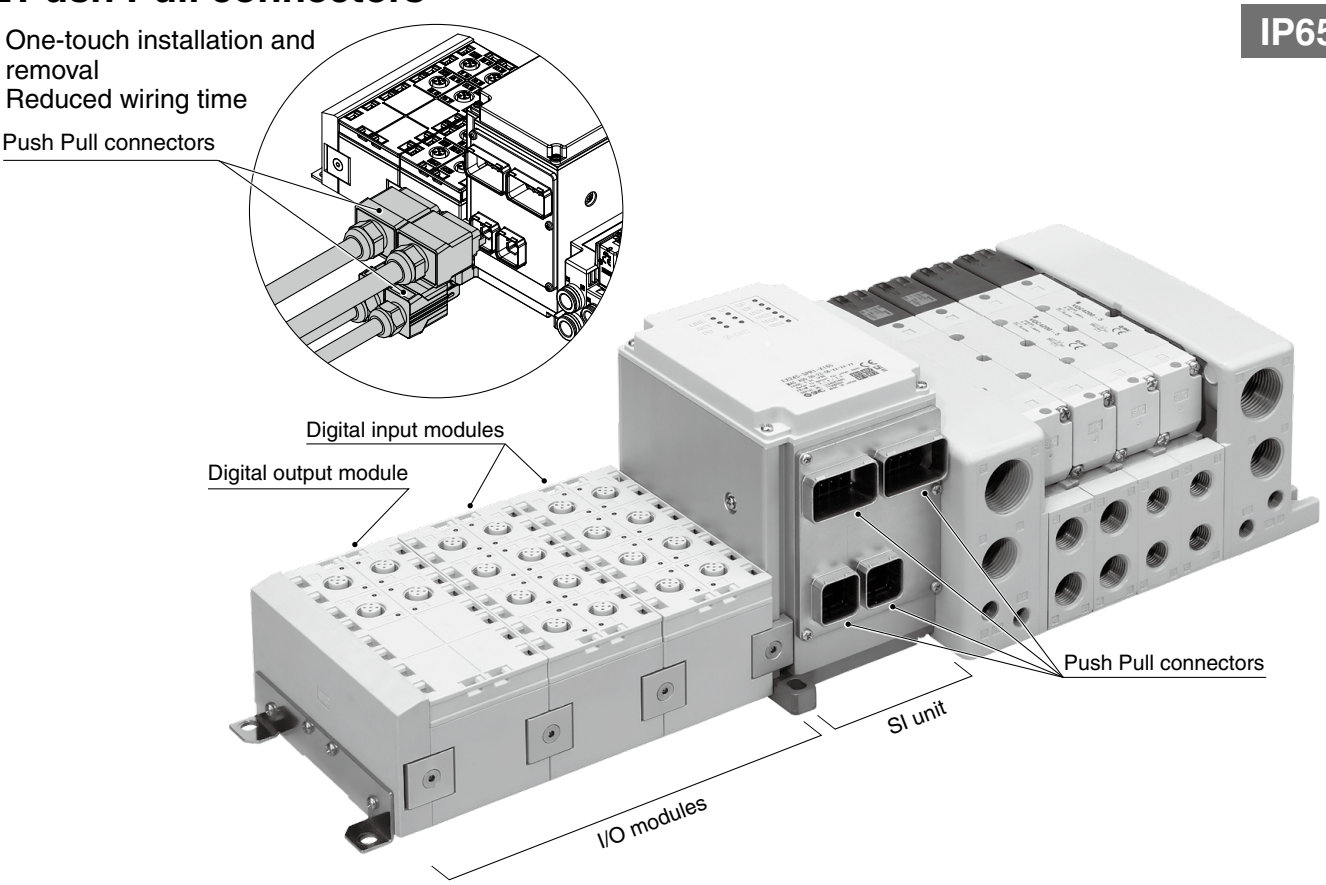
Fieldbus System (For Input/Output)

EX245 Series

■ AIDA*1 specifications compliant
■ Push Pull connectors

- One-touch installation and removal
- Reduced wiring time



∗1 Abbreviation of the Automation Initiative of German (Deutschland) Automobile Manufacturers

■ Compatible Protocols

PROFINET®

Made to Order INTERBUS

- SCRJ connector
- RJ45 connector

■ Modules can be combined flexibly.

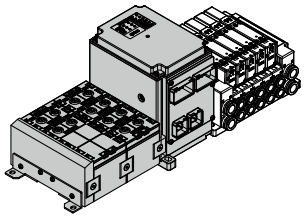
- Number of valves, digital inputs/outputs

Solenoid valve	Max. 32 valves
Digital input	Max. 128 inputs
Digital output	Max. 64 outputs

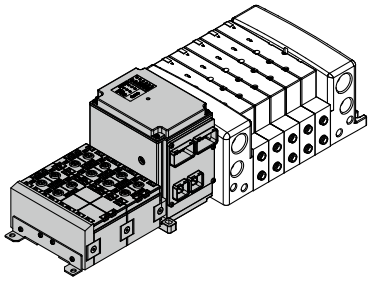
- I/O modules can be connected and removed one by one.
- Up to 8 modules can be connected in any order.

