

Thank you very much for purchasing Panasonic products. Please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference.

WARNING

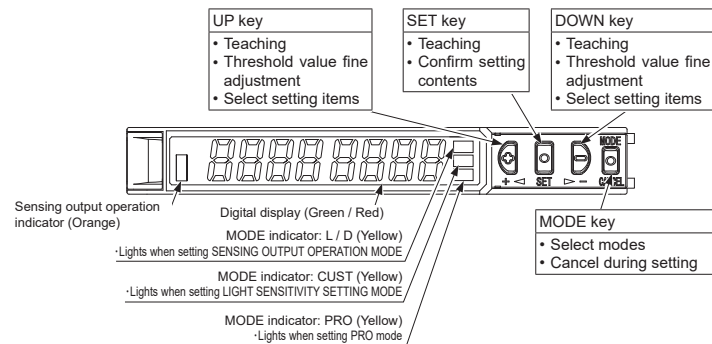
- Never use this product as a sensing device for personnel protection.
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

This product is not equipped with an automatic interference prevention function. By setting different frequencies, interference can be prevented for up to four units. For the setting method, refer to <PRO3> in "12 PRO MODE."

1 REGULATIONS AND STANDARDS

- This product conforms to the regulations and standards below.
 - <Conformity Directives / Conforming Regulations>
 - EU Law:EMC Directive 2014/30/EU
 - British Legislation:EMC Regulations 2016/1091
 - Applicable Standards
 - EN IEC 60947-5-2:2020

2 PART DESCRIPTION

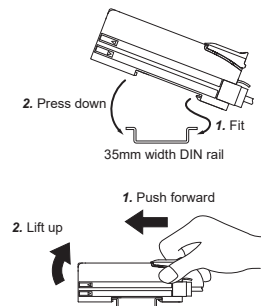


<Reference>
Pressing down SET key + MODE key for 3 sec.: Set key lock or release key lock

3 MOUNTING

How to mount

1. Fit the rear part of the mounting section of the amplifier on a DIN rail.
2. Press down the rear part of the mounting section of the unit on the DIN rail and fit the front part of the mounting section to the DIN rail.



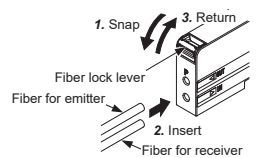
How to remove

1. Push the amplifier forward.
2. Lift up the front part of the amplifier to remove it.

How to connect the fiber cable

- Mount the fiber cables in the state power is not supplied.
- Be sure to fit the attachment to the fibers first before inserting the fibers to the amplifier. For details, refer to the instruction manual enclosed with the fibers.
- Insert the fiber cables slowly into the inlets until they stops. Excessive force may damage the product.

1. Snap the fiber lock lever down till it stops completely.
2. Insert the fiber cables slowly into the inlets until they stops. (Note)
3. Return the fiber lock lever to the original position till it stops.



Note: With the coaxial reflective type fiber, insert the single core fiber cable into the beam-emitting inlet "P" and the multi-core fiber cable into the beam-receiving inlet. If they are inserted in reverse, the sensing performance will deteriorate.

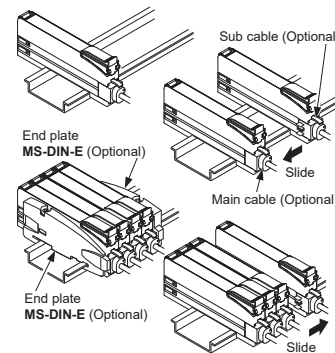
4 INSTALL MORE AMPLIFIER OF SERIES CONNECTION TYPE (Connection type only)

- Make sure that the power supply is OFF while adding or removing the series connection type.
- This product is not equipped with an automatic interference prevention function. By setting different frequencies, interference can be prevented for up to four units. For the setting method, refer to <PRO3> in "12 PRO MODE."
- In case 2 or more the series connection types are connected in cascade, make sure to mount them on a DIN rail.
- In case installing additional amplifier of series connection type, the maximum 15 the series connection types using sub cables (optional) can be added to an amplifier using a main connection cable. (optional)
- When connecting 2 or more the series connection types in cascade, use the sub cable (optional) for the second series connection type onwards.

