Autonics

Remote I/O Boxes (EtherCAT)

ADIO-EC (IO-Link Master Type)

PRODUCT MANUAL

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.
The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

Features

- The upper level communication protocol: EtherCAT
- The lower level communication protocol: IO-Link Ver. 1.1 (port class: Class A)
- Housing material: Zinc Die casting
- Protection rating: IP67, IP69K
- The daisy chain allows the power supply using the connection technology in a standardized 7/8" connector
- The maximum output current of power supply: 2 A per port
- I/O port settings and status monitoring
  (cable short / disconnection, connection status, etc.)
- Supports digital input filter

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

⚠ Warning Failure to follow instructions may result in serious injury or death.

01. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.(e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
Failure to follow this instruction may result in personal injury, economic loss or fire.

02. Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present.
Failure to follow this instruction may result in explosion or fire.

03. Do not connect, repair, or inspect the unit while connected to a power source.
Failure to follow this instruction may result in fire.

04. Check 'Connections' before wiring.
Failure to follow this instruction may result in fire.

05. Do not disassemble or modify the unit.
Failure to follow this instruction may result in fire.

06. Do not touch the product during operation or for a certain period of time after stopping.
Failure to follow this instruction may result in burn.

⚠ Caution Failure to follow instructions may result in injury or product damage.

01. Use the unit within the rated specifications.
Failure to follow this instruction may result in fire or shortening the life cycle of the product.

02. Use a dry cloth to clean the unit, and do not use water or organic solvent.
Failure to follow this instruction may result in fire.

03. Keep the product away from metal chip, dust, and wire residue which flow into the unit.
Failure to follow this instruction may result in fire or product damage.

04. Connect the cable correctly and prevent poor contact.
Failure to follow this instruction may result in fire or product damage.

05. Do not connect or cut off the wire of the cable while operating the unit.
Failure to follow this instruction may result in fire or product damage.

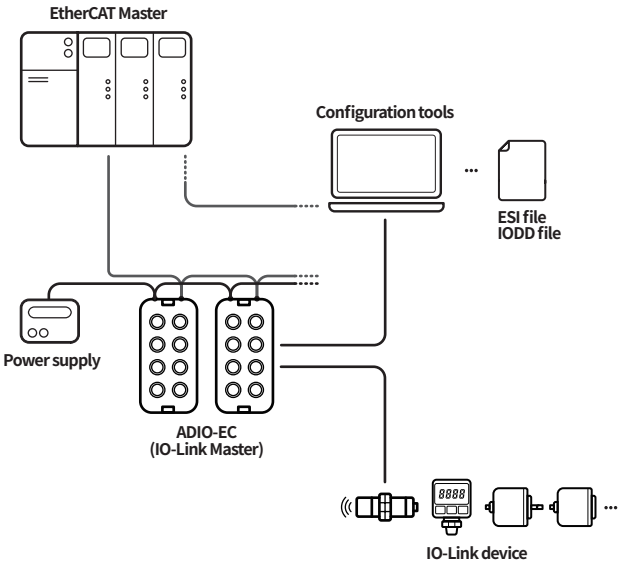
Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- The UA power (actuator power) and US power (sensor power) should be insulated by the individually isolated power device.
- Power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- Use the rated standard cables and connectors. Do not apply excessive power when connecting or disconnecting the connectors of the product.
- Keep away from high voltage lines or power lines to prevent inductive noise.
  In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line.
  For stable operation, use shield wire and ferrite core, when wiring communication wire, power wire, or signal wire.
- Do not use near the equipment which generates strong magnetic force or high frequency noise.
- Do not connect, or remove this unit while connected to a power source.
- This unit may be used in the following environments.
  - Indoors (in the environment condition rated in 'Specifications')
  - Altitude max. 2,000 m
  - Pollution degree 2
  - Installation category II

CE cULus LISTED EtherCAT Conformance tested IO-Link

Configuration of ADIO-EC-ILM

The figure below shows the EtherCAT network and the devices that compose it.
For proper use of the product, refer to the manuals and be sure to follow the safety considerations in the manuals. Download the manuals from the Autonics website.



