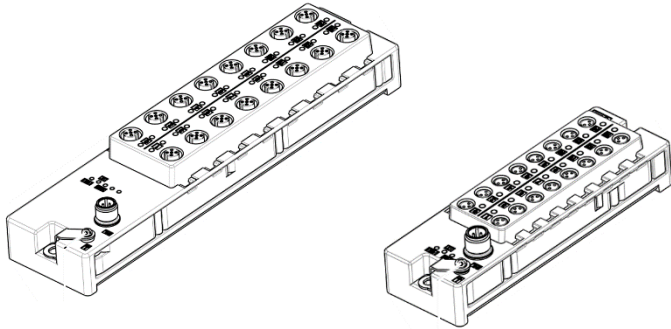




ORIGINAL INSTRUCTIONS

Instruction Manual

Fieldbus device – Terminal unit for IO-Link
EX600-TDX#



The intended use of the Terminal unit is to provide switch input and digital input signals to the IO-Link communication network and master.

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 “Danger,” “Warning” or “Caution.” 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 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: Robotics - Safety requirements - Part 1: Industrial robots.

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

	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.

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.

Caution

- **Provide grounding to assure the safety and noise resistance of the Fieldbus system.**
Individual grounding should be provided close to the product using a short cable.
- Do not disassemble, modify (including changing the printed circuit board) or repair.
- Do not operate the product outside of the specifications.
- If using the product in an interlocking circuit provide a double interlocking system, for example a mechanical system.
- Refer to the operation manual on the SMC website (URL: <https://www.smcworld.com>) for further Safety Instructions.

2 Specifications

2.1 General specifications

Item	Specification	
	EX600-TDX1	EX600-TDX2
Operating temperature	-10 to 50 °C	
Storage temperature	-20 to 60 °C	
Ambient humidity	35 to 85% RH (no condensation)	
Enclosure protection rating	IP65 / IP67 (to IEC 60529)	
Withstand voltage	500 VAC applied for 1 minute (between terminals and FE)	
Insulation resistance	10 MΩ or more at 500 VDC, (between terminals and FE)	
Enclosure material	PBT	
Standards	CE / UKCA, UL (CSA)	
Weight	450 g	250 g
Dimensions (W x L x H) mm	60.0 x 251.0 x 41.3	49.0 x 149.0 x 34.95

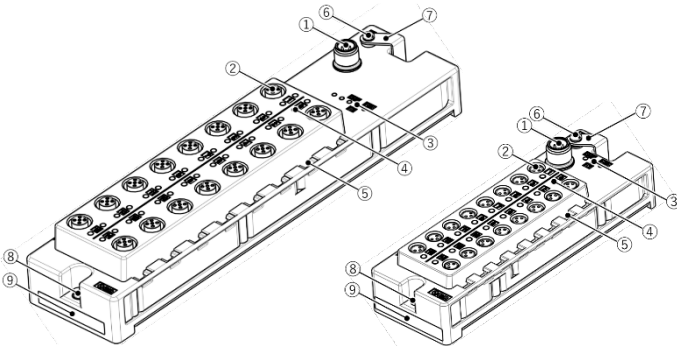
2.2 Electrical specifications

Item	Specification	
	EX600-TDX1	EX600-TDX2
Operating voltage range	18 to 30 VDC	
Internal current consumption	50 mA or less (at 24 VDC)	
Max. supply current	1 A / Connector No.0-7, 1 A / Connector No.8-15, 2 A / Unit	
Circuit protection	Reverse connection protection	
Inputs	Input connector	16 x M12 4-pin socket, A-coded
	Max. number of inputs	32
	Input type	PNP (negative common)
	Input circuit	Type 3 (IEC61131-2)
	Input current	Typ. 4 mA (at 24 VDC)
	ON voltage	11 to 30 V
	OFF voltage	-3 to 5 V
	Overcurrent protection / detection	Provided for connector No.0 to 7 as a set, and No.8 to 15 as a set.

