This Control Unit is specifically designed to control the light intensity of CCS LED Light Units. It is mainly used to control LED Light Units that are used for machine vision and industrial inspections.

**Features**

- One Control Unit can individually control three different Light Units.
- The light intensity can be manually controlled with a dial on the front panel, or externally controlled using Ethernet.
- PWM control is used to control the light intensity at a frequency of 125 kHz.
- External trigger inputs can be used to turn lights ON or OFF, or to strobe lights.
- The Control Unit can be used for CCS LED Light Units with a voltage of 24 V and a power consumption of up to 28 W.

The total power consumption of the connected Light Units must be 28 W or less.

**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.

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**INDEX**

1. Important Information for Equipment Safety
2. Names and Functions of Parts
3. Installation
4. Connections
5. What You Can Achieve with This Control Unit
6. Manual Control
7. Control with External Signals
8. Inputting an External Trigger
9. Troubleshooting
10. Main Specifications
11. Dimensions
12. Optional Accessories
13. Environmental Regulation
14. Warranty Information

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**1 Important Information for Equipment Safety**

--- Read before Use ---

This product has been designed with full consideration of safety. Incorrect usage of the product may result in fire, electric shock, or other serious damages. Observe the following precautions.

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

![WARNING](image)

Indicates that incorrect usage may result in serious injury or death.

![Caution](image)

Indicates that incorrect usage may result in injury or property damage.

**WARNING**

- Do not disassemble or modify the Control Unit. Doing so may result in fire or electric shock.
- Do not touch the plugs or switches with wet hands. Doing so may result in electric shock.
- Make sure that the Control Unit is free of moisture or any liquid. Doing so may result in fire or electric shock.
- Do not touch the power cords during lightning. This may result in electric shock.
- If an abnormal condition occurs, such as burning, heat, smell, or noise, stop using the Control Unit immediately, turn OFF the power source and unplug the power cord. Not doing so may result in fire or electric shock.
- Do not disassemble or modify the Control Unit.
- Do not place the Control Unit in direct sunlight or in a high-humidity environment. Doing so may result in fire due to internal temperature rise.
- Always ground the power cord. Not doing so may cause Control Unit failure due to static electricity destroying electrical components including those in the Light Unit.
- Do not connect any Light Units other than CCS LED Light Units. Doing so may cause overcurrent and the device may overheat or ignite.
- Always use one of the following power cords: 100 to 120 V range: SVT or SJT, AWG18, length: 3 m max., dielectric strength: 125 V min. 200 to 240 V range: H05VV-F, AWG18, length: 3 m max., dielectric strength: 250 V min.
- Plug the power cord directly into an AC outlet. Using a power strip or connecting many loads from one electrical outlet may cause fire or electric shock.
- Do not bundle Control Unit cables with high-voltage lines or power lines. Allow leeway when installing the cables.
- Always place the Control Unit on a stable and flat location. Not doing so may result in the Control Unit falling or toppling, which may cause malfunction, accidents, or bodily injury.
- Always ground the power cord. Not doing so may cause Control Unit failure due to static electricity destroying electrical components including those in the Light Unit.
- Do not drop the Control Unit or subject it to impact. Doing so may cause Control Unit failure.
- Do not disconnect the power cord or pull the power cord. Not doing so may cause Control Unit failure.
- Do not use user-made branch cables. Doing so may cause Control Unit failure.
- Do not connect more than one Light Unit to one Control Unit. Doing so may cause overcurrent and the device may overheat or ignite.
- Do not use Light Units that are suitable for the Control Unit ratings. Exceeding the ratings may cause Control Unit failure.
- Always use a standard Extension Cable that is manufactured by CCS. However, if the cable is too long, the light intensity will decrease due to voltage drop caused by the DC resistance of the cable.
- Do not intentionally short-circuit the positive and negative output terminals.
- Do not disassemble the Control Unit during operation. Pulling on the cable may damage the cable and result in fire or electric shock.
- Use a dry cloth to remove dust or other foreign matter from the electrodes. Failure to do so may result in fire.
- When mounting the Control Units in system racks or cases, do not insert the screws more than 5 mm. Doing so may cause short-circuits in internal components.

