Fieldbus System

(For Input/Output)

IP67

Supports digital inputs/outputs, analog inputs/outputs, and IO-Link units

New **IO-Link** An IO-Link unit compatible terminal unit (IO-Link device) has been added.

M8 connector (Number of inputs: 16 inputs)

M12 connector (Number of inputs: 32 inputs)

<Compatible Protocols>

PROFIBUS DP, DeviceNet, CC-Link, IO-Link, PROFINET, EtherNet/IP, EtherCAT, New OPC UA *1 (*1 PROFINET only), Made to order: Modbus, ETHERNET POWERLINK, CC-Link IE Field

IO-Link unit compatible SI unit

EtherNet/IP, EtherCAT, PROFINET

IO-Link unit

- 2 models (port class A and port class B)
- Diagnostic is possible from the upper level communication.
- The data can be accessed from via PC (setting tool).
- Device parameter setting function, Automatic saving/writing

Self-diagnostic function

Equipped with an input/output open/short-circuit detection function and an input/output signal ON/OFF counter function

Web server function*1

Status checks and forced output are possible via web browser.

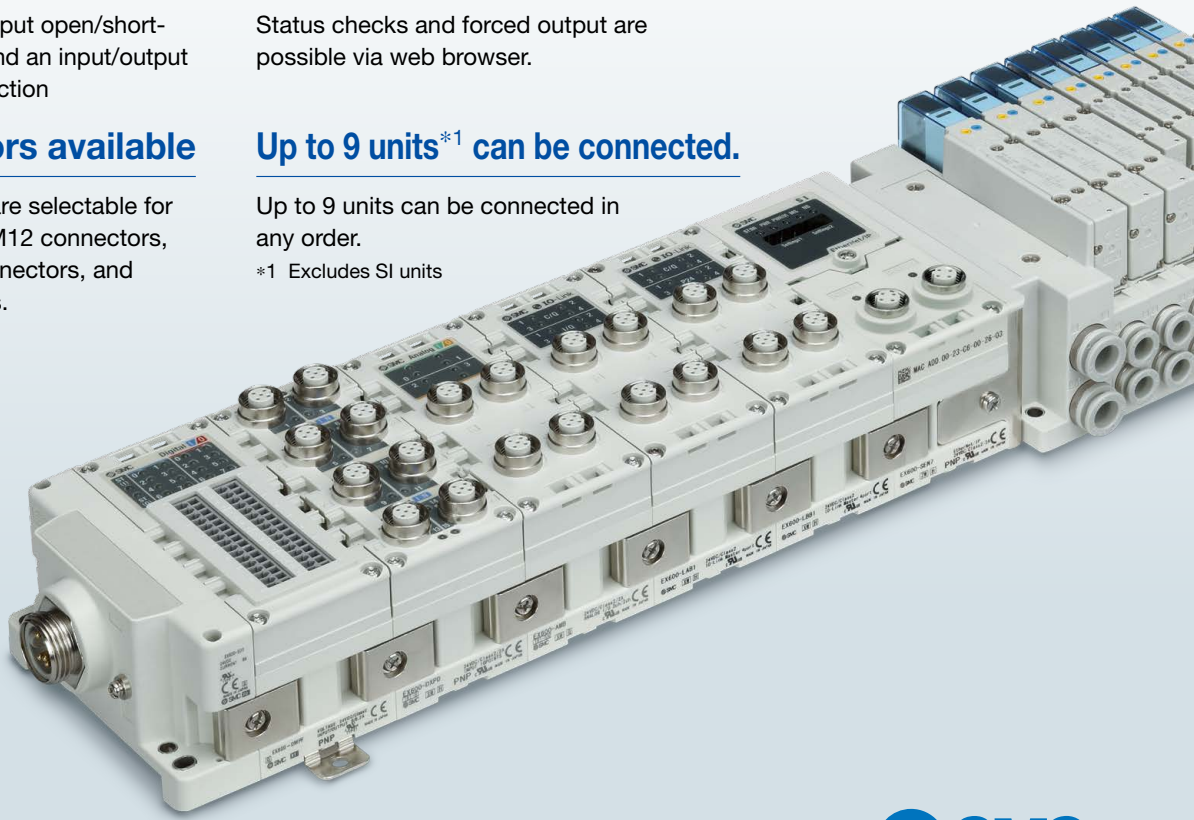
Various connectors available

The following connectors are selectable for the input/output devices: M12 connectors, M8 connectors, D-sub connectors, and spring type terminal blocks.

Up to 9 units*1 can be connected.

Up to 9 units can be connected in any order.

*1 Excludes SI units

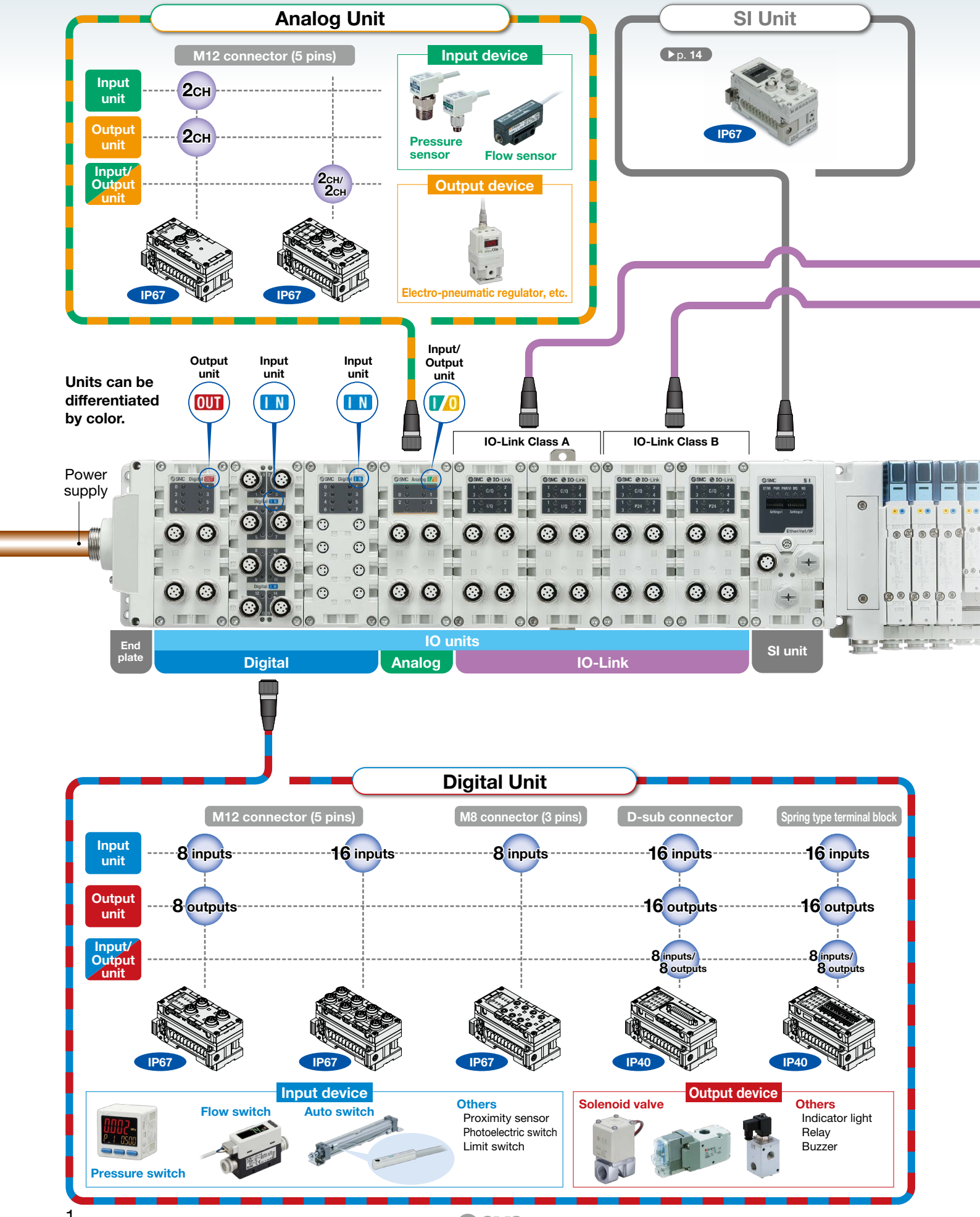


EX600 Series

SMC

CAT.E02-24H

Can be connected with digital, analog, and IO-Link units



SMC

IO-Link Unit / Port Class A Devices

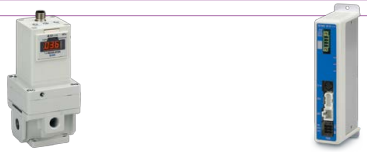
M12 connector (5 pins)

IO-Link unit Port class A — 4 ports

Input devices

Pressure sensor | For air | For general fluids | Digital sensor monitor | Flow sensor | Position sensor

Input/Output devices



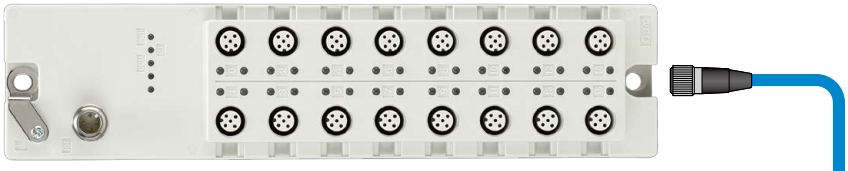
Electro-pneumatic regulator | Step motor controller

Output device

For Y branch connector

Y branch connector | Port class B SI unit

New IO-Link Terminal Unit (IO-Link Device)



Number of inputs: 32 inputs | M12 connector (4 pins)

Number of inputs: 16 inputs | M8 connector (3 pins)

Input device (Non-IO-Link device)

Pressure switch | Flow switch | Auto switch

Others
- Proximity sensor
- Photoelectric switch
- Limit switch

IO-Link Unit / Port Class B Device

M12 connector (5 pins)

IO-Link unit Port class B — 4 ports

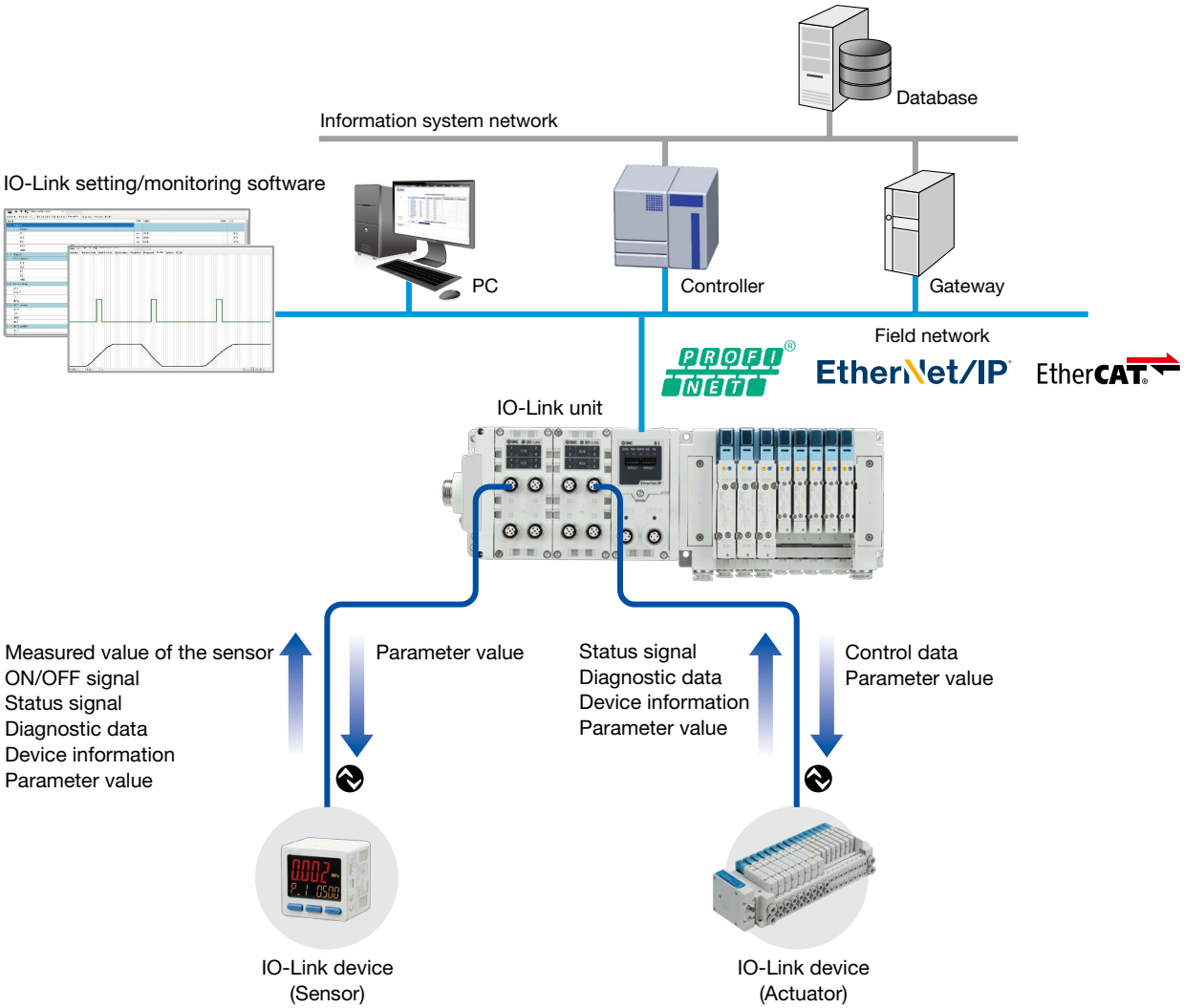
Output device

Port class B SI unit

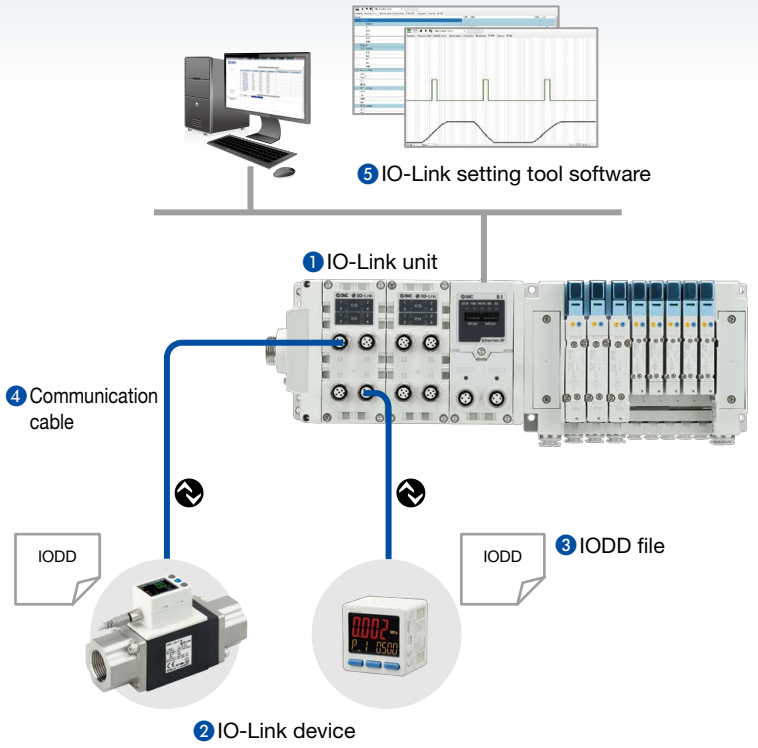
IO-Link

IO-Link is a communication technology for sensors and actuators that is an international standard, IEC 61131-9.
This technology is used to send/receive device information such as manufacturer, product part number, parameters, and diagnostic data, as well as the control data including ON/OFF signals and measured values of the sensor, by connecting the IO-Link master and device in a 1:1 configuration.
IO-Link enables condition monitoring and error detection of the sensor and equipment, and it can contribute to the reduction of startup labor and recovery time and the realization of preventive and predictive maintenance.

Reduced design and startup labor	• Batch setting of device parameters from the upper level • Remote check of device information • Detection and remote unified check of device misconnection/non-connection
Minimum recovery time due to error detection	• Early detection of location where problem is occurring via communication • Early obtaining of information on problem phenomenon via communication • Early recovery during product replacement (automatic setting of device parameters)
Preventive and predictive maintenance through condition monitoring	• Monitors changes in measured values of a sensor during signal ON/OFF • Monitors the number of device operations and automatically notifies when the set number of operations has been exceeded • Remote monitoring of device and equipment conditions via communication



IO-Link System Configuration



1 IO-Link unit
- Acts as a gateway between the IO-Link communication and the upper level communication

2 IO-Link device
- A sensor/actuator connecting to each port of the IO-Link unit in a 1:1 configuration

3 IODD file
- A file in which device properties and parameters are described
- Registered to the setting tool
- Provided by the device manufacturer

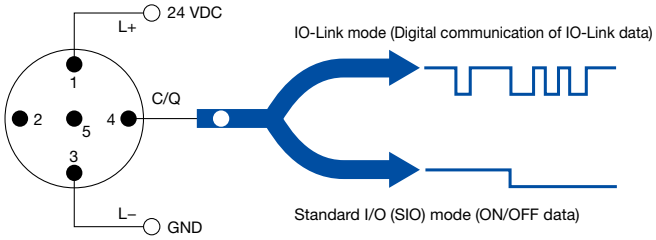
4 Communication cable
- A 4-wire or 5-wire general-purpose cable that is the same as the existing sensor cable (Unshielded cable)
- Max. cable length: 20 m

5 IO-Link setting tool (IO-Link Device Tool)
- Software for the setting and monitoring of an IO-Link unit/device

*1 A setting tool compatible with the IO-Link units of every manufacturer is used for the SMC EX600 series IO-Link unit. (IO-Link Device Tool V5-PE (V5 or later only) manufactured by TMG Technologie und Engineering GmbH (hereinafter referred to as TMG))

IO-Link Interface

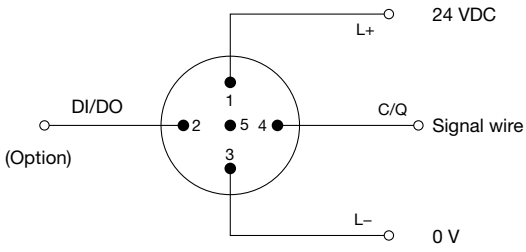
The connecting part between the IO-Link unit and the device is called a “port.” Each port can be switched between “IO-Link mode” for digital communication and “standard I/O mode” for conventional contact input/output.



Reference: IO-Link Consortium

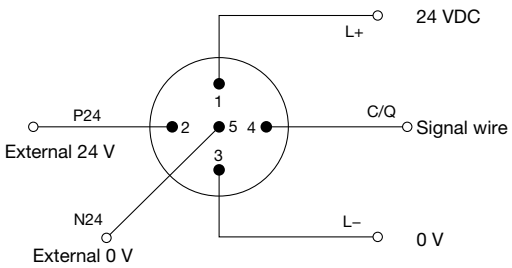
2 types of interfaces

There are two methods for power supply: one is for sensors, and the other is for actuators.



Port class A

The control power supply wire and signal wire can be connected with one cable. (Mainly for sensors)



Port class B

The control power supply wire, external power supply wire, and signal wire can be connected with one cable. (Mainly for actuators)

IO-Link Unit

Can be connected with digital, analog, and IO-Link unit units

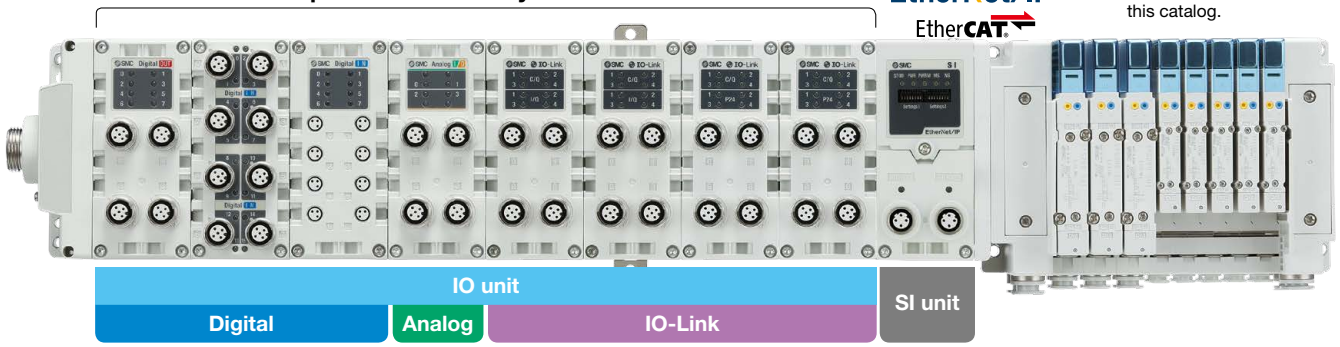
Up to **9** IO-Link units can be connected. (36 IO-Link devices can be connected.)
Digital units, analog units, and IO-Link units can be mixed, and up to 9 units can be connected in any order.

4 IO-Link devices can be connected.

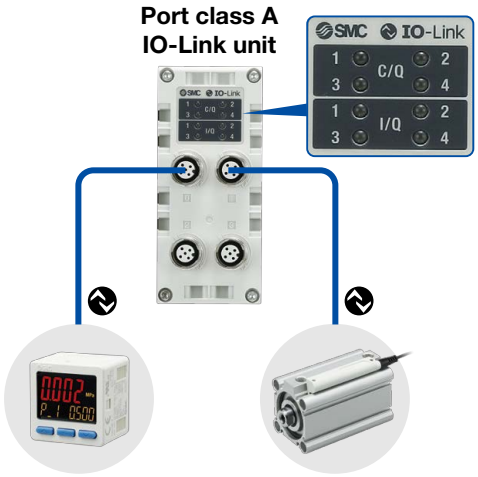
[Connectable SI unit]

PROFINET
EtherNet/IP
EtherCAT

* For connectable SI units, refer to pages 14, 18, and 19 of this catalog.

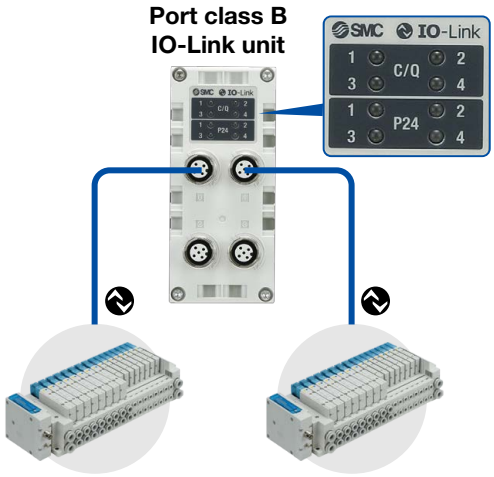


Supports both port class A and port class B



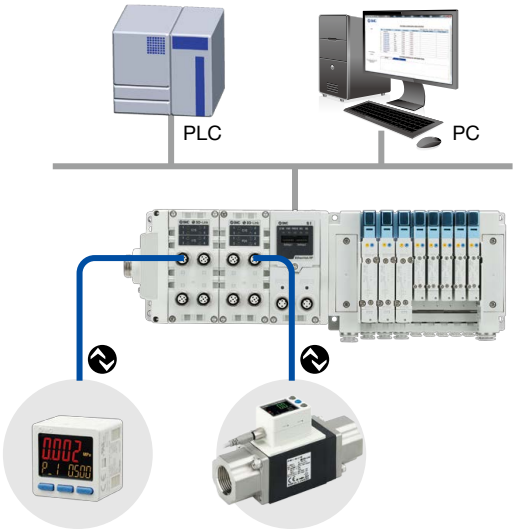
For connecting IO-Link sensors

Pressure sensors, flow sensors, actuator position sensors, electro-pneumatic regulators, etc.

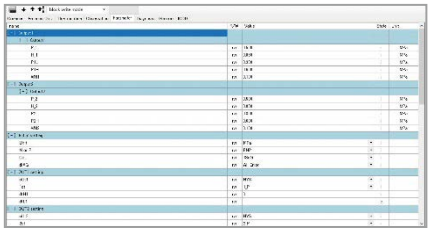


For connecting IO-Link compatible SI units (for valve driving)

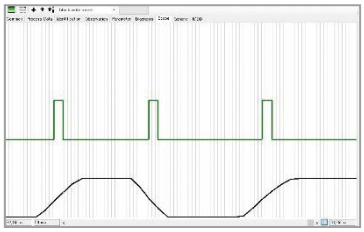
The data can be accessed from via PC (IO-Link setting tool).



Setting screen



Monitoring screen



IO-Link units and IO-Link devices can be set and monitored from a PC without going through a PLC.

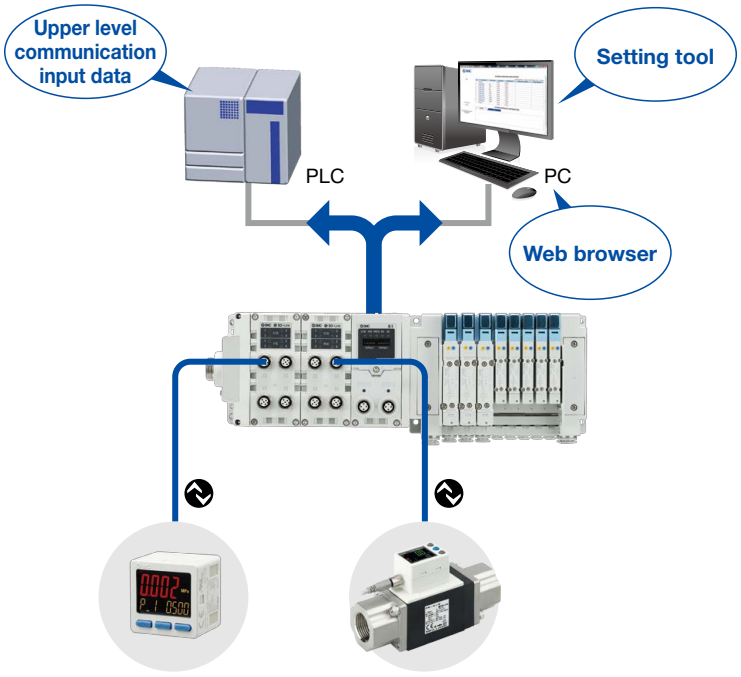
- Process data
- Unit parameters, Device parameters
- Unit information, Device information
- Port diagnostic, Device diagnostic

* The IO-Link setting tool is TMG's IO-Link Device Tool.
It can be downloaded for free from TMG's website. However, to use it for more than 30 days, a license key for the IO-Link Device Tool is required. (Refer to page 50 for details.)