2.3 Communication specifications

Item	Specification	
	EX600-TDX1	EX600-TDX2
Protocol	IO-Link	
Version	1.1	
IO-Link type	Device	
IO-Link Port Class	Class A	
Communication speed	COM3 (230.4 kbps)	
Vendor ID	0x0083 (131)	
Device ID	0x0002DC (732)	0x0002DD (733)
Configuration file	IODD file	

3 Name and function of parts



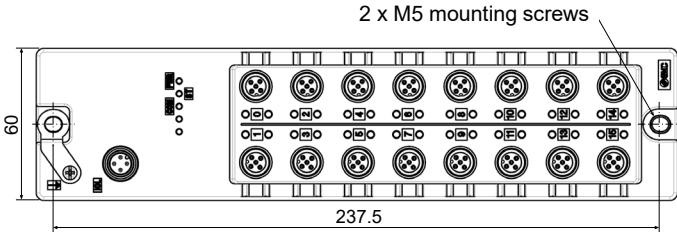
No	Part	Description
1	Communication / Power connector	Connection to an IO-Link master and receives communication and power supply from the IO-Link master (Port Class A, M12 4-pin plug, A-coded).
2	Input connector	Connection for the input devices (M12 4-pin socket, A-coded or M8 3-pin socket, A-coded).
3	Unit LED display	LED display to indicate the status of the Terminal Unit.
4	Input LED display	LED display to indicate the status of the Input device.
5	Marker groove	Used to mount a marker.
6	FE terminal	Connection for Functional Earth (M3 screw).
7	FE bracket	Bracket for electrically connecting the FE terminal and mounting hole.
8	Mounting hole	Used for mounting and installation.
9	Product information label	Information label to indicate the Terminal Unit details such as firmware revision or serial number etc.

4 Installation

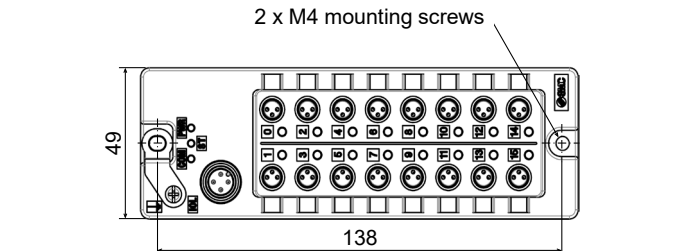
4.1 Installation

Warning

- Do not install the product unless the safety instructions have been read and understood.
- **EX600-TDX1**
Install the Terminal (Input) Unit using 2 x M5 screws with a head of Ø9 to 10 mm and a length of 20 mm minimum.
Recommended tightening torque: 3.0 N•m.



- **EX600-TDX2**
Install the Terminal (Input) Unit using 2 x M4 screws with a head of Ø8 mm maximum and a length of 20 mm minimum.
Recommended tightening torque: 1.5 N•m.