For mounting and removing the amplifier, refer to "3 MOUNTING."

How to cascade

1. Mount the amplifiers, one by one, on the DIN rail.
2. Slide the amplifiers next to each other, and connect the quick-connection cables.
3. Mount the end plates MS-DIN-E (optional) at both the ends to hold the amplifiers between their flat sides.
4. Tighten the screws to fix the end plates.

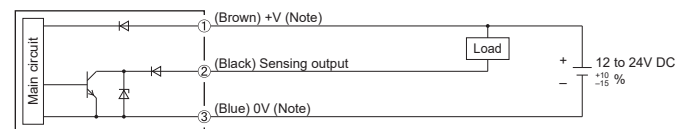


How to Remove

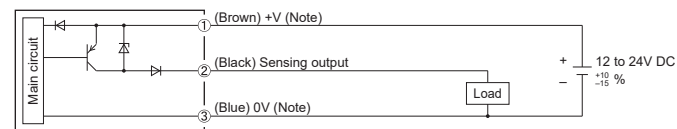
1. Loosen the screws of the end plates.
2. Remove the end plates.
3. Slide the amplifiers and remove them one by one.

5 I/O CIRCUIT DIAGRAMS

< NPN output type >

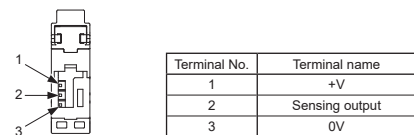


< PNP output type >



Note: The quick-connection sub cable does not incorporate +V (brown) and 0V (blue). The power is supplied from the connector of the main cable.

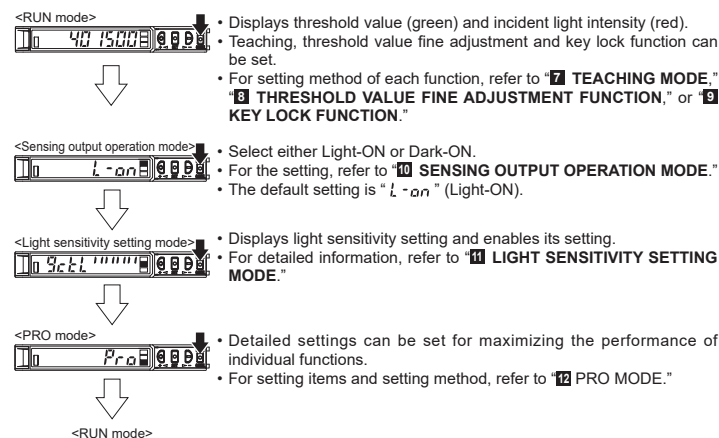
< FX551 terminal arrangement >



6 OPERATION PROCEDURE

The changed settings are not stored if turning the power OFF while setting. Therefore, confirm the settings by pressing the SET key before turning the power OFF.

- When turning ON the power, RUN mode is displayed and the digital display shows the threshold value (green) and the incident light intensity (red).

