Panasonic **INSTRUCTION MANUAL**

Photoelectric Sensor | Digital Fiber Sensor

FX-301 Series

MEUML-FX301 V1.1

Thank you for purchasing products from Panasonic Electric Works SUNX Co., Ltd. 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]

⚠ 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.

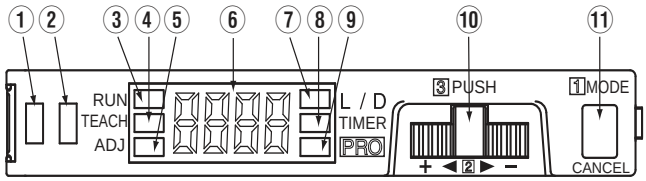
For further details on the fiber sensor amplifier, please refer to our Web site: www.panasonic-electric-works.com, or contact our office.

1 CAUTIONS

- This product has been developed / produced for industrial use only.
- Make sure to carry out wiring with the power OFF.
- Verify that the supply voltage including the ripple is within the rating.
- Do not connect the sensor to voltage that exceeds the rated range or directly to an AC power supply: it may damage or burn the sensor.
- Incorrect wiring or short-circuiting the load may damage or burn the sensor.
- When the emitting level function is turned from OFF to ON for any level, the output may be unstable. Do not use the output control for at least 0.5s after starting emission. (See “PRO1” on page 6.)
- 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.
- 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.
- Do not use during the initial transient time (0.5s) after the power supply is switched on.
- This sensor is suitable for indoor use only.
- You can extend the cable up to 100m max. with 0.3mm^2 or more cable. If 5 to 8 units are connected in cascade, the limit is 50m; for 9 to 16 units in cascade, 20m. However, in order to reduce noise, make the wiring as short as possible.
- Note that extending the cable increases the residual voltage.
- Be sure to use the optional quick-connection cable when connecting to the connector type sensor FX-301(P).
- Avoid dust, dirt and steam.
- Take care that the sensor does not come in contact with oil, grease, organic solvents such as thinner, etc., strong acid, or alkaline.
- Do not use this sensor in an environment containing inflammable or explosive gases.
- Never disassemble or modify the sensor.

[1]The digital fiber sensor FX-301(P) has been modified since production in June, 2004. Hence, this instruction manual has been changed to reflect the modifications.

2 PART DESCRIPTION



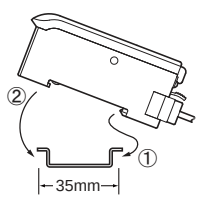
No.	Part	Description
①	Operation indicator (orange)	Lit when output is on.
②	Stability indicator (green)	Lit when detection is stable according to the parameters set.
③	RUN mode indicator (green)	Lit when FX-301 is in RUN mode.
④	TEACH mode indicator (yellow)	Lit when FX-301 is in TEACH mode.
⑤	ADJ mode indicator (yellow)	Lit when FX-301 is in ADJ (threshold value adjustment) mode.
⑥	Digital display (red)	Displays incident light intensity under normal circumstances. Also displays sub-modes and settings.
⑦	L/D mode indicator (yellow)	Lit when FX-301 is in L/D mode (Light-ON, Dark-ON) mode.
⑧	TIMER mode indicator (yellow)	Lit when FX-301 is in TIMER mode.
⑨	PRO mode indicator (yellow)	Lit when FX-301 is in PRO mode.
⑩	Jog switch	The jog switch allows you to select the various sub-modes and confirm settings.
⑪	Mode key	The mode key allows you to switch from mode to mode, or to cancel settings and return to RUN mode.

3 MOUNTING

☛ **You may break the spring hook if you do not follow the mounting instructions carefully.**

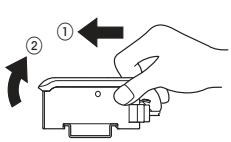
How to mount the amplifier

① Fit the spring hook on a 35mm DIN rail and push forward.
② Slip the front part of the mounting section over the DIN rail and release.