4 Installation (continued)

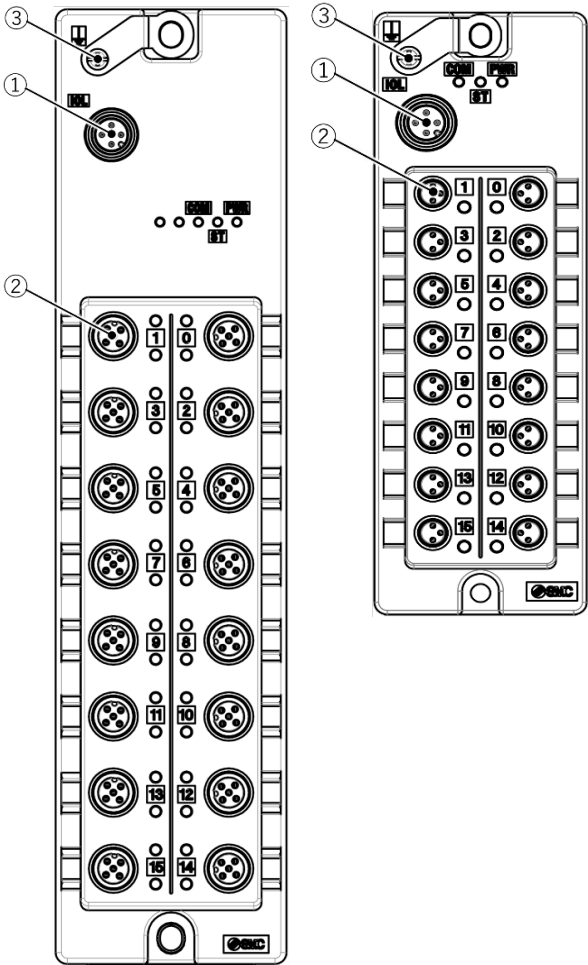
4.2 Environment

Warning

- Do not use in an environment where flammable or corrosive gases, chemicals, salt water or steam are present.
- Do not use in a place where the product could be splashed by oil or chemicals.
- Do not use in an area where electrical surges are generated.
- When a surge-generating load such as a relay or solenoid is driven directly, use a fieldbus system with a built-in surge-absorbing element.
- Prevent foreign matter such as remnant of wires from entering the fieldbus system to avoid failure or malfunction.
- Do not install in a location subject to vibration or impact.
- Do not use in an environment exposed to temperature cycles.
- Do not expose the product to direct sunlight or UV light.
- Do not operate close to a heat source, or in a location exposed to radiant heat.
- Use with caution at an altitude above 2000 m, as the reduction in atmospheric pressure reduces the withstand voltage performance and noise immunity (lightning surge, electro-static discharge).

5 Wiring

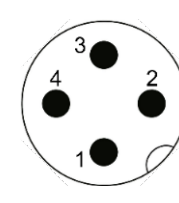
- Connect the Communication / Power cable and FE cable.
Select a Communication / Power cable that is compatible with the connector.
(1) M12 4-pin plug A-coded, Communication / Power connector.
(2) M12 4-pin socket A-coded (EX600-TDX1), or M8 3-pin socket A-coded (EX600-TDX2) input connector.
(3) M3 screw, FE terminal (functional earth).



5 Wiring (continued)

5.1 Communication / Power connector (IO-Link Port Class A)

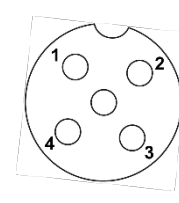
IOL: M12 4-pin Plug, A-coded.



Pin No.	Name	Details
1	L+	+24 V for control/input
2	N.C.	Not used
3	L-	0 V for control/input
4	C/Q	IO-Link communication

5.2 EX600-TDX1 Input connector – Odd No. (1,3,5,7,9,11,13,15)

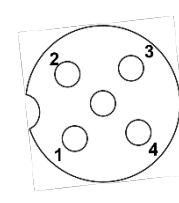
Input: M12 4-pin Socket, A-coded.



Pin No.	Name	Details
1	24 V	+24 V for input device
2	DI2	Input signal 2
3	0 V	0 V for input device
4	DI1	Input signal 1

5.3 EX600-TDX1 Input connector – Even No. (0,2,4,6,8,10,12,14)

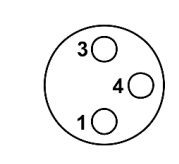
Input: M12 4-pin Socket, A-coded.



Pin No.	Name	Details
1	24 V	+24 V for input device
2	DI2	Input signal 2
3	0 V	0 V for input device
4	DI1	Input signal 1

5.4 EX600-TDX2 Input connector – Odd No. (1,3,5,7,9,11,13,15)

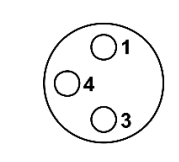
Input: M8 3-pin Socket, A-coded.



Pin No.	Name	Details
1	24 V	+24 V for input device
2	0 V	0 V for input device
3	DI1	Input signal

5.5 EX600-TDX2 Input connector – Even No. (0,2,4,6,8,10,12,14)

Input: M8 3-pin Socket, A-coded.



