CCS FASTUS

LED Lighting Digital Control Units

CD-VA Series — Total 4 Models

Compact and Multifunctional DC Input Type Control Units

Compact size for easier handling (actual size)

CD-VA

LAMP   MODE

PARALLEL   TRIGGER   USB

1   9

L1   L2   L3   L4

Output Channels

2/4-channel
(max. 16 channels*)

*With 4 control units connected

Lighting Output

2-channel: 100 W
4-channel: 200 W
(max. 50 W/channel)

Communication Method

Ethernet
Parallel
USB
RS-232C*

*Using parallel terminals

Power Input

24 VDC Input

PWM control   Variable-voltage control   Strobe overdrive

CE   UKCA

▶ **Total 4 models in the lineup**

CD-VA10024-2P   CD-VA20024-4P   CD-VA10024-2PE   CD-VA20024-4PE

Model name	Number of channels	Lighting output	Ethernet communication
CD-VA10024-2P	2 channels	Max. 100 W	–
CD-VA20024-4P	4 channels	Max. 200 W	–
CD-VA10024-2PE	2 channels	Max. 100 W	○
CD-VA20024-4PE	4 channels	Max. 200 W	○

LIGHTING SOLUTION
CCS Inc.

CD-VA Series

Features

▶ Lighting output of **100 W** with 2 channels and **200 W** with 4 channels available (Max 50W for each channel)

▶ **Up to 4 units** can be connected via infrared communication

▶ **3 intensity control methods** can be set by channel

▶ Clear and visible display screen and high operability

— Compact design with balanced operability and functionality —

Clear and visible display screen
Liquid crystal display, supporting English and Japanese.

High operability
Divided into dial, LAMP, and MODE buttons for simple operation.

Supports Ethernet communication
(CD-VA10024-2PE / CD-VA20024-4PE)
Supports DHCP for automatic acquisition of information such as IP addresses. Just connect a LAN cable to launch communication.

CD-VA20024-4PE

Infrared communication between units
Since units communicate with one another via infrared, cables are not required. Up to 4 units can be connected, for up to 16 channels in use. Setting copy function applies settings to each channel.

Equipped with general-purpose output terminal
Use general-purpose output terminals in parallel communication for checking lighting status, error outputs, etc.

Equipped with USB connector **(USB Type-C)**
Just connect a PC with a USB cable to use the dedicated application.

Lighting Control Functions
Full range of control functions in compact housing

1 Supports 3 Intensity Control Methods
Select the intensity control method suitable to the inspection conditions.

| PWM control | Variable-voltage control | Strobe overdrive |

2 Up to 4 Units Connectable
The use of infrared communication allows for up to 4 units to be connected cable-free. Multiple units can be controlled through external communication with one main unit.

3 Sequence Control
Maximum 16 steps of pattern lighting can be set.

Example of 4-step setup

Lighting output	0	1	2	3
L1				●
L2			●	
L3		●		
L4	●			

● : Lit

4 Recipe Setting Function
Up to 16 lighting setting parameters can be saved.

Parameters are set for each channel

Recipe 1

Register up to **16** recipes

Supports 3 Intensity Control Methods

Choose the control method for each channel between general PWM (pulse width modulation), variable-voltage control suited to line scan camera inspections, and strobe overdrive allowing brighter lighting.
One control unit supports various inspection conditions.

PWM control

Variable-voltage control
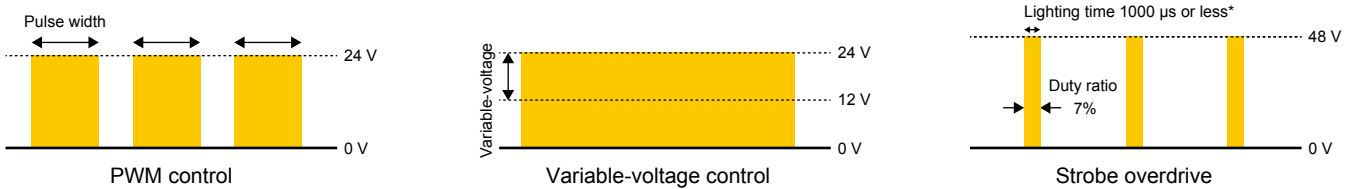
Strobe overdrive

* Operates when lighting time is 1,000 µs or less. When the lighting time is set in units of ms, the strobe overdrive does not operate. Operation is at normal voltage (24 V).