How to remove the amplifier

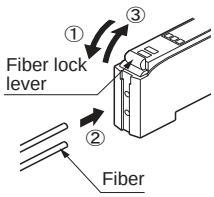
① Push the amplifier forward
② Lift up the front part of the amplifier.



4 CONNECTING THE FIBER CABLE

☛ **Be sure to fit the attachment to the fibers before inserting the fibers into the amplifier. For details, refer to the instruction manual enclosed with the fibers.**

① Snap the fiber lock lever down until it stops completely.
② Slowly insert the fiber cables into the inlets until they stop (**see note**).
If the fiber cables are not inserted until they stop, the sensing range reduces.
Since a flexible fiber is easily bent, be careful when inserting it.
③ Return the fiber lock lever to the original position.



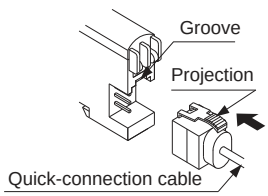
☛ **If the cable is a coaxial reflective type fiber, e.g. FD-G4 or FD-FM2, insert the single-core fiber cable into the beam-emitting inlet "P" and the multi-core fiber cable into the beam-receiving inlet "D." If they are inserted in reverse, the sensing performance will deteriorate.**

5 WIRING

☛ **Make sure that the power supply is off while connecting or disconnecting the quick-connection cable.**

Connection method

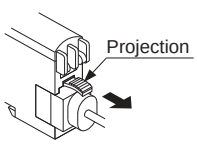
① Align the projection with the groove on the amplifier.
② Insert the connector until you feel it click.



Disconnection method

☛
- Do not remove the connector without pressing the projection, or the projection may break.
- Do not use a quick-connection cable whose projection has broken.
- Always pull on the connector. Pulling on the cable can cause the cable to break.

① Press the projection on the quick-connection cable and gently pull out the connector.



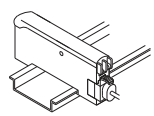
6 CASCADING

- Make sure that the power supply is off while adding or removing amplifiers.
- The ambient temperature allowed depends on the number of amplifiers connected in cascade. See "SPECIFICATIONS" on page 9.
- When connecting two or more amplifiers in cascade, mount them on a DIN rail.
- To prevent amplifiers mounted in cascade from moving on the DIN rail, place the optional end plates (MS-DIN-E) at both ends.
- A total of 16 amplifiers can be connected in cascade.
- When connecting more than two amplifiers in cascade, use the sub cable (CN-71-C1, CN-71-C2, or CN-71-C5) as the quick-connection cable for the second amplifier onwards.
- When connecting amplifiers in parallel but not directly adjacent to each other, mount the optional end plate (MS-DIN-E) on both sides of each amplifier or affix the optional fiber amplifier protective seals (FX-MB1) to the communication window and connector area.
- When mounting the connector type FX-301(P) with the cable type FX-301(P)-C1 in cascade, mount the identical models together.
- When mounting the modified version units and conventional version units together in cascade, place the modified version units on the right of the conventional version units as viewed from the connector side. (For details, see page 8, section 16, UNIT VERSIONS.)
- Only the interference prevention function can be transmitted between this product and other digital fiber amplifiers. Therefore, mount identical models together when mounting in cascade.
Please note: the interference prevention function is not incorporated in the FX-301(P)-HS. Be careful when the sensors are mounted in cascade.
- Since the communication function of this product and that of the FX-301(P)-F differ, affix the accessory amplifier protection seal (FX-MB1) to the communication windows of the amplifiers when mounting these models in cascade.

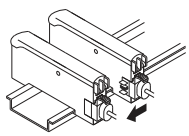
For instructions on how to mount and remove the amplifier, see "MOUNTING" on page 1.

Cascade mounting

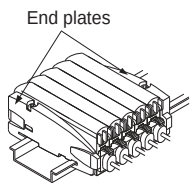
① Mount the amplifiers, one by one, on a 35mm DIN rail.



② Slide the amplifiers against each other so that the prongs of the quick-connection sub-cable connector insert into the adjacent connector.



