

Fieldbus System (For Input/Output)

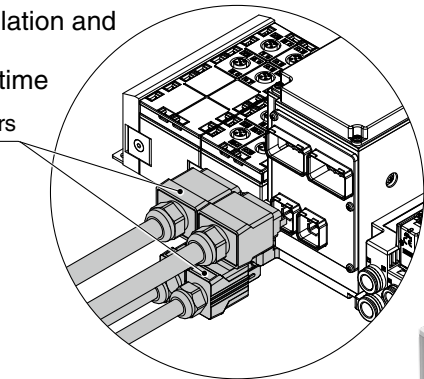
EX245 Series

■ **AIDA^{*1} specifications compliant**

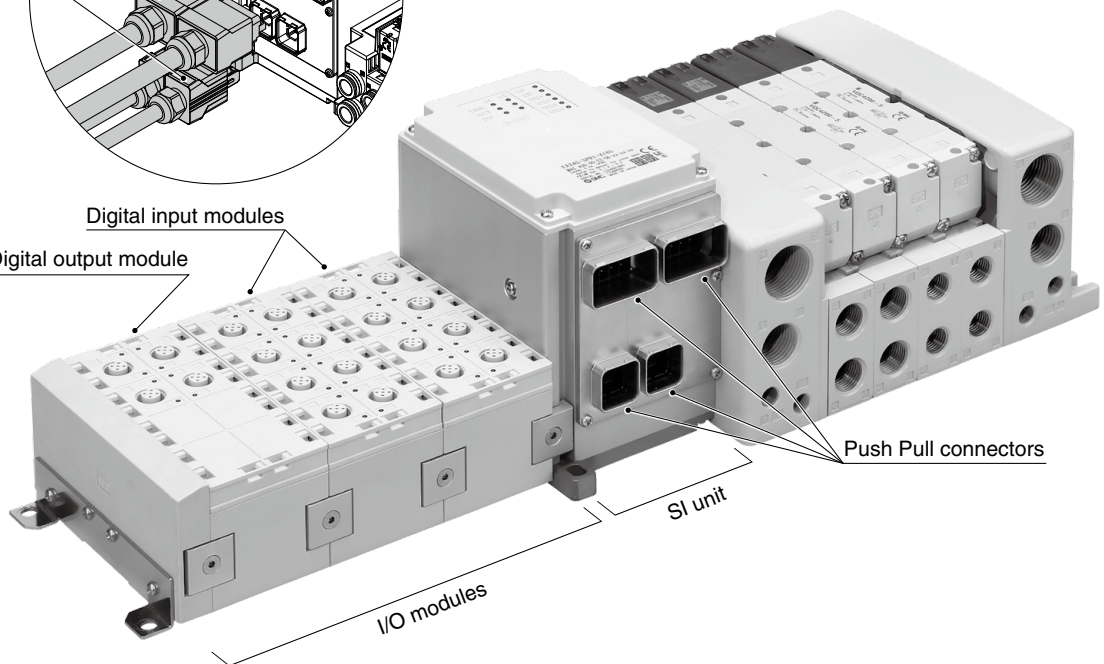
■ **Push Pull connectors**

- One-touch installation and removal
- Reduced wiring time

Push Pull connectors



Digital input modules
Digital output module



Push Pull connectors

SI unit

I/O modules



IP65

| | |
|--------|---------------|
| Type 1 | EX260 |
| Type 2 | EX500 |
| Type 3 | EX600 |
| | EX245 |
| | EX250 |
| Type 1 | EX120/121/122 |
| Type 1 | EX140 |
| | EX180 |
| Type 2 | EX510 |
| | M8/M12 |
| | ATEX |

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

■ **Compatible Protocols**



Made to Order



- SCRJ connector
- RJ45 connector

■ **Modules can be combined flexibly.**

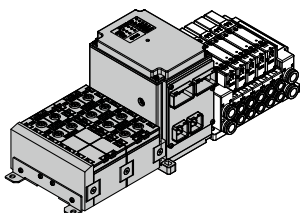
- Number of valves, digital inputs/outputs

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

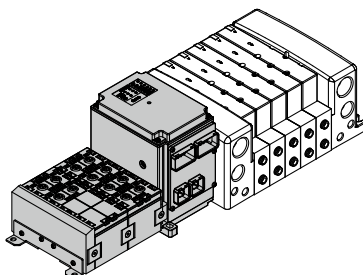
- I/O modules can be connected and removed one by one.
- Up to 8 modules can be connected in any order.