Variable-voltage control dimmer range

Dimmer range can be switched between 2 levels.
Select in accordance with lighting characteristics or applications.

Variable-voltage range: LOW/12 to 24 V

Variable-voltage range: HIGH/18 to 24 V

High resolution in high-output regions

Depending on the characteristics of the lighting in use, the dimming value when lighting starts may vary and lights may turn ON even at a dimming value of 0.

Up to 4 Units Connectable

Maximum 16-channel control is available[1]
*1: With 4 units of the 4-channel model connected

Up to 4 units can be connected to control via infrared communication.
For example, with four units of the 4-channel type connected, the lighting parameters can be set for up to 16 channels.
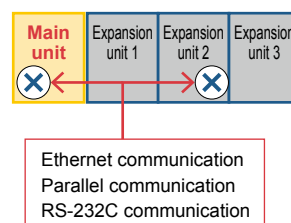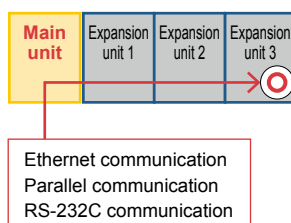External control cables for each unit are unnecessary as the parent unit can control settings on the connected units.
By using the setting copy function, setting can be easily reflected to each channel, allowing for reduced workload.

Caution: For ON/OFF control via trigger input, individual connection to control unit and control is required.

Control to expansion units

Only the main unit can control the connected expansion units. Setting controls on an expansion unit does not apply the same changes to the main unit and the other expansion units.
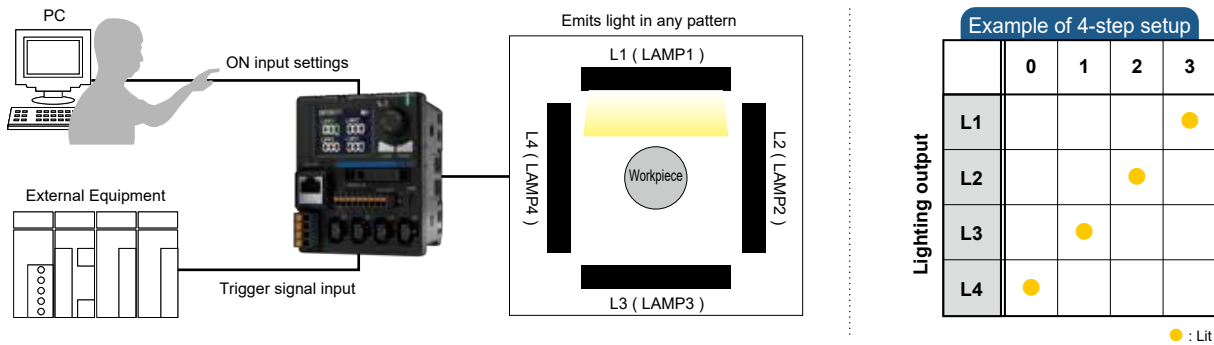
| Main unit | Expansion unit 1 | Expansion unit 2 | Expansion unit 3 |

Ethernet communication
Parallel communication
RS-232C communication

| Main unit | Expansion unit 1 | Expansion unit 2 | Expansion unit 3 |

Ethernet communication
Parallel communication
RS-232C communication

Can also be connected with the Optex FA OPPX Series.

* When using CD-VA as a main unit, OPPX Series, FALUX sensing+ function is unavailable.

Sequence Control

Program up to 16 steps of ON input for a pattern of light emission with desired intensity and emission time.

For example, when using 4-quadrant bar lights or segmented lights to illuminate from multiple directions,

the emission patterns for each channel can be stored and switched ON/OFF by trigger input.

PC

ON input settings

External Equipment

Trigger signal input

Emits light in any pattern

L1 (LAMP1)

L4 (LAMP4)　Workpiece　L2 (LAMP2)

L3 (LAMP3)

Example of 4-step setup

Lighting output		0	1	2	3
	L1				●
	L2			●	
	L3		●		
	L4	●			

● : Lit

**Sequence control application examples**

Photometric stereo imaging

The workpiece is illuminated and imaged from 4 directions.