Diagnostic function

Diagnostic is possible from the upper level communication.

IO-Link unit (port) diagnostic information can be obtained via PLC program or PC (web browser).
Device diagnostic information can be obtained via PC (setting tool).



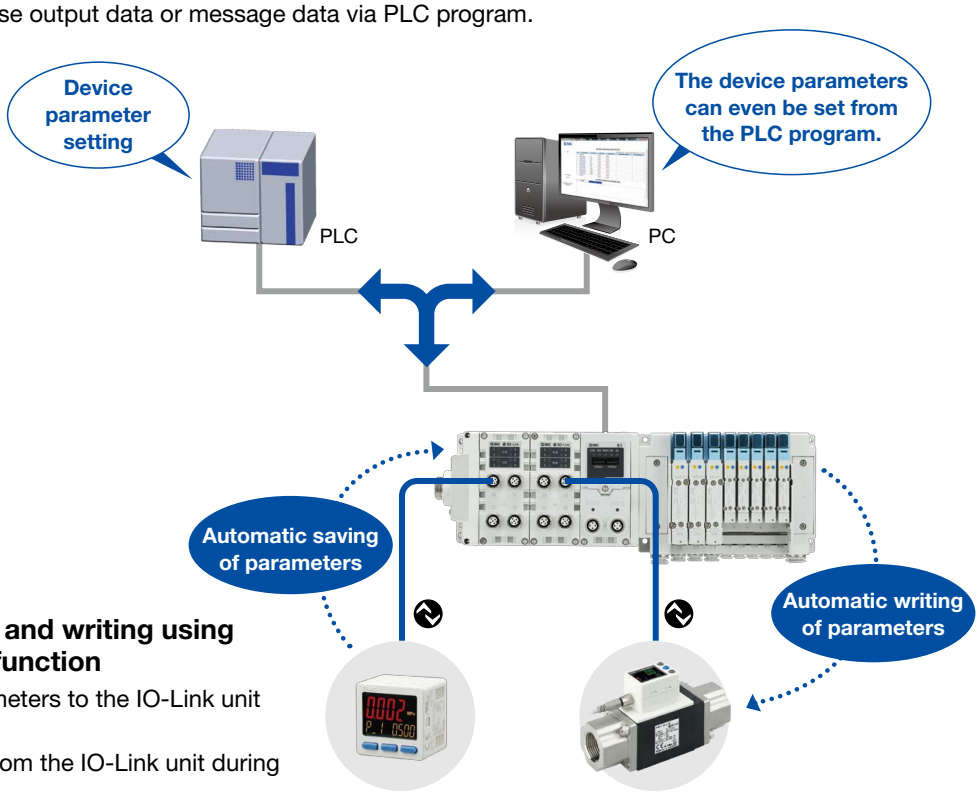
Items of IO-Link unit (port) diagnostic
Detection of port short-circuit
Detection of non-connected device
Detection of misconnected device (check error)
Notification of port misconfiguration (excessively large input/output data)
Conditions of diagnostic event (port, device)

Items of device diagnostic
Diagnostic results (problem phenomenon) received from devices are shown in event codes.

Device parameter setting function, Automatic saving/writing

The parameter setting of devices is possible from the upper level communication.

Parameter setting is possible via PC (setting tool).
It is also possible to use output data or message data via PLC program.

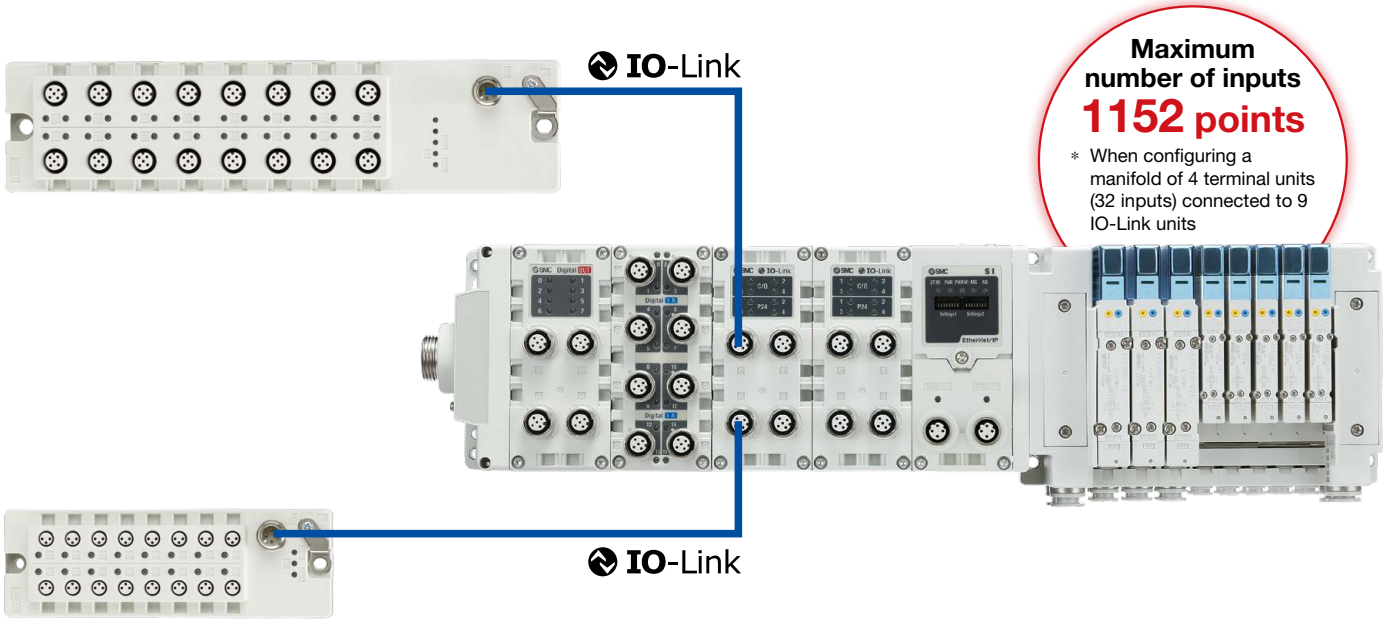


Automatic saving and writing using the data storage function

- Saves device parameters to the IO-Link unit automatically
- Automatic writing from the IO-Link unit during device replacement

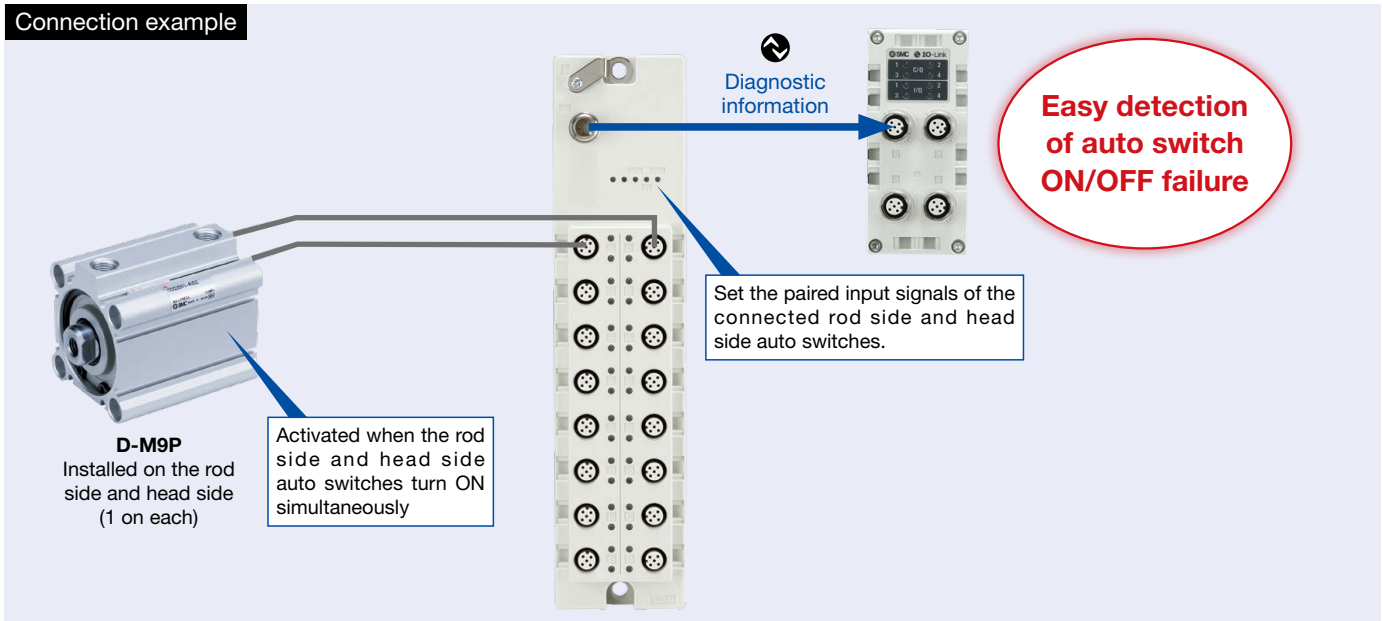
New Separate installation possible via a terminal unit

By using a terminal unit, it is possible to install input devices such as auto switches separately from the valve manifold.



Auto switch failure diagnostic function

By setting the paired input signals of the auto switches mounted on the cylinder to the terminal unit, auto switch failure diagnostics (notification when both auto switches turn ON or OFF simultaneously) is possible. Refer to the connection examples in the "Accessories" section on page 48.



* The auto switch failure diagnostic function is a function built into the terminal unit. It can also be used with IO-Link masters manufactured by other companies.

D-sub connector

IP40

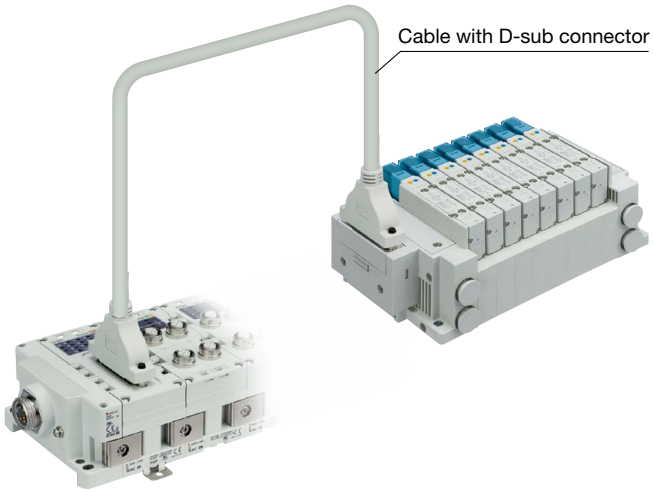
These units are capable of connection using a D-sub connector. There are three types of units: for digital input, output, and input/output. The digital output unit can be connected with an SMC manifold solenoid valve F kit (D-sub connector).

Manifold solenoid valves/Vacuum unit can be connected using a cable with a D-sub connector.

- SY series
- S0700 series
- SJ series
- SQ series
- SV series
- VQC series
- VQ series
- JSY series
- ZK2□A series

* Please limit the number of valve connections to 16 stations for single and 8 stations for double. Refer to the catalog of each product for pin assignment details.

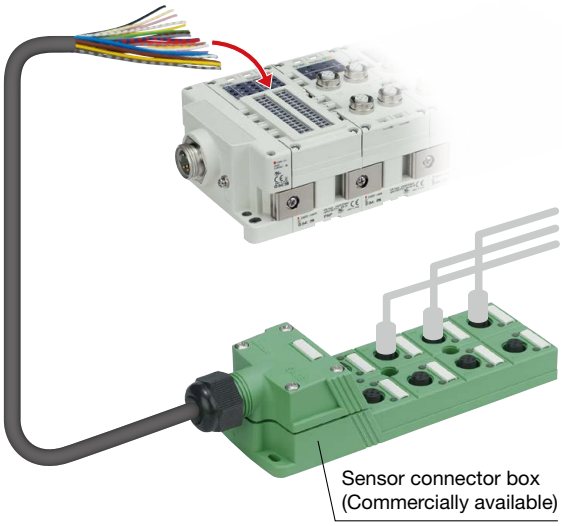
VVZS3000-21A-□-X192 (Non-waterproof cable example)



Spring type terminal block

IP40

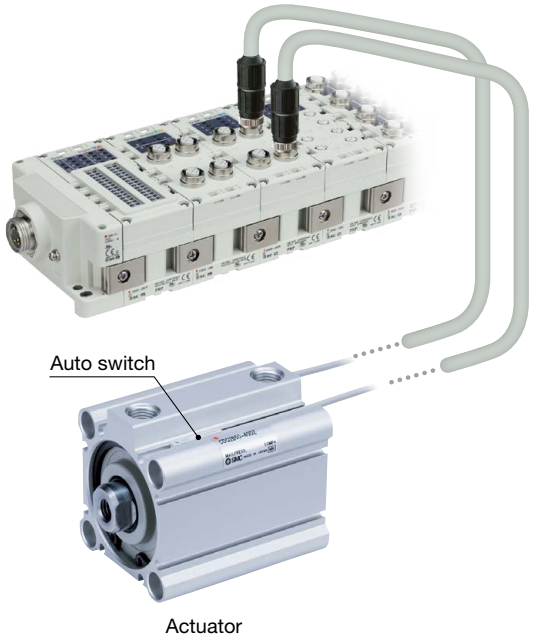
These terminal block units are compatible with individual wiring configurations. There are three types of units: for digital input, output, and input/output. Wiring connection to a sensor connector box, etc., can be carried out easily using only a flat head screwdriver.



Digital input unit

IP67

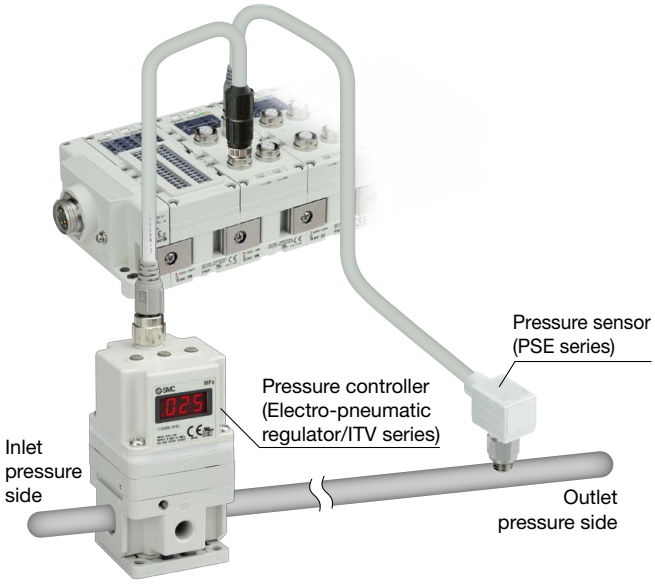
This unit is for inputting a digital signal (ON/OFF signal). The signal of a 2-wire/3-wire auto switch attached to the actuator can be acquired to feedback a signal to the PLC. The control signal of an entire system can be managed by a Fieldbus system.



Analog input/output unit

IP67

These units are for inputting or outputting an analog signal (voltage/current). A single unit performs both input and output, allowing feedback control where analog signals are received from a pressure sensor and sent to a pressure controller. Installation space is minimized as well.



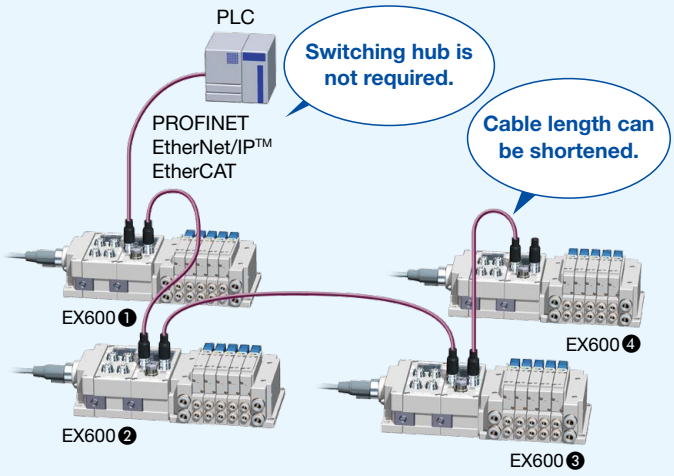
EtherNet Fieldbus Functions

PROFINET (EX600-SPN3/4/31), EtherNet/IP™ (EX600-SEN7/8), and EtherCAT (EX600-SEC3/4) support the following functions.

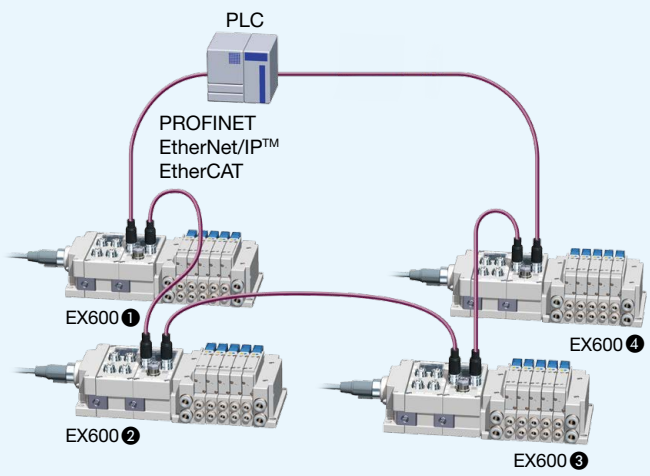
Compatible topologies (Connection configuration)

The **EX600-SEN7/8**, **EX600-SPN3/4/31**, and **EX600-SEC3/4** support **star, linear, and ring** network topologies.

Linear type



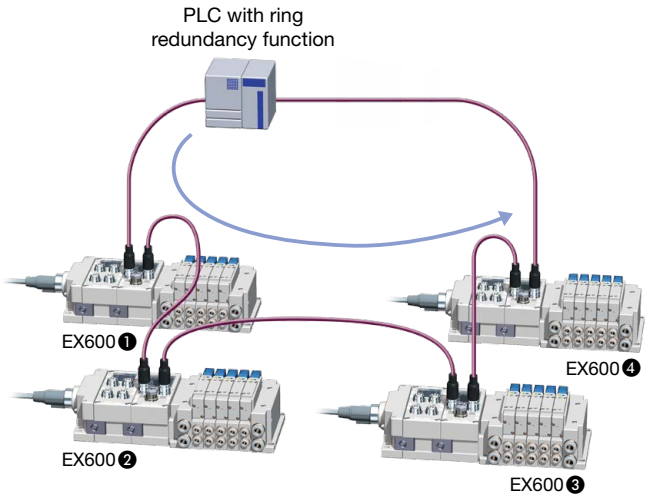
Ring type



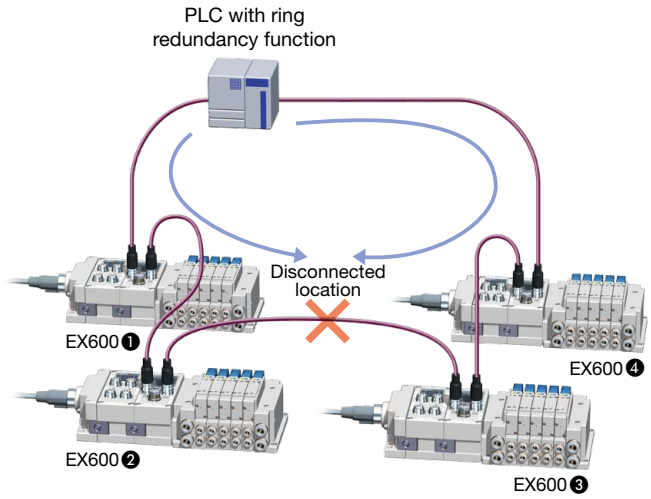
For ring networks, communication can be continued even if one of the communication cables in the network is disconnected or damaged. As the EX600-SEN7/8 supports Device Level Ring (DLR), and the EX600-SPN3/4/31 supports Media Redundancy Protocol (MRP), the disconnected point can be identified.

* In order to use DLR or MRP, the PLC must be able to support it.

Normal flow of data



Data flow when the communication cable is disconnected



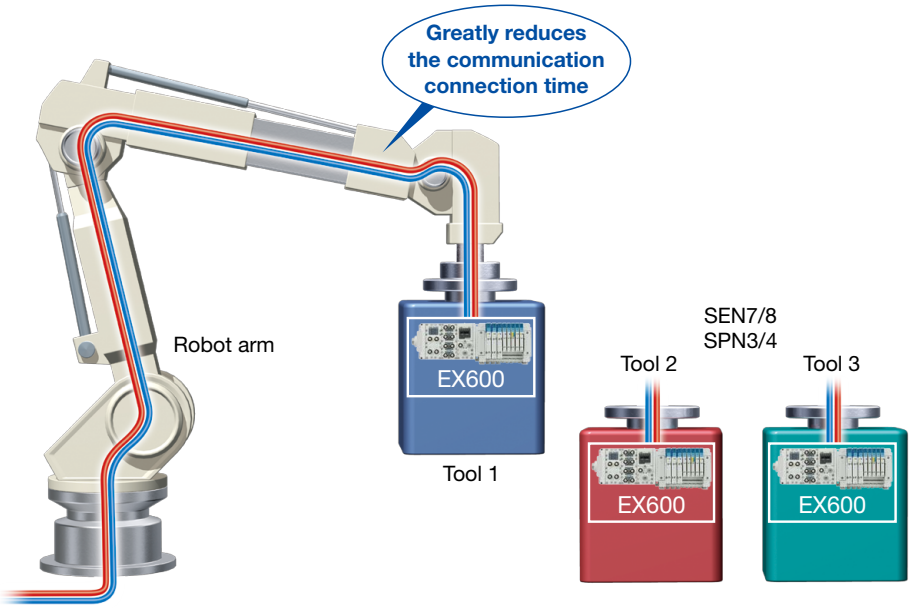
Supports the QuickConnect™ function and the Fast Start Up function

Time from power ON to communication connection

10 s → **Approx. 0.5 s**

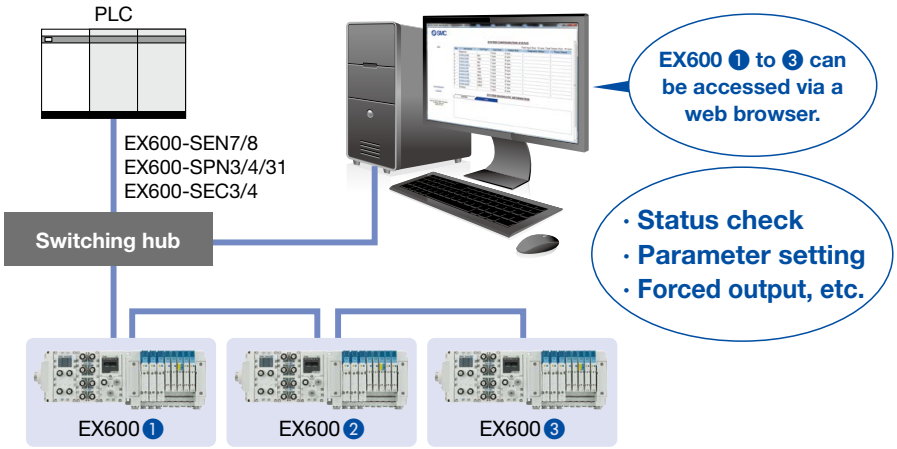
In the case of a tool changer, it takes about 10 seconds for communication to be connected in some products after the power to the device installed on the tool is turned ON.
The EX600-SEN7/8 supports the QuickConnect™ function, and the EX600-SPN3/4 supports the Fast Start Up function, which enables communication connection in only approx. 0.5 s.

* In order to use the QuickConnect™ function or the Fast Start Up function, the PLC must be able to support it.



Built-in web server function

The EX600-SEN7/8, EX600-SPN3/4/31, and EX600-SEC3/4 have a built-in web server function, which enables status checks, parameter settings (EX600-SEN7/8 and EX600-SEC3/4), and forced output of the EX600 using general-purpose web browsers, such as Google Chrome.
Start-up of the system and maintenance can be performed efficiently.



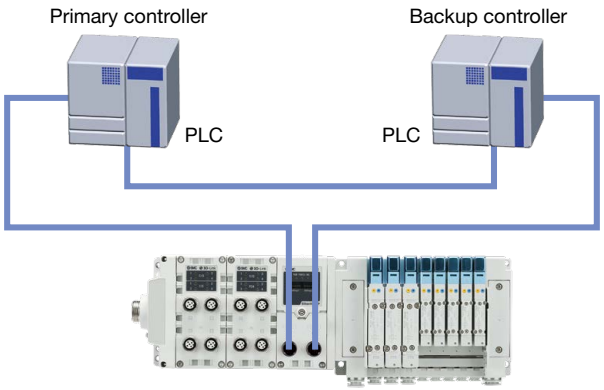
Connection example

PROFINET Technology

System Redundancy S2

As the EX600-SPN3/4/31 supports System Redundancy S2, it can continue communication using the backup controller when the primary controller malfunctions. This allows for the prevention of problems caused by unexpected communication interruption.

* In order to use System Redundancy S2, the PLC must be able to support this function.