③ Mount the optional end plates (MS-DIN-E) at both the ends to hold the amplifiers in place.



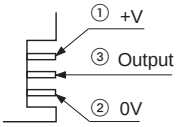
④ Tighten the screws to fix the end plates.

Dismantling

① Loosen the screws of the end plates.
② Remove the end plates.
③ Slide the amplifiers, removing one by one.

7 I/O CIRCUIT DIAGRAMS

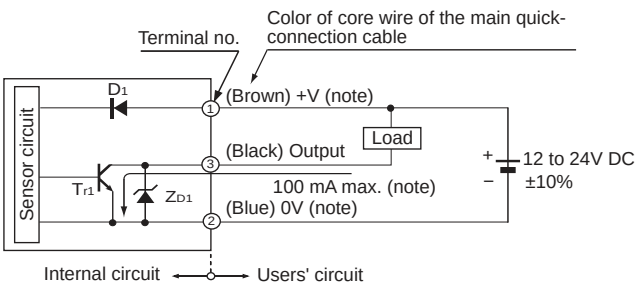
Terminal arrangement diagram, FX-301 connector type



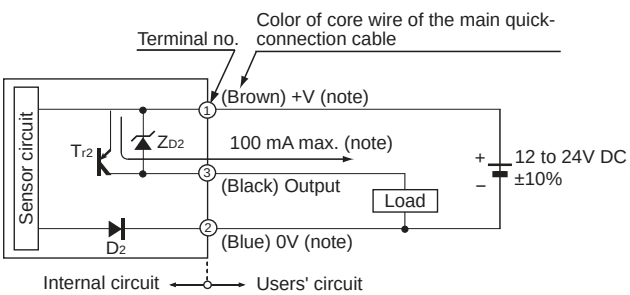
The following symbols are used in this section.

Symbol	Meaning
D	Reverse supply polarity protection diode
Z_D	Surge absorption zener diode
Tr_1	NPN output transistor
Tr_2	PNP output transistor

NPN output type



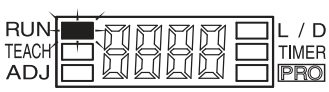
PNP output type



☛ **50mA max. if five or more connector type FX-301(P) amplifiers are connected in cascade.**

8 OPERATION PROCEDURE

When the power supply is switched on, a communication self-check is executed. The RUN mode indicator lights up green and the digital display shows the incident light intensity.



The terminology in the following table will help you navigate through the various modes and make your settings.

MODE key	Jog switch		
Press	Press	Turn	
		"+" side	"-" side
			

General navigation tips

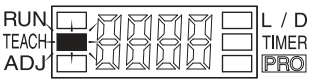
- Press <MODE> briefly and repeatedly to switch from mode to mode.
- Press <MODE> for 2s or more to return to RUN mode.
- To cancel the setting process, press <MODE>.
- Press the jog switch to confirm settings.
- Turn the jog switch to navigate between sub-modes.
- When the jog switch is turned in RUN mode, the current threshold value is displayed. Then the current incident light intensity is displayed again automatically

Navi mode

Starting in RUN mode, you will navigate through the modes in the following order.

Mode	Description
RUN	Normal sensing operation.
	
TEACH	Sets threshold value by “2-point teaching”, “limit teaching”, or “full-auto teaching”. See “TEACHING MODE” on page 4.
	
ADJ	Allows fine adjustment of the threshold value. See “THRESHOLD VALUE ADJUSTMENT MODE” on page 5.
	
L/D	Sets output operation to either Light-ON or Dark-ON. See “OUTPUT OPERATION MODE” on page 5.
	
TIMER	Configures operation of the timer. See “TIMER OPERATION MODE” on page 5.
	
PRO	 Press the jog switch to enter the PRO sub-modes, which allow you to make various detailed settings. See “PRO MODE” on page 5.
	
RUN	Normal sensing operation.

