CV Controller User Manual

MMV-90-4-E01

This instruction manual contains information on product features, specifications, and operating methods.
Please check the following for proper use.

- This product should be handled by a technician.
- Please fully understand the manual.
- If a problem occurs during use, stop using it and keep it for reference.

■ Introduction

This product is the LED lighting controller made for use in industrial inspection equipment.
Do not use the controller for home lighting and other purposes.

● Before using the product, check the input voltage is within the specified range.

● Lighting products connected to the controller must be applied to the specifications.

- **Otherwise, it may cause performance decreasing and malfunction.**

● Do not use this product in the following environments.

- **Place with water or oil**
- **Place with direct sunlight**
- **Place with drastic temperature changes**
- **Place with a risk of freezing or condensation**
- **Place with a large impact of vibration and impact**

● The operating and storage temperature of this product

- **Operating temperature & Humidity : 5 ~ 40℃ / 20 ~ 85%**

- **Storage temperature & Humidity : -20 ~ 60℃ / 20 ~ 85%**

● For technical requirements, please refer to the contact information.

There shall be a statement in the instructions that, if the equipment is used in a manner not Specified by the manufacturer, the protection provided by the equipment may be impaired.

Safety Precautions

	Do not touch with wet hands. There is a risk of electric shock.		Do not disassemble the product. Such as disassembly, modification, or repair.
	Do not leave the product in a wet or wet place. There is a risk of fire, electric shock, and product damage.		Do not drop the product or give it an impact. The product may not work.
	here is a risk of burns due to surface temperature.		Use the power supply voltage and load within the range of specifications and ratings. There is a risk of product damage and fire or electric shock.

Controller Summary

Item	Description
Model	MMV-90-4-E01
Input Voltage	24-30 Vdc, Max. 5 A, Max. 120 W, Class 2
Maximum Output	DC 24V 1 A per CH (Total 4 CH)
Output Frequency	12.5khz
Power Consumption	MAX 100W
Number of channels	4
Intensity step	0 ~ 255 step
Intensity Method	Continues Voltage (CV)
Data Communication	RS-232C / Ethernet
Mode	Manual / Remote
Humidity	20 ~ 85 % R.H
Temperature	Operating : 5 ~ 40 ℃ / Storage : -20 ~ 60 ℃
Weight	1Kg
Housing Construction	SPCC (Steel Plate Cold Commercial)
Cooling Method	Natural air cooling
Size	85 x 80 x 190 mm
Expected Service Life	1 Year

Revision History

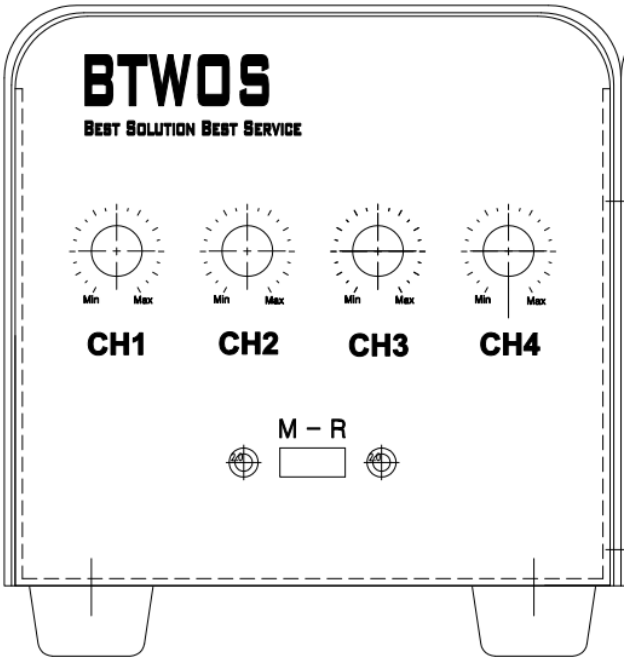
date	Version	Change story	Remark
2024.05.07	1.0	Initial Release	

Index

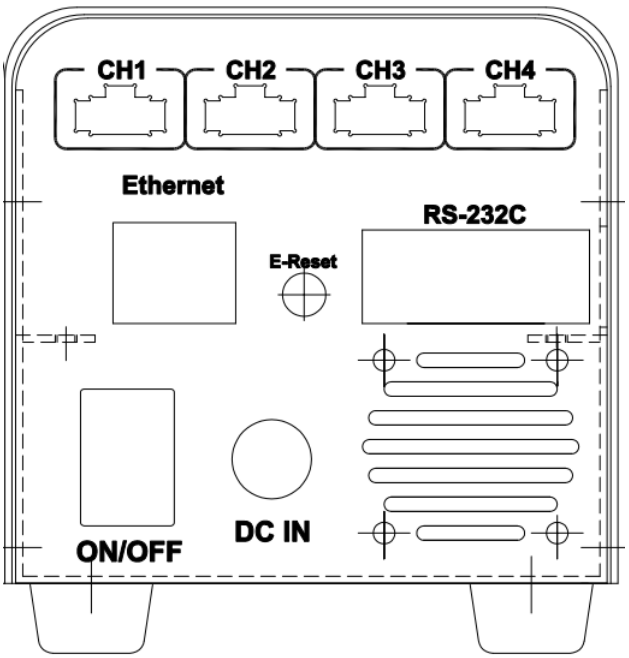
1. Product Composition & Installation
2. Front Detail Composition
3. Rear Detail Composition
4. Connector Pin-Out
5. Protocols
6. Environment Conditions
7. Warranty
8. Trouble Shooting
9. Symbols

