

■ Support for the China RoHS directive



For details on the support for the China RoHS directive (the Administrative Measure on the Control of Pollution Caused by Electronic Information Products), see the following website.

http://www.optex-fa.com/rohs_cn/

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0646911



- Thank you for purchasing this “OPPD-30E” LED Lighting Controller with Ethernet Connectivity.
- Before using this product, please read this user's manual carefully to ensure proper use.
- Please keep this manual at hand for proper use.
- This product is a dedicated LED controller for industrial LED lighting as a machine vision light source.
- The warranty period of this product is two years, starting from the delivery date.
Optex FA will repair or replace the product free of charge if it should fail to function within the specified warranty period.
However, any fault attributable to natural disasters or any other similar disasters or undue alteration or repair will be excluded from the scope of the warranty.

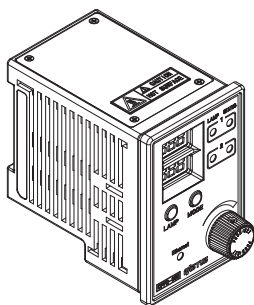
Introduction

Features

LED Lighting Controller with Ethernet Connectivity “OPPD-30E”

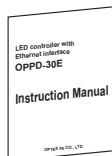
- This is a PWM controlled power supply (lighting frequency: 100 kHz, 1,000 steps) for LED lighting devices.
- Capable of lighting brightness/temperature monitoring and feedback control by utilizing “FALUX sensing.”
- The external illumination control input supports external light intensity control.
- The illumination control input is a 12-30 V input type.
- Lighting control sequences can be used to separately set light intensity values and light emitting widths registered to up to four sequences.
- External light intensity control can be performed via Ethernet.
- Ethernet communication supports Mitsubishi Electric iQSS.
- A lighting control sequence reset function has been added. (Version 4/2 or later.)

The following items are contained in the package. Make sure that everything is in place.



OPPD-30E unit

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Instruction Manual

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Product Lineup

Model	PWM frequency	Light intensity control	Lighting output	Capacity	Input voltage	Version (display version/controller version)
OPPD-30E	100 kHz	1,000 steps	2 ch	30 W	24 VDC $\pm 10\%$	5/2 or later

Versions

You can use the setting reference mode to check the following versions.

Display version (dUr): Displays the software version of the user interface.

Controller version (PUr): Displays the logic version of the controller.

Lighting device version (LUr): Displays the software version of the connected lighting device.

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Safety Precautions















Safety precautions for ensuring safe operation of this product are displayed as follows with the following symbols. Precautions listed here describe important information about safety. Make sure to follow them accordingly.

Safety Symbols

The safety symbols and their meanings are as follows.

 Warning	Indicates that any improper operation or handling may result in moderate or minor injury, and in rare cases, serious injury or death. Also indicates a risk of serious property damage.
 Caution	Indicates that any improper operation or handling may result in minor injury or property damage.

 Warning	
	Do not disassemble, repair, modify, deform under pressure, or attempt to incinerate this product. Doing so may cause injury or fire.
	Do not use this product in water or in a location where it may be exposed to water. Do not use this product if wet. Doing so may cause a fire or damage the product.
	This product is not explosion-proof and should not be used around flammable or explosive gases or liquids. Doing so may cause ignition resulting in a fire.
	Do not use air dusters or any spray that uses flammable gas around the product or on the inside of the product. Doing so may cause ignition resulting in a fire.
	Do not install this product in any of the following locations. Doing so may cause a fire, damage, or a malfunction. 1. Locations where dust, salt, iron powders, or vapor (steam) is present. 2. Locations subjected to corrosive gases or flammable gases. 3. Locations where water, oil, or chemical splashes may occur. 4. Locations where heavy vibrations or impacts may occur. 5. Locations where the ambient temperature exceeds the rated range. 6. Locations subject to rapid temperature changes (or where condensation occurs). 7. Locations with strong electric or magnetic fields. 8. Outdoor locations or locations subject to direct sun light.
	Do not use this product in a non-industrial environment. Doing so may cause induction or radiation interference.
	In the event of a malfunction such as smoke comes out from the product If you detect any malfunction including emission of smoke, abnormal smells or sounds, or the housing becoming very hot, immediately stop operating the product and turn off the power to the controller. Doing so may cause a fire. Repairing the product is dangerous and should in no way be performed by the customer. Contact the Optex FA sales office.
	In case water enters the product If water or any other liquid enters the product, immediately stop operating the product and turn off the power to the controller. Using the product in this condition may cause a fire.

 Caution	
	Do not touch the product with wet hands. Doing so may damage the product.
	Do not drop the product or subject the product to strong impacts. Doing so may damage the product.
	During operation, this product becomes very hot. Do not keep touching it. Doing so may cause a low-temperature burn.
	Follow the instructions in this manual or the specified instruction manual when wiring the product for the correct wiring method. Incorrect wiring can damage the product or cause a malfunction. Output cannot be connected with other LED controller in series nor in parallel.
	Use the dedicated cable for connecting the product to the lighting. Use of anything other than the dedicated cable may cause a malfunction or damage the product.
	Do not excessively twist or apply stress to the cable. Doing so may damage the cable or the connector.
	When connecting the cable, make sure to hold it by the connector portion, and do not apply excessive force to the cable.
	When disconnecting the connector, be careful not to touch the terminals inside the connector, and do not allow foreign objects to enter the connector.
	Route wiring separately from high-voltage circuits and power circuits. If the wires are routed together, induction may occur, which can cause a malfunction or damage the product. If this is unavoidable, use a conductive object such as a properly grounded conduit as a shield.
	Install this product as far away from high-voltage equipment, power equipment, equipment that generates large switching surges, welders, inverter motors, or any equipment that can be a source of noise.
	Use the product within the rated ranges.
	Install this product and the dedicated controller securely. Failure to ensure secure installation can result in the products falling and becoming damaged.
	Make sure to turn the power off before connecting or disconnecting the cable. Connecting or disconnecting while energized may damage the product.

Handling Precautions

1. After carefully considering the intended use, required specifications, and usage conditions, install and use the product within the specified ranges.
2. All specifications may be changed without notice.
3. When using this product, it is the responsibility of the customer to ensure necessary safety designs in hardware, software, and systems in order to prevent any threat to life, physical health, and property due to product malfunction or failure.
4. This product is not intended for use with nuclear power, railways, aviation, vehicles, medical equipment, food-handling equipment, or any application where particular safety measures are required. Absolutely do not use this product for any of these fields.
5. This product cannot be used in applications that directly or indirectly detect human bodies for the purpose of ensuring safety. Do not use this product as a detection device for protecting the human body.
6. Do not use this product for the development of weapons of mass destruction, for military use, or for any other military application. Moreover, if this product is to be exported, comply with all applicable export laws and regulations, including the "Foreign Exchange and Foreign Trade Act" and the "Export Administration Regulations," and carry out the necessary procedures pursuant to the provisions therein.
7. For more details on conformity to the Restriction of Hazardous Substances Directive for this product, please contact an Optex FA sales representative. Before using this product, fully examine the applicable environmental laws and regulations, and operate the product in conformity to such laws and regulations.
Optex FA does not assume any responsibility for damages or losses occurring as a result of noncompliance with applicable laws and regulations.

Installation Notes

Attach the controller to a DIN rail or use the optional panel mounting bracket to securely fix the controller in place.

Notes about the installation position of the controller

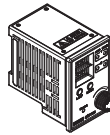
Install the controller in a position shown "Good" in the figure below.

Avoid any other positions for the installation.

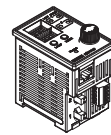
1. Provide at least 50 mm of space all around the device.
When installing multiple numbers of this product in a line, ensure that the pitch is 75 mm or more.
2. Do not close the openings on the left, right, top, and bottom sides of the unit.
Take sufficient care to cause convection for release of heat.
3. The ambient temperature range of this product is 0 to 40°C.
4. Take the following into consideration.