Manifold Solenoid Valves

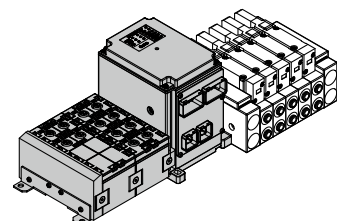
SY3000/5000/7000



VQC1000/2000/4000/5000



SV1000/2000/3000

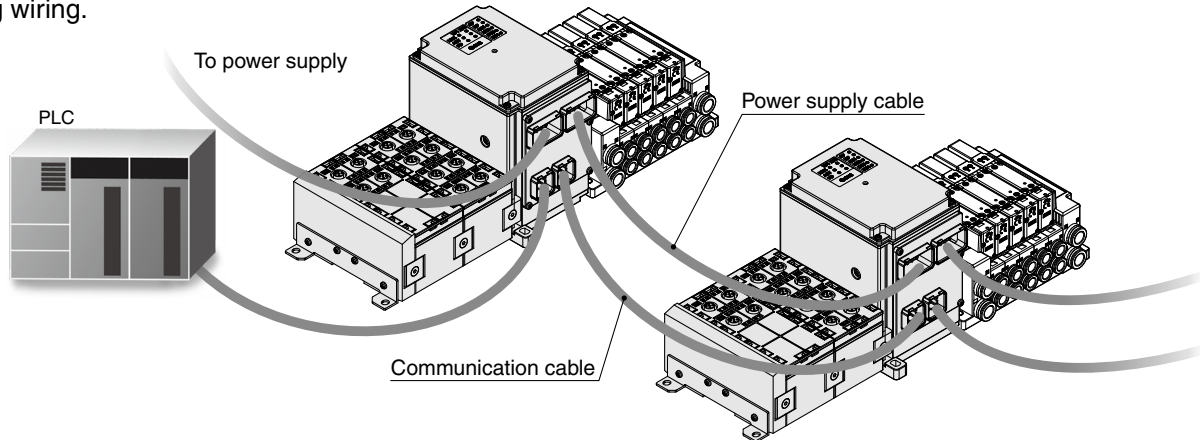


* These products should be ordered separately.

EX245 Series

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.



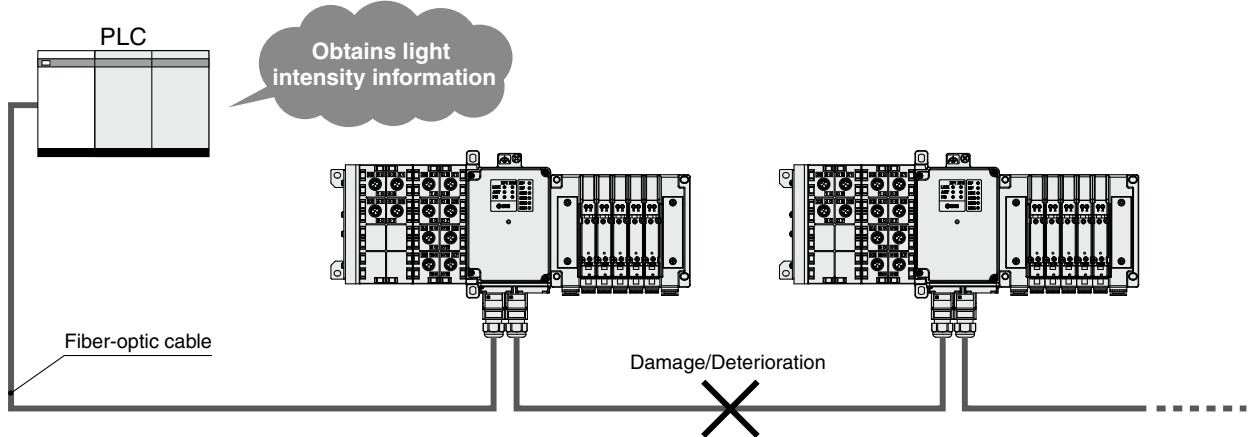
An external branch connector is not necessary. Reduced wiring space

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.

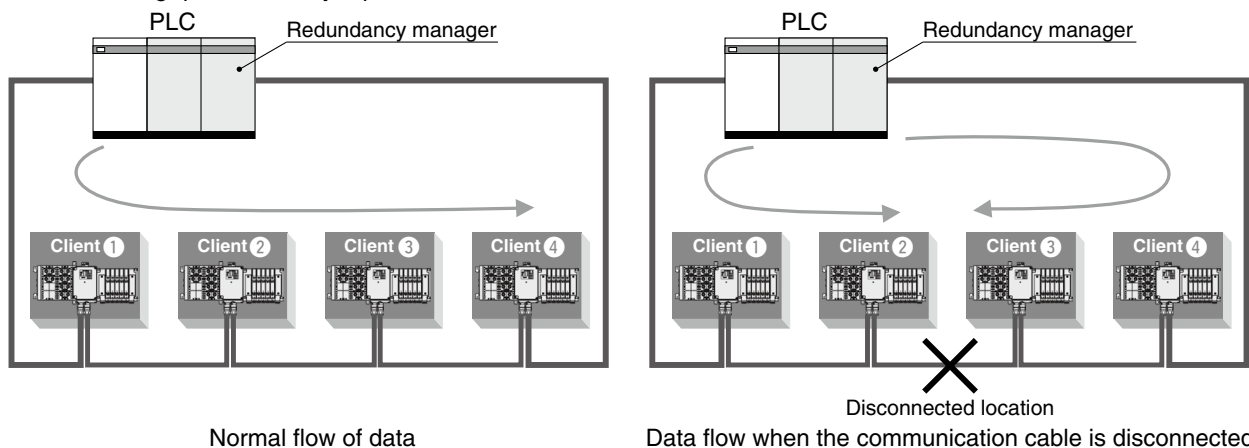


MRP function (Ring wiring)