---

**Caution**

- Always use one of the following power cords: 100 to 120 V range: SVT or SJT, AWG18, length: 3 m max., dielectric strength: 125 V min. 200 to 240 V range: H05VV-F, AWG18, length: 3 m max., dielectric strength: 250 V min.
- Plug the power cord directly into an AC outlet. Using a power strip or connecting many loads from one electrical outlet may cause fire or electric shock.
- Do not bundle Control Unit cables with high-voltage lines or power lines. Allow leeway when installing the cables.
- Always place the Control Unit on a stable and flat location. Not doing so may result in the Control Unit falling or toppling, which may cause malfunction, accidents, or bodily injury.
- Always ground the power cord. Not doing so may cause Control Unit failure due to static electricity destroying electrical components including those in the Light Unit.
- Do not drop the Control Unit or subject it to impact. Doing so may cause Control Unit failure.
- Do not disconnect the power cord or pull the power cord. Not doing so may cause Control Unit failure.
- Do not use user-made branch cables. Doing so may cause Control Unit failure.
- Do not connect more than one Light Unit to one Control Unit. Doing so may cause overcurrent and the device may overheat or ignite.
- Do not use Light Units that are suitable for the Control Unit ratings. Exceeding the ratings may cause Control Unit failure.
- Always use a standard Extension Cable that is manufactured by CCS. However, if the cable is too long, the light intensity will decrease due to voltage drop caused by the DC resistance of the cable.
- Do not intentionally short-circuit the positive and negative output terminals.
- Do not disassemble the Control Unit during operation. Pulling on the cable may damage the cable and result in fire or electric shock.
- Use a dry cloth to remove dust or other foreign matter from the electrodes. Failure to do so may result in fire.
- When mounting the Control Units in system racks or cases, do not insert the screws more than 5 mm. Doing so may cause short-circuits in internal components.
## Names and Functions of Parts

### Setting Indicators
- **BRT lit:** The light intensity can be set.
- **PLS lit:** The lighting mode can be set.
- **LOCK lit:** The settings are locked.

### Channel Selection Switch
Selects L1, L2, or L3.

### External Control Connector
Used for external control with Ethernet communications.

### External Control Reset Switch
Pressed with a pointed object to reset the settings.

### Manual/External Mode Selector
Selects manual (MANU) or external (EXT) control mode.

### Trigger Logic Switch
Selects the logic of the trigger signal.

### AC Inlet
Connects the power source to the Control Unit.

## Installation

### Mounting the Unit to DIN Rail

#### Mounting to DIN Rail
Hook the tab on the upper part of the Unit on the DIN rail and press the Unit in the direction indicated by arrow 2 while pressing it in the direction indicated by arrow 1.

#### Removing from DIN Rail
Press the Unit down in the direction indicated by arrow 1 and pull it out in the direction indicated by arrow 4.

### Securing the Unit with Base Brackets

#### Removing the Rubber Feet from the Bottom of the Unit
Remove the screws that hold the rubber feet in place using a Phillips screwdriver.

#### Securing the Brackets to the Base of the Unit
Secure the Brackets to the base of the Unit with the four screws that come with the Brackets.

#### Securing the Unit with Mounting Screws
Secure the Unit in place with mounting screws. The mounting screws must be provided by the user.

## Connections

### Output Connectors (L1 to L3)

#### Connecting
Insert the connector to the Light Unit all the way in.

#### Removing
Press the lock and pull out the connector.

### External Control Connector (EXTERNAL)

#### Connecting
Firmly insert the connector of the LAN cable.

#### Removing
Press the lock and pull out the connector.

### External Trigger Input Connector (TRIG IN)

#### Connecting
Press the connector in until it locks in place.

#### Removing
Release the lock and remove the connector.

### AC Inlet
Connect the power cord to the Control Unit and the AC outlet. The Control Unit will turn ON when power is supplied from the main power source. When the Unit is ON, the digital display will light.

