

External Input Unit FX-CH2(-P)

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.



When this product is used with safety devices, construct the system such that the device itself always operates in the safety side.

Be sure to use this product in combination with the horizontal connecting connector type digital fiber sensor **FX-301** series (up dated version unit) and **FX-305(P)** incorporating the data bank function.
For details of the digital fiber sensor, refer to the instruction manual enclosed with the digital fiber sensor.

1 OUTLINE

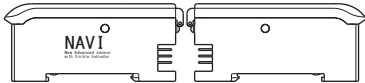
- This is a unit which, by using the external channel selection input, can collectively load / store the setting data of 3 channels which are stored in the data bank of of the digital fiber sensor **FX-301** series (updated version unit) or **FX-305(P)** and can teach the setting and set / cancel the key-lock setting.
- The setting data of max. 16 units of the digital fiber sensors can be changed or taught collectively.

2 SPECIFICATIONS

Type	NPN input type	PNP input type	
Item	Model No.	FX-CH2	FX-CH2-P
Applicable fiber amplifier	FX-301 series (Note 1), FX-305(P)		
Supply voltage	12 to 24V DC ±10% Ripple P-P 10% or less		
Current consumption	Max. 25mA or less (when all indicators light up)		
Input	Low : 0 to +2V DC Source current 0.5mA Input impedance 10kΩ approx. High: +5V to +V DC, or open	High: +4V to +V DC Sink current 0.5 to 3mA Input impedance 10kΩ approx. Low : 0 to +0.6V DC, or open	
	Green LED (Lights up when the power is ON)		
Power indicator	Green LED (Lights up when the power is ON)		
Transmission operation indicator	Green LED (Lights up when loaded, and 2-level / Limit teaching, blinks→lights up when saved, and Full-auto teaching)		
Ambient temperature	-10 to +55°C (if 4 to 7 amplifiers are mounted close together: -10 to +50°C, if 8 to 16 amplifiers are mounted close together: -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		
Weight	20g approx.		
Accessory	Connector for input device: 1 pc.		

Notes: 1) Only updated version of **FX-301** series can be used. Do not use the previous version of **FX-301** series.

The updated version of **FX-301** series have 'NAVI' printed on one side. (See the right figure.)



- 2) The cable for unit connection is not supplied as an accessory. Be sure to use the optional quick-connection cables given below.
Main cable (3-core): **CN-73-C1** (cable length 1m), **CN-73-C2** (cable length 2m)
CN-73-C5 (cable length 5m)

3 CAUTIONS

- This product has been developed / produced for industrial use only.
- Make sure that the power supply is off while wiring.
- Verify that the supply voltage variation is within the rating.
- Take care that if a voltage exceeding the rated range is applied, or if an AC power supply is directly connected, the sensor may get burnt or damaged.
- 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.
- 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.
- Do not use during the initial transient time (1 sec. approx.) after the power supply is switched on.
- Take care that short-circuit of the load or wrong wiring may burn or damage the sensor.
- 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.
- Make sure to use the optional quick-connection cable for the connection of the amplifier. Extension up to total 10m is possible with 0.3mm², or more, cable. However, in order to reduce noise, make the wiring as short as possible.
- This sensor is suitable for indoor use only.
- Avoid dust, dirt, and steam.
- Take care that the product does not come in contact with water, oil, grease, or organic solvents, such as, thinner, etc.

4 INTENDED PRODUCTS FOR CE MARKING

- The models listed under '2 SPECIFICATIONS' come with CE Marking. As for all other models, please contact our office.



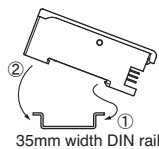
Contact for CE

<Until June 30 ,2013>
Panasonic Electric Works Europe AG
Rudolf-Diesel-Ring 2, D-83607 Holzkirchen, Germany
<From July 1 ,2013>
Panasonic Marketing Europe GmbH Panasonic Testing Center
Winsbergring 15, 22525 Hamburg, Germany

5 MOUNTING

How to mount the unit

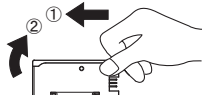
- ① Fit the rear part of the mounting section of the amplifier on a 35mm width DIN rail.
- ② Press down the rear part of the mounting section of the unit on the 35mm width DIN rail and fit the front part of the mounting section to the DIN rail.