STEP		Reference manual
Hardware installation	Install and ground the ADIO ↓ Connect the ports of ADIO ↓ Supply power to the ADIO	Product Manual for ADIO-EC-ILM
IO-Link device settings	Set parameters and functions of IO-Link device	atIOLink User Manual
EtherCAT Master ↕ ADIO-EC-ILM	Integrate the ADIO-EC-ILM to the TwinCAT 3 ↓ Set the ports of ADIO-EC-ILM	TwinCAT 3 Guide 01)
Checking the operation	Check the indicators	Product Manual for ADIO-EC-ILM

01) The purpose of this document is to provide supplementary information for users' convenience.
The project planning software of the upper level communication system may be different depending on the user's environment. For more information, refer to the manufacturer's manual.

■ The supported objects

Operation mode	Safe State 01)	Vali-dation	Data Storage	Input Filter 01)	Vendor ID	Device ID	Cycle Time
Digital Input	-	-	-	○	-	-	-
Digital Output	○	-	-	-	-	-	-
IO-Link Input	-	○	○	-	○	○	○
IO-Link Output	-	○	○	-	○	○	○
IO-Link Input/Output	-	○	○	-	○	○	○

01) Unsupported on the atIOLink

Software

Download the installation file and the manuals from the Autonics website.

■ atIOLink

"atIOLink" is the Port and Device Configuration Tool (PDCT).
It supports the settings for ports and devices in the Field Network.

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

ADIO - ❶ - ❷ ❸ ❹ ❺ ❻ ❼ ❽ - ❾

❶ Communication
EC: EtherCAT

❷ Material
M: Zinc die casting

❸ Port class
A: Class A

❹ Ports
08: 8-port

❺ I/O connector type
No mark: M12

❻ I/O configuration
A: Digital input 16-CH, digital output 8-CH

❼ Power connector type
No makr: 7/8", 5-pin

❽ I/O specification
N: NPN
P: PNP

❾ IO-Link product type
ILM: IO-Link Master

Product Components

- Product × 1
- Name plates × 20
- M4×10 screw with washer × 1
- Instruction manual × 1
- Waterproof cover × 4

Sold Separately

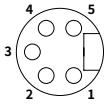
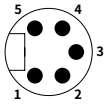
- Name plates
- Waterproof cover
- Communication cable for the PDCT port: SCM-USM12

Connections

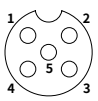
■ Ethernet port

M12 (Socket-Female), D-coded	Pin	Function	Description
	1	TX +	Transmit Data +
	2	RX +	Receive Data +
	3	TX -	Transmit Data -
	4	RX -	Receive Data -

■ Power supply port

OUT (7/8'', Socket-Female)	IN (7/8'', Plug-Male)	Pin	Function	Description
		1, 2	0 V	Sensor and actuator supply
		3	F.G.	Frame ground
		4	+24 VDC⎓	Sensor supply
		5	+24 VDC⎓	Actuator supply

