

FX-CH SERIES

New

Bank Selection Unit



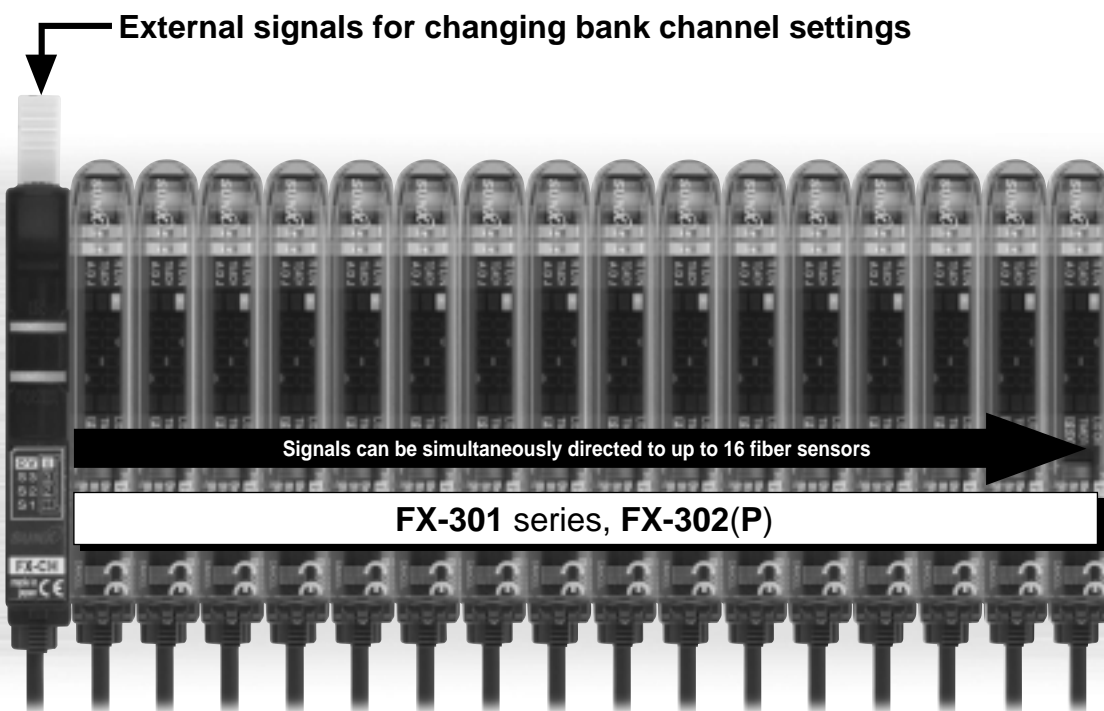
Setting for up to 16 fiber sensors can be changed at once by means of external signals



Settings for up to 16 fiber sensors can be changed at once by means of external signals

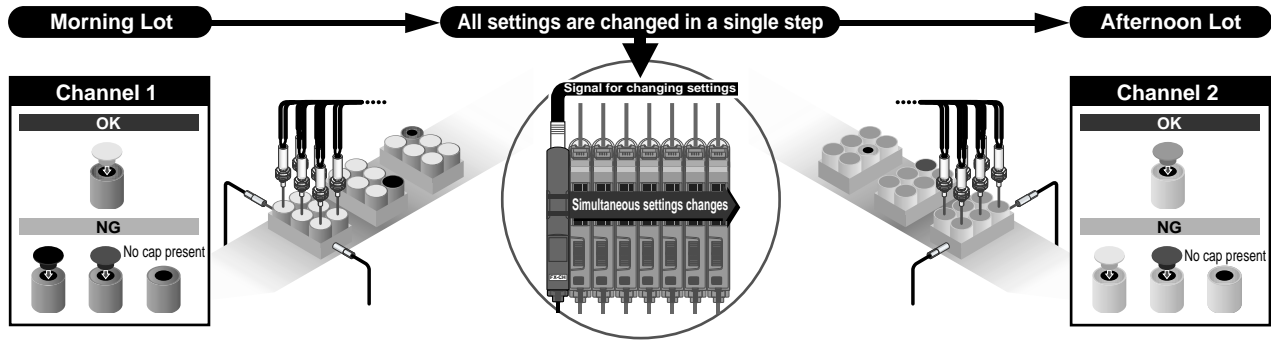
Bank settings for the **FX-301** series digital fiber sensors as well as the **FX-302(P)** can be selected via an external signal without operating the sensors directly. (Load and save)

For example, it is possible to automatically change the threshold values, timer setting, or output operation setting to correspond to work selections. Also, the display setting can be switched from incident light intensity display to percentage display greatly increasing applications.




