CP-SP-1317E

HPX-EG Series Photoelectric Control Supplemental Sheet

Thank you for choosing the HPX-EG Series.

This manual contains information for ensuring correct use of the HPX-EG. It also provides necessary information for installation, maintenance, and troubleshooting.

This manual should be read by those who design and maintain devices that use the HPX-EG.

Be sure to keep this manual nearby for handy reference.

Please read the "Terms and Conditions" from the following URL before ordering or use:

http://www.azbil.com/products/bi/order.html

This supplemental sheet describes particular functions of the HPX-EG Series. Read this sheet together with the HPX-EG Series Photoelectric Control User's Manual (CP-UM-5611JE).

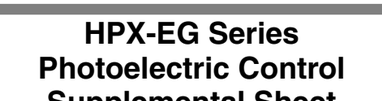
■ Function selection menu

(1) Press the [FUNC/CANCEL] button during normal operation to display the function selection menu.

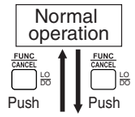
(2) When the [FUNC/CANCEL] button is pressed in the function selection menu, normal operation resumes.

(3) To select an item, use the [+] or [-] button.

(4) To set the selected item, press the [AUTO/OK] button.



For details on default settings, refer to "Initialization selection."



● Sensing type selection

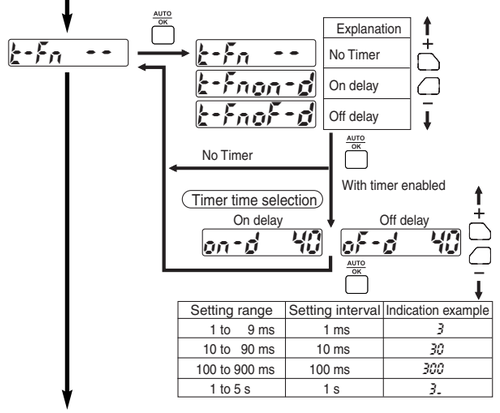
This manual also Sensing type selection. Please read if necessary.

☞ HPX-EG Series User's Manual (CP-UM-5611JE).

(To change the direction, use +)

● Timer type selection

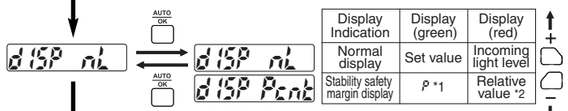
On-delay, off-delay and timer time can be selected.



Setting range	Setting interval	Indication example
1 to 9 ms	1 ms	3
10 to 90 ms	10 ms	30
100 to 900 ms	100 ms	300
1 to 5 s	1 s	3.

● Display type selection

This menu selects the content that is displayed during normal operation. If stability safety margin display is selected, differences in indication between amplifiers installed under the same conditions can be reduced.



Display Indication	Display (green)	Display (red)
Normal display	Set value	Incoming light level
Stability safety margin display	P *1	Relative value *2

*1 With safety margin display, "P" is always shown.
*2 The level of received light, with the set value as 100 %.

● Monitor sleep mode selection

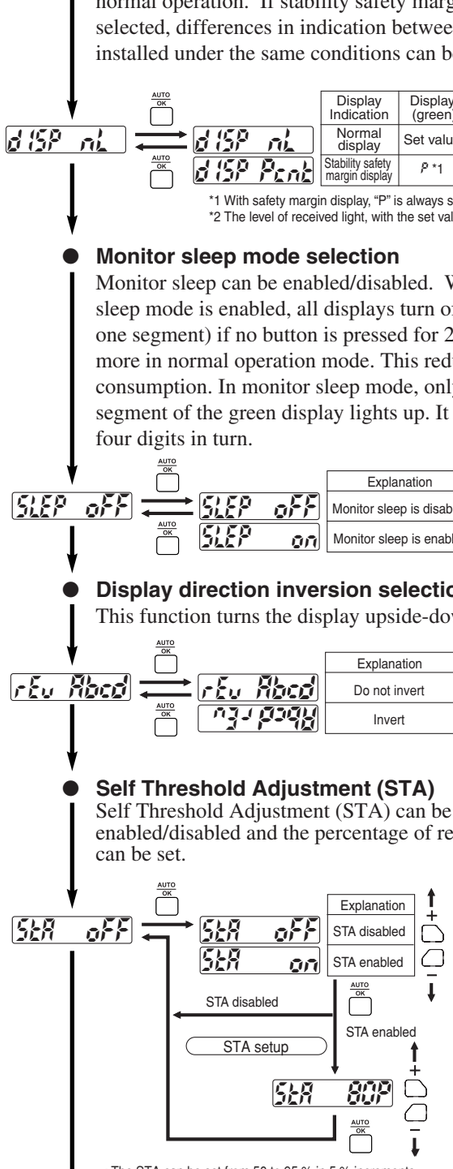
Monitor sleep can be enabled/disabled. When monitor sleep mode is enabled, all displays turn off (except for one segment) if no button is pressed for 20 seconds or more in normal operation mode. This reduces power consumption. In monitor sleep mode, only the center segment of the green display lights up. It lights on the four digits in turn.