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

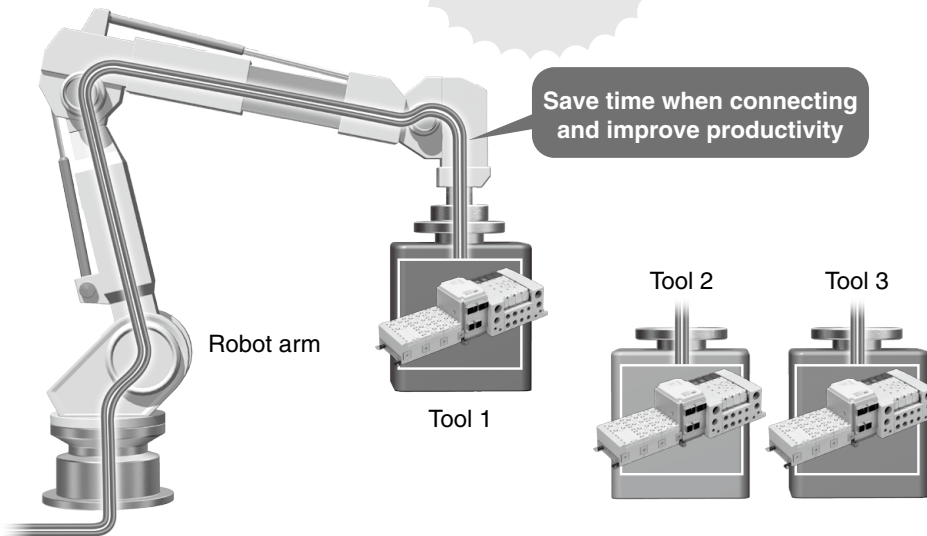
For the Fast Start Up function, time from power ON to communication connection
Approx. 10 sec.



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.

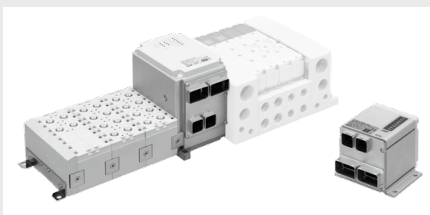


| | |
|--------|---------------|
| Type 1 | EX260 |
| Type 2 | EX123/124/126 |
| | EX500 |
| | EX600 |
| Type 3 | EX245 |
| | EX250 |
| Type 1 | EX120/121/122 |
| | EX140 |
| | EX180 |
| Type 2 | EX510 |
| | M8/M12 |
| | ATEX |

CONTENTS

Type 3 Integrated input-output type

Fieldbus System (For Input/Output)
EX245 Series



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Made to Order

EX245-X171/X172/X35 p. 141

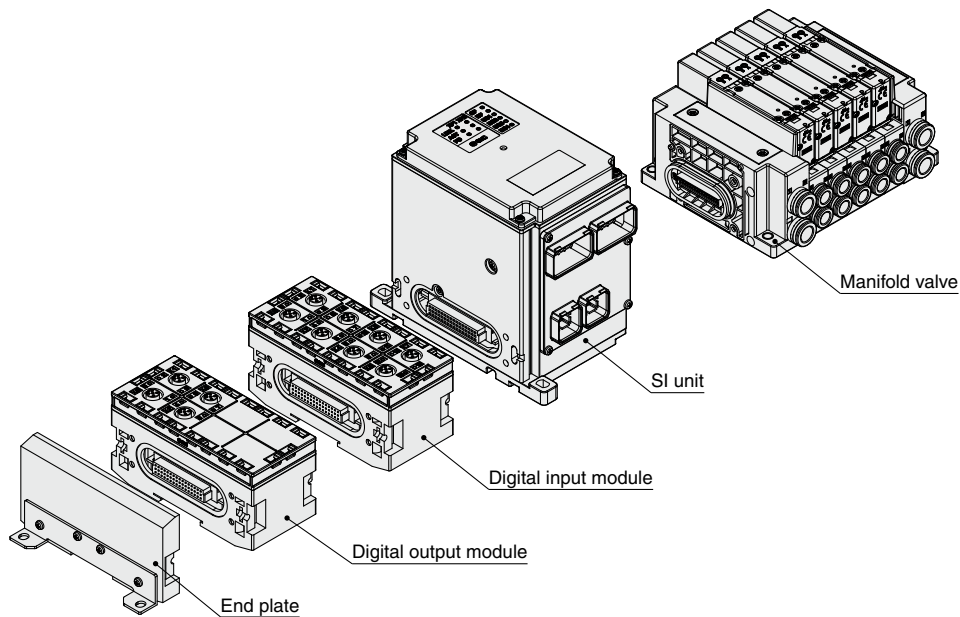
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Fieldbus System For Input/Output **EX245 Series**