It is possible to generate images that highlight only the unevenness or extract only the pattern by using the differences of each captured image.
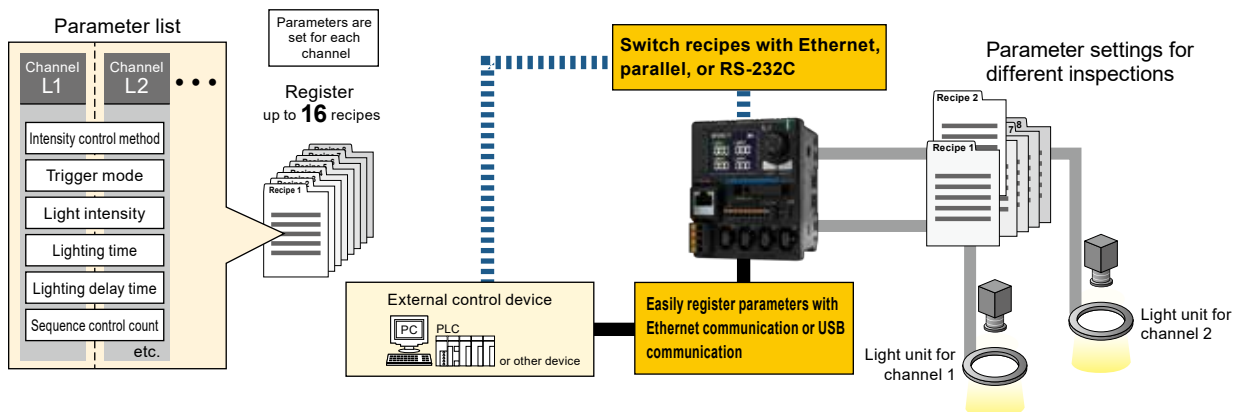
■ Imaging example (4 divisions)

Imaged by illumination from 4 directions

Right Light ON

Top Light ON

Left Light ON

Bottom Light ON

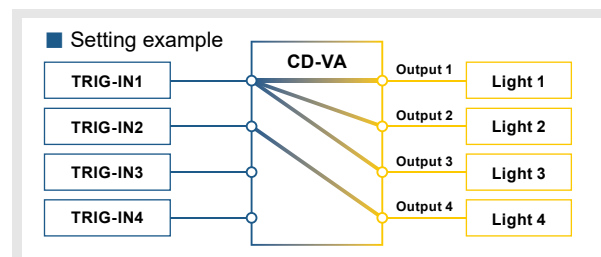**Composed by image processing**
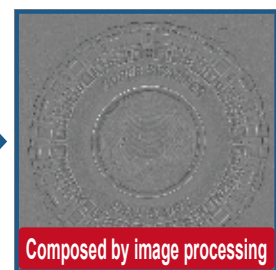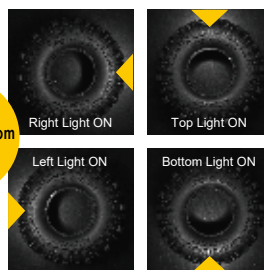
Recipe Setting Function

Up to 16 lighting setting parameters can be saved

Parameter settings such as intensity values for each channel and other inspection-specific parameter settings

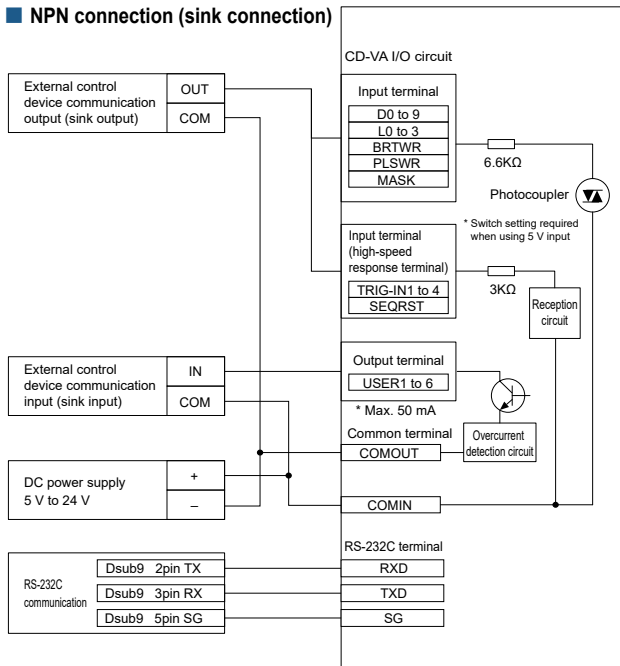can be registered in advance, allowing for easy setting changes simply by recalling recipes.

