bending radius (mm)	30

Graph of change in irradiance in each LWD for the HFR Series



Light unit in use: HLV2-22SW-NR-3W
This data is for reference only. Actual values may vary.

■HFR-25-10 ■HFR-25-30 ■HFR-40-20



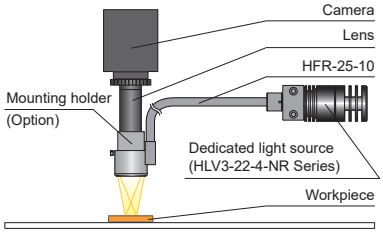
Ø5 mm near LWD 10 mm convergent illumination
Ø10 mm near LWD 30 mm convergent illumination
Ø10 mm near LWD 20 mm convergent illumination

Features

The HFR Series, a ring type, does not illuminate a broad range like a halogen fiber light, but can perform convergent illumination for the required field of vision.

We accept custom orders. Please feel free to inquire.
- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

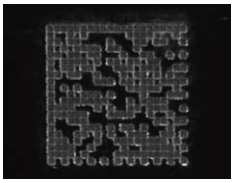
Example configuration (HFR-25-10)



Imaging using HFR-25-10 (white)

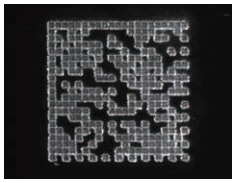
HFR-25-10

100 W halogen + Ring Light guide: LWD 20 mm



Intensity: 100%
Shutter speed: 1/4,000 sec

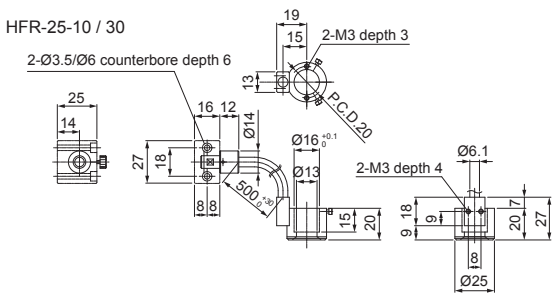
HFR-25-10 (White): LWD 10 mm



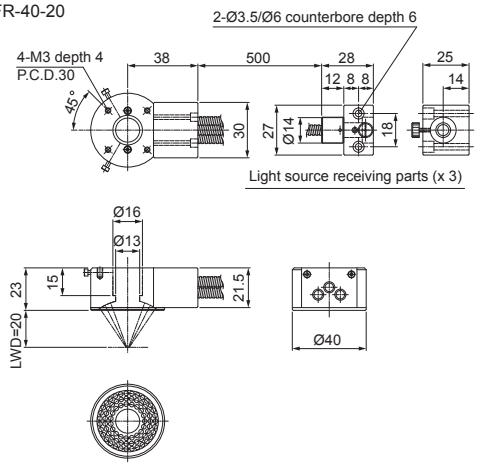
Intensity: 100%
Shutter speed: 1/4,000 sec

Dimensions (mm)

HFR-25-10 / 30



HFR-40-20



Options

Mounting holder for HFR-25-10 / -30

Light units can be easily installed and mounted in the position for the most efficient convergence.

HD-HFR-25-1640 HD-HFR-25-1618

Example of usage

Example of usage

Dedicated Light Source (HLV3-22-4-NR Series) Product Page ▶ P.195

Micro Fiber Head Dedicated Light Sources
HLV3-22-4-NR Series

Refer to our website for product details.
CCS HLV3-22-4-NR ▶ Search

Provides high output spot lighting using an original optical design

Connection example for HLV3-22-4-NR and a micro fiber head

Straight type: HFS-14-500

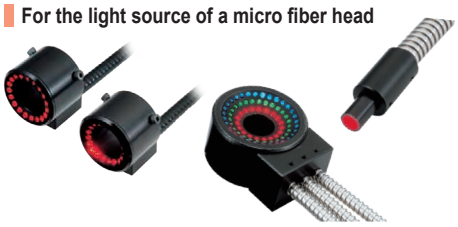
Ring type: HFR-25-10 / HFR-25-30 / HFR-40-20 (Three light sources are required for use.)

Features

The micro fiber head dedicated light source allows for easy installation and removal. It's possible to choose the emission color when imaging the workpiece to achieve accurate feature extraction.

We accept custom orders. Please feel free to inquire.
- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

For the light source of a micro fiber head



Micro Fiber Head Product Page ▼ P.193

For the light source of a full color blending unit

Full Color Blending Unit Product Page ▼ P.196

Lineup

Model Name	LED Color	Peak Wavelength / Correlated Color Temperature (typ.)	Input Current (max.)	Power Consumption (max.)	Options	Extension Cables	Recommended Control Units	Weight (max.)
HLV3-22RD-4-NR	Red	630 nm	1,000 mA	3.0 W	–	FCB* Straight Cable / FRCB Robot Cable / FCB-HLV3-10 Straight Cable / FRCB-HLV3-10 Robot Cable	PJ2	37 g
HLV3-22SW-4-NR	White	5,600 K		3.5 W				
HLV3-22BL-4-NR	Blue	465 nm		3.8 W				
HLV3-22GR-4-NR	Green	520 nm		4.0 W				

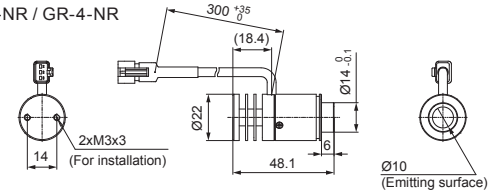
LED Properties: Spectral Distribution ▶ P.396 | Extension Cables ▶ P.371 | PJ2 Series Product Page ▶ P.347

* The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.

Caution	• The total length of the FCB-1/-2/-3/-5 and FRCB-1/-2/-3/-5 extension cables must be no longer than 5 m. • Branch cables cannot be used. Use the FCB Series (straight cable) or the FRCB Series (robot cable).

Dimensions (mm)

HLV3-22RD-4-NR / SW-4-NR / BL-4-NR / GR-4-NR



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

HLV3-3M-RGB-4

Full color light source that provides the illumination color suitable for the workpiece

HLV3-3M-RGB-4

Connection example for HLV3-3M-RGB-4 and a micro fiber head

Straight type: HFS-14-500

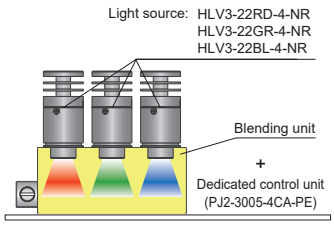
Ring type: HFR-25-10 / HFR-25-30 / HFR-40-20 (Three light sources are required for use.)

Features

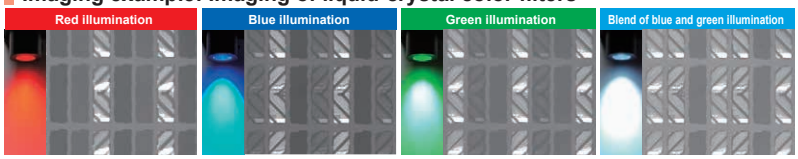
The red/blue/green emission colors emitted from the dedicated light source are mixed in the unit to achieve the illumination color suitable for the workpiece. Combine with a micro fiber head to support a wide variety of applications.

We accept custom orders. Please feel free to inquire.
- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

Example configuration (HLV3-3M-RGB-4)



Imaging example: Imaging of liquid-crystal color filters



Use the HLV3-22-4-NR Series to create illumination with a highly accurate blended color.
Independently adjust the intensity for each color to create exactly the color you want and help improve inspection accuracy.

Micro Fiber Head Product Page ▼ P.193 HLV3-22-4-NR Series Product Page ▼ P.195

Lineup

Model Name	LED Color	Peak Wavelength / Correlated Color Temperature (typ.)	Input Current (max.)	Power Consumption (max.)	Options	Extension Cables	Recommended Control Units	Weight (max.)
HLV3-3M-RGB-4	Red	630 nm	1,000 mA	11 W	–	FCB* Straight Cable FRCB Robot Cable FCB-HLV3-10 Straight Cable FRCB-HLV3-10 Robot Cable	PJ2-3005 -4CA-PE	232 g
	Blue	465 nm						
	Green	520 nm						

LED Properties: Spectral Distribution ▶ P.396 Extension Cables ▶ P.371 PJ2 Series Product Page ▶ P.347

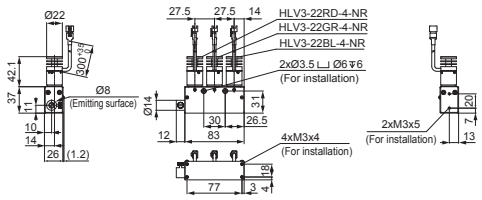
* The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.

Caution	• The total length of the FCB-1/-2/-3/-5 and FRCB-1/-2/-3/-5 extension cables must be no longer than 5 m. • Branch cables cannot be used. Use the FCB Series (straight cable) or the FRCB Series (robot cable).

Dimensions (mm)

HLV3-3M-RGB-4

(Cable length: 300 mm)



High-Power Light Sources

PFBR-600SW2-LL/LLCF

Refer to our website for product details.

CCS PFBR-600SW2 ▶ Search

Next-generation light sources delivering high output and a fast response

NEW

PFBR-600SW2-LLCF
(Filter Changer Model)

PFBR-600SW2-LL

CE

The supplied AC cord is for use with 100 to 120 VAC.
If you want to use the light source unit with 200 to 240 VAC, you must procure another appropriate AC power cord.

Applications Connected to a dedicated light guide and used as a light source / Connected to a plastic light guide and used as a light source * XF type only

Caution These products emit high-intensity visible light. Heat-sensitive or flammable light-absorbing materials may be damaged because light-absorbing materials convert incident light into heat. Check the instructions in the User Manual and use the products in a safe manner.

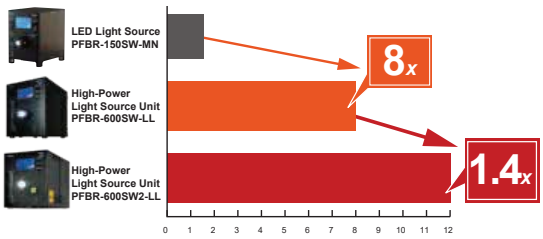
Features

- Continuous lighting and strobe lighting (internal trigger mode and external trigger mode) can be selected
- Available control modes include manual control and external control over Ethernet, parallel communication, and serial communication
- Light intensity can be set in a maximum of 1,024 steps (10-bit: 1,024 steps / 8-bit: 256 steps)

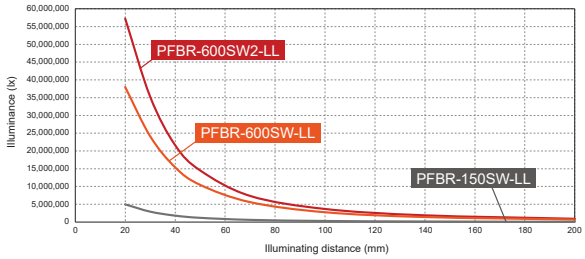
Provides High Output to Easily Replace Xenon Flash Light Sources

Output increased more than 1.4x that of conventional products. The result is an ultra-high output light source unit comparable to xenon flash light sources.

Illuminance Comparison Graph (Image)



Note: Actual measurement values with intensity of 100%, a bundle of Ø8 mm, a straight light guide with a total length of 1,000 mm installed, and at a position 50 mm away from the fiber output edge. (Results may vary for individual units.)

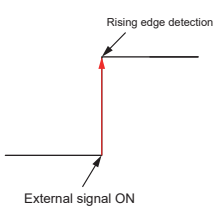


Note: Actual measurement values with intensity of 100%, bundles of Ø8 mm, a straight light guide with a total length of 1,000 mm installed, and at positions at each illuminating distance away from the fiber output edge. (Results may vary for individual units.)

Trigger Filter Function NEW

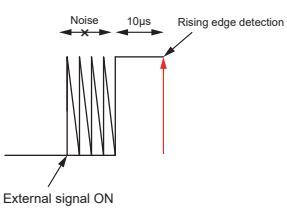
Stable detection of external trigger input even in noisy environments.

Trigger filter set time = 00µs



Recognizes as a rising edge trigger at the time of external signal ON.

Trigger filter set time = 10µs

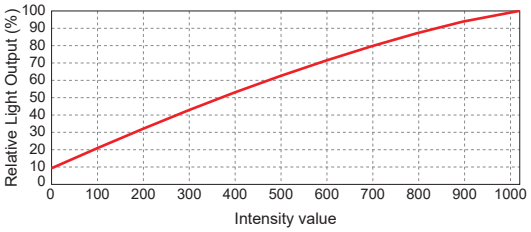


Recognizes as a rising edge trigger after 10µs from external signal ON.
Noise detected from external signal ON until trigger filter set time will not be recognized as a rising edge trigger.

* Please refer to the instruction manual for details.

Dimming and light output characteristics

Light intensity is adjustable with a high resolution of 1,024 steps.



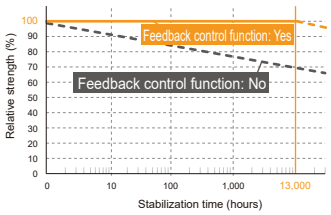
Note: Actual measurement values using our measurement conditions. Results for individual products may vary.
The correction function on this product is permanently enabled.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Equipped with Light Quantity Feedback Control Function

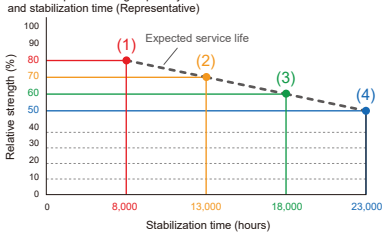
Use the light quantity feedback control function and set the desired stabilization time to maintain output over long periods.

Comparison of relative strength according to light quantity feedback control function (Representative)



Note: When the stabilization time is set to 13,000 hours.
This graph is representative of the function. Actual values may vary.

Relationship between light quantity feedback control function and stabilization time (Representative)



Note: In Ta=40°C environment.
This graph is representative of the function. Actual values may vary.

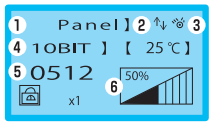
(1) Stabilized up to 8,000 hours at 80% maximum light quantity.
(2) Stabilized up to 13,000 hours at 70% maximum light quantity.
(3) Stabilized up to 18,000 hours at 60% maximum light quantity.
(4) Stabilized up to 23,000 hours at 50% maximum light quantity.

Note: Refer to the user manual for more information on the light quantity feedback control function.

Easily Checked Operating Status on the LCD Panel

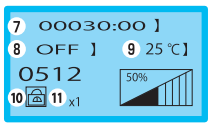
Displays operating status such as light source temperature, light intensity and operating time.

Operation Display 1



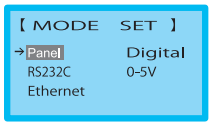
1. Operating mode
2. Feedback function icon
3. Light ON icon
4. Intensity resolution
5. Intensity value
6. Intensity indicator

Operation Display 2



7. Total time (min.)
8. Strobe setting
9. Light source temperature
10. Lock icon
11. Intensity step magnification
When you press the operating knob, the display of the magnification will change in the following order : x1, x10, and x100.

MODE Setting Display



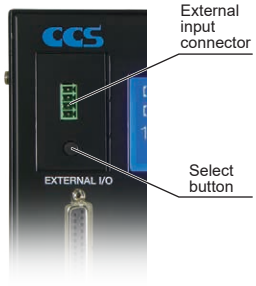
Note: Refer to the user manual for details of displayed contents.

External Control by Use of a Large Variety of Communication Methods

- Ethernet communication control: TCP/IP, UDP/IP
- Serial communication control: RS-232C
- Parallel communication control: Digital light control: Compatible with sink and source types
  Analog light control: Intensity control from 0 to 5 V

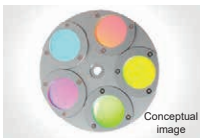
PFBR-600SW2-LLCF Filter Changer Model

Use color filters to emit light at specific wavelengths.



PFBR-600SW2-LLCF

- Equipped with a multi-filter changer that holds five filters.
- Filters can be changed manually and using external communication.
- Easily replace filters by removing the front cover.
- Filters available in six colors.



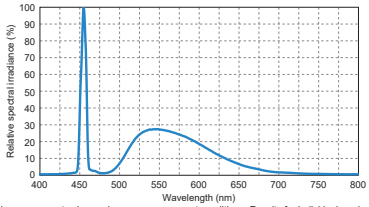
- Red
- Cyan
- Blue
- Magenta
- Green
- Yellow

Note: Refer to the user manual for installing and setting filters.

A variety of filters are available with excellent heat resistance.

Light Spectrum Characteristics

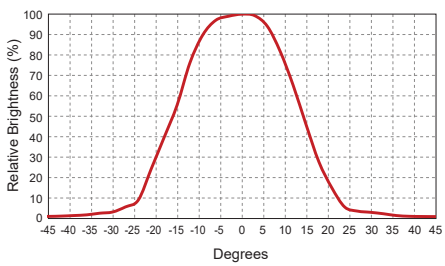
Spectral distribution



Actual measurement values using our measurement conditions. Results for individual products may vary.

Before using the product, be sure to read the User Manual included with the product and follow the usage precautions. The data included is for reference only. Actual values may vary.

Light distribution characteristics at the fiber output end



Note: Actual measurement values with intensity of 100%, a bundle of Ø8 mm, a straight light guide with a total length of 1,000 mm installed, and at a position 1,000 mm away from the fiber output edge. (Results may vary for individual units.)

PFBR-600SW2 Series

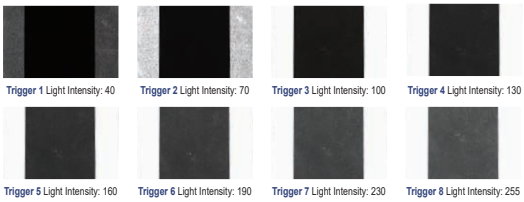
Refer to our website for product details.
CCS PFBR-600SW2 ▶ Search

High Power & High Speed Switching PFBR-600SW2-LL-HD / LLCF-HD (Custom Products)

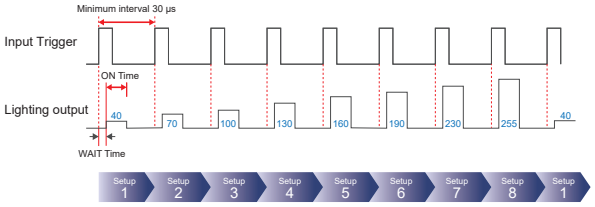
By applying preset light intensity values in a sequence according to the trigger input, it is possible to change light intensity at high speed (8 patterns max). It is suited for inspections where the workpiece surface has differing reflectivity or transparency.

These models are custom products. For more details, please contact your local CCS sales representative.

■ Workpiece sample of electrode sheet (same workpiece under different light intensity set for each trigger input)



■ Timing Chart



High Power & Dedicated Strobe Operation PFBR-600SW2-LL-XF / LLCF-XF (Custom Products)

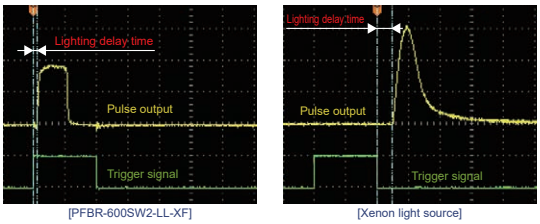
This model is for dedicated strobe operation and offers an alternative solution to xenon flash lamps. It achieves high power output and long life of over 50,000 hours *1. No special light guide is required, but a plastic light guide is available.

These models are custom products. For more details, please contact your local CCS sales representative.

* The strobe lighting time can be set from 1 µs to 99 µs.
*1 Operating environment: 25°C clean room, lighting conditions: Duty 1% Lifetime is the time when the radiant quantity drops to half under our measurement conditions.

Comparison of PFBR-600SW2-LL-XF and Xenon flash lamp in strobe operation.

(PFBR-600SW2-LL-XF has no jitter (delay time after trigger input).



[PFBR-600SW2-LL-XF] [Xenon light source]

Lineup

Series	Model Name	LED Color	Correlated Color Temperature	Power Consumption	Light Guide Adapter	External Control Cables	Weight
Standard type	PFBR-600SW2-LL	White	5500 K	410 VA at 100 V input 420 VA at 240 V input	AD-PFBR-600-01 AD-PFBR-600-02 AD-PFBR-600-03	Parallel Communication Cable	6.6 kg
	PFBR-600SW2-LLCF (Filter changer equipped models)						6.9 kg
HD Series (custom order product)	PFBR-600SW2-LL-HD						6.6 kg
	PFBR-600SW2-LLCF-HD (Filter changer equipped models)						6.9 kg
XF Series (custom order product)	PFBR-600SW2-LL-XF						6.6 kg
	PFBR-600SW2-LLCF-XF (Filter changer equipped models)						6.9 kg

Common Specifications

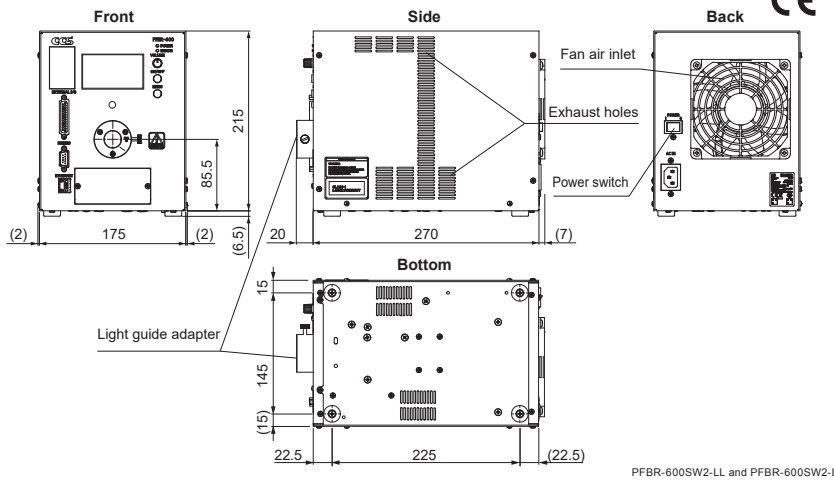
Applicable fiber bundle diameter	Ø6 to Ø14 mm
Light distribution angle	Total angle of 30°
Emitting color	White
Correlated color temperature (typ.)	5500 K
Drive method	Constant-current system
Intensity control method	Variable-current control
Number of channels	1 channel
Input power supply	100 to 240 VAC (±10%), 50/60 Hz
Power consumption (typ.)	410 VA at 100 V input, 420 VA at 240 V input
Inrush current (typ.)	40 A (From a cold start)
Ground leakage current	0.5 mA max. (240 VAC, 60 Hz, with 100 % load)
Insulation withstand voltage (input-output, input-FG)	1500 VAC for one minute, Cutoff current: 10 mA, 500 VDC, 20 MΩ min.
Strobe lighting time	PFBR-600SW2-LL/ LLCF: 1 µs to 9999 µs PFBR-600SW2-LL-HD/LLCF-HD: 1 µs to 9999 µs PFBR-600SW2-LL-XF/LLCF-XF: 1 µs to 99 µs

Operating environment (indoors only)	Temperature: 0 to 40°C, Humidity: 20 to 80% (with no condensation) Altitude: Up to 2000 m AC overvoltage: Category II Pollution Level: 2
Storage environment	Temperature: -15 to 60°C Humidity: 20 to 85% (with no condensation)
Cooling method	Forced cooling
CE marking	Safety standard: Conforms to EN61010-1, EN62311,EN62471 EMC standard: Conforms to EN61000-3-2, EN61000-3-3, EN61000-6-2, EN61000-6-4
Environmental regulations	RoHS compliant
Material and surface processing	Aluminum alloy (black alumite)
Weight	6.6 kg max. *Models with a filter changer weigh less than 6.9 kg
Accessories	User manual, 2-m 3-prong AC power cable with ground terminal, Filter Changer Model Only: Filter holders x 5 pcs., holder mounting screws x 18 pcs.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Dimensions (mm)

PFBR-600SW2-LL / PFBR-600SW2-LLCF



PFBR-600SW2-LL and PFBR-600SW2-LLCF share the same dimensions.

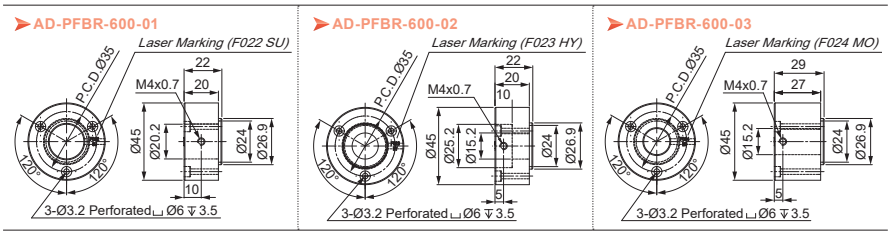
Options

Light Guides

We propose light guides according to the application such as straight, ring and line.

- We accept custom orders for the light guides. Please contact your CCS sales representative for details.

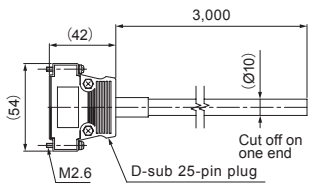
Light Guide Adapter



- Please be aware that the light guide adapter must be installed after purchase by the customer.

External Control Cables: EXCB2-25M-3

Parallel communication cable (Compatible with digital and analog intensity control)



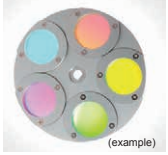
- Purchase a commercially available RS-232 crossover cable (length: 3 m max.) for the serial communication cable.
- Purchase a commercially available LAN cable (length: shorter than 30 m) for the Ethernet communication cable. Refer to the user manual for more information.

Color Filters

Use filters to emit the optimum light for the inspected workpiece.

Available Six Colors

Five filters can be installed.



- Red : DFR-610A
- Blue : DFB-500A
- Green : DFG-505A
- Cyan : DFC-590A
- Magenta : DFM-495A
- Yellow : DFY-520A

- A variety of filters are available with excellent heat resistance.
- Contact your CCS sales representative for the detailed information.

PFBR-150 Series

Refer to our website for product details.

CCS PFBR-150 ▶ Search

Provides light output that exceeds that of a 250 W metal halide light source

We accept custom orders for red, blue, and green light.

Contact your CCS sales representative for details.

CE

The supplied AC cord is for use with 100 to 120 VAC.
If you want to use the light source unit with 200 to 240 VAC, you must procure another appropriate AC power cord.

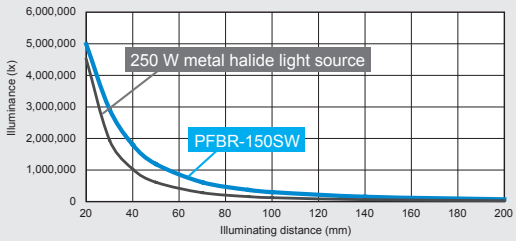
Applications Connect to light guides and use as a light source

Caution This product emits high-intensity visible light. Materials that absorb light may convert that light into heat and be damaged. Check the instructions in the User Manual and use this product in a safe manner.

Achieves the Highest Level in the Industry with 2 Million lx*

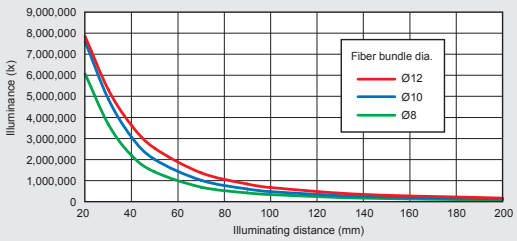
* Actual measurement values with a bundle of Ø10 mm, a straight light guide with a total length of 1,080 mm installed, and at a position 50 mm away from the fiber output edge. Results for individual products may vary.

LED light source unit that exceeds a 250 W metal halide light source



Actual measurement values with intensity of 100%, bundle of Ø8 mm, a straight light guide with a total length of 1,100 mm installed, and at positions at each illuminating distance away from the fiber output edge. Results for individual products may vary.

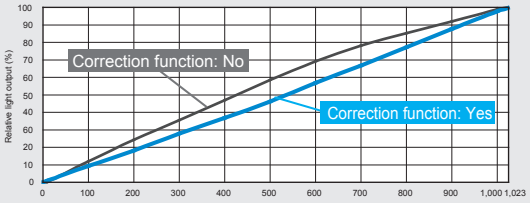
Achieves high output with the optical design tailored to various fibers



Actual measurement values with intensity of 100%, bundles of Ø8, 10, and 12 mm, a straight light guide with a total length of 1,080 mm installed, and at positions at each illuminating distance away from the fiber output edge. Results for individual products may vary.

1,024-Step Intensity, Linear Characteristics with Reproducibility

Our unique correction function is a standard function.
Provides linearity with reproducibility



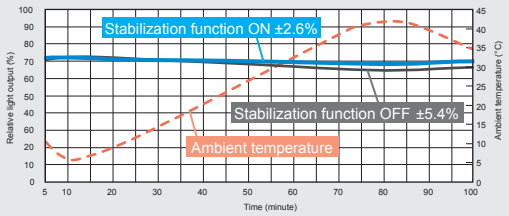
Actual measurement values using our measurement conditions.
Results for individual products may vary.
The correction function of this product is always set to "Yes".

■Intensity value can be adjusted in steps

- 1,024-step intensity (10-bit)
- 256-step intensity (8-bit)

Equipped with a Light Output Stabilization (Feedback) Function

Stable light output even in severe operating environments



Actual measurement values using our measurement conditions. Results for individual products may vary. Stabilization function is set to OFF when shipped from the factory.

Standard Compatibility with Three Types of Light Guides

Check the dimensions of the light guide to be used before selecting an adapter.

- For details, refer to *Dimensions of the light guide adapters chart* on P. 202.
- Be careful as plastic fiber cannot be used.
- A light guide adapter is not provided with the LED light source. Order one separately.

External Control with a Large Variety of Communication Methods

Ethernet communication control: TCP/IP and UDP/IP

Serial communication control: RS-232C

Parallel communication control

Digital light control: Compatible with sink and source types

Analog light control: Intensity control from 0 to 5 V

Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent / Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Lineup

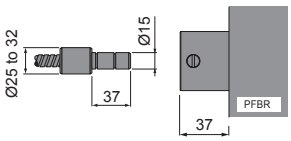
Model Name	LED Color	Correlated Color Temperature	Power Consumption	Light Guide Adapters	External Control Cables	Weight
PFBR-150SW-MN	White	6,500 K	200 VA	AD-PFBR-150-MO AD-PFBR-150-HY AD-PFBR-150-SU	Parallel communication cable Serial communication cable	3,900 g

Dimensions of the light guide adapters chart (mm)

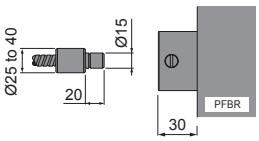
Select a light guide adapter when you evaluate the LED light source.

Options

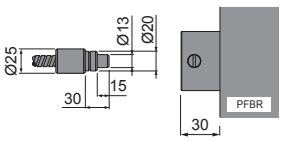
Model name: AD-PFBR-150-MO



Model name: AD-PFBR-150-HY



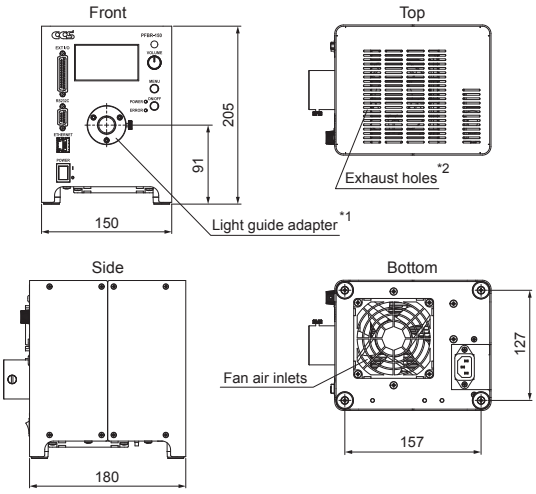
Model name: AD-PFBR-150-SU



Caution

- Be careful as plastic fiber cannot be used.
- Please be aware that the light guide adapter must be installed after purchase by the customer. Inquire with the CCS sales representative regarding sizes not listed here.

Dimensions (mm)



*1 A light guide adapter is not provided with the LED light source. Order one separately.
The shape of the light guide adapter depends on the details of the order.
*2 Installation method: Do not place any objects within 100 mm of the exhaust holes on the top panel.

We accept custom orders.
Please feel free to inquire.

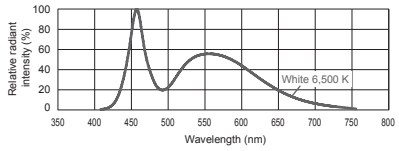
- Changes in wavelength (red, blue, and green)
- Change in light distribution angle, etc.

Specifications

Applicable fiber bundle diameter	Ø8 to Ø14 mm
Light distribution angle	Total angle of 30°
Drive method	Constant-current system
Intensity control method	Variable-current control
Number of channels	1 channel
Input power supply	100 to 240 VAC (±10%), 50/60 Hz
Power consumption (typ.)	200 VA
Inrush current (typ.)	15 A at 100 VAC, 30 A at 200 VAC From a cold start
Ground leakage current	3.5 mA max. (264 VAC, 60 Hz, with no load)
Insulation withstand voltage (Input-FG)	1,500 VAC 1-min. cutoff current 10 mA 500 VDC 20 MΩ min.
Operating environment	Temperature: 5 to 40°C, Humidity: 20% to 80%RH (with no condensation) Altitude: 2,000 m max., Transient overcurrent: Category II, Pollution level: 2
Storage environment	Temperature: −15 to 60°C Humidity: 20% to 85%RH (with no condensation)
Cooling method	Forced air cooling
CE marking	Safety standard: Conforms to EN61010-1 EMC standard: Conforms to EN61000-6-2 and EN61000-6-4
Environmental regulations	RoHS compliant
Material, coating, surface processing	Aluminum alloy (black alumite)
Accessories	User Manual x 1, 3-prong AC cord with ground terminal (2 m) x 1

LED Properties

Spectral distribution

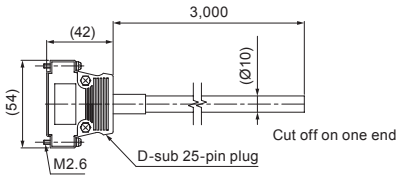


Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Optional Accessories (Sold Separately)

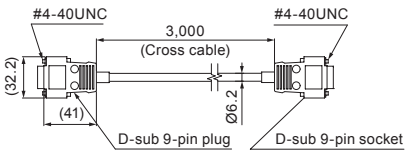
External control cable: EXCB2-25M-3

Parallel communication cable (Compatible with digital and analog intensity)



External control cable: EXCB2-9M-9F-3-CR

Serial communication cable (RS-232C)



LED Light Sources
PFB3(A) Series

Refer to our website for product details.
CCS PFB3(A) ▶ Search

Provides light output that exceeds that of a 100 W halogen light source

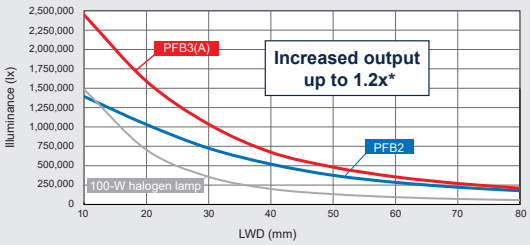
(Without external control) (With external control)

Applications Connect to light guides and use as a light source

Renewed with Increased Brightness

Achieved high output up to 1.2x that of the conventional PFB2 Series.

Illuminance comparison with a 100-W halogen lamp



* Actual measurement values with light intensity of 100%, bundles of Ø8 mm, a straight light guide installed, and at positions of 50 mm illuminating distance away from the fiber output edge.
The data included is for reference only and the results for individual products may vary.

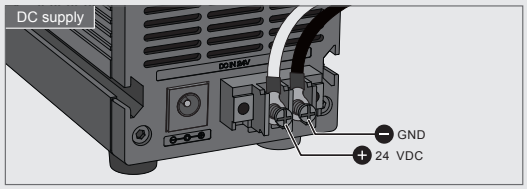
Supports Major Light Guide Manufacturers

Supports major light guide manufacturers (5 Japanese companies, 6 international companies).

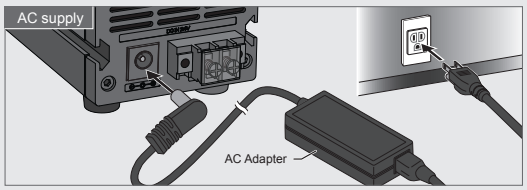
For details, refer to *Light Guide Adapter Dimensions Chart* on P. 204.

Select a Power Supply to Match Your Actual Environment

The terminal block on the unit rear supports 24 VDC input. With an optional AC adapter, it can also support 100 to 240 VAC input. You can make a selection to match your actual environment.



Use the terminal block on the rear of this unit for 24 VDC input.



Use the optional AC adapter for 100 to 240 VAC input.
Model name: ADP2460-PFB-JTLV6
(U.S. DoE CEC Level VI External Power Supply Efficiency Standards compliant)

Selectable External Control

The lineup includes a model where intensity can only be manually adjusted, and models that allow for external control. There are three types of external control: serial, parallel, and analog. ON/OFF control and intensity control are possible by each control type.

Standard type
PFB3-20SW-JT(A) Series
Manual intensity control | Without external control

Serial type
PFB3-20SW-SJT(A) Series
Manual intensity control | With external control

Parallel type
PFB3-20SW-PJT(A) Series
Manual intensity control | With external control

Analog type
PFB3-20SW-AJT(A) Series
Manual intensity control | With external control

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Lineup

Model Name	LED Color	Power Consumption	Options	Weight
PFB3-20SW-JT-□□□(A)	White	18 W	AC Adapter	1,200 g
PFB3-20SW-SJT-□□□(A)			AC Adapter External control cable (Serial type)	
PFB3-20SW-PJT-□□□(A)			AC Adapter	
PFB3-20SW-AJT-□□□(A)			External control cable (Parallel, Analog type)	

LED Properties: Spectral Distribution ▶ P.396

Inquire with your light guide manufacturer for details about the light guide.
Installation method: Do not place anything within 50 mm of the fan exhaust outlet on the rear, the air inlets on the left and right sides, and the top of the PFB3(A) unit.

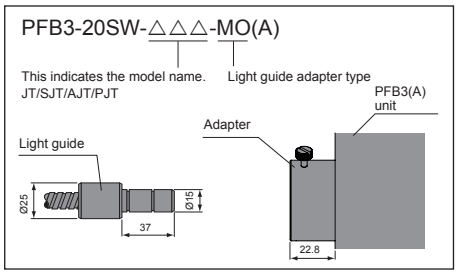
How to read the lineup selection chart

PFB3-20SW-JT-□□□ (A)

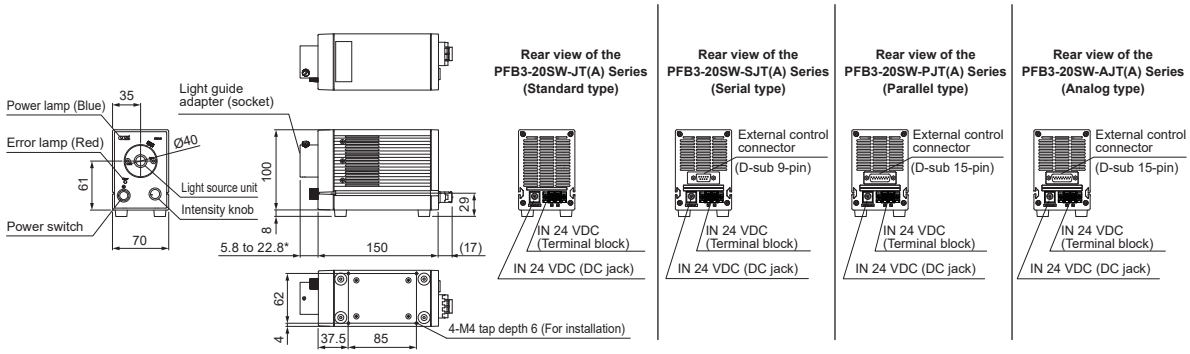
Model name
JT/SJT/AJT/PJT

This indicates the light guide adapter type.
-MO/-NP/-MI/-HY/-SU/-VL/-TF/-TE/-SH1/-SH2/
-DJ1/-DJ2/-DJ3/-DJ4/-CS1/-IT

How to read light guide adapter dimensions chart



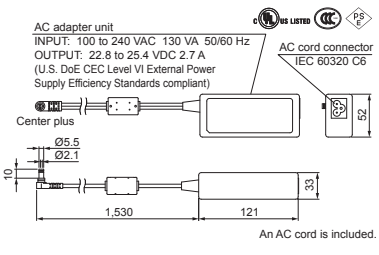
Dimensions (mm)



* The dimensions of the connection adapter (socket) vary based on the light guide in use. For detailed infromation, refer to *Light Guide Adapter Dimensions Chart*.

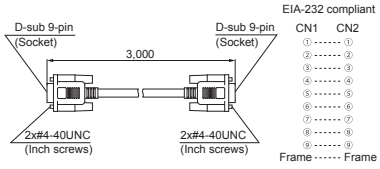
Options

AC adapter: ADP2460-PFB-JTLV6



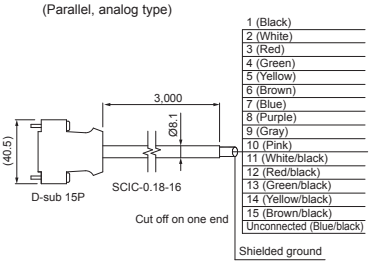
External control cable: EXCB2-9-9-3-ST

(Serial type)



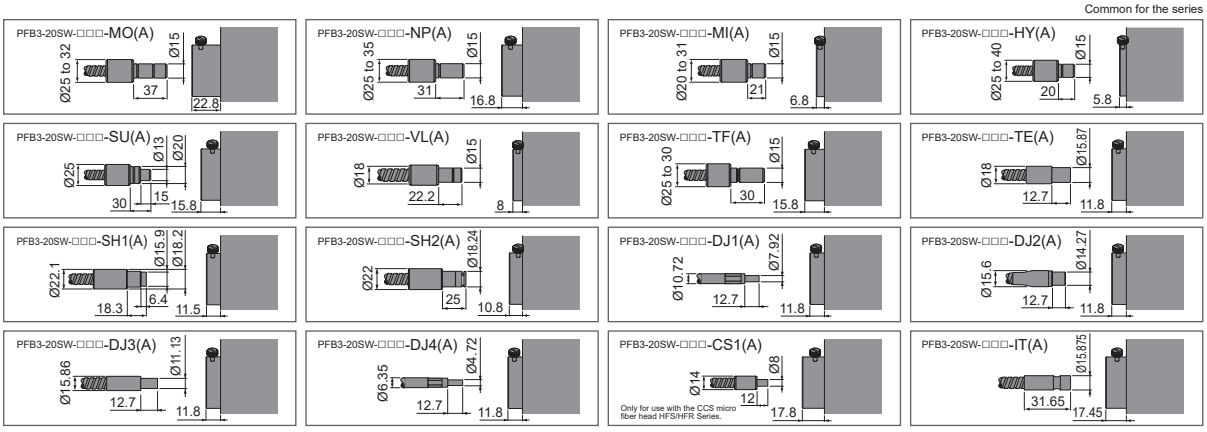
External control cable: EXCB2-B3

(Parallel, analog type)



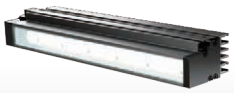
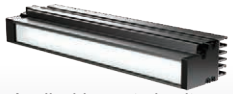
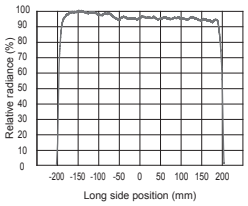
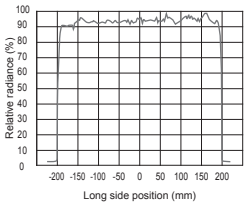
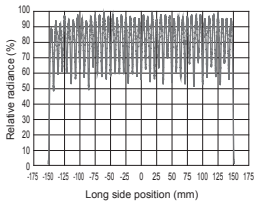
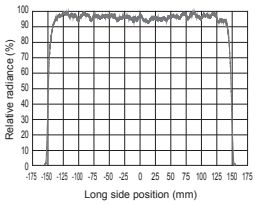
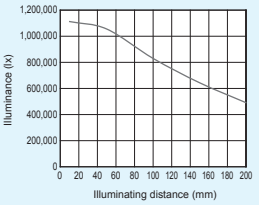
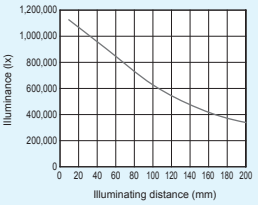
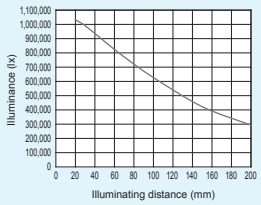
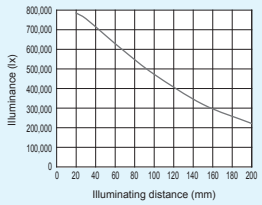
Light Guide Adapter Dimensions Chart (mm)

Common for the series

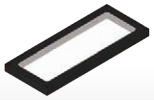
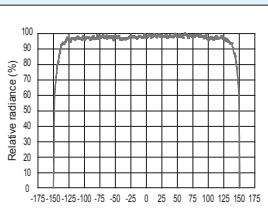
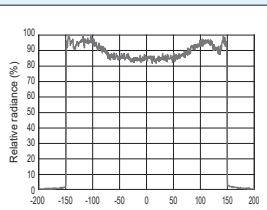
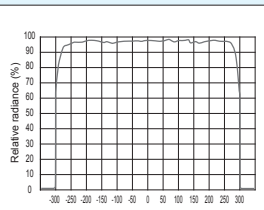
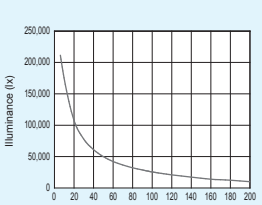
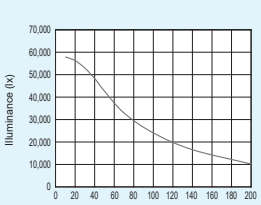
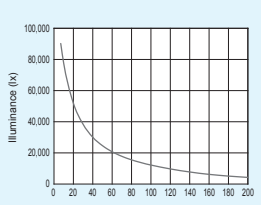


Line Light List INDEX

(By brightness)

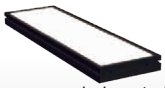
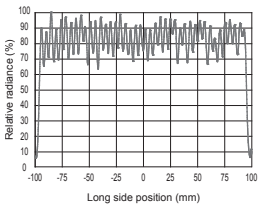
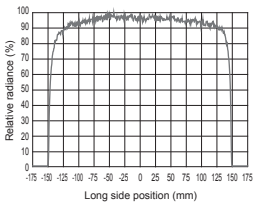
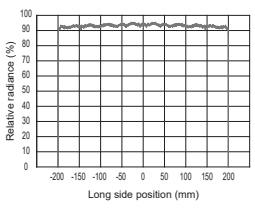
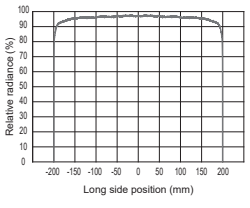
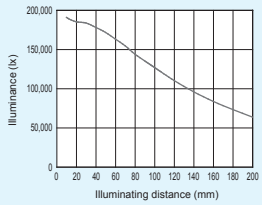
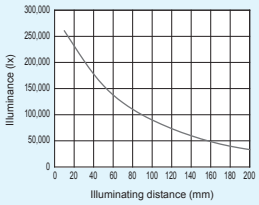
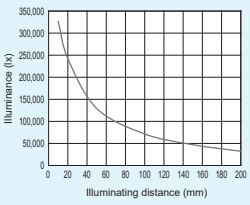
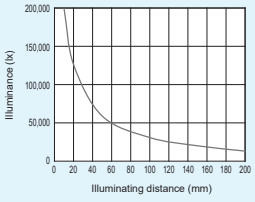
Series name	LNLP Series	LNSP-FN Series	LNSP2 Series (NDF Type)	LNSP2 Series (Standard Type)
				
	Applicable control units: PSCC Series	Applicable control units: PSCC Series	Applicable control unit: PD3-10024-8 / PSB4 Series	Applicable control unit: PD3-10024-8 / PSB4 Series
	Refer to: P.207	Refer to: P.219	Refer to: P.211	Refer to: P.211
Brightness	1,000,000 lx Emitting width (Short side): 21 mm	900,000 lx Emitting width (Short side): 23 mm	900,000 lx Emitting width (Short side): 25 mm	650,000 lx Emitting width (Short side): 25 mm
Cooling method	Natural air	Forced air (Fan)	Natural air	Natural air
Illum. method	Convergent	Convergent	Convergent	Convergent
Relative radiance distribution				
Graph of the change in illuminance (on the optical axis)				

(By brightness)

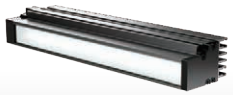
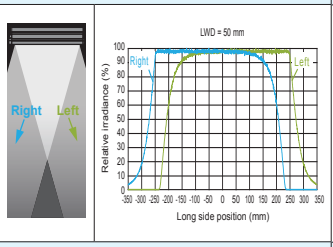
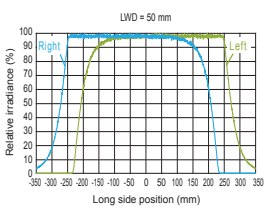
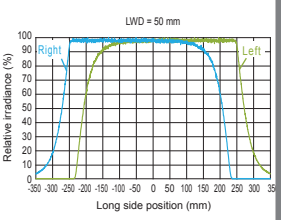
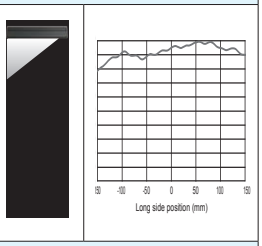
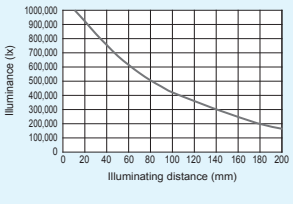
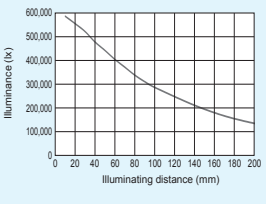
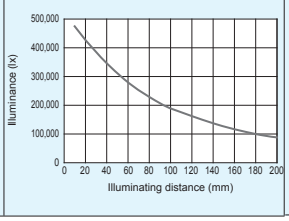
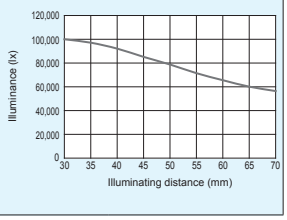
Series name	LT Series	LFXV Series (Rectangular Type)	LND2 Series
			
	Applicable control unit: PSB4 Series	Applicable control unit: PD3 / POD Series	Recommended control units: PD3 Series, PSB4 Series
	Refer to: P.233	Refer to: P.238	Refer to: P.229
Brightness	50,000 lx Emitting width (Short side): 2.8 mm	48,000 lx Emitting width (Short side): 100 mm	25,000 lx Emitting width (Short side): 18.2 mm
Cooling method	Natural air	Natural air	Natural air
Illum. method	Diffused	Diffused	Diffused
Relative radiance distribution			
Graph of the change in illuminance (on the optical axis)			

The brightness is actual measurement value at the illuminating distance of 50 mm. The data included is for reference only. Actual values may vary.

(By brightness)

Series name	LN-HK Series	TH2 Series (Rectangular Type)	LNSD Series (High Luminance Type)	LNSD Series (High Uniformity Type)
				
	Applicable control units: PD3 Series	Recommended control units: PD3-10024-8 / PSB4 Series	Recommended control units: PD3-10024-8 / PSB4 Series	Recommended control units: PD3-10024-8 / PSB4 Series
	Refer to: P.224	Refer to: P.95	Refer to: P.225	Refer to: P.225
Brightness	170,000 lx Emitting width (Short side): 16.5 mm	150,000 lx Emitting width (Short side): 75 mm	128,000 lx Emitting width (Short side): 15 mm	58,000 lx Emitting width (Short side): 15 mm
Cooling method	Natural air	Natural air	Natural air	Natural air
Illum. method	Convergent	Diffused	Diffused	Diffused
Relative radiance distribution				
Graph of the change in illuminance (on the optical axis)				

(By brightness)

Series name	LNIS-FN Series	LNIS2 Series	LNIS Series	LNDG Series
				
	Applicable control units: PSCC Series	Recommended control units: PD3-10024-8 / PSB4 Series	Applicable control unit: PSB4 Series	Applicable control unit: PSCC Series
	Refer to: P.253	Refer to: P.245	Refer to: P.249	Refer to: P.241
Brightness	678,000 lx Emitting width (Short side): 23 mm	440,000 lx Emitting width (Short side): 25 mm	310,000 lx Emitting width (Short side): 21 mm	80,000 lx Emitting width (Short side): 10 mm
Cooling method	Forced air (Fan)	Natural air	Natural air	Natural air
Illum. method	Oblique angled (bi-directional)	Oblique angled (bi-directional)	Oblique angled (bi-directional)	Oblique angled (mono-directional)
Relative irradiance distribution / Relative radiance distribution				
Graph of the change in illuminance (on the optical axis)				

The brightness is actual measurement value at the illuminating distance of 50 mm. The data included is for reference only. Actual values may vary.

Convergent Lighting

Line Lights

LNLP Series

Refer to our website for product details.

CCS LNLP ▶ Search

1,000,000 lx or more in illuminance
High-illuminance fan-less (natural air-cooling) line lights

LED color
Custom orders accepted

Size
Custom orders accepted

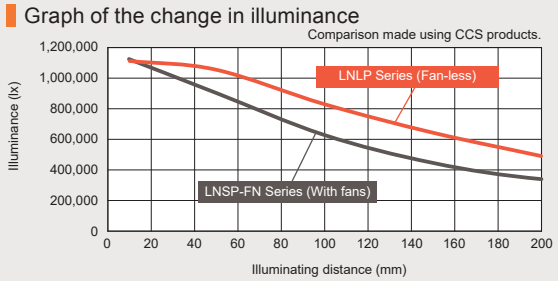
LNLP-400SW

Applications Inspection for scratches on plate glass, inspection for scratches and dents on sheet metal, inspection for scratches and foreign materials on transparent films, inspection of printing on paper, inspection of the appearance of plastic components, etc.

1,000,000 lx or More in Illuminance

The high-illuminance line lights brighter than the conventional fan-type units, despite being fan-less.

Graph of the change in illuminance



Actual measurement values at the center of the emitting surface, at each illuminating distance, 100% intensity. Results for individual products may vary.

Controlling each light unit circuit

The light intensity value for each light unit circuit can be set through the external control. Also, burn-out errors in LED circuits can be detected.

- The light intensity value can be set for each light unit circuit.
- Burn-out in LED circuits and other errors can be detected.

Control units for LED Lights PSCC Series

For detailed information on the applicable PSCC Series control units, refer to the product page (P.353).

Housing shape that suits the site environment

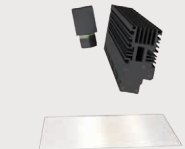
For use at the site of inspection, the light unit shape is optimized with its light emitting tip shifted to one side of the light unit body. As a result, the camera view is not blocked during illumination, and the light unit can be installed close to the workpiece.

Close-up illumination from a low angle

Workpiece: Printed material

When you configure the system at a shallow angle to the horizontal plane, you can emphasize and take advantage of the marginal difference in reflectivity between the white paper and the ink.

Semi-coaxial illumination from a high angle

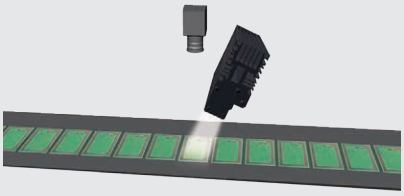


Workpiece: Clear file

It is possible to take advantage of surface reflection of a clear file; scratches and finger prints, which have a low reflectivity, can be imaged as black.

Applications

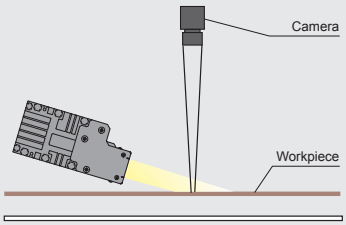
Inspecting the appearance of film substrates



Example Configuration

Achieves high-illuminance despite being fan-less. The constant-current drive system allows for even imaging with a high degree of uniformity.

LNLP Series



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

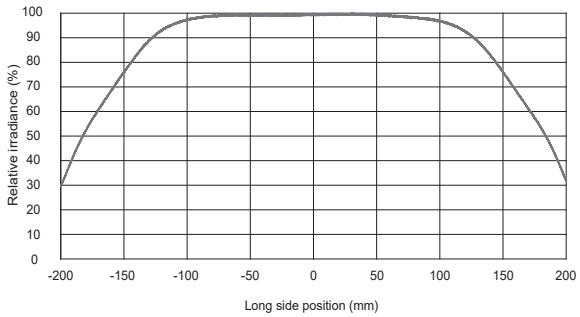
Register to use them.

Data (Representative Example)

The graph included is for reference only. Actual values may vary.

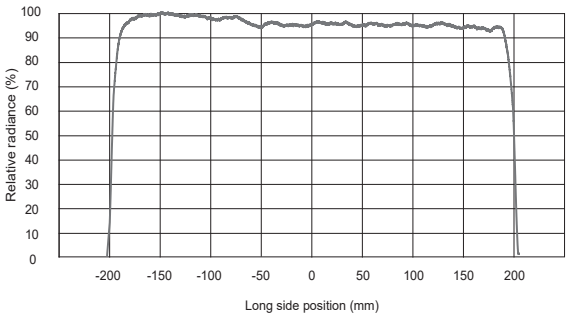
LNLP-400SW

Relative irradiance distribution



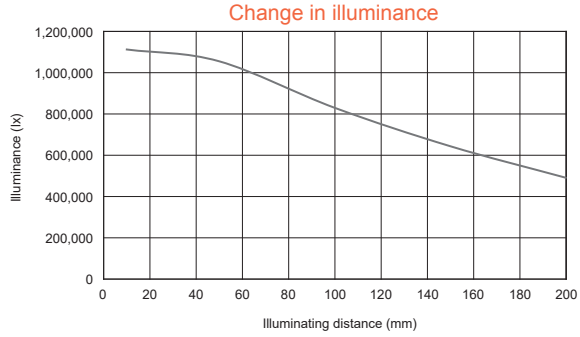
Actual measurement values at 100% intensity in 100 mm illuminating distance.
Results for individual products may vary.

Relative radiance distribution



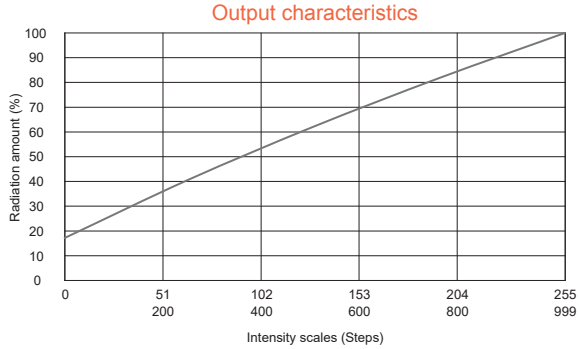
The graph included is for reference only. Actual values may vary.

Change in illuminance



Actual measurement values at 100% intensity in each illuminating distance.
Results for individual products may vary.

Output characteristics

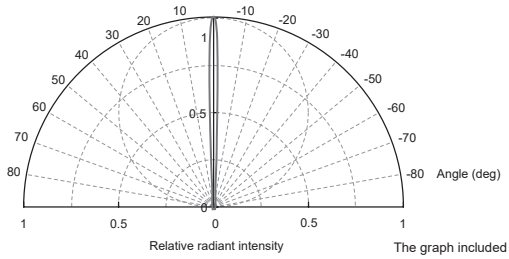


Actual measurement values when using analog control unit, PSCC-30048(A).
Results for individual products may vary.

Illumination distribution characteristics

Measuring direction: short side

Short side

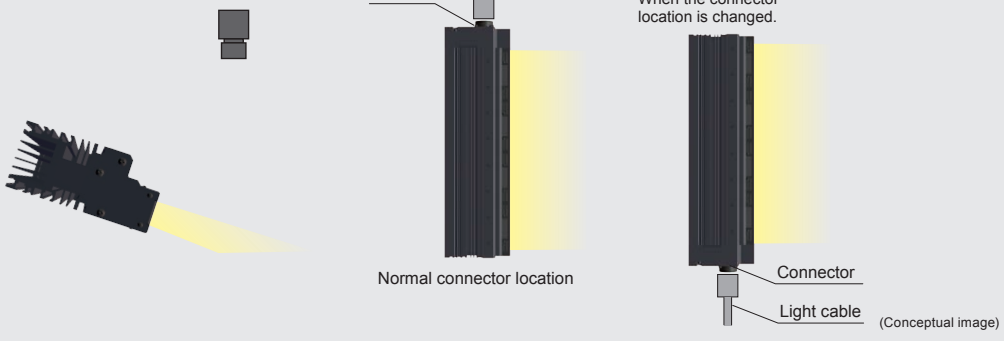


The graph included is for reference only. Actual values may vary.

Custom Order Example

E.g.: Changes the location of the connector on the light unit case.

The location of the light cable can be changed to match your environment.



Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent / Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

LNLP Series

Refer to our website for product details.

CCS LNLP ▶ Search

Lineup

	Model Name	LED Color	Power Consumption	Correlated Color Temperature	Extension Cables*1	Recommended Control Units*1	Weight
Standard products	LNLP-100SW	White	36 W	5,800 K	QCBM-DA	PSCC-30048(A)	1,400 g
	LNLP-200SW		72 W				2,200 g
	LNLP-300SW		108 W				3,000 g
	LNLP-400SW		144 W		QCB-DA	PSCC-60048(A)	3,800 g
	LNLP-500SW		180 W				4,600 g
	LNLP-600SW		216 W				5,400 g
	LNLP-700SW		252 W				6,200 g
	LNLP-800SW		288 W				7,000 g
	LNLP-900SW		324 W		QCB-DA	PSCC-60048(A)	7,800 g
	LNLP-1000SW		360 W				8,600 g
Special orders	LNLP-1100SW		396 W				9,400 g
	LNLP-1200SW		432 W				10,200 g
	LNLP-1300SW		468 W		QCB-DA	PSCC-60048(A)	11,000 g
	LNLP-1400SW		504 W				11,800 g
	LNLP-1500SW		540 W				12,600 g
	LNLP-1600SW		576 W				13,800 g
	LNLP-1700SW		612 W				14,800 g
	LNLP-1800SW		648 W				15,800 g
	LNLP-1900SW		684 W				16,800 g
	LNLP-2000SW		720 W				17,800 g
	LNLP-2100SW		756 W				18,800 g
	LNLP-2200SW		792 W				19,800 g
	LNLP-2300SW		828 W		QCB-DA x 2 *2	PSCC-60048(A) x 2 *2	20,800 g
	LNLP-2400SW		864 W				21,800 g
	LNLP-2500SW		900 W				22,800 g
	LNLP-2600SW		936 W				23,800 g
	LNLP-2700SW		972 W				24,800 g
	LNLP-2800SW		1008 W				25,800 g
	LNLP-2900SW		1044 W				26,800 g
	LNLP-3000SW		1080 W				27,800 g

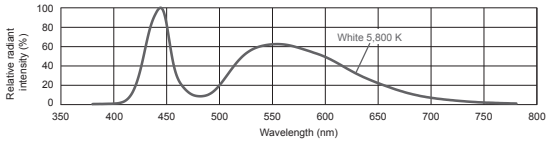
Extension Cables ▶ P.210
PSCC Series Product Page ▶ P.353

*1 Make sure to connect the appropriate extension cables to the control unit.
*2 For sizes 1,600 mm (emitting surface) or longer, a cable connector is located at each end of the light unit.

We accept custom orders, such as changes to the LED color (red/blue/IR/UV, etc.) and size changes. Inquire at your CCS sales representative for details.

LED Properties

Spectral distribution



Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

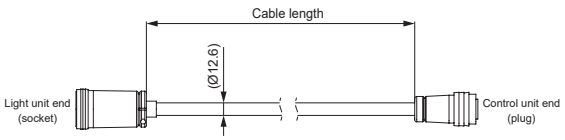
Extension Cables

Necessary when connecting the light unit to the recommended PSCC Series control unit.
Make sure to connect the appropriate extension cables to the control unit.

QCBM-DA

Model Name	Cable Length	Weight	Applicable Control Unit
QCBM-2-DA	2 m	800 g	PSCC-30048(A)
QCBM-3-DA	3 m	1,000 g	
QCBM-5-DA	5 m	1,500 g	
QCBM-10-DA	10 m	2,700 g	
QCBM-20-DA	20 m	5,000 g	

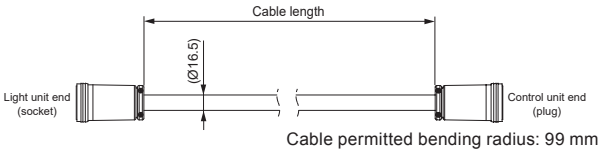
(mm)



Cable permitted bending radius: 75.6 mm

QCB-DA

Model Name	Cable Length	Weight	Applicable Control Unit
QCB-2-DA	2 m	1,100 g	PSCC-60048(A)
QCB-3-DA	3 m	1,500 g	
QCB-5-DA	5 m	2,400 g	
QCB-10-DA	10 m	4,600 g	
QCB-20-DA	20 m	8,900 g	

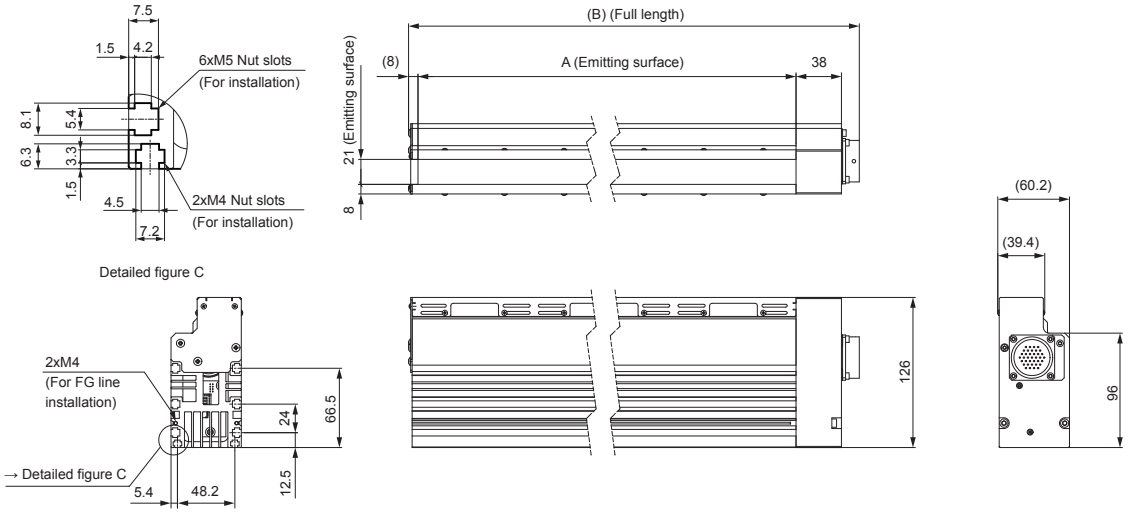


Cable permitted bending radius: 99 mm

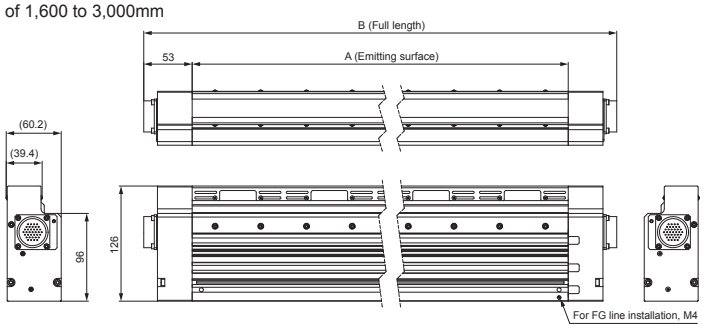
The above cable permitted bending radii are reference values. Actual values may vary.

Dimensions (mm)

● For the emitting surface length of 100 to 1,500mm



● For the emitting surface length of 1,600 to 3,000mm



For sizes 1,600 mm (emitting surface) or longer, a cable comes out of each end of the light unit.

	Model Name	A (Emitting surface)	B (Full length)		Model Name	A (Emitting surface)	B (Full length)
Standard products	LNLP-100SW	100	161	Special orders	LNLP-1600SW	1,600	1,706
	LNLP-200SW	200	261		LNLP-1700SW	1,700	1,806
	LNLP-300SW	300	361		LNLP-1800SW	1,800	1,906
	LNLP-400SW	400	461		LNLP-1900SW	1,900	2,006
	LNLP-500SW	500	561		LNLP-2000SW	2,000	2,106
	LNLP-600SW	600	661		LNLP-2100SW	2,100	2,206
	LNLP-700SW	700	761		LNLP-2200SW	2,200	2,306
	LNLP-800SW	800	861		LNLP-2300SW	2,300	2,406
	LNLP-900SW	900	961		LNLP-2400SW	2,400	2,506
	LNLP-1000SW	1,000	1,061		LNLP-2500SW	2,500	2,606
Special orders	LNLP-1100SW	1,100	1,161		LNLP-2600SW	2,600	2,706
	LNLP-1200SW	1,200	1,261		LNLP-2700SW	2,700	2,806
	LNLP-1300SW	1,300	1,361		LNLP-2800SW	2,800	2,906
	LNLP-1400SW	1,400	1,461		LNLP-2900SW	2,900	3,006
	LNLP-1500SW	1,500	1,561		LNLP-3000SW	3,000	3,106

You can inquire using our website.

Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products

Inquire on our website here.
https://www.ccs-grp.com/contact/

LNSP2 Series

Refer to our website for product details.

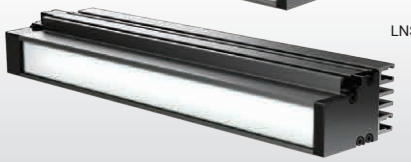
CCS LNSP2 ▶ Search

High-illuminance compact line lights
The light emitting tip is shifted to one side of the light unit body

LED color
Custom orders accepted

Size
Custom orders accepted

LNSP2-300SW-NDF



LNSP2-300SW

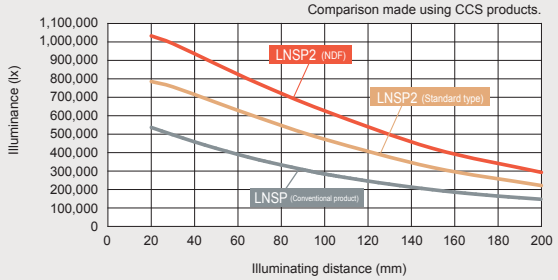
Applications Inspection for stains and scratches on glass; visual inspection of films, circuit boards, and electronic parts; inspection for stains on non-woven fabrics; visual inspection of non-woven fabrics and textured metal surface; etc.

Achieves an Illuminance of Approx. 900,000 lx*

* Measured using NDF type

This high-illuminance line light (NDF type) achieves an illuminance of approx. 900,000 lx.

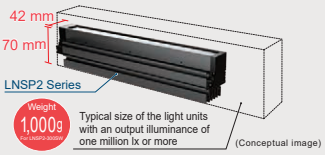
Graph of the change in illuminance



Actual measurement values at the center of the emitting surface, at each illuminating distance, 100% intensity. Results for individual products may vary.

Achieving both high output and compact space

We achieved a compact design compared to general, high output (one million lx or more) LED lights for line sensors.

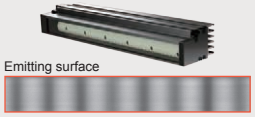


Two Types Are Available to Match Your Needs

A standard type that supports a wide range of applications and the NDF type that is suitable for dark field applications are available.

Standard type

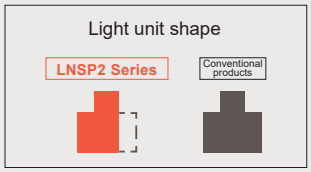
NDF type



A diffusion sheet is included. Diffusion sheet is not included.

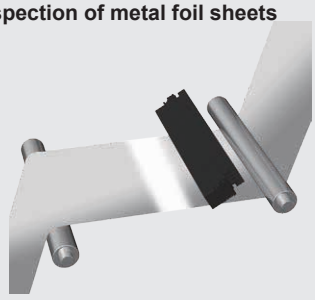
Housing shape that suits the site environment

For use at the site of inspection, the light unit shape is optimized with its light emitting tip shifted to one side of the light unit body. As a result, the camera view is not blocked during illumination, and the light unit can be installed close to the workpiece.



Applications

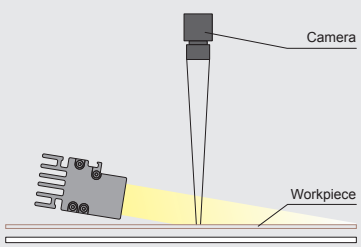
Visual inspection of metal foil sheets



Example Configuration

The light emitting surface had been moved to one side to create a housing shape that matches the on-site environment. High-illuminance and compact line lights

LNSP2 Series



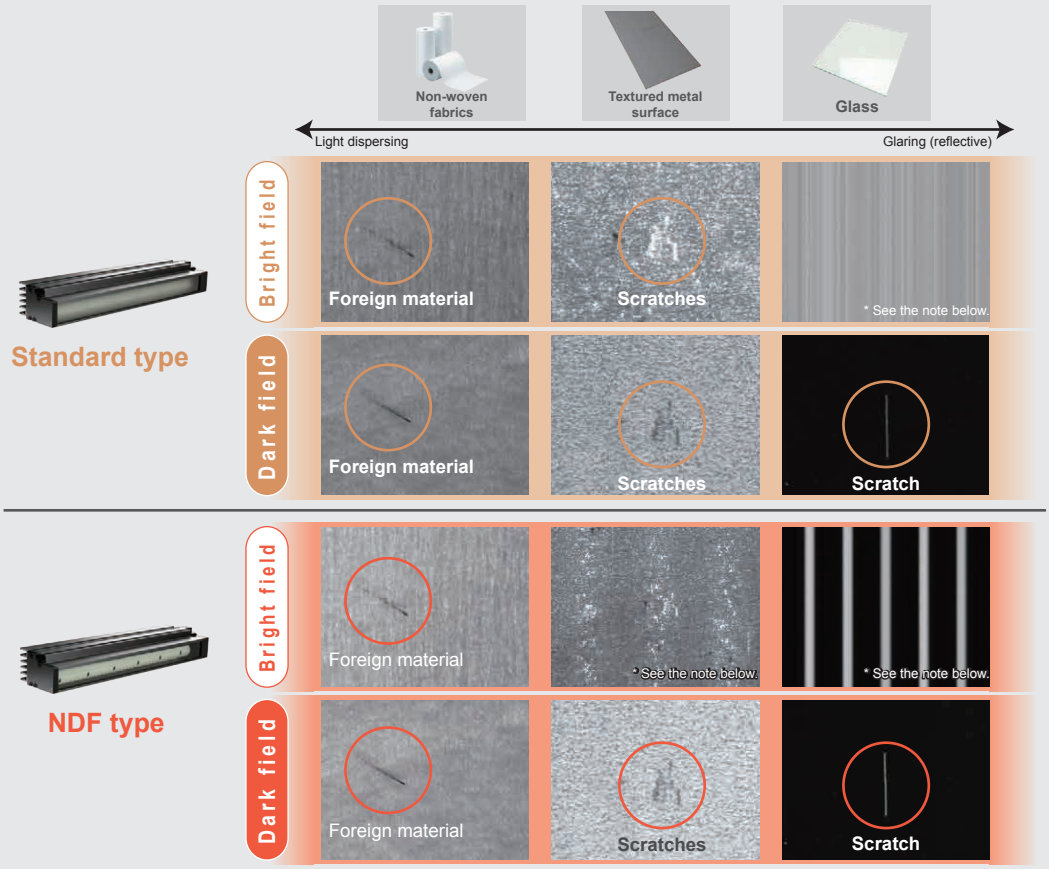
Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent / Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Different Imaging Results of the Typical Workpieces

These workpieces were processed by CCS for sample imaging.



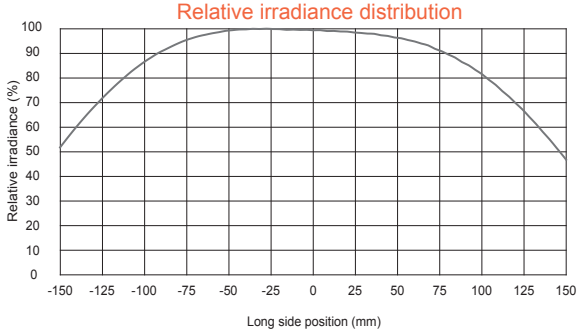
Note: The vertical lines in the above images with an asterisk mark (*) were caused by reflections of light from LEDs.

Data (Representative Example)

The graph included is for reference only. Actual values may vary.

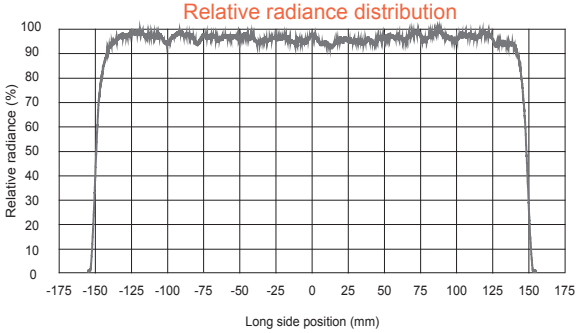
LNSP2-300SW

Relative irradiance distribution



Actual measurement values at 100% intensity in 100 mm illuminating distance.
Results for individual products may vary.

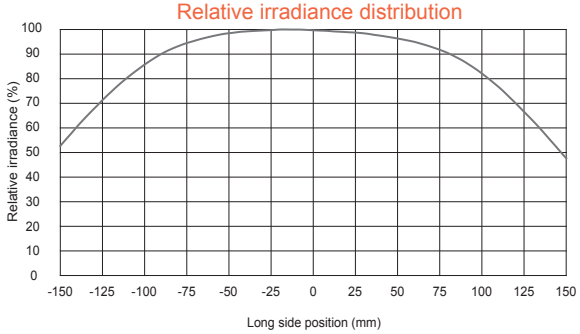
Relative radiance distribution



The graph included is for reference only. Actual values may vary.

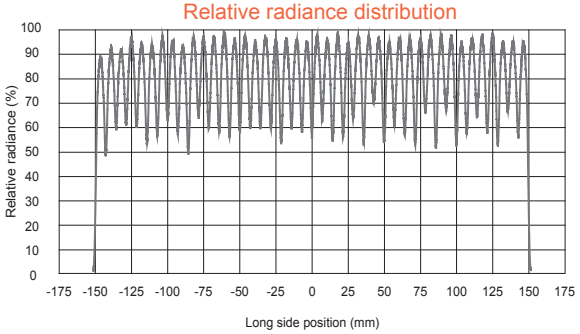
LNSP2-300SW-NDF

Relative irradiance distribution



Actual measurement values at 100% intensity in 100 mm illuminating distance.
Results for individual products may vary.

Relative radiance distribution



The graph included is for reference only. Actual values may vary.

LNSP2 Series

Refer to our website for product details.

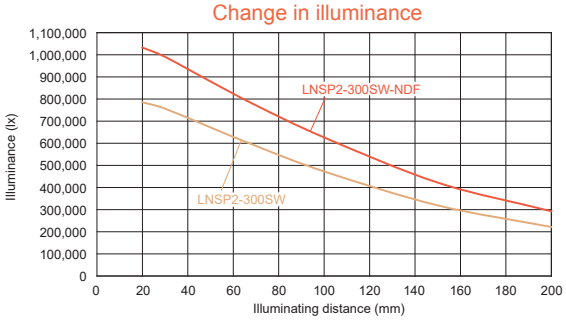
CCS LNSP2 ▶ Search

Data (Representative Example)

The graph included is for reference only. Actual values may vary.

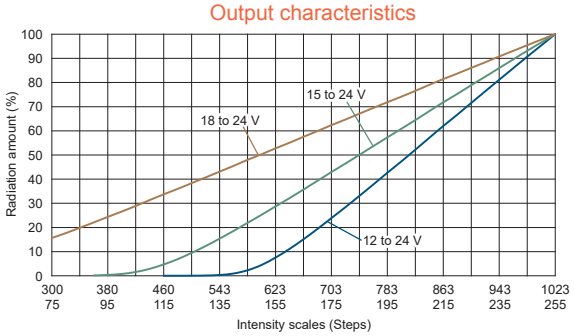
LNSP2-300SW / LNSP2-300SW-NDF

Change in illuminance



Actual measurement values at 100% intensity in each illuminating distance.
Results for individual products may vary.

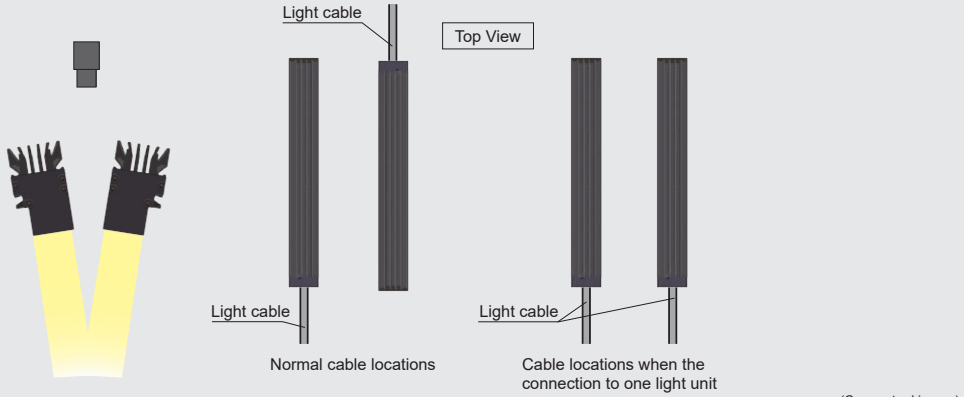
Output characteristics



Actual measurement values using the PSB4-30024-PEI analog control unit.
Results for individual products may vary.
Measured in each voltage range because the PSB4-30024-PEI analog control unit has a switching function for the lower limit of the output voltage.

Custom Order Example

E.g.: The location where the light cable comes out of the light unit case can be changed to match your environment.



(Conceptual image)

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Lineup

	Model Name	LED Color	Power Consumption	Correlated Color Temperature	Extension Cables	Recommended Control Units	Weight
Standard type (Standard products)	LNSP2-100SW	White	24 V / 20 W	6,600 K	FCB-EL2	PSB4	400 g
	LNSP2-200SW		24 V / 40 W			PD4-12024	700 g
	LNSP2-300SW		24 V / 60 W			PD3-10024-8 *1	1,000 g
	LNSP2-400SW		24 V / 80 W			PSB4 / PD4-12024	1,300 g
	LNSP2-500SW		24 V / 100 W				1,600 g
	LNSP2-600SW		24 V / 120 W		FCB-1.25SQ-ME7 / FCB-20-2.0SQ-ME7	PSB4	1,900 g
	LNSP2-700SW		24 V / 140 W				2,200 g
	LNSP2-800SW		24 V / 160 W				2,500 g
	LNSP2-900SW		24 V / 180 W				2,800 g
	LNSP2-1000SW		24 V / 200 W				3,100 g
Standard type (Special order)	LNSP2-1100SW		24 V / 220 W		FCB-1.25SQ-ME7 / FCB-20-2.0SQ-ME7 x 2 *2	PSB4	3,400 g
	LNSP2-1200SW		24 V / 240 W				3,700 g
	LNSP2-1300SW		24 V / 260 W				4,000 g
	LNSP2-1400SW		24 V / 280 W				4,300 g
	LNSP2-1500SW		24 V / 300 W				4,600 g
	LNSP2-1600SW		24 V / 320 W			PSB4-60024-2-PEI	4,900 g
	LNSP2-1700SW		24 V / 340 W				5,200 g
	LNSP2-1800SW		24 V / 360 W				5,500 g
	LNSP2-1900SW		24 V / 380 W				5,800 g
	LNSP2-2000SW		24 V / 400 W				6,100 g
	LNSP2-2100SW		24 V / 420 W				6,400 g
	LNSP2-2200SW		24 V / 440 W				6,700 g
	LNSP2-2300SW		24 V / 460 W				7,000 g
	LNSP2-2400SW		24 V / 480 W				7,300 g
	LNSP2-2500SW		24 V / 500 W				7,600 g
	LNSP2-2600SW		24 V / 520 W				7,900 g
	LNSP2-2700SW		24 V / 540 W				8,200 g
	LNSP2-2800SW		24 V / 560 W				8,500 g
	LNSP2-2900SW		24 V / 580 W				8,800 g
	LNSP2-3000SW		24 V / 600 W				9,100 g
NDF type (Standard products)	LNSP2-100SW-NDF		24 V / 24 W		FCB-EL2	PSB4	400 g
	LNSP2-200SW-NDF		24 V / 48 W			PD4-12024	700 g
	LNSP2-300SW-NDF		24 V / 72 W			PD3-10024-8 *1	1,000 g
	LNSP2-400SW-NDF		24 V / 96 W			PSB4	1,300 g
	LNSP2-500SW-NDF		24 V / 120 W			PD4-12024	1,600 g
	LNSP2-600SW-NDF		24 V / 144 W		FCB-1.25SQ-ME7 / FCB-20-2.0SQ-ME7	PSB4	1,900 g
	LNSP2-700SW-NDF		24 V / 168 W				2,200 g
	LNSP2-800SW-NDF		24 V / 192 W				2,500 g
	LNSP2-900SW-NDF		24 V / 216 W				2,800 g
	LNSP2-1000SW-NDF		24 V / 240 W				3,100 g
NDF type (Special orders)	LNSP2-1100SW-NDF		24 V / 264 W		FCB-1.25SQ-ME7 / FCB-20-2.0SQ-ME7 x 2 *2	PSB4	3,400 g
	LNSP2-1200SW-NDF		24 V / 288 W				3,700 g
	LNSP2-1300SW-NDF		24 V / 312 W			PSB4-60024-2-PEI	4,000 g
	LNSP2-1400SW-NDF		24 V / 336 W				4,300 g
	LNSP2-1500SW-NDF		24 V / 360 W				4,600 g
	LNSP2-1600SW-NDF		24 V / 384 W				4,900 g
	LNSP2-1700SW-NDF		24 V / 408 W				5,200 g
	LNSP2-1800SW-NDF		24 V / 432 W				5,500 g
	LNSP2-1900SW-NDF		24 V / 456 W				5,800 g
	LNSP2-2000SW-NDF		24 V / 480 W				6,100 g
	LNSP2-2100SW-NDF		24 V / 504 W				6,400 g
	LNSP2-2200SW-NDF		24 V / 528 W				6,700 g
	LNSP2-2300SW-NDF		24 V / 552 W				7,000 g
	LNSP2-2400SW-NDF		24 V / 576 W				7,300 g
	LNSP2-2500SW-NDF		24 V / 600 W		Please inquire for more information.	Please inquire for more information.	7,600 g
	LNSP2-2600SW-NDF		24 V / 624 W				7,900 g
	LNSP2-2700SW-NDF		24 V / 648 W				8,200 g
	LNSP2-2800SW-NDF		24 V / 672 W				8,500 g
	LNSP2-2900SW-NDF		24 V / 696 W				8,800 g
	LNSP2-3000SW-NDF		24 V / 720 W				9,100 g

Extension Cables ▶ P.215 | List of Control Unit Specifications ▶ P.307

*1 Custom products with a PWM frequency of 500 kHz are available for PD3 Series digital control unit
*2 For sizes 1,000 mm (emitting surface) or longer, a cable comes out of each end of the light unit.
The products with a model name in red letters require the custom control unit. Contact your CCS sales representative for details.

In addition, we accept custom orders, such as changes to the LED color (red/blue/IR, etc.) and size changes. Inquire at your CCS sales representative for details.

Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent / Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

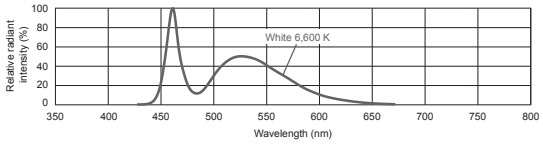
LNSP2 Series

Refer to our website for product details.

CCS LNSP2 ▶ Search

LED Properties

Spectral distribution



Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Options

Coaxial Unit

Allows for imaging with illumination on the same axis as the camera.

Model Name	Applicable Light Unit
CU-LNSP2-100-GL	LNSP2-100SW (-NDF)
CU-LNSP2-200-GL	LNSP2-200SW (-NDF)
CU-LNSP2-300-GL	LNSP2-300SW (-NDF)
CU-LNSP2-400-GL	LNSP2-400SW (-NDF)
CU-LNSP2-500-GL	LNSP2-500SW (-NDF)

CU-LNSP2 Product Page ▶ P.217

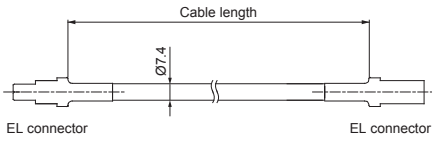
Extension Cables

Necessary when connecting the light unit to the recommended control unit.

(mm)

FCB-EL2

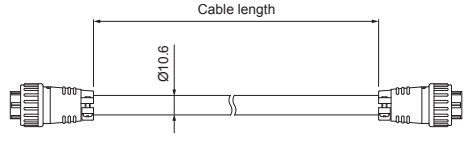
Model Name	Cable Length	Weight
FCB-1-EL2	1 m	85 g
FCB-2-EL2	2 m	165 g
FCB-3-EL2	3 m	245 g
FCB-5-EL2	5 m	405 g
FCB-10-EL2	10 m	805 g
FCB-15-EL2	15 m	1,205 g



Cable permitted bending radius: 29.6 mm

FCB-1.25SQ-ME7

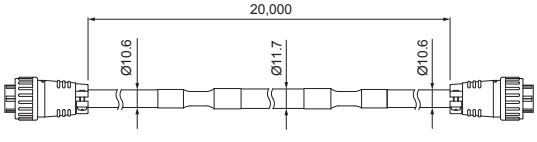
Model Name	Cable Length	Weight
FCB-2-1.25SQ-ME7	2 m	430 g
FCB-3-1.25SQ-ME7	3 m	580 g
FCB-5-1.25SQ-ME7	5 m	1,000 g
FCB-10-1.25SQ-ME7	10 m	2,000 g



Cable permitted bending radius: 63.6 mm

FCB-20-2.0SQ-ME7

Model Name	Cable Length	Weight
FCB-20-2.0SQ-ME7	20 m	5,000 g

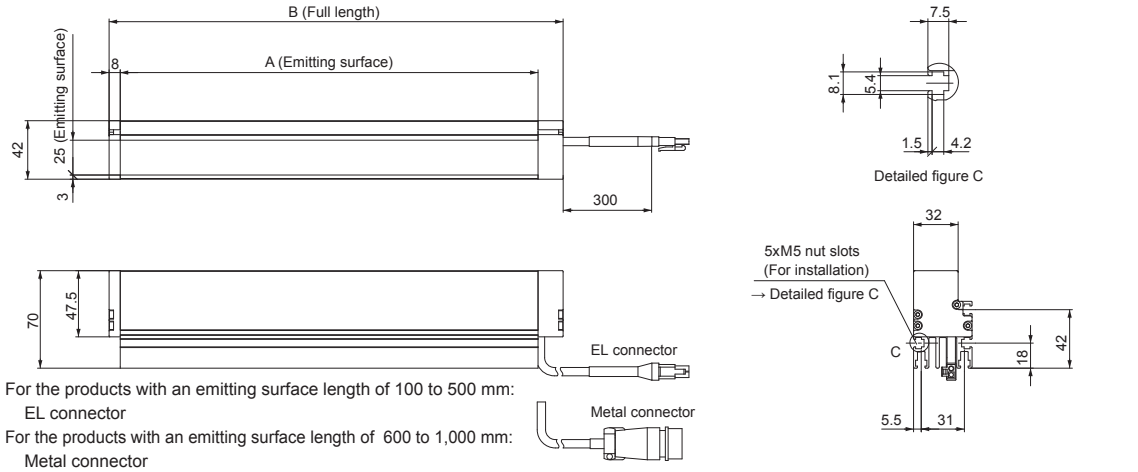


Cable permitted bending radius: 63.6 mm

The above cable permitted bending radii are reference values. Actual values may vary.

Dimensions (mm)

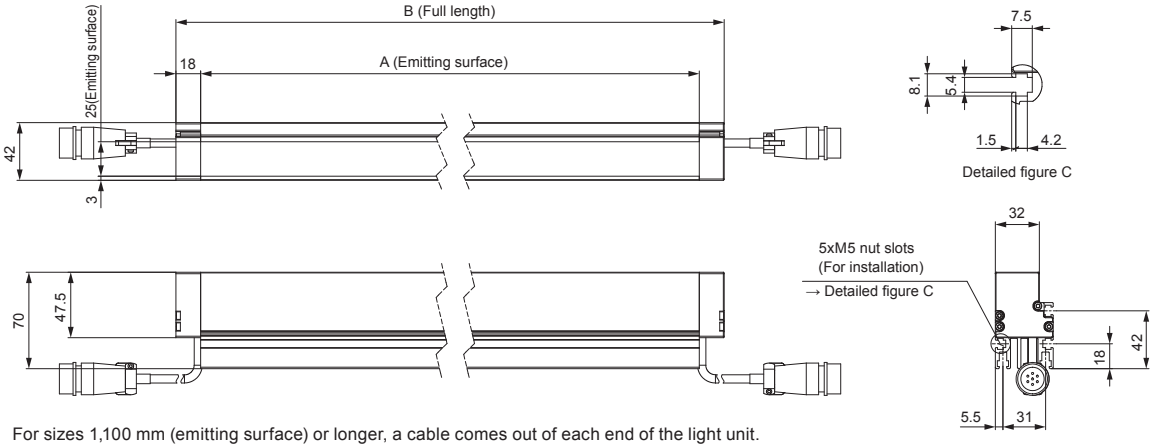
● Emitting surface length: 100 to 1,000 mm



For the products with an emitting surface length of 100 to 500 mm:
EL connector
For the products with an emitting surface length of 600 to 1,000 mm:
Metal connector

CCS accepts custom orders for such as the position where the light cable comes out of the case.
Please contact your CCS sales representative for details.

● Emitting surface length: 1,100 to 3,000 mm



For sizes 1,100 mm (emitting surface) or longer, a cable comes out of each end of the light unit.

	Model Name	A (Emitting surface)	B (Full length)	Connector		Model Name	A (Emitting surface)	B (Full length)	Connector
Standard products	LNSP2-100SW (-NDF)	100	126	EL connector	Special orders	LNSP2-1600SW (-NDF)	1,600	1,636	Metal connector
	LNSP2-200SW (-NDF)	200	226			LNSP2-1700SW (-NDF)	1,700	1,736	
	LNSP2-300SW (-NDF)	300	326			LNSP2-1800SW (-NDF)	1,800	1,836	
	LNSP2-400SW (-NDF)	400	426			LNSP2-1900SW (-NDF)	1,900	1,936	
	LNSP2-500SW (-NDF)	500	526			LNSP2-2000SW (-NDF)	2,000	2,036	
	LNSP2-600SW (-NDF)	600	626	Metal connector		LNSP2-2100SW (-NDF)	5,100	2,136	
	LNSP2-700SW (-NDF)	700	726			LNSP2-2200SW (-NDF)	2,200	2,236	
	LNSP2-800SW (-NDF)	800	826			LNSP2-2300SW (-NDF)	2,300	2,336	
	LNSP2-900SW (-NDF)	900	926			LNSP2-2400SW (-NDF)	2,400	2,436	
	LNSP2-1000SW (-NDF)	1,000	1,026			LNSP2-2500SW (-NDF)	2,500	2,536	
Special orders	LNSP2-1100SW (-NDF)	1,100	1,136	Metal connector		LNSP2-2600SW (-NDF)	2,600	2,636	
	LNSP2-1200SW (-NDF)	1,200	1,236			LNSP2-2700SW (-NDF)	2,700	2,736	
	LNSP2-1300SW (-NDF)	1,300	1,336			LNSP2-2800SW (-NDF)	2,800	2,836	
	LNSP2-1400SW (-NDF)	1,400	1,436			LNSP2-2900SW (-NDF)	2,900	2,936	
	LNSP2-1500SW (-NDF)	1,500	1,536			LNSP2-3000SW (-NDF)	3,000	3,036	

Options

LNSP2 Series Dedicated Coaxial Units

CU-LNSP2 Series

Refer to our website for product details.
CCS CU-LNSP2 ▶ Search

Achieves high output with coaxial illumination

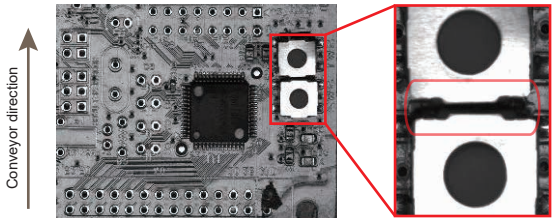
CU-LNSP2-200-GL

With light unit installed.
The light unit is sold separately.

Applications Inspection of electronic parts on circuit boards, visual inspection of secondary battery separators, inspection for damage and dents on touch panels, etc.

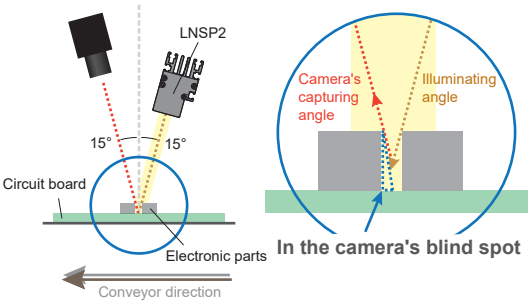
Features

■ When imaging with V-shaped reflection: Only the LNSP2 light unit

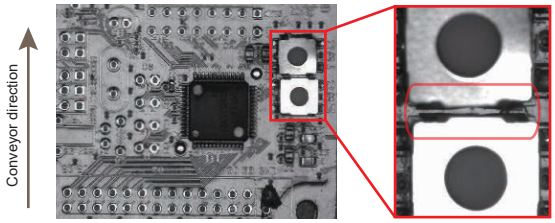


Because the camera is diagonal with respect to the line sensor viewpoint, when capturing objects with protrusions, such as electronic parts on circuit boards, some parts enter the camera's blind spot, limiting the inspected areas.

There is a shadow in the space between electronic parts, preventing visual inspection.

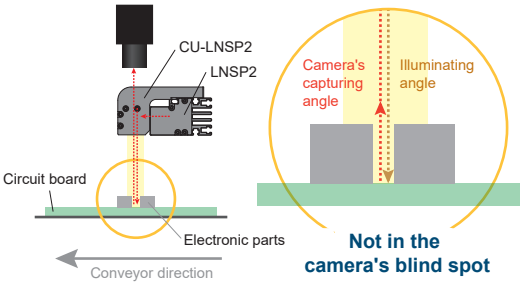


■ When imaging with coaxial illumination: CU-LNSP2 mounted



Because the camera is directly vertical with respect to the line sensor viewpoint, it is not affected by protrusions and can capture the image.

There is no shadow in the space between electronic parts, allowing for visual inspection.



Information about Custom Ordered Products

We also customize coaxial units compatible with the following products.Inquire at your CCS sales representative for details.

■ LN-HK-STK Series ▼ P.224

A cylindrical lens allows for illumination with a convergent line of light. By changing the position of the lens unit on the tip, you can freely set the converging length or the width of emitting light.

■ LNSD Series ▼ P.225

High-luminance, high-uniformity and versatile line sensor light that can be used for various applications. Can be manufactured from 100 mm to 3,000 mm and is recommended as a replacement for fluorescent lamps.

■ LT Series ▼ P.233

* Can be manufactured with the light emitting surface of 10 mm wide

Achieve both high uniformity and high brightness through this unique optical system. It can perform highly-accurate inspections and also supports high-speed scan rates.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

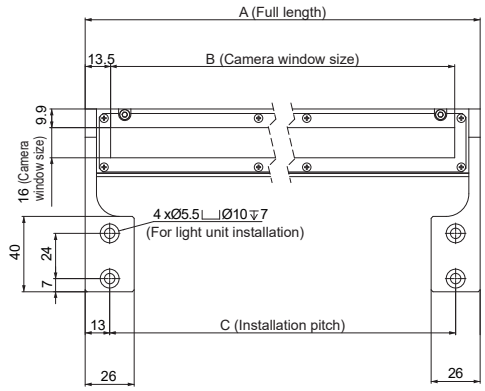
Lineup

CU-LNSP2

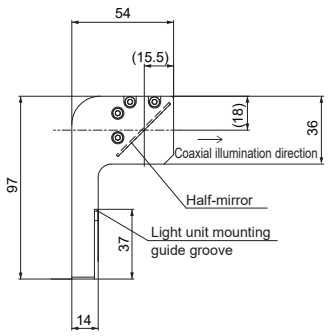
Model Name	Weight	Applicable Light Unit	
CU-LNSP2-100-GL	250 g	LNSP2-100SW	LNSP2 Series Product Page ▼ P.211
CU-LNSP2-200-GL	350 g	LNSP2-200SW	
CU-LNSP2-300-GL	450 g	LNSP2-300SW	
CU-LNSP2-400-GL	550 g	LNSP2-400SW	
CU-LNSP2-500-GL	650 g	LNSP2-500SW	

Dimensions (mm)

CU-LNSP2-100-GL / -200-GL / -300-GL / -400-GL / -500-GL



Four M5 screws and nuts are included for installing the coaxial unit on the light unit.



For a custom order, we can change the location where the light cable comes out of the light unit (LNSP2) case on which the coaxial unit is installed. Please contact your CCS sales representative for details.

Model Name	Dimension A	Dimension B	Dimension C	Model Name	Dimension A	Dimension B	Dimension C
CU-LNSP2-100-GL	112	85	86	CU-LNSP2-400-GL	412	385	386
CU-LNSP2-200-GL	212	185	186	CU-LNSP2-500-GL	512	485	486
CU-LNSP2-300-GL	312	285	286				

Convergent Lighting

Line Lights

LNSP-FN Series

Refer to our website for product details.

CCS LNSP-FN ▶ Search

Uses original converging technology to achieve illumination with reduced diffusion

High output line lights with forced air cooling (fan cooling)

LED color
Custom orders accepted

Size
Custom orders accepted

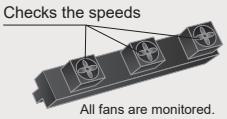
LNSP-400SW-FN

Applications Inspection of parts mounted on circuit boards, inspection for scratches on clear film, inspecting sheet alignment, inspection for unevenness in sheet metal, visual inspection of plastic products, etc.

Avoid Trouble with Error Detection

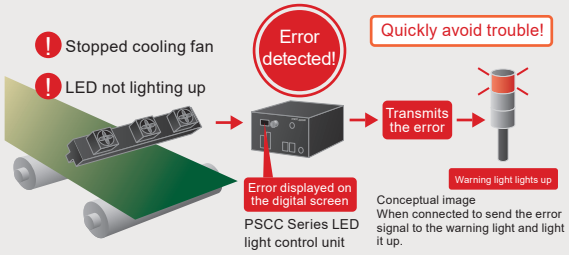
1) Error detection for cooling fans

An error is detected should a fault occur, such as insufficient speed or a stop in the cooling fans.



2) Error detection for the LEDs

Detects dead LEDs due to an open in the light unit circuit or a shorted LED.



Error detection is a function included with the PSCC Series, the recommended control units.

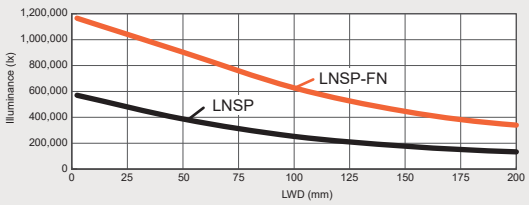
Illuminance of 900,000 lx with Forced Air Cooling (Fan)

Suitable for applications that require high-speed image processing. Also allows for even imaging with a high degree of uniformity.

Comparison of illuminance for the LNSP and LNSP-FN

Comparison of imaging of paper (Japanese paper)

Brightness varies based on the camera's spectral sensitivity.



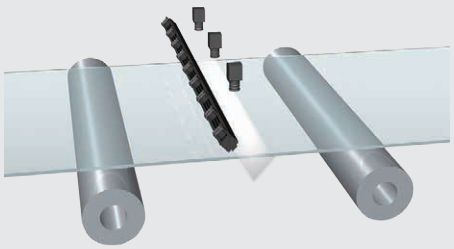
Actual measurement values at 100% intensity in each illuminating distance. Results for individual products may vary.

LWD is the distance from the light unit to the workpiece.

The graph included is for reference only. Actual values may vary.

Applications

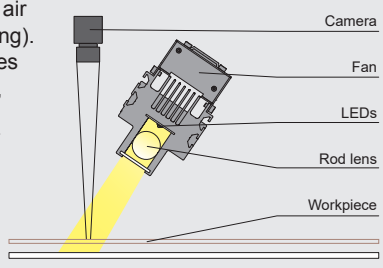
Inspection for damage on glass



Example Configuration

High-output line lights with forced air cooling (fan cooling). Because light does not easily diffuse, there is little loss for the amount of light, allowing for illumination over long distances.

LNSP-FN Series



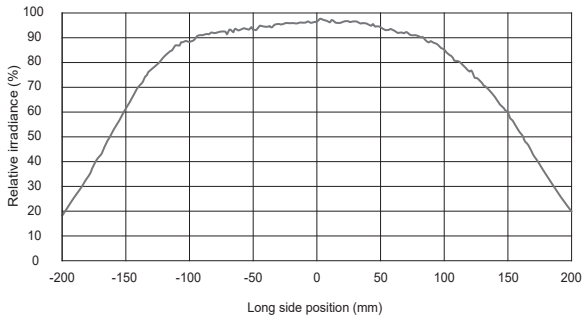
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Data (Representative Example)

The graph included is for reference only. Actual values may vary.

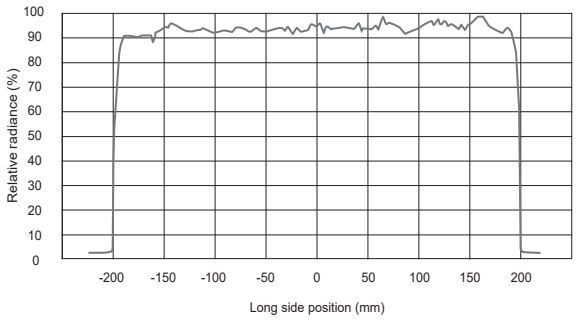
LNSP-400SW-FN

Relative irradiance distribution



Actual measurement values at 100% intensity in 100 mm illuminating distance.
Results for individual products may vary.

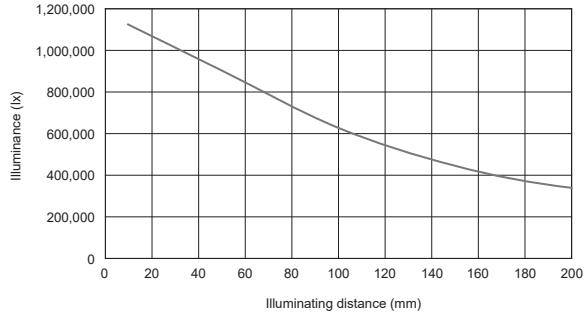
Relative radiance distribution



The graph included is for reference only. Actual values may vary.

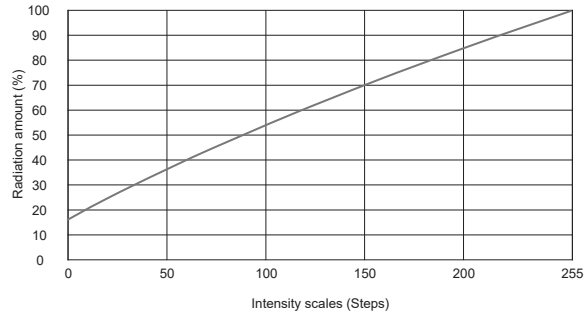
LNSP-1500SW-FN

Change in illuminance



Actual measurement values at 100% intensity in each illuminating distance.
Results for individual products may vary.

Output characteristics



Actual measurement values using the PSCC-60048(A) analog control unit.
Results for individual products may vary.

Custom Order Example

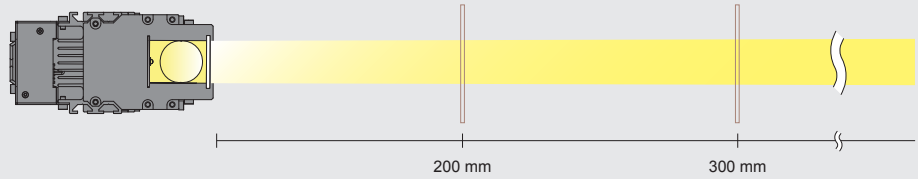
Please contact your CCS sales representative.

Example 1: Changes specifications for the rod lens diameter

Result: Increased irradiance during long-distance illumination.

Irradiance
Comparison with standard product
Approx. **1.6**x when LWD = 200 mm

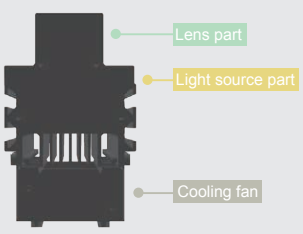
Irradiance
Comparison with standard product
Approx. **1.7**x when LWD = 300 mm

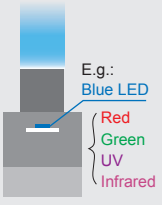


LWD is the distance from the light unit to the workpiece.

Example 2: Changes specifications to match application

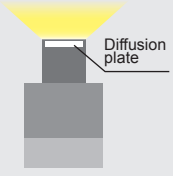
Allows for customization including light source part





Changed wavelength
(From 365 to 940 nm)

No cooling fan
(Natural air cooling)



Diffused lighting type

Light-guiding method slit type

Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent / Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

LNSP-FN Series

Refer to our website for product details.