● Display direction inversion selection

This function turns the display upside-down.

● Self Threshold Adjustment (STA)

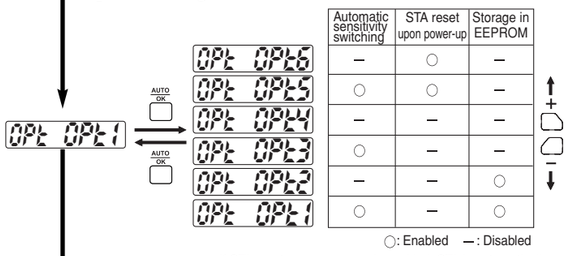
Self Threshold Adjustment (STA) can be enabled/disabled and the percentage of received light can be set.



• The STA can be set from 50 to 95 % in 5 % increments.

● Option selection

The Option selection menu allows any combination of automatic sensitivity switching, STA reset upon power-up, and storage in EEPROM.



	Automatic sensitivity switching	STA reset upon power-up	Storage in EEPROM
OPt OPt6	–	○	–
OPt OPt5	○	○	–
OPt OPt4	–	–	–
OPt OPt3	○	–	–
OPt OPt2	–	–	○
OPt OPt1	○	–	○

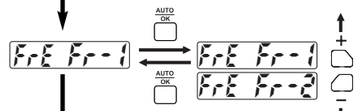
○: Enabled –: Disabled

- If STA reset upon power-up is enabled, STA is automatically reset when the power is turned on.
- If writing to EEPROM is enabled, the results of remote tuning and STA are stored in EEPROM.
  If writing to EEPROM would be very frequent, select "disabled."
  (Durability: approx. 200,000 erase-write cycles.)

● Emitter frequency switching selection

(Sensing types [SF _] and [nL _] only)

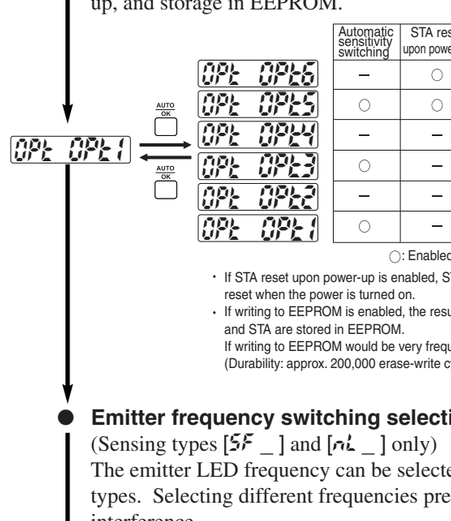
The emitter LED frequency can be selected from 2 types. Selecting different frequencies prevents mutual interference.



- Response times of [Fr-1] and [Fr-2] differ.
- If there is mutual interference, the response time may not meet the specifications.
- When the sensing type is [Ft _], even if [Fr-2] is selected the emitter frequency is the same as that of [Fr-1].

● Initialization selection

All settings are restored to their factory values.



Sensing type	SF 4
Timer type	--
Display type	nL
Monitor sleep mode	oFF
Display direction inversion	Abcd
Self Threshold Adjustment (STA)	oFF
Option	OPt1
Emitter frequency switching	Fr-1

Normal operation

Return to: ● **Sensing type selection**

■ Remote tuning (HPX-EG01only)

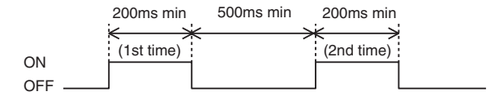
In remote tuning, auto tuning as it was last executed by button operation is executed again by an external input signal. Automatic sensitivity switching works also with remote tuning. However, if a fixed sensitivity is desired during remote tuning, automatic sensitivity switching can be disabled by changing the Option setting.

● Remote 2-point tuning

(1) Use the buttons to do 2-point tuning.
(☞ HPX-EG Series User's Manual CP-UM-5611JE)

(2) Keep the same mounting and target conditions as in step (1).

