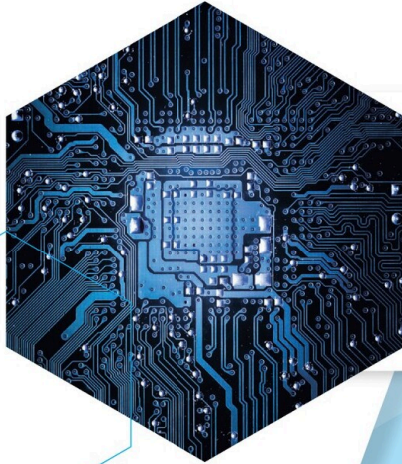


SOLUTIONS IN MACHINE VISION LIGHTING



SOLUTION & TECHNOLOGY

CCS has a high focus on solution - CCS continuously assure our customers of 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

Technology Leadership

- Innovative technology covering all aspects of machine vision lighting from core photonics and spectral illumination, 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 30 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

Customization

- In addition to an extensive standard line-up, CCS also accepts custom orders, whether that be for a specific application or bespoke machine requirements. CCS pays close attention 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 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

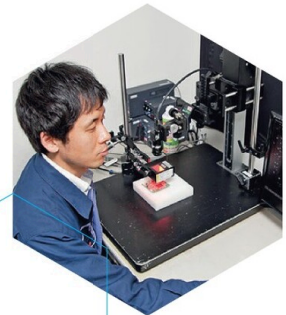
CCS has the global infrastructure and localized services to ensure support for machine vision projects, systems and machines - wherever it is needed.

Support Services

- Providing support reassurance with 33 global business locations 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 ensures professional 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

▶ Lens-Integrated Optical Unit Differential Interference Contrast Unit

NEW

More information on **P.199**

Built to order
This is a built-to-order product. For pricing and details, contact your CCS sales representative.

- Enables detection of tiny scratches or tilts at the nano-level
- Enables high-contrast detection of components of tiny scratches or tilts at nano/micron-levels on mirror-surfaced workpieces, previously difficult with conventional coaxial lights
- Allows for imaging with a wider field of view than conventional differential interference microscopes
- Custom designs suited to field of view or camera sensor size are available upon request
- C mount cameras can be used



▶ Dedicated Spot Light Adapter for PD4-A Series RB-HLV Series

NEW

More information on **P.323**

- Both 24 V light and spot light can be controlled with a single PD4-A Series unit
- Enables use of spot light with brightness equivalent to when using our PJ2 Series Control Units dedicated for spot light
- Enables use of spot light with response speed equivalent to 24 V light
- Eliminates the need for a dedicated control unit for spot light, reducing setup time and saving space



Imaging Solution for Transparent Objects Through Screen Projection

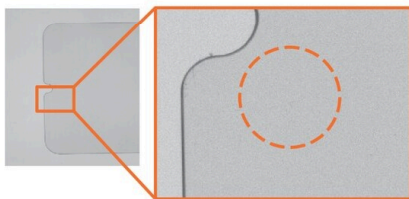
More information on **P.367**

Built to order
This is a built-to-order product. For quotes and specs, contact your CCS sales representative.

Highly directional illumination is achieved by PFBR-150 Series and low-magnification telecentric lens

Enables image capture using the refraction difference for each substance, allowing for imaging of unevenness and striae in transparent objects that are difficult to visualize

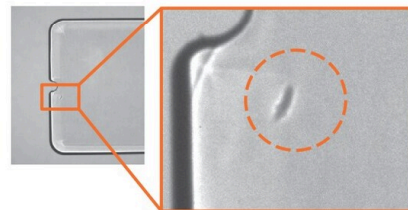
■ Imaging with flat light



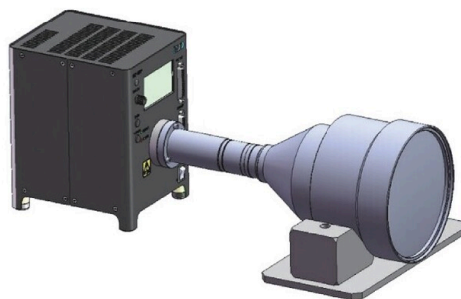
Workpiece dents cannot be visualized



■ Imaging with high-output LED light source (PFBR-150 Series) + low-magnification telecentric lens



High light directivity allows for detection of workpiece dents



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.