APPLICATIONS

In production lines containing target objects that vary in color from lot to lot, the fiber sensor's settings must be changed in accordance with the characteristics of the target objects (see illustration below). However, it can be very troublesome to change sensor settings for each different arrangement or type of work. Making these changes to settings takes time and requires extra care, in order to avoid possible malfunctions. The **FX-CH** series allows preset bank settings to be changed, all in a single step, by utilizing an external signal, without having to handle individual sensors.






ORDER GUIDE

Bank selection units

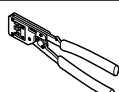
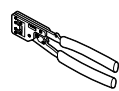
Type	Appearance	Model No.	Description
NPN input type		FX-CH	By using an external signal, this unit can change the bank channel settings for up to 16 fiber sensors [of both the FX-301 series and FX-302(P)], all in a single step.
PNP input type		FX-CH-P	

Connectors

Designation	Appearance	Model No.	Description	
4-pin type snap male connector		SL-CP1 (White)	For 0.08 to 0.2 mm ² (conductor cross-section area) Wire diameter: ϕ 0.7 to ϕ 1.2 mm ϕ 0.028 to ϕ 0.047 in	
		SL-CP2 (Black)		For 0.3 mm ² (conductor cross-section area) Wire diameter: ϕ 1.1 to ϕ 1.6 mm ϕ 0.043 to ϕ 0.063 in
		SL-CP3 (Greenish blue)		For 0.5 mm ² (conductor cross-section area) Wire diameter: ϕ 1.7 to ϕ 2.5 mm ϕ 0.067 to ϕ 0.098 in

This snap male connector is used to connect the channel changing input to the bank selection unit. The bank selection unit includes one **SL-CP1**.

Others

Designation	Appearance	Model No.	Description
Hook-up pliers for the snap male / female connector		SL-JPC	4-pin type hook-up connectors (SL-CP1 , SL-CP2) can be connected in one grip.
SL-CP3 exclusive pliers		SL-JPE	4-pin type snap male connector (SL-CP3) can be connected in one grip.

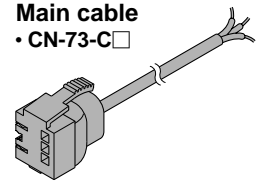
FX-CH

ORDER GUIDE

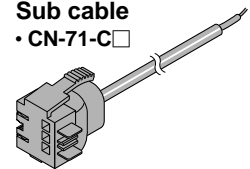
Quick-connection cables Quick-connection cable is not supplied with FX-CH series. Please order it separately.

Type	Model No.	Description	
Main cable	CN-73-C1	Length: 1 m 3.281 ft	This one-touch cable is utilized when connecting the fiber sensors FX-301 series and FX-302(P) and the bank selection unit FX-CH series together in side-by-side configuration. 0.15 mm ² 3-core cabtyre cable, with connector on one end Cable outer diameter: ϕ 3 mm ϕ 0.118 in
	CN-73-C2	Length: 2 m 6.562 ft	
	CN-73-C5	Length: 5 m 16.404 ft	
Sub cable	CN-71-C1	Length: 1 m 3.281 ft	This one-touch cable is utilized when connecting the fiber sensors FX-301 series and FX-302(P) and the bank selection unit FX-CH series together in side-by-side configuration. 0.15 mm ² 1-core cabtyre cable, with connector on one end Cable outer diameter: ϕ 3 mm ϕ 0.118 in
	CN-71-C2	Length: 2 m 6.562 ft	
	CN-71-C5	Length: 5 m 16.404 ft	

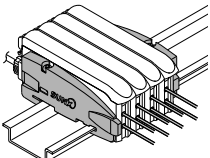
Main cable
• **CN-73-C** □



Sub cable
• **CN-71-C** □



End plates End plate is not supplied with FX-CH series. Please order it separately.