*An optional External Trigger Input Cable (EXCB2-M10-3) (sold separately) is available. In case using a self-made cable, cable length should be within 3 m at maximum.

### Recommended specifications

- **Ratings:**
  - Line-to-line insulation: 100 MΩ
  - Wire diameter: 1.0 mm² min.
  - Socket: EN 60320-1 certified C13 type

- **Input Specifications:**
  - Input voltage: 200 to 240 VAC
  - Input current: 10 A max.

- **Output Specifications:**
  - Output voltage: 2,000 VAC/minute

*If you would like to use the Control Unit with 200 to 240 VAC, you must procure appropriate AC power cord.

---

**WARNING**
Do not place any objects within 20mm from the air vents on the side panels. Insufficient ventilation may cause heat to accumulate inside the product and result in a fire.

Before connecting the Control Unit, make sure that the main power source is turned OFF. Making connections with the power turned ON may result in a fire or electric shock.
5 What You Can Achieve with This Control Unit

Select the control mode and lighting mode from the following Application Guide and proceed to the indicated reference items.

*Data that has been set is retained even after the power is turned OFF with manual or external control.

### Application Guide

<table>
<thead>
<tr>
<th>Lighting mode</th>
<th>Control mode</th>
<th>Front panel operation</th>
<th>External control using a PLC or image process device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous Mode</td>
<td>The Light Units are always ON.</td>
<td>To use manual control in Continuous Mode, refer to items 1, 2, and 3 under 6 Manual Control.</td>
<td>To use external control in Continuous Mode, refer to items 1, 2, and 3 under 7 Control with External Signals.</td>
</tr>
<tr>
<td>ON/OFF Mode</td>
<td>The Light Units are turned ON or OFF according to the external trigger signal input.</td>
<td>To use manual control in ON/OFF Mode, refer to items 1, 2, and 3 under 6 Manual Control and 8 Inputting the External Trigger.</td>
<td>External trigger signal or Ethernet communications setting can be selected when using ON/OFF mode by external control.</td>
</tr>
<tr>
<td>Strobe Mode</td>
<td>The Light Units are turned ON for a set time after the external trigger signal is input.</td>
<td>To use manual control in Strobe Mode, refer to items 1, 2, and 3 under 6 Manual Control and 8 Inputting the External Trigger.</td>
<td>To use external control in Strobe Mode, refer to items 1, 2, and 3 under 7 Control with External Signals and 8 Inputting the External Trigger.</td>
</tr>
</tbody>
</table>

### 6 Manual Control

- Make sure that the main power source is turned ON.
- Set items 1, 2, and 3 when using Continuous Mode or ON/OFF Mode.*
- Set items 1, 2, 3, and 4 when using Strobe Mode.

* If you have changed the lighting mode from the default value, set it to “Continuous Mode or ON/OFF Mode” in item 4.

1 Setting the Manual/External Mode Selector to Manual

Set the Manual/External Mode Selector to MANU to set Manual Mode.

Check

Make sure that the LOCK setting indicator is not light and that the trigger logic switch is set to HIGH. Otherwise you may not be able to perform the rest of this procedure.

2 Selecting the Channel

Press the channel selection switch to select the channel to set (L1 to L3). The channel indicators will change.

3 Setting the Light Intensity

Press the setting switch to light the BRT setting indicator.

Turn the setting switch to set a value between 0 and 255.

(Default setting: 000, Minimum: 000, Maximum: 255)

* The Light Units are light dimly at the minimum value.

4 Selecting the Lighting Mode

Press the setting switch to light the PLS setting indicator.

Turn the setting switch to select the lighting mode from Continuous Mode, ON/OFF Mode, or Strobe Mode.

(Default value: F00)

Continuous Mode

Turn the setting switch and set F00 to turn ON the Light Units continuously.

ON/OFF Mode (If the external trigger is not used, the Light Units are ON continuously.)

Turn the setting switch and set F00 to turn the Light Units ON and OFF. The Light Units are turned ON or OFF according to the external trigger signal input.