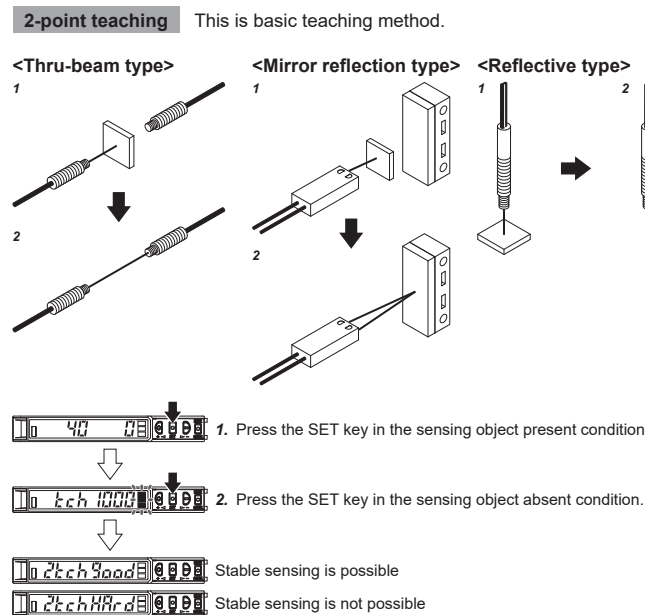


7 TEACHING MODE

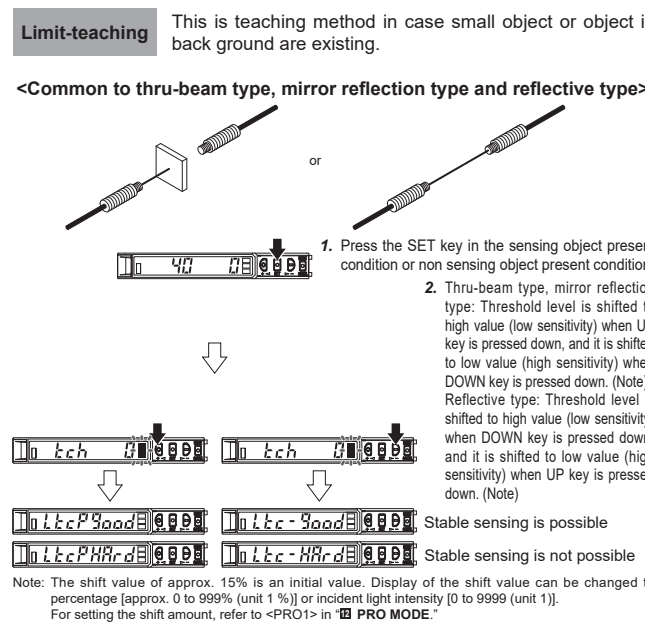
Be sure that detection may become unstable depending on the use environment in teaching if less margin is applied.

- Teaching can be set in RUN mode.

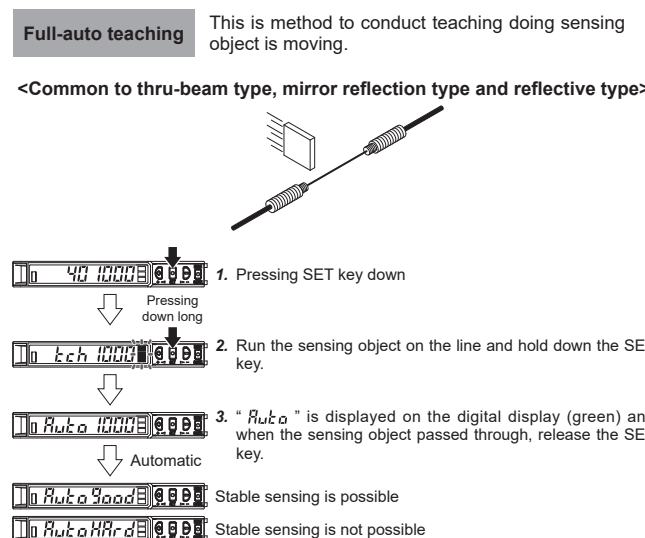
Useful when sensing object can be set



Useful when sensing object cannot be set

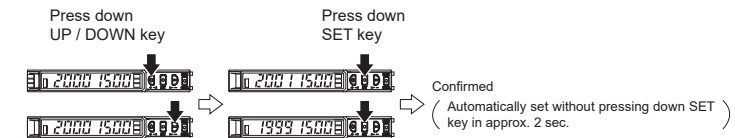


Useful when not want to stop production line and to keep the sensing object move



8 THRESHOLD VALUE FINE ADJUSTMENT FUNCTION

- Set the fine adjustment of threshold value in RUN mode.



9 KEY LOCK FUNCTION

- The key lock function prevents key operations so that the conditions set in each setting mode are not inadvertently changed.
- If operating key switch after key lock is set, "Loc on" is indicated on the digital display.