Parameter list

Channel L1　Channel L2　• • •

Intensity control method

Trigger mode

Light intensity

Lighting time

Lighting delay time

Sequence control count

etc.

Parameters are set for each channel

Register up to **16** recipes

Recipe 1

Switch recipes with Ethernet, parallel, or RS-232C

External control device

PC　PLC　or other device

Easily register parameters with Ethernet communication or USB communication

Parameter settings for different inspections

Recipe 2

Recipe 1

Light unit for channel 1

Light unit for channel 2

Trigger Input Assignment Function

Control ON/OFF of multiple lights with 1 trigger input.

Change assignments even after wiring.

■ Setting example

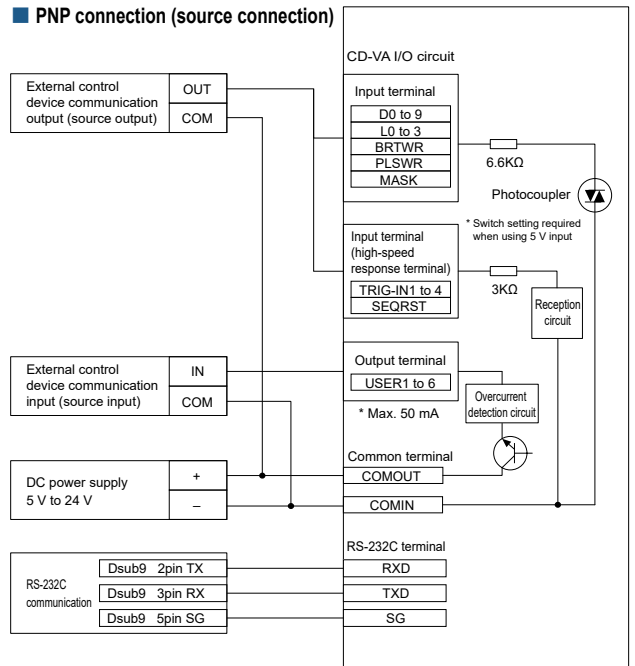| TRIG-IN1 | | CD-VA | Output 1 | Light 1 |
TRIG-IN2			Output 2	Light 2
TRIG-IN3			Output 3	Light 3
TRIG-IN4			Output 4	Light 4

External Signal Connection Example
(Both NPN and PNP connections are supported and logic switching is possible.)

■ NPN connection (sink connection)

CD-VA I/O circuit

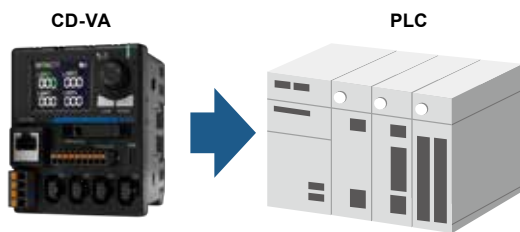External control device communication output (sink output) — OUT / COM

Input terminal
- D0 to 9
- L0 to 3
- BRTWR
- PLSWR
- MASK

6.6KΩ

Photocoupler

Input terminal (high-speed response terminal)
- TRIG-IN1 to 4
- SEQRST

* Switch setting required when using 5 V input

3KΩ

Reception circuit

External control device communication input (sink input) — IN / COM

Output terminal
- USER1 to 6

* Max. 50 mA

Common terminal — COMOUT

Overcurrent detection circuit

DC power supply 5 V to 24 V — + / −

COMIN

RS-232C communication
- Dsub9 2pin TX
- Dsub9 3pin RX
- Dsub9 5pin SG

RS-232C terminal
- RXD
- TXD
- SG

■ PNP connection (source connection)

