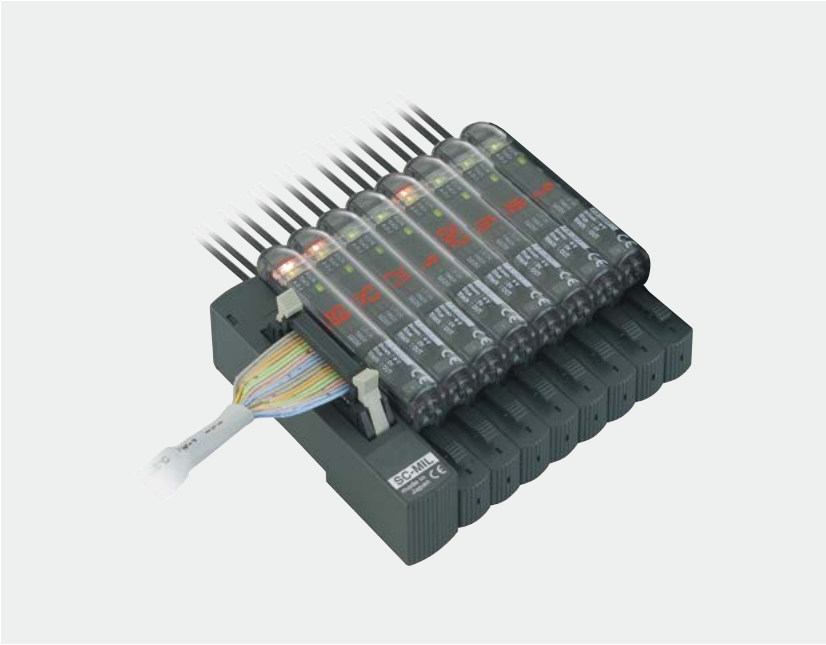
Panasonic
INDUSTRY

Sensor-PLC Connection System

SC SERIES



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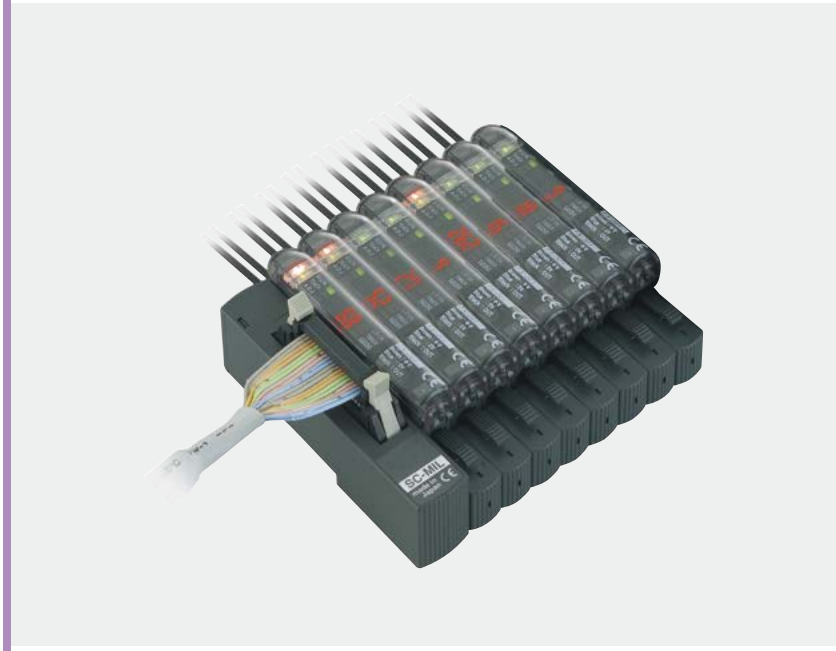

[SC-MIL/T1J(-P) only]