9 TEACHING MODE



2-point teaching

2-point teaching is the most common teaching method and means the threshold value is taught using two points that correspond to the object present and object absent conditions.

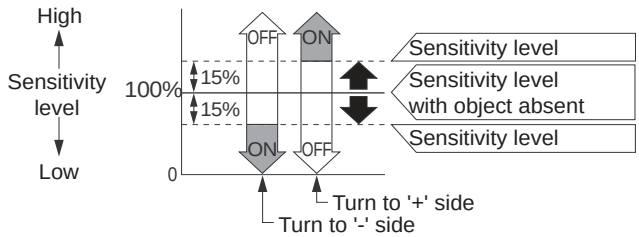
Step	Description
①	Set the fiber within the sensing range. Briefly press <MODE> to switch to TEACH mode.
②	Briefly press the jog switch in the object present condition. If teaching is accepted, the digital display blinks briefly showing the detected incident light intensity and the TEACH mode indicator blinks.
③	Briefly press the jog switch in the object absent condition. If the teaching is accepted, the digital display blinks briefly showing the detected incident light intensity.
④	The threshold value is set half way between the incident light intensities in the object present and the object absent conditions. The judgement for the sensing stability is displayed briefly: • Good : sensing stable. • HArd : stable sensing not possible.
⑤	The threshold value is displayed briefly.
⑥	The actual incident light intensity appears is displayed and the setting is complete.

Limit teaching

Limit teaching is used to set the threshold value for the **object absent condition only**, i.e. for a stable incident light condition. This method is used to detect objects in the presence of a background body or to detect small objects.

Step	Description
①	Set the fiber within the sensing range. Briefly press <MODE> to switch to TEACH mode.
②	Briefly press the jog switch in the object absent condition. If teaching is accepted, the digital display blinks briefly showing the detected incident light intensity and the TEACH mode indicator blinks.
③	Turn the jog switch to the "+" side or the "-" side to set the shift for the threshold value.[*1] A comma scrolls from right to left across the display twice.
④	The judgement for the sensing stability is displayed briefly: • Good : sensing stable. • HArd : stable sensing not possible.
⑤	The threshold value is displayed briefly.
⑥	The actual incident light intensity is displayed and the setting is complete.

[*1] If the jog switch is turned to the "+" side, the threshold level is shifted to a value approx. 15% higher than that set when the jog switch was pressed, yielding lower sensitivity. Use this method for reflective type fibers.
If the jog switch is turned to the "-" side, the threshold level is shifted to a value approx. 15% lower than that set when the jog switch was pressed, yielding higher sensitivity. Use this method for thru-beam type fibers.



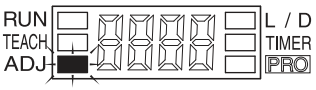
The default shift amount is approx. 15% of the initial value, but you can change this amount within a range of 0 to 80% in PRO mode. See “PRO MODE” on page 5.

Full-auto teaching

Full auto-teaching is used when you want to set the threshold value without stopping the assembly line.

Step	Description
①	Set the fiber within the sensing range. Briefly press <MODE> to switch to TEACH mode.
②	Continuously press the jog switch while the assembly line is moving. Auto appears as long as you press the jog switch while the sensor samples the incident light.
③	Release the jog switch. If the teaching is accepted, the digital display blinks briefly showing the threshold value.
④	The threshold value is set half way between the incident light intensities in the object present and the object absent conditions. The judgement for the sensing stability is displayed briefly: • Good : sensing stable. • HArd : stable sensing not possible.
⑤	The threshold value is displayed briefly.
⑥	The actual incident light intensity appears is displayed and the setting is complete.

10 THRESHOLD VALUE ADJUSTMENT MODE

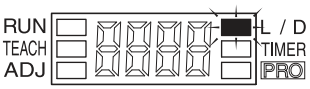


You can make fine adjustments to the threshold value while in ADJ mode.

