



Controller for LED Illumination

VLC-1230-4

Operation Manual



Thank you for purchasing a VAL product.

To use this LED controller with optimum performance and safety,
please read this manual thoroughly before starting operation.







Keep this manual for the whole product lifetime.


The following warning symbols are used in this manual.

Be sure to fully understand the contents.

 WARNING	A warning denotes a hazard that can cause severe injury or death.
 CAUTION	A caution denotes a hazard that can cause injury or damage of equipment.

1. Safety regulations

 WARNING	
	Do not open the chassis to avoid electric shock. High-voltage parts are inside.
	Use appropriate DC power only. 1) DC12V : Input terminal board of the controller M3 terminal board. : Crimp Terminal on the connected side M3 round crimp terminal.
	Earth ground the product. If you do not, it may cause an electric shock when you touch both a part with earthing potential and the power supply at the same time.
	Whenever trouble occurs, such as smoke, smell, noise or abnormal heat, stop the operation immediately and turn off the power and unplug the power cord.
	Use only LED lighting unit made by VS Technology (Thailand) Co., Ltd. If you use with other lighting unit, over current may cause a fire or heat.

 CAUTION	
1.	USE the extension or remote cables 3m maximum to prevent power drop by voltage reduction or malfunction by noise.
2.	Installation of the product 1) Place horizontally in a well ventilated space on the rubber feet at the bottom of the unit. 2) Do not topple or lay on its side. 3) Do not put on unstable or vibrational place. 4) Do not use in environment with humidity, dusty, high temperature or fire. 5) Keep liquids away.
3.	Do not look at the LED directly. If you see the LED long time, your eyes may be damaged.
4.	Cleaning Use wet cloth twisted well. Never use inflammable liquids such as alcohol, benzene or thinner. Turn off the power and unplug the cord from the outlet while cleaning to avoid any injury or damage of the unit.
5.	Dispose the product conforming to the law in the region where the product is used.

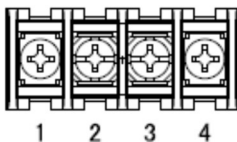
2. General Description

VLC-1230-4 are a controller for VAL series or LED lighting unit made by VS Technology (Thailand) Co., Ltd. It can be used with input voltage range with DC12V and output wattage maximum totally 30W with 1CH and 2CH and 3CH and 4CH. There are four independent output channels and each channels can be controlled separately. Remote control is also available separately in each channels.