1. Product Composition & Installation

Front View

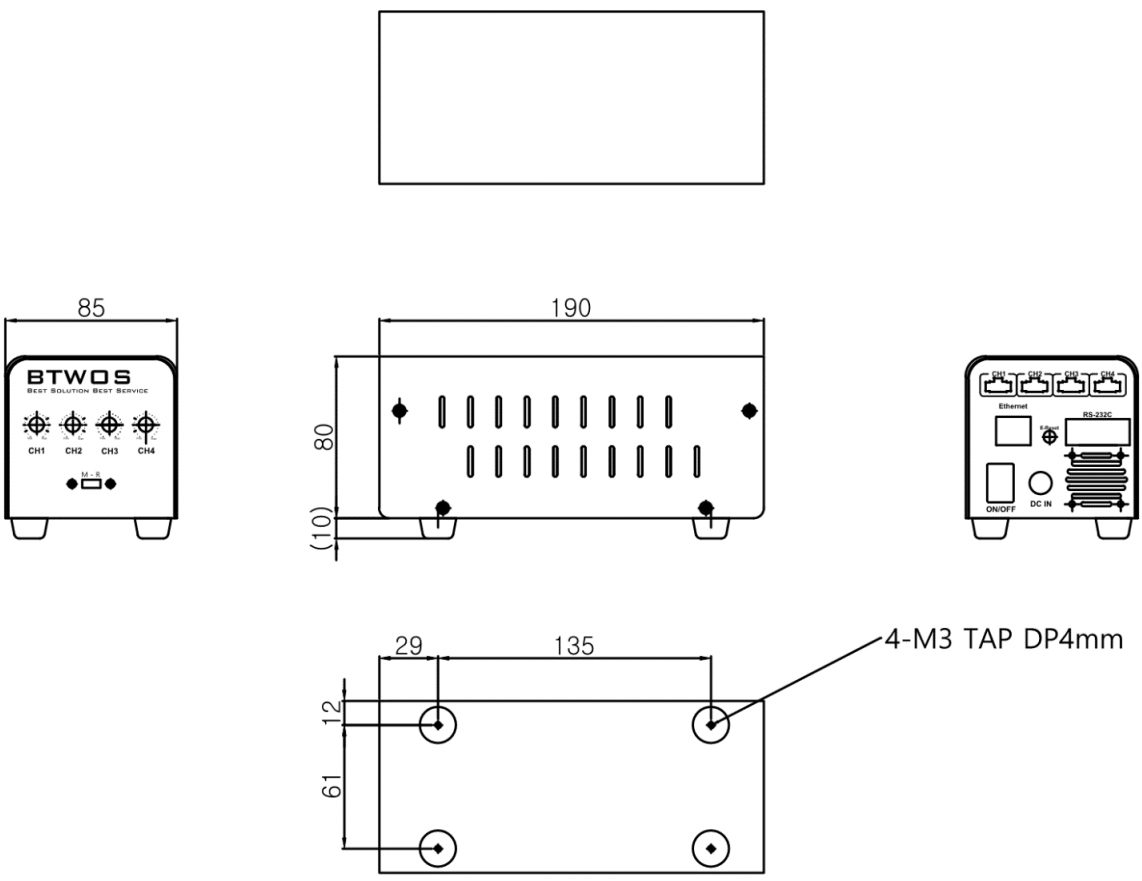


Rear View



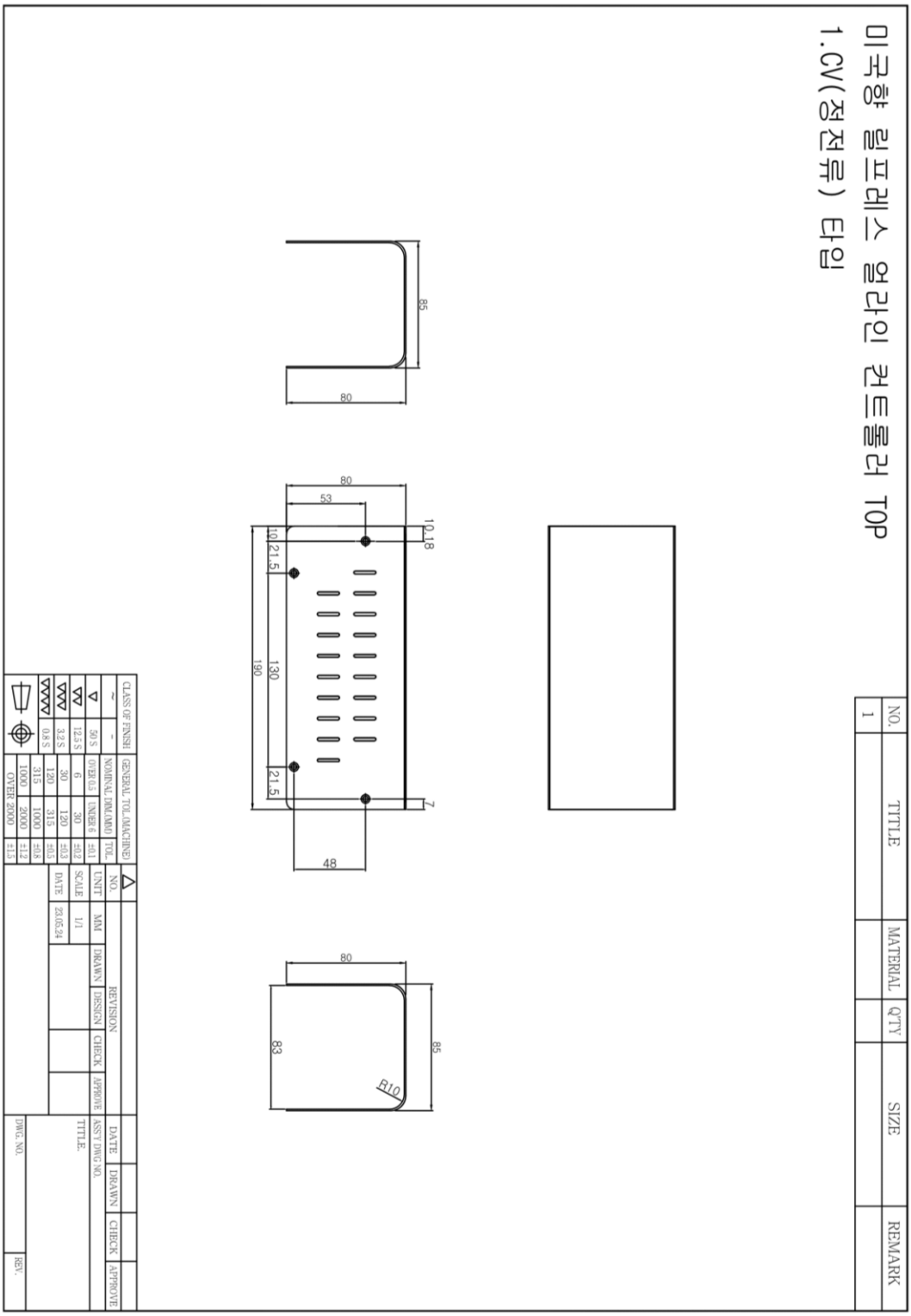
1. Product Composition & Installation

- **Dimension : 85 x 80 x 190 mm**
- **Material : SPCC 2mm**
- **Color : Black Powder Coating**
- **Weight: about 1 Kg**
- **Installation : To install the product, remove the rubber feet at the bottom and install using M3 tap.**
- **Outline View:**