Appearance	Model No.	Description
	MS-DIN-E	After the FX-CH series and the fiber sensors have been attached to the DIN rail, all of these devices must be secured firmly together by placing end plates at each of the ends and sandwiching the FX-CH series and the fiber sensors in between. Ensure that these end plates are used for this purpose. Two pcs. per set

SPECIFICATIONS

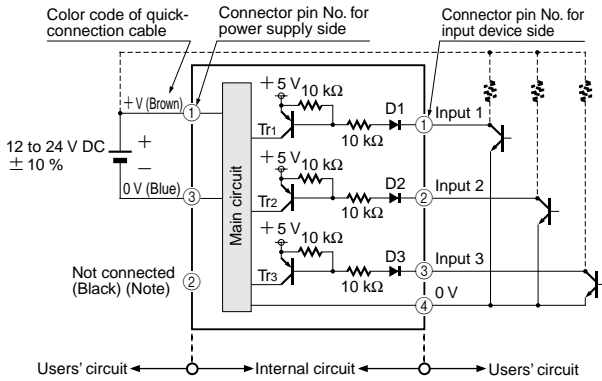
Item	Type	NPN input	PNP input
	Model No.	FX-CH	FX-CH-P
Supply voltage		12 to 24 V DC \pm 10 % Ripple P-P10 % or less	
Current consumption		25 mA or less (When all indicators light up)	
Bank selection input		Low: 0 to 2 V DC (Source current: 0.5 mA Input impedance: 10 k Ω approx.) High: 5 V to + V DC, or open	High: 4 V to + V DC (Sink current: 0.5 to 3 mA Input impedance: 10 k Ω approx.) Low: 0 to 0.6 V DC, or open
Power indicator		Green LED (Lights up when the power is ON)	
Transmission operation indicator		Green LED (Lights up when loaded, blinks → lights up when saved)	
Environmental resistance	Pollution degree	3 (Industrial environment)	
	Ambient temperature	- 10 to + 55 °C + 14 to + 131 °F (No dew condensation or icing allowed), Storage: - 20 to + 70 °C - 4 to + 158 °F	
	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH	
	EMC	EN 50081-2, EN 61000-6-2	
	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure	
	Insulation resistance	20 M Ω , or more, with 250 V DC megger between all supply terminals connected together and enclosure	
	Vibration resistance	10 to 150 Hz frequency, 0.75 mm 0.030 in amplitude in X, Y and Z directions for two hours each	
Shock resistance	98 m/s ² acceleration (10 G approx.) in X, Y and Z directions for five times each		
Material		Enclosure: Heat-resistant ABS	
Connecting method		Connector	
Cable extension		Extension up to total 100 m 328.084 ft is possible with 0.3 mm ² , or more, cable.	
Weight		20 g approx.	
Accessory		SL-CP1 (4-pin type snap male connector): 1 pc.	

Note: The cable for **FX-CH** connection is not supplied as an accessory. Make sure to use the optional quick-connection cable given below.
Main cable (3 core): **CN-73-C1** (cable length 1 m 3.281 ft), **CN-73-C2** (cable length 2 m 6.562 ft), **CN-73-C5** (cable length 5 m 16.404 ft)
Sub cable (1-core): **CN-71-C1** (cable length 1 m 3.281 ft), **CN-71-C2** (cable length 2 m 6.562 ft), **CN-71-C5** (cable length 5 m 16.404 ft)