CCS LNSP-FN ▶ Search

Lineup

	Model Name	LED Color	Power Consumption*1 (Including the fan) June 2017 or earlier	Power Consumption*1 (Including the fan) July 2017 or later	Correlated Color Temperature	Extension Cables*2	Recommended Control Units*2	Weight
Standard products	LNSP-100SW-FN	White	41 W	41 W	5,800 K			900 g
	LNSP-200SW-FN		81 W	82 W				1,400 g
	LNSP-300SW-FN		117 W	118 W			PSCC-30048(A)	1,900 g
	LNSP-400SW-FN		157 W	158 W			PSCC-60048(A)	2,400 g
	LNSP-500SW-FN		192 W	194 W				2,900 g
	LNSP-600SW-FN		233 W	235 W				3,400 g
	LNSP-700SW-FN		268 W	270 W		QCBM		3,900 g
	LNSP-800SW-FN		309 W	311 W		QCB		4,400 g
	LNSP-900SW-FN		345 W	348 W				4,900 g
	LNSP-1000SW-FN		384 W	387 W				5,500 g
	LNSP-1100SW-FN		425 W	428 W			PSCC-60048(A)	6,000 g
	LNSP-1200SW-FN		460 W	464 W				6,500 g
	LNSP-1300SW-FN		501 W	504 W				7,000 g
	LNSP-1400SW-FN		536 W	540 W				7,500 g
	LNSP-1500SW-FN		576 W	581 W				8,000 g
Special orders	LNSP-1600SW-FN		613 W	618 W				8,800 g
	LNSP-1700SW-FN		652 W	658 W				9,300 g
	LNSP-1800SW-FN		689 W	695 W				9,800 g
	LNSP-1900SW-FN		728 W	734 W				10,300 g
	LNSP-2000SW-FN		768 W	775 W				10,900 g
	LNSP-2100SW-FN		804 W	811 W				11,400 g
	LNSP-2200SW-FN		844 W	851 W				11,900 g
	LNSP-2300SW-FN		881 W	888 W		QCB x 2 *3	PSCC-60048(A) x 2 *3	12,400 g
	LNSP-2400SW-FN		920 W	928 W				12,900 g
	LNSP-2500SW-FN		956 W	964 W				13,400 g
	LNSP-2600SW-FN		996 W	1,004 W				13,900 g
	LNSP-2700SW-FN		1,032 W	1,041 W				14,400 g
	LNSP-2800SW-FN		1,071 W	1,080 W				14,900 g
	LNSP-2900SW-FN		1,108 W	1,117 W				15,400 g
	LNSP-3000SW-FN		1,148 W	1,158 W				15,900 g

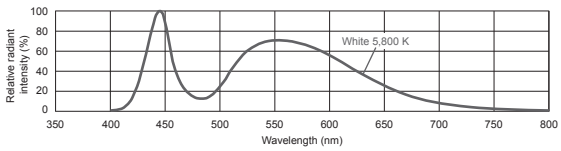
Extension Cables ▶ P.222 PSCC Series Product Page ▶ P.353

*1 The power consumption varies according to the production data. Refer to the power consumption given by the label tag of the product.
*2 Make sure to connect the appropriate extension cables to the control unit.
*3 For sizes 1,600 mm (emitting surface) or longer, a cable comes out of each end of the light unit.

We accept custom orders, such as changes to the LED color (red/blue/IR/UV, etc.) and size changes. Inquire at your CCS sales representative for details.

LED Properties

Spectral distribution



Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Extension Cables

Necessary when connecting the light unit to the recommended PSCC Series control unit.
Make sure to connect the appropriate extension cables to the control unit.

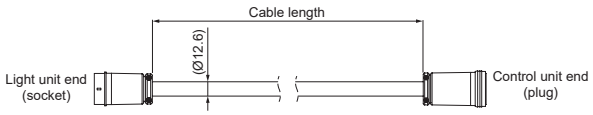
QCBM

Model Name	Cable Length	Weight	Applicable Control Unit
QCBM-2	2 m	800 g	PSCC-30048(A)
QCBM-3	3 m	1,000 g	
QCBM-5	5 m	1,500 g	
QCBM-10	10 m	2,700 g	
QCBM-20	20 m	5,000 g	

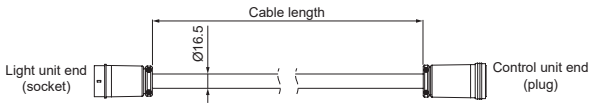
QCB

Model Name	Cable Length	Weight	Applicable Control Unit
QCB-2	2 m	1,100 g	PSCC-60048(A)
QCB-3	3 m	1,500 g	
QCB-5	5 m	2,400 g	
QCB-10	10 m	4,600 g	
QCB-20	20 m	8,900 g	

(mm)



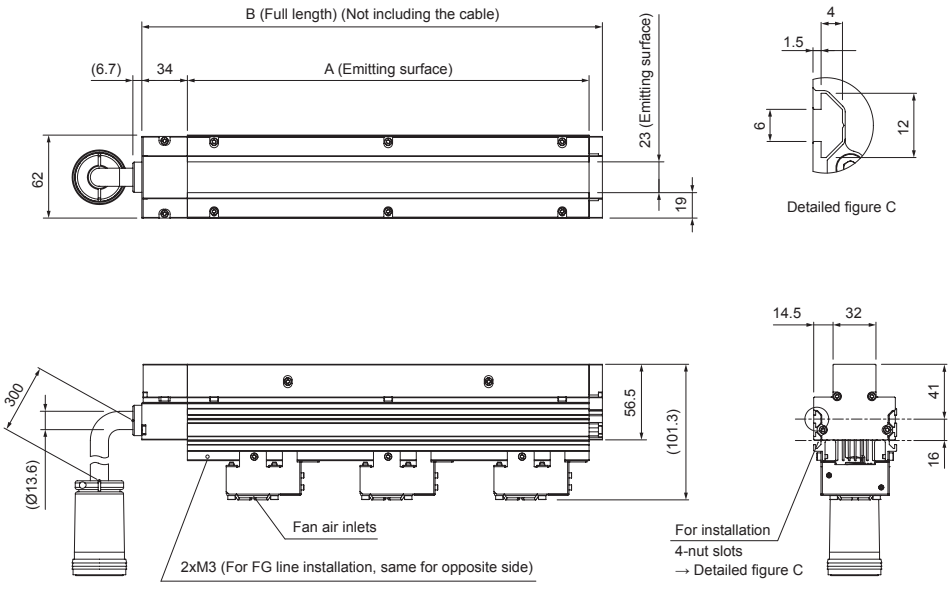
Cable permitted bending radius: 75.6 mm



Cable permitted bending radius: 99 mm

The above cable permitted bending radii are reference values. Actual values may vary.

Dimensions (mm)



For sizes 1,600 mm (emitting surface) or longer, a cable comes out of each end of the light unit.

	Model Name	A (Emitting surface)	B (Full length)		Model Name	A (Emitting surface)	B (Full length)
Standard products	LNSP-100SW-FN	100	144	Special orders	LNSP-1600SW-FN	1,600	1,668
	LNSP-200SW-FN	200	244		LNSP-1700SW-FN	1,700	1,768
	LNSP-300SW-FN	300	344		LNSP-1800SW-FN	1,800	1,868
	LNSP-400SW-FN	400	444		LNSP-1900SW-FN	1,900	1,968
	LNSP-500SW-FN	500	544		LNSP-2000SW-FN	2,000	2,068
	LNSP-600SW-FN	600	644		LNSP-2100SW-FN	2,100	2,168
	LNSP-700SW-FN	700	744		LNSP-2200SW-FN	2,200	2,268
	LNSP-800SW-FN	800	844		LNSP-2300SW-FN	2,300	2,368
	LNSP-900SW-FN	900	944		LNSP-2400SW-FN	2,400	2,468
	LNSP-1000SW-FN	1,000	1,044		LNSP-2500SW-FN	2,500	2,568
	LNSP-1100SW-FN	1,100	1,144		LNSP-2600SW-FN	2,600	2,668
	LNSP-1200SW-FN	1,200	1,244		LNSP-2700SW-FN	2,700	2,768
	LNSP-1300SW-FN	1,300	1,344		LNSP-2800SW-FN	2,800	2,868
	LNSP-1400SW-FN	1,400	1,444		LNSP-2900SW-FN	2,900	2,968
	LNSP-1500SW-FN	1,500	1,544		LNSP-3000SW-FN	3,000	3,068

You can inquire using our website.
Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products
Inquire on our website here.
https://www.ccs-grp.com/contact/

Convergent Lighting

Line Lights

LN Series

Refer to our website for product details.

CCS LN ▶ Search

Provides converged line lighting

LED color
Custom orders accepted

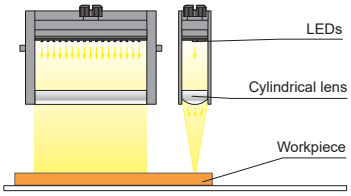
Size
Custom orders accepted

Applications Visual inspection of film circuit boards, inspection for faults in non-woven fabrics, inspection of parts mounted on circuit boards, visual inspection of printed objects, visual inspection of plastic products, etc.

Features

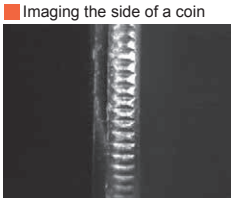
Emits light from the LEDs through the cylindrical lens on the tip and enables converged line-shape light.

Example configuration (LN-60)



We accept custom orders. Please feel free to inquire.
- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

Imaging the side of a coin



Imaging for measuring width of a connector pin

Imaging of damage on glass

Lineup

Model Name	LED Color	Power Consumption	Peak Wavelength / Correlated Color Temperature	Options	Extension Cables	Recommended Control Units	Weight
LN-60RD2	Red	24 V / 2.1 W	630 nm	–	FCB Straight Cable*3 FCB-W 2-branch Cable*4 FCB-F 4-branch Cable FRCB Robot Cable	PD4, PD3*2, CC-ST-1024, POD*1	130 g
LN-60SW2	White		5,500 K				
LN-60BL2	Blue		470 nm				
LN-60GR2	Green		525 nm				
LN-200RD2	Red	24 V / 3.1 W	630 nm				500 g
LN-200SW2	White		5,500 K				
LN-200BL2	Blue		470 nm				
LN-200GR2	Green		525 nm				

*3 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*4 The cables with a model name that ends with "-EL2" are not included.

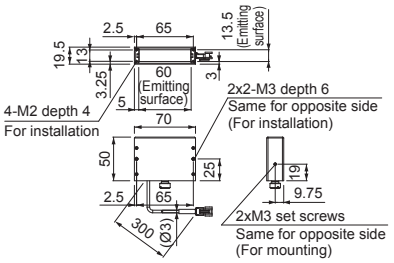
*2 Custom products with a PWM frequency of 500 kHz are available for PD3 Series digital control unit. Please contact your CCS sales representative for details.

LED Properties: Spectral Distribution ▶ P.396 | Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

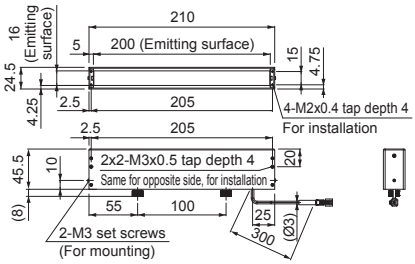
*1 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod

Dimensions (mm)

LN-60RD2/SW2/BL2/GR2



LN-200RD2/SW2/BL2/GR2



You can change the connectors of the light unit cable.
Choose between M12 connectors and flying leads.
Refer to P.19 for details.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Provides converged line lighting (High output type)

LN-200SW2-HK-STK

LN-60SW2-HK-STK

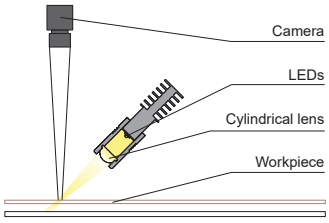
Applications Visual inspection of film circuit boards, inspection for faults in non-woven fabrics, inspection of parts mounted on circuit boards, visual inspection of printed objects, visual inspection of plastic products, etc.

Features

Emits light from the LEDs through the cylindrical lens on the tip and enables converged line-shape light.

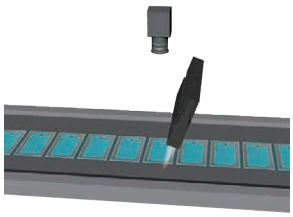
We accept custom orders. Please feel free to inquire.
- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

Example configuration (LN-60SW2-HK-STK)



Applications

Visual inspection of film-circuit boards



Inspection for faults in non-woven fabrics

Lineup

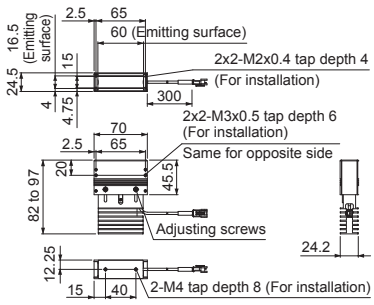
Model Name	LED Color	Power Consumption	Peak Wavelength / Correlated Color Temperature	Options	Extension Cables	Recommended Control Units	Weight
LN-60SW2-HK-STK	White	24 V / 6.1W	5,500 K	–	FCB*3 Straight Cable / FCB-W*4 2-branch Cable / FCB-F 4-branch Cable / FRCB Robot Cable	PD4 / PD3*2 / CC-ST-1024*1 *1 Cannot be used with LN-200SW2-HK-STK.	250 g
LN-200SW2-HK-STK		24 V / 22 W					750 g

LED Properties: Spectral Distribution ▶ P.396 | Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

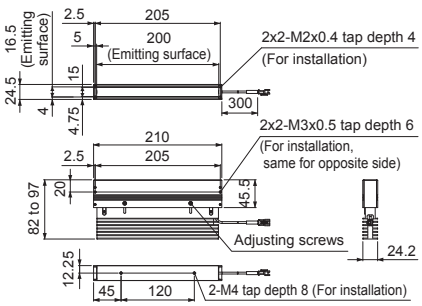
*2 Custom products with a PWM frequency of 500 kHz are available for PD3 Series digital control unit. Please contact your CCS sales representative for details.
*3 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included. *4 The cables with a model name that ends with "-EL2" are not included.

Dimensions (mm)

LN-60SW2-HK-STK



LN-200SW2-HK-STK



You can change the connectors of the light unit cable.
Choose between M12 connectors and flying leads.
Refer to P.19 for details.

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https://www.ccs-grp.com/contact/

Diffused Lighting

Line Lights
LNSD Series

Refer to our website for product details.

CCS LNSD ▶ Search

Highly-versatile Line Lights with a variety of uses

LED color
Custom orders accepted

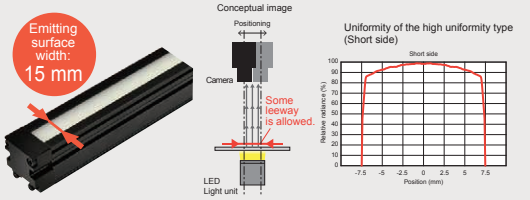
Size
Custom orders accepted

LNSD-400SW(A) LNSD-400SW-HU(A) LNSD-600RD LNSD-800BL

Applications Inspection for dents, foreign-material, or fish-eye-holes on clear film; inspection for blots, unevenness, or scratches on metallic foil; inspection for oil-sots, holes, or edge-breaking on paper; inspection for blots, mixing-of-hairs, or crude-density on non-woven fabric; etc.

Easy-to-Setup, Compact, and Lightweight

The wide and uniform emitting surface facilitates the positioning of the camera. You can improve the efficiency of the setting work.



Compact and lightweight

Stable quality even in a harsh environment

Operation temp. 50℃ allowed

Heat resistant design for a high temperature environment

- Optimized case design for heat dissipation
- Heat resistant cable and diffusion plate
- Other components for thorough heat resistance

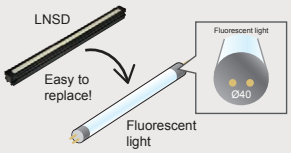
Also make sure the operating temperature of the control unit and the optional accessories.

Can replace fluorescent lights

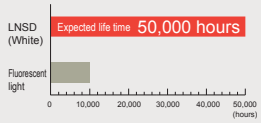
Excellent brightness and the same uniformity as a fluorescent light

Measurement condition: 100% intensity, short side

Great for replacing fluorescent lights due to the equal size



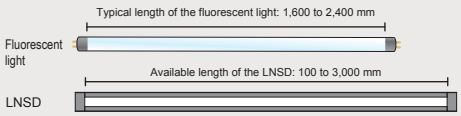
Life time comparison



Light intensity: 70%, Operation temperature: 50°C, Calculated value where the light output drops to 50% Actual values may vary.

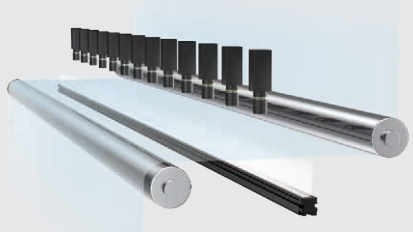
The life time of the fluorescent light is estimated as 10,000 hours according to CCS's research.

Supports 1,600 to 2,400 mm length as with the fluorescent light



Applications

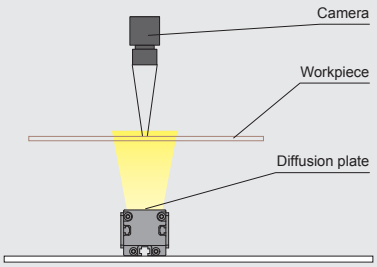
Inspection for foreign material on clear films



Example Configuration

Light from the chip LEDs on the flat boards passes through a diffusion plate to produce a band of diffused illumination.

LNSD Series

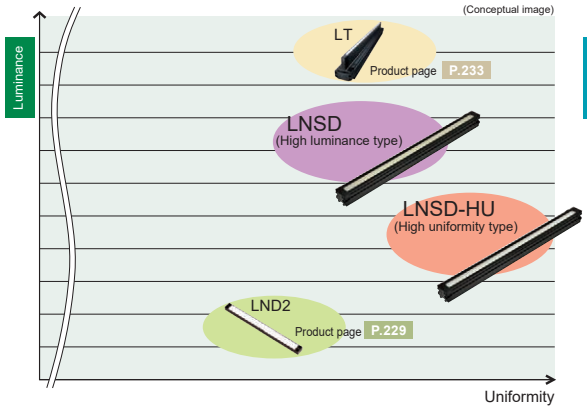


Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

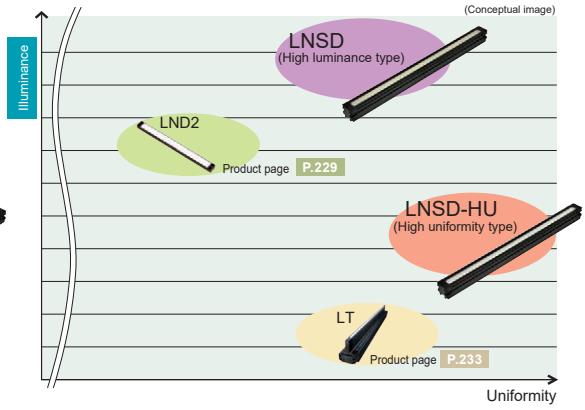
Register to use them.

Comparing Performance of the LNSD with Other CCS Line Lights

Comparison between the luminance and the uniformity



Comparison between the illuminance and the uniformity



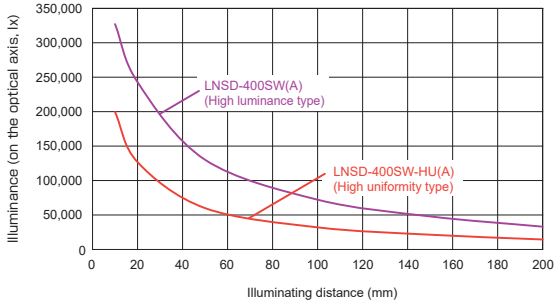
Data (Representative Example)

The graph included is for reference only. Actual values may vary.

Brightness

Series name	Luminance	Illuminance
LNSD-400SW(A) (High luminance type)	328,000 cd/m²	128,000 lx LWD=50 mm
LNSD-400SW-HU(A) (High uniformity type)	117,000 cd/m²	58,000 lx LWD=50 mm

Change in illuminance

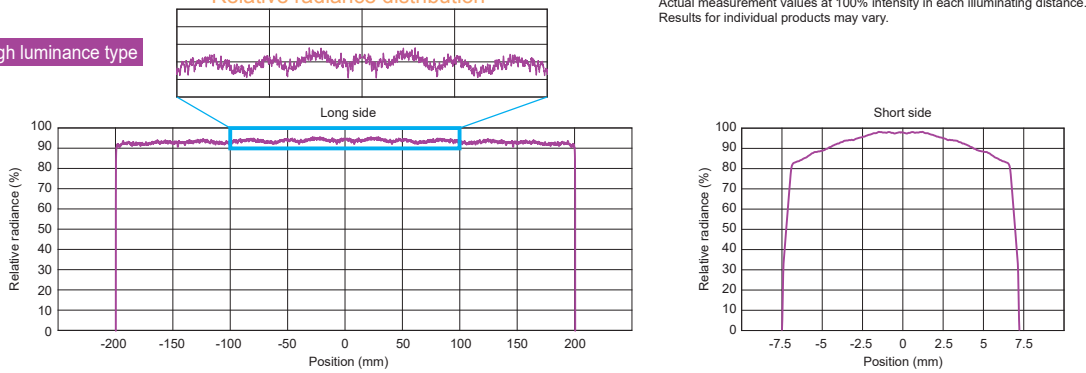


Actual measurement values at 100% intensity in each illuminating distance.
Results for individual products may vary.

LNSD-400SW(A)

High luminance type

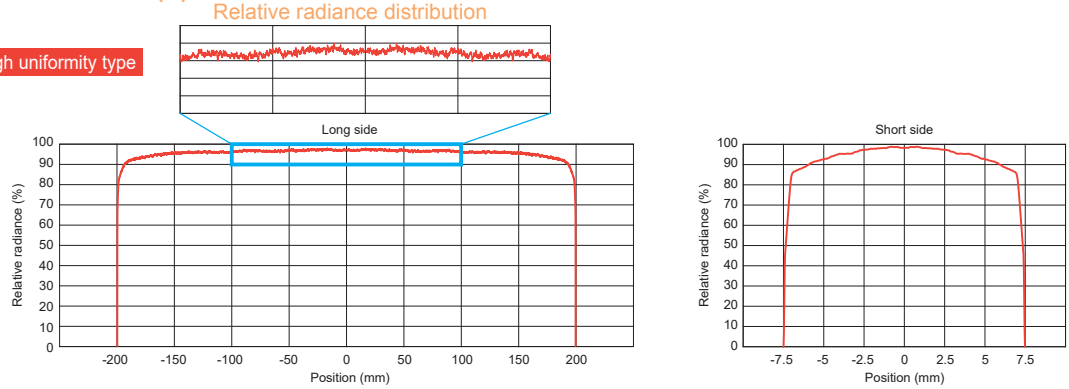
Relative radiance distribution



LNSD-400SW-HU(A)

High uniformity type

Relative radiance distribution



LDR2
LDR2-LA
LDR-LA1
SQR
SQR-TP
Ring (Direct)
HLDR3
HPR2
LFR
LKR
FPR
Ring (Convergent / Diffused)
FPQ3
Square
LDL2
LDLB
HLDL3
LB
Bar
TH2 (5 types)
LFL
Flat
HPD2
LDM2
LAV
PDM
LFXV
LFX3
LFX3-PT
Dome
LFV3
LFV3-G
Coaxial
MSU
MFU
Coaxial
PF
Strobe
HLDR-IP
HSL-PCL
Water-proof
Small COB Lights
COB
UV3/VL3
UV
LNSP-UV3-FN
UV / Violet
IR2 (Under 1000-nm Type)
IR (Over 1000-nm Type)
CIR
Infrared
IU
Intensity Control
HLV3
LV
LSP
HFS/HFR
HLV3-22-4-NR
HLV3-3M-RGB-4
PFBR-600SW2
PFBR-150
PFB3
Spot, Etc.
LNLP
LNSP2
Coaxial Units
LNSP-FN
LN/LN-HK
Line (Convergent)
LNSD
LND2
LT
LNV
LFXV (Rectangular Type)
TH2 (Rectangular Type)
Line (Diffused)
LNDG
LNIS2
LNIS
LNIS-FN
Line (Oblique Angled)
Telecentric Lens
Macro Lens
Lenses

LNSD Series

Refer to our website for product details.

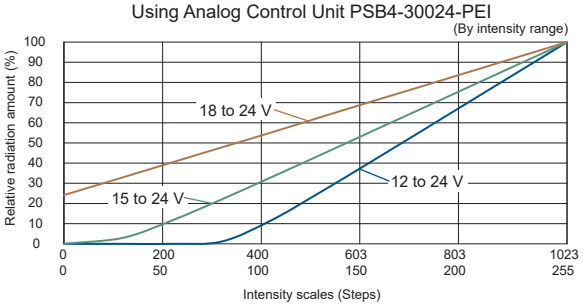
CCS LNSD ▶ Search

Data (Representative Example)

The graph included is for reference only. Actual values may vary.

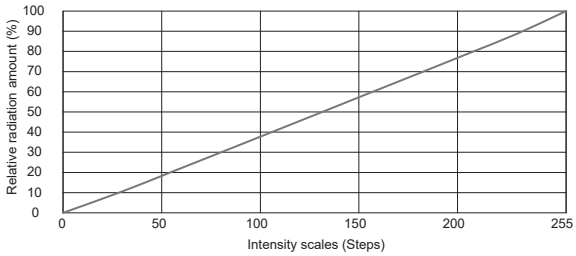
LNSD-400SW(A) / LNSD-400SW-HU(A) Output characteristics

Using Analog Control Unit PSB4-30024-PEI



Actual measurement values using the PSB4-30024-PEI analog control unit.
Results for individual products may vary.

Using Digital Control Unit PD3-10024-8



Actual measurement values using the PD3-10024-8 digital control unit.
Results for individual products may vary.

Lineup

Model Name: High Luminance Type LNSD-□□□□○○ (Emitting Surface Length) (LED Color) High Uniformity Type LNSD-□□□□○○-HU (Emitting Surface Length) (LED Color)

Model Name	LED Color	Power Consumption	Peak Wavelength / Correlated Color Temperature	Extension Cables	Recommended Control Units	Weight
LNSD-100SW(A)/RD/BL		24 V / 11 W				200 g
LNSD-200SW(A)/RD/BL		24 V / 21 W				320 g
LNSD-300SW(A)/RD/BL		24 V / 31 W			PSB4	460 g
LNSD-400SW(A)/RD/BL		24 V / 41 W			PD4-12024	590 g
LNSD-500SW(A)/RD/BL		24 V / 51 W			PD3-10024-8*2	720 g
LNSD-600SW(A)/RD/BL		24 V / 61 W		FCB-EL2		860 g
LNSD-700SW(A)/RD/BL		24 V / 71 W				990 g
LNSD-800SW(A)/RD/BL		24 V / 81 W				1,120 g
LNSD-900SW(A)/RD/BL		24 V / 91 W				1,240 g
LNSD-1000SW(A)/RD/BL		24 V / 101 W			PSB4	1,370 g
LNSD-1100SW(A)/RD/BL		24 V / 111 W			PD4-12024	1,500 g
LNSD-1200SW(A)/RD/BL		24 V / 121 W				1,640 g
LNSD-1300SW(A)/RD/BL		White, Blue: 131 W / Red: 132 W				1,770 g
LNSD-1400SW(A)/RD/BL		White, Blue: 141 W / Red: 142 W				1,910 g
LNSD-1500SW(A)/RD/BL	White (SW)	White, Blue: 151 W / Red: 152 W	White: 6,000 K			2,040 g
LNSD-1600SW(A)/RD/BL	Red (RD)	White, Blue: 161 W / Red: 162 W	Red: 631 nm			2,170 g
LNSD-1700SW(A)/RD/BL	Blue (BL)	White, Blue: 171 W / Red: 172 W	Blue: 470 nm			2,300 g
LNSD-1800SW(A)/RD/BL		White, Blue: 181 W / Red: 182 W				2,440 g
LNSD-1900SW(A)/RD/BL		24 V / 192 W				2,570 g
LNSD-2000SW(A)/RD/BL		24 V / 202 W				2,700 g
LNSD-2100SW(A)/RD/BL		24 V / 212 W		FCB-EL2 x 2 *1	PSB4	2,830 g
LNSD-2200SW(A)/RD/BL		24 V / 222 W				2,960 g
LNSD-2300SW(A)/RD/BL		24 V / 232 W				3,090 g
LNSD-2400SW(A)/RD/BL		24 V / 242 W				3,220 g
LNSD-2500SW(A)/RD/BL		White, Blue: 230 W / Red: 227 W				3,350 g
LNSD-2600SW(A)/RD/BL		White, Blue: 239 W / Red: 236 W				3,480 g
LNSD-2700SW(A)/RD/BL		White, Blue: 248 W / Red: 245 W				3,610 g
LNSD-2800SW(A)/RD/BL		White, Blue: 257 W / Red: 255 W				3,740 g
LNSD-2900SW(A)/RD/BL		White, Blue: 267 W / Red: 264 W				3,870 g
LNSD-3000SW(A)/RD/BL		White, Blue: 276 W / Red: 273 W				4,000 g

High luminance type / High uniformity type (Add "-HU" at the end of the model name.)

*1 The light units with an emitting surface length more than 1,200 mm have two input connectors.
To install the light unit, use two extension cables of the same length. Using the cables of different length may cause uneven emission due to a difference in voltage drop caused by the DC resistance of the cables.

Extension Cables ▶ P.228

List of Control Unit Specifications ▶ P.307

*2 Custom products with a PWM frequency of 500 kHz are available for PD3 Series digital control unit. Please contact your CCS sales representative for details.

Change in model names

"(A)" is added to the end of select model names e.g. LFX3-25SW → LFX3-25SW(A)

Reason	Effect on functions and performance
LEDs have been changed due to the discontinuation of the LEDs used.	Lower correlated color temperature (more yellow) Conventional product: 6600 K New product: 6000 K

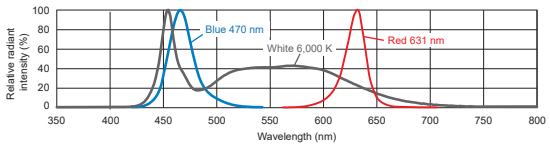
We accept custom orders, such as changes to the LED color (green/IR/UV, etc.) and size changes. Inquire at your CCS sales representative for details.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

LED Properties

Spectral distribution



Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

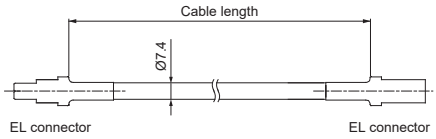
Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Extension Cables

FCB-EL2

Model name	Cable length	Model name	Cable length
FCB-1-EL2	1 m	FCB-5-EL2	5 m
FCB-2-EL2	2 m	FCB-10-EL2	10 m
FCB-3-EL2	3 m	FCB-15-EL2	15 m

(mm)



Cable permitted bending radius: 29.6 mm

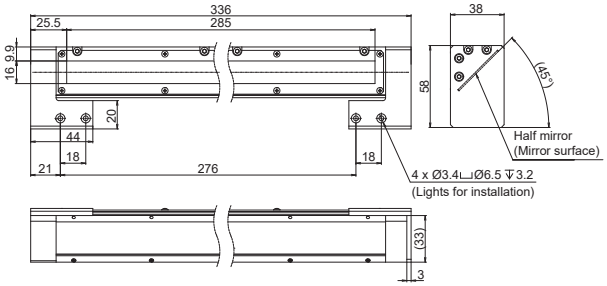
The above cable permitted bending radius is a reference value. Actual value may vary.

Option (mm)

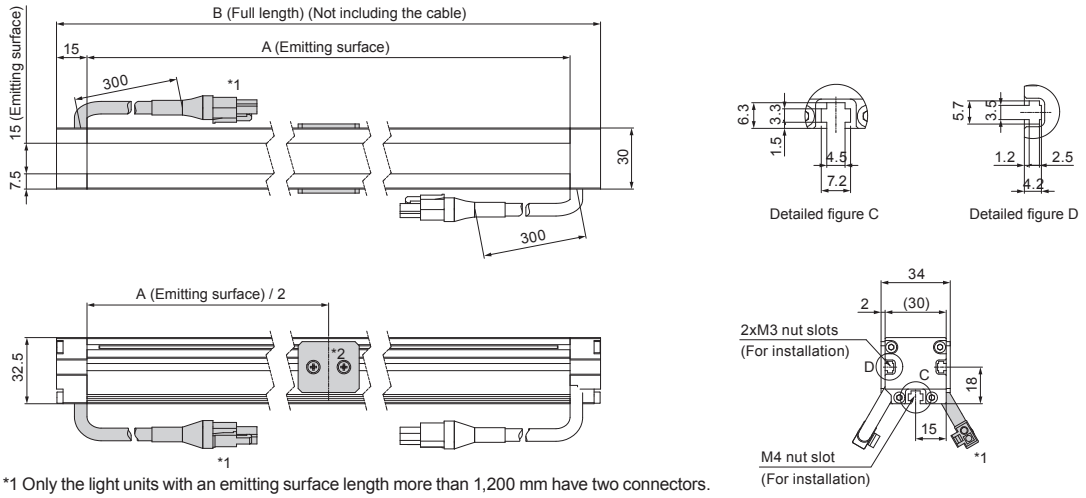
Coaxial unit: CU-LNSD-300-GL

Capable of imaging by illumination from the same axis as the camera.

*This is a custom-order product. Contact our local sales office for details.



Dimensions (mm)



*1 Only the light units with an emitting surface length more than 1,200 mm have two connectors.

*2 Only the light units with an emitting surface length more than 1,600 mm have reinforcing metal fittings.

	Model Name	A (Emitting surface)	B (Full length)		Model Name	A (Emitting surface)	B (Full length)
High luminance type / High uniformity type (Add "-HU" at the end of the model name.)	LNSD-100SW(A)/RD/BL	100	130	High luminance type / High uniformity type (Add "-HU" at the end of the model name.)	LNSD-1600SW(A)/RD/BL	1,600	1,630
	LNSD-200SW(A)/RD/BL	200	230		LNSD-1700SW(A)/RD/BL	1,700	1,730
	LNSD-300SW(A)/RD/BL	300	330		LNSD-1800SW(A)/RD/BL	1,800	1,830
	LNSD-400SW(A)/RD/BL	400	430		LNSD-1900SW(A)/RD/BL	1,900	1,930
	LNSD-500SW(A)/RD/BL	500	530		LNSD-2000SW(A)/RD/BL	2,000	2,030
	LNSD-600SW(A)/RD/BL	600	630		LNSD-2100SW(A)/RD/BL	2,100	2,130
	LNSD-700SW(A)/RD/BL	700	730		LNSD-2200SW(A)/RD/BL	2,200	2,230
	LNSD-800SW(A)/RD/BL	800	830		LNSD-2300SW(A)/RD/BL	2,300	2,330
	LNSD-900SW(A)/RD/BL	900	930		LNSD-2400SW(A)/RD/BL	2,400	2,430
	LNSD-1000SW(A)/RD/BL	1,000	1,030		LNSD-2500SW(A)/RD/BL	2,500	2,530
	LNSD-1100SW(A)/RD/BL	1,100	1,130		LNSD-2600SW(A)/RD/BL	2,600	2,630
	LNSD-1200SW(A)/RD/BL	1,200	1,230		LNSD-2700SW(A)/RD/BL	2,700	2,730
	LNSD-1300SW(A)/RD/BL	1,300	1,330		LNSD-2800SW(A)/RD/BL	2,800	2,830
	LNSD-1400SW(A)/RD/BL	1,400	1,430		LNSD-2900SW(A)/RD/BL	2,900	2,930
	LNSD-1500SW(A)/RD/BL	1,500	1,530		LNSD-3000SW(A)/RD/BL	3,000	3,030

Diffused Lighting

Line Lights

LND2 Series

Refer to our website for product details.

CCS LND2 ▶ Search

Provides diffused light from an emitting surface equipped with LEDs in straight lines

LED color
Custom orders accepted

Size
Custom orders accepted

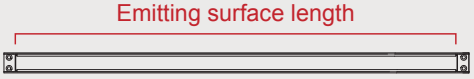
Applications Inspection for damage or dents in metal cylindrical parts, inspection for damage or dents in motor shafts, inspection for foreign material on clear film, etc.

Suitable for All Types of Line Sensor Inspections

This line light achieves brightness equivalent to a fluorescent lamp while keeping the price down.

Emitting surface length

You can select from 101 mm, 201 mm, 301 mm, 401 mm, 503 mm, 603 mm, 703 mm, 803 mm, 903 mm, 1003 mm, 1103 mm and 1,203 mm.



For a custom order, we can create an emitting surface with a length with a 100 mm pitch.

LED color

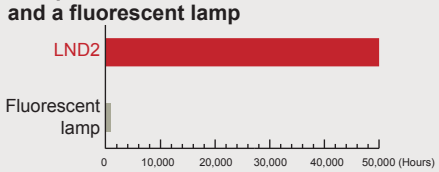
For emitted LED color, we have a lineup consisting of:
Red and White
Select your light unit based on the details of your inspections.

For a custom order, we can create LEDs that emit blue, green, IR, or UV.

Can replace fluorescent lights

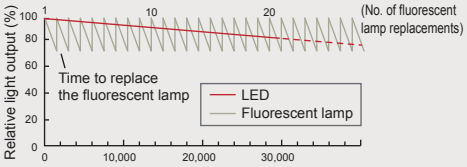
LEDs have a long service life, so the bulbs don't burn out like fluorescent lamps, thus reducing costs for lamp replacement and work hours.

Comparison of service life between the LND2 (red) and a fluorescent lamp



Calculated values with an intensity of 100%, ambient temperature of 25ºC and a light output drop of up to 50%.
Actual values may vary.
Assuming the service life of a fluorescent lamp is 1,500 hours.

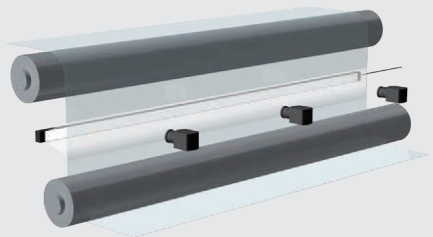
Change in the amount of light from the LEDs and work hours for replacing fluorescent lamps



Imaging comparing the change in LED light and a fluorescent lamp that is replaced every 1,500 hours.

Applications

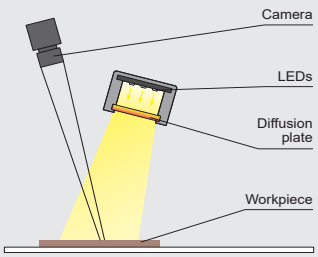
Inspection for foreign material on clear films



Example Configuration

Provides diffused light with a high degree of uniformity by mounting LEDs with high density.

LND2 Series



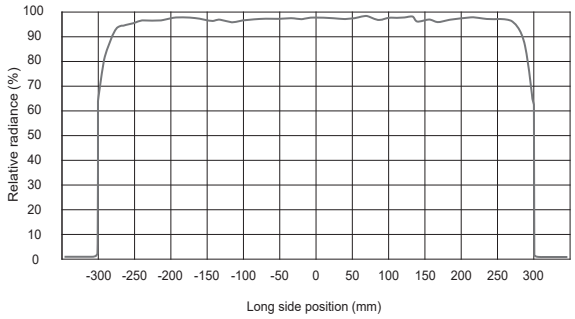
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Data (Representative Example)

The graph included is for reference only. Actual values may vary.

LND2-600SW

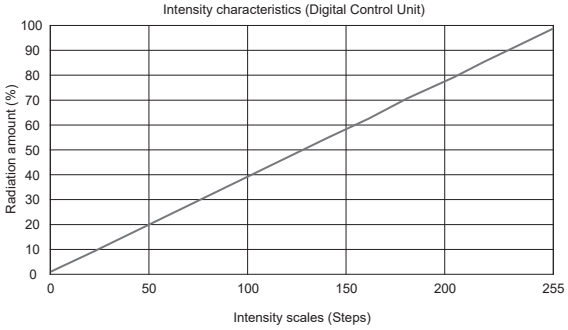
Relative radiance distribution



The graph included is for reference only. Actual values may vary.

LND2-300SW

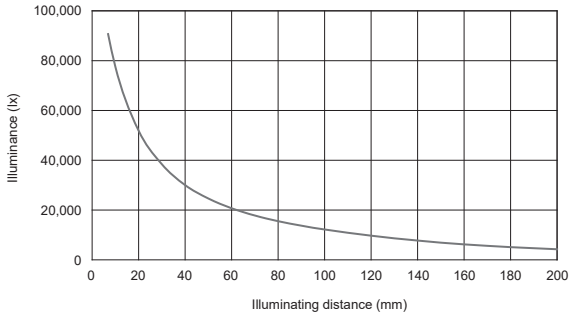
Output characteristics



Actual measurement values using the PD3 Series digital control unit.
Results for individual products may vary.

LND2-300SW

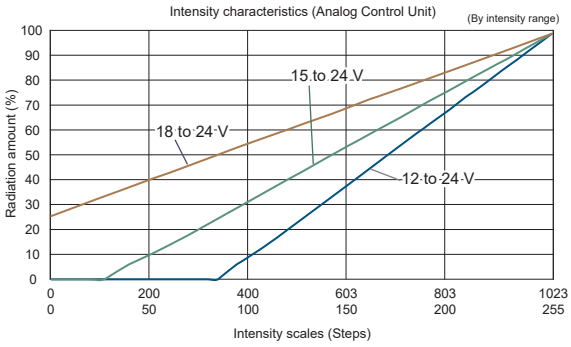
Change in illuminance



Actual measurement values at 100% intensity in each illuminating distance.
Results for individual products may vary.

LND2-900SW

Output characteristics



Actual measurement values using the PSB4-30024-PEI analog control unit.
Results for individual products may vary.

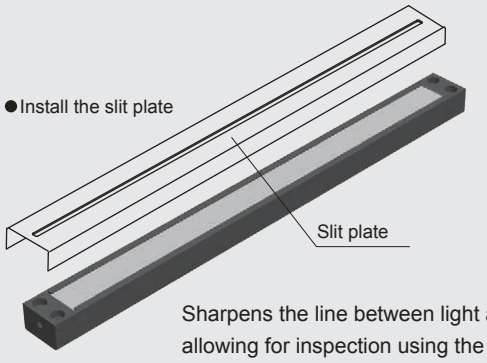
Measured in each voltage range because the PSB4-30024-PEI analog control unit has a switching function for the lower limit of output voltage.

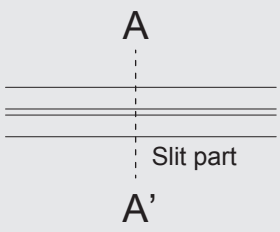
Custom Order Example

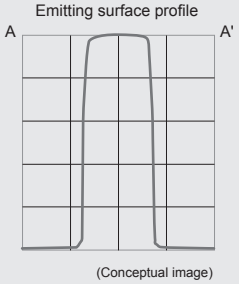
Please contact your CCS sales representative.

E.g.: Slit specifications (Install a slit plate on the emitting surface)

Result: Uses the edge of the emitting surface, effective for inspections for dents and fish eyes where the change in the surface shape is slight.





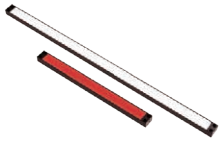


(Conceptual image)

Sharpens the line between light and dark for the light unit, allowing for inspection using the emitting surface's edge.

You can inquire using our website.
Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products
Inquire on our website here.
https://www.ccs-grp.com/contact/

LND2 Series



Refer to our website for product details.

CCS LND2 ▶ Search

Lineup

Model Name	LED Color	Power Consumption	Peak Wavelength / Correlated Color Temperature	Extension Cables	Recommended Control Units	Weight
LND2-100SW	White	24 V / 5.8 W	5,500 K	FCB*3 Straight Cable, FRCB Robot Cable	PD4, PD3*2, POD*1	140 g
LND2-200SW		24 V / 12 W				170 g
LND2-300SW		24 V / 18 W				200 g
LND2-400SW		24 V / 24 W				250 g
LND2-500SW		24 V / 29 W				300 g
LND2-600SW		24 V / 35 W				360 g
LND2-700SW		24 V / 41 W		FCB-EL2 Straight Cable	PD4-12024, PD3-10024-8*2, POD-22024-4-PEI*1, PSB4	405 g
LND2-800SW		24 V / 47 W				455 g
LND2-900SW		24 V / 53 W				505 g
LND2-1000SW		24 V / 58 W				560 g
LND2-1100SW		24 V / 64 W				615 g
LND2-1200SW		24 V / 70 W				670 g
LND2-100RD	Red	24 V / 7.6 W	630 nm	FCB*3 Straight Cable, FRCB Robot Cable	PD4, PD3*2, POD	140 g
LND2-200RD		24 V / 16 W				170 g
LND2-300RD		24 V / 23 W				200 g
LND2-400RD		24 V / 31 W				250 g
LND2-500RD		24 V / 38 W				300 g
LND2-600RD		24 V / 46 W				360 g
LND2-700RD		24 V / 53 W		FCB-EL2 Straight Cable	PD4-12024, PD3-10024-8*2, POD-22024-4-PEI*1, PSB4	405 g
LND2-800RD		24 V / 61 W				455 g
LND2-900RD		24 V / 69 W				505 g
LND2-1000RD		24 V / 76 W				560 g
LND2-1100RD		24 V / 84 W				615 g
LND2-1200RD		24 V / 91 W				670 g

*3 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.

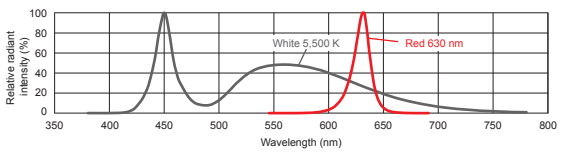
Extension Cables ▶ P.232 | List of Control Unit Specifications ▶ P.307

*1 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod
*2 Custom products with a PWM frequency of 500 kHz are available for PD3 Series digital control unit. Please contact your CCS sales representative for details.

The emitting surface is available in sizes of 100 mm units. For details about other sizes, inquire with your CCS sales representative.
In addition, we accept custom orders, such as changes to the LED color (blue/green/IR, etc.) and size changes. Inquire at your CCS sales representative for details.

LED Properties

Spectral distribution



Lens filters suitable for each wavelength are available.
For details about the lens filter, refer to P.359.

Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Extension Cables

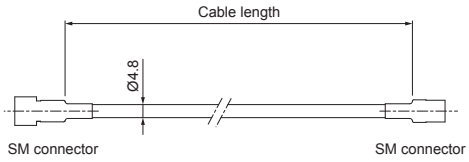
FCB

Model Name	Cable Length
FCB-1	1 m
FCB-2	2 m
FCB-3	3 m
FCB-5	5 m

FRCB

Model Name	Cable Length
FRCB-1	1 m
FRCB-2	2 m
FRCB-3	3 m
FRCB-5	5 m

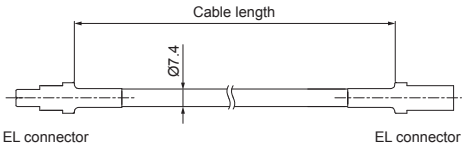
(mm)



Cable permitted bending radius: 28.8 mm

FCB-EL2

Model Name	Cable Length
FCB-1-EL2	1 m
FCB-2-EL2	2 m
FCB-3-EL2	3 m
FCB-5-EL2	5 m
FCB-10-EL2	10 m
FCB-15-EL2	15 m

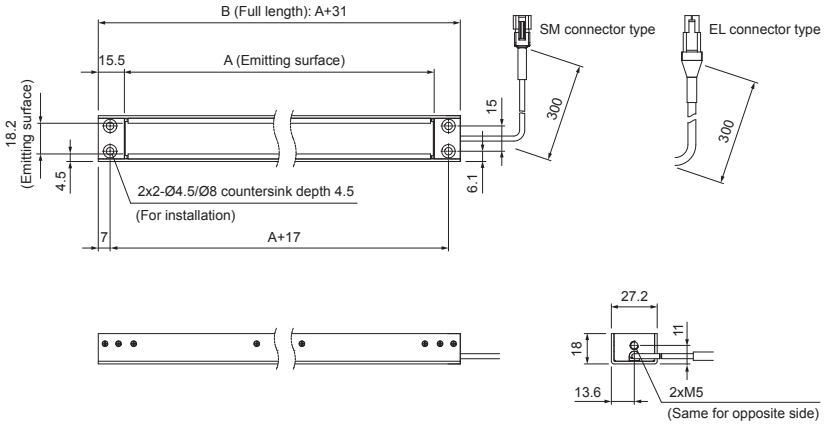


Cable permitted bending radius: 29.6 mm

The above cable permitted bending radii are reference values. Actual values may vary.

Dimensions (mm)

	Model Name
SM connector type	LND2-100
	LND2-200
	LND2-300
	LND2-400
	LND2-500
	LND2-600
EL connector type	LND2-700
	LND2-800
	LND2-900
	LND2-1000
	LND2-1100
	LND2-1200



	Model name	A (Emitting surface)	B (Full length)		Model name	A (Emitting surface)	B (Full length)
White	LND2-100SW	101	132	Red	LND2-100RD	101	132
	LND2-200SW	201	232		LND2-200RD	201	232
	LND2-300SW	301	332		LND2-300RD	301	332
	LND2-400SW	401	432		LND2-400RD	401	432
	LND2-500SW	503	534		LND2-500RD	503	534
	LND2-600SW	603	634		LND2-600RD	603	634
	LND2-700SW	703	734		LND2-700RD	703	734
	LND2-800SW	803	834		LND2-800RD	803	834
	LND2-900SW	903	934		LND2-900RD	903	934
	LND2-1000SW	1,003	1,034		LND2-1000RD	1,003	1,034
	LND2-1100SW	1,103	1,134		LND2-1100RD	1,103	1,134
	LND2-1200SW	1,203	1,234		LND2-1200RD	1,203	1,234

You can change the connectors of the light unit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

Diffused Lighting

Line Lights

LT Series

Refer to our website for product details.

CCS LT ▶ Search

Provides diffused light evenly using an original optical design

LED color
Custom orders accepted

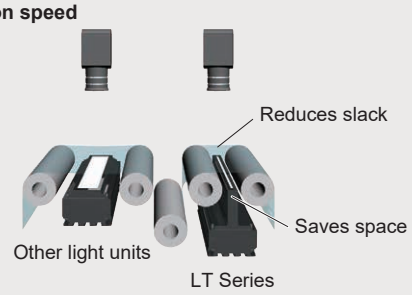
Size
Custom orders accepted

LT-300SW

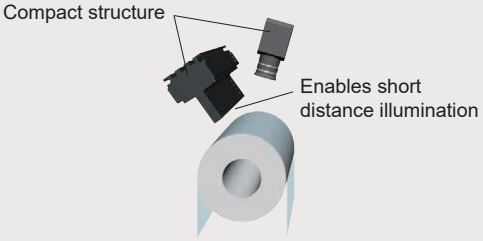
Applications Fish eye inspection on clear film, scratch inspection on film sheets, inspection for cracks or damage on wafers, visual inspection of metal foil sheets, shrinkage inspection of resin, etc.

Imaging with a unique illumination structure

By reducing the space between rolls, you can improve inspection speed



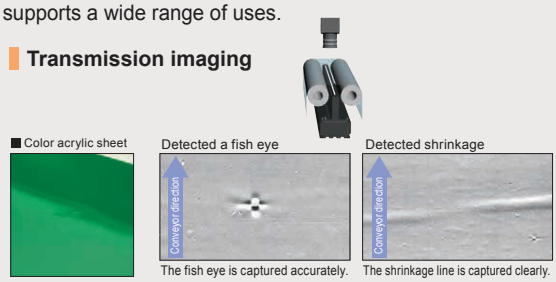
Allows for inspections where the light is installed at a narrow angle with the camera



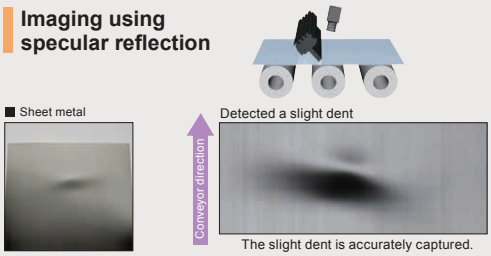
Achieves Both High Uniformity and High Brightness

We achieved both high uniformity and high brightness through our unique optical system. It can perform highly-accurate inspections depending on the scan rate, and supports a wide range of uses.

Transmission imaging



Imaging using specular reflection



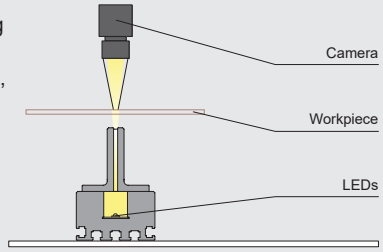
Applications

Inspection for fish eyes, scratches, and foreign materials on clear films

Example Configuration

By employing a mechanism where the emitting surface sticks out from the main unit, it's possible to place the tip close to the workpiece, even in a narrow space.

LT Series



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

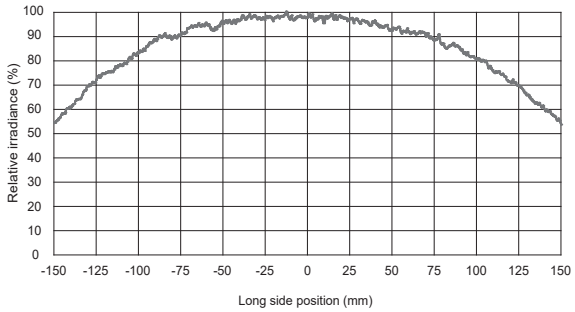
Register to use them.

Data (Representative Example)

The graph included is for reference only. Actual values may vary.

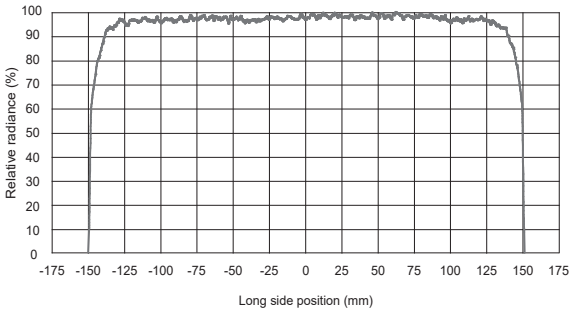
LT-300SW

Relative irradiance distribution



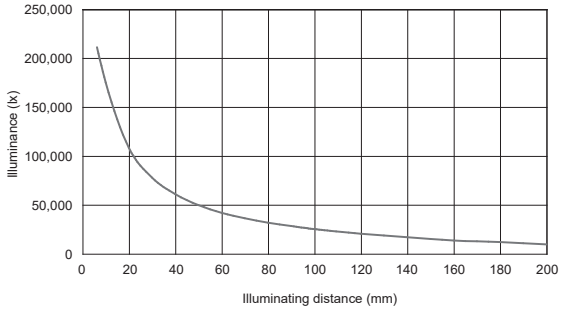
Actual measurement values at 100% intensity in 100 mm illuminating distance.
Results for individual products may vary.

Relative radiance distribution



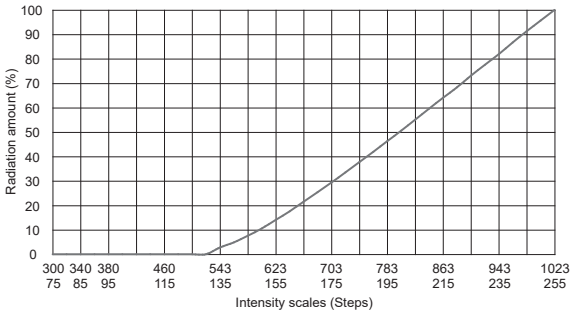
The graph included is for reference only. Actual values may vary.

Change in illuminance



Actual measurement values at 100% intensity in each illuminating distance.
Results for individual products may vary.

Output characteristics



Actual measurement values using the PSB4-30024-PEI analog control unit.
Results for individual products may vary.
Data obtained when output voltage range is 12 to 24 V.

Custom Order Example

Please contact your CCS sales representative.

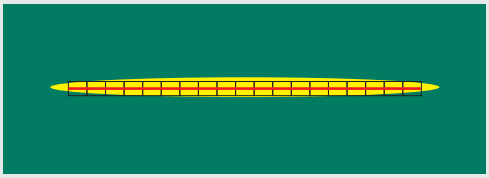
E.g.: Widened emitting surface (Changed the standard product's 2.8 mm to 9.8 mm)

Result: Made it easier to align the line sensor camera axis and the illuminated range when using long Line Lights over 1,000 mm.

Standard product
(Emitting width of 2.8 mm)

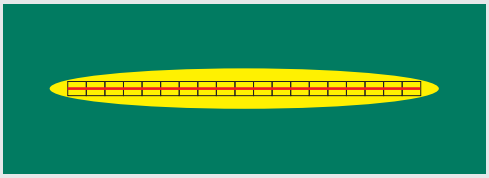
Wide type
(Emitting width of 9.8 mm)

Position image of the camera axis and the illuminated range



Camera axis — Illuminated range

Position image of the camera axis and the illuminated range



Camera axis — Illuminated range

LT Series

Refer to our website for product details.

CCS LT ▶ Search

Lineup

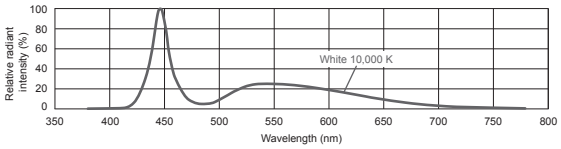
Model Name	LED Color	Power Consumption	Correlated Color Temperature	Extension Cables	Recommended Control Units	Weight
LT-100SW	White	15 W	10,000 K	FCB-1.25SQ-ME7 FCB-20-2.0SQ-ME7	PSB4	500 g
LT-200SW		29 W				1,000 g
LT-300SW		43 W				1,500 g
LT-400SW		57 W				2,000 g
LT-500SW		71 W				2,500 g
LT-600SW		85 W				3,000 g
LT-700SW		99 W				3,500 g
LT-800SW		113 W				4,000 g
LT-900SW		128 W				4,500 g
LT-1000SW		142 W				5,000 g
LT-1100SW		156 W				5,500 g
LT-1200SW		170 W				6,000 g
LT-1300SW		184 W				6,500 g
LT-1400SW		198 W				7,000 g
LT-1500SW		212 W				7,500 g
LT-1600SW		226 W				8,000 g
LT-1700SW		240 W				8,500 g
LT-1800SW		255 W				9,000 g

Extension Cables ▶ P.236
PSB4 Series Product Page ▶ P.355

The emitting surface is available in sizes of 100 mm units. For details about other sizes, inquire with your CCS sales representative.
In addition, we accept custom orders, such as changes to the LED color (red/blue/IR/UV, etc.) and size changes. Inquire at your CCS sales representative for details.

LED Properties

Spectral distribution



Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

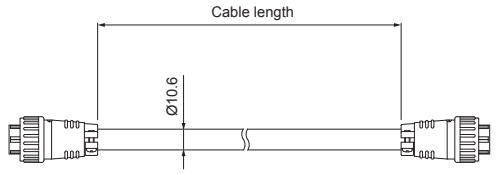
Extension Cables

It is required when connecting the light and recommended control unit PSB4 Series.

FCB-1.25SQ-ME7

Model name	Cable length	Weight
FCB-2-1.25SQ-ME7	2 m	430 g
FCB-3-1.25SQ-ME7	3 m	580 g
FCB-5-1.25SQ-ME7	5 m	1,000 g
FCB-10-1.25SQ-ME7	10 m	2,000 g

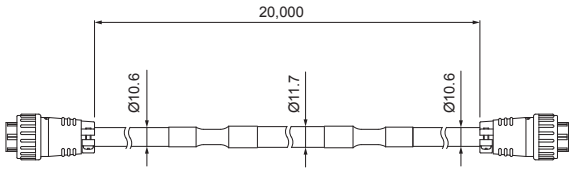
(mm)



Cable permitted bending radius: 63.6 mm

FCB-20-2.0SQ-ME7

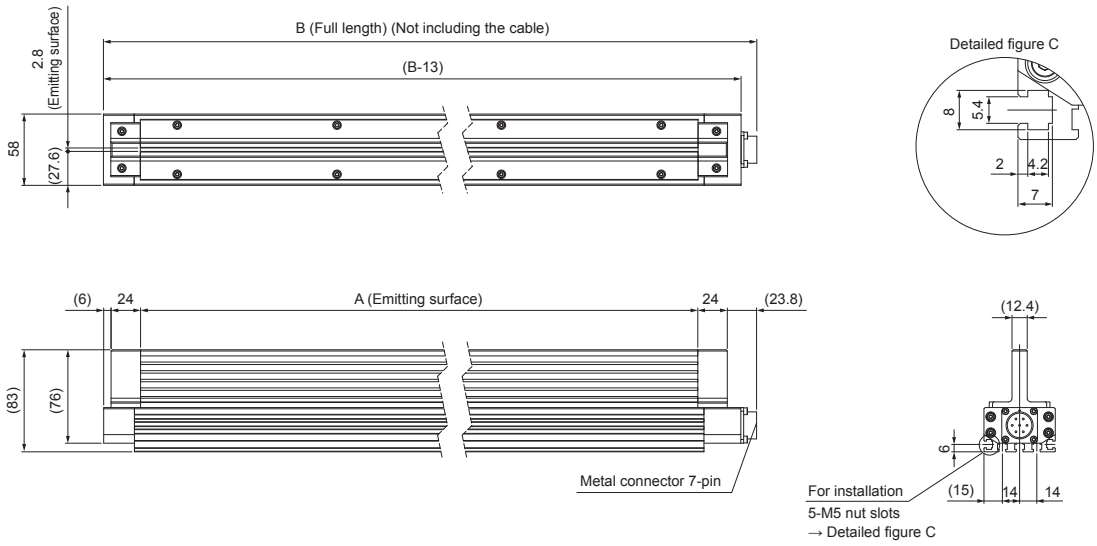
Model name	Cable length	Weight
FCB-20-2.0SQ-ME7	20 m	5,000 g



Cable permitted bending radius: 63.6 mm

The above cable permitted bending radii are reference values. Actual values may vary.

Dimensions (mm)



Model Name	A (Emitting surface)	B (Full length)	Model Name	A (Emitting surface)	B (Full length)
LT-100SW	100	178	LT-1000SW	1,000	1,078
LT-200SW	200	278	LT-1100SW	1,100	1,178
LT-300SW	300	378	LT-1200SW	1,200	1,278
LT-400SW	400	478	LT-1300SW	1,300	1,378
LT-500SW	500	578	LT-1400SW	1,400	1,478
LT-600SW	600	678	LT-1500SW	1,500	1,578
LT-700SW	700	778	LT-1600SW	1,600	1,678
LT-800SW	800	878	LT-1700SW	1,700	1,778
LT-900SW	900	978	LT-1800SW	1,800	1,878

Diffused Lighting

Line Coaxial Lights

LNV Series

Refer to our website for product details.

CCS LNV ▶ Search

Provides diffused light from the same axis as the camera

LED color
Custom orders accepted

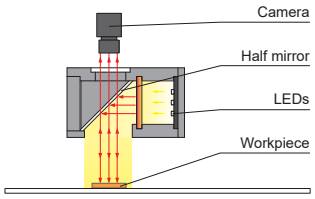
Size
Custom orders accepted

Applications Inspection for gaps between electronic parts on circuit boards, inspection for faults in lead frames, inspection for stains attached to sheet metal, etc.

Features

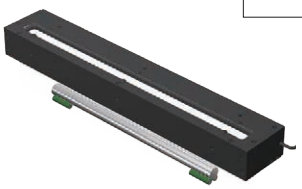
Line coaxial illumination.
Allows for imaging with a line sensor camera.

Example configuration (LNV-300 Series)



Applications

Inspection for dents on metal bars



We accept custom orders.
Please feel free to inquire.

- Shape modifications
- Brightness increases
- Changes in wavelength, etc.

Lineup

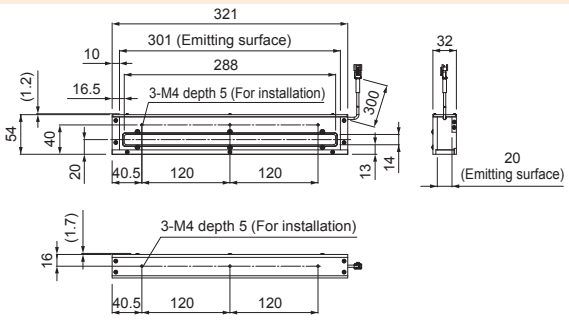
Model Name	LED Color	Power Consumption	Peak Wavelength / Correlated Color Temperature	Options	Extension Cables	Recommended Control Units	Weight
LNV-300RD2	Red	24 V / 19 W	630 nm	–	FCB*4 Straight Cable, FCB-W*5 2-branch Cable, FCB-F 4-branch Cable, FRCB Robot Cable	PD4, PD3*1, CC-ST-1024*3, POD*2 *3 Can only use green.	550 g
LNV-300SW2	White	24 V / 13 W	5,500 K				
LNV-300BL2	Blue	24 V / 13 W	470 nm				
LNV-300GR2	Green	24 V / 9.9 W	525 nm				

LED Properties: Spectral Distribution ▶ P.396 | Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

*1 Custom products with a PWM frequency of 500 kHz are available for PD3 Series digital control unit. Please contact your CCS sales representative for details.
*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod
*4 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included. *5 The cables with a model name that ends with "-EL2" are not included.

Dimensions (mm)

LNV-300RD2/SW2/BL2/GR2

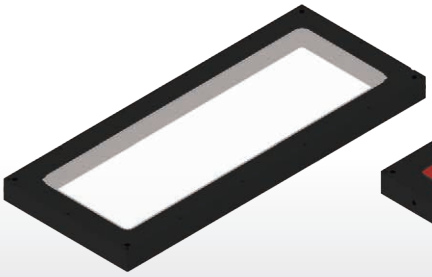


You can change the connectors of the LightUnit cable. Choose between M12 connectors and flying leads. Refer to P.19 for details.

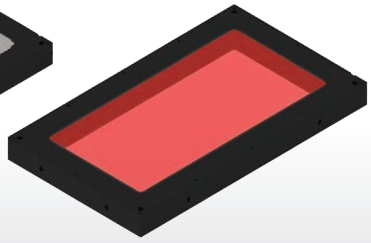
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Recreates the effect of dome lights using thin case design Long type compatible with line sensor camera applications



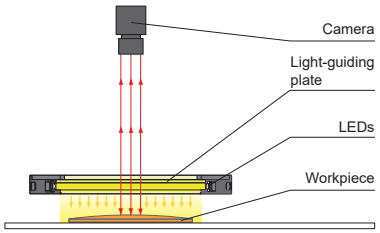
LFXV-300X100



LFXV-200X100

Example Configuration (LFXV-300X100)

Dimples added to the light-guiding plate disperse light over the workpiece



Applications PCB exterior inspection, metal plate defect inspection, non-woven fabric cleanliness inspection, etc.

Features

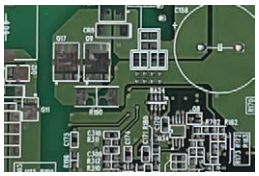
16 mm thick housing helps reduce the size of equipment designs

Line Dome Lights

Flat Dome Lights

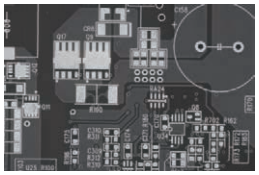
Imagining example (PCB exterior inspection)

Workpiece



(Enlarged image)

LFXV-300X100SW



(Enlarged image)

Allows for imaging with reduced glossy surface reflection

Lineup

Model Name*1	Input Voltage	Power Consumption RD (Red)	SW (White)	BL (Blue)	IR860 (Infrared)	Options	Extension Cables	Recommended Control Units	Weight
LFXV-200X100□□	24 V	23 W	30 W	28 W	17 W	—	FCB*3 Straight Cable FCB-W*4 2-Branch Cable FCB-F 4-Branch Cable FRCB Robot Cable	PD4 PD3 POD*2	870 g
LFXV-300X100□□		31 W	40 W	38 W	23 W				1,300 g

*1 □□ in the model name contains the LED color. (RD: Red, SW: White, BL: Blue, IR860: Infrared)
*2 For information on the combination of light units and POD Series control unit, please refer to our website. https://www.ccs-grp.com/lnk/qr/pod
*3 The cables with a model name that ends with "-ME7", "-EL2", "-PF", or "-PF-EL9" are not included.
*4 The cables with a model name that ends with "-EL2" are not included.

Extension Cables ▶ P.371 | Control Unit Selection Guide ▶ P.305 | List of Control Unit Specifications ▶ P.307

Refer to P.118 for external dimensions diagrams.

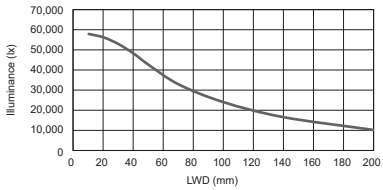
Data: Graph of the Change in Illuminance and Uniformity (Representative Example)

The data included is for reference only. Actual values may vary.

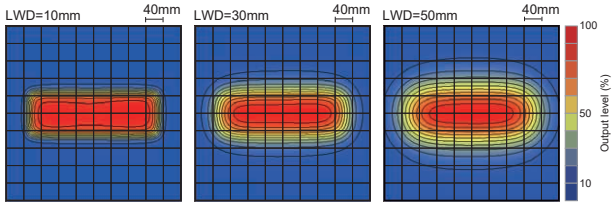
LFXV-300X100SW

Graph of the change in illuminance*1

*1 Illuminance on the optical axis



Uniformity (Relative irradiance)



You can inquire using our website. Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products

Inquire on our website here. https://www.ccs-grp.com/contact/

Diffused Lighting

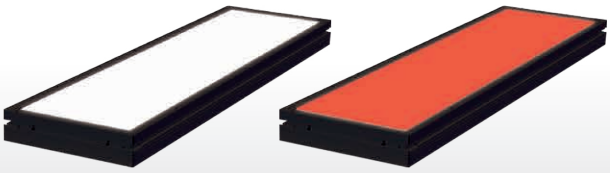
Flat Lights

TH2 Series — Rectangular Type

Refer to our website for product details.

CCS TH2 ▶ Search

Flat light units with a 300 x 75 mm emitting surface Applicable to inspection of rectangular workpieces and imaging with a line sensor camera



TH2-300X75SW　　TH2-300X75RD

Applications Inspection of the appearance of cylindrical containers or square-shaped workpieces, inspection for stains and foreign material on non woven fabrics, fault inspection of films, inspection of the appearance of glass, etc.

Features

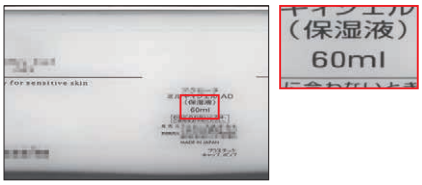
Flat light suitable for rectangular workpieces.
Also applicable to inspections with a line sensor camera.

Inspection with a line sensor camera

Imaging example: Imaging the appearance of a cylindrical container

Workpiece:
Cylindrical container (cosmetics)

TH2-300X75SW



The state of the surface can be images. Also the printed text is clearly recognized.

Lineup

Model Name	LED Color	Power Consumption	Peak Wavelength / Correlated Color Temperature	Options	Extension Cables	Recommended Control Units	Weight
TH2-300X75RD	Red	24 V / 54 W	635 nm	—	FCB-EL2 Straight Cable FCB-W-EL2 2-Branch Cable	PD4-12024 PD3-10024-8 POD-22024-4-PEI*1 PSB4	650 g
TH2-300X75SW	White	24 V / 68 W	5,800 K				

*1 For information on the combination of light units and POD Series control unit, please refer to our website.
https://www.ccs-grp.com/lnk/qr/pod

Extension Cables ▶ P.371　Control Unit Selection Guide ▶ P.305　List of Control Unit Specifications ▶ P.307

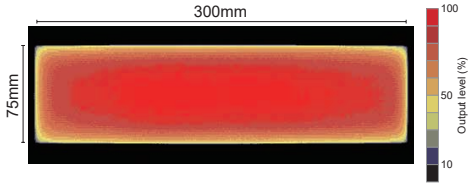
Refer to P.96 for external dimensions diagrams.

Data (Representative Example)

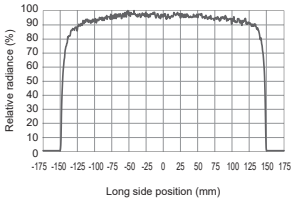
The data included is for reference only. Actual values may vary.

TH2-300X75SW

Uniformity (Relative irradiance)

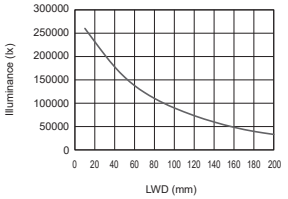


Relative radiance distribution



Illuminance graph (LWD characteristics) *1 *2

*1 Illuminance on the optical axis
*2 Illuminating distance from the light unit to the workpiece



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

High Power Dome Line Light

HLDN-600BLTN55ARELTK

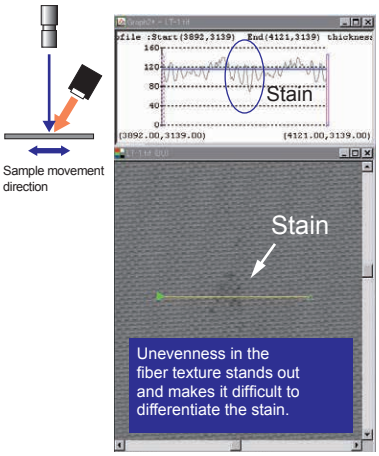
Built to order

This is a made-to-order product. For queries and details, contact your CCS sales representative.

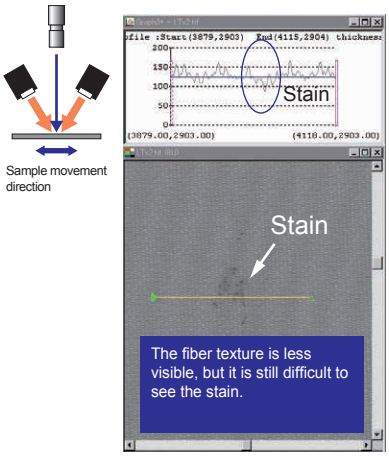
Increased light output by adding forced air cooling.

Example 1: Detecting Stains on Fibers

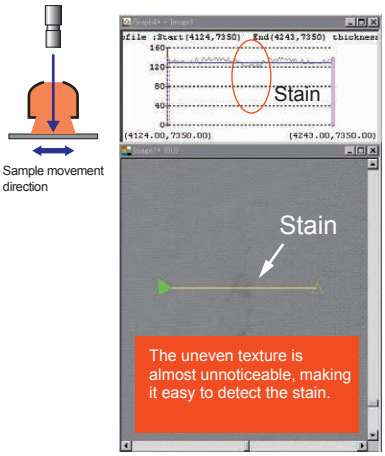
■ Diffused Reflection: One Side



■ Diffused Reflection: Both Sides

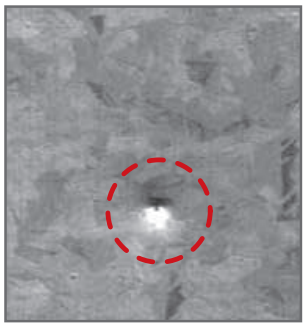


■ High Power Dome Line Light



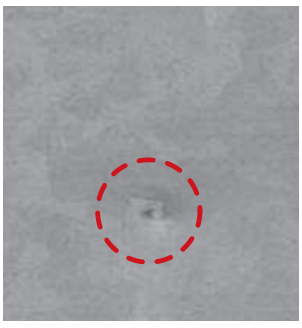
Example 2: Imaging the Appearance of Galvanized Sheet Steel

■ Line Light



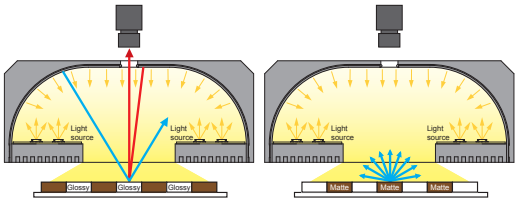
It's difficult to differentiate between minute defects and surface differences.

■ High Power Dome Line Light



The diffused light from the dome light negates differences in the surface pattern, making it possible to notice defects.

Surface imaging of galvanized sheet steel using a high power dome line light



Glossy section

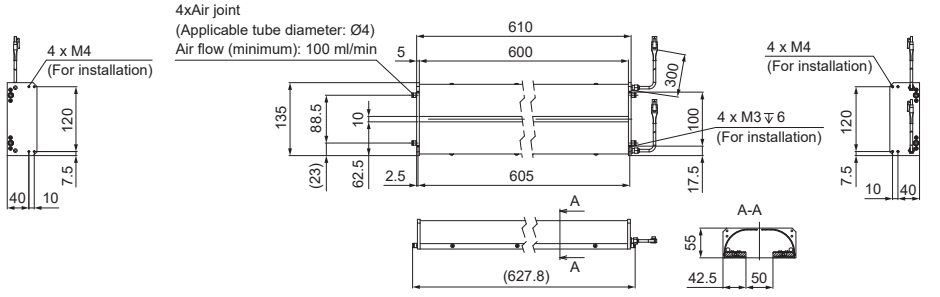
Only the light emitted from near the roof of the reflective panel is reflected on the glossy section of the inspected item with semi-specular reflection and is captured by the camera.

Matte section

The matte section has a lower reflection rate compared to the glossy section. The light emitted from the whole reflective panel is diffused on the matte section and is captured by the camera.

Dimensions (mm)

HLDN-600BLTN55ARELTK



■ Other Examples

- HLDN-150SW-TN55AREL
- HLDN-300SW-TN55AREL
- HLDN-400SW-TN55ARDV4

Custom orders for size and emitting color are available. Please feel free to contact us.

Oblique Angled Lighting

Line Lights
LNDG Series

Refer to our website for product details.
CCS LNDG ▶ Search

Achieves angled illumination using an original optical design
Bumps and subtle vertical wrinkles can be detected

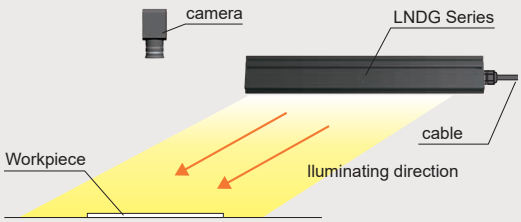
LNDG-500SW-LA

Applications Inspection for vertical wrinkles in paper, vertical striations in cardboard, vertical wrinkles and folding in non-woven fabric, wrinkles in bonded sheets, etc

Achieves Angled Illumination

The LNDG Series enables detection of bumps and subtle vertical wrinkles, which were difficult to detect with conventional line sensor lights, in paper or non-woven fabric that disperses light.

Conceptual image of angled illumination



Other features

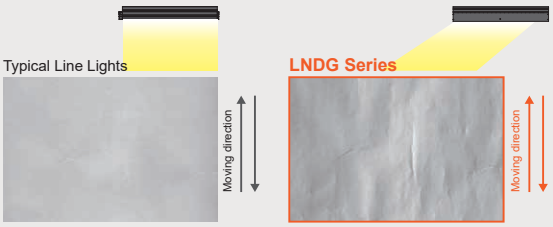
1) Fan-less (Natural air cooling)
2) Error detection support
3) Emitting surface 300 to 3,000 mm long (can be made in units of 100 mm)

Error detection is a function included with the PSCC Series, the recommended control units.

Bumps and Subtle Vertical Wrinkles Can Be Detected

Imaging samples

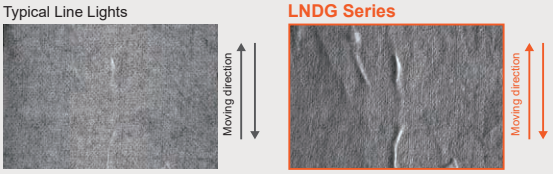
Inspections for vertical wrinkles in paper labels



Vertical wrinkles and bumps cannot be detected.

Vertical wrinkles and bumps and are clearly visible.

Inspecting non-woven fabric for defects



Fiber fraying and kinks cannot be detected.

Fiber fraying and kinks are clearly visible.

Applications

Inspection for vertical wrinkles in paper labels

Example Configuration

Achieves angled illumination using an original optical design. Lights for line sensors suitable for detecting irregularities and vertical wrinkles in the flow direction in a workpiece that diffuses light.

LNDG Series

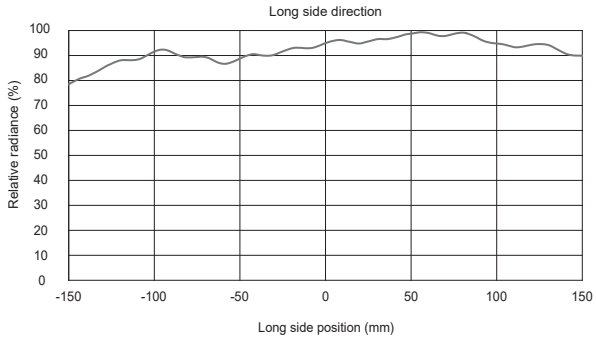
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

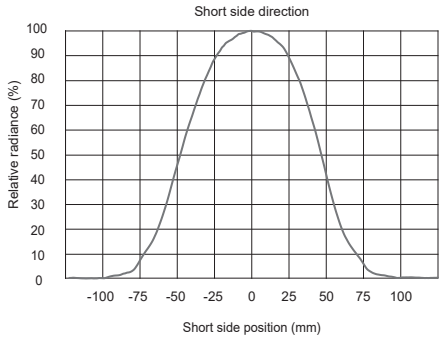
Data (Representative Example)

The graph included is for reference only. Actual values may vary.

LNDG-500SW-LA

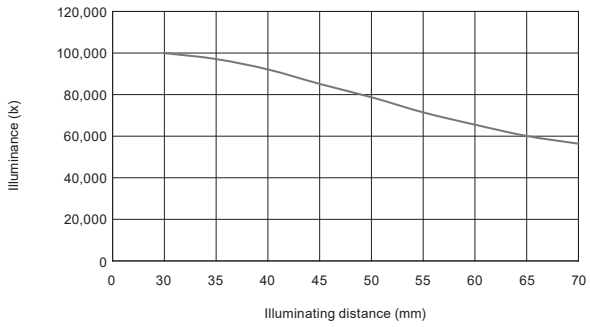
Relative radiance distribution





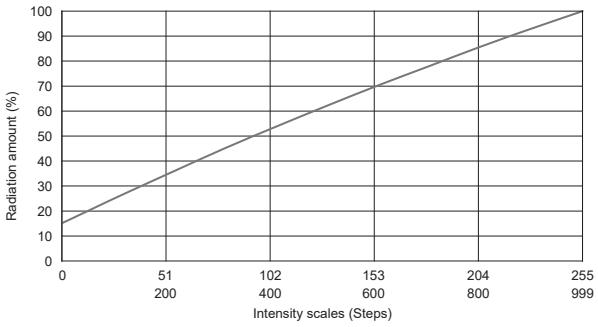
The graph included is for reference only. Actual values may vary.

Change in illuminance



Actual measurement values at 100% intensity, in the center part of emission in each illuminating distance.
Results for individual products may vary.

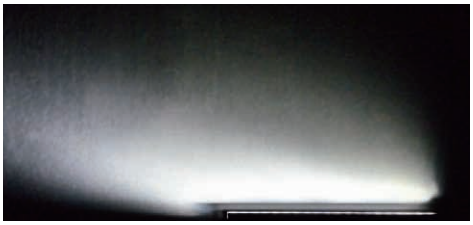
Graph of the correlation between intensity and output



Actual measurement values using the PSCC-30048(A) analog control unit.
Results for individual products may vary.

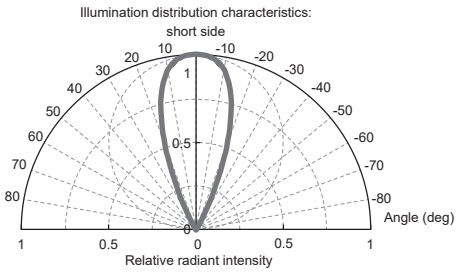
Characteristic of the illumination distribution

Measuring direction: long side



Measuring direction: short side

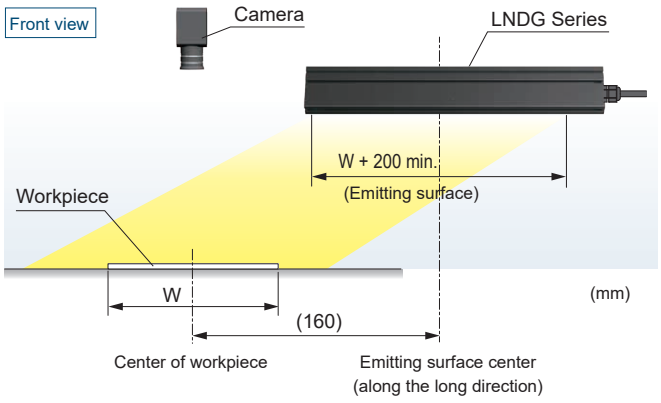
Illumination distribution characteristics:

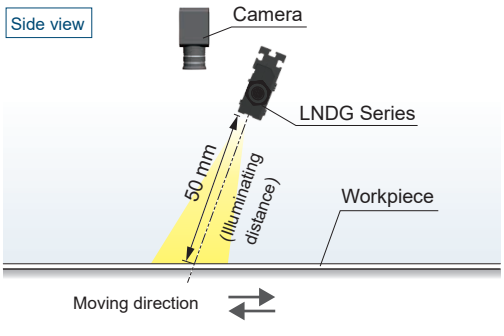


These graphs are for reference only. Actual values may vary.

Select a Light Unit That Is Longer Than the Width of the Workpiece.

The LNDG Series light unit emits light at an angle to enable detecting "vertical wrinkles and bumps." When you select a light unit, select one that is at least 200 mm longer than the width of the workpiece to be inspected. We recommend a illuminating distance of 50 mm to obtain sufficient illumination.





The above illustration is an example of typical installation.
Consider the application environment for actual applications.

LNDG Series

Refer to our website for product details.

CCS LNDG ▶ Search

Lineup

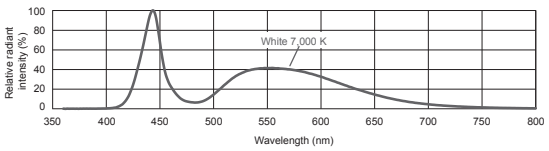
Model Name	LED Color	Power Consumption	Correlated Color Temperature	Extension Cables	Recommended Control Units	Weight
LNDG-300SW-LA	White	39 W	7,000 K			1,600 g
LNDG-400SW-LA		52 W				2,000 g
LNDG-500SW-LA		65 W				2,400 g
LNDG-600SW-LA		78 W				2,800 g
LNDG-700SW-LA		91 W				3,200 g
LNDG-800SW-LA		104 W				3,600 g
LNDG-900SW-LA		117 W				4,000 g
LNDG-1000SW-LA		130 W		QCBM	PSCC-30048(A)	4,400 g
LNDG-1100SW-LA		143 W		QCB	PSCC-60048(A)	4,800 g
LNDG-1200SW-LA		156 W				5,200 g
LNDG-1300SW-LA		169 W				5,500 g
LNDG-1400SW-LA		182 W				5,900 g
LNDG-1500SW-LA		195 W				6,300 g
LNDG-1600SW-LA		208 W				6,700 g
LNDG-1700SW-LA		221 W				7,100 g
LNDG-1800SW-LA		234 W				7,500 g
LNDG-1900SW-LA		247 W				7,900 g
LNDG-2000SW-LA		260 W				8,300 g
LNDG-2100SW-LA		273 W				8,700 g
LNDG-2200SW-LA		286 W				9,100 g
LNDG-2300SW-LA		299 W				9,500 g
LNDG-2400SW-LA		312 W				9,900 g
LNDG-2500SW-LA		325 W		QCB	PSCC-60048(A)	10,300 g
LNDG-2600SW-LA		338 W				10,700 g
LNDG-2700SW-LA		351 W				11,100 g
LNDG-2800SW-LA		364 W				11,500 g
LNDG-2900SW-LA		377 W				11,900 g
LNDG-3000SW-LA		390 W				12,300 g

Extension Cables ▶ P.244 PSCC Series Product Page ▶ P.353

The emitting surface is available in sizes of 100 mm units. For details about other sizes, inquire with your CCS sales representative.
In addition, we accept custom orders, such as changes to the LED color (red/blue/IR, etc.). Inquire at your CCS sales representative for details.

LED Properties

Spectral distribution



Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

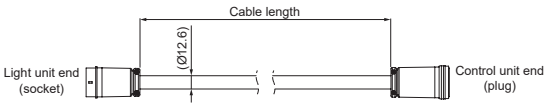
Extension Cables

Necessary when connecting the light unit to the recommended control unit, the PSCC Series.
Make sure to connect the appropriate extension cables to the control unit.

(mm)

QCBM

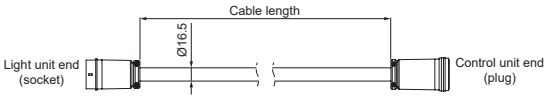
Model name	Cable length	Weight	Applicable Control Unit
QCBM-2	2 m	800 g	PSCC-30048(A)
QCBM-3	3 m	1,000 g	
QCBM-5	5 m	1,500 g	
QCBM-10	10 m	2,700 g	
QCBM-20	20 m	5,000 g	



Cable permitted bending radius: 75.6 mm

QCB

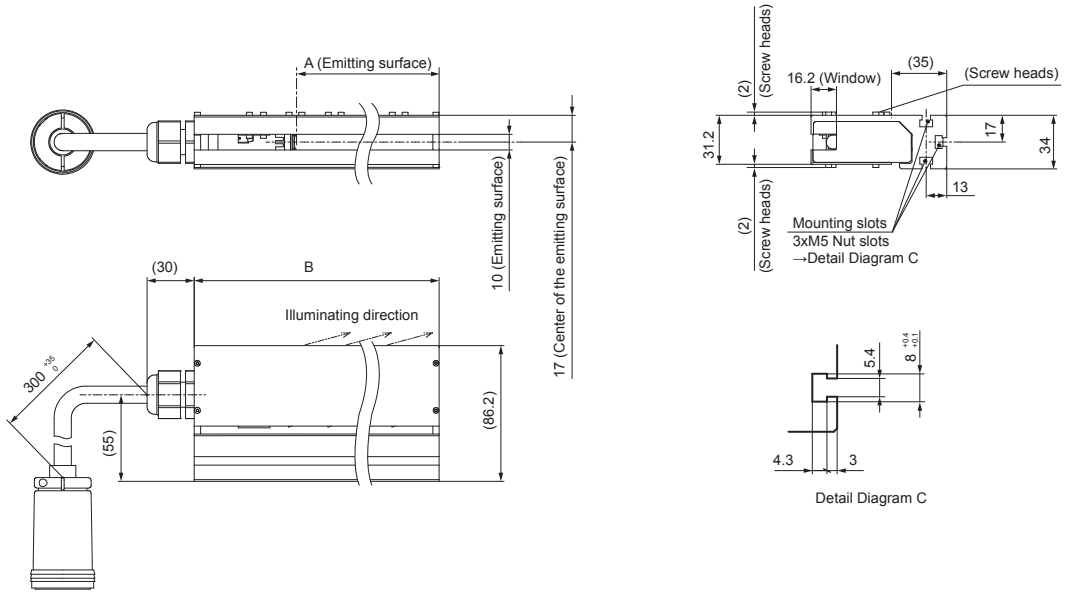
Model name	Cable length	Weight	Applicable Control Unit
QCB-2	2 m	1,100 g	PSCC-60048(A)
QCB-3	3 m	1,500 g	
QCB-5	5 m	2,400 g	
QCB-10	10 m	4,600 g	
QCB-20	20 m	8,900 g	



Cable permitted bending radius: 99 mm

The above cable permitted bending radii are reference values. Actual values may vary.

Dimensions (mm)



Model name	A (Emitting surface)	B (Full length)	Model name	A (Emitting surface)	B (Full length)
LNDG-300SW-LA	300	365	LNDG-1700SW-LA	1,700	1,765
LNDG-400SW-LA	400	465	LNDG-1800SW-LA	1,800	1,865
LNDG-500SW-LA	500	565	LNDG-1900SW-LA	1,900	1,965
LNDG-600SW-LA	600	665	LNDG-2000SW-LA	2,000	2,065
LNDG-700SW-LA	700	765	LNDG-2100SW-LA	2,100	2,165
LNDG-800SW-LA	800	865	LNDG-2200SW-LA	2,200	2,265
LNDG-900SW-LA	900	965	LNDG-2300SW-LA	2,300	2,365
LNDG-1000SW-LA	1,000	1,065	LNDG-2400SW-LA	2,400	2,465
LNDG-1100SW-LA	1,100	1,165	LNDG-2500SW-LA	2,500	2,565
LNDG-1200SW-LA	1,200	1,265	LNDG-2600SW-LA	2,600	2,665
LNDG-1300SW-LA	1,300	1,365	LNDG-2700SW-LA	2,700	2,765
LNDG-1400SW-LA	1,400	1,465	LNDG-2800SW-LA	2,800	2,865
LNDG-1500SW-LA	1,500	1,565	LNDG-2900SW-LA	2,900	2,965
LNDG-1600SW-LA	1,600	1,665	LNDG-3000SW-LA	3,000	3,065

Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent / Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

Oblique Angled Lighting

Line Lights

LNIS2 Series

Refer to our website for product details.

CCS LNIS2 ▶ Search

Achieves bi-directional angled illumination using an original optical design

LNIS2-300SW

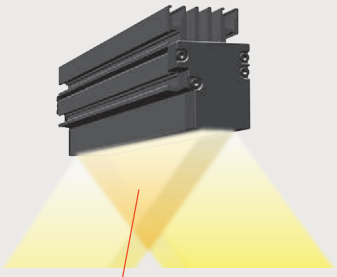
Applications	Streak inspection of sheet surfaces, scratch inspection on clear film, scratch inspection on glass panels, damage inspection on sheet metal, etc.

Achieves Bi-Directional Angled Illumination

The LNIS2 Series is a completely new concept product that was developed to detect "moving-direction scratches," which were difficult to detect with conventional line sensor lights.

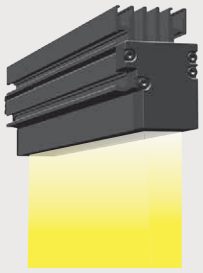
Difference between bi-directional angled illumination and conventional illumination

Cross angled illumination



Recommended illuminating range

Conventional illumination



Other features

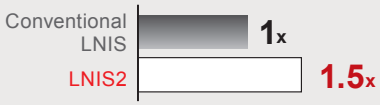
1) Fan-less (Natural air cooling)
2) Compact design
3) Emitting surface 100 to 1,000 mm long (can be made in units of 100 mm)

Brightness Up to 1.5x

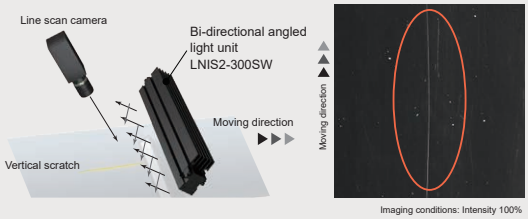
The LNIS2 Series has achieved the brightness up to 1.5x that of the conventional LNIS Series. This expands the range of applications.

Higher output power than the conventional products

Illuminance comparison graph



Imaging of vertical scratches (moving-direction scratches) on film

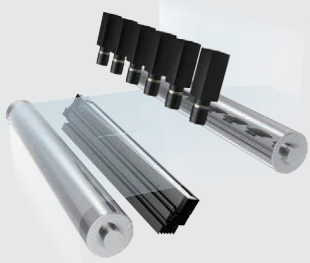


Emphasizes only the vertical scratch. Even if you increase the output, the background noise and brightness do not increase.

The data included is for reference only. Actual values may vary.

Applications

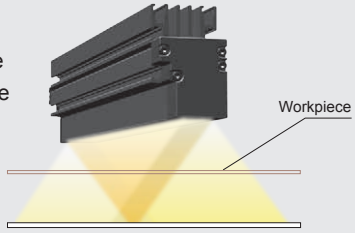
Inspection for scratches on transparent films



Example Configuration

Achieves bi-directional angled illumination using an original optical design. Line sensor light suitable for detecting scratches in the flow direction.

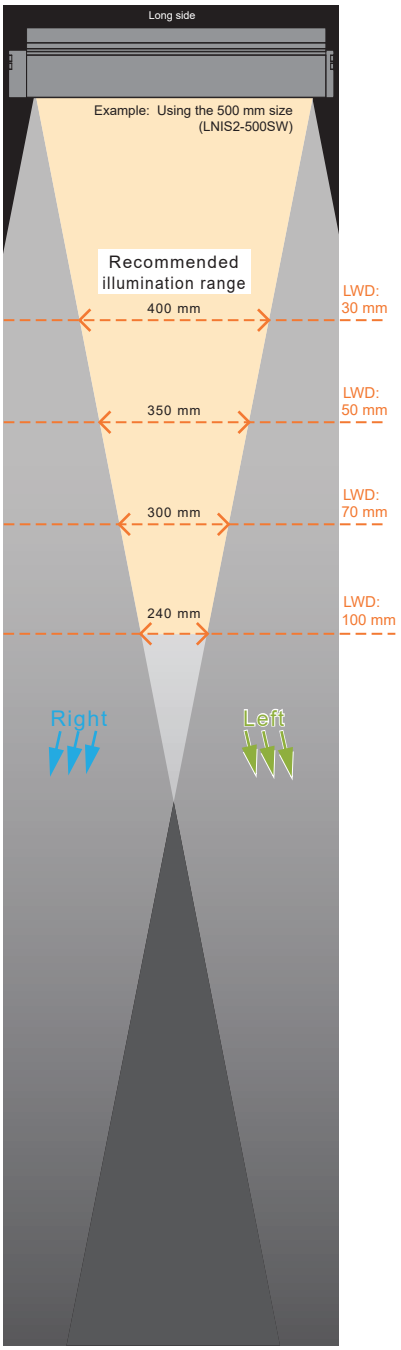
LNIS2 Series



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Recommended Illumination Range Light unit in use: LNIS2-500SW

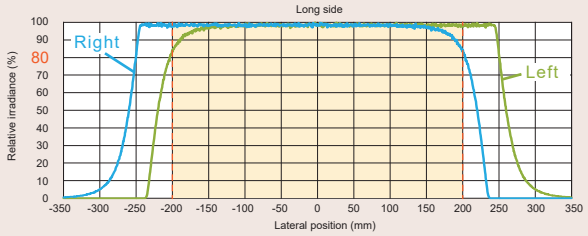


LWD is the distance from the line light to the workpiece.

Graph of effective illumination range

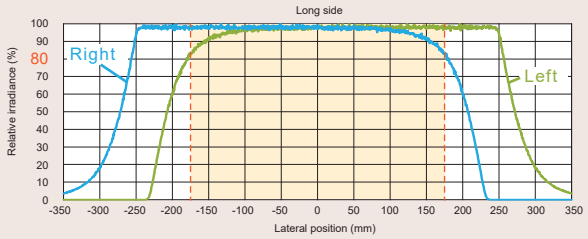
Illuminating distance: 30 mm

The values are based on the simulation. Actual values may vary.



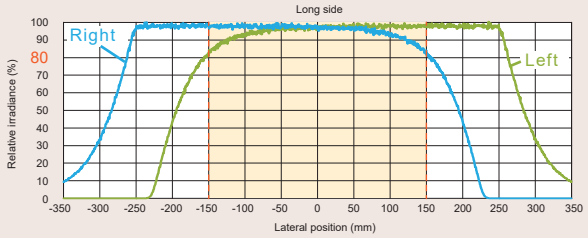
Illuminating distance: 50 mm

The values are based on the simulation. Actual values may vary.



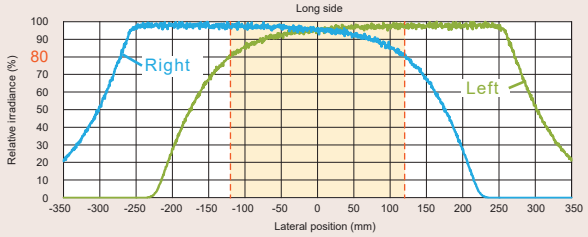
Illuminating distance: 70 mm

The values are based on the simulation. Actual values may vary.



Illuminating distance: 100 mm

The values are based on the simulation. Actual values may vary.



The section on the graph where "Left" and "Right" overlap is the section where light from the left and right sides overlaps. The recommended illumination range is the range in this overlapping section where each illuminance is ensured for 80% or higher of the peak.

These graphs are for reference only. Actual values may vary.

Table of the recommended illumination range

(Where illuminance of the left/right beam is 80% of the peak value or more.) (mm)

LWD: Illuminating distance	Emitting surface length									
	100	200	300	400	500	600	700	800	900	1,000
10	40	140	240	340	440	540	640	740	840	940
30		100	200	300	400	500	600	700	800	900
50		50	150	250	350	450	550	650	750	850
70			100	200	300	400	500	600	700	800
100			40	140	240	340	440	540	640	740

These values are based on the simulation. Actual range of the effective illumination depends on your imaging environment.

Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent / Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

LNIS2 Series

Refer to our website for product details.

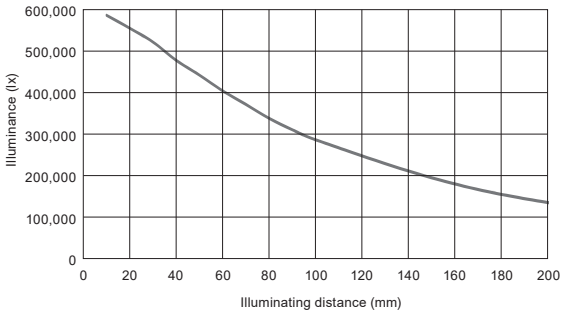
CCS LNIS2 ▶ Search

Data (Representative Example)

The graph included is for reference only. Actual values may vary.

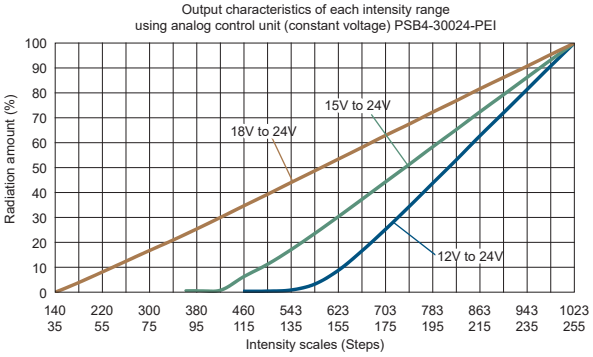
LNIS2-500SW

Change in illuminance



Actual measurement values at the center of the emitting surface, 100% intensity.
Results for individual products may vary.

Graph of the correlation between intensity and output

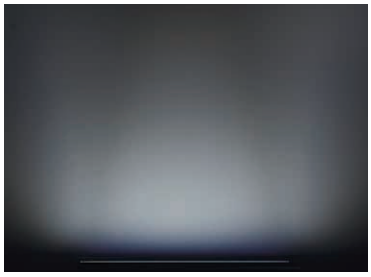


Actual measurement values using PSB4-30024-PEI analog control unit.
Results for individual products may vary.
Measured in each voltage range because the PSB4-30024-PEI analog control unit has a switching function for the lower limit of output voltage.

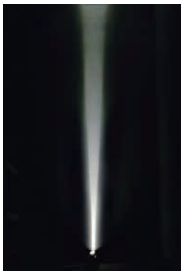
LNIS2-400SW

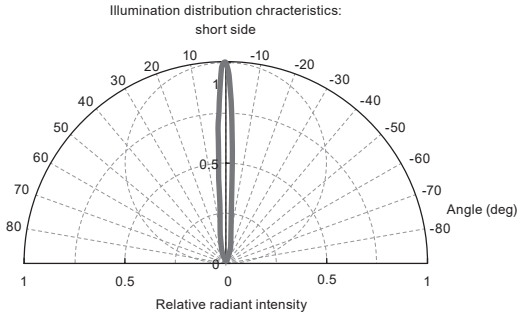
Characteristics of the illumination distribution

Measuring direction: long side



Measuring direction: short side





These graphs are for reference only. Actual values may vary.

Lineup

Model Name	LED Color	Power Consumption	Correlated Color Temperature	Extension Cables	Recommended Control Units	Weight
LNIS2-100SW	White	24 V / 18 W	6,500 K			400 g
LNIS2-200SW		24 V / 35 W			PSB4	700 g
LNIS2-300SW		24 V / 52 W		FCB-EL2	PD4-12024	1,000 g
LNIS2-400SW		24 V / 69 W			PD3-10024-8*	1,300 g
LNIS2-500SW		24 V / 86 W				1,600 g
LNIS2-600SW		24 V / 103 W			PSB4	1,900 g
LNIS2-700SW		24 V / 120 W			PD4-12024	2,200 g
LNIS2-800SW		24 V / 138 W		FCB-1.25SQ-ME7 FCB-20-2.0SQ-ME7		2,500 g
LNIS2-900SW		24 V / 155 W			PSB4	2,800 g
LNIS2-1000SW		24 V / 172 W				3,100 g

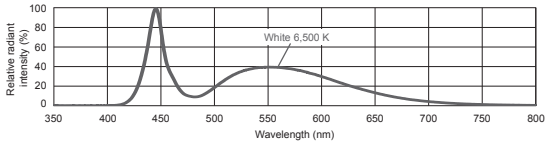
* Custom products with a PWM frequency of 500 kHz are available for PD3 Series digital control unit. Please contact your CCS sales representative for details.

Extension Cables ▶ P.248
List of Control Unit Specifications ▶ P.307

The emitting surface is available in sizes of 100 mm units. For details about other sizes, inquire with your CCS sales representative.
In addition, we accept custom orders, such as changes to the LED color (red/blue/IR, etc.) and size changes. Inquire at your CCS sales representative for details.

LED Properties

Spectral distribution



Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

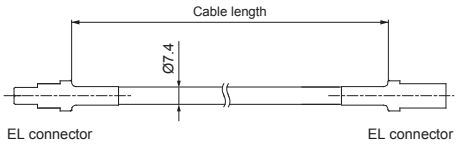
Extension Cables

Necessary when connecting the light unit to the recommended control unit.

FCB-EL2

Model Name	Cable Length	Weight
FCB-1-EL2	1 m	85 g
FCB-2-EL2	2 m	165 g
FCB-3-EL2	3 m	245 g
FCB-5-EL2	5 m	405 g
FCB-10-EL2	10 m	805 g
FCB-15-EL2	15 m	1,205 g

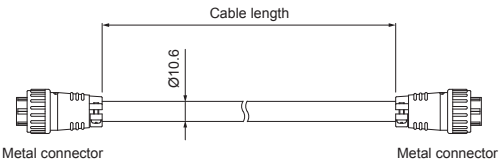
(mm)



Cable permitted bending radius: 29.6 mm

FCB-1.25SQ-ME7

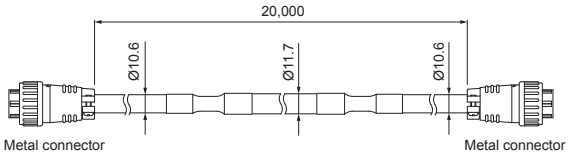
Model Name	Cable Length	Weight
FCB-2-1.25SQ-ME7	2 m	430 g
FCB-3-1.25SQ-ME7	3 m	580 g
FCB-5-1.25SQ-ME7	5 m	1,000 g
FCB-10-1.25SQ-ME7	10 m	2,000 g



Cable permitted bending radius: 63.6 mm

FCB-20-2.0SQ-ME7

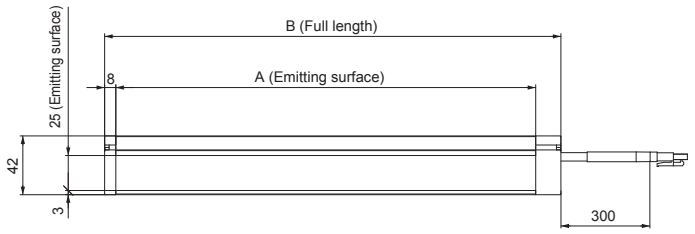
Model Name	Cable Length	Weight
FCB-20-2.0SQ-ME7	20 m	5,000 g

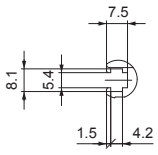


Cable permitted bending radius: 63.6 mm

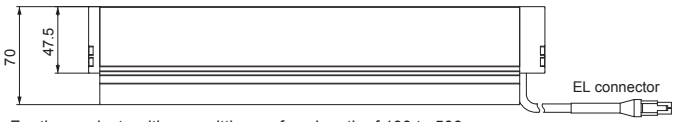
The above cable permitted bending radii are reference values. Actual values may vary.

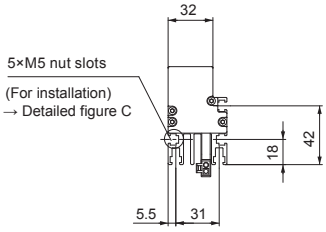
Dimensions (mm)



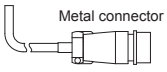


Detailed figure C





For the products with an emitting surface length of 100 to 500 mm:
EL connector
For the products with an emitting surface length of 600 to 1,000 mm:
Metal connector



CCS accepts custom orders for such as the position where the light cable comes out of the case.
Please contact your CCS sales representative for details.

Model Name	A (Emitting surface)	B (Full length)	Connector
LNIS2-100SW	100	126	EL connector
LNIS2-200SW	200	226	
LNIS2-300SW	300	326	
LNIS2-400SW	400	426	
LNIS2-500SW	500	526	

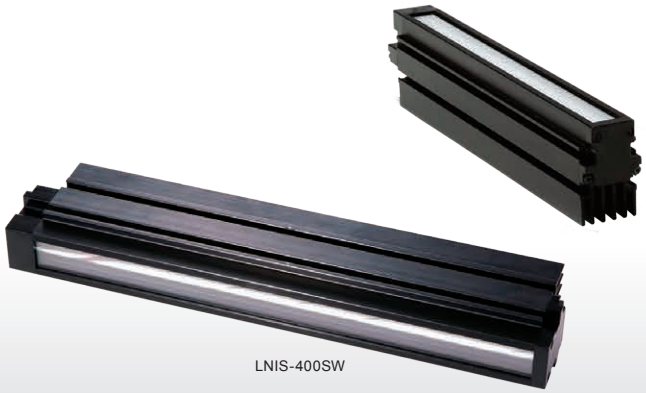
Model Name	A (Emitting surface)	B (Full length)	Connector
LNIS2-600SW	600	626	Metal connector
LNIS2-700SW	700	726	
LNIS2-800SW	800	826	
LNIS2-900SW	900	926	
LNIS2-1000SW	1,000	1,026	

Oblique Angled Lighting

Line Lights
LNIS Series

Refer to our website for product details.
CCS LNIS ▶ Search

Achieves bi-directional angled illumination using an original optical design

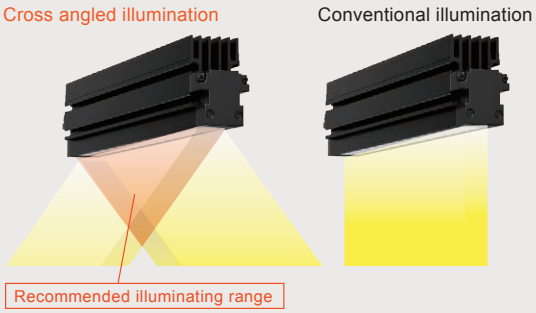


Applications	Streak inspection of sheet surfaces, scratch inspection on clear film, scratch inspection on glass panels, damage inspection on sheet metal, etc.

Achieves Bi-Directional Angled Illumination

The LNIS Series is a completely new concept product that was developed to detect "moving-direction scratches," which were difficult to detect with conventional line sensor lights.