Manifold Solenoid Valves

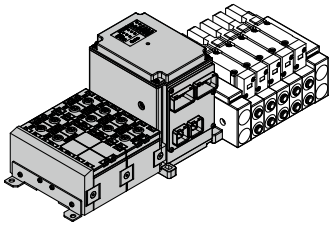
SY3000/5000/7000



VQC1000/2000/4000/5000



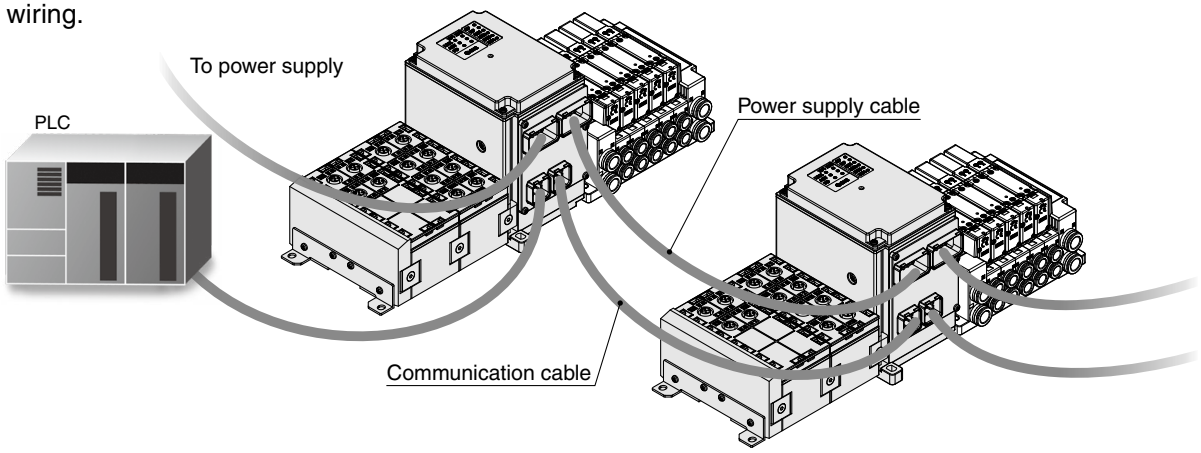
SV1000/2000/3000



∗ These products should be ordered separately.

Dual communication and dual power connectors

Dual communication connectors allow daisy chain or ring topology for Media Redundancy Protocol (MRP).
Dual power connectors allow for daisy chain connections avoiding branch or splitter adapters, saving cost and reducing wiring.

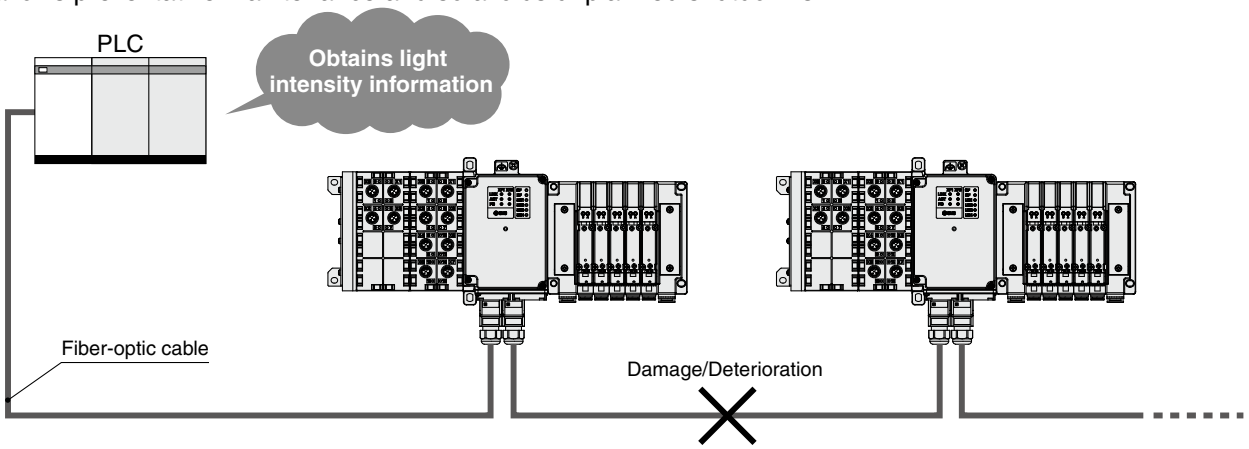


An external branch connector is not necessary. Reduced wiring space
Easy to use one touch AIDA Push Pull connectors (compliant with AIDA specifications) saves time when installing and maintaining.

Fiber-optic cable maintenance alarm*1

*1 Only available to the EX245-SPN1

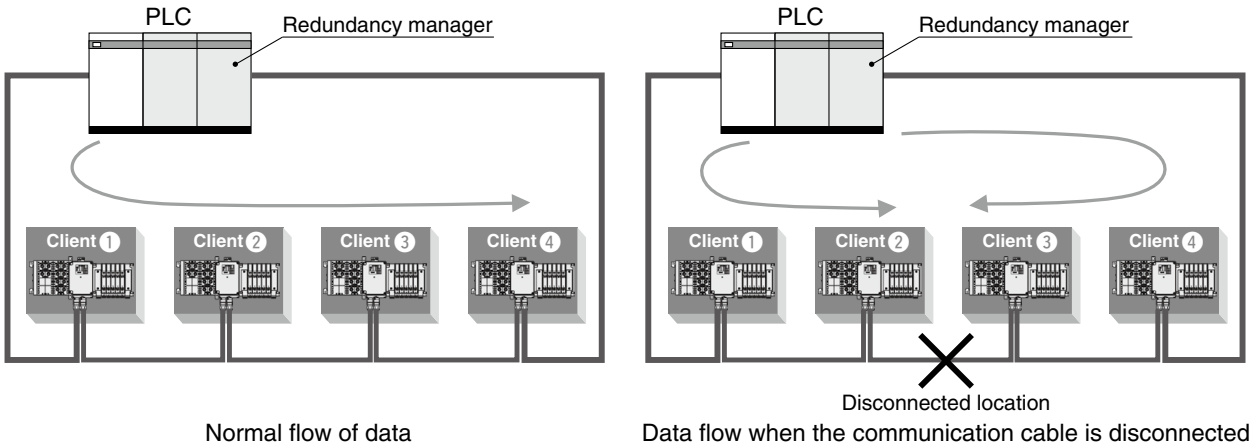
This feature continuously monitors the received light intensity from the fiber-optic cable and reports it to the PLC.
Any loss of intensity is an indicator of damage to the cable so may give a warning before communication is lost.
This allows preventative maintenance and so avoids unplanned shutdowns.