■ PDCT port

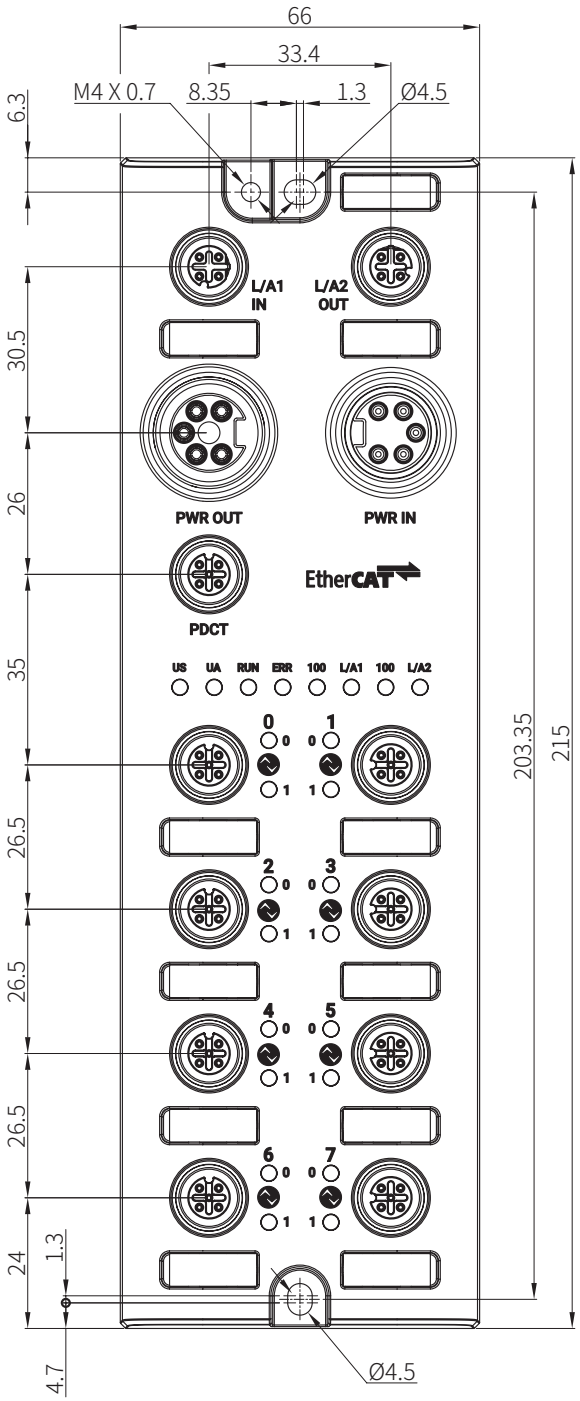
M12 (Socket-Female), A-coded	Pin	Function
	1	Not Connected (N.C.)
	2	Data -
	3	0 V
	4	Not Connected (N.C.)
	5	Data +

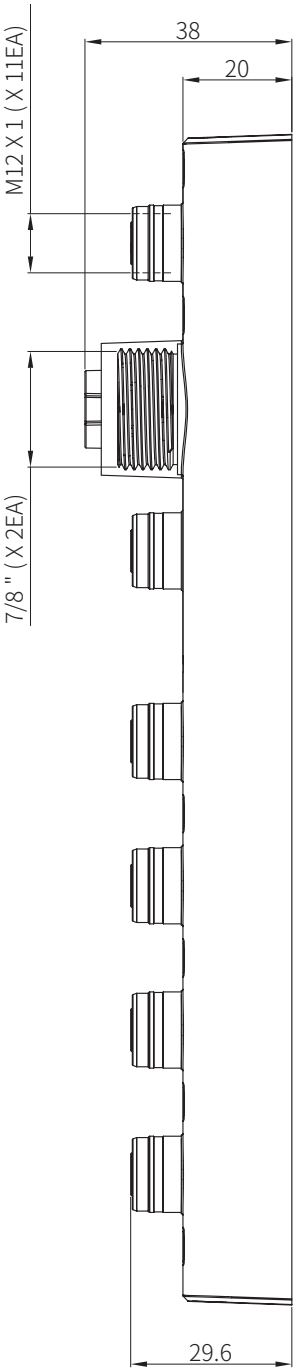
■ I/O port

M12 (Socket-Female), A-coded	Pin	Function
	1	+24 VDC⎓
	2	I/Q: Digital Input
	3	0 V
	4	C/Q: IO-Link, Digital Input/Output
	5	Not Connected (N.C.)