Difference between bi-directional angled illumination and conventional illumination

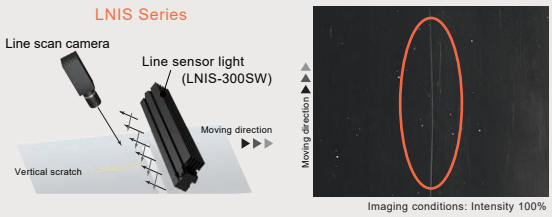


Other features

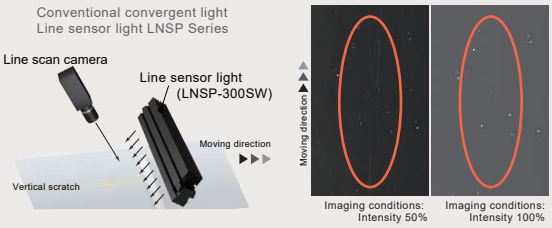
1) Fan-less (Natural air cooling)
2) Compact design
3) Emitting surface 100 to 1,000 mm long (can be made in units of 100 mm)

For detecting scratches in the flow direction such as streaks

Imaging of vertical scratches (moving-direction scratches) on film



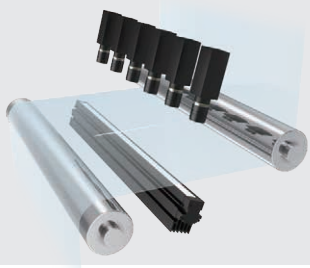
Emphasizes only the vertical scratch. Even if you increase the output, the background noise and brightness do not increase.



It's difficult to highlight only the vertical scratch. If you increase the output, the background noise and brightness increase but the contrast ratio does not.

Applications

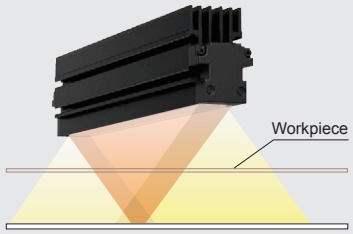
Inspection for scratches on transparent films



Example Configuration

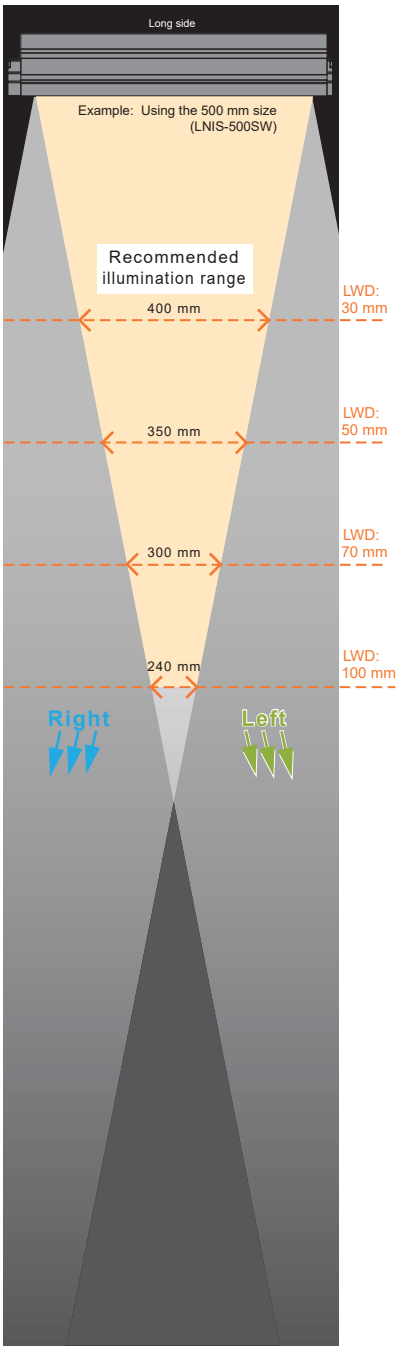
Achieves bi-directional angled illumination using an original optical design. Line sensor light suitable for detecting scratches in the flow direction.

LNIS Series



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

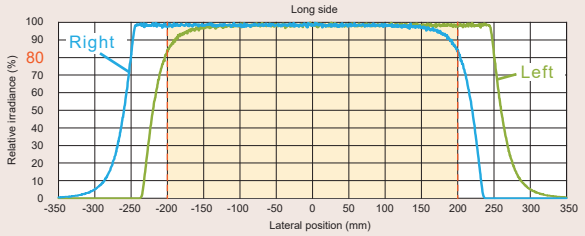
Recommended Illumination Range Light unit in use: LNIS-500SW



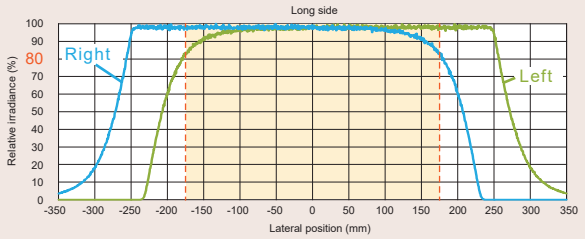
LWD is the distance from the line light to the workpiece.

Graph of effective illumination range

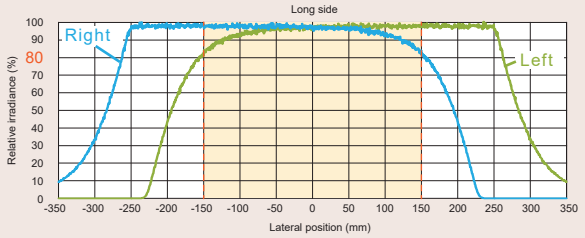
Illuminating distance: 30 mm The values are based on the simulation. Actual values may vary.



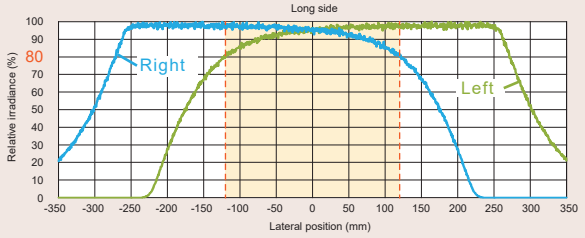
Illuminating distance: 50 mm The values are based on the simulation. Actual values may vary.



Illuminating distance: 70 mm The values are based on the simulation. Actual values may vary.



Illuminating distance: 100 mm The values are based on the simulation. Actual values may vary.



The section on the graph where "Left" and "Right" overlap is the section where light from the left and right sides overlaps. The recommended illumination range is the range in this overlapping section where each illuminance is ensured for 80% or higher of the peak.

These graphs are for reference only. Actual values may vary.

Table of the recommended illumination range

(Where illuminance of the left/right beam is 80% of the peak value or more.) (mm)

LWD: Illuminating distance	Emitting surface length									
	100	200	300	400	500	600	700	800	900	1,000
10	40	140	240	340	440	540	640	740	840	940
30		100	200	300	400	500	600	700	800	900
50		50	150	250	350	450	550	650	750	850
70			100	200	300	400	500	600	700	800
100			40	140	240	340	440	540	640	740

These values are based on the simulation. Actual range of the effective illumination depends on your imaging environment.

LNIS Series

Refer to our website for product details.

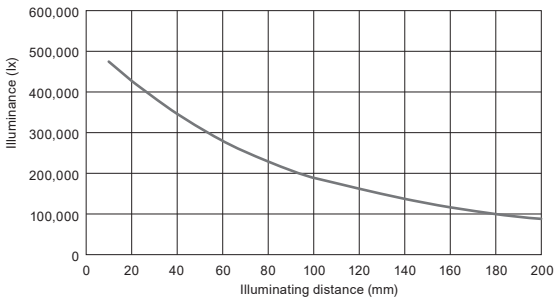
CCS LNIS ▶ Search

Data (Representative Example)

The graph included is for reference only. Actual values may vary.

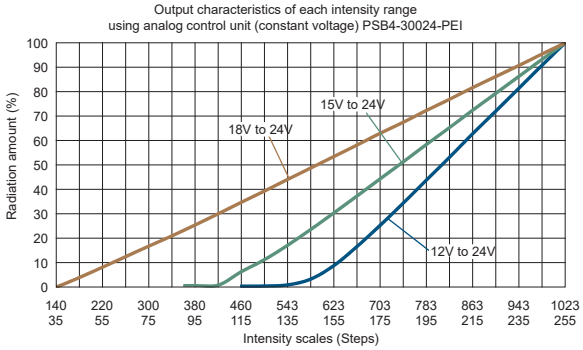
LNIS-500SW

Change in illuminance



Actual measurement values at the center of the emitting surface, 100% intensity.
Results for individual products may vary.

Graph of the correlation between intensity and output



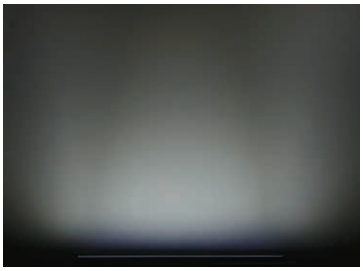
Actual measurement values using PSB4-30024-PEI analog control unit.
Results for individual products may vary.

Measured in each voltage range because the PSB4-30024-PEI analog control unit has a switching function for the lower limit of output voltage.

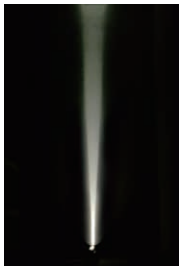
LNIS-400SW

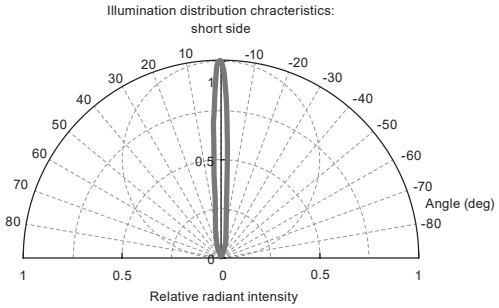
Characteristics of the illumination distribution

Measuring direction: long side



Measuring direction: short side





These graphs are for reference only. Actual values may vary.

Lineup

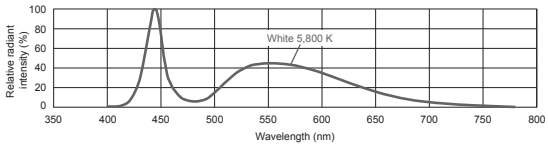
Model Name	LED Color	Power Consumption	Correlated Color Temperature	Extension Cables	Recommended Control Units	Weight
LNIS-100SW	White	24 V / 21 W	5,800 K	FCB-1.25SQ-ME7 FCB-20-2.0SQ-ME7	PSB4	430 g
LNIS-200SW		24 V / 41 W				760 g
LNIS-300SW		24 V / 61 W				1,090 g
LNIS-400SW		24 V / 81 W				1,420 g
LNIS-500SW		24 V / 101 W				1,740 g
LNIS-600SW		24 V / 121 W				2,070 g
LNIS-700SW		24 V / 142 W				2,400 g
LNIS-800SW		24 V / 162 W				2,730 g
LNIS-900SW		24 V / 182 W				3,050 g
LNIS-1000SW		24 V / 202 W				3,380 g

Extension Cables ▶ P.252
PSB4 Series Product Page ▶ P.355

The emitting surface is available in sizes of 100 mm units. For details about other sizes, inquire with your CCS sales representative.
In addition, we accept custom orders, such as changes to the LED color (red/blue/IR, etc.) and size changes. Inquire at your CCS sales representative for details.

LED Properties

Spectral distribution



Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

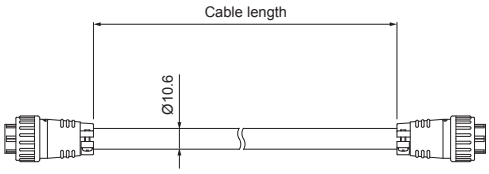
Extension Cables

It is required when connecting the light and recommended control unit PSB4 Series.

FCB-1.25SQ-ME7

(mm)

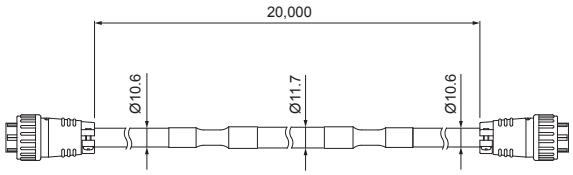
Model Name	Cable Length	Weight
FCB-2-1.25SQ-ME7	2 m	430 g
FCB-3-1.25SQ-ME7	3 m	580 g
FCB-5-1.25SQ-ME7	5 m	1,000 g
FCB-10-1.25SQ-ME7	10 m	2,000 g



Cable permitted bending radius: 63.6 mm

FCB-20-2.0SQ-ME7

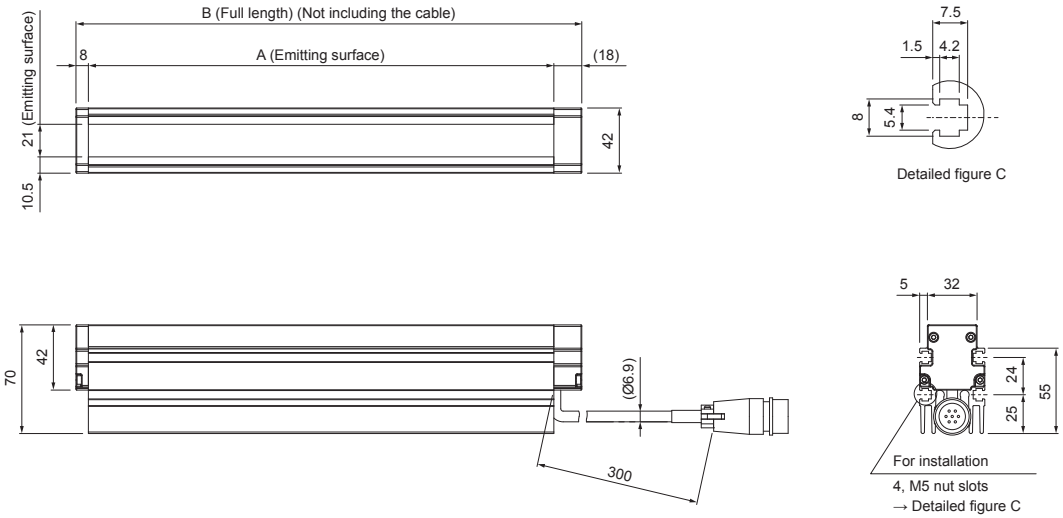
Model Name	Cable Length	Weight
FCB-20-2.0SQ-ME7	20 m	5,000 g



Cable permitted bending radius: 63.6 mm

The above cable permitted bending radii are reference values. Actual values may vary.

Dimensions (mm)



Model Name	A (Emitting surface)	B (Full length)	Model Name	A (Emitting surface)	B (Full length)
LNIS-100SW	100	126	LNIS-600SW	600	626
LNIS-200SW	200	226	LNIS-700SW	700	726
LNIS-300SW	300	326	LNIS-800SW	800	826
LNIS-400SW	400	426	LNIS-900SW	900	926
LNIS-500SW	500	526	LNIS-1000SW	1,000	1,026

Oblique Angled Lighting

Line Lights
LNIS-FN Series

Refer to our website for product details.
CCS LNIS-FN ▶ Search

Achieves bi-directional angled illumination using an original optical design
High output type which adopts forced air (fan)

LED color
Custom orders accepted

Size
Custom orders accepted

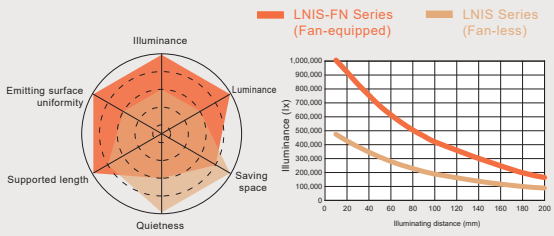
LNIS-400SW-FN

Applications Streak inspection on sheet surfaces, scratch inspection on clear film, scratch inspection on glass panels, damage inspection on sheet metal, etc.

Illuminance of 678,000 lx Using Forced Air (Fan)

This is a high-output (fan-equipped) type of the LNIS Series, developed to detect moving-direction scratches such as streaks. It meets the needs of customers who require even brighter lights.

Comparison between LNIS and LNIS-FN



Series name	Brightness
LNIS-FN Series	678,000 lx LWD = 50 mm
LNIS Series	310,000 lx LWD = 50 mm

Other features

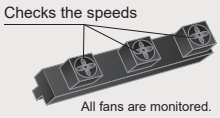
1) Emitting surface 100 to 1,500 mm long (can be made in units of 100 mm)
2) Due to the constant-current drive system, the emitting surface has uniformity higher than the LNIS Series.

The graph included is for reference only. Actual values may vary.

Avoid Trouble with Error Detection

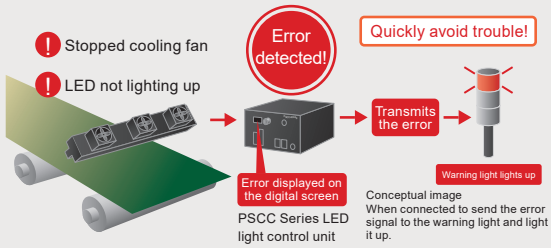
1) Error detection for cooling fans

An error is detected should a fault occur, such as insufficient speed or a stop in the cooling fans.



2) Error detection for the LEDs

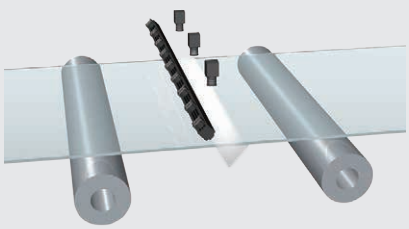
Detects dead LEDs due to an open in the light unit circuit or a shorted LED.



Error detection is a function included with the PSCC Series, the recommended control units.

Applications

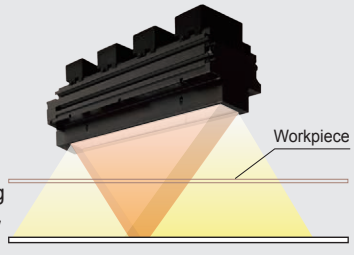
Inspection for scratches on plate glass



Example Configuration

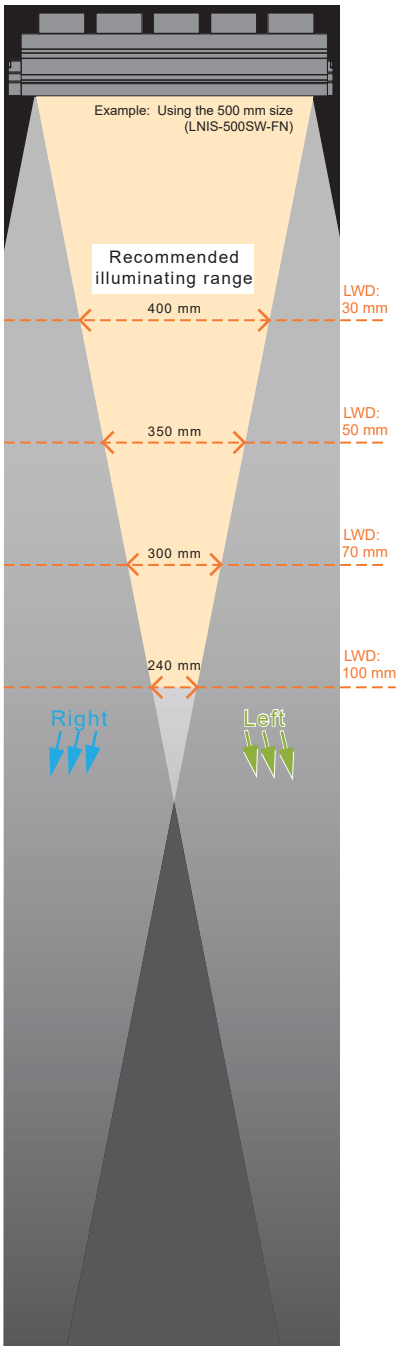
Achieves bi-directional angled illumination using an original optical design. High-output line sensor light (fan air-cooled type) suitable for detecting scratches in the flow direction.

LNIS-FN Series



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Recommended Illumination Range Light unit in use: LNIS-500SW-FN

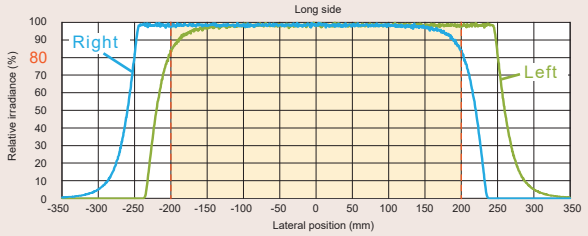


LWD is the distance from the line light to the workpiece.

Graph of effective illumination range

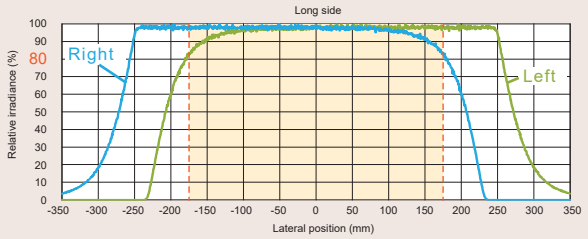
Illuminating distance: 30 mm

The values are based on the simulation. Actual values may vary.



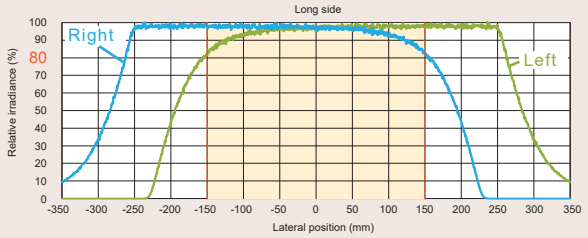
Illuminating distance: 50 mm

The values are based on the simulation. Actual values may vary.



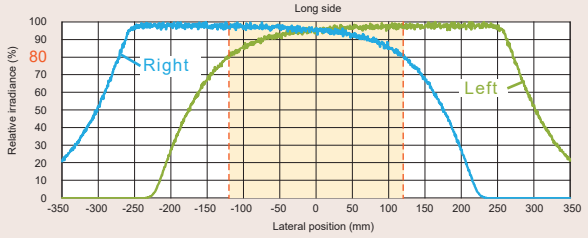
Illuminating distance: 70 mm

The values are based on the simulation. Actual values may vary.



Illuminating distance: 100 mm

The values are based on the simulation. Actual values may vary.



The section on the graph where "Left" and "Right" overlap is the section where light from the left and right sides overlaps. The recommended illumination range is the range in this overlapping section where each illuminance is ensured for 80% or higher of the peak.

These graphs are for reference only. Actual values may vary.

Table of the recommended illumination range

(Where illuminance of the left/right beam is 80% of the peak value or more.) (mm)

LWD: Illuminating distance	Emitting surface length														
	100	200	300	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500
10	40	140	240	340	440	540	640	740	840	940	1,040	1,140	1,240	1,340	1,440
30		100	200	300	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400
50		50	150	250	350	450	550	650	750	850	950	1,050	1,150	1,250	1,350
70			100	200	300	400	500	600	700	800	900	1,000	1,100	1,200	1,300
100			40	140	240	340	440	540	640	740	840	940	1,040	1,140	1,240

These values are based on the simulation. Actual range of the effective illumination depends on your imaging environment.

You can inquire using our website.
Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products
Inquire on our website here.
https://www.ccs-grp.com/contact/

Ring (Direct): LDR2, LDR2-LA, LDR-LA1, SQR, SQR-TP
Ring (Convergent / Diffused): HLDR3, HPR2, LFR, LKR, FPR
Square: FPQ3
Bar: LDL2, LDLB, HLDL3, LB
Flat: TH2 (5 types), LFL
Dome: HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT
Coaxial: LFV3, LFV3-G
Coaxial: MSU, MFU
Strobe: PF
Water-proof: HLDR-IP, HSL-PCL
COB: Small COB Lights
UV / Violet: UV3/VL3, UV, LNSP-UV3-FN
Infrared: IR2 (Under 1000-nm Type), IR (Over 1000-nm Type), CIR
Intensity Control: IU
Spot, Etc.: HLV3, LV, LSP, HFS/HFR, HLV3-22-4-NR, HLV3-3M-RGB-4, PFBR-600SW2, PFBR-150, PFB3
Line (Convergent): LNLP, LNSP2, Coaxial Units, LNSP-FN, LN/LN-HK
Line (Diffused): LNSD, LND2, LT, LNV, LFXV (Rectangular Type), TH2 (Rectangular Type)
Line (Oblique Angled): LNDG, LNIS2, LNIS, LNIS-FN
Lenses: Telecentric Lens, Macro Lens

LNIS-FN Series

Refer to our website for product details.

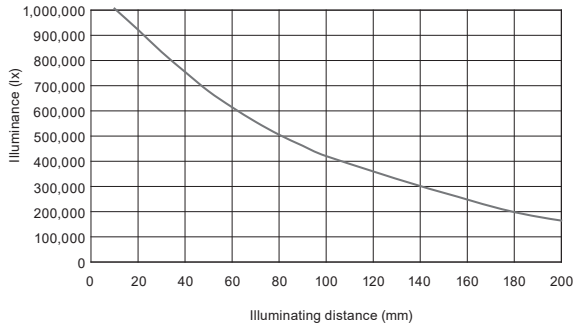
CCS LNIS-FN ▶ Search

Data (Representative Example)

The graph included is for reference only. Actual values may vary.

LNIS-400SW-FN

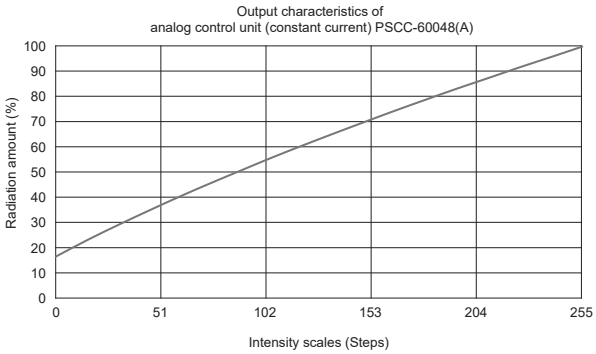
Change in illuminance



Actual measurement values at the center of the emitting surface, 100% intensity.
Results for individual products may vary.

LNIS-1500SW-FN

Graph of the correlation between intensity and output



Actual measurement values using the PSCC-60048(A) analog control unit.
Results for individual products may vary.

Lineup

Model Name	LED Color	Power Consumption*1 (including fans)		Correlated Color Temperature	Extension Cables*2	Recommended Control Units*2	Weight
		June 2017 or earlier	July 2017 or later				
LNIS-100SW-FN	White	41 W	41 W	5,800 K	QCBM / QCB	PSCC-30048(A) / PSCC-60048(A)	900 g
LNIS-200SW-FN		81 W	82 W				1,400 g
LNIS-300SW-FN		117 W	118 W				1,900 g
LNIS-400SW-FN		157 W	158 W				2,400 g
LNIS-500SW-FN		192 W	194 W				2,900 g
LNIS-600SW-FN		233 W	235 W				3,400 g
LNIS-700SW-FN		268 W	270 W				3,900 g
LNIS-800SW-FN		309 W	311 W		QCB	PSCC-60048(A)	4,400 g
LNIS-900SW-FN		345 W	348 W				4,900 g
LNIS-1000SW-FN		384 W	387 W				5,500 g
LNIS-1100SW-FN		425 W	428 W				6,000 g
LNIS-1200SW-FN		460 W	464 W				6,500 g
LNIS-1300SW-FN		501 W	504 W				7,000 g
LNIS-1400SW-FN		536 W	540 W				7,500 g
LNIS-1500SW-FN		576 W	581 W				8,000 g

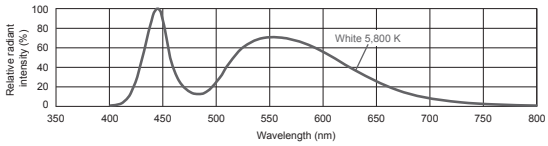
Extension Cables ▶ P.256 PSCC Series Product Page ▶ P.353

*1 The power consumption varies according to the production data. Refer to the power consumption given by the label tag of the product.
*2 Make sure to connect the appropriate extension cables to the control unit.

The emitting surface is available in sizes of 100 mm units. For details about other sizes, inquire with your CCS sales representative.
In addition, we accept custom orders, such as changes to the LED color (red/blue/IR/UV, etc.) and size changes. Inquire at your CCS sales representative for details.

LED Properties

Spectral distribution



Be sure to read the User Manual included with the product before use and follow the safety precautions upon use.
The data included is for reference only. Actual values may vary.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

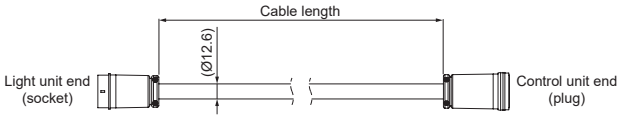
Extension Cables

Necessary when connecting the light unit to the recommended control unit, the PSCC Series.
Make sure to connect the appropriate extension cables to the control unit.

QCBM

(mm)

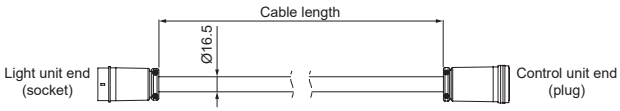
Model Name	Cable Length	Weight	Applicable Control Unit
QCBM-2	2 m	800 g	PSCC-30048(A)
QCBM-3	3 m	1,000 g	
QCBM-5	5 m	1,500 g	
QCBM-10	10 m	2,700 g	
QCBM-20	20 m	5,000 g	



Cable permitted bending radius: 75.6 mm

QCB

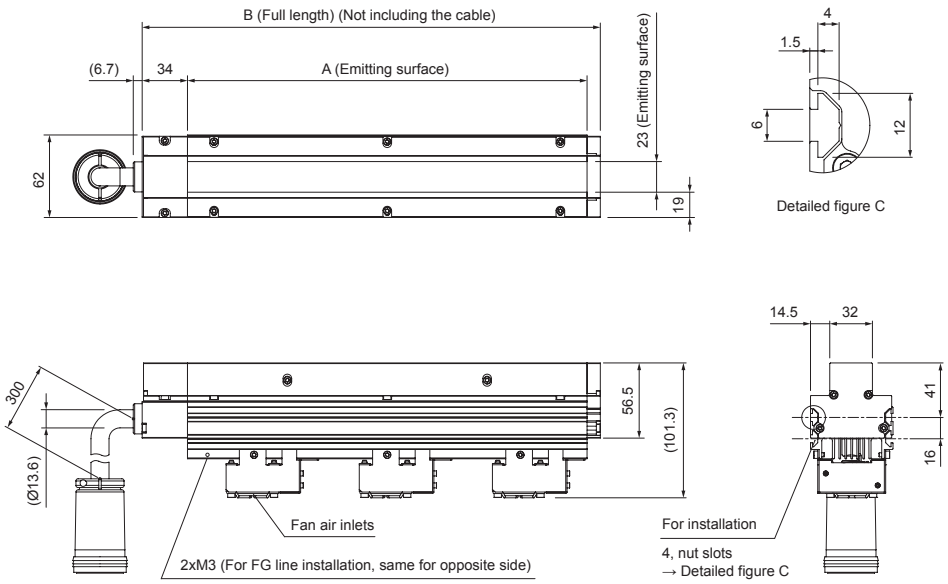
Model Name	Cable length	Weight	Applicable Control Unit
QCB-2	2 m	1,100 g	PSCC-60048(A)
QCB-3	3 m	1,500 g	
QCB-5	5 m	2,400 g	
QCB-10	10 m	4,600 g	
QCB-20	20 m	8,900 g	



Cable permitted bending radius: 99 mm

The above cable permitted bending radii are reference values. Actual values may vary.

Dimensions (mm)



Model Name	A (Emitting surface)	B (Full length)	Model Name	A (Emitting surface)	B (Full length)
LNIS-100SW-FN	100	144	LNIS-900SW-FN	900	944
LNIS-200SW-FN	200	244	LNIS-1000SW-FN	1,000	1,044
LNIS-300SW-FN	300	344	LNIS-1100SW-FN	1,100	1,144
LNIS-400SW-FN	400	444	LNIS-1200SW-FN	1,200	1,244
LNIS-500SW-FN	500	544	LNIS-1300SW-FN	1,300	1,344
LNIS-600SW-FN	600	644	LNIS-1400SW-FN	1,400	1,444
LNIS-700SW-FN	700	744	LNIS-1500SW-FN	1,500	1,544
LNIS-800SW-FN	800	844			

High-Resolution Telecentric Lenses
SE-65-M/SE-110-M Series

Refer to our website for product details.

CCS telecentric lens ▶ Search

Compatible with 5-megapixel cameras*1
For combination with a megapixel camera*2

*1 2/3"L (5.98 mm height, 11.26 mm width) and 5.5 µm/pixel, Applicable models: SE-110VT03-5M and SE-110ST03-5M
*2 Approx. 4.65 µm/pixel min.

Total of **28** Models

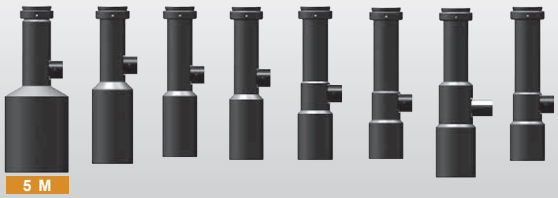
SE-65-M Series (WD 65 mm)

Coaxial type, 0.5x to 6.0x

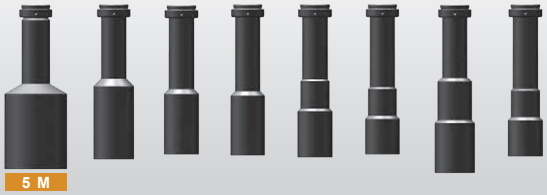
Straight type, 0.5x to 6.0x

SE-110-M Series (WD 110 mm)

Coaxial type 0.3x to 4.0x



Straight type 0.3x to 4.0x



Specifications (SE-65-M Series)

Model name (Coaxial type)	SE-65VT05-M	SE-65VT08-M	SE-65VT10-M	SE-65VT20-M	SE-65VT40-M	SE-65VT60-M
Model name (Straight type)	SE-65ST05-M	SE-65ST08-M	SE-65ST10-M	SE-65ST20-M	SE-65ST40-M	SE-65ST60-M
Optical magnification	0.5x±5%	0.8x±5%	1.0x±5%	2.0x±5%	4.0x±5%	6.0x±5%
WD	65.1±2 mm	65.4±2 mm	65.1±2 mm	65.2±2 mm	65.3±2 mm	64±2 mm
Depth of field*1*2	2.87 mm	1.18 mm	0.79 mm	0.26 mm	0.08 mm	0.06 mm
Resolution*2*3	12.0 µm	8.0 µm	6.7 µm	4.4 µm	2.9 µm	2.9 µm
NA*2	0.028	0.042	0.05	0.076	0.118	0.118
Actual F-number (Fe)*2	9.0	9.4	9.8	12.9	16.9	25.5
TV distortion*2	-0.001%	+0.006%	-0.023%	+0.021%	-0.003%	-0.026%
Weight (Coaxial)	80 g	62 g	54 g	55 g	85 g	100 g
Weight (Straight)	77 g	57 g	49 g	49 g	83 g	98 g
Mount	C mount					
Maximum applicable image size	2/3 inch (Ø11.00 mm)			2/3 inch L (Ø12.75 mm)*4		
Physical distance (O/I)*2	171.1 mm	171.5 mm	161 mm	160.9 mm	184.5 mm	216.7 mm

*1 The depth of field is a value calculated using 40 µm as the permissible circle of confusion.
*2 These are calculated values.
*3 The resolution is a value calculated using a 550 nm wavelength.
*4 2/3 inch L (Length: 5.98 mm, Width: 11.26 mm) The specifications above are values based on the optical design. Differences between individual devices may occur due to assembly accuracy, etc.

Field of Vision Chart (SE-65-M Series) These values are for reference.

Model name (Coaxial type)	SE-65VT05-M	SE-65VT08-M	SE-65VT10-M	SE-65VT20-M	SE-65VT40-M	SE-65VT60-M
Model name (Straight type)	SE-65ST05-M	SE-65ST08-M	SE-65ST10-M	SE-65ST20-M	SE-65ST40-M	SE-65ST60-M
Optical magnification	0.5x	0.8x	1.0x	2.0x	4.0x	6.0x
Sensor size	2/3 inch			2/3 inch L		
Length	13.20 mm	8.25 mm	6.60 mm	2.99 mm	1.50 mm	1.00 mm
Width	17.60 mm	11.0 mm	8.80 mm	5.63 mm	2.82 mm	1.88 mm
Diagonal	22.00 mm	13.75 mm	11.00 mm	6.38 mm	3.19 mm	2.13 mm

For other fields of vision, refer to the field of vision chart in the Technical Guide. ▼ P.402

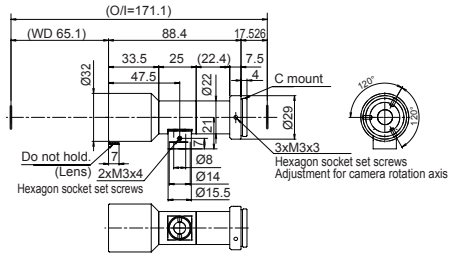
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

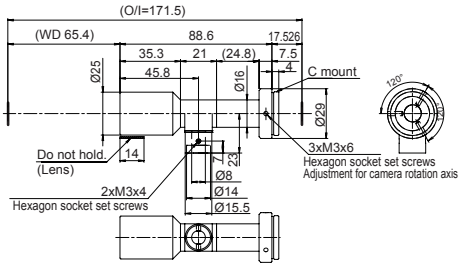
Dimensions (SE-65-M Series, mm)

Coaxial type

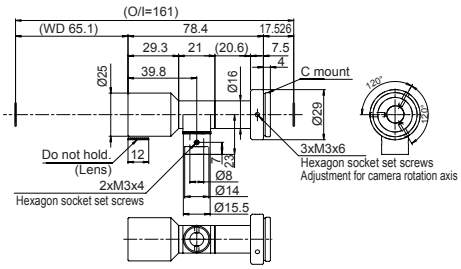
SE-65VT05-M



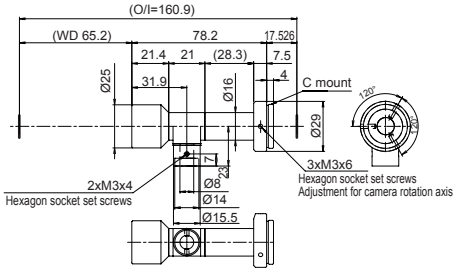
SE-65VT08-M



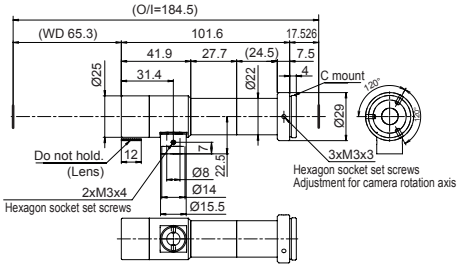
SE-65VT10-M



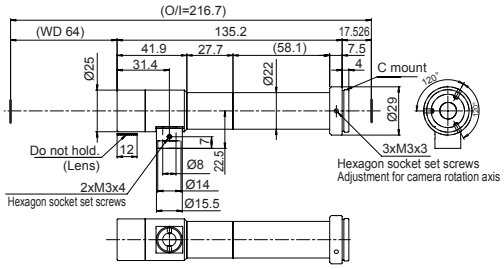
SE-65VT20-M



SE-65VT40-M

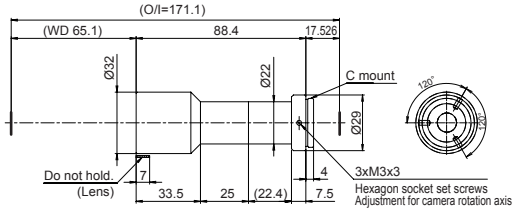


SE-65VT60-M

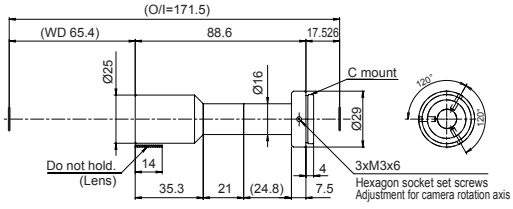


Straight type

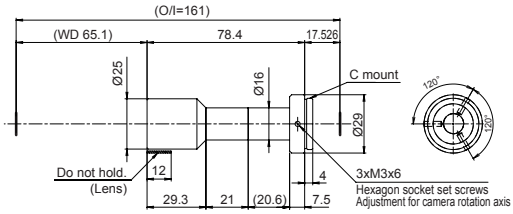
SE-65ST05-M



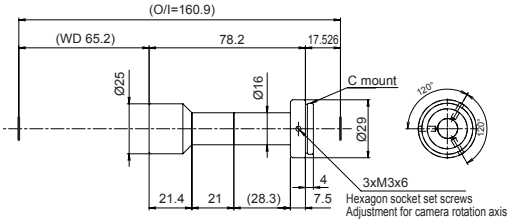
SE-65ST08-M



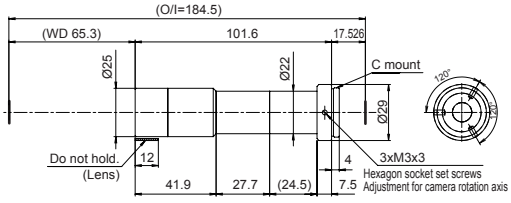
SE-65ST10-M



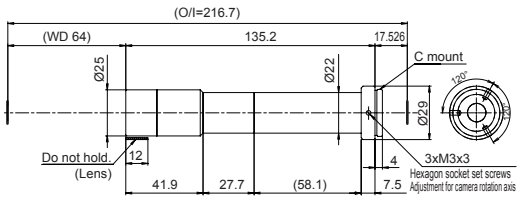
SE-65ST20-M



SE-65ST40-M



SE-65ST60-M



SE-65-M/ SE-110-M Series

Refer to our website for product details.

CCS telecentric lens ▶ Search

Specifications (SE-110-M Series)

5 M

Model name (Coaxial type)	SE-110VT03-5M	SE-110VT05-M	SE-110VT08-M	SE-110VT10-M	SE-110VT15-M	SE-110VT20-M	SE-110VT30-M	SE-110VT40-M
Model name (Straight type)	SE-110ST03-5M	SE-110ST05-M	SE-110ST08-M	SE-110ST10-M	SE-110ST15-M	SE-110ST20-M	SE-110ST30-M	SE-110ST40-M
Optical magnification	0.3x±5%	0.5x±5%	0.8x±5%	1.0x±5%	1.5x±5%	2.0x±5%	3.0x±5%	4.0x±5%
WD	110.3±3.3 mm	110.8±3.3 mm	110.1±3.3 mm	110.5±3.3 mm	110.1±3.3 mm	110.6±3.3 mm	111.4±3.3 mm	110.5±3.3 mm
Depth of field*1*2	5.75 mm	3.03 mm	1.31 mm	0.82 mm	0.42 mm	0.27 mm	0.14 mm	0.11 mm
Resolution*2*3	14.5 µm	12.7 µm	8.8 µm	6.9 µm	5.2 µm	4.5 µm	3.6 µm	3.7 µm
NA*2	0.023	0.026	0.038	0.049	0.064	0.075	0.094	0.091
Actual F-number (Fe)*2	6.5	9.4	10.3	10.2	11.7	13.0	16.0	21.9
TV distortion*2	+0.026%	-0.009%	-0.026%	-0.0007%	+0.024%	-0.018%	+0.008%	-0.004%
Weight (Coaxial)	212 g	131 g	106 g	108 g	110 g	115 g	166 g	121 g
Weight (Straight)	211 g	128 g	103 g	105 g	108 g	113 g	160 g	120 g
Mount	C mount							
Maximum applicable image size	2/3 inch L*4 (Ø12.75 mm)	2/3 inch (Ø11.00 mm)	2/3 inch L*4 (Ø12.75 mm)					2/3 inch (Ø11.00 mm)
Physical distance (O/I)*2	268.2 mm	259.7 mm	254.2 mm	255.8 mm	256.9 mm	255.8 mm	272.9 mm	256.7 mm

*1 The depth of field is a value calculated using 40 µm as the permissible circle of confusion.
*2 These are calculated values.
*3 The resolution is a value calculated using a 550 nm wavelength.
*4 2/3 inch L (Length: 5.98 mm, Width: 11.26 mm) The specifications above are values based on the optical design. Differences between individual devices may occur due to assembly accuracy, etc.

Field of Vision Chart (SE-110-M Series)

These values are for reference.

5 M

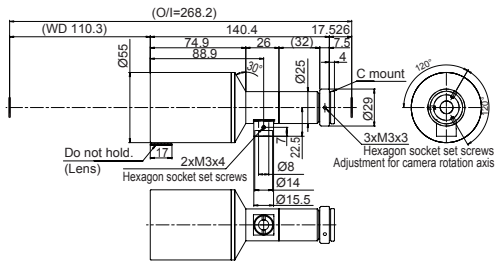
Model name (Coaxial type)	SE-110VT03-5M	SE-110VT05-M	SE-110VT08-M	SE-110VT10-M	SE-110VT15-M	SE-110VT20-M	SE-110VT30-M	SE-110VT40-M
Model name (Straight type)	SE-110ST03-5M	SE-110ST05-M	SE-110ST08-M	SE-110ST10-M	SE-110ST15-M	SE-110ST20-M	SE-110ST30-M	SE-110ST40-M
Optical magnification	0.3x	0.5x	0.8x	1.0x	1.5x	2.0x	3.0x	4.0x
Sensor size	2/3 inch L	2/3 inch	2/3 inch L					2/3 inch
Length	19.95 mm	13.20 mm	7.48 mm	5.98 mm	3.99 mm	2.99 mm	1.99 mm	1.65 mm
Width	37.55 mm	17.60 mm	14.08 mm	11.26 mm	7.51 mm	5.63 mm	3.75 mm	2.20 mm
Diagonal	42.52 mm	22.00 mm	15.94 mm	12.75 mm	8.50 mm	6.38 mm	4.25 mm	2.75 mm

For other fields of vision, refer to the field of vision chart in the Technical Guide. ▼ P.402

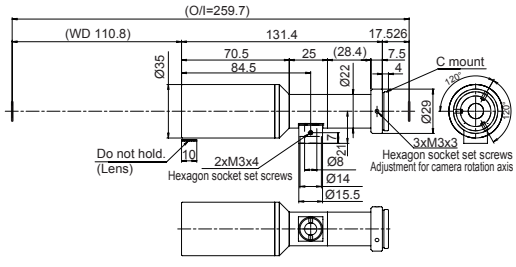
Dimensions (SE-110-M Series, mm)

Coaxial type

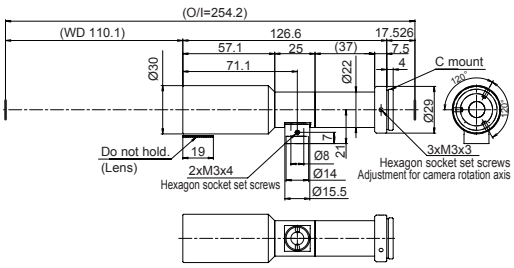
SE-110VT03-5M 5 M



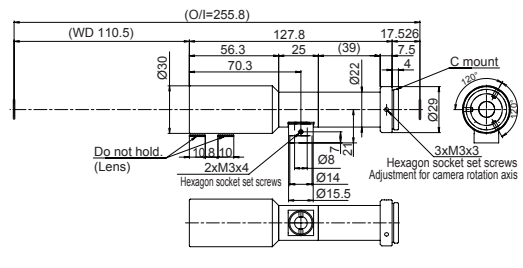
SE-110VT05-M



SE-110VT08-M



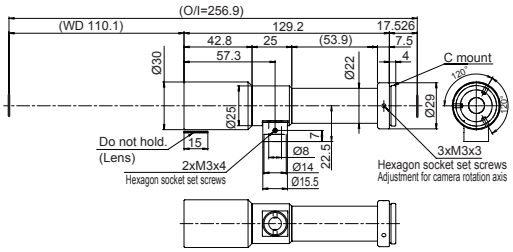
SE-110VT10-M



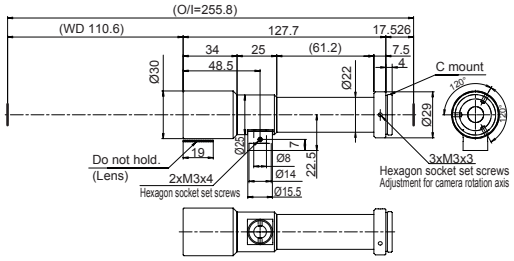
Dimensions (SE-110-M Series, mm, Continued)

Coaxial type (continued)

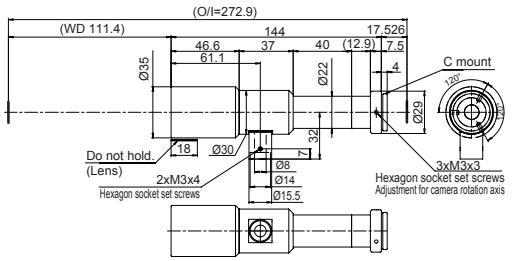
SE-110VT15-M



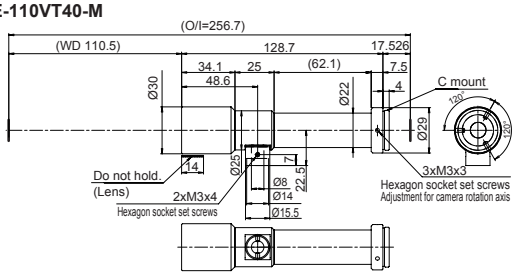
SE-110VT20-M



SE-110VT30-M



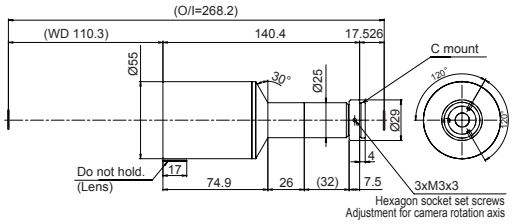
SE-110VT40-M



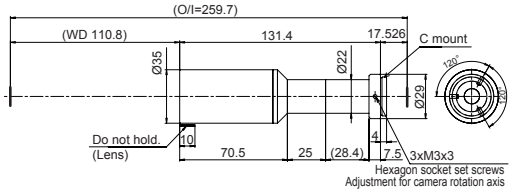
Straight type

SE-110ST03-5M

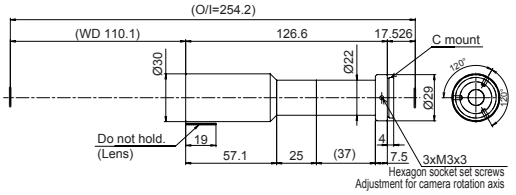
5 M



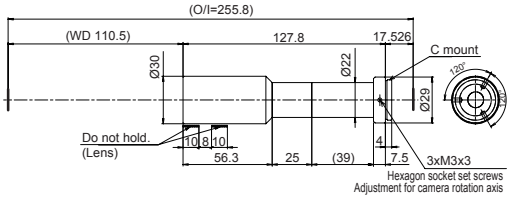
SE-110ST05-M



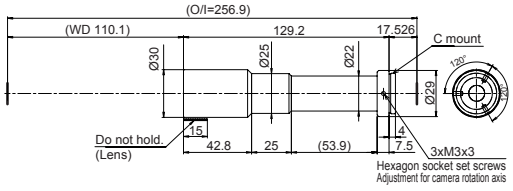
SE-110ST08-M



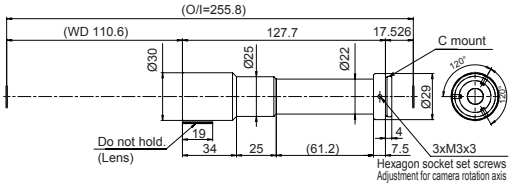
SE-110ST10-M



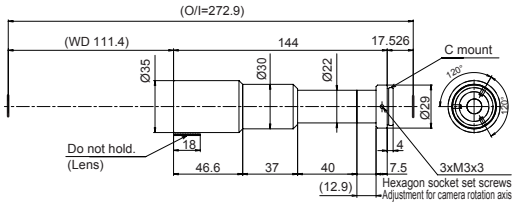
SE-110ST15-M



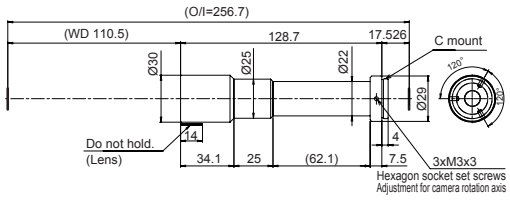
SE-110ST20-M



SE-110ST30-M



SE-110ST40-M



Lenses

Telecentric Lenses

SE-65/SE-110 Series

Refer to our website for product details.

CCS telecentric lens ▶ Search

Object-side telecentric lenses supporting a wide variety of applications beyond just dimension measuring

SE-65 Series (WD 65 mm)

Straight type
0.8x to 4x

Coaxial type
0.8x to 4x

SE-110 Series (WD 110 mm)

Straight type
0.8x to 4x

Coaxial type
0.8x to 4x

SE-65/SE-110 Series Specifications

Coaxial type

Model name	SE-65VT08	SE-65VT10	SE-65VT15	SE-65VT20	SE-65VT40	SE-110VT08	SE-110VT10	SE-110VT15	SE-110VT20	SE-110VT40
Optical magnification	0.8x±5%	1.0x±5%	1.5x±5%	2.0x±5%	4.0x±5%	0.8x±5%	1.0x±5%	1.5x±5%	2.0x±5%	4.0x±5%
WD	67.7±2 mm	65.2±2 mm	65.0±2 mm	65.1±2 mm	65.1±2 mm	110.4±3.3 mm	110.0±3.3 mm	114.1±3.4 mm	110.0±3.3 mm	110.0±3.3 mm
Depth of field*1*2	1.85 mm	1.33 mm	0.59 mm	0.33 mm	0.13 mm	2 mm	1.6 mm	0.86 mm	0.65 mm	0.2 mm
Resolution*2*3	12.4 µm	11.2 µm	7.5 µm	5.6 µm	4.3 µm	13.4 µm	13.4 µm	10.8 µm	10.8 µm	6.6 µm
NA*2	0.027	0.030	0.045	0.060	0.078	0.025	0.025	0.031	0.031	0.051
Actual F-number (Fe)*2	14.9	16.8	16.7	16.7	25.4	16.0	19.9	24.0	32.0	39.5
TV distortion*2	-0.027%	-0.010%	-0.017%	-0.013%	+0.006%	-0.05%	-0.05%	+0.01%	-0.01%	+0.01%
Weight	50 g	54 g	37 g	38 g	40 g	54 g	56 g	48 g	50 g	50 g
Mount	C mount					C mount				
Maximum applicable image size	1/1.8 inch					1/1.8 inch				
Physical distance (O/I)*2	164.6 mm	172.1 mm	133.3 mm	135.8 mm	147 mm	211 mm	213.9 mm	208 mm	216.1 mm	212.5 mm

*1 The depth of field is a value calculated using 40 µm as the permissible circle of confusion.
*2 These are calculated values.
*3 The resolution is a value calculated using a 550 nm wavelength. The specifications above are values based on the optical design. Differences between individual devices may occur due to assembly accuracy, etc.

Straight type

Model name	SE-65ST08	SE-65ST10	SE-65ST15	SE-65ST20	SE-65ST40	SE-110ST08	SE-110ST10	SE-110ST15	SE-110ST20	SE-110ST40
Optical magnification	0.8x±5%	1.0x±5%	1.5x±5%	2.0x±5%	4.0x±5%	0.8x±5%	1.0x±5%	1.5x±5%	2.0x±5%	4.0x±5%
WD	67.7±2 mm	65.2±2 mm	65.0±2 mm	65.1±2 mm	65.1±2 mm	110.4±3.3 mm	110.0±3.3 mm	114.1±3.4 mm	110.0±3.3 mm	110.0±3.3 mm
Depth of field*1*2	1.85 mm	1.33 mm	0.59 mm	0.33 mm	0.13 mm	2 mm	1.6 mm	0.86 mm	0.65 mm	0.2 mm
Resolution*2*3	12.4 µm	11.2 µm	7.5 µm	5.6 µm	4.3 µm	13.4 µm	13.4 µm	10.8 µm	10.8 µm	6.6 µm
NA*2	0.027	0.030	0.045	0.060	0.078	0.025	0.025	0.031	0.031	0.051
Actual F-number (Fe)*2	14.9	16.8	16.7	16.7	25.4	16.0	19.9	24.0	32.0	39.5
TV distortion*2	-0.027%	-0.010%	-0.017%	-0.013%	+0.006%	-0.05%	-0.05%	+0.01%	-0.01%	+0.01%
Weight	45 g	49 g	32 g	33 g	35 g	49 g	51 g	43 g	45 g	45 g
Mount	C mount					C mount				
Maximum applicable image size	1/1.8 inch					1/1.8 inch				
Physical distance (O/I)*2	164.6 mm	172.1 mm	133.3 mm	135.8 mm	147 mm	211 mm	213.9 mm	208 mm	216.1 mm	212.5 mm

*1 The depth of field is a value calculated using 40 µm as the permissible circle of confusion.
*2 These are calculated values.
*3 The resolution is a value calculated using a 550 nm wavelength. The specifications above are values based on the optical design. Differences between individual devices may occur due to assembly accuracy, etc.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Field of Vision Chart

These values are for reference.

Coaxial type

(Unit: mm)

Model name	Optical magnification	Sensor size: 1/1.8 inch		
		Length	Width	Diagonal
SE-65VT08	0.8x	6.65	8.98	11.16
SE-65VT10	1.0x	5.32	7.18	8.93
SE-65VT15	1.5x	3.55	4.78	5.95
SE-65VT20	2.0x	2.66	3.59	4.47
SE-65VT40	4.0x	1.33	1.80	2.23

Model name	Optical magnification	Sensor size: 1/1.8 inch		
		Length	Width	Diagonal
SE-110VT08	0.8x	6.65	8.97	11.17
SE-110VT10	1.0x	5.32	7.18	8.93
SE-110VT15	1.5x	3.55	4.78	5.95
SE-110VT20	2.0x	2.66	3.59	4.47
SE-110VT40	4.0x	1.33	1.79	2.23

Straight type

(Unit: mm)

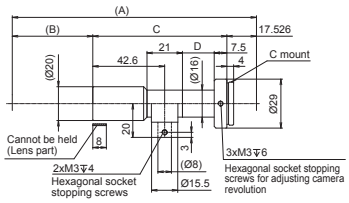
Model name	Optical magnification	Sensor size: 1/1.8 inch		
		Length	Width	Diagonal
SE-65ST08	0.8x	6.65	8.98	11.16
SE-65ST10	1.0x	5.32	7.18	8.93
SE-65ST15	1.5x	3.55	4.78	5.95
SE-65ST20	2.0x	2.66	3.59	4.47
SE-65ST40	4.0x	1.33	1.80	2.23

Model name	Optical magnification	Sensor size: 1/1.8 inch		
		Length	Width	Diagonal
SE-110ST08	0.8x	6.65	8.97	11.17
SE-110ST10	1.0x	5.32	7.18	8.93
SE-110ST15	1.5x	3.55	4.78	5.95
SE-110ST20	2.0x	2.66	3.59	4.47
SE-110ST40	4.0x	1.33	1.79	2.23

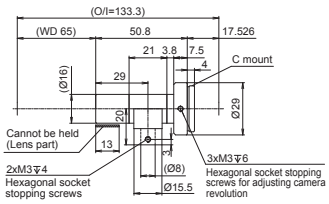
For other fields of vision, refer to the field of vision chart in the Technical Guide. ▼ P.402

Dimensions (mm)

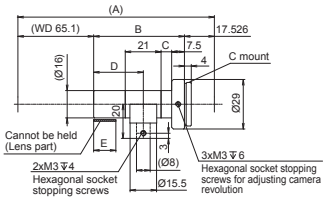
SE-65VT08/SE-65VT10 (Coaxial)



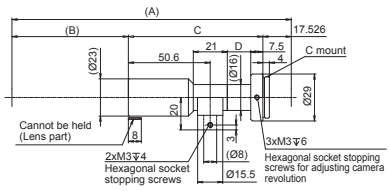
SE-65VT15 (Coaxial)



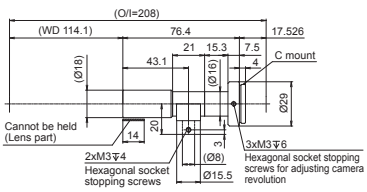
SE-65VT20/SE-65VT40 (Coaxial)



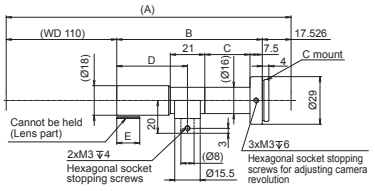
SE-110VT08/SE-110VT10 (Coaxial)



SE-110VT15 (Coaxial)

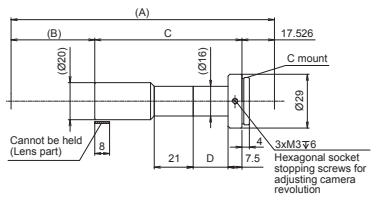


SE-110VT20/SE-110VT40 (Coaxial)

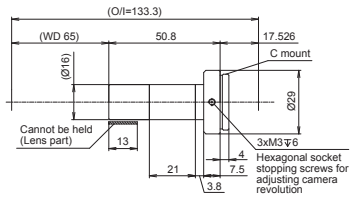


		SE-65VT08	SE-65VT10	SE-65VT20	SE-65VT40	SE-110VT08	SE-110VT10	SE-110VT20	SE-110VT40
Dimensions chart	A	O/I=164.6	O/I=172.1	O/I=135.8	O/I=147	O/I=211	O/I=213.9	O/I=216.1	O/I=212.5
	B	WD 67.7	WD 65.2	53.2	64.4	WD 110.4	WD 110	88.6	84.9
	C	79.4	89.4	6.2	18.5	83.1	86.3	27.5	30.4
	D	18.8	28.8	29	27.9	14.5	17.7	43.1	36.5
	E	–	–	13	11	–	–	14	11

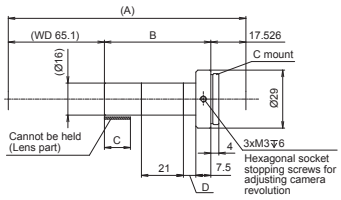
SE-65ST08/SE-65ST10 (Straight)



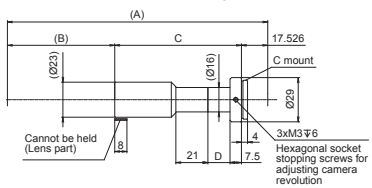
SE-65ST15 (Straight)



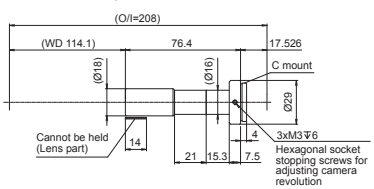
SE-65ST20/SE-65ST40 (Straight)



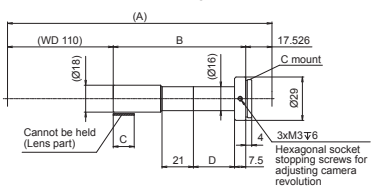
SE-110ST08/SE-110ST10 (Straight)



SE-110ST15 (Straight)



SE-110ST20/SE-110ST40 (Straight)



		SE-65ST08	SE-65ST10	SE-65ST20	SE-65ST40	SE-110ST08	SE-110ST10	SE-110ST20	SE-110ST40
Dimensions chart	A	O/I=164.6	O/I=172.1	O/I=135.8	O/I=147	O/I=211	O/I=213.9	O/I=216.1	O/I=212.5
	B	WD 67.7	WD 65.2	53.2	64.4	WD 110.4	WD 110	88.6	84.9
	C	79.4	89.4	13	11	83.1	86.3	14	11
	D	18.8	28.8	6.2	18.5	14.5	17.7	27.5	30.4

Lenses

Macro Lenses

SE-16/SE-18 Series

Refer to our website for product details.

CCS Macro Lens ▶ Search

Original macro lenses that achieve both "high performance" and "low cost"

SE-16 Series

Straight type
0.5x to 2x

Coaxial type
0.5x to 2x

Full set

Model: SE-16MS
Set details:
- Straight mount
- Coaxial mount
- Lens unit
- Lens tube (Short)
- Lens tube (Long)

SE-18 Series

Straight type
2x to 6x

Coaxial type
2x to 6x

Full set

Model: SE-18MS
Set details:
- Straight lens unit
- Coaxial lens unit
- C mounted ring
- 4x ring
- 6x ring

SE-16/SE-18 Series Specifications

Coaxial type

Model name	SE-16VM05	SE-16VM1	SE-16VM2	SE-18VM2	SE-18VM4	SE-18VM6
Optical magnification	0.5x	1.0x	2.0x	2.0x	4.0x	6.0x
WD	105 mm	66 mm	47 mm	113 mm	109 mm	108 mm
Depth of field*1*2	1880 µm	620 µm	240 µm	390 µm	200 µm	140 µm
Resolution*2*3	7.9 µm	5.2 µm	4.0 µm	6.7 µm	6.8 µm	7.1 µm
NA*2	0.043	0.067	0.091	0.054	0.056	0.057
Actual F-number (Fe)*2	5.9	7.8	12.0	19.9	40.7	63.9
Weight	41.9 g	46.3 g	55.8 g	50 g	60 g	65 g
Mount	C mount			C mount		
Maximum applicable image size	1/2 inch			2/3 inch		
Physical distance (O/I)*2	178 mm	159 mm	181 mm	202 mm	228 mm	256 mm

*1 The depth of field is a value calculated using 40 µm as the permissible circle of confusion.
*2 These are calculated values.
*3 The resolution is a value calculated using a 550 nm wavelength. The specifications above are values based on the optical design. Differences between individual devices may occur due to assembly accuracy, etc.

Straight type

Model name	SE-16SM05	SE-16SM1	SE-16SM2	SE-18SM2	SE-18SM4	SE-18SM6
Optical magnification	0.5x	1.0x	2.0x	2.0x	4.0x	6.0x
WD	104 mm	66 mm	47 mm	113 mm	109 mm	108 mm
Depth of field*1*2	1880 µm	620 µm	240 µm	390 µm	200 µm	140 µm
Resolution*2*3	7.9 µm	5.2 µm	4.0 µm	6.7 µm	6.8 µm	7.1 µm
NA*2	0.043	0.067	0.091	0.054	0.056	0.057
Actual F-number (Fe)*2	5.9	7.8	12.0	19.9	40.7	63.9
Weight	29.6 g	34 g	43.5 g	40 g	50 g	55 g
Mount	C mount			C mount		
Maximum applicable image size	1/2 inch			2/3 inch		
Physical distance (O/I)*2	177 mm	159 mm	181 mm	200 mm	226 mm	254 mm

*1 The depth of field is a value calculated using 40 µm as the permissible circle of confusion.
*2 These are calculated values.
*3 The resolution is a value calculated using a 550 nm wavelength. The specifications above are values based on the optical design. Differences between individual devices may occur due to assembly accuracy, etc.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Field of Vision Chart

These values are for reference.

Coaxial type

(Unit: mm)

Model name	Optical magnification	Sensor size: 1/2 inch		
		Length	Width	Diagonal
SE-16VM05	0.5x	9.60	12.80	16.00
SE-16VM1	1.0x	4.80	6.40	8.00
SE-16VM05+SE-EX2 (2x rear converter)				
SE-16VM2	2.0x	2.40	3.20	4.00
SE-16VM1+SE-EX2 (2x rear converter)				
SE-16VM2+SE-EX2 (2x rear converter)	4.0x	1.20	1.60	2.00

Model name	Optical magnification	Sensor size: 2/3 inch		
		Length	Width	Diagonal
SE-18VM2	2.0x	3.30	4.40	5.50
SE-18VM4	4.0x	1.65	2.20	2.75
SE-18VM2+SE-EX2 (2x rear converter)				
SE-18VM6	6.0x	1.10	1.47	1.83

Straight type

(Unit: mm)

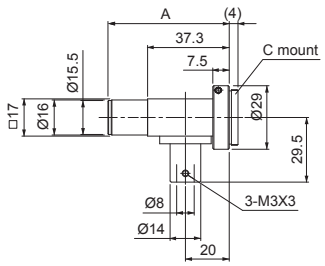
Model name	Optical magnification	Sensor size: 1/2 inch		
		Length	Width	Diagonal
SE-16SM05	0.5x	9.60	12.80	16.00
SE-16SM1	1.0x	4.80	6.40	8.00
SE-16SM05+SE-EX2 (2x rear converter)				
SE-16SM2	2.0x	2.40	3.20	4.00
SE-16SM1+SE-EX2 (2x rear converter)				
SE-16SM2+SE-EX2 (2x rear converter)	4.0x	1.20	1.60	2.00

Model name	Optical magnification	Sensor size: 2/3 inch		
		Length	Width	Diagonal
SE-18SM2	2.0x	3.30	4.40	5.50
SE-18SM4	4.0x	1.65	2.20	2.75
SE-18SM2+SE-EX2 (2x rear converter)				
SE-18SM6	6.0x	1.10	1.47	1.83

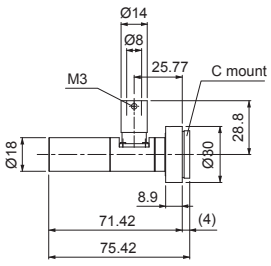
For other fields of vision, refer to the field of vision chart in the Technical Guide. ▼ P.402

Dimensions (mm)

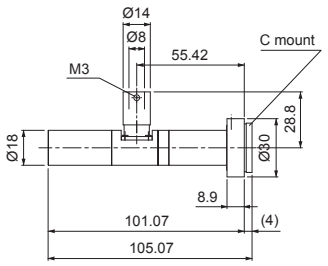
SE-16 (Coaxial)



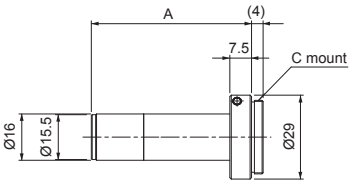
SE-18VM2 (Coaxial)



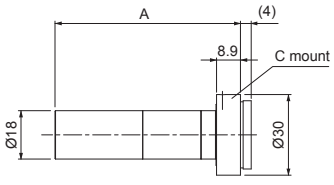
SE-18VM4 (Coaxial)



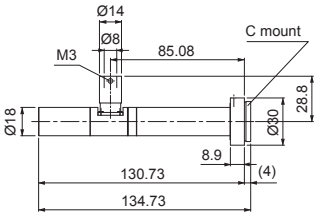
SE-16 (Straight)



SE-18 (Straight)



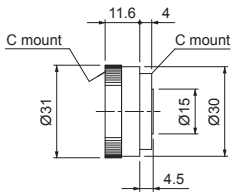
SE-18VM6 (Coaxial)



	Model name	A
Coaxial	SE-16VM05	55.4
	SE-16VM1	75.5
	SE-16VM2	116.1
Straight	SE-16SM05	55.4
	SE-16SM1	75.5
	SE-16SM2	116.1
	SE-18SM2	69.1
	SE-18SM4	98.8
	SE-18SM6	128.4

Options

SE-EX2 (2x rear converter)



Mount between the lens and camera to double the magnification. Be aware this will reduce the brightness and resolution.

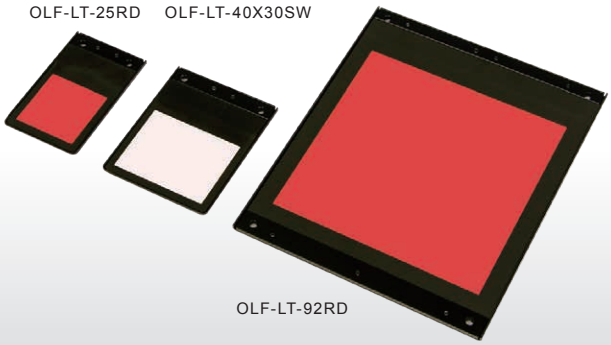
Organic LED (OLED) Products

CCS OLF-LT ▶ Search

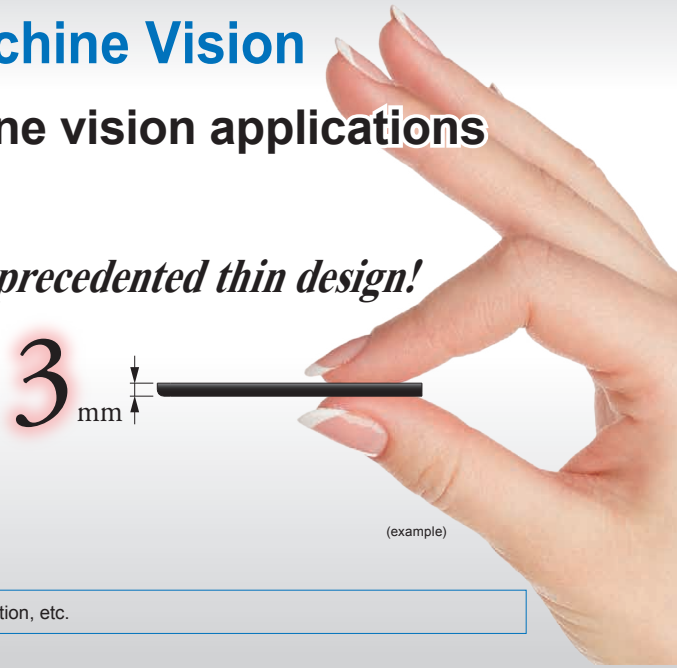
Warranty Warranty for this product differs from standard CCS lights. Contact our local sales office for details.

Organic LED Lights for Machine Vision

Brightness required for machine vision applications



Unprecedented thin design!



Applications Visual inspections, dimension measuring, foreign material inspection, etc.

A New CCS Brand, "CCS-LT"

"CCS-LT" ("CCS Leading Technology") is a new CCS product brand providing advanced technologies.

Its purpose is to introduce newly developed technologies to the market early and to broaden our range of solution proposals.

* The warranty period for lighting products is for 1 year from when the product ships from CCS. Emission amounts not guaranteed. Contact our local sales office for details.

Features

- Available in 3 sizes, for a total lineup of 6 models
- Uniform light emitting surface
- Expands the possibilities for lighting installation with a 3 mm-thin design
- Thin, lightweight, and low heat next-generation light source* * Comparison with CCS LED lighting.
- Red and white light emitting colors
- Notifies the user regarding recommended lighting replacement periods through a dedicated controller

Guidance for lighting service lifetime status is provided in three stages: (1) Good (no problems), (2) Lifetime warning (replacement period approaching), and (3) Lifetime expired (replacement recommended)

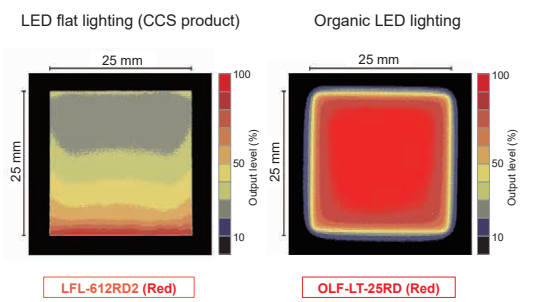
Dedicated controller

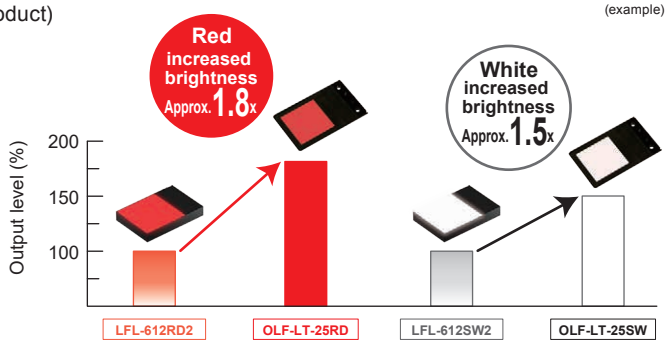
OC-0736-1-ET OC-G-5646-2-ET

Brightness Required for Machine Vision Applications

■ Brightness comparison with LED flat lighting (CCS product)

(example)





(The data included is for reference only. Actual values may vary.)

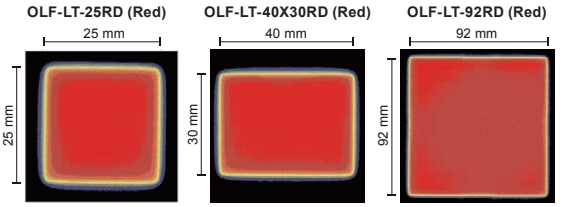
Warranty Warranty for this product differs from standard CCS lights. Contact our local sales office for details.

Specifications by Lighting Model

Model name	LED emitting color	Peak wavelength/ Correlated color temperature (typ.)	Input current (max.)	Power consumption (max.)	Weight (max.)	Expected service life (hours)
OLF-LT-25RD	Red	630 nm	0.019 A	0.40 W	19 g	50,000
OLF-LT-25SW	White	3800 K	0.018 A	0.42 W	19 g	32,000
OLF-LT-40X30RD	Red	630 nm	0.037 A	0.78 W	29 g	50,000
OLF-LT-40X30SW	White	3800 K	0.035 A	0.81 W	29 g	28,000
OLF-LT-92RD	Red	630 nm	0.262 A	5.6 W	102 g	50,000
OLF-LT-92SW	White	3800 K	0.250 A	5.8 W	102 g	19,000

* Use OC-G-5646-2-ET when using OLF-LT-92 model in overdrive mode.

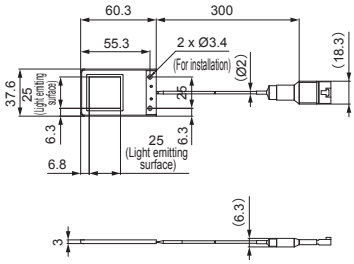
Uniformity (Relative Irradiance)



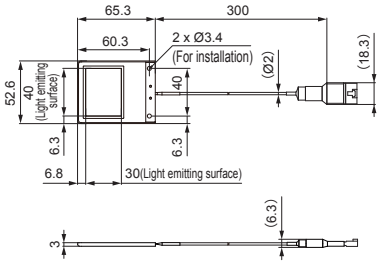
(The data included is for reference only. Actual values may vary.)

Dimensions (mm)

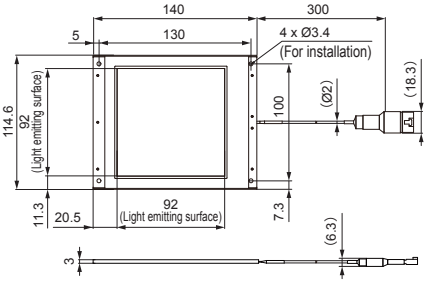
OLF-LT-25RD/SW



OLF-LT-40X30RD/SW



OLF-LT-92RD/SW

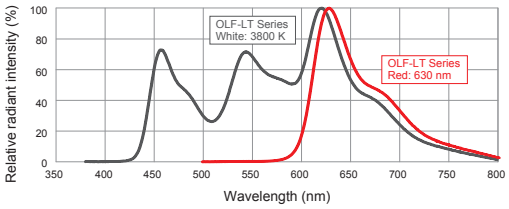


General Specifications

Cable length	300 mm
Cooling method	Natural air-cooling
Operating environment (indoors only)	Temperature: 5 to 40°C, Humidity: 20% to 85% (with no condensation)
Storage environment	Temperature: -20 to 50°C, Humidity: 20 to 85%RH (with no condensation)
CE marking	Safety standard: Conforms to EN62471
Environmental regulations	RoHS2 compliant
Case material	Aluminum alloy
Accessories	User Manual, Extension Cable (1 m)

* The warranty period for lighting products is for 1 year from when the product ships from CCS. Emission amounts not guaranteed. Contact our local sales office for details.

Spectral Distribution Comparison



(The data included is for reference only. Actual values may vary.)

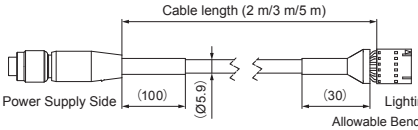
Optional Extension Cable

Model name	OLCB-2	OLCB-3	OLCB-5
Cable length	2 m	3 m	5 m
Weight	127 g max.	182 g max.	292 g max.

* A 1 m cable is supplied with this light.

OLCB Dimensions (mm)

Extension cable: OLCB



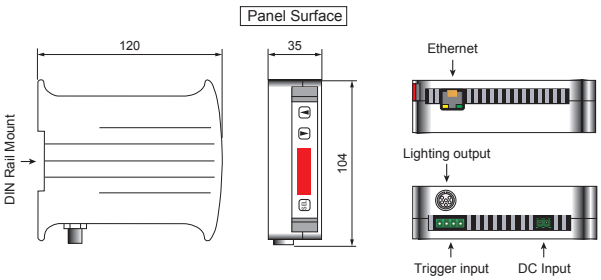
Allowable Bending Radius: 35.4 mm

OC-0736-1-ET Specifications

Input voltage	24 VDC (21.6 to 26.4 V)
Drive method	Constant-current system
Light emission mode	Regular Emission [Continuous], ON/OFF Emission [Switch], Strobe Emission (With Overdrive Mode) [Pulse]
Setting method	Ethernet, Panel Surface Button Operation
Number of channels	1
Input current peak	1 A
Power consumption (typ.)	12 W (Continuous light emission at time of maximum load)
Trigger cycle	Max. 100 Hz
Trigger input	3 to 24 VDC input TTL, NPN, and PNP Input impedance (nominal) 8 kΩ
Strobe light emission time setting	100 µs to 10 ms (100 µs units)
Light emission delay time setting	2 µs to 10 ms (100 µs units)
Strobe emission response speed	Max. 10 µs
ON/OFF emission response speed	Max. 100 µs
Operating environment	Temperature: 0 to 40°C, Humidity: 20 to 85% RH (with no condensation)
Storage environment	Temperature: - 20 to 60°C, Humidity: 20 to 85% RH (with no condensation)
CE marking	EMC standard: Conforms to EN61000-6-2, EN61000-6-4
Environmental regulations	RoHS2 compliant
Weight	300 g max.
Accessories	Wurth 351 Series 2 pins x1, Wurth 361 Series 4 pins x1

OC-0736-1-ET Dimensions (mm)

Controller: OC-0736-1-ET



* Use OC-G-5646-2-ET when using OLF-LT-92 model in overdrive mode. Contact our local sales office for details.

Regarding the recommended lighting replacement period

Expected Service Life (Hours until radiant quantity drops to 50% when used at intensity: 100%, ambient temperature: 40°C) * Not a guaranteed value.

When the expected service life is at 20%, the "Lifetime warning" is displayed, and when at 0%, the "Lifetime expired" notice is displayed.

*See the specifications of each light for its expected service life.

* Settings can be verified using a web browser while the lights are connected to the controller and the controller is connected to a PC via LAN connection.

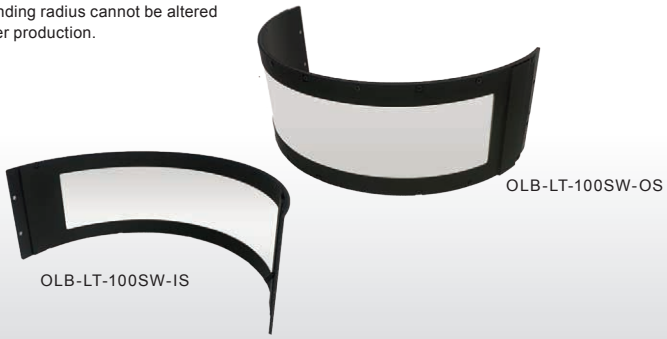
CCS OLB-LT ▶ Search

Warranty Warranty for this product are not the same as CCS standard lighting. Contact our local sales office for details.

Organic LED Lights for Machine Vision

Thin! Light! Bendable!*

* Design of minimum bending radius 100 mm is available. Bending radius cannot be altered after production.



CCS LT **Special Order Products**

(example)

Applications Exterior inspection of cylindrical workpieces, liquid surface inspection (such as for chemical ampoules moving along an arc rail)

Features

- Bending radius can be freely designed upon request *1
- Achieves the brightness and uniformity required for machine vision applications
- Thin, lightweight, and low heat next-generation light source
- Two types of light emitting surfaces: internal light emitting and external light emitting
- Notifies the user regarding recommended lighting replacement periods by connecting to a dedicated controller*2

Dedicated controller

OC-0736-1-ET

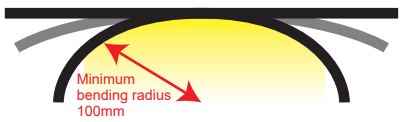
OC-G-5646-2-ET

*1 Designs of up to a minimum bending radius 100 mm are possible (special order).
*2 Guidance for lighting service lifetime status is provided in three stages: (1) Good (no problems), (2) Lifetime warning (replacement period approaching), and (3) Lifetime expired (replacement recommended)

Bending radius can be freely designed upon request

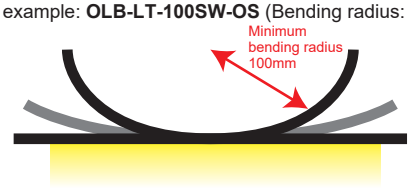
Inner surface emission Type

Model example: **OLB-LT-100SW-IS** (Bending radius: 100mm)



Outer surface emission Type

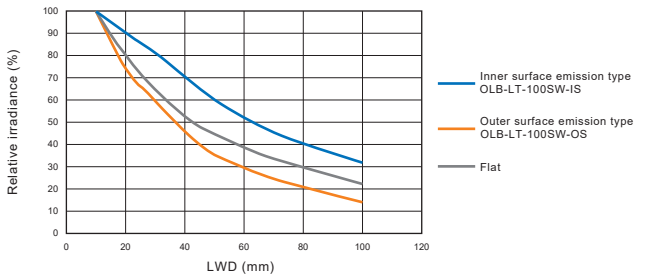
Model example: **OLB-LT-100SW-OS** (Bending radius: 100mm)



Achieves the brightness and uniformity required for machine vision applications

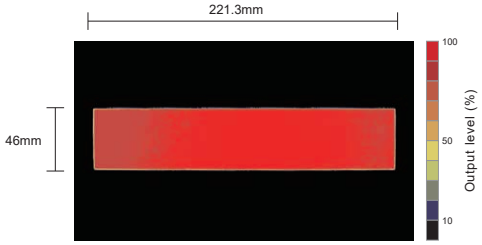
Relative Irradiance Graph*1 (LWD Characteristics)*2

*1 Irradiance on the optical axis
*2 Illuminating distance between the light unit and the workpiece



Uniformity (Relative radiance)

* Measured in a flat state



Warranty Warranty for this product are not the same as CCS standard lighting. Contact our local sales office for details.

Specifications

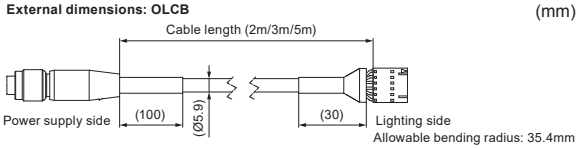
Model name*1	OLB-LT-☐SW-△
LED Color	White
Correlated Color Temperature	4000 K
Input current*2	0.295 A (Power supply: when using OC-G-5646-2-ET) 0.250 A (Power supply: when using OC-0736-1-ET)
Power consumption	7.0 W
Weight	190 g
Designed life expectancy*3	23,000 hours (at 40°C ambient temperature)

*1 ☐ in the model name contains the bending radius. Minimum bending radius: 100 mm.
△ contains OS (Outer surface emission) or IS (Inner surface emission).
*2 Use an OC-G-5646-2-ET power source during use at the maximum luminance listed in the lighting specifications.
*3 Continuous Lighting, Dimmer 100%, Ambient Temperature 40°C, Design Value Until Irradiation Amount Drops to 50%

Optional Extension Cable

Model name	OLCB-2	OLCB-3	OLCB-5
Cable length	2 m	3 m	5 m
Weight	127 g or less	182 g or less	292 g or less

External dimensions: OLCB (mm)



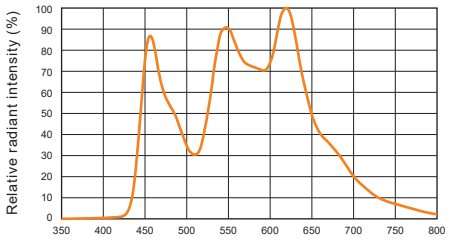
* A 1 m extension cable is supplied with this light.

Common Specifications

Cable length	300 mm
Cooling method	Natural air-cooling
Operating environment (indoors only)	Temperature: 5 to 40°C, Humidity: 20% to 85% (with no condensation)
Storage environment	Temperature: -20 to 60°C, Humidity: 20 to 85% RH (with no condensation)
CE marking	Safety standard: Conforms to EN 62471 EMC standard: Conforms to EN61000-6-2, EN61000-6-4
Environmental regulations	RoHS and REACH compliant
Case material	Aluminum alloy/SUS
Accessories	User Manual, Extension Cable (1 m)

* The warranty period of lights is for one year following shipment by CCS. Irradiation amounts are not guaranteed.
Contact our local sales office for details.

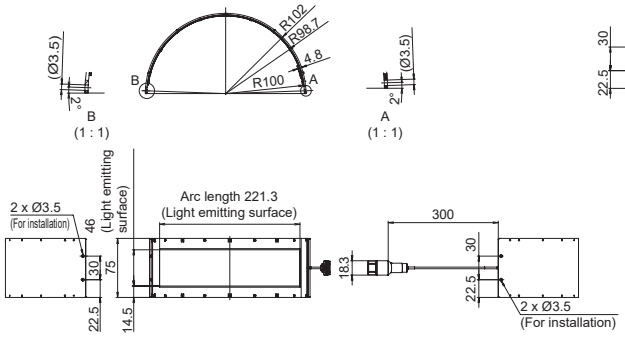
Spectral Distribution



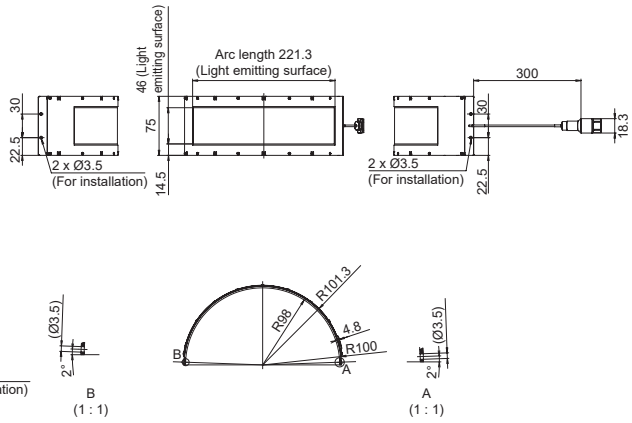
(This data is for reference only. Actual values may vary.)

Dimensions (mm)

OLB-LT-100SW-IS (Inner surface emission Type)

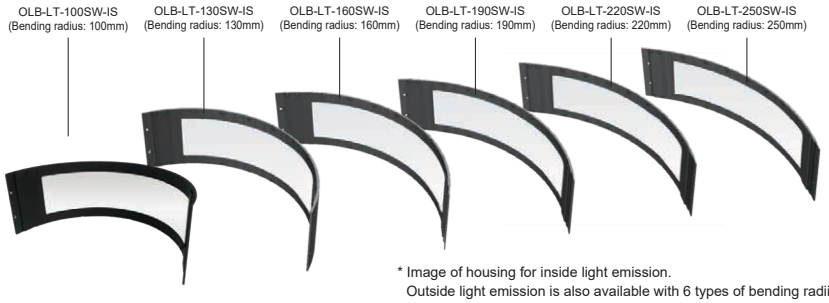


OLB-LT-100SW-OS (Outer surface emission Type)



Demo kit that allows you to try bending radii according to the installation environment

A demo kit is available for you to choose from 2 types of light emission, i.e. Inner surface emission and Outer surface emission, and also 6 bending radii.



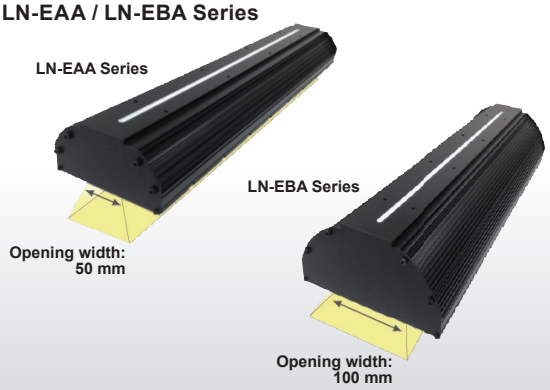
* Image of housing for inside light emission.
Outside light emission is also available with 6 types of bending radii.

You can apply for the demo kit via your sales representative or our website.

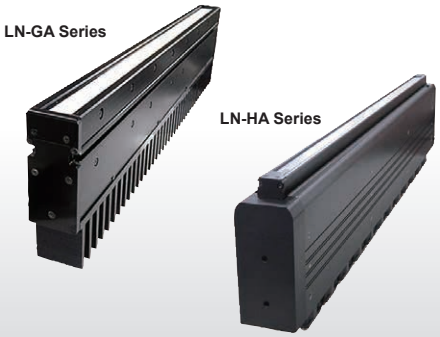
Warranty Warranty for this product differs from standard CCS lights. Contact our local sales office for details.

High-Level Intensity for the Machine Vision Industry

High-Illuminance Tunnel-Dome Lights
LN-EAA / LN-EBA Series



Light Units for Line Sensors
LN-GA / LN-HA Series



Applications Visual inspections, dimension measuring, foreign material inspection, etc.

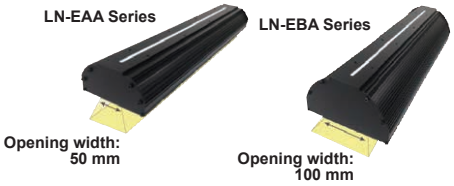
A New Brand, "CCS Altec"

CCS Altec, a new brand offering long and high-illuminance line lights, provides a wide product lineup applicable to various kinds of inspections such as glass, film, liquid crystal and metal inspection.

Features *LN-EAA / LN-EBA Series

- Light from the LEDs is scattered inside the light unit to evenly illuminate the whole surface of the workpiece, reducing overexposure and underexposure
- Light emitting surface length up to 1,600 mm
- Fan-less cooling system suitable for use in a clean room environment such as for printed circuit board production

2 types of Opening width



Available in a lineup of light emitting surface opening width of 50 mm and 100 mm

Features *LN-GA / LN-HA Series

- Provides high output to easily replace metal halide lamp sources *LN-GA Series
- Industry-leading high illuminance with slim and fan-less case design *LN-HA Series
- Light emitting surface length up to 3 m for standard products
  * For sizes longer than 3 m, please contact us

Dedicated Control Units for LN-GA and LN-HA Series

PSCC-J1A Series

- Constant-current power system
- Light intensity can be set in 256 or 1000 levels with digital setting.
- Provides external light intensity control through parallel, RS-232C, and Ethernet communications.
- Detects errors, such as LED burnout, LED overheat, power unit overheat, control unit fan stoppage, and abnormal voltage in LED power supply.

Note: The light intensity for the parallel communications can be set only in 256 steps.

See the website for the product details.
https://www.ccs-grp.com/aitec/

Basler Camera Light Products

CCS BCL ▶ Search

Warranty Warranty for this product differs from standard CCS lights. Contact our local sales office for details.

LET THERE BE LIGHT. WHENEVER YOU NEED IT. CAMERA AND LIGHT – EASILY SYNCED WITH BASLER SLP.

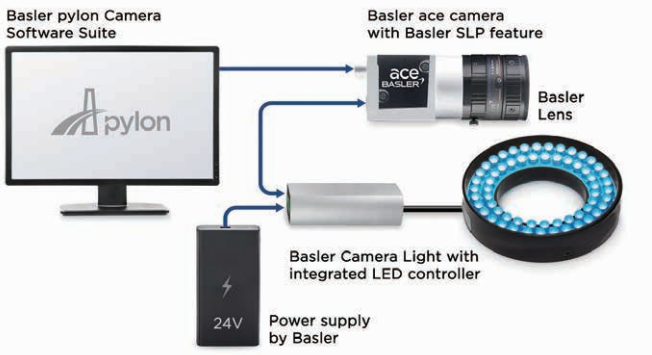
Applications Visual inspections, dimension measuring, foreign material inspection, etc.

Basler Camera Light Series

An intelligent lighting solution for easy integration of lighting and camera in one environment. By using a Basler camera with SLP feature and a Basler Camera Light with an integrated controller, the light can be controlled directly from the camera.

Plug and play without complicated calculation or lighting setup

- Parameterization of light and camera via one software interface only (Basler pylon Camera Software Suite)
- One power supply only to reduce the number of devices for system construction and reduce costs
- Automatic synchronization and configuration between light and camera (current limiting, timings, etc.)
- Save time and costs for consultation, evaluation, integration, and parametrization
- One-click strobe or overdrive mode while optimizing lifetime



Lineup

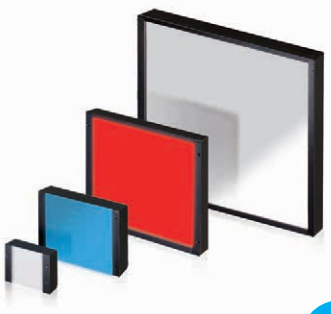
	Ring Light	Bar Light	Back Light	Flood Light
LED Color	Red, White, Blue	Red, White, Blue	Red, White, Blue	Red, White, Blue
Dimensions	50, 70, 90 mm-OD	100, 150, 200 mm	60×60 mm 120×120 mm	255 mm
Input voltage	24 VDC (+/-10%)			
Lighting modes	Continuous: Strobe incl. overdrive mode			
Pulse width	50 µs-100 ms			
Pulse step size	10 µs			
Conformity	Lighting: CE, RoHS, IEC 62471 Compliant Product Controller: CE: EN61000-6-2, EN61000-6-4			

CCS Lighting + Basler SLP Controller

The Basler SLP controller enables direct communication between controller, camera, and any light source. CCS offers the industry's widest range of lights compatible with the SLP controller. Choose from hundreds of lights to suit your application's specific needs

See the website for the product details.
https://www.ccs-grp.com/product/vision/BCL/

CCS FASTUS realizes long-term stable



New brand offering new value

CCS + FASTUS = CCS FASTUS

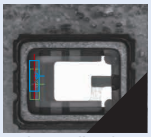
Problem 1

Temperature changes influence brightness.

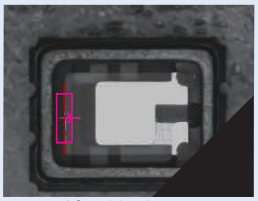
Increased temperature due to self-heating and changes in ambient temperature as air conditioning equipment starts up can affect the brightness of LED lighting.

Inspection example: Extraction of the liquid crystal edge of liquid crystal elements

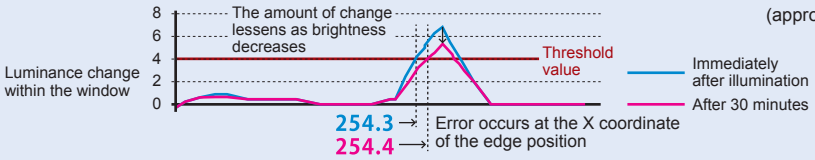
Liquid crystal blank edge extraction is difficult to detect due to transparency, but if the brightness decreases as a result of heating due to lighting, the contrast will be further lowered and a sub-pixel error will occur at the detection position.



Immediately after illumination



After 30 minutes (approx. 20% brightness drop)



Solution 1

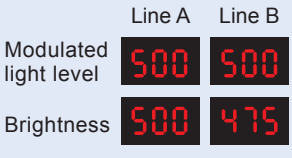
Our FALUX technology automatically compensates for brightness fluctuations due to temperature changes.

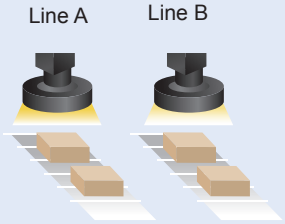
FALUX ► P.274

Problem 3

Need consistent level of brightness across multiple light units.

Actual brightness of light unit is different on each inspection line even though the setting is the same.





Solution 3

Solved by using an absolute brightness monitor + copying setting values across all units.

► P.274

sensing lighting

inspection environments

Sensing

Monitoring

Feedback

Problem 2

Need consistent brightness for long-term use.

On a fully operational 24-hour line, LEDs begin to lose brightness after about 1,000 hours, causing costly inspection failures.

Solution 2

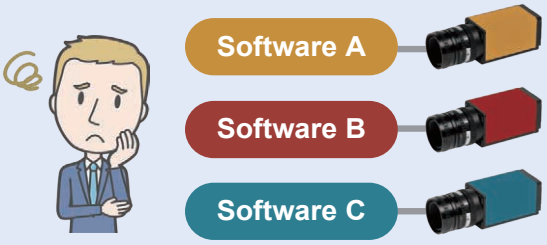
Brightness is automatically adjusted to maintain initial settings after receiving a low brightness alarm.

▶ P.274

Problem 4

Different settings are needed one after another

Different settings or programs must be used depending on the camera, requiring extra time and cost.

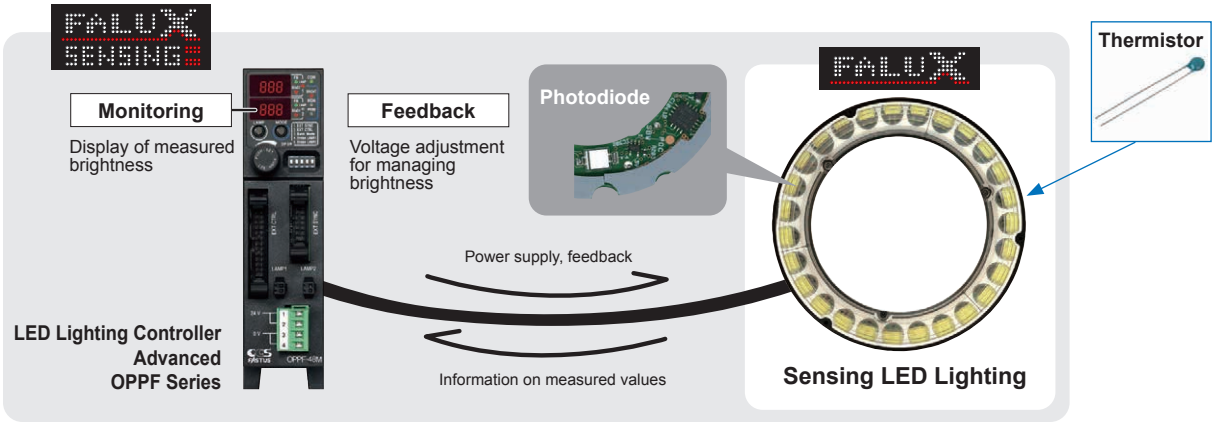


Solution 4

Easy configuration with our original controllers.

▶ P.275

Outline of FALUX and FALUX Sensing



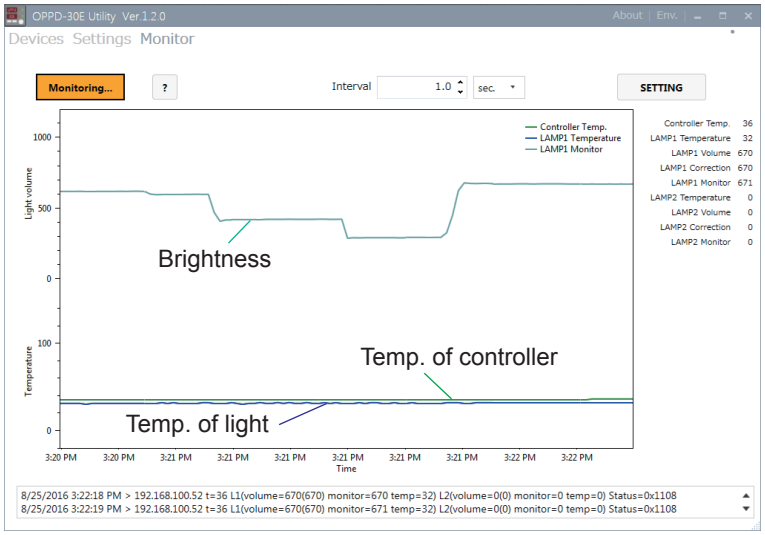
Built-in “FALUX” circuit to correct variations in brightness

FALUX SENSING for monitoring brightness and temperature to maintain the default brightness

Data Logging and Predictive Maintenance

Measured values can be displayed and recorded.

- ✓ Measure brightness
- ✓ Output an alarm when brightness decreases to a predetermined value
- ✓ Measure internal temperatures



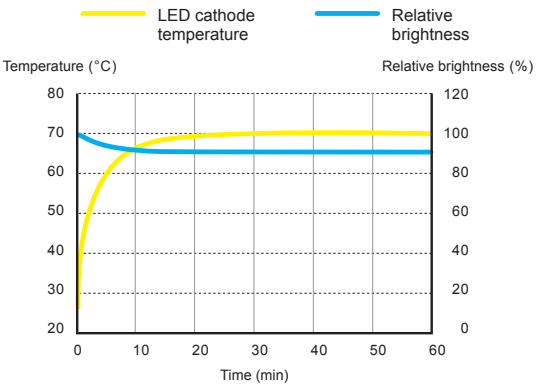
Monitoring changes in brightness is useful for predictive maintenance

Note: The above graph is displayed using dedicated software for the OPPD-30E controller.

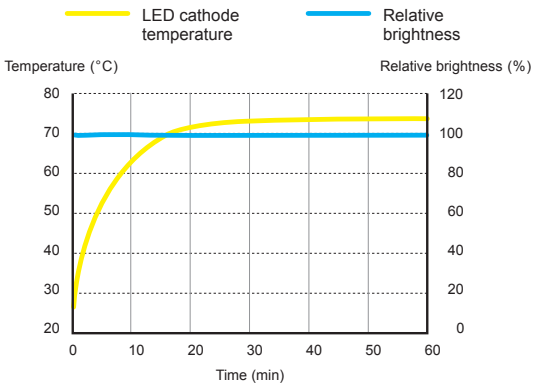
‘FALUX’ Technology

Did you know the LED brightness varies depending on ambient temperature?

FALUX not included

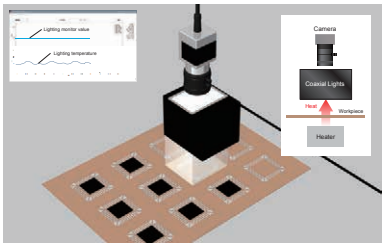


FALUX included



Using the constant current circuit dependent on the input voltage, variations in the forward current of individual LEDs are corrected for uniform brightness.
The temperature compensation circuit compensates for fluctuations in brightness due to changes in temperature.

Application Example: Chip positioning in a high temperature environment

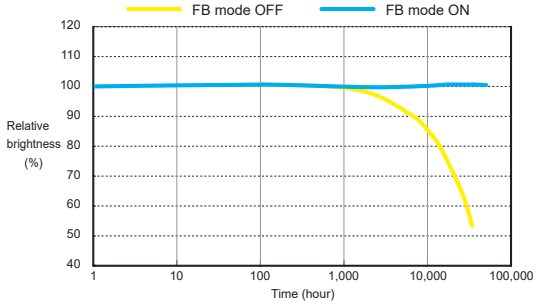


Controller: OPPD-30E / Lighting units: OPX Series

Before placing the chip on the lead frame, positioning is performed using a camera and coaxial illumination.
Because it is heated from below for bonding, the brightness of the lighting fluctuates due to an increase in the ambient temperature, which results in variations in positioning accuracy. If using sensing coaxial illumination, the OPPD-30E controller can not only monitor the illumination temperature, but the feedback function also adjusts the brightness to remain constant even if the brightness varies as the temperature rises. This enables variations to be minimized.

‘FALUX Sensing’ Technology

Did you know the LED brightness decreases after 1,000 hours of operation?

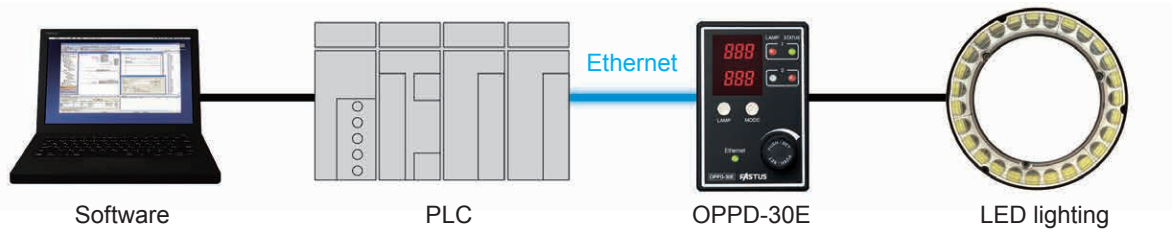


FB control

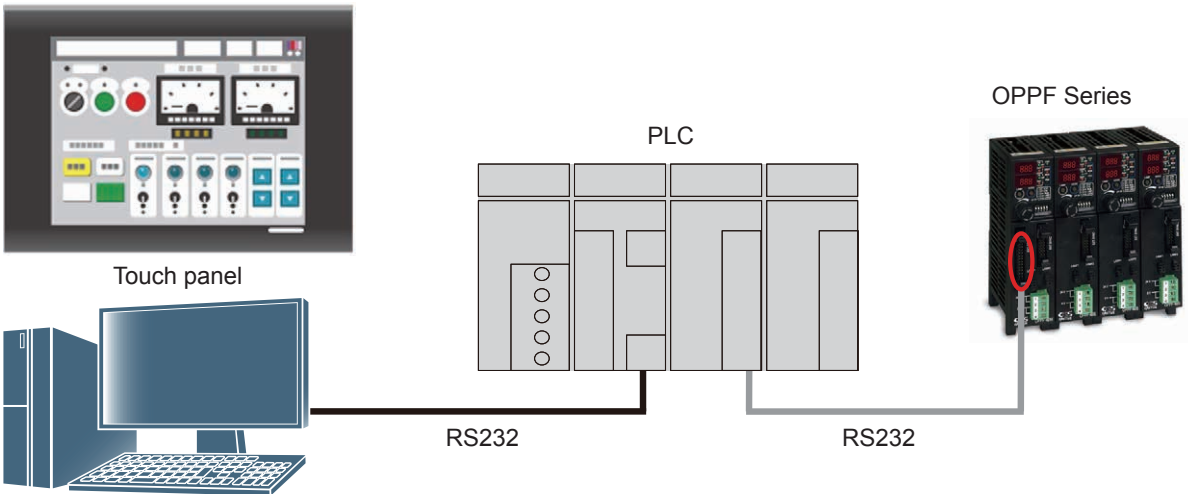
- ✓ Eliminates variations over long periods
- ✓ FB control fine tunes the output voltage to match the standard brightness
- ✓ Output as a feedback error when the upper or lower output voltage adjustment limit is reached

Connection Example

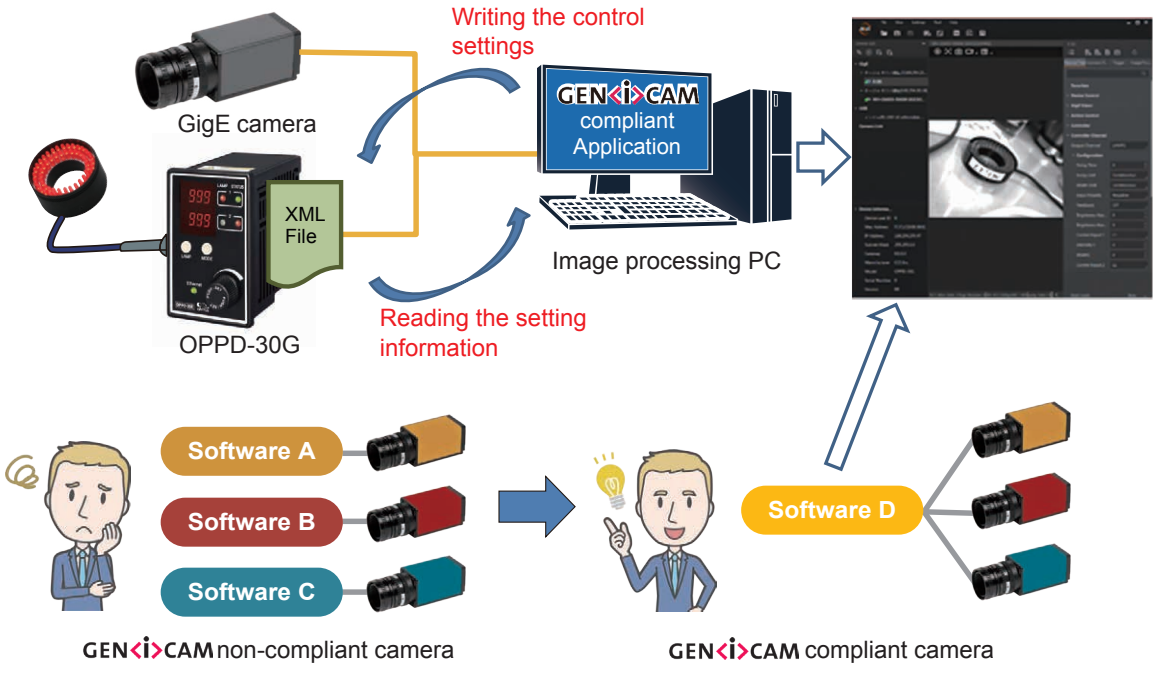
Connection example (Ethernet / OPPD-30E)



Connection example (RS232 / OPPF Series)



Connection example (GEN<i>CAM / OPPD-30G)

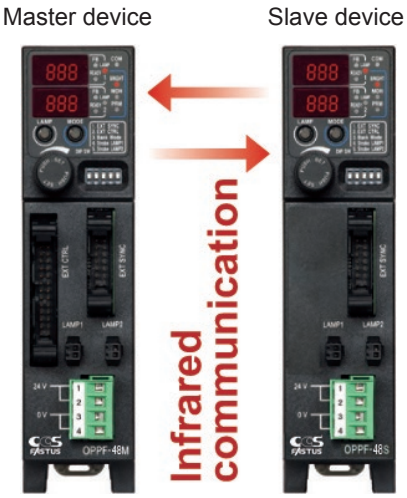


Fastus Controllers




Comparison of Fastus Controllers				
Model	**OPPD-15**	**OPPD-30E**	**OPPD-30G**	**OPPF Series**
Capacity	15 W	30 W	30 W	48 W
Number of channels	1	2	2	2
External control	---	Ethernet	GiGE Vision (Gen<I>Cam)	Parallel/RS232 0-5 V analog input
Sensing	×	○	○	○
Monitoring	×	○	○	○
Feedback	×	○	○	○
Alarm	×	○	○	○
Overdrive	×	×	×	○ (Max 18 V)
PWM frequency	100 kHz	100 kHz	100 kHz	100 kHz

Multi Channel Support (OPPF)



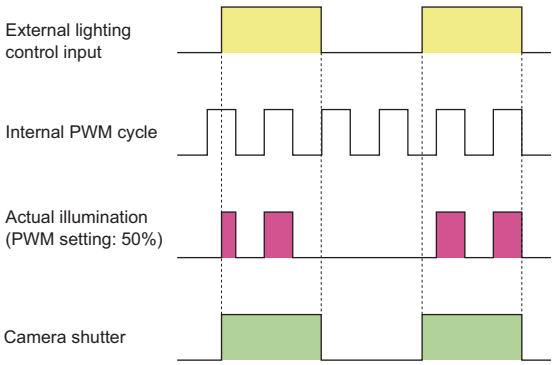
- With 2 channels per unit, support for up to 8 channels is possible by linking (DIN mounting) 3 master and slave devices.
- Communication between units is connector-less and uses infrared.
- A setting copy function allows settings to be batch copied to all channels.
- Connecting a single slave device or just a slave device is possible.