MRP function (Ring wiring)

MRP (Media Redundancy Protocol) function:
Even if a communication cable is disconnected or damaged at any location, **communication can be continued**. **The cable segment that is causing the problem is identified** allowing quick and easy replacement.

To use the MRP function, the PLC should be able to support the MRP function.



Normal flow of data

Data flow when the communication cable is disconnected

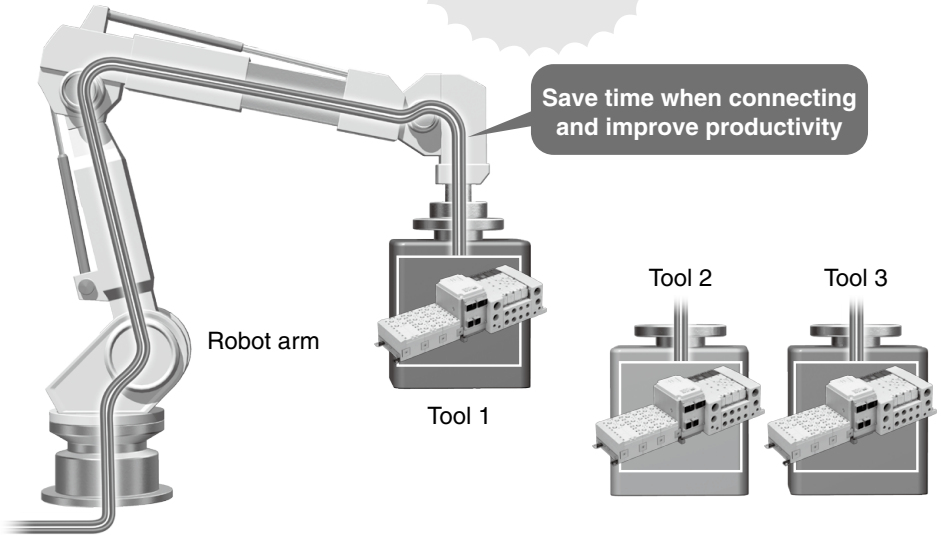
Fast Start Up function

For the Fast Start Up function, time from power ON to communication connection

Approx. 10 sec. → **Approx. 0.5 sec.**

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. For products which support the Fast Start Up function, communication can be operational even faster.

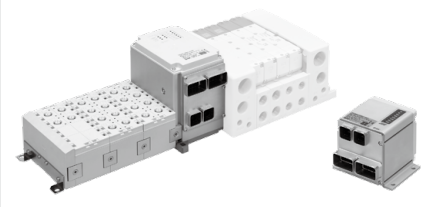
* **To use the Fast Start Up function, the PLC should be able to support the Fast Start Up function.**



CONTENTS

Type 3 **Integrated input-output type**

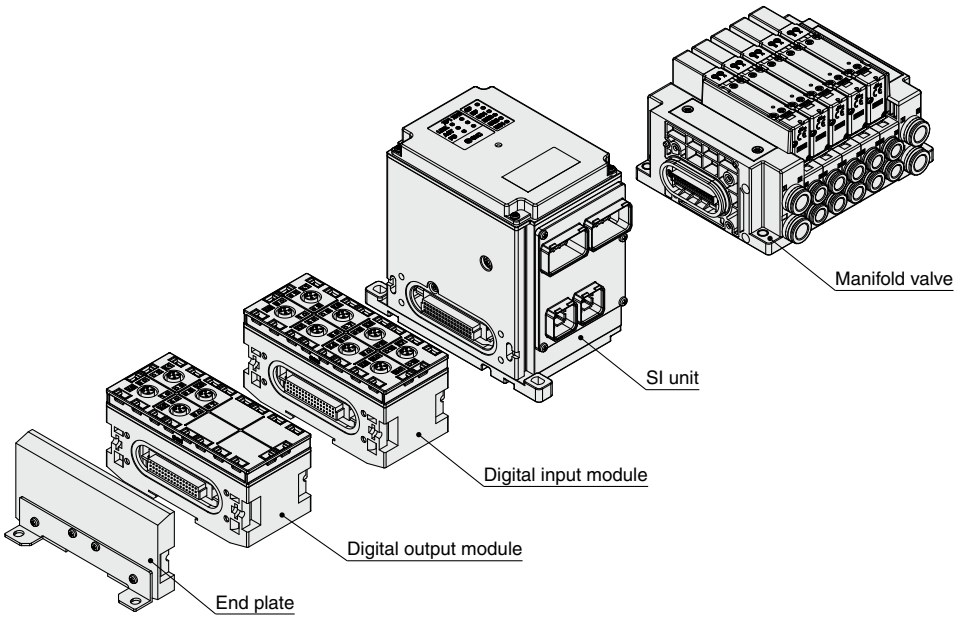
Fieldbus System (For Input/Output)
EX245 Series



Made to Order

Fieldbus System For Input/Output
EX245 Series

Construction



How to Order

SI Unit

EX245 – SPN1

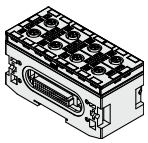
● **SI unit specification**

Model	Protocol	Max. number of modules	Max. number of digital inputs	Max. number of digital outputs	Communication connector	Power connector
SPN1	PROFINET	8	128	64	Push Pull connector (SCRJ): 2 pcs.	Push Pull connector (24 V): 2 pcs.
SPN2					Push Pull connector (RJ45): 2 pcs.	Push Pull connector (24 V): 2 pcs.