- Avoid installing the unit near devices that generate a large amount of heat (heaters, transformers, power supplies, etc.)
- Where the ambient temperature may exceed 40°C, install a forced cooling fan or air conditioner.
- When installing the controller in an enclosure, locate it at the bottom wherever possible.

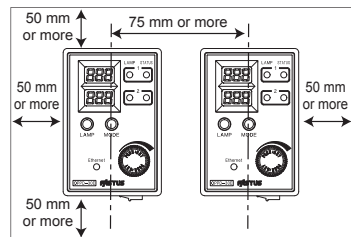
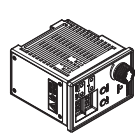
Good



Good



No good



Part Names and Functions

LAMP1 monitor

Light intensity value/
monitored value
Setting name

LAMP2 monitor

Light intensity value/
monitored value Setting

LAMP switch button

MODE switch button

Ethernet Link display

• Green: Connected

LAMP1/2 selection display

Displays the selected lamp

STATUS display

- Green: $F_b = on$
- Orange: $F_b = off$
- Flashing orange: FB error or alarm on monitored brightness
- Red: $F_b = cPb$ or communication with the lamp terminated
- Flashing red: LED output over current or power supply temperature error
- Unlit: Insufficient input voltage of 24 VDC

Dial + Confirmation button

Panel mounting bracket hole

Ethernet modular jack

LAMP2 output








LAMP1 output

Terminal block

Operations for Each Mode





■ Light intensity control mode

Light intensity values are shown on the LAMP1 and LAMP2 monitors and the LAMP indicator of the selected lamp lights.

-  **Press** Selects either LAMP1 or LAMP2 for setting the light intensity value with the dial.
-  **Press long** Turns OFF the lighting device output for both LAMP1 and LAMP2. Another long press turns the output ON.
-  **Press** Switches to the monitoring mode.
-  **Press long** Switches to the setting reference mode.
-  **Rotate** Changes the light intensity value of the currently selected lamp. A counterclockwise turn by one click decreases the value by 1 and a clockwise turn increases it by 1.
-  **Press** Moves the digit of the light intensity value to be changed.
-  **Press long** Pressing the two buttons at the same time brings about a locked state. Performing the same operation again unlocks the state. In the locked state, the light intensity values and settings cannot be changed.

■ Monitoring mode

The monitored values are shown on the LAMP1 and LAMP2 monitors. The LAMP1 and LAMP2 indicators both turn off. If no lighting device is connected, "---" will be displayed. For lighting devices that do not support sensing, "-b-" is displayed when communication is shut down automatically. The automatic communication shut down is reset when the power is turned OFF.

-  **Press** While the button is pressed, the LAMP1 and LAMP2 light intensity values or correction light intensity values are displayed.
-  **Press** Returns to the light intensity control mode.
-  **Press** Displays the internal temperature (°C) of the lamp. If no lamp is connected, "---" will be displayed.
-  **Press simultaneously** Displays the internal temperature (°C) of the power supply device. If the temperature reaches 105°C or more, the light intensity value is set to a 1/4 level to protect the internal circuits.

■ Setting reference mode (The upper menu display flashes.)

In light intensity control mode, a long press of the MODE button switches the LED lighting controller to the setting reference mode.



Press Selects the setting to be displayed from LAMP1 and LAMP2.



Press long Returns to the light intensity control mode.



Rotate Switches the setting item to be displayed.



Press Transitions to the setting change mode.

■ Setting change mode (The lower setting display flashes.)

In the setting reference mode, pressing the dial switches the LED lighting controller to the setting change mode.



Press long Returns to the setting reference mode without writing the changed setting.



Rotate Changes the currently displayed setting.



Press Moves the digit of a setting to be changed. If left for 30 seconds, the digit for the change returns to the lowest digit.



Press long Writes the changed setting and returns to the setting reference mode.

* Note: When the light intensity value display is flashing (when the digit is being moved), the displayed light intensity value will be saved if no operations are performed for 1.5 seconds.

Connecting Cables

Connecting Cables


24 VDC input (power supply)/input signal terminal block

Applicable connector : PHOENIX CONTACT screw-connection plug
5-pole type, MC 1, 5/5-ST-3, 5
Applicable wire : Single wire: 0.2 to 1.5 mm², twisted wire: 0.2 to 1.5 mm², pin terminal: 0.25 to 1.5 mm², 24 AWG to 16 AWG
Length of stripping part : 7 mm



Name	Signal name
24V	24 V
0V	0 V
COM	Input COM
L2 IN	LAMP2 illumination control input
L1 IN	LAMP1 illumination control input

Illumination output (LAMP1, LAMP2)

Applicable connector housing : JST's SMR-02V-B

 1: Lighting device output positive side
 2: Lighting device output negative side

Ethernet connector

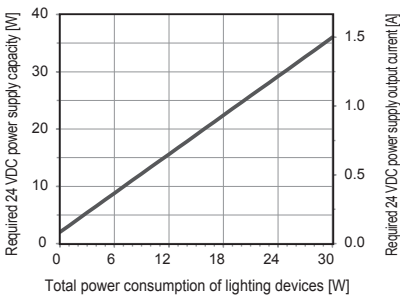
Applicable cable : STP (Shielded Twisted Pair), category 5e, straight or crossover
Cable length: Max. 100 m

Required 24 VDC Power Supply Capacity to Handle Power Consumption of Lighting Devices

Based on the total power consumption of the LED lighting to be connected, select a 24 VDC power source that offers more than the required capacity.

Note:

When using in conjunction with other equipment, the characteristics of the other equipment will affect the power supply, so be sure to choose a power supply that has a sufficient margin (about twice as much) as that shown in the table.



Capacity

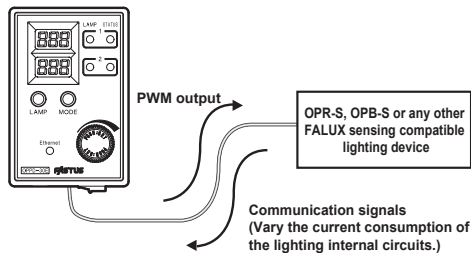
Per channel : Max. 30 W

For 2 channels (total) : Max. 30 W

Illumination Output

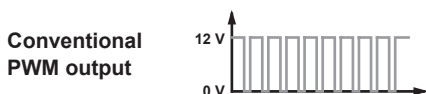
Differences from Conventional Models

With the OPPE-30E, connecting a FALUX sensing-compatible lighting device makes it possible to not only provide the power supply for lighting but also to communicate with the lighting device to read information such as the LED brightness and the internal temperature. The communication does not require a dedicated cable. Communication signals are superimposed on two wires connected to the lighting device. Lighting devices without FALUX sensing capability can also be connected in the conventional manner.

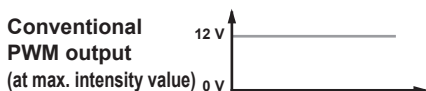


To drive the internal circuits of a FALUX sensing-compatible lighting device, a voltage of 6 V is applied while the lighting device is unlit.

When the illumination control input is ON, the lighting device is lit by applying PWM output to the illumination output. Turning the monitoring function ON and OFF switches the voltage between 12 V to 6 V (ON) and 12 V to 0 V (OFF).



Also, because the power supply wire is used to perform communication, DC lighting is not initiated even if the light intensity value is set to the maximum.



Illumination Control Input

Illumination Control Input

The illumination output switches between lit and not lit according to the combination of the external input ON/OFF status and the illumination control input polarity.