■ No changes in brightness thanks to full synchronization between illumination control input and PWM

Even with fast shutter speeds, illumination is synchronized when using external input lighting, eliminating variations in brightness.

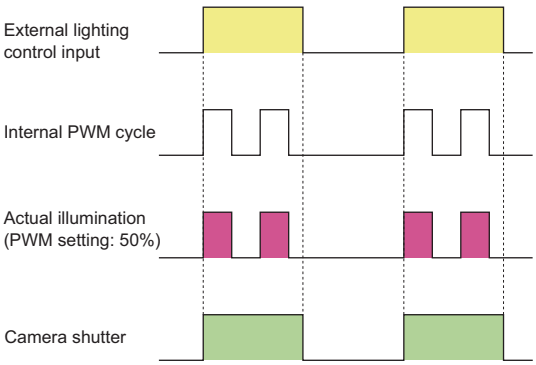
Conventional control

The internal input for external control and the PWM frequency are not synchronized, so brightness will vary with every illumination.



Full synchronization between illumination control input and PWM

The external control input and PWM are synchronized before starting, preventing variations in the cumulative illumination times of each light.



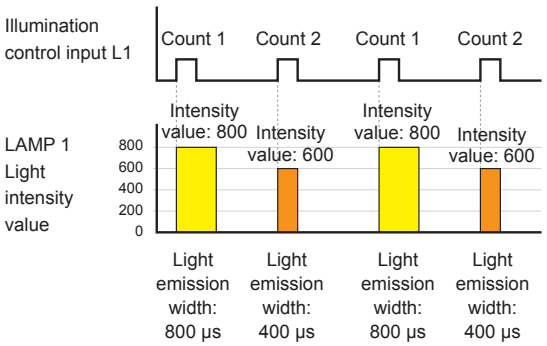
Lighting control sequence

An industry first!

With the OPPD-30E, up to four illumination setting patterns including light intensity values can be configured.
Each pattern can be configured in an illumination control sequence with ordered switching for each illumination control input. (Lighting delay time settings are shared.)
With intensity values and illumination widths set in advance, automatic switching is only performed for illumination control input, allowing the time required for changing settings to be kept to a minimum.
With conventional models, control is not possible without using a PLC and setting up complex ladders.
With the OPPD-30E, such control can be achieved with no other equipment required.

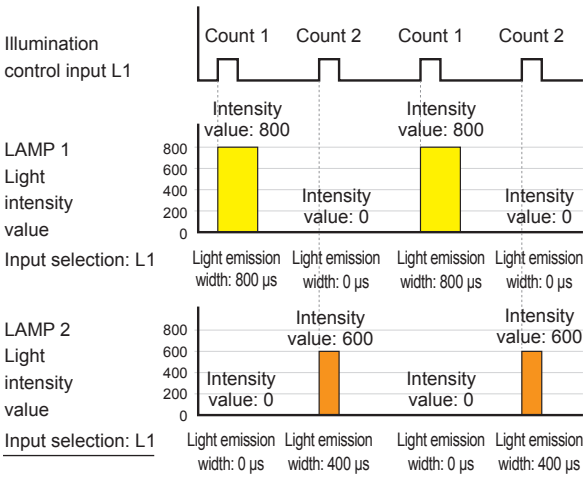
Ex. 1: Light intensity value and emission width switching

Lighting control sequence: 2-count setting



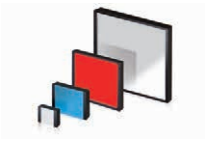
Ex. 2: Lighting switching

Lighting control sequence: 2-count setting



Fastus Lighting Products



Fastus Lighting Products				
Category	**Ring Lights**	**Ring Lights**	**Bar Lights**	**Back Lights**
Model	OPR	OPR-SF	OPB-S	OPF-PS/DF
FALUX SENSING				
Monitoring	○	○	○	○
Feedback	○	×	○	○
FALUX	○	×*1	○	○
Advantages	3 way illumination 	High brightness		PS - Narrow directivity DF - Wide directivity

*1 Instead of FALUX, this series has an automatic shutoff function which works if the internal temperature reaches a specific temperature or higher (SF55 - 80°C, SF70, 85 - 60°C).




Fastus Lighting Products				
Category	**Coaxial Lights**	**Spot Lights**	**Ring Lights**	**Dome Lights**
Model	OPX-S / M	OPS / -U / -ST	HPRS	HPDS
FALUX SENSING				
Monitoring	○	○	○	○
Feedback	○ / ×	○	○	○
FALUX	×	○	○	○
Advantages		OPS - High brightness -U - High uniformity -ST - For overdrive use		

For more details, please visit our website.
https://www.ccs-grp.com/fastus/

What is Computational Imaging?

Also refer to our website.
www.computationalimaging.com

Computational Imaging (CI) refers to digital image capture and processing techniques that combine computation and optical encoding. Relying on data extracted and computed from a series of input images captured under different lighting or optical conditions, CI can improve the capability of a camera or introduce new features not previously possible. By creating an output image focused on the image properties most important to a particular machine vision task, CI offers powerful advantages over traditional one-shot imaging. Within this summary, we introduce the concept of Computational Imaging with an analogy from an every day trend in the consumer environment, and then explain how this technology is making an ever greater impact in high performance Machine Vision (MV) applications.

Analogy with the consumer environment

Consumers want functionality such as the ability to hold up their cell phones and snap the perfect selfie with the sun setting over the beach behind them; they want to sweep them left to right in order to create panorama shots that challenge even the best of wide angle lenses!

In the case of the setting sun, the sun and sky are often thousands of times brighter than the subject of the selfie. The dynamic range of the small imagers used in cell phones is easily exceeded, yet the consumer expects to clearly see both their face and the brilliantly lit sky. To meet this expectation, many of the top cell phones now snap 2 or 3 pictures in rapid succession, each with a different exposure level. Invisible to the user, an algorithm in the background picks the most usable pixels in each image, weights them relative to each exposure level, and combines them into one single high dynamic range (HDR) image with a total dynamic range greater than possible with a single image capture.

Wide angle panorama images are created by grabbing many shots as the camera is swept left to right. An algorithm aligns each image to the last, merges the border between the two, and then repeats this for the next image in the sequence. The final wide angle panorama is a composite image created from the best pixels of all the aligned images and with a wider field-of-view (FOV) than would be possible with a single shot from a fixed imager and lens.

These techniques and many more are part of a trend to use multiple images to create a single computed output image and fit into an area called Computational Imaging. Computational imaging has slowly crept its way into the cameras on smart phones and other portable devices.

Computational Imaging in Machine Vision

Advances in technology and the latest high speed CMOS cameras are making many computational imaging techniques viable for machine vision applications. With CI, system designers can start to think in new ways about creating solutions to difficult imaging problems. Unlike traditional image acquisition, which often requires substantial post-capture image processing and still falls short in producing the optimal image, CI — with its targeted feature extraction — directly outputs the image you need, allowing for more robust MV solutions. Better or previously impossible images for Machine Vision systems can be created at a lower cost.

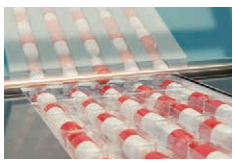
By using multiple image captures and processing the computed “super image”, computational imaging directly outputs the image you need, shortening development time and allowing for more robust MV solutions.

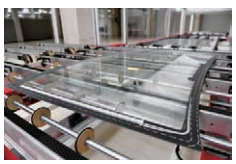
Computational imaging is easier than ever to implement into almost any vision system. In the following pages we outline some of the typical functions that can be accomplished with applications that previously would have been difficult.

Illumination for Computational Imaging

Computational Illumination is a necessary component of computational imaging. It refers to controlling illumination in a structured fashion, to encode the relevant information needed for digital processing. Typically, programmable lighting systems are used to create lighting sequences that vary application-specific parameters such as illumination direction or angle, wavelength, intensity, or focus.

Fundamental techniques include image-based relighting, image enhancement, image deblurring, geometry/material recovery and others. These methods are applied in numerous practical ways to enhance machine vision solutions.

Principle of Operation

In this section we introduce the principle of Computational Imaging. The key principles of CI are:

- Computation is inherent in the image formation process
- Combines special optics and/or lighting along with image processing during image capture
- Typically involves a sequence of images with different illumination for each frame
- Covers a wide variety of techniques, all designed to output better images or images with unique characteristics
- Ends with the image acquisition process — does not involve image analysis

The illustrated example below uses Super-Resolution Color Image Capture as its theme. With this example, we can show the practical elements that comprise the steps of computational imaging. These steps can be generalized as computational illumination/optical encoding, image capture and image processing/decoding.

Example using super-resolution color imaging

Using a monochrome camera with a CCS full-color ring light, which has 3-channel control of red, green, and blue output, the user can generate full resolution RGB color images at practical data rates. By grabbing a sequence of 3 monochrome images correlated to red, green, and blue strobes, a full color composite image at the full monochrome resolution can be created by aligning the images and using the red, green, and blue values for each pixel to create the color pixel.

Advantages of composite images

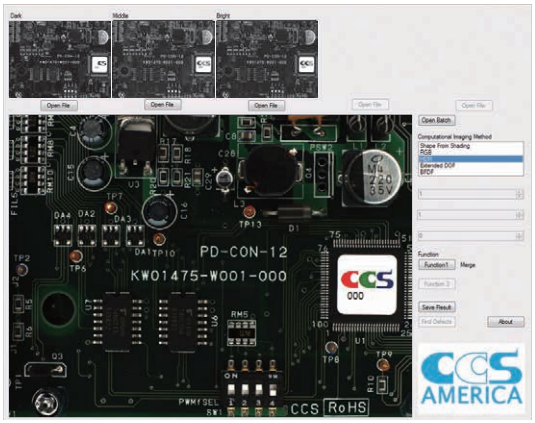
In this illustrated example, the resulting composite color images are much sharper than that of a single image capture with a Bayer or mosaic color camera. The images are similar to those from 3-CCD cameras without the expense, special prism or lens limitations, and at much higher resolutions than that of available 3-CCD cameras. The advantage of this method is the ability to have the best of both worlds; complete color information at the full pixel resolution of the imager. Due to the spatial effects of interpolation, Bayer color imagers capture the color information, but lose spatial resolution across several pixels.

Practical Application Examples

High resolution color (RGB)

Here we take a look at a practical example of the concept outlined in the previous section on the principle of Computational imaging.

Three monochrome full resolution images are captured. To get the color information, each image is strobed with a single color; Red, Green, or Blue. A color image with the full resolution of the monochrome camera can be created from the data of the 3 input images. In this example, 3 monochrome 8-bit 1600 x 1200 images are combined to make a 24-bit color 1600 x 1200 image.

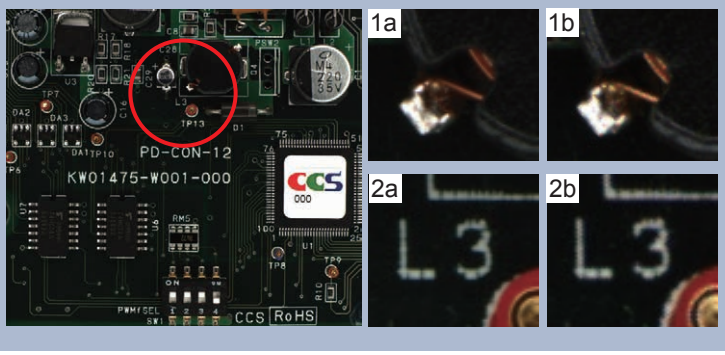


Composite color image

The advantages of this method to create composite color images becomes apparent as you zoom into feature details, as you might in a machine vision inspection.

In the zoomed image 1a, you can see the two exposed layers of the coil wire and the exit wire to the solder point. The edges are sharp and transitions are smooth with good contrast. In image 1b, the Bayer interpolation artifacts cause the wire to alias red + green along its length. Contrast to the background and between wire layers is reduced and noisy.

You can see similar effects in the 2a + 2b zoomed images. In the Bayer image 2b, the white silkscreen is almost completely Bayer noise. The red/gold/black boundaries of the test point in the lower corner become blurred and wider. In the 2a equivalent image, the silkscreen and test point are sharper, with good contrast and color.



Bright field + dark field

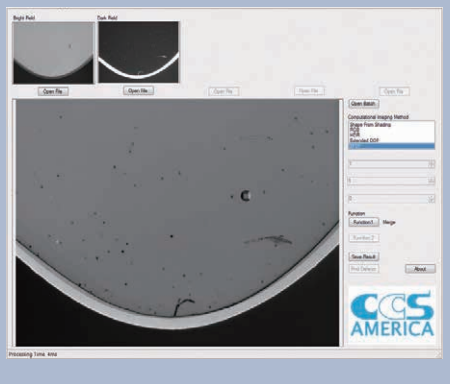
Bright field and dark field are two common methods of illumination for machine vision inspection. Normally, they are used independently, as most samples image best using one method or the other. But what if your sample contains some features that can only be seen with bright field, and other features that can only be seen with dark field?

Multishot imaging nicely solves this problem through the use of a combined bright field/dark field illuminator. The bright field image is combined with the dark field image to generate an output image which contains the features or defects found in both input images.

Oil drop on scratched glass plate

The piece of glass in this example contains several types of common defects — microscopic particles, fine scratches, pits, and oil droplets on the surface.

Bright field imaging shows the droplets and larger particles, but not the fine surface details. Dark field imaging highlights all the surface details, readily showing the scratches, pits and microscopic particles. While neither bright field nor dark field lighting show everything, a CI process can produce an output image that does.



Photometric Stereo (PMS)

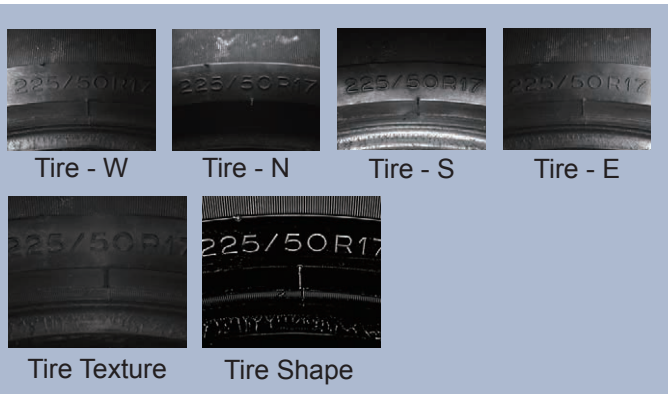
Photometric stereo allows the user to separate the shape of an object from its 2D texture. It works by firing segmented light arrays from multiple angles and then processing the resulting shadows in a process called “shape from shading.” It is useful for the detection of small surface defects and 3D surface reconstruction. PMS is a height driven process which can enhance surface details like scratches, dents, pin holes, raised printing, or engraved characters. Because the final image is a computed surface based on the shading information surface coloring or features without height are removed. This can make visually noisy or highly reflective surfaces easier to inspect. This capability is rapidly becoming popular in the MV market. Numerous machine vision suppliers are offering photometric stereo tools.

A basic PMS system uses a ring light with four 90 degree quadrants to cast a directional shadow around raised features on an object. The feature map can be applied through different algorithms to show surface details that are hard to find or can’t be detected in pure visual images.

Tire inspection with PMS

The images in this example were captured with a ring light with four 90 degree quadrants. The quadrants were fired in sequence to create the West, North, South, and East images as shown on the right.

Images of the Tire Texture and Tire Shape are then created by combining these images in software as shown. The PMS routine removes the visual noise and leaves only the features of interest.



CCS illumination for Computational Imaging systems

Computational Illumination from CCS provides illumination in a structured format — enabling high quality image capture in a controlled fashion. These systems are open-architecture so that they can be integrated with any GenICam cameras and many Smart cameras.

CCS provide Computational Illumination components and kits to allow for easy implementation. Please contact your CCS sales representative if you require any assistance in selecting relevant cameras and imaging software.

LSS-2404 and segmented HPR2 Ring Light

The LSS-2404 Light Sequencing Switch is a special-purpose programmable LED Lighting controller designed to switch external +24 VDC power for up to 4 channels of lights. Upon receiving an external system trigger, the LSS-2404 executes a pre-programmed sequence of lighting on the 4 channels and outputs a set of correlated camera triggers, automatically synchronizing a series of external camera exposures to the programmed lighting sequence. Arbitrarily complex lighting sequences are possible to support any combination of Computational Imaging (multi-shot) and conventional (single-shot) image capture. Bundled software allows the user to configure the controller and update the firmware.

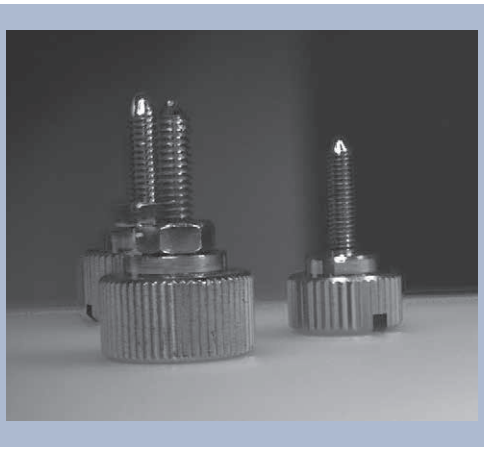
CCS also offers a range of segmented ring lights. The special version of HPR2 Series is available in 4 segments, which is ideal in combination with the LSS-2404 for Photometric Stereo applications. All standard sizes are available in segmented form.

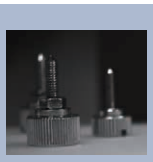
For more information, please visit www.computationalimaging.com or contact your local CCS representative.

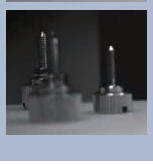
Extended Depth of Field (EDOF)

All images have a depth of field (DOF), a distance over which objects appear in sharp focus. In any single image, DOF is limited by the magnification and aperture size used. In some machine vision applications, the DOF may not be great enough to focus sharply on all the objects in a scene. Conventional solutions for increasing DOF such as closing the aperture (higher f/#) come with substantial tradeoffs such as decreased light and less resolution.

The EDOF technique allows an image to be created with a DOF greater than any of the single images. Using EDOF image processing software and the CCS computational illumination kit, multiple images with various depths of field can be merged to return a clear, sharp result - without loss of light or resolution.







How to get a lot more Depth of Field

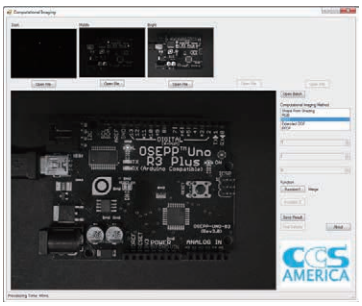
To extend DOF, several input images captured at different focal planes are necessary. While there are a number of methods for EDOF imaging, two common ones are:

- Using motorized or liquid lenses to vary the focal point
- Using a chromatically uncorrected lens along with multiple wavelengths of light to induce focal plane shifts

The example to the left merged three separately focused images to produce an EDOF image with all three fasteners in sharp focus.

High Dynamic Range (HDR)

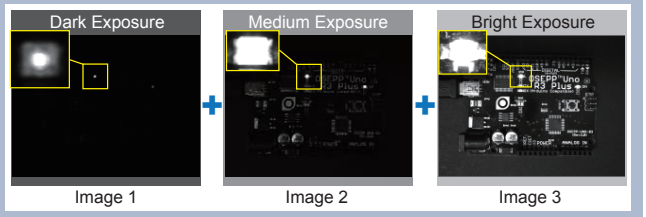
All imagers have a limit to the ratio of the brightest object to the darkest object that can be distinguished in a single image. This is called the dynamic range. Many machine vision applications involve bright, shiny, or dark objects that challenge the dynamic range of the camera. To solve these cases, a series of images with different exposure levels can be captured to create a single HDR image with all the detail that needs to be included for the inspection.

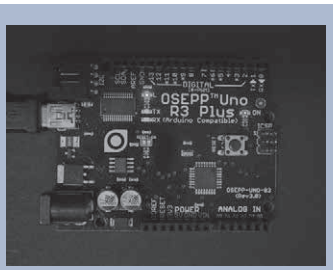


HDR imaging

This HDR image is created from 3 images with different exposures. Image 1 lets you see the LED die and surrounding package, but no other details are visible. Image 2 exposure allows the silkscreen and brightest parts of the components to be seen, but the LED is oversaturated.

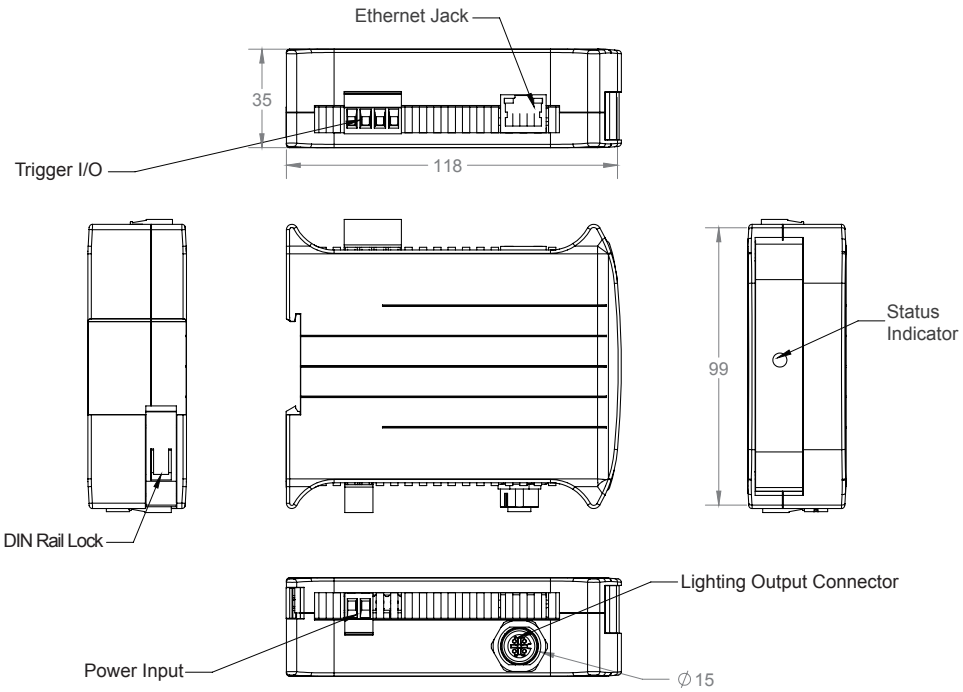
Image 3 allows the barrel connector and other dark components to be seen, but the text and component leads are oversaturated; the LEDs are completely washed out. The HDR image allows correct exposure of the bright LEDs, proper saturation of the silkscreen and component leads, yet the dark components can still be seen.





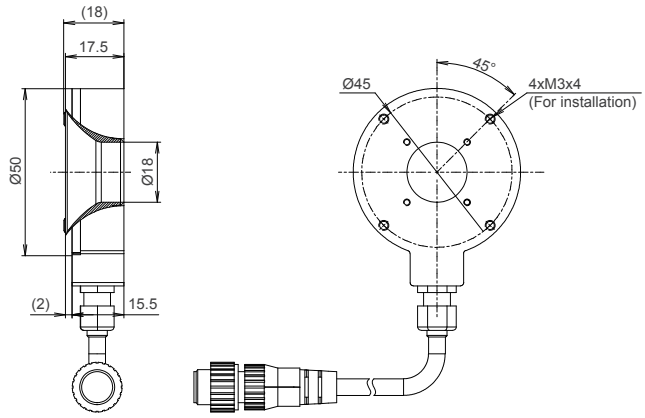
Relevant Products

LSS-2404 Specifications	
Description	The LSS-2404 Light Sequencing Switch is designed to be the heart of any CI system and can switch external +24 VDC power for up to 4-channels of lights. Upon receiving an external system trigger, the LSS-2404 executes a pre-programmed sequence of lighting on the 4-channels and outputs a correlated camera trigger, automatically timing an external camera exposure to the programmed lighting sequence. May be set-up as master or slave in a system.
Number of lighting channels	4
Input voltage	10.8 – 28.8 VDC (absolute range); suitable for either 12 V or 24 V DC lighting.
Power consumption	5W maximum internal dissipation; excluding attached lighting and dependent on configuration.
Trigger Out (to camera)	Selectable to 5 V, 12 V, or 24 V via software. Voltage level tolerance +/- 15%. Maximum limited to ~93% Vin
Trigger Input	Voltage mode: Accepts 3.3 – 24 VDC logic level voltage with adjustable trigger level Switched Ground Mode: Use opto-isolators or closed contacts via direct connection without external components.
Trigger Threshold	Software programmable 1 - 24 VDC trigger level in 100 mV increments Default = 9.6 V threshold to work with 12 V or 24 V trigger logic
Maximum Current Rating	1 A/ch x 4-channels; 4 A maximum all channels.
Communication Port	RJ45 connector. 100BaseT Ethernet. TCP/IP protocol. Control via web-based GUI or TCP/IP command set.
Firmware	User upgradeable via GUI (included).
Sequence Timing	User programmable via GUI (included).
Timing Resolution	Maximum Trigger rate: 10,000 fps (100 µS) Minimum output signal width: 100 µS Timing resolution: 1 µS Channel skew + jitter: <= 10 µS
Operating Temperature Range	Range 0 to 40 °C
Storage Temperature Range	Range -10 to 50 °C
Cooling	Free air cooling (standard model)
Dimensions	4.13 x 6.15 x 1.57 inches L x W
Weight	442g

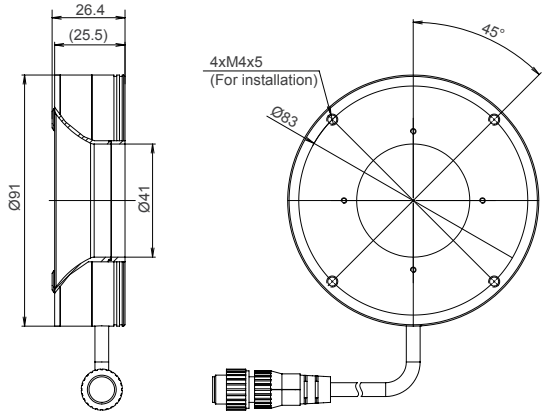


Dimensions Segmented Ring Lights

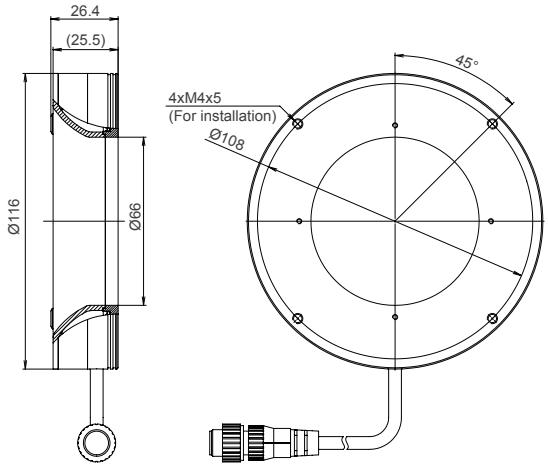
HPR2-50SW-DV04M12-5



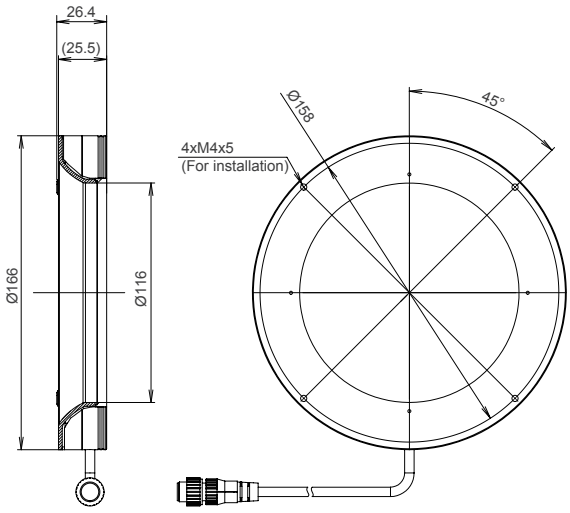
HPR2-75SW-DV04M12-5



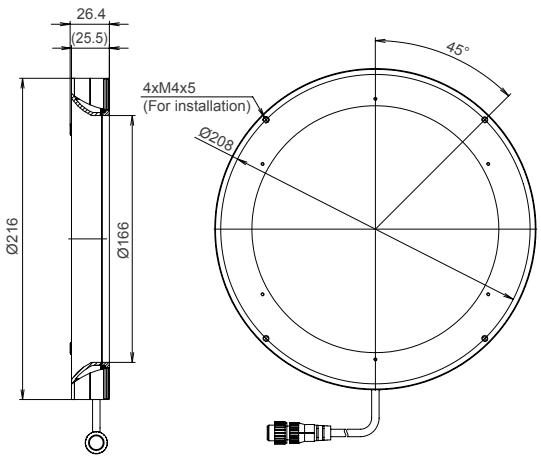
HPR2-100SW-DV04M12-5



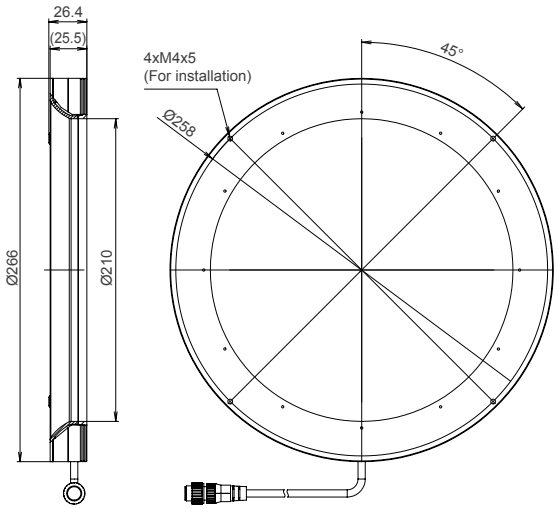
HPR2-150SW-DV04M12-5



HPR2-200SW-DV04M12-5



HPR2-250SW-DV04M12-5



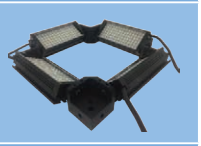
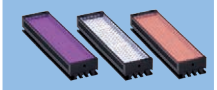
CCS Illumination for Computational Imaging Systems

Computational Imaging

Computational Illumination from CCS provides illumination in a structured format – enabling high quality multi-shot image capture in a controlled fashion. These components are open-architecture so that they can be integrated with any machine vision camera and many smart cameras.

CCS provides a number of Computational Illumination products to allow for easy implementation. Please contact your local CCS Sales office, or CCS Partners, if you require any assistance in selecting compatible components, such as cameras, lenses and imaging software.

CCS Computational Illumination Kit components

Item	Size	Part Number	Key specifications	Photo
Light Sequencing Switch	1.5x DIN Module	LSS-2404	The LSS-2404 Light Sequencing Switch is a programmable LED lighting controller designed to manage multi-shot image capture sequences for Computational Imaging.	
Ring Light (4 Quadrant)	50 mm 75 mm 100 mm 150 mm 200 mm 250 mm	HPR2-YYYxx-DV04M12-5 YYY=size: 50,75,100,150,200,250 mm xx=color: BL, RD, SW, IR	PMS - Photometric Stereo HDR - High Dynamic Range	
Bar Lights (4 Quadrant)	33-509 mm 300 mm 150-1500 mm Universal	LDL2 Series LDLB Series HLDL2 Series BK-QUADBAR-4C	PMS - Photometric Stereo HDR - High Dynamic Range Corner Bracket Assembly w/mounting - Fits all sizes	
Full Color	33-509 mm 50-400 mm 27-500 mm 50-400 mm 13-200 mm	LDL2 Bar Lights HPR2 Ring Lights TH2 Panel Lights HPD2 Dome Lights LFV3(A) Coaxial Lights	URC - Ultra-Resolution Color CHDR - Color HDR EDOF - Extended DOF (chromatic dispersion)	
Multi-spectral	Wide Range	UV Series NIR Series Full Color Series	Wide range of form factors and sizes in UV, NIR, visible, and Full Color (RGB) lights available for any multi-spectral application.	
Segmented Full Color Light	50 mm 75 mm 100 mm 150 mm 200 mm 250 mm	HPR2 Series	Combo 4-segment + Full Color RGB 12-channel input for ultimate flexibility	
Breakout Cable	300 mm 900 mm	FCB-F-0.3-XS2-zzz FCB-F-0.9-XS2-zzz zzz=Light Connector type: Blank=M12 (default) or SM3	4-way branch, 0.3 meters total length 4-way branch, 0.9 meters total length Allows any four CCS lights to connect to the LSS-2404 controller.	
Extension Cables M12	1,3,5, or 9 meters	FCB-X-0.5SQM12-5M5F X=length of 1,3, 5, or 9 m	Straight extension cables for use between the LSS-2404 controller and breakout cables or lights with M12 connector.	
Extension Cables SM3	1,2,3,5, or 10 meters	FCB-XX XX=Length: 1,2,3,5, or 10 m	Straight extension cables for use between FCB-F-X.X-XS2 branches and CCS lights with SM3 connectors only.	
Adjustable Bracket	150 mm Other sizes available	BK-HPR2-150-IS	Mounting bracket for camera and segmented or standard HPR2 ring light. The bracket has a slider mechanism, allowing for the camera working distance to be adjusted. Bracket mountable at either camera or light position.	
Software			Software support for Computational Imaging available through leading machine vision suppliers. Visit www.computationalimaging.com for details.	

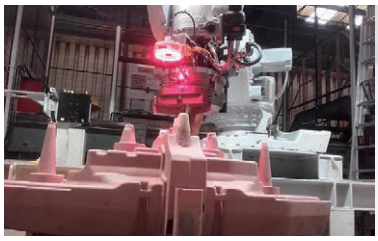
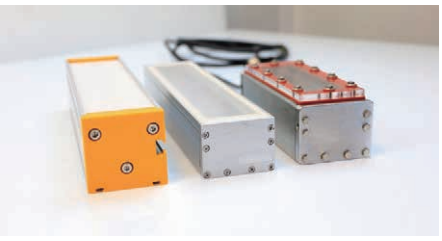
Depending on the particular CI process, any standard light may be incorporated. CCS can create custom products such as integrated multi-spectral lights in one unit. Contact CCS for additional details.

Flood lights, 3D Pattern Projector,

CCS introduces a new range of high-quality plug & play lighting that achieves an innovative advancement in flexible design. This comprehensive range of lighting innovations includes Flood Lights, 3D Pattern Projector, Hyperspectral & Multispectral, SWIR, and more.

HIGHLIGHTS

Flood light

Specialised in high-power LED lights for wide field of view inspection.

Flexibility


Do it yourself! Lights with adjustable wavelength, lens position, diffusers, drivers, and optical accessories delivers a new level of flexibility and convenience.

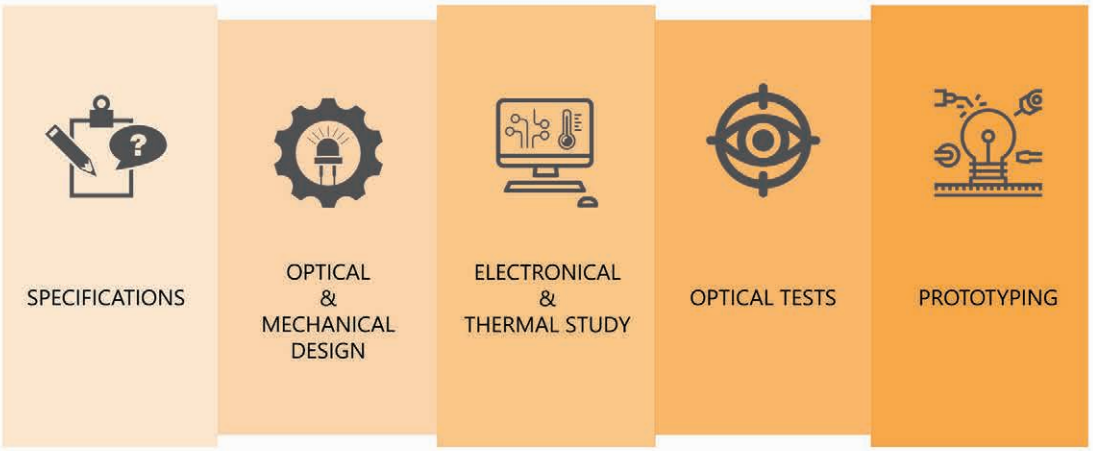
IP standard compliance

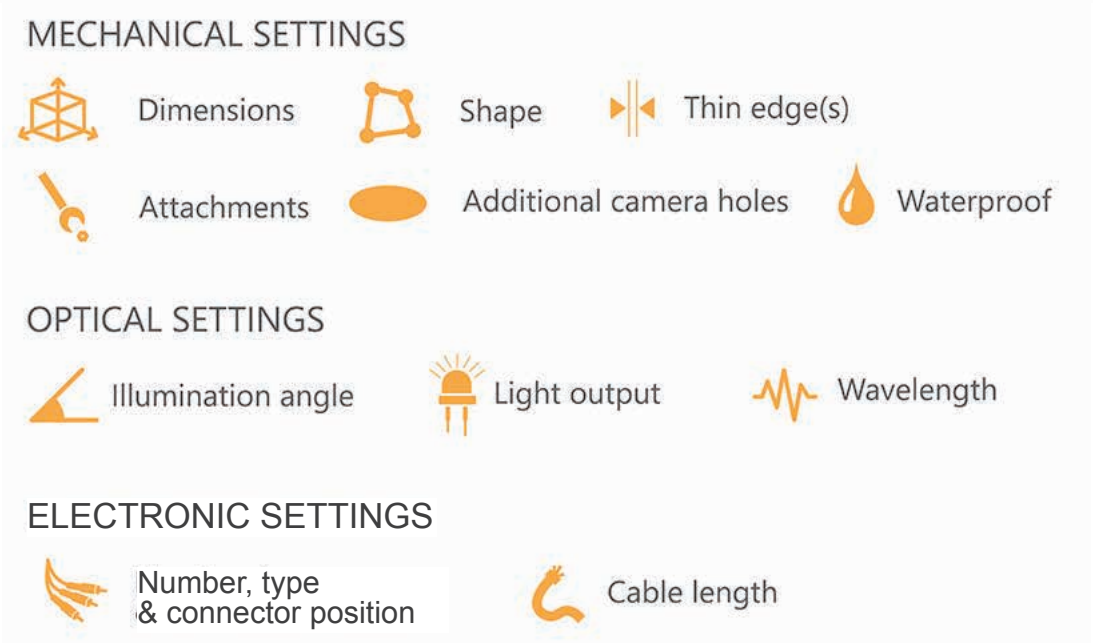

IP options are available to overcome challenges in industrial applications such as food processing and pharmaceuticals, where equipment is exposed to water, dust or other contaminants.

Built-in controller with M12 cable

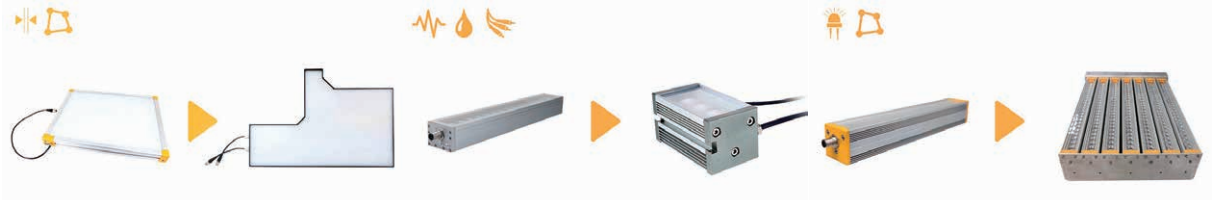

Space & cost-saving built-in controller with M12 cable is a standard feature, allowing easy overdrive, auto-strobe, dimming, and current control.

Customization and OEM solutions





CUSTOM



Back light
Backlight custom form with 2 connectors.

Bar light
Tri-color LED bar - 3 wavelengths.

Bar light
Multiple LED bars
(more luminance and greater illuminated area).

OEM

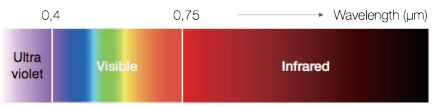
Light sheet
Visualization of airflow.

Projector
12 focus light solution for xenon flash replacement.

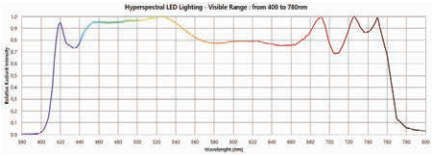
“L” projector (50m distance)
Safety markings Ø300 mm.

COMPREHENSIVE PRODUCT RANGE

Wavelength



From UV to IR

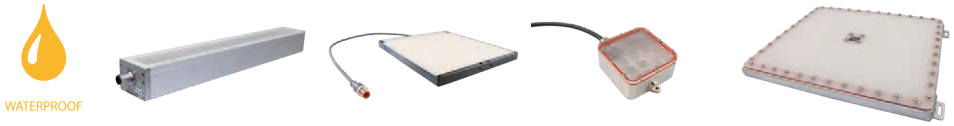


Hyper & Multispectral

Size

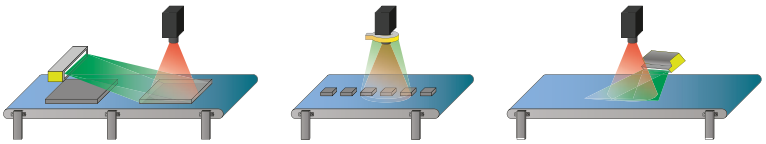
Any size upon request

Protection



UP to IP69K Standard

Camera type



3D, Area scan, Line scan, SWIR, NIR, Board, Smart, Hyperspectral, Multispectral, UV, High-speed

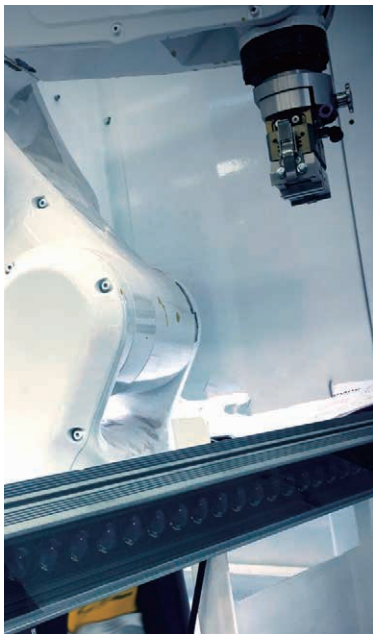
Standard Custom

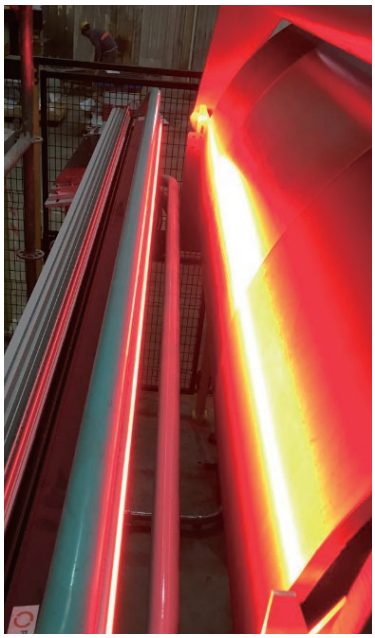
Standard

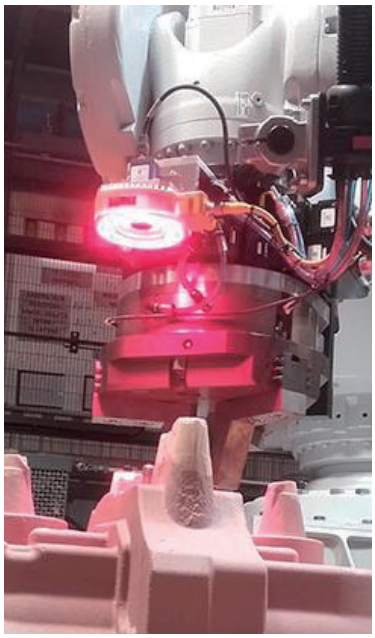
Custom

APPLICATIONS

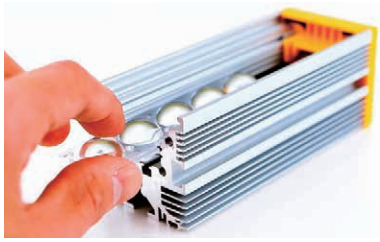
Best suited for robotics, logistics, biomedical, F&B, automotive, 3D, pharmaceuticals, packaging, cosmetics and many other machine vision applications.







FLOOD TYPE BAR LIGHT



High-power user adjustable bar light featuring high intensity and uniformity offers 24 possible configurations in just one light. The innovative design, maximum optical, electronic, and mechanical flexibility allow users to easily adapt to any application requirements.

- 3 diffuser plates (Clear, Semi-diffuse, Diffuse) are included to create a suitable balance between power and homogeneity.
- 4 adjustable lens positions to easily change the emission angle from 90° to 10° to provide the optimal amount of coverage.
- Integrated controller with Auto-strobe feature that automatically illuminates at 300% increased intensity in strobe mode as compared to continuous operation.
- Easy-to-use standard M12 connector.
- Easy to open to make optical adjustments (lens position, diffuser, optical accessories).
- Robust design for challenging inspection environments.

Common uses: Most machine vision inspection applications with large FOV.

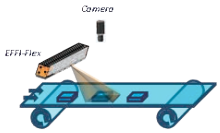
Color	UV		Blue	Green	Red	IR	White (T°= 5500 k ± 500 K)
Wavelength (nm)	365	405	465	525	625	850	000

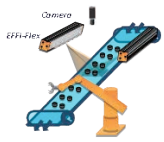
Transparent

Semi-diffuse

Opaline

Position	P0	P1	P2	P3
Angle	90° Without lens	45°	25°	10°





FLOOD TYPE RING LIGHT

High-power adjustable ring light with changeable diffuser plates and lens positions offers 24 possible configurations in just one light. It includes a smart Auto-strobe driver and IP65 rating for dust & water protection.

- 3 diffuser plates (Clear, Semi-diffuse, Diffuse) are included to create a suitable balance between power and homogeneity.
- 4 adjustable lens positions to easily change the emission angle from 90° to 10° to adapt from flood lighting to a spotlight.
- Integrated controller with Auto-strobe feature allows for automatic 700% increased intensity in strobe mode as compared to continuous operation.
- Easy-to-use standard M12 connector.
- Easy to open to make optical adjustments and easy to mount on the end of a robotic arm.
- Compatible with most lenses (58 mm camera hole).

Common uses: Robot guidance, pick & place and any large FOV inspection.

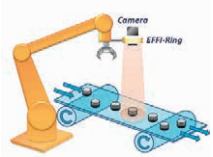
Color	UV	Blue	Green	Red	IR	White (T°= 5500 k ± 500 K)	Full Color
Wavelength (nm)	405	465	525	625	850	000	RGB

Transparent

Semi-diffuse

Opaline

Position	P0	P1	P2	P3
Angle	90° Without lens	45°	25°	10°



FLOOD TYPE BRICK LIGHT

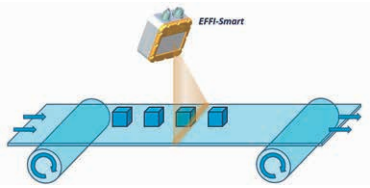
High-power brick light with 2 rows of LEDs. Highly flexible design which allows user to easily adjust lens positioning and diffuser plates when necessary.

- 3 diffuser plates (Clear, Semi-diffuse, Diffuse) are included to create a suitable balance between power and homogeneity.
- 4 adjustable lens positions to easily change the emission angle from 90° to 10°.
- Integrated controller for dimming or auto-strobe functionality. In case of Auto-strobe, it offers 700% increased intensity in strobe mode as compared to continuous operation.
- Easy-to-use standard M12 connector.
- Robust design with IP67 rating to overcome challenging working environments.

Common uses: Harsh working environments, where dust and water are constant factors.

Color	UV	Blue	Green	Red	IR	White (T°= 5500 k ± 500 K)
Wavelength (nm)	405	465	525	625	850	000

Position	P0	P1	P2	P3
Angle	90° Without lens	45°	25°	10°



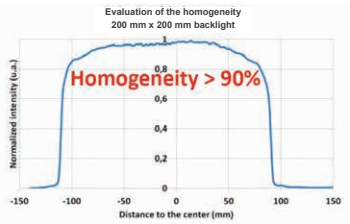
FLOOD TYPE BACK LIGHT

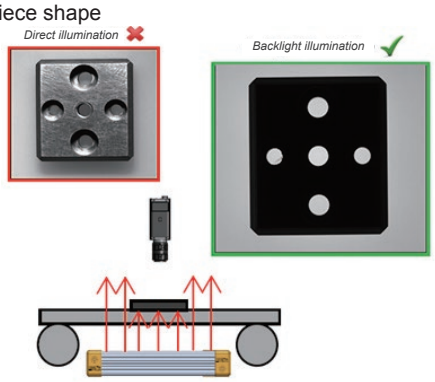
High performance back light offers exceptional contrast, high intensity & uniformity to provide a superior solution for strobed or continuous backlight inspections.

- Excellent uniformity (>90%).
- Anti-reflection system to absorb unwanted reflections from interfering light.
- Built-in dimming controller offers convenient and precise Analog Intensity Control.
- Easy-to-use M12 connector.
- Easy to mount with the built-in T-slot profile.
- Robust design for challenging inspection environments.

Common uses: Inspection which requires high accuracy measurement of work piece shape

Color	Blue	Green	Red	IR	White (T°= 5500 k ± 500 K)
Wavelength (nm)	465	525	625	850	000





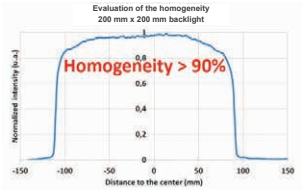
FLAT LIGHT WITH CAMERA HOLE

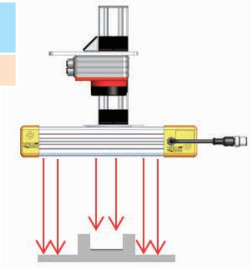
High-power flat light with camera hole offers high uniformity plus an integrated intensity controller. This light is an ideal front light for highly reflective work pieces and applications with a large field of view or mechanical constraints.

- Excellent uniformity (>90%).
- Anti-reflection system to absorb unwanted reflections from interfering light.
- Built-in dimming controller offers convenient and precise Analog Intensity Control.
- Strobe or Continuous use.
- Easy-to-use M12 connector.
- 39 mm standard size camera hole.

Common uses: Inspection with large FOV on reflective surfaces.

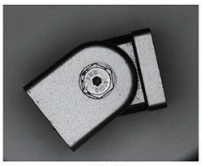
Color	Blue	Red	IR	White (T°= 5500 k ± 500 K)
Wavelength (nm)	465	625	850	000






Inspected part


Inadequate lighting


Dome lighting

3D PATTERN PROJECTOR

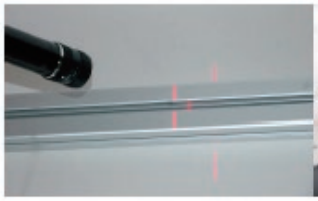
LED based structured LED pattern projector retains all the advantages of LEDs compared to laser sources (e.g. pattern uniformity and sharpness, eye safety, lifetime issues).

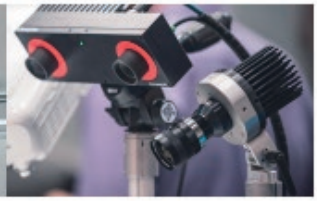
- Ultra-high power, superior homogeneity, sharp edges, speckle-free.
- Multiple interchangeable patterns with wide depth of field.
- Dedicated cloud of dots pattern mask for body scanning and stereo vision.
- Compatible with most lenses (C-Mount, E-Mount) to change the size of the projection area.
- Strobe mode and trigger mode are customizable to fit application needs.
- Full range of wavelengths (UV, visible, IR).

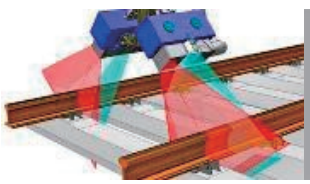
Common uses: 3D profilometry, body scanning, stereo vision, bin picking in robotics, alignment applications

Color	UV		Blue	Green	Red	IR	White (T°= 5500 k ± 500 K)
Wavelength (nm)	365	395	405	465	525	625	850	000

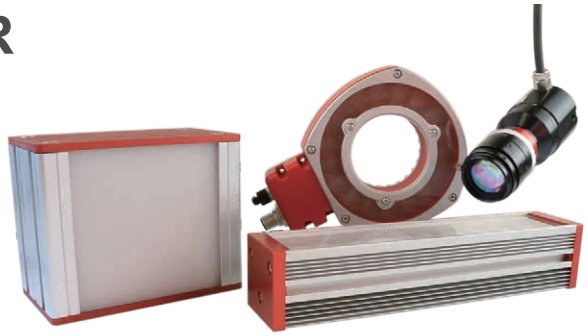
Name	Line	Cloud	Grid
Mask			

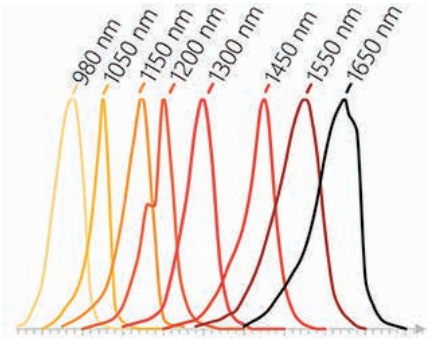






SWIR





Thanks to the innovative high-power LED SWIR source developed by EFFILUX, our full range of SWIR lighting solutions can be well adapted to different cameras, overcoming the current limitations of common lighting and taking machine vision inspection to the next level.

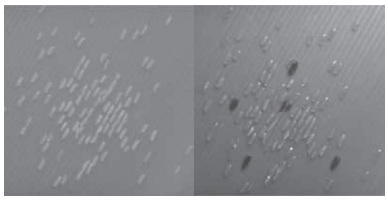
- Great lifetime and no excessive warm up.
- Perfect stability and reliability for repetitive tasks and measurements.
- Speckle free light source, thanks to LED-based technology.
- Quick pulse is achievable as a result of quick response time.
- Fully safe for human eyes, in contrast to laser source.
- Low power consumption as a result of great energy efficiency design.

In partnership with the French Institute of Optics, EFFILUX developed an innovative LED SWIR source - SWIR H.O.P. (High Optical Power) Technology, based on a proprietary material that emits SWIR light, which is designed to deliver high output power.

The SWIR H.O.P. Technology retains all the advantages of LEDs compared to halogen or laser sources, with huge improvements in power and the flexibility to create both highly focused SWIR beams, as well as large area uniform SWIR illumination. In fact, one “chip” of the H.O.P. Technology emits a luminous flux comparable to a 50 W halogen source.

- Cost efficient: many expensive SWIR LEDs can be replaced by a single H.O.P. “chip” to achieve the same output power, resulting in lower costs for system builders.
- Superior optical performances and flexibility: User can project any pattern required on illuminated objects from short working distances (focused light) to far working distances (5 meters)
- Compact size with high level of adaptability: Can be integrated easily into a variety of illuminators.
- Exceptionally powerful LED SWIR source: To reveal the invisible phenomena that usual LED systems could not.

Common uses: Water detection (agriculture, food, medical/biotech), opaque materials inspection (plastics, silicon, solar cells etc), fill level, security, see through smoke, fog, dust, etc.

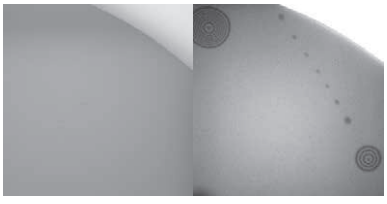


Visible *SWIR*

Dry vs Wet rice

Visible *SWIR*

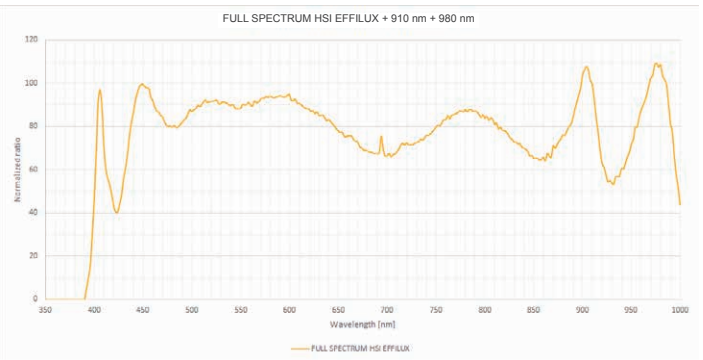
Isopropanol / Water / Acetone



Visible *SWIR*

Wafer Bonding Inspection

HYPERSPECTRAL & MULTISPECTRAL



With CCS & EFFILUX combined expertise in optics & LEDs and a close collaboration with hyperspectral camera manufacturers, EFFILUX offers the best solution to fit any specific need.

- Single LED technology with the most broadband spectrum (400 - 1000 nm).
- Highly flexible and can be integrated for any lighting solution.
- Ideal for collimated line light bar for line scan hyperspectral cameras, backlight or spotlight for area scan sensors.
- Excellent uniformity both spectrally and spatially.

Common uses: Quality control, information transmission to robotic actuators, automated picking and sorting of commodities.

Collimated line light bar for line scan hyperspectral cameras

Backlight for area scan sensors

“Spot” concept for area scan sensors

MANUFACTURER

EFFILUX, a member of the CCS Group with headquarters in Paris, specializes in the design, manufacturing and sales of powerful, flexible and easy-to-use LED lighting solutions for machine vision applications. EFFILUX differentiates itself through cutting-edge flexible LED lighting design, more than 35 years of optical experience, extensive technical expertise, strong customization capabilities, and comprehensive lighting solutions with superior quality.

TALK TO THE EXPERTS

For more information about EFFILUX’s products and solutions, please contact your nearest CCS sales representative or check the relevant product pages on ccs-grp.com.

Warranty Warranty for this product differs from standard CCS lights. Contact our local sales office for details.

GARDASOFT
Machine Vision Control

Gardasoft Vision design and manufacture high-performance lighting pulse controllers, LED strobe controllers, liquid lens controllers and timing controllers for machine vision applications. Our products include stand-alone units and embedded solutions to lighting control, lens control and timing control and we offer a custom design service.

Constant Current Lighting Controllers and Machine Vision Component Controllers

The Gardasoft Vision range of controllers for machine vision includes a large range of LED lighting controllers as well as machine vision timing controllers and controllers for associated machine vision components such as deformable (liquid) lenses.

Lighting control

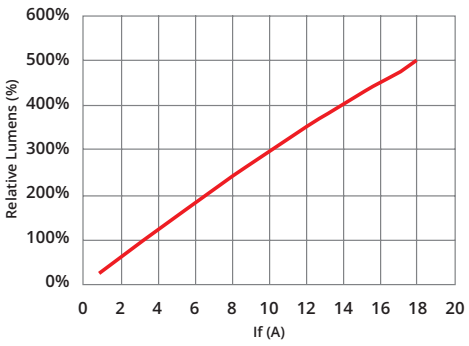
Gardasoft controllers are uniquely versatile and every unit can drive a wide range of LED types including 24V and 12V lights. There are suitable controllers for end users, system integrators and OEMs. All controllers are based on an advanced, current-drive technology and provide a versatile alternative to controllers based on voltage drive or voltage drive with pulse width modulation (PWM). The constant-current drive creates a very stable and dependable brightness and some ranges have additional safety functionality to protect the light from misuse.

All Gardasoft lighting controllers provide three modes of operation

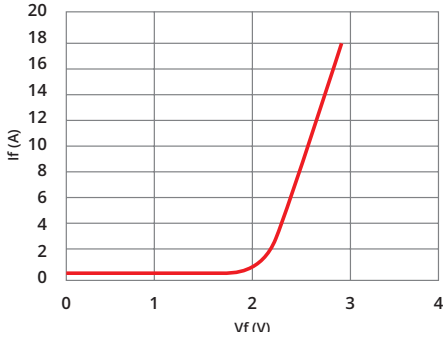
- constant (always on) mode
- switched mode, where the light is turned on and off by a precise external signal
- strobed (pulsed) mode, where the light is briefly turned on with a specific timing, sometimes at very high speed. Overdriving, by pulsing under specific conditions, provides the ability to get extra brightness from the light

Many of the controllers offer Ethernet and GigE Vision connectivity for simple external control and set-up and easy networking with other machine vision components. Specialist applications may require the additional capabilities provided by some controllers in the range. For example, the FP, HT, RTCC controllers have extra timing & sequencing capability for cases when user wants to include encoders, reject gates, variable timing or logic in their application and the FP controller is also designed for very fast, transient lighting pulses.

Relative Output Flux vs. Forward Current
20ms, single pulse, Tj-25C



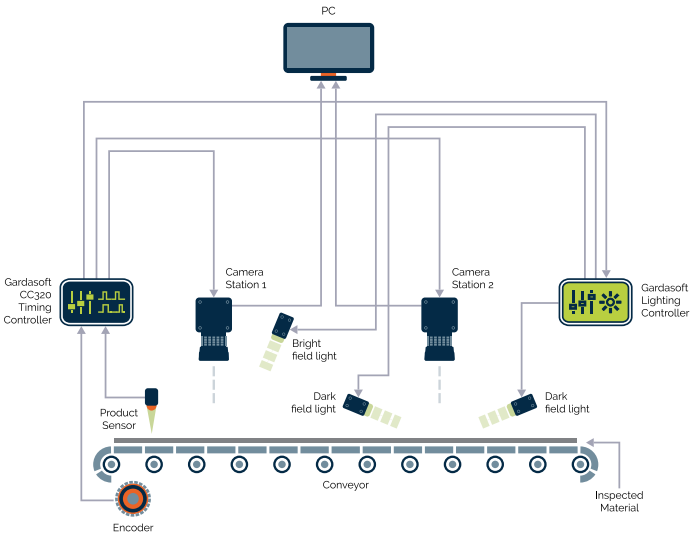
Forward Current vs. Forward Voltage
20ms, single pulse, Tj-25C



Machine vision sequencing and control

When a number of devices must be accurately sequenced in a machine vision system, the CC320 timing controller provides an easy, effective solution for accurate timing of machine vision components. It offers the functionality of a high-performance PLC and allows devices such as lighting, cameras, proximity sensors, reject gates and encoders to be configured with precise timings or on exact conveyor belt travel without expensive and complex PLC products. Trigger timing capability has also been incorporated into many lighting controllers.

Typical line scan system with bright field and dark field inspection



High-speed liquid lens focusing

Liquid, or focus-tunable lenses are able to focus very rapidly. They have clear advantages over traditional optics and are suitable for diverse applications including robotics, packaging equipment, logistics and unmanned vehicles (UAVs). The TR-CL lens controllers are suitable for both machine vision and traffic applications and are designed specifically for Optotune liquid lenses. They allow precise change of focus over a wide range of distances in under 10ms.

Lighting Controllers

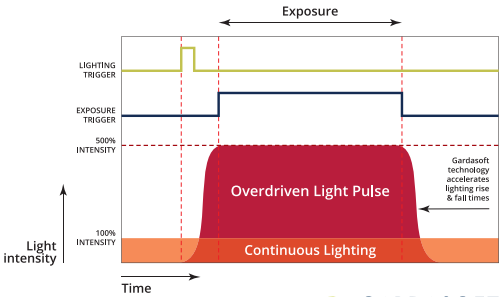
Gardasoft constant current lighting controllers provide direct control of LED illumination intensity from a steady, controllable current flow through the light. This precise control of current enables consistent light levels to be achieved which help guarantee accurate, repeatable machine vision measurements.
All lighting controllers can drive both 24V and 12V LEDs. In addition to continuous operation and an on/off switched mode using an external trigger signal, all controllers can also operate in pulsed mode:

- Accurate, high-speed pulsing (strobing) of light enables objects moving at high speed to be frozen in time. The fine timing adjustment of the controllers is normally far more precise than internal camera timing.

- Precise control of the pulse width, frequency and intensity of illumination enables the light to safely be "overdriven". This can create short pulses of illumination that are up to 5x brighter than the manufacturer's specified maximum for that light.

Gardasoft Lighting Controllers

Obtain 5x LED Intensity With Strobed Lighting



Controllers are available with up to sixteen lighting output channels and a choice of other parameters such as external communication interface and maximum current rating per channel. Pulse widths down to 1µs and maximum trigger frequencies up to 100kHz can be achieved. Multi-channel controllers have internal sequencing capabilities to enable multiple lights to be triggered individually at different intensities and durations in a pre-defined sequence. This permits multiple quality measures at a single camera station.

These features make these lighting controllers extremely adaptable and an excellent choice for almost every application, including line scan imaging. For line scan imaging, the controller can enable capture information from two different illumination schemes simultaneously, so saving costs and improving throughput.

Warranty Warranty for this product differs from standard CCS lights. Contact our local sales office for details.

Gardasoft Lighting Controllers

Gardasoft is the world's leading provider of precision control for machine vision applications. Since the company launched the first machine vision lighting controller with LED overdrive in 2001, Gardasoft has grown to become the global supplier of machine vision lighting control equipment.

The versatile Gardasoft lighting controllers are compatible with all major brands of illumination and include sequencing capability. The controllers are powerful and conform to the popular machine vision communications protocols, including GigE Vision, GenICam, I2C, SPI, UART and other embedded serial protocols.

Gardasoft custom designs can be embedded inside lighting, vision systems, robotics and other automation and industrial equipment. Gardasoft collaborates with equipment manufacturers throughout the world to provide custom solutions which are powerful and compact, and help create unique solutions for the end user.

RC/RT controllers

The RC is an entry level single channel controller while the RT Series is available with 2, 4 and 8 channel versions. All RT controllers have a maximum trigger frequency of 1 kHz and a minimum pulse width of 1 or 20 µs. RTCC versions have integrated trigger timing and sequencing capabilities to provide trigger outputs where encoders, reject gates, variable timing or logic need to be included.

HT high power controllers

HT controllers are designed for driving high power LED area and bar lights. With unique switching technology, these controllers have 2 independent output channels, each rated at 150W and each capable of driving 50A in pulsed mode and 5A in continuous mode. These controllers also have integrated trigger timing and sequencing capabilities.

FP high-speed controller

The FP220 2-channel controller features a unique output drive technology which can create very fast, accurate light pulses. It provides high-speed, high-power pulsing with low power dissipation, as well as very stable low-current performance down to less than 1mA It has particular benefits in high-speed pulsing applications such as line scan and high-power, long-pulse systems such as UV curing. This controller also has integrated trigger timing and sequencing capabilities.

PP lighting controllers

The PP range of high performance lighting controllers are designed for volume applications for OEMs. Appropriate power supplies for the application can be designed into the machine itself, removing the need for power management in the controller, making the PP Series highly cost-competitive per channel. PP Series controllers are available in 2, 4, 8 and 16 channel versions with a maximum output of 96 W/channel and maximum trigger frequency of 100 kHz. These versatile controllers also offer special firmware options for advanced sequencing of multiple lights.

PPCC controllers

PPCC versions have integrated trigger timing and sequencing capabilities to provide trigger outputs where encoders, reject gates, variable timing or logic need to be included in the application.

SafeSense™

SafeSense™ technology accurately calculates the maximum overdrive that's available, depending on the type of light, the frequency and the duty cycle. The controller automatically imposes safe working limits to prevent possible damage to the LED while delivering the maximum light possible for the application.

SafePower™

SafePower™ technology makes installation very easy by removing the need of having to use a bespoke DC power supply or heat sinking the controller. SafePower™ allows any light to be operated via a standard 24 VDC power supply and allows LEDs to be overdriven without having to increase the input power supply voltage.

Sequence Control

CC320 timing controller

The CC320 trigger timing controller enables high speed synchronization and sequencing of machine vision devices through flexible triggering of lights, lighting controllers, cameras, proximity sensors, encoders and reject gates to generate an automated production line solution without the need for expensive PLC solutions. The ultra-high-speed triggering and sequencing design allows the CC320 to achieve response times far exceeding the performance of standard PLCs.

- Eight digital inputs and eight digital outputs
- Each output can be individually configured to create precision triggers based on a combination of input signals.
- Timing can be based on precise delays or on an exact conveyor belt travel by using an encoder to measure belt movement. A trigger delay is available in case it's necessary to filter noisy trigger signals.
- Multiple cameras can be triggered at different times with the duration of the trigger signal controlling the illumination time and camera exposure time.
- Ethernet enabled. An internal web server allows the CC320 be fully controlled via image processing software on a remote PC.

Lens Control

TR-CL180 industrial lens controller

The TR-CL180 single-channel industrial liquid lens controller, developed in close collaboration with Optotune, provides very accurate and repeatable control of Optotune tunable lenses. Liquid lenses can easily be added to a standard imaging system to increase the versatility of the system eliminating the need for multiple objectives and cameras.

- Compatible with Optotune EL-10-30-Ci and EL-16-40-TC and EL-3-10 lenses
- No need to adjust focus manually
- Lens adjustment in less than 10 ms
- Includes constant current Lens drive and Lens EEPROM data communications
- -400mA to +400mA in 0.1mA steps
- Full current calibration with lens temperature compensation

Applications include postal sorting, robotics, packaging equipment, logistics and unmanned vehicles (UAVs) and microscopy and life sciences.
A National Instruments LabVIEW Utility available for the TR-CL Series is particularly relevant for applications in these sectors such as Z slices, Light sheet imaging, In vivo (live tissue) imaging, and many types of automated imaging.

Warranty Warranty for this product differs from standard CCS lights. Contact our local sales office for details.

GARDASOFT Products

Controller Selection Guide

Product	CHANNELS AND TRIGGERING			OUTPUT & PULSING							ADVANCED FEATURES	COMMUNICATION INTERFACES			
				Maximum Current Rating Per Channel			Power		Pulsing						
	Channels	Advanced Trigger Timing	Trigger o/ps	Continuous (A)	Pulsed (A)	Resolution (mA)	Max o/p Power per Channel (W)	Max o/p Power per Controller (W)	Min pulse width (µS)	Max Trigger Frequency	SafeSense™ SafePower™	P-Button	Ethernet	RS232	GigE Vision
RC Series Entry-Level Controllers															
RC100	1	-	-	1	1	3	25	25	100	100 Hz	•	•	-	-	-
RC120	1	-	-	1.2	2	3	25	25	100	100 Hz	•	•	•	-	•
TR-RC Triniti Controllers															
TR-RC120	1	-	-	1.2	2	3	25	25	100	100 Hz	•	•	•	-	•
TR-RC122	1	-	-	1.2	7	3	30	30	100	100 Hz	•	•	•	-	•
RT Series Versatile Lighting Controllers															
RT200-2	2	-	-	2	2	1	30	40	20	1 kHz	•	•	-	-	-
RT200-20	2	-	-	3	20	5	30	40	20	1 kHz	•	•	-	-	-
RT200F-2	2	-	-	2	2	1	30	40	1	1 kHz	•	•	-	-	-
RT200F-20	2	-	-	3	20	5	30	40	1	1 kHz	•	•	-	-	-
RT220-2	2	-	-	2	2	1	30	40	20	1 kHz	•	-	•	-	•
RT220-20	2	-	-	3	20	5	30	40	20	1 kHz	•	-	•	-	•
RT220F-2	2	-	-	2	2	1	30	40	1	1 kHz	•	-	•	-	•
RT220F-20	2	-	-	3	20	5	30	40	1	1 kHz	•	-	•	-	•
RT260-2	2	-	-	2	2	1	30	40	20	1 kHz	•	-	-	•	-
RT260-20	2	-	-	3	20	5	30	40	20	1 kHz	•	-	-	•	-
RT260F-2	2	-	-	2	2	1	30	40	1	1 kHz	•	-	-	•	-
RT260F-20	2	-	-	3	20	5	30	40	1	1 kHz	•	-	-	•	-
RT420-2	4	-	-	2	2	1	30	50	20	1 kHz	•	-	•	-	•
RT420-20	4	-	-	3	20	5	30	50	20	1 kHz	•	-	•	-	•
RT420F-2	4	-	-	2	2	1	30	50	1	1 kHz	•	-	•	-	•
RT420F-20	4	-	-	3	20	5	30	50	1	1 kHz	•	-	•	-	•
RT460-2	4	-	-	2	2	1	30	50	20	1 kHz	•	-	-	•	-
RT460-20	4	-	-	3	20	5	30	50	20	1 kHz	•	-	-	•	-
RT460F-2	4	-	-	2	2	1	30	50	1	1 kHz	•	-	-	•	-
RT460F-20	4	-	-	3	20	5	30	50	1	1 kHz	•	-	-	•	-
RT820F-2	8	-	-	2	2	1	30	100	1	1 kHz	•	-	•	-	-
RT820F-20	8	-	-	3	20	5	30	100	1	1 kHz	•	-	•	-	-
RT860F-2	8	-	-	2	2	1	30	100	1	1 kHz	•	-	-	•	-
RT860F-20	8	-	-	3	20	5	30	100	1	1 kHz	•	-	-	•	-
TR-RT Triniti Lighting Controllers															
TR-RT220-2	2	-	-	2	2	1	30	40	20	1 kHz	•	-	•	-	•
TR-RT220-20	2	-	-	3	20	5	30	40	20	1 kHz	•	-	•	-	•
TR-RT220F-2	2	-	-	2	2	1	30	40	1	1 kHz	•	-	•	-	•
TR-RT220F-20	2	-	-	3	20	5	30	40	1	1 kHz	•	-	•	-	•
TR-RT420-2	4	-	-	2	2	1	30	50	20	1 kHz	•	-	•	-	•
TR-RT420-20	4	-	-	3	20	5	30	50	20	1 kHz	•	-	•	-	•
TR-RT420F-2	4	-	-	2	2	1	30	50	1	1 kHz	•	-	•	-	•
TR-RT420F-20	4	-	-	3	20	5	30	50	1	1 kHz	•	-	•	-	•
RTCC Versatile Lighting Controllers with Trigger Timing Control															
RTCC420-2	4	•	4	2	2	1	30	50	20	1 kHz	•	-	•	-	•
RTCC420-20	4	•	4	3	20	5	30	50	20	1 kHz	•	-	•	-	•
RTCC420F-2	4	•	4	2	2	1	30	50	1	1 kHz	•	-	•	-	•
RTCC420F-20	4	•	4	3	20	5	30	50	1	1 kHz	•	-	•	-	•
RTCC460-2	4	•	4	2	2	1	30	50	20	1 kHz	•	-	-	•	-
RTCC460-20	4	•	4	3	20	5	30	50	20	1 kHz	•	-	-	•	-
RTCC460F-2	4	•	4	2	2	1	30	50	1	1 kHz	•	-	-	•	-
RTCC460F-20	4	•	4	3	20	5	30	50	1	1 kHz	•	-	-	•	-

PP Series Lighting Controllers for Volume Applications

PP4, PP5 OEM Lighting Controllers

	CHANNELS AND TRIGGERING			OUTPUT & PULSING							ADVANCED FEATURES	COMMUNICATION INTERFACES			
				Maximum Current Rating Per Channel			Power		Pulsing						
	Channels	Advanced Trigger Timing	Trigger o/ps	Continuous (A)	Pulsed (A)	Resolution (mA)	Max o/p Power per Channel (W)	Max o/p Power per Controller (W)	Min pulse width (µS)	Max Trigger Frequency	SafeSense™ SafePower™	P-Button	Ethernet	RS232	GigE Vision
PP420	4	-	-	2	10	3	96*	96	20	25 kHz	SafeSense	-	●	-	-
PP420F	4	-	-	2	10	3	96*	96	1	50 kHz	SafeSense	-	●	-	-
PP500	2	-	-	2	10	3	96*	96	20	25 kHz	SafeSense	●	-	-	-
PP500F	2	-	-	2	10	3	96*	96	1	50 kHz	SafeSense	●	-	-	-
PP520	2	-	-	2	10	3	96*	96	20	25 kHz	SafeSense	●	●	-	-
PP520F	2	-	-	2	10	3	96*	96	1	50 kHz	SafeSense	●	●	-	-

PP8, PP16 High Performance, 8-channel & 16-channel controllers for fast applications

PP820	8	-	-	2	20	100	96*	576	1	100 kHz	-	-	●	-	-
PP820C	8	-	-	2	20	5	96*	576	1	100 kHz	-	-	●	-	-
PP821	8	-	-	2	2	10	96*	576	1	100 kHz	-	-	●	-	-
PP821C	8	-	-	2	2	0.5	96*	576	1	100 kHz	-	-	●	-	-
PP822	8	-	-	2	5	25	96*	576	1	100 kHz	-	-	●	-	-
PP822C	8	-	-	2	5	1.5	96*	576	1	100 kHz	-	-	●	-	-
PP860	8	-	-	2	20	100	96*	576	1	100 kHz	-	-	-	●	-
PP860C	8	-	-	2	20	5	96*	576	1	100 kHz	-	-	-	●	-
PP861	8	-	-	2	2	10	96*	576	1	100 kHz	-	-	-	●	-
PP861C	8	-	-	2	2	0.5	96*	576	1	100 kHz	-	-	-	●	-
PP862	8	-	-	2	5	25	96*	576	1	100 kHz	-	-	-	●	-
PP862C	8	-	-	2	5	1.5	96*	576	1	100 kHz	-	-	-	●	-
PP1620	16	-	-	2	20	5	96*	576	1	100 kHz	-	-	●	-	-
PP1621	16	-	-	2	2	1	96*	576	1	100 kHz	-	-	●	-	-
PP1660	16	-	-	2	20	5	96*	576	1	100 kHz	-	-	-	●	-
PP1661	16	-	-	2	2	1	96*	576	1	100 kHz	-	-	-	●	-

PPCC16 High Performance, 16-channel controllers with trigger timing control

PPCC1620	16	●	8	2	20	5	96*	576	1	100 kHz	-	-	●	-	-
PPCC1621	16	●	8	2	2	1	96*	576	1	100 kHz	-	-	●	-	-
PPCC1660	16	●	8	2	20	5	96*	576	1	100 kHz	-	-	-	●	-
PPCC1661	16	●	8	2	2	1	96*	576	1	100 kHz	-	-	-	●	-

***Theoretical output**

High Speed and High-Power Controllers

FP220	2	●	4	3	20	0.1/5	30	60	1	10 kHz	●	-	●	-	●
TR-HT220-50	2	●	4	5	50	0.6/15	150	300	1	30 kHz	●	-	●	-	●
TR-HT260-50	2	●	4	5	50	0.6/15	150	300	1	30 kHz	●	-	-	●	-

Trigger Timing Controller

	Digital Inputs	Digital Outputs						P-Button	Ethernet	RS232	GigE Vision
CC320	8	8	-	-	-	-	-	●	●	-	-

Optotune Liquid Lens Controllers

	Input	Output						P-Button	Ethernet	RS232	GigE Vision
TR-CL180	Digital (3V-24V)	-400mA									
	Analogue (0-10V)	to +400mA	-	-	-	-	-	●	●	●	●

triniti™ Gardasoft Technology

CCS Creating Customer Satisfaction

triniti™ technology

Expert control of Machine Vision lighting… made easy

triniti™ is a new, enabling technology from Gardasoft, which provides expert control, operational intelligence and full integration of Machine Vision Lighting — all within a 'plug-&-play' environment.

With **triniti**, Machine Vision systems with LED Lighting are now much easier to create, configure and commission, while, at the same time, offering increased functionality.

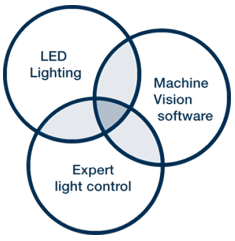
This is because complex control techniques have now been made very easy to implement.

triniti delivers many benefits to users, including that it:

- enables non-expert users to use expert Machine Vision lighting techniques
- revolutionises the integration of lighting parameters right through to application level software
- addresses the industry's identified need for a highly flexible system that is also readily 'plug-&-play'
- provides a stability of brightness, long-term, that helps to enhance the reliability of Machine Vision systems, over many years.

Interworking between Machine Vision product manufacturers

As a system-enabling technology, **triniti** embraces a collaborative approach with leading manufacturers of LED Lighting and providers of Machine Vision software.



LED Lighting - CCS is one of the world's most prominent Machine Vision product manufacturers; CCS is also one of the leading triniti partners for LED Lighting.

CCS Creating Customer Satisfaction

Machine Vision APIs - The triniti API is compatible with Image Processing Software from leading suppliers.

triniti™ comprises three key technological elements:

1 Integration of Lights into software

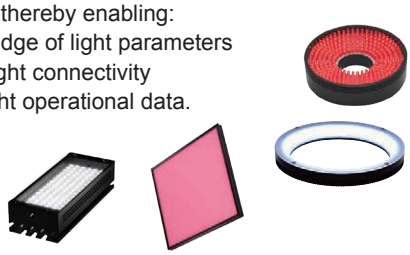
triniti-enabled LED lights are seamlessly integrated into Machine Vision networks, providing diagnostic and configuration benefits through imaging and application processing software.

2 Expert Light Control

triniti systems incorporate the control functionality of Gardasoft Vision's patented LED light controller technology, in either discrete or embedded form.

3 Light Identification and Operational Data

triniti chips are mounted into partner lights or light cabling, thereby enabling:
- knowledge of light parameters
- easy light connectivity
- and light operational data.

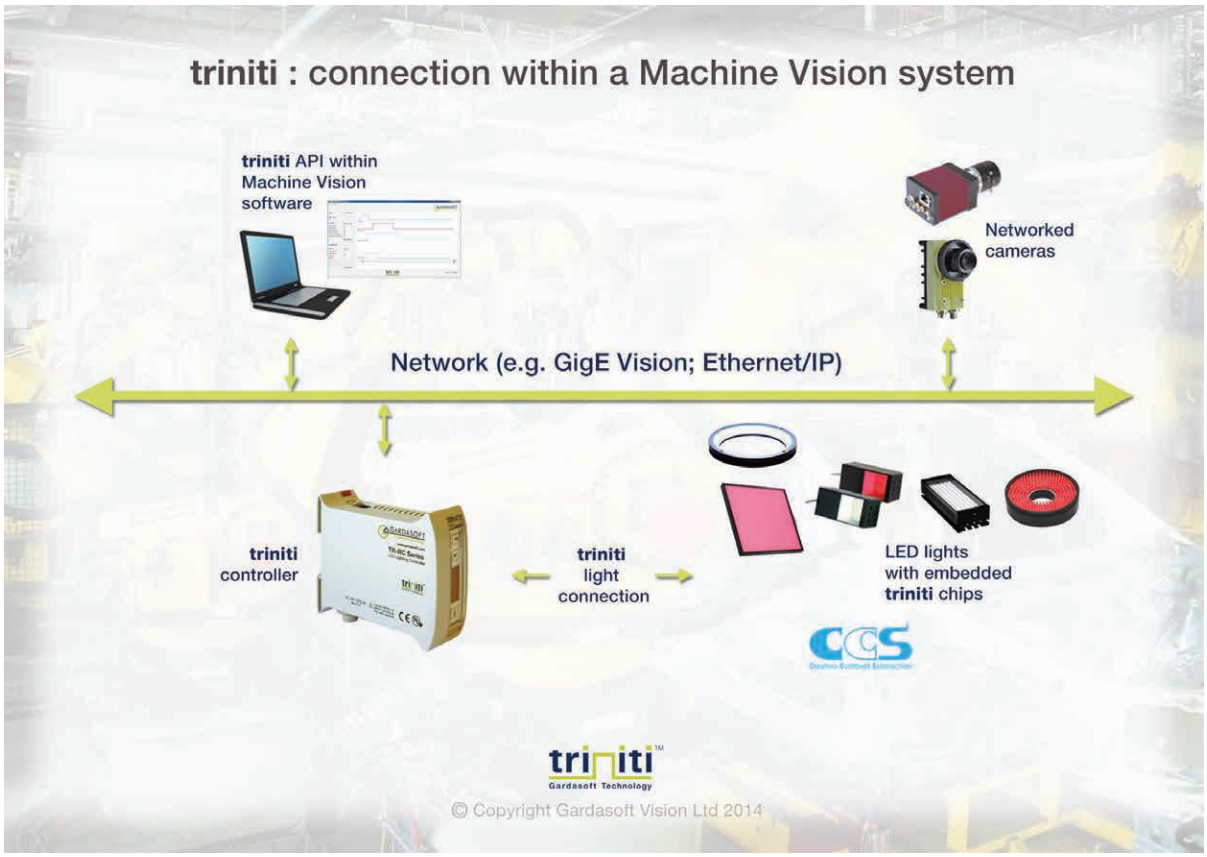


A Collaboration of Machine Vision manufacturers: LED lighting; image processing software; expert light control

triniti™ products and developments

As part of the collaborative development programme, **triniti** deliverables include core hardware and software elements that are integrated with, or embedded into, products from leading LED Light hardware and Machine Vision software manufacturers.

triniti also exploits standard Machine Vision networking and communication architectures such as **GigE Vision** and **GenICam**, in order to ensure that the resulting solutions are fully integrated as follows:



a) triniti Machine Vision Software Interface (API)

triniti-enabled LED lights are seamlessly integrated into Machine Vision networks and provide diagnostic and configuration benefits through Image Processing Software.

b) triniti Protocols

The **GigE Vision** protocol has been implemented in the **triniti** controllers so that intelligent cameras and applications and libraries which support **GigE Vision** or GenICam can interface directly to **triniti** controllers.

c) triniti Controller

These are LED light controllers which inherit the patented Gardasoft functionality, and combine this with **triniti** communication and GigE Vision compatibility.

d) triniti Chip

The **triniti** chip has been built into partners' lights or light cabling. It holds manufacturer's data on the lights, stores dynamic usage data and can return measurements from sensors within the light.

triniti-enabled LED Lights

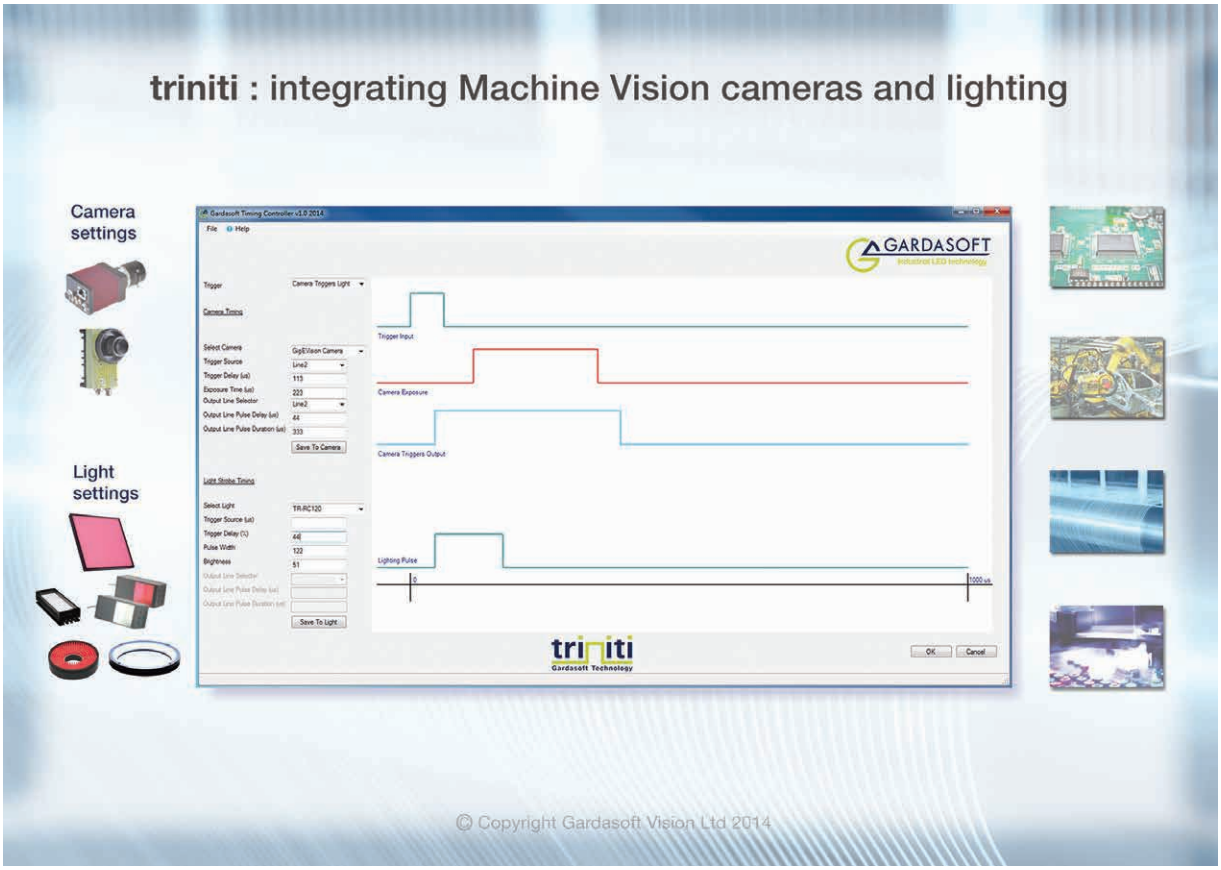
triniti™ provides APIs for integration with Image Processing Software

triniti offers much closer integration of lighting to the application level. This is done by providing links from the applications to the light through industry-standard protocols and software APIs for specific environments.

triniti API extensions are available for leading Machine Vision software for Image Processing and System configuration — with the result that a full graphical interface is provided to the user for configuration and synchronisation between GigE Vision (and other cameras) and lighting.

By integrating camera and lighting configuration and control at the application level, the operation of the system as a whole can be more visible.

For example, a timing diagram (like the below example) showing the timing of the trigger source, camera exposure time and lighting pulses, can be shown on-screen, to make it much easier for both development and diagnostics.



triniti™ gives expert control

With **triniti**-enabled lighting, users benefit from having expert control techniques for their lighting systems readily available — with an ease-of-use more typically associated with 'plug-&-play' products.

Functional advantages include enhanced overdrive and pulse control, and flexible light switching and synchronisation. (Note: refer to **CCS** – www.ccs-grp.com – for specific details.)

'Plug-&-play' customer benefits include:
Optimum application settings for lighting are easy to configure, multiple light systems are easy to manage, and automatic adjustment can maintain more stable brightness over many years of operation.

Expert customer benefits include:
Machine Vision functionality is increased, as performance is improved, and the potential of camera and lighting equipment can be fully exploited. This means that system reliability is maximised, and at the same time, services to end users can be extended and enhanced.

triniti Products

Model Name	Led Color	Wavelength/ Correlated Color temp.	Options		Weight (g)
Ring Lights					
LDR2-32RD2-TR	Red	630 nm	Diffusion plate Polarization plate	Lens attachment ring	30
LDR2-32SW2-TR	White	5,500 K	Diffusion plate Polarization plate	Lens attachment ring	30
LDR2-42RD2-TR	Red	630 nm	Diffusion plate Polarization plate	Adapter	50
LDR2-42SW2-TR	White	5,500 K	Diffusion plate Polarization plate	Adapter	50
LDR2-50RD2-TR	Red	630 nm	Diffusion plate Polarization plate	Lens attachment ring	50
LDR2-50SW2-TR	White	5,500 K	Diffusion plate Polarization plate	Lens attachment ring	50
LDR2-70RD2-TR	Red	630 nm	Diffusion plate	Polarization plate	110
LDR2-70SW2-TR	White	5,500 K	Diffusion plate Polarization plate		120
LDR2-74RD2-LA-TR	Red	630 nm	Diffusion plate		90
LDR2-74SW2-LA-TR	White	5,500 K	Diffusion plate		90
LDR2-100RD2-LA-TR	Red	630 nm	Diffusion plate		170
LDR2-100SW2-LA-TR	White	5,500 K	Diffusion plate		170
LDR2-132RD2-LA-TR	Red	630 nm	Diffusion plate		270
LDR2-132SW2-LA-TR	White	5,500 K	Diffusion plate		270
HPR2-50RD-TR	Red	635 nm	Bracket		46
HPR2-50SW-TR	White	6,000 K	Bracket		46
HPR2-50BL-TR	Blue	470 nm	Bracket		46
HPR2-75RD-TR	Red	635 nm	Bracket		160
HPR2-75SW-TR	White	6,000 K	Bracket		160
HPR2-75BL-TR	Blue	470 nm	Bracket		160
HPR2-100RD-TR	Red	635 nm	Bracket		170
HPR2-100SW-TR	White	6,000 K	Bracket		170
HPR2-100BL-TR	Blue	470 nm	Bracket		170
Square Lights					
FPQ3-32RD-TR	Red	630 nm		-	50
FPQ3-32SW-TR	White	6,000 K		-	50
FPQ3-48RD-TR	Red	630 nm		-	85
FPQ3-48SW-TR	White	6,000 K		-	85
Bar Light					
LDL2-33X8RD-TR	Red	635 nm	Diffusion plate Polarization plate	Bracket	20
LDL2-33X8SW-TR	White	6,600 K	Diffusion plate Polarization plate	Bracket	20
LDL2-41X16RD-NR-TR	Red	635 nm	Diffusion plate Polarization plate	Protective plate Bracket	50
LDL2-41X16SW-NR-TR	White	6,600 K	Diffusion plate Polarization plate	Protective plate Bracket	50
LDL2-41X16RD-WD-TR	Red	635 nm	Diffusion plate Polarization plate	Protective plate Bracket	50
LDL2-41X16SW-WD-TR	White	6,600 K	Diffusion plate Polarization plate	Protective plate Bracket	50
LDL2-119X16RD-NR-TR	Red	635 nm	Diffusion plate Polarization plate	Protective plate Bracket	95
LDL2-119X16SW-NR-TR	White	6,600 K	Diffusion plate Polarization plate	Protective plate Bracket	95
LDL2-119X16RD-WD-TR	Red	635 nm	Diffusion plate Polarization plate	Protective plate Bracket	95
LDL2-119X16SW-WD-TR	White	6,600 K	Diffusion plate Polarization plate	Protective plate Bracket	95
LDL2-74X30RD-NR-TR	Red	635 nm	Diffusion plate Polarization plate	Protective plate Bracket	100
LDL2-74X30SW-NR-TR	White	6,600 K	Diffusion plate Polarization plate	Protective plate Bracket	100
LDL2-74X30RD-WD-TR	Red	635 nm	Diffusion plate Polarization plate	Protective plate Bracket	100
LDL2-74X30SW-WD-TR	White	6,600 K	Diffusion plate Polarization plate	Protective plate Bracket	100
Flat Lights					
TH2-27X27RD-TR	Red	635 nm	Light control film	Bracket	30
TH2-27X27SW-TR	White	5,800 K	Light control film	Bracket	30
TH2-43X35RD-TR	Red	635 nm	Light control film	Bracket	40
TH2-43X35SW-TR	White	5,800 K	Light control film	Bracket	40
TH2-51X51RD-TR	Red	635 nm	Light control film	Bracket	60
TH2-51X51SW-TR	White	5,800 K	Light control film	Bracket	60
TH2-63X60RD-TR	Red	635 nm	Light control film	Bracket	100
TH2-63X60SW-TR	White	5,800 K	Light control film	Bracket	100
TH2-83X75RD-TR	Red	635 nm	Light control film	Bracket	140
TH2-83X75SW-TR	White	5,800 K	Light control film	Bracket	140
TH2-100X100RD-TR	Red	635 nm	Light control film	Bracket	200
TH2-100X100SW-TR	White	5,800 K	Light control film	Bracket	200
Dome Lights					
HPD2-75RD-TR	Red	635 nm	Bracket		140
HPD2-75SW-TR	White	6,500 K	Bracket		140
HPD2-75BL-TR	Blue	470 nm	Bracket		140
HPD2-100RD-TR	Red	635 nm	Bracket		160
HPD2-100SW-TR	White	6,500 K	Bracket		160
HPD2-100BL-TR	Blue	470 nm	Bracket		160
Coaxial Lights					
LFV3-CP-18RD-TR	Red	635 nm		-	80
LFV3-CP-18SW-TR	White	6,000 K		-	80
LFV3-35RD-TR (A)	Red	635 nm	Diffusion plate Polarization plate	Light control film	175
LFV3-35SW-TR (A)	White	6,000 K	Diffusion plate Polarization plate	Light control film	175
LFV3-50RD-TR (A)	Red	635 nm	Diffusion plate Polarization plate	Light control film	335
LFV3-50SW-TR (A)	White	6,000 K	Diffusion plate Polarization plate	Light control film	335

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Guide to Selecting Control Units According to Functions

You can easily find and select the control unit you need.

Excluding the PSCC Series, PSB4 Series, and PSB3-30024.

PD4 Series	PD3 Series	PD2 Series	CC-ST-1024	POD Series	CN-EPOE Series	CN-4024-2-EIPT	PTU2 Series	PB-2430-1	PF Series
									 Dedicated Light Units ▶ P.143
Refer to P. 309 .	Refer to P. 317 .	Refer to P. 325 .	Refer to P. 345 .	Refer to P. 329 .	Refer to P. 339 .	Refer to P. 341 .	Refer to P. 333 .	Refer to P. 343 .	Refer to P. 335 .

★Control units recommended by CCS

▶ Search by Power Supply

AC input
- ★**PD4** Series
- ★**PD3** Series
- **PD2** Series

DC input
- ★**PD3** Series
- **CC-ST-1024**
- **CN-4024-2-EIPT**
- **PB-2430-1**

PoE input
- ★**CN-EPOE** Series

▶ Search by Output Voltage

24 V output
- ★**PD4** Series
- **PD3** Series
- **PD2** Series
- **CC-ST-1024**
- **CN-EPOE** Series
- **CN-4024-2-EIPT**
- **PB-2430-1**

12 V output
- **PD2** Series

▶ Search by Capacity

Actual capacity varies depending on the product. Refer to the corresponding product specifications for details.

- 100 W — ★**PD4** Series, **PD3** Series
- 50 W — ★**PD4** Series, **PD3/PD2** Series
- 40 W — **CN-4024-2-EIPT**
- 30 W — ★**PD3** Series, **PD2** Series **PB-2430-1**
- 10 W (Capacity) — ★**CC-ST-1024**, **CN-EPOE** Series, **PD2** Series

▶ Search by Number of Channels

- 1 2 3 4 5 6 7 8 — ★**PD3** Series
- 1 2 3 4 — ★**PD4** Series, **PD3** Series, **PD2** Series, **CN-EPOE** Series
- 1 2 — ★**PD4** Series, **CN-4024-2-EIPT**
- 1 (Number of channels) — ★**CC-ST-1024**, **PB-2430-1**

▶ Search by External Control

Parallel communication (If you want prompt control by receiving set values in a batch:)
- ★**PD4** Series
- **PD3** Series
- **PD2** Series

Serial communication EIA-485 (If you want to individually manage multi-drop wiring:)
- **PD3** Series

Ethernet communication TCP/IP UDP/IP (If you want to manage the control units from an upper level network:)
- ★**PD4** Series
- **PD3** Series
- **CN-EPOE** Series

Ethernet communication EtherNet/IP TCP/IP
- **CN-4024-2-EIPT**

▶ Search by ON/OFF Control

Continuous lighting (Use when continuously emitting light:)
- ★**PD4** Series
- **PD3** Series
- **PD2** Series
- **CC-ST-1024**
- **CN-EPOE** Series
- **CN-4024-2-EIPT**
- **PB-2430-1**

ON/OFF lighting (Use for emitting light only when necessary:)
- ★**PD4** Series
- **PD3** Series
- **PD2** Series
- **CC-ST-1024**
- **CN-4024-2-EIPT**

Strobe lighting (Use for emitting light momentarily:)

No overdrive
- ★**PD4** Series
- **PD3** Series
- **CC-ST-1024**
- **CN-EPOE** Series
- **CN-4024-2-EIPT** (Continuous emitting type)

If you want to emit light brighter than ON/OFF lighting or strobe lighting without overdrive:

Overdrive specifications

Light emission is made even brighter by increasing the output to light units for a short time.
- ★**POD** Series
- **CN-4024-2-EIPT**
- **PTU2** Series
- **PF** Series (Used with dedicated light units for strobe emitting) ▶ P.143

Guide to Selecting Control Units for the Spot Lights HLV Series

PD3 Series

Refer to P. 317 .

PJ2 Series

Refer to P. 347 .

PJ Series

Refer to P. 349 .

CC-PJ-0707

Refer to P. 351 .

Search by Output Voltage

Selection is not necessary.

Search by Capacity

If you want to use the HLV3 Series, check the input current of the spot light and select the applicable control unit.
Also note that you cannot connect multiple spot lights with a branch cable.

If you are connecting any light units other than the spot lights HLV Series to the PD3 Series, be sure to check that the total power consumption of the light unit is within the output power of the control unit before using.

★Control units recommended by CCS

*1 The PD3-3024-3 and PD3-5024-3 Series are not applicable to the spot lights HLV Series.
*2 The HLV3-4M/HLV3-4S/HLV3-22-4-NR/HLV3-3M-RGB-4 must be used with the PJ2 Series.

▶ Search by Power Supply

AC input
- ★**PD3** Series*1
- ★**PJ2** Series*2
- **PJ** Series

DC input
- ★**PD3** Series*1
- **PJ** Series
- **CC-PJ-0707**

▶ Search by Number of Channels

1	2	3	4	5	6	7	8	★**PD3** Series*1
1	2	3	4					★**PJ2** Series*2
1	2	3						**PJ** Series
1								★**CC-PJ-0707**

(Number of channels)

▶ Search by External Control

If you want to individually manage IP addresses from an upper level network:

Ethernet communication
TCP/IP UDP/IP
- ★**PD3** Series*1
- ★**PJ2** Series*2

If you want prompt control by receiving set values in a batch:

Parallel communication
- ★**PD3** Series*1
- ★**PJ2** Series*2

If you want to control intensity by analog voltage:

Analog input
- ★**PJ** Series

If you want to individually manage multi-drop wiring:

Serial communication
EIA-485
- ★**PD3** Series*1

▶ Search by Intensity Control Method

Variable-current control
- ★**PD3** Series*1
- ★**PJ2** Series*2
- **PJ** Series
- **CC-PJ-0707**

▶ Search by ON/OFF Control

Use when continuously emitting light:	Use for emitting light only when necessary:	Use for emitting light momentarily:
Continuous lighting	**ON/OFF lighting**	**Strobe lighting**
★**PD3** Series*1 ★**PJ2** Series*2 **PJ** Series **CC-PJ-0707**	★**PD3** Series*1 ★**PJ2** Series*2 **PJ** Series **CC-PJ-0707**	★**CC-PJ-0707** No overdrive

Refer to the Technical Guide on P. 400 for details regarding the technical structure and meanings of terminology for PWM, variable voltage and other types of control.

List of Control Unit Specifications

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Digital Control Units　Analog Control Units　Excluding the PF Series, PJ2 Series, PJ Series, and CC-PJ-0707.

Model name	PD4-6024-2-P	PD4-6024-2-E	PD4-6024-4-P	PD4-6024-4-E	PD4-12024-2-P	PD4-12024-2-E	PD4-12024-4-P	PD4-12024-4-E	PD3-3024-3-PI	PD3-3024-3-SI(A)	PD3-3024-3-EI(A)
Output voltage	24 V										
Output power	60 W				120 W				28 W		
No. of channels	2		4		2		4		3		
Lighting method	Continuous / Strobe lighting										
Intensity control method	PWM control / Lighting time control										
PWM frequency	125 kHz										
Intensity value	1,024 steps								256 steps		
Input voltage	100 to 240 VAC										
Frequency	50/60 Hz										
Power consumption	155 VA	152 VA	155 VA	152 VA	170 VA	168 VA	170 VA	168 VA	78 VA		
Parallel communication	○	—	○	—	○	—	○	—	○	—	—
EIA-485 communication	—	—	—	—	—	—	—	—	—	○	—
Ethernet	—	○	—	○	—	○	—	○	—	—	○
Analog input	—	—	—	—	—	—	—	—	—	—	—
Manual control	○	○	○	○	○	○	○	○	○	○	○
ON/OFF lighting	○	○	○	○	○	○	○	○	○	○	○
Strobe lighting	○ No overdrive										
Lighting time	0~992 µs (8 µs steps) or 0~40 ms (1 ms steps)								40 µs / 80 µs / 120 µs / 200 µs / 600 µs / 1 ms / 4 ms / 10 ms / 20 ms / 40 ms		
Lighting delay time	0~999 µs or 0~1,000 ms								10 µs max.		
CE marking	Not compliant with CE and UKCA (certification expected June 2023)								○		
Weight	1.5 kg								600 g		
Cooling method	Natural air cooling										
Mounting method	Bottom and DIN rail mounting										
Relevant page	P.309								P.317		

Model name	PD3-5024-4-PI(A)	PD3-5024-4-SI(A)	PD3-5024-4-EI(A)	PD3-10024-8-PI	PD3-10024-8-SI(A)	PD3-10024-8-EI(A)	PD3-3024-3-PT	PD3-3024-3-ET(A)	PD3-5024-3-PT	PD3-5024-3-ET(A)	PD3-5024-4-PT(A)	PD3-5024-4-ET(A)
Output voltage	24 V											
Output power	46 W			95 W			28 W		48 W		46 W	
No. of channels	4			8			3				4	
Lighting method	Continuous / Strobe lighting											
Intensity control method	PWM control / Lighting time control											
PWM frequency	125 kHz											
Intensity value	256 steps											
Input voltage	100 to 240 VAC						24 VDC					
Frequency	50/60 Hz						—					
Power consumption	70 VA			130 VA			32 W		52 W			
Parallel communication	○	—	—	○	—	—	○	—	○	—	○	—
EIA-485 communication	—	○	—	—	○	—	—	—	—	—	—	—
Ethernet	—	—	○	—	—	○	—	○	—	○	—	○
Analog input	—	—	—	—	—	—	—	—	—	—	—	—
Manual control	○	○	○	○	○	○	○	○	○	○	○	○
ON/OFF lighting	○	○	○	○	○	○	○	○	○	○	○	○
Strobe lighting	○ (No overdrive)											
Lighting time	40 µs / 80 µs / 120 µs / 200 µs / 600 µs / 1 ms / 4 ms / 10 ms / 20 ms / 40 ms											
Lighting delay time	20 µs max.						10 µs max.				20 µs max.	
CE marking	○											
Weight	1.2kg			1.5kg			400 g				850 g	
Cooling method	Forced air cooling						Natural air cooling				Forced air cooling	
Mounting method	Bottom and DIN rail mounting											
Relevant page	P.317											

Model name	PD2-1024(A)	PD2-3024(A)	PD2-3024-2(A)	PD2-3024-4(A)	PD2-3024-8(A)	PD2-5024(A)	POD-5024-2-PEI	POD-22024-4-PEI	CN-4024-2-EIPT
Output voltage	24 V						24 to 48 V (Overdrive mode)		24 to 48 V (Overdrive)
Output power	9 W	28 W		27 W	25 W	46 W	Refer to the spec. table on P.331 *1		Spec. table on P.342 *2
No. of channels	1		2	4	8	1	2	4	2
Lighting method	Continuous						Strobe lighting / Continuous		Strobe lighting / Continuous
Intensity control method	PWM control						Variable voltage control / PWM control		Lighting time control / PWM control
PWM frequency	62.5 kHz						125 kHz		125 kHz
Intensity value	256 steps						512 steps		512 steps
Input voltage	100 to 120 VAC	100 to 240 VAC							24 VDC
Frequency	50/60 Hz						50/60 Hz		—
Power consumption	27 VA	78 VA				122 VA	65 VA	260 VA	45W (average), 71.3W (peak)
Parallel communication	○	○	○	○	○	○	○		—
EIA-485 communication	—	—	—	—	—	—	—		—
Ethernet	—	—	—	—	—	—	○		○ *3
Analog input	—	—	—	—	—	—	—		—
Manual control	○	○	○	○	○	○	○		—
ON/OFF lighting	○	○	○	○	○	○	○		○
Strobe lighting	—						○ (With overdrive)		○ (With overdrive)
Lighting time	—						1~1,000µs (1µs steps)	1~3,000µs (See the spec. table.)	Refer to the user manual.
Lighting delay time	—						0~1,000µs (1µs steps)		0~10,000µs (1µs steps)
CE marking	—	○					○		○
Weight	700 g	1.1 kg		1.2 kg	1.5 kg	1.3 kg	1.5 kg	3.3 kg	500 g
Cooling method	Natural air cooling					Forced air cooling	Forced air cooling		Natural air cooling
Mounting method	Bottom mounting	Bottom and Side mounting					Bottom mounting		DIN rail mounting
Relevant page	P.325						P.329		P.341

*1, *2 Confirm the peak current of the light units and use them within the output current of the control unit. For information on possible combinations of light units with a control unit, please refer to our website.
https://www.ccs-grp.com/lnk/qr/pod
*3 EtherNet/IP and TCP/IP interfaces support

Model name	PTU2-3024(A)	CN-1024-2-EPOE	CN-1024-4-EPOE	CC-ST-1024	PSCC-30048(A)	PSCC-60048(A)	PSB4-30024-PEI	PSB4-60024-2-PEI	PSB3-30024
Output voltage	48 V	24 V		24 V	43 V		24 V		24 V
Output power	27 W	10W for total		10 W	300 W	600 W	300 W	300 W (Total for 1 ch)	300 W
No. of channels	2	2	4	1	1		1	2	1
Lighting method	Strobe lighting	Continuous / Strobe lighting		Continuous / Strobe lighting	Continuous lighting		Continuous lighting		Continuous lighting
Intensity control method	Lighting time control	PWM control / Lighting time control		PWM control / Lighting time control	Variable current control		Variable voltage control		Variable voltage control
PWM frequency	—	125 kHz		100 kHz	—		—		—
Intensity value	10%~100% (10% steps)	256 steps		100 steps	256 or 1,000 steps		256 or 1,024 steps		256 steps
Input voltage	100 to 240 VAC	RJ-45 connector (based on PoE)		24 VDC	100 to 240 VAC		100 to 240 VAC		100 to 240 VAC
Frequency	50/60 Hz	—		—	50/60 Hz		50/60 Hz		50/60 Hz
Power consumption	78 VA	13.9 W		11 W	360 VA	750 VA	388 VA	765 VA	410 VA
Parallel communication	○	—		—	○	○	○		○
EIA-485 communication	—	—		—	○	○	—		○
Ethernet	—	○		—	○	○	○		—
Analog input	—	—		—	—	—	—		○
Manual control	○	—		○	○	○	○		○
ON/OFF lighting	—	○		○	○	○	○		○
Strobe lighting	○ (With overdrive)	○ (No overdrive)		○ (No overdrive)	—		—		—
Lighting time	10~990µs (10µs steps)	8µs~100 ms (8µs steps)		50µs/100µs/250µs/ 500µs/1 ms/4 ms/ 10 ms/40 ms	—		—		—
Lighting delay time	15µs max.	0µs~100 ms (10µs steps)		3µs max.	—		—		—
CE marking	○	○		○	○		○		○
Weight	1.2 kg	140 g		80 g	3.1 kg	7.0 kg	2.4 kg	4.1 kg	2.3 kg
Cooling method	Natural air cooling	Natural air cooling		Natural air cooling	Forced air cooling		Forced air cooling		Forced air cooling
Mounting method	Bottom mounting	DIN rail mounting, Bottom mounting		DIN rail mounting	Bottom mounting		Bottom mounting		Bottom mounting
Relevant page	P.333	P.339		P.345	P.353		P.355		P.357

Control Units

Digital Control Units

PD4 Series

Refer to our website for product details.