Made to Order **Made to Order**
➡ p. 141

Digital Input Module

EX245 – DX1

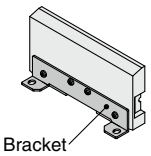


● **Digital input module specification**

DX1	Digital input (16 inputs)

End Plate

EX245 – EA2 – 1

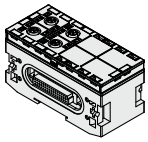


● **Bracket**

1	With bracket
2	Without bracket

Digital Output Module

EX245 – DY1



● **Digital output module specification**

DY1	Digital output (8 outputs)

∗ Please contact SMC for manifold valve part numbers.

Specifications

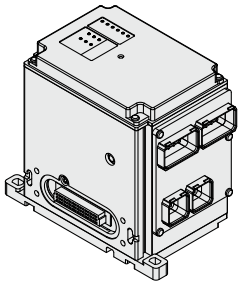
Common Specifications for All Units/Modules

Item	Specifications
Operating temperature range	Operating: −10 to 50°C, Stored: −20 to 60°C (No condensation)
Operating humidity range	Operating, Stored: 35 to 85%RH (No condensation)
Withstand voltage	500 VAC for 1 minute between external terminals and FE
Insulation resistance	500 VDC, 10 MΩ or more between external terminals and FE
Enclosure	IP65 (Manifold assembly, With seal cap)
Standards	CE marking (EMC directive/RoHS directive)

SI Unit Specifications

Model			EX245-SPN1	EX245-SPN2
Communication	**Protocol**		PROFINET	
	Device type		PROFINET IO	
	Communication speed		100 Mbps full duplex	
	Configuration file∗1		GSD file	
	Applicable function		MRP Fast Start Up	
			Fiber-optic cable maintenance alarm	—
Electrical	**Internal current consumption (US1)**		300 mA or less	250 mA or less
	Loop through current between power connector		10 A	
	Operating voltage/ Max. current	**US1**	24 VDC +20%, −15%/6 A	
		US2	24 VDC +20%, −15%/4 A	
Output	**Output type**		Source/PNP (Negative common)	
	Number of outputs		32 outputs	
	Load		Solenoid valve with surge voltage suppressor of 24 VDC, 1 W or less (SMC)	
	Power supply		24 VDC, 2 A	
	Fail safe		HOLD/CLEAR/Forced power ON	
	Protection		Short-circuit protection	
General	**Max. number of modules**		8	
	Max. number of digital inputs		128	
	Max. number of digital outputs		64	
	Weight		1000 g	

∗1 The setting file can be downloaded from the SMC website, https://www.smcworld.com

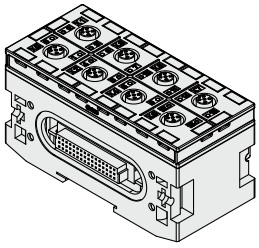


EX245-SPN1/SPN2

Digital Input Module

Model		EX245-DX1
Input	**Input type**	PNP
	Input connector	M12 (5-pin) socket∗1
	Number of inputs	16 inputs
	Supplied voltage	24 VDC
	Max. supplied current	0.5 A/Connector, 2 A/Module
	Protection	Short-circuit protection
	Input current (at 24 VDC)	Typ. 4.5 mA
	ON voltage	11 to 30 V
	OFF voltage	−3 to 5 V
Internal current consumption		50 mA or less
Weight		280 g

∗1 An M12 (4-pin) connector can also be connected.

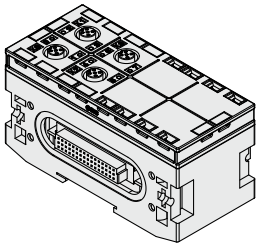


EX245-DX1

Digital Output Module

Model		EX245-DY1
Output	**Output type**	PNP
	Output connector	M12 (5-pin) socket∗1
	Number of outputs	8 outputs
	Supplied voltage	24 VDC
	Max. load current	0.5 A/Output, 2 A/Module
	Protection	Short-circuit protection
Current consumption		50 mA or less
Weight		280 g

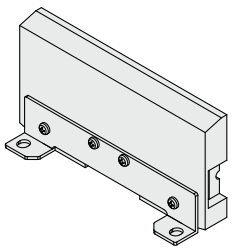
∗1 An M12 (4-pin) connector can also be connected.