Illumination control input polarity

Lighting status		External input	
		OFF	ON
Illumination control input polarity	normal (initial value)	Lit	Not lit
	reverse	Not lit	Lit

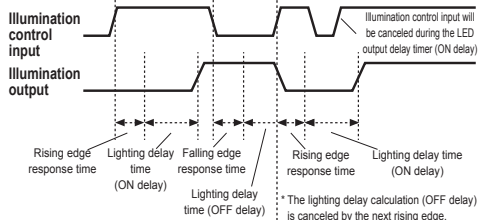
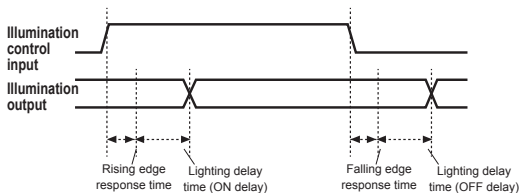
Response to Illumination Control Input

The start of lighting is the value found by adding t_{FL} , the LED output delay timer setting (10 μ s to 999 ms), to the response times shown below. The LED output delay timer setting is added on both the rising edge and the falling edge. If the next illumination control input turns ON during the falling edge off delay, the off delay will be canceled and the next rising edge operation will start. Moreover, if the next illumination control input turns ON during the rising edge on delay, the illumination control input will be canceled.

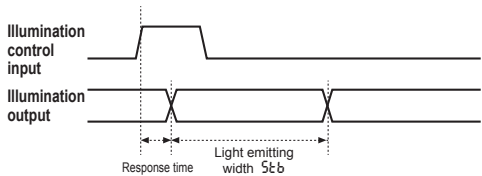
- Input response time: With 24 V input: 5 μ s, with 12 V input: 8 μ s

In this situation, the delay time from the rising edge of the trigger input to the actual emission of light will vary as shown below depending on the t_{FL} filter time setting.

Filter time	Delay time
1 μ s	0.8 to 1.0 μ s
5 μ s	4 to 5 μ s
25 μ s	20 to 25 μ s
100 μ s	80 to 100 μ s



Also, when the light emitting width setting 5t b is larger than 0, the lighting illuminates just for the specified time in synchronization with the lighting control rising edge.



Lighting Control Sequences

With the OPDP-30E, up to four light intensity value and lighting patterns can be set for each lighting. Sequence control is possible in which the set patterns are operated in order from 1 to 4 upon each illumination control input. Setting light intensity value and lighting in advance with lighting control sequences makes it possible to operate the sequences just with input, which reduces the time required to perform communication. The LAMP1 and LAMP2 settings are applied to the LED output delay timer Δt . Illumination control input during ON delay is also canceled during sequencing, and illumination control input during OFF delay will begin on the rising edge operation (see previous section).

To return to the first pattern during a sequence, use Ethernet communication to execute a "lighting control sequence reset." By setting 5L 2 to on, you can also use illumination control input L2 to reset sequences. In this situation, the assignment of the LAMP2 illumination control input is fixed to illumination control input L1. Also, turning the power OFF/ON resets the controller to the first sequence. Turning ON the illumination control input by switching the illumination control input polarity also causes the controller to proceed to the next sequence.

* When the lighting control sequence is being used, the feedback function automatically turns OFF. In addition, the light intensity values and monitored values of subsequent sequences (second and later) will not be displayed or monitored, and instead the values of the first sequence will be displayed.

Configurable settings

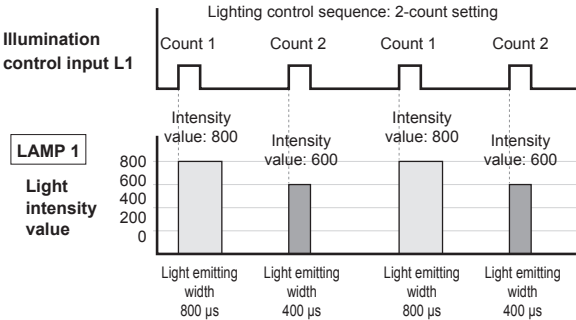
Lighting control count	5E9	This setting sets the number of times to control a lighting control sequence (0 to 4).
Sequence reset	5L 2	Uses illumination control input L2 to reset the sequence.
Illumination control input selection	59 to 594	Selects the illumination control input for the nth sequence from L1 and L2.
Light intensity value	EU 1 to EU4	Sets the light intensity value for the nth sequence.
Light emitting width	5t 1 to 5t4	Sets the light emitting width for the nth sequence.

Ex. 1. Light intensity value/light emitting width switching

Repeatedly obtaining images with two different lighting conditions for LAMP1 under one illumination control input

	Common setting
Lighting control count	5E9 = 2

	LAMP1 settings
Illumination control input selection (count 1)	59 = 1
Light intensity value (count 1)	EU 1 = 800
Light emitting width (count 1)	5t 1 = 800
Illumination control input selection (count 2)	592 = 1
Light intensity value (count 2)	EU2 = 600
Light emitting width (count 2)	5t2 = 400

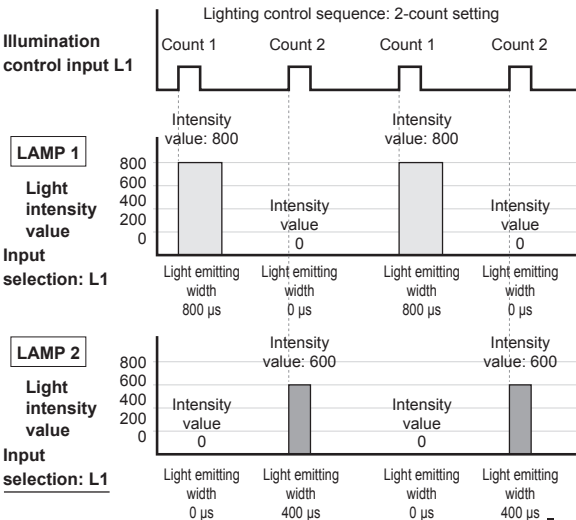


Ex. 2. LAMP1/LAMP2 switching

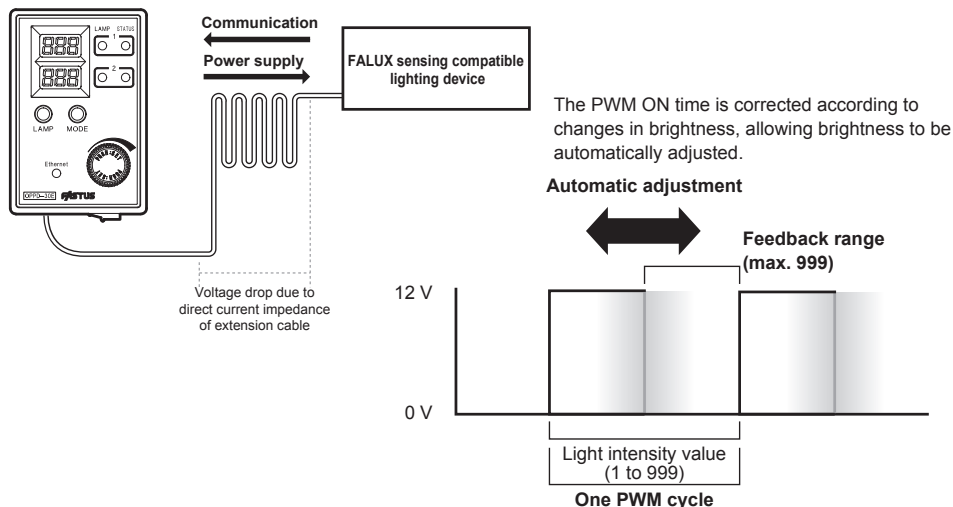
Controlling two channels, LAMP1 and LAMP2, with one illumination control input

	Common setting
Lighting control count	5E9 = 2

	LAMP1 settings	LAMP2 settings
Illumination control input selection (count 1)	59 = 1	59 = 1
Light intensity value (count 1)	EU 1 = 800	EU 1 = 0
Light emitting width (count 1)	5t 1 = 800	5t 1 = 0
Illumination control input selection (count 2)	592 = 1	592 = 1
Light intensity value (count 2)	EU2 = 0	EU2 = 600
Light emitting width (count 2)	5t2 = 0	5t2 = 400



Monitoring and Feedback Functions



General Description

With FALUX sensing-compatible lighting devices, the built-in photodiodes make it possible to detect LED brightness. They accurately monitor the brightness not only in the case of continuous lighting but also in any situation of less frequent flashing.