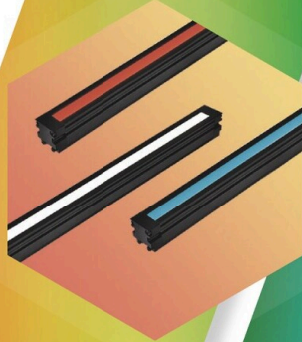




SPECTRAL

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.363 P.373



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.201



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.249



PHOTOMETRIC STEREO SOLUTION

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.299 P.365 P.368



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.

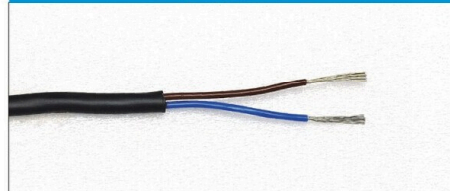
Now You can choose

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.

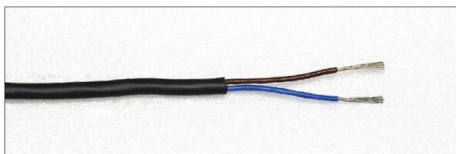
Specifications

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>▶ P.19 Ring Lights LDR2</p> 	<p>▶ P.45 Low-angle Square Lights FPQ3</p> 	<p>▶ P.113 Coaxial Lights LFV3</p> 
<p>▶ P.23 Low-angle Ring Lights LDR2-LA</p> 	<p>▶ P.49 Bar Lights LDL2</p> 	<p>▶ P.123 Coaxial Lights MSU</p> 
<p>▶ P.27 Low-angle Ring Lights LDR-LA1</p> 	<p>▶ P.59 ▶ P.63 Bar Lights HLDL3 / LB</p> 	<p>▶ P.147 Ultraviolet / Violet Lights UV3 / VL3</p> 
<p>▶ P.31 ▶ P.32 Ring Lights / Low-angle Ring Lights SQR / SQR-TP</p> 	<p>▶ P.71 Flat Lights TH2</p> 	<p>▶ P.157 ▶ P.163 Infrared Lights IR2 Series Under 1000-nm Type / IR Series Over 1000-nm Type</p> 
<p>▶ P.33 Ring Lights HLDL3</p> 	<p>▶ P.87 Flat Lights LFL</p> 	<p>▶ P.179 Spot Lights LV</p> 
<p>▶ P.35 Ring Lights HPR2</p> 	<p>▶ P.91 Dome Lights HPD2</p> 	<p>▶ P.215 ▶ P.216 Line Lights LN / LN-HK</p> 
<p>▶ P.39 Ring Lights LFR</p> 	<p>▶ P.95 Dome Lights LDM2</p> 	<p>▶ P.221 Line Lights LND2</p> 
<p>▶ P.41 Ring Lights LKR</p> 	<p>▶ P.97 Dome Lights LAV</p> 	
<p>▶ P.43 Low-angle Ring Lights FPR</p> 	<p>▶ P.99 ▶ P.105 ▶ P.111 Flat Dome Lights / Line Pattern Lights LFXV / LFX3 / LFX3-PT</p> 	

Applicable Products

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INDEX

LED Lights

Ring Lights

Provides direct light from an angled emitting part

P.19

LDR2 Series

For character recognition, visual inspection, and inspection for damage or stains

- Applications: Character recognition, visual inspection, inspection for damage or stains, and reading 2-dimensional code, etc.
- 31 models
- LED colors: ● ○ ● ●



Low-Angle Ring Lights

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

P.23

LDR2-LA Series

For edge extraction, inspection for engraved characters, damage or stains

- Applications: Inspection for engraved characters on metal surfaces, inspection for damage or stains, foreign material inspection, etc.
- 24 models
- LED colors: ● ○ ● ●



Low-Angle Ring Lights

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

P.27

LDR-LA1 Series

For edge extraction, inspection for engraved characters, damage, or stains

- Applications: Inspection for engraved characters on metal surfaces, inspection for damage or stains, foreign material inspection, etc.
- 20 models
- LED colors: ● ○ ● ●



Multi-stage Ring Light

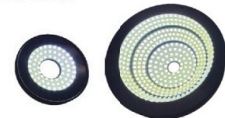
Ring lights supporting multiple inspection items with a single unit

P.30

Multi-stage Ring Light

Switchable among 4 lighting patterns: high-, middle-, and low-angle as well as full lighting

- Applications: Inspection of the appearance of resin parts Inspection of metal surface engraving, scratches, stains, etc.
- LED colors: ○



*This is a custom order product.