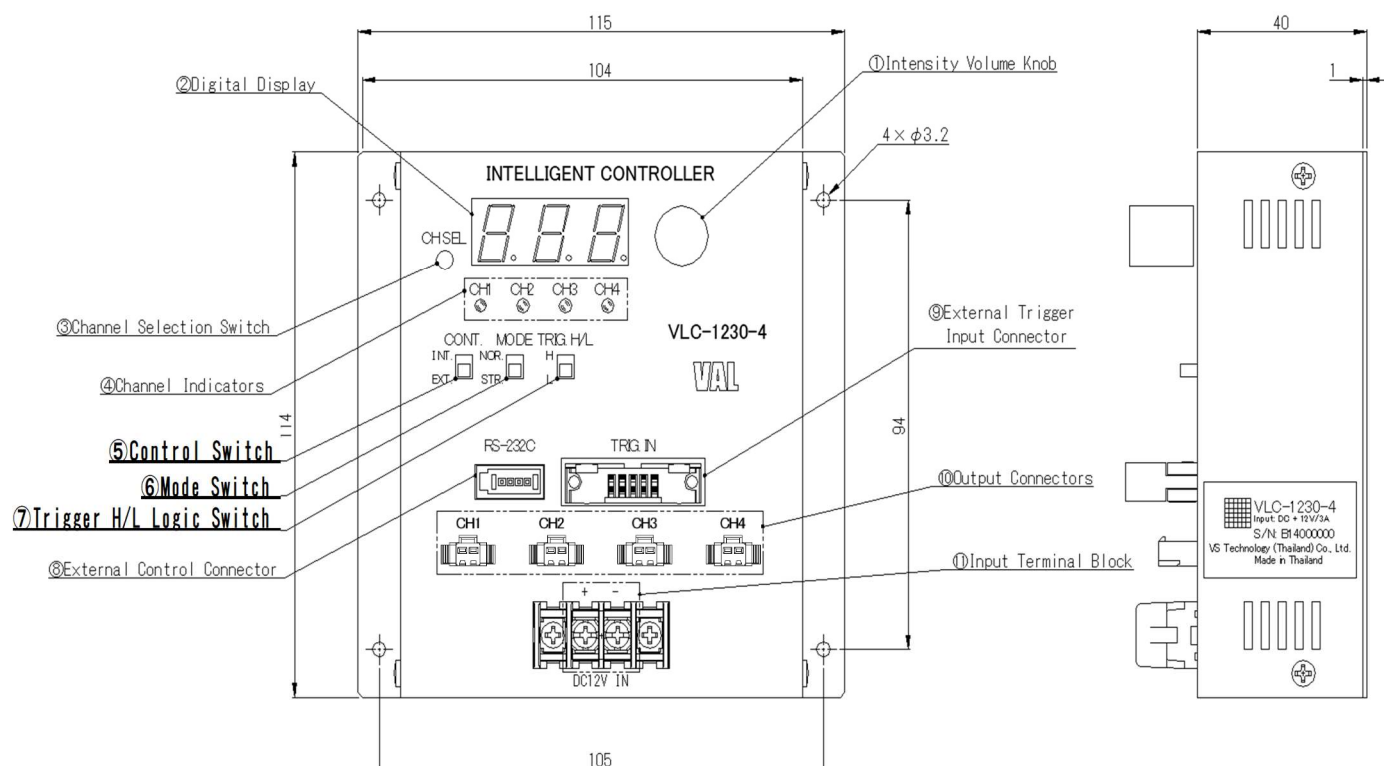
3. Confirming package contents

Item	Q'ty
Main unit	1
This operation manual	1

4. Specification

Model	VLC-1230-4
Input Voltage	DC 12V (rated) $\pm 10\%$ 50/60Hz
Power Consumption	DC 12V/3A
Rated output voltage	4 Channels DC12V (between output and GND)
Rated output current	2.5A (Total for 4 channels)
Input Connectors	<p>DC input 3M round crimp terminal is are recommend to connect to the terminal block</p>  <p>1: NC 2: + (DC12V/3A) 3: - (DC0V) 4: NC</p>
Output Connectors	<p>SMP-02V-BC (JST) 1:output+ 2:output-</p> <p>Insulation resistance: 500MΩ (min.) Withstand voltage: AC1500V/minute</p>
External control connectors	<p>Trigger input MIL connector (MIL-C-83503 compliant), 10-pole</p> <p>For setting the light intensity and lighting mode: e-CON 3-pole</p>
Intensity Control	<p>INT.: Control manually by volume knobs</p> <p>EXT.: Remote control by external EIA-232-D</p>
Strobe Control	<p>NOR.: The lights are always ON.</p> <p>STR.: Strobe control.</p>
Lighting method	PWM (100KHz)
Overcurrent protection	Operates at 105% or higher of the rated current
Operating Environment	<p>Temperature: 0 to 40°C Humidity: 20~85% RH without condensation</p> <p>Altitude: 2000m Max. Pollution level: 2</p> <p>Protective ground class I Installation category II (restricted to use in indoor environment)</p>
Storage Temperature/ Humidity	-15 to 40°C / 20 to 85% RH without condensation
Cooling Method	Natural air cooling
Dimensions	W115mm x D40mm x H114mm
Weight	Approx. 445g
Environmental regulations	RoHS compliant
European Standards	EN55011:2009 +A1:2010
(CE Marking) *Under processing	EN61000-6-2:2005