OPC UA server function

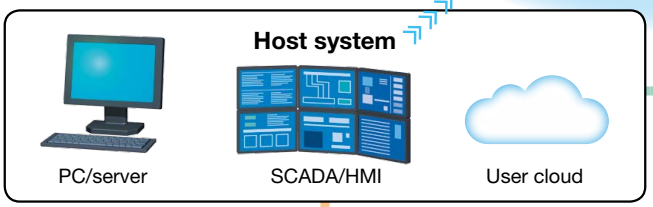
As the data communication protocol OPC UA is platform independent, it can be used to improve efficiency and visualization onsite by transmitting operating status, diagnostic information, etc.
It can also communicate with devices using other Fieldbus protocols.

Various production equipment status visualization methods

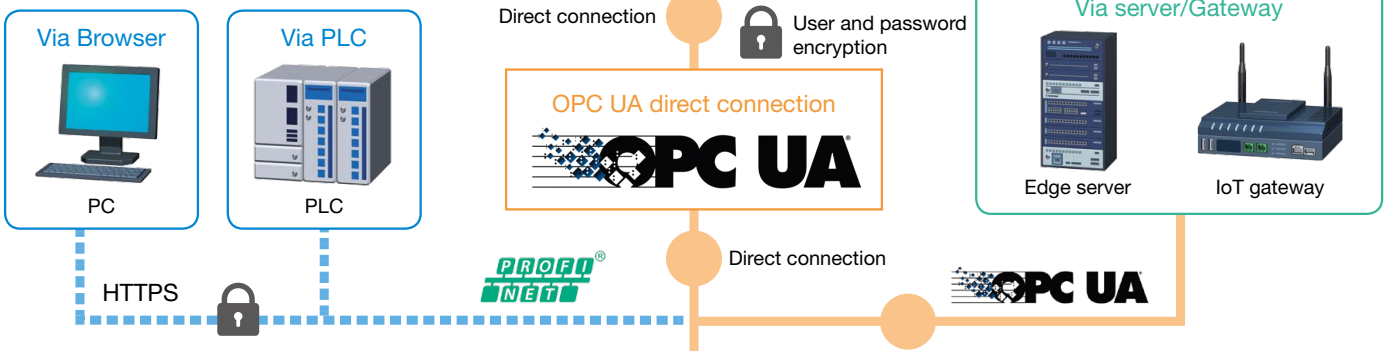
Flow, pressure, temperature, and other sensor information can be communicated to the host system via Industrial Ethernet or the OPC UA data communication protocol.



Equipment status can be monitored from another location or from outside the office.

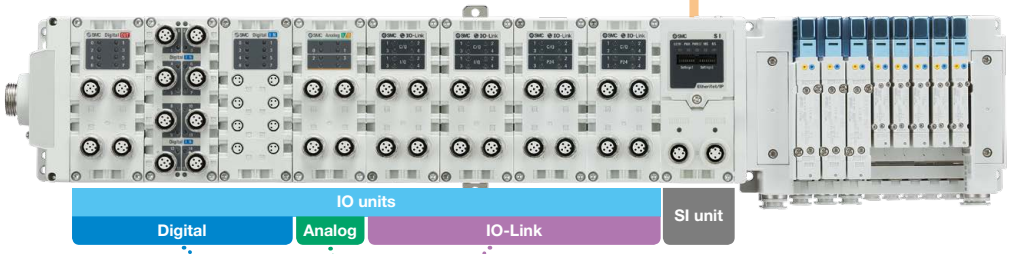


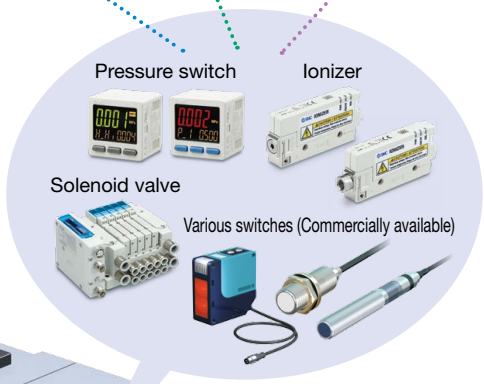
Web server function
The operating status can be confirmed via a standard web browser, eliminating the need for PLC-dependent software.



Supports secure communication

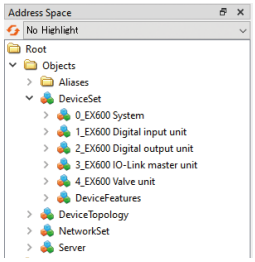
Supports communication methods with communication encryption and username and password authentication requirements





OPC UA Newly supported functions

Supports the display of hierarchy
As objects are displayed by unit, equipment configuration is easy to understand.



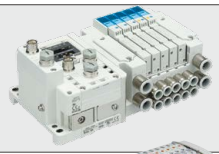
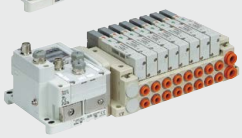
Supports the text display of operating status
As the unit operating status numerical value is also displayed as text, information is easy to understand.

Data Access View

#	Server	Display Name	Value
1	EX600@192.168.0.2	Communication status	1 (Communication is established (Idle))
2	EX600@192.168.0.2	Port status info	4 (Operate)
3	EX600@192.168.0.2	Port status info	1 (Deactivated)
4	EX600@192.168.0.2	Port status info	5 (Standard I/O input)
5	EX600@192.168.0.2	Port status info	6 (Standard I/O output)

OPC UA client UAexpert display examples

Connectable Solenoid Valve/Vacuum Unit

Applicable valve		Flow rate characteristics (4/2 → 5/3)		Max. number of solenoids	Power consumption [W]	Applicable cylinder size
		C [dm³/(s·bar)]	b			
IP67 *1 	SY3000	1.6	0.19	32	0.35 (Standard) 0.1 (With power-saving circuit)	ø50
	SY5000	3.6	0.17			ø63
	SY7000	5.9	0.20			ø80
IP67 *1, *3 	JSY1000	0.91	0.48	32	0.2 (With power-saving circuit)	ø40
	JSY3000	2.77	0.27		0.4 (Standard) 0.1 (With power-saving circuit)	ø50
	JSY5000	6.59	0.22			ø80
IP40 	S0700*2	0.37	0.39	32	0.35	ø25
IP67 *1 	SV1000*2	1.1	0.35	32	0.6	ø40
	SV2000*2	2.4	0.18			ø63
	SV3000*2	4.3	0.21			ø80
IP67 *1 	VQC1000	1.0	0.30	24	0.4 (Standard)	ø40
	VQC2000	3.2	0.30			ø63
	VQC4000	7.3	0.38		0.95 (Standard) 0.4 (Low-wattage type)	ø160
	VQC5000	17	0.31			ø180

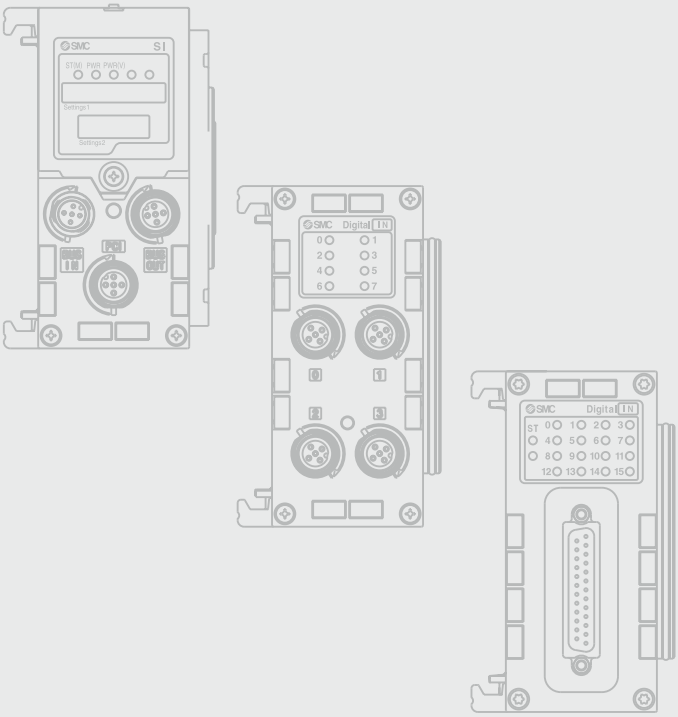
Applicable vacuum unit		Nozzle diameter [mm]	Max. number of solenoids	Power consumption [W]	Max. vacuum pressure [kPa]
IP40 	ZK2□A	0.7	16	0.4	–91
		1.0			
		1.2			
		1.5			

*1 Units with a D-sub connector or spring type terminal block are IP40.
*2 There are no manifold part number setting for the EX600-SPN3/4/31, EX600-SEN7/8, and EX600-SEC3/4. (Order it separately.)
*3 The JSY1000 is IP40.

CONTENTS

Type 3 **Integrated input-output type**

Fieldbus System (For Input/Output)
EX600 Series



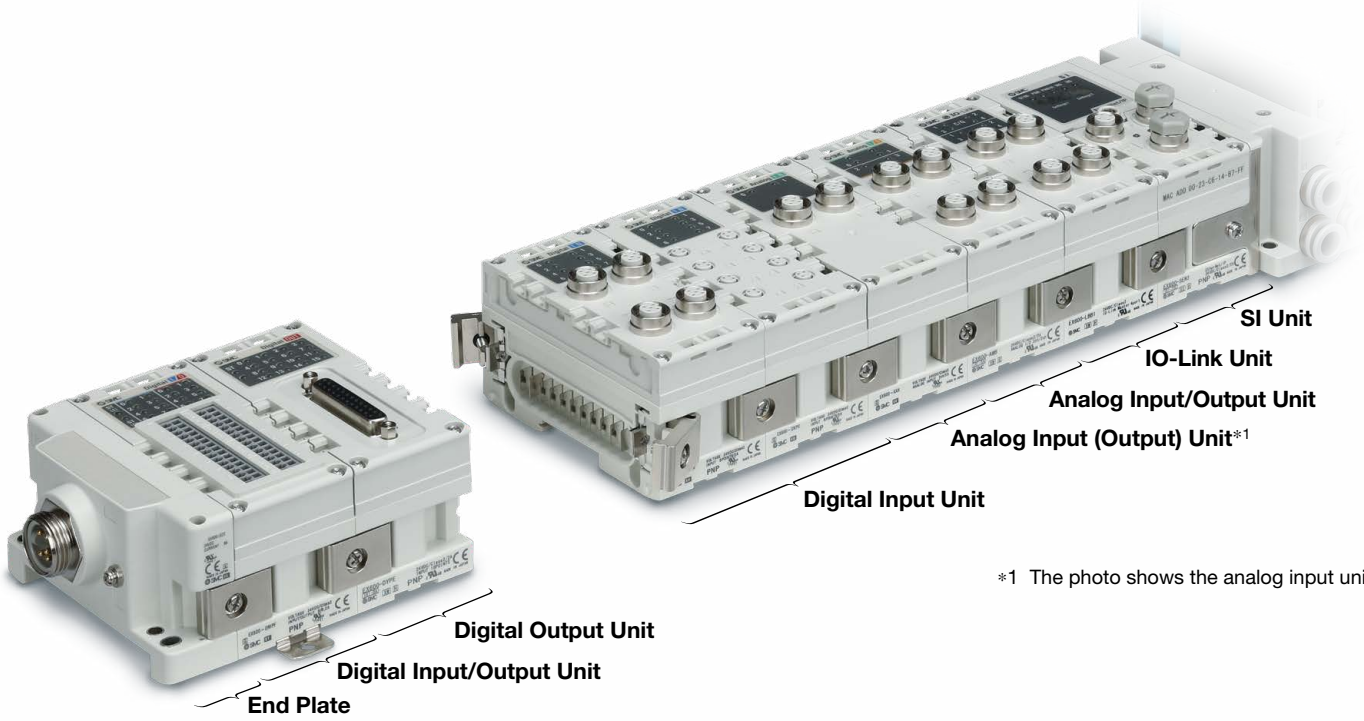
Fieldbus System For Input/Output

EX600 Series

* Only the SY and SV valves are UL-compliant.

RoHS

Parts Structure

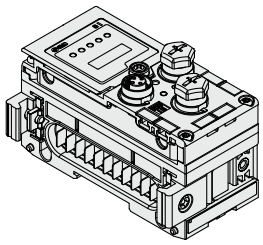


*1 The photo shows the analog input unit.

How to Order

SI Unit **EX600-S PR1A**

Specifications

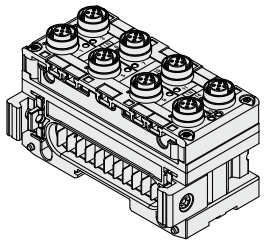


Symbol	Protocol	Output type	Note
PR1A	PROFIBUS DP	PNP (Negative common)	—
PR2A		NPN (Positive common)	—
DN1A	DeviceNet®	PNP (Negative common)	—
DN2A		NPN (Positive common)	—
MJ1	CC-Link	PNP (Negative common)	—
MJ2		NPN (Positive common)	—
CF1-X60	CC-Link IE Field	PNP (Negative common)	(Made to order)
EN7	EtherNet/IP™	PNP (Negative common)	IO-Link unit
EN8		NPN(Positive common)	IO-Link unit
EC3	EtherCAT	PNP (Negative common)	IO-Link unit
EC4		NPN (Positive common)	IO-Link unit
PN3	PROFINET	PNP (Negative common)	IO-Link unit
PN4		NPN (Positive common)	IO-Link unit
PN31		PNP (Negative common)	IO-Link unit OPC UA server

How to Order

Digital Input Unit

EX600-DX[P][D]



Input type

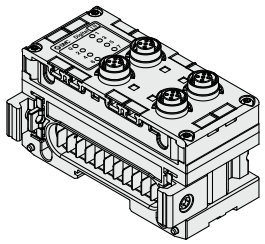
Symbol	Description
P	PNP
N	NPN

Number of inputs, open-circuit detection, and connector

Symbol	Number of inputs	Open-circuit detection	Connector
B	8 inputs	No	M12 connector (5 pins) 4 pcs.
C	8 inputs	No	M8 connector (3 pins) 8 pcs.
C1	8 inputs	Yes	M8 connector (3 pins) 8 pcs.
D	16 inputs	No	M12 connector (5 pins) 8 pcs.
E	16 inputs	No	D-sub connector (25 pins)
F	16 inputs	No	Spring type terminal block (32 pins)

Digital Output Unit

EX600-DY[P][B]



Output type

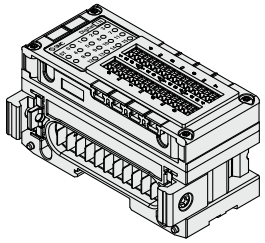
Symbol	Description
P	PNP
N	NPN

Number of outputs and connector

Symbol	Number of outputs	Connector
B	8 outputs	M12 connector (5 pins) 4 pcs.
E	16 outputs	D-sub connector (25 pins)
F	16 outputs	Spring type terminal block (32 pins)

Digital Input/Output Unit

EX600-DM[P][F]



Input/Output type

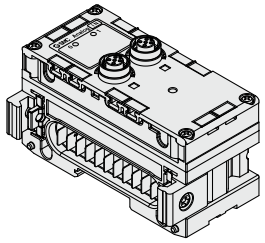
Symbol	Description
P	PNP
N	NPN

Number of inputs/outputs and connector

Symbol	Number of inputs	Number of outputs	Connector
E	8 inputs	8 outputs	D-sub connector (25 pins)
F	8 inputs	8 outputs	Spring type terminal block (32 pins)

Analog Input Unit

EX600-AX[A]



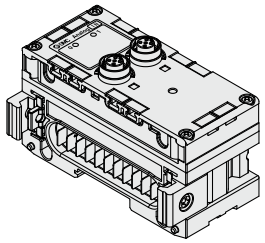
Analog input

Number of input channels and connector

Symbol	Number of input channels	Connector
A	2 channels	M12 connector (5 pins) 2 pcs.

Analog Output Unit

EX600-AY[A]



Analog output

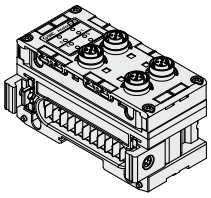
Number of output channels and connector

Symbol	Number of output channels	Connector
A	2 channels	M12 connector (5 pins) 2 pcs.

How to Order

Analog Input/Output Unit

EX600 – AM B



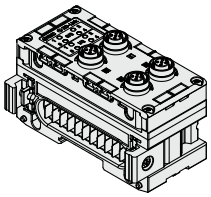
Analog input/output

Number of input/output channels and connector

Symbol	Number of input channels	Number of output channels	Connector
B	2 channels	2 channels	M12 connector (5 pins) 4 pcs.

IO-Link Unit

EX600 – L A B 1



Port specification

Symbol	Description
A	Port class A
B	Port class B

Number of ports and connector

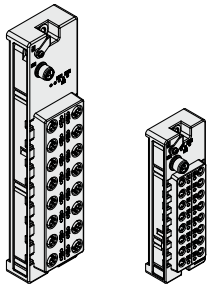
Symbol	Number of ports	Connector
B	4 ports	M12 connector (5 pins) 4 pcs.

⚠ Caution

The compatible SI unit models are as shown below. (Refer to the **Web Catalog**.)
EtherNet/IP™: EX600-SEN7/8
PROFINET: EX600-SPN3/4/31
EtherCAT: EX600-SEC3/4

Terminal Unit (IO-Link device)

EX600 – T DX 1



Terminal unit (IO-Link device)

Digital input

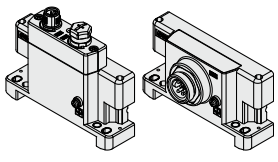
Individual specifications (Number of inputs, connectors, etc.)

Symbol	Number of inputs	Connector
1	32 inputs	M12 connector (4 pins) 16 pcs.
2	16 inputs	M8 connector (3 pins) 16 pcs.

End Plate (D side)

EX600 – E D 2 – 2

EX600-ED4/5 are not yet UL-compliant.



For M12 **For 7/8 inch**

End plate

End plate mounting position: D side

Power supply connector

Symbol	Power supply connector	Specifications
2	M12 (5 pins) B-coded	IN
3	7/8 inch (5 pins)	IN
4	M12 (4/5 pins) A-coded*1	IN/OUT
5	M12 (4/5 pins) A-coded*1	IN/OUT

*1 The pin layout for the "4" and "5" pin connectors is different.
Refer to the dimensions on page 27.

Mounting method

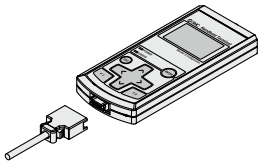
Symbol	Description	Note
Nil	Without DIN rail mounting bracket	—
2	With DIN rail mounting bracket	For SV, S0700, and VQC series
3	With DIN rail mounting bracket	For SY, JSY, and ZK2□A series

* When the end plate (U side) is used, the symbol for the mounting method must be the same as the D side.

Handheld Terminal

EX600 – HT1A – 3

Handheld terminals are not yet UL-compliant.



Version

Cable length

Symbol	Description
Nil	No cable
1	1 m
3	3 m

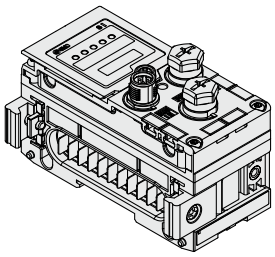
Specifications

All Units Common Specifications

Environment	**Operating temperature range**	Operating: –10 to 50°C, Stored: –20 to 60°C
	Operating humidity range	35 to 85% RH (No condensation)
	Withstand voltage∗1	500 VAC for 1 minute between external terminals and FE
	Insulation resistance∗1	500 VDC, 10 MΩ or more between external terminals and FE

∗1 Except handheld terminals

SI Unit (EX600-SPR□A) PROFIBUS

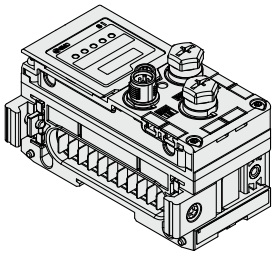


EX600-SPR□A

Model		EX600-SPR1A	EX600-SPR2A
Communication	**Protocol**	PROFIBUS DP (DP-V0)	
	Device type	PROFIBUS DP Slave	
	Communication speed	9.6/19.2/45.45/93.75/187.5/500 kbps 1.5/3/6/12 Mbps	
	Configuration file	GSD file∗2	
	Occupation area (Number of inputs/outputs)	Max. (512 inputs/512 outputs)	
Terminating resistor		Internally implemented	
Internal current consumption (Power supply for Control/Input)		80 mA or less	
Output	**Output type**	Source/PNP (Negative common)	Sink/NPN (Positive common)
	Number of outputs	32 outputs (8/16/24/32 outputs selectable)	
	Load	Solenoid valve with surge voltage suppressor 24 VDC, 1.5 W or less (SMC)	
	Power supply	24 VDC, 2 A	
	Fail safe	HOLD/CLEAR/Forced power ON	
	Protection	Short-circuit protection	
Enclosure		IP67 (Manifold assembly)	
Standards		CE/UKCA marking, UL (CSA)	
Weight		300 g	

∗2 The configuration file can be downloaded from the SMC website: https://www.smcworld.com

SI Unit (EX600-SDN□A) DeviceNet®

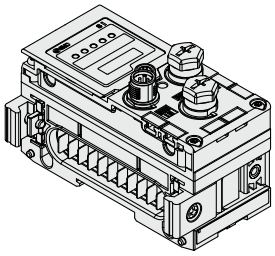


EX600-SDN□A

Model		EX600-SDN1A	EX600-SDN2A
Communication	**Protocol**	DeviceNet®: Volume 1 (Edition 2.1), Volume 3 (Edition 1.1)	
	Device type	Communication Adapter	
	Communication speed	125/250/500 kbps	
	Configuration file	EDS file∗3	
	Occupation area (Number of inputs/outputs)	Max. (512 inputs/512 outputs)	
	Applicable messages	Duplicate MAC ID Check Message, Group 2 Only Unconnected Explicit Message Explicit Message (Group 2), Poll I/O Message (Predefined M/S Connection set)	
	Applicable function	QuickConnect™	
DeviceNet® power supply		11 to 25 VDC (Current consumption 50 mA or less)	
Internal current consumption (Power supply for Control/Input)		55 mA or less	
Output	**Output type**	Source/PNP (Negative common)	Sink/NPN (Positive common)
	Number of outputs	32 outputs (8/16/24/32 outputs selectable)	
	Load	Solenoid valve with surge voltage suppressor 24 VDC, 1.5 W or less (SMC)	
	Power supply	24 VDC, 2 A	
	Fail safe	HOLD/CLEAR/Forced power ON	
	Protection	Short-circuit protection	
Enclosure		IP67 (Manifold assembly)	
Standards		CE/UKCA marking, UL (CSA)	
Weight		300 g	

∗3 The configuration file can be downloaded from the SMC website: https://www.smcworld.com

SI Unit (EX600-SMJ□) CC-Link

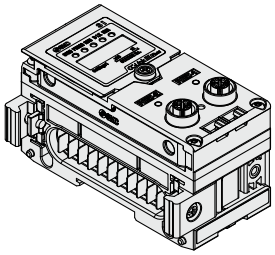


EX600-SMJ□

Model		EX600-SMJ1	EX600-SMJ2
Communication	**Protocol**	CC-Link (Ver. 1.10, Ver. 2.00)	
	Station type	Remote Device Station	
	Communication speed	156/625 kbps 2.5/5/10 Mbps	
	Configuration file	CSP+ file∗4	
	Occupation area (Number of inputs/outputs)	Max. (512 inputs/512 outputs) 1/2/3/4 stations occupied	
Internal current consumption (Power supply for Control/Input)		75 mA or less	
Output	**Output type**	Source/PNP (Negative common)	Sink/NPN (Positive common)
	Number of outputs	32 outputs (8/16/24/32 outputs selectable)	
	Load	Solenoid valve with surge voltage suppressor 24 VDC, 1.5 W or less (SMC)	
	Power supply	24 VDC, 2 A	
	Fail safe	HOLD/CLEAR/Forced power ON	
	Protection	Short-circuit protection	
Enclosure		IP67 (Manifold assembly)	
Standards		CE/UKCA marking, UL (CSA)	
Weight		300 g	

∗4 The configuration file can be downloaded from the SMC website: https://www.smcworld.com

Specifications

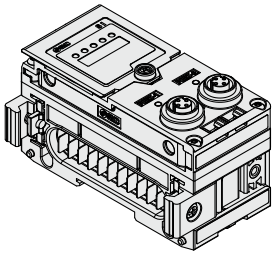


EX600-SCF1-X60

SI Unit (EX600-SCF1-X60) CC-Link IE Field

Model		EX600-SCF1-X60*1
Communication	Protocol	CC-Link IE Field
	Station type	Intelligent Device Station
	Communication speed	1 Gbps
	Allowable station number setting	1 to 120
	Allowable network number setting	1 to 239
	Transmission method	Cyclic transmission
	Configuration file	CSP+ file*2
	Occupied input size	RX: 32 to 176 bits RWr: 32 to 608 words
	Occupied output size	RY: 32 to 176 bits RWw: 32 to 608 words
Internal current consumption (Power supply for Control/Input)		140 mA or less
Output	Output type	Source/PNP (Negative common)
	Number of outputs	32 outputs
	Load	Solenoid valve with surge voltage suppressor 24 VDC, 1.0 W or less (SMC)
	Power supply	24 VDC, 2 A
	Fail safe	HOLD/CLEAR/Forced power ON
	Protection	Short-circuit protection
Enclosure		IP67 (Manifold assembly)
Standards		CE/UKCA marking
Weight		300 g

*1 For details on this product, refer to the SMC website.
*2 The configuration file can be downloaded from the SMC website: https://www.smcworld.com