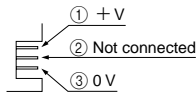
I/O CIRCUIT AND WIRING DIAGRAMS

FX-CH NPN input type

In case of connection with NPN output type



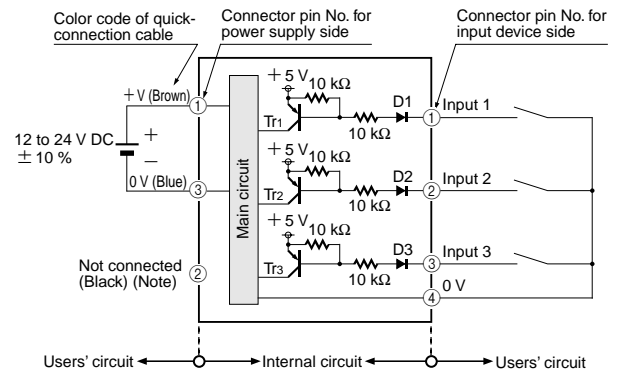
Terminal arrangement for power supply side



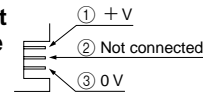
Note: The output wire (black) of the quick-connection cable (CN-73-C□) is not connected to the internal circuit. Open, or connect to 0 V.

Symbols ... D1, D2, D3 : Reverse supply polarity protection diode
Tr1, Tr2, Tr3 : PNP transistor

In case of connection with contact type



Terminal arrangement for power supply side

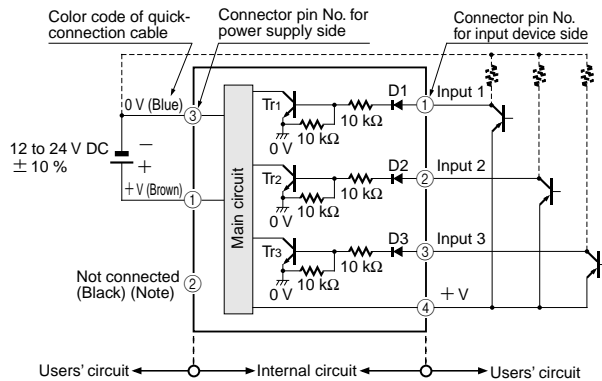


Note: The output wire (black) of the quick-connection cable (CN-73-C□) is not connected to the internal circuit. Open, or connect to 0 V.

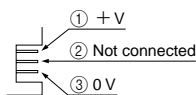
Symbols ... D1, D2, D3 : Reverse supply polarity protection diode
Tr1, Tr2, Tr3 : PNP transistor

FX-CH-P PNP input type

In case of connection with PNP output type



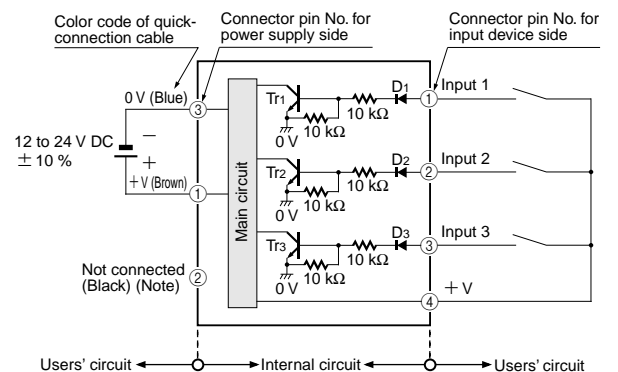
Terminal arrangement for power supply side



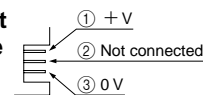
Note: The output wire (black) of the quick-connection cable (CN-73-C□) is not connected to the internal circuit. Open, or connect to 0 V.

Symbols ... D1, D2, D3 : Reverse supply polarity protection diode
Tr1, Tr2, Tr3 : NPN transistor

In case of connection with contact type



Terminal arrangement for power supply side



Note: The output wire (black) of the quick-connection cable (CN-73-C□) is not connected to the internal circuit. Open, or connect to 0 V.

Symbols ... D1, D2, D3 : Reverse supply polarity protection diode
Tr1, Tr2, Tr3 : NPN transistor

Fiber Selection

FX-301

FX-302

FX-303

Digital Setting

FX-301

FX-302

FX-303

Bank Selection Unit

FX-CH

Manually Set

FX-311

FX-11A

Analog Output

FZ-10

FX-CH

PRECAUTIONS FOR PROPER USE



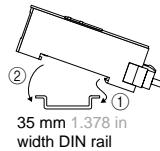
This product does not possess control functions needed for accident prevention or safety maintenance.