<Set key lock>

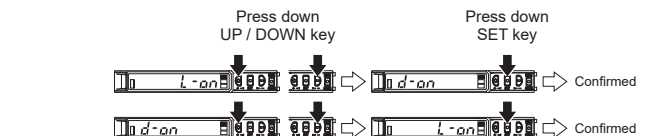


<Release key lock>



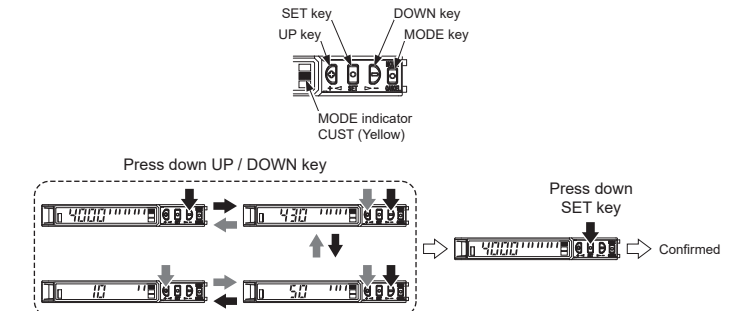
10 SENSING OUTPUT OPERATION MODE

- When MODE indicator: L / D (yellow) lights up, sensing output operation can be set.



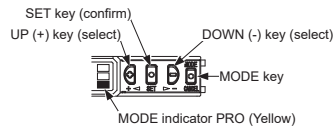
11 LIGHT SENSITIVITY SETTING MODE

- When the MODE indicator: CUST (yellow) lights up, light sensitivity setting can be displayed.
- By pressing down UP key or DOWN key, light sensitivity setting can be changed.
- Press SET key to confirm the setting.



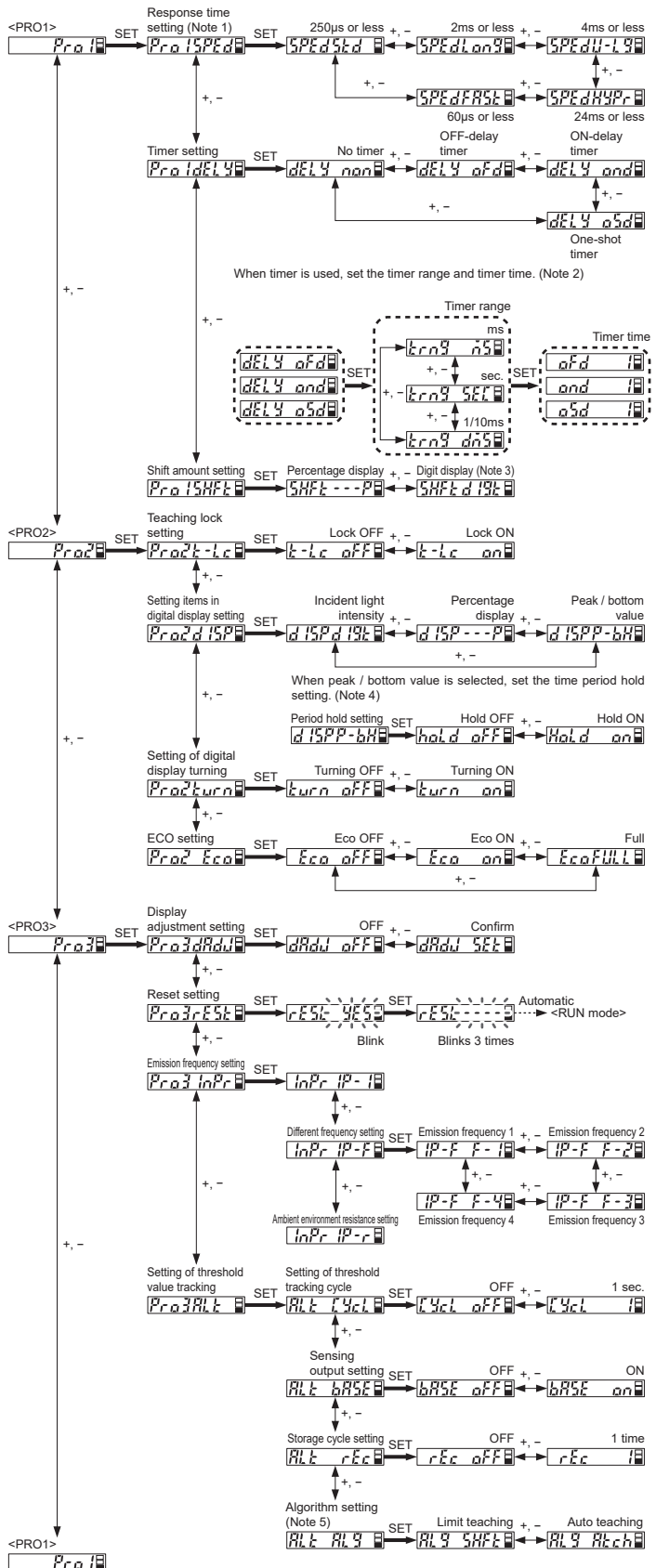
12 PRO MODE

- When MODE indicator: PRO (yellow) lights up, PRO mode can be set.