CCS PD4 ▶ Search

Digital power supply with enhanced lighting control functions

NEW

500 PWM kHz
Custom orders accepted

Ethernet
Enabled

PD4-6024 Series

PD4-12024 Series

Estimated availability date: June 2023

Features

- Continuous lighting, ON/OFF lighting, or strobe lighting
- Lighting output of 60 W/120 W available
- Number of channels: 2 channels / 4 channels
- Ethernet / parallel external control
- Parallel type supports both NPN and PNP connections
- 1,024 steps of precise intensity settings
- All types have natural air cooling for easier installation

Various Lighting Control Functions

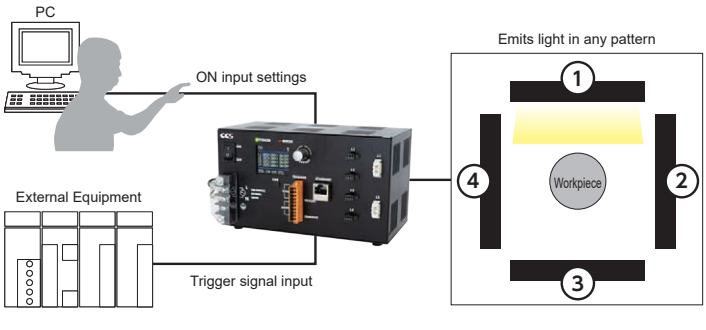
- Turn lights on in desired pattern with sequence control function
- Supports PLC link function for easy integration with PLCs
- Trigger output function simplifies the synchronization of the camera and lighting
- With Recipes setting, save lighting settings in a maximum of 8 recipes
- Real-time information monitoring from applications, such as operating status and operation logs

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Sequence

Program a maximum of 16 steps of ON input, turn lights on in desired pattern. For example, when using 4-quadrant bar lights or segmented lights to illuminate from multiple directions, the emission patterns for each channel can be stored and switched ON / OFF by trigger input.



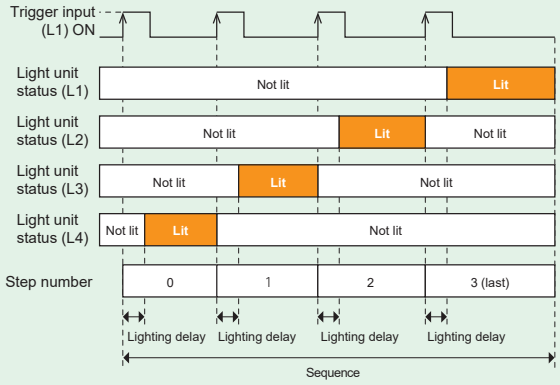
Example of 4-step setup

Lighting output	0	1	2	3
L1				●
L2			●	
L3		●		
L4	●			

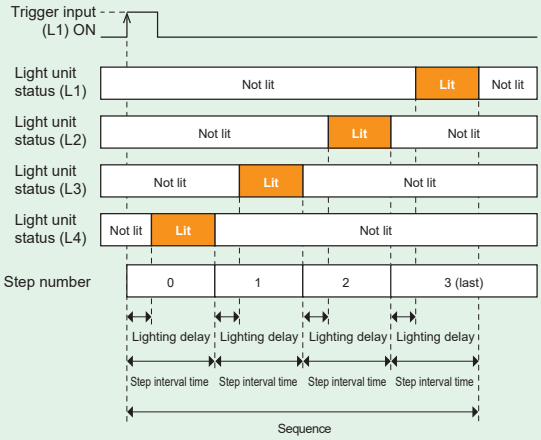
●:Lit

■ Difference in lighting operation depending on trigger operation mode setting values

● When the Set Value of the Trigger Operation Mode Is 1-Trigger 1-Step Sequence Operation



● When the Set Value of the Trigger Operation Mode Is 1-Trigger N-Steps Sequence Operation

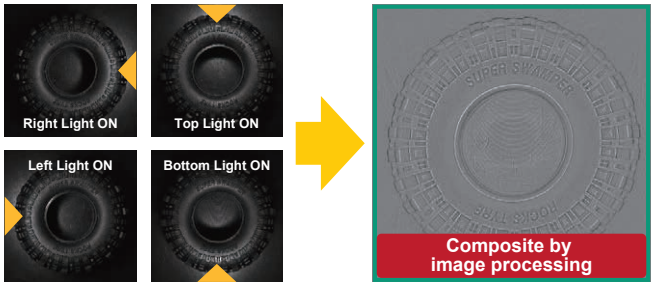


■ Sequence Control Application Examples: Imaging using photometric stereo method

The workpiece is illuminated and imaged in each direction. It is possible to generate images that highlight only the unevenness or extract only the pattern by using the differences of each captured image.

Imaged by illumination from 4 directions

■ Imaging Example (4 Divisions)



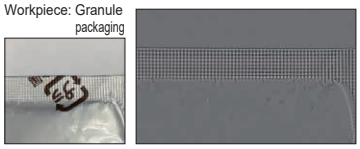
● Character inspection of patterned tiles

By removing patterns and extracting unevenness, it is possible to acquire images in which characters can be easily recognized.

● Surface imaging on rubber products

By enhancing the unevenness of the rubber product, it is possible to acquire images in which characters can be easily recognized.

● Heat seal inspection



Removes the pattern and halation and obtains information on the unevenness of the heat seal.

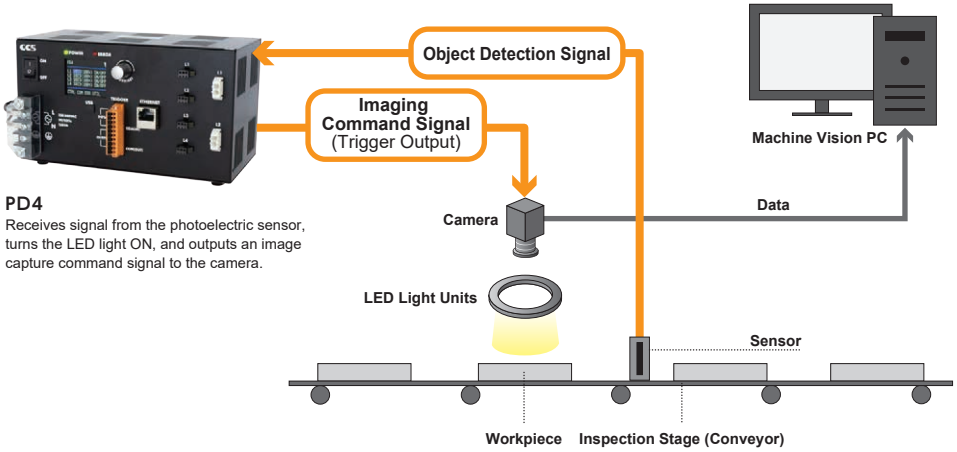
PD4 Series

Refer to our website for product details.
CCS PD4 ▶ Search

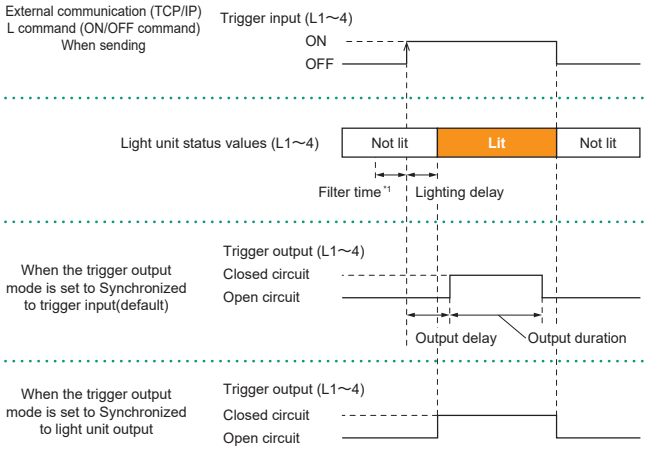
Trigger Output Mode

Sends an output trigger signal to the camera so the timing of the light and camera can be synchronized.

Trigger Output Application Example



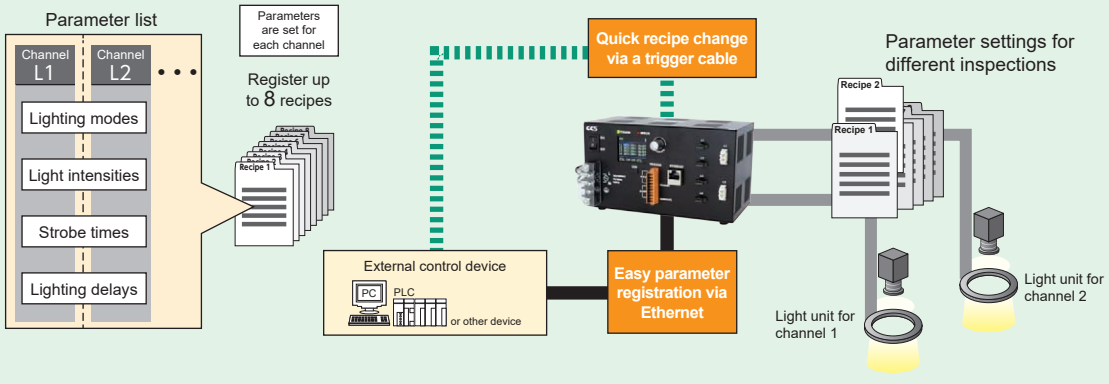
Trigger Output Signal Connection Example



*1 Filter time can be set when noise is mixed in with the signal input from the trigger pin.

Recipes

Save lighting settings in a maximum of 8 recipes. Parameter settings such as intensity values for each channel and other inspection-specific parameter settings can be registered in advance, allowing for easy setting changes simply by recalling recipes.



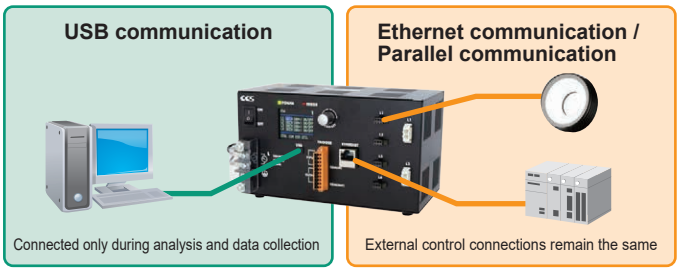
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs
Register to use them.

USB Communication

Equipped with a USB connector (Mini-B) to enable data communication with a PC while connected to external control devices.

Various settings and operations can be verified via USB communication.
Use a USB cable with a ferrite core.

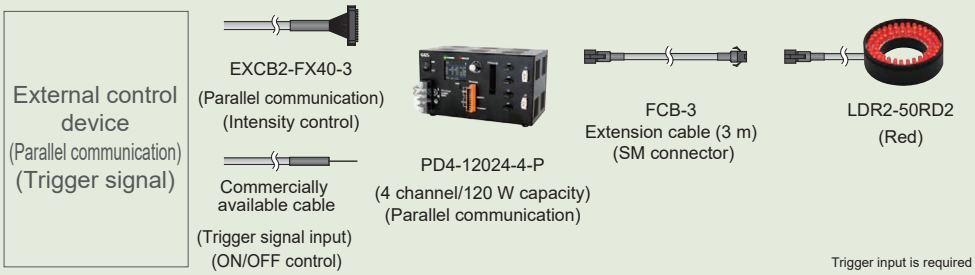
USB Connection Image



Example System Configuration

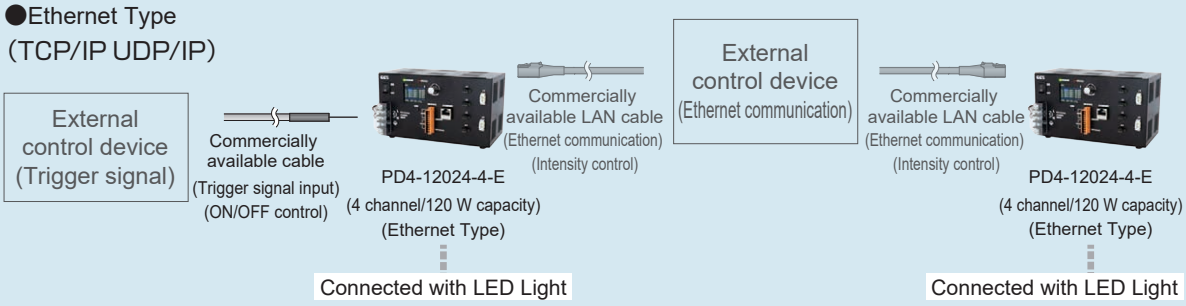
Example:
External control device — **External control cables** — **Control unit** — **Extension cables** — **LED light**

●Parallel Type



Trigger input is required for ON / OFF light and strobe light.

●Ethernet Type (TCP/IP UDP/IP)



Trigger input is required for ON / OFF light and strobe light.

Light and power adapter compatibility table (example)

To connect to the HLV3 Series, use a power adapter (sold separately).

Light Model Name	Emitting Color					Power Adapter Model Name (Custom Order)
HLV3-14	RD	SW	BL	GR	—	Model Name: RB-82-24-15SP Quantity of Light: 0.9X, Power Consumption: 7.3W*1
HLV3-22-1 / -1C	RD	SW	BL	GR	—	Model Name: RB-56-24 Quantity of Light: 0.8X, Power Consumption: 11W*1
HLV3-22-2 / -2C	RD	SW	BL	GR	—	Model Name: RB-56-24 Quantity of Light: 0.8X, Power Consumption: 18W*1
HLV3-22-4S / 4M /-4C HLV3-22-NR-4 HLV3-22IR860	RD	SW	BL	GR	IR	Model Name: RB-56-24 Quantity of Light: 0.7X, Power Consumption: 25W*1

*1 Power consumption is the total value of the applicable light and power adapter. Note) Quantity of light will be lower than when using the PJ Series control unit dedicated for spot lights.

PD4 Series

Refer to our website for product details.

CCS PD4 ▶ Search

Common Specification: Parallel Type

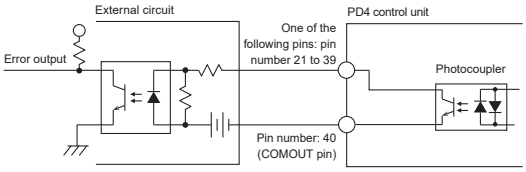
Model name	PD4-6024-4-P	PD4-6024-2-P	PD4-12024-4-P	PD4-12024-2-P
Input voltage (rated)	AC 100 to 240 V(±10 %)			
Lighting method	Continuous / Strobe lighting (no overdrive)			
Drive method	Constant-voltage system			
Intensity control method	PWM control			
No. of channels	4 channels	2 channels	4 channels	2 channels
Applicable light unit (rated)	Light units with 24 VDC input, Total channels: 60 W (SM connector: one 60 W connector)		Light units with 24 VDC input, Total channels: 120 W (SM connector: one 60 W connector, EL connector: one 120 W connector) *When using EL connector: L1 (CH1), L2(CH2)	
PWM frequency	125 kHz			
Power consumption (typ.)	155 VA		170 VA	
Frequency	50/60 Hz			
Output voltage (rated)	DC 24 V			
Intensity setting	1,024 step			
External control	Parallel control			
Operating temperature and humidity	Temperature: 0 to 40°C, Humidity: 20% to 85% (with no condensation) Altitude: 2,000 m max., protective ground class: class I, pollution degree: 2, indoor use only			
Storage temperature and humidity	Temperature: -20 to 60°C, Humidity: 20% to 85% (with no condensation)			
Cooling method	Natural air cooling			
Material/Surface processing	Steel sheet, cover thickness: 1.6 mm, chassis thickness: 1.0 mm, black (leather satin)			
Weight	1.5 kg max.			
Accessories	One hardware manual, one Power Terminal Block Cover, two M4 screws for the cover, one 2-m-long 3-prong AC power cable with ground terminal *1, one Trigger Terminal Block			

*1 Model available that does not include an AC cable as an accessory. Models not supplied with extension cables have "-NC" at the end. Eg. PD4-6024-4-P-NC
The model number of the AC cable alone is ACC-JIS-125-7-M4-2.

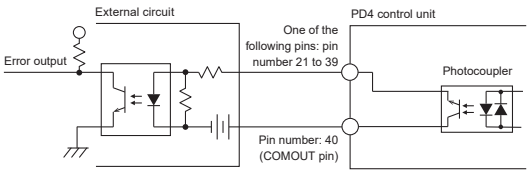
External Signal Connection Example (Supports Both PNP / NPN Connections) Refer to the User Manual for details.

External Signal Connection Example (Parallel Type)

Sinking (NPN)



Sourcing (PNP)

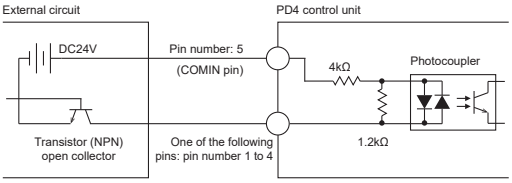


Connection Specifications (Per 1 Terminal)			
Rated input voltage	Maximum input voltage	Photocoupler ON voltage / ON current	Photocoupler OFF voltage / OFF current
DC24V ±10%	DC26.4V	DC21.6V min./ 1.4mA min.	DC1.5V max./ 0.05mA max.

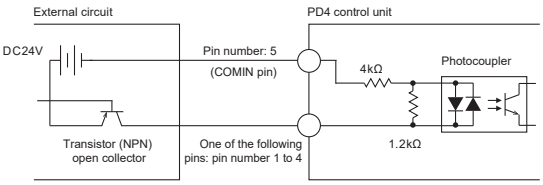
Set Values	Photocoupler	Data	Signal input through the write pin
ACTIVE HI (default)	OFF	0	OFF
	ON	1	ON
ACTIVE LO	OFF	1	ON
	ON	0	OFF

External Trigger Input Signal Connection Example

Sinking (NPN)



Sourcing (PNP)



Connection Specifications (Per 1 Terminal)			
Rated input voltage	Maximum input voltage	Photocoupler ON voltage / ON current	Photocoupler OFF voltage / OFF current
DC24V ±10%	DC26.4V	DC21.6V min./ 3mA min.	DC1.5V max./ 1mA max.

Set Values	Photocoupler	When in ON/OFF Mode	When in Strobe Mode
ACTIVE HI (default)	OFF	Light Unit OFF	When the photocoupler switches from OFF to ON, the light comes on with the specified ON time
	ON	Light Unit ON	
ACTIVE LO	OFF	Light Unit ON	When the photocoupler switches from ON to OFF, the light comes on with the specified ON time
	ON	Light Unit OFF	

Common Specification: Ethernet Type

Model name	PD4-6024-4-E	PD4-6024-2-E	PD4-12024-2-E	PD4-12024-4-E
Input voltage (rated)	AC 100 to 240 V(±10 %)			
Lighting method	Continuous / Strobe lighting (no overdrive)			
Drive method	Constant-voltage system			
Intensity control method	PWM control			
No. of channels	4 channels	2 channels	4 channels	2 channels
Applicable light unit (rated)	Light units with 24 VDC input, Total channels: 60 W (SM connector: one 60 W connector)		Light units with 24 VDC input, Total channels: 120 W (SM connector: one 60 W connector, EL connector: one 120 W connector) *When using EL connector: L1 (CH1), L2(CH2)	
PWM frequency	125 kHz			
Power consumption (typ.)	152 VA		168 VA	
Frequency	50/60 Hz			
Output voltage (rated)	DC 24 V			
Intensity setting	1,024 step			
External control	Ethernet comm. TCP/IP UDP/IP (CCS Command Comm, PLCCOM Comm (MC Protocol · FINS Command))			
Operating temperature and humidity	Temperature: 0 to 40°C, Humidity: 20% to 85% (with no condensation) Altitude: 2,000 m max., protective ground class: class I, pollution degree: 2, indoor use only			
Storage temperature and humidity	Temperature: -20 to 60°C, Humidity: 20% to 85% (with no condensation)			
Cooling method	Natural air cooling			
Material/Surface processing	Steel sheet, cover thickness: 1.6 mm, chassis thickness: 1.0 mm, black (leather satin)			
Weight	1.5 kg max.			
Accessories	One hardware manual, one Power Terminal Block Cover, two M4 screws for the cover, one 2-m-long 3-prong AC power cable with ground terminal *1, one Trigger Terminal Block			

*1 Model available that does not include an AC cable as an accessory. Models not supplied with extension cables have "-NC" at the end. Eg. PD4-6024-4-E-NC
The model number of the AC cable alone is ACC-JIS-125-7-M4-2.

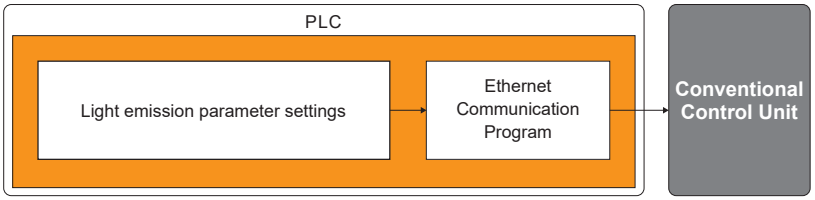
PLCCOM Communication

PLCCOM communication allows the product to be controlled by reading and writing memory areas on the PLC via Ethernet.
Easy to install because there is no need to create a program specifically for the control unit.

■ Without PLCCOM Communication <For Conventional Control Units>

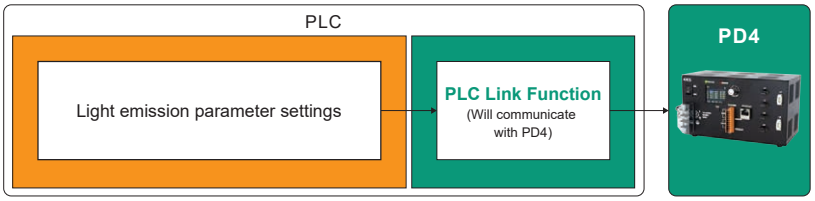
User programmable range
Functions loaded in the PLCA

A program is needed to communicate with the control unit separately from the various lighting parameter settings.



■ With PLCCOM Communication <For PD4>

Can be connected via the PLC function,
so there is no need to build a communication program



■ PLCCOM Communication Specifications

For PLCs supporting MC protocol	For PLCs supporting FINS commands
●Device : Data register ●Protocol : MC protocol for MELSEC-Q series ●Frame : 3E frame ●Transmission code : Binary ●Transport : TCP or UDP	●I/O Memory : DM Area ●Protocol : FINS Commands ●Transmission code : Binary ●Transport : TCP or UDP ●FINS node address :For the TCP setting, specify the address that is automatically assigned by the PLC. For the UDP setting, specify the 4th octet of the IP address of the control unit. (Eg. When the IP address is 192.168.0.123, specify 123.)

For details, see "Overview of PLCCOM Communication" on page 25 of the operation manual.
Can be downloaded from the web page. https://www.ccs-grp.com/products/series/371

PD4 Series

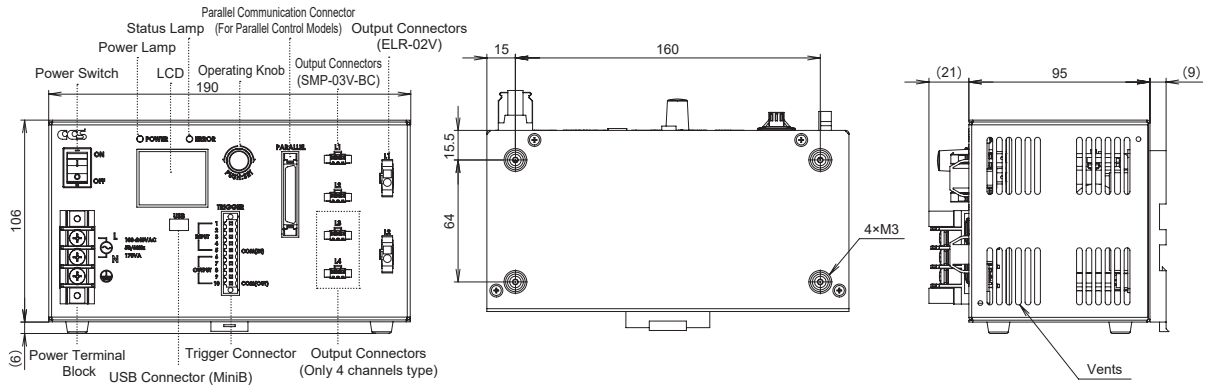
Refer to our website for product details.

CCS PD4 ▶ Search

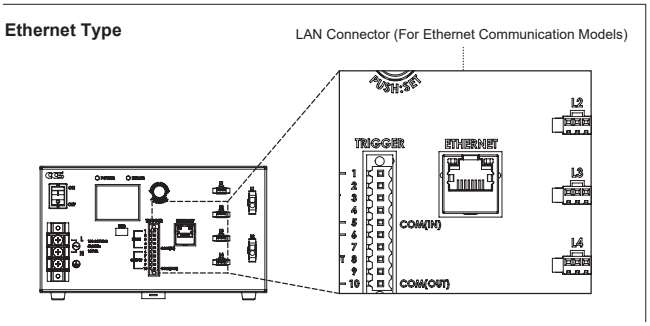
Dimensions (mm)

PD4-12024-4-E / PD4-12024-4-P / PD4-12024-2-E / PD4-12024-2-P

Parallel Type

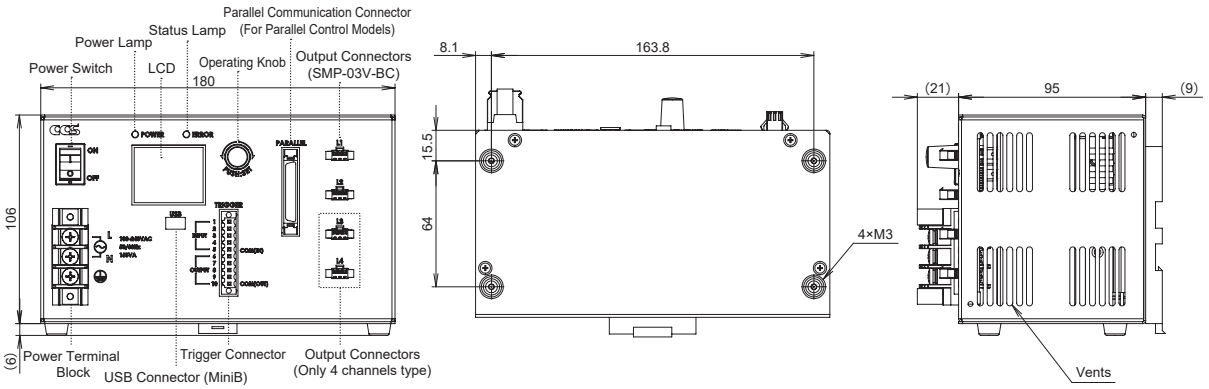


Ethernet Type

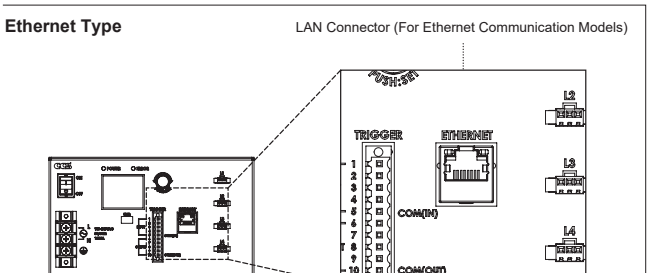


PD4-6024-4-E / PD4-6024-4-P / PD4-6024-2-E / PD4-6024-2-P

Parallel Type



Ethernet Type

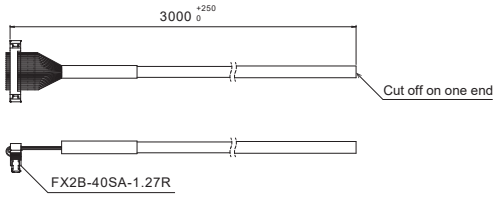


Options

Parallel Communication Cable Model Name: EXCB2-FX40-3

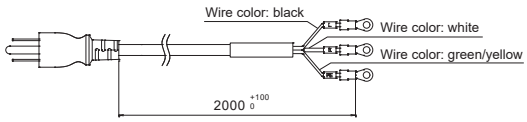
Used for performing external control via parallel communication.

Dimensions (mm)



PIN No	Line Color	Marking	PIN No	Line Color	Marking	PIN No	Line Color	Marking	PIN No	Line Color	Marking
1	Orange	Red 1	11	Orange	Red 2	21	Orange	Red 3	31	Orange	Red 4
2	Orange	Black 1	12	Orange	Black 2	22	Orange	Black 3	32	Orange	Black 4
3	Gray	Red 1	13	Gray	Red 2	23	Gray	Red 3	33	Gray	Red 4
4	Gray	Black 1	14	Gray	Black 2	24	Gray	Black 3	34	Gray	Black 4
5	White	Red 1	15	White	Red 2	25	White	Red 3	35	White	Red 4
6	White	Black 1	16	White	Black 2	26	White	Black 3	36	White	Black 4
7	Yellow	Red 1	17	Yellow	Red 2	27	Yellow	Red 3	37	Yellow	Red 4
8	Yellow	Black 1	18	Yellow	Black 2	28	Yellow	Black 3	38	Yellow	Black 4
9	Pink	Red 1	19	Pink	Red 2	29	Pink	Red 3	39	Pink	Red 4
10	Pink	Black 1	20	Pink	Black 2	30	Pink	Black 3	40	Pink	Black 4

AC Power Cable Model Name: ACC-JIS-125-7-M4-2

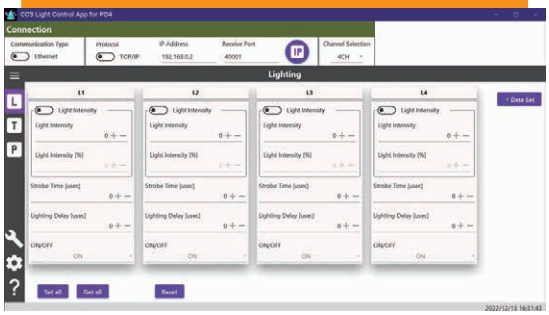


Application

■ You can choose between the basic version and the standard version. *The application can be downloaded from the web page.

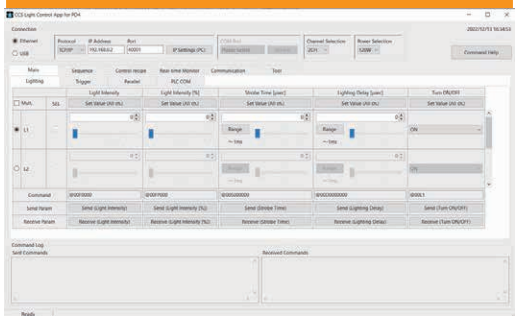
System Requirements: Windows 10 / NET Framework 4.7.2 https://www.ccs-grp.com/products/series/371

Basic Version



Basic lighting settings such as intensity value and light emission time, as well as trigger input / output settings.

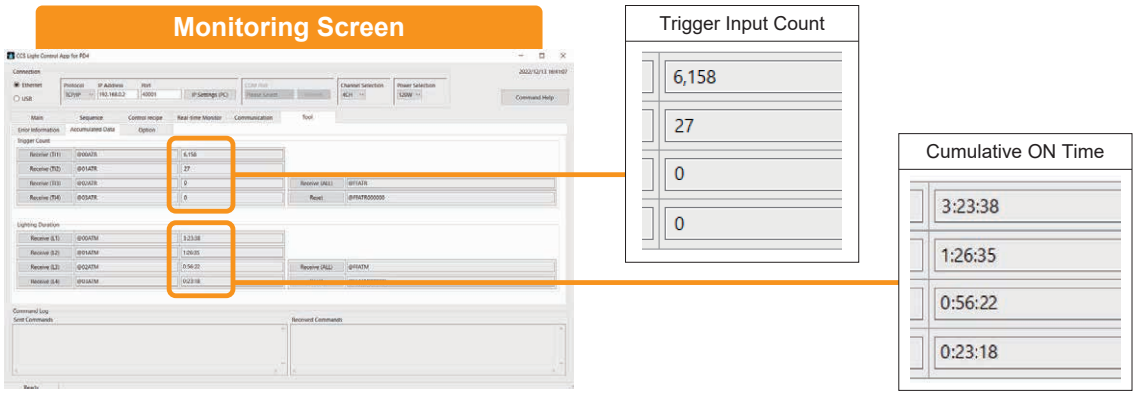
Standard Version



In addition to the functions of the basic version, all functions of the PD4 Series can be configured, including sequence control, real-time monitoring functions, etc.

■ Real-time monitoring of information such as lighting operation status, operation logs, etc.

Monitoring Screen



Control Units

Digital Control Units

PD3 Series

Refer to our website for product details.

CCS PD3 ▶ Search

Select digital control units matching your network

500 PWM kHz
Custom orders accepted

Ethernet
Enabled

Parallel Type
PNP input model can be selected

AC Input Types

DC Input Types

CE Compliant

The supplied AC cord is for use with 100 to 120 VAC.
If you want to use the control unit with 200 to 240 VAC, you must procure another appropriate AC power cord.

For information on change in model names, refer to P.323.

Features

- Each single unit is compatible with continuous, ON/OFF and strobe lighting.(Spot Light HLV Series cannot emit strobe.)
  Spot Light HLV3 Series Product Page ▶ P. 185
- Digital display enables set values to be easily checked.
- 256 stage dimmer settings.
- Select from 3 types of external control.
- AC input types and DC input types available.
- DIN rail installation is standard.
- Select from 3 channel, 4 channel or 8 channel models.
- There are four types of capacity: 3 channel/28 W, 3 channel/48 W[*1], 4 channel/46 W[*2], and 8 channel/95 W[*3].
  *1: Can be connected only with 24 V Light. *2: Lineup includes only DC-input control units.
  *3: Can be connected with both 24 V Light and Spot Light HLV Series.

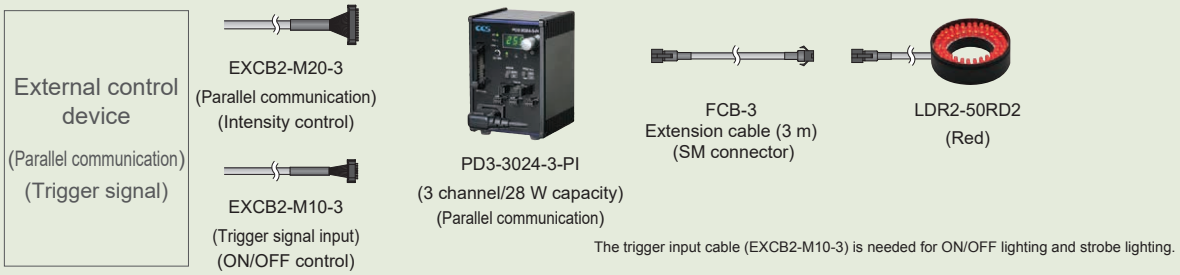
A Wide Ranging Lineup is Available and Custom Orders are Accepted

- The parallel type has the fastest switching for settings. Perform high-speed control through batch transmission.
  (External trigger signal input is available as an NPN input model (standard) or PNP input model (custom order product: PD3-PNP)) See ▶ P.319 for details
- Ethernet types support standard TCP/IP and UDP/IP protocols.
  (Models with keep-alive functions (custom order: PD3-EIK) are available) See ▶ P.320 for details
  Keep-alive functions monitor the validity of the connection of the machine to the network, wherein to prevent the connection from dropping, a signal is periodically sent between machines.
- The EIA-485 type can individually manage units using multi-drop wiring. Can manage up to 4 units.
  See ▶ P.321 for details
- PWM frequency is available in 125 kHz (standard) and 500 kHz (custom order: PD3-500).
  See ▶ P.320 for details

Example System Configuration

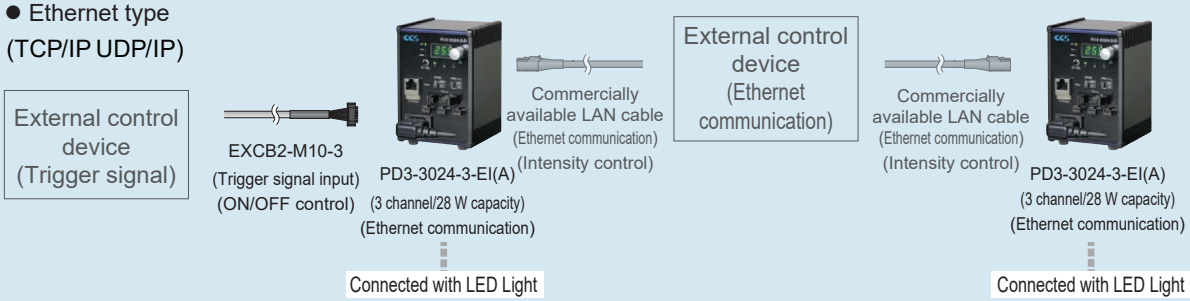
Example:
External control device — **External control cables** — **Control unit** — **Extension cables** — **LED light**

● Parallel type

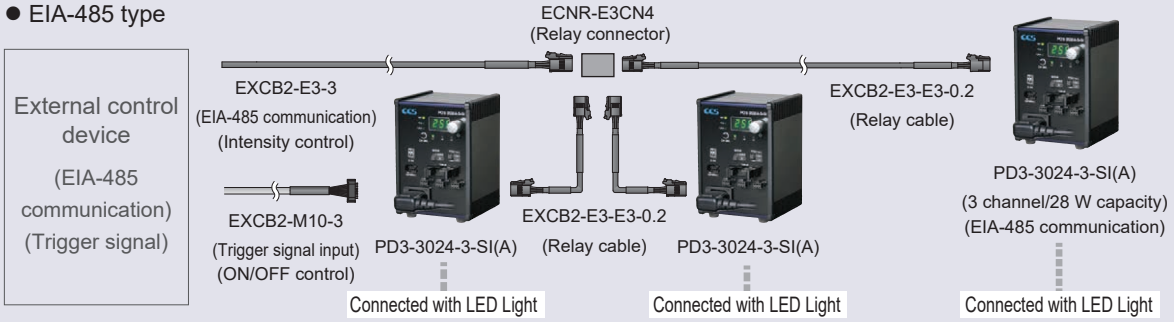


The trigger input cable (EXCB2-M10-3) is needed for ON/OFF lighting and strobe lighting.

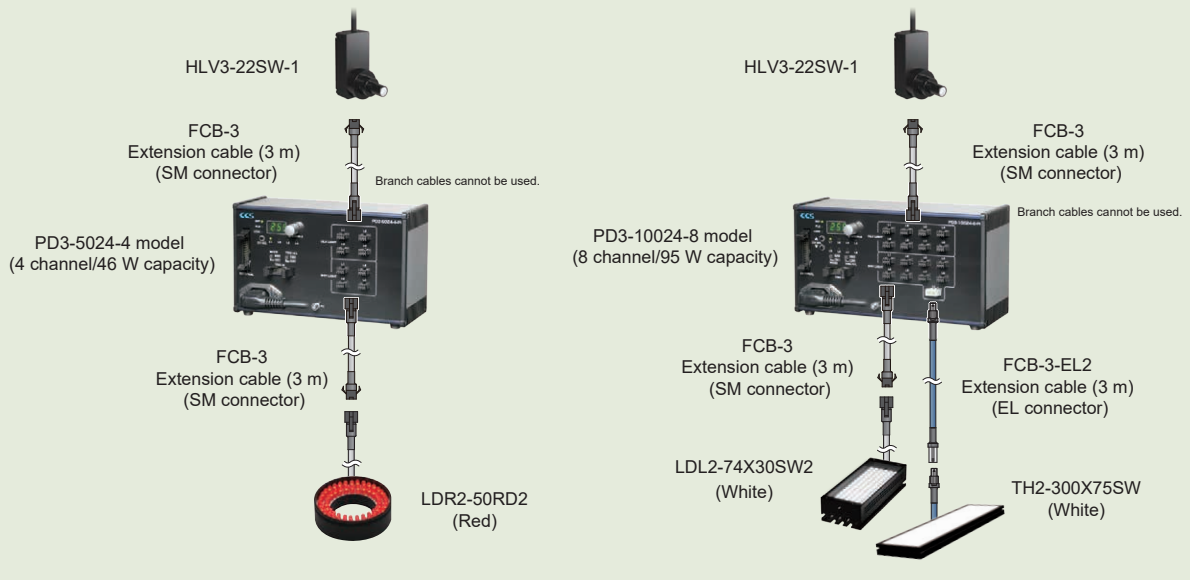
● Ethernet type
(TCP/IP UDP/IP)



● EIA-485 type



Fixture Connection Example



PD3 Series

Refer to our website for product details.

CCS PD3 ▶ Search

Common Specifications: Parallel Types

External trigger signal input is also available as a PNP input (custom order).

Model name	NPN Input Model	PD3-3024-3-PI	PD3-5024-4-PI(A)	PD3-10024-8-PI	PD3-3024-3-PT	PD3-5024-3-PT	PD3-5024-4-PT(A)
	PNP Input Model	PD3-3024-3-PI-PNP	PD3-5024-4-PI-PNP(A)	PD3-10024-8-PI-PNP	PD3-3024-3-PT-PNP	PD3-5024-3-PT-PNP	PD3-5024-4-PT-PNP(A)
Input voltage (rated)		100 to 240 VAC (+10% -15%)			24 VDC (21.6 to 26.4 V)		
Lighting method		Continuous / Strobe lighting (no overdrive)					
Drive method		Constant-voltage system	24 V LIGHT: Constant-voltage system HLV LIGHT: Constant-current system		Constant-voltage system		24 V LIGHT: Constant-voltage system HLV LIGHT: Constant-current system
Intensity control method		PWM control and lighting time control	24 V LIGHT: PWM control and lighting time control HLV LIGHT: Variable-current control		PWM control and lighting time control		24 V LIGHT: PWM control and lighting time control HLV LIGHT: Variable-current control
No. of channels		3 channels	4 channels	8 channels	3 channels		4 channels
Applicable light unit (rated)		Light units with 24 VDC input Total for 3 channels: 28 W	Light units with 24 VDC input, HLV Series (Spot Light) Total for 4 channels: 46 W	Light units with 24 VDC input, HLV Series (Spot Light) Total for 8 channels: 95 W (EL connector: one 95 W connector) *When using EL connector: L1 (CH1)	Light units with 24 VDC input Total for 3 channels: 28 W	Light units with 24 VDC input Total for 3 channels: 48 W	Light units with 24 VDC input, HLV Series (Spot Light) Total for 4 channels: 46 W
PWM frequency		125 kHz					
Error detection display		"OCP" displayed on front digital display: Overcurrent error	"OCP" displayed on front digital display: Overcurrent error "EFN" display: Fan stop error "EID" display: ID error (HLV Series only)		"OCP" displayed on front digital display: Overcurrent error		"OCP" displayed on front digital display: Overcurrent error "EFN" display: Fan stop error "EID" display: ID error (HLV Series only)
Overcurrent protection		Operates at 107% of the output current. Reset by pressing and holding the setting switch for 1 sec., or turning the power off and then on again. Do not create an intentional short circuit between the positive (+) and negative (-) outputs.					
Power consumption (typ.)		78 VA	70 VA	130 VA	32 W	52 W	
Frequency		50/60 Hz			–		
Output voltage (rated)		24 VDC					
Intensity setting		Manual: 256-step using the front setting switch					
		External: 8-bit input (B0 to B7), write pulse (BRTWR), and channel selection (CHSEL0 to CHSEL2)					
ON/OFF setting		External trigger input					
Lighting mode setting		Manual: 11-step using the front setting switch					
		External: 4-bit input (M0 to M3), write pulse (TRGWR), and channel selection (CHSEL0 to CHSEL2)					
Error detection output		External control connector 19(OC)-20(OE) pin with transistor output When normal: Non-conducting, With overcurrent output detected: Conducting					
External control connector		Trigger input: MIL connector, 10-pin					
		Intensity/Lighting mode setting: MIL connector, 20-pin					
Operating temperature and humidity		Temperature: 0 to 40°C, Humidity: 20 to 85%RH (with no condensation)					
Storage temperature and humidity		Temperature: -20 to 60°C, Humidity: 20 to 85%RH (with no condensation)					
Cooling method		Natural air cooling	Forced air cooling		Natural air cooling		Forced air cooling
CE marking		Safety standard: Conforms to EN61010-1, EMC standard: Conforms to EN61326-1 Class A			EMC standard: Conforms to EN61326-1 Class A		
Material/Surface processing		Material: aluminum and resin, Surface processing: blue alumite					
Weight		600 g max.	1,200 g max.	1,500 g max.	400 g max.		850 g max.
Accessories		3-prong AC cord with ground terminal (2 m) x 1, User Manual x 1, Base Brackets x 1 set (PD3-5024-4-PI(A)/-PI-PNP(A), PD3-10024-8-PI/-PI-PNP)			User Manual x 1, Base Brackets x 1 set (PD3-5024-4-PT(A)/-PT-PNP(A))		

Connection Example

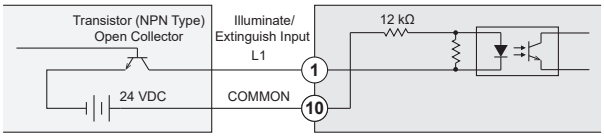
Refer to the User Manual for more information.

External Trigger Signal Connection Example

NPN Input Model

Sink Type (NPN)

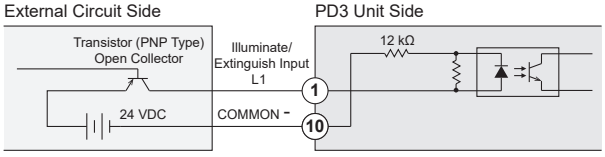
External Circuit Side / PD3 Unit Side



PNP Input Model

Source Type (PNP)

External Circuit Side / PD3 Unit Side



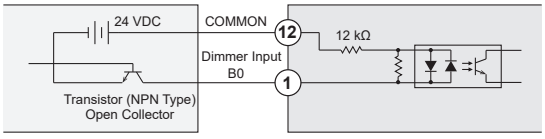
Connection Specifications (Per 1 Terminal)			
Rated Input Voltage	Max. Input Voltage	Photocoupler ON Voltage/ON Current	Photocoupler OFF Voltage/OFF Current
24 VDC	26.4 VDC	14.4 VDC or more/1 mA or more	5 VDC or less/0.4 mA or less

Trigger Principle Setting Switch	Input Signal	Photocoupler	ON/OFF Mode	Strobe Mode
HIGH	HIGH	OFF	LED ON	LED ON for Set Time
	LOW	ON	LED OFF	No Change
LOW	HIGH	OFF	LED OFF	No Change
	LOW	ON	LED OFF	LED ON for Set Time

External Signal Connection Example (Parallel Type)

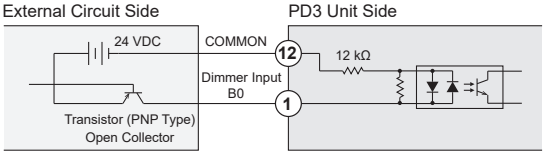
Sink Type (NPN)

External Circuit Side / PD3 Unit Side



Source Type (PNP)

External Circuit Side / PD3 Unit Side



Connection Specifications (Per 1 Terminal)			
Rated Input Voltage	Max. Input Voltage	Photocoupler ON Voltage/ON Current	Photocoupler OFF Voltage/OFF Current
24 VDC	26.4 VDC	14.4 VDC or more/1 mA or more	5 VDC or less/0.4 mA or less

	Input Signal	Photocoupler	Data
Sink Type	HIGH	OFF	1
	LOW	ON	0
Source Type	HIGH	ON	0
	LOW	OFF	1

Common Specifications: Ethernet Type

External trigger signal input PNP input model (custom order) and model with keep alive function (custom order) are also available.

Model name	–	PD3-3024-3-EI(A)	PD3-5024-4-EI(A)	PD3-10024-8-EI(A)	PD3-3024-3-ET(A)	PD3-5024-3-ET(A)	PD3-5024-4-ET(A)
	PNP Input Model	PD3-3024-3-EI-PNP(A)	PD3-5024-4-EI-PNP(A)	PD3-10024-8-EIPNP(A)	PD3-3024-3-ET-PNP(A)	PD3-5024-3-ET-PNP(A)	–
	With Keep-Alive Function	PD3-3024-3-EIK	PD3-5024-4-EIK	PD3-10024-8-EIK	PD3-3024-3-ETK	PD3-5024-3-ETK	PD3-5024-4-ETK
Input voltage (rated)		100 to 240 VAC (+10% -15%)			24 VDC (21.6 to 26.4 V)		
Lighting method		Continuous / Strobe lighting (no overdrive)					
Drive method		Constant-voltage system	24 V LIGHT: Constant-voltage system HLV LIGHT: Constant-current system		Constant-voltage system		24 V LIGHT: Constant-voltage system HLV LIGHT: Constant-current system
Intensity control method		PWM control and lighting time control	24 V LIGHT: PWM control and lighting time control HLV LIGHT: Variable-current control		PWM control and lighting time control		24 V LIGHT: PWM control and lighting time control HLV LIGHT: Variable-current control
No. of channels		3 channels	4 channels	8 channels	3 channels		4 channels
Applicable light unit (rated)		Light units with 24 VDC input Total for 3 channels: 28 W	Light units with 24 VDC input, HLV Series (Spot Light) Total for 4 channels: 46 W	Light units with 24 VDC input, HLV Series (Spot Light) Total for 8 channels: 95 W (EL connector: one 95 W connector) *When using EL connector: L1 (CH1)	Light units with 24 VDC input Total for 3 channels: 28 W	Light units with 24 VDC input Total for 3 channels: 48 W	Light units with 24 VDC input, HLV Series (Spot Light) Total for 4 channels: 46 W
PWM frequency		125 kHz					
Error detection display		"OCP" displayed on front digital display: Overcurrent error	"OCP" displayed on front digital display: Overcurrent error "EFN" display: Fan stop error "EID" display: ID error (HLV Series only)		"OCP" displayed on front digital display: Overcurrent error		"OCP" displayed on front digital display: Overcurrent error "EFN" display: Fan stop error "EID" display: ID error (HLV Series only)
Overcurrent protection		Operates at 107% of the output current. Reset by pressing and holding the setting switch for 1 sec., or turning the power off and then on again. Do not create an intentional short circuit between the positive (+) and negative (-) outputs.					
Power consumption (typ.)		78 VA	70 VA	130 VA	32 W	52 W	
Frequency		50/60 Hz			–		
Output voltage (rated)		24 VDC					
Intensity setting		Manual: 256-step using the front setting switch					
		External: Command input via TCP/IP or UDP/IP communication					
ON/OFF setting		External trigger input or command input via TCP/IP or UDP/IP communication					
Lighting mode setting		Manual: 11-step using the front setting switch					
		External: Command input via TCP/IP or UDP/IP communication					
Error detection output		Command sent when overcurrent output is detected.					
External control connector		Trigger input: MIL connector, 10-pin					
		Intensity/Lighting mode setting: RJ-45 connector					
Operating temperature and humidity		Temperature: 0 to 40°C, Humidity: 20 to 85% RH (with no condensation)					
Storage temperature and humidity		Temperature: -20 to 60°C, Humidity: 20 to 85% RH (with no condensation)					
Cooling method		Natural air cooling	Forced air cooling		Natural air cooling		Forced air cooling
CE marking		Safety standard: Conforms to EN61010-1, EMC standard: Conforms to EN61326-1 Class A			EMC standard: Conforms to EN61326-1 Class A		
Material/Surface processing		Material: Aluminum and resin, Surface processing: Blue alumite					
Weight		600 g max.	1,200 g max.	1,500 g max.	400 g max.		850 g max.
Accessories		3-prong AC cord with ground terminal (2 m) x 1, User Manual x 1, Base Brackets x 1 set (PD3-5024-4-EI(A)/-EI-PNP(A)/-EIK, PD3-10024-8-EI(A)/-EIPNP(A)/-EIK)			User Manual x 1, Base Brackets x 1 set (PD3-5024-4-ET(A)/-ET-PNP(A)/-ETK)		

Keep-alive functions monitor the validity of the connection of the machine to the network, wherein to prevent the connection from dropping, a signal is periodically sent between machines.

Lineup of Models with 500 kHz PWM Frequency <Custom Order Products>

When selecting a digital power supply, consider using the higher frequency type. Power supplies with a PWM frequency of 500 kHz can be made to order. Contact our local sales office for details.

Introducing High Frequency Power Supplies (Custom Order)

PD3-10024-8 Series

- PWM Dimmer Control (500 kHz)
- 95 W Capacity (EL Connector: 1 Channel)
- AC Input
- 3 types of external control
  - ・Parallel communication
  - ・Ethernet communication
  - ・EIA-485 communication

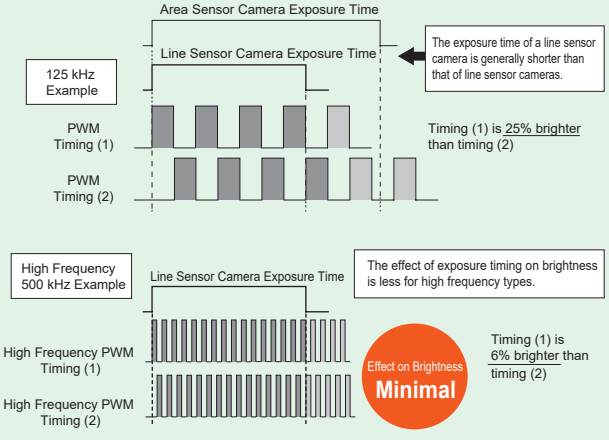
PD3-10024-8-SI-500
(EIA-485 type)

PD3-10024-8-PI-500
(Parallel type)

PD3-10024-8-EI-500
(Ethernet type)
(TCP/IP UDP/IP)

(Example)

● Effect of PWM Frequency versus Brightness



PD3 Series

Refer to our website for product details.

CCS PD3 ▶ Search

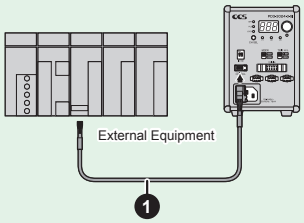
Common Specifications: EIA-485 Type

Model name	PD3-3024-3-SI(A)	PD3-5024-4-SI(A)	PD3-10024-8-SI(A)
Input voltage	100 to 240 VAC (+10% -15%)		
Lighting method	Regular Emission/Strobe Emission (Without Overdrive)		
Drive method	Constant-voltage system	24 V LIGHT: Constant-voltage system	HLV LIGHT: Constant-current system
Intensity control method	PWM Control Or Light Emission Time Control	24 V LIGHT: PWM control or light emission time control HLV LIGHT: Variable-current control	
No. of channels	3 channels	4 channels	8 channels
Applicable light units (rated)	24 VDC Input Lights, 3 Channel Total: 28 W	24 VDC Input Lights, HLV Series (Spot Lighting) 4 Channel Total: 46 W	24 VDC Input Lights, HLV Series (Spot Lighting) 8 Channel Total: 95 W (EL connector: 1 connector 95 W)
PWM frequency	125 kHz		
Error detection display	Front Digital "OCP" Display: Overcurrent Error	Front Digital "OCP" Display: Overcurrent error "EFN" Display: Fan stop error "EID" Display: ID error (HLV Series only)	
Overcurrent protection	Activated at output current of 107% min. and can be restored by holding the setting switch for 1 second, or by reinserting power assumes output +/- are not unintentionally short-circuited.		
Power consumption (typ.)	78 VA	70 VA	130 VA
Frequency	50/60 Hz		
Output voltage (rated)	24 VDC		
Dimmer setting	Manual: 256 stages via front setting switch		
	External: Command input via EIA-485 communication		
ON/OFF setting	External: Trigger input or command input via EIA-485 communication		
Emission mode setting	Manual: 11 stages via front setting switch		
	External: Command input via EIA-485 communication		
Error detection output	Command Sending for Overcurrent Detection		
External control connector	Trigger Input: MIL connector 10-pole		
	Dimmer/Emission Mode Setting: e-Con Connector 3-Pole		
Operating environment	Temperature: 0 to 40°C, Humidity: 20 to 85% (with no condensation)		
Storage environment	Temperature: -20 to 60°C, Humidity: 20 to 85% (with no condensation)		
Cooling method	Natural air-cooling	Forced cooling	
CE marking	Safety standard: Conforms to EN61010-1 EMC standard: Conforms to EN61326-1 Class A		
Electrical appliance and Material safety law	–	Specified electrical equipment (DC power supply) compliant with technical standards	
Material/Surface processing	Material: Aluminum, resin, Surface processing: Navy anodizing		
Weight	600 g max.	1,200 g max.	1,500 g max.
Accessories	2 m 3-prong AC power cable with ground terminal, User Manual x 1, Bottom installation bracket x 1 set (PD3-5024-4-SI(A)/10024-8-SI(A))		

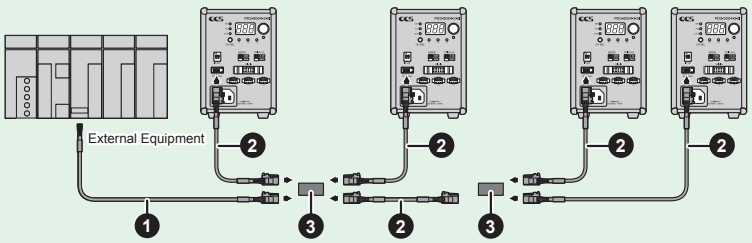
EIA-485 Communication Cable Connection Method

EIA-485 communication types identify based on ID switch settings, enables up to 4 units to be connected on one signal line. The options differ depending on the number of units to be connected. Refer to the following connection diagram.

For 1 connected unit



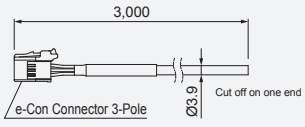
For 4 connected units



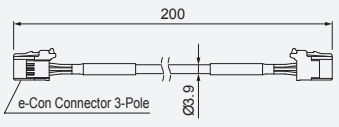
* illustration shows PD3-3024-3-SI

Options

1 EXCB2-E3-3



2 EXCB2-E3-E3-0.2

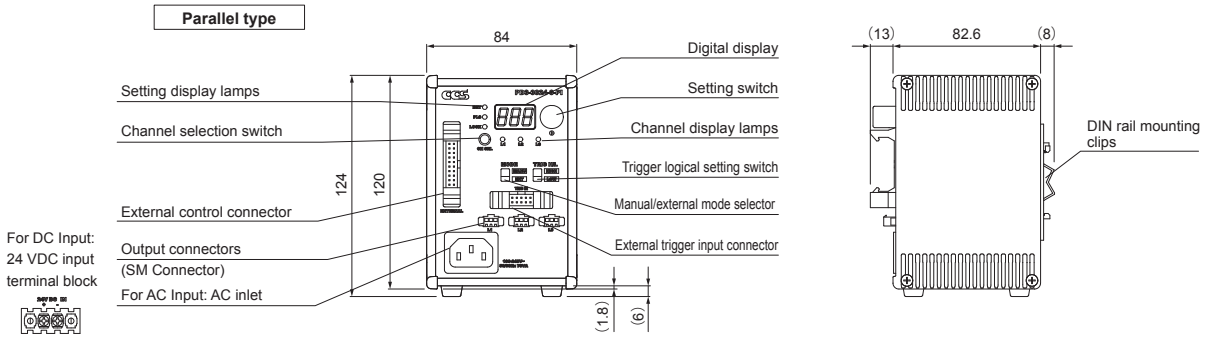


3 ECNR-E3CN4

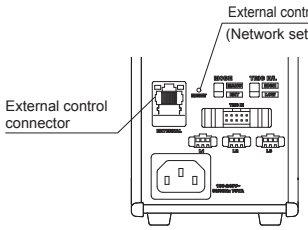
Dimensions (mm)

PD3-3024-3-PI / PD3-3024-3-EI(A) / PD3-3024-3-SI(A) / PD3-3024-3-PT / PD3-3024-3-ET(A) / PD3-5024-3-PT / PD3-5024-3-ET(A)

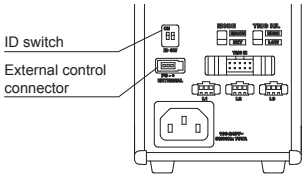
Parallel type

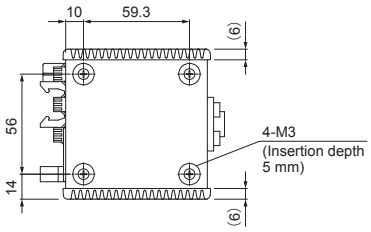


Ethernet type



EIA-485 type



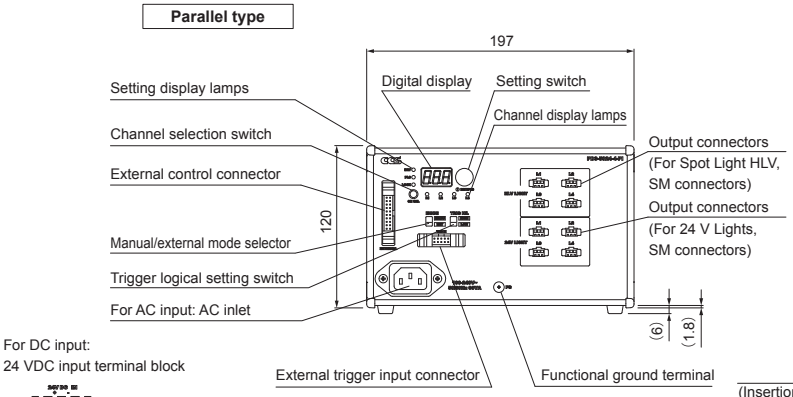


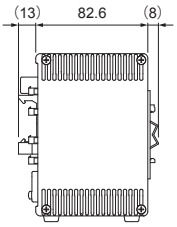
Ethernet/EIA-485 types have the same external dimensions as the parallel type.

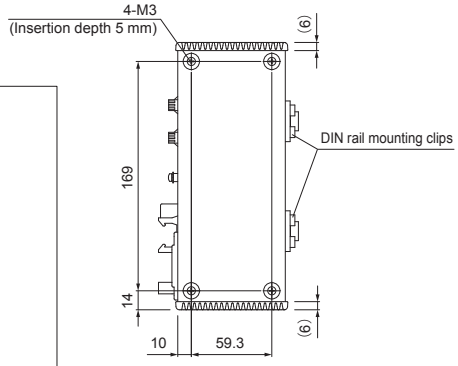
Dimensions (mm)

PD3-5024-4-PI(A) / PD3-5024-4-EI(A) / PD3-5024-4-SI(A) / PD3-5024-4-PT(A) / PD3-5024-4-ET(A)

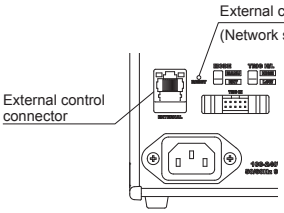
Parallel type



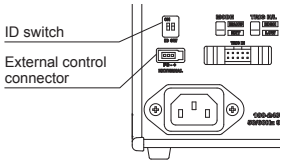




Ethernet type



EIA-485 type



Ethernet/EIA-485 types have the same external dimensions as the parallel type.

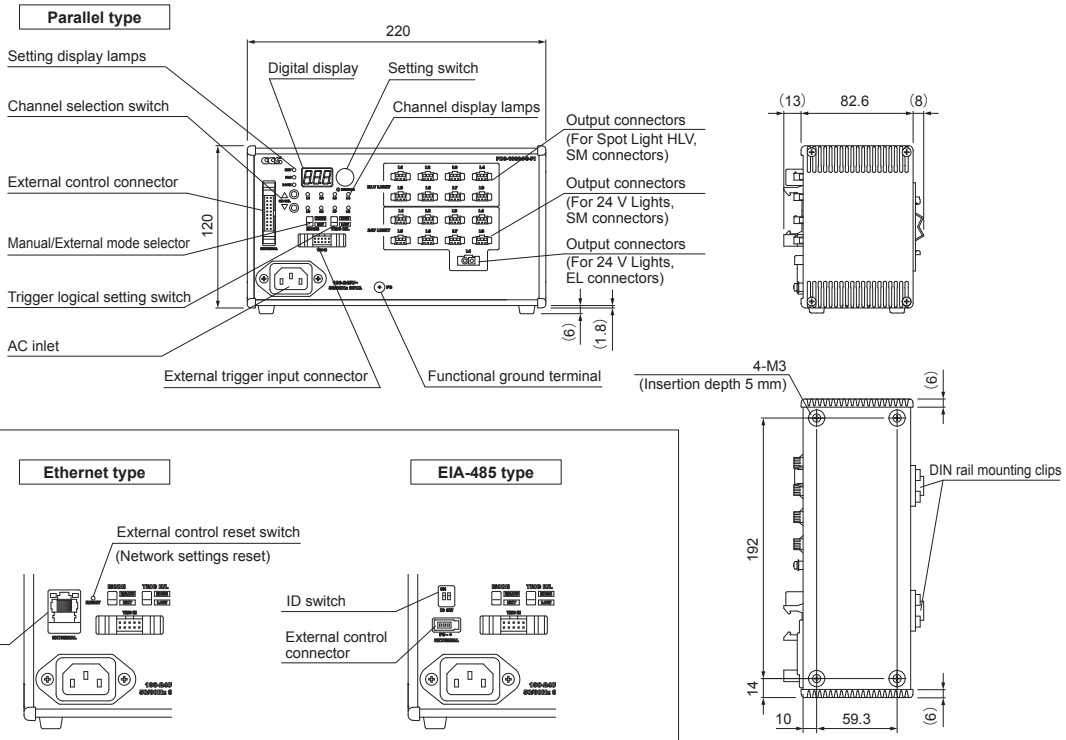
PD3 Series

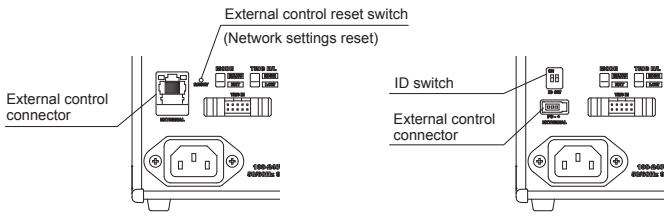
Refer to our website for product details.

CCS PD3 ▶ Search

Dimensions (mm)

PD3-10024-8-PI / PD3-10024-8-EI(A) / PD3-10024-8-SI(A)





Ethernet/EIA-485 types have the same external dimensions as the parallel type.

Differences Between Specifications and Models

[(A) attached to end of model number] Ex.: PD3-3024-3-EI → PD3-3024-3-EI(A)

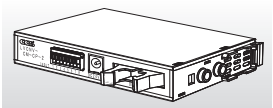
Contents Changed		Applicable Models
Software Change	• Command specifications for changing the setting values for dimmer control commands (F commands) as a batch have been added. • Command specifications for changing the status of each channel for ON/OFF commands (L commands) as a batch have been added.	PD3-3024-3-EI(A) / PD3-3024-3-SI(A) / PD3-3024-3-ET(A) / PD3-5024-4-EI(A) / PD3-5024-4-SI(A) / PD3-5024-4-ET(A) / PD3-5024-3-ET(A) / PD3-10024-8-EI(A) / PD3-10024-8-SI(A)
DIN Rail Mount Added	• The number of DIN rail mounts for 50 W power supplies has increased from 1 to 2.	PD3-5024-4-PI(A) / PD3-5024-4-EI(A) / PD3-5024-4-SI(A) / PD3-5024-4-PT(A) / PD3-5024-4-ET(A)

Options

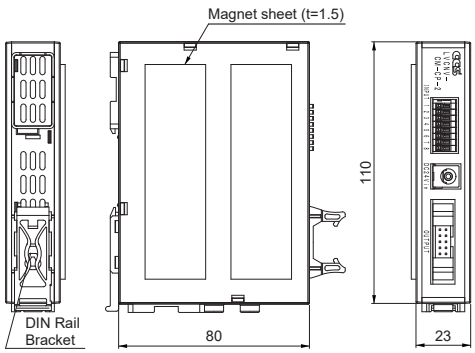
Trigger Voltage Level Conversion Unit

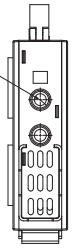
· Can be used when performing trigger input from a device with 3.3 V, 5 V or 12 V output (PCB, etc.).
· It can also be used when performing trigger input using a contact signal such as a relay.

Be sure to prepare an AC adapter with 24 V output separately as a control unit source.



Model Name: LVCNV-CM-CP-2-MG-WOC



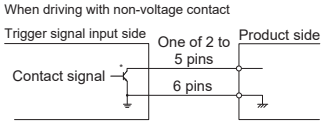


*1 Use it as an aid when placing the unit with the top facing up and fixing the unit to the wall surface or L-shaped bracket. Note that fixing with only the provided screw holes may cause the product to fall.

* This product is custom-made. Contact our local sales office for details.

Connection Example

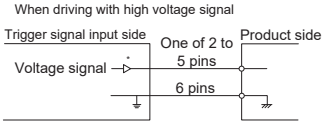
When driving with non-voltage contact



* Elements used: Photocoupler, open collector or driver IC

Trigger signal input	Trigger signal output	Photocoupler inside the control unit for LED lights
Open	ON	ON
Short	OFF	OFF

When driving with high voltage signal



* Elements used: Buffer, HS-CMOS or driver IC

Trigger signal input	Trigger signal output	Photocoupler inside the control unit for LED lights
High	ON	ON
Low	OFF	OFF

Trigger signal output	Trigger signal input	Description
ON	High	Input voltage range: +3 to 13.2 VDC, input current: Approximately 8 mA (at 12 VDC input, per terminal)
	Open	Terminal voltage: Approx. 2.9 V
OFF	Low/Short	Input voltage range: 0.0 to +0.5 VDC, input current: Approximately -3 mA (at 0 VDC input, per terminal)

When the trigger signal to this product is set to High or Open (non-conducting), the trigger signal output from this product turns ON. When it is set to Low or Short (conducting), the trigger signal output is turned OFF.

Options

External control cables

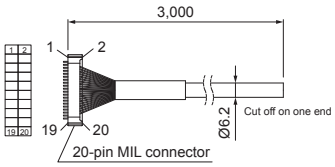
Dimensions (mm)

Parallel communication cable

Used for performing external control via parallel communication. You can select the channel, intensity setting and lighting mode (continuous, ON/OFF and strobe modes).

The trigger input cable shown (EXCB2-M10-3) below is needed for ON/OFF lighting and strobe lighting.

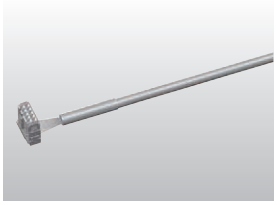
Model name: EXCB2-M20-3



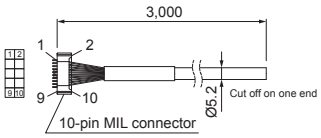
PIN No.	Line color	Marking	PIN No.	Line color	Marking
1	Orange	Black1	11	Orange	Black2
2	Orange	Red1	12	Orange	Red2
3	Gray	Black1	13	Gray	Black2
4	Gray	Red1	14	Gray	Red2
5	White	Black1	15	White	Black2
6	White	Red1	16	White	Red2
7	Yellow	Black1	17	Yellow	Black2
8	Yellow	Red1	18	Yellow	Red2
9	Pink	Black1	19	Pink	Black2
10	Pink	Red1	20	Pink	Red2

Trigger input cable

Cable through which external trigger signals are input by parallel bit method. Used when performing ON/OFF or strobe lighting using an external trigger signal.



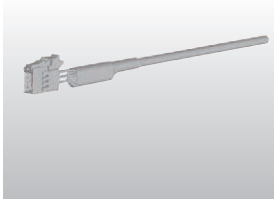
Model name: EXCB2-M10-3



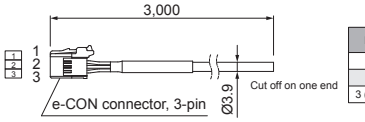
PIN No.	Line color	Marking
1	Orange	Black1
2	Orange	Red1
3	Gray	Black1
4	Gray	Red1
5	White	Black1
6	White	Red1
7	Yellow	Black1
8	Yellow	Red1
9	Pink	Black1
10	Pink	Red1

EIA-485 communication cable

Used for performing external control via EIA-485 communication. You can select the channel, intensity setting, ON/OFF setting and lighting mode (continuous, ON/OFF and strobe modes).



Model name: EXCB2-E3-3

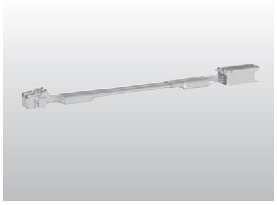


PIN No.	Line color	Embedded line color
1	Black	None
2	Black	White
3 (shielded)	Drain wire	None

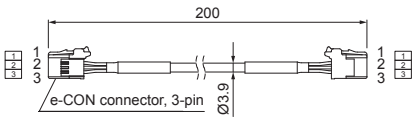
EIA-485 communication relay cable

Relay cable necessary if using with two or more PD3 Series units connected for EIA-485 communication.

EIA-485 communication relay connector

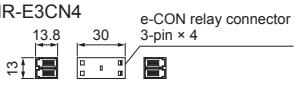


Model name: EXCB2-E3-E3-0.2



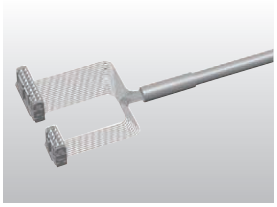
Refer to the material "Connecting EIA-485 Communications Cables" on the CCS website for information on multi-drop wiring connections. You can download this information from the product website page.

Model name: ECNR-E3CN4

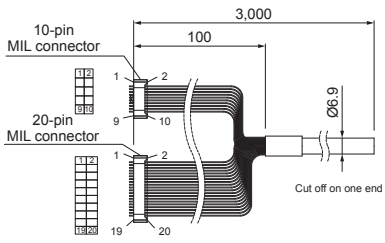


Parallel communication/Trigger input branch cable

Branch cable that combines parallel communication and trigger input cables into a single cable.



Model name: EXCB2-M10M20-3



20-pin MIL connector

PIN No.	Line color	Marking
1	Orange	Black2
2	Orange	Red2
3	Gray	Black2
4	Gray	Red2
5	White	Black2
6	White	Red2
7	Yellow	Black2
8	Yellow	Red2
9	Pink	Black2
10	Pink	Red2
11	Orange	Black3
12	Orange	Red3
13	Gray	Black3
14	Gray	Red3
15	White	Black3
16	White	Red3
17	Yellow	Black3
18	Yellow	Red3
19	Pink	Black3
20	Pink	Red3

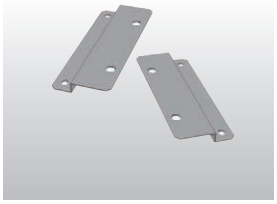
10-pin MIL connector

PIN No.	Line color	Marking
1	Orange	Black1
2	Orange	Red1
3	Gray	Black1
4	Gray	Red1
5	White	Black1
6	White	Red1
7	Yellow	Black1
8	Yellow	Red1
9	Pink	Black1
10	Pink	Red1

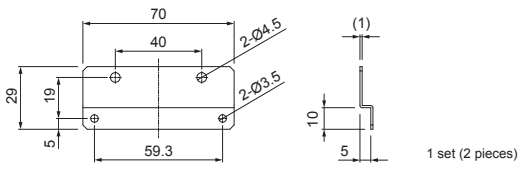
Base brackets

Bracket for securing PD3 Series units to the floor, shelving and similar locations.

Base Brackets are included with PD3-5024-4 and PD3-10024-8 models.



Model name: BK-PD3



1 set (2 pieces)

Control Units

Digital Control Units

PD2 Series

Refer to our website for product details.

CCS PD2 ▶ Search

Production of the PD2 Series digital power supplies is scheduled to end at the end of December 2023.

Intensity control to 256-step Compatible with a wide range of uses

PD2-3012-4(A) / PD2-3024-4(A)

PD2-3012-8(A) / PD2-3024-8(A)

PD2-1012(A) / PD2-1024(A)

PD2-3012(A) / PD2-3024(A)

PD2-5012(A) / PD2-5024(A)

PD2-3012-2(A) / PD2-3024-2(A)

CE Compliant model(s)
PD2-3012(A) / PD2-3024(A) / PD2-5012(A) / PD2-5024(A) / PD2-3012-2(A) / PD2-3024-2(A) / PD2-3012-4(A) / PD2-3024-4(A) / PD2-3012-8(A) / PD2-3024-8(A)

The supplied AC cord is for use with 100 to 120 VAC. If you want to use the control unit with 200 to 240 VAC, you must procure another appropriate AC power cord.

Features

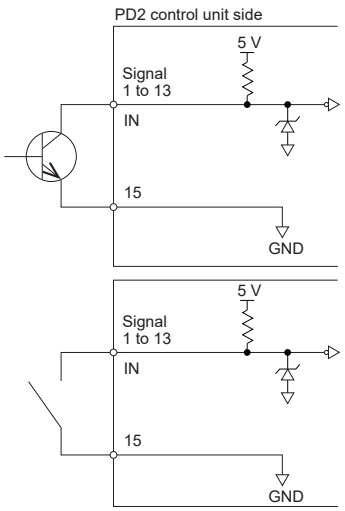
- Can be selected from 12 V and 24 V types according to the input voltage of your LED lights.
- Can be selected from 10 W, 30 W and 50 W types according to the total power consumption of your LED lights.
- You can select from 2, 4 and 8-channel types if you are using individual intensity settings for multiple light units.
- You can select an optional external control cable if you are using external control (refer to P.328).

Example Connection

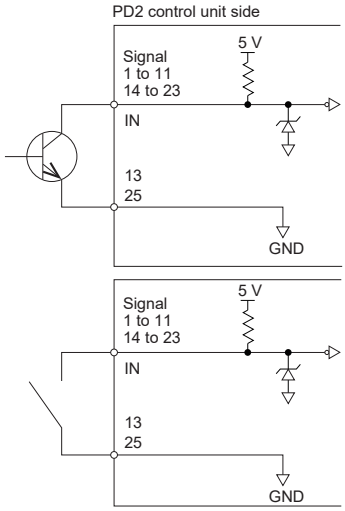
Refer to the User Manual for details.

Example connections of external control signal

■ 1, 2 channels



■ 4, 8 channels



Drive using driver IC or NPN open-collector. Drive is possible if there is a device through which flows an approximately 10 mA current from signal to ground.

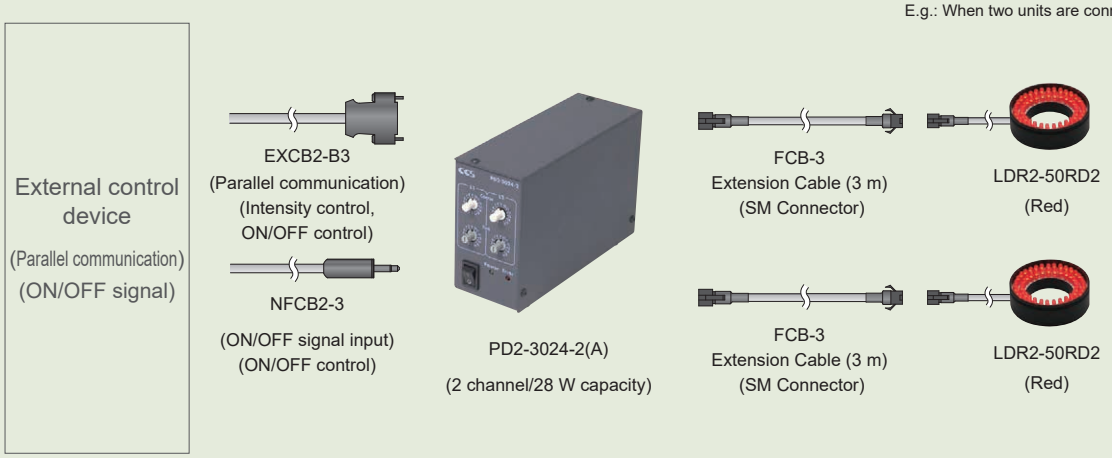
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs — Register to use them.

Example System Configuration

Example:

External control device — **External control cables** — **Control unit** — **Extension cables** — **LED lights (two units connected)**

E.g.: When two units are connected



Specifications

Model name	PD2-1012(A)	PD2-1024(A)	PD2-3012(A)	PD2-3024(A)	PD2-5012(A)	PD2-5024(A)	PD2-3012-2(A)	PD2-3024-2(A)	PD2-3012-4(A)	PD2-3024-4(A)	PD2-3012-8(A)	PD2-3024-8(A)
Input voltage	100 to 120 VAC		100 to 240 VAC									
Input current*1	0.25 A typ.		0.78 A typ.		1.3 A typ.		0.78 A typ.					
Frequency	50/60 Hz											
Inrush current	15 A typ.											
No. of channels	1 channel	1 channel	1 channel	1 channel	1 channel	1 channel	2 channels	2 channels	4 channels	4 channels	8 channels	8 channels
DC output voltage	12 V	24 V	12 V	24 V	12 V	24 V	12 V	24 V	12 V	24 V	12 V	24 V
Output power	9.5 W max.	9.0 W max.	28 W max.	28 W max.	46 W max.	46 W max.	28 W max.	28 W max.	27 W max.	27 W max.	25 W max.	25 W max.
Intensity control	Intensity control method: 62.5 kHz PWM control Manual: 16-step intensity control using coarse and fine rotary switches on the front panel External: Intensity control using 8-bit parallel signal											
External control input	Input circuit: Pull-up of +5.0 V internally by use of resistor (4.7 kΩ)								Input circuit: Pull-up of +5.0 V internally by use of resistor (2.2 kΩ)			
	HS-CMOS input: Low level of max. 1.0 V, high level of 3.5 V or more											
External control connector	D-sub 15-pin (plug)								D-sub 25-pin (plug)			
Lights ON/OFF control	ON/OFF control during manual intensity control: Ø3.5 mm microphone jack ON/OFF control during external intensity control: D-sub 15-pin ON signal (not synchronized with writing sequence)								Manual/External: D-sub 25-pin ON signal (not synchronized with writing sequence)			
Light ON/OFF response time	OFF→ON: 10 µs typ., ON→OFF: 10 µs typ.											
Startup time	0.5 sec typ.											
Output overcurrent protection	Operates at 107% of the output current. Reset by turning the power off and then on again.											
Operating environment	Temperature: 0 to 40°C, Humidity: 20% to 85%RH (with no condensation)											
Storage environment	Temperature: -20 to 60°C, Humidity: 20% to 85%RH (with no condensation)											
Weight	0.7 kg max.		1.1 kg max.		1.3 kg max.		1.1 kg max.		1.2 kg max.		1.5 kg max.	
Accessories	3-prong AC cord with ground terminal*2 (2 m) x 1, User Manual x 1											

*1 For 100 VAC
*2 Except for PD2-1012(A) / 1024(A)

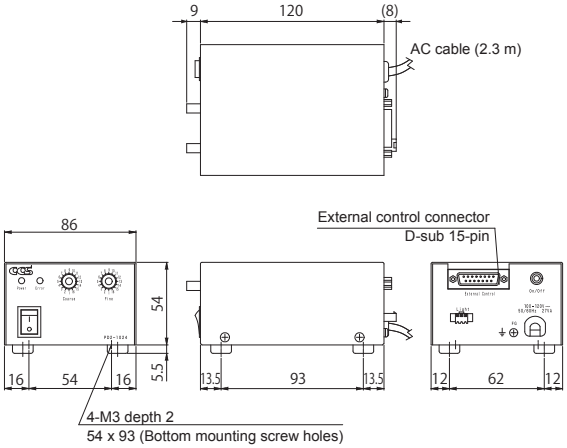
PD2 Series

Refer to our website for product details.

CCS PD2 ▶ Search

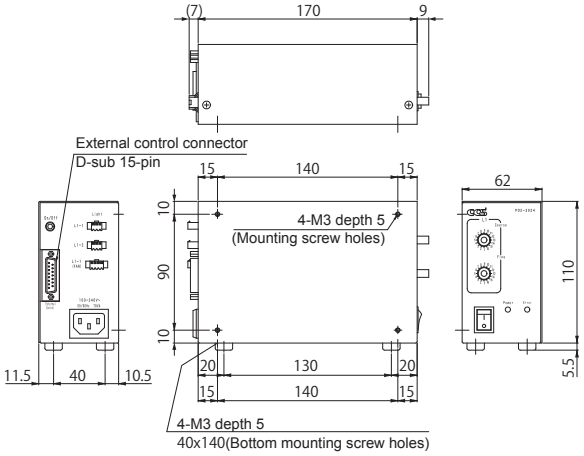
Dimensions (mm)

PD2-1012(A) / PD2-1024(A)



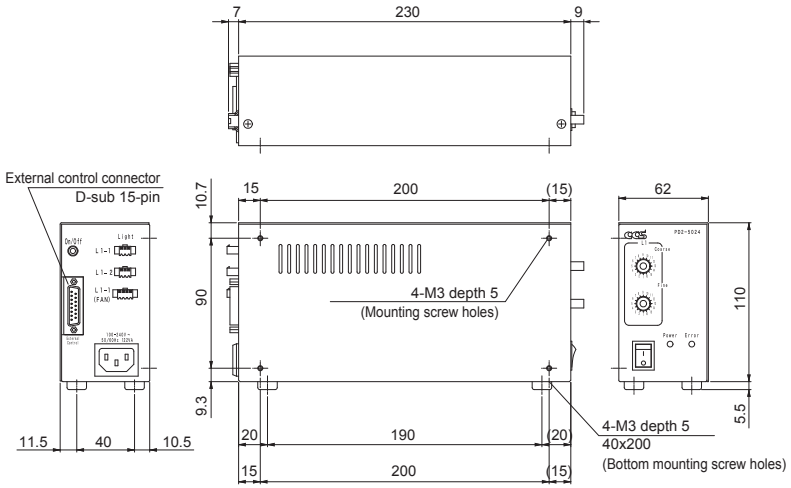
*For the 12 V type PD2-1012(A), the light connector is 2-pin.

PD2-3012(A) / PD2-3024(A)



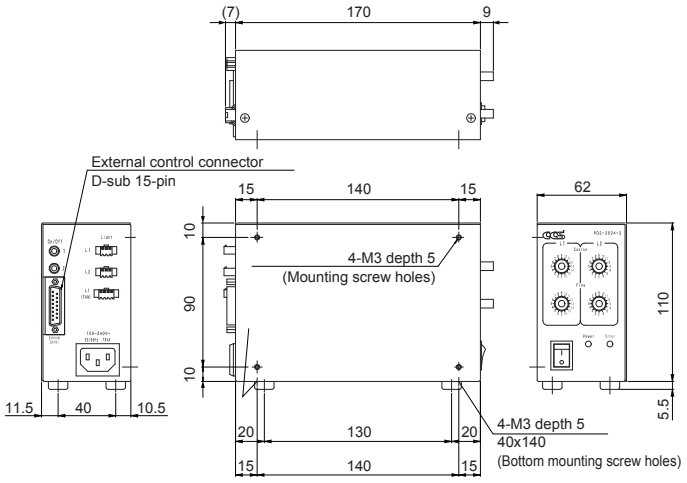
*For the 12 V type PD2-3012(A), the light connector is 2-pin.

PD2-5012(A) / PD2-5024(A)



*For the 12 V type PD2-5012, the light connector is 2-pin.

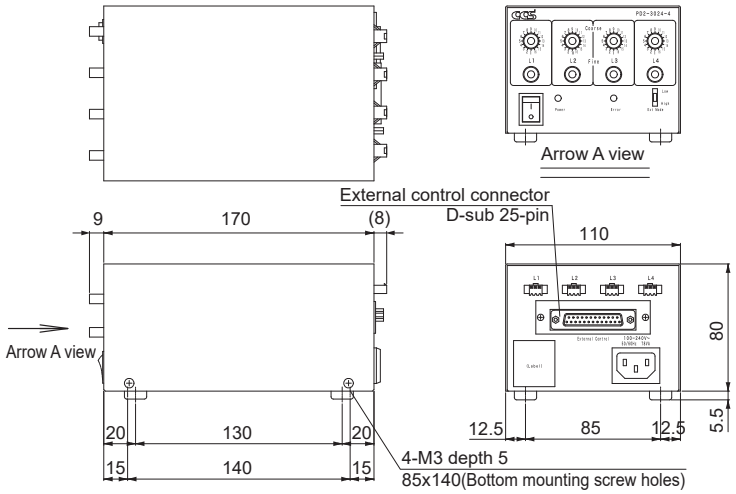
PD2-3012-2(A) / PD2-3024-2(A)



*For the 12 V type PD2-3012-2(A), the light connector is 2-pin.

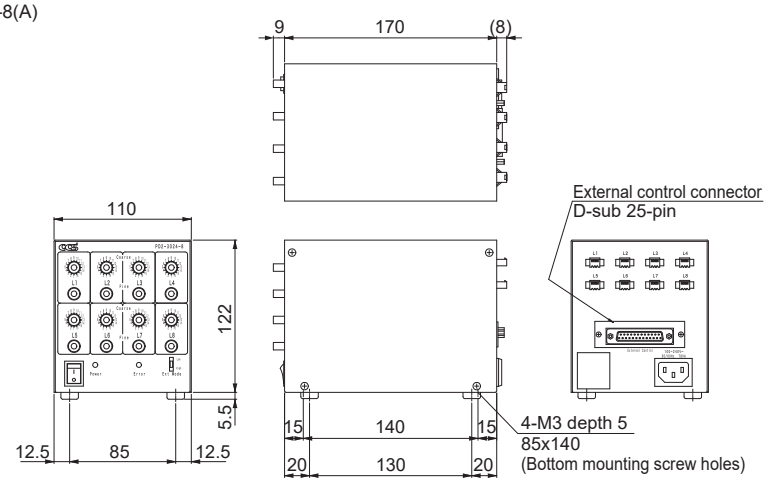
Dimensions (mm, Continued)

PD2-3012-4(A) / PD2-3024-4(A)



*For the 12 V type PD2-3012-4(A), the light connector is 2-pin.

PD2-3012-8(A) / PD2-3024-8(A)



*For the 12 V type PD2-3012-8(A), the light connector is 2-pin.

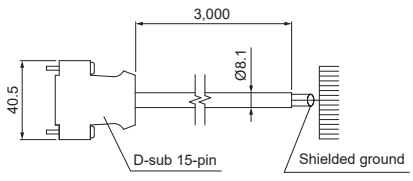
Options

External control cable

Dimensions (mm)

Corresponding control unit: PD2 (1 and 2 channels) Series

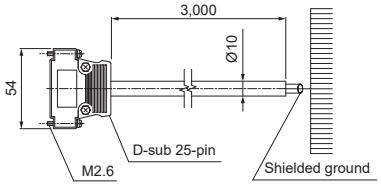
EXCB2-B3 (3 m): D-sub 15-pin



No.	Line color	No.	Line color
1	Black	9	Gray
2	White	10	Pink
3	Red	11	White/Black
4	Green	12	Red/Black
5	Yellow	13	Green/Black
6	Brown	14	Yellow/Black
7	Blue	15	Brown/Black
8	Purple	NC	(Blue/Black)

Corresponding control unit: PD2 (4 and 8 channels) Series

EXCB2-25-3 (3 m): D-sub 25-pin

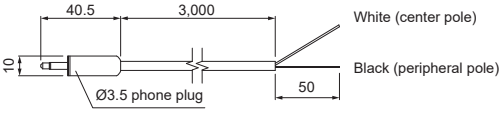


No.	Line color	No.	Line color	No.	Line color	No.	Line color
1	Black	9	Gray	17	Purple/Black	25	Brown/White
2	White	10	Pink	18	Grey/Black	NC	(Blue/White)
3	Red	11	White/Black	19	Pink/Black	NC	(Purple/White)
4	Green	12	Red/Black	20	Light green/Black	NC	(Grey/White)
5	Yellow	13	Green/Black	21	Black/White	NC	(Pink/White)
6	Brown	14	Yellow/Black	22	Red/White	NC	(Light green/White)
7	Blue	15	Brown/Black	23	Green/White		
8	Purple	16	Blue/Black	24	Yellow/White		

External ON/OFF control cable

Corresponding control unit: PD2 (1 and 2 channels) Series

NFCB2-3 (3 m)



Line color	Signal
White	ON/OFF
Black	GND (-)

Refer to our website for product details.

CCS POD ▶ Search

Multi-functional and fine-tunable control units

Overdrive Variable-voltage Control

Ethernet Enabled

Minimum Strobe Time: 1 µs

10 Scenes Storable

CE Compliant

The supplied AC cord is for use with 100 to 120 VAC. If you would like to use the control unit with 200 to 240 VAC, you must procure another appropriate AC power cord.

POD-5024-2-PEI
(2 channel model)

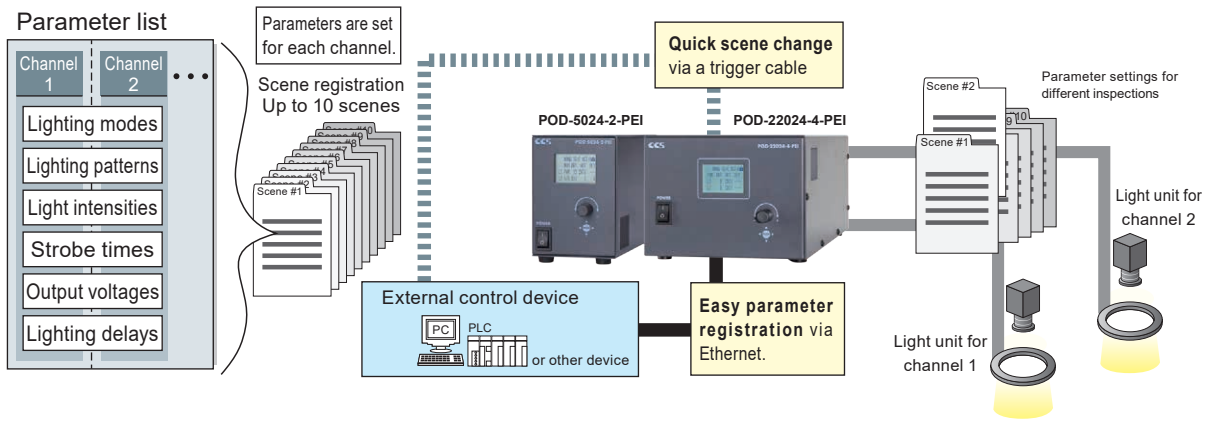
POD-22024-4-PEI
(4 channel model)

Features

- Strobe lighting. Overdrive specifications.
- Voltage control during overdrive operation.
- Ethernet and parallel communications.
- Continuous lighting under PWM control.
- Sets of parameters related to light control can be registered.
- The light intensity can be set to one of 512 levels.
- Output voltage: 24 to 48 VDC
- Minimum strobe time of 1 µs.
- Strobe delay: 0 to 1,000 µs (in steps of 1 µs)
- 2 channels (POD-5024-2-PEI), 4 channels (POD-22024-4-PEI).
- Trigger link function (POD-22024-4-PEI).
  You can make the light units on multiple channels turn ON (or OFF) with a single trigger signal that is input through one of the pins of the trigger input connector.

A Specification Difference between POD-5024-2-PEI and POD-22024-4-PEI
In POD-22024-4-PEI (4-channel model), the lighting mode setting (Overdrive or PWM) is applied to all channels. Please note that the setting cannot be individually specified for each channel as in POD-5024-2-PEI (2-channel model).

●Registering Scenes (sets of parameters)



You can register sets of parameters called scenes that consist of the light control settings for all channels. By just applying a scene to the channels, you can easily change the settings. Up to 10 scenes can be registered. Refer to the User Manual for details.
For information on possible combinations of light units with a POD Series control unit, refer to our website.
https://www.ccs-grp.com/lnk/qr/pod

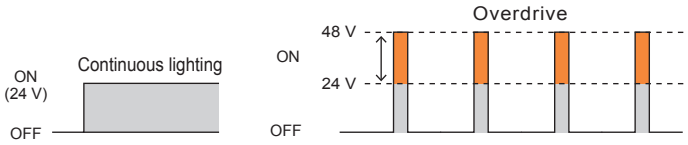
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

● What Is "Overdriving"?

Overdriving is used to emit brighter light by applying a high voltage to an LED light unit.

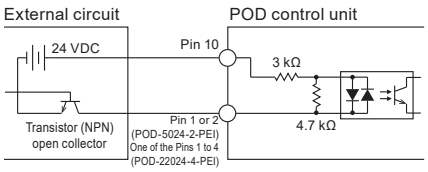
This voltage exceeds the voltage for continuous lighting.



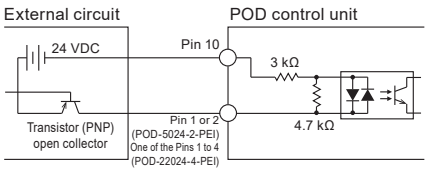
Example Connections Refer to the User Manual for details.

Example connections of external trigger signal

■ Sink type (NPN)



■ Source type (PNP)

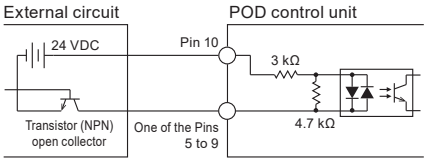


Connection specifications (for each terminal)				
Rated input voltage	Maximum input voltage	Photocoupler ON voltage / ON current	Photocoupler OFF voltage / OFF current	Response time
24 VDC	26.4 VDC	21.6 VDC min. / 6 mA min.	1.5 VDC max. / 1 mA max.	Refer to the sequence diagrams on the User Manual.

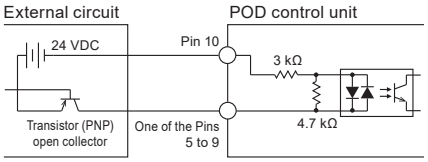
Setting of the LCG-TRG item on the COM Menu	Photocoupler	When lighting mode is set to O/D Mode, or when lighting mode is set to PWM Mode and lighting pattern is set to Strobe Lighting Pattern	When lighting mode is set to PWM Mode and lighting pattern is set to Continuous Lighting Pattern
ACTIVE HI	ON	No change	Light Unit OFF
	OFF	Light unit flashes for the strobe time.	Light Unit ON
ACTIVE LO	ON	Light unit flashes for the strobe time.	Light Unit ON
	OFF	No change	Light Unit OFF

Example connections of external trigger signal (Applying scenes)

■ Sink type (NPN)



■ Source type (PNP)

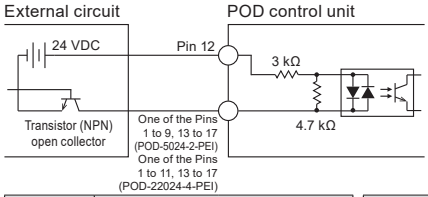


Photocoupler	Data	
	When the LGC-PAR item on the COM Menu is set to *ACTIVE HI*	When the LGC-PAR item on the COM Menu is set to *ACTIVE LO*
ON	1	0
OFF	0	1

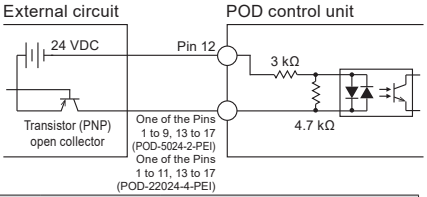
Scene number	Data				LCD
	SC3	SC2	SC1	SC0	
00	0	0	0	0	S01
01	0	0	0	1	S02
02	0	0	1	0	S03
03	0	0	1	1	S04
04	0	1	0	0	S05
05	0	1	0	1	S06
06	0	1	1	0	S07
07	0	1	1	1	S08
08	1	0	0	0	S09
09	1	0	0	1	S10

Example connections of external signal (Parallel communications)

■ Sink type (NPN)



■ Source type (PNP)



Photocoupler	Data	
	When the LGC-PAR item on the COM Menu is set to *ACTIVE HI*	When the LGC-PAR item on the COM Menu is set to *ACTIVE LO*
ON	1	0
OFF	0	1

Connection specifications (for each terminal)				
Rated input voltage	Maximum input voltage	Photocoupler ON voltage / ON current	Photocoupler OFF voltage / OFF current	Response time
24 VDC	26.4 VDC	21.6 VDC min. / 6 mA min.	1.5 VDC max. / 1 mA max.	Refer to the sequence diagrams on the User Manual.

POD Series

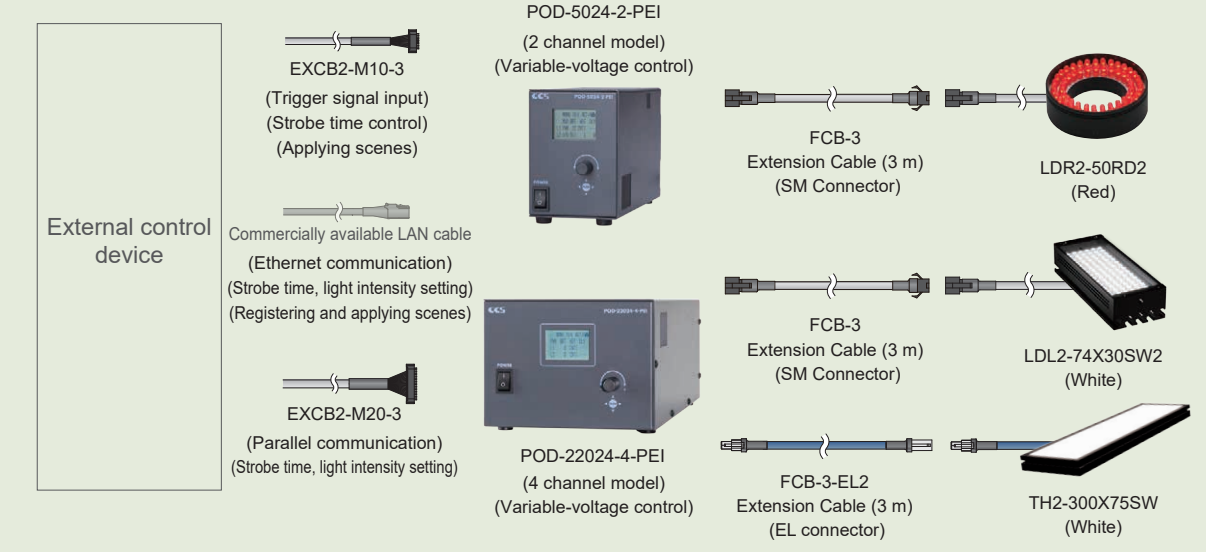
Refer to our website for product details.

CCS POD ▶ Search

Example System Configuration

Example:

External control device —— **External control cable** —— **Control unit** ——— **Extension cables** —— **LED light**



Specifications

Model name	POD-5024-2-PEI / POD-22024-4-PEI			
Lighting method	Strobe lighting (Overdrive mode), continuous lighting (PWM mode)			
Drive method	Costant-voltage system			
Intensity control method	Variable-voltage control or PWM control			
Number of channels	POD-5024-2-PEI: 2 channels / POD-22024-4-PEI: 4 channels			
Number of output connectors	POD-5024-2-PEI	L1: 1 (SM connector), L2: 1 (SM connector)		
	POD-22024-4-PEI	L1: 2 (EL connectors, SM connectors), L2: 2 (EL connector, SM conenctor), L3: 1 (SM connector), L4: 1 (SM connector)		
Output ratings*1	POD-5024-2-PEI		POD-22024-4-PEI	
	When both channels are in O/D Mode	Output current: 10 A max. (total for 2 channels)	O/D Mode (peak)	**Total for 4 channels: 50 A max.** L1, L2: 15 A max./channel (EL connector: 15 A max./channel) (SM connector: 10 A max./channel) L3, L4: 10 A max./channel
	When both channels are in PWM Mode	Output power: 45 W max. (total for 2 channels)		
	When the channels are used together with different lighting modes	Output current: 6.3 A max. and Output power: 36 W max. (total for 2 channels)	PWM Mode	**Total for 4 channels: 200 W max.** L1, L2: 100 W max./channel (EL connector: 100 W max./channel) (SM connector: 60 W max./channel) L3, L4: 60 W max./channel
Output voltage (ratings)	Overdrive (O/D) mode: 24 to 48 VDC, PWM mode: 24 VDC			
PWM frequency	125 kHz			
Light control settings	Manual	Operation on the front panel	512 levels	
	External	Command input via TCP/IP or UDP/IP communications		
		Signal input through parallel port		
Strobe time settings	Manual	Operation on the front panel	POD-5024-2-PEI: 1 to 1,000 µs (in steps of 1 µs) POD-22024-4-PEI: 1 to 3,000 µs*2	
	External	Command input via TCP/IP or UDP/IP communications		
		Signal input through parallel port		
Lighting delay settings	Manual	Operation on the front panel	0 to 1,000 µs (in steps of 1 µs)	
	External	Command input via TCP/IP or UDP/IP communications		
		Signal input through parallel port		
Input power	100 to 240 VAC (+10%, -15%), 50/60 Hz			
Power consumption (typ.)	POD-5024-2-PEI: 65 VA, POD-22024-4-PEI: 260 VA			
Inrush current (typ.)	POD-5024-2-PEI: 15 A (at 100 VAC), 36 A (at 240 VAC) from a cold start			
	POD-22024-4-PEI: 17 A (at 100 VAC), 40.8 A (at 240 VAC) from a cold start			
Ground leakage current	3.5 mA max. (264 VAC, 60 Hz, with no load)			
Insulation withstand voltage (input-output, input-FG)	1,500 VAC for one minute, Cutoff current: 10 mA, 500 VDC, 20 MΩ min.			
Overvoltage category	Category II			
Operating environment	Temperature: 0 to 40°C, Humidity: 20% to 85% (with no condensation), Altitude: 2,000 m max., Protective ground class: Class I, Pollution degree: 2, Indoor use only			
Storage environment	Temperature: −20 to 60°C, Humidity: 20% to 85% (with no condensation)			
Cooling method	Forced air cooling			
CE marking	Safety standard: Conforms to EN 61010-1 EMC standard: Conforms to EN61000-6-2, EN61000-6-4			
Environmental regulations	RoHS compliant			
Material, coating, and surface processing	Steel sheet, Cover thickness: 1.6 mm, Chassis thickness: 1.0 mm, N3 (leather tone)			
Weight	POD-5024-2-PEI: 1,500 g max., POD-22024-4-PEI: 3,300 g max.			
Accessories	User Manual x1, 2-m-long 3-prong AC power cord with ground terminal x1			

*1 For information on possible combinations of light units with a POD Series control unit, refer to our website. https://www.ccs-grp.com/lnk/qr/pod

*2 For manual control and Ethernet communications: 1 to 1,000 µs (in steps of 1 µs), 1,002 to 3,000 µs (in steps of 3 µs)
For parallel communications: 3 to 3,000 µs (in steps of 3 µs) for high strobe time range, 1 to 1,000 (in steps of 1 µs) for low strobe time range

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

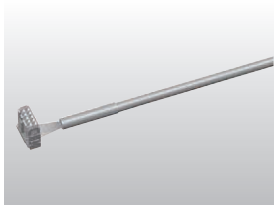
Options

External control cables

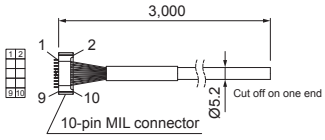
Dimensions (mm)

Trigger input cable

Used to input a external trigger signal of parallel bits. Used for performing strobe lighting and scene application.



Model name: EXCB2-M10-3

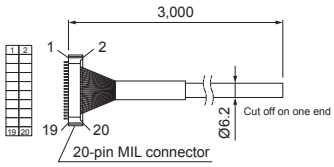


PIN No.	Line color	Marking
1	Orange	Black1
2	Orange	Red1
3	Gray	Black1
4	Gray	Red1
5	White	Black1
6	White	Red1
7	Yellow	Black1
8	Yellow	Red1
9	Pink	Black1
10	Pink	Red1

Parallel communication cable

Used for performing external control via parallel communication.