Pin No.	Name	Details
1	24 V	+24 V for input device
2	0 V	0 V for input device
3	DI1	Input signal

Caution

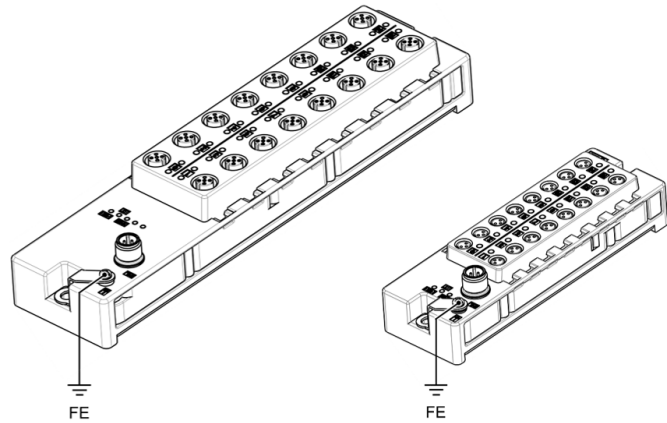
- Be sure to fit a dust cover on all unused connectors. Correct use of the dust cover enables the enclosure to maintain IP65 / IP67 specification.

Item	Specification	
Part number	EX9-AWTS	EX9-AWES
Applicable connector	M12 connector (socket)	M8 connector (socket)
Quantity in package	10 pcs.	10 pcs.
Applicable product.	EX600-TDX1	EX600-TDX2
Recommended Tightening torque.	0.1 N•m	0.05 N•m

5 Wiring (continued)

5.6 Ground Terminal

- The Terminal (input) unit must be connected to FE (Functional Earth) to divert electromagnetic interference. The mounting hole is electrically connected to the FE terminal via the FE bracket.
- If the mounting location is not grounded, connect a grounding cable from the FE terminal screw on the Terminal unit to the nearest functional earth point.
- The grounding cable should be as thick and short as possible.
- Resistance to ground should be 100 ohms or less.



6 Setting

6.1 IODD configuration file

- An IODD (IO Device Description) file is a profile held by an IO-Link device, which contains device specific information such as process data, parameter and initial values, vendor name and product name etc.
- The contents of the IODD file description are defined as the IO-Link specifications.

- The IODD file is supplied with a set of image files e.g., vendor logo, device photo and device icon.
- The IODD file of the Terminal (input) unit is as follows:

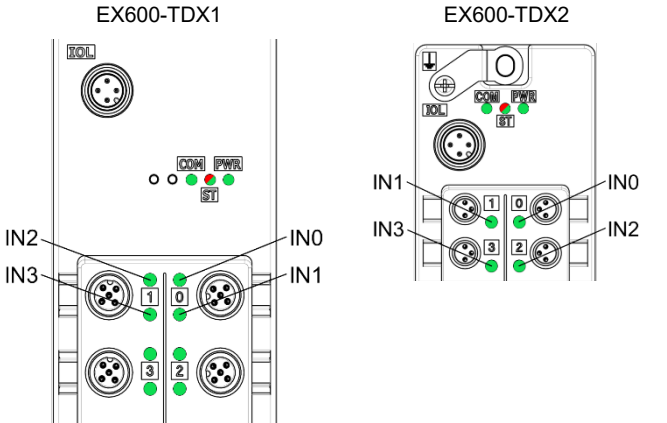
Model	Max. No. of inputs	Process data size		IODD file
		Input	Output	
EX600-TDX1	32	4 bytes	0 bytes	SMC-EX600-TDX_32-yyyymmdd-IODD1.1
EX600-TDX2	16	2 bytes	0 bytes	SMC-EX600-TDX_16-yyyymmdd-IODD1.1

Note: "yyyymmdd" represents the date the IODD file was created, "yyyy" is the year, "mm" is the month and "dd" is the date.

Download the latest IODD files from the SMC website.