Up to 16 I/O devices can be connected at once using MIL connectors

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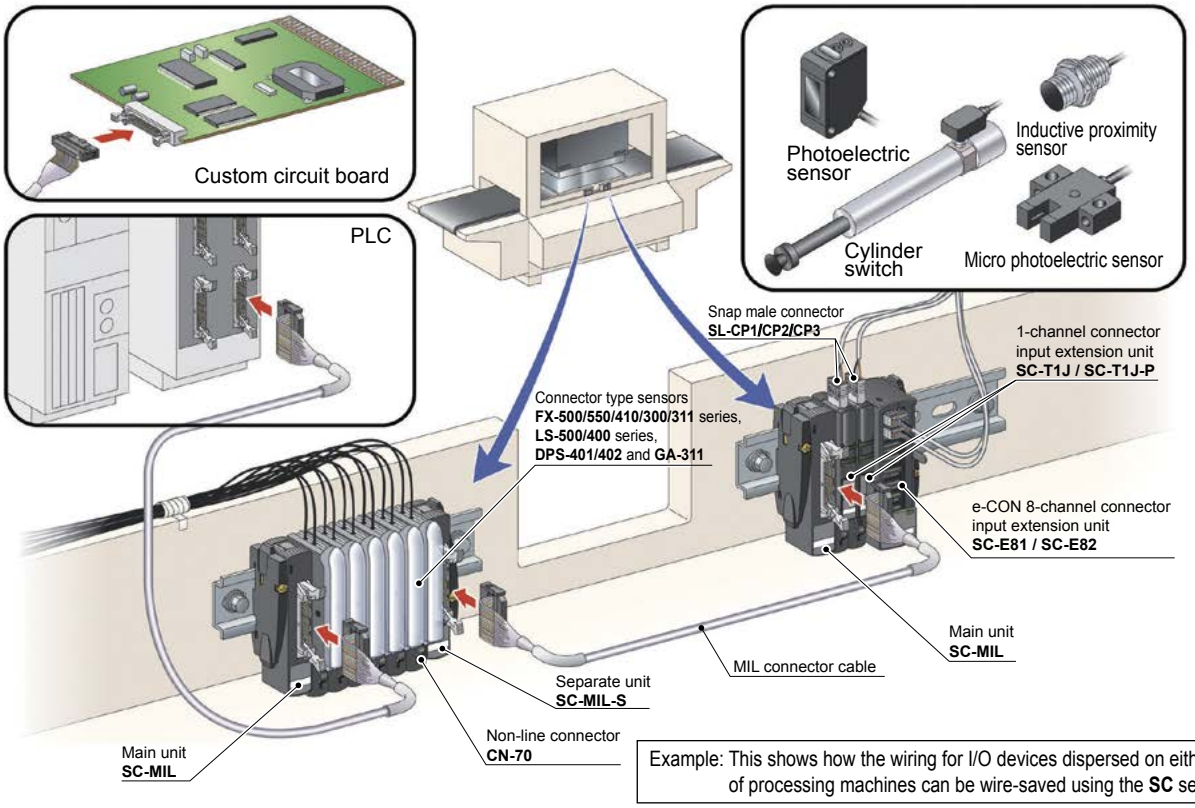
Up to 16 units, such as fiber sensors **FX-500/550/410/300/311** series, digital laser sensors **LS-500/400** series, digital pressure sensors **DPS-401/402** and compact inductive proximity sensors **GA-311**, can be connected side-by-side configuration without tools in a main unit. Also, dispersed mounting is possible using a separate unit. In addition, using the connector input / output extension unit, photoelectric sensors, micro photoelectric sensors, inductive proximity sensors, pressure sensors, or any other type of sensor or switch can be one-touch connected to an output device.



Example: This shows how the wiring for I/O devices dispersed on either side of processing machines can be wire-saved using the **SC** series.