How to remove the unit

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

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.



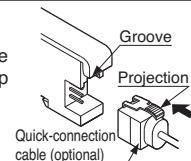
6 CONNECTION

<Connection of the quick-connection cable CN-73-C□>

Make sure to connect or disconnect the quick-connection cable **CN-73-C□** (optional) in the power supply off condition.

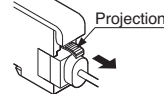
Connection method

- ① Holding the connector of the quick-connection cable (optional), align its projection with the groove at the top portion of the amplifier connector.
- ② Insert the connector till a click is felt.



Disconnection method

- ① Pressing the projection at the top of the quick-connection cable, pull out the connector.



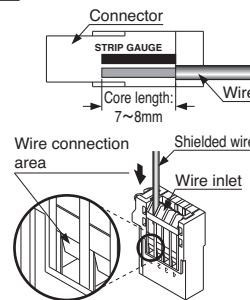
Note: Take care that if the connector is pulled out without pressing the projection, the projection may break. Do not use a quick-connection cable whose projection has broken. Further, do not pull by holding the cable, as this can cause a cable-break.

<Connection of the connector for input device>

- Make sure that the power is off while connecting or disconnecting the connector for input device.
- When there are any unused wires, insulate them.
- The applicable wire is 0.08mm² (AWG 28) to 0.5mm² (AWG 20) and the wire sheath diameter should be φ 1.5mm or less.

Connection method of the connector for input device

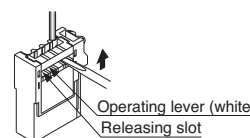
- ① Process the core length to 7 to 8mm in accordance with 'STRIP GAUGE' indicated on the side of this unit, and twist the core several times.
- ② Insert the wire to the innermost of the wire inlet. Check that the shielded wire is properly inserted into the wire inlet as well as that the core end has passed through the wire connection area as shown in the right figure.



<Connector pin position>

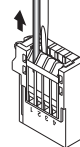
①	FX-CH2	FX-CH2-P
②	S1	S1
③	S2	S2
④	S3	S3
	COM. (0V)	COM. (+V)

- ③ Place the head of a flathead screwdriver underneath the operating lever (white) through the releasing slot, and lift the screwdriver head. If you hear a snap, the operating lever (white) is returned and the wire is fixed.
- ④ Slightly pull the wire to ensure that wire is not loose.



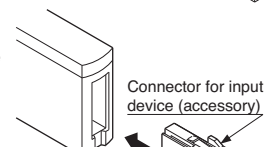
Disconnection method

- ① Use a flathead screwdriver (blade width: 2mm or less) to push the operating lever (white) located at the wire inlet and remove the wire.



Connection method to the unit

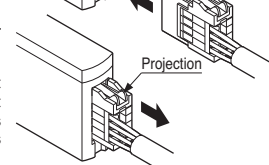
- ① Insert the connector for input device in the connector inlet till a 'click' is felt.



Disconnection method

- ① Pressing the projection at the top of the connector for input device, pull out the connector.

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



7 CASCADING UNITS

- Make sure that the power is off while mounting or removing the units.
- Locate the unit in the main unit side of the digital fiber amplifiers.
- After mounting the units in cascade, be sure to mount the end plates (**MS-DIN-E**) (optional) at both ends to hold the units between their flat sides.
- 16 units of the digital fiber amplifier can be cascaded for a unit.

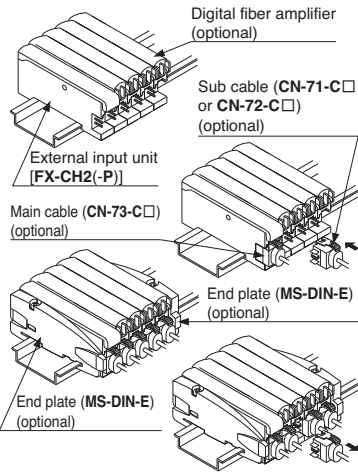
For mounting and removing the unit, refer to '5 MOUNTING'.