CD-VA I/O circuit

External control device communication output (source output) — OUT / COM

Input terminal
- D0 to 9
- L0 to 3
- BRTWR
- PLSWR
- MASK

6.6KΩ

Photocoupler

Input terminal (high-speed response terminal)
- TRIG-IN1 to 4
- SEQRST

* Switch setting required when using 5 V input

3KΩ

Reception circuit

External control device communication input (source input) — IN / COM

Output terminal
- USER1 to 6

* Max. 50 mA

Overcurrent detection circuit

Common terminal — COMOUT

DC power supply 5 V to 24 V — + / −

COMIN

RS-232C communication
- Dsub9 2pin TX
- Dsub9 3pin RX
- Dsub9 5pin SG

RS-232C terminal
- RXD
- TXD
- SG

Enhanced Status Confirmation Functions

Status of the control unit and light (errors, ON/OFF, etc.) can be confirmed using the output[1] function

*1 There are two output systems: parallel and trigger pin.

■ Usage example: Trigger input ready status confirmation

Output ON: each channel can accept a trigger input. Output OFF: light in operation (ON, strobe, etc.).

CD-VA → PLC

Operation	Output
Trigger input ready	ON
Trigger input will not be accepted while light is on	OFF

Output timing example

ON/OFF control input

Lighting delay

Lighting output

General-purpose output
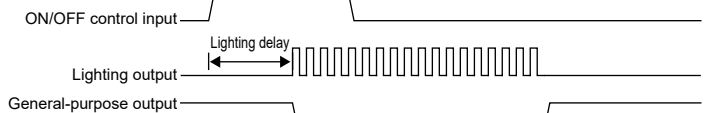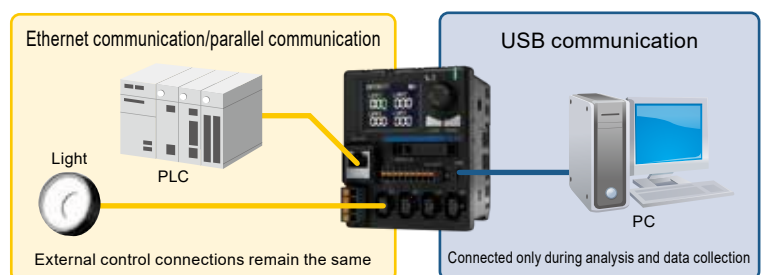
USB connector (Type-C) for data communication with a PC even while connected to external control devices

■ USB connection image

Check settings and verify operation using the CD-VA dedicated app (utility software).

Ethernet communication/parallel communication

USB communication

Light

PLC

PC

External control connections remain the same

Connected only during analysis and data collection

Common Specifications

Model name		CD-VA10024-2P	CD-VA20024-4P	CD-VA10024-2PE	CD-VA20024-4PE
Input voltage		24 VDC ±10%			
Lighting method		Continuous lighting, strobe lighting (overdrive when emission time is 1000 μs or less)			
Drive method		Constant-voltage system			
Intensity control method		PWM control (frequency: 100 kHz, 130 kHz), variable-voltage control			
Number of channels		2 channels	4 channels	2 channels	4 channels
Applicable light units (rated)		24 VDC light units 2 channels total: 100W (1 channel 50 W or less)	24 VDC light units 4 channels total: 200W (1 channel 50 W or less)	24 VDC light units 2 channels total: 100W (1 channel 50 W or less)	24 VDC light units 4 channels total: 200W (1 channel 50 W or less)
Lighting output voltage	PWM mode	24 VDC			
	Strobe mode[1][2]	48 VDC *1 Automatically switches to 24 VDC drive when strobe emission time is 1 ms or more (the lighting time is set in units of ms). Applies 48 VDC drive when strobe emission time is 1,000 μs or less (the lighting time is set in units of μs).			
	Variable-voltage mode	LOW: 12 to 24 V, HIGH: 18 to 24 V			
Lighting output current	Strobe mode[3]	5.0 A/channel (duty 7%)			
Strobe emission time	PWM frequency: 100 kHz	Lighting time: 10 μs to 9,990 μs (10 μs steps), 1 ms to 999 ms (1 ms steps)			
	PWM frequency: 130 kHz	Lighting time: 7.7 μs to 7684.6 μs (7.7 μs steps), 1 ms to 999 ms (1 ms steps)			
	Lighting cycle limit	Duty 7% (requires cycle of 14.3x or more pulse width)			
External control method		USB communication (full-speed, Type-C connector), parallel communication, RS-232C communication		Ethernet communication (10BASE-T/100BASE-TX), USB communication (full-speed, Type-C connector), parallel communication, RS-232C communication	
Communication interface	USB	Serial communication via virtual COM port			
	RS-232C	4800 / 9600 / 19200 / 38400 / 57600 / 115200 bps			
	Ethernet	UDP, TCP, DHCP Client			
Operating environment		Temperature: 0 to 40°C, humidity: 20 to 85% RH (no condensation)			
Storage environment		Temperature: -20 to 60°C, humidity: 20 to 85% RH (no condensation)			
Cooling method		Natural air cooling			
Vibration resistance		10 to 55 Hz, double amplitude 1.5 mm, X, Y, Z directions 2 hours each			
Impact resistance		Approx. 10 G, X, Y, Z directions 3 times each			
Degree of protection		IP20 (IEC 60529)			
Environmental regulations		RoHS, REACH			
Compatible standards		CE, UKCA (Non-compliant with KC)			
Material/surface processing		Polycarbonate			
Weight		260 g	360 g	260 g	360 g
Accessories		Hardware manual x1, trigger connector x1, power connector x1			