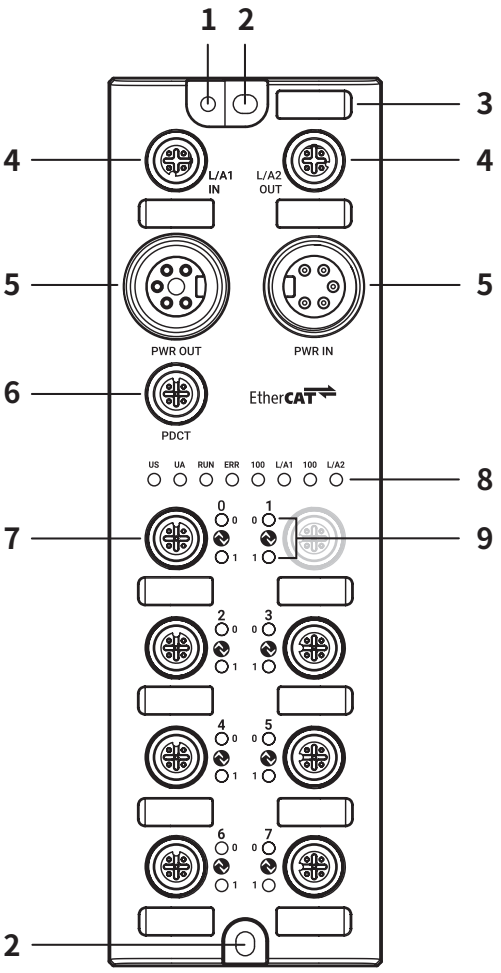
Dimensions

• Unit: mm, For the detailed dimensions of the product, follow the Autonics website.





Unit Descriptions

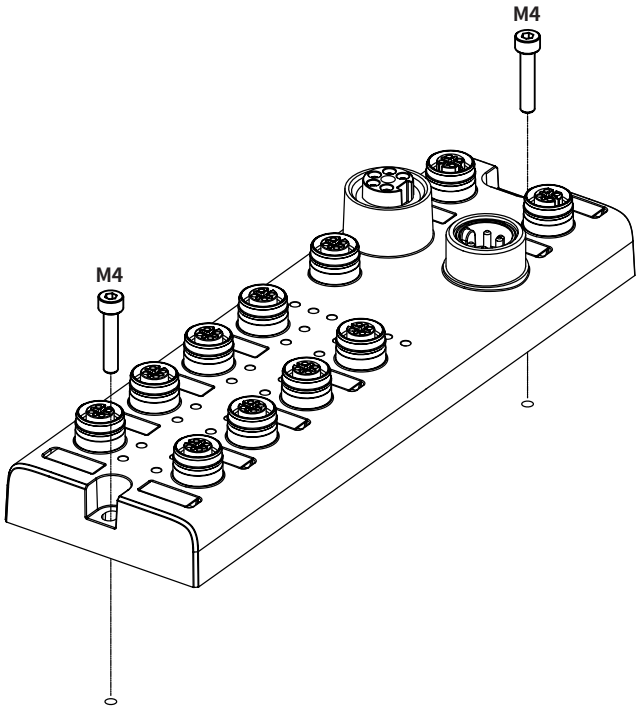


01. Grounding hole
02. Mounting hole
03. Insertion part for the name plate
04. Ethernet port
05. Power supply port
06. PDCT port
07. I/O port
08. Status indicator
09. I/O port indicator

Installation

■ Mounting

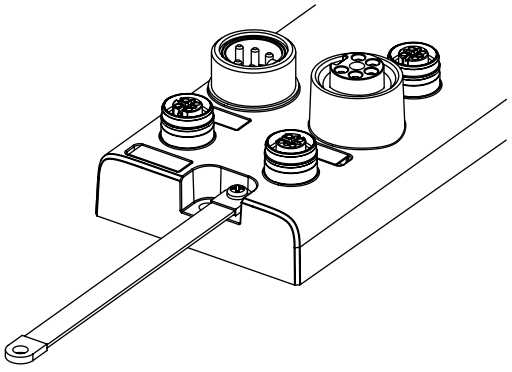
01. Prepare a flat or metal panel in the enclosure.
02. Drill a hole to mount and ground the product on the surface.
03. Turn off all power.
04. Fix the product using M4 screws in the mounting holes.
    Tightening torque: 1.5 N m



■ Grounding

⚠ Be sure to use a cable with low impedance and as short as possible for connecting the housing to the product.

