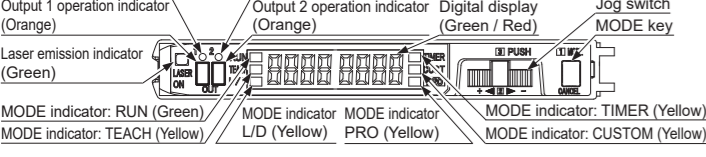


Thank you very much for purchasing Panasonic products. Please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product.
 Kindly keep this manual in a convenient place for quick reference.

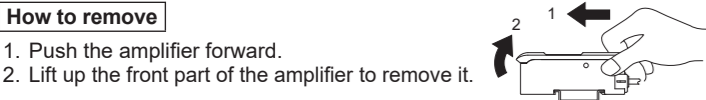
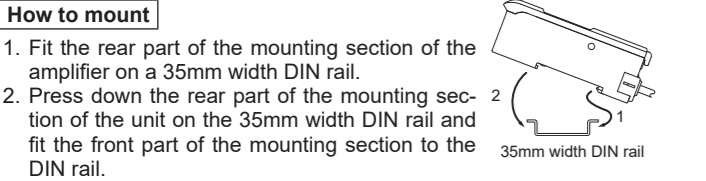
1 PART DESCRIPTION



<Description of the operation part>

Jog switch		MODE key	
Press	Turn to "+" side	Turn to "-" side	Press
To decide each item.	To select each item.		To select a mode or to cancel during setting.

2 MOUNTING

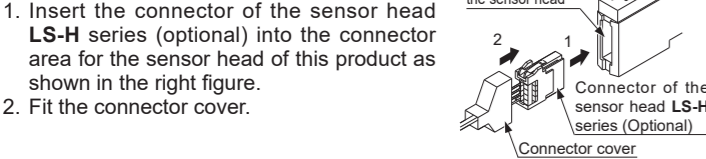


Note: Take care that if the front part is lifted without pushing the amplifier forward, the hook on the rear portion of the mounting section is likely to break.

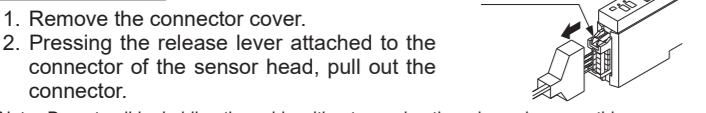
3 CONNECTION OF A SENSOR HEAD

Make sure that the power supply is OFF while connecting or disconnecting the sensor head LS-H series (optional).

How to connect



How to remove



Note: Do not pull by holding the cable without pressing the release lever, as this can cause cable break or connector break.

<Terminal arrangement>

Terminal No.	Connection cable
1	Cable core: Brown Cable color: Gray
2	Shielded wire
3	Cable core: Yellow Cable color: Black
4	Shielded wire

WARNING

- Never use this product as a sensing device for personnel protection.
- In case of using 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.
- In case of control or adjustment using procedures other than those specified in this instruction manual, hazardous laser radiation exposure can result.

4 WIRING

Make sure to connect or disconnect the quick-connection cable (optional) in the power supply OFF condition.

How to connect

- Holding the connector of the quick-connection cable, align its release lever with the groove at the top portion of the controller connector.
 - Insert the connector till a click is felt.
-

How to remove

- Pressing the release lever at the top of the quick-connection cable connector, pull out the connector.
-

Note: Take care that if the connector is pulled out without pressing the release lever, the release lever may break. Do not use a quick-connection cable whose release lever has broken. Further, do not pull by holding the cable, as this can cause a cable-break.

<Terminal arrangement>

Terminal No.	Terminal name
1	+V
2	Output 1
3	0V
4	Output 2

5 AMPLIFIER CASCADING

- Make sure that the power supply is OFF while adding or removing the amplifier.
 - Make sure to check the allowable ambient temperature, as it depends on the number of amplifiers connected in cascade.
 - In case 2 or more amplifiers are connected in cascade, make sure to mount them on a DIN rail.
 - When the amplifiers move on the DIN rail depending on the attaching condition or the amplifiers are mounted close to each other in cascade, fit them between the end plates MS-DIN-E (optional) mounted at the two ends.
 - Up to maximum 15 amplifiers can be added (total 16 amplifiers connected in cascade).
 - When connecting 2 or more amplifiers in cascade, use the sub cable CN-72-C (optional) as the quick-connection cable for the second amplifier onwards.
 - When connecting amplifiers not close to each other in parallel, be sure to mount the end plate MS-DIN-E (optional) at both sides of each amplifier.
 - When this product and other products (e.g. fiber sensor amplifiers, pressure sensor controllers, etc.) are connected together in cascade, install those products so that they are in order of Group A, B, and C as shown in the right figure. This product is included in Group C.
 - As for the products that are located between different groups, put the amplifier protection seal FX-MB1 (optional) on the communication window of each corresponding product.
 - Within each group, identical models should be connected in a lump.
 - When this product and other products (fiber sensor amplifiers, pressure sensor controllers, etc.) are connected together in cascade, items that can be copied at Copy setting are limited. Copiable items are digital display setting in RUN mode, Eco setting, time period hold setting and CUSTOM setting.
-

For mounting and removing the amplifier, refer to "2 MOUNTING."