EX245-DY1

End Plate

Model	EX245-EA2-1	EX245-EA2-2
Bracket	Yes	No
Weight	200 g	150 g

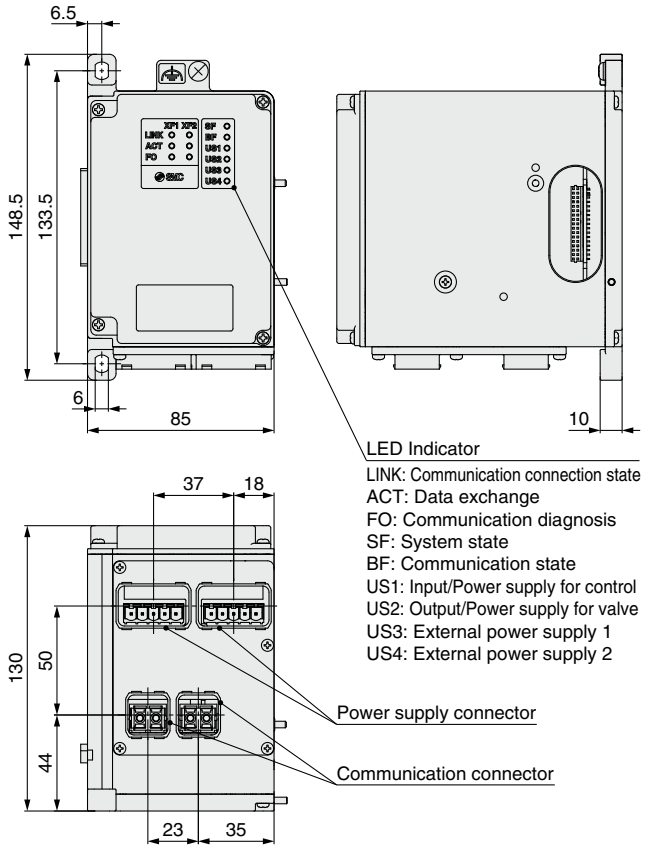


EX245-EA2-□

Dimensions/Parts Description

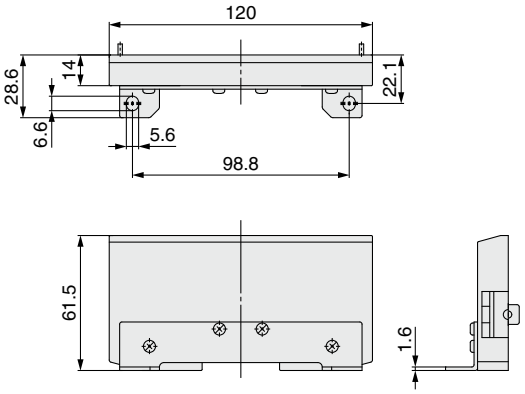
SI Unit

EX245-SPN1

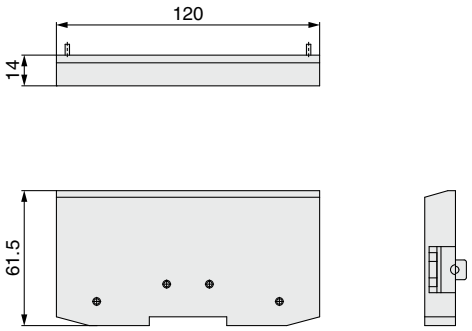


End Plate

EX245-EA2-1

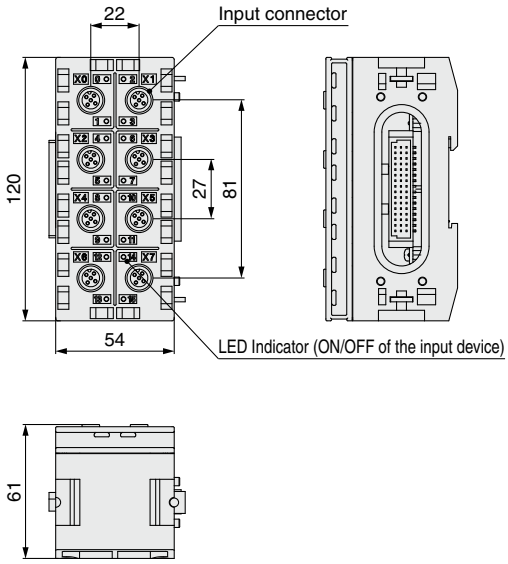


EX245-EA2-2



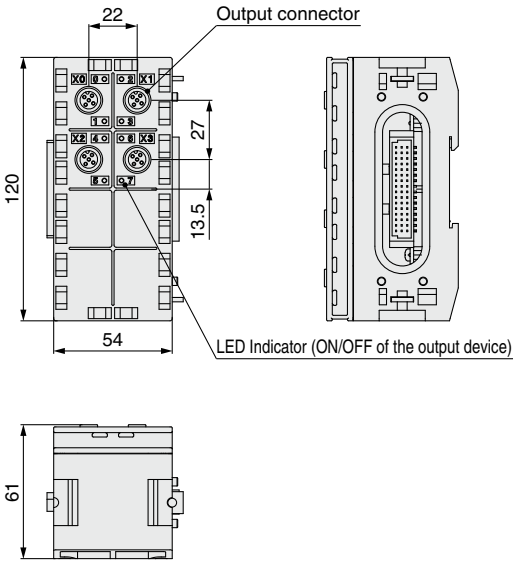
Digital Input Module

EX245-DX1



Digital Output Module

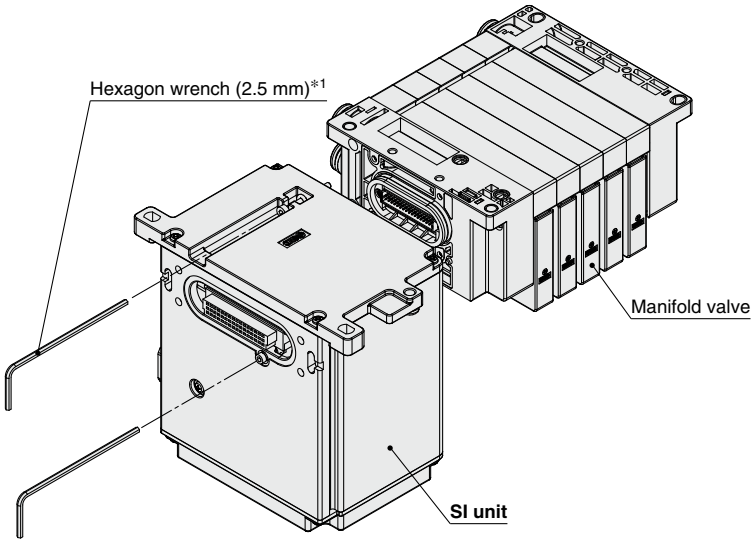
EX245-DY1

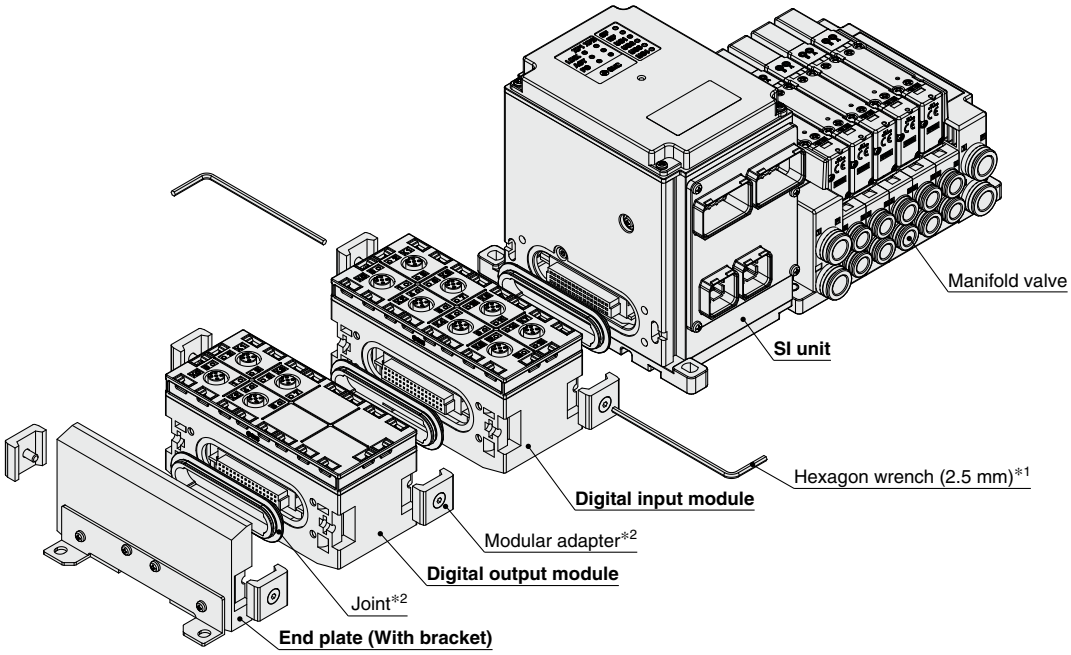


Assembly Examples

Manifold valve ——— Please contact SMC for order numbers.
SI unit ——— EX245-SPN1
Digital module (Input) ——— EX245-DX1
Digital module (Output) ——— EX245-DY1
End plate ——— EX245-EA2-1

The modules and manifold valve are not assembled at the time of shipment.
After assembling the SI unit and manifold valve, assemble the modules.





*1 Hexagon wrench is not included. It should be provided by the customer.
*2 Joint and modular adapter are shipped together with the product.

Made to Order

Fieldbus System

EX245-X171/X172/X35

How to Order

Please contact SMC for detailed specifications and lead times.
Prepare the SI unit, each type of module, and the manifold valve (without SI unit) separately, and combine them before use.

SI Unit/Repeater

EX245 – SPR1-X171

SI unit specification

Model	Protocol	Max. number of modules	Max. number of digital inputs	Max. number of digital outputs	Communication connector	Power supply connector
SPR1-X171	PROFINET	8	128	64	M12 connector: 2 pcs.	7/8 connector: 1 pc.
SPR1-X172	PROFINET	8	128	64	Push Pull connector (RJ45): 2 pcs.	Push Pull connector (24 V): 2 pcs.
SIB1-X35	INTERBUS	8	128	64	Rugged Line connector: 2 pcs.	

Repeater specification