ORDER GUIDE

Designation	Appearance	Model No.	Description	
Main unit (Note 1)		**SC-MIL**	The MIL connector allows up to 16 input / output device connections to a PLC or custom circuit board, in a single step.	
Separate unit (Note 1)		**SC-MIL-S**	Distributed installations are possible through the use of a main unit and MIL connectors.	
1-channel connector input extension unit		**SC-T1J**	For NPN output devices	Allows the connection of input device, such as sensor or switch. Incorporates a power indicator and an input signal indicator (1 ch).
		SC-T1J-P	For PNP output devices	
e-CON 1-channel connector input extension unit		**SC-E1**	This extension unit can be connected to commercially available devices including an NPN output type or DC 2-wire type sensor. Includes power and input signal indicators (for one channel). When using in combination with the **SC-GU3** series, use with the **SC-71**.	
e-CON 8-channel connector input extension unit		**SC-E81**	This extension unit can be connected to eight NPN output type devices. Includes power and input signal indicators (for eight channels).	
e-CON 8-channel connector input extension unit (Without an input signal indicator)		**SC-E82**	This extension unit can be connected to eight commercially available devices and output devices including an NPN/PNP output type sensors, switches or DC 2-wire sensors. Includes a power indicator. Does not include an input signal indicator.	
Non-line connector		**CN-70**	This one-touch connector is used to connect the main unit to the following devices: The **FX-500/550/410/300/311** fiber sensor, the **LS-500/400** laser sensor, digital pressure sensor **DPS-401/402**, the **GA-311** compact inductive proximity sensor, the **FX-CH**(**-P**) bank selection unit and 1-channel connector input extension unit. (Note 2, 3)	
End plates		**MS-DIN-E** 2 pcs. per set	When **SC** series units are connected on a DIN rail, these end plates clamp amplifiers into place on both sides. Make sure to use end plates when cascading multiple amplifiers together.	

Notes: 1) Conditions of connectable DC 2-wire type input device
- Leak current: 1 mA or less (when the power is OFF), Offset voltage: 3 V or less (when the power is ON)
- Product whose load current range includes 5 to 8 mA

2) The non-line connector now can be used with 4-pin types, such as the **FX-305** and **LS-401**, since its production run starting in August 2004.
3) The 2-output type can output the output 1 (OUT 1) only from **SC-MIL**. There is no connection for output 2 (OUT2).

OPTIONS

Designation	Appearance	Model No.	Description	
4-pin type snap male connector (Note)		**SL-CP1** (White) 10 pcs. per set	For 0.08 to 0.2 mm^2 (Conductor cross-section area) Wire diameter: ø0.7 to ø1.2 mm ø0.028 to ø0.047 in	Snap male connectors are utilized to connect input / output devices to the 1-channel connector input extension unit. The 1-channel connector input extension unit includes one **SL-CP1**.
		SL-CP2 (Black) 10 pcs. per set	For 0.3 mm^2 (Conductor cross-section area) Wire diameter: ø1.1 to ø1.6 mm ø0.043 to ø0.063 in	
		SL-CP3 (Greenish blue) 10 pcs. per set	For 0.5 mm^2 (Conductor cross-section area) Wire diameter: ø1.7 to ø2.5 mm ø0.067 to ø0.098 in	
Compatible installation tool for **SC**		**SC-BUX10** 10 pcs. per set	This tool is used to install **SC-MIL-S** into the **SC-GU3** series.	

Note: Exclusive pliers are also available.

SPECIFICATIONS

Sensor units

Item \ Type	Main unit	Separate unit
Model No.	**SC-MIL**	**SC-MIL-S**
CE marking directive compliance	EMC Directive, RoHS Directive	———
Supply voltage	12 to 24 V DC ±10 % (Note 2)	Depends on the supply voltage from **SC-MIL**
Allowable through current (Note 3)	2 A or less (Same as maximum permissible current consumption of all units connected to **SC-MIL**.)	1 A or less (Same as maximum permissible current consumption of all units connected to **SC-MIL-S**.)
Signal channel No.	Connectable up to 16 channels (The signal from up to 16th point (counting from unit adjacent to **SC-MIL**) of all units connected to **SC-MIL** is transferred. However, the signal thereafter is not transferred. Note that **SC-MIL** and **SC-MIL-S** do not occupy any signal point.)	
Max. distance between units	10 m 32.808 ft or less (the distance between **SC-MIL** and PLC and that between **SC-MIL** and **SC-MIL-S** put together)	
Ambient temperature	–10 to +45 °C +14 to +113 °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	
Material	Enclosure: Heat-resistant ABS	
Net weight	25 g approx.	20 g approx.
Accessory	Connector protection seal: 1 pc.	