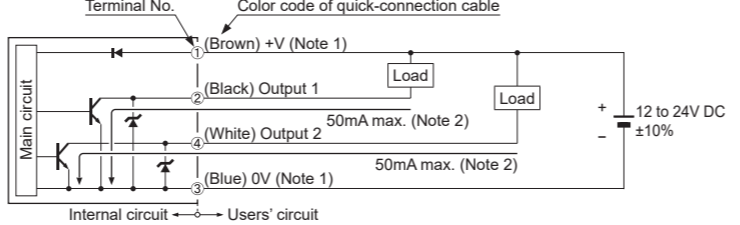
How to cascade

- Mount the amplifiers, one by one, on the 35mm width DIN rail.
 - Slide the amplifiers next to each other, and connect the quick-connection cables.
 - Mount the end plates MS-DIN-E (optional) at both the ends to hold the amplifiers between their flat sides.
 - Tighten the screws to fix the end plates.
-

How to remove

- Loosen the screws of the end plates.
 - Remove the end plates.
 - Slide the amplifiers and remove them one by one.
-

6 I/O CIRCUIT DIAGRAM



- Notes: 1) The quick-connection sub cable does not have +V (brown) and 0V (blue). The power is supplied from the connector of the main cable.
 2) 25mA max. if 5 or more controllers are connected together.
 3) Do not use the amplifiers in a series (AND) connection.

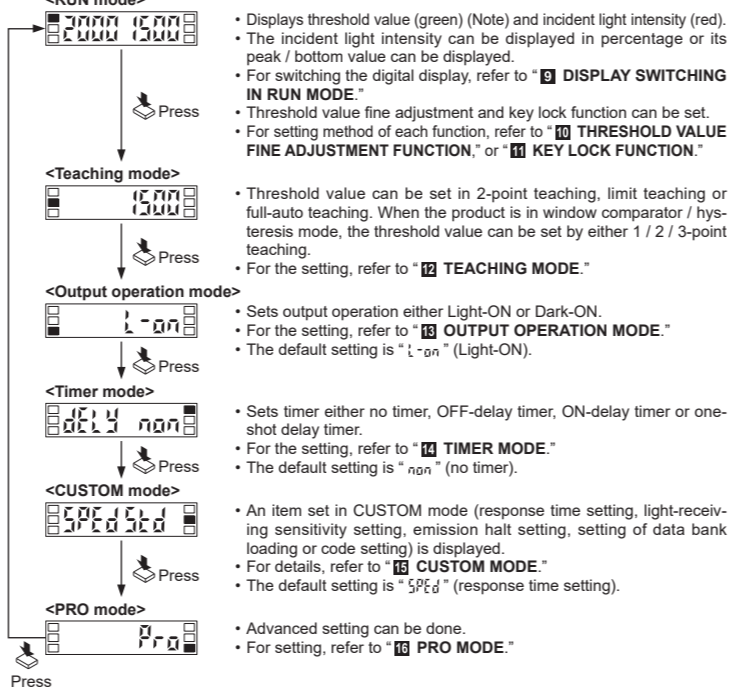
7 OUTPUT CHANNEL SWITCHING

- Press the MODE key for 2 sec. or more to switch the output 1 / 2.
 - The output 1 can be set when the Select 1 indicator (yellow) lights up, and the output 2 can be set when the Select 2 indicator (yellow) lights up.
-

8 OPERATION PROCEDURE

- Be sure to set the output 1 or the output 2 before setting each item.
- The items that can be set in the output 1 and the output 2 respectively are only 1. Threshold value, 2. Output operation, 3. Timer and 4. Output mode. The items other than those are common. (However, in case of code setting, a combination of the output 1 / 2 can be set only for output operation, timer and output mode.)
- The changed contents are not stored if turning the power OFF while setting. Therefore, make sure to confirm the settings by pressing the jog switch before turning the power OFF.

- When turning ON the power, normal condition is displayed [MODE indicator: RUN (green) lights up] and the digital display shows the threshold value (green) (Note) and the incident light intensity (red).
- When pressing MODE key, the mode changes as per the diagram below.

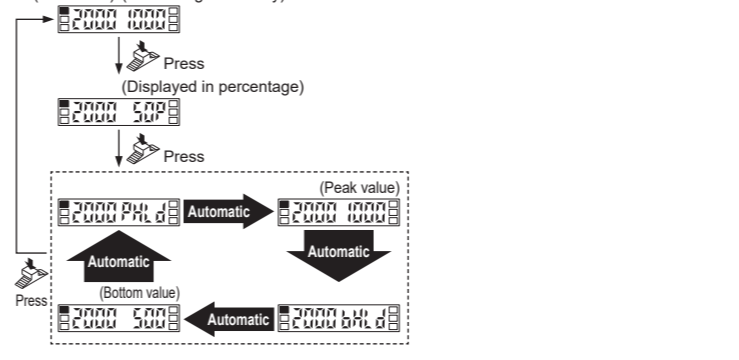


Note: When setting the output mode to the forced ON output mode, "on" is displayed on the digital display (green), while when setting to the forced OFF output mode, "off" is displayed on the digital display (green). For the output mode, refer to <PRO 6> in "16 PRO MODE."