RPN1-A-X51	PROFINET	0	0	0	Push Pull connector (SCRJ): 2 pcs.	Push Pull connector (24 V): 2 pcs.

Specifications

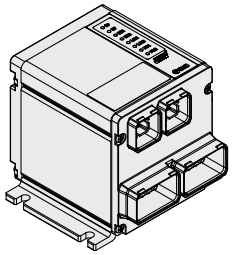
Common Specifications for All Units/Modules

Item	Specifications
Operating temperature range	Operating: –10 to 50°C, Stored: –20 to 60°C (No condensation)
Operating humidity range	Operating, Stored: 35 to 85%RH (No condensation)
Withstand voltage	500 VAC for 1 minute between external terminals and FE
Insulation resistance	500 VDC, 10 MΩ or more between external terminals and FE
Enclosure	IP65 (Manifold assembly, With seal cap)
Standards	CE marking, RoHS compliant

SI Unit Specifications

Model			EX245-SPR1-X171	EX245-SPR1-X172	EX245-SIB1-X35
Communication	**Protocol**		PROFINET		INTERBUS
	Device type		PROFINET IO		Remote bus device
	Communication speed		100 Mbps full duplex		500 kbps, 2 Mbps
	Configuration file∗1		GSD file		XML file, Database file
	Applicable function		MRP, Fast Start Up		—
	Terminating resistor		—		—
Electrical	Internal current consumption (US1)		250 mA	250 mA	200 mA
	Loop through current between power connector		—	10 A	10 A
	Operating voltage/ Max. current	US1	24 VDC +20%, –15%/6 A		24 VDC ±10%/6 A
		US2	24 VDC +20%, –15%/4 A		24 VDC +10%, –5%/4 A
Output	**Output type**		PNP (Negative common)		
	Number of outputs		32 outputs		
	Load		Solenoid valve with surge voltage suppressor of 24 VDC, 1 W or less (SMC)		
	Power supply		24 VDC, 2 A		
	Fail safe		HOLD/CLEAR/Forced power ON		
	Protection		Short-circuit protection		
General	**Max. number of modules**		8		8
	Max. number of digital inputs		128		128
	Max. number of digital outputs		64		64
	Max. number of analog inputs		8		—
	Weight		1000 g		1200 g

∗1 Please contact SMC for the setting file.