01. Connect the grounding strap and M4×10 screw with washer.
02. Fix the screw in the grounding hole.
    Tightening torque: 1.2 N m



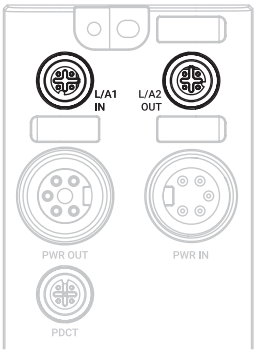
Port Connections

■ Port specifications

• Be sure to check the port specifications below before connecting the device. Prepare a cable that complies with the protection rating IP67/IP69K.

	Ethernet port	I/O port	PDCT port	Power supply port
Type	M12 (Socket-Female), 4-pin, D-coded	M12 (Socket-Female), 5-pin, A-coded	M12 (Socket-Female), 5-pin, A-coded	Input: 7/8" (Plug-Male), 5-pin Output: 7/8" (Socket-Female), 5-pin
Push-Pull	YES	YES	YES	N.A
Number of ports	2	8	1	2
Tightening torque	0.6 N m	0.6 N m	0.6 N m	1.5 N m
Supported function	Daisy chain	-	USB serial communication	Daisy chain

01. Connect to the EtherCAT



01. Connect the M12 connector to the Ethernet port. See the connections below.

1	TX +	Transmit Data +
2	RX +	Receive Data +
3	TX -	Transmit Data -
4	RX -	Receive Data -

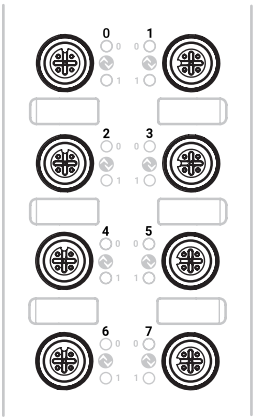
02. Connect the connector to the EtherCAT network.
  • Network device: PLC or EtherCAT device supporting EtherCAT protocol

03. Put the waterproof cover on the unused port.

02. Connect the IO-Link devices

⚠ The maximum output current is 2 A at each I/O port. Configure the device so that the total current of the I/O ports does not exceed 9 A.

⚠ Check the wiring information in the manual of the IO-Link device to be connected.



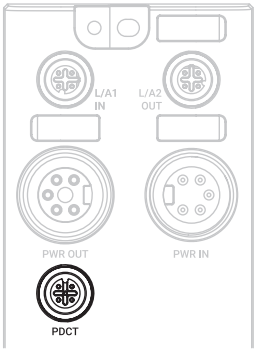
01. Connect the M12 connector to the I/O port. See the connections below.

1	+24 VDC⎓
2	I/Q: Digital Input
3	0 V
4	C/Q: IO-Link, Digital Input/Output
5	Not Connected (N.C.)

02. Put the waterproof cover on the unused port.

03. Connect with the atIOLink

⚠ Do not use the PDCT port and the Ethernet port at the same time.



01. Connect the M12 connector of SCM-USM12, the communication cable for the PDCT port (sold separately), to the PDCT port. See the connections below.

1	Not Connected (N.C.)
2	Data -
3	0 V
4	Not Connected (N.C.)
5	Data +

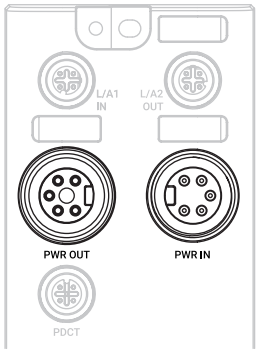
02. Connect the USB connector of the SCM-USM12, the communication cable for the PDCT port (sold separately), to the network device.
  • Network device: PC/laptop that atIOLink software is installed

03. Put the waterproof cover on the unused port.

Port Connections

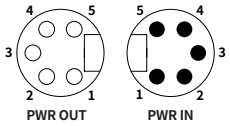
04. Connect the power supply to ADIO

⚠ Be sure not to exceed 9 A of the maximum supplying current to the sensor (US).