*2 See the URL below for the combinations of LED lighting available when using strobe overdrive.

https://www.ccs-grp.com/support/matching/check/

*3 Overdrive is unavailable in variable-voltage mode.

■ 24 VDC power supply capacity

The 24 VDC control unit should be selected according to the total power consumption of the light used, based on the graph to the right.
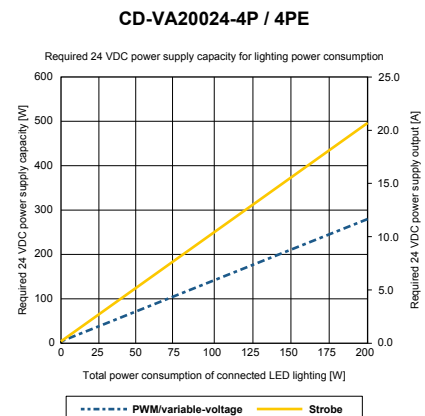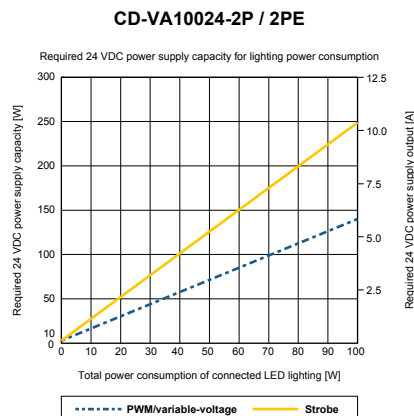
Note: When using with other devices, select a control unit depending on the device characteristics, leaving sufficient margin (approx. 2x) compared to the graph.

CD-VA10024-2P / 2PE

Required 24 VDC power supply capacity for lighting power consumption

CD-VA20024-4P / 4PE

Required 24 VDC power supply capacity for lighting power consumption

5

Options (sold separately)

* For details, including compliance with environmental regulations, please contact your local sales office.
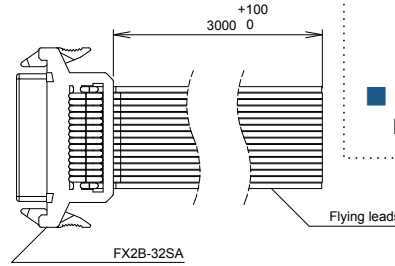
■ Trigger cable
Model name: EXCB2-FER08-22-3-9CL

* This product comes with 9 wires/set.