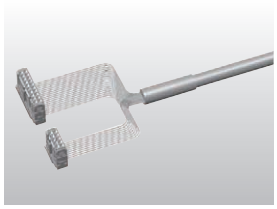
Model name: EXCB2-M20-3



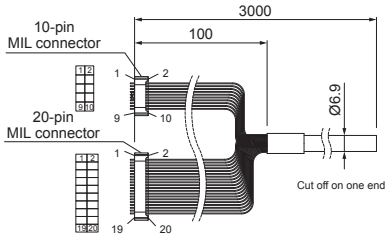
PIN No.	Line color	Marking	PIN No.	Line color	Marking
1	Orange	Black1	11	Orange	Black2
2	Orange	Red1	12	Orange	Red2
3	Gray	Black1	13	Gray	Black2
4	Gray	Red1	14	Gray	Red2
5	White	Black1	15	White	Black2
6	White	Red1	16	White	Red2
7	Yellow	Black1	17	Yellow	Black2
8	Yellow	Red1	18	Yellow	Red2
9	Pink	Black1	19	Pink	Black2
10	Pink	Red1	20	Pink	Red2

Parallel communication/Trigger input branch cable

Branch cable that combines parallel communication and trigger input cables into a single cable.



Model name: EXCB2-M10M20-3



10-pin MIL connector

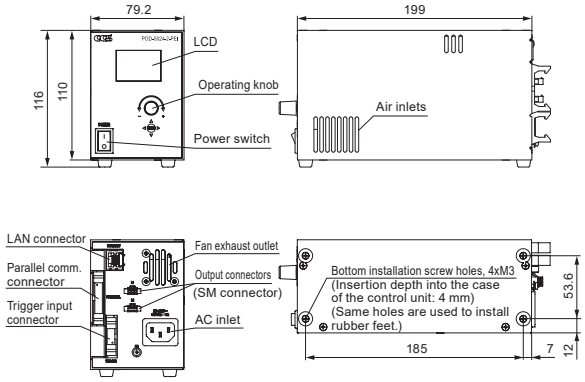
PIN No.	Line color	Marking
1	Orange	Black1
2	Orange	Red1
3	Gray	Black1
4	Gray	Red1
5	White	Black1
6	White	Red1
7	Yellow	Black1
8	Yellow	Red1
9	Pink	Black1
10	Pink	Red1

20-pin MIL connector

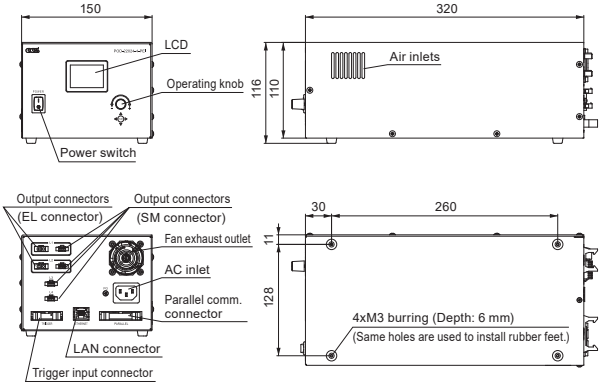
PIN No.	Line color	Marking
1	Orange	Black2
2	Orange	Red2
3	Gray	Black2
4	Gray	Red2
5	White	Black2
6	White	Red2
7	Yellow	Black2
8	Yellow	Red2
9	Pink	Black2
10	Pink	Red2
11	Orange	Black3
12	Orange	Red3
13	Gray	Black3
14	Gray	Red3
15	White	Black3
16	White	Red3
17	Yellow	Black3
18	Yellow	Red3
19	Pink	Black3
20	Pink	Red3

Dimensions (mm)

POD-5024-2-PEI



POD-22024-4-PEI



Control Units

Strobe Overdrive Control Units
PTU2 Series

Refer to our website for product details.
CCS PTU2 ▶ Search

Overdrive strobe control units
Enables even brighter emission of light units

Overdrive Specifications

CE Compliant

The supplied AC cord is for use with 100 to 120 VAC.
If you want to use the control unit with 200 to 240 VAC, you must procure another appropriate AC power cord.

The PTU2 Series enables strobe lighting with overdrive. Overdrive refers to brighter than normal emission of light by increasing the voltage and current supplied to the light unit.

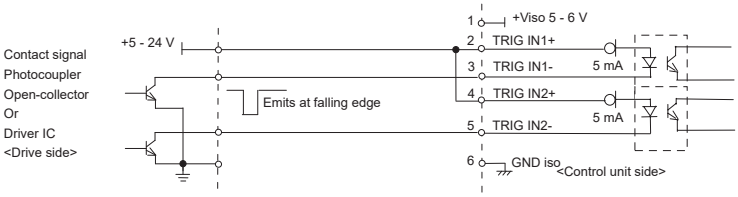
Features

- The PTU2 Series enables the lights to emit several times brighter than the conventional control units.
- The two independent channels allow for setting each channel to emit for 10 to 990 μs.

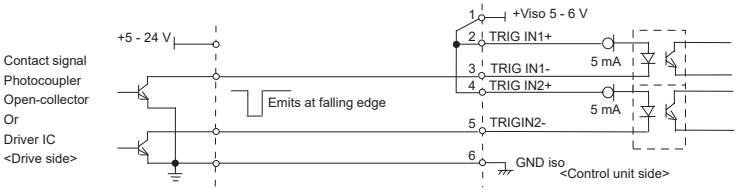
Example Connections

Refer to the User Manual for details.

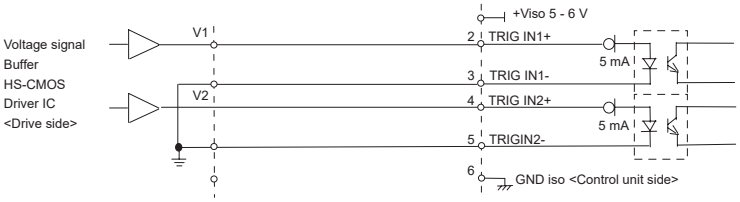
(1) Non-voltage contact drive 1
(using drive-side power supply)



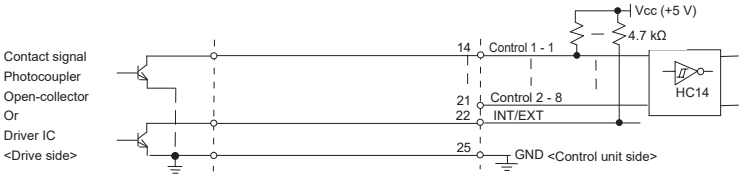
(2) Non-voltage contact drive 2
(using insulation power supply)



(3) If driven by the high-pulse
voltage output signal



(4) External intensity input



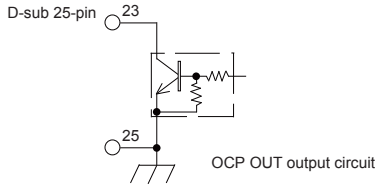
Low: 0 V or more 1.13 V max. High: 3.15 V or more 5 V max.

Overcurrent protection function

PTU2 control units forcibly stop the power output when the current consumption in the light unit exceeds the value shown below. The error lamp (red) on the front of the unit also flashes. Stopping of output is not released until the control unit is restarted.

Model name	PTU2-3012(A)	PTU2-3024(A)
Power consumption	8.5 A peak min	6.0 A peak min

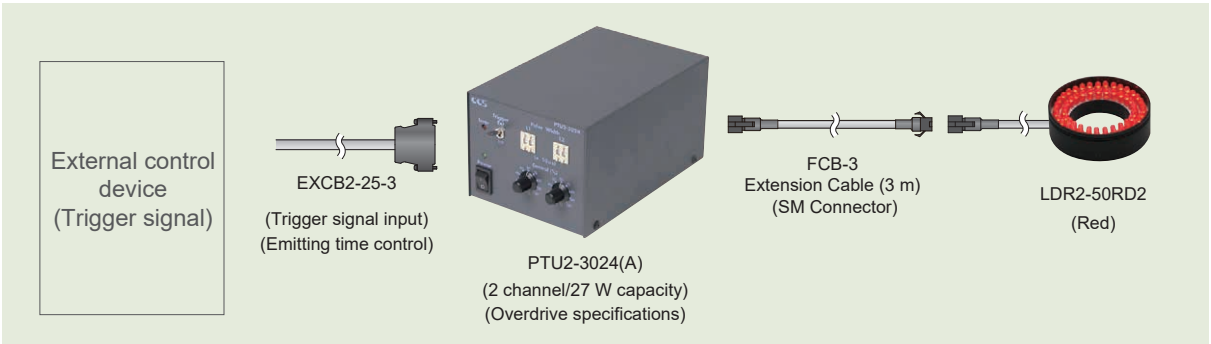
Use 24 VDC and 20 mA max. for the OCP OUT load in order to obtain a margin.



Example System Configuration

Example:

External control device — **External control cable** — **Control unit** — **Extension cables** — **LED light**

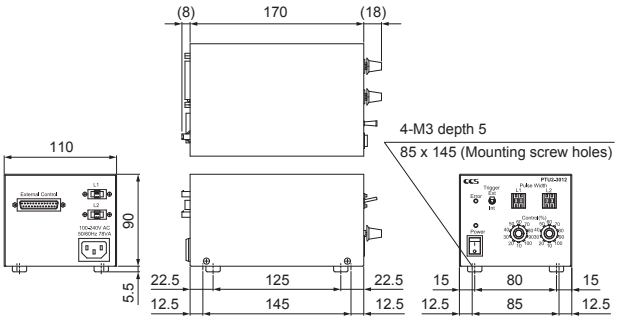


Specifications

Model name	PTU2-3012(A)	PTU2-3024(A)
Input voltage (rated)	100 to 240 VAC	
Frequency	50/60 Hz	
Inrush current (typ.)	26 A (for 100 VAC) 63 A (for 240 VAC) at cold start	15 A (for 100 VAC) 30 A (for 240 VAC) at cold start
Output	18 VDC, 8.1 A max. (Peak value when connected to max. load)	48 VDC, 4.3 A max. (Peak value when connected to max. load)
Applicable light unit (rated)	Total for 2 channels: 27 W max.	
Lighting time	10 to 990 µs Lighting time = Pulse Width [x10 µs] x Control (10 to 100%) Pulse Width: 0 to 99 x 10 µs Control: 10 to 100% (10% steps)	
Lighting delay	15 µs max.	
Output connector	SMP-02V-BC	SMP-03V-BC
External control connector	D-sub 25-pin (plug), M2.6 screw	
Overcurrent protection	Output shutdown: 107% min. of rated load Reset by clearing the cause, and then turning the power off and on again.	
Weight	1.2 kg max.	
Accessories	3-prong AC cord with ground terminal (2 m) x 1, External control connector x 1, User Manual x 1	

Dimensions (mm)

PTU2-3012(A) / 3024(A)

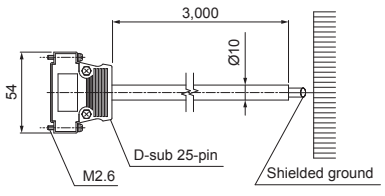


Options

External control cable

Dimensions (mm)

EXCB2-25-3 (3 m)
D-sub 25-pin



No.	Line color	No.	Line color	No.	Line color	No.	Line color
1	Black	9	Gray	17	Purple/Black	25	Brown/White
2	White	10	Pink	18	Grey/Black	NC	(Blue/White)
3	Red	11	White/Black	19	Pink/Black	NC	(Purple/White)
4	Green	12	Red/Black	20	Light green/Black	NC	(Grey/White)
5	Yellow	13	Green/Black	21	Black/White	NC	(Pink/White)
6	Brown	14	Yellow/Black	22	Red/White	NC	(Light green/White)
7	Blue	15	Brown/Black	23	Green/White		
8	Purple	16	Blue/Black	24	Yellow/White		

Control Units

High Power Strobe Control Units
PF Series

Refer to our website for product details.
CCS PF ▶ Search

Enables “extreme power” strobe lights
Dedicated for the high power strobe light units

Light intensity 512 levels
Ethernet enabled
Available Strobe time 1 µs min.
Lighting delay time 0 to 100 µs

PF-A4048-2
(2 channel model)

PF-A16048-4
(4 channel model)

CE Compliant

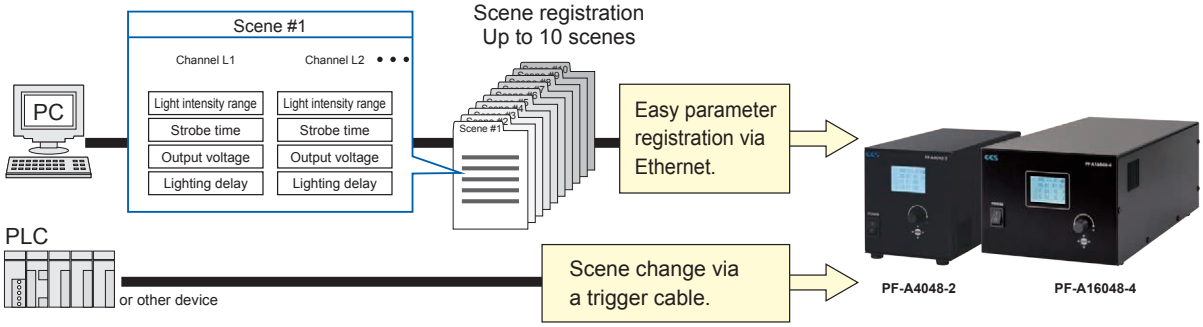
The supplied AC cord is for use with 100 to 120 VAC.
If you would like to use the control unit with 200 to 240 VAC, you must procure another appropriate AC power cord.

High Power Strobe Lights PF Series
Product Page ▼ P.143

Features

- Dedicated control unit for the high power strobe lights PF Series.
  PF Series Product Page ▼ P.143
- Light intensity: 512 levels
- Minimum strobe time of 1 µs.
- Lighting delay time: 0 to 100 µs (in steps of 0.1 µs)
- 2 channels (PF-A4048-2), 4 channels (PF-A16048-4).
- Ethernet and parallel communications.
- Sets of parameters related to light control can be registered.
- Trigger link function (PF-A16048-4)
  You can make the light units on multiple channels turn ON (or OFF) with a single trigger signal that is input through one of the pins of the trigger input connector.

● Registering Scenes (sets of parameters)

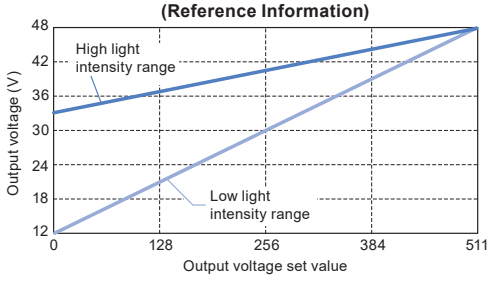


You can register sets of parameters called scenes that consist of the light control settings for all channels.
By just applying a scene to the channels, you can easily change the settings. Up to 10 scenes can be registered.
Refer to the User Manual for operation details.

● **Light Intensity Ranges**
Each channel can be set to either of the light intensity ranges below. The output voltage of the output connectors varies depending on the light intensity range.

- High light intensity range (default): 33 to 48 VDC
- Low light intensity range: 12 to 48 VDC

Output Voltage Characteristics (Reference Information)



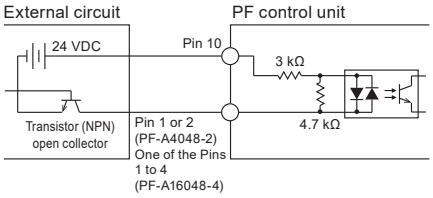
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs
Register to use them.

Example Connections

Refer to the User Manual for details.

Example connections of external trigger signal

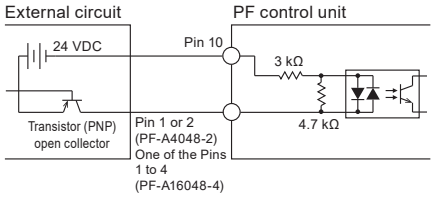
■ Sink type (NPN)



Connection specifications for each terminal				
Rated input voltage	Maximum input voltage	Photocoupler ON voltage / ON current	Photocoupler OFF voltage / OFF current	Response time
24 VDC	26.4 VDC	21.6 V DC min. / 7 mA min.	1.5 V DC max. / 1 mA max.	Refer to the sequence diagrams on the User Manual.

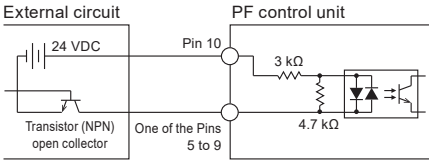
Setting of the LCG-TRG item on the COM Menu	Photocoupler	Light unit status
ACTIVE HI	ON	No change
	OFF	Light unit flashes for the strobe time.
ACTIVE LO	ON	Light unit flashes for the strobe time.
	OFF	No change

■ Source type (PNP)



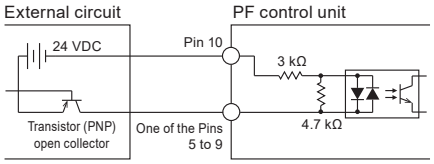
Example connections of external trigger signal (Applying scenes)

■ Sink type (NPN)



Photocoupler	Data	
	When the LGC-PAR item on the COM Menu is set to *ACTIVE HI*	When the LGC-PAR item on the COM Menu is set to *ACTIVE LO*
ON	1	0
OFF	0	1

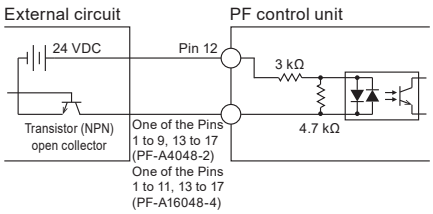
■ Source type (PNP)



Scene number	Data				LCD
	SC3	SC2	SC1	SC0	
00	0	0	0	0	S01
01	0	0	0	1	S02
02	0	0	1	0	S03
03	0	0	1	1	S04
04	0	1	0	0	S05
05	0	1	0	1	S06
06	0	1	1	0	S07
07	0	1	1	1	S08
08	1	0	0	0	S09
09	1	0	0	1	S10

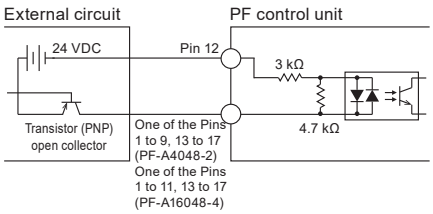
Example connections of external signal (Parallel communications)

■ Sink type (NPN)



Photocoupler	Data	
	When the LGC-PAR item on the COM Menu is set to *ACTIVE HI*	When the LGC-PAR item on the COM Menu is set to *ACTIVE LO*
ON	1	0
OFF	0	1

■ Source type (PNP)



Connection specifications for each terminal				
Rated input voltage	Maximum input voltage	Photocoupler ON voltage / ON current	Photocoupler OFF voltage / OFF current	Response time
24 VDC	26.4 VDC	21.6 V DC min. / 7 mA min.	1.5 V DC max. / 1 mA max.	Refer to the sequence diagrams on the User Manual.

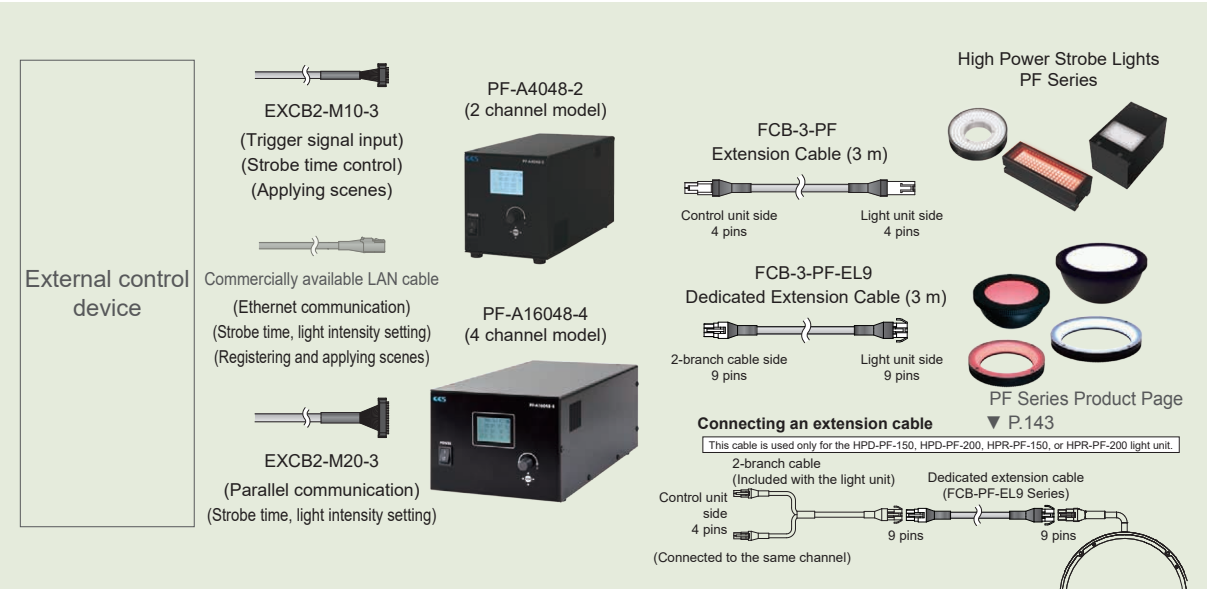
PF Series

Refer to our website for product details.

CCS PF ▶ Search

Example System Configuration

Example:
External control device — **External control cable** — **Control unit** — **Extension cables** — **LED light**



Specifications

Model name	PF-A4048-2, PF-A16048-4		
Lighting method	Strobe lighting		
Drive method	Constant-voltage system		
Intensity control method	Variable-voltage control, Strobe time control		
Number of channels	PF-A4048-2	2 channels	
	PF-A16048-4	4 channels	
Number of output connectors	PF-A4048-2	L1: 2, L2: 1	
	PF-A16048-4	L1: 2, L2: 2, L3: 2, L4: 2	
Applicable light unit (ratings)	CCS high power strobe light units		
Output voltage settings	Manual	Operation on the front panel	512 levels
	External	Command input via TCP/IP or UDP/IP communications	
		Signal input through parallel port	
Strobe time settings	Manual	Operation on the front panel	PF-A4048-2: 1 to 100 µs (in steps of 0.1 µs) PF-A16048-4: 1 to 500 µs*1
	External	Command input via TCP/IP or UDP/IP communications	
		Signal input through parallel port	
Lighting delay settings	Manual	Operation on the front panel	0 to 100 µs (in steps of 0.1 µs)
	External	Command input via TCP/IP or UDP/IP communications	
		Signal input through parallel port	
Input power	100 to 240 VAC (+10%, -15%), 50/60 Hz		
Power consumption (typ.)	PF-A4048-2	65 VA	
	PF-A16048-4	140 VA	
Inrush current (typ.)	PF-A4048-2	15 A (at 100 VAC), 36 A (at 240 VAC) from a cold start	
	PF-A16048-4	17 A (at 100 VAC), 40.8 A (at 240 VAC) from a cold start	
Ground leakage current	3.5 mA max. (264 VAC, 60 Hz, with no load)		
Output voltage (ratings)	High light intensity range: 33 to 48 VDC Low light intensity range: 12 to 48 VDC		
Output current (peak)	PF-A4048-2	Total for 2 channels: 43.2 A (21.6 A/connector)	
	PF-A16048-4	Total for 4 channels: 172.8 A (21.6 A/connector)	
Insulation withstand voltage (input-output, input-FG)	1500 VAC for one minute, Cutoff current: 10 mA, 500 VDC, 20 MΩ min.		
Overvoltage category	Category II		
Operating environment	Temperature: 0 to 40°C, Humidity: 20% to 85% (with no condensation) Altitude: 2,000 m max., Protective ground class: Class I, Pollution degree: 2, Indoor use only		
Storage environment	Temperature: −20 to 60°C, Humidity: 20% to 85% (with no condensation)		
Cooling method	Forced air cooling		
CE marking	Safety standard: Conforms to EN 61010-1 EMC standard: Conforms to EN61000-6-2, EN61000-6-4		
Environmental regulations	RoHS compliant		
Material and surface processing	Steel sheet, Cover thickness: 1.6 mm, Chassis thickness: 1.0 mm, Black (half matte)		
Weight	PF-A4048-2	1900 g max.	
	PF-A16048-4	3,300 g max.	
Accessories	User manual, 2-m-long 3-prong AC power cord with ground terminal		

*1 For Ethernet communications: 1 to 100 µs (in steps of 0.1 µs), 100.5 to 500 µs (in steps of 0.5 µs)
For parallel communications: High strobe time range (5 to 500 µs, in steps of 0.5 µs), Low strobe time range (1 to 100 µs, in steps of 0.1 µs)

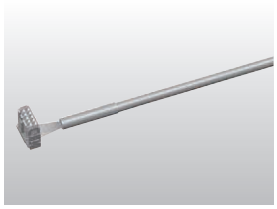
Options

External control cables

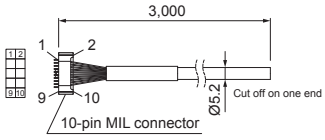
Dimensions (mm)

Trigger input cable

Used to input a external trigger signal of parallel bits. Used for performing strobe lighting and scene application.



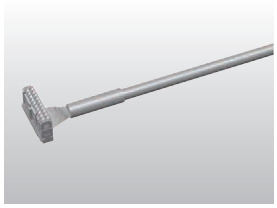
Model name: EXCB2-M10-3



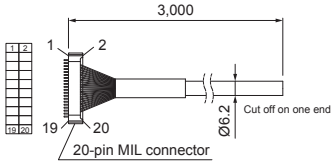
PIN No.	Line color	Marking
1	Orange	Black1
2	Orange	Red1
3	Gray	Black1
4	Gray	Red1
5	White	Black1
6	White	Red1
7	Yellow	Black1
8	Yellow	Red1
9	Pink	Black1
10	Pink	Red1

Parallel communication cable

Used for performing external control via parallel communication.



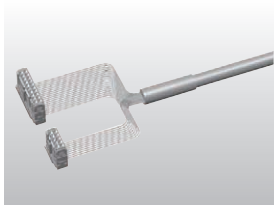
Model name: EXCB2-M20-3



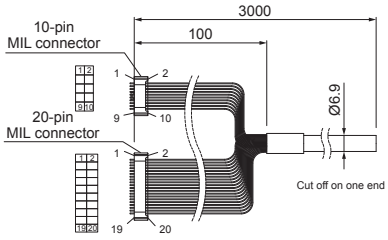
PIN No.	Line color	Marking	PIN No.	Line color	Marking
1	Orange	Black1	11	Orange	Black2
2	Orange	Red1	12	Orange	Red2
3	Gray	Black1	13	Gray	Black2
4	Gray	Red1	14	Gray	Red2
5	White	Black1	15	White	Black2
6	White	Red1	16	White	Red2
7	Yellow	Black1	17	Yellow	Black2
8	Yellow	Red1	18	Yellow	Red2
9	Pink	Black1	19	Pink	Black2
10	Pink	Red1	20	Pink	Red2

Parallel communication/Trigger input branch cable

Branch cable that combines parallel communication and trigger input cables into a single cable.



Model name: EXCB2-M10M20-3



10-pin MIL connector

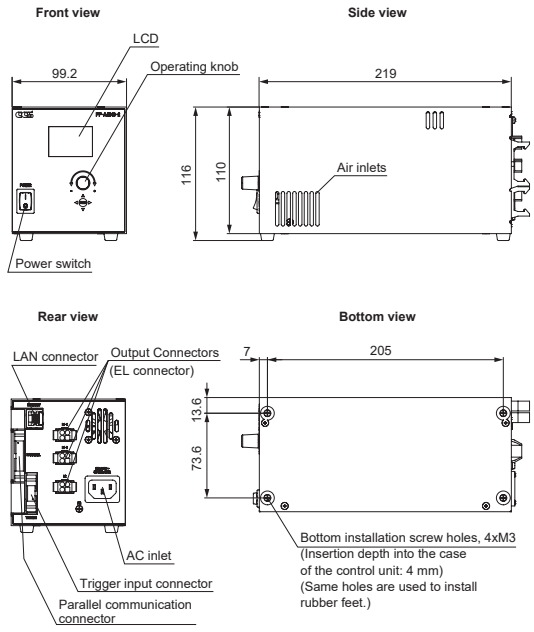
PIN No.	Line color	Marking
1	Orange	Black1
2	Orange	Red1
3	Gray	Black1
4	Gray	Red1
5	White	Black1
6	White	Red1
7	Yellow	Black1
8	Yellow	Red1
9	Pink	Black1
10	Pink	Red1

20-pin MIL connector

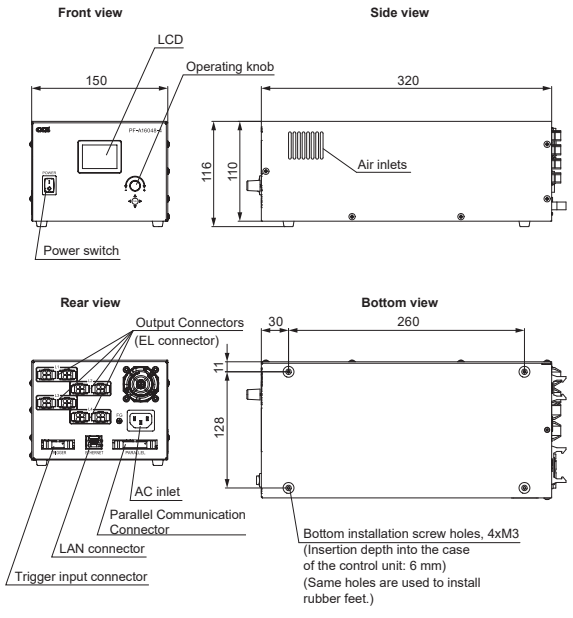
PIN No.	Line color	Marking
1	Orange	Black2
2	Orange	Red2
3	Gray	Black2
4	Gray	Red2
5	White	Black2
6	White	Red2
7	Yellow	Black2
8	Yellow	Red2
9	Pink	Black2
10	Pink	Red2
11	Orange	Black3
12	Orange	Red3
13	Gray	Black3
14	Gray	Red3
15	White	Black3
16	White	Red3
17	Yellow	Black3
18	Yellow	Red3
19	Pink	Black3
20	Pink	Red3

Dimensions (mm)

PF-A4048-2



PF-A16048-4



PoE Enabled Light Controller
CN-EPOE Series

Refer to our website for product details.

CCS CN-PoE ▶ Search

Using a single LAN cable for power receiving and communication

PoE Enabled

Ethernet Enabled

10 Scenes Storable

CE Compliant

Front Panel
CN-1024-2-EPOE / CN-1024-4-EPOE Common

Rear Panel

CN-1024-2-EPOE (2 channel model)

CN-1024-2-EPOE

CN-1024-4-EPOE (4 channel model)

CN-1024-4-EPOE

*4-branch cable supplied

Note: The CN controller is operated only through external control, and cannot be controlled manually.

Features

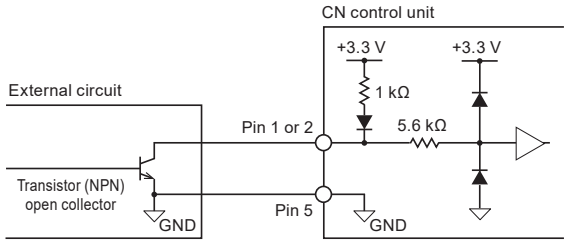
- Reduce the number of cables in your system by using a single LAN cable for power receiving and communication.
- Light control via Ethernet communication from your machine vision device or PC.
- Compact case design
- Can be installed apart from the control panel and close to the inspection site.
- Models equipped with 2 channels and 4 channels are available.
- Selectable continuous and strobe lighting with a single unit
- Trigger sequencing mode enables all channels to be simultaneously controlled with 1 trigger.
  (both 2 channel model/4 channel model)
- Trigger circulation mode enables channels to be turned on in sequence with each trigger input.
  (4 channel models only)
- Provides accumulated values of controller power ON duration, total light ON time, and other operation data.
- 256 levels of light intensity.
- Compatible with approx. 350 models of CCS LED lights up to 10 W.

Example Connection

Refer to the User Manual for details.

Example connection of external trigger signal

When the transistor shown below is turned ON, the trigger signal will be turned OFF.
Ensure that the external circuit allows the current of 3.1 mA to flow.



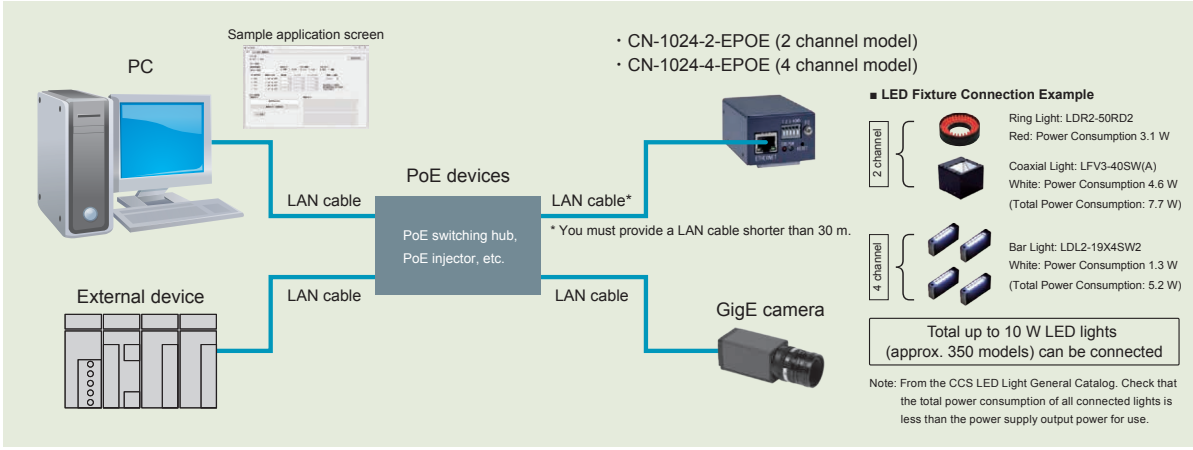
Trigger signal ON	Trigger signal OFF
Either pin 1 or 2 and pin 5 are open.	Either pin 1 or 2 and pin 5 are closed.

Note: Do not use the 3.3 V power supply provided in the control unit for different purposes other than trigger input.
Also, do not apply the voltage exceeding the rating to the pins.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Example System Configuration



PoE (Power over Ethernet) is a technology that uses a LAN cable used for Ethernet to simultaneously deliver signaling and supply power to PoE compatible equipment connected.
Two standards, IEEE802.3af and IEEE802.3at are defined. (As of August 2019) Connect a PoE compatible device compliant with these standards to this product.

Specifications

Model name	CN-1024-2-EPOE	CN-1024-4-EPOE
Applicable light units (ratings)	24 VDC 10 W (2 channels total)	24 VDC 10 W (4 channels total)
Number of channels	2 channels	4 channels
Lighting method	Strobe Mode: Strobe lighting, Continuous Mode: Continuous lighting	
Drive method	Constant-voltage system	
Intensity control method	Strobe Mode: Lighting time control, Continuous Mode: PWM control	
PWM frequency	125 kHz	
Power input	RJ-45 connector (based on PoE)	
Power consumption (typ.)	13.9 W	
External control protocol	TCP/IP, UDP/IP	
Strobe time setting (Strobe mode)	8 µs to 100 ms (Must be a multiple of 8 µs)	
Lighting delay setting (Strobe mode)	Strobe mode: 0 to 100 ms (Must be a multiple of 10 µs)	
Light intensity setting	256 levels (including 0: Not lit.)	
Operating environment (Indoor use only)	Temperature: 0 to 40°C, Humidity: 20 to 85% (with no condensation)	
Storage environment	Temperature: −20 to 60°C, Humidity: 20 to 85% (with no condensation)	
Cooling method	Natural air cooling	

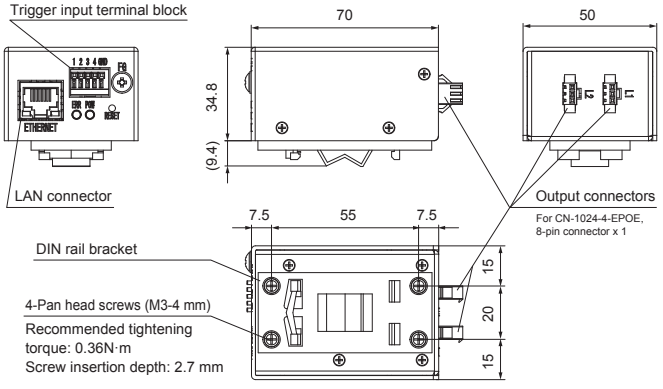
CE marking	EMC standard: Conforms to EN61000-6-2, EN61000-6-4	
Environmental regulations	RoHS compliant	
Output connectors	SMP-03V-BC x 2 pcs.	SMP-08V-BC
Trigger input	Screw-less terminal block, 5-pin, Solid wires or stranded wires AWG 28 to 22	
Trigger input voltage (range)	24 VDC	
Material and surface processing	Aluminum alloy, thickness: 1.5 mm, navy-blue, leather tone	
Weight	140 g max.	
Accessories	User manual	User manual, 4-branch cable

A sample application that demonstrates the initial settings including IP address and the light control settings is available on our website. Please download it as required.

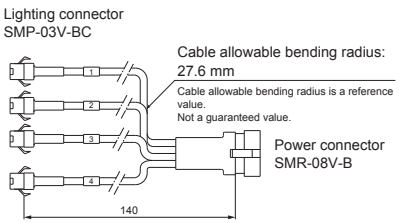
Sample application screen

Dimensions (mm)

■ CN-1024-2-EPOE
(CN-1024-4-EPOE is the same size except for the output connector)



■ For CN-1024-4-EPOE 4-branch cable (supplied)
Model name: CN-1024-4-CABLE



Weight: 20 g max.

• Turn OFF the power source when you remove and attach the DIN rail bracket.
• Do not reverse the position when attaching the DIN rail bracket.

Controllers

Controller with EtherNet/IP Interface

CN-4024-2-EIPT

Refer to our website for product details.
CCS CN-EIPT ▶ Search

Light Control through an EtherNet/IP Network

Overdrive Specifications

EtherNet/IP Compatible

CE Compliant

CN-4024-2-EIPT

EtherNet/IP ODVA

"EtherNet/IP" is a trademark of ODVA, Inc.

Note: The CN controller is operated only through external control, and cannot be controlled manually.

Features

- Operated only through external control.
- Light intensity and other settings can be controlled with explicit messages via EtherNet/IP communications and with I/O commands via TCP/IP communications.

Device classification	Message type	Connection type for implicit messaging	Requested packet interval	DLR function
Adapter	Explicit (UCMM, Class 3), Implicit	Exclusive owner, Input only	10 to 3200 ms	Available

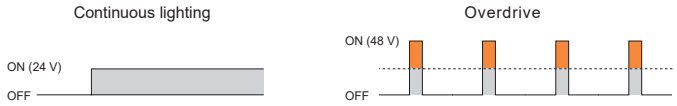
Port number to use (TCP)	Port number to use (UDP)	DHCP	Conformity
44818	2222, 44818	Available (Default: fixed IP address)	ODVA Composite Conformance Test Revision CT15

- Three selectable lighting modes:

1. Overdrive Mode

(48 VDC output, Strobe time control: 1 to 1,000 µs, Maximum duty ratio: 7%)

When an external trigger signal is input to the CN controller, the corresponding light unit flashes.
By overdriving the voltage that is applied to the light unit, you can make the light unit flash a few times brighter than when the light units operate in any other lighting modes.



2. Strobe Mode

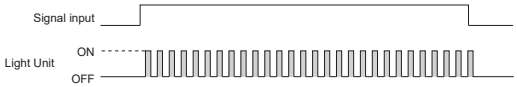
(24 VDC Output, Strobe time control: 1 to 10,000 µs)

When an external trigger signal is input to the CN controller, the corresponding light unit flashes.
LED lights can withstand being turned on and off frequently. Turning on the light unit only when taking images will reduce heat generation, provide a more stable radiation output, and increase the service life of the light unit.

3. Continuous Mode

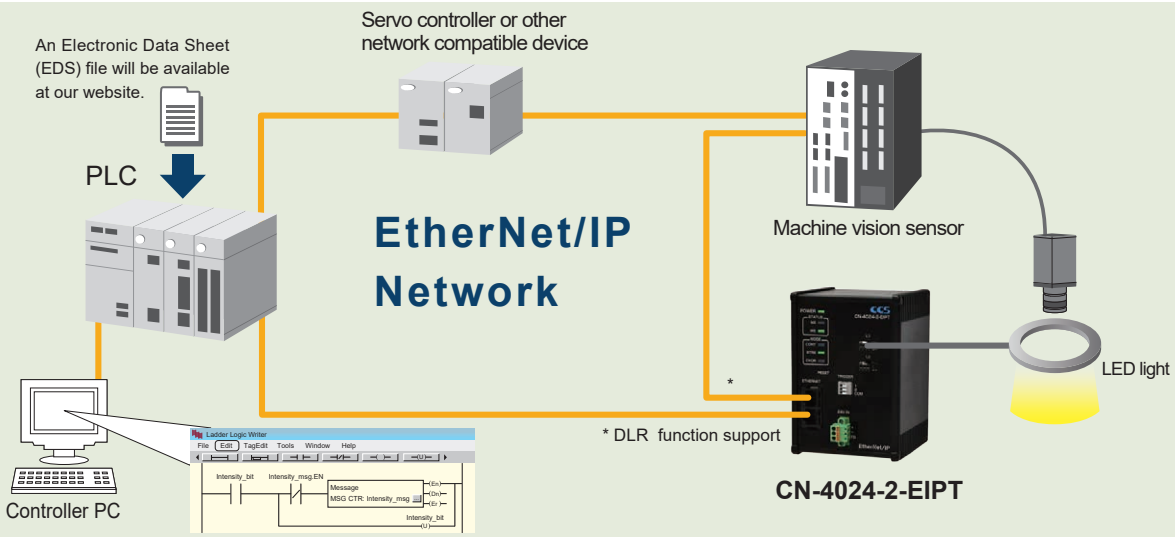
(24 VDC Output, PWM Control: the light intensity can be set to any of 512 levels.)

The light unit will be ON (or OFF) as long as there is an external trigger signal input to the CN controller.



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs
Register to use them.

Example System Configuration



The PLC specifies light control settings for the CN controller via EtherNet/IP communications.
When you use a PLC ladder editor, you can get and set the operation values for the CN controller.

You can get the following values through an EtherNet/IP network:
Accumulated trigger count, accumulated lighting duration, and error status
Additionally, you can set and check the following values:
Lighting mode, trigger logic, ON/OFF setting for the light unit, light intensity, strobe time, and lighting delay
The CN controller also provides TCP/IP commands for the same operations.

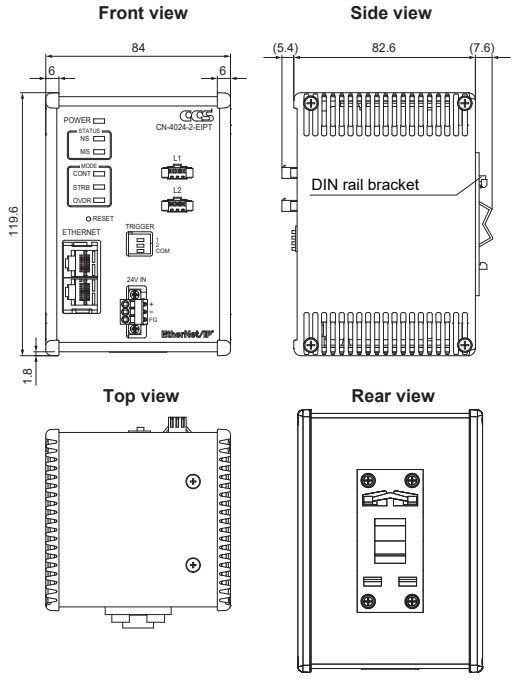
Specifications

Model name	CN-4024-2-EIPT
Lighting method	Overdrive (O/D) Mode, Strobe Mode: Strobe lighting Continuous Mode: Continuous lighting
Drive method	Constant-voltage system
Intensity control method	O/D Mode, Strobe Mode: Lighting time control Continuous Mode: PWM control
PWM frequency	125 kHz
Number of channels	2 channels
Output ratings (O/D Mode)	48 VDC 5 A max./connector, Total for 2 channels: 7 A max.*1
Output ratings (Strobe Mode, Continuous Mode)	24 VDC 40 W max./connector, Total for 2 channels: 40 W max.
External control protocol	EtherNet/IP, TCP/IP
Strobe time	O/D Mode: 1 to 1,000 µs (in steps of 1 µs) Strobe Mode: 1 to 10,000 µs (in steps of 1 µs)
Lighting delay	O/D Mode, Strobe Mode: 0 to 10,000 µs (in steps of 1 µs)
Light intensity	Continuous Mode: Set any of 512 levels
Trigger input	Terminal block, 3 poles, Solid wires or stranded wires AWG 28 to 22 Maximum duty ratio (O/D Mode): 7%
Trigger input voltage (rating)	24 VDC
Power input	Terminal block, 3 poles, Solid wires or stranded wires AWG 24 to 16
Power input voltage (rating)	24 VDC
Power input voltage (range)	21.6 to 26.4 VDC
Average power consumption (typ.)	45 W
Peak power consumption (max.)	71.3 W *2
Inrush current (typ.)	6.9 A, 21.4 µs (reference values)
Insulation withstand voltage, Insulation resistance (i/o-FG)	250 VAC for one minute, Cutoff current: 10 mA, 500 VDC, 20 MΩ min.
Operating environment	Temperature: 0 to 40°C, Humidity: 20% to 85% (with no condensation), Indoor use only
Storage environment	Temperature: −20 to 60°C, Humidity: 20% to 85% (with no condensation)
Cooling method	Natural air cooling

*1 Confirm the peak current of the LED Lights and use them within the above output current. For information on the availability of your LED Lights, refer to our website.
https://www.ccs-grp.com/lnk/qr/pod
*2 When you select a power supply, the rated output power must be larger than the above peak power consumption.

CE marking	EMC standard: Conforms to EN61000-6-2, EN61000-6-4
Environmental regulations	RoHS compliant
Material and surface processing	Material: Aluminum and resin, Surface processing: Black alumite
Weight	500 g max.
Accessories	User Manual

Dimensions (mm)



You can inquire using our website.
Sample Testing | Light Unit Selection | Free Product Trial | Custom Orders | Product Details | Pricing/ Quotation | Discontinued Products

Inquire on our website here.
https://www.ccs-grp.com/contact/

Controllers

Analog Controller

PB-2430-1

Refer to our website for product details.

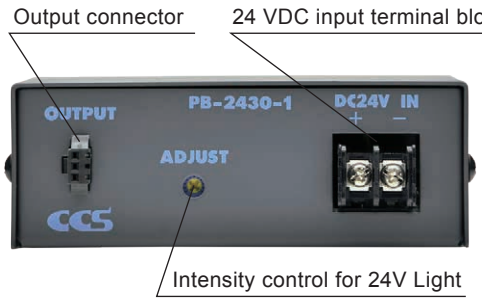
CCS PB-2430-1 ▶ Search

Low-price DC input controller contributing to cost reductions

CE Compliant

Features

- 24 VDC input
- 24 V / 24 W rating
- 1 channel model
- DIN rail installation
- Intensity control with variable voltage
- Lightweight, compact design

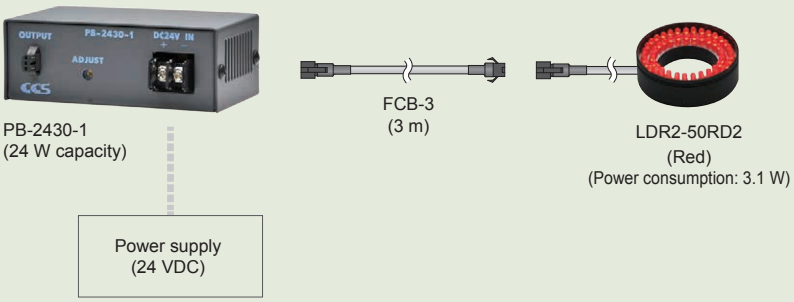


Example System Configuration

Example:

Controller —— **Extension cables** — **LED Light**

Power supply (24 VDC)



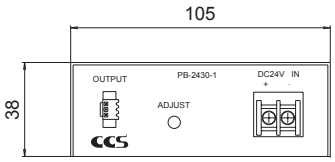
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

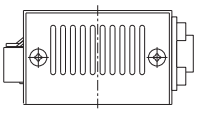
Specifications

Model name	PB-2430-1
Lighting method	Constant lighting
Drive method	Constant-voltage system
Light control method	Variable voltage control
No. of channels	One channel
Applicable light units (rating)	24 V 24 W
Over current protection	Built in (input section, with poly-switch), 5.0 A, 20°C during continuous operation
Input voltage (rating)	24 VDC
Input voltage (range)	21.6 to 26.4 VDC
Power consumption (typ.)	30 W
Output voltage (range)	15.0 to 23.0 VDC (±10%) (for 24 VDC input)
Insulation resistance, dielectric strength (Input/output - housing)	50 VDC, 20 MΩ min. 250 VAC for one minute 1 mA cutoff current
Operating temperature and humidity	Temperature: 0 to 40°C, Humidity: 20 to 85% RH (No condensation)
Storage temperature and humidity	Temperature: -20 to 60°C, Humidity: 20 to 85% RH (No condensation)
Cooling method	Natural air cooling
CE marking	EMC standard: Complies with EN61000-6-2, EN61000-6-4
Environmental regulation	RoHS compliant
Input connector	Input terminal block, use M3 screws with 7.62 mm pitch
Output connector	SMP-03V-BC (JST)
Material, coating, surface processing	Steel plate, Thickness: 1.0, N3, Matt finish
Weight	270 g

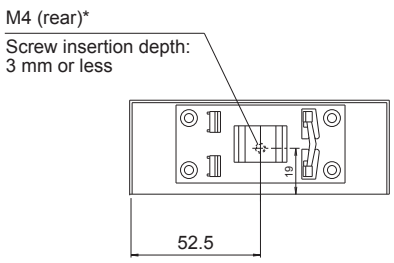
Dimensions (mm)



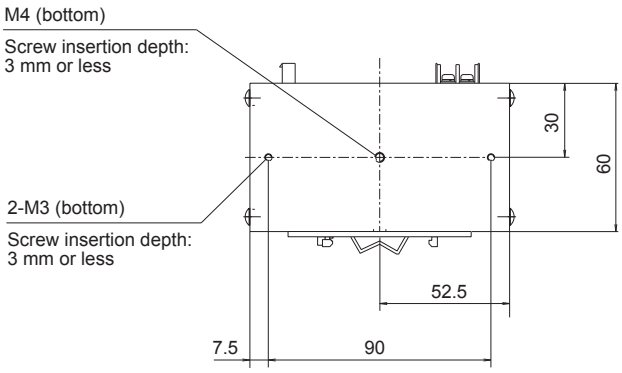
Front



Side



Rear



Bottom

* Remove the DIN rail bracket to find the hole.

Controllers

Compact Controller

CC-ST-1024

Refer to our website for product details.

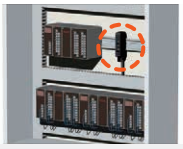
CCS CC-ST-1024 ▶ Search

Compact, lightweight LED Light-dedicated controller

Compliant

Installation inside the device
Mount it on a compact device or single devices

Installation inside a control panel to centrally manage other instruments



Installation next to the camera or near the light for a compact configuration

These are conceptual images.

Features

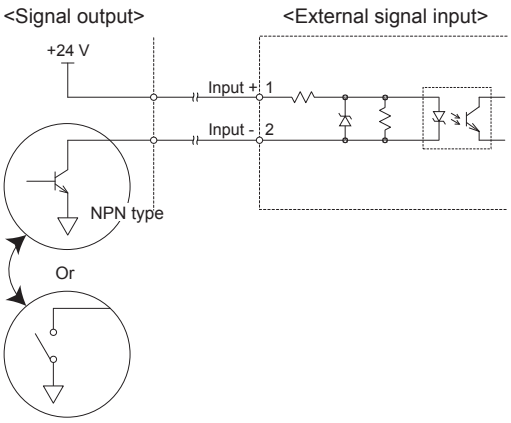
- This LED Light-dedicated controller has the same size as a sensor amp.
- DIN rail installation
- Can be installed in various locations such as inside a control panel or next to any type of sensor amp inside a device.
- Power supply is 24 VDC, optimal for on-site usage.

Example Connections

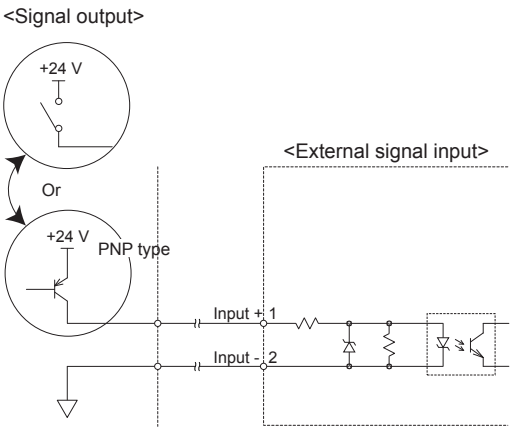
Refer to the User Manual for details.

External signal Example connections

■ Sink type（NPN）



■ Source type（PNP）



Becomes HIGH when 24 V is applied to input+ and 0 V is applied to input-.
Apply a current using the open-collector circuit, high-speed photocoupler, semiconductor relay, or others. (We recommend 10 mA or less.) The pulse width must be 10 µs or more (Applied voltage 24 V±10%).
If using in an environment where noise is likely to occur, we recommend isolating the signal line and GND line from the drive device using a photocoupler or semiconductor relay.

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

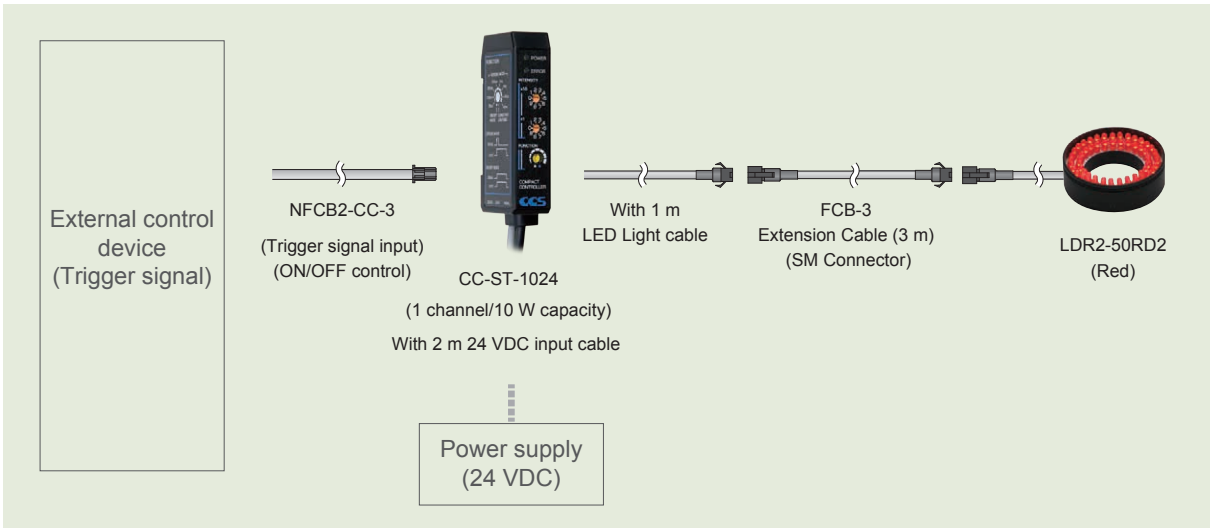
Register to use them.

Example System Configuration

Example:

External control device — **External control cable** — **Controller** — **Extension cables** — **LED Light**

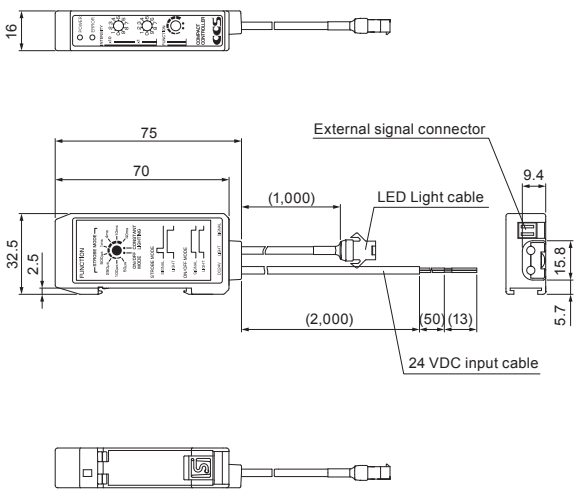
Power supply (24 VDC)



Specifications

Model name	CC-ST-1024
Drive method	Constant-voltage system
Intensity control method	PWM control and lighting time control
Applicable light unit (rated)	24 V 10 W
PWM frequency	100 kHz
Input overcurrent protection	Overcurrent protection is provided by fuse interruption.
Input voltage	24 VDC±10%
Power consumption (typ.)	11.0 W (with 10 W LED Light during max. intensity drive)
Output voltage (rated)	24 VDC
Operating environment (indoors only)	Temperature: 0 to 40°C, Humidity: 20% to 85%RH (with no condensation)
Storage environment	Temperature: -20 to 60°C, Humidity: 20% to 85%RH (with no condensation)
Vibration resistance	Acceleration: 19.6 m/sec^2, Frequency: 10 to 55 Hz, Cycle: 3 min., Sweep cycle: Each hour in the X, Y, and Z directions
Impact resistance	Acceleration: 49.0 m/sec^2, Operation time: 30 m sec, Repetitions: Three times for each of the six directions
Cooling method	Natural air cooling
CE marking	EMC standard: Conforms to EN61326-1 Class A
Environmental regulations	RoHS compliant
Material	ABS
Weight	80 g
Accessories	User Manual x 1, flat-head screwdriver x 1

Dimensions (mm)



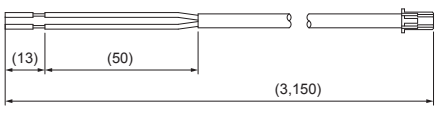
Options

External signal cable

NFCB2-CC-3 (3 m)

This cable is for use with external signals. It is used for intaking HIGH signals (during ON/OFF mode) and trigger signals (during strobe mode) into this product.

Dimensions (mm)



1: White (Input+)
2: Black (Input -)

Housing: PAP-02V-K (JST)
Contact: BPHD-002T-P0.5 (JST)

External control compatible with Ethernet and parallel communications

Ethernet Enabled

Adjust light intensity to 1,024 levels

PJ2-1505-2CA-PE
(2 channel model)

PJ2-3005-4CA-PE
(4 channel model)

CE Compliant

The supplied AC cord is for use with 100 to 120 VAC.
If you want to use the control unit with 200 to 240 VAC, you must procure another appropriate AC power cord.

Features

- Dedicated Analog control units for the spot light HLV Series.
- Easily check and set operation of light units with the built-in LCD.
- Light intensity can be set in 1,024 steps.
- Available in 2-channel and 4-channel light unit output types.
- Can be controlled manually or via Ethernet or parallel communications.

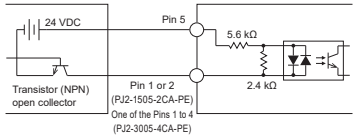
(Spot Light HLV3 Series Product Page ▼ P. 185)

Example Connection

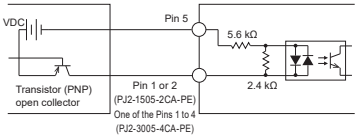
Refer to the User Manual for details.

Example connections of external trigger signal

■ Sink type (NPN)



■ Source type (PNP)



Connection specifications (for each terminal)				
Rated input voltage	Maximum input voltage	Photocoupler ON voltage / ON current	Photocoupler OFF voltage / OFF current	Response time
24 VDC	26.4 VDC	21.6 VDC min. / 4 mA min.	1.5 VDC max. / 1 mA max. or open-circuit	Refer to the User Manual.

Example System Configuration

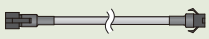
Example:
External control device — **External control cables** — **Control unit** — **Extension cables** — **LED light (spot light)**

External control device

Commercially available LAN cable
(Ethernet communication)
(Light intensity setting)

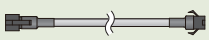
EXCB2-M20-3
(Parallel communication)
(Light intensity setting)

PJ2-3005-4CA-PE
(AC input)
(4 channels)
(Spot Light dedicated)



FCB-3
Extension Cable (3 m, SM Connector)

FCB-HLV3-10
Extension Cable (10 m, SM Connector)



FRCB-HLV3-10
Extension Cable (10 m, SM Connector)
Robot Cable Type

Branch cables cannot be used.

HLV3-22SW-4S
(White)

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

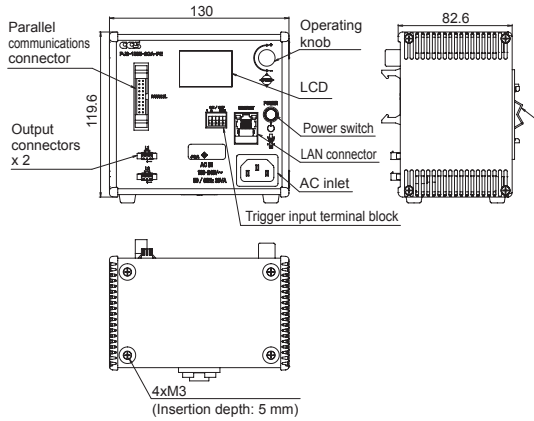
Register to use them.

Specifications

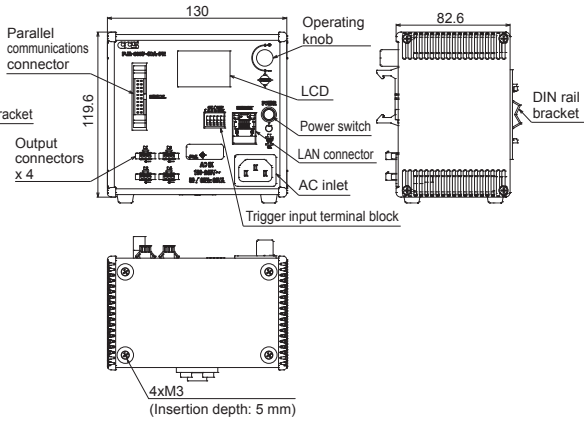
Model name	PJ2-1505-2CA-PE	PJ2-3005-4CA-PE
Lighting method	Continuous lighting	
Drive method	Constant-voltage system	
Intensity control method	Variable-current control	
Number of channels	2 channels	4 channels
Applicable light units	HLV Series Spot Lights (The type of Spot Light is automatically detected.)	
Output voltage (ratings)	5.5 VDC	
Output current	1,000 mA max./channel (Depends on the maximum input current of the Spot Light.)	
Input power	100 to 240 VAC (+10%, -15%), 50/60 Hz	
Power consumption	38 VA max.	68 VA max.
Inrush current (typ.)	15 A (at 100 VAC), 36 A (at 240 VAC) from a cold start	
Ground leakage current	3.5 mA max. (264 VAC, 60 Hz, with no load)	
Insulation withstand voltage (input-output, input-FG)	1500 VAC for one minute, Cutoff current: 10 mA, 500 VDC, 20 MΩ min.	
Overvoltage category	Category II	
Operating environment	Temperature: 0 to 40°C, Humidity: 20% to 85% (with no condensation), Altitude: 2,000 m max., Protective ground class: Class I, Pollution degree: 2, Indoor use only	
Storage environment	Temperature: −20 to 60°C, Humidity: 20% to 85% (with no condensation)	
Cooling method	Forced air cooling	Natural air cooling
CE marking	Safety standard: Conforms to EN 61010-1 EMC standard: Conforms to EN61000-6-2, EN61000-6-4	
Material and surface processing	Material: Aluminum and resin, Surface processing: Blue alumite	
Weight	700 g max.	
Accessories	User Manual, 2-m-long 3-prong AC power cord with ground terminal	

Dimensions (mm)

PJ2-1505-2CA-PE



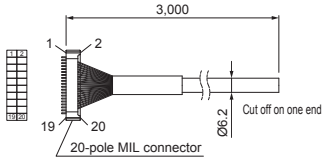
PJ2-3005-4CA-PE



Options

Parallel communication cable

EXCB2-M20-3

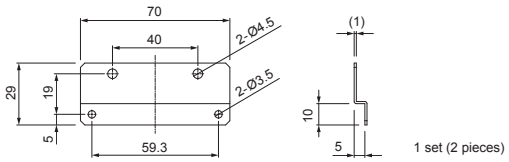


Pin No.	Wire color	Marks	Pin No.	Wire color	Marks
1	Orange	Black 1	11	Orange	Black 2
2	Orange	Red 1	12	Orange	Red 2
3	Gray	Black 1	13	Gray	Black 2
4	Gray	Red 1	14	Gray	Red 2
5	White	Black 1	15	White	Black 2
6	White	Red 1	16	White	Red 2
7	Yellow	Black 1	17	Yellow	Black 2
8	Yellow	Red 1	18	Yellow	Red 2
9	Pink	Black 1	19	Pink	Black 2
10	Pink	Red 1	20	Pink	Red 2

Base brackets

Dimensions (mm)

BK-PD3



Refer to our website for product details.
CCS PJ ▶ Search

Four types to match your use environment

AC Input Types

PJ-1505-2CA
(2 channel model)

PJ-1505-3CA
(3 channel model)

24 VDC Input Types

PJ-1505-2CD24
(2 channel model)

PJ-1505-3CD24
(3 channel model)

CE Compliant model(s)
PJ-1505-2CA / PJ-1505-3CA / PJ-1505-2CD24 / PJ-1505-3CD24

The supplied AC cord is for use with 100 to 120 VAC.
If you want to use the control unit with 200 to 240 VAC, you must procure another appropriate AC power cord.

Features

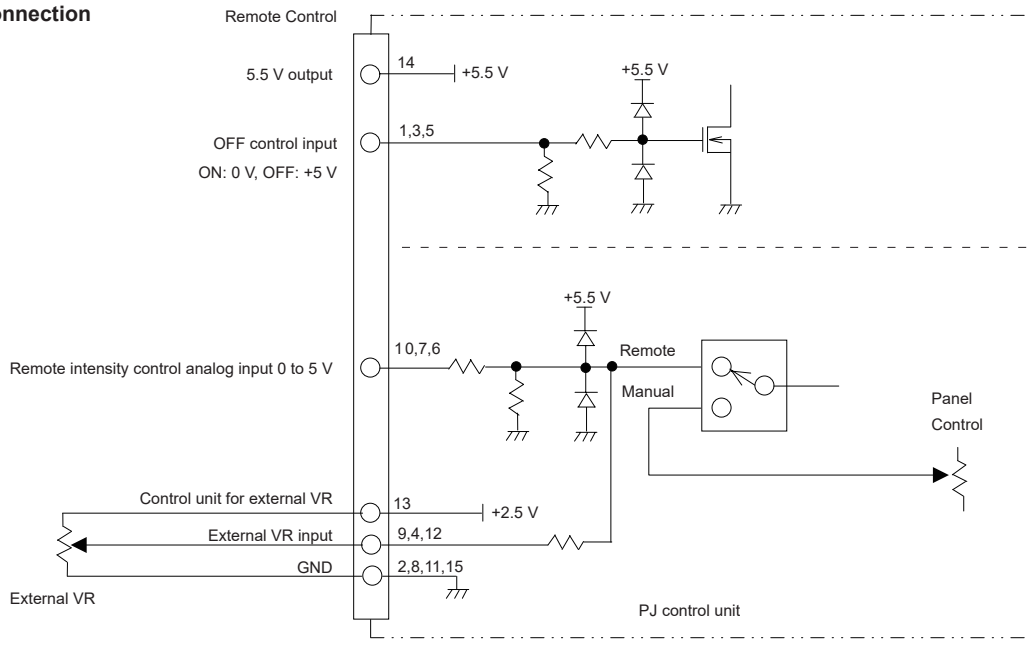
- Dedicated Analog control units for the spot light HLV Series.
- Stepless intensity control is performed by varying the current.
- There are 2 and 3-channel light unit output types.
- You can select AC or DC power supply types.

(Spot Light HLV3 Series Product Page ▼ P. 185)

Example Connection

Refer to the User Manual for details.

PJ Series
Example connection



Remote intensity control or external VR can be used. (Cannot be used at same time.)

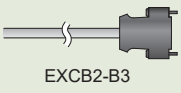
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs
Register to use them.

Example System Configuration

Example:

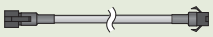
External control device — **External control cable** — **Control unit** — **Extension cables** — **LED light (spot light)**

External control device
(Analog output)
(0 to 5 V output)



EXCB2-B3
(Intensity analog input)
(OFF control)

PJ-1505-2CA
(AC input)
(2 channels)
(Spot Light dedicated)



FCB-3
Extension Cable (3 m)
(SM Connector)
You cannot connect multiple Spot Lights with a branch cable.

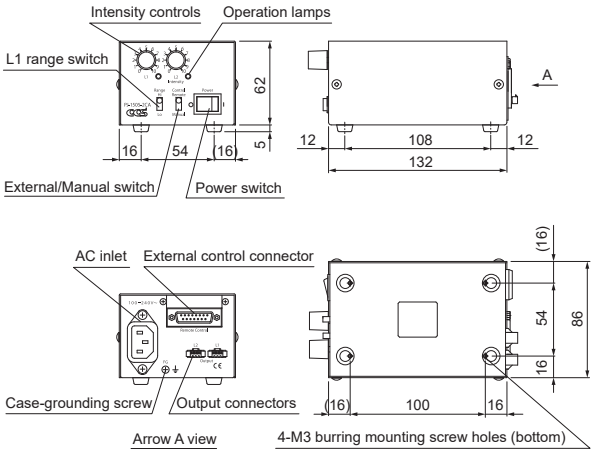
HLV3-22SW-1
(White)

Specifications

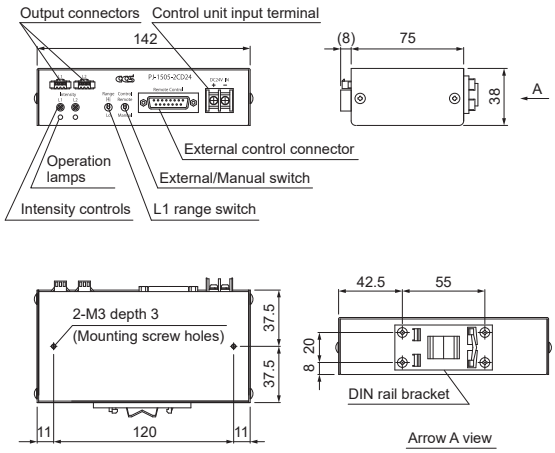
Model name	PJ-1505-2CA	PJ-1505-3CA	PJ-1505-2CD24	PJ-1505-3CD24
Input voltage (rated)	100 to 240 VAC		24 VDC	
Input voltage (range)	85 to 264 VAC		10 to 24 VDC	
Power consumption	27 VA typ.	37 VA typ.	10 W typ.	14.5 W typ.
No. of channels	2	3	2	3
Output voltage (max. rating)	5.5 VDC			
Intensity	Manual: Intensity control on front of unit Remote: Analog input voltage of 0 to 5 V (5.25 V max.)			
ON/OFF control	OFF: 2.5 to 5.0 V (24 V max.), ON: 0.8 to 0 V (pull-down with 4.7 kΩ resistance)			
External control connector	D-sub 15-pin (plug), Optional external control cable: EXCB2-B3 (3 m)			
Weight	640 g	660 g	380 g	
Accessories	AC cord with ground wire (2 m), User Manual x 1		Rubber feet x 4, User Manual x 1	

Dimensions (mm)

PJ-1505-2CA (PJ-1505-3CA is also the same size.)



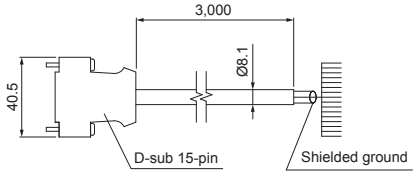
PJ-1505-2CD24 (PJ-1505-3CD24 is also the same size.)



Options

External control cable

EXCB2-B3 (3 m)



Dimensions (mm)

No.	Line color	No.	Line color
1	Black	9	Gray
2	White	10	Pink
3	Red	11	White/Black
4	Green	12	Red/Black
5	Yellow	13	Green/Black
6	Brown	14	Yellow/Black
7	Blue	15	Brown/Black
8	Purple	NC	(Blue/Black)

Controllers

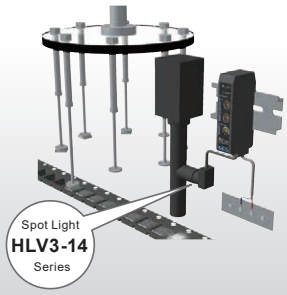
Spot Light Dedicated Controller

CC-PJ-0707

Refer to our website for product details.
CCS CC-PJ-0707 ▶ Search

A single unit compatible with continuous, ON/OFF and strobe lighting

Can be used with spot lights to save space.



This is a conceptual image.

CE Compliant

Features

- Dedicated control unit for the spot light HLV Series.
- The compact size allows installation in a limited space.
- Intensity value can be adjusted in 100 steps.
- Power supply is 24 VDC, optimal for on-site usage.

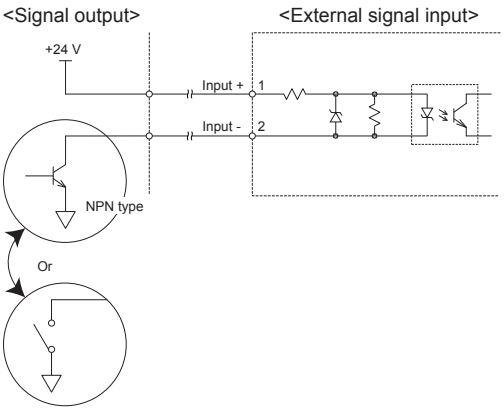
(Spot Light HLV3 Series Product Page ▼ P. 185)

Example Connections

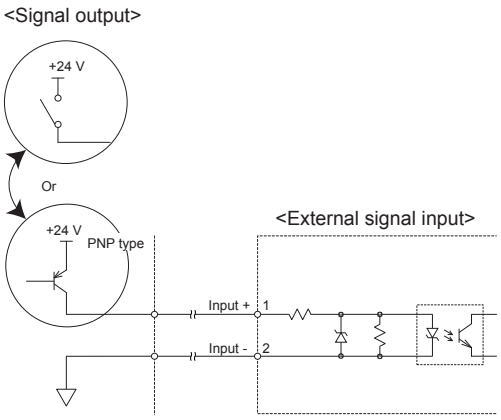
Refer to the User Manual for details.

External signal Example connections

■ Sink type (NPN)



■ Source type (PNP)



Becomes HIGH when 24 V is applied to input + and 0 V is applied to input - (applied voltage is 24 V±10%).
Apply a current using the open-collector circuit, high-speed photocoupler, semiconductor relay, or others. (We recommend 10 mA or less.)
If using in an environment where noise is likely to occur, we recommend isolating the signal line and GND line from the drive device using a photocoupler or semiconductor relay.

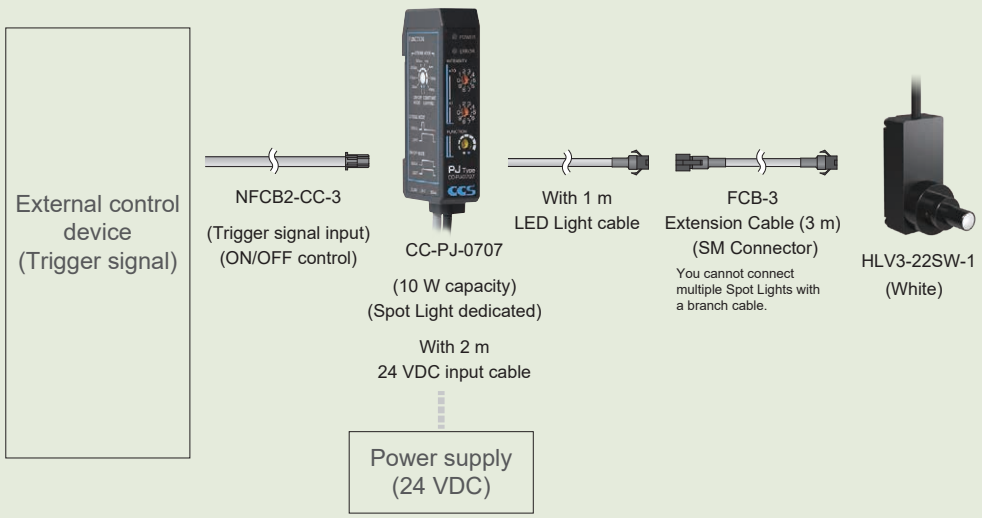
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs
Register to use them.

Example System Configuration

Example:

External control device — **External control cable** — **Controller** — **Extension cables** — **LED Light (Spot Light)**

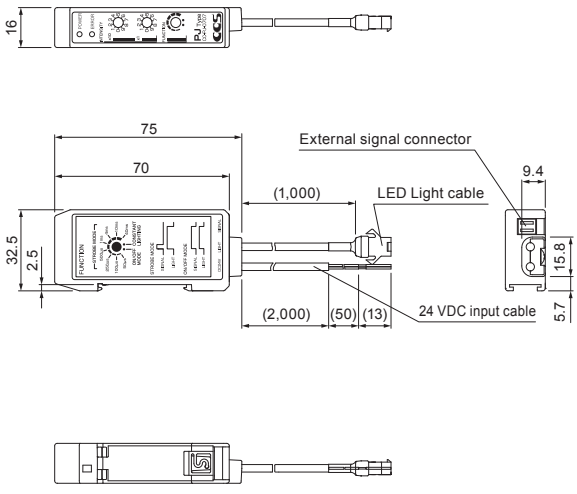
Power supply (24 VDC)



Specifications

Model name	CC-PJ-0707
Drive method	Constant-current system
Intensity control method	Variable-current control method and lighting time control
Input overcurrent protection	Overcurrent protection is provided by fuse interruption.
Input voltage	24 VDC±10%
Power consumption (typ.)	7 W
Output voltage (max.)	7 VDC
Output current (rated)	700 mA
Operating environment (indoors only)	Temperature: 0 to 40°C, Humidity: 20% to 85%RH (with no condensation)
Storage environment	Temperature: -20 to 60°C, Humidity: 20% to 85%RH (with no condensation)
Vibration resistance	Acceleration: 19.6 m/sec², Frequency: 10 to 55 Hz, Cycle: 3 min., Sweep cycle: each hour in the X, Y, and Z directions
Impact resistance	Acceleration: 49.0 m/sec², Operation time: 30 m sec, Repetitions: three times for each of the six directions
Cooling method	Natural air cooling
CE marking	EMC standard: Conforms to EN61000-6-2, EN61000-6-4
Environmental regulations	RoHS compliant
Material	ABS
Weight	100 g
Accessories	User Manual x 1, flat-head screwdriver x 1

Dimensions (mm)



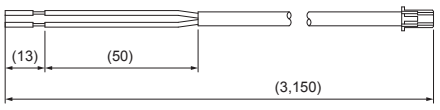
Options

External signal cable

NFCB2-CC-3 (3 m)

This cable is for use with external signals. It is used for intaking HIGH signals (during ON/OFF mode) and trigger signals (during strobe mode) into this product.

Dimensions (mm)



1: White (Input+)
2: Black (Input -)

Housing: PAP-02V-K (JST)
Contact: BPHD-002T-P0.5 (JST)

Control Units

Analog Control Units (Constant Current)

PSCC Series

Refer to our website for product details.

CCS PSCC ▶ Search

High-capacity constant current analog control units

With error detection function

(Common for PSCC Series)
- Stopped cooling fan
- LED not lighting up

Ethernet Enabled

Adjust light intensity to 1,000 levels

Detect errors
· LED failure to light.
· Light Unit cooling fan stop, etc.

CE Compliant

The supplied AC cord is for use with 100 to 120 VAC.
If you want to use the control unit with 200 to 240 VAC, you must procure another appropriate AC power cord.

PSCC-30048(A)
(300 W capacity)

PSCC-60048(A)
(600 W capacity)

With key-lock function
(PSCC-60048(A) only)

Features

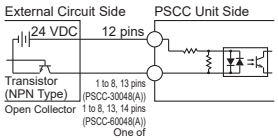
- The light intensity can be set to any of 256 or 1,000 different levels. (For parallel communications: Set to any of 256 levels)
- You can adjust the light intensity separately for each light unit circuit. (With Ethernet or EIA-485 communication)
- External control compatible with parallel, EIA-485 and Ethernet communication using a single unit.
- The error detection function is able to detect insufficient speed or stopping of the light unit cooling fan and bulb burn-out errors by disconnected or shorted LED circuit.

Example Connections

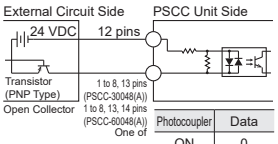
Refer to the User Manual for details.

Parallel Communication External Signal Connection Example

Sink Type (NPN)



Source Type (PNP)



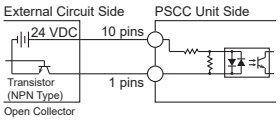
Photocoupler	Data
ON	0
OFF	1

Connection specifications					
Rated Input Voltage	Max. Input Voltage	Photocoupler ON Voltage/ON Current	Photocoupler OFF Voltage/OFF Current	Response Time	Input Impedance
24 VDC	26.4 VDC	20 VDC or more/6 mA or more	3 VDC or less/1 mA or less	Approx. 100 ms	6.8 kΩ (Per 1 Terminal)

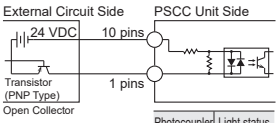
ON/OFF input External Signal Connection Example

The behavioral logic can be inverted.

Sink Type (NPN)



Source Type (PNP)



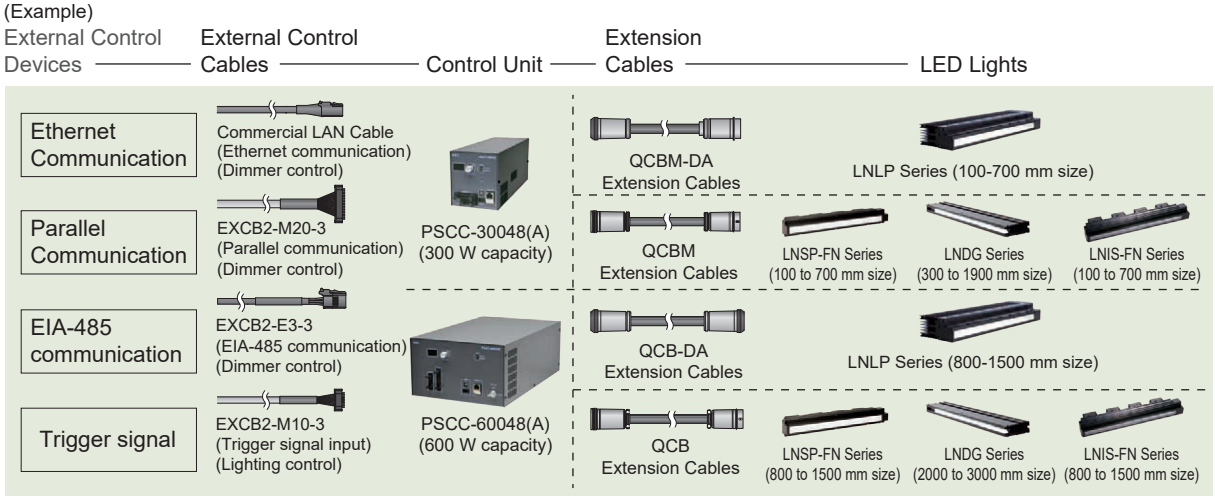
When making settings with the ON/OFF input connector, EIA-485 communication and Ethernet communication, the light turns OFF (ON) when any one of them is set to OFF (ON) signal.
The numbers in parentheses are for logical inversion

Photocoupler	Light status
ON	OFF (ON)
OFF	ON (OFF)

Connection specifications					
Rated Input Voltage	Max. Input Voltage	Photocoupler ON Voltage/ON Current	Photocoupler OFF Voltage/OFF Current	Response Time	Input Impedance
24 VDC	26.4 VDC	20 VDC or more/6 mA or more	3 VDC or less/1 mA or less	Approx. 100 ms	6.8 kΩ (Per 1 Terminal)

Example System Configuration

(Example)



Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

Specifications

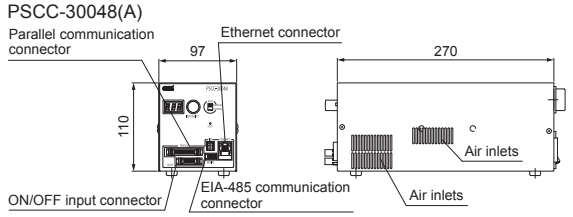
Model name		PSCC-30048(A) / PSCC-60048(A)	
Lighting method		Continuous lighting	
Drive method		Constant-current system	
Intensity control method		Variable-current control	
Number of channels		1 channel	
Number of circuits		PSCC-30048(A): 7 circuits max. (Light intensity can be adjusted for each light unit circuit.)	
		PSCC-60048(A): 15 circuits max. (Light intensity can be adjusted for each light unit circuit.)	
Applicable light unit (rated)		PSCC-30048(A): 43 VDC or less and 293 W max. (36 W max. of which is for the fan)	
		PSCC-60048(A): 43 VDC or less and 602 W max. (50 W max. of which is for the fan)	
Intensity control		Manual and external intensity	Front manual/external switch (MODE)
	Manual	Set any of 256 or 1,000 steps via the setting switch. Press and hold the switch for 2 seconds to lock the intensity value.	
	External	Parallel communication*1	8-bit intensity value setting (B0 to B7) and write signal (WR)
		EIA-485 communication	Command input via EIA-485 communication
		Ethernet communication	Command input via TCP/IP or UDP/IP communication
		External control mode can be selected by pushing the setting switch while turning ON the power.	
ON/OFF control		Parallel bit input	OFF signal (ON/OFF)
		EIA-485 communication	Command input via EIA-485 communication
		Ethernet communication	Command input via TCP/IP or UDP/IP communication
		ON/OFF logic can be selected by pushing the setting switch while turning ON the power. 25H or 99H: Normal logic (default) 25L or 99L: Reversed logic	
EIA-485 communication settings		ID	Set via the front ID switch (00 to 03). Maximum of 4 connected units.
		Terminating resistance	Set via the front ID switch (terminating resistance is ON only when the ID is 00).

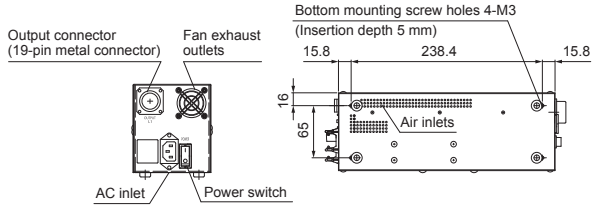
*1 Parallel communications: Adjustment to 256 levels only

Error detection display	Burnt-out LED detection (open circuit)	"E01" is displayed on the front-panel digital display.
	Burnt-out LED detection (short circuit)	"E02" is displayed on the front-panel digital display.
	Light unit fan speed decrease/stop detection	"F01 to F07" is displayed on the front-panel digital display (PSCC-30048(A)).
		"F01 to F15" is displayed on the front-panel digital display(PSCC-60048(A)).
	Control unit fan speed decrease/stop detection	"E03" is displayed on the front-panel digital display.
	Light unit communication error detection	"E04" is displayed on the front-panel digital display.
	Connector disconnection detection	"E04" is displayed on the front-panel digital display.
	Internal control unit error detection	"E05" is displayed on the front-panel digital display (PSCC-60048(A) only).
Error detection output	Parallel communication	Output at pins 19 and 20: Photocoupler insulation, open collector output, short circuit at alert (load current of 10 mA or less)
	EIA-485 communication	Checked by using a status command through EIA-485 communication
	Ethernet communication	Checked by using a status command through TCP/IP or UDP/IP communication
Input power supply	100 to 240 VAC (+10% - 15%), 50/60 Hz	
Power consumption (typ.)	PSCC-30048(A): 360 VA, PSCC-60048(A): 750 VA	
Operating temperature and humidity	Temperature: 0 to 40°C, Humidity: 20% to 85%RH (with no condensation)	
Storage temperature and humidity	Temperature: -20 to 60°C, Humidity: 20% to 85%RH (with no condensation)	
Cooling method	Forced air cooling	
CE marking	Safety standard: Conforms to EN61010-1, EMC standard: Conforms to EN61326-1 Class A	
Environmental regulations	RoHS compliant	
Material, coating, surface processing	Steel plate, Thickness of cover: 1.0, Thickness of chassis: 1.6 (PSCC-30048(A)), 2.0 (PSCC-60048(A)), N3 leather tone finish	
Weight	PSCC-30048(A): 3,100 g max., PSCC-60048(A): 7,000 g max.	
Accessories	PSCC-30048(A): 3-prong AC cord with ground terminal (2 m) x 1, User Manual x 1 PSCC-60048(A): 3-prong AC cord with ground terminal (2 m) x 1, User Manual x 1, key x 2	

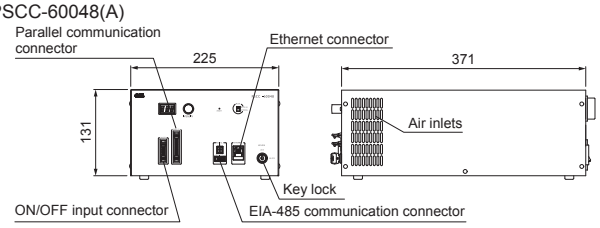
Dimensions (mm)

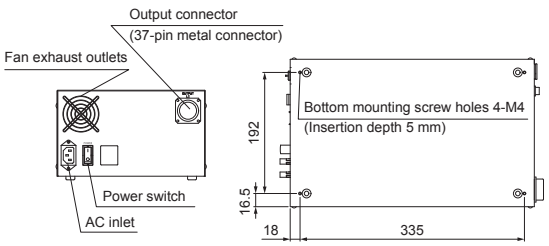
PSCC-30048(A)





PSCC-60048(A)





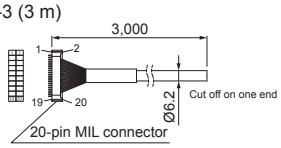
Options

These are cables for parallel and EIA-485 communication. Select yours to match your control method.

Dimensions (mm)

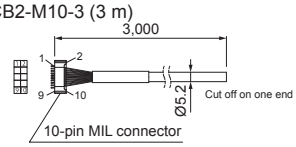
Parallel communication cable

EXCB2-M20-3 (3 m)



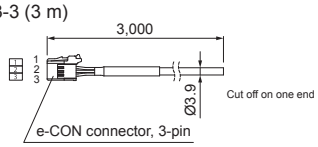
ON/OFF input cable

EXCB2-M10-3 (3 m)



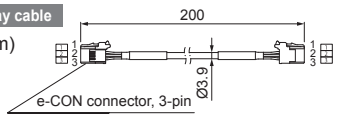
EIA-485 communication cable

EXCB2-E3-3 (3 m)



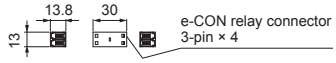
EIA-485 communication relay cable

EXCB2-E3-E3-0.2 (0.2 m)



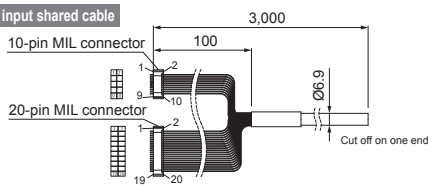
Relay connector

ECNR-E3CN4



Parallel communication / ON/OFF input shared cable

EXCB2-M10M20-3 (3 m)



Refer to the material "Connecting EIA-485 Communications Cables" on the CCS website for information on multi-drop wiring connections. You can download this information from the product website page.

Control Units

Analog Control Units (Constant Voltage)

PSB4 Series

Refer to our website for product details.

CCS PSB4 ▶ Search

High-capacity constant current analog control units Ethernet functionality enabled

Ethernet Enabled

CE Compliant

The supplied AC cord is for use with 100 to 120 VAC.
If you want to use the control unit with 200 to 240 VAC, you must procure another appropriate AC power cord.

PSB4-30024-PEI
(1 channel model)

PSB4-60024-2-PEI
(2 channel model)

Features

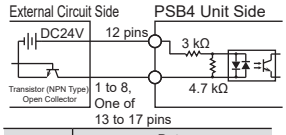
- LCD for improved legibility.
- Uses an operating knob for intuitive operation.
- Dimmer value can be set to 256 or 1,024 levels.
- Dimmer range can be switched between 3 levels.
- External control via EtherNet / parallel communication.
- Equipped with a metal connector and EL connector.

Example Connection

Refer to the User Manual for details.

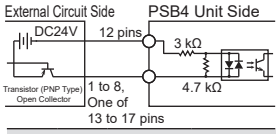
Parallel Communication External Signal Connection Example

Sink Type (NPN)



Photocoupler	Data	
	When COM menu LGC-PAR is "ACTIVE HI"	When COM menu LGC-PAR is "ACTIVE LO"
ON	1	0
OFF	0	1

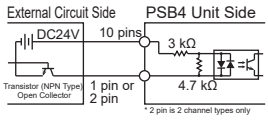
Source Type (PNP)



Connection Specifications (Per 1 Terminal)			
Rated Input Voltage	Max. Input Voltage	Photocoupler ON Voltage/ON Current	Photocoupler OFF Voltage/OFF Current
DC24V	DC26.4V	21.6 VDC or more/ 6 mA or more	1.5 VDC or less/ 1 mA or less

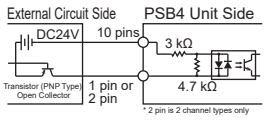
ON/OFF input External Signal Connection Example

Sink Type (NPN)



COM Menu LGC-TRG Setting Value	Photocoupler	Light status
ACTIVE HI	ON	OFF
	OFF	ON
ACTIVE LO	ON	ON
	OFF	OFF

Source Type (PNP)



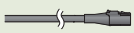
Connection Specifications (Per 1 Terminal)			
Rated Input Voltage	Max. Input Voltage	Photocoupler ON Voltage/ON Current	Photocoupler OFF Voltage/OFF Current
DC24V	DC26.4V	21.6 VDC or more/ 6 mA or more	1.5 VDC or less/ 1 mA or less

Example System Configuration

(Example)

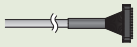
External Control Devices — External Control Cables — Control Unit — Extension Cables — LED Lights

Ethernet Communication



Commercial LAN Cable
(Ethernet communication) (Dimming setting)

Parallel Communication



EXCB2-M20-3
(Parallel communication) (Dimmer control)

Trigger signal

EXCB2-M10-3
(Trigger signal input) (Lighting control)

PSB4-30024-PEI
(1 channel model)

PSB4-60024-2-PEI
(2 channel model)

FCB-3-EL2
Extension Cable (3 m)
(EL connector)

FCB-3-1.25SQ-ME7
Extension Cable (3 m)
(Metal Connector)

LNSP2-300SW
(300mm size)

LNSP2-600SW
(600mm size)

Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs

Register to use them.

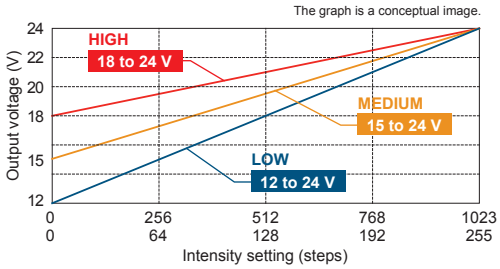
Specifications

Model name	PSB4-30024-PEI	PSB4-60024-2-PEI
Lighting method	Continuous lighting	
Drive method	Constant-voltage system	
Intensity control method	Variable voltage control	
Number of channels	1 channel	2 channels (L1, L2)
Applicable light unit (rated)	Metal connector: 24 V, 300 W (300 W max. per connector) EL connector: 24 V, 300 W (150 W max. per connector) Total for all connectors: 300 W max.	Metal connector (L1-1, L1-2/ L2-1, L2-2): 24 V 300 W (1 connector 300 W or less) EL connector (L1-3, L1-4/L2-3, L2-4): 24 V 300 W (1 connector 150 W or less) All L1 connectors total: 300 W or less (same as L2 connectors)
Intensity control	Manual: Operation on the front panel, 256 or 1,024 levels	
	External: Command input via TCP/IP or UDP/IP communications	
	External: Signal input through parallel port	
ON/OFF control	External: Command input via TCP/IP or UDP/IP communications	
	External: Signal input through parallel port	
Input power	100 to 240 VAC (+10%, -15%), 50/60 Hz	
Output current (rating)	12.5 A	12.5 A/channel, 2 channels total: 25 A
Power consumption (typ.)	388 VA	765 VA
Inrush current (typ.)	55 A (at 100 VAC), 84 A (at 240 VAC) from a cold start	55 A/95 A (primary/secondary value, at 100 VAC), 132 A/132 A (primary/secondary value, at 240 VAC) during cold start
Ground leakage current	3.5 mA max. (264 VAC, 60 Hz, with no load)	
Insulation withstand voltage (input-output, input-FG)	1500 VAC for one minute, Cutoff current: 20 mA, 500 VDC, 20 MΩ or more	
Operating environment	Temperature: 0 to 40°C, Humidity: 20% to 85% (with no condensation)	
Storage environment	Temperature: −20 to 60°C, Humidity: 20% to 85% (with no condensation)	

Cooling method	Forced air cooling	
CE marking	Safety standard: Conforms to EN 61010-1 EMC standard: Conforms to EN 61000-6-2, EN 61000-6-4	
Environmental regulations	RoHS compliant	
Material, coating, and surface processing	Steel sheet, Cover thickness: 1.0 mm, Chassis thickness: 1.6 mm, N3 (leather tone)	
Weight	2,400 g max.	4,100 g max.
Accessories	User Manual, 2-m-long 3-prong AC power cord with ground terminal	

Intensity Range

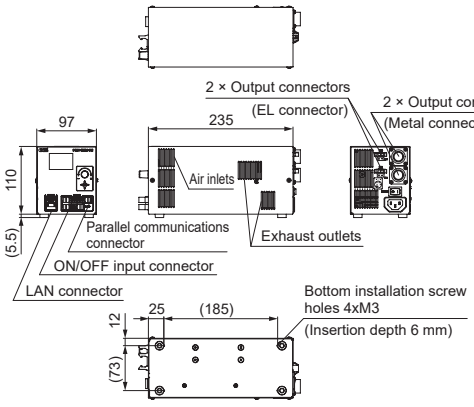
Dimmer range can be switched between 3 levels. Select based on lighting characteristics or to suit the application.



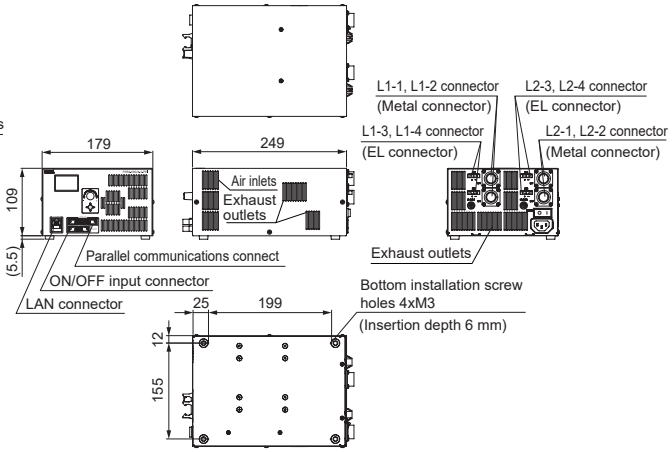
* While the dimmer control is set to 256 steps, even if the dimmer value is 0 the light will illuminate.

Dimensions (mm)

PSB4-30024-PEI



PSB4-60024-2-PEI

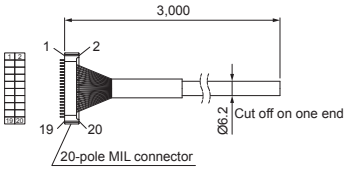


Options

Dimensions (mm)

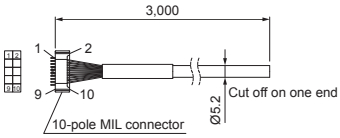
Parallel communications cable

EXCB2-M20-3 (3 m)



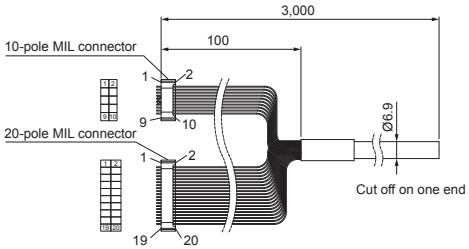
ON/OFF input cable

EXCB2-M10-3 (3 m)



Parallel communication / ON/OFF input cable

EXCB2-M10M20-3 (3 m)



Control Units

Analog Control Unit (Constant Voltage)

PSB3-30024

Refer to our website for product details.
CCS PSB3-30024 ▶ Search

High-capacity 300 W constant voltage analog control units adjustable in 256-step intensity settings

CE Compliant

The supplied AC cord is for use with 100 to 120 VAC.
If you want to use the control unit with 200 to 240 VAC, you must procure another appropriate AC power cord.

Features

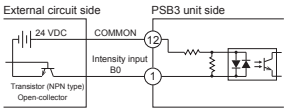
- Light unit output is compatible with 1 channel / 4 connectors (metal connector x 2, EL connector x 2).
- Each single unit is equipped with parallel, serial and analog control for external control.
- You can select the optimal output according to the light unit and optimize the intensity setting by switching the intensity range.

Example Connections

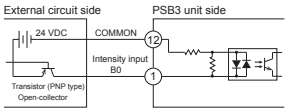
Refer to the User Manual for details.

Parallel communication
Example connections of external signal

■ Sink type (NPN)



■ Source type (PNP)



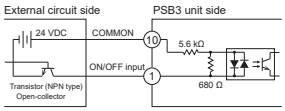
Connection specifications

Rated input voltage	Maximum input voltage	Photocoupler ON voltage/current	Photocoupler OFF voltage/current	Response time	Input impedance
24 VDC	26.4 VDC	20 VDC min. / 6 mA min.	3 VDC max. / 1 mA max.	Approx. 100 ms	5.6 kΩ (per terminal)

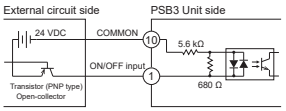
	Input signal	Photocoupler	Data
Sink type	HIGH	OFF	1
	LOW	ON	0
Source type	HIGH	ON	0
	LOW	OFF	1

ON/OFF input
Example connections of external signal

■ Sink type (NPN)



■ Source type (PNP)



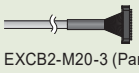
Connection specifications

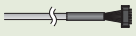
Rated input voltage	Maximum input voltage	Photocoupler ON voltage/current	Photocoupler OFF voltage/current	Response time	Input impedance
24 VDC	26.4 VDC	20 VDC min. / 6 mA min.	3 VDC max. / 1 mA max.	Approx. 100 ms	5.6 kΩ (per terminal)

	Input signal	Photocoupler	Light unit status
Sink type	HIGH	OFF	On
	LOW	ON	Off
Source type	HIGH	ON	Off
	LOW	OFF	On

Example System Configuration

Example:
External control devices — **External control cables** — **Control unit** — **Extension cable** — **LED light**

Parallel communication

EXCB2-M20-3 (Parallel communication) (Intensity control)

Trigger signal

EXCB2-M10-3 (Trigger signal input) (ON/OFF control)

EIA-485 communication

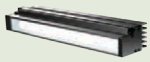
EXCB2-E6SR-3
(EIA-485 communication) (Intensity control)

Analog input

EXCB2-E6AN-3
(Analog input) (Intensity control)


PSB3-30024
(1 channel/300 W capacity)


FCB-3-1.25SQ-ME7
Extension Cable (3 m)
(Metal Connector)


LNSP2-600SW
(600 mm size)

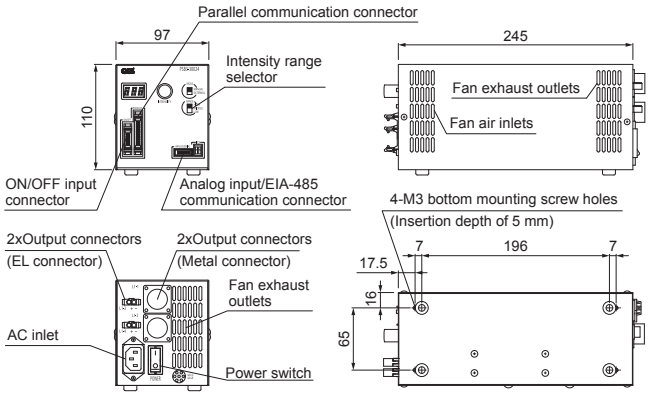
Various technical documents available. PDF Drawings | DXF Drawings | Product Brochures | Instruction Guides | 3D CAD | Data Sheets | Imaging Examples | Digital Catalogs
Register to use them.

Specifications

Model name		PSB3-30024	
Lighting method		Continuous lighting	
Drive method		Constant-voltage system	
Intensity control method		Variable voltage control	
Number of channels		1 channel	
Applicable light unit (rated)		24 V 300 W	
Intensity control		Manual and external intensity	Manual/External switch (MODE)
		Variable output voltage range	Select between 3 steps by using the intensity range selector (RANGE).
	Manual		Set any of 256 steps via the setting switch. Press and hold the switch for 2 seconds to lock the intensity value.
	External	Parallel communication	8-bit intensity value setting (B0 to B7) and write signal (WR)
		Serial communication	Command input via EIA-485 communication
		Analog input	Analog voltage (0 V to +5 V)
		External control mode can be selected by pushing the setting switch while turning ON the power.	
ON/OFF control		Parallel bit input	Lighting signal (OFF)
		Serial communication	Command input via EIA-485 communication
EIA-485 communication settings		ID	Set by using the ID switch (00 to 03) Connect up to four units
		Terminating resistance	Set by using the ID switch (Terminating resistance is ON only when ID = 00)
Lighting delay (typ.)		0.1 s	
Error detection display		"Err" is displayed on the digital display.	
Error detection output		Errors are output and light output is stopped for an internal AC power error.	
		External control Connector	Error output terminal (OC, OE), photocoupler insulation, open-collector output, alert open (load current of 10 mA or less), and error status (serial communication)

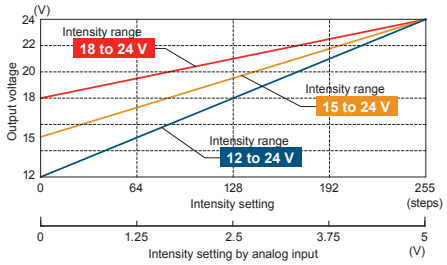
Overcurrent protection	Operates at 105% of the rated current or higher. Resets by cycling the control unit.
Overvoltage protection	Operates at 120% to 155% of the rated voltage. Resets by cycling the control unit.
Input voltage (rated)	100 to 240 VAC (+10% - 15%), 50/60 Hz
Power consumption (typ.)	410 VA
Frequency	50/60 Hz
Inrush current (typ.)	40 A at cold start
Ground leakage current	3.5 mA max. (264 VAC, 60 Hz, with no load)
Output voltage variation range (typ.)	Select between 3 steps by using the intensity range selector. 12 V to 24 V with no load 15 V to 24 V with no load 18 V to 24 V with no load
Operating temperature and humidity	Temperature: 0 to 40°C, Humidity: 20% to 85%RH (with no condensation)
Storage temperature and humidity	Temperature: -20 to 60°C, Humidity: 20% to 85%RH (with no condensation)
Vibration resistance	Acceleration: 19.6 m/sec², Frequency: 10 to 55 Hz, Cycle: 3 min., Sweep cycle: each hour in the X, Y, and Z directions
Cooling method	Forced air cooling
CE marking	Safety standard: Conforms to EN61010-1, EMC standard: Conforms to EN61326-1 Class A
Environmental regulations	RoHS compliant
Material and surface processing	Steel plate, Thickness of cover: 1.0, Thickness of chassis: 1.6, N3 leather tone finish
Weight	2,300 g max.
Accessories	3-prong AC cord with ground terminal (2 m) x 1, User Manual x 1

Dimensions (mm)



Intensity Range

Optimize your intensity setting with the intensity lower limit selection function.
You can choose an intensity range to match the light unit.



The graph is a conceptual image.

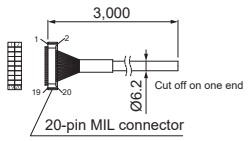
Options

These are cables for parallel communication, EIA-485 communication, and analog input. Select yours to match your control method.

Dimensions (mm)

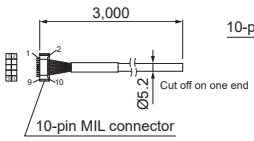
Parallel communication cable

EXCB2-M20-3 (3 m)



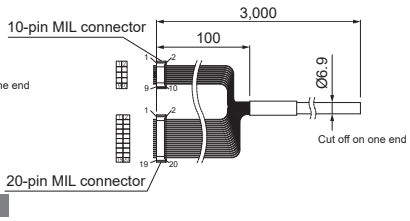
ON/OFF input cable

EXCB2-M10-3 (3 m)



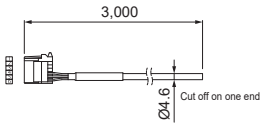
Parallel communication / ON/OFF input shared cable

EXCB2-M10M20-3 (3 m)



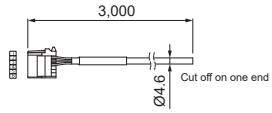
Analog input cable

EXCB2-E6AN-3 (3 m)



EIA-485 communication cable

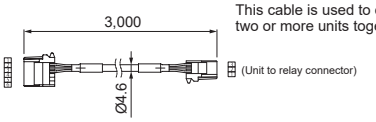
EXCB2-E6SR-3 (3 m)



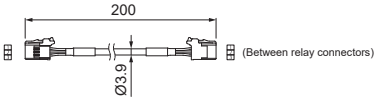
EIA-485 communication relay cable

EXCB2-E6SR-E3-3 (3 m)

This cable is used to connect two or more units together.

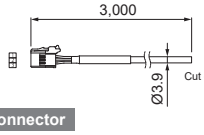


EXCB2-E3-E3-0.2 (0.2 m)



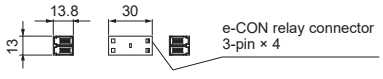
EXCB2-E3-3 (3 m)

This cable is used to connect to an external device when connecting two or more control units together.



Relay connector

ECNR-E3CN4



Refer to the material "Connecting EIA-485 Communications Cables" on the CCS website for information on multi-drop wiring connections. You can download this information from the product website page.

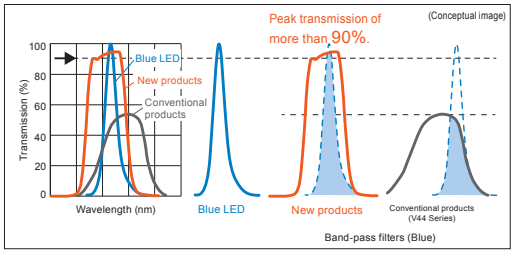
Lens Filters

Refer to our website for product details.
CCS filters ▶ Search

These camera lens filters transmit light in a specific wavelength region and prevent the influence of ambient light.

