



ORIGINAL INSTRUCTIONS

Instruction Manual

Fieldbus device - Digital IO modules

EX245-DX1 / EX245-DY1



The intended use of this product is for the connection of Input and Output signals to a fieldbus system for the control of pneumatic valves.

1 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) ^{*)}, and other safety regulations.

^{*)} ISO 4414: Pneumatic fluid power - General rules relating to systems.
ISO 4413: Hydraulic fluid power - General rules relating to systems.
IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots –Safety, etc.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

	Caution	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
	Warning	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	Danger	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Warning

- Always ensure compliance with relevant safety laws and standards.
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

2 Specifications

2.1 EX245-DX1 - Digital Input Module

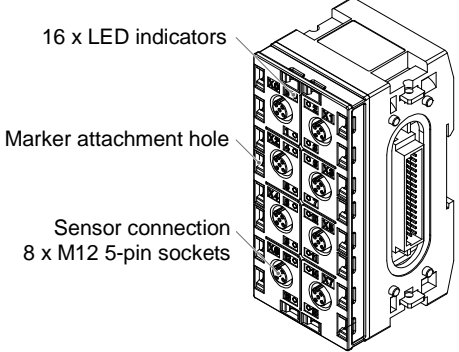
Item	Description
Dimensions (W x L x H)	54 x 120 x 61 mm
Weight	265 g
Housing material	Nylon, PBT
Rated supply voltage	24 VDC
Voltage drop to sensor supply	1.6 V maximum
Internal current consumption at 24 VDC	50 mA or less
Input connection type	8 x M12, 5-pins sockets with double allocation
Over Voltage protection	Yes, more than 28 VDC at US1 (sensor/input)
Over current protection	Yes
Sensor supply current per connector	0.5 A maximum
Sensor supply current per module	2 A maximum
Status indication	Yes (per input)
Over current indication	Yes (per connector)
Number of inputs	16
Input type	PNP
Signal 1	11 to 30 V
Signal 0	-3 to 5 V
Permissible residual current	1.5 mA maximum
Input current signal 1	4.5 mA typical

2.2 EX245-DY1 - Digital Output Module

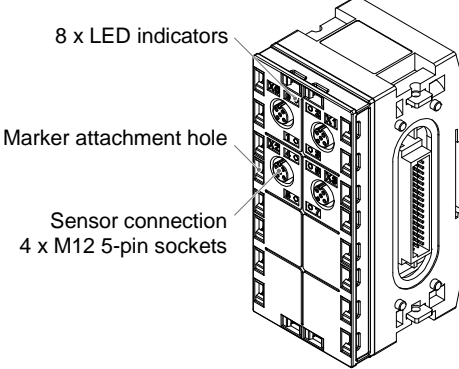
Item	Description
Dimensions (W x L x H)	54 x 120 x 61 mm
Weight	255 g
Housing material	Nylon, PBT
Rated supply voltage	24 VDC
Voltage drop to load supply	1.6 V maximum
Internal current consumption at 24 VDC	50 mA or less
Load connection	4 x M12, 5-pins sockets with double allocation
Over Voltage protection	Yes, more than 28 VDC at US2 (solenoid/output)
Over current protection	Yes
Output current per output	0.5 A maximum
Output current per module	2 A maximum
Status indication	Yes (per output)
Over current indication	Yes (per output)
Number of outputs	8
Output type	PNP

3 Names and Function of Parts

3.1 EX245-DX1



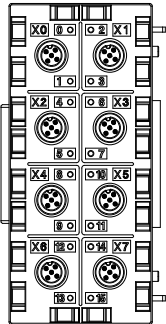
3.2 EX245-DY1



4 LED indicators

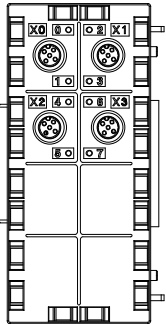
The status indicators are arranged on the EX245-DX1 and EX245-DY1 as shown in the illustrations below.

• EX245-DX1



X0 to X15	Description
OFF	Input is not activated, No errors.
Green ON	Input is activated.
Red ON	Short circuit is detected.

• EX245-DY1



X0 to X7	Description
OFF	Output is not activated, No errors.
Green ON	Output is activated.
Red ON	Short circuit is detected.

5 Installation

5.1 Installation

Warning

- Do not install the product unless the safety instructions have been read and understood.

5.2 Environment

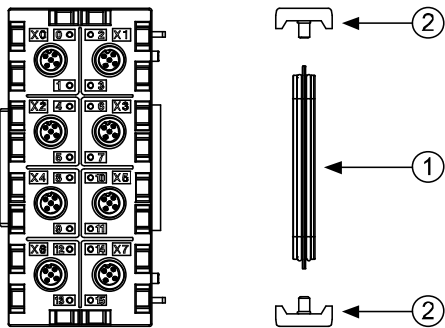
Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product's specifications.

5.3 Module Connection

Connect the SI Unit, the IO modules and the End plate using the 2 modular adaptor assemblies and a joint assembly. These are supplied together in a Joint pack (Part No.EX245-ZJP).