With the feedback function, the monitored brightness is compared with the lighting device's recorded reference brightness, and then the OPPD-30E light intensity value is adjusted to match the reference brightness.

It is also possible to measure not only the lighting device's LED brightness but also its internal temperature and to monitor these measurements on the OPPD-30E side. These brightness and temperature measurements can be read with Ethernet communication. * For details on reading with Ethernet communication see "Ethernet Communication" on page 14.

* If a lighting device that does not support sensing is connected, light may be emitted for one pulse even when the light intensity value is 0.

Lighting devices whose LEDs light due to the 6 V output for communication are automatically recognized immediately after lighting, and then the signal's 6 V output is shut down. In this situation, "-b-" is displayed for the monitoring mode. The automatic shut down is reset when the power is turned OFF. There are some devices on which the automatic shut down described above does not activate and faint lighting occurs due to the 6 V for communication. In this situation, set the PRM setting Fb to equal cPb in order to turn OFF the 6 V output for communication.

Usage Method (1) Detecting the Drop or Rise in the Brightness to Generate an Alarm (Monitoring Only)

Use the setting items to turn OFF the feedback function ($Fb = OFF$), and then set the upper (bRH) and lower (bRL) limits of the monitored brightness alarm. The monitored brightness alarm setting is the monitor value divided by the light intensity value and is displayed as a percentage (%). However, if these settings are 0 (which are their initial values), the monitored brightness alarm function is turned OFF. When the value is greater than the set upper limit or lower than the set lower limit, the monitored brightness alarm turns ON.

Examples) To generate an alarm when the monitored brightness decreases by 10%:

$bRL \text{ setting} = bRL \text{ upper display value} \times 90 (\%)$

To generate an alarm when the monitored brightness exceeds the upper limit by 10%:

$bRH \text{ setting} = bRH \text{ upper display value} \times 110 (\%)$

If the lighting cable is long, the actual brightness will be reduced due to the component of direct current impedance. You can check the degree to which the brightness is decreased by comparing the monitored brightness and the set light intensity value.

For example, if the light intensity value is 500 and the monitored value is 450, the brightness is always lowered to 90% (450/500). If you want to generate an alarm when the monitored value decreases by a further 10%, set the monitored brightness alarm lower limit to 81% (90% of 90%).

Usage Method (2) Using the PWM Output Feedback Function to Maintain Constant Output

When you use the setting items to turn ON the feedback function ($Fb = ON$), the light intensity value is corrected so that the reference brightness is maintained to match the light intensity value. The light intensity value in this situation is called the corrected light intensity value. You can check the corrected light intensity value by pressing the LAMP button in monitoring mode.

Generally, extending the lighting cable will actually decrease the brightness with which the lighting illuminates due to the voltage drop caused by the component of direct current impedance and due to the dull waveform caused by the components of impedance and capacity. If you extend the cable to 5 meters or 10 meters and use a lighting of a relatively large capacity, the brightness may be decreased by half or more. By adjusting the PWM output value, the feedback function effectively works to correct for the decreased brightness caused by the voltage drop attributable to the direct current impedance.

The PWM output value can be adjusted to a value from 1 to 999, so it cannot be adjusted to a value that exceeds 999. If the target brightness is not reached even when adjustments are made within this range, a feedback error occurs. However, if the monitored brightness alarm has been set, it will be given priority.

The monitored brightness alarm function turns OFF when the setting is 0 (which is the initial value). When the value is greater than the set upper limit or lower than the set lower limit, the monitored brightness alarm turns ON.

Notes about the Use of the Monitoring and Feedback Functions

The monitoring and feedback functions may not work in the following cases.

- Smearing of the lighting lens or diffusion plate is not reflected in the monitored brightness.
- If the light intensity value is less than 50, the feedback function is automatically turned OFF.
- When the pulse width for the external illumination control input is very small (less than about 2 μ s), the lit time will be extremely short and, therefore, it will not be possible to perform normal brightness monitoring.
- If the cable to the lighting is long and the capacity of the lighting is large, it may not be possible to communicate with the lighting.
In that case, decrease the PWM frequency to 50 kHz.
- If the communication with the lighting is unstable due to noise, take anti-noise measures such as protecting the lighting cable with a shield cover (shield gasket, etc.).

Shown below are the operating conditions for the monitoring and feedback functions.

- The monitoring of the brightness requires at least 8 flashing actions. In the case of continuous lighting, it requires 100 ms or more of lit time.
- The monitored brightness alarm action requires a minimum of 24 flashes or 300 ms or more of lit time.
- When the device is turned OFF after a minimum of 160 flashes or 2 seconds or more of lit time, a feedback-compensated PWM output is saved in memory. The next time the device is turned ON, it is lit in the same state as before it was turned OFF.
- The period of updating the brightness by the communication between the lighting and the power supply unit is 21 ms. The period for the temperature is 105 ms.

List of Setting Items

A long press of the MODE button on the operation panel switches the LED lighting controller to the “setting reference mode.”

You can press the dial button to change the setting of each setting item.