Features

- Highly transmissive
- Hard-coated filters with superior durability
- 12 different models
- Each filter available in 25 sizes
- Total of 300 Models



Model Name

Example:

F-BP470-□

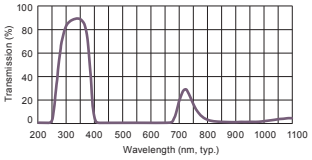
Wavelength
Filter size

BP: Band-pass filter
LP: Sharp-cut filter or protective filter
SP: Short-pass filter

For Ultraviolet Light Units

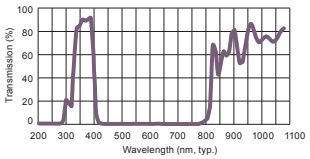
F-BP324-□

Filter color	Ultraviolet
Lens material	Glass
Useful range	290 to 365 nm
Full width at half max	105 nm
Wavelength tolerance	+/- 10 nm
Peak transmission	>90%
Filter size	Refer to Table of Filter Dimensions.

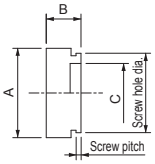


F-BP365-□

Filter color	Ultraviolet
Lens material	Glass
Useful range	335 to 400 nm
Full width at half max	80 nm
Wavelength tolerance	+/-10 nm
Peak transmission	>85%
Filter size	Refer to Table of Filter Dimensions.



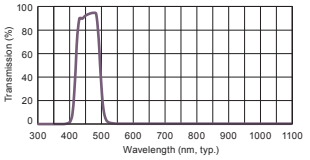
● Dimensions (mm)



For Blue Light Units

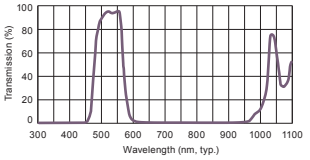
F-BP470-□

Filter color	Blue
Lens material	Glass
Useful range	425 to 495 nm
Full width at half max	85 nm
Wavelength tolerance	+/- 10 nm
Peak transmission	>90%
Filter size	Refer to *Table of Filter Dimensions.*

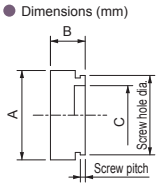


F-BP505-□

Filter color	Cyan
Lens material	Glass
Useful range	485 to 550 nm
Full width at half max	90 nm
Wavelength tolerance	+/- 10 nm
Peak transmission	>90%
Filter size	Refer to *Table of Filter Dimensions.*



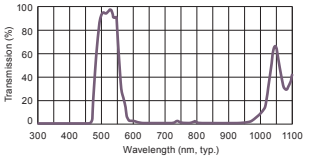
● Dimensions (mm)



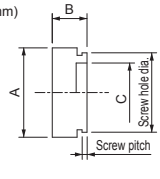
For Green Light Units

F-BP525-□

Filter color	Light green
Lens material	Glass
Useful range	500 to 555 nm
Full width at half max	80 nm
Wavelength tolerance	+/- 10 nm
Peak transmission	>90%
Filter size	Refer to *Table of Filter Dimensions.*



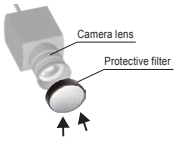
● Dimensions (mm)



Protective Filter

F-LP340-□

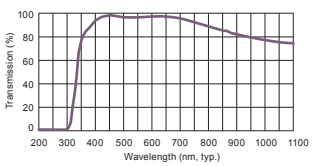
Anti-reflection coating glass is used.



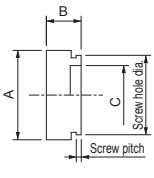
Protects the camera lens from scratches and dust.

Lens material	Glass
Useful range	350 to 800 nm
Cut-on wavelength (50% transmission)	340 nm
Wavelength tolerance	+/- 10 nm
Peak transmission	98%
Filter size	Refer to *Table of Filter Dimensions.*

Note: Please contact your CCS sales representative for information on acrylic protective filters.



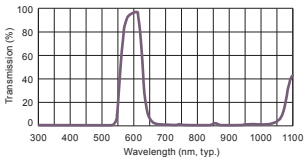
● Dimensions (mm)



For Red Light Units

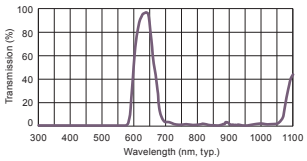
F-BP590-☐

Filter color	Orange
Lens material	Glass
Useful range	560 to 600 nm
Full width at half max	70 nm
Wavelength tolerance	+/- 10 nm
Peak transmission	>90%
Filter size	Refer to *Table of Filter Dimensions.*



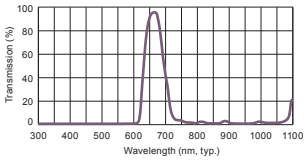
F-BP635-☐

Filter color	Light red
Lens material	Glass
Useful range	615 to 645 nm
Full width at half max	60 nm
Wavelength tolerance	+/- 10 nm
Peak transmission	>90%
Filter size	Refer to *Table of Filter Dimensions.*

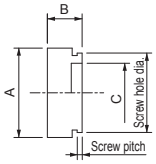


F-BP660-☐

Filter color	Dark red
Lens material	Glass
Useful range	640 to 680 nm
Full width at half max	65 nm
Wavelength tolerance	+/- 10 nm
Peak transmission	>90%
Filter size	Refer to *Table of Filter Dimensions.*



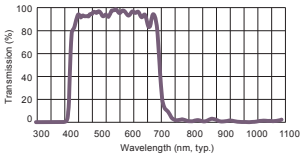
● Dimensions (mm)



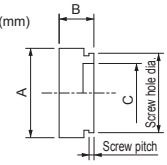
Short-Pass Filter

F-SP700-☐

Lens material	Glass
Useful range	410 to 690 nm
Cut-on wavelength (50% transmission)	400/700 nm (Cut-on / cut-off)
Wavelength tolerance	+/-10 nm
Peak transmission	>90 %
Filter size	Refer to *Table of Filter Dimensions.*



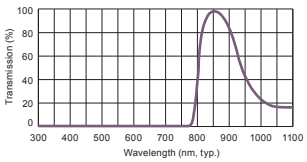
● Dimensions (mm)



For Infrared Light Units

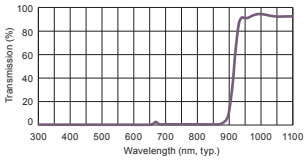
F-BP850-☐

Filter color	Infrared
Lens material	Glass
Useful range	820 to 910 nm
Full width at half max	160 nm
Wavelength tolerance	+/- 10 nm
Peak transmission	>90%
Filter size	Refer to *Table of Filter Dimensions.*



F-LP920-☐
(sharp-cut filter)

Filter color	Infrared (sharp-cut)
Lens material	Glass
Useful range	930 to 1,100 nm
Cut-on wavelength (50% transmission)	920 nm
Wavelength tolerance	+/- 10 nm
Peak transmission	90%
Filter size	Refer to *Table of Filter Dimensions.*



● Dimensions (mm)

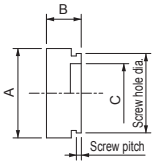


Table of Filter Dimensions (mm)

End of the model name (-☐)	Notes		Dimensions		
	Screw hole diameter	Screw pitch	A	B	C
13.25	M13.25	P0.5	Ø14.75	7.5	Ø10.5
22.5	M22.5		Ø24	7	Ø18.5
25.5	M25.5		Ø27.5		Ø21
27	M27.0		Ø29		Ø22.5
30.5	M30.5		Ø32.5		Ø25.5
34	M34		Ø36		Ø29
35.5	M35.5		Ø37.5		Ø30.5
37	M37	P0.75	Ø39		Ø32.5
37.5	M37.5	P0.5	Ø39.5		Ø32.5
39	M39		Ø41		Ø34
40.5	M40.5		Ø42.5		Ø35.5
43	M43	P0.75	Ø45		Ø38
46	M46		Ø48		Ø41
49	M49		Ø51		Ø44
52	M52		Ø54		Ø47
55	M55		Ø57		Ø50
58	M58		Ø60		Ø53
62	M62		Ø64		Ø57
67	M67		Ø70	8.3	Ø62.5
72	M72		Ø75		Ø67.5
77	M77		Ø80		Ø73
82	M82		Ø84	8.0	Ø77.5
86	M86	P1.0	Ø89	8.3	Ø81.7
95	M95		Ø98.2	10	Ø89.9
105	M105		Ø107.8	8.5	Ø100

Test Kit

This Kit includes various filters.

Model name: F-FK-10

Contents (total of 12 models)

- Ultraviolet (F-BP324-27)
- Blue (F-BP470-27)
- Cyan (F-BP505-27)
- Light green (F-BP525-27)
- Orange (F-BP590-27)
- Light red (F-BP635-27)
- Dark red (F-BP660-27)
- Infrared: band-pass (F-BP850-27)
- Infrared: sharp-cut (F-LP920-27)
- Protective filter (F-LP340-27)
- Step adapter
  M25.5-M27 (F-SU25.5-27)
  M30.5-M27 (F-SD30.5-27)

Lens Filters

Refer to our website for product details.
CCS filters ▶ Search


Sharp-cut filter


Blue filter


Polarizing filter


Ultraviolet cutting filter


Ultraviolet transmission filter

Control Units and Controllers
PD4
PD3
PD2
POD
PTU2
PF
CN-EPOE
CN-4024-2-EIPT
PB-2430-1
CC-ST-1024
PJ2
PJ
CC-PJ-0707
PSCC
PSB4
PSB3-30024
Options
Lens Filters
Diffusion Plates
Polarizing Plates
Light Control Films
Fixtures, etc.
Brackets
SM/EL Cables

Sharp-Cut Filters

Mounted in front of a lens, the R60 Series blocks light of 600 nm max., and the R64 Series blocks light of 640 nm max., and both transmit the light in a wavelength longer than these.

R60 Series

Model name	Notes		Dimensions		
	Screw hole diam.	Screw pitch	A	B	C
R60-16	M16.0	P0.5	Ø18	7	Ø12
R60-25	M25.5		Ø27.5		Ø21
R60-27	M27.0		Ø28.5		Ø23
R60-30	M30.5		Ø32		Ø27

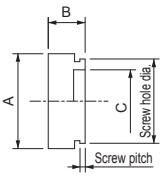
Model name	Notes		Dimensions		
	Screw hole diam.	Screw pitch	A	B	C
R60-40	M40.5	P0.5	Ø42	7	Ø36.5
R60-46	M46.0	P0.75	Ø48		Ø41.5
R60-C	For C-mount attachment		Ø30	9	Ø20.1

R64 Series

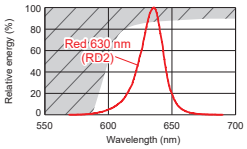
Model name	Notes		Dimensions		
	Screw hole diam.	Screw pitch	A	B	C
R64-16	M16.0	P0.5	Ø18	7	Ø12
R64-25	M25.5		Ø27.5		Ø21
R64-27	M27.0		Ø28.5		Ø23
R64-30	M30.5		Ø32		Ø27

Model name	Notes		Dimensions		
	Screw hole diam.	Screw pitch	A	B	C
R64-40	M40.5	P0.5	Ø42	7	Ø36.5
R64-46	M46.0	P0.75	Ø48		Ø41.5
R64-C	For C-mount attachment		Ø30	9	Ø20.1

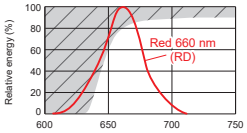
• Dimensions (mm)



Characteristics of R60 Series



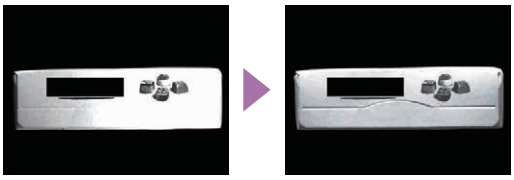
Characteristics of R64 Series



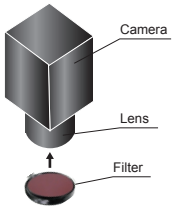
Light is transmitted in the white range.

Example of usage

External imaging of candy box


Sharp cut no filter　　Sharp cut using filter

Example installation



Blue Filters

Mounted in front of a lens, the V44 Series transmits the light in a band centered on 440 nm in a blue wavelength range from 350 to 520 nm.

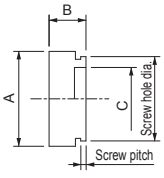
V44 Series

Model name	Notes		Dimensions		
	Screw hole diam.	Screw pitch	A	B	C
V44-25	M25.5	P0.5	Ø27.5	7	Ø21
V44-27	M27.0		Ø28.5		Ø23
V44-30	M30.5		Ø32		Ø27

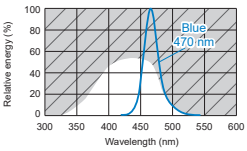
Model name	Notes		Dimensions		
	Screw hole diam.	Screw pitch	A	B	C
V44-40	M40.5	P0.5	Ø42	7	Ø36.5
V44-46	M46.0	P0.75	Ø48		Ø41.5
V44-C	For C-mount attachment		Ø30	9	Ø20.1

With the V44 Series, you cannot attach any other filters or lens attachment rings (MR Series) on the workpiece side.

• Dimensions (mm)



Characteristics of V44 Series



Light is transmitted in the white range.

Polarizing Filters

These filters are attached to the filter thread part of lens. They are used together with a polarizing plate attached to the light unit for the purpose of eliminating surface glare.

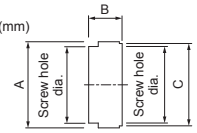
PL Series / PL2 Series

"-NL" models have a locking mechanism.

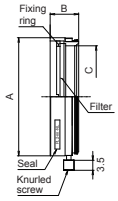
Model name	Notes		Dimensions		
	Screw hole diam.	Screw pitch	A	B	C
PL-25	M25.5	P0.5	Ø27.4	9.3	Ø27.0
PL-25-NL	M25.5		Ø30.5	12	
PL-27	M27.0		Ø29.4	9.3	Ø28.5
PL-27-NL	M27.0		Ø32	12	
PL-30	M30.5		Ø32.4	9.3	Ø32.0
PL-30-NL	M30.5		Ø32.0	12	Ø35.5
PL-40	M40.5		Ø42.4	9.3	Ø42.0
PL-40-NL	M40.5		Ø42.0	12	Ø45.0
PL-46	M46.0	P0.75	Ø48.5	9.5	Ø48.0
PL2-35.5-NL	M35.5	P0.5	Ø37	9.6	Ø31
PL2-37.5-NL	M37.5		Ø39	9.5	Ø33
PL2-43-NL	M43	P0.75	Ø45	10	Ø38.9
PL2-46-NL	M46		Ø48	10	Ø41.7

Model name	Notes		Dimensions		
	Screw hole diam.	Screw pitch	A	B	C
PL2-48-NL	M48	P0.75	Ø50	10	Ø43.7
PL2-49-NL	M49		Ø51	10	Ø44.8
PL2-52-NL	M52		Ø54	10	Ø47.8
PL2-55-NL	M55		Ø57	10	Ø50.7
PL2-58-NL	M58		Ø60	10	Ø53.7
PL2-62-NL	M62		Ø65	11	Ø57.8
PL2-67-NL	M67		Ø70	11	Ø62.8
PL2-72-NL	M72		Ø75	11	Ø67.8
PL2-77-NL	M77		Ø80	11	Ø72.4
PL2-82-NL	M82		Ø85	11	Ø76.8
PL2-86-NL	M86	P1.0	Ø90	12.5	Ø80
PL2-95-NL	M95		Ø100	14	Ø89.5
PL2-105-NL	M105		Ø109.7	14	Ø99.05

• PL Series dimensions (mm)



• PL2 Series dimensions (mm)



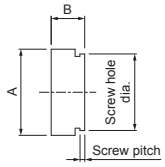
Ultraviolet Cutting Filters

The L42 Series blocks light of 420 nm max. and transmits the light in a wavelength longer than this.

L42 Series

Model name	Notes		Dimensions	
	Screw hole dia.	Screw pitch	A	B
L42-25	M25.5	P0.5	Ø27.5	6.5
L42-27	M27.0		Ø28.5	
L42-30	M30.5		Ø32	
L42-40	M40.5		Ø42	
L42-46	M46.0	P0.75	Ø48	7.2

• Dimensions (mm)



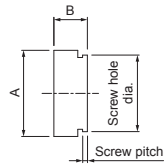
Ultraviolet Transmission Filters

The U-340 Series transmits light in a wavelength range from approximately 280 to 380 nm centered on 340 nm.

U-340 Series

Model name	Notes		Dimensions	
	Screw hole dia.	Screw pitch	A	B
U340-25	M25.5	P0.5	Ø27.5	6.5
U340-27	M27.0		Ø28.5	
U340-30	M30.5		Ø32	
U340-40	M40.5		Ø42	
U340-46	M46.0	P0.75	Ø48	7.2

• Dimensions (mm)



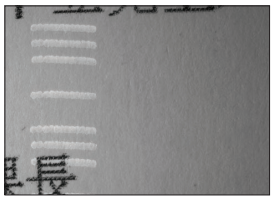
UV Transmission Filter, UV Cut Filter Usage Example

Imaging Invisible Ink on Postcard

Workpiece

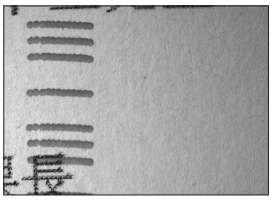
Postcard

No Filter



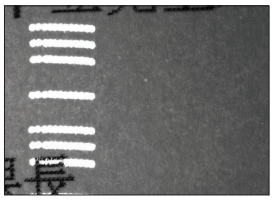
Without a filter, both UV and visible light are captured.

With UV Transmission Filter



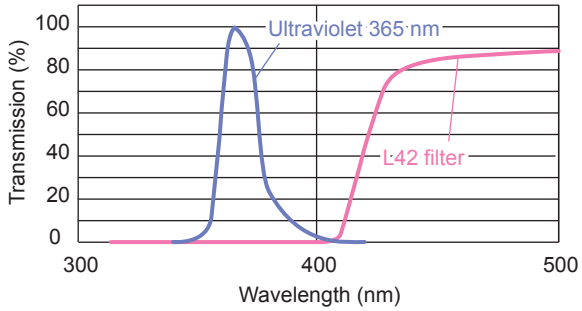
By using a UV transmission filter, it is possible to capture only wavelengths in the UV region.

With UV Cut Filter

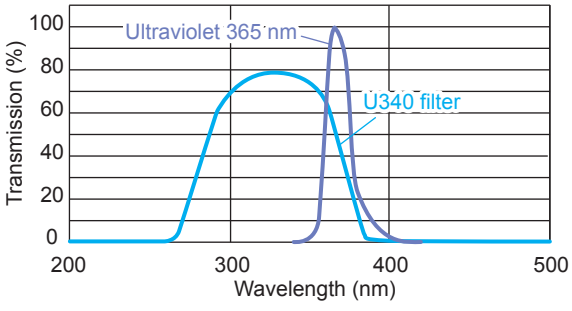


By using a UV cut filter, only the excited scattering light from the ink will be captured.

Comparison of characteristics of ultraviolet cutting filter and light spectrum of ultraviolet LED



Comparison of characteristics of ultraviolet transmission filter and light spectrum of ultraviolet LED



Options

Diffusion Plates

Refer to our website for product details.

CCS diffusion plates ▶ Search

Can prevent glare, which is a problem when making images of glossy workpieces.


For the Ring Lights
LDR2 / LDR-PF Series


For the Low-angle Ring Lights
LDR2-LA Series


For the Bar Lights
LDL2-19X4 Series
LDL2-33X8 Series


LDL2 Series
LDL-PF Series

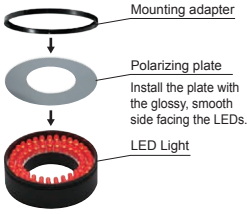
For the Ring Lights LDR2 / SQR / LDR-PF Series

Model name	Applicable Light Unit (Common for all colors)	Dimensions A	Dimensions B	Dimensions Thickness
DF-LDR-32*1	LDR2-32	Ø32	Ø9	(2)
DF-LDR-42*1	LDR2-42	Ø42	Ø14	
DF-LDR-50*1	LDR2-50	Ø50	Ø25	
DF-LDR-70	LDR2-70	Ø66	Ø35	
DF-LDR-90*1	LDR2-90	Ø90	Ø40	
DF-LDR-90-H28*2	LDR2-90-30	Ø90	Ø28	
DF-LDR-120-45*1	LDR2-120	Ø120	Ø45	
DF-SQR-56	SQR-56	Refer to the drawing		
DF-LDR-PF-36*1	LDR-PF-36	Ø36	Ø10	
DF-LDR-PF-54*1	LDR-PF-54	Ø54	Ø22	
DF-LDR-PF-75*1	LDR-PF-75	Ø75	Ø35	

*1 An AD Series adapter is needed when installing light units. (Product Page ▼ P. 368)
*2 This is a custom order product. Contact our local sales office for details.

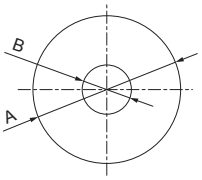
Example installation

Example: Attachment of Ring Lights LDR2 Series

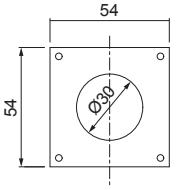


● Dimensions (mm)

DF-LDR-□□
DF-LDR-PF-□□



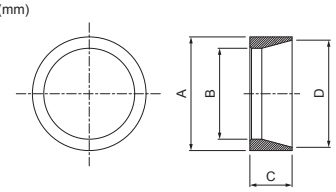
DF-SQR-56



For the Low-Angle Ring Lights LDR2-LA / LDR-PF-LA Series

Model name	Applicable Light Unit (Common for all colors)	Dimensions A	Dimensions B	Dimensions C	Dimensions D
DF-LDR-48LA	LDR2-48-LA	Ø22	Ø13	18.5	Ø21.77
DF-LDR-74LA	LDR2-74-LA	Ø48	Ø40	24	Ø50
DF-LDR-100LA	LDR2-100-LA	Ø70	Ø56	26	Ø66
DF-LDR-132LA	LDR2-132-LA	Ø98	Ø82		Ø92
DF-LDR-170LA	LDR2-170-LA	Ø133.5	Ø120		Ø130
DF-LDR-208LA	LDR2-208-LA	Ø173.5	Ø152	32	Ø174.3
DF-LDR-PF-75-LA	LDR-PF-75-LA	Please check the web page for details.			
DF-LDR-PF-100-LA	LDR-PF-100-LA				
DF-LDR-PF-150-LA	LDR-PF-150-LA				

● Dimensions (mm)

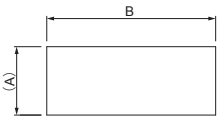


For the Bar Lights LDL2 / LDL-PF Series

Model name	Applicable Light Unit (Common for all colors)	Dimensions A	Dimensions B
DF-LDL2-19X4	LDL2-19X4	6.4	28
DF-LDL2-33X8	LDL2-33X8	10.4	44
DF-LDL2-41X16	LDL2-41X16	23.2	46
DF-LDL2-80X16	LDL2-80X16		84.7
DF-LDL2-119X16	LDL2-119X16		123.7
DF-LDL2-158X16	LDL2-158X16		162.7
DF-LDL-PF-52X18	LDL-PF-52X18	22	58
DF-LDL-PF-102X18	LDL-PF-102X18		108
DF-LDL-PF-152X18	LDL-PF-152X18		158

Model name	Applicable Light Unit (Common for all colors)	Dimensions A	Dimensions B
DF-LDL2-26X30	LDL2-26X30	37.2	30.7
DF-LDL2-50X30	LDL2-50X30		54.7
DF-LDL2-74X30	LDL2-74X30		79
DF-LDL2-98X30	LDL2-98X30		102.7
DF-LDL2-122X30	LDL2-122X30		126.7
DF-LDL2-146X30	LDL2-146X30		150.7
DF-LDL2-218X30	LDL2-218X30		222.7
DF-LDL2-266X30	LDL2-266X30		270.7
DF-LDL-PF-52X30	LDL-PF-52X30	34	58
DF-LDL-PF-102X30	LDL-PF-102X30		108
DF-LDL-PF-152X30	LDL-PF-152X30		158

● Dimensions (mm)



For the Bar Lights HLDL3 Series

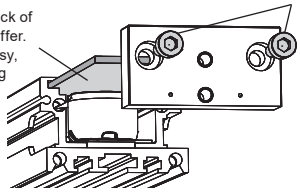
Lights are shipped with a low-uniformity, high-transmissivity diffusion plate mounted. Light characteristics can be changed by changing the diffusion plate. * White wide-type lights are shipped with the DF-HLDL3 Series diffusion plate mounted.

Model name	Applicable Light Unit (Common for all colors)	Dimension A
DF-HLDL3-150(-HU)	HLDL3-150X28	154
DF-HLDL3-300(-HU)	HLDL3-300X28	304
DF-HLDL3-450(-HU)	HLDL3-450X28	454
DF-HLDL3-600(-HU)	HLDL3-600X28	604
DF-HLDL3-750(-HU)	HLDL3-750X28	754
DF-HLDL3-900(-HU)	HLDL3-900X28	904
DF-HLDL3-1050(-HU)	HLDL3-1050X28	1054
DF-HLDL3-1200(-HU)	HLDL3-1200X28	1204
DF-HLDL3-1350(-HU)	HLDL3-1350X28	1354
DF-HLDL3-1500(-HU)	HLDL3-1500X28	1504
DF-HLDL3-1650(-HU)	HLDL3-1650X28	1654
DF-HLDL3-1800(-HU)	HLDL3-1800X28	1804

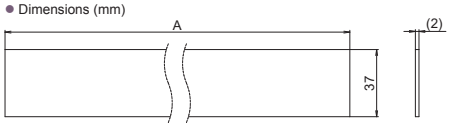
Series	Uniformity	Transmissivity
DF-HLDL3 Series	Medium	Medium
DF-HLDL3-HU Series	High	Low

M4 screw (recommended screw tightening torque: 0.6 N•m)

The front and the back of the diffusion plate differ. Ensure that the glossy, smooth side is facing the LED.

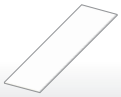


● Dimensions (mm)



Caution	Diffusion plates are consumables. Heat may cause deformation or discoloring depending on the use environment. Make sure that countermeasures against overheating are implemented and that the temperature does not exceed the operating limit.

Can prevent glare, which is a problem when making images of glossy workpieces.



Diffused Bar Lights
LB Series

For the Coaxial Lights
LFV3 / LFV-PF Series

For the Coaxial Lights
LFV3 / LFV-PF Series
(End of the model name: -UF)

For Diffused Lighting Bar Lights LB Series

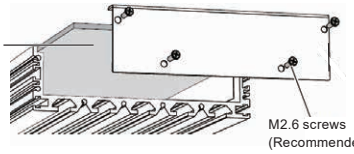
Light characteristics can be changed by changing the diffusion plate.
The DF-LB Series diffusion plates have lower uniformity and higher transmissivity than the standard type diffusion plates installed at the time of shipment.
For high power type lighting, DF-LB Series diffusion plates are installed at the time of shipment.

Model name	Applicable Light Unit (Common for all colors)	Dimensions	
		A	B
DF-LB-200X50	LB-200X50	214	55
DF-LB-300X50	LB-300X50	314	
DF-LB-400X50	LB-400X50	414	
DF-LB-500X50	LB-500X50	514	
DF-LB-600X50	LB-600X50	614	
DF-LB-700X50	LB-700X50	714	
DF-LB-800X50	LB-800X50	814	
DF-LB-900X50	LB-900X50	914	
DF-LB-1000X50	LB-1000X50	1014	
DF-LB-1100X50	LB-1100X50	1114	
DF-LB-1200X50	LB-1200X50	1214	
DF-LB-1300X50	LB-1300X50	1312	
DF-LB-1400X50	LB-1400X50	1412	
DF-LB-1500X50	LB-1500X50	1512	
DF-LB-1600X50	LB-1600X50	1612	
DF-LB-1700X50	LB-1700X50	1712	
DF-LB-1800X50	LB-1800X50	1812	
DF-LB-1900X50	LB-1900X50	1912	
DF-LB-2000X50	LB-2000X50	2012	
DF-LB-2100X50	LB-2100X50	2111	
DF-LB-2200X50	LB-2200X50	2211	
DF-LB-2300X50	LB-2300X50	2311	
DF-LB-2400X50	LB-2400X50	2411	
DF-LB-2500X50	LB-2500X50	2510.5	
DF-LB-2600X50	LB-2600X50	2610.5	
DF-LB-2700X50	LB-2700X50	2710.5	

Model name	Applicable Light Unit (Common for all colors)	Dimensions	
		A	B
DF-LB-200X100	LB-200X100	214	105.5
DF-LB-300X100	LB-300X100	314	
DF-LB-400X100	LB-400X100	414	
DF-LB-500X100	LB-500X100	514	
DF-LB-600X100	LB-600X100	614	
DF-LB-700X100	LB-700X100	714	
DF-LB-800X100	LB-800X100	814	
DF-LB-900X100	LB-900X100	914	
DF-LB-1000X100	LB-1000X100	1014	
DF-LB-1100X100	LB-1100X100	1114	
DF-LB-1200X100	LB-1200X100	1214	
DF-LB-1300X100	LB-1300X100	1312	
DF-LB-1400X100	LB-1400X100	1412	
DF-LB-1500X100	LB-1500X100	1512	
DF-LB-1600X100	LB-1600X100	1612	
DF-LB-1700X100	LB-1700X100	1712	
DF-LB-1800X100	LB-1800X100	1812	
DF-LB-1900X100	LB-1900X100	1912	
DF-LB-2000X100	LB-2000X100	2012	
DF-LB-2100X100	LB-2100X100	2111	
DF-LB-2200X100	LB-2200X100	2211	
DF-LB-2300X100	LB-2300X100	2311	
DF-LB-2400X100	LB-2400X100	2411	
DF-LB-2500X100	LB-2500X100	2510.5	
DF-LB-2600X100	LB-2600X100	2610.5	
DF-LB-2700X100	LB-2700X100	2710.5	

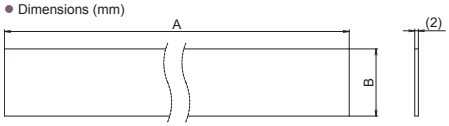
Model name	Applicable Light Unit (Common for all colors)	Dimensions	
		A	B
DF-LB-200X150	LB-200X150	214	155.5
DF-LB-300X150	LB-300X150	314	
DF-LB-400X150	LB-400X150	414	
DF-LB-500X150	LB-500X150	514	
DF-LB-600X150	LB-600X150	614	
DF-LB-700X150	LB-700X150	714	
DF-LB-800X150	LB-800X150	814	
DF-LB-900X150	LB-900X150	914	
DF-LB-1000X150	LB-1000X150	1014	
DF-LB-1100X150	LB-1100X150	1114	
DF-LB-1200X150	LB-1200X150	1214	
DF-LB-1300X150	LB-1300X150	1312	
DF-LB-1400X150	LB-1400X150	1412	
DF-LB-1500X150	LB-1500X150	1512	
DF-LB-1600X150	LB-1600X150	1612	
DF-LB-1700X150	LB-1700X150	1712	
DF-LB-1800X150	LB-1800X150	1812	
DF-LB-1900X150	LB-1900X150	1912	
DF-LB-2000X150	LB-2000X150	2012	
DF-LB-2100X150	LB-2100X150	2111	
DF-LB-2200X150	LB-2200X150	2211	
DF-LB-2300X150	LB-2300X150	2311	
DF-LB-2400X150	LB-2400X150	2411	
DF-LB-2500X150	LB-2500X150	2510.5	
DF-LB-2600X150	LB-2600X150	2610.5	
DF-LB-2700X150	LB-2700X150	2710.5	

For sizes ≥ 1000, the diffusion plate has a front side and a back side. Install it with the glossy, smooth side facing the LEDs.



M2.6 screws
(Recommendedtightening torque:0.2 N•m)

● Dimensions (mm)



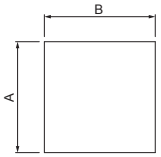
For the Coaxial Lights LFV3 / LFV-PF Series

Model name	Transmission	Applicable Light Unit (Common for all colors)	Dimensions		
			A	B	Thickness
DF-LFV3-35	High	LFV3-35 / LFV-PF-35	34	42	(2)
DF-LFV3-35-UF	Low				
DF-LFV3-50	High	LFV3-50 / LFV-PF-50	52	56	
DF-LFV3-50-UF	Low				
DF-LFV3-50X100	High	LFV3-50X100		106	
DF-LFV3-50X100-UF	Low				
DF-LFV3-70	High	LFV3-70/ LFV-PF-70	73	80	
DF-LFV3-70-UF	Low				

Model name	Transmission	Applicable Light Unit (Common for all colors)	Dimensions		
			A	B	Thickness
DF-LFV3-100	High	LFV3-100 / LFV-PF-100	100	106	(2)
DF-LFV3-100-UF	Low				
DF-LFV3-130	High	LFV3-130	130	138	
DF-LFV3-130-UF	Low				
DF-LFV3-200	High	LFV3-200	202	222	
DF-LFV3-200-UF	Low				

Transmission High: Standard for red and white
Transmission Low (End of the model name: -UF): Standard for blue

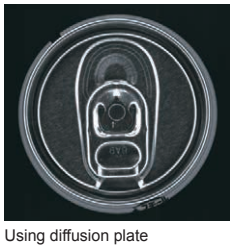
● Dimensions (mm)



Example of usage

Imaging of can from above

No diffusion plate



Using diffusion plate

There are two types of diffusion plates with different transmission for the Coaxial Lights LFV3 Series. Select one to match your work environment.

E.g.: If changing from a low transmission diffusion plate to a high one:

Intensity value 70%

Bright even though uniformity is low.

E.g.: If changing from a high transmission diffusion plate to a low one:

Intensity value 75%

Brightness decreases as uniformity is increased.

Caution	Diffusion plates are consumables. Heat may cause deformation or discoloring depending on the use environment. Make sure that countermeasures against overheating are implemented and that the temperature does not exceed the operating limit.

Options

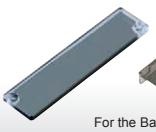
Polarizing Plates

Refer to our website for product details.

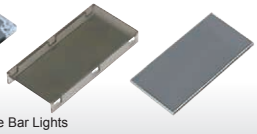
CCS polarizing plates ▶ Search

These are used together with a polarizing filter attached to the camera lens for the purpose of eliminating surface glare.

For the Ring Lights
LDR2 / LDR-PF Series



For the Bar Lights
LDL2-19X4 Series
LDL2-33X8 Series



LDL2 Series
LDL-PF Series

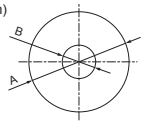
For the Spot Lights
LSP Series

For the Ring Lights LDR2 / SQR / LDR-PF Series

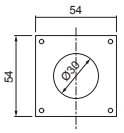
Model name	Applicable Light Unit (Common for all colors)	Dimensions A	Dimensions B	Dimensions Thickness
PL-LDR-32*1	LDR2-32	Ø32	Ø9	0.8
PL-LDR-42*1	LDR2-42	Ø42	Ø14	
PL-LDR-50*1	LDR2-50	Ø50	Ø26	
PL-LDR2-70	LDR2-70	Ø76*2	Ø35	
PL-LDR-90*1	LDR2-90	Ø90	Ø40	
PL-LDR-90-H28*1*3	LDR2-90-30	Ø90	Ø28	
PL-LDR-120-40*1	LDR2-120	Ø120	Ø40	
PL-SQR-56	SQR-56	Refer to the drawing		
PL-LDR-PF-36*1	LDR-PF-36	Ø36	Ø10	(2)
PL-LDR-PF-54*1	LDR-PF-54	Ø54	Ø22	
PL-LDR-PF-75*1	LDR-PF-75	Ø75	Ø35	

● Dimensions (mm)

PL-LDR-□□
PL-LDR-PF-□□



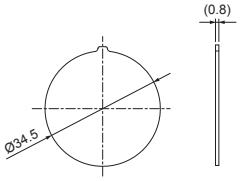
PL-SQR-56



*1 An AD Series adapter is needed when installing light units. (Product Page ▶ P. 368)
*2 The dimensions are that of the outer diameter of the included mounting adapter.
*3 This is a custom order product. Contact our local sales office for details.

For the Spot Lights LSP Series

Model name	Applicable Light Unit (Common for all colors)
PL-LSP-41	LSP-41



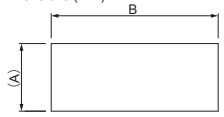
For the Bar Lights LDL2 / LDL-PF Series

Model name	Applicable Light Unit (Common for all colors)	Dimensions A	Dimensions B
PL-LDL2-19X4-HO	LDL2-19X4	6.4	28
PL-LDL2-19X4-VE			
PL-LDL2-33X8-HO	LDL2-33X8	10.4	44
PL-LDL2-33X8-VE			
PL-LDL2-41X16	LDL2-41X16	23.2	46
PL-LDL2-41X16-VE			
PL-LDL2-80X16	LDL2-80X16		84.7
PL-LDL2-80X16-VE			
PL-LDL2-119X16	LDL2-119X16		123.7
PL-LDL2-119X16-VE			
PL-LDL2-158X16	LDL2-158X16		162.7
PL-LDL2-158X16-VE			
PL-LDL-PF-52X18-HO	LDL-PF-52X18	22	58
PL-LDL-PF-52X18-VE			
PL-LDL-PF-102X18-HO	LDL-PF-102X18		108
PL-LDL-PF-102X18-VE			

Model name	Applicable Light Unit (Common for all colors)	Dimensions A	Dimensions B
PL-LDL-PF-152X18-HO	LDL-PF-152X18	22	158
PL-LDL-PF-152X18-VE			
PL-LDL2-26X30	LDL2-26X30	37.2	30.7
PL-LDL2-26X30-VE			
PL-LDL2-50X30	LDL2-50X30		79
PL-LDL2-50X30-VE			
PL-LDL2-74X30	LDL2-74X30		79
PL-LDL2-74X30-VE			
PL-LDL2-98X30	LDL2-98X30		102.7
PL-LDL2-98X30-VE			
PL-LDL2-122X30	LDL2-122X30		126.7
PL-LDL2-122X30-VE			
PL-LDL2-146X30	LDL2-146X30		150.7
PL-LDL2-146X30-VE			
PL-LDL2-218X30	LDL2-218X30		222.7
PL-LDL2-218X30-VE			

Model name	Applicable Light Unit (Common for all colors)	Dimensions A	Dimensions B
PL-LDL2-266X30	LDL2-266X30	37.2	270.7
PL-LDL2-266X30-VE			
PL-LDL-PF-52X30-HO	LDL-PF-52X30	34	58
PL-LDL-PF-52X30-VE			
PL-LDL-PF-102X30-HO	LDL-PF-102X30		108
PL-LDL-PF-102X30-VE			
PL-LDL-PF-152X30-HO	LDL-PF-152X30		158
PL-LDL-PF-152X30-VE			

● Dimensions (mm)



For the Bar Lights HLDL3 Series

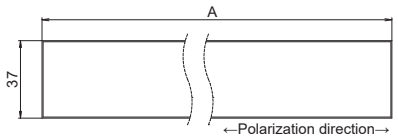
Model name	Applicable Light Unit (Common for all colors)	Dimensions A	Dimensions B
PL-HLDL3-150-HO	HLDL3-150X28	154	—
PL-HLDL3-150-VE			
PL-HLDL3-300-HO	HLDL3-300X28	304	—
PL-HLDL3-300-VE			
PL-HLDL3-450-HO	HLDL3-450X28	454	—
PL-HLDL3-450-VE			
PL-HLDL3-600-HO	HLDL3-600X28	604	—
PL-HLDL3-600-VE			
PL-HLDL3-750-HO	HLDL3-750X28	754	(377)
PL-HLDL3-750-VE			—
PL-HLDL3-900-HO	HLDL3-900X28	904	(452)
PL-HLDL3-900-VE			—

Model name	Applicable Light Unit (Common for all colors)	Dimensions A	Dimensions B	Dimensions C
PL-HLDL3-1050-HO	HLDL3-1050X28	1054	(527)	—
PL-HLDL3-1050-VE				
PL-HLDL3-1200-HO	HLDL3-1200X28	1204	(602)	—
PL-HLDL3-1200-VE				
PL-HLDL3-1350-HO	HLDL3-1350X28	1354	(451.5)	(451)
PL-HLDL3-1350-VE			(677)	—
PL-HLDL3-1500-HO	HLDL3-1500X28	1504	(501.5)	(501)
PL-HLDL3-1500-VE			(752)	—
PL-HLDL3-1650-HO	HLDL3-1650X28	1654	(551.5)	(551)
PL-HLDL3-1650-VE			(827)	—
PL-HLDL3-1800-HO	HLDL3-1800X28	1804	(601.5)	(601)
PL-HLDL3-1800-VE			(902)	—

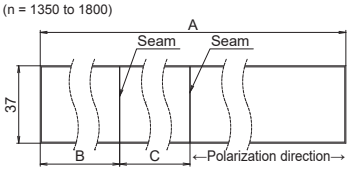
* Remove the diffusion plate to mount the polarizing plate. If you want to use both the polarizing plate and diffusion plate, contact us for custom orders.
Note: There may be some lifting between the film and resin plate due to environmental changes. However, this will not affect functionality and performance.

● Dimensions (mm)

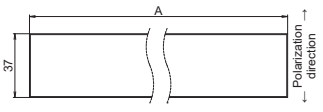
PL-HLDL3-n-HO
(n = 150 to 600)



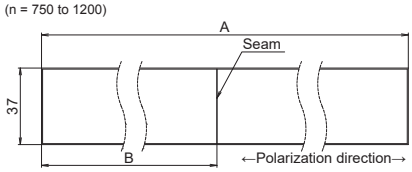
PL-HLDL3-n-HO
(n = 1350 to 1800)



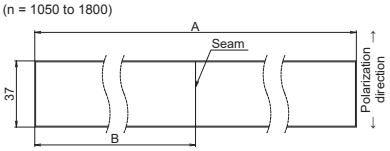
PL-HLDL3-n-VE
(n = 150 to 900)



PL-HLDL3-n-HO
(n = 750 to 1200)



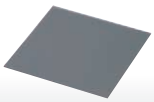
PL-HLDL3-n-VE
(n = 1050 to 1800)



Caution	Polarizing plates are consumables. Heat may cause deformation or discoloring depending on the use environment. Make sure that countermeasures against overheating are implemented and that the temperature does not exceed the operating limit.

These are used together with a polarizing filter attached to the camera lens for the purpose of eliminating surface glare.

Diffused Bar Lights
LB Series



For the Coaxial Lights
LFV3 / LFV-PF Series

For Diffused Lighting Bar Lights LB Series

Model name	Dimensions A	Dimensions B
PL-LB-200X50-HO/VE	214	55
PL-LB-300X50-HO/VE	314	
PL-LB-400X50-HO/VE	414	
PL-LB-500X50-HO/VE	514	
PL-LB-600X50-HO/VE	614	
PL-LB-700X50-HO/VE	714	
PL-LB-800X50-HO/VE	814	
PL-LB-900X50-HO/VE	914	
PL-LB-1000X50-HO/VE	1014	
PL-LB-1100X50-HO/VE	1114	
PL-LB-1200X50-HO/VE	1214	
PL-LB-1300X50-HO/VE	1312	
PL-LB-1400X50-HO/VE	1412	
PL-LB-1500X50-HO/VE	1512	
PL-LB-1600X50-HO/VE	1612	
PL-LB-1700X50-HO/VE	1712	
PL-LB-1800X50-HO/VE	1812	
PL-LB-1900X50-HO/VE	1912	
PL-LB-2000X50-HO/VE	2012	
PL-LB-2100X50-HO/VE	2111	
PL-LB-2200X50-HO/VE	2211	
PL-LB-2300X50-HO/VE	2311	
PL-LB-2400X50-HO/VE	2411	
PL-LB-2500X50-HO/VE	2510.5	
PL-LB-2600X50-HO/VE	2610.5	
PL-LB-2700X50-HO/VE	2710.5	

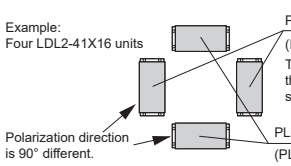
Model name	Dimensions A	Dimensions B
PL-LB-200X100-HO/VE	214	105.5
PL-LB-300X100-HO/VE	314	
PL-LB-400X100-HO/VE	414	
PL-LB-500X100-HO/VE	514	
PL-LB-600X100-HO/VE	614	
PL-LB-700X100-HO/VE	714	
PL-LB-800X100-HO/VE	814	
PL-LB-900X100-HO/VE	914	
PL-LB-1000X100-HO/VE	1014	
PL-LB-1100X100-HO/VE	1114	
PL-LB-1200X100-HO/VE	1214	
PL-LB-1300X100-HO/VE	1312	
PL-LB-1400X100-HO/VE	1412	
PL-LB-1500X100-HO/VE	1512	
PL-LB-1600X100-HO/VE	1612	
PL-LB-1700X100-HO/VE	1712	
PL-LB-1800X100-HO/VE	1812	
PL-LB-1900X100-HO/VE	1912	
PL-LB-2000X100-HO/VE	2012	
PL-LB-2100X100-HO/VE	2111	
PL-LB-2200X100-HO/VE	2211	
PL-LB-2300X100-HO/VE	2311	
PL-LB-2400X100-HO/VE	2411	
PL-LB-2500X100-HO/VE	2510.5	
PL-LB-2600X100-HO/VE	2610.5	
PL-LB-2700X100-HO/VE	2710.5	

Model name	Dimensions A	Dimensions B
PL-LB-200X150-HO/VE	214	155.5
PL-LB-300X150-HO/VE	314	
PL-LB-400X150-HO/VE	414	
PL-LB-500X150-HO/VE	514	
PL-LB-600X150-HO/VE	614	
PL-LB-700X150-HO/VE	714	
PL-LB-800X150-HO/VE	814	
PL-LB-900X150-HO/VE	914	
PL-LB-1000X150-HO/VE	1014	
PL-LB-1100X150-HO/VE	1114	
PL-LB-1200X150-HO/VE	1214	
PL-LB-1300X150-HO/VE	1312	
PL-LB-1400X150-HO/VE	1412	
PL-LB-1500X150-HO/VE	1512	
PL-LB-1600X150-HO/VE	1612	
PL-LB-1700X150-HO/VE	1712	
PL-LB-1800X150-HO/VE	1812	
PL-LB-1900X150-HO/VE	1912	
PL-LB-2000X150-HO/VE	2012	
PL-LB-2100X150-HO/VE	2111	
PL-LB-2200X150-HO/VE	2211	
PL-LB-2300X150-HO/VE	2311	
PL-LB-2400X150-HO/VE	2411	
PL-LB-2500X150-HO/VE	2510.5	
PL-LB-2600X150-HO/VE	2610.5	
PL-LB-2700X150-HO/VE	2710.5	

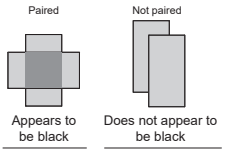
* When n ≥ 700 for the PL-LB-HO Series or n ≥ 1000 for the PL-LB-VE Series, the film on the polarizing plate has seams. For detailed information, please visit our website.
* Remove the diffusion plate to mount the polarizing plate. If you want to use both the polarizing plate and diffusion plate, contact us for custom orders.

There are two types of polarizing plates for the Bar Lights LDL2 Series. They are used together as shown below.

Installation to illuminate the workpiece from all four directions:



● Distinguishing paired polarizing plates

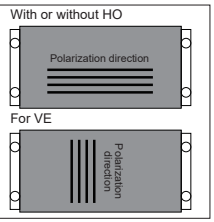


When the model number ends with or without HO

As shown in the figure, the polarization direction is **horizontal** with respect to the long side of the polarizing plate.

When the model number ends with VE

As shown in the figure, the polarization direction is **perpendicular** with respect to the long side of the polarizing plate.



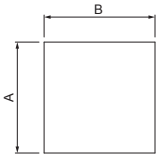
Refer to the Technical Guide (Glossary) for polarization. ▶P.401

For the Coaxial Lights LFV3 / LFV-PF Series

Model name	Applicable Light Unit (Common for all colors)	Dimensions A	Dimensions B	Dimensions Thickness
PL-LFV3-35	LFV3-35 / LFV-PF-35	34	42	0.8
PL-LFV3-50	LFV3-50 / LFV-PF-50	52	56	
PL-LFV3-50X100	LFV3-50X100	52	106	
PL-LFV3-70	LFV3-70 / LFV-PF-70	73	80	

Model name	Applicable Light Unit (Common for all colors)	Dimensions A	Dimensions B	Dimensions Thickness
PL-LFV3-100	LFV3-100 / LFV-PF-100	100	106	0.8
PL-LFV3-130	LFV3-130	130	138	
PL-LFV3-200	LFV3-200	202	222	

● Dimensions (mm)



Example of usage

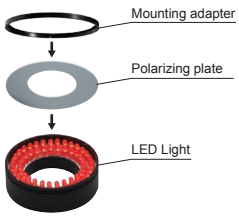
Imaging of QR code

No polarizing plate

Using a polarizing plate

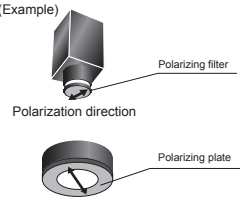
Example installation

Example: Attachment of Ring Lights LDR2 Series



● The polarizing filters and plates are used together.

(Example)



Adjustment procedures for polarizing plates and polarizing filters

Specular reflective components are cut out and the effects can be observed when the polarization direction of the polarizing plate installed on the light unit and the polarization direction of the filter attached to the camera are at a right angle (90°) to each other.

Refer to the Technical Guide (Glossary) for polarization. ▶P.401

Caution	Polarizing plates are consumables. Heat may cause deformation or discoloring depending on the use environment. Make sure that countermeasures against overheating are implemented and that the temperature does not exceed the operating limit.

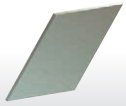
Options

Light Control (LC) Films

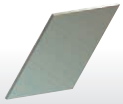
Refer to our website for product details.

CCS LC film ▶ Search

The parallelism of light is improved to reduce light diffraction for performing external inspection of workpieces, and provide sharp imaging of profiles.



For the Flat Lights
TH2/TH-PF Series



For the Coaxial Lights
LFV3 / LFV-PF Series

For the Flat Lights TH2/TH-PF Series

Model name	Applicable Light Unit (Common for all colors)	Dimensions		
		A	B	Thickness
LC-TH-27X27-HO	TH2-27X27	39	29	0.5
LC-TH-27X27-VE				
LC-TH-43X35-HO	TH2-43X35	47	45	
LC-TH-43X35-VE				
LC-TH-51X51-HO	TH2-51X51	63	53	
LC-TH-51X51-VE				
LC-TH-63X60-HO	TH2-63X60	72	75	
LC-TH-63X60-VE				
LC-TH-83X75-HO	TH2-83X75	87	95	
LC-TH-83X75-VE				
LC-TH-100X100-HO	TH2-100X100 TH-PF-100X100	112	112	
LC-TH-100X100-VE				

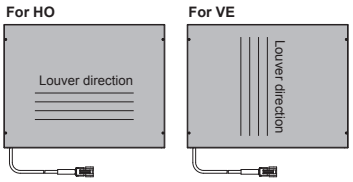
Model name	Applicable Light Unit (Common for all colors)	Dimensions		
		A	B	Thickness
LC-TH-140X105-HO	TH2-140X105	117	152	0.5
LC-TH-140X105-VE				
LC-TH-160X120-HO	TH2-160X120	132	172	
LC-TH-160X120-VE				
LC-TH-200X150-HO	TH2-200X150	162	212	
LC-TH-200X150-VE				
LC-TH-211X200-HO	TH2-211X200	212	223	
LC-TH-211X200-VE				
LC-TH-224X170-HO	TH2-224X170	182	236	
LC-TH-224X170-VE				

For the TH2: These films are not applicable to the high-directivity, large, rectangular, and camera-window type light units.

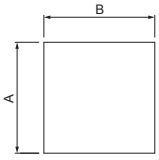
The Flat Lights TH2/TH-PF Series offers a selection of long or short louver directions.

Model names ending with HO:
The direction of louvers is horizontal when attaching with the cable outlet facing downwards as shown in the drawing.

Model names ending with VE:
The direction of louvers is vertical when attaching with the cable outlet facing downwards as shown in the drawing.



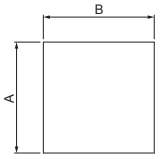
● Dimensions (mm)



For the Flat Lights LFL Series

Model name	Applicable Light Unit (Common for all colors)	Dimensions		
		A	B	Thickness
LC-LFL-100	LFL-100	120	132	0.5
LC-LFL-180	LFL-180	176.8	213.8	
LC-LFL-200	LFL-200	222	234	

● Dimensions (mm)

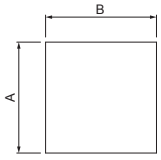


For the Coaxial Lights LFV3 / LFV-PF Series

Model name	Applicable Light Unit (Common for all colors)	Dimensions		
		A	B	Thickness
LC-LFV3-35	LFV3-35 / LFV-PF-35	34	42	0.5
LC-LFV3-50	LFV3-50 / LFV-PF-50	52	56	
LC-LFV3-50X100	LFV3-50X100	52	106	
LC-LFV3-70	LFV3-70 / LFV-PF-70	73	80	

Model name	Applicable Light Unit (Common for all colors)	Dimensions		
		A	B	Thickness
LC-LFV3-100	LFV3-100 / LFV-PF-100	100	106	0.5
LC-LFV3-130	LFV3-130	130	138	
LC-LFV3-200	LFV3-200	202	222	

● Dimensions (mm)



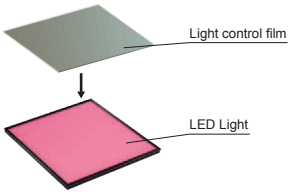
Example of usage

External imaging of a metal rod

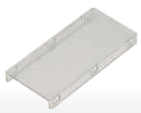
No light control film Using light control film

Example installation

Example: Attachment of the Flat Lights TH2/TH-PF Series



Caution	LC film is a consumable. Heat may cause deformation or discoloring depending on the use environment. Make sure that countermeasures against overheating are implemented and that the temperature does not exceed the operating limit.


Protective plate
CV Series


Adapter
AD Series


Lens attachment rings
MR Series


FA Series


JP-LDL2

Fixtures

Protective Plates

Protects the emitting part of the light unit.

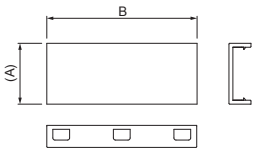
It is not intended to protect against dust or water.

CV Series

Model name	Applicable Light Unit (Common for all colors)	Dimensions A	Dimensions B
CV-LDL2-41X16	LDL2-41X16	23.2	46
CV-LDL2-80X16	LDL2-80X16		84.7
CV-LDL2-119X16	LDL2-119X16		123.7
CV-LDL2-158X16	LDL2-158X16		162.7
CV-LDL2-26X30	LDL2-26X30	37.2	30.7
CV-LDL2-50X30	LDL2-50X30		79
CV-LDL2-74X30	LDL2-74X30		79

Model name	Applicable Light Unit (Common for all colors)	Dimensions A	Dimensions B
CV-LDL2-98X30	LDL2-98X30	37.2	102.7
CV-LDL2-122X30	LDL2-122X30		126.7
CV-LDL2-146X30	LDL2-146X30		150.7
CV-LDL2-218X30	LDL2-218X30		222.7
CV-LDL2-266X30	LDL2-266X30		270.7

● Dimensions (mm)



Refer to the product page for the protective plate PR-LFXV dedicated for the flat dome light LFXV Series. (Product Page ▶ P.117)
Refer to the product page for the protective plate PR-LFV3 for the coaxial light LFV3 Series. (Product Page ▶ P.135)
Refer to the product page for the protective plate PR-LB for the diffused bar light LB Series. (Product page ▶ P.77)

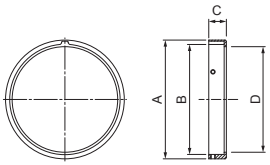
Adapters

Use when installing a diffusion plate or polarizing plate to the light unit.

AD Series

Model name	Applicable Light Unit (Common for all colors)	Dimensions A	Dimensions B	Dimensions C	Dimensions D
AD-LDR-32	LDR2-32	Ø36	Ø32.2	7	Ø28
AD-LDR-42	LDR2-42	Ø46	Ø42.2		Ø38
AD-LDR-50	LDR2-50	Ø54	Ø50.2	8	Ø48
AD-LDR-90	LDR2-90	Ø96	Ø90.2		Ø84
AD-LDR-120	LDR2-120	Ø126	Ø120		Ø114
AD-LDR-PF-36	LDR-PF-36	Ø42	Ø36.6		Ø30
AD-LDR-PF-54	LDR-PF-54	Ø60	Ø54.3		Ø50
AD-LDR-PF-75	LDR-PF-75	Ø81	Ø75.3		Ø71
AD-LDR-PF-75-LA	LDR-PF-75-LA	Ø75.3	Ø81	12	Ø69
AD-LDR-PF-100-LA	LDR-PF-100-LA	Ø100.3	Ø106		Ø94
AD-LDR-PF-150-LA	LDR-PF-150-LA	Ø142	Ø157		Ø142

● Dimensions (mm)



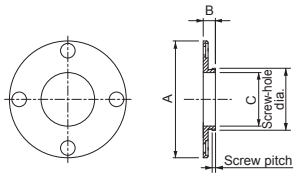
Lens Attachment Rings

You can directly install the light unit to the filter thread part of lens.
Suitable for environments with limited installation space.

MR Series

Model name	Applicable Light Unit (Common for all colors)	Notes Screw hole dia.	Notes Screw pitch	Dimensions A	Dimensions B	Dimensions C
MR-LDR-32-M25	Common for LDR2-32	M25.5	P0.5	Ø36	10	Ø12
MR-LDR-32-M27		M27				
MR-LDR-32-M30		M30.5				
MR-LDR-50-M25	Common for LDR2-50	M25.5		Ø48	5	Ø22
MR-LDR-50-M27		M27				Ø24
MR-LDR-50-M30		M30.5				Ø27

● Dimensions (mm)



Fixtures

A fixing jig suitable for workpiece tests and temporary settings.

FA Series

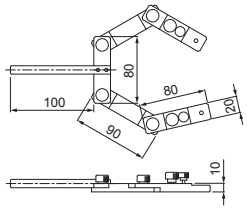
Model name	Notes
FA-10	Rod part Ø10 mm
FA-12	Rod part Ø12 mm

JP-LDL2 Series

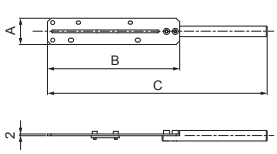
Model name	Notes	Dimensions A	Dimensions B	Dimensions C
JP-LDL2-LE70WT20	Rod part Ø12 mm	20	71	171
JP-LDL2-LE100WT30		30	101	201
JP-LDL2-LE150WT30		30	151	251

● Dimensions (mm)

FA-10/12



JP-LDL2



Caution	Be sure to read the User Manual included with the product before use and observe cautionary information.

Brackets

Refer to our website for product details.

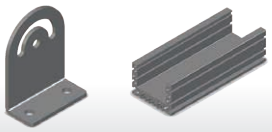
CCS brackets ▶ Search


For the Bar Lights
LDL2 / LDL-PF Series


For the Bar Lights
LDL2-33X8


For the Bar Lights
LDL2 Series


For the Flat Lights
TH2 Series


For the Bar Lights
HLDL3 Series

For the Bar Lights LDL2 / LDL-PF Series

The angle of illumination can be adjusted as you desire when securing the light unit.

L-model bracket

Model name	Applicable Light Unit (Common for all colors)
BK-LDL2	For the LDL2 Series
BK-LDL-PF	For the LDL-PF Series

Four-way mounting brackets

Model name	Applicable Light Unit (Common for all colors)
BK-LDQ2-33X8	For LDL2-33X8

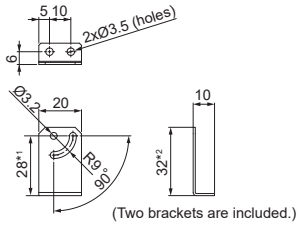
Four-way mounting brackets

Model name	Applicable Light Unit (Common for all colors, four-unit use)	Dimensions	
		A	B
BK-LDQ2-41X16	LDL2-41X16 Series	108	60
BK-LDQ2-80X16	LDL2-80X16 Series	148	100
BK-LDQ2-119X16	LDL2-119X16 Series	186	138
BK-LDQ2-158X16	LDL2-158X16 Series	225	177
BK-LDQ2-74X30	LDL2-74X30 Series	150	100
BK-LDQ2-98X30	LDL2-98X30 Series	174	124
BK-LDQ2-122X30	LDL2-122X30 Series	198	148
BK-LDQ2-146X30	LDL2-146X30 Series	222	172
BK-LDQ2-218X30	LDL2-218X30 Series	294	244
BK-LDQ2-266X30	LDL2-266X30 Series	342	292

Model name	Applicable Light Unit (Common for all colors, four-unit use)	Dimensions	
		A	B
BK-LDQ2-PF-52X18	LDL-PF-52X18 Series	126	70

● Dimensions (mm)

BK-LDL2 / BK-LDL-PF

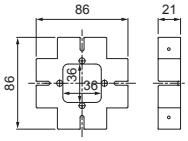


(Two brackets are included.)

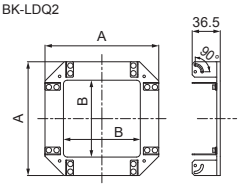
*1 For BK-LDL-PF: 32

*2 For BK-LDL-PF: 36

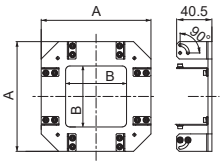
BK-LDQ2-33X8



BK-LDQ2



BK-LDQ2-PF-52X18



For the Bar Lights HLDL3 Series

The angle of illumination can be adjusted as you desire when securing the light unit.

Installation bracket

Model name	Applicable Light Unit (Common for all colors)
BK-HLDL3	HLDL3 Series

* For long lighting, provide support separately around the middle if required.
* This is not intended for use together with a mounting compatibility bracket (AD-HLDL3).

This bracket is used to install HLDL3 Series products (unit width: 44 mm) with the same method as HLDL2 Series products (unit width: 62 mm).

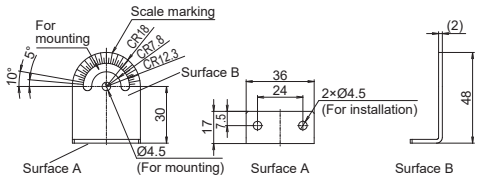
Compatible Mounting Bracket

Model name	Applicable Light Unit (Common for all colors)
AD-HLDL3	HLDL3 Series

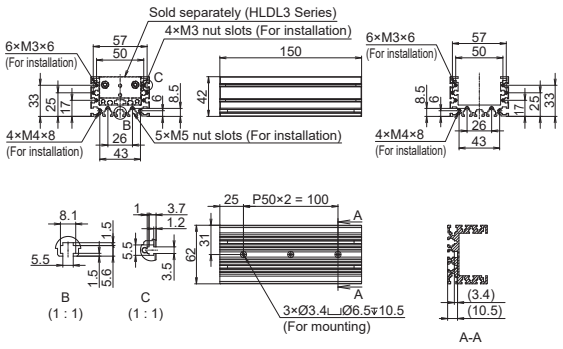
* The thickness is increased by 16 mm compared with a wide type HLDL2 Series light. If using a wide type secured from the back, the light emitting surface will therefore be closer than usual to the irradiated object.

● Dimensions (mm)

BK-HLDL3



AD-HLDL3



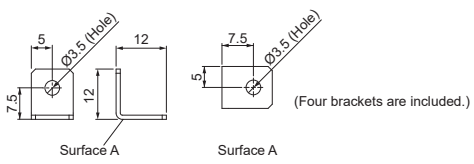
For the Flat Lights TH2 Series

This is a dedicated bracket for securing the TH2 Series light units. You can secure the light units at four points.

Model name	Applicable Light Unit (Common for all colors)
BK-TH-LE12	For the TH2 Series

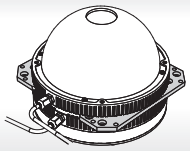
TH2: Excluding large type and hole type 300x300 mm size light emitting surfaces.

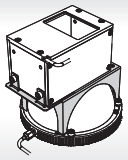
● Dimensions (mm)

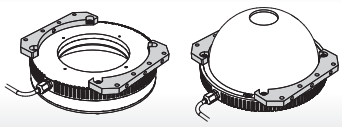


(Four brackets are included.)

Caution	Be sure to read the User Manual included with the product before use and observe cautionary information.


Light joint bracket


Coaxial Light joint bracket

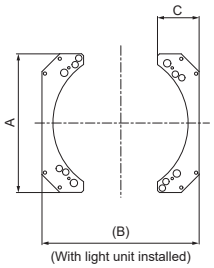

Expansion mounting bracket

Light Joint Brackets

You can combine dome and ring lights. Imaging can be performed by lighting switching or simultaneous lighting.

Model name	Applicable Light Unit 1 (Common for all colors)	Applicable Light Unit 2 (Common for all colors)	Dimensions			
			A	B	C	Thickness
BK-75-JO	HPD2-75 Series HPD-PF-75 Series	HPR2-75 Series HPR2-PF-75 Series LDR2-100-LA Series LDR-96-LA1 Series	84	91	35	4
BK-100-JO	HPD2-100 Series HPD-PF-100 Series	HPR2-100 Series HPR-PF-100 Series LDR2-132-LA Series LDR-146-LA1 Series	106	116	32	
BK-150-JO	HPD2-150 Series HPD-PF-150 Series	HPR2-150 Series HPR-PF-150 Series LDR2-170-LA Series LDR-176-LA1 Series	140	166	42	
BK-200-JO	HPD2-200 Series HPD-PF-200 Series	HPR2-200 Series HPR-PF-200 Series LDR2-208-LA Series LDR-206-LA1 Series	170	216	52	
BK-250-JO	HPD2-250 Series	HPR2-250 Series	210	266	56	

● Dimensions (mm)



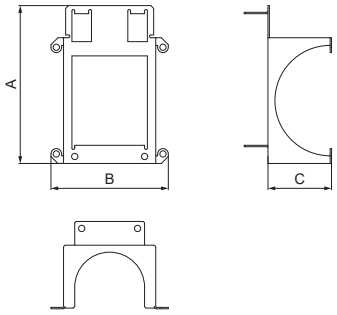
(With light unit installed)

Coaxial Light Joint Brackets

You can combine dome and coaxial lights. Uniform illumination can be provided from all directions.
Illumination irregularities are eliminated.

Model name	Applicable Light Unit 1 (Common for all colors)	Applicable Light Unit 2 (Common for all colors)	Dimensions		
			A	B	C
BK-HPD2-75-LFV	HPD2-75 Series HPD-PF-75 Series	LFV3-35 Series LFV-PF-35 Series	95	66	33
BK-HPD2-100-LFV	HPD2-100 Series HPD-PF-100 Series	LFV3-50 Series LFV-PF-50 Series	113	84	45.5
BK-HPD2-150-LFV	HPD2-150 Series HPD-PF-150 Series	LFV3-50 Series LFV-PF-50 Series	129.5	119	70.5
BK-HPD2-200-LFV	HPD2-200 Series	LFV3-70 Series	164	155	95.5
BK-HPD2-250-LFV	HPD2-250 Series	LFV3-70 Series	200	190	116.5

● Dimensions (mm)



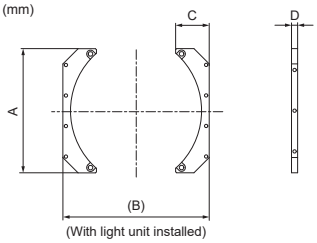
Expansion Mounting Brackets

These brackets are for expanding the mounting methods of light units. You can mount on horizontal as well as vertical surfaces.

Model name	Applicable Light Unit 1 (Common for all colors)	Dimensions			
		A	B	C	D
BK-50-CI	HPR2-50 Series	40	50	13	5
BK-75-CI	HPR2-75 Series HPR-PF-75 Series HPD2-75 Series HPD-PF-75 Series	70	91	22	6
BK-100-CI	HPR2-100 Series HPR-PF-100 Series HPD2-100 Series HPD-PF-100 Series	90	116	25	

Model name	Applicable Light Unit 1 (Common for all colors)	Dimensions			
		A	B	C	D
BK-150-CI	HPR2-150 Series HPR-PF-150 Series HPD2-150 Series HPD-PF-150 Series	122	166	33	6
BK-200-CI	HPR2-200 Series HPR-PF-200 Series HPD2-200 Series HPD-PF-200 Series	160	216	40	
BK-250-CI	HPD2-250 Series HPR2-250 Series	210	266	60	

● Dimensions (mm)



(With light unit installed)

● Example of the expansion mounting bracket in use


Ring Light: Image of usage with HPR2-200RD

● Example of the expansion mounting bracket in use


Dome Light: Image of usage with HPD2-250SW

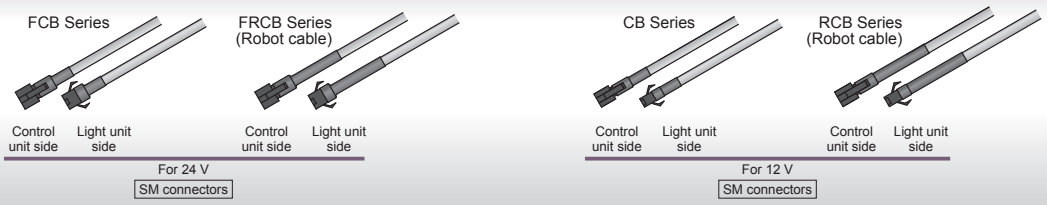
Caution	Be sure to read the User Manual included with the product before use and observe cautionary information.

Options

SM / EL Cables

Refer to our website for product details.

CCS cables ▶ Search



SM Connector Type

The cable permitted bending radii shown below are for reference only. Actual values may vary.

Straight Cables

This extension cable connects an LED light and control unit.

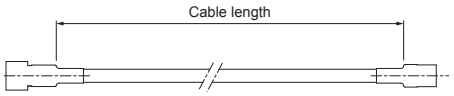
FCB Series (For 24 V / HLV)

Model name	Cable length	Notes
FCB-1	1 m	Used for 24 V input LED lights or the HLV Series Spot Lights, and 24 V output control units.
FCB-2	2 m	
FCB-3	3 m	
FCB-5	5 m	

CB Series (For 12 V)

Model name	Cable length	Notes
CB-1	1 m	Used for 12 V input LED lights and 12 V output control units.
CB-2	2 m	
CB-3	3 m	
CB-5	5 m	

● Dimensions (mm)



24 V / HLV Series cable permitted bending radius: 28.8 mm
12 V cable permitted bending radius: 27.6 mm

2-Branch Cables

* Not compatible with HLV Series.

This 2-branch cable connects two LED lights and a control unit.

FCB-W Series (For 24 V)

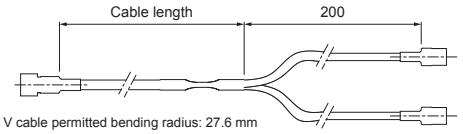
Model name	Cable length	Notes
FCB-W-1	1 m	Used for 24 V input LED lights and 24 V output control units.
FCB-W-2	2 m	
FCB-W-3	3 m	
FCB-W-5	5 m	

CB-W Series (For 12 V)

Model name	Cable length	Notes
CB-W-1	1 m	Used for 12 V input LED lights and 12 V output control units.
CB-W-2	2 m	
CB-W-3	3 m	
CB-W-5	5 m	

Total power consumption of the connected light units must not exceed the output of the control unit.
CCS recommends using a multi-channel control unit if you wish to set intensity separately for each light unit.

● Dimensions (mm)



24 V cable permitted bending radius: 27.6 mm
12 V cable permitted bending radius: 27.6 mm

4-Branch Cables

* Not compatible with HLV Series.

This 4-branch cable connects four LED lights and a control unit.

FCB-F Series (For 24 V)

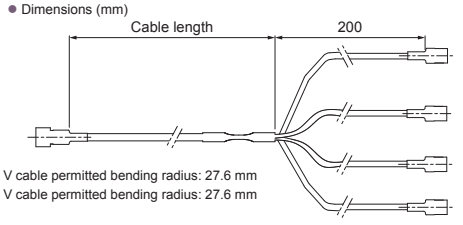
Model name	Cable length	Notes
FCB-F-1	1 m	Used for 24 V input LED Lights and 24 V output control units.
FCB-F-2	2 m	
FCB-F-3	3 m	
FCB-F-5	5 m	

CB-F Series (For 12 V)

Model name	Cable length	Notes
CB-F-1	1 m	Used for 12 V input LED Lights and 12 V output control units.
CB-F-2	2 m	
CB-F-3	3 m	
CB-F-5	5 m	

Total power consumption of the connected light units must not exceed the output of the control unit.
CCS recommends using a multi-channel control unit if you wish to set intensity separately for each light unit.

● Dimensions (mm)



24 V cable permitted bending radius: 27.6 mm
12 V cable permitted bending radius: 27.6 mm

Robot Cables

These robot cables have excellent flexibility and durability.

FRCB Series (For 24 V / HLV)

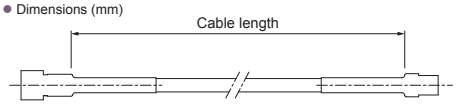
Model name	Cable length	Notes
FRCB-1	1 m	Used for 24 V input LED Lights or the HLV Series Spot Lights, and 24 V output control units.
FRCB-2	2 m	
FRCB-3	3 m	
FRCB-5	5 m	

RCB Series (For 12 V)

Model name	Cable length	Notes
RCB-1	1 m	Used for 12 V input LED Lights and 12 V output control units.
RCB-2	2 m	
RCB-3	3 m	
RCB-5	5 m	

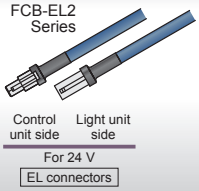
If using robot cables, affix the cable section on the light unit side (including the connector section).

● Dimensions (mm)



24 V / HLV Series cable permitted bending radius: 29.4 mm
12 V cable permitted bending radius: 27.6 mm

Caution	The light intensity might be unstable if you join cables.



EL Connector Type

The cable permitted bending radii shown below are for reference only. Actual values may vary.

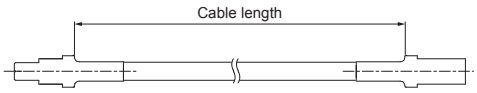
Straight Cables

This extension cable connects an LED light and control unit.

FCB-EL2 Series (For 24 V)

Model name	Cable length	Notes
FCB-1-EL2	1 m	Use for LED lights and control units that have an EL connector.
FCB-2-EL2	2 m	
FCB-3-EL2	3 m	
FCB-5-EL2	5 m	
FCB-10-EL2	10 m	
FCB-15-EL2	15 m	

• Dimensions (mm)



Cable permitted bending radius: 29.6 mm

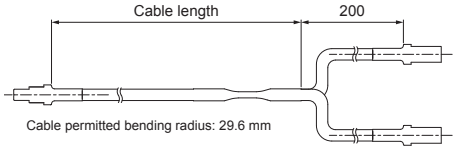
2-Branch Cables

This 2-branch cable connects two LED lights and a control unit.

FCB-W-EL2 Series (For 24 V)

Model name	Cable length	Notes
FCB-W-1-EL2	1 m	Use for LED lights and control units that have an EL connector.
FCB-W-2-EL2	2 m	
FCB-W-3-EL2	3 m	
FCB-W-5-EL2	5 m	
FCB-W-10-EL2	10 m	
FCB-W-15-EL2	15 m	

• Dimensions (mm)



Cable permitted bending radius: 29.6 mm

Guide to Custom Cable Manufacturing

Cables can be custom ordered in accordance with customer requests. Inquiries are welcomed.

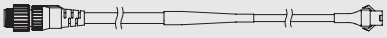
(n = Cable length)

• Conversion Cable

Example: FCB-n-M12-OC

Power Supply Side — Lighting Side

4-pin M12 socket connector — SM Connector

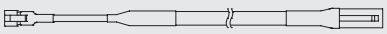


Example: FCB-n-EL2SM3

(Reverse connector specifications type: FCB-n-EL2-SM3-OC)

Power Supply Side — Lighting Side

SM Connector — EL connector



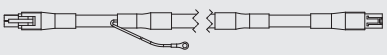
• Cable with Ground Terminal

Example: FCB-n-PF-2.0SQ-SH

(Power Flash Light PF Series Dedicated Cable)

Power Supply Side — Lighting Side

EL connector — EL connector

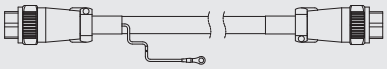


Example: FRCB-n-2SQ-SH-ME7

(Line Sensor Light Dedicated Cable)

Power Supply Side — Lighting Side

Metal connector — Metal connector



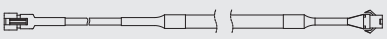
• Voltage Drop Countermeasure Cable

Example: FRCB-n-1.25SQ

(Robot Cable 1.25sq)

Power Supply Side — Lighting Side

SM Connector — SM Connector

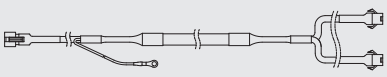


Example: FRCB-W-n-1.25SQ-SH

(2-Branch Robot Cable 1.25sq with Ground Terminal)

Power Supply Side — Lighting Side

SM Connector — SM Connector



As the length of the cable gets longer, the brightness decreases due to voltage drops, potentially causing the dimmer to become unstable.
In such cases, a wire with a thicker core is needed to reduce the effect of voltage drops.
If you are having issues, we are happy to consult on a solution to suit your usage conditions.

Caution	The light intensity might be unstable if you join cables.

Introduction to CCS Custom Ordered Products

Presenting examples of custom ordered light units manufactured by CCS in the past.
We can manufacture a wide variety of light units to meet your needs.

High-Power Dome Light Units for Line Scan Sensors (Tunnel Dome Light Units)

HLDN Series

HLDN-300SW-TN55AREL

Achieves higher output through the use of compressed air cooling. The light emitting section is configured with white SMD LEDs in a high-density layout.

Manufactured Products

- HLDN-200SW
- HLDN-300SW
- HLDN-500SW
- HLDN-600SW
- HLDN-700SW
- HLDN-800SW

LDFTP Series

LDFTP300X50SWACLMSL4

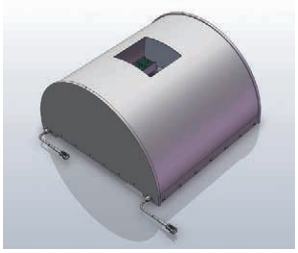
Using two flat lights provided with high output and high uniformity to illuminate the workpiece at the optimum angle from both lateral sides.

Delivers a long, stable dome effect and uniform diffused light irradiation with high output.

Custom Ordered Product Page ▶ P.240

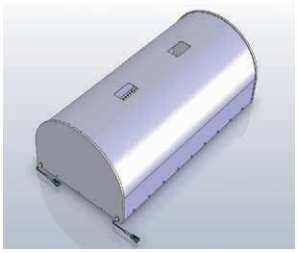
High-Power Dome Light Units for Area Scan Sensors (Tunnel Dome Light Units)

HLDN Series



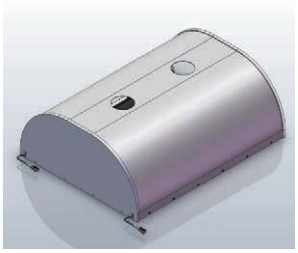
HLDN-300RD

Designed with a square opening for the camera.
The light emitting section is configured with red bar lights.



HLDN-500SW

Designed with two square openings for the cameras.
The light emitting section is configured with white SMD LEDs in a high-density layout.



HLDN-516X408SW

Designed with two round openings for the cameras.
The light emitting section is configured with white COB LEDs in a high-density layout.

Manufactured Products

- HLDN-400RD
- HLDN-600SW
- HLDN-500X400SW

Optimized design for multiple fields of view suited to area scan sensor arrays. Ensures uniform diffused light using the dome effect.

Custom Ordered Product Page ▶ P.240

Multi-Wavelength Split Emission Light Units

DV Series

HPR2-150FC-DV04

The four segments can be individually controlled. Delivers high-output diffused light irradiation with full-color (RGB) light emissions.

HPR2 Custom Ordered Base Light Unit Page ▶ P.47

Manufactured Products

4-Segment Types

- HPR2-50SW-DV04
- HPR2-50FC-DV04 (full color type)
- HPR2-75SW-DV04
- HPR2-150SW-DV04

8-Segment Types

- HPR2-100SW-DV08
- HPR2-150SW-DV08
- HPR2-100RDBL-DV08 (Mixed two-color type)

12-Segment Types

- LDR2-120SW2-DV12

16-Segment Types

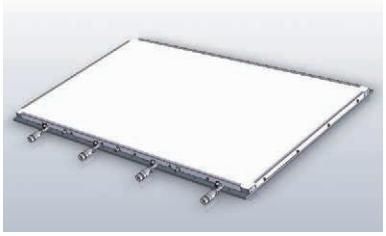
- LDR2-88RD2-DV16

LDR2 Custom Ordered Base Light Unit Page ▶ P.31

Efficiently designed to set the light emission area and switch the light emission color.
Delivers advanced light unit control in combination with a control unit.

Large Flat Light Units

LDF-TP Series



LDF-TP-1100X600SW

Achieves higher output through the use of compressed air cooling.
The light emitting section is configured with white SMD LEDs in a high-density layout.

Manufactured Products

- LDF-TP-1100X600SW
- LDF-TP-2000X1500SW

Ensures uniformity in the effective range with high output. Implements optimal measures for heat dissipation.

TH2 Standard Flat Light Unit Page ▶ P.85

Coaxial Light Units (Changeable Irradiation Port Type)

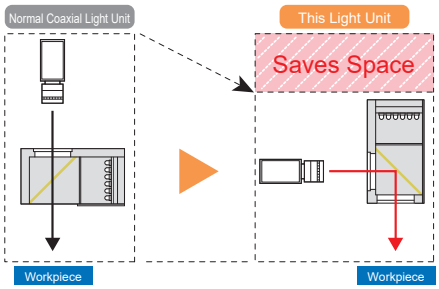
LFV3-RA Series

LFV3-35SW-RA24

Changes the position of the irradiation port of the normal coaxial light unit by 90°.
Optimized products for use in test subject conveyance systems and environments with constrained camera installation conditions.

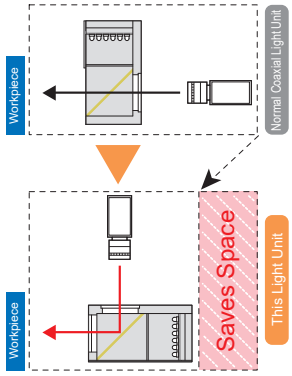
Note: Captured images will be mirrored.

1. Reduces vertical installation space.



When compared to a normal coaxial light unit, this light unit helps reduce vertical installation space.

2. Reduces horizontal installation space.



When compared to a normal coaxial light unit, this light unit helps reduce horizontal installation space.

LFV3 Custom Ordered Base Light Unit Page ▶ P.127

CCS offers optimal light unit designs for the installation conditions of cameras and light units.

Introduction to CCS Custom Ordered Products

Presenting examples of custom ordered light units manufactured by CCS in the past.
We can manufacture a wide variety of light units to meet your needs.

Infrared Light Units (1,200 nm / 1,450 nm / 1,550 nm)

IR Series

Bar type

Uses 1,200, 1,450, and 1,550 nm LEDs.

LDL2 Custom Ordered Base Light Unit Page ▶ P.61

Dome type

Uses 1,200 nm and 1,450 nm LEDs.

HPD2 Custom Ordered Base Light Unit Page ▶ P.105

CCS offers light units that feature optimal wavelength regions to fully utilize the capabilities of InGaAs cameras.

Manufactured Products

Bar Light Units

- LDL-74X27IR1200
- LDL-74X27IR1450
- LDL-74X27IR1550

Dome Light Units

- HPD-100IR1450
- HPD-150IR1450
- HPD-400IR1450

Full Color (RGB) Light Units

HPR2 Standard Full Color Light Units Product Page ▶ P.47

HPD2 Standard Full Color Light Units Product Page ▶ P.105

FC Series

LDL2-146X30FC-WD

Bar light unit with a light emission width of 30 mm. Wide and narrow types can be selected for the directional characteristics of the LEDs.

LDL2 Custom Ordered Base Light Unit Page ▶ P.61

LFV3-50FC

Full color coaxial light unit.

LFV3 Custom Ordered Base Light Unit Page ▶ P.127

TH2-100X100FC

Full color flat light unit.

TH2 Custom Ordered Base Light Unit Page ▶ P.85

Single light units that control red, blue, and green to deliver the desired color of irradiated light.

Manufactured Products

Low-Angle Square Light Units

- FPQ3-48FC
- FPQ3-75FC

FPQ3 Custom Ordered Base Light Unit Page ▶ P.57

Coaxial Light Units

- LFV3-CP-18FC
- LFV3-34FC(A)
- LFV3-35FC(A)
- LFV3-50FC(A)
- LFV3-70FC(A)
- LFV3-100FC(A)
- LFV3-130FC(A)
- LFV3-200FC(A)
- LFV3-50X100FC(A)

Special Wavelength Light Units (Yellow Light Units / Orange Light Units)

OR Series

LDR2-74-OR-LA

Low-angle ring light unit that uses LEDs with a peak emission wavelength of 590 nm.

LDR2-LA Custom Ordered Base Light Unit Page ▶ P.35

MLDL-325X70OR

Bar light unit in a IP67-rated waterproof specification.

TH2-100X100OR

Yellow flat light unit.

TH2 Custom Ordered Base Light Unit Page ▶ P.85

CCS also offers optimized products that use LEDs of specific wavelengths for special test applications.

Manufactured Products

Ring Light Units

- LDR2-70-OR

LDR2 Custom Ordered Base Light Unit Page ▶ P.31

Bar Light Units

- LDL2-74X30-OR

LDL2 Custom Ordered Base Light Unit Page ▶ P.61

Spot Lights

- HLV2-22-OR590-3W

Line Lights

- LNSP-1000-OR

12-V Light Units

Ring Lights
LDR2 Series

LDR2 Custom Ordered Base Light Unit Page ▶ P.31

Low-Angle Ring Lights
LDR2-LA Series

LDR2-LA Custom Ordered Base Light Unit Page ▶ P.35

Diffused Ring Lights
HPR2 Series

HPR2 Custom Ordered Base Light Unit Page ▶ P.47

Low-Angle Square Lights
FPQ3 Series

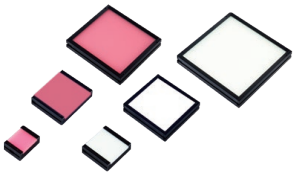
FPQ3 Custom Ordered Base Light Unit Page ▶ P.57

Bar Lights
LDL2 Series

LDL2 Custom Ordered Base Light Unit Page ▶ P.61

Flat Lights
TH2 Series

TH2 Custom Ordered Base Light Unit Page ▶ P.85



Coaxial Lights
LFV3 Series

LFV3 Custom Ordered Base Light Unit Page ▶ P.127

Lineup

Series Name	Model Name	LED Color	Power Consumption
LDR2 (8 models)	LDR2-32RD2-12V	Red	1.6 W
	LDR2-32SW2-12V	White	1.9 W
	LDR2-42RD2-12V	Red	2.1 W
	LDR2-42SW2-12V	White	2.7 W
	LDR2-50RD2-12V	Red	3.8 W
	LDR2-50SW2-12V	White	3.8 W
	LDR2-70RD2-12V	Red	6.1 W
	LDR2-70SW2-12V	White	7.6 W
LDR2-LA (6 models)	LDR2-74RD2-LA-12V	Red	4.6 W
	LDR2-74SW2-LA-12V	White	5.7 W
	LDR2-100RD2-LA-12V	Red	9.1 W
	LDR2-100SW2-LA-12V	White	12 W
	LDR2-132RD2-LA-12V	Red	13 W
	LDR2-132SW2-LA-12V	White	16 W
HPR2 (4 models)	HPR2-100RD-12V	Red	20 W
	HPR2-100SW-12V	White	23 W
	HPR2-150RD-12V	Red	28 W
	HPR2-150SW-12V	White	27 W
FPQ3 (3 models)	FPQ3-32RD-12V	Red	3.8 W
	FPQ3-32SW-12V	White	7.1 W
	FPQ3-48RD-12V	Red	5.1 W
LDL2 (14 models)	LDL2-33X8RD-12V	Red	1.0 W
	LDL2-33X8SW2-12V	White	2.6 W
	LDL2-41X16RD-12V	Red	1.9 W
	LDL2-41X16SW2-12V	White	3.8 W
	LDL2-41X16RD-WD-12V	Red	1.9 W
	LDL2-41X16SW2-WD-12V	White	3.8 W

Series Name	Model Name	LED Color	Power Consumption
LDL2 (14 models)	LDL2-74X30RD-12V	Red	5.7 W
	LDL2-74X30SW2-12V	White	12 W
	LDL2-74X30RD-WD-12V	Red	5.7 W
	LDL2-74X30SW2-WD-12V	White	12 W
	LDL2-119X16RD-12V	Red	5.7 W
	LDL2-119X16SW2-12V	White	12 W
	LDL2-119X16RD-WD-12V	Red	5.7 W
	LDL2-119X16SW2-WD12V	White	12 W
TH2 (6 models)	TH2-27X27SW-12V	White	2.9 W
	TH2-43X35SW-12V	White	4.8 W
	TH2-51X51SW-12V	White	8.2 W
	TH2-63X60SW-12V	White	9.7 W
	TH2-83X75SW-12V	White	16 W
	TH2-100X100SW-12V	White	25 W
LFV3 (6 models)	LFV3-CP-18RD-12V	Red	3.3 W
	LFV3-CP-18SW-12V	White	3.6 W
	LFV3-35RD-12V(A)	Red	4.1 W
	LFV3-35SW-12V(A)	White	3.7 W
	LFV3-50RD-12V(A)	Red	9.1 W
	LFV3-50SW-12V(A)	White	11 W

External dimensions, weight, and options (diffusion plates and polarizing plates) are the same as 24-V light units.
Use 12-V extension cables (CB and RCB Series).

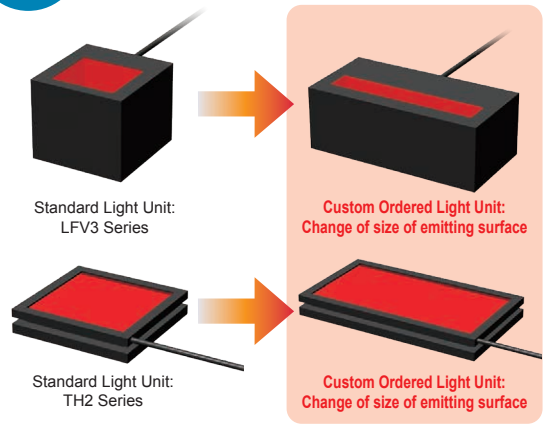
CCS offers light units optimized for various usage environments.

Recommended Custom Ordered Products

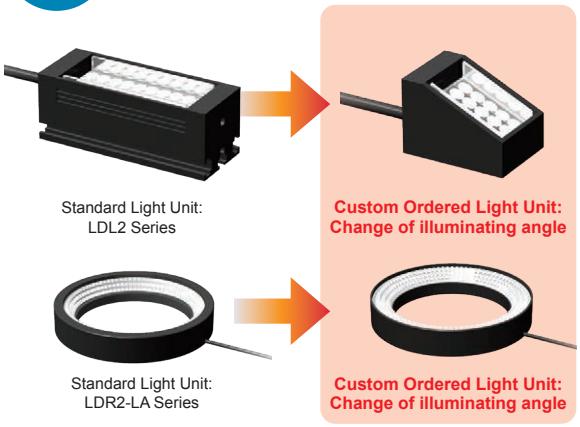
Size Change | Change to Illuminating Angle | Shape Change | Increased Brightness

Please feel free to consult with us about anything else.

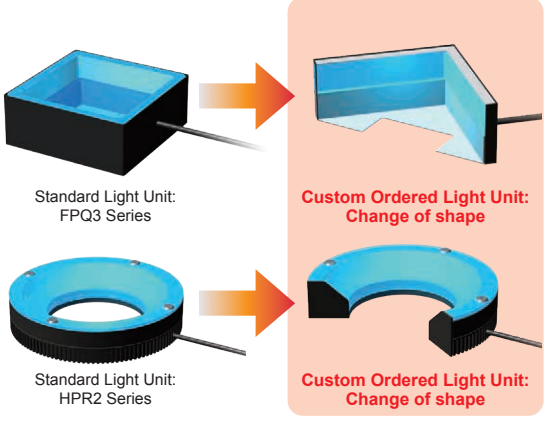
CASE.1 With a standard product, there are no light units with a length or thickness that is suitable for the workpiece or device



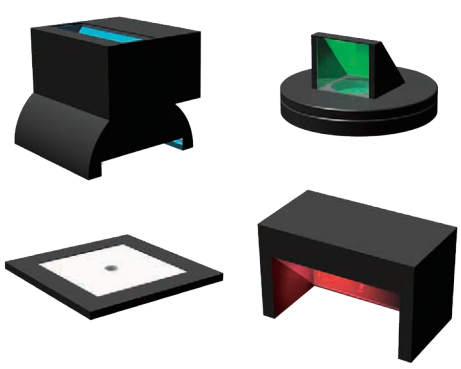
CASE.2 When the size is good but you want to illuminate the workpiece at a different angle



CASE.3 With a standard product, light is irradiated up to the unnecessary part and contrast drops



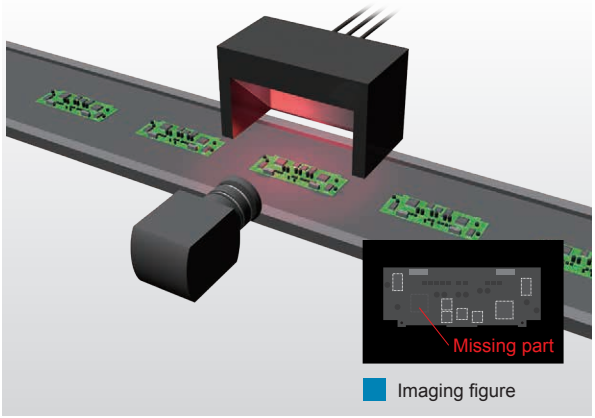
CASE.4 Examples of other custom ordered items



We Suggest Light Units That Are Optimal for Your Inspection Procedures and Environment

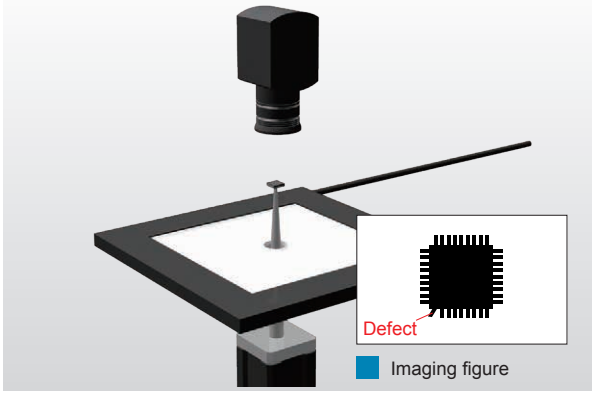
Light Units for External Inspection of Electronic Parts on Circuit Boards

The light unit design is optimized to match your desired camera position or split imaging. Changing the position of the irradiation port of coaxial lights and distributed control of the emitting surface are achieved.



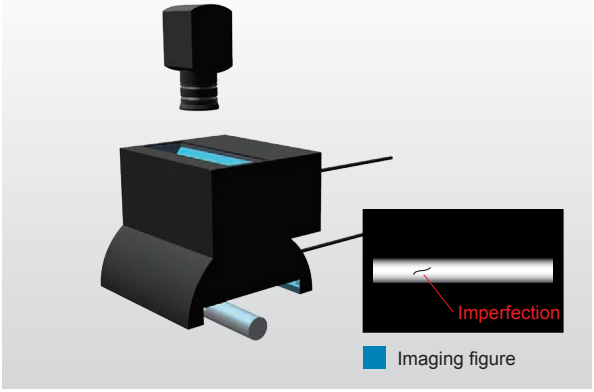
Light Units for External Inspection of Minute Electronic Parts

Creating a hole in the center of a flat light provides a passage for the operating section of a suction nozzle. This can be used for external inspection of electronic parts held by suction at the tip.



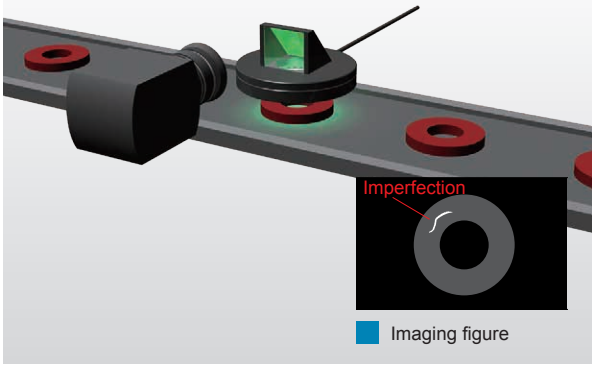
Light Units for Damage Inspection of Metal Rods

You can combine coaxial and dome lights to create an appropriate configuration for imaging using line sensor cameras. They can be used for damage inspection of metal rods with glossy surfaces.



Light Units for External Inspection of Metal Parts

Light unit design is optimized to match your camera installation requirements.
Allows for the combining of a mirror with a low-angle ring light.



Examples of Items That Can Be Custom Ordered

Light Unit

- Size
- Width and thickness
- Brightness
- Illuminating mechanism
- Wavelength and color temperature
- Mounting position and securing method
- Cable length
- Connector format

Other products

- Changes in specifications of control unit
- Changes in cable specifications
- Optional products can also be custom ordered.

Please feel free to inquire about anything else that is not mentioned above.

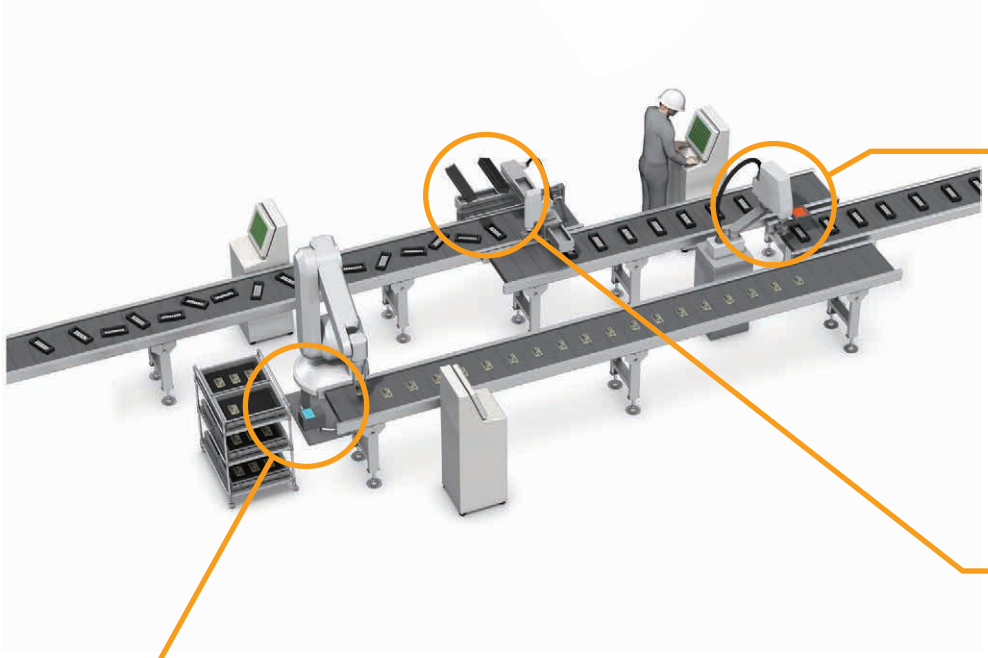
Flow of Custom Orders

Inquiry ▶ Specifications study (Verification of required specifications; Verification of product realization; Proposal of approximate costs) ▶ Design procedures (Specifications fixed; Drawing creation) ▶ Proposal of specifications and costs (Dimensions; Specifications; Estimate) ▶ Order ▶ Production, inspection and shipping (Production procedures; Inspection performed; Shipping procedures) ▶ Delivery

LED lights suitable for robot vision systems

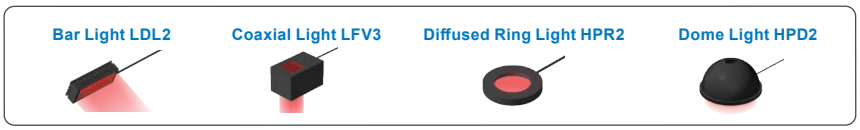
Conceptual image

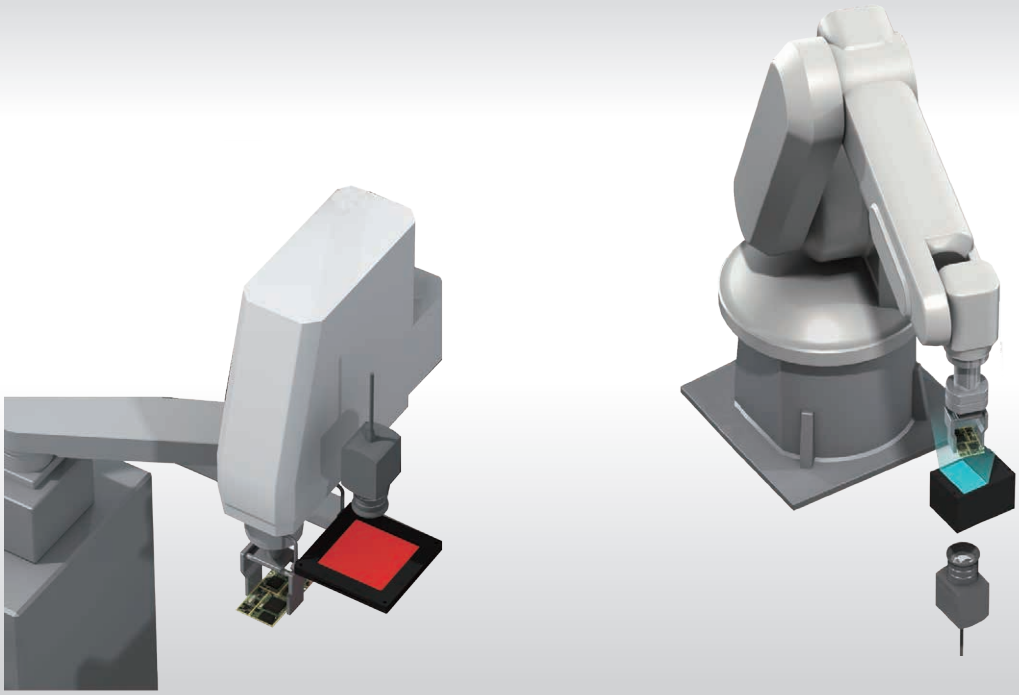
CCS Light Units for Robot Vision Can Be Used in a Variety of Situations.

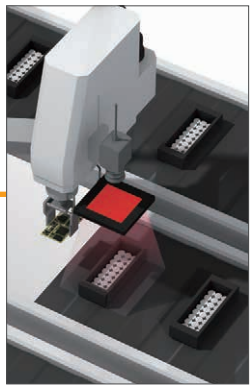


Line-Mounted Light Units

Light units optimized to the type of inspection are indispensable for line-mounted cameras used to inspect the appearance of picked up workpieces.
We offer optimum light units based on our knowledge of lighting cultivated in visual inspections.

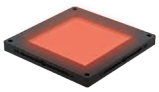






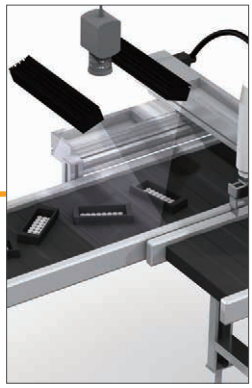
Hand-Eye Light Units

Compact, light-weight light units that will not interfere with operation are available for hand-eye systems with built-in cameras on robot hands.



Flat Dome Light LFX3
13 mm thick light units with a dome-light effect at short distances and a coaxial-light effect at long distances from workpieces. Works well for imaging glossy workpieces.

Diffused Ring Light HPR2
General-purpose ring lights that achieve brightness and ease-of-use. Easy-to-use diffused light units for a variety of applications, from front/back determination and reading symbols to visual inspections.



Top-Mounted Light Units

We offer light units for top-mounted cameras frequently used with pick-and-place machines that can brightly illuminate the picking area, even when mounted at the same height as the camera.

Large Bar Light HLDL3
Bar lights that can brightly illuminate a wide area at a distance.
Suitable for lines where the operating range of robots is wide and for high-speed lines.

Long-Distance Light LDLB
High-intensity, long-distance light units that can illuminate workpieces at 2 m.
Dust-proof IP67 models also available.

Optimized Solutions with Custom Light Units

- Designs for screw fall prevention
- Use robot cables with superior flexibility and durability
- We can custom build light units for your needs.
  (Emitting surface size, emission wavelength, brightness, illuminating mechanism, cable length, connector shape, mounting method, and other specifications.)

HPR2-75SW-QPRCB3

- Measures implemented to prevent screws from falling
- Threaded cover
- Robot cable 3 m

HPR2-75SW-QPLMRCB3

- Measures implemented to prevent screws from falling
- Threaded cover
- Robot cable 3 m

Custom Ordered Light Units

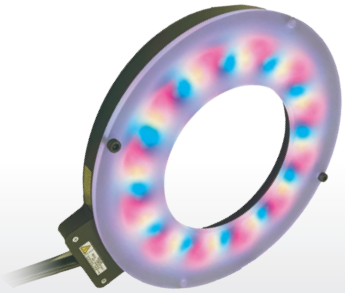
We can manufacture custom light units to meet your needs. We can also offer optimum light units from examples of custom ordered light units we have manufactured in the past. Contact your CCS sales representative for more information.

Contact your CCS sales representative for product specifications and other detailed information.

Imaging solution with 8 types of wavelength

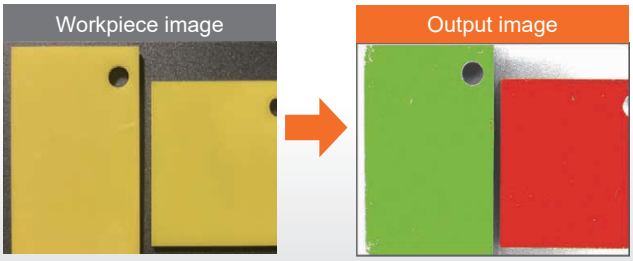
Built to order

This is a made-to-order product. For queries and details, contact your CCS sales representative.



HPR2150VL405IR94STSP
(visible light)

Imaging picture (resin color plate)

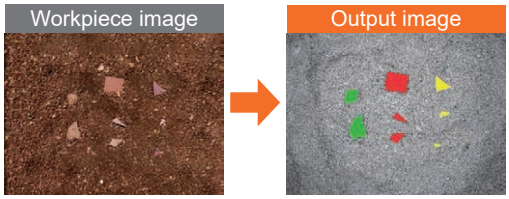


Inspections that are usually difficult such as foreign substance detection and color sorting are possible.

▶ Features

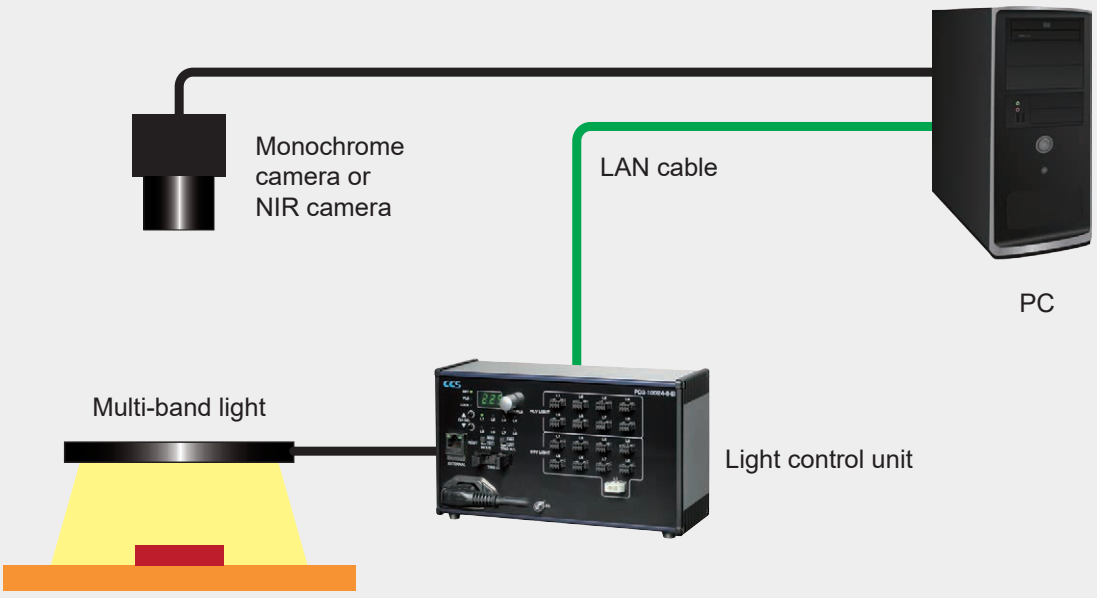
- The use of different wavelengths enables the identification of objects that are difficult to be identified with a single wavelength.
- By using sequential LED light with different wavelengths for imaging, it is possible to acquire an image for each wavelength.
- Classification is possible by acquiring multiple images with different illumination wavelengths and performing image processing based on the difference in features.