Mounting

- Make sure that **FX-CH(-P)** should be mounted to a 35 mm 1.378 in width DIN rail.

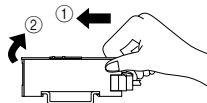
How to mount the unit

- ① Fit the rear part of the mounting section of the unit on a 35 mm 1.378 in width DIN rail.
- ② Press down the rear part of the mounting section of the unit on the 35 mm 1.378 in width DIN rail and fit the front part of the mounting section on the 35 mm 1.378 in width DIN rail.



How to remove the unit

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



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

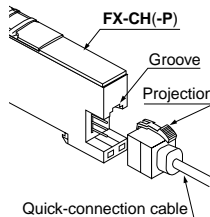
Connection

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

- Make sure that the power supply is off while connecting or disconnecting the quick-connection cable **CN-73-C□**.

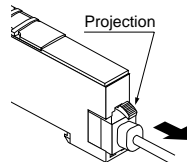
Connection method

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



Disconnection method

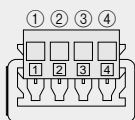
- ① Pressing the projection at the top of the quick-connection cable connector, pull out the connector.



Note: Take care that if the connector is pulled out without pressing the 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 snap male connector SL-CP1/CP2/CP3>

- Make sure that the power supply is off while connecting or disconnecting the snap male connector **SL-CP1/CP2/CP3**.
- When there are any unused wires, please insulate them.



	FX-CH	FX-CH-P
①	Input 1	Input 1
②	Input 2	Input 2
③	Input 3	Input 3
④	0 V	+ V

- For details of hook-up procedure etc. of the snap male connector **SL-CP1/CP2/CP3**, please refer to the instruction manual enclosed with the snap male connector.

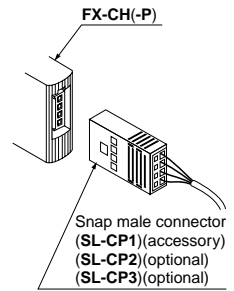
Connection method

- ① Insert the **SL-CP1/CP2/CP3** with the cable connected, with holding its body, to each connector of the unit reliably.

Disconnection method

- ① Pull the **SL-CP1/CP2/CP3**, with holding its body, from the **FX-CH(-P)** horizontally.

Note: Take care that if the connector is pulled by holding the cable, the cable may break.

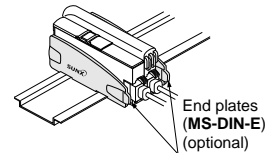
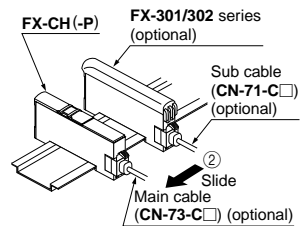


Cascading units

- Make sure that the power supply is off while cascading or removing the units.
- When connecting in cascade, the **FX-301/302** series or when amplifier moves depending on the way it is installed on a DIN rail, mount the amplifiers close to each other, fitting them between the optional end plates (**MS-DIN-E**) mounted at the two ends.
- Up to maximum 16 **FX-301/302** series amplifiers can be added.

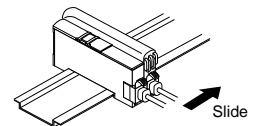
Cascading method

- ① Mount the **FX-CH(-P)** and the **FX-301/302** series on a 35 mm 1.378 in width DIN rail. When attaching these units, be sure that the **FX-CH(-P)** is located to the leftmost position as shown in the diagram right. (For details, please refer to 'Mounting'.
- ② Slide the **FX-301/302** series to the **FX-CH(-P)** and connect the each connector closely without any gap between them. (For details of the **FX-301/302** series, please refer to p.62 / p.116~)
- ③ Mount the end plate (**MS-DIN-E**) (optional) at both ends to hold the units between their flat sides.
- ④ Tighten the screws to fix the end plates (**MS-DIN-E**).