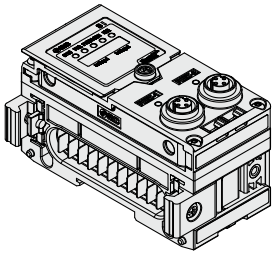
EX600-SEN7/8

SI Unit (EX600-SEN□) EtherNet/IP™

Model		EX600-SEN7	EX600-SEN8
Communication	Protocol	EtherNet/IP™ (Conformance version: Composite 18)	
	Communication speed	10/100 Mbps	
	Communication method	Full duplex/Half duplex	
	Configuration file	EDS file*3	
	IP address setting range	SI Unit switch settings: 192.168.0 or 1.1 to 254 Through DHCP server: Optional address	
	Device information	Vendor ID: 7 (SMC Corporation) Device type: 12 (Communication Adapter) Product code: 258	
	QuickConnect	●	
	DLR	●	
	Web server function	●	
IO-Link unit		●	
Internal current consumption (Power supply for Control/Input)		120 mA or less	
Output	Output type	Source/PNP (Negative common)	Sink/NPN (Positive common)
	Number of outputs	32 outputs	
	Load	Solenoid valve with surge voltage suppressor 24 VDC, 1.0 W or less (SMC)	
	Power supply	24 VDC, 2 A	
	Fail safe	HOLD/CLEAR/Forced power ON	
	Protection	Short-circuit protection	
Enclosure		IP67 (Manifold assembly)	
Standards		CE/UKCA marking, UL (CSA)	
Weight		300 g	

*3 The configuration file can be downloaded from the SMC website: https://www.smcworld.com

Specifications

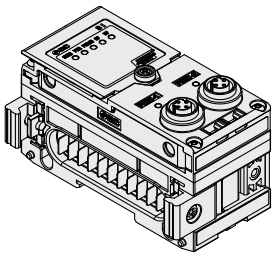


EX600-SEC3/4

SI Unit (EX600-SEC□) EtherCAT

Model		EX600-SEC3	EX600-SEC4
Communication	Protocol	EtherCAT (Conformance Test Record V.2.3.0)	
	Communication speed	100 Mbps	
	Configuration file	XML file*1	
	Web server function	●	
IO-Link unit		●	
Internal current consumption (Power supply for Control/Input)		120 mA or less	
Output	Output type	Source/PNP (Negative common)	Sink/NPN (Positive common)
	Number of outputs	32 outputs (8/16/24/32 outputs selectable)	
	Load	Solenoid valve with surge voltage suppressor 24 VDC, 1.0 W or less (SMC)	
	Power supply	24 VDC, 2 A	
	Fail safe	HOLD/CLEAR/Forced power ON	
	Protection	Short-circuit protection	
Enclosure		IP67 (Manifold assembly)	
Standards		CE/UKCA marking, UL (CSA)	
Weight		300 g	

*1 The configuration file can be downloaded from the SMC website: https://www.smcworld.com



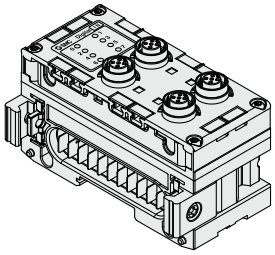
EX600-SPN3/4/31

SI Unit (EX600-SPN□) PROFINET

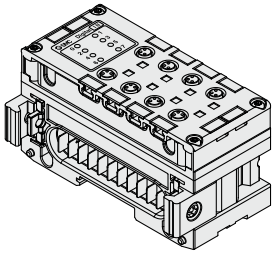
Model		EX600-SPN3	EX600-SPN4	EX600-SPN31
Communication	Protocol	PROFINET IO (Conformance Class C)		PROFINET IO (Conformance Class B)
	Communication speed	100 Mbps		
	Configuration file	GSDML file*2		
	Fast Start Up (Communication connection time)	● (Approx. 500 ms)		●*3 (Approx. 1 s)
	MRP	●		
	System Redundancy S2	●		
	Web server function	●		
	OPC UA server function	—		●
IO-Link unit		●		
Internal current consumption (Power supply for Control/Input)		120 mA or less		
Output	Output type	Source/PNP (Negative common)	Sink/NPN (Positive common)	Source/PNP (Negative common)
	Number of outputs	32 outputs		
	Load	Solenoid valve with surge voltage suppressor 24 VDC, 1.0 W or less (SMC)		
	Fail safe	HOLD/CLEAR/Forced power ON		
	Protection	Short-circuit protection		
Enclosure		IP67 (Manifold assembly)		
Standards		CE/UKCA marking, UL (CSA)		
Weight		300 g		

*2 The configuration file can be downloaded from the SMC website: https://www.smcworld.com
*3 When the OPC UA server is set to disabled

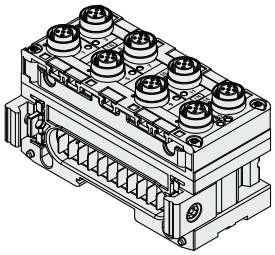
Specifications



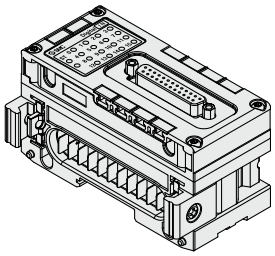
EX600-DX□B



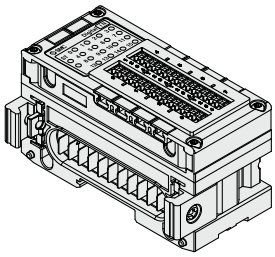
EX600-DX□C□



EX600-DX□D



EX600-DX□E



EX600-DX□F

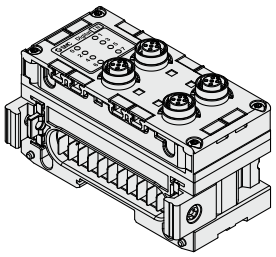
Digital Input Unit

Model			EX600-DXPB	EX600-DXNB	EX600-DXPC□	EX600-DXNC□	EX600-DXPD	EX600-DXND
Input	Input type		PNP	NPN	PNP	NPN	PNP	NPN
	Input connector		M12 (5-pin) socket*1		M8 (3-pin) socket*3		M12 (5-pin) socket*1	
	Number of inputs		8 inputs (2 inputs/Connector)		8 inputs (1 input/Connector)		16 inputs (2 inputs/Connector)	
	Supplied voltage		24 VDC					
	Max. supplied current		0.5 A/Connector 2 A/Unit		0.25 A/Connector 2 A/Unit		0.5 A/Connector 2 A/Unit	
	Protection		Short-circuit protection					
	Input current (at 24 VDC)		9 mA or less					
	ON voltage		17 V or more (At NPN input, between the pin for input terminal and supplied voltage of +24 V) (At PNP input, between the pin for input terminal and supplied voltage of 0 V)					
	OFF voltage		5 V or less (At NPN input, between the pin for input terminal and supplied voltage of +24 V) (At PNP input, between the pin for input terminal and supplied voltage of 0 V)					
	Open circuit detection current	2 wires	—		0.5 mA/Input*2		—	
		3 wires	—		0.5 mA/Connector*2		—	
Current consumption			50 mA or less		55 mA or less		70 mA or less	
Enclosure			IP67 (Manifold assembly)					
Standards			CE/UKCA marking, UL (CSA)					
Weight			300 g		275 g		340 g	

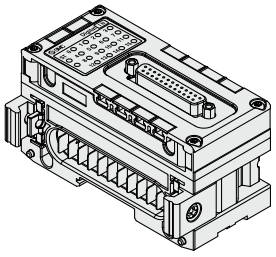
*1 M12 (4-pin) connector can be connected.
*2 Function only applies to the EX600-DX□C1.
*3 When connecting the M8 plug connector, the tightening torque must be 0.2 N·m ±10%. If tightened with an excessive tightening torque, this may cause the connector thread of the unit to break.

Model		EX600-DXPE	EX600-DXNE	EX600-DXPF	EX600-DXNF
Input	Input type	PNP	NPN	PNP	NPN
	Input connector	D-sub socket (25 pins) Lock screw: No.4-40 UNC		Spring type terminal block (32 pins)	
	Number of inputs	16 inputs		16 inputs (2 inputs x 8 blocks)	
	Supplied voltage	24 VDC			
	Max. supplied current	2 A/Unit		0.5 A/Block 2 A/Unit	
	Protection	Short-circuit protection			
	Input current (at 24 VDC)	5 mA or less			
	ON voltage	17 V or more (At NPN input, between the pin for input terminal and supplied voltage of +24 V) (At PNP input, between the pin for input terminal and supplied voltage of 0 V)			
	OFF voltage	5 V or less (At NPN input, between the pin for input terminal and supplied voltage of +24 V) (At PNP input, between the pin for input terminal and supplied voltage of 0 V)			
Applicable wire		—		0.08 to 1.5 mm² (AWG16 to 28)	
Current consumption		50 mA or less		55 mA or less	
Enclosure		IP40 (Manifold assembly)			
Standards		CE/UKCA marking, UL (CSA)			
Weight		300 g			

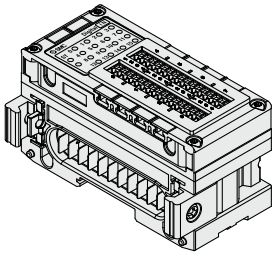
Specifications



EX600-DY□B



EX600-DY□E
EX600-DM□E



EX600-DY□F
EX600-DM□F

Digital Output Unit

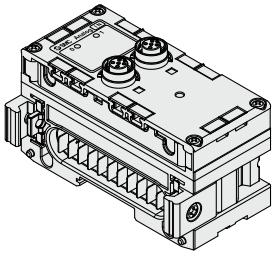
Model		EX600-DYPB	EX600-DYNB	EX600-DYPE	EX600-DYNE	EX600-DYPF	EX600-DYNF
Output	Output type	PNP	NPN	PNP	NPN	PNP	NPN
	Output connector	M12 (5-pin) socket*1		D-sub socket (25 pins) Lock screw: No.4-40 UNC		Spring type terminal block (32 pins)	
	Number of outputs	8 outputs (2 outputs/Connector)		16 outputs		16 outputs (2 outputs x 8 blocks)	
	Supplied voltage	24 VDC					
	Max. load current	0.5 A/Output 2 A/Unit					
	Protection	Short-circuit protection					
Applicable wire		—		—		0.08 to 1.5 mm² (AWG16 to 28)	
Current consumption		50 mA or less					
Enclosure		IP67 (Manifold assembly)		IP40 (Manifold assembly)			
Standards		CE/UKCA marking, UL (CSA)					
Weight		300 g					

*1 M12 (4-pin) connector can be connected.

Digital Input/Output Unit

Model		EX600-DMPE	EX600-DMNE	EX600-DMPF	EX600-DMNF
Input/Output type		PNP	NPN	PNP	NPN
Connector		D-sub socket (25 pins) Lock screw: No.4-40 UNC		Spring type terminal block (32 pins)	
Input	Number of inputs	8 inputs		8 inputs (2 inputs x 4 blocks)	
	Supplied voltage	24 VDC			
	Max. supplied current	2 A/Unit		0.5 A/Block 2 A/Unit	
	Protection	Short-circuit protection			
	Input current (at 24 VDC)	5 mA or less			
	ON voltage	17 V or more (At NPN input, between the pin for input terminal and supplied voltage of +24 V) (At PNP input, between the pin for input terminal and supplied voltage of 0 V)			
	OFF voltage	5 V or less (At NPN input, between the pin for input terminal and supplied voltage of +24 V) (At PNP input, between the pin for input terminal and supplied voltage of 0 V)			
Output	Number of outputs	8 outputs		8 outputs (2 outputs x 4 blocks)	
	Supplied voltage	24 VDC			
	Max. load current	0.5 A/Output 2 A/Unit			
	Protection	Short-circuit protection			
Applicable wire		—		0.08 to 1.5 mm² (AWG16 to 28)	
Current consumption		50 mA or less		60 mA or less	
Enclosure		IP40 (Manifold assembly)			
Standards		CE/UKCA marking, UL (CSA)			
Weight		300 g			

Specifications

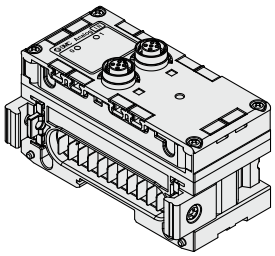


EX600-AXA

Analog Input Unit

Model			EX600-AXA	
Input	Input type		Voltage input	Current input
	Input connector		M12 (5-pin) socket*1	
	Input channel		2 channels (1 channel/Connector)	
	Supplied voltage		24 VDC	
	Max. supplied current		0.5 A/Connector	
	Protection		Short-circuit protection	
	Input signal range	12 bit resolution	0 to 10 V, 1 to 5 V, 0 to 5 V	0 to 20 mA, 4 to 20 mA
		16 bit resolution	–10 to 10 V, –5 to 5 V	–20 to 20 mA
	Max. rated input signal		±15 V	±22 mA*2
	Input impedance		100 kΩ	50 Ω
	Linearity (25°C)		±0.05% F.S.	
	Repeatability (25°C)		±0.15% F.S.	
	Absolute accuracy (25°C)		±0.5% F.S.	±0.6% F.S.
Current consumption			70 mA or less	
Enclosure			IP67 (Manifold assembly)	
Standards			CE/UKCA marking, UL (CSA)	
Weight			290 g	

*1 M12 (4-pin) connector can be connected.
*2 When input signal exceeds 22 mA, the protection function activates and the input signal is interrupted.



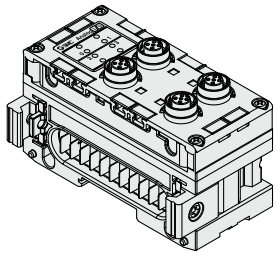
EX600-AYA

Analog Output Unit

Model			EX600-AYA	
Output	Output type		Voltage output	Current output
	Output connector		M12 (5-pin) socket*3	
	Output channel		2 channels (1 channel/Connector)	
	Supplied voltage		24 VDC	
	Max. load current		0.5 A/Connector	
	Protection		Short-circuit protection	
	Output signal range	12 bit resolution	0 to 10 V, 1 to 5 V, 0 to 5 V	0 to 20 mA, 4 to 20 mA
	Load impedance		1 kΩ or more	600 Ω or less
	Linearity (25°C)		±0.05% F.S.	
	Repeatability (25°C)		±0.15% F.S.	
	Absolute accuracy (25°C)		±0.5% F.S.	±0.6% F.S.
Current consumption			70 mA or less	
Enclosure			IP67 (Manifold assembly)	
Standards			CE/UKCA marking, UL (CSA)	
Weight			290 g	

*3 M12 (4-pin) connector can be connected.

Specifications



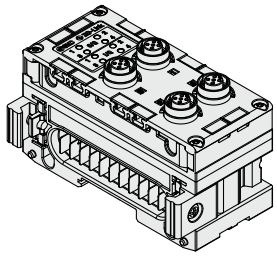
EX600-AMB

Analog Input/Output Unit

Model			EX600-AMB	
Input	Input type		Voltage input	Current input
	Input connector		M12 (5-pin) socket*1	
	Input channel		2 channels (1 channel/Connector)	
	Supplied voltage		24 VDC	
	Max. supplied current		0.5 A/Connector	
	Protection		Short-circuit protection	
	Input signal range	12 bit resolution	0 to 10 V, 1 to 5 V, 0 to 5 V	0 to 20 mA, 4 to 20 mA
	Max. rated input signal		15 V	22 mA*2
	Input impedance		100 kΩ	250 Ω
	Linearity (25°C)		±0.05% F.S.	
	Repeatability (25°C)		±0.15% F.S.	
	Absolute accuracy (25°C)		±0.5% F.S.	±0.6% F.S.
Output	Output type		Voltage output	Current output
	Output connector		M12 (5-pin) socket*1	
	Output channel		2 channels (1 channel/Connector)	
	Supplied voltage		24 VDC	
	Max. load current		0.5 A/Connector	
	Protection		Short-circuit protection	
	Output signal range	12 bit resolution	0 to 10 V, 1 to 5 V, 0 to 5 V	0 to 20 mA, 4 to 20 mA
	Load impedance		1 kΩ or more	600 Ω or less
	Linearity (25°C)		±0.05% F.S.	
	Repeatability (25°C)		±0.15% F.S.	
	Absolute accuracy (25°C)		±0.5% F.S.	±0.6% F.S.
Current consumption			100 mA or less	
Enclosure			IP67 (Manifold assembly)	
Standards			CE/UKCA marking, UL (CSA)	
Weight			300 g	

*1 M12 (4-pin) connector can be connected.
*2 When input signal exceeds 22 mA, the protection function activates and the input signal is interrupted.

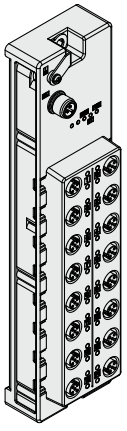
Specifications



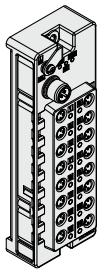
EX600-L□B1

IO-Link Unit

Model		EX600-LAB1		EX600-LBB1
IO-Link version		Version 1.1		
IO-Link port class		Class A		Class B
Communication speed		COM1 (4.8 kBaud) COM2 (38.4 kBaud) COM3 (230.4 kBaud) ∗ Changes automatically according to the connected device		
Number of IO-Link ports		4		
Compatible SI unit (Protocol)		EX600-SEN7/8 (EtherNet/IP™) EX600-SPN3/4/31 (PROFINET) EX600-SEC3/4 (EtherCAT)		
Max. supply current	**Device power supply (L+)**	0.5 A/Connector (2 A/Unit)		0.5 A/Connector (1 A/Unit)
	External power supply (P24)	—		1.6 A/Connector (3 A/Unit)
Input	**Pin no.**	2	4	4
	Input type	PNP		
	Protection	Short-circuit protection		
	Rated input current	Approx. 2.5 mA	Approx. 5.8 mA	
	ON voltage	13 V or more		
	OFF voltage	8 V or less		
Output	**Pin no.**	4		
	Output type	PNP		
	Max. load current (C/Q line)	0.25 A/Output (Supplied from the power supply for control/input)		
	Protection	Short-circuit protection		
Current consumption		50 mA or less		
Enclosure		IP67 (Manifold assembly)		
Standards		CE/UKCA marking, UL (CSA)		
Weight		320 g		



EX600-TDX1



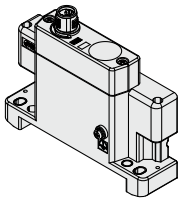
EX600-TDX2

Terminal Unit (IO-Link input unit)

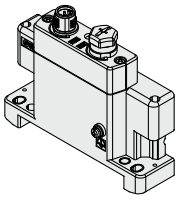
Model		EX600-TDX1	EX600-TDX2
Communication	**IO-Link version**	Version 1.1	
	IO-Link port class	Class A	
	Communication speed	COM3 (230.4 kBaud)	
	Configuration file	IODD file∗1	
Electrical	**Power supply voltage range**	24 VDC ±25%	
	Internal current consumption	50 mA or less	
	Max. supplied current	1 A/Connector No.0 to 7, 1 A/Connector No.8 to 15 2 A/Unit	
Input	**Input type**	PNP	
	Input connector	M12 (4-pin) socket∗2	M8 (3-pin) socket∗3
	Number of inputs	32 inputs (2 inputs/Connector)	16 inputs (1 input/Connector)
	Input current (at 24 VDC)	Typ. 4 mA	
	ON voltage	11 to 30 V	
	OFF voltage	–3 to 5 V	
	Protection	Short-circuit protection	
Enclosure		IP67	
Standards		CE/UKCA marking, UL (CSA)	
Weight		450 g	250 g

∗1 The configuration file can be downloaded from the SMC website: https://www.smcworld.com
∗2 M12 (5-pin) connector can be connected.
∗3 When connecting the M8 plug connector, the tightening torque must be 0.2 N·m ±10%.
If tightened with an excessive tightening torque, this may cause the connector thread of the unit to break.

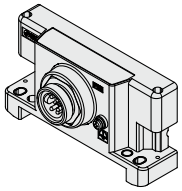
Specifications



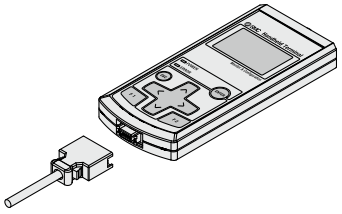
EX600-ED2-□



EX600-ED4/5-□



EX600-ED3-□



EX600-HT1A-□

End Plate

Model			EX600-ED2-□	EX600-ED3-□	EX600-ED4/5-□
Power specifications	Power supply connector	PWR IN	M12 (5-pin) plug	7/8 inch (5-pin) plug	M12 (4-pin) plug
		PWR OUT	—	—	M12 (5-pin) socket
	Rated voltage	Power supply for control/input	24 VDC ±10%		
		Power supply for output	24 VDC +10/–5%		
	Rated current	Power supply for control/input	Max. 2 A	Max. 8 A	Max. 4 A
		Power supply for output			
Enclosure			IP67 (Manifold assembly)		
Standards*1			CE/UKCA marking, UL (CSA)		
Weight			170 g	175 g	170 g

*1 The EX600-ED4/5-□ is not compliant with UL (CSA) standards.

Handheld Terminal

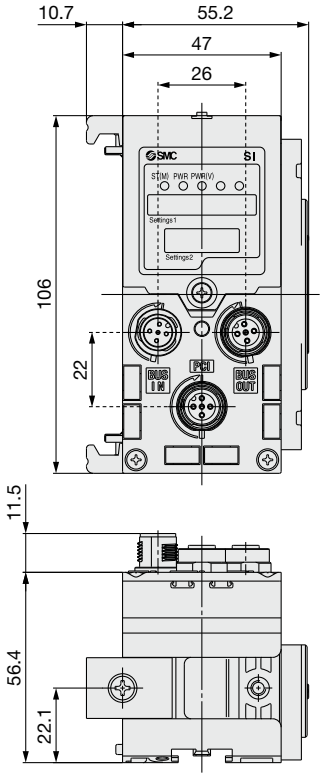
Model	EX600-HT1A-□
Power supply	Power supplied from SI unit connector (24 VDC)
Current consumption	50 mA or less
Display	LCD with backlight
Connection cable	Handheld terminal cable (1 m ··· EX600-AC010-1, 3 m ··· EX600-AC030-1)
Enclosure	IP20
Standards*1	CE/UKCA marking
Weight	160 g

*1 The handheld terminal is not compliant with UL (CSA) standards.
* Cannot be used with the EX600-SEN7/8, EX600-SPN3/4/31, EX600-SEC3/4, and EX600-L□B1

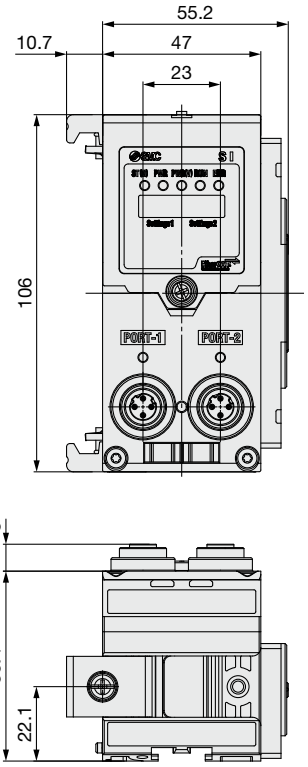
Dimensions

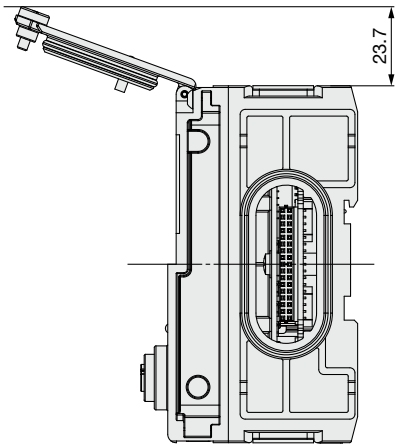
SI Unit

EX600-SPR□A
EX600-SDN□A
EX600-SMJ□



EX600-SEN7/8
EX600-SPN3/4/31
EX600-SEC3/4

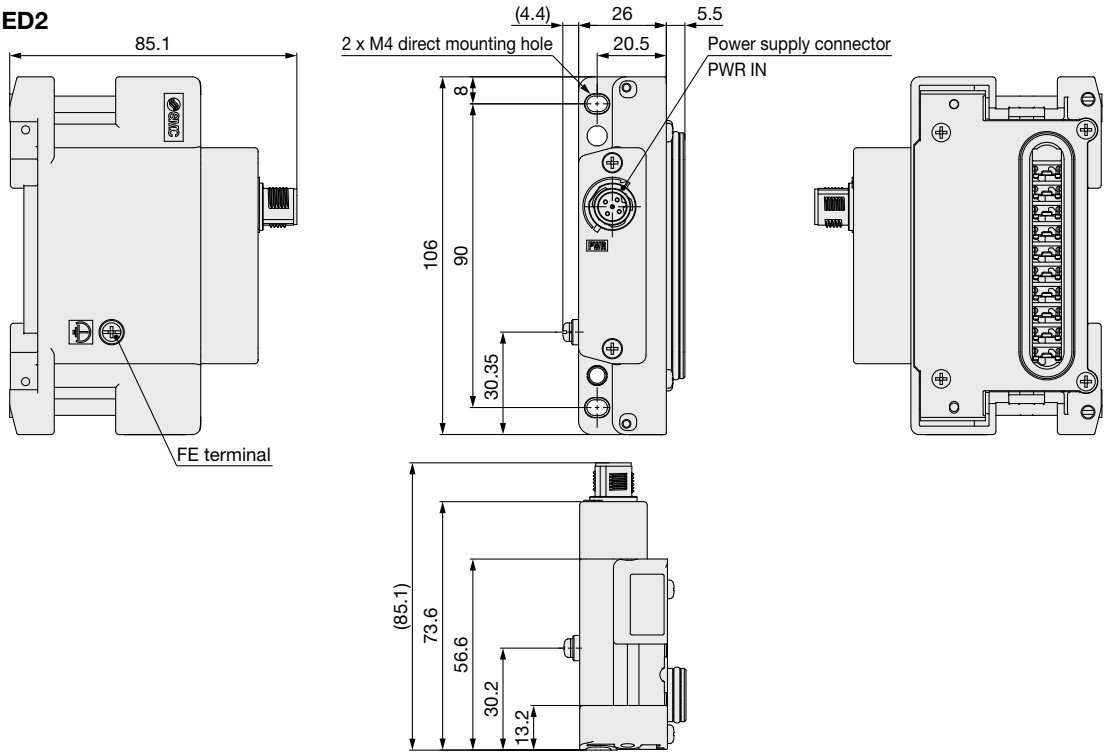




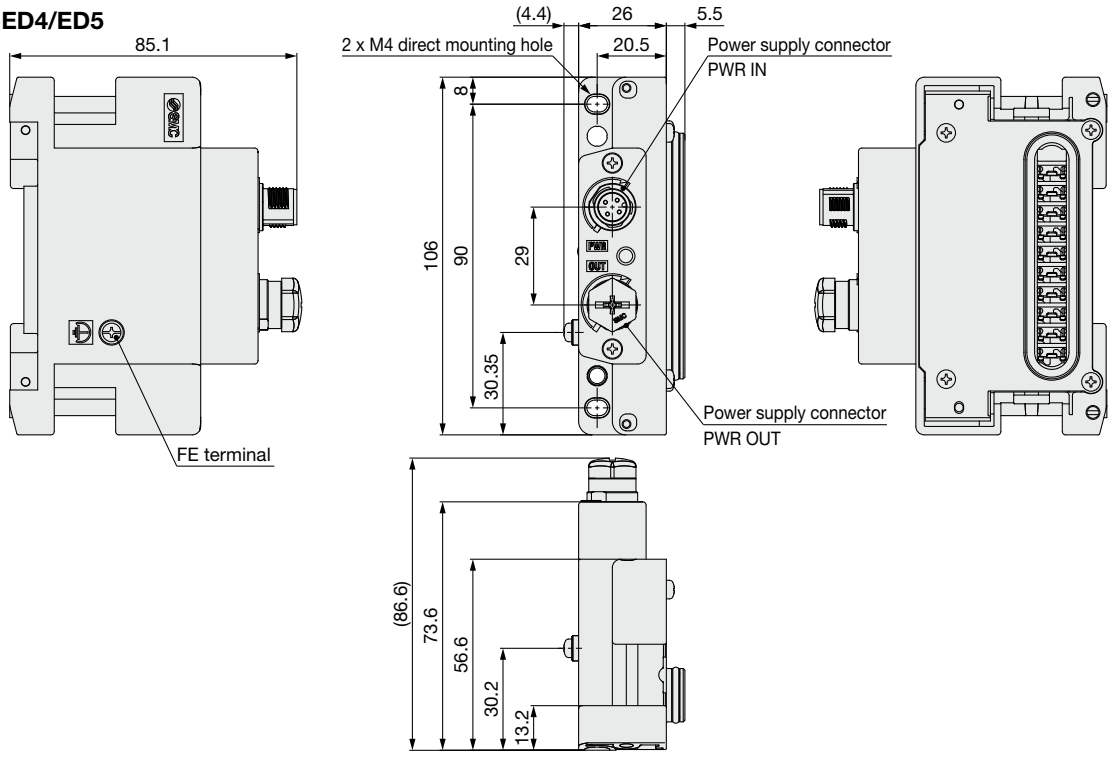
Dimensions

End Plate (D side)