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.
2) The plug-in sensor main unit **SC-MIL** incorporates a cable lead-out connector in addition to the MIL connector, which allows to receive the supply voltage from the separate power supply.
3) When either the permissible current amount of power supply unit or the permissible current amount of cable to be connected is less than allowable through current value, adjust the current to the smallest value.

e-CON connector input extension unit

Item \ Designation	e-CON 1-channel connector input extension unit
Model No.	**SC-E1**
Supply voltage	12 to 24 V DC ±10 %
Current consumption	20 mA or less (with all indicators on) (Note 1)
Number of signals	1 input
Input	Connectable devices: NPN open-collector transistor output type (Input 1) and DC 2-wire output type (Input 2) sensors (Note 2), switches, and other devices Current supply for input device: 100 mA or less Input impedance: Approx. 17 kΩ (Input 1) or approx. 3.2 kΩ (Input 2)
Output	NPN open-collector transistor • Maximum sink current: 50 mA • Applied voltage: 30 V DC or less (between output and 0 V) • Residual voltage: 1.5 V or less (with sink current of 50 mA)
Power indicator	Green LED (lights up when the power is ON)
Input indicator	Green LED (lights up when input is being received by unit)
Ambient temperature	–10 to +55 °C +14 to +131 °F (No dew condensation or icing allowed), (If 4 to 7 units are connected in cascade: –10 to +50 °C +14 to +122 °F, if 8 to 16 units are connected in cascade: –10 to +45 °C +14 to +113 °F) Storage: –20 to +70 °C –4 to +158 °F
Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH
Material	Enclosure: Flame-resistant PBT, Connector: Polyester
Weight	Net weight: 15 g approx., Gross weight: 40 g approx.
Accessory	Connector (e-CON): 1

Notes: 1) Does not include current consumption or input current for connected input devices.
2) Conditions of connectable DC 2-wire type input device
• Leak current: 1 mA or less (when the power is OFF), Offset voltage: 3 V or less (when the power is ON)
• Product whose load current range includes 5 to 8 mA

Connector input extension units

Item \ Type	Connector input extension units	
	For NPN output devices	For PNP output devices
	1 channel	1 channel
Model No.	**SC-T1J**	**SC-T1J-P**
CE marking directive compliance	EMC Directive, RoHS Directive	
Supply voltage	12 to 24 V DC ±10 %	
Current consumption (Note 2)	20 mA or less (when all indicators light up)	
Signal channel No.	1 input	
Connectable device	NPN open-collector, or DC 2-wire output type sensor, or switch etc.	PNP open-collector, or DC 2-wire output type sensor, or switch etc.
Supply current for units (Note 3)	100 mA or less	
Power indicator	Green LED (Lights up when the power is ON)	
Input indicator	Green LED (Lights up when each channel input is ON)	
Ambient temperature	–10 to +45 °C +14 to +113 °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	
Material	Enclosure: Heat-resistant ABS	
Net weight	10 g approx.	
Accessory	**SL-CP1** (Snap male connector): 1 pc.	

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.
2) The current consumption and input current of the input unit connected are not included.
3) Set the maximum current passing through input / output line to 50 mA or less.