Strobe Mode (If the external trigger is not used, the Light Units are ON continuously.)

To flash the strobe, turn the setting switch and select a setting from F01 to F10 (strobe time of 40 μs to 40 ms).

The Light Units are turned ON for the period of time set on the setting switch after the external trigger signal is input.

5 Locking Settings

When the setting switch is pressed for 2 seconds or longer, the lighting mode and light intensity settings are locked, and the LOCK setting indicator lights. (The set values can be viewed.) Pressing the switch again for 2 seconds or longer releases the lock.
## Command Formats

### Send Data (*1)

<table>
<thead>
<tr>
<th>Function</th>
<th>Header</th>
<th>Channel specification</th>
<th>Instruction</th>
<th>Send Command</th>
<th>Checksum</th>
<th>Delimiter</th>
<th>Default (*4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Intensity Setting</td>
<td>@00 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>00 to 255 (00: Minimum intensity; 255: Maximum intensity)</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>Lighting Mode Setting</td>
<td>@00 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>00 to 255 (00: Minimum: 100; Maximum: 255)</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>ON/OFF Setting</td>
<td>@00 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>00 to 255 (00: Minimum intensity; 255: Maximum intensity)</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>Status Check (interface check)</td>
<td>@00 (fixed)</td>
<td>0000-0000-0000-0000</td>
<td>FF</td>
<td>Status code</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>All Channel Initialization</td>
<td>@00 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>Status code</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>IP Address</td>
<td>@01 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>IP address</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>@01 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>Subnet Mask</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>Default Gateway</td>
<td>@01 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>Default Gateway</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>Reply IP Address</td>
<td>@01 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>Reply IP address</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>Reception Port Setting</td>
<td>@01 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>Reception Port Setting</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Function</th>
<th>Header</th>
<th>Channel specification</th>
<th>Instruction</th>
<th>Send Command</th>
<th>Checksum</th>
<th>Delimiter</th>
<th>Default (*4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Channel Status Check</td>
<td>@00 (fixed)</td>
<td>0000-0000-0000-0000</td>
<td>FF</td>
<td>Status code</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
</tbody>
</table>

### Receive Data (*3)

<table>
<thead>
<tr>
<th>Function</th>
<th>Header</th>
<th>Channel specification</th>
<th>Instruction</th>
<th>Send Command</th>
<th>Checksum</th>
<th>Delimiter</th>
<th>Default (*4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Intensity Setting</td>
<td>@00 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>00 to 255 (00: Minimum intensity; 255: Maximum intensity)</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>Lighting Mode Setting</td>
<td>@00 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>00 to 255 (00: Minimum: 100; Maximum: 255)</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>ON/OFF Setting</td>
<td>@00 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>00 to 255 (00: Minimum intensity; 255: Maximum intensity)</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>Status Check (interface check)</td>
<td>@00 (fixed)</td>
<td>0000-0000-0000-0000</td>
<td>FF</td>
<td>Status code</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>All Channel Initialization</td>
<td>@00 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>Status code</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>IP Address</td>
<td>@01 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>IP address</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>@01 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>Subnet Mask</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>Default Gateway</td>
<td>@01 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>Default Gateway</td>
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<td>Reply IP Address</td>
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<td>Refer to Channel Specification</td>
<td>FF</td>
<td>Reply IP address</td>
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<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
<tr>
<td>Reception Port Setting</td>
<td>@01 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>Reception Port Setting</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
</tbody>
</table>

### Example

**Setting the Light Intensity of Channel 2 to 125**

<table>
<thead>
<tr>
<th>Function</th>
<th>Header</th>
<th>Channel specification</th>
<th>Instruction</th>
<th>Send Command</th>
<th>Checksum</th>
<th>Delimiter</th>
<th>Default (*4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Intensity Setting</td>
<td>@00 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>00 to 255 (00: Minimum intensity; 255: Maximum intensity)</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
</tbody>
</table>