Dismantling method

- ① Loosen the screws of the end plates (**MS-DIN-E**). Slide the **FX-301/302** series and remove them one by one. (For details, please refer to 'Mounting')



PRECAUTIONS FOR PROPER USE

Operation timing chart

- The operation timing of FX-CH(-P) is set with the following procedure.

Setting procedure

- Select the data bank channel in the input 1 or input 2.

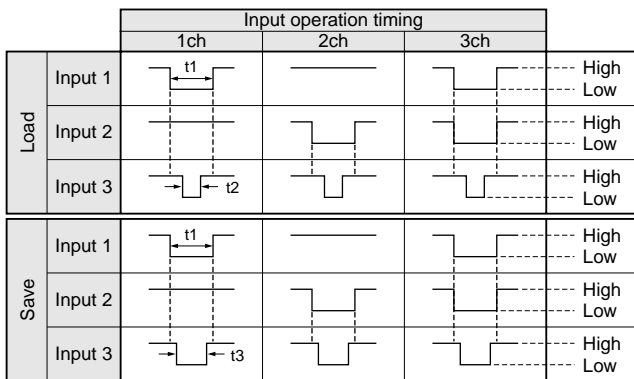
<FX-CH>				<FX-CH-P>			
	Load / Save				Load / Save		
	1ch	2ch	3ch		1ch	2ch	3ch
Input 1	Low	High	Low	Input 1	High	Low	High
Input 2	High	Low	Low	Input 2	Low	High	High
Input 3	Low	Low	Low	Input 3	High	High	High

Low : 0 to 2 V DC
High: 5 V to +V DC, or open

High: 4 V to +V DC
Low : 0 to 0.6 V DC, or open

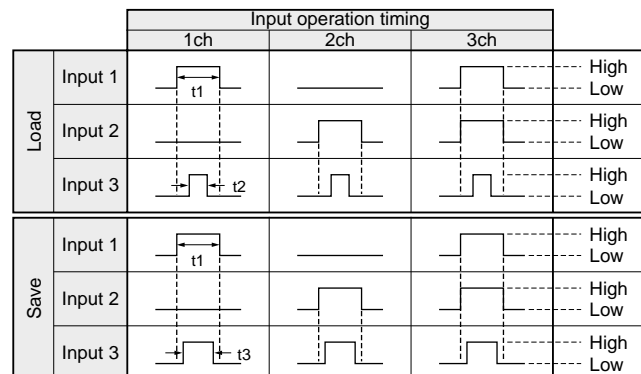
- Maintain the condition of the input 1 or input 2.
- Input the timing period t2 and load from the input 3. At this time, the transmission operation indicator (green) lights up. [Input the timing period t3 for saving. At this time, the communication operation indicator (green) blinks → lights up.]
- Cancel the input 3.

<FX-CH>



Timing period: t1 = t1 > t2, t1 > t3, t2 = 1 ms to less than 2 sec., t3 = 2 sec. or more

<FX-CH-P>



Timing period: t1 = t1 > t2, t1 > t3, t2 = 1 ms to less than 2 sec., t3 = 2 sec. or more

Wiring

- Make sure that the power supply is off while wiring or adding the units.
- 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 product, connect the frame ground (F.G.) terminal of the equipment to actual ground.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of power supply is connected to an actual ground.
- Make sure to use an isolation transformer for the DC power supply. If an auto-transformer (single winding transformer) is used, this product or the power supply may get damaged.
- In case a surge is generated in the used power supply, connect a surge absorber to the supply and absorb the surge.
- Make sure to wire correctly since miswiring can result in device damage.
- 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 unit. Extension up to total 100 m (328.084 ft) is possible with 0.3 mm², or more, cable. However, in order to reduce noise, make the wiring as short as possible.

Others

- Do not use during the initial transient time (4 sec. approx.) after the power supply is switched on.
- This product is suitable for indoor use only.
- Avoid dust, dirt, and steam.
- Take care that the product does not come in direct contact with water, oil, grease or organic solvents, such as, thinner, etc.
- This product cannot be used in an environment containing inflammable or explosive gases.
- Never disassemble, repair or modify this product.