Construction



How to Order

SI Unit

EX245-SPN1

SI unit specification

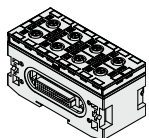
| Model | Protocol | Max. number of modules | Max. number of digital inputs | Max. number of digital outputs | Communication connector | Power connector |
|-------|----------|------------------------|-------------------------------|--------------------------------|------------------------------------|------------------------------------|
| 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
→ p. 141

Digital Input Module

EX245-DX1

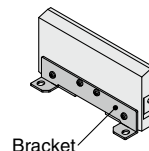


Digital input module specification

| | |
|-----|---------------------------|
| DX1 | Digital input (16 inputs) |
|-----|---------------------------|

End Plate

EX245-EA2-1

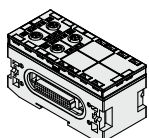


Bracket

| | |
|---|-----------------|
| 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.

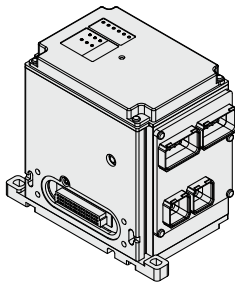
Specifications

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/ US1 | 24 VDC +20%, -15%/6 A | |
| | Max. current 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 | |



EX245-SPN1/SPN2

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

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.

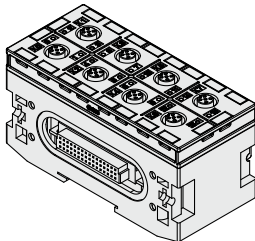
Digital Output Module

| 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 | |

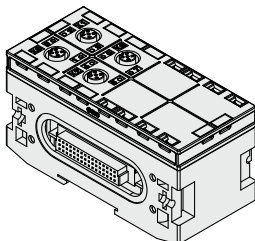
*1 An M12 (4-pin) connector can also be connected.

End Plate

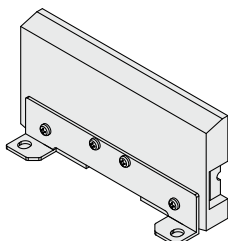
| Model | EX245-EA2-1 | EX245-EA2-2 |
|----------------|-------------|-------------|
| Bracket | Yes | No |
| Weight | 200 g | 150 g |



EX245-DX1



EX245-DY1



EX245-EA2-□

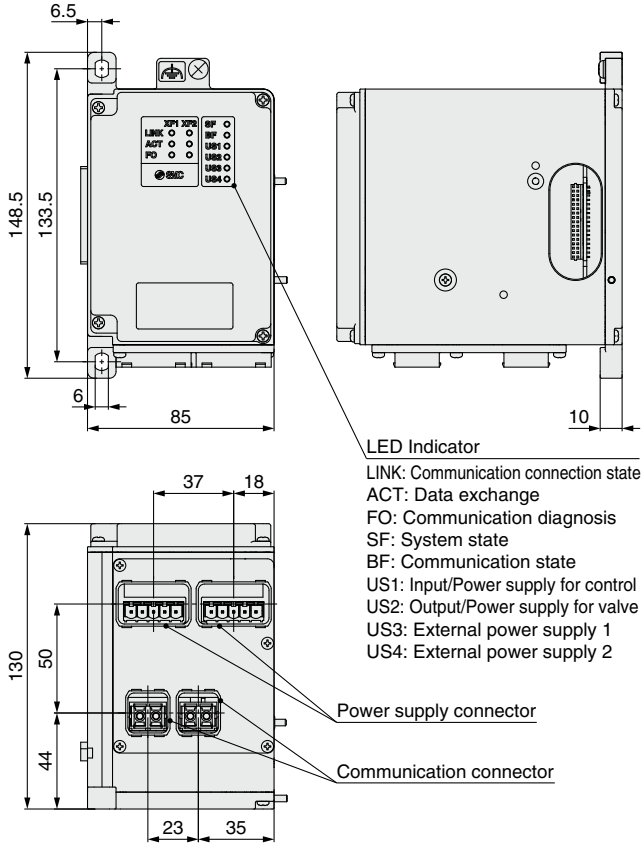
Type 1
EX260
EX123/124/126
Type 2
EX500
EX600
EX245
Type 3
EX250
Type 1
EX120/121/122
EX140
EX180
Type 2
EX510
M8/M12
ATEX