SPECIFICATIONS

e-CON connector input extension unit

Item \ Designation / Model No.	e-CON 8-channel connector input extension unit
	SC-E81
Supply voltage	12 to 24 V DC ±10 %
Current consumption	60 mA or less (with all indicators on) (Note 1)
Number of signals	8 inputs (Note 2)
Input	Connectable devices: NPN open-collector transistor output type sensors, switches, and other devices Current supply for input devices: 800 mA or less (total for 8 inputs) Input impedance: 17 kΩ approx.
Output	NPN open-collector transistor • Maximum sink current: 50 mA • Applied voltage: 30 V DC or less (between output and 0 V) • Residual voltage: 1.5 V or less (with sink current of 50 mA)
Power indicator	Green LED (lights up when the power is ON)
Input indicator	8 green LEDs (light up when input is received from the corresponding channel)
Ambient temperature	–10 to +55 °C +14 to +131 °F (No dew condensation or icing allowed), (If 4 to 7 units are connected in cascade: –10 to +50 °C +14 to +122 °F, if 8 to 9 units are connected in cascade: –10 to +45 °C +14 to +113 °F) Storage: –20 to +70 °C –4 to +158 °F
Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH
Material	Enclosure: Polycarbonate, Connector: Polyester
Weight	Net weight: 40 g approx., Gross weight: 85 g approx.

Notes: 1) Does not include current consumption or input current for connected input devices.
2) Uses eight channels of signaling, regardless of the number of connected input devices.

Non-line connector

Item \ Designation / Model No.	Non-line connector
	CN-70
Applicable unit	Refer to the list of "**Applicable unit of non-line connector**"
Supply voltage	Depends on the supply voltage from **SC-MIL**
Supply current for units	100 mA or less
Signal channel No.	1 channel
Ambient temperature	–10 to +45 °C +14 to +113 °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
Material	Enclosure: ABS
Weight	Net weight: 4 g approx.

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.
2) The non-line connector now can be used with 4-pin types, such as the **FX-305** and **LS-401**, since its production run starting in August 2004.

Item \ Designation / Model No.	e-CON 8-channel connector input extension unit (without an input signal indicator)
	SC-E82
Supply voltage	5 to 24 V DC ±10 %
Current consumption	7 mA or less
Number of signals	8 inputs (Note 1)
Input	Connectable devices: NPN/PNP open-collector transistor output type sensors, switches, etc. and commercially available devices and output devices including a DC 2-wire type sensor (Note 2) Current supply for input devices: 800 mA or less (total for 8 inputs)
Power indicator	Green LED (Lights up when the power is ON)
Ambient temperature	–10 to +55 °C +14 to +131 °F (No dew condensation or icing allowed), (If 4 to 7 units are connected in cascade: –10 to +50 °C +14 to +122 °F, if 8 to 9 units are connected in cascade: –10 to +45 °C +14 to +113 °F) Storage: –20 to +70 °C –4 to +158 °F
Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH
Material	Enclosure: Polycarbonate, Connector: Polyester
Weight	Net weight: 40 g approx., Gross weight: 85 g approx.

Notes: 1) Uses eight channels of signaling, regardless of the number of connected input devices.
2) When using in combination with the **SC-GU3** series, it cannot use as a commercially available device including a DC 2-wire type sensor or output.

Applicable unit of non-line connector

Designation	Model No.	Description
1-channel input extension units	**SC-T1J**	For NPN output devices
	SC-T1J-P	For PNP output devices
Digital fiber sensors (Note)	**FX-501/502**	For NPN output devices
	FX-501P/502P	For PNP output devices
	FX-551	For NPN output devices
	FX-551P	For PNP output devices
	FX-301(B/G/H) **FX-301-HS**	For NPN output devices
	FX-301(B/G/H)P **FX-301P-HS**	For PNP output devices
	FX-305	For NPN output devices
	FX-305P	For PNP output devices
	FX-411(B/G) **FX-412(B/G)**	For NPN output devices
	FX-411(B/G)P	For PNP output devices
Manually set fiber sensors	**FX-311(B/G)**	For NPN output devices
	FX-311(B/G)P	For PNP output devices
Digital fiber sensors for leak detection fiber / liquid detection fiber	**FX-301-F**	For NPN output devices
	FX-301P-F	For PNP output devices
Digital laser sensors (Note)	**LS-501**	For NPN output devices
	LS-501P	For PNP output devices
	LS-401/403	For NPN output devices
	LS-401P	For PNP output devices
Digital pressure sensor	**DPS-401/402**	For NPN output devices
Compact inductive proximity sensor	**GA-311**	For NPN output devices
Bank selection unit	**FX-CH**	For NPN input devices
	FX-CH-P	For PNP input devices