Cascading method

- Mount the unit and digital fiber amplifier, one by one, on the 35mm width DIN rail and make them close each other.
- Insert the connector of the quick-connection cable to the connector part of the unit and digital fiber amplifier.
- Mount the optional end plates (MS-DIN-E) at both ends to hold the amplifiers between their flat sides.
- Tighten the screws to fix the end plates (MS-DIN-E).

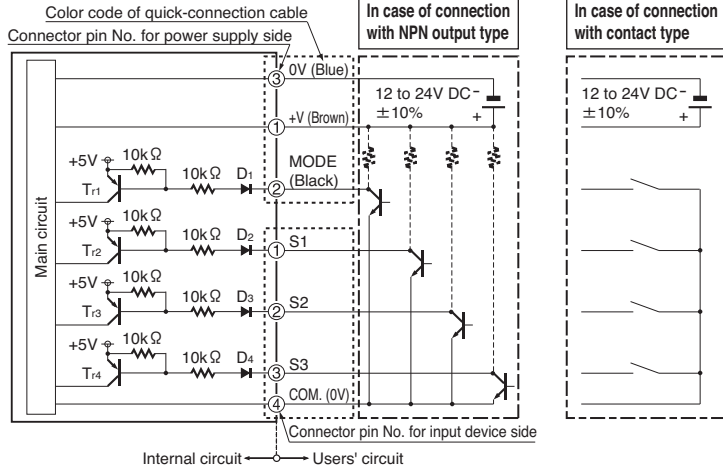
Dismantling

- Pressing the projection at the top of the quick-connection cable, pull out the connector.
- Remove the unit and the digital fiber amplifier.

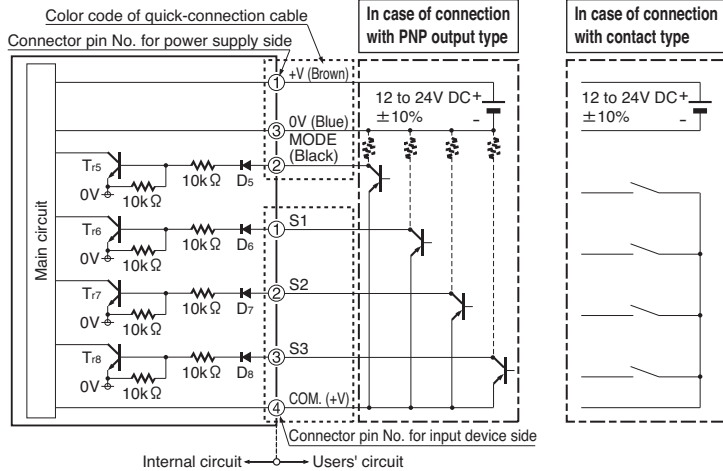


8 I/O CIRCUIT DIAGRAM

FX-CH2

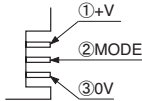


FX-CH2-P



Symbols... D1 to D8: Reverse supply polarity protection diode
T1 to T4: PNP input transistor, T5 to T8: NPN input transistor

Terminal arrangement for power supply side



9 OPERATION TIMING CHART

The digital fiber sensor cannot be used for 50ms after confirmation of each MODE.

- The operation timing of the unit is set with the following procedure.

<Operation timing when data bank selection mode is ON>

Setting procedure

- Set the MODE to High (Low for PNP type) or open.
- Select the data bank channel in the S1 or S2.

FX-CH2

	Load / Save		
	1 ch	2 ch	3 ch
S1	●	○	●
S2	○	●	●
S3	●	●	●

●: Low (0 to +2V DC)
○: High (+5V to +V DC, or open)

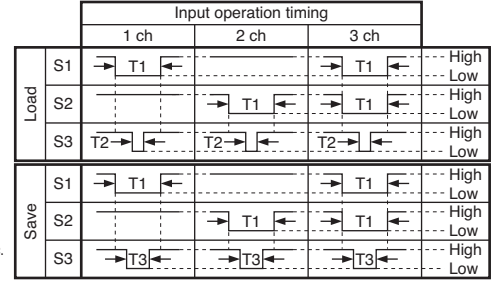
FX-CH2-P

	Load / Save		
	1 ch	2 ch	3 ch
S1	■	□	■
S2	□	■	■
S3	■	■	■

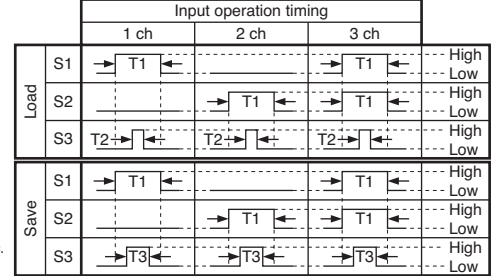
■: High (+4V to +V DC)
□: Low (0 to +0.6V DC, or open)