Indication	Name	Range	Initial value	Unit	LAMP1,2	Description
εPL	Polarity of illumination control input	αΕΓ Ρο5	αΕΓ	-	Individual	αΕΓ : While the illumination control input is OFF, the lighting device is illuminated. Ρο5 : While the illumination control input is ON, the lighting device is illuminated.
5εb	Light emitting width	0~999	0	10 μs/1 ms	Individual	Sets the light emitting width. You can change the unit with setting 5εu. Set this to 0 to follow the illumination control input.
5εu	Light emitting width unit	10u, 1	10u	-	Individual	The value 10u sets the light emitting width unit to 10 μs and the value 1 sets the unit to 1 ms. The light emitting widths that can be set are 10 μs to 9.99 ms and 1 ms to 999 ms, respectively.
dL	LED output delay timer	0~999	0	10 μs/1 ms	Individual	Sets the delay time for the external illumination control. The device may be switched by the setting dLu. The delay timer dL is added to both the rising edge and the falling edge. If the next illumination control input comes ON during this delay timer, the following operations will be executed for the rising edge and the falling edge. Rising edge during ON delay: The new illumination control input is canceled and rising edge operation starts after the set dL has elapsed. Falling edge during OFF delay: The running OFF delay is canceled and the next rising edge operation starts.
dLu	Unit of LED output delay timer	10u, 1	10u	-	Individual	The value 10u sets the unit of the LED output delay timer at 10 μs and the value 1 at 1 ms. The delay time ranges that can be set are 0 to 9.99 ms and 0 to 999 ms, respectively.
εFL	Filter time factor for illumination control input selection	1u, 5u 25u, 100	1u	μs	Common	Designates the time for filtering to remove noises of the illumination control inputs. The input delay times are shown below. 1u: 0.8 to 1.0 μs, 5u: 4 to 5 μs, 25u: 20 to 25 μs, 100: 80 to 100 μs
59	Illumination control input selection	ε 1 ε 2	LAMP1: ε 1 LAMP2: ε 2	-	Individual	Selects the illumination control input to use. ε 1: Illumination control input L1 IN, ε 2: Illumination control input L2 IN
bRL	Monitored brightness lower limit value for alarm	0~200	0	%	Individual	If the brightness of the lighting being monitored falls lower than the lower limit or becomes higher than the upper limit, which are percentages of the brightness at the time of factory shipment, the STATUS lamp on the corresponding LAMP side flashes in orange. When you select this setting, the current monitored value (%) is displayed on the upper monitor and the lower limit/upper limit setting (%) is displayed on the lower monitor.
bRH	Monitored brightness upper limit value for alarm	0~255	0	%	Individual	If the extension cable for the lighting is long, a reduced brightness will be displayed due to the component of direct current impedance, so keep this in mind when setting the upper and lower limits. Also, the initial values of the alarm upper and lower limits are 0 When Fb is set to on, the feedback error output turns ON if the target brightness is not reached even if the pulse width is adjusted. If Fb is set to on and the monitored brightness alarm has been set, the alarm judgment will be given priority.
Fb	Feedback function	oFF on cPb	oFF	-	Individual	This function corrects the pulse width so the brightness of the illumination being monitored matches the light intensity value. oFF: Only monitoring is performed. Feedback is not performed. on: The pulse width is corrected according to the feedback. cPb: Turns OFF the supply of the 6 V communication voltage to the illumination. Select this setting for models on which the supplying of 6 V causes the illumination to light. When the target brightness is not reached even if the pulse width is corrected, the feedback error occurs. However, if the monitored brightness alarm has been set, it will be given priority. When the light intensity value is less than 50 or when the lighting control sequence is being used, the feedback function automatically turns OFF. * If illumination that does not support sensing is connected, light may be emitted for one pulse even when the light intensity value is 0. Illumination whose LEDs light due to the 6 V output for communication are automatically recognized immediately after lighting, and then the signal's 6 V output is shut down. In this situation, “b-” is displayed for the monitoring mode. The automatic shut down is reset when the power is turned OFF. For devices on which the automatic shut down described above does not activate and faint lighting occurs due to the 6 V for communication, set Fb to cPb.
PFr	PWM frequency switching	50, 100 99, 98, 97	100	kHz	Common	Set the PWM frequency. If the extension cable to the illumination is long, the capacity of the illumination is large, and the light intensity value is also large, the communication between the power supply and the illumination may be broken. In that case, decrease the PWM frequency to 50. Also, when using the same PWM frequency to light illumination that has multiple inputs, flickering may occur due to the interference between PWM outputs.
5ε9	Lighting control sequence	oFF 2, 3, 4	oFF	-	Common	You can perform sequence control in which the illumination control input selection, light intensity value, and light emitting width set in advance are used to repeatedly switch between the illumination control inputs in order. This setting sets the count of lighting control sequences. oFF: Off, 2: 2 times, 3: 3 times, 4: 4 times * When the lighting control sequence is being used, the feedback function automatically turns OFF.

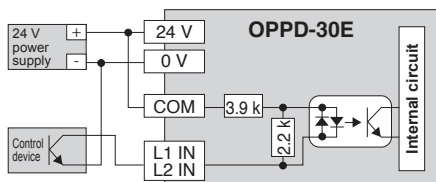
Indication	Name	Range	Initial value	Unit	LAMP1,2	Description
SL2	Sequence reset assignment	oFF on	oFF	-	Common	Use illumination control input L2 to reset and assign the sequence. L2 input resets the controller to the first sequence. The assignment of the LAMP2 illumination control input is fixed to illumination control input L1.
SL2	Illumination control input selection	t1 t2	LAMP1: t1 LAMP2: t2	-	Individual	Selects the control input for the second lighting control sequence. t1: Illumination control input L1 IN, t2: Illumination control input L2 IN
EL2	Light intensity value 2	0~999	0	-	Individual	Sets the light intensity value for the second lighting control sequence.
St2	Light emitting width 2	0~999	0	10 μs/1 ms	Individual	Sets the light emitting width for the second lighting control sequence.
:	:	:	:	:	:	:
SL4	Illumination control input selection	t1 t2	LAMP1: t1 LAMP2: t2	-	Individual	Selects the control input for the fourth lighting control sequence. t1: Illumination control input L1 IN, t2: Illumination control input L2 IN
EL4	Light intensity value 4	0~999	0	-	Individual	Sets the light intensity value for the fourth lighting control sequence.
St4	Light emitting width 4	0~999	0	10 μs/1 ms	Individual	Sets the light emitting width for the fourth lighting control sequence.
dHc	DHCP setting (automatic IP address assignment)	on oFF	on	-	Common	Turns DHCP ON or OFF. on: The IP address is assigned automatically. oFF: A fixed IP address is used.
IP1	IP address	0~255	169.254.0.30	-	Common	Displays and sets the IP address. Each time the dial is pressed briefly, the display transitions between the IP addresses: IP1 → IP2 → IP3 → IP4. If DHCP has been used to assign the address automatically, it is displayed.
Sn1	Subnet mask	0~255	255.255.0.0	-	Common	Displays and sets the subnet mask. Each time the dial is pressed briefly, the display transitions between the subnet masks: Sn1 → Sn2 → Sn3 → Sn4. If DHCP has been used to assign the address automatically, it is displayed.
Gt1	Gateway	0~255	0.0.0.0	-	Common	Displays and sets the default gateway. Each time the dial is pressed briefly, the display transitions between the default gateways: Gt1 → Gt2 → Gt3 → Gt4. If DHCP has been used to assign the address automatically, it is displayed.
cPY	Copying of the settings	no YES	no	-	Common	Copies the settings of LAMP1 to LAMP2. Select "YES" to copy the settings.
in	Initialization of the settings	no YES	no	-	Common	Initializes all the settings of LAMP1 and LAMP2 to the factory shipped state. Select "YES" to initialize the settings.
brt	Absolute brightness monitoring and brightness adjustment of the lighting intensity	0~999	-	-	Individual	While ordinary brightness monitoring displays the brightness of the lighting relative to the brightness in the factory shipped state, this displays the absolute brightness (the brightness that reflects individual differences) relative to the reference value that depends on the model. Upper monitor: Absolute brightness. Lower monitor: Light intensity value. By adjusting the light intensity value here, you can match the brightness to the target absolute brightness. You can forcibly switch the output regardless of the illumination control input.
Foc	Forced output switch	--- on, oFF	---	-	Common	---: Synchronizes the lighting of the illumination with the illumination control input. on: Ignores the illumination control input and turns ON the illumination at all times. oFF: Ignores the illumination control input and turns OFF the illumination at all times.
iQS	iQSS periodic transmission	oFF on	oFF	-	Common	Turns iQSS periodic transmission ON or OFF. oFF: Periodic transmission will not be performed. on: The monitored value will be transmitted at the interval specified with iQt.
iQt	Periodic transmission time	1~999	50	100 ms	Common	Sets the iQSS periodic transmission interval.
iQd	iQSS device number	0~999	100	-	Common	Sets the leading device number of the iQSS periodic transmission data. Six consecutive digits from this number are used. The device is fixed to D.
dUr	Display version	-	-	-	Common	Displays the software version of the user interface.
PUR	Controller version	-	-	-	Common	Displays the software version of the controller.
LUR	Illumination version	-	-	-	Individual	Displays the software version of the connected illumination.
End	Menu termination	-	-	-	Common	Terminates the settings display and returns to the light intensity value display.

- Setting items related to lighting control sequences are only displayed when SL9 is set to a value other than oFF.
- The versions and the setting items related to iQSS are only displayed when the dial has been turned with the LAMP button pressed. For details on iQSS periodic transmission items, see P. 19.