**Setting the L1 light intensity to 123, L2 light intensity to 255.**

@00E01192.168.003.00230CRLF

**Setting the L2 light intensity to 045.**

@00E02255.255.255.00035CRLF

**Setting the L3 light intensity to OFF.**

@00E03000.000.000.00030CRLF

### Setting the Lighting Mode

<table>
<thead>
<tr>
<th>Function</th>
<th>Header</th>
<th>Channel specification</th>
<th>Instruction</th>
<th>Send Command</th>
<th>Checksum</th>
<th>Delimiter</th>
<th>Default (*4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighting Mode Setting</td>
<td>@00 to @02</td>
<td>Refer to Channel Specification</td>
<td>FF</td>
<td>00 to 255 (00: Minimum: 100; Maximum: 255)</td>
<td>@00</td>
<td>@00OEFCRLF</td>
<td>(\text{FF})</td>
</tr>
</tbody>
</table>

**Setting the L1 light intensity to 123, L2 light intensity to 045.**

@00E01192.168.003.00230CRLF

**Setting the L2 light intensity to 255.**

@00E02255.255.255.00035CRLF

**Setting the L3 light intensity to OFF.**

@00E03000.000.000.00030CRLF

### Setting Procedures

- **Make sure that the main power source is turned ON.**
- **Set items 1, 2, and 3 when using Continuous Mode.**
- **Set items 1, 2, 3, and 5 when using ON/OFF Mode.**
- **Set items 1, 2, 3, and 6 when using Strobe Mode.**

### Setting the Manual/External Mode Selector to External

- **Set the Manual/External Mode Selector to EXT to set External Mode.**
- **All Channel settings will be initialized after the power supply is turned ON.**

### Setting Up the Network (Only Initially and When Settings Are Changed)

- **Set the Unit’s IP address and the reply address.**
- **Enable the settings that were changed, cycle the power supply.**

- **If the IP address changes, do not forget to change the send destination of commands.**

### Setting the Light Intensity

- **Specify the channel and set the light intensity.**

### Setting the Lighting Mode

- **Specify the channel and set the lighting mode.**

### To Set ON/OFF Signal in ON/OFF Mode

- **Specify the channel and set ON/OFF signal.**

### To Check the Setting Status

- **When checking the setting status, send the following command after specify the channel.**

### Checking the Unit Status

- **Send the following command to check the Unit status.**

### Reseting the Light Intensity and Lighting Mode

- **To restore the external control setting to default value, send the following command.**

### Initialize the Network Setting

- If the IP address setting and others is incorrect, you will not be able to connect to the Control Unit. You will also not be able to reset the IP address and others. If that occurs, use a point object to press the external control reset switch on the front panel to reset network settings to their default values. To enable the reset settings, cycle the power supply.
8 Inputting an External Trigger

### Input Signal and Photocoupler

The input signal from the external trigger input connector can be used to control the photocoupler inside the Unit to turn the LED Light Units ON and OFF or to control strobe timing. The operation depends on the setting of the trigger logic switch.

<table>
<thead>
<tr>
<th>Trigger Logic Switch</th>
<th>Input Signal</th>
<th>Photocoupler</th>
<th>ON/OFF Mode</th>
<th>Strobe Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>HIGH</td>
<td>OFF</td>
<td>ON</td>
<td>Strobe ON</td>
</tr>
<tr>
<td></td>
<td>LOW</td>
<td>ON</td>
<td>No change</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When operating trigger signal input and Ethernet communications at the same time in ON/OFF mode, when trigger logic switch is at HIGH, if either control setting is OFF setting, Light unit will be turned OFF. When trigger logic switch is at LOW, if either control setting to ON setting, Light unit will be turned ON.