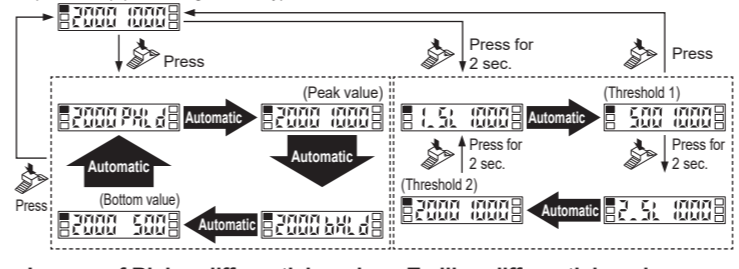
9 DISPLAY SWITCHING IN RUN MODE

- When switching the digital display in RUN mode, the digital display setting should be "d-Lc OFF" (lock OFF). For the digital display setting, refer to <PRO 2: Digital display setting> in "16 PRO MODE."
- When pressing the jog switch while the MODE indicator: RUN (green) lights up, the digital display can be switched as the following diagram depending on each output mode. For the output mode, refer to <PRO 6> in "16 PRO MODE."

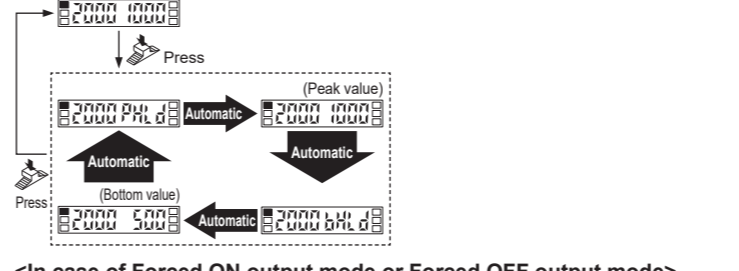
<In case of Normal mode>



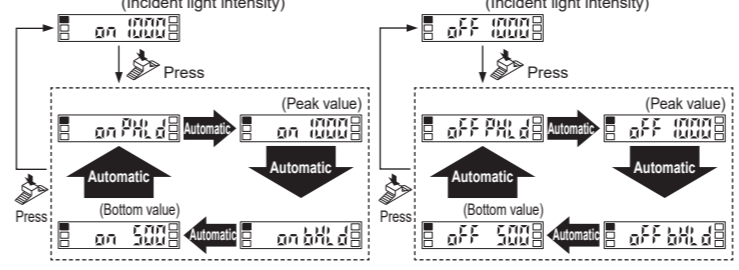
<In case of Window comparator mode or Hysteresis mode>



<In case of Rising differential mode or Trailing differential mode>



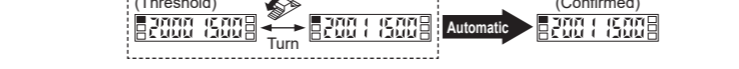
<In case of Forced ON output mode or Forced OFF output mode>



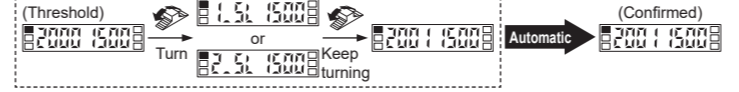
10 THRESHOLD VALUE FINE ADJUSTMENT FUNCTION

- When the MODE indicator: RUN (green) lights up, threshold value fine adjustment can be done.
- Turn the jog switch to "+" side to increase the threshold value, while turn the jog switch to "-" side to decrease the threshold value.
- When setting output mode to the window comparator mode or hysteresis mode, turn the jog switch to show "1_SL" (or "2_SL"). Keep turning the jog switch to conduct the threshold value fine adjustment. Press down the jog switch for 2 sec. or more to show "2_SL" (or "1_SL").
- The value is automatically memorized unless TEACH mode is selected after the adjustment or any switch operation is not carried out within a certain period of time.
- For output mode, refer to <PRO 6> in "16 PRO MODE."

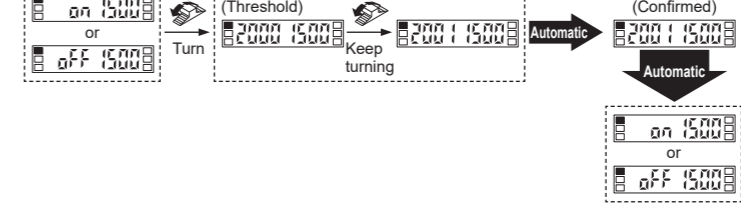
<In case of Normal mode, Rising differential mode or Trailing differential mode>



<In case of Window comparator mode or Hysteresis mode>



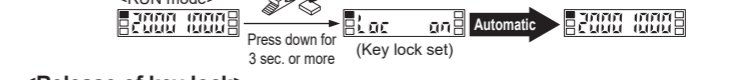
(In case of Forced ON output mode or Forced OFF output mode)



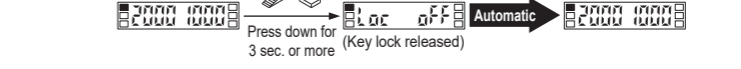
11 KEY LOCK FUNCTION

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

<Setting of key lock>



<Release of key lock>



12 TEACHING MODE

When teaching in Window comparator mode or Hysteresis mode, a setting has to be made in PRO mode beforehand. In case of 1-point teaching, a shift value (the initial value is 100 or 15%) has to be set as well. For setting, refer to <PRO 6> in "16 PRO MODE."