Procedure

The changed settings are not stored if turning the power OFF while setting. Therefore, confirm the settings by pressing the SET key before turning the power OFF.



Notes: 1) Display of incident light intensity depends on the response time.

Response time	Incident light intensity
"StLd", "FRSt"	Max. 4,000
"Lan9"	Max. 8,000
"U-L9", "HYPr"	Max. 9,999

Notes: 2) When timer is used, set the timer time. The timer time differs depending on the timer range, as shown in the table below. Set the timer time after setting the timer range. When setting "Lan9", "U-L9", "HYPr", "IP-F" and "IP-r", the timer time of the timer range "1/10ms" cannot be carried out.

Timer range	Timer time
"ms"	Approx. 1 to 9,999ms
"sec."	Approx. 1 to 32 sec.
"1/10ms"	Approx. 0.1 to 999.9ms

Notes: 3) When setting the shift value using the digit display, the setting range differs depending on the response time, as shown in the table below.

Response time	Shift value setting range
"StLd", "FRSt"	Max. 4,000
"Lan9"	Max. 8,000
"U-L9", "HYPr"	Max. 9,999

Notes: 4) To clear the value, turn off the time period holding function. Turning off the power switch also clears the value. Notes: 5) When "SHFL" is set, limit teaching is conducted according to the change in the incident light intensity, and then the threshold value is reset. Shift direction of the threshold value differs depending on the combination of sensing output status and sensing output operation, as shown in the table below.

Sensing output status	Sensing output operation	Shift direction of threshold value
Sensing output ON	Light-ON	Limit teaching is conducted for the negative (-) side of the threshold value.
Sensing output ON	Dark-ON	Limit teaching is conducted for the positive (+) side of the threshold value.
Sensing output OFF	Light-ON	Limit teaching is conducted for the positive (+) side of the threshold value.
Sensing output OFF	Dark-ON	Limit teaching is conducted for the negative (-) side of the threshold value.

Item	Default setting	Description	
PRO1 mode	Response time setting	SPEdStLd	
	Timer setting	dEL4 non	
	Timer range setting	trn9 n5	
PRO2 mode	Shift amount setting	SHFL ---P	
	Teaching lock setting	t-Lc OFF	
	Digital display item setting	d1SPd19t	
	Period hold setting	HalD OFF	
	Digital display turning on setting	turn OFF	
	ECO setting	Eco OFF	
	Display adjustment setting	dRdW OFF	
	Reset setting	-	
	PRO3 mode	Emission frequency setting	InPr IP-1
		Setting of threshold value tracking	tYcl OFF
Sensing output setting		bRSSE OFF	
Storage cycle setting		rEc OFF	
Algorithm setting		Rl9 SHFL	
Algorithm setting (Note 5)		Rl9 SHFL	
Algorithm setting (Note 5)		Rl9 SHFL	
Algorithm setting (Note 5)		Rl9 SHFL	
Algorithm setting (Note 5)		Rl9 SHFL	
Algorithm setting (Note 5)		Rl9 SHFL	

13 ERROR INDICATION

- In case of errors, attempt the following measures.

Error indication	Description	Remedy
ErD1	EEPROM is broken or reached the end of its working life.	Please replace the product.
ErB2	EEPROM writing error	Please replace the product.
ErI1	Load of the sensing output is short-circuited causing an over-current to flow.	Turn OFF the power and check the load.