### External Trigger Signal Connection Example

#### External Circuits

<table>
<thead>
<tr>
<th>External Circuits</th>
<th>PD3 Control Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transistor (NPN)</td>
<td>open collector</td>
</tr>
<tr>
<td>Transistor (NPN)</td>
<td>open collector</td>
</tr>
<tr>
<td>Transistor (NPN)</td>
<td>open collector</td>
</tr>
</tbody>
</table>

#### Signal Specifications

<table>
<thead>
<tr>
<th>Signal specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
</tr>
<tr>
<td>24 VDC</td>
</tr>
<tr>
<td>36 VDC</td>
</tr>
<tr>
<td>48 VDC</td>
</tr>
<tr>
<td>50 VDC</td>
</tr>
<tr>
<td>54 VDC</td>
</tr>
<tr>
<td>10 μs (per terminal)</td>
</tr>
</tbody>
</table>

#### Trigger Input Sequence Diagram

**ON/OFF Mode**

- **Trigger Logic Switch Set to HIGH**
  - The Light Units turn ON when the photocoupler is OFF, and OFF when the photocoupler is ON.

- **Trigger Logic Switch Set to LOW**
  - The Light Units turn ON when the photocoupler is ON, and OFF when the photocoupler is OFF.

**Strobe Mode**

- **Trigger Logic Switch Set to HIGH**
  - The Light Units are turned ON when the photocoupler OFF in Strobe Mode, the starting point of the reentered trigger is taken as the start time and the strobe light continues for the set time from that point.

- **Trigger Logic Switch Set to LOW**
  - From the point where the photocoupler goes OFF, the Light Units are turned ON for the set time (40 µs to 40 ms).

### Setting Procedures

With the external trigger input connector pins 1 to 3, select the channels (L1 to L3) where you want to input an external trigger, and input the trigger. Trigger signals are input from the external trigger input connector in ON/OFF Mode and Strobe Mode in both Manual Mode or External Mode.

**ON/OFF Mode**

- The Light Units are turned ON or OFF according to the external trigger signal input.

**Strobe Mode**

- The Light Units are turned ON for the set time after the external trigger signal is input.

### Troubleshooting

If the consumption current of Light Units exceeds 107% higher than the rated current, the overcurrent protection operates and stops the output. OCP will be displayed on the digital display. Please check the rated current of Light Units and connect the Light Units under the rated current of this control unit.

Please press Setting Switch for over a second to reset the OCP error. (OCP error can be reset by rebooting.)

**Error Output**

When detecting the error during external control, command will be received as acknowledgement for checking status (over current confirmation) command “C”.

* Immediately after the error, occurrence of an error will be noticed only once by using UDP protocol. Notify data is the same as checking status (over current confirmation) command “C”.

For details, refer to 7. Control with External Signals.
10 Main Specifications

- **Product name**: Digital Control Unit for LED Light Units (with Ethernet communications)
- **Model**: PD3-3024-3-EI(A)
- **Applicable Light Unit rating**: 24 V, 28 W
- **PWM frequency**: 125 kHz
- **Input power**: 100 to 240 VAC (+10%, −15%), 78 VA, 50/60 Hz
- **Input current (typ.)**: 15 A (at 100 VAC), 30 A (at 200 VAC) from a cold start
- **Ground leakage current**: 3.5 mA max. (284 VAC, 60 Hz, with no load)
- **Rated output voltage**: 24 VDC
- **Rated output current**: Total for 3 channels: 1.1 A
- **Insulation withstand voltage**: 1,500 VAC for one minute, Cutoff current: 10 mA, 500 VDC, 20 MD min.
- **Operating temperature and humidity**: Temperature: 0 to 40°C, Humidity: 20% to 85% (with no condensation)
- **Storage temperature and humidity**: Temperature: −20 to 60°C, Humidity: 20% to 85% (with no condensation)
- **Vibration resistance**: Acceleration: 19.6 m/s², Frequency: 10 to 55 Hz, Cycles: 3 minutes, Sweep cycle: For 1 hour each in X, Y, and Z directions
- **Cooling method**: Natural air cooling
- **CE Marking**: Safety standard: Conforms to EN61010-1, EXAC standard: Conforms to EN 61233, Class A
- **Environmental regulations**: RoHS compliant
- **Input connector**: AC input: 3-pin INlet EN 60320-1 certified C14 type × 1
- **Output connectors**: Light output: SMP-03V-BC (J.S.T. Mfg. Co., Ltd.) x 3
- **External control connector**: Trigger input: MIL connector (MIL-C-83503 compliant), 10-pole
- **Material and surface processing**: Material: Aluminum and resin, Surface processing: Blue alumite
- **Weight**: 600 g max.
- **Accessories**: One 2-m long 3-pin power cord with ground terminal, Instruction Guide