Step	Description
①	Press <MODE> briefly and repeatedly until the ADJ operation indicator is lit.
②	Turn the jog switch to the "+" side to increase the threshold value, i.e. decrease sensitivity, or to the "-" side to lower the threshold value, i.e. increase sensitivity.
③	Press the jog switch briefly to confirm the setting.

☛ **Set the threshold value at least a bit higher than the minimum threshold value. The minimum threshold value is reached when you cannot lower it any further even though the jog switch is turned to the "-" side.**

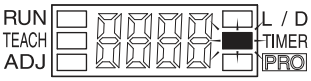
11 OUTPUT OPERATION MODE



For the output operation, you can select between Light-ON or Dark-ON.

Step	Description
①	Press <MODE> briefly and repeatedly until the L/D operation indicator is lit.
②	Turn the jog switch to switch between Light-ON (L-on is displayed) and Dark-ON (D-on is displayed).
③	Press the jog switch briefly to confirm the setting.

12 TIMER OPERATION MODE



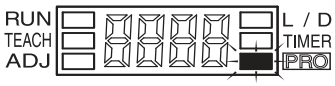
In the timer operation mode, you choose amongst the following settings:

- non : no timer
- oSd : one-shot timer
- ond : ON-delay timer
- oFd : OFF-delay timer

Step	Description
①	Press <MODE> briefly and repeatedly until the TIMER operation indicator is lit.
②	Turn the jog switch to the "+" or "-" side until the desired timer mode is selected.
③	Press the jog switch briefly to confirm the setting.

☛ **Set the timer interval in PRO1 mode.**

13 PRO MODE



For an even more detailed explanation of PRO mode, check out our Web site for the "PRO Mode Operation Guide", www.panasonic-electric-works.com, or contact our office.

PRO mode overview

PRO1	
SPEd : response time change	Stb : stability
dELY : timer setting	SHFt : shift
HYS : hysteresis	PctL : emission level

PRO2
d ISP : digital display setting
turn : digital display inversion
Eco : ECO mode setting

PRO3
chL0 : data bank load setting
chSA : data bank save setting

PRO4	
CoPY : setting condition copy	C-Lc : communication lock
chL0 : remote data bank load setting	b-uP : back-up
chSA : remote data bank save setting	

PRO5
Cod : code setting
A_Lc : adjust lock setting
rSEt : reset

☛ **The 0-ADJ setting function was removed in May, 2005.**

PRO mode detailed settings

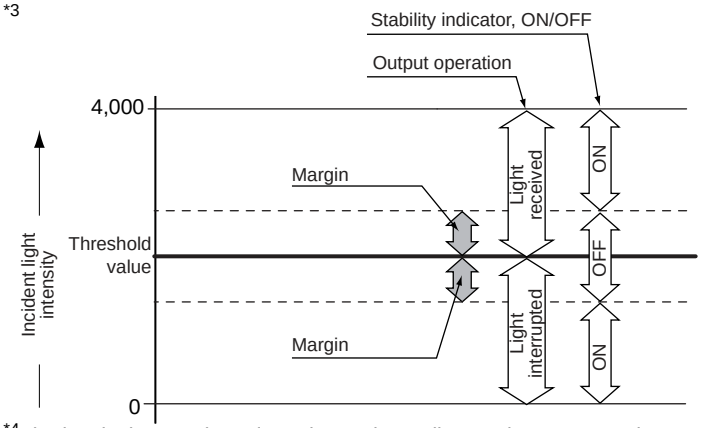
① Turn the jog switch to navigate between PRO modes.
② Press the jog switch to enter a specific PRO mode.
③ Turn the jog switch to navigate between the settings within each specific PRO mode.

④ Press the jog switch to confirm settings.
⑤ Press <MODE> briefly at any time to move up one level. Press <MODE> for 2s to return to RUN mode.

