

# MFU Series

## Instruction Guide



Thank you for purchasing a CCS product. To ensure proper use of the product, please read this instruction guide before use and keep it for your future reference.

### 1 Important Information for Equipment Safety - Read Before Use -

These products have been designed with full consideration of safety. However, incorrect usage of the products may result in fire, electric shock, or other serious damages. Please ensure to follow the conditions below.

The following symbols are used in this instruction guide to indicate and classify the relative importance of warnings and cautions.

	<b>Warning</b> Indicates that incorrect usage may result in serious injury or death.		<b>Caution</b> Indicates that incorrect usage may result in injury or property damage.
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The following symbols in the Instruction Guide indicate and classify the precautions.

These symbols indicate prohibited actions.				This symbol indicates required actions.

<b>Warning</b>	
Do not disassemble or modify the Light Unit. Doing so may result in fire or electric shock.	LED Light radiation may cause corneal or retinal abnormalities if you look directly at the light. To prevent harmful light exposure, never look directly at the LED Light.
Do not touch the Light Unit with wet hands. Doing so may result in electric shock.	This Light Unit generates high temperatures. Do not touch the Light Unit while it is turned on or immediately after it is turned off, or burning may result. Provide cooling with a fan or other ventilation if the Light Unit is to be used in a closed space.
Make sure that the Light Unit is free of moisture or any liquid. Exposure to water may result in fire, electric shock.	Connect or disconnect the light cable only after turning off the power source. Failure to do so may result in circuit damage, fire caused by a minute spark, or electric shock.
If abnormal condition occurs such as fuming, heat, smell, noise, or so on, stop using the Light Unit immediately, and turn off the power source. A fire or electric shock may result if the Light Unit is kept used.	

<b>Caution</b>	
Do not use user-made cables. Doing so may cause product failure. Use the CCS extension cable if it is necessary to extend the distance between the Light Unit and the Control Unit.	Use Control Unit that is suitable for the Light Unit ratings. Using an incorrect Control Unit can cause Light Unit failure.
Be careful of static electricity. Damage to the LED Light may occur, if a person charged with static electricity touches it. Keep the product away from all items charged with static electricity.	Use a standard Extension Cable that is manufactured by CCS. However, if the cable is too long, the light intensity will decrease due to the DC resistance of the cable.
Do not drop the Light Unit or subject it to impact. Doing so may cause the Light Unit to malfunction.	

Do not use the Light Unit in the following situations.

- Under conditions or in an environment not described in this instruction guide.
- In nuclear energy control systems, railroad systems, aviation systems, vehicles, combustion equipment, medical equipment, amusement machines, or safety equipment.
- In applications involving serious risk to life or property, particularly applications demanding a high level of safety.

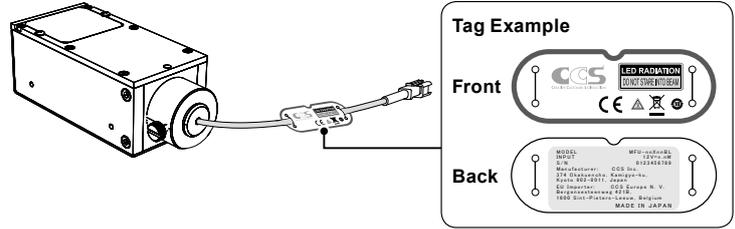
Please install the Light Unit to locations with following conditions. Incorrect installation location may cause Light Unit failure.

- In a flat and stable location with minimal vibration.
- Well-ventilated places with minimal dust.
- Places that are not subject to sudden temperature changes.
- Places free from any water, oil, liquid, chemical, or steam.
- Places free from corrosive or combustible gas.
- Places away from water faucets, boilers, humidifiers, air conditioners, heaters, or stoves.

### 2 Confirming Product Information

The following tag is attached to the cable on the LED Light. The color of the label indicates the luminescence color of the Light. The back of the tag there is a name label that gives the model number, power consumption, and serial number.

Be sure to check the contents before using the product and handle the label with care. If the label is missing or damaged and the contents cannot be checked, please contact CCS Inc.



### 3 Operating Instructions

Make sure that the Control Unit for the LED Light is turned OFF.

**Caution** Thin and delicate glasses are used for the Light Unit. Do not drop it or subject it to impact. Doing so may cause damage to the Light Unit.

#### 1 Connect the light cable of the Light Unit to the Control Unit.

**When the input voltage of the Light Unit is 12 V**

Connect to the Control Unit equipped with **SMP-02V-BC** Connectors for power output.

12 V output Control Units, such as PD2 and PSB series manufactured by CCS, are available for the Light Unit.

**When the input voltage of the Light Unit is 24 V**

Connect to the Control Unit equipped with **SMP-03V-BC** Connectors for power output.

24 V output Control Units, such as PD3 and POD series manufactured by CCS, are available for the Light Unit.

Insert the plug all the way into the connector.