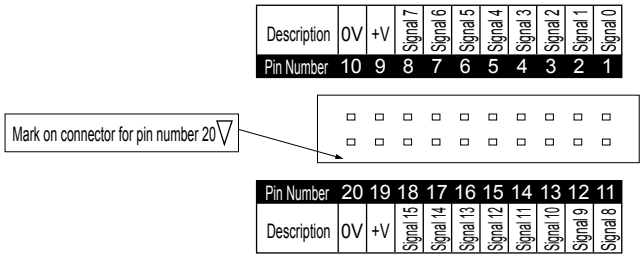
Note: The 2-output type can output the output 1 (OUT 1) only from **SC-MIL**. There is no connection for output 2 (OUT2).

I/O CIRCUIT AND WIRING DIAGRAMS

SC-MIL SC-MIL-S

Main unit
Separate unit

Pin layout diagram for MIL connector pins



* The MIL connector pin layout is compatible with **SL-BMW** sensor block, which is utilized to simplify wiring and save space.

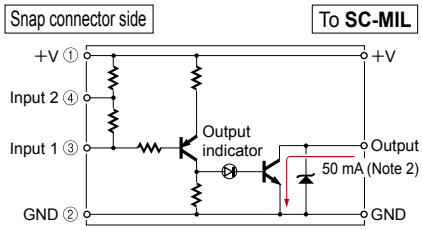
* +V (pin No.10 and 20) and 0 V (pin No. 9 and 19) are connected inside the block.

SC-T1J

Connector input extension unit
For NPN output devices

Snap male connector pin position

Pin No.	SC-T1J
1	+V
2	GND
3	Input 1
4	Input 2 (Note 1)



Notes: 1) For DC 2-wire type input device
Conditions
- Leak current : 1 mA or less (when the power is OFF)
- Offset voltage : 3 V or less (when the power is ON)
- The product of which the load current range contains 5 to 8 mA.

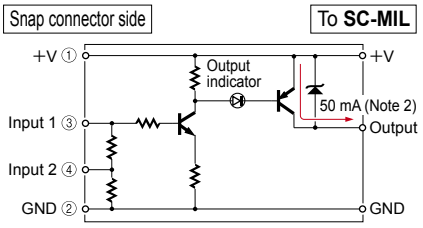
2) Residual voltage: 1 V or less (at 50 mA sink current)

SC-T1J-P

Connector input extension unit
For PNP output devices

Snap male connector pin position

Pin No.	SC-T1J-P
1	+V
2	GND
3	Input 1
4	Input 2 (Note 1)

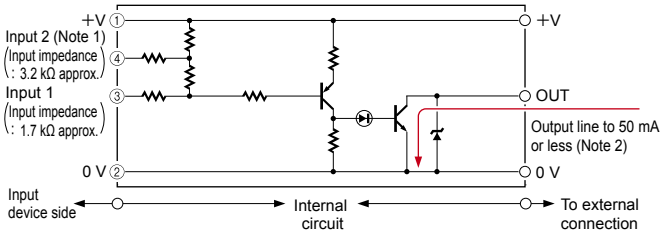


Notes: 1) For DC 2-wire type input device
Conditions
- Leak current: 1 mA or less (when the power is OFF)
- Offset voltage: 3 V or less (when the power is ON)
- The product of which the load current range contains 5 to 8 mA.