EX600-ED2



EX600-ED4/ED5



Power supply connector PWR IN: M12 5-pin plug, B-coded

Configuration	EX600-ED2	
	Pin no.	Description
2 1 5 3 4	**1**	24 V (for output)
	2	0 V (for output)
	3	24 V (for control/input)
	4	0 V (for control/input)
	5	FE

Power supply connector PWR IN: M12 4-pin plug, A-coded

Configuration	EX600-ED4 (Pin arrangement 1)		EX600-ED5 (Pin arrangement 2)	
	Pin no.	Description	Pin no.	Description
3 2 4 1	**1**	24 V (for control/input)	**1**	24 V (for output)
	2	24 V (for output)	**2**	0 V (for output)
	3	0 V (for control/input)	**3**	24 V (for control/input)
	4	0 V (for output)	**4**	0 V (for control/input)

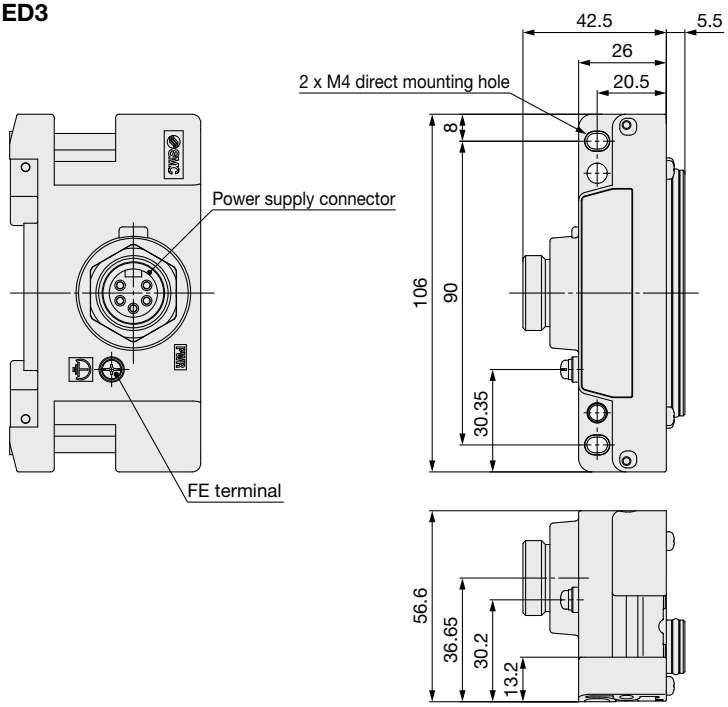
Power supply connector PWR OUT: M12 5-pin socket, A-coded

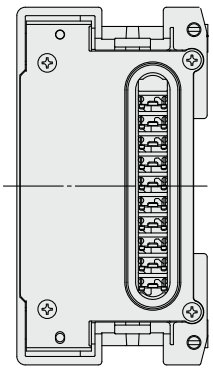
Configuration	EX600-ED4 (Pin arrangement 1)		EX600-ED5 (Pin arrangement 2)	
	Pin no.	Description	Pin no.	Description
1 2 4 5 3	**1**	24 V (for control/input)	**1**	24 V (for output)
	2	24 V (for output)	**2**	0 V (for output)
	3	0 V (for control/input)	**3**	24 V (for control/input)
	4	0 V (for output)	**4**	0 V (for control/input)
	5	Unused	**5**	Unused

Dimensions

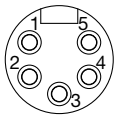
End Plate (D side)

EX600-ED3





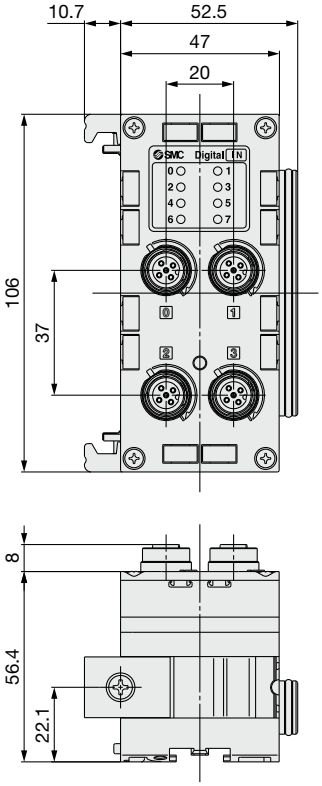
Power supply connector PWR: 7/8 inch 5-pin plug

Configuration	Pin no.	Description
	**1**	0 V (for output)
	2	0 V (for control/input)
	3	FE
	4	24 V (for control/input)
	5	24 V (for output)

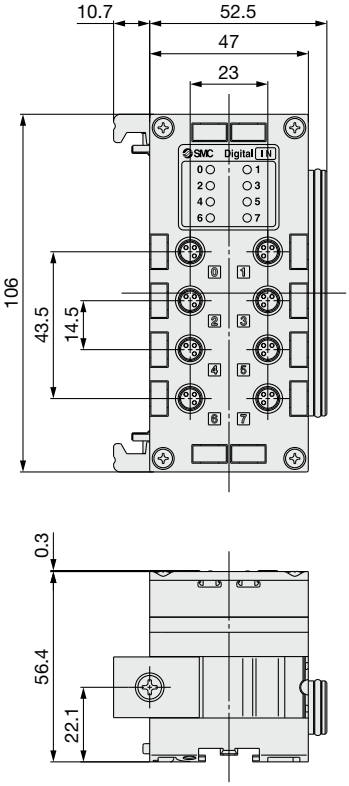
Dimensions

Digital Unit

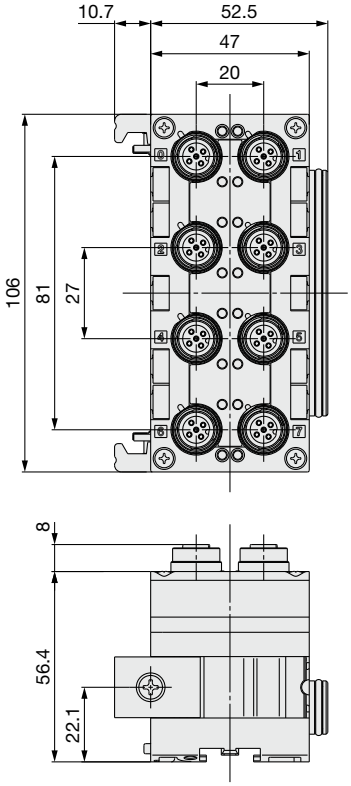
EX600-DX□B
EX600-DY□B



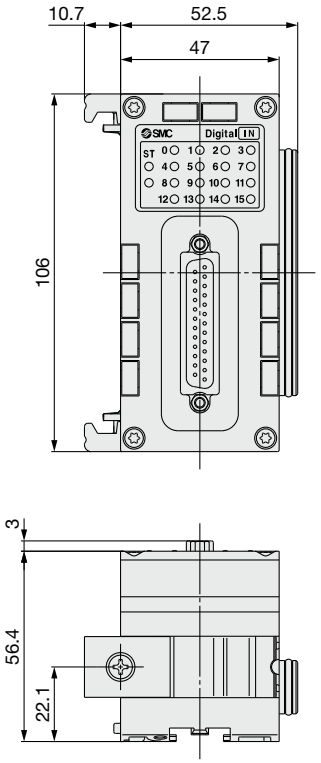
EX600-DX□C□



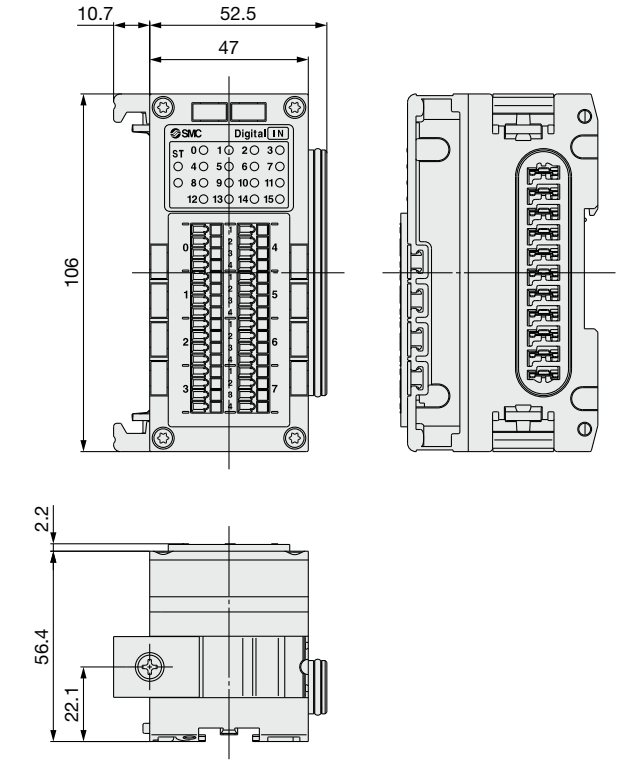
EX600-DX□D



EX600-DX□E
EX600-DY□E
EX600-DM□E



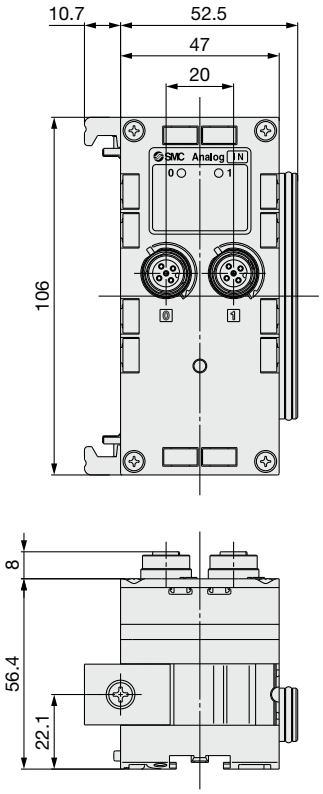
EX600-DX□F
EX600-DY□F
EX600-DM□F



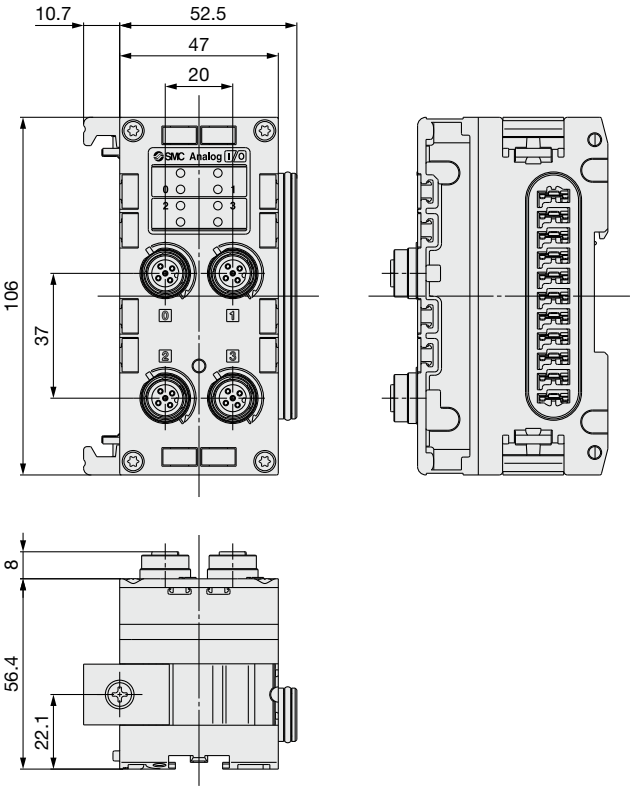
Dimensions

Analog Unit

EX600-AXA
EX600-AYA

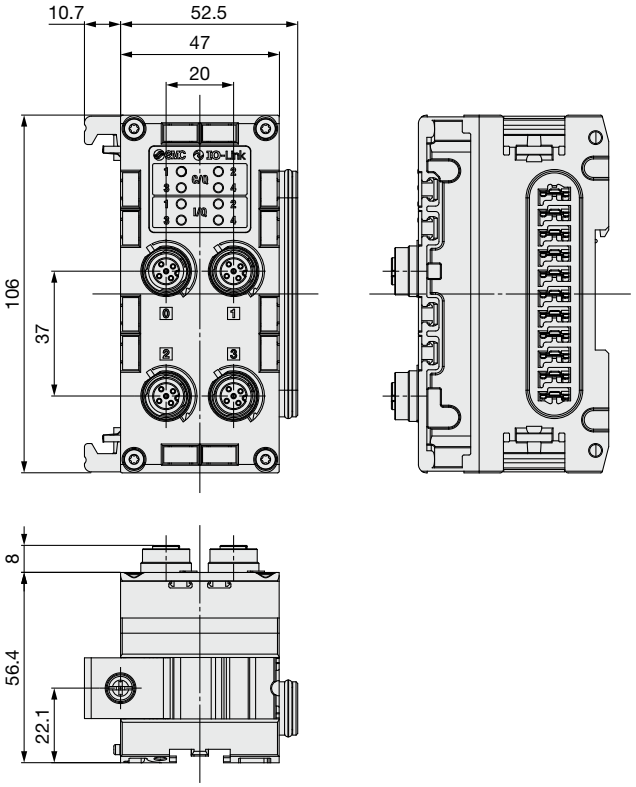


EX600-AMB



IO-Link Unit

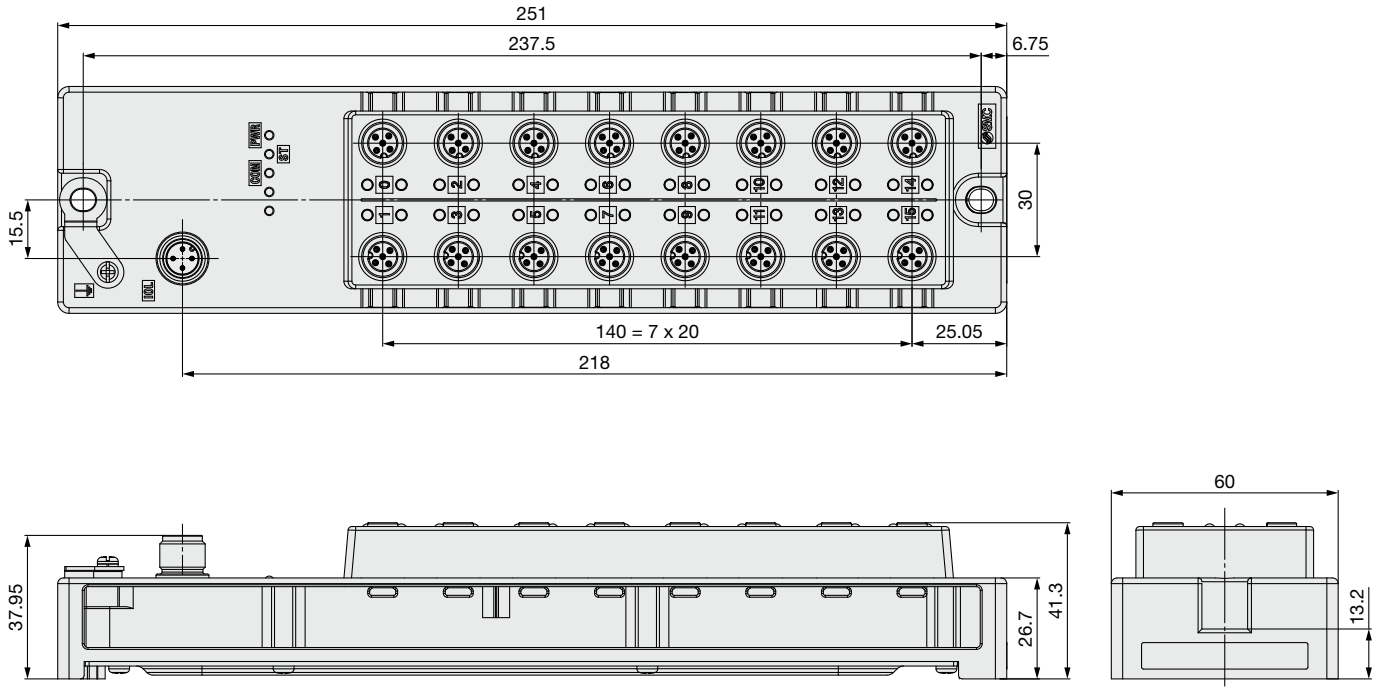
EX600-LAB1
EX600-LBB1



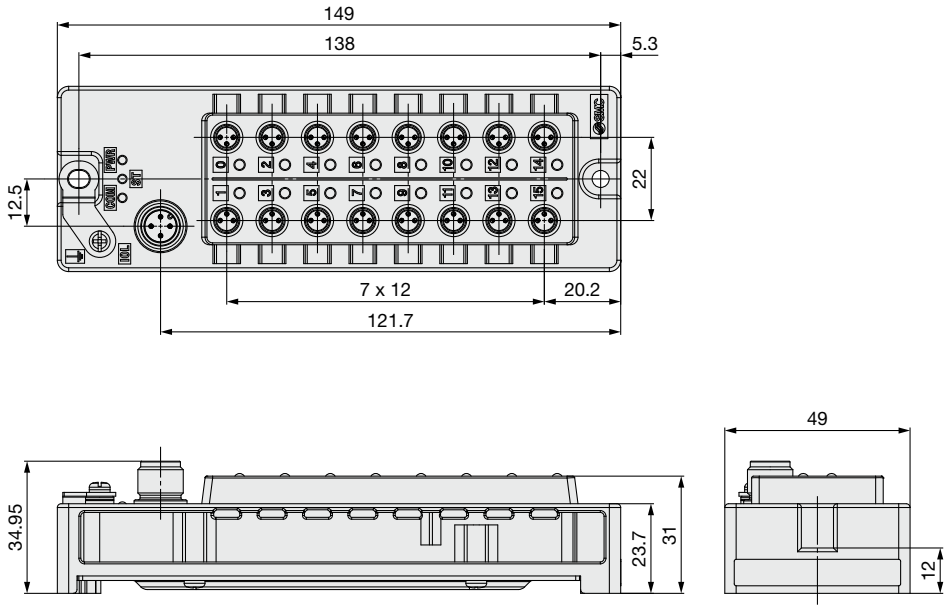
Dimensions

Terminal Unit

EX600-TDX1

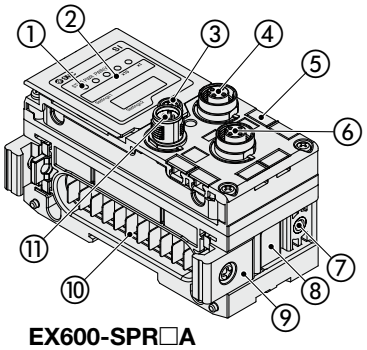


EX600-TDX2

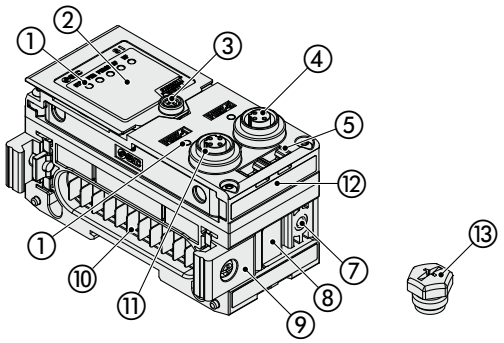


Parts Description

SI Unit



EX600-SPR□A
EX600-SMJ□
EX600-SDN□A

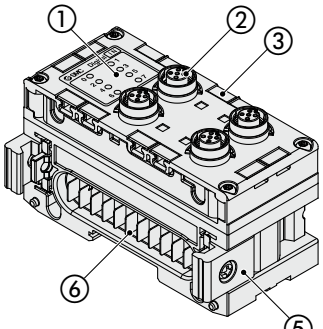


EX600-SEN7/8
EX600-SPN3/4/31
EX600-SEC3/4

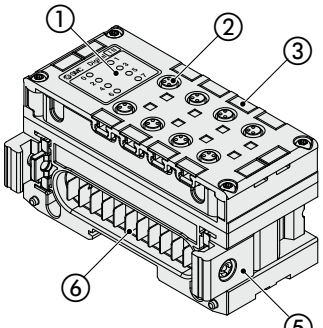
No.	Name	Use
1	**Status indication LED**	Displays unit status
2	**Indication cover**	Open for setting the switch.
3	**Indication cover set screw**	Loosen for opening the indication cover.
4	**Connector (BUS OUT)**	Connects to the fieldbus output cable (SPEEDCON)*1
5	**Marker groove**	Can be used to mount a marker
6	**Connector (PCI)**	Connects to the handheld terminal cable (SPEEDCON)
7	**Valve plate mounting holes**	Fixes a valve plate in place
8	**Valve plate mounting groove**	Inserts a valve plate
9	**Joint bracket**	Links units to one another
10	**Connector for unit (Plug)**	Transmits signals to the neighboring unit and supplies power
11	**Connector (BUS IN)**	Connects to the cable for fieldbus input (SPEEDCON)*1
12	**MAC address name plate**	Displays a unique 12-digit MAC address for each SI unit
13	**Seal cap**	Mounted on the connectors (BUS OUT and PCI) at the time of shipment

*1 The EX600-SEN7/8, EX600-SPN3/4/31, and EX600-SEC3/4 are not SPEEDCON compatible.