5. Dimensions and Functions



①	Intensity Volume Knob	For digital control
②	Digital Display	Display the setting of the light intensity or the setting of the lighting mode.
③	Channel Selection Switch	Selects CH1, CH2, CH3, CH4.
④	Channel Indicators	CH1 lit: Lit when changing settings for Light Unit connected to output connector CH1. CH2 lit: Lit when changing settings for Light Unit connected to output connector CH2. CH3 lit: Lit when changing settings for Light Unit connected to output connector CH3. CH4 lit: Lit when changing settings for Light Unit connected to output connector CH4.
⑤	Control Switch	Selects internal (INT.) or external (EXT.) control mode.
⑥	Mode Switch	Selects normal (NOR.) or strobe (STR.) control mode.
⑦	Trigger H/L Logic Switch	Selects the logic of the trigger signal.
⑧	External Control Connector	For external control with RS-232C communications.
⑨	External Trigger Input Connector	Inputs the ON/OFF signal for ON/OFF Mode. Inputs the trigger signal for Strobe Mode.
⑩	Output Connectors	Supply power to the Light Units.
⑪	Input Terminal Block	Connects the power source to the Control Unit DC12V.

6. Operation

(1) Connections

Connect the LED lighting unit to CH1 or CH2 or CH3 or CH4 output connector on front panel of the product.
Connect DC power cord to input terminal block on front panel of the product.

(2) Internal control

Light intensity is adjustable manually when the control switch on the front panel is set at "INT."

(3) External control

When the control switch on front panel is set at "EXT." , external control input signal is available through "RS-232C" or "TRIG. IN" connector on front panel.

(4) On/Off Control

It is possible to turn off the light by inputting "off" signal by External control mode.

(5) Error Signal

Error indicator on front panel will be on if an error of LED lighting unit detected such as breaking of wire.

Error signal from external signal connector will be output at the same time.

It does not identify error of CH1 or CH2 or CH3 or CH4. Please check the lighting units.

This function does not detect the connection of lighting unit. To avoid signal malfunction, set the output minimum level if the lighting unit is not connected.

This function works regardless of the control switch ("INT./EXT." mode).

7. Control with External Signals



CAUTION

Use output signal cable of 3m or shorter.
Do not apply too high current and voltage.
Do not use external connector except SELV circuit with reinforced insulation or a circuit with double insulation.

Connector Communications Specifications

No.	Signal	Communications protocol	EIA-232-D
1	Tx	Baud rate	38,400 bps
2	Rx	Data bit length	8 bits
3	NC	Parity bit	None
4	GND	Stop bits	1 bit

Command Formats

Send Data (*1)

Function	Header	Channel specification	Sent command		ID specification	Checksum	Delimiter	Default
			Instruction	Data (*2)				
Light Intensity Setting	@	00 to 03 (Refer to Channel Specification) FF: All channels (ON/OFF setting only)	F	000 to 255 (000:Min. Intensity, 255:Max. Intensity)	00 (Fixed)	00 to FF (Refer to Checksum)	<CR><LF>	000
Lighting Mode Setting			S	01 to 10 (Refer to Lighting Mode Settings)				00
ON/OFF Setting (*3)			L	0 : Not Lit , 1 : Lit (*4)	----			(*5)

*1: Send a data within 4 seconds from 'Header' to 'Delimiter', otherwise time-out error occurs and command data will be rejected.

*2: Specify all numbers in Decimal format.

*3: ON/OFF settings from EIA-232-D communications without regards to trigger logic switch, turned OFF at '0' and ON at '1'. ON/OFF setting will not be held after turning the power off.

*4: When operating EIA-232-D Communications and trigger signal input at same time in ON/OFF mode.

When Trigger H/L logic switch is at H : if either controls setting to OFF setting, Light unit will be turned OFF.

When Trigger H/L logic switch is at L : if either controls setting to ON setting, Light unit will be turned ON.

*5: Default setting for trigger logic switch is H='1(ON)' and L='0(OFF)'.