- Maintain the condition of the S1 or S2.
- Input the timing period T2 and load from the S3. At this time, the transmission operation indicator (green) lights up. [Input the timing period T3 for saving. At this time, the communication operation indicator (green) blinks → lights up.]

FX-CH2



FX-CH2-P



<Operation timing when teaching mode is ON>

- Three ways of teaching, the 2-level / full-auto teaching, the limit teaching '+', the limit teaching '-' can be selected via external input.

Setting procedure

- Set the MODE to Low (High for PNP type).
- Select the teaching in S1 and S2.

FX-CH2

	2-level / Full-auto teaching	Limit teaching	
		+	-
S1	●	○	●
S2	○	●	●
S3	●	●	●

FX-CH2-P

	2-level / Full-auto teaching	Limit teaching	
		+	-
S1	■	□	■
S2	□	■	■
S3	■	■	■

●: Low (0 to +2V DC)

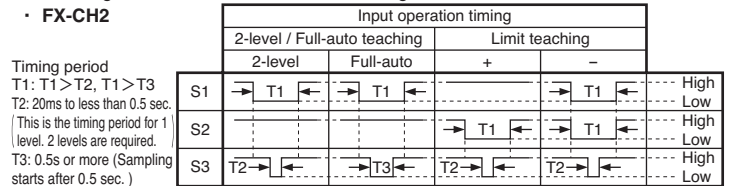
○: High (+5V to +V DC, or open)

■: High (+4V to +V DC)

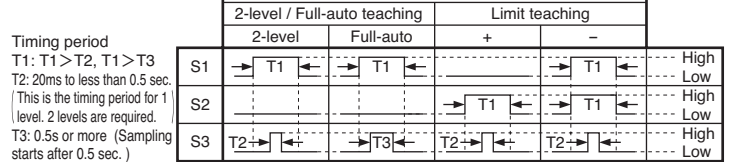
□: Low (0 to +0.6V DC, or open)

- Maintain the state of S1 and S2, and teaching is carried out with S3. When 2-level / full-auto teaching is selected, 2-level teaching or the full-auto teaching can be selected as shown in the figure below.

FX-CH2



FX-CH2-P



- Notes: 1) For FX-305(P), the teaching can be done with only output 1 in the normal mode.
2) The guaranteed No. of times for writing in to the EEPROM in sensor side is 1,000,000 times. If the setting is changed a lot, set the back-up function in the sensor side to OFF.

<Operation timing when key-lock mode is ON>

Setting procedure

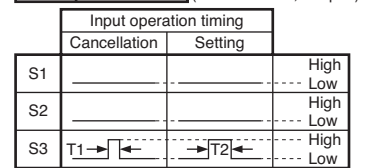
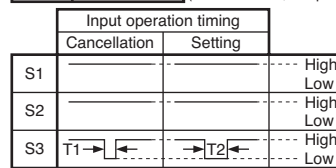
- Set the MODE to Low (High for PNP type).
- Set the key-lock setting with S3.

FX-CH2

	Setting / Cancellation		●: Low (0 to +2V DC) ○: High (+5V to +V DC, or open)
S2	○		
S3	●		

FX-CH2-P

	Setting / Cancellation		■: High (+4V to +V DC) □: Low (0 to +0.6V DC, or open)
S2	□		
S3	■		



Panasonic Industrial Devices SUNX Co., Ltd.

<http://panasonic.net/id/pidsx/global>

Overseas Sales Division (Head Office)

2431-1 Ushiyama-cho, Kasugai-shi, Aichi, 486-0901, Japan
Phone: +81-568-33-7861 FAX: +81-568-33-8591

About our sale network, please visit our website.

PRINTED IN JAPAN

© Panasonic Industrial Devices SUNX Co., Ltd. 2012