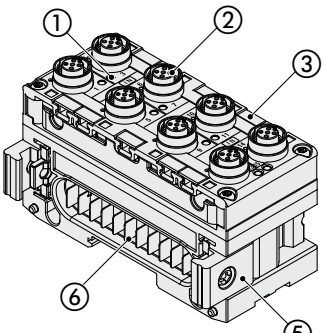
Digital Unit



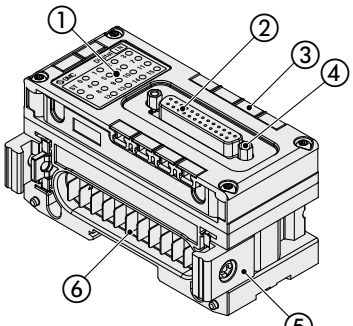
EX600-DX□B
EX600-DY□B



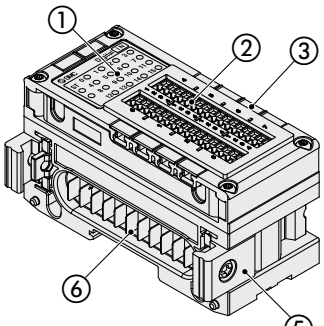
EX600-DX□C□



EX600-DX□D



EX600-DX□E
EX600-DY□E
EX600-DM□E

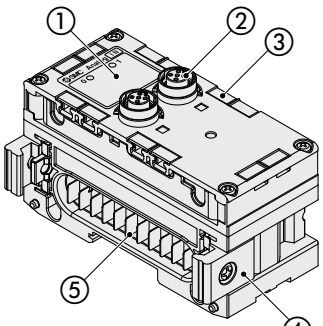


EX600-DX□F
EX600-DY□F
EX600-DM□F

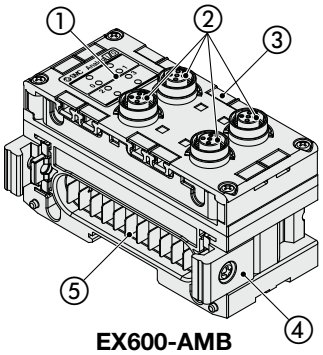
No.	Name	Use
1	**Status indication LED**	Displays unit status
2	**Connector**	Connects with input or output devices (Only the EX600-D□□B and EX600-DX□D are SPEEDCON compatible.)
3	**Marker groove**	Can be used to mount a marker
4	**Lock screw**	Secures the D-sub connector in place (No.4-40 UNC)
5	**Joint bracket**	Links units to one another
6	**Connector for unit (Plug)**	Transmits signals to the neighboring unit and supplies power

Parts Description

Analog Unit



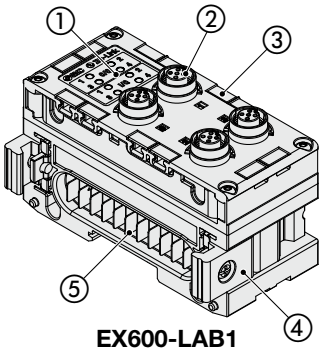
EX600-AXA
EX600-AYA



EX600-AMB

No.	Name	Use
1	**Status indication LED**	Displays unit status
2	**Connector**	Connects with input or output devices (SPEEDCON)
3	**Marker groove**	Can be used to mount a marker
4	**Joint bracket**	Links units to one another
5	**Connector for unit (Plug)**	Transmits signals to the neighboring unit and supplies power

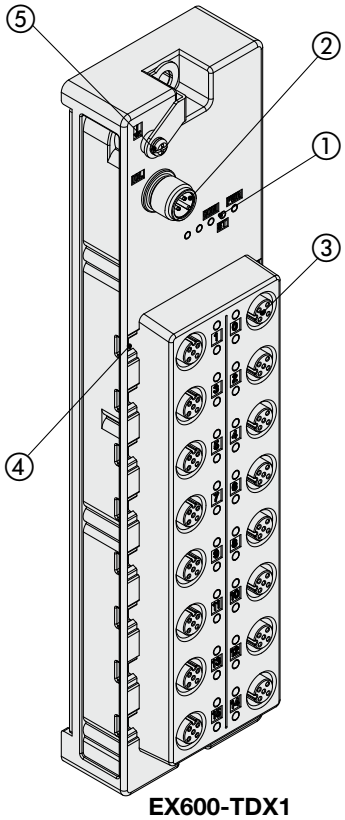
IO-Link Unit



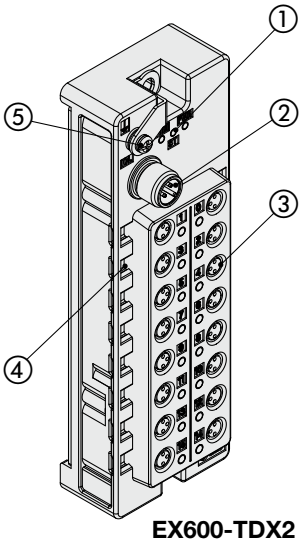
EX600-LAB1
EX600-LBB1

No.	Name	Use
1	**Status indication LED**	Displays unit status
2	**Connector**	Connects with IO-Link, input, or output devices (SPEEDCON)
3	**Marker groove**	Can be used to mount a marker
4	**Joint bracket**	Links units to one another
5	**Connector for unit (Plug)**	Transmits signals to the neighboring unit and supplies power

Terminal Unit



EX600-TDX1

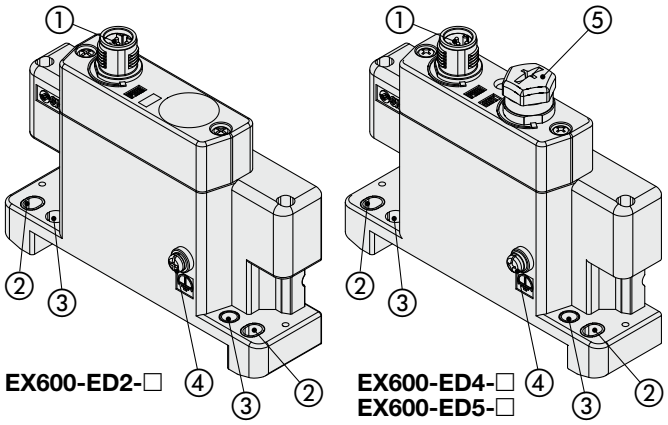


EX600-TDX2

No.	Name	Use
1	**Status indication LED**	Displays unit status
2	**Connector (IOL)**	For connection to the IO-Link communication
3	**Connector**	Connector for an input device.
4	**Marker groove**	Can be used to mount a marker
5	**FE terminal**	Used for grounding Ground this terminal securely to improve noise immunity.

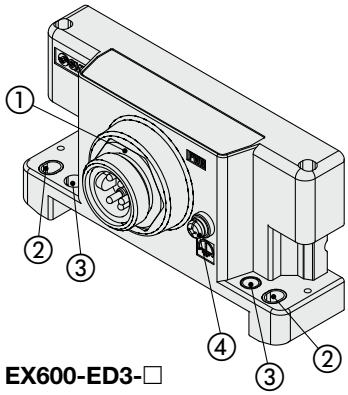
Parts Description

End Plate



EX600-ED2-□

EX600-ED4-□
EX600-ED5-□

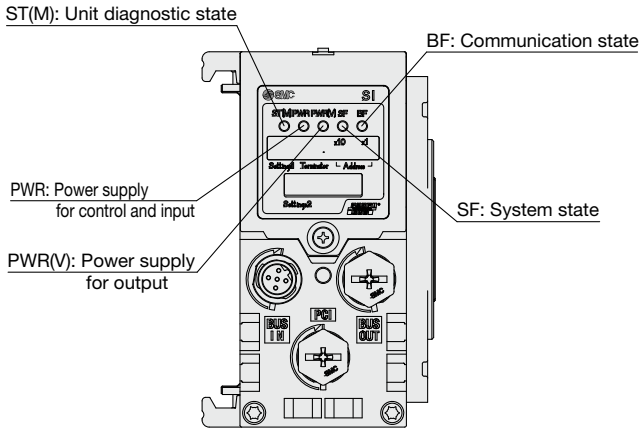


EX600-ED3-□

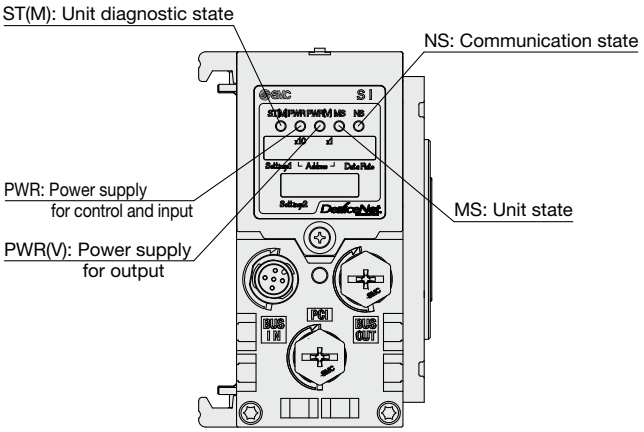
No.	Name	Use
1	**Power connector (PWR IN)**	Supplies power to the unit and/or input/output device (Only the EX600-ED2/ED4/ED5-□ is SPEEDCON compatible.)
2	**Fixing hole for direct mounting**	Connects directly to equipment
3	**Fixing hole for DIN rail**	Converts to manifold or for DIN rail mounting
4	**FE terminal**	Used for grounding Ground this terminal securely to improve noise immunity.
5	**Connector (Unused)** **Power connector (PWR OUT)**	Supplies power to the device on the downstream side

LED Indicator

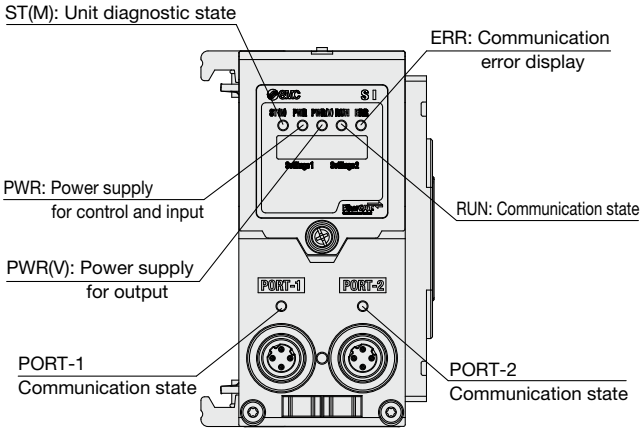
EX600-SPR□A



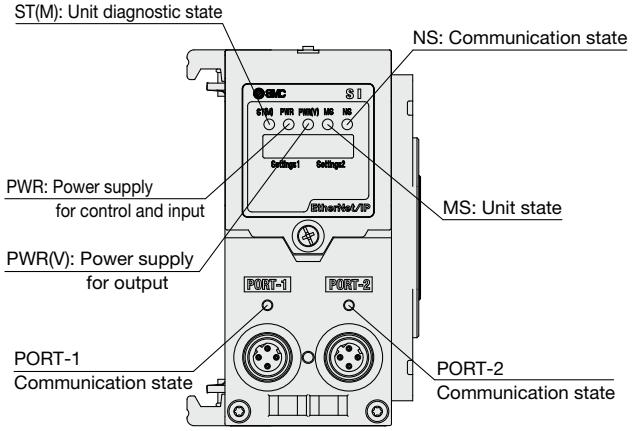
EX600-SDN□A



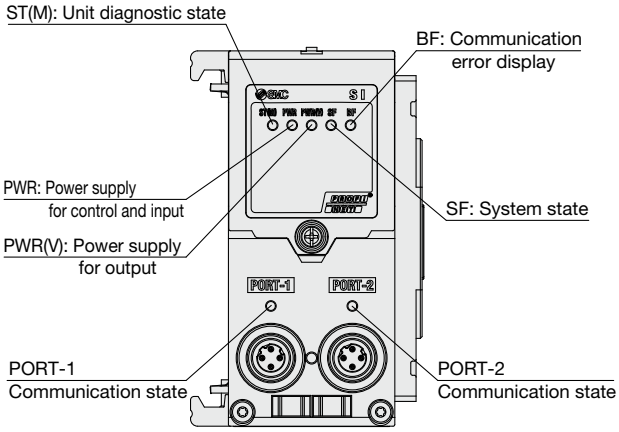
EX600-SEC□



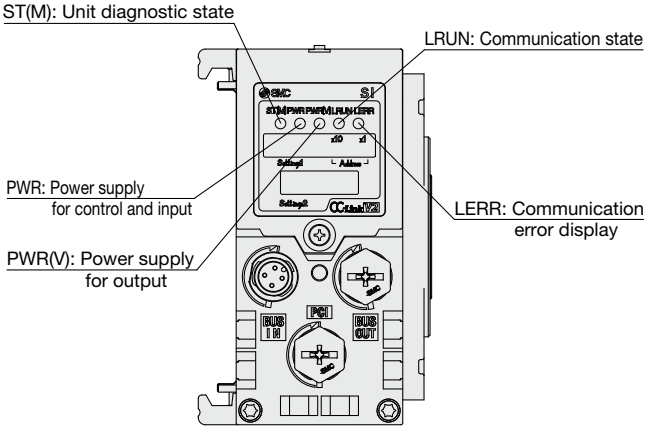
EX600-SEN7/SEN8



EX600-SPN3/4/31

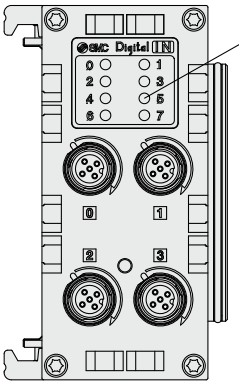


EX600-SMJ□

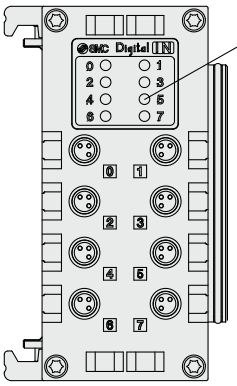


LED Indicator

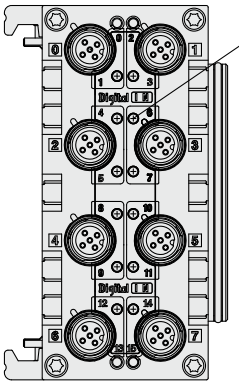
EX600-DX□B



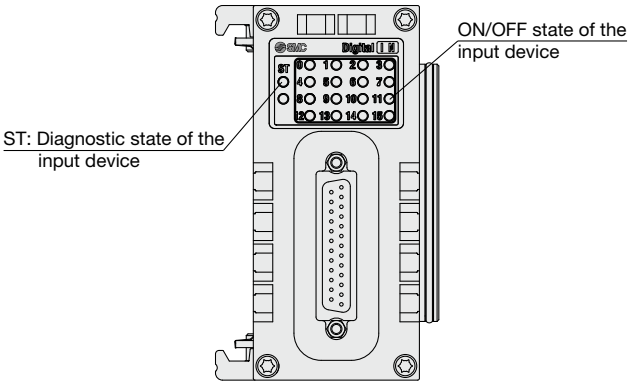
EX600-DX□C□



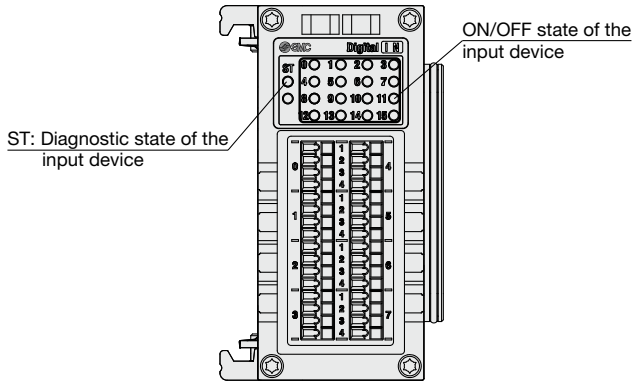
EX600-DX□D



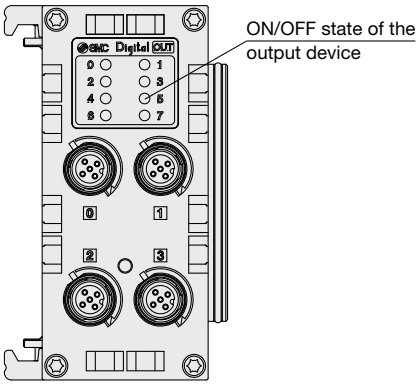
EX600-DX□E



EX600-DX□F

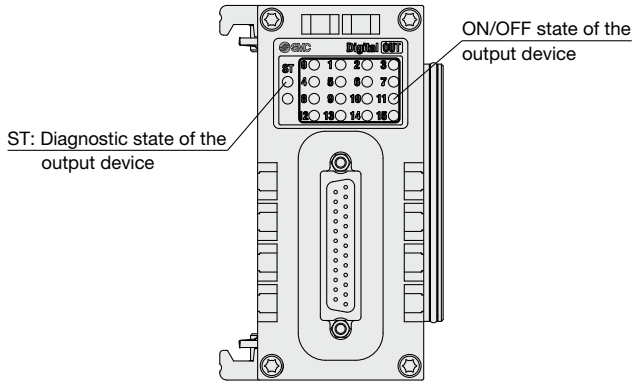


EX600-DY□B

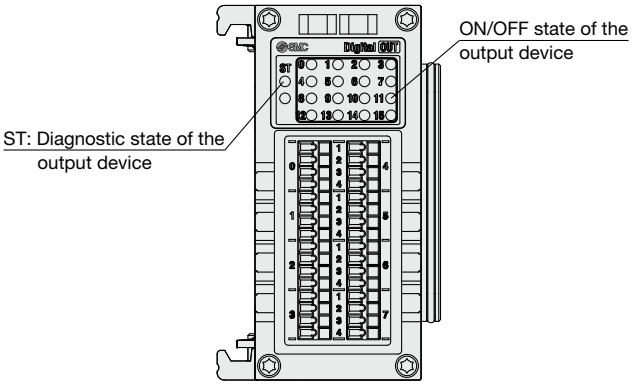


LED Indicator

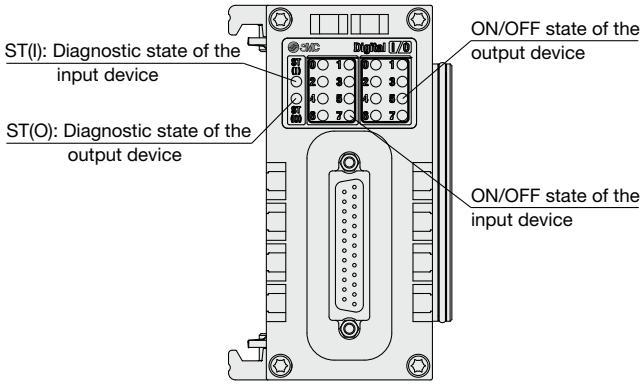
EX600-DY□E



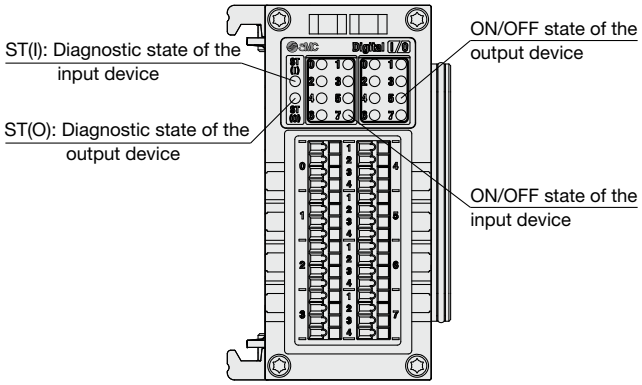
EX600-DY□F



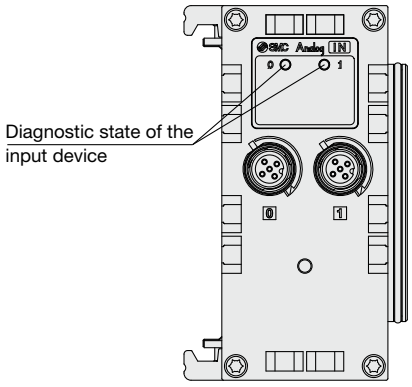
EX600-DM□E



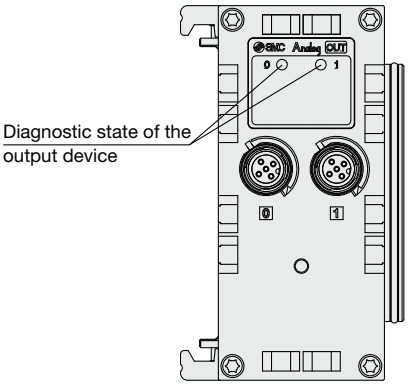
EX600-DM□F



EX600-AXA

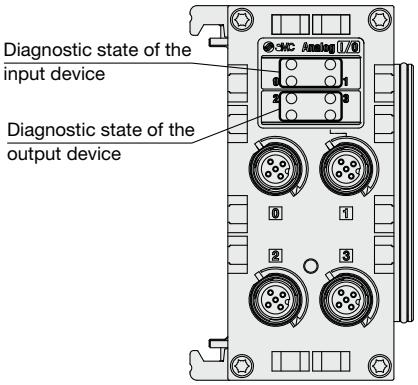


EX600-AYA

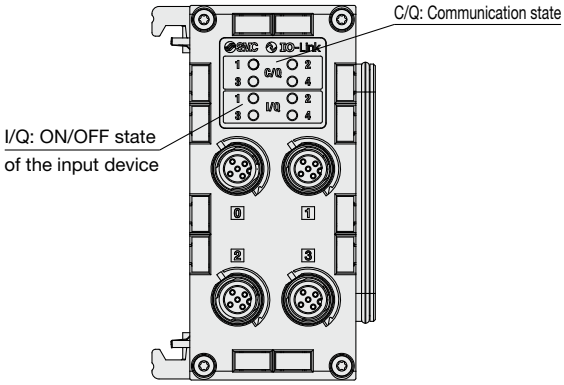


LED Indicator

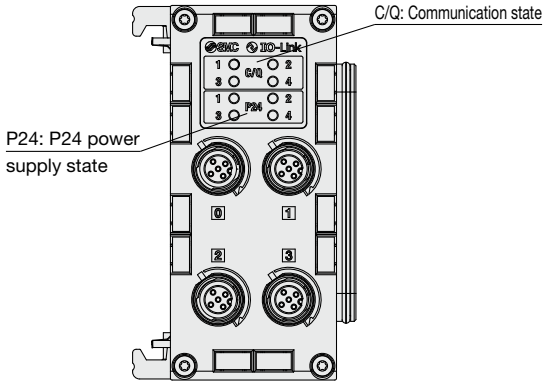
EX600-AMB



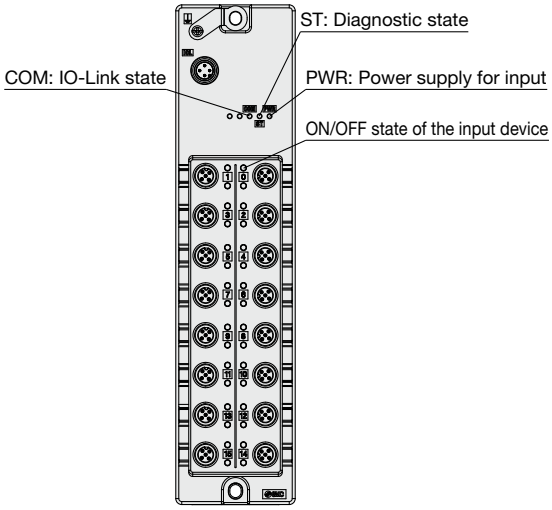
EX600-LAB1



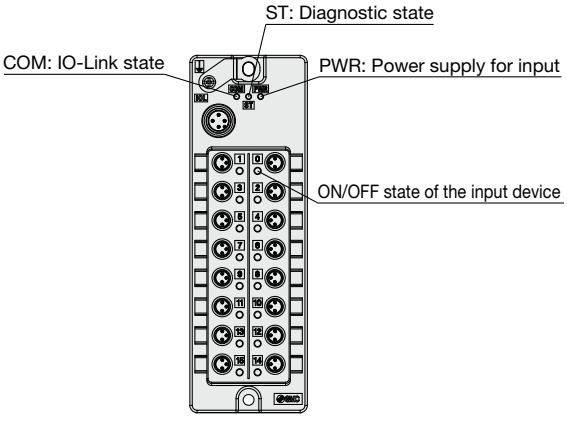
EX600-LBB1



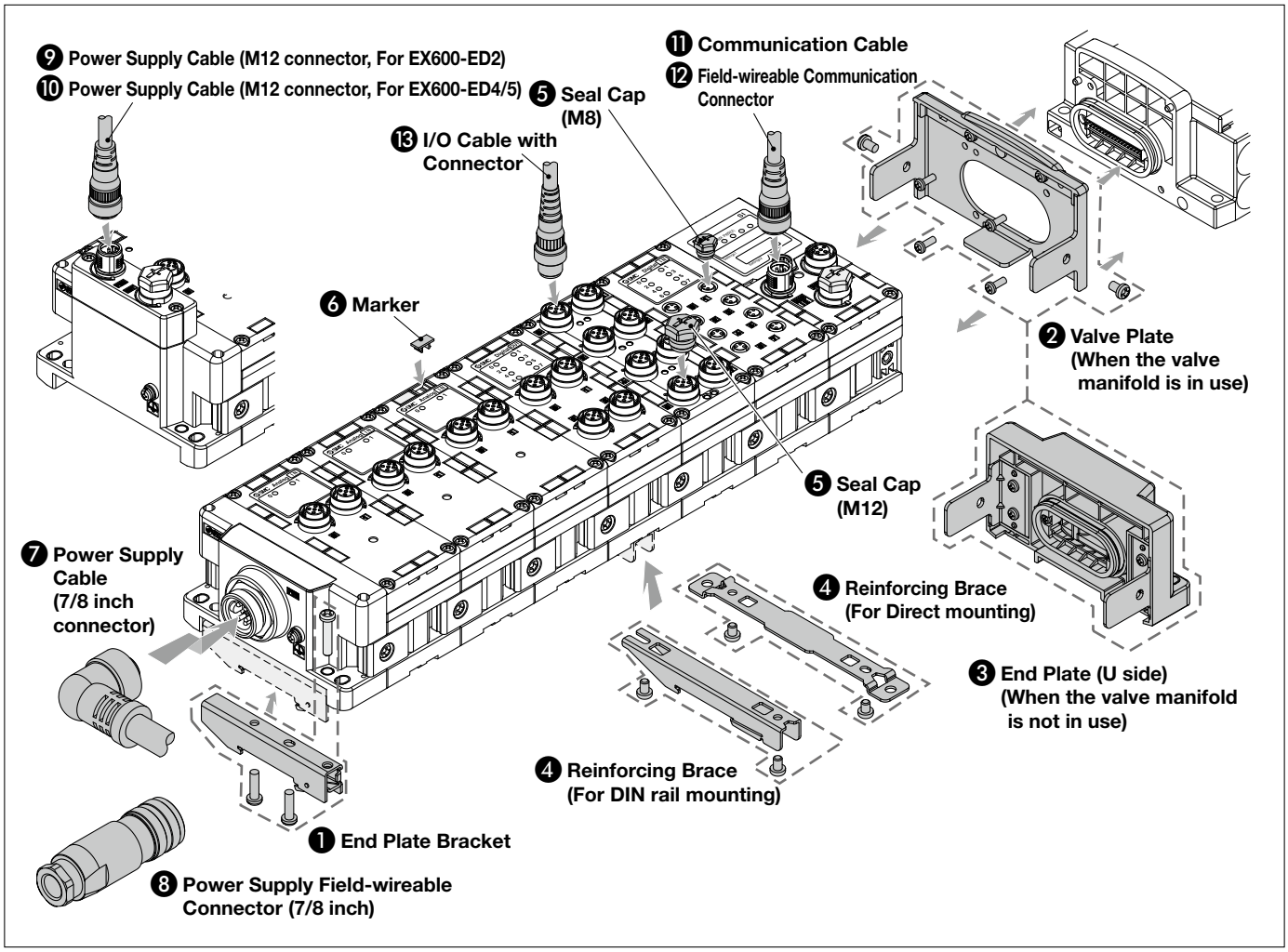
EX600-TDX1



EX600-TDX2



EX600 Series
Accessories



❶ End Plate Bracket

This bracket is used for the end plate of DIN rail mounting.