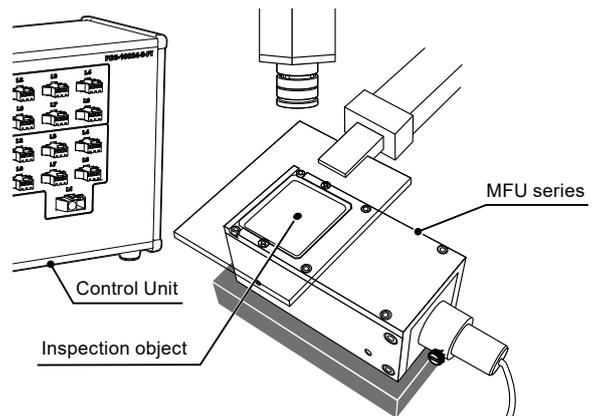
For information on applicable Control Units and cables, refer to the product catalogs or the CCS web pages.

#### 2 Turn ON the Control Unit to turn ON the light.

Read the instruction guide of the Control Unit before use.

#### 3 Adjust light range and radiant quantity to optimize images.

For capturing the image using the Light Unit, it is necessary to use a goniometer stage and others to precisely locate the equipment. For detailed information on imaging procedures, refer to *MFU series Operating Procedures* on the CCS web pages.

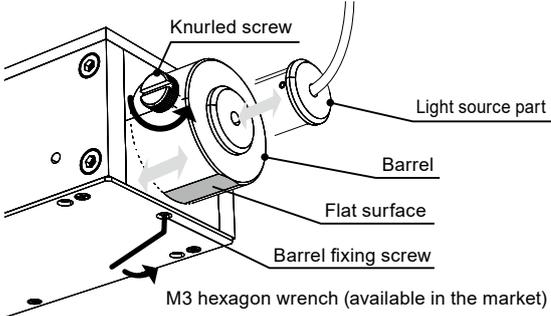


- Conceptual Diagram -

### 3 Operating Instructions (Continued)

#### Changing the Light Source Position

You can change the position of the light source by loosening the knurled screw. Also, you can change the position of the barrel by loosening the barrel fixing screw if necessary.

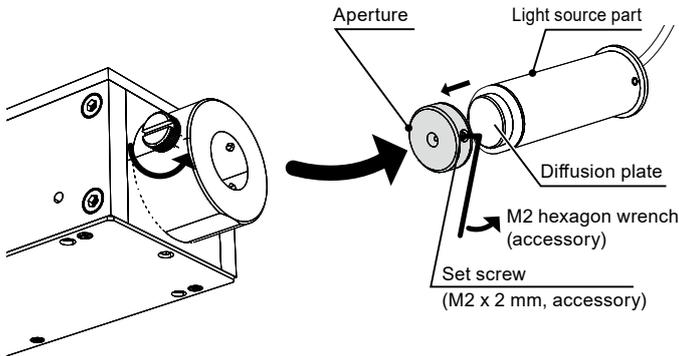


- Caution**
- Do not remove the knurled screw from the barrel. Doing so may allow the barrel falls into the main body.
  - Tighten the barrel fixing screw with the flat surface of the barrel facing downward.

#### Replacing the Aperture

An aperture with an aperture hole diameter of  $\varnothing 1$  is attached to the light source part at the factory shipment. You can change the quantity and distribution of light by replacing the aperture with one of those ( $\varnothing 0.5$  and  $\varnothing 2$ ) that come with the product. Select the most suitable aperture depending on your application.

Aperture hole diameter	Light amount	Light distribution
Small	Small	Narrow
Large	Large	Wide



Note: When replacing the aperture, be careful not to drop the diffusion plate from the light source part. If you drop it, insert it with its glossy, smooth side facing the light source.

#### Precautions

Dust, dirt, or fingerprints on the glass portions of the Light Unit may affect the captured image. In that case, clean the Light Unit as follows:

- Remove dust and dirt by blowing it off with air. Do not touch them with your hand.
- Use a soft, finely woven cloth to wipe away any marks, such as fingerprints.
- Use a soft, finely woven cloth soaked with diluted neutral detergent to remove any heavy dirt.

Handle the Light Unit with care during daily use. Make sure no dust, dirt, or fingerprints adhere to the Light Unit.

### 4 Main Specifications

#### Common Specifications

LED color	Blue
Peak wavelength (typ.)	465 nm
Cable length	300 mm
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 85%RH (with no condensation)
CE marking	Safety standard: Conforms to EN62471
Case material	Aluminum alloy, steel plate, resin
Accessories	Aperture ( $\varnothing 0.5$ ) x 1 pc., aperture ( $\varnothing 2$ ) x 1 pc., set screws (M2 x 2 mm, black) x 3 pcs., M2 hexagon wrench x 1 pc.

#### Specifications by Model

Model name	Input voltage	Connector/polarity	Power consumption (max.)	Weight
MFU-34X30BL2-12	12 VDC	SMR-02V-B 1: (+), 2: (-)	0.9 W	Approx. 0.2 kg
MFU-54X40BL2-12			0.9 W	Approx. 0.4 kg
MFU-34X30BL2-24	24 VDC	SMR-03V-B 1: (+), 2: NC, 3: (-)	1.7 W	Approx. 0.2 kg
MFU-54X40BL2-24			1.7 W	Approx. 0.4 kg