- When MODE indicator: TEACH (yellow) lights up, teaching can be done.

In case of 2-point teaching

- Press the jog switch in the sensing object present condition.
- Press the jog switch in the sensing object absent condition. The MODE indicator: TEACH (yellow) blinks.
- A threshold value is set between the step 1 and 2. In case stable sensing is possible: "Good" blinks in the red digital display. In case stable sensing is not possible: "Hr-d" blinks in the red digital display.

In case of Limit-teaching

- Press the jog switch in the sensing object absent condition.
- The MODE indicator: TEACH (yellow) blinks.
- Turn the jog switch to "+" or "-" side. Turn to "+" side: The threshold level is shifted to a value approx. 15% higher (low sensitivity) than that set at step 1. (Note) Turn to "-" side: The threshold level is shifted to a value approx. 15% lower (high sensitivity) than that set at step 1. (Note)
- In case stable sensing is possible: "Good" blinks in the red digital display. In case stable sensing is not possible: "Hr-d" blinks in the red digital display.

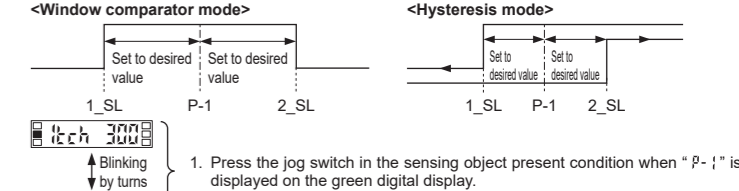
Note: Approx. 15% of the shift amount is an initial value. The shift amount can be changed in a range of approx. 0 to 999% (increment of 1%). For setting the shift amount, refer to <PRO 1: Shift setting> in "16 PRO MODE."

In case of Full-auto teaching

- Run the sensing object on the line and hold down the jog switch.
- "Auto" is displayed on the green digital display and when the sensing object passed through, release the jog switch. The MODE indicator: TEACH (yellow) blinks.
- In case stable sensing is possible: "Good" blinks in the red digital display. In case stable sensing is not possible: "Hr-d" blinks in the red digital display.

In case of 1-point teaching in Window comparator mode or Hysteresis mode

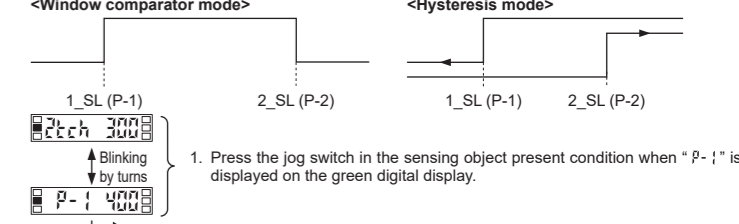
- This is the method to set the shift value to the desired value and set the threshold range by using the 1-point teaching.



- Press the jog switch in the sensing object present condition when "P-1" is displayed on the green digital display.
 - The threshold value (1_SL) that has been calculated by subtracting the shift value (100) from the incident light intensity and the threshold value (2_SL) that has been calculated by adding the shift value (100) to the incident light intensity are alternatively blinks on the green digital display. (Note 1, 2) In case stable sensing is possible: "Good" blinks in the red digital display. In case stable sensing is not possible: "Hr-d" blinks in the red digital display.
- Notes: 1) The shift value of 100 is an initial value. The shift value can be set in PRO mode. Furthermore, the shift value can be set in percentage. For setting, refer to <PRO 6> in "16 PRO MODE."
 2) If the value after setting exceeds the maximum (minimum), the maximum (minimum) sensitivity will be set.

In case of 2-point teaching in Window comparator mode or Hysteresis mode

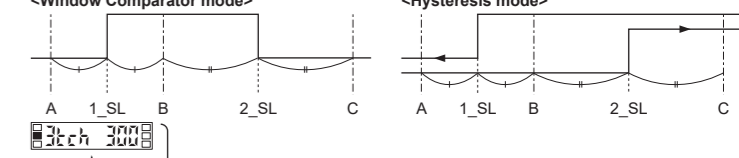
- This method is to set the threshold range by using the 2-point teaching (P-1, P-2).
- When conducting teaching, use sensing objects (P-1 and P-2) whose incident light intensity is different from each other.