Ring Lights

Provides direct light from the upper section

P.31

SQR Series

For character recognition, visual inspection, and inspection for damage or stains

- Applications: Character recognition, visual inspection, inspection for damage or stains, and reading 2-dimensional code, etc.
- 5 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

Direct Lighting

Low-Angle Ring Lights

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

P.32

SQR-TP Series

For edge extraction, inspection for text or damage

- Applications: Visual inspection of metal parts and inspection for damage or stains, etc.
- 2 models
- LED color: ●



Ring Lights

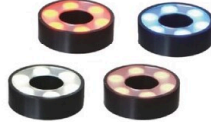
Ring lights using condenser lens suitable for long-distance illumination

P.33

HLDR3 Series

For wide-area, long-distance, and robot picking inspections

- Applications: Exterior inspection of circular workpieces, metal parts, etc.
- 12 models
- LED colors: ● ○ ● ●



Ring Lights

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

P.35

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.39

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.41

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: ● ○ ● ●



LED Lights

Diffused Lighting

Low-Angle Ring Lights

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

P.43

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: ● ○ ● ●



Low-Angle Square Lights

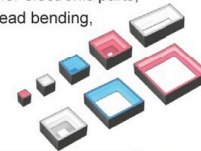
Provides diffused light at a low angle from four directions

P.45

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: ● ○ ●



Bar Lights

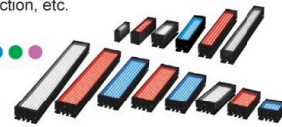
Provides direct light from an emitting part equipped with LEDs in straight lines

P.49

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.
- 144 models
- LED colors: ● ○ ● ● ●



Bar Lights

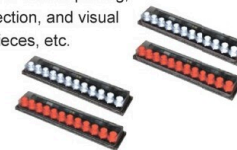
Bar light with built-in controller, perfect even for large workpieces

P.55

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.59

HLDL3 Series

For product identification inspection, visual inspection, and dimension measuring

- Applications: Large workpiece exterior inspection, etc.
- 144 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.

Diffused Lighting

Direct Lighting / Convergent Lighting

LED Lights

Flat Dome Lights

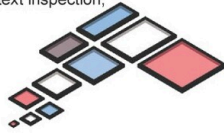
Recreates the effect of a Dome Light with a thin case design

P.99

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

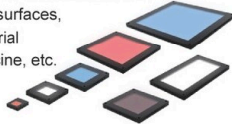
Recreates the effect of a Dome Light with a thin case design

P.105

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

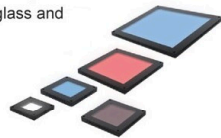
A cutting-edge method for inspecting bumps on a reflective surface

P.111

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

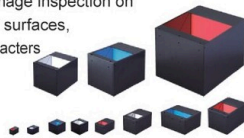
Provides diffused light evenly from the same axis as the camera

P.113

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

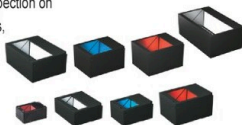
Equipped with a slim half mirror to support imaging using high-resolution cameras

P.119

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

Coaxial Lights

Provides diffused light with high parallelism using original lighting technology

P.123

MSU Series

For damage inspection, character recognition, inspection for dents or stain

- Applications: Inspection for fine damage on glossy surfaces, etc.
- 9 models
- LED colors: ● ○ ● ●



Lens-integrated Parallelism-variable Coaxial Lights

Integrated lens for easy light source and camera optical axis adjustment

P.125

MSU Series

For inspection of scratches and dents

- Applications: Inspection of tiny scratches or dents on glossy surfaces, etc.
- LED color: ○



*This is a custom order product.

Collimated Lighting

Coaxial Lights

Provides diffused light with high parallelism using original lighting technology

P.127

MFU Series

For visual inspection and dimension measuring

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



High Power Strobe Lights

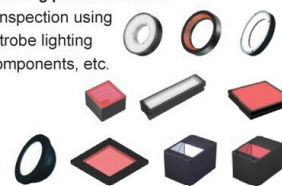
Extremely powerful strobe lighting

P.129

PF Series

For inspection of fast moving production lines

- Applications: Visual inspection using extremely powerful strobe lighting for minuscule chip components, etc.
- 76 models
- LED colors: ● ○



Strobe 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.

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