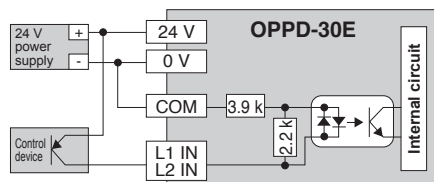
Connecting to External Devices

Connecting to External Devices (Lighting Control)

■ With NPN open collector output device



■ With PNP open collector output device



* When connecting voltage output control equipment, input 12 to 30 VDC between IN and COM. The input photocoupler is bi-directional.

Ethernet Communication

You can use Ethernet communication to perform operations such as setting the light intensity value and lighting control sequence.

1. Communication Specifications

Communication interface	Ethernet 10BASE-T/100BASE-TX
Communication protocol	UDP/IP, DHCP
Port used	61440
Cable	CAT5 or higher straight through and crossover cables are both supported by way of Auto MDI-X
Other	IP fragmentation is not supported Transmission source IP address in UDP/IP: Replies to the transmission source port

2. Communication Commands

2.1. List of Commands

Command	Command
Manual network settings	0x4e 0x00
Host name reading	0x48 0x00
Host name writing	0x48 0x01
Parameter reading	0x52 0x00
Parameter writing	0x57 0x00
Status reading	0x53 0x00

* Numbers starting with "0x" are hexadecimal values.

2.2. Error Conditions and Responses

Error condition	Response details
Request message other than 0x41 0x00	The response status is set to 0x00 0x04.
Transmission size less than 6 bytes	The response status is set to 0x00 0x05.
Undefined command	The response status is set to 0x00 0x01.
Length of transmission differs from that of actual data	The response status is set to 0x00 0x05.

3. Manual Network Settings

Sets the IP address, subnet mask, and default gateway. After transmitting this command, restart the LED controller.

Request command

No.	Item name	Byte length	Details
1	Header	—	Ethernet/IP/UDP header
2	Request message	2	0x41 0x00
3	Command	2	0x4e 0x00
4	Length of data transmission	2	0x00 0x0D
5	Network setting	1	0x00: DHCP OFF 0x01: DHCP ON
6	IP address	4	
7	Subnet mask	4	
8	Default gateway	4	

Response command

No.	Item name	Byte length	Details
1	Header	—	Ethernet/IP/UDP header
2	Response message	2	0x00 0x41
3	Command	2	0x4e 0x00
4	Length of response data	2	0x00 0x02
5	Response status	2	0x00 0x00: Success 0x00 0x01: Undefined command 0x00 0x02: Data cannot be written (writing is in progress)

<Command example>

- Set the fixed IP address.

IP: 192.168.100.001 SN: 255.255.255.0 GW: 192.168.100.253

Request command: 41 00 4e 00 00 0d 01 c0 a8 64 01 ff ff 00 c0 a8 64 fd

Response command: 00 41 4e 00 00 02 00 00 → Success

4. Host Name Setting

4.1. Host Name Reading

Reads the host name.

Request command

No.	Item name	Byte length	Details
1	Header	—	Ethernet/IP/UDP header
2	Request message	2	0x41 0x00
3	Command	2	0x48 0x00
4	Length of data transmission	2	0x00 0x00

Response command

No.	Item name	Byte length	Details
1	Header	—	Ethernet/IP/UDP header
2	Response message	2	0x00 0x41
3	Command	2	0x48 0x00
4	Length of response data	2	Number of host name characters + 2
5	Response status	2	0x00 0x00: Success 0x00 0x01: Undefined command
6	Host name		* See the list of characters that can be used.

<Command example>

- Host name reading

Request command: 41 00 48 00 00 00

Response command: 00 41 48 00 00 0a 00 00 4f 50 50 44
2d 33 30 45 → Host name: OPPD-30E

4.2. Host Name Writing

Writes the host name.

Request command

No.	Item name	Byte length	Details
1	Header	—	Ethernet/IP/UDP header
2	Request message	2	0x41 0x00
3	Command	2	0x48 0x01
4	Length of data transmission	2	Number of host name characters (max. 63 characters)
5	Host name		* See the list of characters that can be used.

Response command

No.	Item name	Byte length	Details
1	Header	—	Ethernet/IP/UDP header
2	Response message	2	0x00 0x41
3	Command	2	0x48 0x01
4	Length of response data	2	0x00 0x02
5	Response status	2	0x00 0x00: Success 0x00 0x01: Undefined command 0x00 0x02: Data cannot be written (writing is in progress) 0x00 0x03: Unusable character or too many characters

* List of characters that can be used

0123456789
ABCDEFGHIJKLMNQRSTUUVWXYZ
abcdefghijklmnopqrstuvwxyz
~:~_

5. Parameter Settings

5.1. Parameter Reading

Reads parameters from the LED controller.

Request command

No.	Item name	Byte length	Details
1	Header	—	Ethernet/IP/UDP header
2	Request message	2	0x41 0x00
3	Command	2	0x52 0x00
4	Length of data transmission	2	2n
5	Parameter ID 1	2	See the List of Parameter IDs.
⋮			
	Parameter ID n	2	

<Command example>

- Parameter reading

LAMP1 light intensity value 1: 0x00 0x0c

LAMP2 light intensity value 1: 0x00 0x1f

Request command: 41 00 52 00 00 04 00 0c 00 1f

Response command: 00 41 52 00 00 0a 00 00 00 0c 01

f4 00 1f00 64 → LAMP1 light intensity value 1: 500,

LAMP2 light intensity value 1: 100

Response command

No.	Item name	Byte length	Details
1	Header	—	Ethernet/IP/UDP header
2	Response message	2	0x00 0x41
3	Command	2	0x52 0x00
4	Length of response data	2	4n + 2
5	Response status	2	0x00 0x00: Success 0x00 0x01: Undefined command
6	Parameter ID 1	2	See the List of Parameter IDs.
7	Setting	2	
⋮			
	Parameter ID n	2	See the List of Parameter IDs.
	Setting	2	

* The response command returns a set containing parameter IDs and their corresponding settings.

* The parameter IDs in the response command are sorted in ascending order.
This order is not related to the order of the parameter IDs in the request command.

5.2. Parameter Writing

Writes parameters from the LED controller. When saving data to the EEPROM, it takes approximately 100 ms to write all the data.

Request command

No.	Item name	Byte length	Details
1	Header	—	Ethernet/IP/UDP header
2	Request message	2	0x41 0x00
3	Command	2	0x57 0x00: Save data to EEPROM 0x57 0x01: Do not save data to EEPROM
4	Length of data transmission	2	4n
5	Parameter ID 1	2	See the List of Parameter IDs.
6	Setting	2	
⋮			
	Parameter ID n	2	
	Setting	2	

Response command

No.	Item name	Byte length	Details
1	Header	—	Ethernet/IP/UDP header
2	Response message	2	0x00 0x41
3	Command	2	0x57 0x00: Save data to EEPROM 0x57 0x01: Do not save data to EEPROM
4	Length of response data	2	0x00 0x02
5	Response status	2	0x00 0x00: Success 0x00 0x01: Undefined command 0x00 0x02: Data cannot be written (writing is in progress)

<Command example>

- Parameter writing

LAMP1 light intensity value 1: 700 → 0x00 0x0c 0x02 0xbc LAMP2 light intensity value 1: 300 → 0x00 0x1f 0x01 0x2c