01. Turn off all power.

02. Connect the 7/8" connector to the power supply port. See the connections below.



1, 2	0 V	Sensor and actuator supply
3	F.G.	Frame ground
4	+24 VDC⎓	Sensor supply
5	+24 VDC⎓	Actuator supply

Indicators

■ Status indicator

01. The power supply of sensor

Indicator	LED Color	Status	Description
US	Green	ON	Applied voltage: normal
	Red	Flashing (1 Hz)	Applied voltage: low (< 18 VDC⎓)

02. The power supply of actuator

Indicator	LED Color	Status	Description
UA	Green	ON	Applied voltage: normal
	Red	Flashing (1 Hz)	Applied voltage: low (< 18 VDC⎓)
		ON	Applied voltage: none (< 10 VDC⎓)

03. Product initialization

Indicator	LED Color	Status	Description
US, UA	Red	ON	ADIO initialization failure

04. EtherCAT state machine

Indicator	LED Color	Status	Description
RUN	Green	OFF	EtherCAT state: INIT
		Flashing	EtherCAT state: PRE-OPERATIONAL
		Flashing (once)	EtherCAT state: SAFE-OPERATIONAL
		ON	EtherCAT state: OPERATIONAL

05. Error alert

Indicator	LED Color	Status	Description
ERR	Red	OFF	No error
		Flashing	Invalid configuration
		Flashing (once)	Local error
		ON	Error in application

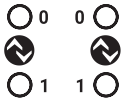
06. Ethernet connection

Indicator	LED Color	Status	Description
L/A1 L/A2	Green	OFF	No Ethernet connection.
		ON	The Ethernet connection is established.

07. Transmission rate of the Ethernet

Indicator	LED Color	Status	Description
100	Green	ON	Transmission rate: 100 Mbps

■ I/O port indicator



01. Pin 4 (C/Q)

Indicator	LED Color	Status	Description
0	Yellow	OFF	DI/DO: pin 4 OFF
		ON	DI/DO: pin 4 ON
	Green	ON	Port configuration: IO-Link
		Flashing (1 Hz)	Port configuration: IO-Link, No IO-Link device found
	Red	Flashing (2 Hz)	IO-Link configuration error
		ON	Short circuit occurred on pin 4

02. Pin 2 (I/Q)

Indicator	LED Color	Status	Description
1	Yellow	OFF	DI: pin 2 OFF
		ON	DI: pin 2 ON

03. The power supply of the I/O port

Indicator	LED Color	Status	Description
0,1	Red	Flashing (1 Hz)	Short circuit occurred in the I/O supply power (pin 1, 3)

Specifications

■ Electrical/Mechanical specifications

Supply voltage	18 - 30 VDC⎓
Rated voltage	24 VDC⎓
Current consumption	2.4 W (≤ 216 W)
Supplying current per port	≤ 2 A/Port
Sensor current (US)	≤ 9 A
Dimensions	W 66 × H 215 × D 38 mm
Material	Zinc Die casting
Ethernet port	M12 (Socket-Female), 4-pin, D-coded, Push-Pull Number of ports: 2 (IN/OUT) Supported function: daisy chain
Power supply port	Input: 7/8" (Plug-Male), 5-pin Output: 7/8" (Socket-Female), 5-pin Number of ports: 2 (IN/OUT) Supported function: daisy chain
PDCT port	M12 (Socket-Female), 5-pin, A-coded, Push-Pull Number of ports: 1 Connection method: USB serial communication
I/O port	M12 (Socket-Female), 5-pin, A-coded, Push-Pull Number of ports: 8
Mounting method	Mounting hole: fixed with M4 screw
Grounding method	Grounding hole: fixed with M4 screw
Unit weight (packaged)	≈ 700 g (≈ 900 g)