EX245 Series

Dimensions/Parts Description

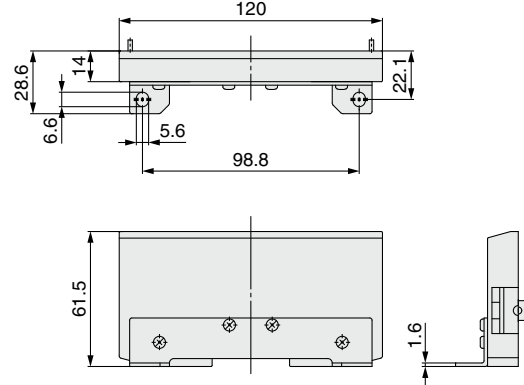
SI Unit

EX245-SPN1

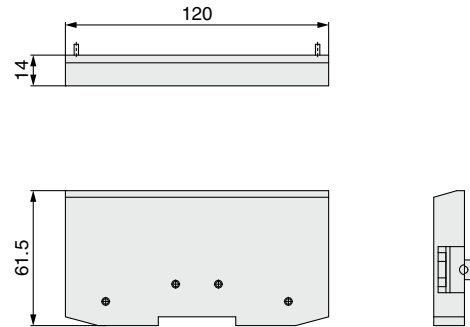


End Plate

EX245-EA2-1

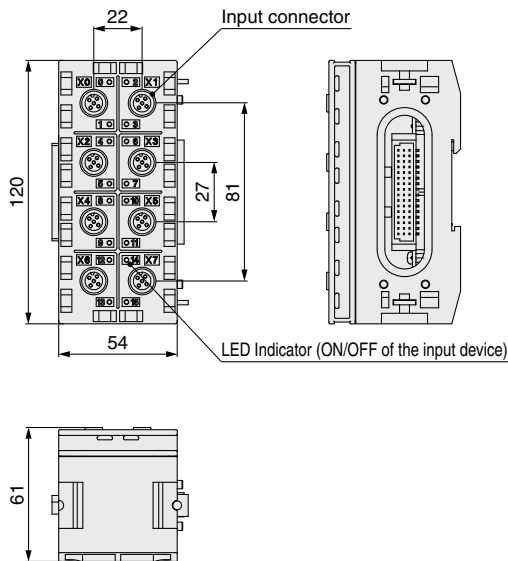


EX245-EA2-2



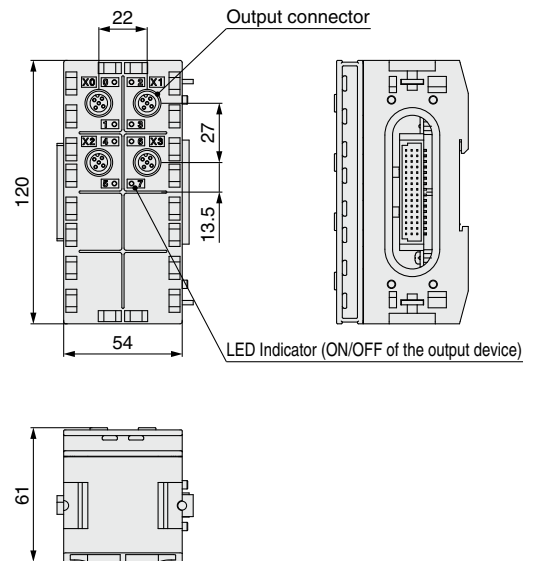
Digital Input Module

EX245-DX1



Digital Output Module

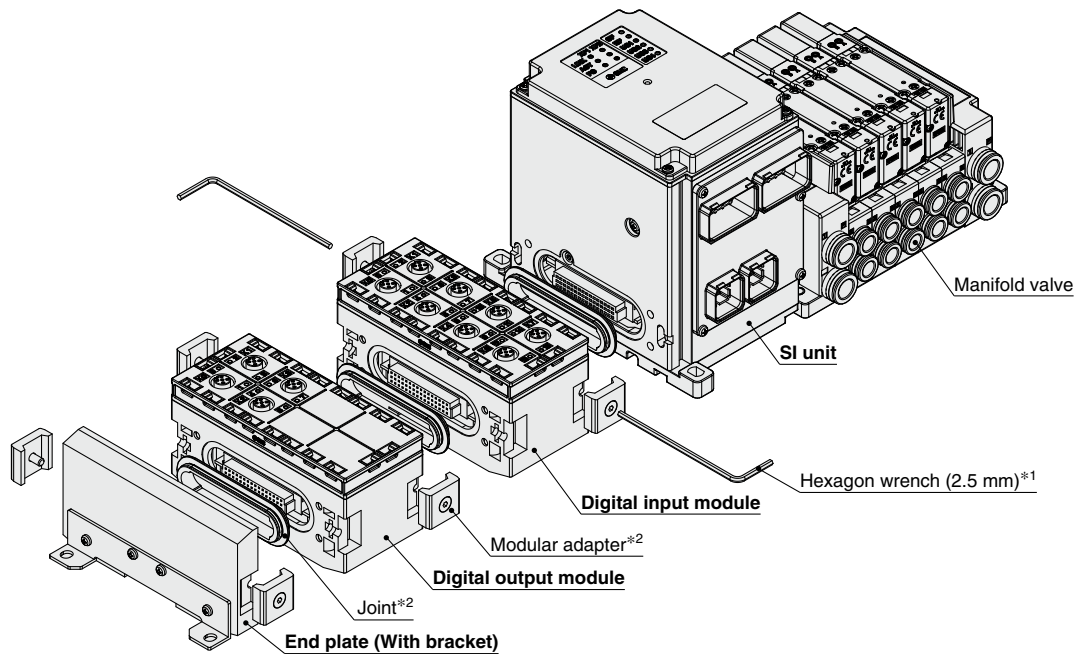
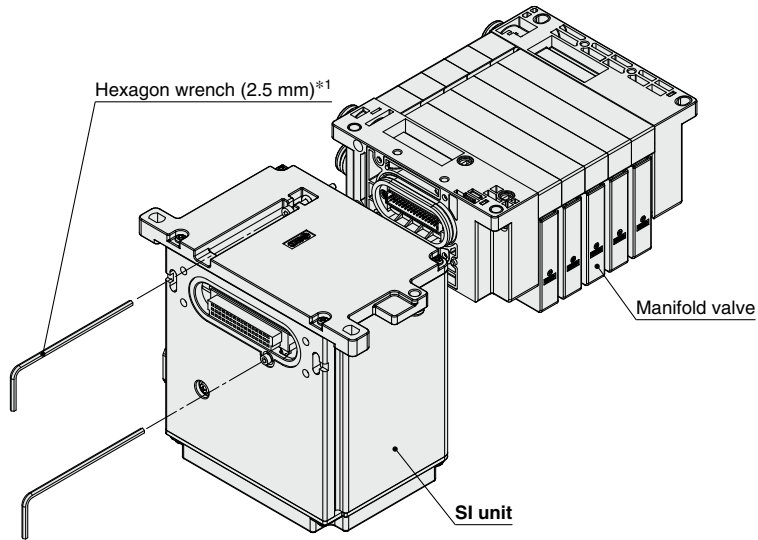
EX245-DY1



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.

| | |
|--------|---------------|
| Type 1 | EX260 |
| | EX123/124/126 |
| Type 2 | EX500 |
| | EX600 |
| Type 3 | EX245 |
| | EX250 |
| Type 1 | EX120/121/122 |
| | EX140 |
| | EX180 |
| Type 2 | EX510 |
| | M8/M12 |
| | ATEX |

Made to Order

Fieldbus System

EX245-X171/X172/X35

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.

How to Order

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

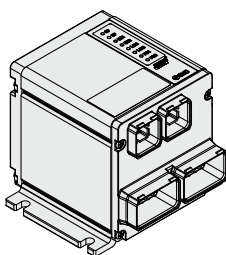
Common Specifications for All Units/Modules

| 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 | 24 VDC +20%, -15%/6 A | | 24 VDC ±10%/6 A |
| | | 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