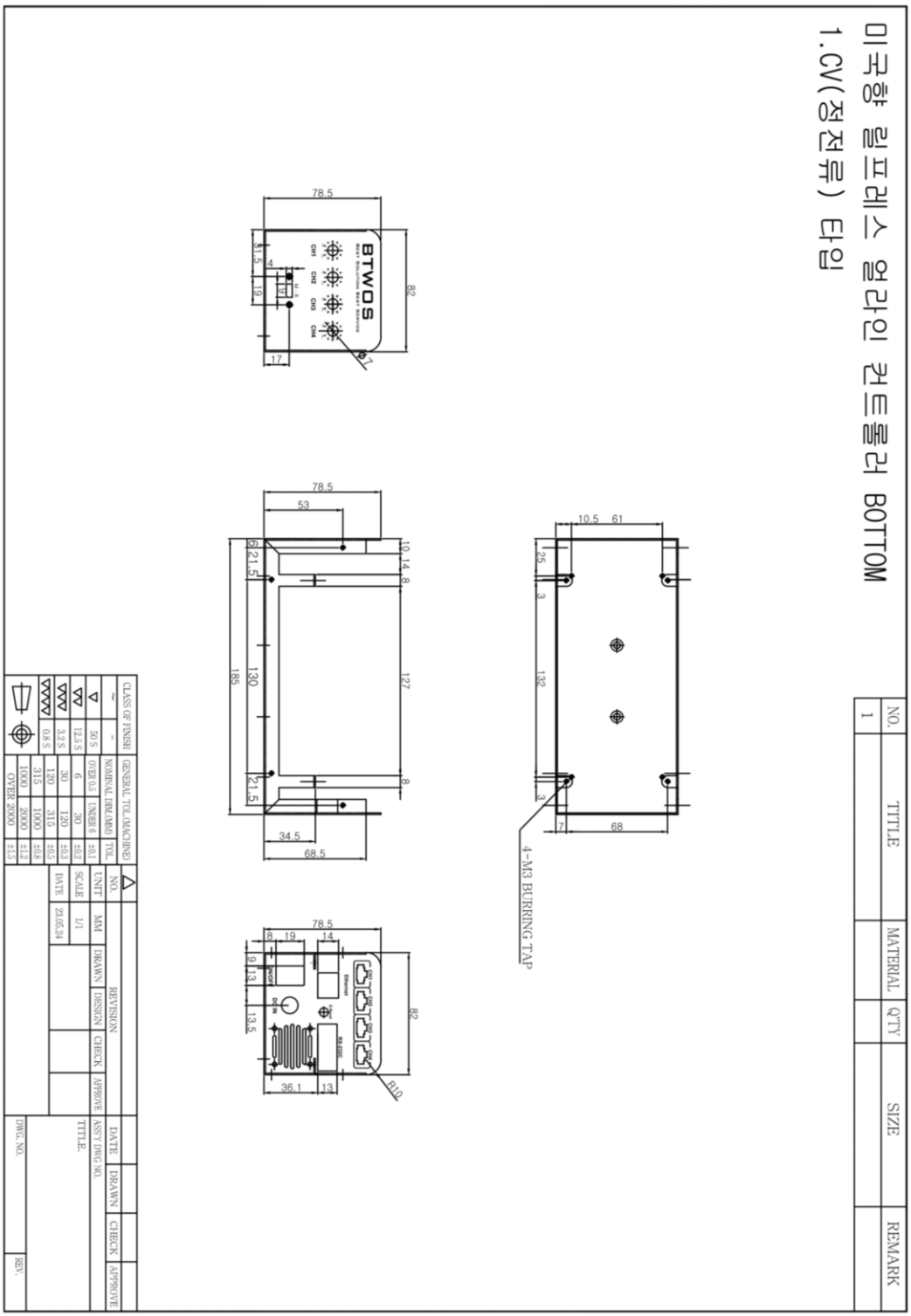
1. Product Composition & Installation

- **Top Cover technical drawing:**

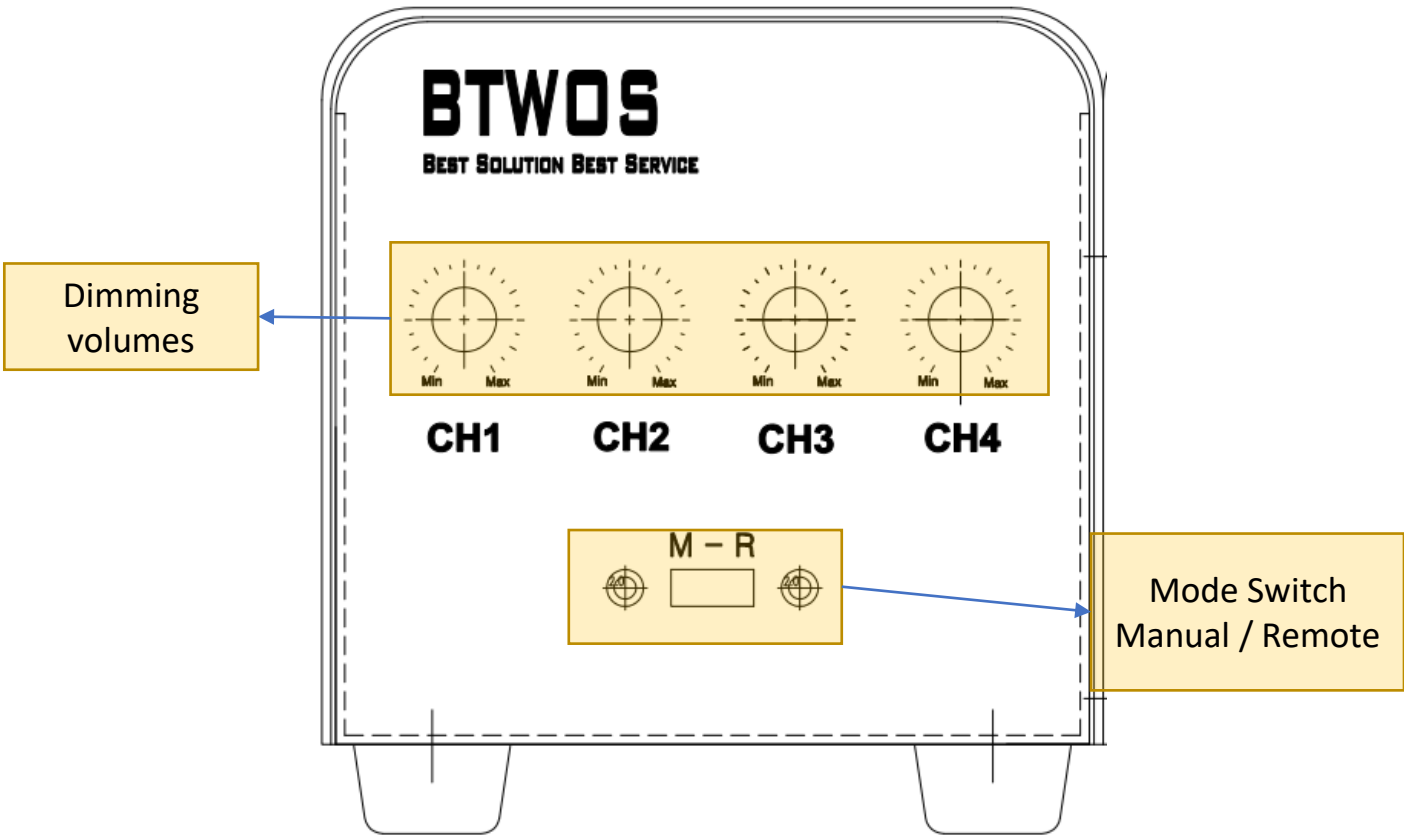


1. Product Composition & Installation

- **Bottom technical drawing:**



2. Front Detail Composition



- **Dimming Volumes : Each Channel change Dimming value (only manual mode)**

  Clockwise -> Dimming value up

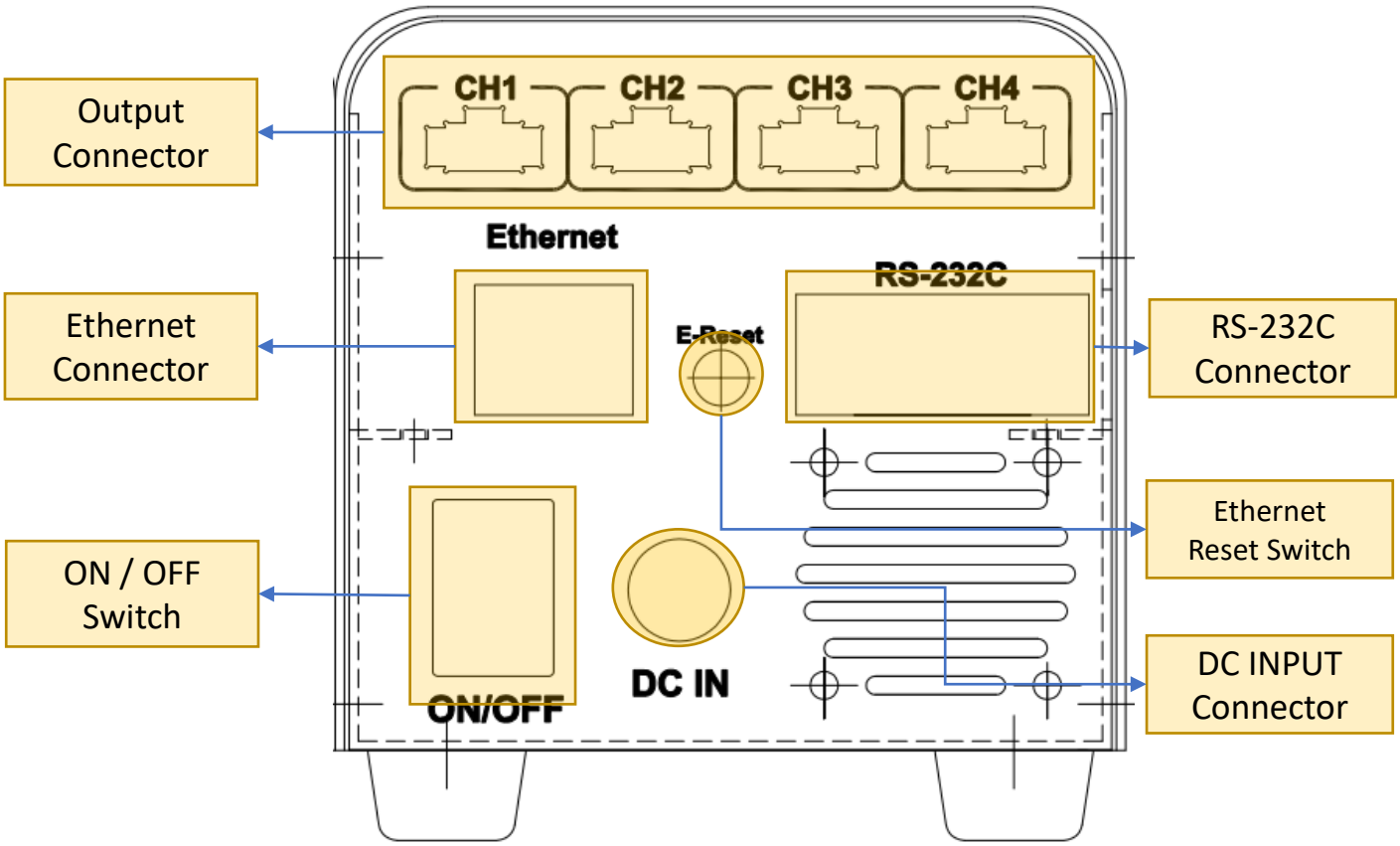
  CounterClockwise -> Dimming value down