Receive Data

Receive Data									
Function	Header	Channel specification	Receive Command				ID specification	Checksum	Delimiter
			OK		NG				
Light Intensity Setting	@	00 to 03 (Refer to Channel Specification) FF: All channels (ON/OFF setting only)	0	-----	N	01: Command Error 02: Checksum Error 03: Setvalue out of Range Error	00 (Fixed)	00 to FF (Refer to Checksum)	<CR><LF>
Lighting Mode Setting									
ON/OFF Setting									

Channel Specification

Channel	CH1	CH2	CH3	CH4
Set Value	00	01	02	03

Lighting Mode Setting

Status	Strobe Mode									
	40 μ S	80 μ S	120 μ S	200 μ S	600 μ S	1.2mS	4mS	10mS	20mS	40mS
Channel	F01	F02	F03	F04	F05	F06	F07	F08	F09	F10
Set Value	01	02	03	04	05	06	07	08	09	10

Checksum

The codes of the ASCII characters from the header to the ID are added, the lowest byte is converted to hexadecimal, and two characters are sent.

Example: Setting the Light Intensity of Channel 2 to 125

	Header	Channel	Sent command					ID		Total
	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9	
Character	@	0	1	F	1	2	5	0	0	
ASCII (hexadecimal)	40 hex	30 hex	31 hex	46 hex	31 hex	32 hex	35 hex	30 hex	30 hex	10F hex

*Set value that are higher than 10 are not valid.

Setting Procedure

-Make sure that the main power source is turned ON.

-Set the Internal/External mode selector to EXT. to set External mode.

-Setting the Light Intensity

Specify the ID and the channel, and the light intensity.

Setting example	Send data	Receive data (When ON)	Receive data (When NG)
Setting the light intensity to 75 for CH2 of the VLC-1230-4 that has the ID set to 01	@01F07500E4CRLF	@0100051CRLF	@01N0300B3CRLF

-Setting the Lighting Mode

Specify the ID and channel, and set the lighting mode.

Setting example	Send data	Receive data (When ON)	Receive data (When NG)
Setting the lighting mode to Strobe Mode at 200 μ s for CH2 of the VLC-1230-4 that the ID set to 00.	@00S0400B8CRLF	@0000050CRLF	@00N0300B2CRLF

-To set ON/OFF Signal in ON/OFF mode

Specify the ID and the channel, and set ON/OFF signal.

Setting example	Send data	Receive data (When ON)	Receive data (When NG)
To turn all light units OFF of the VLC-1230-4 that has the ID set to FF.	@FFL000A8CRLF	@FF007BCRLF	@FFN0300DDCRLF (When there is a set value out of range error)

8. Inputting an External Trigger

*Input Signal and Photo coupler

The input signal from the external trigger input connector can be used to control the photo coupler inside the Unit to turn the LED Light Units ON and OFF or to control strobe timing.

Trigger H/L Logic Switch	Input signal	Photo coupler	ON/OFF Mode	Strobe Mode
H	HIGH LOW	OFF ON	Light Units ON Light Units OFF	Lights Units ON for the set time No change
L	HIGH LOW	OFF ON	Light Units OFF Light Units ON	No change Lights Units ON for the set time

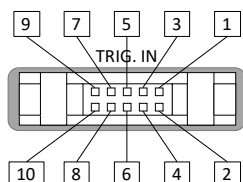
*When operating trigger signal input and communication used External trigger input connector at same time in ON/OFF mode.

When Trigger logic switch is at H : if either controls setting, Light unit will be turned OFF.

When Trigger logic switch is at L : if either controls setting, Light unit will be turned ON.