(3) Input an external signal consisting of 2 pulses, each at least 200 ms in duration, with at least 500 ms between them, as shown below.

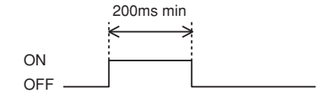


● Remote BGS tuning

(1) Use the buttons to do BGS tuning.
(☞ HPX-EG Series User's Manual CP-UM-5611JE)

(2) Keep the same mounting and target conditions as in step (1).

(3) Input an external signal consisting of 1 pulse at least 200 ms in duration, as shown below.

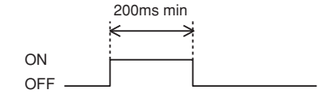


● Remote percent tuning

(1) Use the buttons to do percent tuning
(☞ HPX-EG Series User's Manual CP-UM-5611JE)

(2) Keep the same mounting and target conditions as in step (1).

(3)Input an external signal consisting of 1 pulse at least 200 ms in duration, as shown below.



■ Corrective actions for tuning errors

If a tuning error is indicated, follow the steps below to check the settings.

(1) Push the [FUNC/CANCEL] button to cancel the settings. (Values are reset to the pre-tuning default settings.)

(2) Take action according to the error type.

Display	Contents of error	Corrective actions
2Pnt Er-C	Insufficient difference between light levels	Adjust the fiber unit position to increase the difference in incoming light levels. If automatic sensitivity switching is not used, change the sensitivity of the sensing type.
2Pnt Er-H	Too much light	Adjust the fiber unit position to decrease the amount of light. If automatic sensitivity switching is not used, decrease the sensitivity of the sensing type.
2Pnt Er-L	Not enough light	Adjust the fiber unit position to increase the amount of light. If automatic sensitivity switching is not used, increase the sensitivity of the sensing type.
bGS Er-H	Too much light	Adjust the fiber unit position to decrease the amount of light. If automatic sensitivity switching is not used, decrease the sensitivity of the sensing type.
PcntEr-H	Too much light The set value is too high.	Adjust the fiber unit position to decrease the amount of light. If automatic sensitivity switching is not used, decrease the sensitivity of the sensing type. Decrease the threshold percentage.
PcntEr-L	Not enough light The set value is too low.	Adjust the fiber unit position to increase the amount of light. If automatic sensitivity switching is not used, increase the sensitivity of the sensing type. Increase the threshold percentage.

(3) Perform auto tuning again.

!Handling Precautions

- If the error cannot be corrected, contact the azbil Group or your dealer.

■ STA (Self Threshold Adjustment)

This function automatically adjusts the set value to a specified percentage (%) of the incoming light level.
Even if the level of received light varies due to a change in the environment (dirt on the fiber unit head or a change in the ambient temperature), STA provides stable sensing, adjusting the set value automatically in proportion to the incoming light level.

● STA setup

1. Enable STA.

(1) During normal operation, press the [FUNC/CANCEL] button to display the function selection menu.

(2) In the function selection menu, select [StA ___] and press the [AUTO/OK] button.

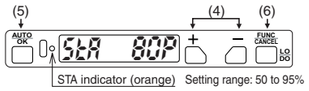
(3) Select [StA on] using the [+] or [-] button and press the [AUTO/OK] button.

2. Next, specify a percentage of the incoming light level as the set value (= the STA percentage).

(4) Set the desired value using the [+] or [-] button.

(5) Press the [AUTO/OK] button. STA is now enabled and the STA indicator is lit.

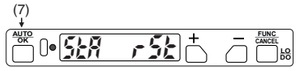
(6) Pressing the [FUNC/CANCEL] button resumes normal operation.



3. When necessary, STA can be reset.

(7) Press the [AUTO/OK] button during normal operation.

(8) [StA rSt] is displayed when STA has been reset. The set value is adjusted automatically according to the preset STA percentage.



!Handling Precautions

- Execute an operational check before using STA. If the light level fluctuates due to the use of a diffuse scan fiber unit or due to a slowly changing incoming light level during detection, STA may fail to adjust the set value to the expected one.
  (Auto-adjustment of the set value is done at regular intervals approx. every 3 s.)
- When STA is enabled, neither manual tuning nor auto-tuning (remote tuning) are possible.
- During STA reset, the optimal sensitivity level for the level of received light is automatically set by the automatic sensitivity switching. While STA is operating, the sensitivity level for the incoming light does not change.
- The STA setting can be changed by using the [+] or [-] button during normal operation, as well as by using the function selection menu.
- When STA is enabled, the STA indicator is lit. Also, the STA indicator blinks when the light level has fallen below the minimum, either during STA reset or during Self Threshold Adjustment of the set value. In this case, since the expected threshold will not be set, check the fiber unit's installation and the amplifier settings.