- **Mode Switch : Change mode (Manual / Remote)**

  Left side : Manual mode

  Right side : Remote mode

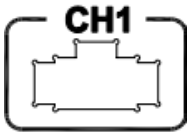
3. Rear Detail Composition



- **Output Connector :** Led Output Connector (JST 3P)
- **Ethernet Connector :** RJ45 Ethernet Connector
- **ON / OFF SWITCH :** MAIN POWER ON / OFF SWITCH
- **RS-232C Connector :** Rs-232c Communication Connector (D-sub 9P)
- **Ethernet Reset Switch :** Ethernet IP & Mac address Initialize
- **DC INPUT Connector :** Main DC POWER INPUT Connector

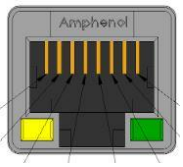
4. Connector Pin-Out

1) Output Connector (JST 3P – SMP-03V-BC)



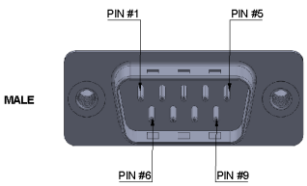
1	2	3
OUTPUT +	N.C	OUTPUT -

2) Ethernet Connector (RJ45)



1	2	3	4	5	6	7	8
Tx +	Tx -	Rx +	N.C	N.C	Rx -	N.C	N.C

3) RS-232C Connector (D-SUB 9P Male)



1	2	3	4	5	6	7	8	9
N.C	Rxd	Txd	N.C	GND	N.C	N.C	N.C	N.C

4) DC INPUT Connector (5.5mm x 2.5mm)