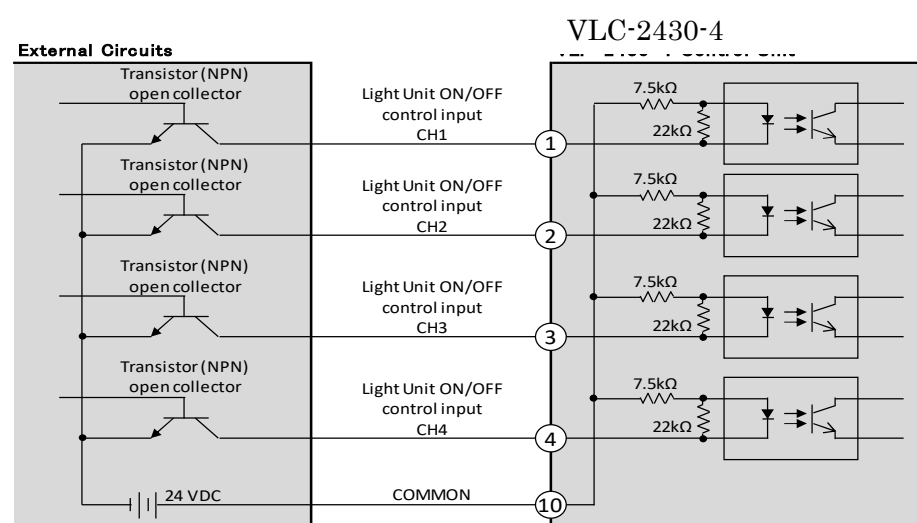
*Connector Layout

External Trigger Input Connector Plug



NO	Signal	Cable
		Wire color
1	Light Unit ON/OFF control input CH1	Black
2	Light Unit ON/OFF control input CH2	Black/White
3	Light Unit ON/OFF control input CH3	Brown
4	Light Unit ON/OFF control input CH4	BROWN/WHITE
5 to 9	No used	---
10	COMMON+	Yellow/Black

*External Trigger Signal Connection Example



Signal Specifications					
Rated input voltage	Maximum input voltage	ON voltage/ON current	OFF voltage/OFF current	ON/OFF response time	Input impedance
24 VDC	26.4 VDC	14.4 VDC min. /3 mA max.	5 VDC max. /1 mA max.	10 μ s max.	7.5k Ω (per terminal)

*Setting Procedures

With external trigger input connectors pins 1 to 4, select the channels (CH1 to CH2 to CH3 to CH4) where you want to input an external trigger, and input trigger.

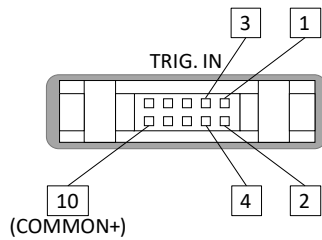
Trigger signals are input from the external trigger input connector in ON/OFF Mode and Strobe Mode in both Internal Mode or External Mode.

ON/OFF Mode

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

Strobe Mode

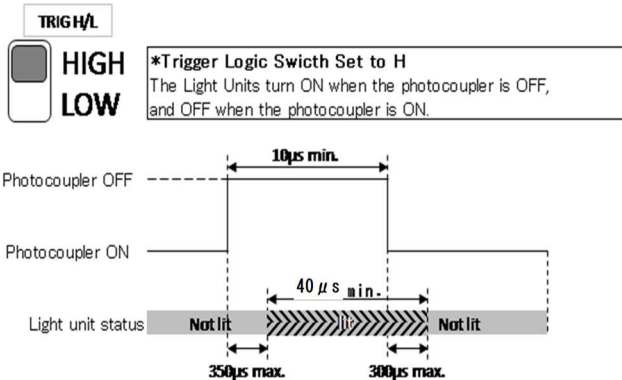
The Light Units are turned ON for the set time after the external trigger signal input.



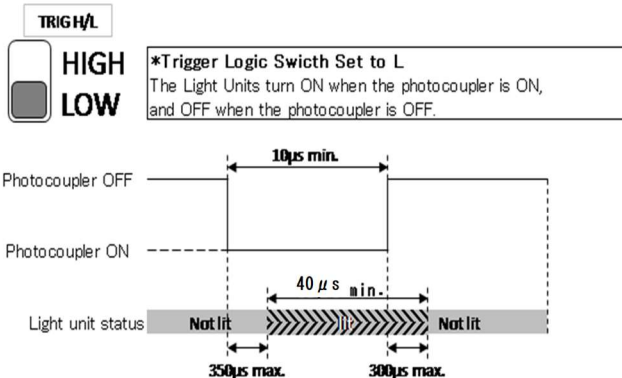
*Trigger Input Sequence Diagram

- A pulse width of ON signal shall be $10\mu\text{s}$ or more. The Light Units will be turned on for at least $40\mu\text{s}$, even when the input ON signal is less than $40\mu\text{s}$.
- If another trigger is input before the Light Units turns 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.