EX245-RPN1-A-X51

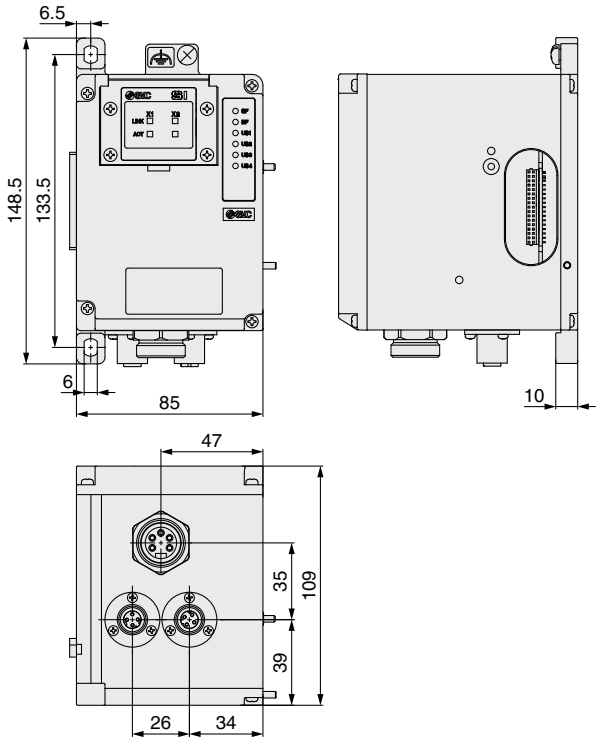
Repeater

Model			EX245-RPN1-A-X51
Communication	**Protocol**		PROFINET
	Device type		PROFINET IO
	Communication speed		100 Mbps full duplex
	Configuration file		GSD file
	Applicable function		Fiber-optic cable maintenance alarm, MRP, Fast Start Up
Electrical	**Internal current consumption**		250 mA
	Loop through current between power connector		16 A
	Operating voltage	US1	24 VDC +20%, –15%
		US2	24 VDC +20%, –15%
Weight			500 g