TIP	SLEEVE
DC +	DC -

5. Protocols

- **Communication sequence**

  1. Host(PC) request to Controller
  2. Controller receive from Host, and response to Host
  * response time is about within 10mSec . If controller get wrong protocol then rise timeout after 2Sec, message buffer is initialized

- **Communication initial configuration**

  - Ethernet :
  Controller IP : 192.168.0.150
  NetMask IP : 255.255.255.0
  Gateway IP : 0.0.0.0
  Port num : 1070
  * Controller Socket server. Host Socket client

  -Rs-232:
  Baudrate : 115200
  Data Bits : 8
  Parity : None
  Stop bit : 1
  Flow Control : None

- **Protocol components**

  Header + Command + Length + Data + Footer

  - Host to Contoller
  Header : “P” , 0x50
  Command : Command Code
  Length : Total bytes number
  Data : Value for command and Channel
  Footer : “C” , 0x40

5. Protocols

- **Protocol components**

  - Contoller to Host
  Header : “P” , 0x43
  Command : Command Code
  Length : Total bytes number
  Data : Value for command and channel
  Footer : “C” , 0x50

- **These Protocols is used only remote mode**

5. Protocols

- **Command List**

Command		description	Remark
Set	0x01	Change Dimming value	
Set	0x02	Change all each CH Dimming value	
Set	0x05	Change ON / OFF state	
Read	0x11	Read Dimming value	
Read	0x15	Read ON / OFF state	
Read	0x1A	Read Firmware version	
Read	0x1C	Read Local / remote	
Set	0x41	Change Ethernet IP	
Read	0x42	Read Ethernet IP	
Set	0x44	Change Mac address	Above Ver 1.4
Read	0x45	Read Mac address	Above ver 1.4

5. Protocols

- **Change Dimming value (0x01)**

- Request

Components	Code (HEX CODE)	Remark
Header	0x50	
Command	0x01	
Length	0xXX	Total bytes number.
Data 1	0xXX	Channel number, 0x00 all ch, 0x01 ~ 0x04 each ch
Data 2	0xXX	Dimming value 0x00 ~ 0xff , 0 ~ 255 value
Footer	0x43	

Ex)
Req: 50 01 06 00 FF 43 (All CH set 255 dimming value)
Res: 43 01 06 00 FF 50

Total bytes number is 6. 6 hex code is 0x06.

Ex)
Req: 50 01 06 04 0A 43 (4 CH set 10 dimming value)
Res: 43 01 06 04 0A 50

- Response

Components	Code (HEX CODE)	Remark
Header	0x43	
Command	0x01	
Length	0xXX	Total bytes number.
Data 1	0xXX	Channel number, 0x00 all ch, 0x01 ~ 0x04 each ch
Data 2	0xXX	Dimming value 0x00 ~ 0xff , 0 ~ 255 value
Footer	0x50	

5. Protocols

- **Change all each CH Dimming value (0x02)**

- Request

Components	Code (HEX CODE)	Remark
Header	0x50	
Command	0x02	
Length	0xXX	Total bytes number.
Data	0xXX 0xXX 0xXX 0xXX	Dimming value 0x00 ~ 0xff , data : 1CH 2CH 3CH 4CH
Footer	0x43	

Ex)
Req: 50 02 08 0A 14 1E 28 43 (1CH -> 10 , 2CH -> 20 , 3CH -> 30, 4CH -> 40 dimming values)
Res: 43 02 08 0A 14 1E 28 50

- Response

Components	Code (HEX CODE)	Remark
Header	0x43	
Command	0x02	
Length	0xXX	Total bytes number.
Data	0xXX 0xXX 0xXX 0xXX	Dimming value 0x00 ~ 0xff , data : 1CH 2CH 3CH 4CH
Footer	0x50	

5. Protocols

- **Change ON / OFF state (0x05)**

- Request

Components	Code (HEX CODE)	Remark
Header	0x50	
Command	0x05	
Length	0xXX	Total bytes number.
Data 1	0xXX	Channel number, 0x00 all ch, 0x01 ~ 0x04 each ch
Data 2	0xXX	ON / OFF state, 0x00 OFF, 0x01 ON
Footer	0x43	

Ex)
Req: 50 05 06 00 01 43 (All CH STATE ON)
Res: 43 05 06 00 01 50

Ex)
Req: 50 05 06 01 00 43 (1 CH STATE OFF)
Res: 43 05 06 01 00 50

- Response

Components	Code (HEX CODE)	Remark
Header	0x43	
Command	0x05	
Length	0xXX	Total bytes number.
Data 1	0xXX	Channel number, 0x00 all ch, 0x01 ~ 0x04 each ch
Data 2	0xXX	ON / OFF state, 0x00 OFF, 0x01 ON
Footer	0x50	

5. Protocols

- **Read Dimming value (0x11)**

- Request

Components	Code (HEX CODE)	Remark
Header	0x50	
Command	0x11	
Length	0xXX	Total bytes number.
Data	0xXX	Channel number, 0x00 all ch, 0x01 ~ 0x04 each ch
Footer	0x43	

Ex)
Req: 50 11 05 00 43 (Read All CH Dimming value)
Res: 43 11 08 0A 14 1E 28 50 (1CH -> 10 , 2CH -> 20 , 3CH -> 30, 4CH -> 40 dimming values)

Ex)
Req: 50 11 05 01 43 (Read 1 CH Dimming value)
Res: 43 11 06 01 0A 50 (1CH -> 10 dimming value)

- Response

Components	Code (HEX CODE)	Remark
Header	0x43	
Command	0x11	
Length	0xXX	Total bytes number.
Data 1	0xXX / Not Send	Channel number 0x01 ~ 0x04 each ch / Note 1)
Data 2	0xXX / 0xXX 0xXX 0xXX 0xXX	Dimming value 0x00 ~ 0xff X CH data : 1CH 2CH 3CH 4CH
Footer	0x50	

Note 1) if Request all ch, Data1 Component is not include.