2) Residual voltage: 1 V or less (at 50 mA source current)

SC-E1 SC-E81

e-CON 1-channel connector input extension unit
e-CON 8-channel connector input extension unit

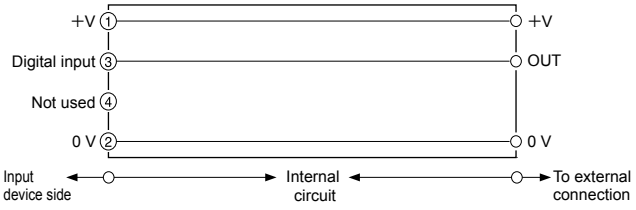


Notes: 1) Only **SC-E1** can be used.
For DC 2-wire type input device (24 V DC only)
- Leak current: 1 mA or less (when the power is OFF)
- Offset voltage: 3 V or less (when the power is ON)
- The product of which the load current range contains 5 to 8 mA.

2) Residual voltage: 1 V or less (at 50 mA sink current)

SC-E82

e-CON 8-channel connector input extension unit
(Without an input signal indicator)



Notes: 1) It depends on the power supply from **SC-MIL** or **SC-GU3-0**□.
2) When using a DC 2-wire input device, connect a device recommended load to the outside.

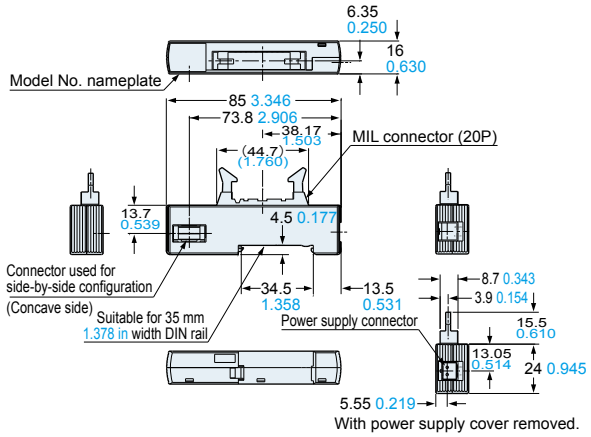
PRECAUTIONS FOR PROPER USE

- Never use this product in a 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.

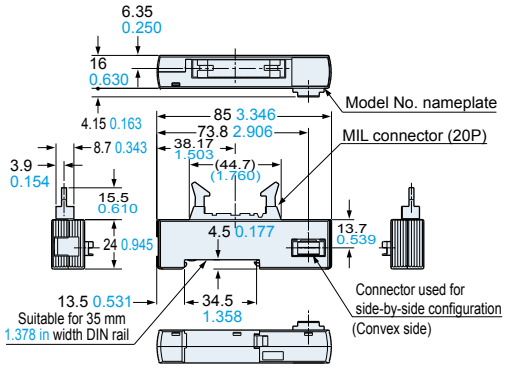
DIMENSIONS (Unit : mm in)

The CAD data can be downloaded from our website.