+100
3000 0

15

(5)
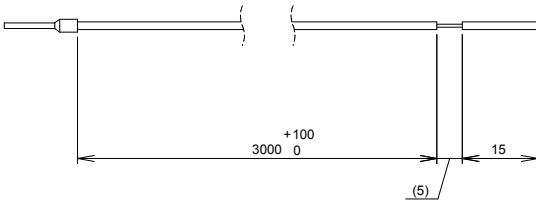
No.	Signal name	Cable colors
1	Trigger input 1	Brown
2	Trigger input 2	Red
3	Trigger input 3	Orange
4	Trigger input 4	Yellow
5	Sequence reset input	Green
6	Input COM	Blue
7	General-purpose output 1	Violet
8	General-purpose output 2	Gray
9	Output COM	White

■ External control cable
Model name: EXCB-FX32-3

+100
3000 0

Flying leads

FX2B-32SA

■ Ferrite core
Model name: OP-NFT-13S

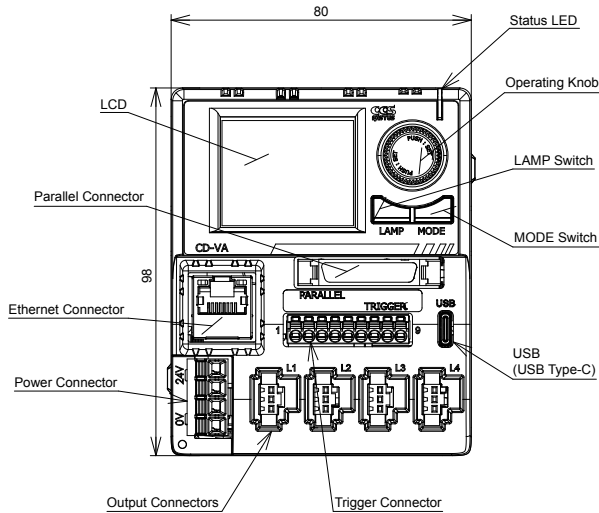Recommended installation location: Lighting output cable termination of CD-VA

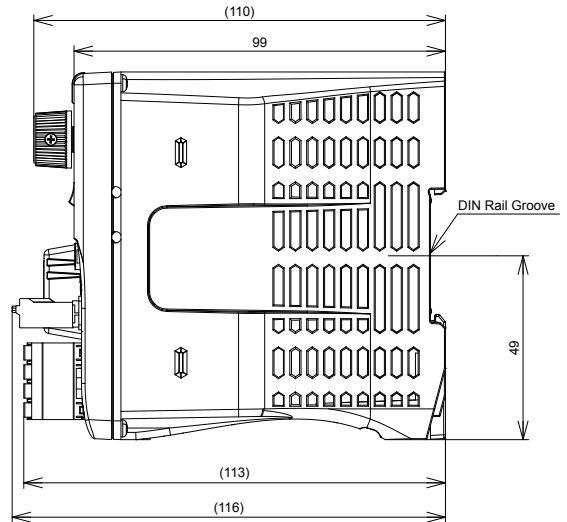## ■ RS-232C cable
Model name: EXCB2-FX32-9F-3

PIN No.	Signal name	Wire color	PIN No.	Signal name	Wire color	PIN No.	Signal name	Wire color
1	Dimming bit 0	Brown	12	Lamp switching 1	Red	23	General-purpose output 2	Violet
2	Dimming bit 0	Red	13	Lamp switching 2	Orange	24	General-purpose output 3	Gray
3	Dimming bit 0	Orange	14	Lamp switching 3	Yellow	25	General-purpose output 4	White
4	Dimming bit 0	Yellow	15	Dimming value write	Green	26	General-purpose output 5	Black
5	Dimming bit 0	Green	16	Input COM	Blue	27	General-purpose output 6	Brown
6	Dimming bit 0	Blue	17	RS-232C reception input	Brown	28	Output COM	Red
7	Dimming bit 0	Violet	18	RS-232C sending output	Red	29	Trigger input 1	Orange
8	Dimming bit 0	Gray	19	RS-232C common terminal	Orange	30	Trigger input 2	Yellow
9	Dimming bit 0	White	20	Lighting time write	Yellow	31	Trigger input 3	Green
10	Dimming bit 0	Black	21	Write mask	Green	32	Trigger input 4	Blue
11	Lamp switching 0	Brown	22	General-purpose output 1	Blue			

Dimensions(mm)

■ CD-VA20024-4PE (with Ethernet communication)

* All models have the same external dimensions

80

LCD

Parallel Connector

Ethernet Connector

Power Connector

98

CD-VA

PARALLEL

TRIGGER

USB

2.4V

0V

L1 L2 L3 L4

Status LED

Operating Knob

LAMP Switch

MODE Switch

USB (USB Type-C)

Output Connectors

Trigger Connector

* CD-VA10024-2PE has 2 output connectors.