URL: <https://www.smcworld.com>

7 LED Display

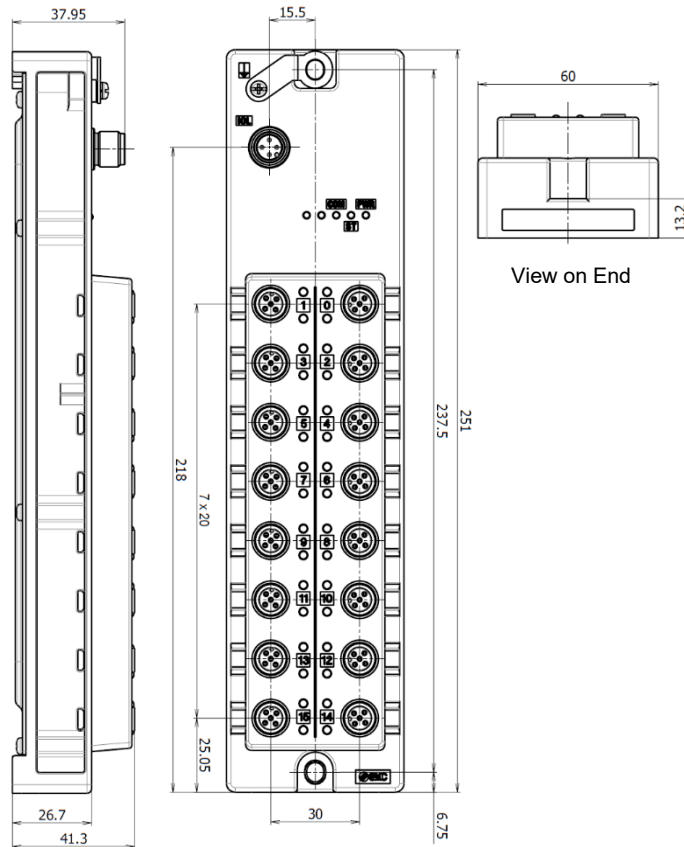


7 LED Display (continued)

LED	Indication	Explanation
COM	Green LED flashing (900 ms ON, 100 ms OFF)	IO-Link communication in progress with control/input power turned ON.
	Green LED ON	No IO-Link communication in progress with control/input power turned ON.
	OFF	Power supply for control/input is OFF.
ST	OFF	No diagnostic information.
	Red LED ON	The following diagnosis is in place. (DeviceStatus: Failure) <ul style="list-style-type: none">An overcurrent has occurred in the power supply for input devices.
	Green LED flashing (0.5 Hz)	The following diagnosis is in place. (DeviceStatus: Maintenance-Required) <ul style="list-style-type: none">The ON count of the input device has exceeded the set value.Auto switch failure is detected.The power supply for control/input has dropped.
PWR	Green LED ON	The power supply for input devices is ON.
	Green LED flashing (0.5 Hz)	The power supply for input devices has dropped.
	OFF	The power supply for input devices is OFF.
IN0 to 31	Green LED ON	The input signal to input device is ON.
	OFF	The input signal to input device is OFF.

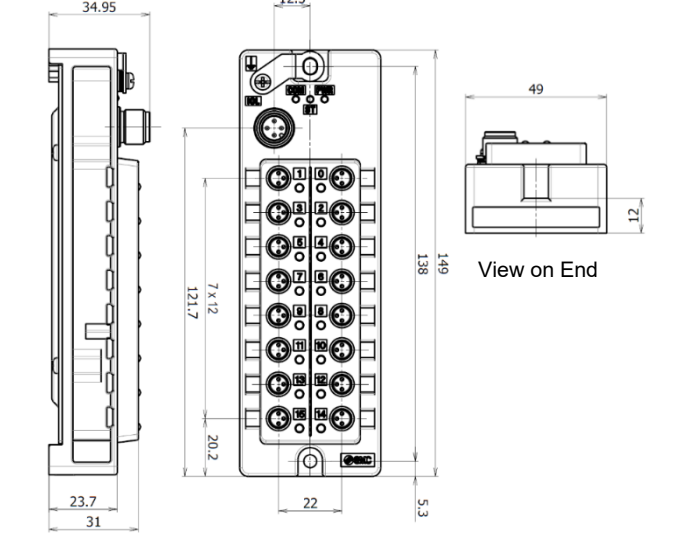
8 Outline Dimensions - mm

- EX600-TDX1



8 Outline Dimensions - mm (continued)

- EX600-TDX2



9 How to Order

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

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.
- Do not use solvents such as benzene, thinners, etc. to clean the product.

11 Limitations of Use

11.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

12 Product Disposal

This product shall 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)
SMC Corporation, 1-5-5, Kyobashi, Chuo-ku, Tokyo 104-0031, JAPAN
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