- 1 x Joint assembly
- 2 x Modular adaptor assembly (hexagonal socket wrench size 2.5 mm, torque = 1.3 N•m)



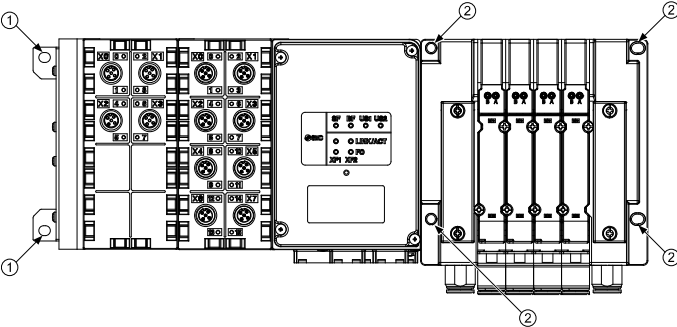
Caution

- For a protection rating of IP65 to be ensured the modular adaptor assemblies and joint assembly must be installed correctly between each module.
- To prevent the modules and assemblies being damaged, apply the recommended tightening torque.

5.4 Mounting

To prevent the manifold components being damaged, apply the recommended tightening torque. Mount the manifold using the 6 base mounting positions with screws. Required screws are as follows:

- 2 x M5 (End plate: torque = 1.5 N•m)
- 4 x M* (Valve manifold: refer to valve manifold catalogue)



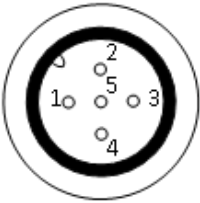
All manifolds are mounted using 6 screws (except VQC4000 which uses 5 screws).

6 Wiring

Caution

- To prevent damage all power supplies to the SI Unit must be turned off (de-energised) before the modules are installed or removed.
- For a protection rating of IP65 to be ensured, all covering caps must be screwed down correctly after wiring and settings have been performed.
- For a protection rating of IP65 to be ensured, unused sockets must be fitted with the M12 Seal cap.

Pin allocation of the M12, 5-pin socket connector as shown below:



EX245-DX1

Pin	Description
1	24 V
2	DI (input signal "n+1")
3	0 V (US1)
4	DI (input signal "n")
5	FE / Shield

EX245-DY1

Pin	Description
1	N.C.
2	DO (output signal "n+1")
3	0 V (valves/loads)
4	DO (output signal "n")
5	FE / Shield

7 Settings

7.1 Process data

- EX245-DX1

The EX245-DX1 occupies 2 bytes of input data. The following table shows the allocation of the digital inputs and the process image.

Digital Input allocation and process data

Connector position									
Connector designation		X0	X1	X2	X3	X4	X5	X6	X7
Input	Pin 2	Bit 1	Bit 3	Bit 5	Bit 7	Bit 9	Bit 11	Bit 13	Bit 15
	Pin 4	Bit 0	Bit 2	Bit 4	Bit 6	Bit 8	Bit 10	Bit 12	Bit 14

- EX245-DY1

The EX245-DY1 occupies 1 byte of output data. The following table shows the allocation of the digital outputs and the process image.

Digital Output allocation and process data

Connector position					
Connector designation		X0	X1	X2	X3
Output	Pin 2	Bit 1	Bit 3	Bit 5	Bit 7
	Pin 4	Bit 0	Bit 2	Bit 4	Bit 6

7 Settings (continued)

7.2 Module parameters

- EX245-DX1

The EX245-DX1 has the following module parameter.

Module parameter of “EX245-DX1”

Name	Range of values	Default	Meaning
Input filter	Enable Disable	Enable	Sets the time to ignore the input signal change per module as follows: Enable: 8 msec. Disable: No input filter

- EX245-DY1

The EX245-DY1 has the following module parameters.

Module parameters of “EX245-DY1”

Name	Range of values	Default	Meaning
Digital Output 0	Force to OFF Force to ON Hold last state	Force to OFF	When a bus fault occurs, the output can be made to react in one of the following ways: Force to OFF Force to ON Hold last state
Digital Output 1	Force to OFF Force to ON Hold last state	Force to OFF	
...	
Digital Output 7	Force to OFF Force to ON Hold last state	Force to OFF	

Refer to the Operation manual on the SMC website (URL: <https://www.smcworld.com>) for further Setting details.

8 How to Order

Refer to the operation manual on the SMC website (URL: <https://www.smcworld.com>) for How to order information.

9 Outline Dimensions (mm)

Refer to the operation manual on the SMC website (URL: <https://www.smcworld.com>) for outline dimensions.

10 Maintenance

10.1 General Maintenance

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.

11 Limitations of Use

11.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

12 Product disposal

This product should not be disposed of as municipal waste. Check your local regulations and guidelines to dispose of this product correctly, in order to reduce the impact on human health and the environment.

13 Contacts

Refer to www.smcworld.com or www.smc.eu for your local distributor / importer.

SMC Corporation

URL : <https://www.smcworld.com> (Global) <https://www.smc.eu> (Europe)
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