5. Protocols

- **Read ON / OFF state (0x15)**

- Request

Components	Code (HEX CODE)	Remark
Header	0x50	
Command	0x15	
Length	0xXX	Total bytes number.
Data	0xXX	Channel number, 0x00 all ch, 0x01 ~ 0x04 each ch
Footer	0x43	

Ex)
Req: 50 15 05 00 43 (Read All CH ON / OFF STATE)
Res: 43 15 06 00 0F 50 (ALL CH STATE ON , Binary Channel state , Data -> 0x0F -> 0b00001111)
0b00001111 -> N.C, N.C, N.C, N.C, 4CH, 3CH, 2CH, 1CH

Ex)
Req: 50 15 05 01 43 (Read 1 CH ON / OFF STATE)
Res: 43 15 06 01 01 50 (1CH ON STATE)

- Response

Components	Code (HEX CODE)	Remark
Header	0x43	
Command	0x15	
Length	0xXX	Total bytes number.
Data 1	0xXX	Channel number, 0x00 all ch, 0x01 ~ 0x04 each ch
Data 2	0xXX	Read One CH -> 0x01 ON , 0x00 OFF Read ALL CH -> Binary state note 1)
Footer	0x50	

Note 1) , Binary Channel state ,if Data -> 0x0F -> 0b00001111
0b00001111 -> N.C, N.C, N.C, N.C, 4CH, 3CH, 2CH, 1CH

5. Protocols

- **Read Firmware version (0x1A)**

- Request

Components	Code (HEX CODE)	Remark
Header	0x50	
Command	0x1A	
Length	0xXX	Total bytes number.
Footer	0x43	

Ex)
Req: 50 1A 04 43
Res: 43 1A 05 01 50 (ver 0.1)

Ex)
Req: 50 1A 04 43
Res: 43 1A 05 0D 50 (ver 1.3 -> 0x0D is integer 13, multiply by 0.1)

- Response

Components	Code (HEX CODE)	Remark
Header	0x43	
Command	0x1A	
Length	0xXX	Total bytes number.
Data	0xXX	version number, Multiply the Integer value by 0.1
Footer	0x50	

5. Protocols

- **Read Local / remote (0x1C)**

- Request

Components	Code (HEX CODE)	Remark
Header	0x50	
Command	0x1C	
Length	0xXX	Total bytes number.
Footer	0x43	

Ex)
Req: 50 1C 04 43
Res: 43 1C 05 01 50 (Remote mode)

Ex)
Req: 50 1C 04 43
Res: 43 1C 05 00 50 (Manual mode)

- Response

Components	Code (HEX CODE)	Remark
Header	0x43	
Command	0x1C	
Length	0xXX	Total bytes number.
Data	0xXX	0x00 manual mode, 0x01 remote mode
Footer	0x50	

5. Protocols

- **Change Ethernet IP (0x41)**

- Request

Components	Code (HEX CODE)	Remark
Header	0x50	
Command	0x41	
Length	0xXX	Total bytes number.
Data	0xXX ~	Note 1)
Footer	0x43	

Note 1) Data field -> Controller IP, Netmask IP, Gateway IP, Port Num

Ex) Controller IP 192.168.0.1, Netmask IP 255.255.255.0, Gateway IP 0.0.0.0, Port Num 1070
Req: 50 41 12 C0 A8 00 96 FF FF FF 00 00 00 00 00 04 2E 43
Res: 43 41 12 C0 A8 00 96 FF FF FF 00 00 00 00 00 04 2E 50

- Response

Components	Code (HEX CODE)	Remark
Header	0x43	
Command	0x41	
Length	0xXX	Total bytes number.
Data	0xXX ~	Note 1)
Footer	0x50	

5. Protocols

- **Read Ethernet IP (0x42)**

- Request

Components	Code (HEX CODE)	Remark
Header	0x50	
Command	0x42	
Length	0xXX	Total bytes number.
Footer	0x43	

Ex)
Req: 50 42 04 43
Res: 43 42 12 C0 A8 00 96 FF FF FF 00 00 00 00 00 04 2E 50

Controller IP 192.168.0.1, Netmask IP 255.255.255.0, Gateway IP 0.0.0.0, Port Num 1070

- Response

Components	Code (HEX CODE)	Remark
Header	0x43	
Command	0x42	
Length	0xXX	Total bytes number.
Data	0xXX ~	Note 1)
Footer	0x50	

Note 1) Data field -> Controller IP, Netmask IP, Gateway IP, Port Num

Ex) Controller IP 192.168.0.1, Netmask IP 255.255.255.0, Gateway IP 0.0.0.0, Port Num 1070
C0 A8 00 96 FF FF FF 00 00 00 00 00 04 2E

5. Protocols

- **Change Mac address (0x44)**

- Request

Components	Code (HEX CODE)	Remark
Header	0x50	
Command	0x44	
Length	0xXX	Total bytes number.
Data	0xXX 0xXX	Only can change last 2 mac address Note 1)
Footer	0x43	

Note 1) initial mac address 00:80:E1:00:00:00
Only can change last 2 mac address.