Request command: 41 00 57 00 00 08 00 0c 02 bc 00 1f01 2c

Response command: 00 41 57 00 00 02 00 00 → Success

5.3. List of Parameter IDs

ID	Hexadecimal	Byte length	Setting	Explanation
1	0x00 0x01	2	PWM frequency	Sets the PWM frequency. 0: 50 kHz, 1000 steps 1: 100 kHz, 1000 steps 2: 99 kHz, 1000 steps 3: 98 kHz, 1000 steps 4: 97 kHz, 1000 steps
2	0x00 0x02	2	Illumination control input filter time	Illumination control input filter time 0: 1 μ s, 1: 5 μ s, 2: 25 μ s, 3: 100 μ s
3	0x00 0x03	2	Lighting control sequence	Lighting control sequence 0: OFF, 1: 2-count, 2: 3-count, 3: 4-count
4	0x00 0x04	2	LAMP1 lighting delay time	This is the delay time from the illumination control input turning ON to illumination. 0 to 999
5	0x00 0x05	2	LAMP1 lighting delay time unit	Lighting delay time unit 0: 10 μ s, 1: 1 ms
6	0x00 0x06	2	LAMP1 light emitting width unit	Light emitting width unit 0: 10 μ s, 1: 1 ms
7	0x00 0x07	2	LAMP1 illumination control input (polarity switching)	Illumination control input (polarity switching) 0: Illumination output when the illumination control input turns OFF (negative polarity) 1: Illumination output when the illumination control input turns ON (positive polarity)
8	0x00 0x08	2	LAMP1 feedback function	Feedback function 0: Off, 1: On, 2: cPb (6 V OFF)
9	0x00 0x09	2	LAMP1 monitor alarm lower limit value	Monitored brightness alarm lower limit value: 0 to 200
10	0x00 0x0a	2	LAMP1 monitor alarm upper limit value	Monitored brightness alarm upper limit value: 0 to 255
11	0x00 0x0b	2	LAMP1 illumination control input selection 1	Illumination control input selection 0: Illumination control input L1 1: Illumination control input L2
12	0x00 0x0c	2	LAMP1 light intensity value 1	Light intensity value: 0 to 999
13	0x00 0x0d	2	LAMP1 light emitting width 1	This is the lighting width from the illumination control input turning ON. 0 to 999 When this is set to 0, the lighting width is the time when the illumination control input is ON. When this is set to 1 or higher, the lighting width is the specified time.
14	0x00 0x0e	2	LAMP1 illumination control input selection 2	Illumination control input selection 0: Illumination control input L1 1: Illumination control input L2
15	0x00 0x0f	2	LAMP1 light intensity value 2	Light intensity value: 0 to 999
16	0x00 0x10	2	LAMP1 light emitting width 2	This is the lighting width from the illumination control input turning ON. 0 to 999 When this is set to 0, the lighting width is the time when the illumination control input is ON. When this is set to 1 or higher, the lighting width is the specified time.
17	0x00 0x11	2	LAMP1 illumination control input selection 3	Illumination control input selection 0: Illumination control input L1 1: Illumination control input L2
18	0x00 0x12	2	LAMP1 light intensity value 3	Light intensity value: 0 to 999
19	0x00 0x13	2	LAMP1 light emitting width 3	This is the lighting width from the illumination control input turning ON. 0 to 999 When this is set to 0, the lighting width is the time when the illumination control input is ON. When this is set to 1 or higher, the lighting width is the specified time.
20	0x00 0x14	2	LAMP1 illumination control input selection 4	Illumination control input selection 0: Illumination control input L1 1: Illumination control input L2
21	0x00 0x15	2	LAMP1 light intensity value 4	Light intensity value: 0 to 999
22	0x00 0x16	2	LAMP1 light emitting width 4	This is the lighting width from the illumination control input turning ON. 0 to 999 When this is set to 0, the lighting width is the time when the illumination control input is ON. When this is set to 1 or higher, the lighting width is the specified time.
23	0x00 0x17	2	LAMP2 lighting delay time	This is the delay time from the illumination control input turning ON to illumination. 0 to 999
24	0x00 0x18	2	LAMP2 lighting delay time unit	Lighting delay time unit 0: 10 μ s, 1: 1 ms
25	0x00 0x19	2	LAMP2 light emitting width unit	Light emitting width unit 0: 10 μ s, 1: 1 ms
26	0x00 0x1a	2	LAMP2 illumination control input (polarity switching)	Illumination control input (polarity switching) 0: Illumination output when the illumination control input turns OFF (negative polarity) 1: Illumination output when the illumination control input turns ON (positive polarity)

ID	Hexadecimal	Byte length	Setting	Explanation
27	0x00 0x1b	2	LAMP2 feedback function	Feedback function 0: Off, 1: On, 2: cPb (6 V OFF)
28	0x00 0x1c	2	LAMP2 monitor alarm lower limit value	Monitored brightness alarm lower limit value: 0 to 200
29	0x00 0x1d	2	LAMP2 monitor alarm upper limit value	Monitored brightness alarm upper limit value: 0 to 255
30	0x00 0x1e	2	LAMP2 illumination control input selection 1	Illumination control input selection 0: Illumination control input L1 1: Illumination control input L2
31	0x00 0x1f	2	LAMP2 light intensity value 1	Light intensity value: 0 to 999
32	0x00 0x20	2	LAMP2 light emitting width 1	This is the lighting width from the illumination control input turning ON. 0 to 999 When this is set to 0, the lighting width is the time when the illumination control input is ON. When this is set to 1 or higher, the lighting width is the specified time.
33	0x00 0x21	2	LAMP2 illumination control input selection 2	Illumination control input selection 0: Illumination control input L1 1: Illumination control input L2
34	0x00 0x22	2	LAMP2 light intensity value 2	Light intensity value: 0 to 999
35	0x00 0x23	2	LAMP2 light emitting width 2	This is the lighting width from the illumination control input turning ON. 0 to 999 When this is set to 0, the lighting width is the time when the illumination control input is ON. When this is set to 1 or higher, the lighting width is the specified time.
36	0x00 0x24	2	LAMP2 illumination control input selection 3	Illumination control input selection 0: Illumination control input L1 1: Illumination control input L2
37	0x00 0x25	2	LAMP2 light intensity value 3	Light intensity value: 0 to 999
38	0x00 0x26	2	LAMP2 light emitting width 3	This is the lighting width from the illumination control input turning ON. 0 to 999 When this is set to 0, the lighting width is the time when the illumination control input is ON. When this is set to 1 or higher, the lighting width is the specified time.
39	0x00 0x27	2	LAMP2 illumination control input selection 4	Illumination control input selection 0: Illumination control input L1 1: Illumination control input L2
40	0x00 0x28	2	LAMP2 light intensity value 4	Light intensity value: 0 to 999
41	0x00 0x29	2	LAMP2 light emitting width 4	This is the lighting width from the illumination control input turning ON. 0 to 999 When this is set to 0, the lighting width is the time when the illumination control input is ON. When this is set to 1 or higher, the lighting width is the specified time.
42	0x00 0x2a	2	Lock	0: Dial operations are received. 1: Dial operations are not received.
43	0x00 0x2b	2	DHCP	1: Enable automatic IP address assignment by way of DHCP. 0: Select the fixed IP address.
44	0x00 0x2c	2	Forced lighting/turning OFF	0: Synchronizes the illumination of the lighting with the illumination control input 1: Ignores the illumination control input and forcibly illuminates the lighting 2: Ignores the illumination control input and forcibly turns OFF the lighting
45	0x00 0x2d	2	Lighting control sequence reset	1: Resets the internal status of the lighting control sequence. This parameter is always 0 when read.
46	0x00 0x2e	2	iQSS periodic transmission	0: Periodic transmission will not be performed. 1: Periodic transmission will be performed.
48	0x00 0x30	2	iQSS periodic transmission time	Sets the iQSS periodic transmission interval. 1 to 999 × 100 ms
50	0x00 0x32	2	iQSS device number	Sets the leading device number of the iQSS periodic transmission data. 0 to 994
55	0x00 0x37	2	LAMP1 monitor value	Read only 0 to 4095
56	0x00 0x38	2	LAMP1 absolute brightness	Read only 0 to 4095
57	0x00 0x39	2	LAMP1 internal temperature	Read only -100 to 155°C
66	0x00 0x42	2	LAMP2 monitor value	Read only 0 to 4095
67	0x00 0x43	2	LAMP2 absolute brightness	Read only 0 to 4095
68	0x00 0x44	2	LAMP2 internal temperature	Read only -100 to 155°C
77	0x00 0x4d	2	LAMP1 corrected light intensity value	Light intensity value after correction by way of feedback
78	0x00 0x4e	2	LAMP2 corrected light intensity value	Light intensity value after correction by way of feedback
81	0x00 0x51	2	Sequence reset assignment	1: Assigns L2 to reset lighting control sequences

6. Reading the Status

Reads various statuses from the LED controller.