14 SPECIFICATIONS

Type	Connection type		Cable type	
	NPN output	PNP output	NPN output	PNP output
Model No.	FX-551	FX-551P	FX-551-C2	FX-551P-C2
Supply voltage	12 to 24V DC: $\pm 10\%$ % Ripple P-P10% or less			
Power consumption	Normal operation: 960mW or less (current consumption 40mA or less at 24V supply voltage) Eco mode: 680mW or less (current consumption 28mA or less at 24V supply voltage)			
Sensing output	< NPN output type > NPN open-collector transistor • Maximum sink current: 100mA (Note 1) • Applied voltage: 30V DC or less (Between sensing output and 0V) • Residual voltage: 2V or less (Note 2) [At 100mA (Note 1) sink current]		< PNP output type > PNP open-collector transistor • Maximum source current: 100mA (Note 1) • Applied voltage: 30V DC or less (Between sensing output and +V) • Residual voltage: 2V or less (Note 2) [At 100mA (Note 1) source current]	
	Output operation	Switchable either Light-ON or Dark-ON		
Short-circuit protection	Incorporated			
Response time (Note 3)	FAST: 60µs or less, STD: 250µs or less, LONG: 2ms or less, U-LG: 4ms or less, HYPR: 24ms or less, Selectable			
Interference revention function	Incorporated Emission frequency selection method (Functions at emission frequency 1, 2, 3 or 4)			
Protection	IP40 (IEC)			
Ambient temperature (Note 4)	-10 to +55°C (when 4 to 7 units are installed: -10 to +50°C, when 8 to 16 units are installed: -10 to +45°C) (No dew condensation or icing allowed), Storage: -20 to +70°C			
Ambient humidity	35 to 85% RH, Storage: 35 to 85% RH			
Material	Enclosure: Polycarbonate, Key: Polyacetal, Protective cover: Polycarbonate			
Cable	(Note 5)		0.2-mm ² 3-core cable (2 m) provided	
Weight (Main body only)	Approx. 15 g		Approx. 60 g	

- Notes: 1) 50mA in the case 5 or more connection-type units are connected in series.
2) When 5-m-long one-touch cable (optional) is used with connection-type units.
3) Response time varies depending on the emission frequency setting. Regarding the response time in the case "IP-F" or "IP-r" is selected, refer to <PRO3> in "PRO MODE".
4) In the case of connection type: When connected in series.
In the case of cable type: When adherence-mounted.
5) Cable is not provided with the connection-type product. Be sure to use the following cables (optional).

< Connection type >

	Cable					
	Cable length 1m		Cable length 2m		Cable length 5m	
	Main cable	Sub cable	Main cable	Sub cable	Main cable	Sub cable
FX-551□	CN-73-C1	CN-71-C1	CN-73-C2	CN-71-C2	CN-73-C5	CN-71-C5

15 CAUTIONS

- This product has been developed / produced for industrial use only.
- Make sure that the power supply is OFF while adding or removing the amplifiers.
- Take care that if a voltage exceeding the rated range is applied, or if an AC power supply is directly connected, the product may get burnt or be damaged.
- Take care that short-circuit of the load or wrong wiring may burn or damage the product.
- Do not run the wires together with high-voltage lines or power lines, or put them in the same raceway. This can cause malfunction due to induction.
- The specification may not be satisfied in a strong magnetic field.
- Verify that the supply voltage variation is within the rating.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this product, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- The ultra long distance (U-LG, HYPR) mode is more likely to be affected by extraneous noise since the sensitivity of that is higher than the other modes. Make sure to check the environment before use.
- Do not use during the initial transient time (FAST, STD: 0.5 sec., LONG, U-LG, HYPR: 1 sec.) after the power supply is switched ON.
- When extending the cable length, use a cable with a conductor cross-sectional area of 0.3 mm² or more. Note that the maximum allowed cable length is 100 m. However, in order to reduce noise, make the wiring as short as possible.
- Set the power supply voltage by considering the voltage drop resulting from the conduction resistance of the cable.
- Make sure that the cable joint is not applied with stress, such as strain caused by forcible bending or pulling.
- This product is suitable for indoor use only.
- Avoid dust, dirt, and steam.
- Take care that the product does not come into contact with organic solvents such as thinner.
- Take care that the product does not come into contact with strong acids or alkalis.
- Take care that the product does not come into contact with oil or grease.
- This product cannot be used in an environment containing inflammable or explosive gasses.
- Never disassemble or modify the product.
- This product adopts EEPROM. Settings cannot be done 100 thousand times or more because of the EEPROM's lifetime.

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Please visit our website for inquiries and about our sales network.

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