Ex)
Req: 50 44 06 00 01 43
Res: 43 44 06 00 01 50 (Now mac address is 00:80:E1:00:00:01)

- Response

Components	Code (HEX CODE)	Remark
Header	0x43	
Command	0x44	
Length	0xXX	Total bytes number.
Data	0xXX 0xXX	Return last 2 mac address
Footer	0x50	

5. Protocols

- **Read Mac address (0x45)**

- Request

Components	Code (HEX CODE)	Remark
Header	0x50	
Command	0x45	
Length	0xXX	Total bytes number.
Footer	0x43	

Ex)
Req: 50 45 04 43
Res: 43 45 06 00 01 50 (mac address is 00:80:E1:00:00:01)

- Response

Components	Code (HEX CODE)	Remark
Header	0x43	
Command	0x45	
Length	0xXX	Total bytes number.
Data	0xXX 0xXX	Return last 2 mac address
Footer	0x50	

6. Environment Conditions

1) Indoor use only

2) Altitude : up to 2000 m

3) Temperature : 5 ~ 40℃

4) Relative humidity : 20 ~ 85%

5) Overvoltage category Ⅱ, except for cord / plug-connected equipment)

6) Do not use in wet location)

7) Applicable POLLUTION DEGREE (DEGREE 2) of the intended environmental conditions.

There shall be a statement in the instructions that, if the equipment is used in a manner not Specified by the manufacturer, the protection provided by the equipment may be impaired.

● To ensure safety in the event of a problem, place the equipment in a controllable position to operate the disconnecting device.

● To prevent contamination of the product, do not install it where there is dust or oil. Periodically inspect the appearance of the product and wipe it with a dry towel.

● Installation and operation of lighting controller

● Install the lighting controller in a room where there is no moisture and dust.

● Install the lighting controller in a well-ventilated place and do not block the ventilation holes of the lighting controller.

● The lighting and cable used for the lighting controller must be provided with the product provided by the manufacturer.

● Make sure that the cables are connected tightly so that they do not come loose.

● Do not allow the temperature of the lighting controller or lighting to exceed 65℃ during operation, and stop operation if the temperature rises.

● If an inappropriate power cord is used, it may cause product failure. Be sure to use a power cord that meets the rating.

7. Warranty

Model	MMV-90-4-E01
Company	MAC LINE
Warranty Period	1 Year (From delivery date)
Warranty Details	

- If a manufacturing defect or natural breakdown occurs within the warranty period, we will provide free repairs or compensation in accordance with consumer damage compensation regulations.

- In the following cases, we will repair for a fee even during the warranty period.

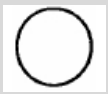
  - Malfunction due to incorrect use or careless handling.
  - When the free warranty period has expired.
  - In case of malfunction due to the consumer's intention or negligence.
  - Breakdown and damage caused by repairs and modifications by other than our C/S personnel

- For other inquiries, please contact us and we will kindly answer you.
  - Company address : MACLINE, C-1010 unit, Incheon-u1 center, 236, Jubuto-ro, Bupyeong-gu, Incheon, Republic of Korea
  (Zip Code : 21330)
  - Phone : +82-10-715-6320
  - E-mail : mac@macline.co.kr
  - Homepage : https://macline.co.kr/

8. Trouble Shooting

CONDITION	SELF-DIAGNOSIS	REMARK
Do not Working controller	1. Check Power Cable (damaged or disconnected) 2. Check Input voltage (Suitable for voltage / Frequency / Rated current) 3. Check Fuse (Only product with AC inlet applied) 4. Check Main SW	
Do not Working Light	1. Check controller Power 2. Check Light Cable (damaged or disconnected) 3. Check the light channel state & dimming value	
In case of smoke or overheating	• Must be turned off immediately. • Contact us (MACLINE)	

9. Symbols

Number	Symbol	Description	Reference
1		Direct current (Courant continu)	IEC 60417-5031 (2002-10)
2		Alternating current (Courant alternatif)	IEC 60417-5032 (2002-10)
3		Earth (Ground) Terminal (Borne de terre)	IEC 60417-5019 (2006-08)
4		On (power)	IEC 60417-5007 (2009-02)
5		Off (power)	IEC 60417-5008 (2009-02)
6		Equipment protected throughout by Double Insulation or Reinforced Insulation (Équipement entièrement protégé par une double isolation ou une isolation renforcée)	IEC 60417-5172 (2003-02)
7		Caution, hot surface (Attention surface chaude)	IEC 60417-5041 (2002-10)
8		Caution (Mise en garde)	IEC 60417-0434B (2004-01)
9		UL Mark (Marque UL)	UL 61010-1, 3rd Edition, May 11, 2012, Revised July 19, 2019, CAN/CSA-C22.2 No. 61010-1(2012-05), 3rd Edition, with revisions through 2018-11