(110)

99

DIN Rail Groove

49

(113)

(116)

■ CD-VA10024-2P/CD-VA20024-4P (without Ethernet communication)

PARALLEL

TRIGGER

USB

CD-VA

2.4V

0V

L1 L2
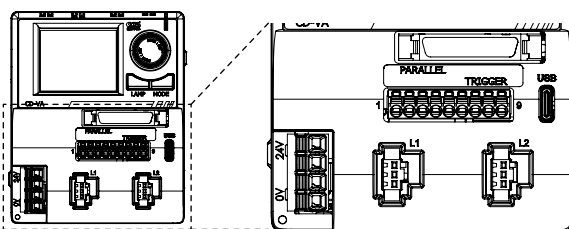
* CD-VA20024-4P has 4 output connectors.

14

26

26

73

10.5

3×φ3.7 Bottom Installation Holes (Depth 5)
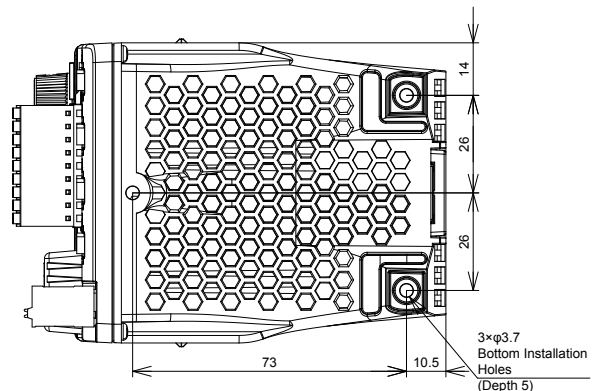
Setting Application CD-VA Dedicated App (Utility Software)

A dedicated app to easily set lighting parameters can be downloaded from the website.

https://www.ccs-grp.com/products/series/386

Set each channel's dimming value and ON/OFF control, as well as sequence control, recipe setting, ON/OFF input assignment, etc. The app also monitors operation status.
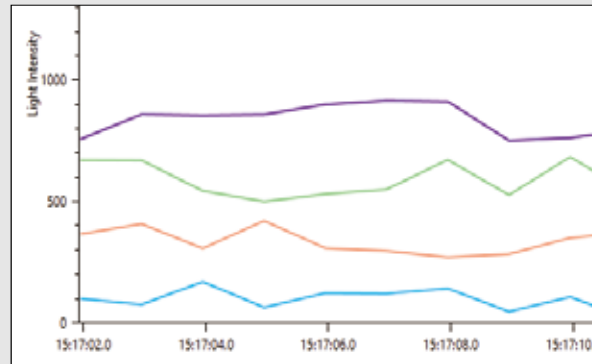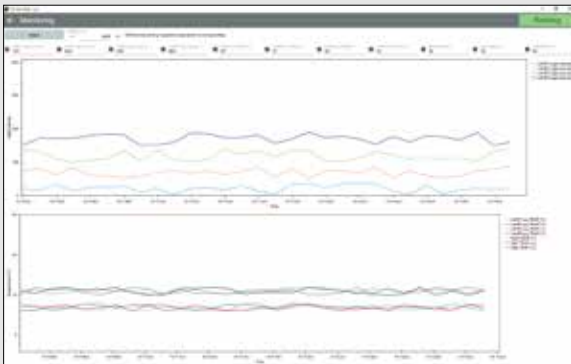
Setting screen

Sequence control setting screen

Recipe setting screen

Lighting operation status monitoring screen

For more information about this product, please refer to the hardware manual and operation manual.

< Downloadable from the web page > **https://www.ccs-grp.com/products/series/386**

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Notes

● To ensure proper and safe use of the product, please read the Instruction Guide completely before using the product.

● The design and specifications of this product are subject to change without notification for the purpose of product improvement.

CCS Inc.