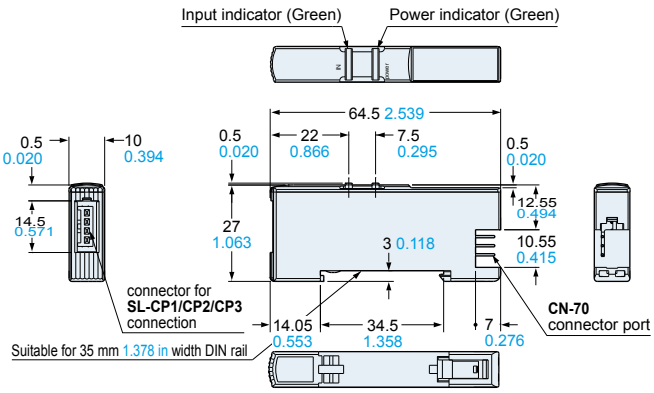
SC-MIL — Main unit



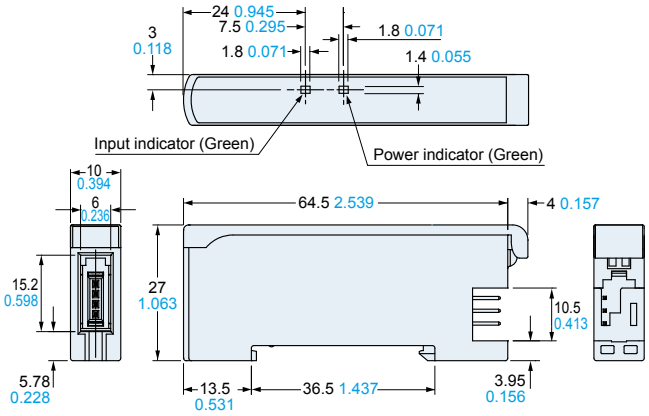
SC-MIL-S — Separate unit



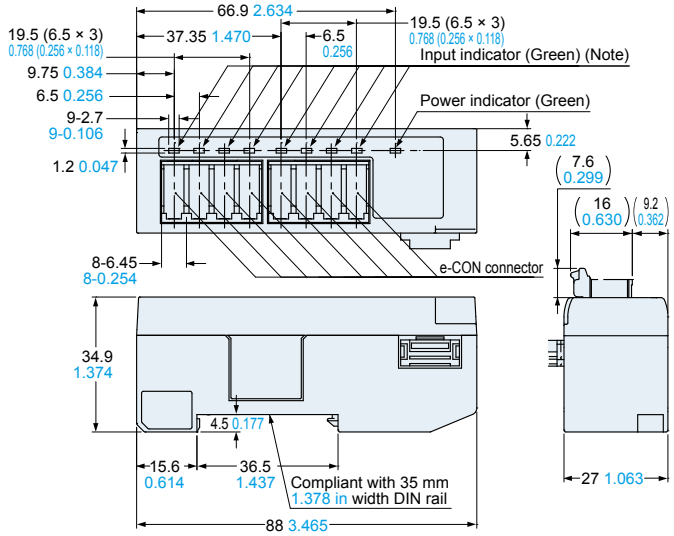
SC-T1J SC-T1J-P — Connector input extension unit



SC-E1 — e-CON 1ch connector input extension unit

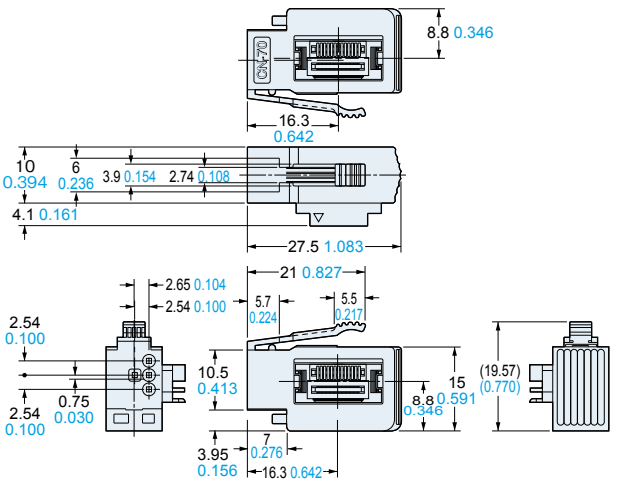


SC-E81 SC-E82 — e-CON 8ch connector input extension unit

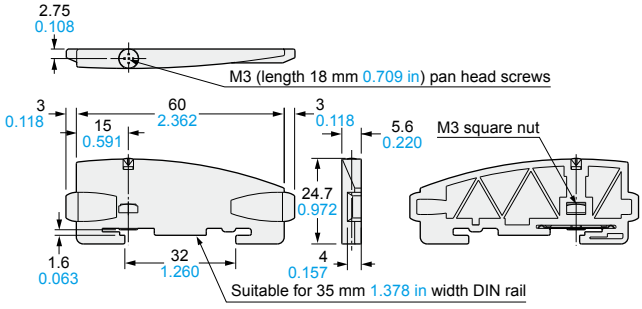


Note: **SC-E82** is not equipped with an input indicator.

CN-70 — Non-line connector



MS-DIN-E — End plate



Material: Polycarbonate

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