- Press the jog switch in the sensing object present condition when "P-1" is displayed on the green digital display.
 - "P-2" blinks in the green digital display. Press the jog switch in the sensing object present condition for the second point.
 - The value of the first point (1_SL) and the second point (2_SL) are alternatively blink on the green digital display. (Note) In case stable sensing is possible: "Good" blinks in the red digital display. In case stable sensing is not possible: "Hr-d" blinks in the red digital display.
- Note: If the value after setting exceeds the maximum (minimum), the maximum (minimum) sensitivity will be set.

In case of 3-point teaching in Window comparator mode or Hysteresis mode

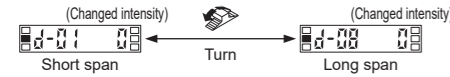
- This is the method to set the threshold range by setting the threshold (1_SL) of the mid-point between "A" and "B" and the threshold (2_SL) of the mid-point between "B" and "C", using the 3-point teaching (P-1, P-2 and P-3).
- When conducting teaching, use sensing objects (A, B and C) whose incident light intensity is different from each other.
- After teaching, P-1, P-2 and P-3 will be automatically relocated in ascending order: i.e. the lowest value is placed in "A", the second lowest in "B" and the highest in "C".



- Press the jog switch in the sensing object present condition when "P-1" is displayed on the green digital display.
 - "P-2" blinks in the green digital display. Press the jog switch in the sensing object present condition for the second point.
 - "P-3" blinks in the green digital display. Press the jog switch in the sensing object present condition for the third point.
 - The threshold (1_SL) of the mid-point between "A" and "B" and the threshold (2_SL) of the mid-point between "B" and "C" blinks alternatively on the green digital display. (Note) In case stable sensing is possible: "Good" blinks in the red digital display. In case stable sensing is not possible: "Hr-d" blinks in the red digital display.
- Note: If the value after setting exceeds the maximum (minimum), the maximum (minimum) sensitivity will be set.

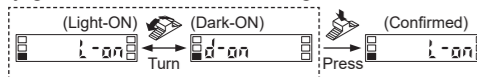
Span adjustment in Rising differential mode or Trailing differential mode

- The span adjustment in rising differential mode or trailing differential mode can be set as follows. The value is automatically memorized unless the Output operation mode is selected after the adjustment or any switch operation is not carried out within a certain period of time.
- The threshold can be set by using the threshold value fine adjustment function. For the threshold value fine adjustment function, refer to "15 THRESHOLD VALUE FINE ADJUSTMENT FUNCTION."



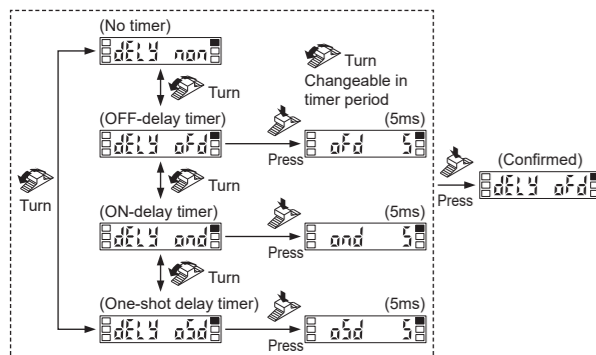
13 OUTPUT OPERATION MODE

- When MODE indicator: L/D (yellow) lights up, output operation can be set.
- Turn the jog switch to "+" or "-" side to switch the output operation.
- Press the jog switch to confirm the setting.



14 TIMER MODE

- When MODE indicator: TIMER (yellow) lights up, timer operation and timer period can be set.
- Turn the jog switch to "+" or "-" side to switch the timer operation and the timer period.
- When selecting OFF-delay timer, ON-delay timer or one-shot delay timer, the timer period can be set in the range of approx. 0.5ms or approx. 1 to 9,999ms.
- Press the jog switch to confirm the setting.
- This mode works in conjunction with the timer setting in PRO 1 under PRO mode. For the timer setting, refer to <PRO 1: Timer setting> in "15 PRO MODE."