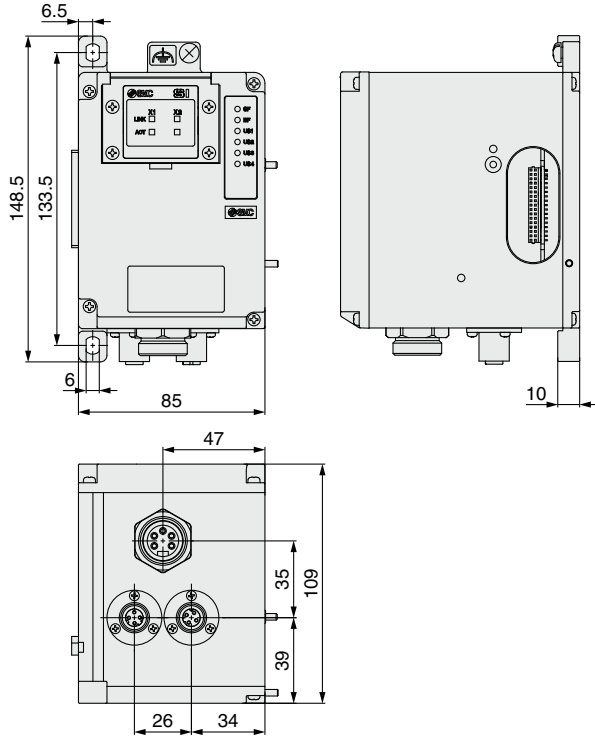
Repeater

| 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 | |

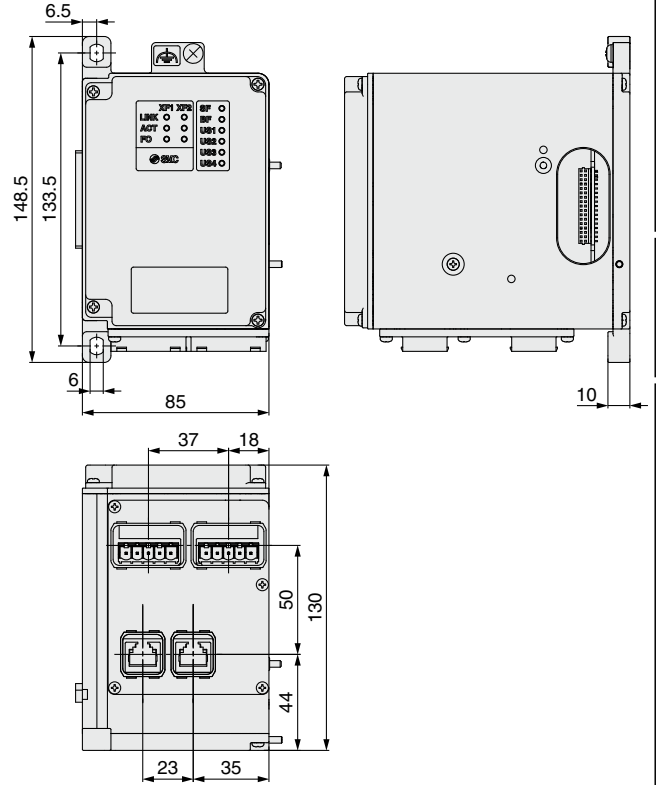
Dimensions

SI Unit

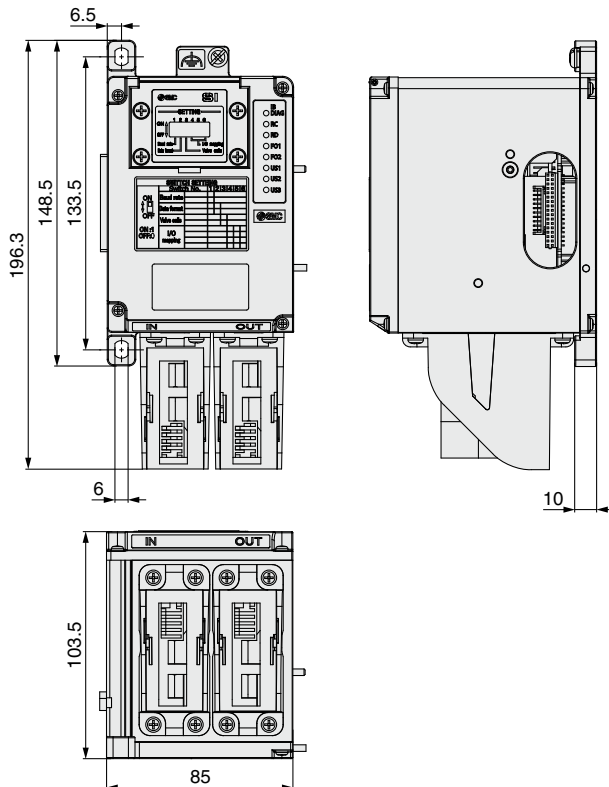
EX245-SPR1-X171



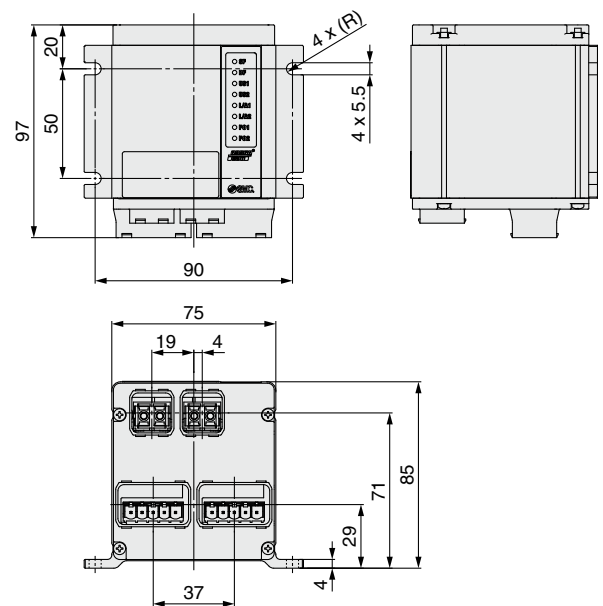
EX245-SPR1-X172



EX245-SIB1-X35



EX245-RPN1-A-X51



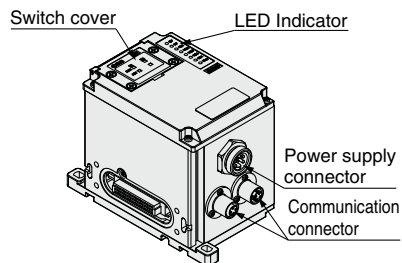
| | |
|--------|---------------|
| Type 1 | EX260 |
| Type 2 | EX123/124/126 |
| Type 3 | EX500 |
| | EX600 |
| | EX245 |
| | EX250 |
| Type 1 | EX120/121/122 |
| | EX140 |
| | EX180 |
| Type 2 | EX510 |
| | M8/M12 |
| | ATEX |