● STA reset

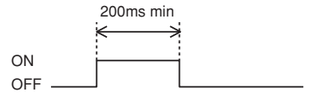
STA reset changes the set value so that the ratio of it to the current incoming light level meets the STA setting. When executing an STA reset, use the reference incoming light level.

Example: no target object, using a thru-scan fiber unit

Execute STA reset when the fiber unit installation site changes for retooling, etc. or when the STA setting has been changed.

In addition to button operation, STA reset can be executed by using an external input signal or executed automatically upon power-up if [OPtS] or [OPtS] is selected in the Option selection.

External input signal for STA reset



Operation when STA is enabled and disabled

	STA disabled	STA enabled
[AUTO/OK] button	Auto tuning	STA reset
[+], [-] button	Manual tuning	Change of STA percentage
External input signal	Remote tuning	STA reset

■ Key lock function

The key lock prevents incorrect settings due to accidental key operation.

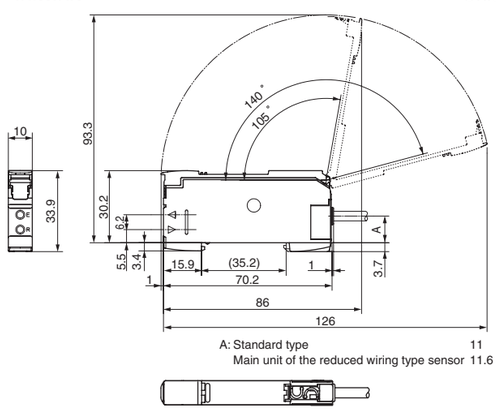
Key lock setting

Press the [+] button 3 seconds or more while holding down the [FUNC/CANCEL] button during normal operation.
The key lock toggles on and off.

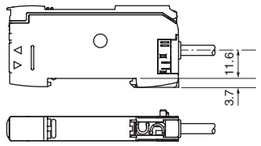
When key lock is ON and a button is pushed,
[Loc] is displayed.
External input signals can be executed normally when the key lock is ON.

■ External dimensions

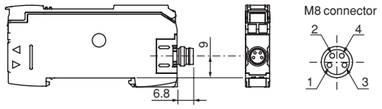
• Standard type / Main unit of the reduced wiring type sensor Unit: mm



• Expansion unit



• M8 connector type



■ Specifications

Item			Standard type	Reduced wiring type	
			Connector type	Main unit	Expansion unit
Output type	NPN open collector		HPX-EG__-1S	HPX-EG__-3S	HPX-EG__-5S
	PNP open collector		HPX-EG__-2S	HPX-EG__-4S	HPX-EG__-6S
Supply voltage			DC12 to 24 Vdc +10%/ -15%		
Power consumption			750 mW max (24 Vdc, 30 mA max)		
Output rating	Dielectric Strength		DC26.4V		
	Switching current		100 mA max	50 mA max	
Input rating	On	NPN	0 to 2 Vdc		
		PNP	7.2 to 26.4 Vdc		
	Off	NPN	Open (no connection) or connected to the + side of the power supply		
		PNP	Open (no connection) or connected to the - side of the power supply		
Ambient light immunity			Incandescent: 5,000 lx max. Sunlight: 20,000 lx max.		
Ambient temperature			-20 to +55 °C: Stand-alone or 2 units gang-mounting -20 to +50 °C: 3 units gang-mounting -20 to +45 °C: 4 to 5 units gang-mounting -20 to +40 °C: 6 to 16 units gang-mounting		
Allowable storage temperature			-20 to +70 °C		
Ambient humidity			35 to 85 %RH (without condensation)		
Mutual interference prevention function			Up to 2 units (Except when sensing type [Ft _])		
Sealing			IP40		
Mass			Approx. 45g However, HPX-EG00-5/6S: Approx. 30 g HPX-EG0_-_S-CT: Approx. 20 g		

azbil *Specifications are subject to change without notice.* (09)

Azbil Corporation
Advanced Automation Company

1-12-2 Kawana, Fujisawa
Kanagawa 251-8522 Japan

URL: http://www.azbil.com

1st edition: May 2010 (M)
2nd edition: Apr. 2012 (M)