Request command

No.	Item name	Byte length	Details
1	Header	–	Ethernet/IP/UDP header
2	Request message	2	0x41 0x00
3	Command	2	0x53 0x00
4	Length of data transmission	2	0x00 0x00

List of internal statuses

Bit	Status
b0	1 = Internal circuit communication error
b1	1 = Power supply temperature error
b2	1 = EEPROM access failure
b3	1 = Input voltage of 18 V or more
b4	Not used
b5	1 = DHCP error
b6	LAMP1 feedback error
b7	LAMP2 feedback error
b8	LAMP1 6 V supply
b9	LAMP1 monitored brightness alarm
b10	LAMP1 overcurrent
b11	LAMP1 output stoppage
b12	LAMP2 6 V supply
b13	LAMP2 monitored brightness alarm
b14	LAMP2 overcurrent
b15	LAMP2 output stoppage

<Command example>

- Parameter reading

Request command: 41 00 53 00 00 00

Response command: 00 41 53 00 00 1c 00 00 02 01 04 ff 00 2b 02 bc 02 b2 00 30 02 bc 01 2c 00 00 00 00 01 2c 00 00 11 08

→ Software version	2	LAMP1 light intensity value 1	700	LAMP2 monitor value	0
FPGA version	1	LAMP1 monitor value	690	LAMP2 internal temperature	0
LAMP1 version	4	LAMP1 internal temperature	48	LAMP2 corrected light intensity value	300
LAMP2 version	255	LAMP1 corrected light intensity value	700	Internal status	0001 0001 0000 1000 → b3, b8, b12
LED controller temperature	43	LAMP2 light intensity value 1	300		

Response command

No.	Item name	Byte length	Details
1	Header	–	Ethernet/IP/UDP header
2	Response message	2	0x00 0x41
3	Command	2	0x53 0x00
4	Length of response data	2	0x00 0x1C
5	Response status	2	0x00 0x00: Success
6	Software version	1	uint8 (8-bit unsigned integer)
7	FPGA version	1	uint8
8	LAMP1 version	1	uint8, "255" when not connected
9	LAMP2 version	1	uint8, "255" when not connected
10	LED controller temperature	2	int16 (16-bit signed integer)
11	LAMP1 light intensity value 1	2	int16
12	LAMP1 monitor value	2	int16
13	LAMP1 internal temperature	2	int16
14	LAMP1 corrected light intensity value	2	int16
15	LAMP2 light intensity value 1	2	int16
16	LAMP2 monitor value	2	int16
17	LAMP2 internal temperature	2	int16
18	LAMP2 corrected light intensity value	2	int16
19	Internal status	4	Converted from a hexadecimal value to a binary value whose bits are than used to assign the statuses in order from b0 to b15

7. Mitsubishi Electric iQSS Support



This LED controller supports iQSS Ethernet by Mitsubishi Electric Corporation.
See the "iQ Sensor Solution Reference Manual."

Change the OPPD-30E DHCP setting to OFF, and then connect to the network.
If you connect to the network with the DCHP setting set to ON (the initial value), wait 20 seconds, and then perform automatic detection of the connected devices from the engineering tool.

Specify a port number from 0 to 45236 or from 45238 to 61439.






* Do not specify port number 45237 for other devices on the same Ethernet network.

* Do not specify a port number from 61440 to 65534 for the local station port number.

• Status monitor

Item name	Current value
L1Vol	LAMP1 light intensity value
L1Mon	LAMP1 monitor value
L1Tmp	LAMP1 internal temperature
L2Vol	LAMP2 light intensity value
L2Mon	LAMP2 monitor value
L2Tmp	LAMP2 internal temperature

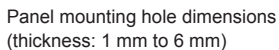
Error Display

Item	Indication	Error details
Input voltage drop		Displayed if the 24 V power supply voltage has dropped to 18 V or lower.
Internal failure		Communication error of the internal circuit. This is displayed when, due to some failure, the communication with the power supply board fails.
Temperature error		This flashes when the internal temperature of the power supply exceeds 105°C. When a temperature error occurs, this indication flashes until the temperature falls below 95°C. To protect the device, the light intensity value output is reduced to 1/4 while this error is occurring.
Overcurrent		This flashes when an illumination overcurrent is detected. It flashes only for the lamp on which the overcurrent has been detected. When an overcurrent is detected, only the illumination for which the overcurrent was detected is turned OFF. You cannot clear this error until you restart the device.
Output voltage error		This flashes when an output voltage error is detected in the internal power supply circuit. Only the lamp indicator for which the output error was detected flashes. When an output error is detected, only the illumination for which the output error was detected is turned OFF. You cannot clear this error until you restart the device.

Specifications

Model	OPPD-30E
Power supply voltage	24 VDC $\pm 10\%$
Current consumption	Max. 1.3 A
Illumination output	2 ch
Connectable lighting	Max. 30 W (2 ch total)
Illumination output voltage	PWM mode: 12 VDC
Illumination output current	Max. 2.5 A (2 ch total)
Light intensity control	PWM intensity control, Frequency: 50/100/99/98/97 kHz
Monitoring	Lighting brightness monitor/Lighting internal temperature monitor, Monitor brightness alarm upper/lower limit value setting
Feedback	PWM correction method
Input	External illumination control input $\times 2$ ON voltage: 12 V or more, OFF voltage: 2 V or less, Max. input voltage: 30 V Input response time (actual), 24 V input: 5 μ s (OFF \rightarrow ON)/ 50 μ s (ON \rightarrow OFF), 12 V input: 8 μ s (OFF \rightarrow ON)/ 45 μ s (ON \rightarrow OFF) Input resistance: 3.9 k Ω , insulated
Communication interface	Ethernet 10BASE-T/100BASE-TX, AutoMDI-X
Communication protocol	UDP/IP, DHCP, iQSS (Mitsubishi Electric's iQ Sensor Solution)
Communication response speed	From command reception to response completion: 6 ms (typ.)
Protective functions	Overcurrent, power supply internal temperature monitoring (PWM output cut to 1/4 at 105°C)
Applicable regulations	EMC (2014/30/EU)/RoHS (2011/65/EU, MIIT Order No.32)
Applicable standards	EN 61326-1:2013, EN 55011:2009/A1:2010 Group 1, Class A
Degree of protection	IP30 (IEC 60529: 1989/A1: 1999 + A2: 2013)
Ambient temperature/humidity	0 to 40°C/35 to 85% RH (no condensation)
Storage temperature/humidity	-20 to 70°C/35 to 95% RH (no condensation)
Vibration resistance	10 to 55 Hz; amplitude: 1.5 mm; 2 hours in each of the X, Y, and Z directions
Shock resistance	Approximately 10 G; 3 times in each of the X, Y, and Z directions
Insulation resistance	500 VDC, 10 M Ω or more
Material	Housing: Polycarbonate and aluminum
Weight	150 g
Accessories	Instruction manual, terminal block $\times 1$ (installed)
Options	Panel mounting bracket, Panel stand

■ LED controller



Panel mounting bracket

BKT-OP-01



PNL-OPPD