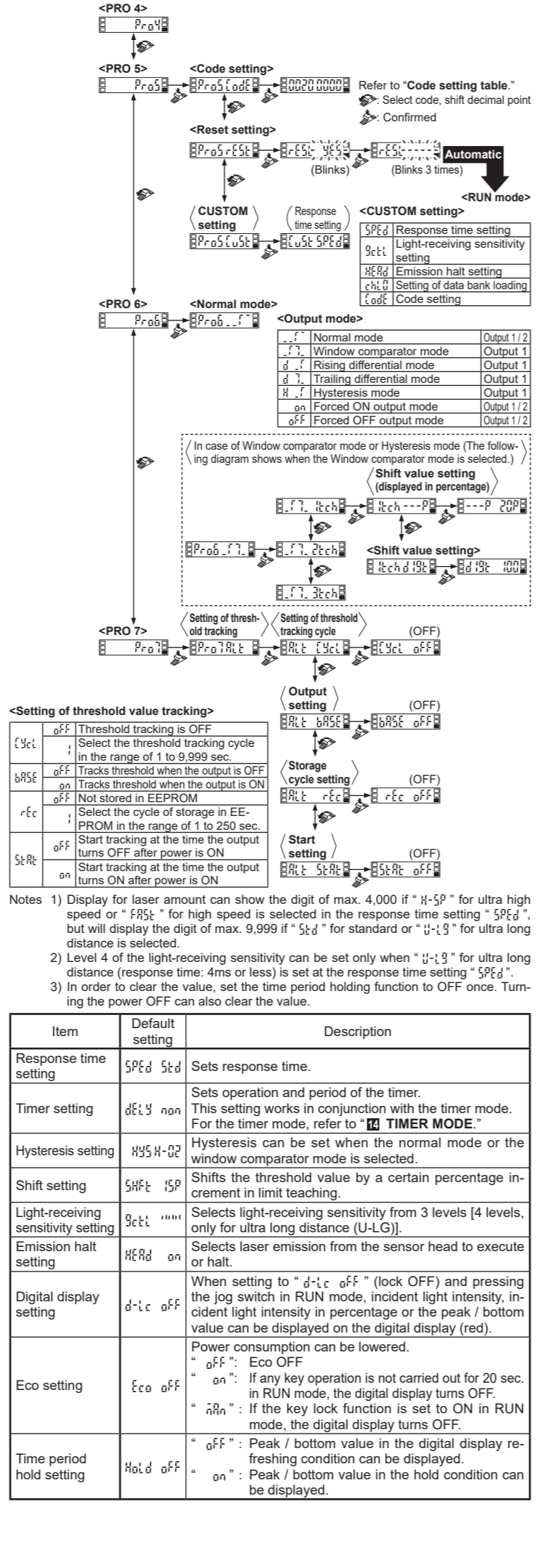
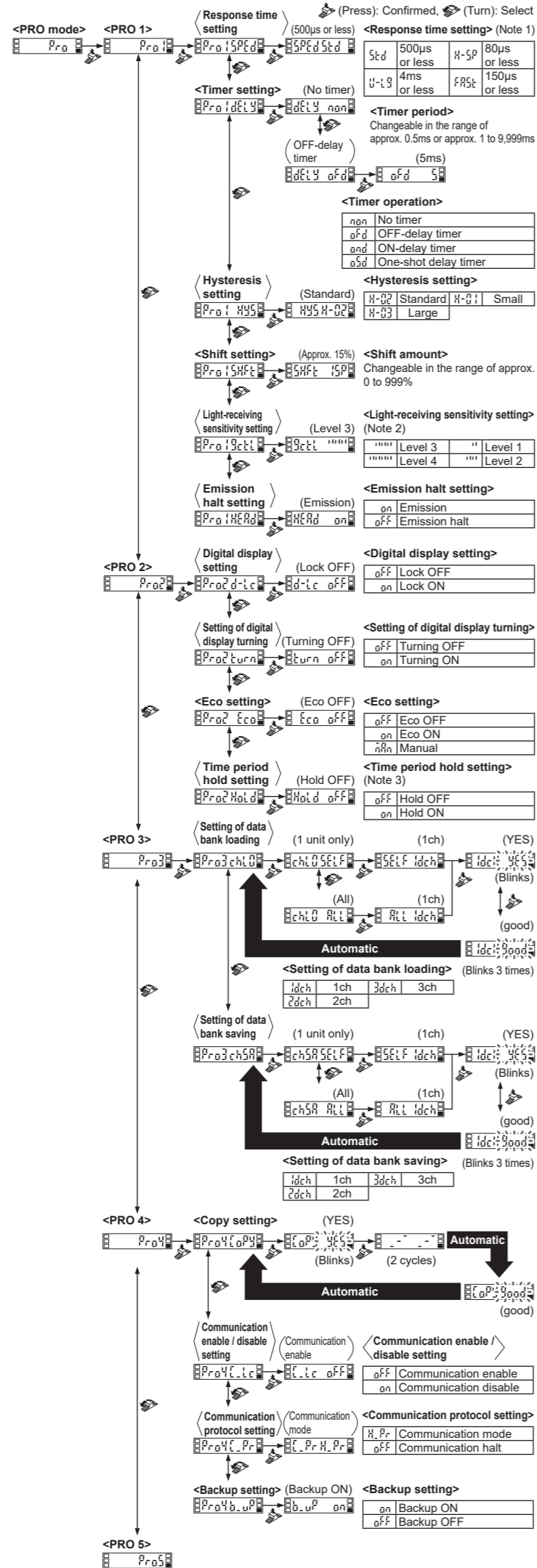
15 CUSTOM MODE

- When MODE indicator: CUST (yellow) lights up, response time setting, light-receiving sensitivity setting, emission halt setting, setting of data bank loading (one unit only) or code setting can be displayed. For the setting procedure, refer to <PRO 5: CUSTOM setting> in "15 PRO MODE."
- Turn the jog switch to "+" or "-" side to switch the setting contents of each item.
- Press the jog switch to confirm the setting.
- For setting of each item, refer to the following table.