PRO1

Mode	Setting	Description
SPEd	H-SP Ultra high speed	Response time 65µs or less.
	FASt Fast	Response time 150µs or less.
	S-d Reduced intensity*1	Response time 250µs or less.
	Std Standard	Response time 250µs or less.
	Lon9 Long-range	Response time 2ms or less.
dELY	non No timer	–
	oFd OFF-delay timer*2	Extends the output signal for a fixed period of time. This function is useful if the output signal is so short that the connected device cannot respond.
	ond ON-delay timer*2	Neglects short output signals. This function is useful for detection if a line is clogged, or for sensing only objects that take a long time to travel.
	oSd One-shot timer*2	Outputs a fixed width signal upon sensing. This function is useful when the input specifications of the connected device require a signal of fixed width.
HYS	H-01	Small. The optimal limit of detection range.
	H-02	Standard
	H-03	Large. Capable of detecting objects that vibrate.
Stb	S-01	Margin width ±5%*3 The margin is the smallest, hence the range in which the stability indicator will light up is largest.
	S-02	Margin width ±10% Factor setting. Medium range.
	S-03	Margin width ±15% The margin is the largest, hence the range in which the stability indicator will light up is smallest.
SHFt	ISP (Factory setting.)	For limit teaching (+, -), you can shift, i.e. offset, the theshold value by 0 to 80% in increments of 5%. • **Reflective type fiber**. If the threshold value is shifted toward the "-" direction, minute detections are possible. • **Thru-beam type fiber**. If the threshold value is shifted toward the "+" direction, minute detections are possible.
PoEU*4	6 bars	Level 4. Highest emitting power.
	4 bars	Level 3.
	2 bars	Level 2.
	1 bar	Level 1. Lowest emitting power.
	oFF	Emission halt. While in RUN mode, E-oF is displayed when the emission halt state is valid.

*1 The S-d setting is suitable for delicate sensing, such as when the received light is saturated due to an insufficient sensing distance or when detecting translucent objects, etc.
*2 The range starts at 0.5ms, and then proceeds from 1 to 9999ms in 1ms intervals.
*3



*4 The levels that can be selected vary depending on the response time.

PRO2

PRO2 mode is used to control the display.

Mode	Setting	Description
diSP	d iSt	The incident light intensity is displayed.
	---P	Percent above threshold value. This function displays the incident light intensity within a range of 1P (1%) to 999P (999%) using the threshold value as reference.
	PHLd	Peak hold display. This function displays the peak numerical value of the incident light intensity. It is refreshed continuously.
	bHLd	Bottom hold display. This function displays the bottom numerical value of the incident light intensity. It is refreshed continuously.
turn	oFF	The direction of the digital display is normal.
	on	The direction of the digital display is inverted.
Eco	oFF	ECO mode is OFF.
	on	ECO mode is ON. When ECO mode is ON, the display turns off after 20s in RUN mode. To reactivate the display, press any key for 2s.

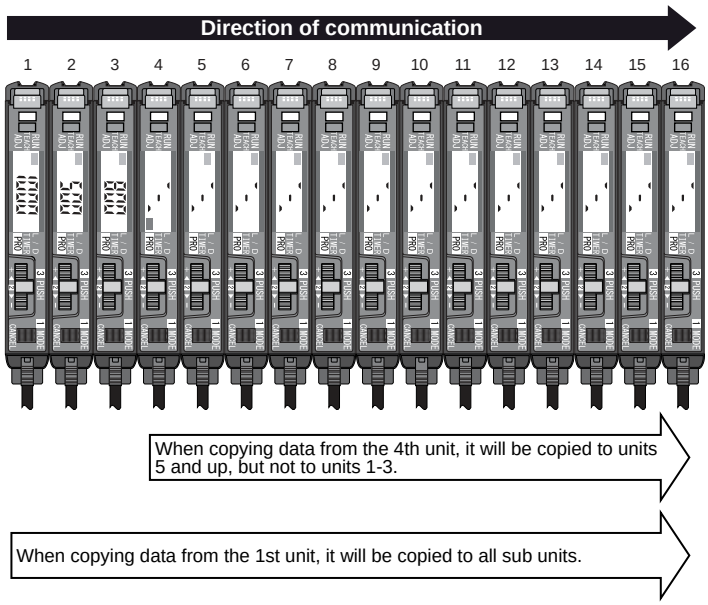
PRO3

PRO3 mode can load configuration settings from the data bank, i.e. “channel”, and save configuration settings to the data bank.