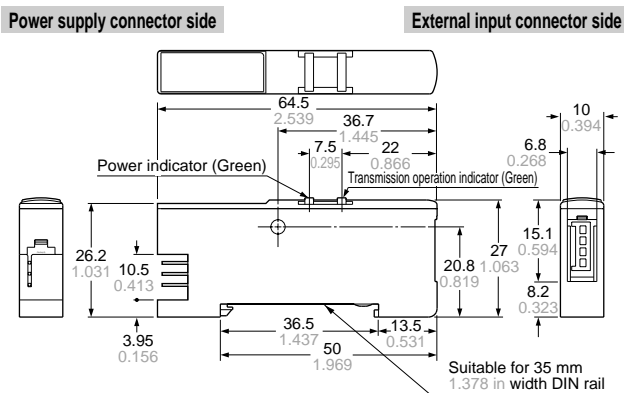
FX-CH

DIMENSIONS (Unit: mm in)

The CAD data in the dimensions can be downloaded from the SUNX website: <http://www.sunx.co.jp/>

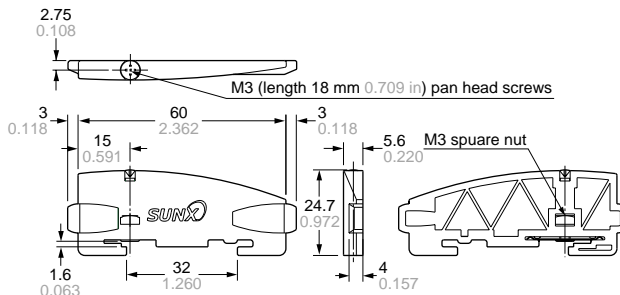
FX-CH FX-CH-P

Bank selection unit



MS-DIN-E

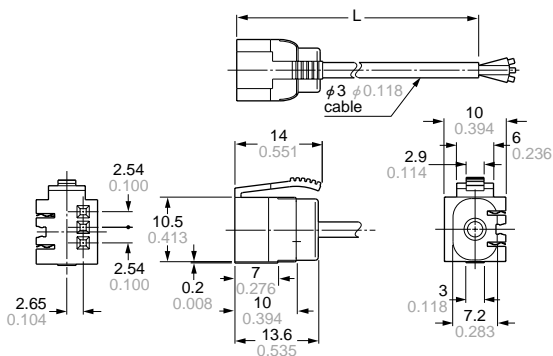
End plates (Optional)



Material: Polycarbonate

CN-73-C1 CN-73-C2 CN-73-C5

Main cable (Optional)

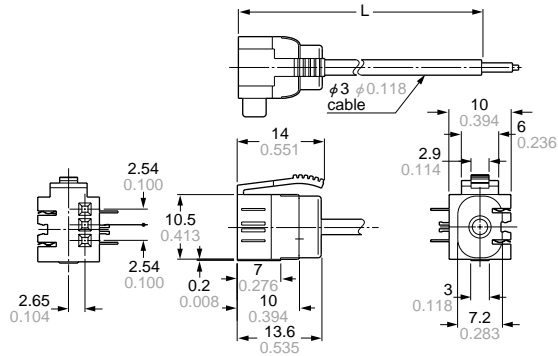


• Length (L)

Model No.	Length (mm in)
CN-73-C1	1,000 39.370
CN-73-C2	2,000 78.740
CN-73-C5	5,000 196.850

CN-71-C1 CN-71-C2 CN-71-C5

Sub cable (Optional)



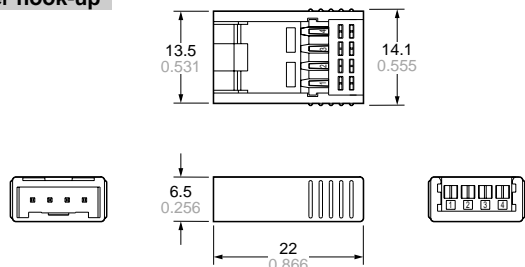
• Length (L)

Model No.	Length (mm in)
CN-71-C1	1,000 39.370
CN-71-C2	2,000 78.740
CN-71-C5	5,000 196.850

SL-CP1 SL-CP2

Snap male connector

After hook-up



SL-CP3

Snap male connector

After hook-up