Item	Digital display	Reference item
Response time setting	5PEd 5td	<PRO 1: Response time setting> in "15 PRO MODE"
Light-receiving sensitivity setting	9ctt *****	<PRO 1: Light-receiving sensitivity setting> in "15 PRO MODE"
Emission halt setting	HEEd on	<PRO 1: Emission halt setting> in "15 PRO MODE"
Setting of data bank loading (One unit only)	cht0 tdc	<PRO 3: Setting of data bank loading> in "15 PRO MODE"
Code setting	cod	<PRO 5: Code setting> in "15 PRO MODE"

16 PRO MODE

- When MODE indicator: PRO (yellow) lights up, PRO mode can be set.
- Press the jog switch to confirm the setting.



Item	Default setting	Description
Setting of data bank loading	cht0 5td	Loads configuration setting from the data bank. "5td": Select this mode when only one amplifier to load. "Rlt": Select this mode when all the cascading amplifiers to load in a lump by optical communications. For the optical communications, refer to "18 OPTICAL COMMUNICATIONS."
Setting of data bank saving	cht0 5td	Saves configuration setting to the data bank. "5td": Select this mode when only one amplifier to save. "Rlt": Select this mode when all the cascading amplifiers to save in a lump by optical communications. For the optical communications, refer to "18 OPTICAL COMMUNICATIONS."
Copy setting	-	Using optical communications, configuration settings from the main amplifier are copied to all of the sub amplifiers connected on the right side of the main controller connector. However, except the data bank loading / saving. For optical communications, refer to "18 OPTICAL COMMUNICATIONS."
Communication enable / disable setting	ctc off	When conducting the copy setting or setting of data bank loading / saving from the main amplifier via optical communications, it is possible that only the sub amplifier which is set to communication disable "ctc on", not to receive the set contents.
Communication protocol setting	ctc H, Pr	When conducting the copy setting or setting of data bank loading / saving from the main amplifier via optical communications, the optical communications through a sub amplifier which is set to communication halt "ctc on" and the following sub amplifiers can be halted.
Backup setting	b, up on	Allows to save or not to save the threshold value by teaching in EEPROM.
Code setting	0000 0000	Consistent setting can be done by inputting 8-digit code instead of independent setting. In addition, present setting can be confirmed.
Reset setting	-	If setting to "55", returns to default settings (factory settings).
CUSTOM setting	cod 5PEd	Selects an item in CUSTOM mode to display.
Output mode	Pr ob . . f	Sets output 1 and output 2 individually. <Settable for both output 1 and 2> ". . f": Normal mode Sets a threshold value for ON / OFF operation. "on": Forced ON output mode Sets forcibly the output to ON. "off": Forced OFF output mode Sets forcibly the output to OFF. <Settable only for output 1> ". . f": Window comparator mode Judges if set two threshold values are within the required range or not. This can be selected in 1 / 2 / 3-point teaching. "d . f": Rising differential mode Only drastic rises in incident light intensity are detected. "d . l": Trailing differential mode Only drastic drops in incident light intensity are detected. "H . f": Hysteresis mode Changes hysteresis to ignore small change of incident light intensity. This can be selected in 1 / 2 / 3-point teaching.
Setting of threshold tracking cycle (Note)	ctc off	This mode can change the threshold value depending on the cycle (1 to 9,999 sec.) that is set with the variations of the incident light intensity. The tracking shift amount is the one which is set at the <Shift setting>.
Output setting	bR5E off	Selects whether tracking threshold when the output is OFF or when the output is ON.
Storage cycle setting	rEc off	Selects a threshold storage cycle in EEPROM from 1 to 250 sec.
Start setting	5tRt off	Selects whether start tracking threshold at the time the output turns OFF or at the time the output turns ON after power is ON.

Note: Conducts the limit teaching for the changed incident light intensity. Shift direction of the threshold differs depending on the combination of the output status and the output operation.

Output status	Output operation	Shift direction
Output ON	Light-ON	- side
Output ON	Dark-ON	+ side
Output OFF	Light-ON	+ side
Output OFF	Dark-OFF	- side

Code setting table

• Green digital display (right side is the first digit)

Code	4th digit		3rd digit		2nd digit		1st digit	
	Output operation mode	Timer mode	Output 1	Output 2	Response time setting	Light-receiving sensitivity setting	Level 3	Level 2
1	Light-ON	Light-ON	No timer	No timer	80µs or less (H-SP)	Level 3	-	-
2	Light-ON	Light-ON	OFF-delay timer	ON-delay timer	150µs or less (FAST)	Level 2	-	-
3	Dark-ON	Dark-ON	One-shot delay timer	One-shot delay timer	500µs or less (STD)	Level 1	-	-
4	-	-	-	-	4ms or less (U-LG)	Level 4 (U-LG only)	-	-
5	-	-	No timer	No timer	-	-	-	-
6	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-

• Red digital display (right side is the first digit)