Mode	Setting	Description
chL0	1dch	Press the jog switch to load configuration settings from the respective channel (1, 2 or 3). When the display blinks YES, press the jog switch to confirm.
	2dch	
	3dch	
chSA	1dch	Press the jog switch to save configuration settings to the respective channel (1, 2 or 3). When the display blinks YES, press the jog switch to confirm.
	2dch	
	3dch	

PRO4

PRO4 mode is used mainly to configure communication with sub units. Communication takes place only in the direction shown in the following diagram.



Mode	Setting	Description
CoPY	–	Except for data bank information, settings are copied to the sub units.
chL0	1dch	Press the jog switch to load the configuration settings from each amplifier’s respective remote channel (1, 2 or 3). When the display blinks YES, press the jog switch to confirm.
	2dch	
	3dch	
chSA	1dch	Press the jog switch so that each amplfier saves its configuration settings to the respective remote channel (1, 2 or 3). When the display blinks YES, press the jog switch to confirm.
	2dch	
	3dch	
C-Lc	oFF	Communication lock function OFF. You can load and save settings remotely.
	on	Communication lock function ON. You cannot load or save settings remotely.
b-uP	on	Back-up ON.
	oFF	Back-up OFF. Prevents frequent overwriting of data in the EEPROM: the threshold values are not stored in the EEPROM when teaching via external input, e.g. with the FX-CH2 external input unit for digital sensors.

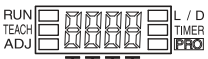
PRO5

PRO5 mode allows you to make multiple settings at once based on codes, adjust lock functions and reset the unit.

☛ **The 0-ADJ setting function was removed in May, 2005.**

Mode	Setting	Description
CodE	0004 (Factory setting.)	Choose a code from the code setting table (See “Code setting table” on page 7.) If any other code is entered, ' - ' is displayed. ① Press the jog switch to select the first digit in the code. ② Turn the jog switch to select a number. ③ Press the jog switch to confirm the number and move to the next digit.
A_Lc	on	Adjust lock ON. You cannot adjust the threshold value in RUN mode.
	oFF	Adjust lock OFF. You can adjust the threshold value in RUN mode.
rSEt	YES	Press the jog switch to reset the unit. Press <MODE> to cancel.

Code setting table



1st digit			2nd digit			3rd digit			4th digit	
Code	Response time	Hysteresis	Code	L-ON/ D-ON	Display	Code	Adjust lock	Timer operation	Code	Timer
0	Std	H-02	0	L-On	dIGt	0	ON	nOn	0	OFF
1	Std	H-03	1	L-On	---P	1	ON	OFd	1	1ms
2	Std	H-01	2	L-On	PHLd	2	ON	Ond	2	3ms
3	LOn9	H-02	3	L-On	bHLd	3	ON	OSd	3	5ms
4	LOn9	H-03	4	d-On	dIGt	4	OFF	nOn	4	10ms
5	LOn9	H-01	5	d-On	---P	5	OFF	OFd	5	30ms
6	FASt	H-02	6	d-On	PHLd	6	OFF	Ond	6	50ms
7	FASt	H-03	7	d-On	bHLd	7	OFF	OSd	7	100ms
8	FASt	H-01	–	–	–	–	–	–	8	300ms
9	S-d	H-02	–	–	–	–	–	–	9	500ms
–	–	–	–	–	–	–	–	–	A	1s
–	–	–	–	–	–	–	–	–	b	2s
–	–	–	–	–	–	–	–	–	C	3s
–	–	–	–	–	–	–	–	–	d	4s
–	–	–	–	–	–	–	–	–	E	5s

14 KEY LOCK FUNCTION

The key lock function prevents settings from being changed inadvertently.
While in RUN mode, press <MODE> + the jog switch for at least 2s to set or release the key lock function.
When the keys are locked, only the threshold value confirmation and adjust functions are valid.