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**EU RoHS Directive**

The EU RoHS Directive is short for "the restriction of use of certain hazardous substances in electrical and electronic equipment." As a directive, it restricts the use of specific hazardous substances for new electrical and electronic equipment marketed in the EU or on or after July 1, 2006, and restricts the use of six substances, which are (1) lead, (2) mercury, (3) cadmium, (4) hexavalent chromium, (5) polybrominated biphenyl (PBB), and (6) polybrominated diphenyl ether (PBDE). This regulation restricts the usage of six substances such as lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE). The number used in this logo is based on "Management Methods for Controlling Pollution by Electronic Information Products", which was implemented on March 1, 2007 in China. Same as EU RoHS Directive, China RoHS Directive is formally known as "Management Methods for Controlling Pollution by Electronic Information Products", which was implemented on March 1, 2007 in China. Same as EU RoHS Directive, this regulation restricts the usage of six substances such as lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE). This regulation requires electronic information products which are manufactured or imported, and sold in China, to clearly disclose contents of the 6 restricted substances listed below.

**Name and Amount of Toxic and Hazardous Substances or Elements**

- **Usage details for toxic and hazardous substances or elements**
- **Product name**: Lead
- **CAS number**: 7439-92-1
- **Name of toxic or hazardous substance or element**: Lead
- **Content**: 1000 ppm max.
- **Usage**: Included two Base Brackets and four mounting screws

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**Environmental Protection**

Do not use the product 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.

- Contents of this Instruction Guide may be changed without prior notice.
- Illustrations used in this Instruction Guide may differ from actual products.
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**Warranty Information**

1. **WARRANTY PERIOD**: TWO YEARS, STARTING FROM CCS Inc. SHIPMENT DATE.
2. **WARRANTY TERMS**
   - 1) CCS Inc. WILL REPAIR OR REPLACE THE PRODUCT FREE OF CHARGE IF IT SHOULD FAIL TO FUNCTION WITHIN THE SPECIFIED WARRANTY PERIOD. IF EITHER OF THESE CONDITIONS OCCURS, PLEASE TAKE THE PRODUCT TO YOUR CCS SALES REPRESENTATIVE.
   - 2) CCS Inc. WILL CHARGE A REPAIR FEE UNDER THE FOLLOWING CONDITIONS:
     - a) IF THE PRODUCT HAS BEEN SUBJECTED TO MISUSE, UNAUTHORIZED REPAIRS, OR MODIFICATION FROM ITS ORIGINAL DESIGN.
     - b) IF THE PRODUCT HAS BEEN DAMAGED FROM IMPACTS DUE TO IMPROPER HANDLING.
     - c) IF THE PRODUCT RESULTS FROM EXTERNAL CAUSES INCLUDING ACCIDENTS, FIRE, POLLUTION, RUSTS, COMMUNICATION FAILURES, EARTHQUAKES, THUNDERSTORMS, WIND AND FLOOD DAMAGE, OR ANY OTHER ACT OF PROVIDENCE, OR ANY EXTRAORDINARY CONDITIONS SUCH AS ELECTRICAL SURGES, WATER LEAKAGE, CORROSION, OR THE USE OF CHEMICALS.
     - d) IF THE PRODUCT FAILS TO FUNCTION TO ANY LED LIGHT UNIT OR TO ANY EQUIPMENT WHICH CCS INC. DOES NOT MANUFACTURE OR DOES NOT OFFER FOR USE.
   - 3) 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.

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**Ask any product queries to the following address or to your nearest CCS representative.**

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Use our website to find your nearest CCS representative. [http://www.ccs-grp.com](http://www.ccs-grp.com)