■ Mode specifications

Mode	**Digital Input**
Number of channels	16-CH (I/Q: 8-CH, C/Q:8-CH)
I/O common	NPN / PNP
Input current	5 mA
ON voltage/current	Voltage: ≥ 15 VDC⎓ Current: ≥ 5 mA
OFF voltage	≤ 5 VDC⎓

Mode	**Digital Output**
Number of channels	8-CH (C/Q)
I/O common	NPN / PNP
Power supply	24 VDC⎓ (18 - 30 VDC⎓), Max. 300 mA
Leakage current	≤ 0.1 mA
Residual voltage	≤ 1.5 VDC⎓
Short circuit protection	YES

Mode	**IO-Link**
Input current	2 mA
ON voltage/current	Voltage: ≥ 15 VDC⎓ Current: ≥ 2 mA
OFF voltage	≤ 5 VDC⎓

■ Environmental conditions

Ambient temperature 01)	-5 to 70 °C, Storage: -25 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 75%RH (no freezing or condensation)
Protection rating	IP67 (IEC standard), IP69K (DIN standard)

01) UL approved ambient temperature: 45 °C

■ Certification

Certification	CE cULus LISTED EtherCAT IO-Link

Communication Interface

■ Ethernet

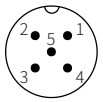
Ethernet standard	100BASE-TX
Cable spec.	STP (Shielded Twisted Pair) Ethernet cable over Cat 5
Transmission rate	100 Mbps
Cable length	≤ 100 m
Protocol	EtherCAT
ESI file	Downlaod the ESI file from the Autonics website.

■ IO-Link

Version	1.1
Transmission rate	COM1 : 4.8 kbps / COM2 : 38.4 kbps / COM3 : 230.4 kbps
Port class	Class A
Standard	IO-Link Interface and System Specification Version 1.1.2 IO-Link Test Specification Version 1.1.2

Sold Separately: SCM-USM12 (Comm. Cable for PDCT Port)

■ Specifications

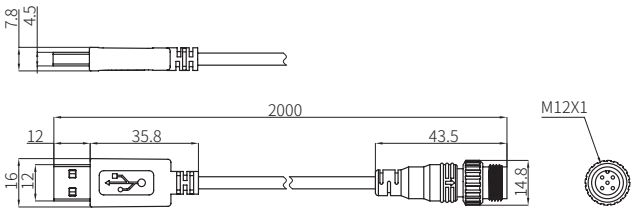
Connector 1	**Connector 2**	**Length**	**Feature**
 USB Type A (Plug-Male), 4-pin	 M12 (Plug-Male), 5-pin, A-coded	2 m	• IP20 / IP67 • PVC

■ Connection

Connector 1				**Connector 2**	
Pin no.	Function			Pin no.	Function
1	0 V	→		3	0 V
2	Data +	→		5	Data +
3	Data -	→		2	Data -
4	+ 5 VDC⎓			1	Not Connected (N.C.)
-	-			4	Not Connected (N.C.)

■ Dimensions

• Unit: mm, For the detailed dimensions of the product, follow the Autonics website.



X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Sensor Cables / Actuator Cables ***category:***

Click to view products by Autonics ***manufacturer:***

Other Similar products are found below :

60963 60964 M83513/19-F01CP 703000D02F2002 703000D02F300 703001D02F1201 703001D02F300 704000D02F120 773032K02F030 802027213811-1 804001A09M150 84914-0235 84914-0237 883030A09M050 884031A09M005 885030A09M010 8R4006A18M010 8R4J30E03C3003 1200650503 1200651713 1200680071 1200720537 1200860125 1200870123 1200650218 1200660183 1200661295 1200661297 1200661342 1200670080 1200720139 1200720255 1200720597 1200730184 1200860344 1200870359 1200870643 1200980008 1200980031 1210401265 1211810021 1300060465 1300060544 1300060784 1300061140 1300061169 1300061497 1300101010 1300101015 1300101144