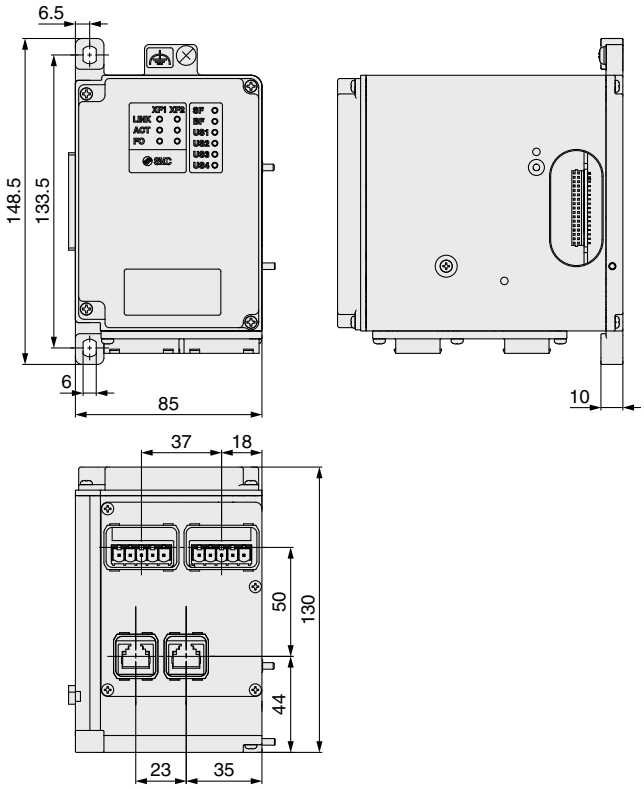
Dimensions

SI Unit

EX245-SPR1-X171

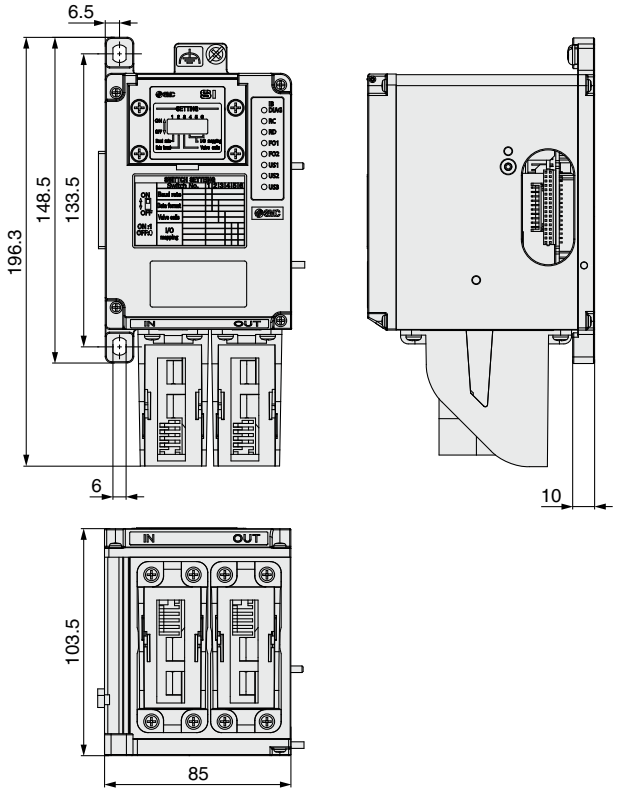


EX245-SPR1-X172

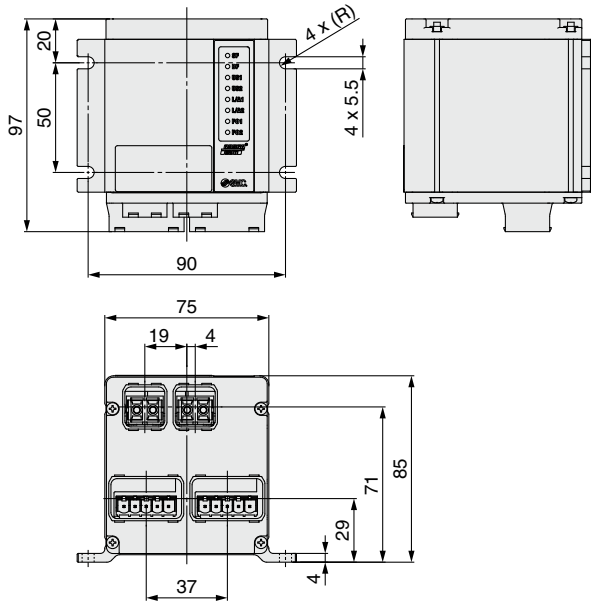


Repeater

EX245-SIB1-X35



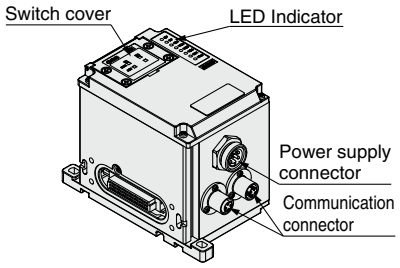
EX245-RPN1-A-X51



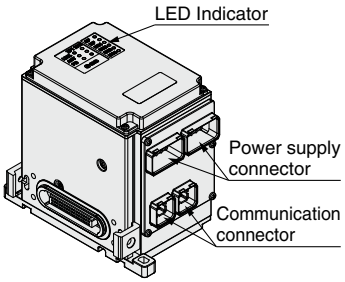
Parts Description

SI Unit

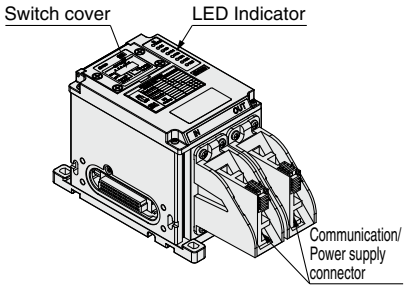
EX245-SPR1-X171



EX245-SPR1-X172

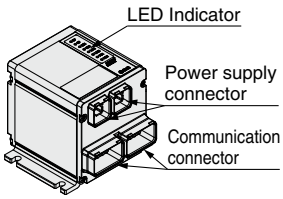


EX245-SIB1-X35



Repeater

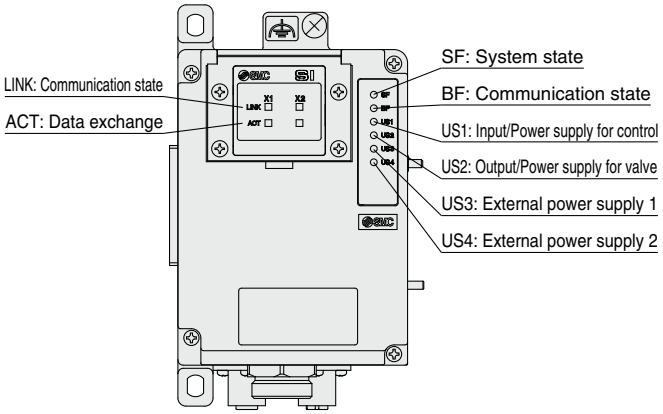
EX245-RPN1-A-X51



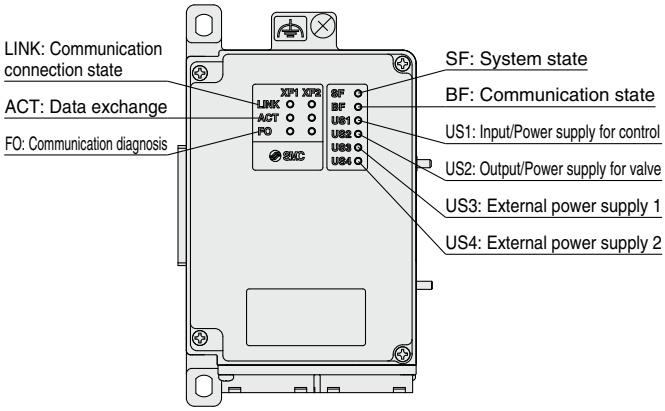
LED Indicator

SI Unit

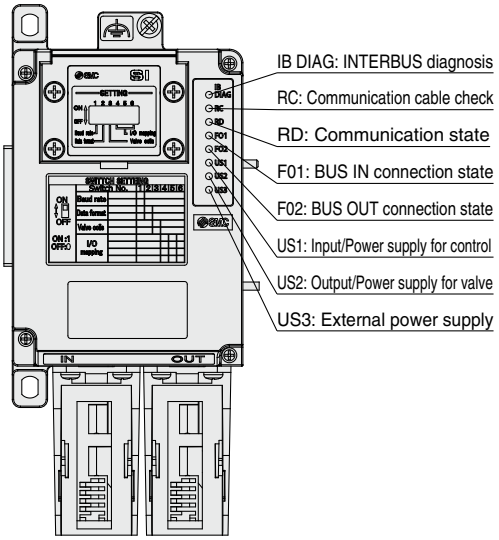
EX245-SPR1-X171



EX245-SPR1-X172

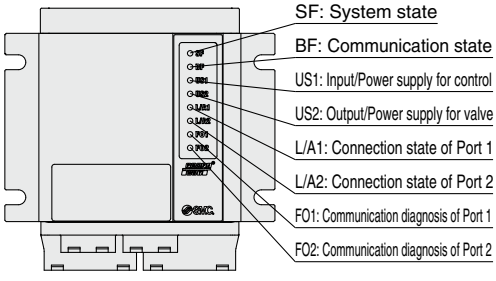


EX245-SIB1-X35



Repeater

EX245-RPN1-A-X51



EX245 Series
Specific Product Precautions

Be sure to read this before handling the products. Refer to page 277 for safety instructions. For fieldbus system precautions, refer to pages 278 to 280 and the "Operation Manual" on the SMC website: http://www.smcworld.com

Operating Environment

⚠ Caution

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

IP65 is achieved when the following conditions are met.

1) Provide appropriate wiring of the electrical wiring cables, communication connectors, and cables with M12 connectors.
2) Suitable mounting of the SI unit, each module, and the manifold valve
3) Be sure to mount a seal cap on any unused connectors.

If using in an environment where it may be exposed to water splash, please take measures such as using a cover.