EX600-ZMA2

Enclosed parts

Round head screw (M4 x 20)	1 pc.
P-tight screw (4 x 14)	2 pcs.

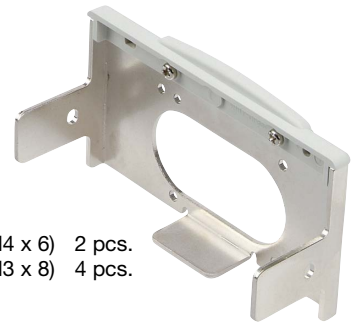
EX600-ZMA3
(Specialized for SY series)

Enclosed parts

Round head screw with washer (M4 x 20)	1 pc.
P-tight screw (4 x 14)	2 pcs.

❷ Valve Plate

EX600-ZMV1



Enclosed parts

Round head screw (M4 x 6)	2 pcs.
Round head screw (M3 x 8)	4 pcs.

EX600-ZMV2
(Specialized for SY series)

Enclosed parts

Round head screw (M4 x 6)	2 pcs.
Round head screw (M3 x 8)	2 pcs.

❸ End Plate (U side)

The end plate is for use when the manifold valve is not connected.

EX600- E U 1 - 2

End plate

End plate mounting position: U side

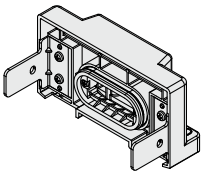
Specification

Symbol	Specification
1	Waterproof cover

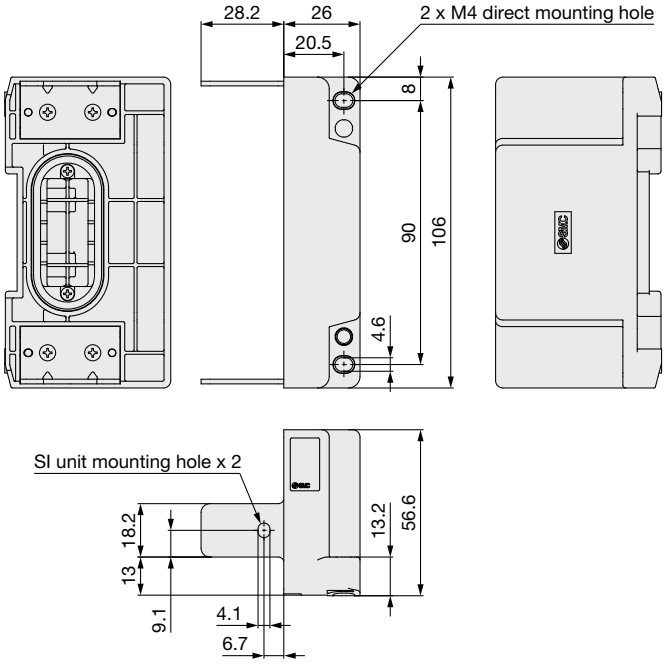
Mounting method

Symbol	Description	Note
Nil	Without DIN rail mounting bracket	—
2	With DIN rail mounting bracket	For EX600-ED□-2
3	With DIN rail mounting bracket	For EX600-ED□-3

∗ Select in accordance with the symbol for the end plate (D side) mounting method.



EX600-EU1



Enclosed parts

Round head screw (M4 x 5) 2 pcs.

❹ Reinforcing Brace

This bracket is used on the bottom of the unit at the intermediate position for connecting 6 units or more.

∗ Be sure to attach this bracket to prevent connection failure between the units caused by deflection.

For Direct mounting

EX600-ZMB1

Enclosed parts

Round head screw (M4 x 5) 2 pcs.

For DIN rail mounting

EX600-ZMB2

Enclosed parts

Round head screw (M4 x 6) 2 pcs.

❺ Seal Cap (10 pcs.)

Be sure to mount a seal cap on any unused I/O connectors. Otherwise, the specified enclosure cannot be maintained.

EX9-AWES

For M8

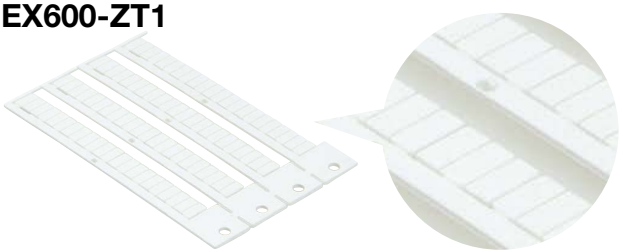
EX9-AWTS

For M12

❻ Marker (1 sheet, 88 pcs.)

The signal name of I/O device and each unit address can be entered and mounted on each unit.

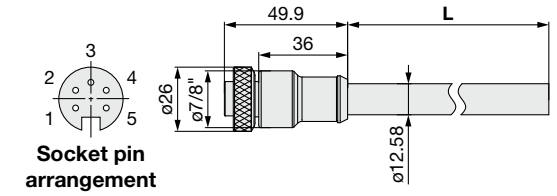
EX600-ZT1



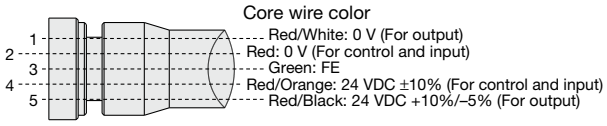
❼ Power Supply Cable (7/8 inch connector)

PCA-1558810 Straight 2 m
PCA-1558823 Straight 6 m
PCA-1558836 Right angled 2 m
PCA-1558849 Right angled 6 m

Straight connector type

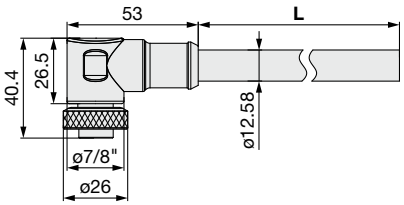


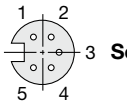
Socket pin arrangement



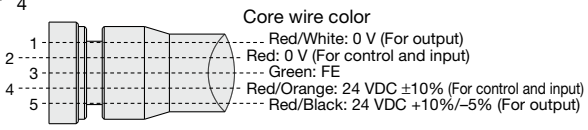
Connections

Angled connector type





Socket pin arrangement



Connections

Item	Specifications
Cable O.D.	ø12.58 mm
Conductor nominal cross section	1.5 mm²/AWG16
Wire O.D. (Including insulator)	2.35 mm
Min. bending radius (Fixed)	110 mm

❽ Power Supply Field-wireable Connector (7/8 inch)

PCA-1578081 Socket [compatible with AWG22-16]

Applicable Cable

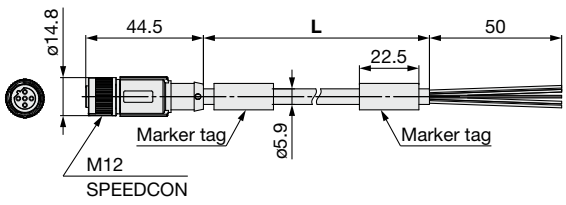
Item	Specifications
Cable O.D.	ø12.0 to 14.0 mm
Wire gauge (Stranded wire cross section)	0.34 to 1.5 mm² AWG22 to 16

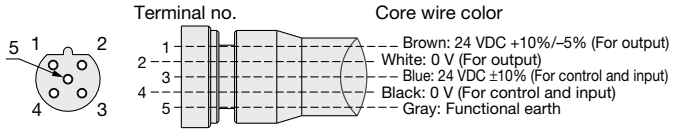
❾ Power Supply Cable (M12 connector, For EX600-ED2) * The shape of the M12 connector is B-coded (Reverse key).

PCA-1564927 Straight 2 m
PCA-1564930 Straight 6 m
PCA-1564943 Right angled 2 m
PCA-1564969 Right angled 6 m

SPEEDCON

Straight connector type

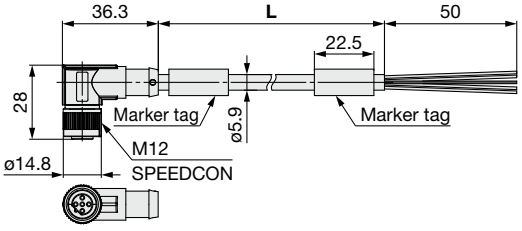


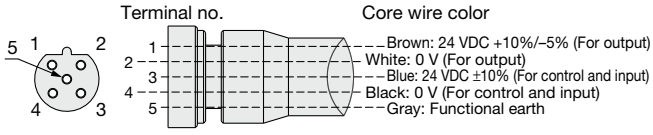


Socket connector pin arrangement
B-coded (Reverse key)

Connections

Angled connector type





Socket connector pin arrangement
B-coded (Reverse key)

Connections

Item	Specifications
Cable O.D.	ø5.9 mm
Conductor nominal cross section	0.34 mm²/AWG22
Wire O.D. (Including insulator)	1.27 mm
Min. bending radius (Fixed)	59 mm

⑩ Power Supply Cable (M12 connector, For EX600-ED4/5)

＊ The shape of the M12 connector is A-coded (Normal key).

EX500-AP 050 - S

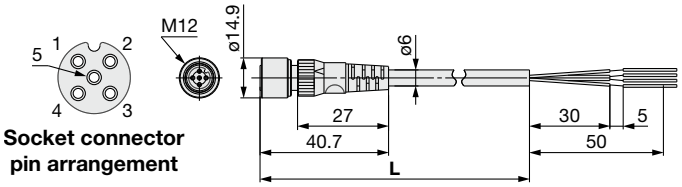
Cable length (L)

010	1000 mm
050	5000 mm

Connector specification

S	Straight
A	Angled

Straight connector type

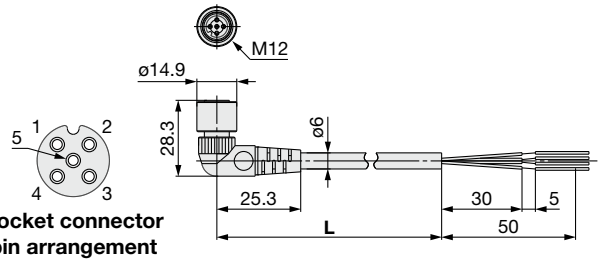


Socket connector pin arrangement

A-coded (Normal key)

Item	Specifications
Cable O.D.	ø6 mm
Nominal cross section	0.3 mm²/AWG22
Wire diameter (Including insulator)	1.5 mm
Min. bending radius	40 mm (Fixed)

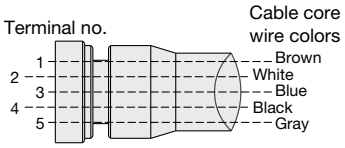
Angled connector type



Socket connector pin arrangement

A-coded (Normal key)

Item	Specifications
Cable O.D.	ø6 mm
Nominal cross section	0.3 mm²/AWG22
Wire diameter (Including insulator)	1.5 mm
Min. bending radius	40 mm (Fixed)



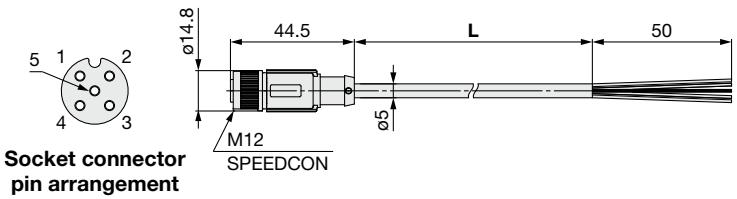
Connections

SPEEDCON

PCA- 1401804

Cable length (L)

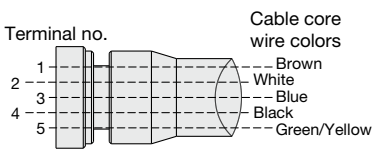
1401804	1500 mm
1401805	3000 mm
1401806	5000 mm



Socket connector pin arrangement

A-coded (Normal key)

Item	Specifications
Cable O.D.	ø5 mm
Nominal cross section	0.3 mm²/AWG22
Wire diameter (Including insulator)	1.27 mm
Min. bending radius	21.7 mm (Fixed)

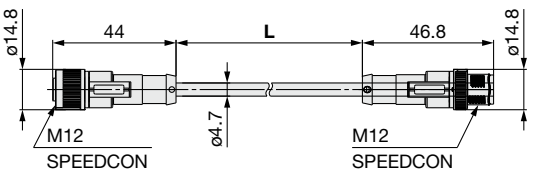


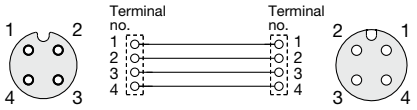
Connections

PCA- 1557769

Cable length (L)

1557769	3000 mm





Socket connector pin arrangement

A-coded (Normal key)

Connections

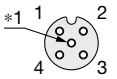
Plug connector pin arrangement

A-coded (Normal key)

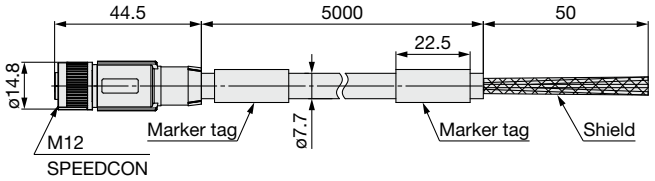
⓫ Communication Cable

For CC-Link

PCA-1567720
(Socket)

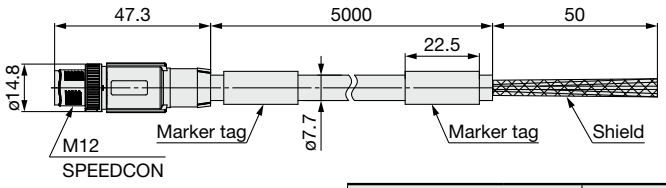


Socket connector pin arrangement
A-coded (Normal key)
∗1 Number of holes: 5,
Total number of pins: 4



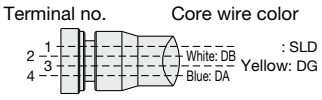
PCA-1567717
(Plug)

Plug connector pin arrangement
A-coded (Normal key)



Made to Order

Cable length	10000 mm	Web Catalog



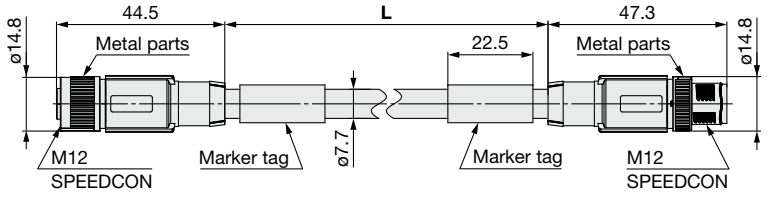
Connections

Item		Specifications
Cable O.D.		ø7.7 mm
Conductor nominal cross section	**Data pair**	0.5 mm²/AWG20
	Drain	0.34 mm²/AWG22
Wire O.D. (Including insulator)		2.55 mm
Min. bending radius (Fixed)		77 mm

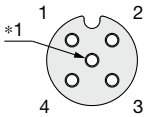
EX9-AC 005 MJ-SSPS (With connector on both sides (Socket/Plug))

Cable length (L)

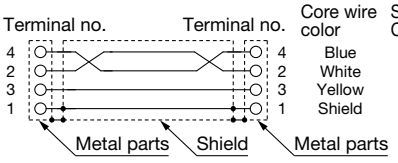
005	500 mm
010	1000 mm
020	2000 mm
030	3000 mm
050	5000 mm
100	10000 mm



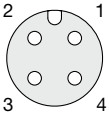
Item		Specifications
Cable O.D.		ø7.7 mm
Conductor nominal cross section	**Data pair**	0.5 mm²/AWG20
	Drain	0.34 mm²/AWG22
Wire O.D. (Including insulator)		2.55 mm
Min. bending radius (Fixed)		77 mm



Socket connector pin arrangement
A-coded (Normal key)
∗1 Number of holes: 5,
Total number of pins: 4



Connections

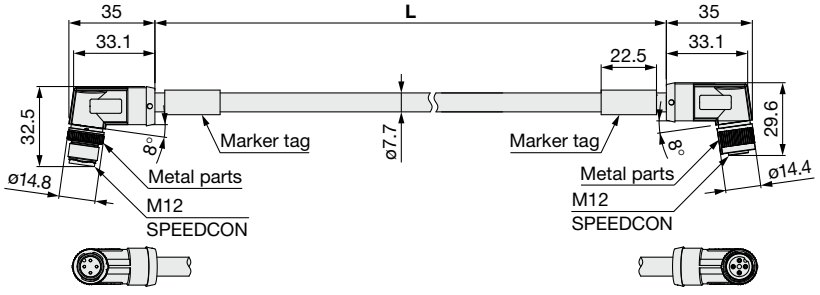


Plug connector pin arrangement
A-coded (Normal key)

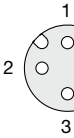
EX9-AC 005 MJ-SAPA (With angled connector on both sides (Socket/Plug))

Cable length (L)

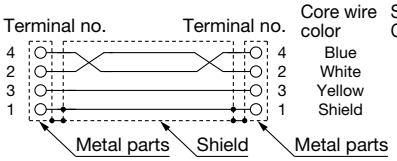
005	500 mm
010	1000 mm
020	2000 mm
030	3000 mm
050	5000 mm
100	10000 mm



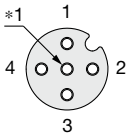
Item		Specifications
Cable O.D.		ø7.7 mm
Conductor nominal cross section	**Data pair**	0.5 mm²/AWG20
	Drain	0.34 mm²/AWG22
Wire O.D. (Including insulator)		2.55 mm
Min. bending radius (Fixed)		77 mm



Plug connector pin arrangement
A-coded (Normal key)



Connections

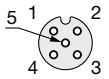


Socket connector pin arrangement
A-coded (Normal key)
∗1 Number of holes: 5,
Total number of pins: 4

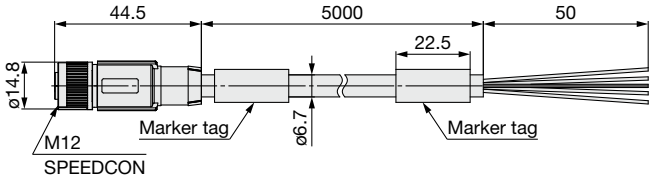
⓫ Communication Cable

For DeviceNet®

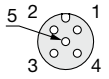
PCA-1557633
(Socket)



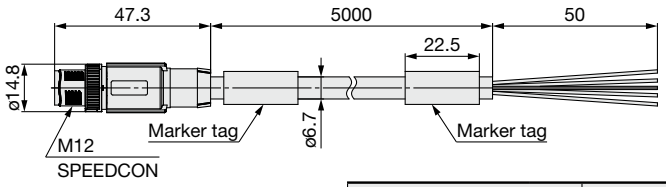
Socket connector pin arrangement A-coded (Normal key)

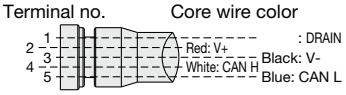


PCA-1557646
(Plug)



Plug connector pin arrangement A-coded (Normal key)





Connections

Item		Specifications
Cable O.D.		ø6.7 mm
Conductor nominal cross section	Power pair	0.34 mm²/AWG22
	Data pair	0.25 mm²/AWG24
Wire O.D. (Including insulator)	Power pair	1.4 mm
	Data pair	1.95 mm
Min. bending radius (Fixed)		67 mm

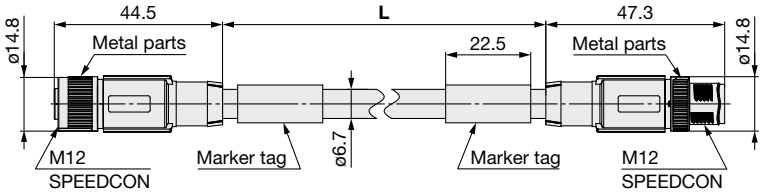
Made to Order

Cable length	10000 mm	Web Catalog

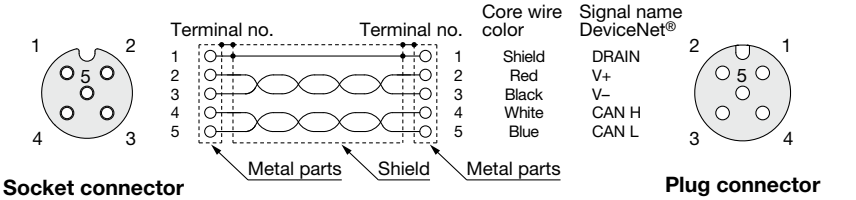
EX9-AC 005 DN-SSPS (With connector on both sides (Socket/Plug))

Cable length (L)

005	500 mm
010	1000 mm
020	2000 mm
030	3000 mm
050	5000 mm
100	10000 mm



Item		Specifications
Cable O.D.		ø6.7 mm
Conductor nominal cross section	Power pair	0.34 mm²/AWG22
	Data pair	0.25 mm²/AWG24
Wire O.D. (Including insulator)	Power pair	1.4 mm
	Data pair	1.95 mm
Min. bending radius (Fixed)		67 mm



Socket connector pin arrangement A-coded (Normal key)

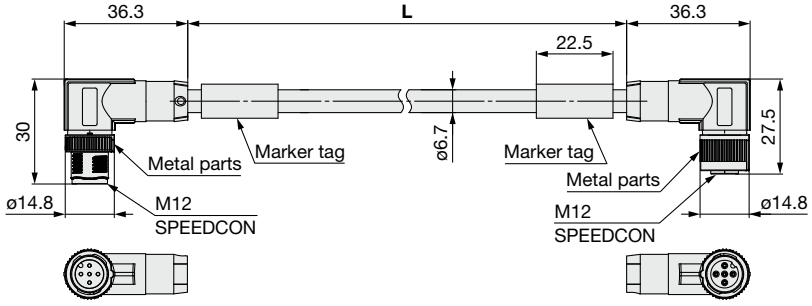
Connections

Plug connector pin arrangement A-coded (Normal key)

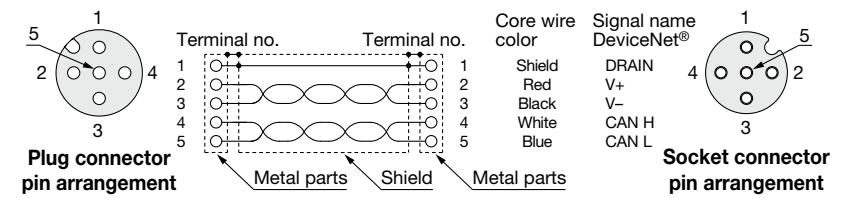
EX9-AC 005 DN-SAPA (With angled connector on both sides (Socket/Plug))

Cable length (L)

005	500 mm
010	1000 mm
020	2000 mm
030	3000 mm
050	5000 mm
100	10000 mm



Item		Specifications
Cable O.D.		ø6.7 mm
Conductor nominal cross section	Power pair	0.34 mm²/AWG22
	Data pair	0.25 mm²/AWG24
Wire O.D. (Including insulator)	Power pair	1.4 mm
	Data pair	1.95 mm
Min. bending radius (Fixed)		67 mm



Plug connector pin arrangement A-coded (Normal key)

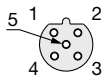
Connections

Socket connector pin arrangement A-coded (Normal key)

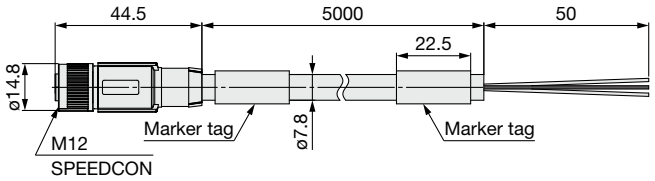
⓫ Communication Cable

For PROFIBUS DP

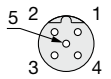
PCA-1557688
(Socket)



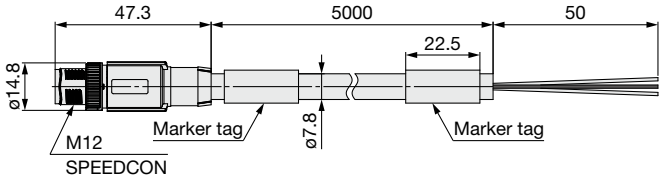
Socket connector pin arrangement B-coded (Reverse key)

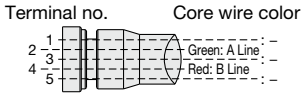


PCA-1557691
(Plug)



Plug connector pin arrangement B-coded (Reverse key)





Shield line is connected to the knurl.
Connections

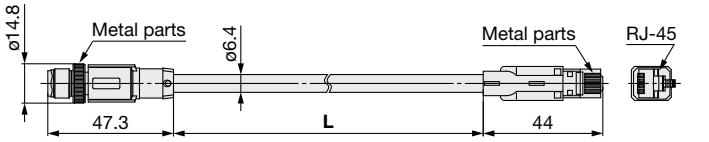
Item	Specifications
Cable O.D.	ø7.8 mm
Conductor nominal cross section	0.34 mm²/AWG22
Wire O.D. (Including insulator)	2.55 mm
Min. bending radius (Fixed)	78 mm