Code	4th digit		3rd digit		2nd digit		1st digit	
	Communication enable / disable setting	Hysteresis setting	Backup setting	CUSTOM mode	Output mode	Output 1	Output 2	
1	Communication enable	H-02	Backup ON	Response time setting	Normal mode	-	-	
2	Communication disable	H-02	Backup OFF	Light-receiving sensitivity setting	Window comparator mode	-	-	
3	Communication enable	H-03	-	Emission halt setting	Rising differential mode	-	-	
4	Communication disable	H-03	-	Setting of data bank loading	Trailing differential mode	-	-	
5	Communication enable	H-01	Code setting	Hysteresis mode	Forced ON output mode	-	-	
6	Communication disable	H-01	-	Forced OFF output mode	Forced OFF output mode	-	-	
7	-	-	-	Normal mode	Normal mode	-	-	
8	-	-	-	Normal mode	Normal mode	-	-	

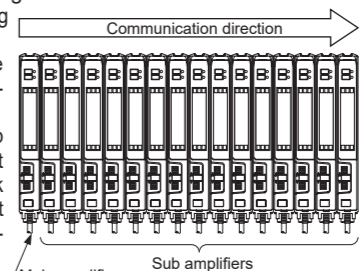
17 ERROR INDICATION

- In case of errors, attempt the following measures.

Error indication	Description	Remedy
Err 01	EEPROM is broken or reached the end of its working life.	Please contact our office.
Err 02	EEPROM writing error.	
Err 11	Load of the output 1 is short-circuited causing an overcurrent to flow.	Turn OFF the power and check the load.
Err 12	Load of the output 2 is short-circuited causing an overcurrent to flow.	
Err 42	Disconnection error of sensor head.	Check the connection of sensor head.
Err 52	Communication error when the amplifiers are mounted in cascade.	Verify that there is no loose or clearance between amplifiers.
Err 53	Communication error between the upper communication unit and amplifiers.	Verify that there is no loose or clearance between the upper communication unit and amplifiers.

18 OPTICAL COMMUNICATION

- When the setting of data bank loading / saving, or copy setting is conducted via optical communications, cascade the sub amplifiers right side to the main amplifier as follows.
- If an amplifier is under any of the following conditions, the setting of data bank loading / saving, or copy setting cannot be carried out.
 - In case the digital display is blinking
 - In case PRO mode is being set
 - In case the communication enable / disable setting is set to communication disable "ctc on"
- When communication protocol of a sub amplifier is set to communication halt "ctc on", the setting of data bank loading / saving, or copy setting cannot be carried out to sub amplifiers subsequent to the mentioned amplifier.
- The sensing operation stops during optical communications.



19 SPECIFICATIONS

Type	Digital laser sensor amplifier
Item	Model No. LS-403
Supply voltage	12 to 24V DC±10% Ripple P-P 10% or less
Power consumption	Normal operation: 950mW or less (current consumption 40mA or less at 24V supply voltage)
	Eco mode: 780mW or less (current consumption 33mA or less at 24V supply voltage)
Output (Output 1 / 2)	NPN open-collector transistor
	• Maximum sink current: 50mA (Note 1) • Applied voltage: 30V DC or less (between output and 0V) • Residual voltage: 1.5V or less (Note 2) [at 50mA (Note 1) sink current]
Output operation	Switchable either Light-ON or Dark-ON
Short-circuit protection	Incorporated
Response time	H-SP: 80µs or less, FAST: 150µs or less, STD: 500µs or less, U-LG: 4ms or less Selectable with jog switch
Timer function	Changeable in ON-delay, OFF-delay or One-shot delay timer Switchable either effective or ineffective (timer period: approx. 0.5ms, approx. 1 to 9,999ms)
Interference prevention function	Incorporated [Up to four sensor heads can be mounted adjacently (However, in H-SP mode, up to two sensor heads can be mounted adjacently)]
Ambient temperature	-10 to +55°C (if 4 to 7 units are cascaded: -10 to +50°C, if 8 to 16 units are cascaded: -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: Heat-resistant ABS, Protective cover: Polycarbonate Jog switch: ABS, MODE key: Acrylic
Weight	Approx. 15g (Main body only)

- Notes: 1) 25mA max. if 5 or more units are connected in cascade.
2) In case of using the quick-connection cable (cable length 5m) (optional).
3) Make sure to use the quick-connection cables (optional) given below.
Main cable (4-core): **CN-74-C1** (cable length 1m), **CN-74-C2** (cable length 2m), **CN-74-C5** (cable length 5m)
Sub cable (2-core): **CN-72-C1** (cable length 1m), **CN-72-C2** (cable length 2m), **CN-72-C5** (cable length 5m)
4) The values specified above are applied only to the amplifier. Regarding the specifications for the applied sensor head, refer to the instruction manual enclosed with the sensor head.

20 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 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) 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 (0.5 sec.) after the power supply is switched ON.
- Make sure to use the quick-connection cable (optional) for the connection of the controller. Extension up to total 100m is possible with 0.3mm² or more, cable. However, in order to reduce noise, make the wiring as short as possible.
- Make sure that stress by forcible bend or pulling is not applied to the sensor cable joint.
- This product is suitable for indoor use only.
- Avoid dust, dirt, and steam.
- Take care that the product does not come in contact with oil, grease, organic solvents such as thinner, etc., strong acid or alkaline.
- 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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