ON/OFF Mode

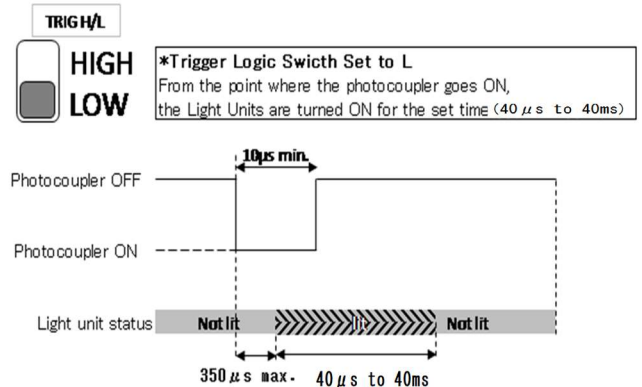
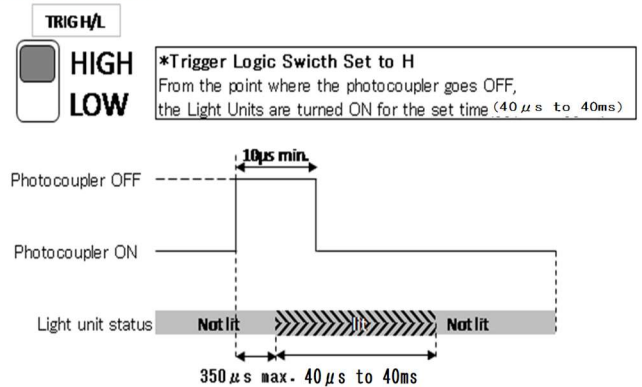


*The LED Light Unit will turn off by OFF signal sent by either trigger signal input or EIA-232-D communications.



*The LED Light Unit will turn on by ON signal sent by either trigger signal input or EIA-232-D communications.

Strobe Mode



9. Optional Accessories

*External Control Cable

Model: VL-EXCB1-3

Connector: XN2A-1470 (Manufactured by OMRON)

*External Trigger Input Cable

Model: VL-EXCB2-3

Connector: XG4M-1030-T (Manufactured by OMRON)

10. Warranty

•Duration of warranty

The duration of the product warranty shall be two years from the day of product delivery.

•Extent of warranty

If a fault or defect attributable under normal use during the warranty period, VS Technology (Thailand) Co., Ltd. will in good faith ship a replacement or repair the defective part of the product free of charge.

- ☐ Faults or damage that occur due to conditions, environments, handling, or usage other than those described in the Instruction Manual and specifications.
- ☐ Faults or damage that occur due to modification of structure, performance, specifications, etc., by customers after the day of product delivery.
- ☐ Faults or damage that occur due to use of the product other than for its designed purpose.
- ☐ Faults or damage that occur due to natural or human causes such as saltwater air damage, gas damage, earthquakes, floods, fire, lighting or armed conflicts.

•Disclaimer

VS Technology (Thailand) Co., Ltd. shall not be responsible for any appendant damaged for example business interests cost or abort of business.

«Note»

- If there are any unclear points or if you have any questions, please feel free to inquire VS Technology (Thailand) Co., Ltd.

For repair or after sales service, please contact any VS Technology (Thailand) Co., Ltd. office or the sales representative where you have purchased the unit.

- Please provide us with the following information when requesting service.

Model Name

Serial No.:

Date of purchase:

State of trouble: Please provide detailed information

Your name, address, telephone number, email-address