15 ERROR INDICATION

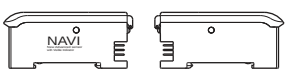
If the following error codes are displayed, please take appropriate measures.

Display	Error Description	Measures
Er-1	The load is short-circuited causing overcurrent.	Turn off the power, then check the load.
Er-5	Communication error in cascade connection.	Check that the amplifiers mounted in cascade are in close contact with each other.

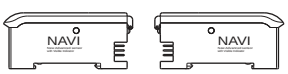
16 UNIT VERSIONS

If “NAVI” is printed on only one side, the unit is the modified version. The 0-ADJ setting function was removed in May, 2005.
If “NAVI” is printed on both sides, the unit is the original version.

Modified unit



Conventional unit



☛ **When mounting the modified version units and conventional version units together in cascade, place the modified version units on the right of the conventional version units as viewed from the connector side.**

17 SPECIFICATIONS

Item		Connector type	Cable type
		FX-301 (NPN)	**FX-301-C1 (NPN)**
		FX-301P (PNP)	**FX-301P-C1 (PNP)**
Supply voltage		12 to 24V DC ± 10% Ripple P-P 10% or less	
Power consumption		• Normal operation: 960mW or less (Current consumption 40mA or less at 24V supply voltage) • ECO mode: 600mW or less (Current consumption 25mA or less at 24V supply voltage)	
Output		**NPN output type** NPN open-collector transistor • Maximum sink current: 100mA[*1] • Applied voltage: 30V DC or less (between output and 0V) • Residual voltage: 1.5V or less (at 100mA[*1] sink current)	**PNP output type** PNP open-collector transistor • Maximum source current: 100mA[*1] • Applied voltage: 30V DC or less (between output and +V) • Residual voltage: 1.5V or less (at 100mA[*1] source current)
	Output operation	Light-ON or Dark-ON, selectable	
	Short-circuit protection	Incorporated	
Response time[*2]		• H-SP 65µs or less • FAST: 150µs or less • S-D: 250µs or less	• STD: 250µs or less • LONG: 2ms or less
Display		4-digit red LED display	
Sensitivity setting		2-point teaching, limit teaching, full-auto teaching, manual adjustment	
Sensitivity adjustment function[*3]		Incorporated.	
Timer function		Incorporated. Available modes: off, ON-delay, OFF-delay, ONE-SHOT timer. Timer interval range: approx. 0.5 to 9999ms.	
Interference prevention function		Incorporated. Up to four fibers can be mounted adjacently. For the H-SP response time, the maximum is two fibers.[*4]	
Ambient temperature		• 1 to 3 units mounted in cascade: -10 to +55°C • 4 to 7 units mounted in cascade: -10 to +50°C • 8 to 16 units mounted in cascade: -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	
Emitting element		Red LED (modulated)	
Material		Enclosure: Heat-resistant ABS, Transparent cover: Polycarbonate Mode key: Acrylic, Jog switch: Heat-resistant ABS	
Cable		–	0.3mm² 3-core cabtyre cable, 1m long
Weight		Approx. 20g	Approx. 60g
Accessory		FX-MB1 (Amplifier protection seal): 1 set[*5]	

[*1] 50mA, if five or more connector type FX-301(P) amplifiers are connected in cascade.
[*2] Select in PRO1 mode. See “PRO1” on page 6.
[*3] See “THRESHOLD VALUE ADJUSTMENT MODE” on page 5.
[*4] When the power supply is switched on, the light emission timing is automatically set for interference prevention.
[*5] Cables for connecting the amplifiers are not supplied as an accessory. Make sure to use the following optional quick-connection cables:
Main cable (3-core): CN-73-C1 (cable length 1m), CN-73-C2 (cable length 2m), CN-73-C5 (cable length 5m)
Sub cable (1-core): CN-71-C1 (cable length 1m), CN-71-C2 (cable length 2m), CN-71-C5 (cable length 5m)