For EtherCAT® For PROFINET For EtherNet/IP™

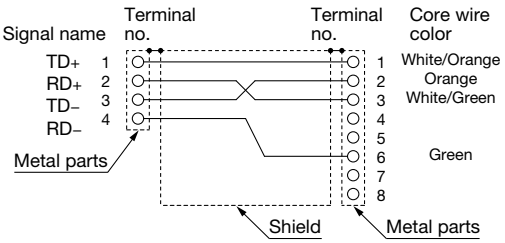
EX9-AC 020 EN-PSRJ (Plug/RJ-45 connector)

Cable length (L)

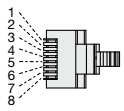
010	1000 mm
020	2000 mm
030	3000 mm
050	5000 mm
100	10000 mm



Plug connector pin arrangement D-coded



Connections (Straight cable)

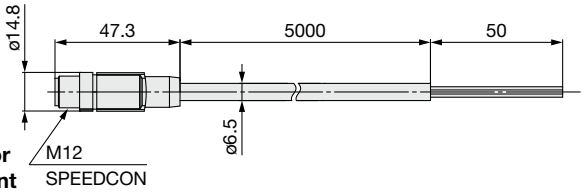


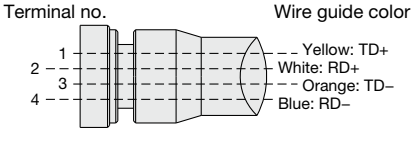
Plug connector pin arrangement

Item	Specifications
Cable O.D.	ø6.4 mm
Conductor nominal cross section	0.14 mm²/AWG26
Wire O.D. (Including insulator)	0.98 mm
Min. bending radius (Fixed)	26 mm

PCA-1446566 (Plug)

Plug connector pin arrangement D-coded





Connections

Item	Specifications
Cable O.D.	ø6.5 mm
Conductor nominal cross section	AWG22
Wire O.D. (Including insulator)	1.55 mm
Min. bending radius (Fixed)	45.5 mm

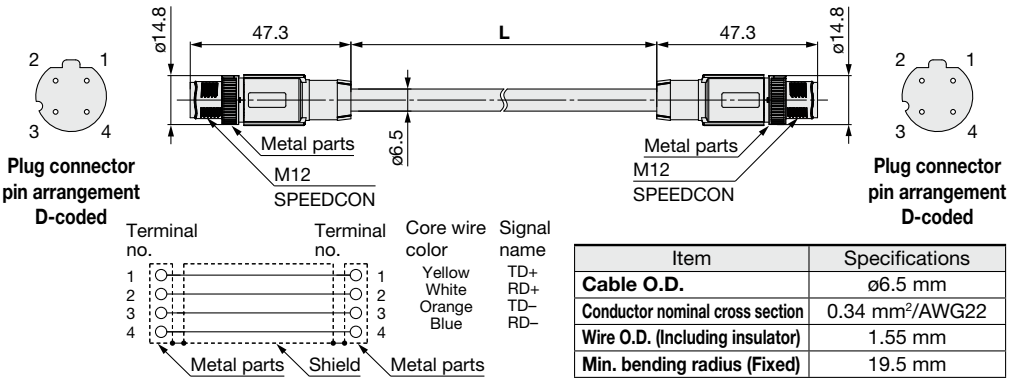
⓫ Communication Cable

For EtherCAT® **For PROFINET** **For EtherNet/IP™**

EX9-AC 005 EN-PSPS (With connector on both sides (Plug/Plug))

Cable length (L)

005	500 mm
010	1000 mm
020	2000 mm
030	3000 mm
050	5000 mm
100	10000 mm



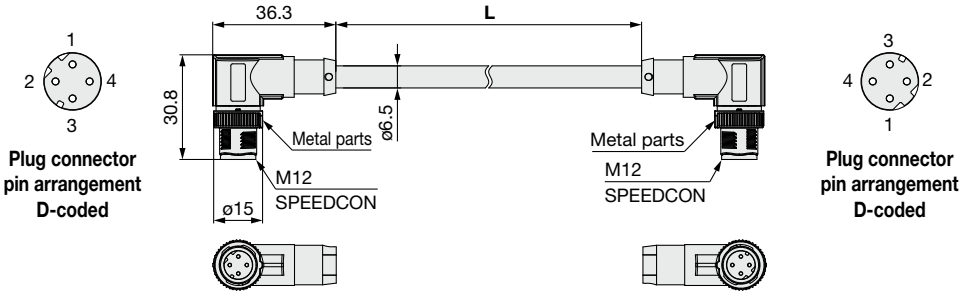
Connections (Straight cable)

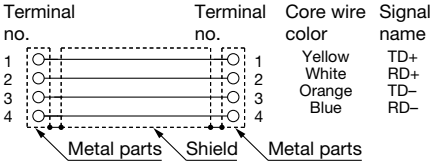
Item	Specifications
Cable O.D.	ø6.5 mm
Conductor nominal cross section	0.34 mm²/AWG22
Wire O.D. (Including insulator)	1.55 mm
Min. bending radius (Fixed)	19.5 mm

EX9-AC 005 EN-PAPA (With angled connector on both sides (Plug/Plug))

Cable length (L)

005	500 mm
010	1000 mm
020	2000 mm
030	3000 mm
050	5000 mm
100	10000 mm





Connections (Straight cable)

Item	Specifications
Cable O.D.	ø6.5 mm
Conductor nominal cross section	0.34 mm²/AWG22
Wire O.D. (Including insulator)	1.55 mm
Min. bending radius (Fixed)	19.5 mm

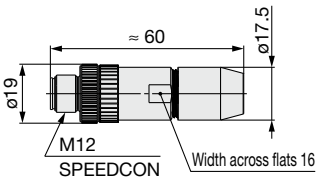
⑫ Field-wireable Communication Connector

Plug

For CC-Link **For DeviceNet®**

PCA-1075526 PCA-1075528

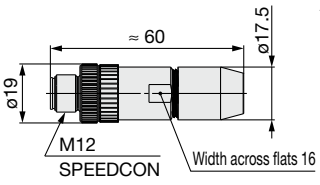
A-coded (Normal key)



For PROFIBUS DP

PCA-1075530

B-coded (Reverse key)



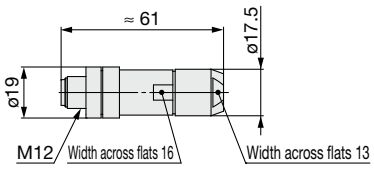
Applicable Cable

Item	Specifications
Cable O.D.	4.0 to 8.0 mm
Wire gauge (Stranded wire cross section)	0.14 to 0.75 mm²/AWG26 to 18 (Solid cable/Flexible cable) 0.08 to 0.5 mm²/AWG28 to 20 (With ferrule)

For EtherCAT® **For PROFINET** **For EtherNet/IP™**

PCA-1446553

D-coded



Applicable Cable

Item	Specifications
Cable O.D.	4.0 to 8.0 mm
Wire gauge (Stranded wire cross section)	0.14 to 0.34 mm²/AWG26 to 22

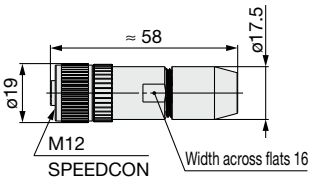
* The table above shows the specifications for the applicable cable. Adaptation for the connector may vary on account of the conductor construction of the electric wire.

Socket

For CC-Link **For DeviceNet®**

PCA-1075527 PCA-1075529

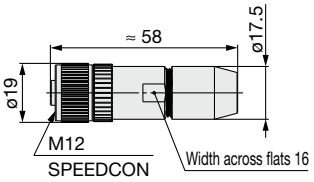
A-coded (Normal key)



For PROFIBUS DP

PCA-1075531

B-coded (Reverse key)



Applicable Cable

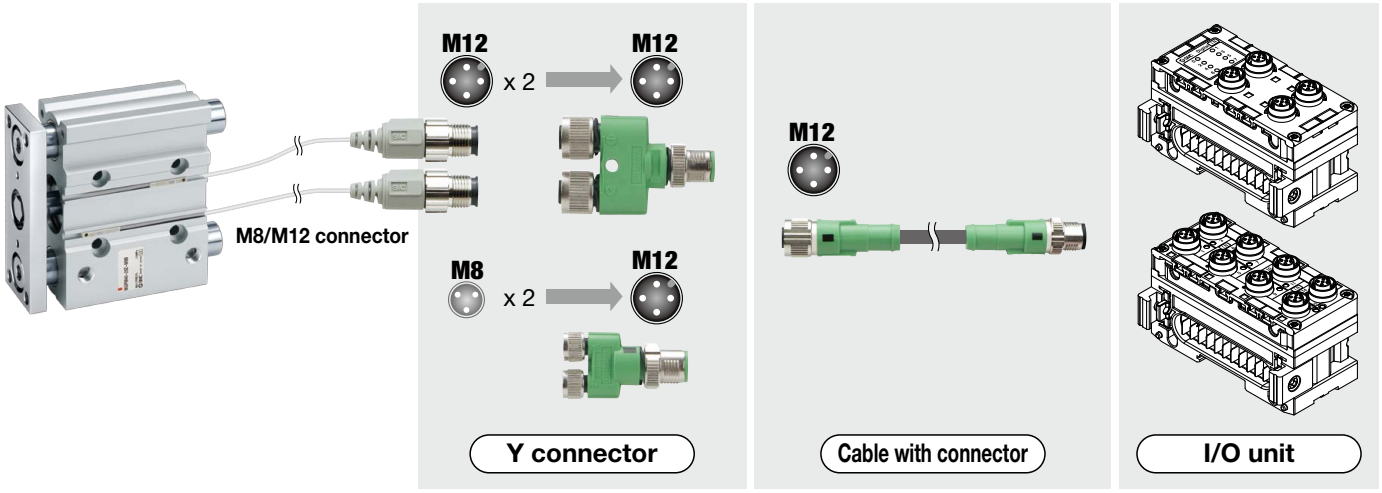
Item	Specifications
Cable O.D.	4.0 to 8.0 mm
Wire gauge (Stranded wire cross section)	0.14 to 0.75 mm²/AWG26 to 18 (Solid cable/Flexible cable) 0.08 to 0.5 mm²/AWG28 to 20 (With ferrule)

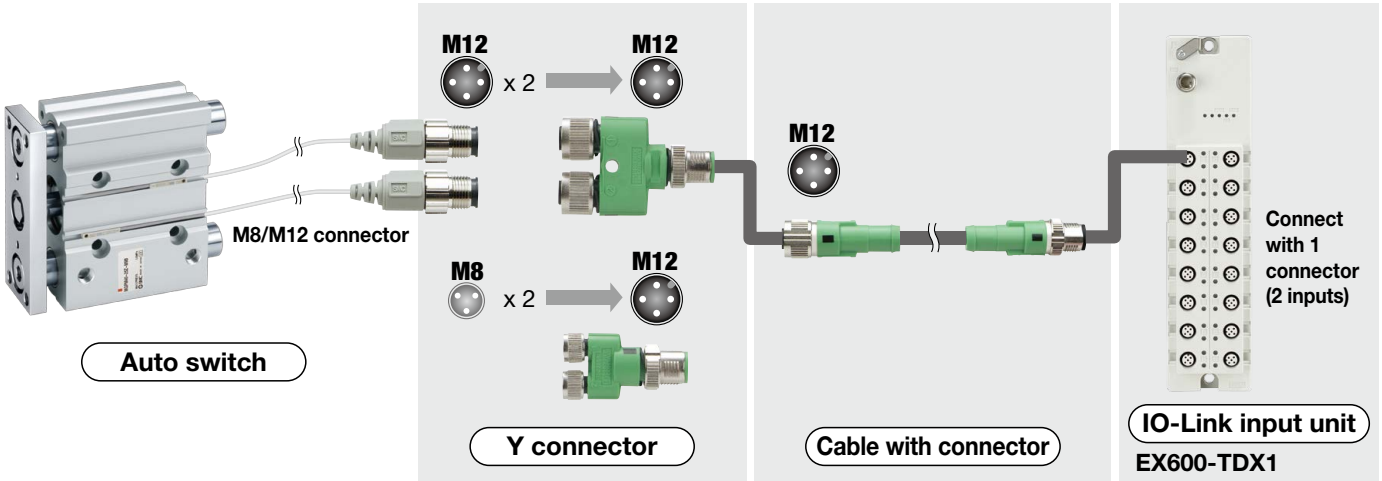
⓭ I/O Cable with Connector, I/O Connector

For details, refer to the **Web Catalog**.

Name	Use	Part no.	Description
Cable with connector	For sensor 	**PCA-1557769**	Cable with M12 connector (4 pins/3 m)
		PCA-1557772	Cable with M8 connector (3 pins/3 m)
Field-wireable connector	For sensor 	**PCA-1557730**	Field-wireable connector (M8/3 pins/Plug/Piercecon® connection)
		PCA-1557743	Field-wireable connector (M12/4 pins/Plug/QUICKON-ONE connection/SPEEDCON)
		PCA-1557756	
Y connector	For sensor 	**PCA-1557785**	Y connector (2 x M12 (5 pins)-M12 (5 pins)/SPEEDCON)
		PCA-1557798	Y connector (2 x M8 (3 pins)-M12 (4 pins)/SPEEDCON)

* When using the Y connector, connect it to the connector on the I/O unit through the sensor cable (PCA-1557769) with the M12 connector.





Ex.: Set the auto switch on the cylinder rod side to IN2 on the IO-Link input unit, and set the auto switch on the cylinder head side to IN3 on the IO-Link input unit.
⇒ An abnormality is detected when both auto switches turn ON simultaneously.

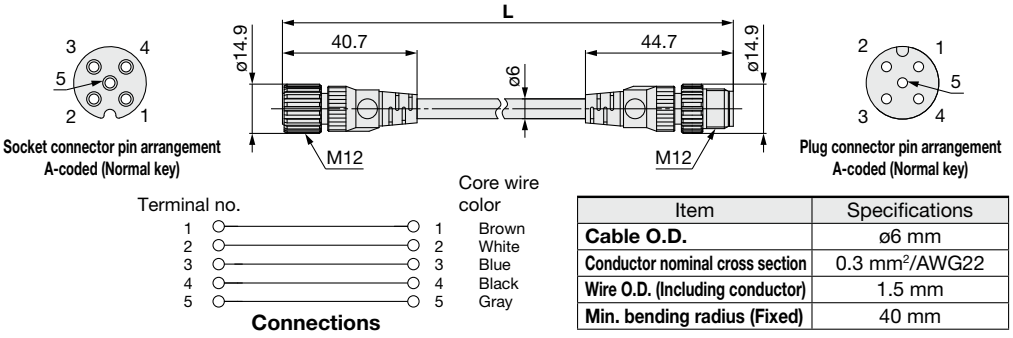
⓭ I/O Cable with Connector, I/O Connector

For IO-Link Cable

EX9-AC 005 -SSPS (With connector on both sides (Socket/Plug))

Cable length (L)

005	500 mm
010	1000 mm
020	2000 mm
030	3000 mm
050	5000 mm
100	10000 mm

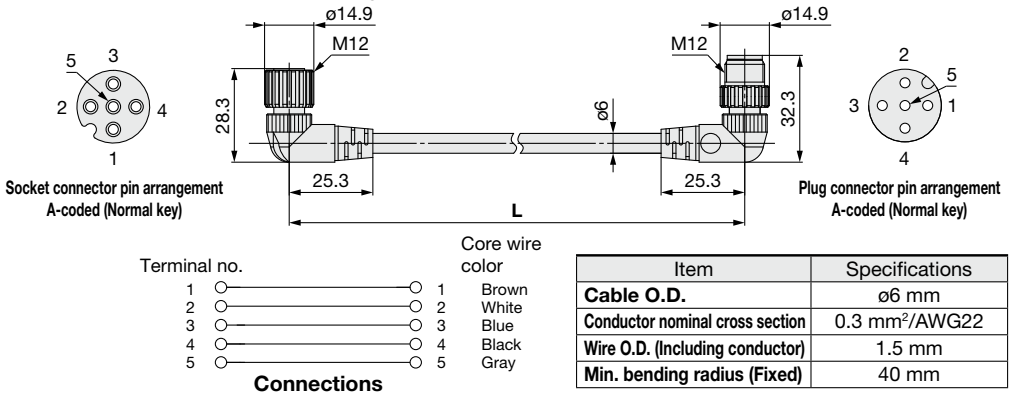


Item	Specifications
Cable O.D.	ø6 mm
Conductor nominal cross section	0.3 mm²/AWG22
Wire O.D. (Including conductor)	1.5 mm
Min. bending radius (Fixed)	40 mm

EX9-AC 005 -SAPA (With connector on both sides (Socket/Plug))

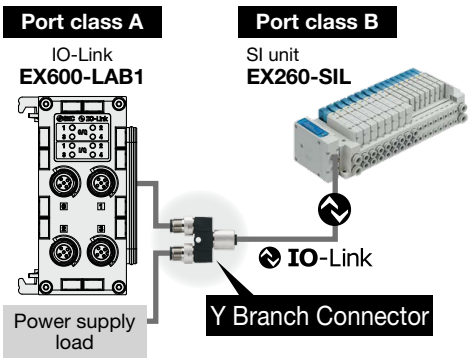
Cable length (L)

005	500 mm
010	1000 mm
020	2000 mm
030	3000 mm
050	5000 mm
100	10000 mm



Item	Specifications
Cable O.D.	ø6 mm
Conductor nominal cross section	0.3 mm²/AWG22
Wire O.D. (Including conductor)	1.5 mm
Min. bending radius (Fixed)	40 mm

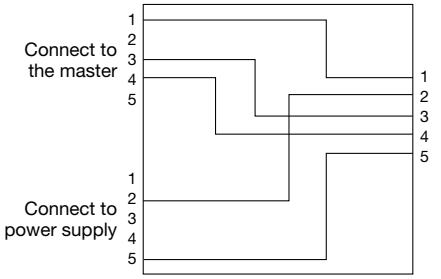
Port Class B EX260-SIL SI Unit and Port Class A IO-Link Master Connection Example



Port class A compliant

A special wiring Y branch connector is available.

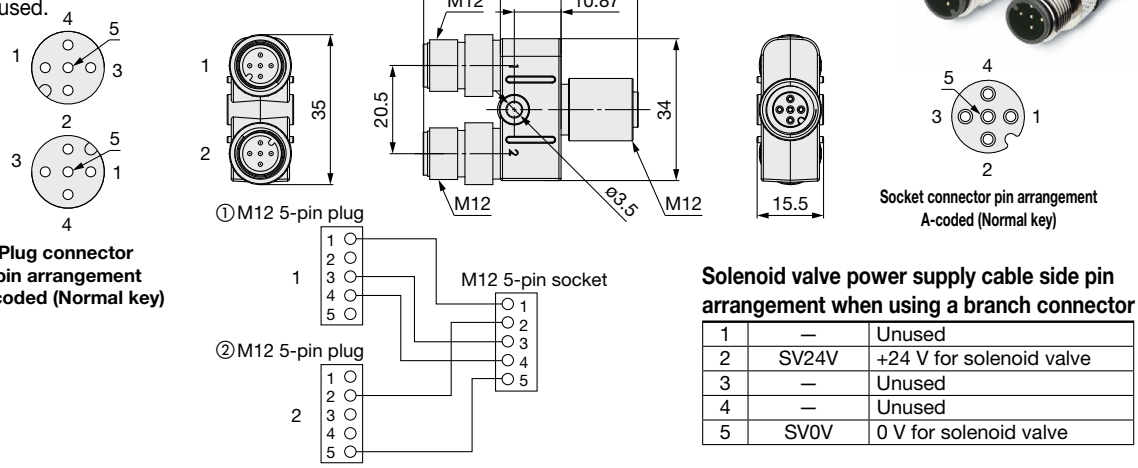
Used when connecting to a port class A type IO-Link master, which is often used when connecting to an IO-Link sensor



Y Branch Connector for IO-Link

This connector is used to supply power to the valve manifold by branching the IO-Link communication cable in cases where a port class A IO-Link master is used.

EX9-ACY02-S



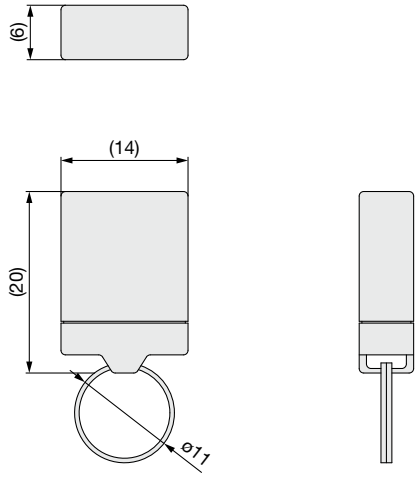
Solenoid valve power supply cable side pin arrangement when using a branch connector

1	—	Unused
2	SV24V	+24 V for solenoid valve
3	—	Unused
4	—	Unused
5	SV0V	0 V for solenoid valve

⓮ IO-Link Device Tool License Key

USB dongle

EX9-ZSW-LDT1



* The IO-Link Device Tool V5-PE (V5 or later only) manufactured by TMG is required for setting IO-Link devices.
The IO-Link Device Tool can be downloaded for free from TMG's website. However, to use it for more than 30 days, a license key for the IO-Link Device Tool is required.

EX600 Series
Specific Product Precautions

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For fieldbus system precautions, refer to the "Operation Manual" on the SMC website: https://www.smcworld.com

Mounting

⚠ Caution

1. When handling and assembling units, do not touch the sharp metal parts of the connector or plug.

2. When connecting six stations or more, be sure to use the intermediate reinforcing brace (EX600-ZMB1 or EX600-ZMB2).

Operating Environment

⚠ Caution

1. Select the proper type of enclosure according to the operating environment.

IP65/67 is achieved when the following conditions are met.

1) Provide appropriate wiring between all units using electrical wiring cables, communication connectors and cables with M12 connectors.

2) Appropriately mount each unit and valve manifold.

3) Be sure to mount a seal cap on any unused connectors.

If using in an environment that is exposed to water splashes, please take measures such as using a cover.

When the enclosure is IP40, do not use in an operating environment or atmosphere where it may come in contact with corrosive gas, chemical agents, seawater, water, or water vapor.

When connected to the EX600-D□□E or EX600-D□□F, manifold enclosure is IP40.

Also, the handheld terminal conforms to IP20, so prevent foreign matter from entering inside, and water, solvent or oil from coming in direct contact with it.

Adjustment / Operation

⚠ Warning

<Handheld Terminal>

1. Do not apply pressure to the LCD.

There is a possibility of the crack of LCD and injuring.

2. The forced input/output function is used to change the signal status forcibly. When operating this function, be sure to check the safety of the surroundings and installation.

This may cause injuries or equipment damage.

3. Incorrect setting of parameters can cause a malfunction. Be sure to check the settings before use.

This may cause injuries or equipment damage.

⚠ Caution

<Handheld Terminal>

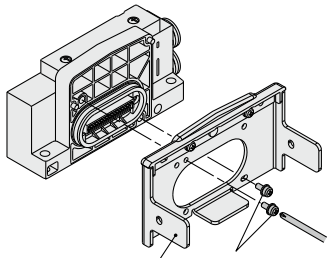
1. Do not press the setting buttons with a sharp pointed object.

This may cause damage or equipment failure.

2. Do not apply excessive load and impact to the setting buttons.

This may cause damage, equipment failure or malfunction.

When the order does not include the SI unit, a valve plate which connects the manifold and SI unit, is not mounted. Use attached valve holding screws and mount the valve plate.
(Tightening torque: 0.6 to 0.7 N·m)



Screw tightened parts
- SV series: 2 places
- S0700 series: 2 places
- VQC1000 series: 2 places
- VQC2000 series: 3 places
- VQC4000 series: 4 places
- VQC5000 series: 4 places
- SY series: 2 places
- JSY series: 2 places
- ZK2□A series: 2 places

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

⚠ Danger : **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

⚠ Warning: **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ Caution: **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

*1) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1:Robots
etc.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/ equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. SMC products cannot be used beyond their specifications. They are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not allowed.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, combustion equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

⚠ Caution

SMC develops, designs, and manufactures products to be used for automatic control equipment, and provides them for peaceful use in manufacturing industries.
Use in non-manufacturing industries is not allowed.
Products SMC manufactures and sells cannot be used for the purpose of transactions or certification specified in the Measurement Act of each country. The new Measurement Act prohibits use of any unit other than SI units in Japan.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) **Suction cups (Vacuum pads) are excluded from this 1 year warranty.**
A suction cup (vacuum pad) is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the suction cup (vacuum pad) or failure due to the deterioration of rubber material are not allowed by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Revision History

Edition B	* The EtherNet/IP™ communication protocol has been added.	
	* An analog output unit and an input/output unit have been added.	
	* A D-sub connector and a spring type terminal block have been added.	
	* SY3000/5000 series valves have been added as applicable solenoid valves.	
	* Number of pages has been decreased from 64 to 60.	OW
Edition C	* The EtherCAT® communication protocol has been added.	PX
Edition D	* The PROFINET communication protocol has been added.	RS
Edition E	* A dual port EtherNet/IP™ product has been added.	
	* SY7000 series valves have been added as applicable solenoid valves.	TS
Edition F	* The IO-Link unit has been added.	
	* JSY series valves have been added as connectable valves.	
	* The "How to Order" and "Dimensions" pages of the connectable valves have been deleted.	
	* An end plate (D side) and M12 (4/5 pins) A-coded power supply connectors have been added.	
	* Number of pages has been decreased from 68 to 48.	YT
Edition G	* An IO-Link compatible SI unit has been added (PROFINET).	ZR
Edition H	* An IO-Link compatible terminal unit has been added.	
	Number of pages has been increased from 48 to 56.	

⚠ Safety Instructions Be sure to read the "Handling Precautions for SMC Products" (M-E03-3) and "Operation Manual" before use.

SMC Corporation https://www.smcworld.com