Imaging picture (inspection of contaminants in coffee)

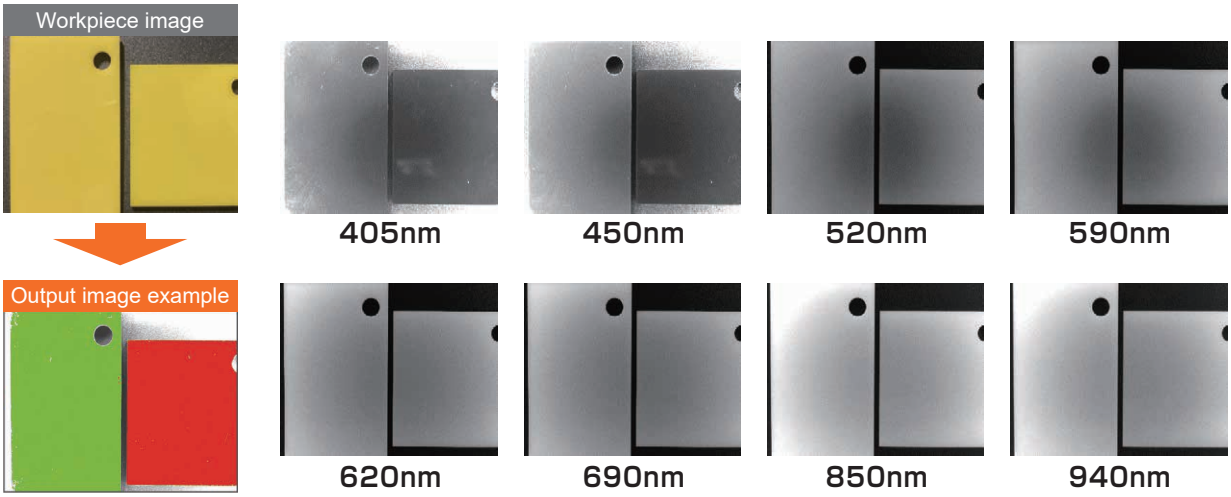


[Red] Paper [Green] Cookie [Yellow] Film

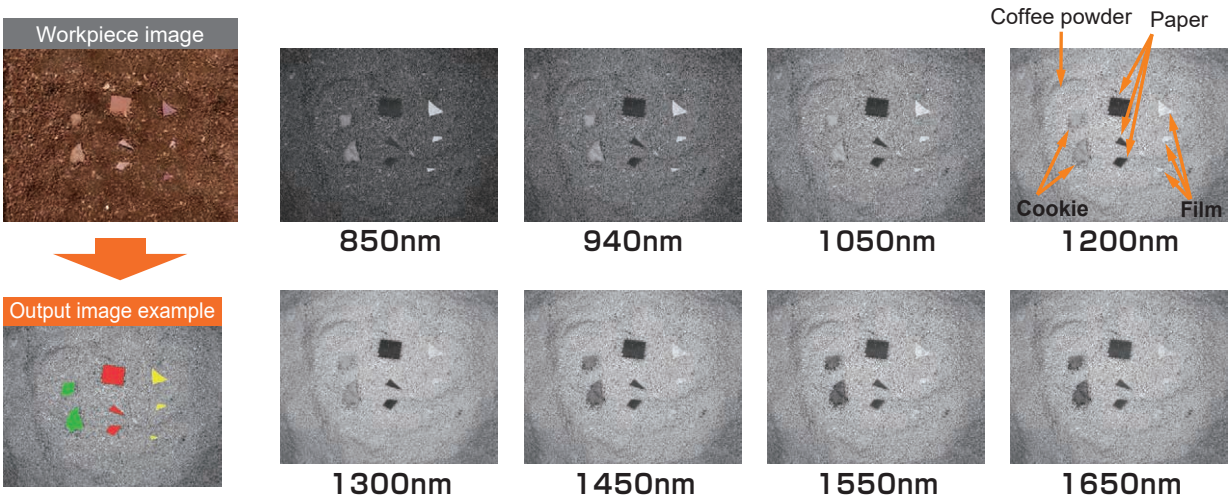
▶ System Configuration Example



▶ Imaging Example: Visible Light for Resin Color Plate

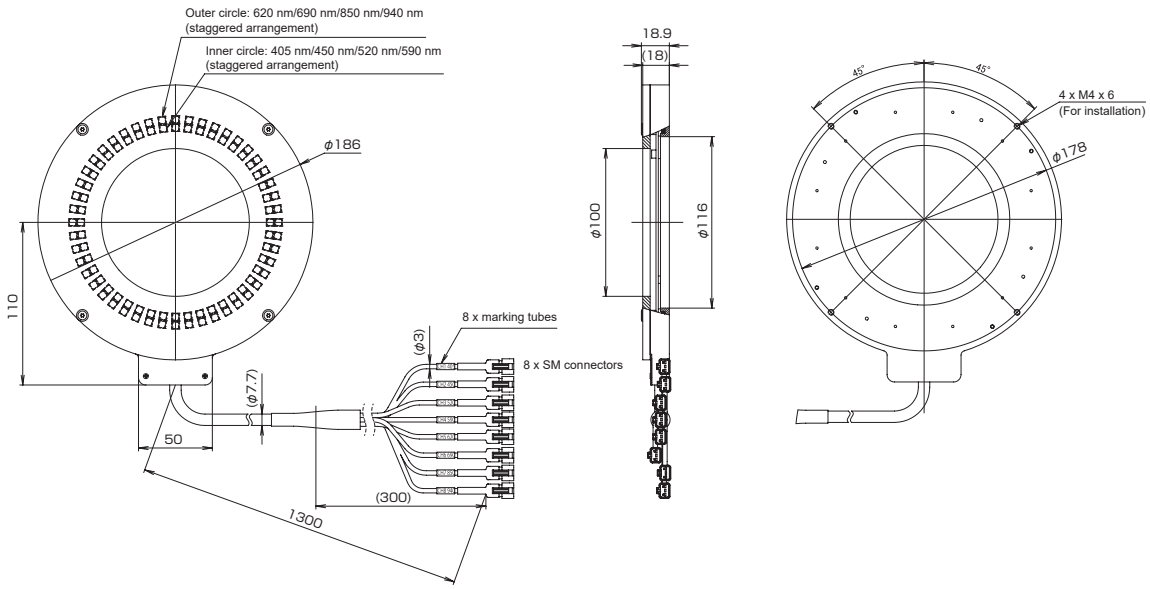


▶ Imaging Example: Visible Light for Contaminants in Coffee Powder (Cookie, Paper, Film)



▶ Dimensions (mm)

HPR2150VL405IR94STSP



Classify subtle color differences with hyperspectral imaging light

LDL-222X42CIR-LACL

EFFI-FLEX-HSI*

*EFFILUX LED light

TH-200X30CIR

EFFI-RING-HSI*

EFFI-FLEX-HSI Cylindrical*

▶ Features

CIR Series

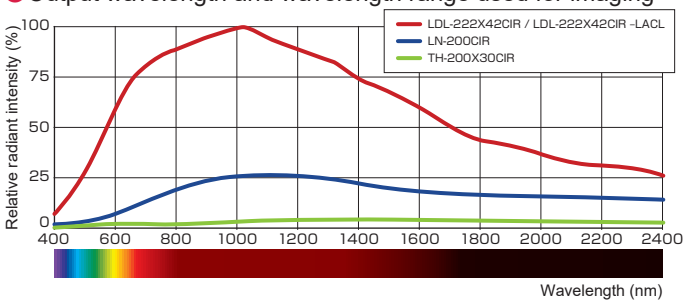
- Wavelength characteristics from visible light to near infrared (around 2,500 nm)
- The special halogen lamp achieves long life*
- Shape and size of the lighting can be customized according to the applications

TH-200X30CIR

LDL-222X42CIR-LACL

*Refer to P.181 for product details.

Output wavelength and wavelength range used for imaging



EFFILUX LED Light

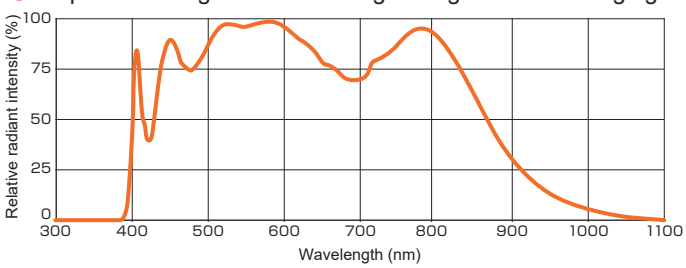
- Entire visible wavelength (400 to 900 nm)
- Illumination ranges can be adjusted by positioning the condenser lens inside the light.
- IP67 type and cylindrical lens type are also available

EFFI-FLEX-HSI

EFFI-RING-HSI

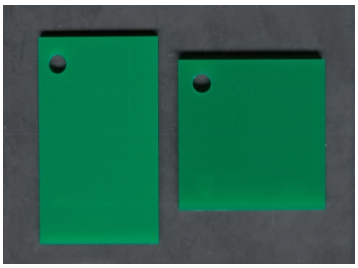
EFFI-FLEX-HSI Cylindrical

Output wavelength and wavelength range used for imaging

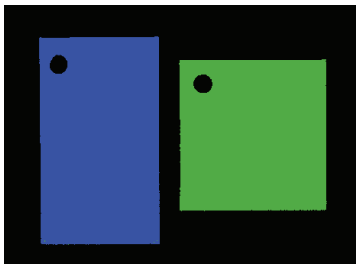


▶ Imaging Example: Color Identification of Plastic

Imaging with a color camera

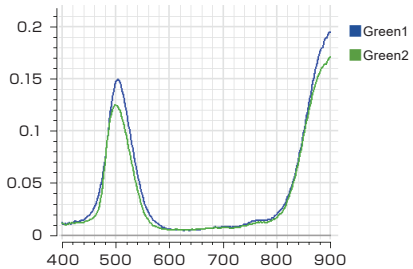


Output image



Imaging with a hyperspectral camera (400 to 900 nm)

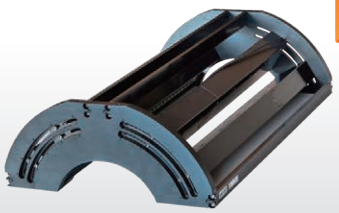
Reflection spectrum of each color



Highlight wrinkles and uneven surfaces in a single stage by imaging light effects from 4 directions and removing patterns on the workpiece

Built to order

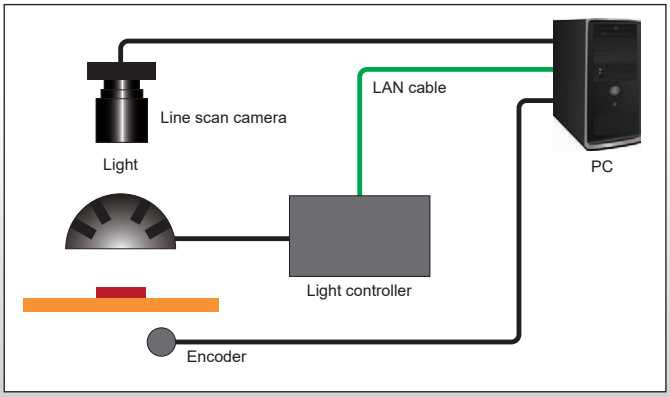
This is a made-to-order product. For queries and details, contact your CCS sales representative.



Angled lighting from 4 directions

*Size of the lighting can be customized according to the applications

System Configuration Example



▶ Imaging Example

Inspection of wrinkles and folds in printed paper

Workpiece image

Top Left Light ON / Top Right Light ON

Imaged by illumination from 4 directions

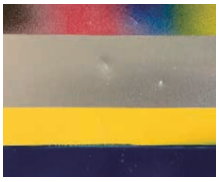
Bottom Left Light ON / Bottom Right Light ON

Image after processing

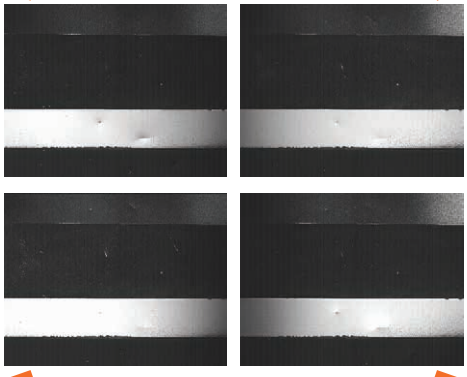
Capable of canceling prints and acquiring images that emphasize wrinkles and uneven surfaces.

Inspection of blowholes and dents in metal plates

Workpiece image



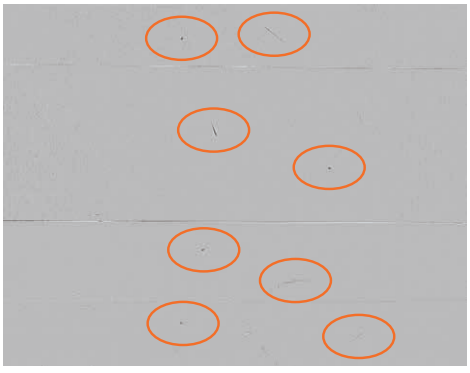
Top Left Light ON / Top Right Light ON



Imaged by illumination from 4 directions

Bottom Left Light ON / Bottom Right Light ON

Image after processing

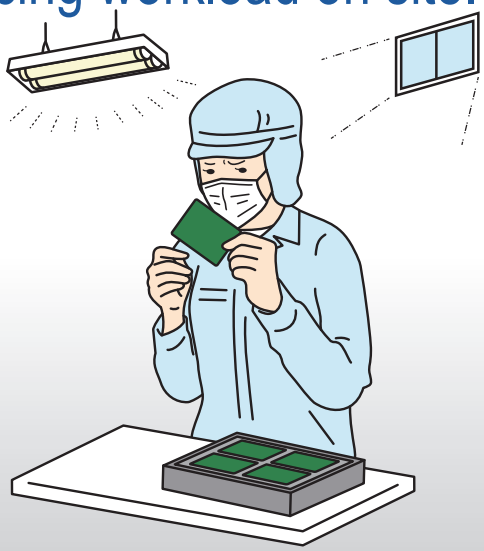


Capable of canceling surface patterns and acquiring images that emphasize blowholes and dents.

Improves accuracy and efficiency for visual inspection. Increases productivity by reducing workload on site.

Imaging with a camera

Checking from the monitor display

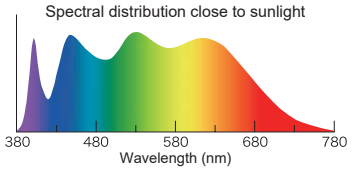


▶ Equipment and expertise for visual inspection

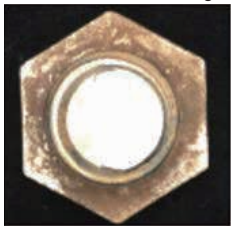
● Selection of suitable lights based on the inspection

Wide lighting selection of over 1,600 models are available. Additionally, natural light LED lights are available for more accurate color reproduction than general white LEDs.

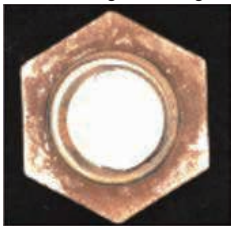
Natural Light LED Light



■ General White LED Light



■ Natural Light LED Light



● Selection of suitable imaging equipment based on the inspection

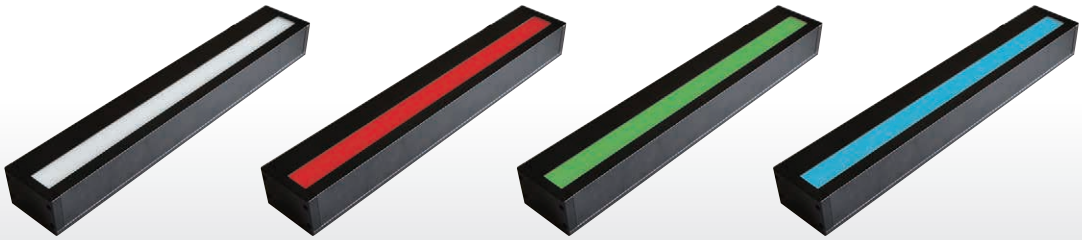
Testing equipment set
► P.368

Camera

Lens

Visualizes hard-to-see unevenness in coatings, thin films, and lamination gaps by using lights with a special optical system

Built to order
This is a made-to-order product. For queries and details, contact your CCS sales representative.



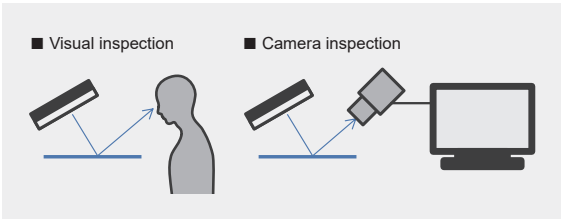
White type　Red type　Green type　Blue type

*Shapes and sizes such as line type and surface type can be customized according to customer's request.
*Specifications and appearance are subject to change.

▶ Features of Lights for Fringe Interference Inspection

- Suitable for inspections of distortion and unevenness of thin film materials.
- White type and single-color types in red, blue, and green are available.
- Compatible with both camera and visual inspections.
- An improvement from three-wavelength fluorescent lamps and sodium vapor lamps.

▶ Example of Lighting Installation



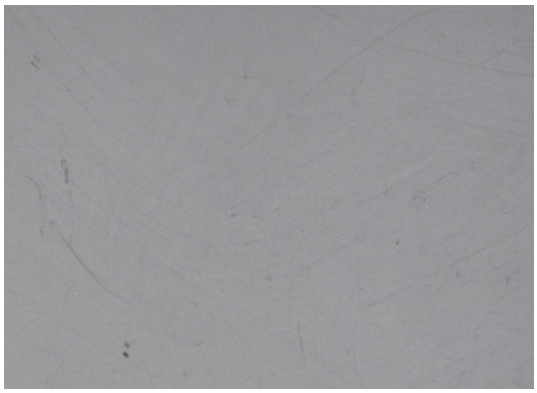
▶ Compatible Applications

- Unevenness and presence of coatings on films and glasses
- Uneven glass laminations
- Uneven coating on wafers

Etc.

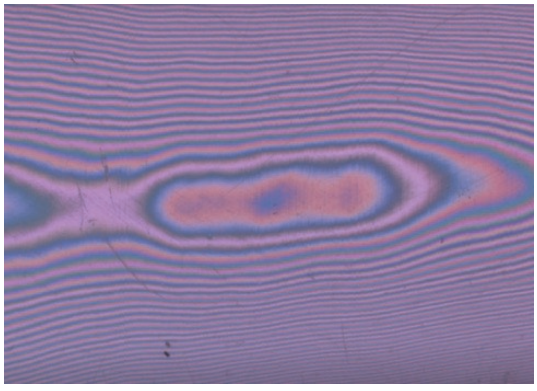
▶ Imaging Example: Uneven Glass Lamination

General white LED



Distortion of transparent glass under general white LED is difficult to see

White type lights for fringe interference inspection

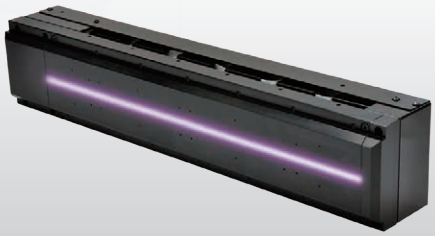


Lights for fringe interference inspection can show uneven adhesion

High-Output UV-LED Lights

Example of line-type product

Example of area-type product

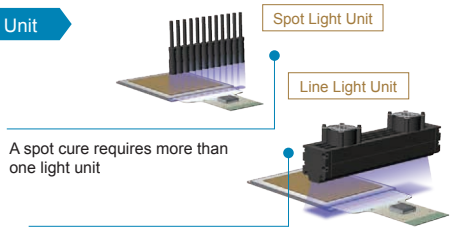


Example of spot-type product

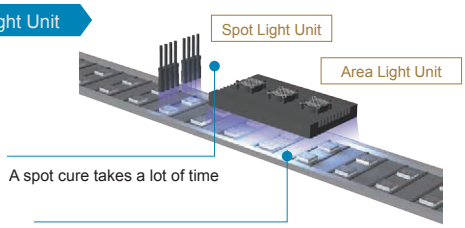
New Solutions Provided by Area Cures (Wide Range)

You can use area and line lights to efficiently illuminate wide-range areas that are difficult to illuminate using spot lights.
The area cure serves to reduce man-hours as well as the number of light unit.

Line Light Unit



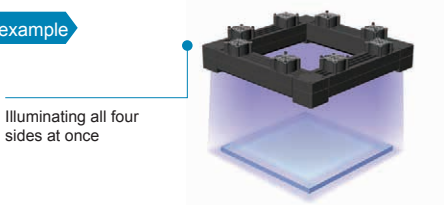
Area Light Unit

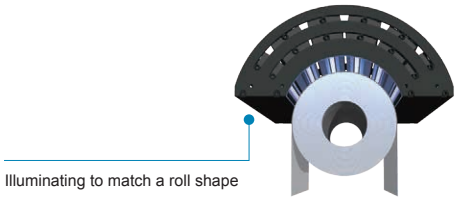


Custom Orders

Based on the technology we have accumulated producing light units for image processing, we can provide high-output UV-LED lights that meet a wide variety of requirements.
To meet those requirements, we have our standard line and area type lights, and can provide any other shape or format by custom order.

Illuminating example



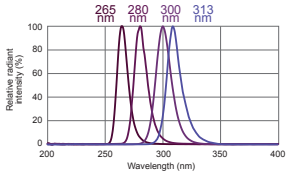


Range Covered by CCS's UV-LED Lights

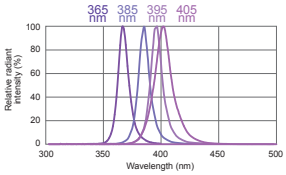
Various peak wavelength fitting your needs are available. Mixed wavelengths are also available.

Wavelength ranges from UV-C to UV-A are available.

Deep UV type



UV type



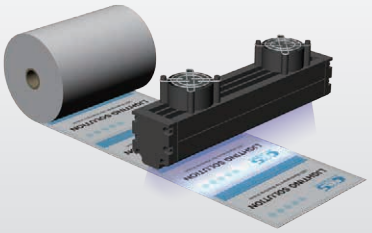
Examples of Use of Ultraviolet Curing

You can use area and line lights to efficiently illuminate wide-range areas that are difficult to illuminate using spot lights.
The area cure serves to reduce man-hours as well as the number of light unit.

Curing of Label and Sticker Ink

UV ink curing

Line type

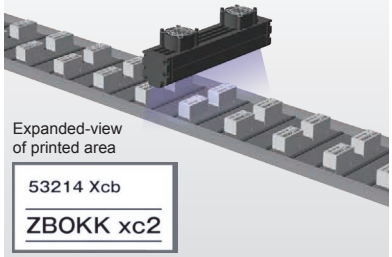


Labels and stickers

Curing of Electronic Parts Printing

Printing ink drying

Line type

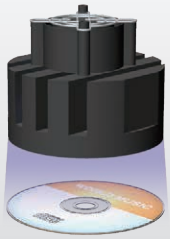


Electronic part (relays)

Curing of Label and Sticker Ink

UV ink curing and surface coating

Area type

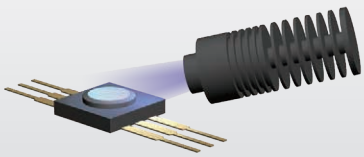


CD and DVD discs

Camera Lens Adhering

Curing adhesive

Spot type

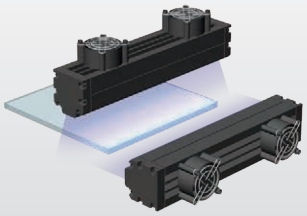


Lens units

Adhering and Sealing Panels

Gluing together of panels

Line type

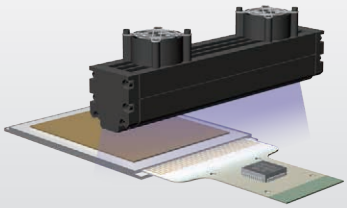


Panels

Electronic Parts Adhering

Adhering of liquid crystals and substrates

Line type



Liquid crystal substrates

Merits of Ultraviolet Irradiation Using LEDs

Reduce system size

Our LED systems consist only of LED lights and control units, allowing you to create a compact system.

Reduced running costs

Due to the long service life of LEDs, lamp replacement costs and replacement labor times are reduced, as well as management man-hours.

Great responsiveness and stability

The excellent ON/OFF responsiveness of LED lights allow for illuminating control that matches the given medium.

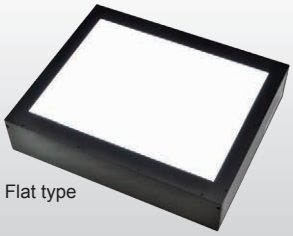
High Color Rendering (Natural-Light) LED Lights

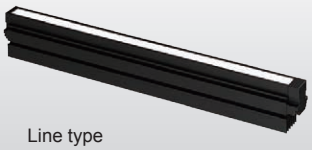
Color determining inspection | Colorimetric inspection | Color evaluation inspection and other applications


Ring type


Bar type


Dome type


Flat type


Line type

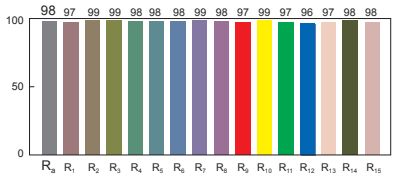

Spot type

What are High Color Rendering (Natural-light) LED Lights?

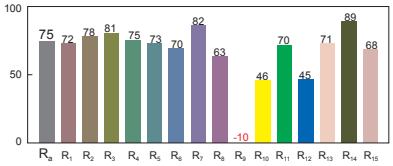
Achievement of the General Color Rendering Index at Ra 98

CCS's high color rendering (natural-light) LED Lights use our specially developed LEDs that reproduce natural-light colors that are close to standard light sources (such as sunlight or white light bulbs). At Ra 98, we have achieved the general color rendering index (CRI), demonstrating just how close the light is to sunlight. Additionally, even when the light color is changed, our unique technology makes it possible to maintain a CRI of Ra 95 or more. In addition to the high general CRI, CCS has also achieved high special CRI values, such as those for primary colors and flesh tones. Specifically for red (R_9), yellow (R_{10}) and blue (R_{12}), you can see colors rendered to a level that was not possible for previous light sources.*

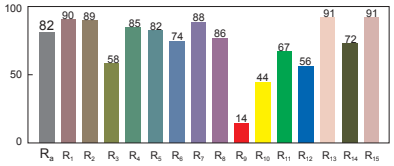
Example of high color rendering (natural-light) LED [correlated color temperature: 5,000 K]



Example of regular white LED [correlated color temperature: 5,000 K]



Example of three-wavelength fluorescent light (daylight) [Correlated color temperature: 5,000 K]

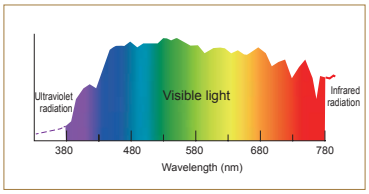


* A color rendering index is used to evaluate the ability to render each of 15 colors against a standard value of 100.
General color rendering index Ra: Avg. value of R_1 to R_8
Special color rendering index Ri: Individual evaluation of colors R_1 to R_{15} (evaluation gives precedence to R_9 to R_{15}). (According to JIS Z 8726, "Method of Specifying Colour Rendering Properties of Light Sources".)

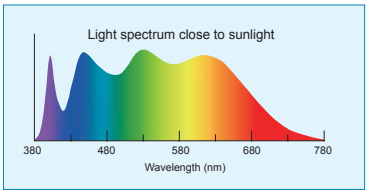
Light Spectrum Characteristics Close to Sunlight

High color rendering (natural-light) LEDs produce a smooth continuous light spectrum characteristics across all wavelengths that is similar to the light spectrum of sunlight. While normal white LEDs and fluorescent lights have some wavelength regions that are very strong or even missing, CCS's high color rendering LEDs cover almost the entire range of visible light.

Example of light spectrum of sunlight

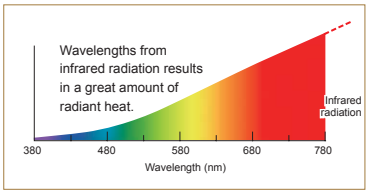


Example of light spectrum of high color rendering (natural-light) LEDs

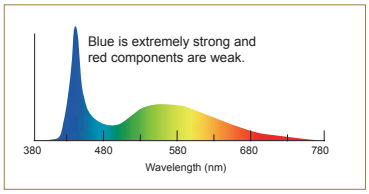


Light spectrum of other light sources

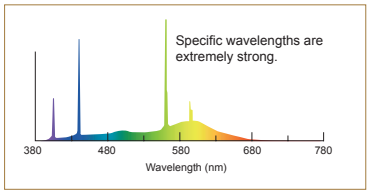
Example of light spectrum of halogen bulb



Example of light spectrum of regular white LED light



Example of light spectrum of three-wavelength fluorescent light



What are Color Rendering Properties?

"Color rendering" refers to how the way the colors of an object are affected when a light or other light source illuminates said object, and "color rendering properties" are the light source properties that determine how the colors of the object will appear.
In general, a "good light source of color rendering properties" refers to a light source that can faithfully reproduce the color tint when illuminated by a standard light source* with the same correlated color temperature.
In Japan, the color rendering indices (Ri and Ra) are defined according to JIS standards and the way objects appear are expressed numerically with a maximum of 100. The higher the value is, the closer the colors of the object appear to the natural colors.

* Refers to sunlight (CIE daylight), white light bulb light and similar types of light.

Comparison of color rendering properties

High color rendering (natural-light) LED Light

Standard white LED

Tuning the Correlated Color Temperature and Light Spectrum

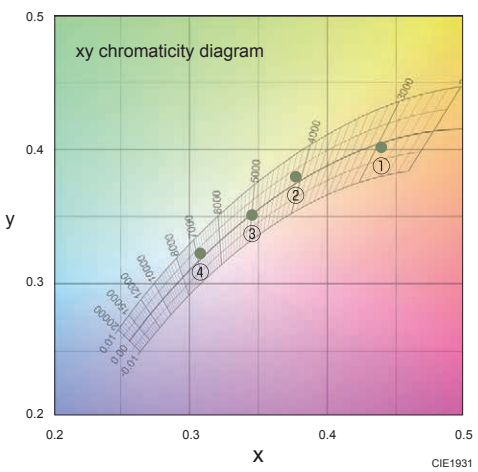
CCS's high color rendering (natural light) LED lights can be tuned for correlated color temperature and spectral distribution according to customer requests. We provide appropriate LED lights through a production system that integrates everything from LED device development to commercialization.

Tuning Examples

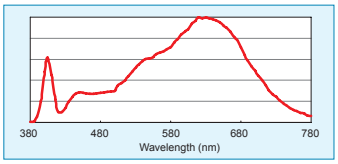
- Correlated color temperature close to illuminant A (2,856 K)
- Correlated color temperature close to illuminant D65 (6,504 K)
- Correlated color temperature of 5,500 K
- Correlated color temperature of 2,700 or 5,000 K
- Light spectrum with few green wavelength components
- Products to prevent variations in chromaticity

Our specially developed high color rendering (natural-light) LED devices

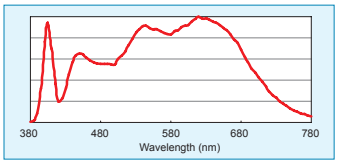
Example of tuning the correlated color temperature and light spectrum



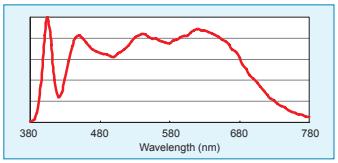
① Correlated color temperature: 2,800 K, General color rendering index: Ra 97



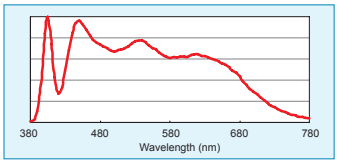
② Correlated color temperature: 4,000 K, General color rendering index: Ra 97



③ Correlated color temperature: 4,700 K, General color rendering index: Ra 97



④ Correlated color temperature: 6,500 K, General color rendering index: Ra 97



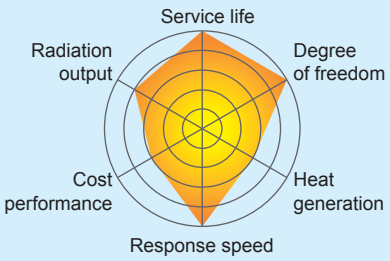
Y axis: Relative radiant intensity

LED Characteristics

- High degree of freedom in lighting design
- Long service life
- Fast response
- Selectable color
- Low total running cost

Comparison of Light Sources for Image Processing

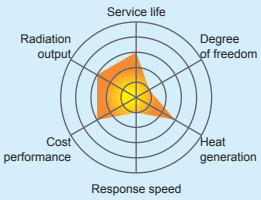
LED



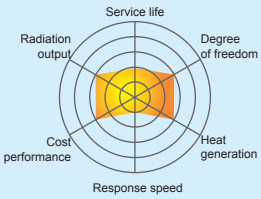
The characteristics of LED Lights are that they are compact, save energy, and have a long service life and a high degree of design freedom. The product can be utilized to design lights suitable for various workpieces (samples).

Other main light sources

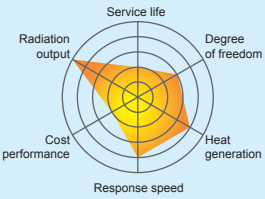
Fluorescent lamp



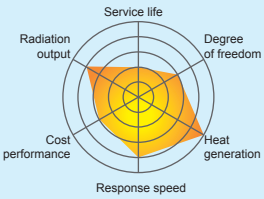
Halogen bulb



Xenon lamp



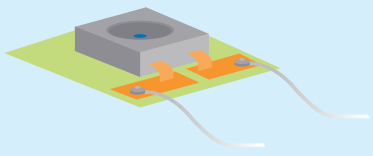
Metal halide



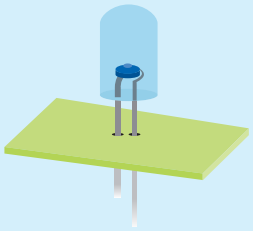
LED Type

Although the emitting principles are basically the same, they are available in the following types of shapes.

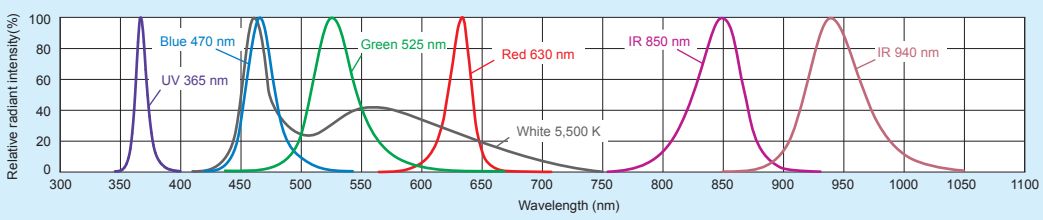
Surface-mounted (high-watt)



Cannonball shape (low-watt)



Light Spectrum (representative sample of the products in this catalog)



Skillful Use of LED Lights

The service life of LED Lights is shorter at high temperatures

Using LEDs at high temperatures for an extended period of time will cause them to deteriorate and the radiation output will decline. (The normal radiation output will not return even after they cool down.)

How to prevent LED deterioration and reduction in radiation output due to heat generated by LEDs

Avoid using at the maximum intensity

When used with a low control unit intensity value, the light unit is supplied with a lower amount of current, which therefore reduces the heat given off as well as LED deterioration. As a guideline, we recommend that you set the intensity value low at first and then turn it up gradually as the radiant output of the light unit decreases.

Turn on the light only when capturing images

LED lights can withstand being turned on and off frequently. Turning on the light unit only when taking images using a strobe emitting or external signal input will reduce heat generation, provide a more stable radiation output, and increase the service life of the light unit.

Important Points of LED Lights

LED service life

Unlike a light bulb, an LED Light does not burn out suddenly but rather gradually deteriorates. Replace when captured images are dark and increasing the intensity value does not improve the conditions.

LED variations

LED Lights have different individual radiant quantities. There are also differences in the emitted color.

Wavelength shift

The LED emission spectrum varies due to ambient temperature and heat generated when energized. Temperature rising causes a shift towards the long-wavelength side.

Items You Must Check When Selecting a Light Unit

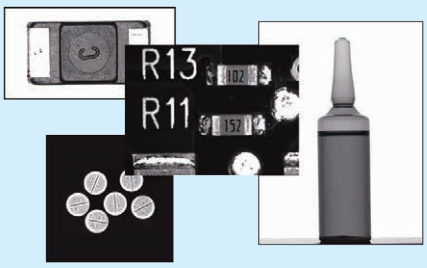
Workpiece (sample) shape, conditions, color and related items

Applications

External inspection	Part count inspection
Character recognition	Liquid volume inspection
Foreign material inspection	Detection inspection
Dimension measurement	Code recognition

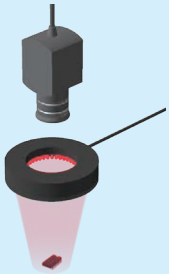
Etc.

Large field of view (resolution)



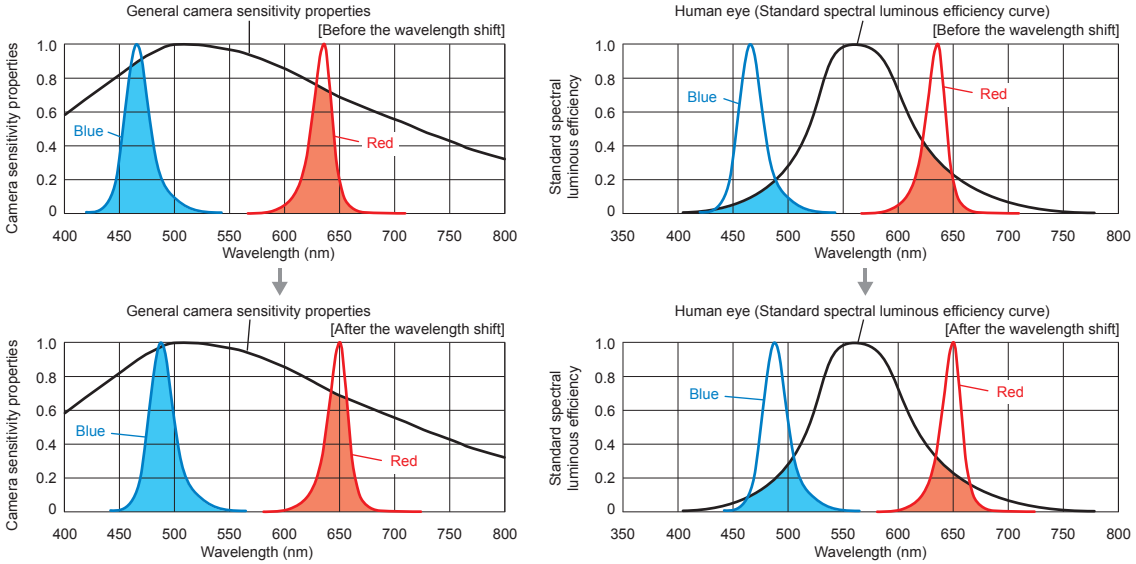
Installation conditions and ambient environment

- Production line conveyor speed
- Types of surrounding devices and similar items
- Separation of light units and workpiece



Changes in Brightness for Camera and the Human Eye

By only slightly shifting the wavelength of blue or red, the value for the human eye (illuminance and luminance) changes greatly.



Effective Field of View of Coaxial Lights

Figure 1 shows a cross-section of a coaxial light. Light from the LED is reflected using a half-mirror, so that the position of the emitting surface can be treated as if it were directly behind the mirror (See “Virtual emitting surface” in the figure). In this case, the distance from the emitting surface to the workpiece is LWD'.

The effective field of view of a coaxial light is determined by 1) the LWD (distance from the light unit to the workpiece) and 2) the WD (distance from the workpiece to the camera). Figure 2 shows how to determine the field of view "V" when the WD is held constant and the LWD (distance to the light unit) is varied. The following is an explanation of what the effective field of view will be when the virtual emitting surface is at positions A and B.

In the case of position A, if we assume that the workpiece is a reflecting surface, we can say that there is an emitting surface at A opposite to the workpiece (position A' of the LWD'a distance). Therefore, when the workpiece is viewed through the camera, it appears as if the emitting surface is at A', and thus the effective field of view is Va.

In the same way, in the case of B, the emitting surface is at B' and the effective field of view is Vb. Comparing Va to Vb, we find that Va, which has a shorter LWD, has a greater effective field of view. In this way, the effective field of view grows larger as the LWD becomes smaller.

What is the effective field of view?

For example, when reading characters engraved on a shiny piece of metal, if we assume that the virtual emitting surface is at position B, the effective field of view of Vb will be determined, in regards to the camera field of view V as shown in Figure 3 below, by the virtual emitting surface position B'. For this reason, only the letters CDEFG will be visible as dark letters against a light background, and the letters AB and HI, which appear dark against a dark background, will not be discernible. In this way, the effective field of view Vb is smaller than the field of view V.

Figure 1. Cross-section of Coaxial Light

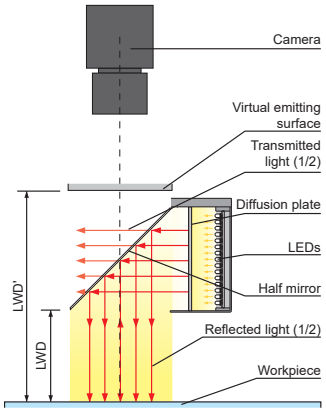


Figure 2. Determining the field of view by LWD

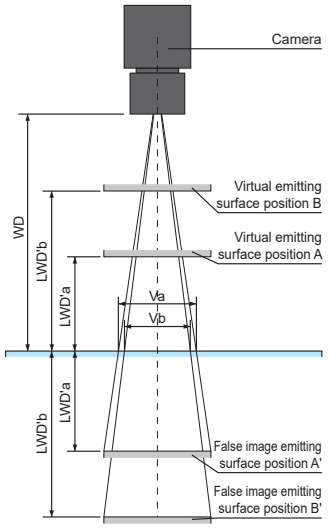
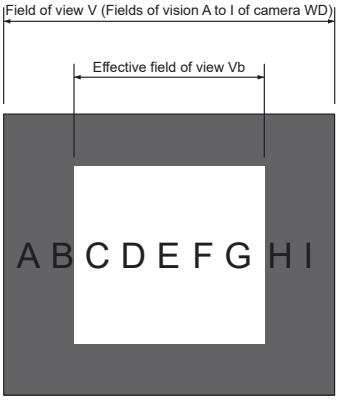


Figure 3. Field of view and effective field of view

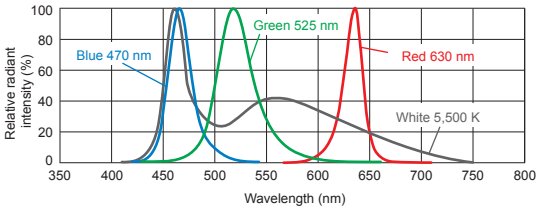


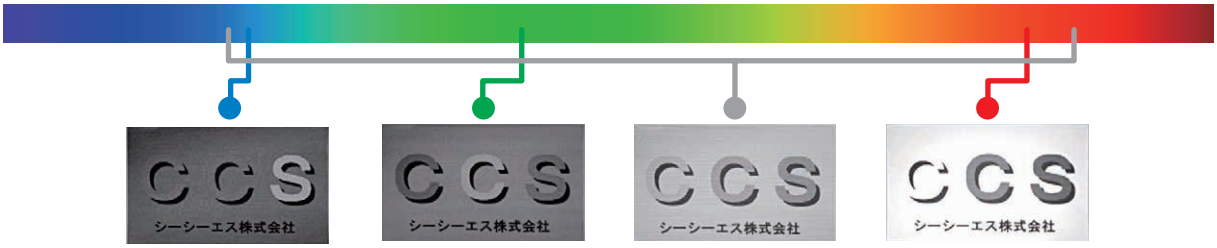
Objects Appear Differently Depending on the Emitted Color of a Light Unit

Imaged sample workpiece (printed card)

Background — Orange
Left-side C — Red
Center C — Green
S — Blue
Shadow and kana/kanji characters — Black

Light spectrum of colored LEDs (representative sample)





Imaging with Blue

When using blue lighting, parts that are the same color as the lighting become white and other colors become black.

Imaging with Green

Although, when using green lighting, there are some variations in color strength, green (same color as the lighting), as well as orange, yellow and blue all become white. The remaining red-colored area become black.

Imaging with White

As white lighting covers all three primary colors (red, blue and green), color brightness is even resulting in all colors appearing as gray with the same brightness. By comparing with other imaging, it is apparent that there is little strength of color. If using white lighting when imaging with a color camera or when imaging a multicolored workpiece, it is possible to perceive the particularities of the workpiece as their are no effects from color.

Imaging with Red

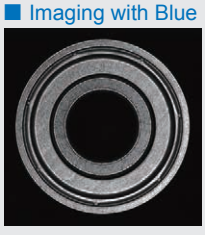
When using red lighting, parts that are the same color as the light (red) as well as orange and yellow become white and other colors (green and blue) become black. This is due to the property of the light expressed as, “Color reflects light of similar colors and absorbs light of complementary colors.”

(Using a monochrome camera)

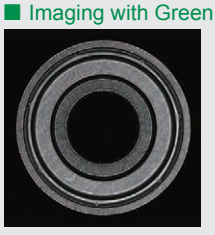
Example of workpieces which don't relate to the emitted color

Imaged sample workpiece
Metal (bearing)

Imaging with Blue

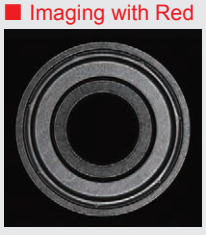


Imaging with Green

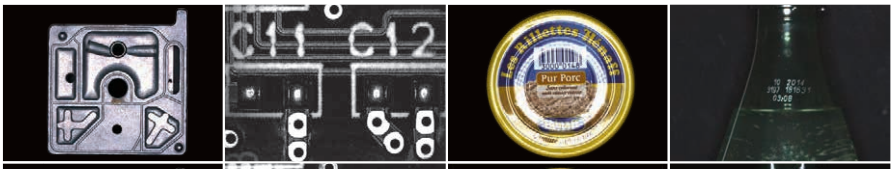
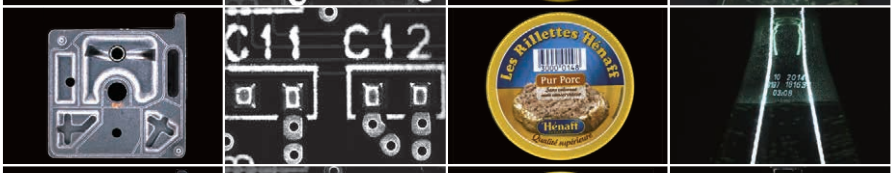
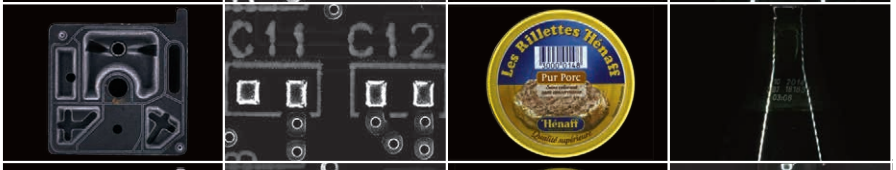
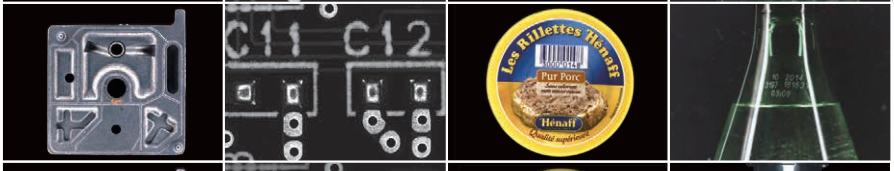
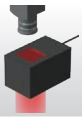
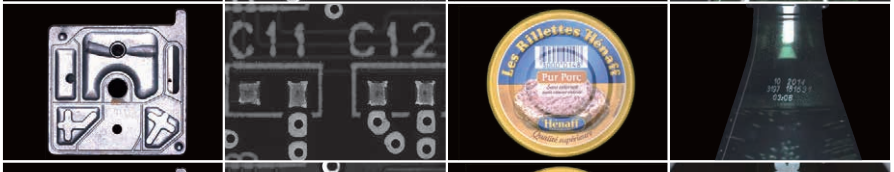
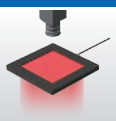
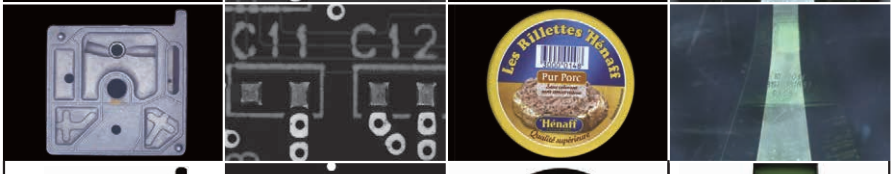
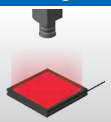
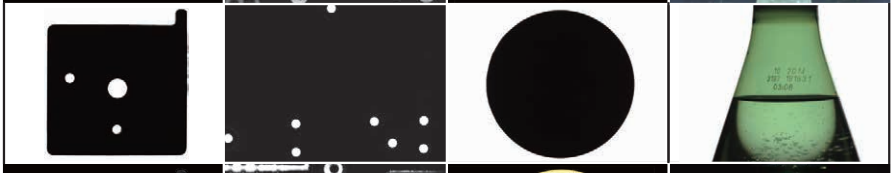
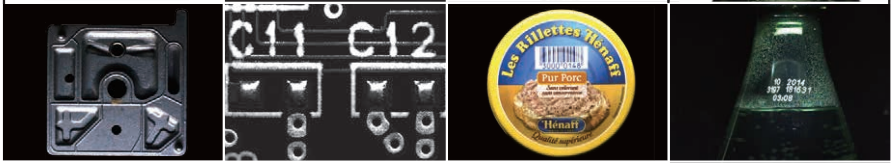


Imaging with White

Imaging with Red



Imaging Differs Depending on the Combination of the Light Unit and Workpiece

Light unit in use \ Imaged workpiece	Metal part (automotive part)	Circuit board (electronic part)	Can (food)	PET bottle (drink)
Ring Lights				
 **LDR2** Series ▼ P.31				
 **LDR2-LA** Series ▼ P.35				
 **LDR-LA1** Series ▼ P.39				
 High-angle **HPR2** Series ▼ P.47				
 Low-angle **HPR2** Series ▼ P.47				
Coaxial Lights				
 **LFV3** Series ▼ P.127				
Dome Lights				
 **HPD2** Series ▼ P. 105				
Flat Dome Lights				
 **LFX3** Series ▼ P. 119				
Flat Lights				
 **TH2** Series ▼ P. 85				
Bar Lights				
 **LDL2** Series ▼ P.61				

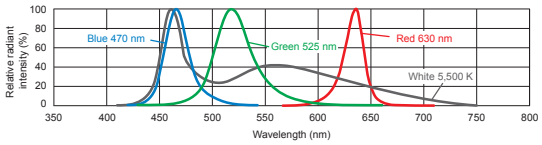
There are great differences in imaging results depending on the shape of the light unit, emitted color, illuminating method and similar conditions.
Please inquire with CCS so that we can use our vast knowledge and experience to help you with imaging.

LED Properties: Spectral Distribution

(part not described on each product page)

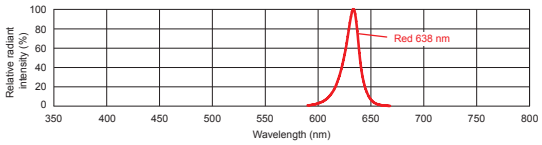
SQR Series

Product Page ► P. 43



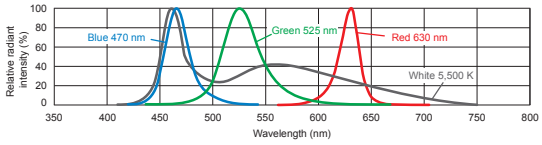
SQR-TP Series

Product Page ► P. 44



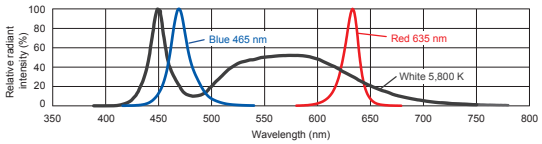
LFR Series

Product Page ► P. 51



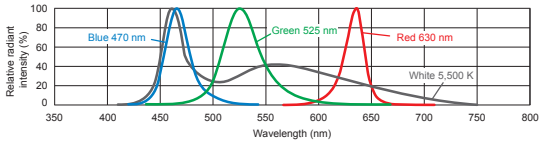
TH2 Series

Product Page ▼ P. 85



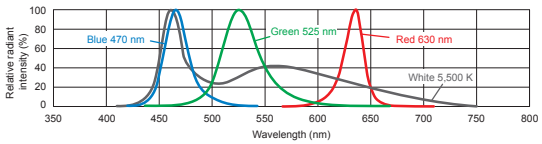
LFL Series

Product Page ► P. 101



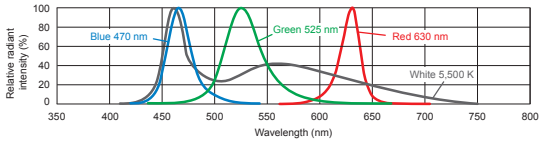
LAV Series

Product Page ► P. 111



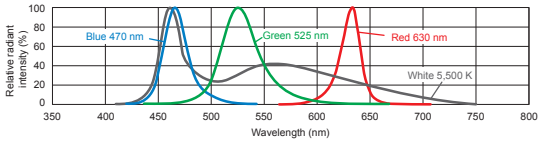
PDM Series

Product Page ► P. 112



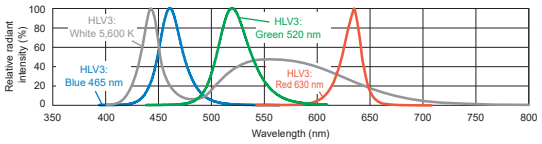
MSU Series

Product Page ► P. 137



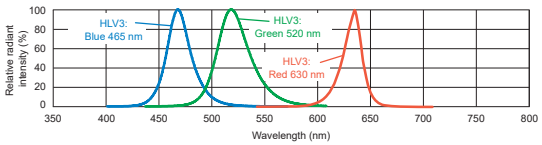
HLV3-22-4-NR Series

Product Page ▼ P. 195



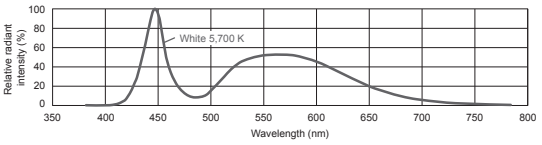
HLV3-3M-RGB-4

Product Page ▼ P. 196



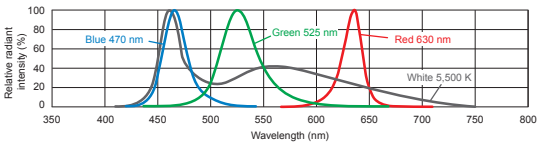
PFB3(A) Series

Product Page ▼ P. 203



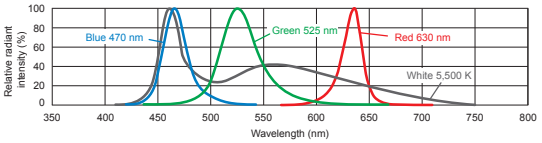
LV Series

Product Page ► P. 191



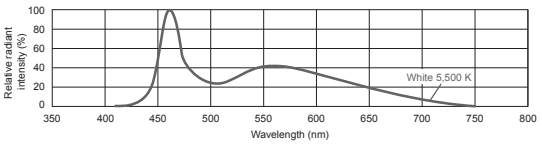
LN Series

Product Page ► P. 223



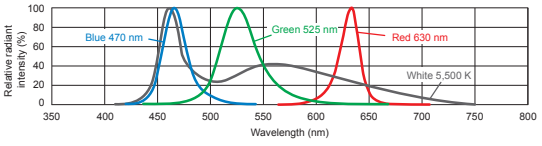
LN-HK Series

Product Page ► P. 224



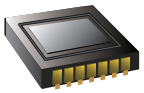
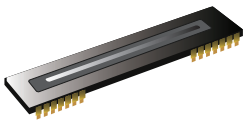
LNV Series

Product Page ► P. 237



Basic Line Sensor Camera Knowledge

1 Differences between area sensor cameras and line sensor cameras

	Area sensor camera	Line sensor camera
Shape of imaging element		
Lens mount	C mount, F mount, etc.	F mount, M72 mount, etc.
Pixel expression	2M (1,600 × 1,200 pix)	8 K (8,192 pix)
Capture expression	Shutter speed 1/4,000 (250 µsec) 1/60 (16.67 msec)	Charge storage time 4,000 Hz (250 µsec) 1,000 Hz (1 msec)

Imaging methods for the area sensor camera and the line sensor camera (Conceptual image)

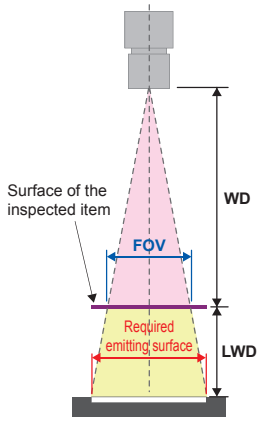
2 Pixel count for line cameras

Pixel count	Pixel size	Ratio of receiving surface area
2K (2,048)	14×14 µm	16
4K (4,096)	10×10 µm	8
8K (8,192)	7×7 µm	4
12K (12,228)	5×5 µm	2
16K (16,384)	3.5×3.5 µm	1

Note: Brightness varies based on the wavelength of the light source and the receiving sensitivity of the image sensor. Brightness does not necessarily correspond to the receiving surface area ratio.

3 How to find the required emitting surface when selecting a line sensor light

Setup examples



Information required when selecting the length of your light unit

(1) WD (Working distance):
Distance from the camera to the surface of the inspected item

(2) LWD (Light working distance):
Distance from the light unit to the surface of the inspected item

(3) FOV (Field of vision)

Calculate the require emitting surface using the items above

Solve Use the trigonometric ratio and calculate using the following procedure.

WD : FOV = (WD + LWD) : Required emitting surface

$$\text{Required emitting surface} = \frac{\text{FOV} \times (\text{WD} + \text{LWD})}{\text{WD}}$$

Note: The above is only valid for applications using direct light transmission or direct light reflection. The emitting surface must be uniform. Select a light unit longer than the emitting surface you calculated.

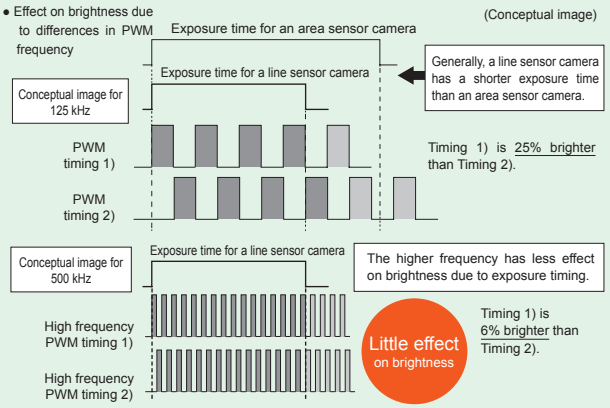
When selecting a digital control unit, be sure to consider high-frequency types as well. A control unit with a PWM frequency of 500 kHz can be made for custom orders. Please contact your CCS sales representative for details.

Introduction to the High-Frequency Digital Control Units (Custom Order)

PD3-10024-8 Series

- PWM intensity control (500 kHz)
- 95 W capacity (EL connector: 1 channel)
- AC input
- 3 types of external control
  - Parallel communication
  - Ethernet communication
  - EIA-485 communication

See the PD3 Series (standard) product page ▶P.317



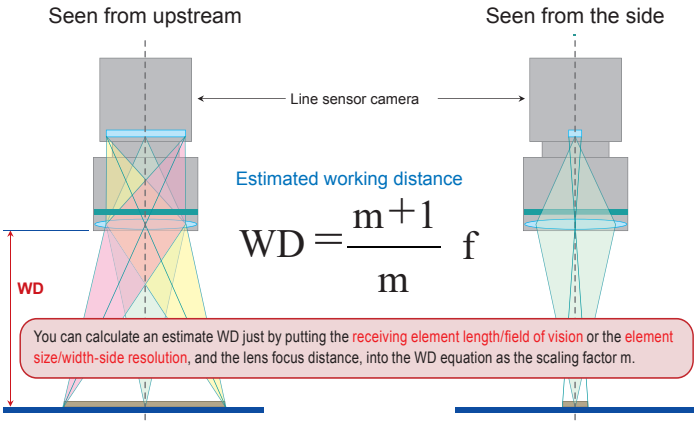
For details about PWM, refer to P.400 in the technical guide.

Setting Optical and Lighting Conditions

1 How to find the working distance (WD) (Reference value)

Optical system for the line sensor camera (Wide-side resolution)

It is necessary to calculate the working distance in advance.



Method for testing line sensor image input

When using a line sensor camera, calculate the working distance (WD), carrying speed, and scan rate before starting the test.

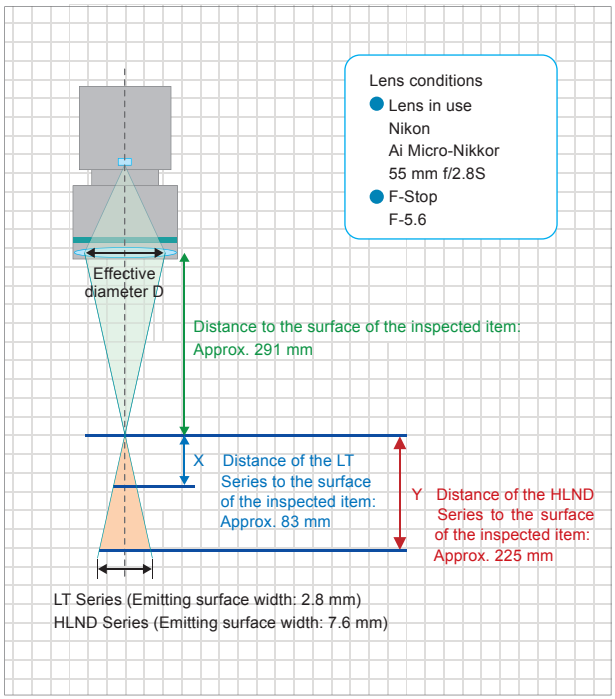
■ Example calculation with the following camera specs and conditions

Pixel size: 7 µm × 7 µm (Pixel count: 8,192)
The scan rate and working distance when performing an image input test with the following conditions for a lens where focus distance f = 55 mm is calculated as follows:

Cond. 1 Carrying speed: 200 mm/sec
Cond. 2 Resolution: 30 µm (Moving direction) × 30 µm (Lateral direction)

Scan rate = 0.03 mm ÷ 200 mm/sec = 0.00015 sec
= 150 µsec
Working distance = {(7/30 + 1) / (7/30)} × 55 mm
= Aprox. 291 mm

2 Relationship between the lens' effective diameter and the light unit's installation distance (Reference value)



■ What is the effective diameter for the lens in the conditions on the left?
D = Lens focus distance ÷ F-stop = 55 ÷ 5.6 = 9.8

■ What is the longest distance where the most efficient brightness can be achieved for the emitting width (short side) of each light unit?
⇒Find it using similar relationships

1) If using the LT Series
9. 8: 291 = 2. 8 : X
X = (291 x 2. 8) ÷ 9. 8 = Approx. 83 mm

2) If using the HLND Series
9. 8: 291 = 7. 6 : Y
Y = (291 x 7. 6) ÷ 9. 8 = Approx. 225 mm

For both the above light units, if the light unit is farther than the distance above, it will be darker, but if the light unit is closer than the distance above, there will be virtually no change in the brightness. (However, this assumes that the inspected item is limited to something transparent where the illuminated light can be observed directly. This cannot be applied to an inspected item with a possibility for diffusion.) Also, if the lens in use or the F-stop changes, various conditions such as the effective diameter and WD change. Therefore, please consider this only as a reference value under certain conditions. Furthermore, the camera's pixel size is a large factor regarding brightness.

3 Comparison of the images for the area sensor camera and the line sensor camera

■ Imaging sample (Metal bar)

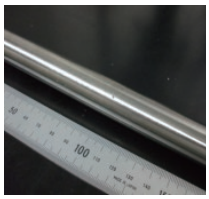
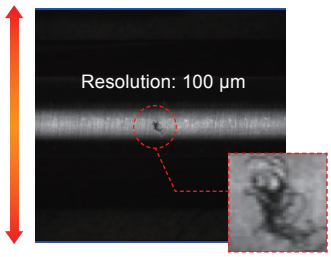


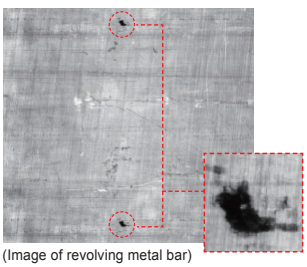
Image of scratches on a metal bar

- Sample size: Length 150 mm, Ø20 mm
- Resolution: 100 µm
- Pixels of the camera in use
  - Line camera: 8,192 pixels
  - Area camera: 300,000 pixels

■ Imaging with the area sensor camera



■ Imaging with the line sensor camera



(Image of revolving metal bar)

Maintenance and Inspection

LED Lights (Be careful not to touch the casing during or after use as the temperature is high and can cause burns.)

Use a dry soft cloth to wipe away any dust, grime or other foreign material from the emitting surface. If there is any oil or similar substance adhering, use a soft cloth that has been dampened with a neutral cleaner to wipe it off. Do not use thinner, benzene or any similar liquids. Doing so could result in discoloration and deformation.

Control Units for LED Lights (Always be sure that the control unit is turned off before cleaning.)

Use a dry soft cloth to wipe away any dust, grime or other foreign material from the electrodes. If there is any oil or similar substance adhering, use a soft cloth that has been dampened with a neutral cleaner to wipe it off. Do not use thinner, benzene or any similar liquids. Doing so could result in discoloration and deformation.

Options

Periodically inspect option parts such as polarizing and diffusion plates as all of these are consumables. Replace any parts that show discoloration or deformation during inspection. CCS recommends maintaining extra option parts on-hand in order to be prepared for replacement.

Always be sure to consult the User Manual when performing maintenance and inspection.

Operating and Storage Environments

These products are LED Lights that are mainly used for image processing and industrial inspection. Do not use these for other purposes. Always be sure to obey the following precautions.

Absolutely never use under the following conditions.

- Use under conditions or in an environment not described in the User Manual
- Use for nuclear power control, railroads, aircraft, automobiles, combustion devices, medical equipment, home entertainment equipment, safety equipment. or any similar devices or equipment
- Use where it is thought that human life or property will be greatly affected, especially application where safety is required

Install in a location that satisfies the following conditions. An improper installation location can result in product malfunction.

- Low vibration and stable
- Water, oil, liquid, chemicals, steam or similar substances cannot contact or otherwise affect the product*
- Low level of dust and good ventilation
- No corrosive or flammable gases
- No sudden changes in temperature
- Far away from water lines, water heaters, humidifiers, air conditioners, heaters and similar equipment

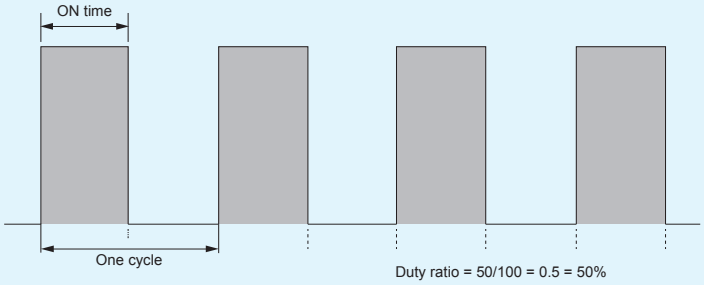
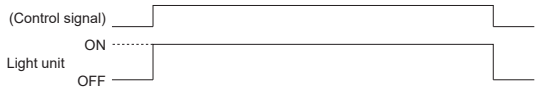
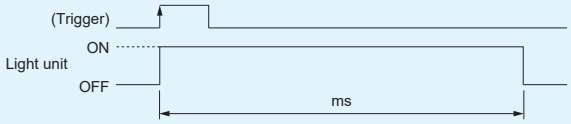
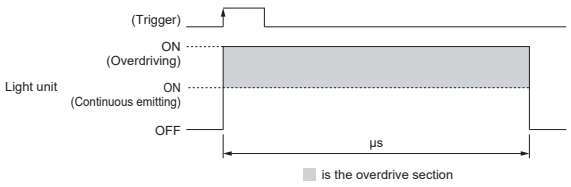
* Install IP-compatible products in a range that permits performance.

Use in the following environments.
An improper operating environment can result in product malfunction.

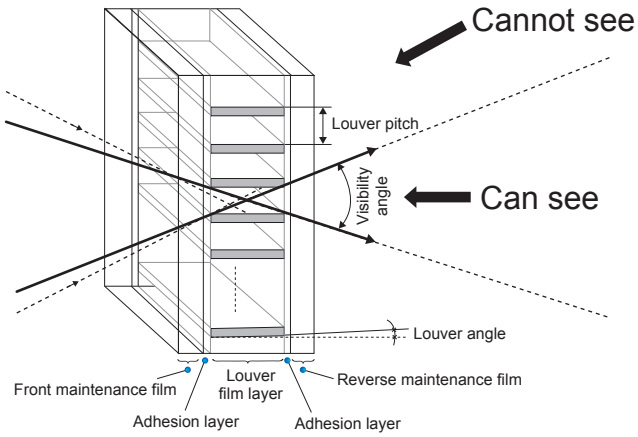
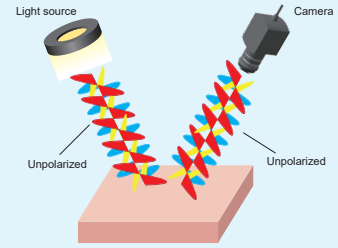
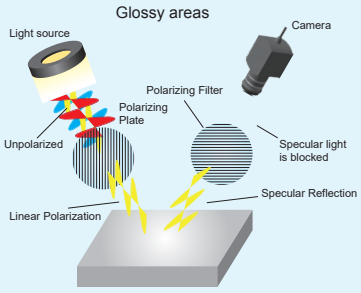
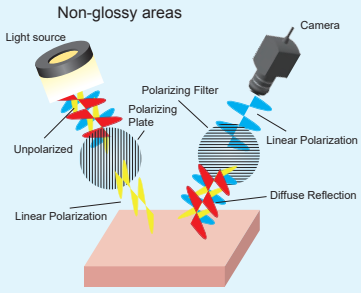
- Operating temperature: 0 to 40°C, Humidity: 20% to 85%RH (with no condensation)
- Storage temperature: -20 to 60°C, Humidity: 20% to 85%RH (with no condensation)

Operating and storage environments of products that are different from these are described on the corresponding product page.

Glossary

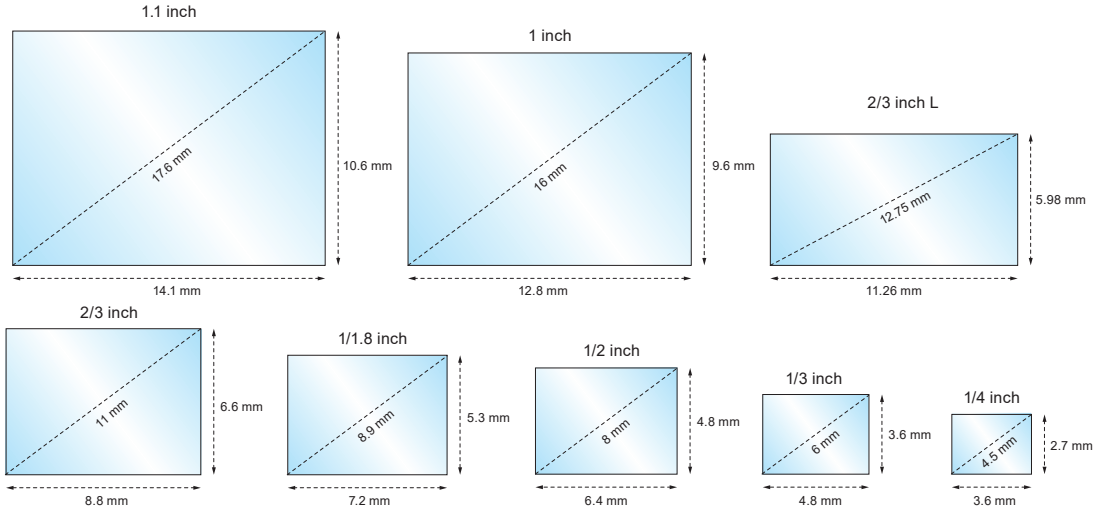
No.	Classification	Term	Explanation of Terminology
1	Control Unit	Digital control (Duty control)	This is a method of intensity control of the PD Series. Intensity control is performed by varying the duty of the pulse on (proportion of time it is on (lit up) during a single pulse). With 8-bit control, you can perform 256-step linear intensity control. If using a high-speed shutter, you must be careful of frequency interference.
2	Control Unit	PWM control	PWM: An abbreviation of pulse width modulation, one pulse modulation method in which the period and amplitude are maintained at a constant, and only the pulse width is changed. Duty ratio: Expresses the amount of time a pulse wave is ON during a cycle as a ratio. Relational expression: Duty ratio = ON time/Period Products with this mark at the top of their product introduction page can be customized for a PWM frequency of 500 kHz. 
3	Control Unit	External ON/OFF control (ON/OFF emitting)	 A method for emitting light for the time during which the ON signal of an ON/OFF signal is received.
4	Control Unit	Strobe emitting	"Strobe" refers to light being emitted for a specified amount of time in synchronization with a trigger signal. This additionally includes emitting light for a fixed amount of time after a delay has been applied for a fixed amount of time. 
5	Control Unit	Overdrive	“Overdrive” is a use method for emitting brighter light by applying a large current to an LED light for a fixed amount of time. This current exceeds the current during continuous ON/OFF emitting. Products with this mark at the top of their product introduction page support overdrive. 

Glossary

No.	Classification	Term	Explanation of Terminology
6	Options	Sharp-cut filter	This filter sharply cuts off light of wavelengths that are less (or more) than the specified wavelength. At CCS, we mainly use these attached to the lens.
7	Options	Light control film	This plastic film is arranged as a minute louver with extremely small gaps. It functions to reduce the diffusion of light in a specific direction and improves parallelism.  **Basic structure of light controller film (cross-section)**
8	Options	Polarizing Plate / Polarizing Filter	Light with a regular vibration direction of the electric vector of the light wave is called “polarized light”. The surface reflection of the workpiece can be removed when used in combination with a polarizing plate and polarizing filter. **• Without polarizing plate and polarizing filter**  **Imaging Example**  Reflection of the light prevents proper imaging. **• With polarizing plate and polarizing filter**   **Imaging Example**  The specularly reflected light is blocked by the polarizing filter and only the dispersed reflection of the light is captured, making it possible to take images without light reflection.
9	Other	LWD	The distance from the tip of the light source to the surface of the workpiece (sample). Abbreviation for light-work-distance. Note: Although this term is used in our website, catalogs and other materials with the above meaning, care must be paid if it is used for other publications as it is not a term that is officially defined by standards or a similar document.

Camera Image Sensor Size

These are examples of image sensor sizes for use with a camera of an image processing inspection system.



Field of Vision Chart

These values are for reference. (Unit: mm)

Refer to the field of vision chart for the following products:
High-resolution telecentric lenses (SE-65-M/SE-110-M) ▼ P.257 Telecentric lenses (SE-65/SE-110) ▼ P.261 Macro lenses (SE-16/SE-18) ▼ P.263

Optical magnification	Camera image sensor size														
	1.1 inch			1 inch			2/3 inch			1/1.8 inch			1/3 inch		
	Length	Width	Diagonal	Length	Width	Diagonal	Length	Width	Diagonal	Length	Width	Diagonal	Length	Width	Diagonal
0.1x	106.00	141.00	176.00	96.00	128.00	160.00	66.00	88.00	110.00	53.00	72.00	89.00	36.00	48.00	60.00
0.2x	53.00	70.50	88.00	48.00	64.00	80.00	33.00	44.00	55.00	26.50	36.00	44.50	18.00	24.00	30.00
0.3x	35.33	47.00	58.67	32.00	42.67	53.33	22.00	29.33	36.67	17.67	24.00	29.67	12.00	16.00	20.00
0.4x	26.50	35.25	44.00	24.00	32.00	40.00	16.50	22.00	27.50	13.25	18.00	22.25	9.00	12.00	15.00
0.5x	21.20	28.20	35.20	19.20	25.60	32.00	13.20	17.60	22.00	10.60	14.40	17.80	7.20	9.60	12.00
0.6x	17.67	23.50	29.33	16.00	21.33	26.67	11.00	14.67	18.33	8.83	12.00	14.83	6.00	8.00	10.00
0.7x	15.14	20.14	25.14	13.71	18.29	22.86	9.43	12.57	15.71	7.57	10.29	12.71	5.14	6.86	8.57
0.8x	13.25	17.63	22.00	12.00	16.00	20.00	8.25	11.00	13.75	6.63	9.00	11.13	4.50	6.00	7.50
0.9x	11.78	15.67	19.56	10.67	14.22	17.78	7.33	9.78	12.22	5.89	8.00	9.89	4.00	5.33	6.67
1x	10.60	14.10	17.60	9.60	12.80	16.00	6.60	8.80	11.00	5.30	7.20	8.90	3.60	4.80	6.00
1.5x	7.07	9.40	11.73	6.40	8.53	10.67	4.40	5.87	7.33	3.53	4.80	5.93	2.40	3.20	4.00
2x	5.30	7.05	8.80	4.80	6.40	8.00	3.30	4.40	5.50	2.65	3.60	4.45	1.80	2.40	3.00
3x	3.53	4.70	5.87	3.20	4.27	5.33	2.20	2.93	3.67	1.77	2.40	2.97	1.20	1.60	2.00
4x	2.65	3.53	4.40	2.40	3.20	4.00	1.65	2.20	2.75	1.33	1.80	2.23	0.90	1.20	1.50
5x	2.12	2.82	3.52	1.92	2.56	3.20	1.32	1.76	2.20	1.06	1.44	1.78	0.72	0.96	1.20
6x	1.77	2.35	2.93	1.60	2.13	2.67	1.10	1.47	1.83	0.88	1.20	1.48	0.60	0.80	1.00
7x	1.51	2.01	2.51	1.37	1.83	2.29	0.94	1.26	1.57	0.76	1.03	1.27	0.51	0.69	0.86
8x	1.33	1.76	2.20	1.20	1.60	2.00	0.83	1.10	1.38	0.66	0.90	1.11	0.45	0.60	0.75
9x	1.18	1.57	1.96	1.07	1.42	1.78	0.73	0.98	1.22	0.59	0.80	0.99	0.40	0.53	0.67
10x	1.06	1.41	1.76	0.96	1.28	1.60	0.66	0.88	1.10	0.53	0.72	0.89	0.36	0.48	0.60
12x	0.88	1.18	1.47	0.80	1.07	1.33	0.55	0.73	0.92	0.44	0.60	0.74	0.30	0.40	0.50

Regulations

Photobiological safety evaluation of LED Lights for image processing

In order to ensure the safe usage of LED lights, CCS has categorized the risks related to each light unit.
When you are considering the purchase of LED lights or are checking risk information of a product you have purchased, please refer to the specifications section of the product information page of our website.

List of EU standards, UKCA marking and compliant products

The following CCS products comply with the corresponding standards.

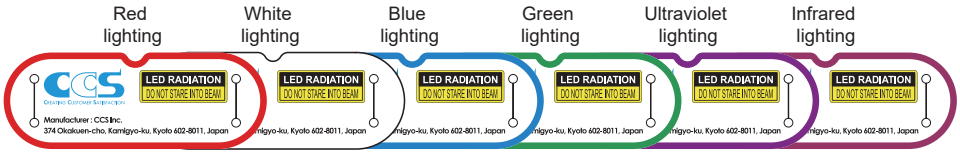
Series name		CE			UKCA		
		Safety standard	EMC standard		Safety standard	EMC standard	
			EMS	EMI		EMS	EMI
Light Units	LDR2, LDR2-LA, LDR-LA-1, SQR, SQR-TP, HLDR3, HLDR-IP, HPR2, LFR, LKR, FPR, FPQ3, LDL2, HLDL3, LB, TH2, TH2-PM, TH2-CR, LFL, HPD2, LDM2, LAV, PDM, LFXV, LFX3, LFX3-PT, LFV3, LFV3-G, MSU, MFU, PF, UV3/VL3, UV, IR2, IR(Over 1000-nm Type), CIR, HLV3-14, HLV3-22, HLV3-22-4-NR, HLV3-3MRGB- 4, HSL-PCL, LV, LS, LNSP2, LN, LN-HK, LNSD, LND2, LT, LNV, LNIS2, LNIS	EN 62471	—	—	BS EN 62471	—	—
	LNLP, LDLB, LNSP-FN, LNIS-FN, LNDG, OLF-LT, OLB-LT, IU, triniti-enabled LED lights	EN 62471	EN 61000-6-2	EN 61000-6-4	BS EN 62471	BS EN 61000-6-2	BS EN 61000-6-4
Integrated Control Units for Light Units	PFBR-600SW2-LL, PFBR-600SW2-LLCF, PFBR-150SW-MN	EN 62471 EN 61010-1 EN 62311	EN 61000-6-2	EN 61000-3-2 EN 61000-3-3 EN 61000-6-4	BS EN 62471 BS EN 61010-1 BS EN 62311	BS EN 61000-6-2	BS EN 61000-3-2 BS EN 61000-3-3 BS EN 61000-6-4
	PFB3-20SW-AJT(A), PJT(A), SJT(A) , JT(A)	EN 62471	EN 61000-6-2	EN 61000-6-4	BS EN 62471	BS EN 61000-6-2	BS EN 61000-6-4
Control Units	PD3(AC input types), PD2, POD, PF, PJ2, PJ(AC input types), PSCC-60048(A), PSCC-30028(A), PSB4, PSB3	EN 61010-1 EN 62311	EN 61000-6-2	EN 61000-6-4	BS EN 61010-1 BS EN 62311	BS EN 61000-6-2	BS EN 61000-6-4
	PTU2	EN 61010-1 EN 62311	EN 61326-1		BS EN 61010-1 BS EN 62311	BS EN 61326-1	
	PD3(DC input types/Parallel), PJ(DC input types), CC-PJ-0707, CN-EPOE, CN-4024-2-EIPT, OC-0736-1-ET,PB-2430-1	—	EN 61000-6-2	EN 61000-6-4	—	BS EN 61000-6-2	BS EN 61000-6-4
	PD3(DC input types/Keepalive), CC-ST-1024	—	EN 61326-1		—	BS EN 61326-1	

Note: Our light units that were designed and developed in September 2011 or later comply with the EU standard and bear the CE marking.
For information on the cabling products, refer to the product web pages.

Note: The warranty period of the custom order product is different from that listed above. Contact our local sales office for details.

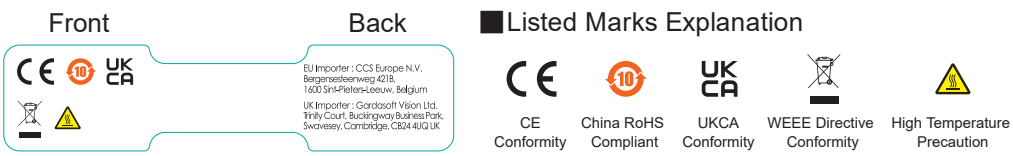
Examples of label tags

LED lights of CCS have label tags as shown below attached to their cables or case bodies. These labels are color-coded according to the emitted light of the corresponding light unit. The model, serial number, CE marking and related information are shown on the rear of the label.



Marking ties

These Ties are CE marking and related information are shown on the rear of the label.



Environmental Regulations

EU RoHS Directive

The products described in this catalog are compliant with EU RoHS Directive.
Refer to our website or the User Manual included with the product for details regarding EU RoHS Directive.

China RoHS

The products described in this catalog are compliant with China RoHS.
Refer to our website or the User Manual included with the product for details regarding the China RoHS.

REACH Regulations

To perform appropriate risk management for the chemical materials included in the products listed in this catalog, we have established efforts related to reducing the burden on the environment from procured parts, and we strive to select more environmentally-friendly procured parts. Also, as a response to REACH regulations, we have newly constructed an assessment/information transmission system for the chemical materials included in our products, and we are performing autonomous management.
Inquire with your CCS sales representative regarding products and each product's use of materials designated as SVHC (substances of very high concern) under REACH regulations.

Note: The warranty period of the custom order product is different from that listed above. Contact our local sales office for details.

Warranty Information

Warranty Period: Two years from the date the product is shipped from CCS. (However, radiant quantity *warranty is one year)

EXCEPT FOR THE EXPRESS WARRANTIES STATED IN THIS DOCUMENT, CCS MAKES NO ADDITIONAL WARRANTIES, EXPRESS, IMPLIED, OR STATUTORY, AS TO ANY MATTER WHATSOEVER. IN PARTICULAR, ANY AND ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED. EXCEPT AS EXPRESSLY SET FORTH HEREIN, CCS MAKES NO WARRANTIES WITH RESPECT TO THE PRODUCTS.

WARRANTY PERIOD: TWO YEARS (ONE YEAR FOR RADIANT QUANTITY), STARTING FROM CCS Inc. SHIPPING DATE.

CCS Inc. WILL REPAIR OR REPLACE THE PRODUCT FREE OF CHARGE IF IT SHOULD FAIL TO FUNCTION OR IF THE RADIANT QUANTITY OF THE PRODUCT SHOULD DROP TO 50% OR LESS OF ITS INITIAL RADIANT QUANTITY WITHIN THE SPECIFIED WARRANTY PERIOD.
IF EITHER OF THESE CONDITIONS OCCURS, PLEASE TAKE THE PRODUCT TO YOUR CCS SALES REPRESENTATIVE.

WARRANTY TERMS

1. CCS Inc. WILL REPAIR OR REPLACE THE PRODUCT FREE OF CHARGE IF IT SHOULD FAIL TO FUNCTION UNDER USE ON OUR SPECIFIED CONDITION IN ACCORDANCE WITH THE USER MANUAL AND OTHER WRITTEN CAUTIONS DURING THE INDICATED WARRANTY PERIOD OF TWO YEARS.

2. CCS Inc. WILL REPAIR OR REPLACE THE PRODUCT FREE OF CHARGE IF ITS RADIANT QUANTITY SHOULD DROP TO 50% OR LESS OF ITS INITIAL RADIANT QUANTITY UNDER USE ON OUR SPECIFIED CONDITION IN ACCORDANCE WITH THE USER MANUAL AND OTHER WRITTEN CAUTIONS DURING THE INDICATED WARRANTY PERIOD OF ONE YEAR.

3. CCS Inc. WILL CHARGE A REPAIR FEE UNDER THE FOLLOWING CONDITIONS:
1) IF THE PRODUCT HAS BEEN SUBJECTED TO MISUSE, UNAUTHORIZED REPAIRS, OR MODIFICATION FROM ITS ORIGINAL DESIGN.
2) IF THE PRODUCT HAS BEEN DAMAGED FROM IMPACTS DUE TO INAPPROPRIATE HANDLING.
3) IF DAMAGE TO THE PRODUCT RESULTS FROM EXTERNAL CAUSES INCLUDING ACCIDENTS, FIRE, POLLUTION, RIOTS, COMMUNICATION FAILURES, EARTHQUAKES, THUNDERSTORMS, WIND AND FLOOD DAMAGE, OR ANY OTHER ACT OF PROVIDENCE, OR FROM ANY EXTRAORDINARY CONDITIONS SUCH AS ELECTRICAL SURGES, WATER LEAKAGE, CONDENSATION, OR THE USE OF CHEMICALS.
4) IF THE DAMAGE RESULTS FROM CONNECTION TO ANY POWER SUPPLY OR TO ANY EQUIPMENT WHICH CCS Inc. DOES NOT MANUFACTURE OR DOES NOT SPECIFY FOR USE.

4. CCS ASSUMES NO LIABILITY FOR ANY PURCHASER'S SECONDARY DAMAGE (DAMAGE OF EQUIPMENT, LOSS OF OPPORTUNITIES, LOSS OF PROFITS, ETC.) OR ANY OTHER DAMAGE RESULTING FROM A FAILURE OF OUR PRODUCT.

THIS WARRANTY INFORMATION PROVIDES THE SCOPE OF CCS'S PRODUCT WARRANTY WITHIN THE SPECIFIED PERIOD, AND DOES NOT INDICATE OR IMPLY ANY FURTHER GUARANTEE BEYOND THE WARRANTY TERMS.
CONTACT CCS FOR INQUIRIES OR INFORMATION ON REPAIRS TO THE PRODUCT AFTER THE EXPIRATION OF THE WARRANTY.

*THE RADIANT QUANTITY REFERS TO THE WATTAGE OF PHYSICAL ENERGY RADIATED FROM AN LED. IT REFERS TO THE RADIATION LUMINOSITY OF THE LED MEASURED UNDER CONDITIONS SPECIFIED BY CCS OR THE RADIATION ILLUMINATION OF THE LED UNDER SPECIFIED IRRADIATION CONDITIONS. CCS SPECIFIES THE RADIANT QUANTITY FOR EACH LED LIGHT BECAUSE THE MEASUREMENT AND IRRADIATION CONDITIONS VARY FROM THE FORM, THE APPLICATION AND THE IRRADIATION WAVELENGTH.

Notes

- The above warranty applies only to CCS brand products. However, some catalog products, special order products, and optional products may differ from the above warranty.
- Product warranty details differ for each brand. See our website for details. https://www.ccs-grp.com/support/warranty/
- Product warranties for purchased goods are determined by the applicable manufacturer or seller.

Repairs and Returns

Inquire at your CCS sales representative about repairs and returns.

Notes

- To ensure proper and safe use of the product, please read the User Manual completely before using the product.
- The design and specifications of this product are subject to change without notification for product improvement.
- The workpiece imaging examples included in this catalog are intended to serve only as references to help you select a suitable light unit. Please verify the functionality and conditions required for your particular application before you make a final selection. The sample workpieces used in this catalog have been processed specifically for sample imaging. They are not intended to represent product quality and performance.
- Before purchasing the light unit, consider the functionality and use conditions of the corresponding equipment and examine the light unit.

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SQR-56□2	Ring light SQR-56	43
SQR-56RD2-WD		
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U U340-■	Ultraviolet transmission filter	362
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Model names that end with **"TR"**	triniti-enabled LED light	301
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Discontinued Products Information

Discontinued products			Successor	
	Series	Note	Series	
F	FPQ Series, FPQ2 Series	Obsolete	FPQ3 Series	P.57
F	FPR Series (RD/SW/BL/GR type)	Obsolete	FPR Series (RD2/SW2/BL2/GR2 type)	P.55
H	HLDL2 Series	Obsolete	HLDL3 Series	P.73
H	HLDR-IP67-100UV2-365	Obsolete	HLDR-IP67-100UV3-365	P.155
H	HLND Series	Obsolete	LNSD Series	P.225
H	HLV Series, HLV2 Series	Obsolete	HLV3 Series	P.185
H	HPD Series	Obsolete	HPD2 Series	P.105
H	HPR Series	Obsolete	HPR2 Series	P.47
H	HSL Series	Obsolete	HSL-PCL Series (Built to order)	P.159
I	IR Series	Obsolete	IR2 Series	P.171
L	LDL Series	Obsolete	LDL2 Series	P.61
L	LDL Series (Flat type)	Obsolete	TH2 Series (high-luminance type)	P.85
L	LDL-TP Series	Obsolete		
L	LDM2 Series (RD/SW/BL/GR type)	Obsolete	LDM2 Series (RD2/SW2/BL2/GR2 type)	P.109
L	LDQ Series	Obsolete	LDL2 Series	P.61
L	LDR-LA-1 Series (RD/SW/BL/GR type)	Obsolete	LDR-LA1 Series (RD2/SW2/BL2/GR2 type)	P.39
L	LDR2 Series (RD/SW/BL/GR type)	Obsolete	LDR2 Series (RD2/SW2/BL2/GR2 type)	P.31
L	LDR2-LA Series (RD/SW/BL/GR type)	Obsolete	LDR2-LA Series (RD2/SW2/BL2/GR2 type)	P.35
L	LFL Series (RD/SW/BL/GR type)	Obsolete	LFL Series (RD2/SW2/BL2/GR2 type)	P.101
L	LFR Series (RD/SW/BL/GR type)	Obsolete	LFR Series (RD2/SW2/BL2/GR2 type)	P.51
L	LFV Series, LFV2 Series	Obsolete	LFV3 Series	P.127
L	LFV-34-M Series	Obsolete	—	—
L	LFX Series	Obsolete	LFXV / LFX3 Series	P.113 / P.119
L	LFX2 Series	Obsolete		

Discontinued products				Successor		
Series			Note	Series		
L	LKR Series (RD/SW/BL/GR type)		Obsolete	LKR Series (RD2/SW2/BL2/GR2 type)		P.53
	LN Series (RD/SW/BL/GR type)		Obsolete	LN Series (RD2/SW2/BL2/GR2 type)		P.223
	LN-HK Series	SW type (white)	Obsolete	LN-HK Series	SW2 type (white)	P.224
	LND Series		Obsolete	LND2 Series		P.229
	LNSP Series		Obsolete	LNSP2 Series		P.211
	LNSP-UV-FN Series		Obsolete	LNSP-UV3/VL3-FN Series		P.169
	LNV Series (RD/SW/BL/GR type)		Obsolete	LNV Series (RD2/SW2/BL2/GR2 type)		P.237
	LV Series (RD/SW/BL/GR type)		Obsolete	LV Series (RD2/SW2/BL2/GR2 type)		P.191
M	MFU Series	BL type (Blue)	Obsolete	MFU Series	BL2 type (Blue)	P.141
	MSU Series (RD/SW/BL/GR type)		Obsolete	MSU Series (RD2/SW2/BL2/GR2 type)		P.137
P	PFB Series		Obsolete	PFB3(A) Series		P.203
	PFB2 Series		Obsolete			
	PHL-0508-CD24		Obsolete	CC-PJ-0707		P.351
	PSB-512V, PSB-512VL		Obsolete	—		—
	PSB Series		Obsolete	—		—
	PSB2 Series		Obsolete	PSB4-30024-PEI / PSB3-30024		P.355 / P.357
S	SQR Series (RD/SW/BL/GR type)		Obsolete	SQR Series (RD2/SW2/BL2/GR2 type)		P.43
	SQR-TP-28/34-OR		Obsolete	SQR-TP-28/34RD		P.44
	STU-3000		Obsolete	—		—
T	TH Series		Obsolete	TH2 Series (high-luminance type)		P.85
U	UV2 Series		Obsolete	UV3/VL3 Series		P.161

Company Information

Motto

The Spirit of Love and Appreciation for Customers

Philosophy

Advancing Society with the Science of Light

Company Overview

Company name	:	CCS Inc.
Established	:	October 6, 1993
Capital	:	462.15 million yen
Business operations	:	Development, manufacturing and sales of LED Lights and control equipment for image processing. Development, manufacturing and sales of other LED Lights for applications such as microscope light sources, plant cultivation, and art and other museums.

Provide Services Appropriate to All of Our Customers' Needs

Customers in the field of LED lighting for image processing choose CCS because of our lighting solutions and product development capabilities. Customers who are thinking, "I want to capture this image" or "I need to solve this problem," can select the optimal light unit from our product lineup of approximately 2,500 models of products. Additionally, we can create prototypes, and perform design and development of custom ordered products to match your exact needs.

Since we established our company in 1993, we have become a leading company in the industry by accumulating over 60,000 captured workpiece images, and providing design, development and manufacturing of over 15,000 models of custom ordered light units. The experience we've accumulated in various fields such as optics, heat management, lighting control, and evaluation allows us to provide "optimal images" to our customers.

Based on the know-how and skills we have accumulated since our founding, CCS combines various elements, such as light wavelength, illuminating distance, and illuminating angle, to provide a "lighting solution" environment that is perfect for our customers.

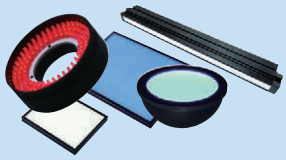
We Believe Strongly in Our Promise of Product Quality

Under the key words of "Quality First", we create products that thoroughly meet our exacting standards of product quality. In order to maintain and improve that product quality, we have introduced ISO 9001 and are developing products based on a design review system. We conduct internal examination throughout all process of product planning, design and production, and also perform our own rigorous quality control from LED selection up until manufacturing, inspection and shipping. Additionally, we secure traceability of the components, assembly, measurement results, shipping and other aspects of each individual product to create a system that can provide support to our customers even after the product is delivered.

At the time CCS was established, we focused on the great potential of LEDs that were only used for display devices and have continuously developed products since then in order to provide reliable product quality that only CCS, with our vast knowledge of LED Lights, can offer.

Achievements — Leading company in the field of LED Lights for image processing

- Largest standard products lineup in the industry with approximately 2,500 models
- Design, development and manufacturing of over 15,000 models of custom ordered light units
- More than 60,000 captured workpiece images
- More than 38,000 free loan products
- 15 locations in Japan, 15 locations outside of Japan, for offering service & support

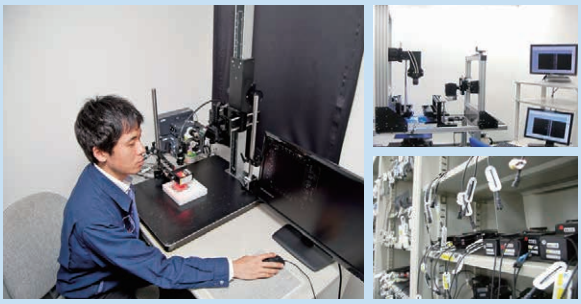


Standard products

Custom ordered light units

Consulting — Pursuing precision lighting

We provide consulting regarding our top world class lighting technology. Each office has a laboratory (Tokyo, Nagoya, and Kyoto are fully equipped with line sensor laboratories) that can be hired for imaging experiments. We suggest light units that are optimal for all of your needs.



Development — Design without compromises

CCS carries out design and development of light units by applying optical, heat, control, evaluation and other technology such as optical, heat and other simulation. We give form to lighting technology by using our unique development capabilities.

Production — High-quality domestic manufacturing

All of our products are manufactured in Japan. We produce small quantities of a large variety of products in order to develop products that match a wide range of needs. Each of our workers have their own individual work station where they take responsibility for all aspects from mounting and assembly to inspection using our own unique inspection equipment.

Application — Discovering new lighting

We are also applying the technology and know-how accumulated in the field of LED light for image processing in order to advance into new fields such as the development of UV LED lights used in manufacturing processes such as panel affixing, and the development of an original natural light LED with characteristics near to those of sunlight.

Business Locations

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TEL: +1-781-272-6900, FAX: +1-781-272-6902
Email: info@ccsamerica.com
https://www.ccsamerica.com/

CCS Europe N.V. (Belgium)

Bergensesteenweg 421B,
1600 Sint-Pieters-Leeuw, Belgium
TEL: +32-(0)2-333-0080
FAX: +32-(0)2-333-0081
Email: sales@ccseu.com

Detroit Testing Room (USA)

2701 Cambridge Crt., Suite 100,
Auburn Hills, MI 48326, U.S.A.

CCS Asia PTE. LTD. (Singapore)

35 Marsiling Industrial Estate Road 3,
#05-03, Singapore 739257
TEL: +65-6363-1180, FAX: +65-6363-1236
Email: sales@ccs-asia.com.sg
http://www.ccs-asia.com.sg/

CCS Asia Malaysia Representative Office

Level 2, Unit 15, Setia SPICE, Jalan Tun Dr Awang,
11900 Penang, Malaysia
Email: sales@ccs-asia.com.sg

Fully-equipped line sensor testing room

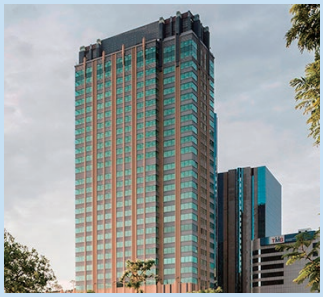
CCS Asia Kuala Lumpur Testing Room (Malaysia)

Suite 755a, Level 7, Oasis Wing, Brunsfield Oasis Tower 3, No. 2, Jalan PJU 1A/7A, Oasis Square, Oasis Damansara, 47301 Petaling Jaya, Selangor, Malaysia
(Contact: CCS Asia Malaysia Representative Office)

CCS MV (Thailand) Co., Ltd.

349 SJ Infinite I Business Complex, 16th Floor, Unit 1607,
Vibhavadi-rangsit Road, Kwaeng Chompol,
Khet Chatuchak, Bangkok 10900, Thailand
TEL: +66-(0)2-7791-1051, FAX: +66-(0)2-7791-1054
Email: salesth@ccs-asia.com.sg

Fully-equipped line sensor testing room



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Email: taiwan-tr@ccs-inc.co.jp

CCS KOREA Inc. (Korea)

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Anyang-si, Gyeonggi-do,
Republic of Korea
TEL: +82-31-360-3656
Email: ccskorea@ccs-inc.co.jp

Fully-equipped line sensor testing room

CCS China Inc. (China)

A407, TCL Building, Gaoxinnan 1st Road,
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P.R. China
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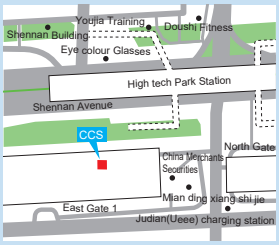
FAX: +86-755-8279-0478
Email: ccschina@ccs-inc.co.jp
https://www.ccs-chn.com/

Fully-equipped line sensor testing room



CCS China Inc. Shanghai Branch (China)

Room 2006, 20/F, Tower 1, Kerry Everbright City, 218
Tian Mu Road West, Jingan District, Shanghai 200070
P.R. China
TEL: +86-21-5835-8728
FAX: +86-21-5835-8928
Email: ccschina@ccs-inc.co.jp
https://www.ccs-chn.com/

Fully-equipped line sensor testing room

CCS China Suzhou Testing Room

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Dong Ping Street, SIP, Suzhou, Jiangsu, China
TEL: +86-189-6251-1166
Email : ccschina@ccs-inc.co.jp
https://www.ccs-chn.com/

Fully-equipped line sensor testing room

Affiliated Companies

EFFILUX SAS (France)

Mini Parc du Verger - Bâtiment E,
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TEL: +33 9 72 38 17 80
FAX: +33 9 72 11 21 69
URL: https://effilux.com/
Email: contact@effilux.fr

EFFILUX GmbH (Germany)

Robert-Bosch-Str. 2A,
50354 Hürth, Germany
TEL: +49 (0)221 28887010
URL : www.effilux.com/de
Email : kontakt@effilux.de

Gardasoft Vision Limited (UK)

Units B & C Trinity Court Buckingway
Business Park, Anderson
Road, Swavesey, Cambridge,
Cambridgeshire, CB24 4UQ, UK
TEL: +44 1954 234970
URL: http://www.gardasoft.com/
Email: vision@gardasoft.com

Business Locations

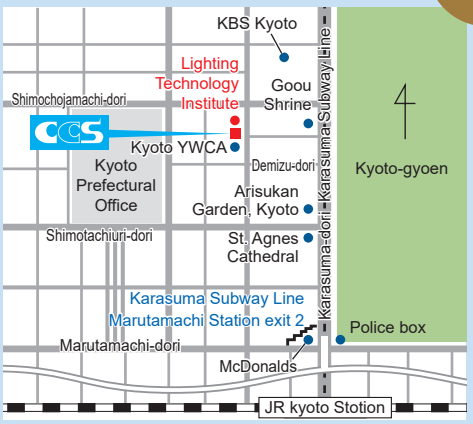
Japan Domestic Offices

Kyoto Head Office / Seibu Sales Office / Testing Room / Kyoto AI Lab

38 Konoe-cho, Demizu-Agaru, Muromachi-dori,
Kamigyo-ku, Kyoto 602-8019, Japan
TEL: +81-75-415-8277 (Sales), FAX: +81-75-415-8278 (Sales)

<Access Information>
From JR Kyoto Station, take the Subway Karasuma Line to Marutamachi Station. 7 minutes walk to left.

Fully-equipped line sensor testing room



Tokyo Sales Office

3F Hamarikyu Intercity 1-9-1, Kaigan, Minato-ku, Tokyo
105-0022, Japan
TEL: +81-3-4346-0560, FAX: +81-3-4346-0561

<Access Information>
6 minutes walk from Hamamatsu-cho Station(JR)
7 minutes walk from Daimon Station (Oedo Subway Line)
4 minutes walk from Takeshiba Station (Yurikamome train)

Nagoya Sales Office / Testing Room

6F Horiuchi Building Part 3, 4-6-23 Meieki, Nakamura-ku,
Nagoya, Aichi 450-0002, Japan
TEL: +81-52-541-6550, FAX: +81-52-541-6050

< Access Information>
3 minutes walk from JR Nagoya Station (Right outside exit 5 of the underground Unimall)

Fully-equipped line sensor testing room

Sendai Sales Office / Testing Room

13F Mitsui-seimei sendai-honcho Building (Azur Sendai),
1-1-1 Honcho, Aoba-ku, Sendai, Miyagi 980-0014, Japan
TEL: +81-22-224-9101, FAX: +81-22-224-9102

<Access Information>
3 minutes walk from the West exit of JR Sendai Station
/3 minutes walk from subway Sendai Station
/3 minutes walk from subway Hirose-dori Station

Kyoto Technology Development and Manufacturing Center

506 Takeda Mukaishiro-cho, Fushimi-ku,
Kyoto 612-8418, Japan
TEL : +81-75-555-3479 FAX : +81-75-555-3480
(Research and Technology Development Unit)
TEL : +81-75-691-5600 FAX : +81-75-691-5601
(Production Unit)

Lighting Technology Institute (Kyoto)

33 Konoemachi, Demizu-Agaru, Muromachi-dori,
Kamigyo-ku, Kyoto 602-8019, Japan
TEL: +81-75-415-2101, FAX: +81-75-432-0101

Sapporo (Hokkaido) Testing Room

Room #201 Sun Court Kita 7-jo Ichibankan, 21-3, Kita 7-jo Higashi 7-chome, Higashi-ku, Sapporo, Hokkaido 060-0907, Japan
TEL: +81-22-224-9101
(Contact: Sendai Sales Office)
<Access Information>
14 minutes walk from JR Sapporo station
9 minutes walk from exit 4 of Subway Higashi-Kuyakusho-Mae Station

Ebisu Testing Room / Tokyo AI Lab

11F Asahi Mutual Life Insurance Co. Ebisu Building
1-3-1, Ebisu, Shibuya-ku, Tokyo 150-0013, Japan
TEL : +81-3-4346-0560
(Contact: Tokyo Sales Office)
<Access Information>
3 minutes walk from Ebisu Station, of both JR Yamanote Line and Hibiya Subway Line

Kanazawa (Ishikawa) Testing Room

Room #301 Royal Park Plaza 1-13-38, Kitayasue, Kanazawa, Ishikawa, 920-0022, Japan
TEL : +81-52-541-6550
(Contact: Nagoya Sales Office)
<Access Information>
9 minutes walk from JR Kanazawa Station by West exit

Moriyama (Shiga) Testing Room

3F Umeda Sky Building 10-1, Umeda-Cho, Moriyama, Shiga, 524-0037, Japan
TEL : +81-75-415-8277
(Contact: Seibu Sales Office)
<Access Information>
7 minutes walk from JR Moriyama Station by West exit

Hakata (Fukuoka) Testing Room

Room #703 1-14-3 Hakataekihigashi, Hakata-ku, Fukuoka, 812-0013, Japan
TEL : +81-75-415-8277
(Contact: Seibu Sales Office)
< Access Information>
5 minutes walk from JR Hakata Station

Omiya (Saitama) Testing Room

Room #608 Charmant 5 3-210-1
Miyahara-cho, Kita-ku, Saitama-shi, Saitama, 331-0812, Japan
TEL: +81-3-4346-0560 FAX: +81-3-4346-0561 (Contact: Tokyo Sales Office)
<Access Information>
4 minutes walk from Miyahara Station on the JR Takasaki line (One minute from JR Omiya station).
7 minutes walk from Kakonomiya Station, Saitama New Urban Transit

Yokohama (Kanagawa) Testing Room

Room #201 Grand Chariot, 1-32-18 Hiranuma, Nishi-ku, Yokohama-shi, Kanagawa 220-0023, Japan
TEL : +81-3-5791-3701
(Contact: Tokyo Sales Office)
< Access Information>
9 minutes walk from JR Yokohama station by East exit.
4 minutes walk from Sagami Railway Hiranumabashi Station by South exit.
6 minutes wlak from Keikyu Tobe Station.

Mikawa Testing Room

Room #1401 Casa Verde, 2-3-8 Mikawa Anjo hon-machi, Anjo City, Aichi 446-0059, Japan
TEL : +81-52-541-6550
(Contact: Nagoya Sales Office)
<Access Information>
6 minutes walk from JR Mikawa anjo station

Yodoyabashi (Osaka) Testing Room

Room #1101 3F Exe Tower Doshomachi 3-3-8, Doshomachi, Chuo-ku, Osaka, 541-0045, Japan
TEL : +81-6-6203-8886 FAX : +81-75-415-8281
(Contact: Seibu Sales Office)
<Access Information>
2 minutes walk from Midosuji Line Yodoyabashi Station

Kumamoto Testing Room

Room #203 Lurashu-toroku, 6-10-51 Toroku, Chūō-ku, Kumamoto, 862-0970, Japan
TEL : +81-75-415-8277
(Contact: Seibu Sales Office)
<Access Information>
10 minutes walk from JR Tōkai-Gakuen-mae Station

I want to verify some various light units but **our company doesn't have a proper environment.**

Resolve by free loan products

I need to **change the wavelength and size of the light unit** for defect testing of electronic parts...

Resolve by custom ordering

These worries can be resolved.

I'm not sure that the light units mounted on my existing testing equipment are okay... **I want to make them more stable.**

Resolve by free consulting

Can the shiny lettering on the surface of a workpiece **be clearly read?**

Resolve by free testing

We can do it because CCS is number one in the industry.

Light unit design

is the key to success in Image Processing!

Testing Room Information

We can satisfy all of your requirements with our rich product assortment.

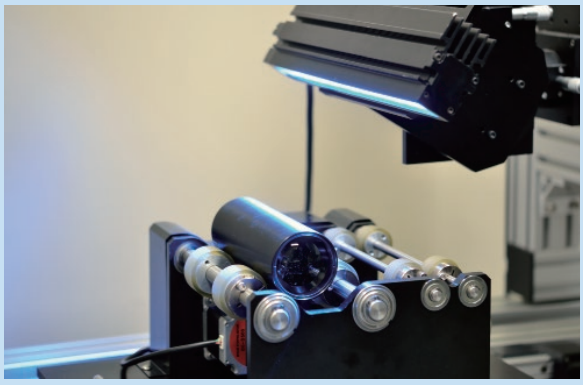
Testing Rooms

CCS has fully-equipped testing rooms where we can find out the optimum inspection conditions for your workpieces. The equipment includes LED lights for machine vision, control units, cameras, lenses, and other peripherals from various manufacturers.
If you want to test a workpiece, send us a sample. We will provide you with the optimal image to meet your needs.
You can use this service free of charge. We are looking forward to helping you.

Line-Sensor Testing Rooms

We have testing rooms especially for line sensor light.

Cylindrical sample test bench

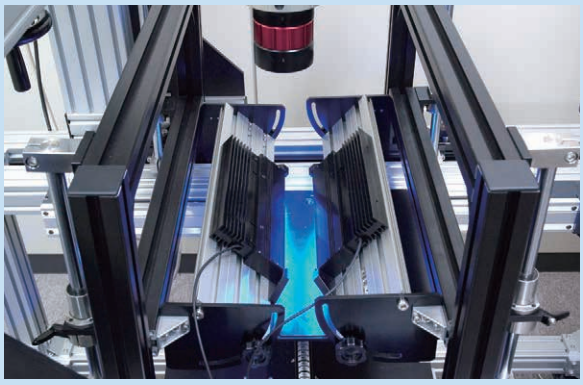


We perform tests that nearly recreate your imaging environment.
We suggest the lighting solution for getting optimal images using our LED lights, control units, and options.

- For customers without line-sensor testing equipment who are concerned about workpiece testing
- Customers who want to bring in line cameras

It is also applicable to various other imaging environments.

Flat sample test bench



Installation example

Optical system (Lens)	Nikon Ai Micro-Nikkor 55 mm f/2.8S Large format lens x 0.7
Camera	8,192 pixel line sensor camera
Image processing	Hardware image processing board
Uniaxial table	Stepping motor Stroke: 600 mm max, 50 mm/sec to 400 mm/sec
Resolution	10 µm x 10 µm to 100 µm x 100 µm
Variety of setups	Direct light setup, diffused light setup, transmitted light setup

In addition to the above, we have a wide variety of lenses and cameras. Please feel free to inquire.

CCS website
www.ccs-grp.com

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CREATING CUSTOMER SATISFACTION