EX245 Series

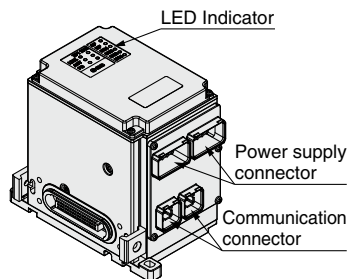
Parts Description

SI Unit

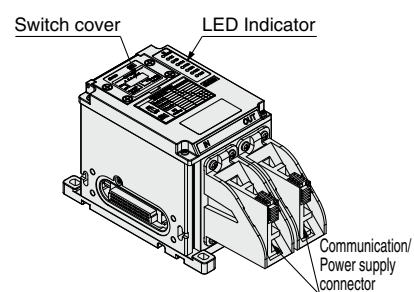
EX245-SPR1-X171



EX245-SPR1-X172

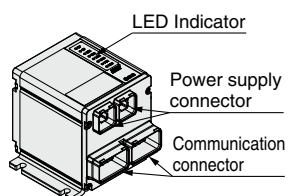


EX245-SIB1-X35



Repeater

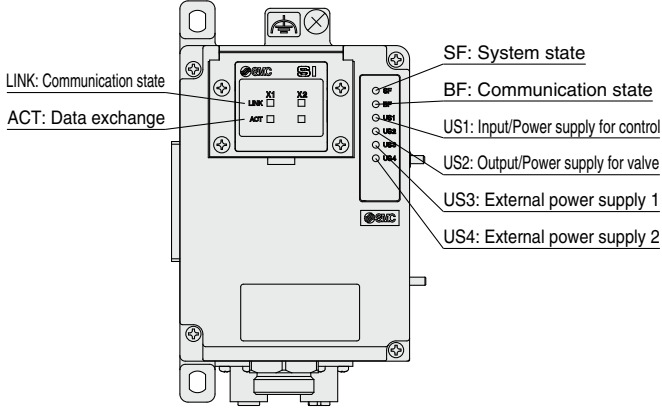
EX245-RPN1-A-X51



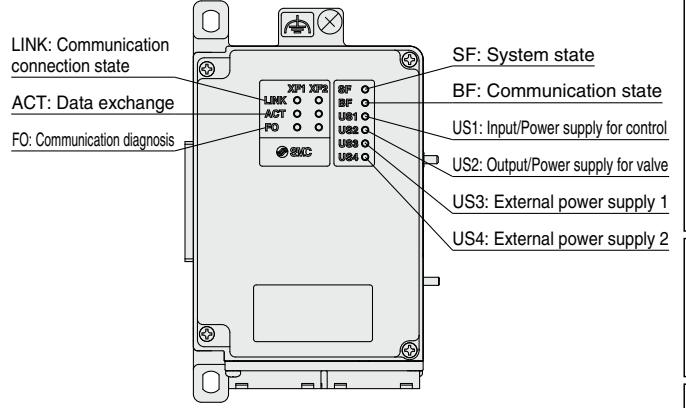
LED Indicator

SI Unit

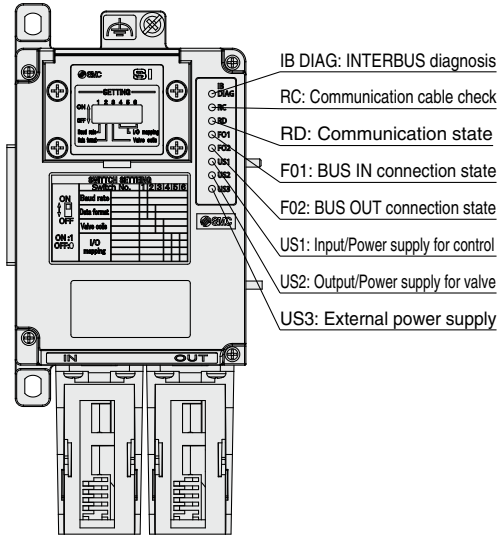
EX245-SPR1-X171



EX245-SPR1-X172

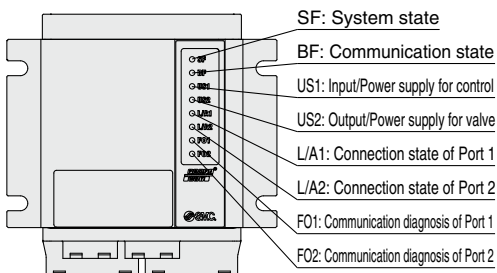


EX245-SIB1-X35



Repeater

EX245-RPN1-A-X51



| | |
|--------|---------------|
| Type 1 | EX260 |
| Type 1 | EX123/124/126 |
| Type 2 | EX500 |
| Type 2 | EX600 |
| Type 3 | EX245 |
| Type 3 | EX250 |
| Type 1 | EX120/121/122 |
| Type 1 | EX140 |
| Type 1 | EX180 |
| Type 2 | EX510 |
| Type 2 | M8/M12 |
| Type 2 | ATEX |



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.