IO Modules

IO-Link Master	4 x Class A	EtherNet/IP / EtherCAT / PROFINET

Simple connection for any Ethernet protocol.

Different variants for the EtherNet/IP, EtherCAT and PROFINET protocols with 4 Class A ports.

Existing field devices that send classic switching signals can also be operated in SIO mode via the Class A ports.

Features

- Variants for any Ethernet network:
  PROFINET, EtherNet/IP oder EtherCAT

- 4 IO-Link Ports Class A:
  for IO-Link communication and/or for digital inputs/outputs (SIO mode)

- Support for all common transmission speeds:
  4.8 kBit/s (COM1), 38.4 kBit/s (COM2) and 230.4 kBit/s (COM3).

- Robust aluminum alloy housing with protection class IP67 and a temperature range of -40 °C ... +85 °C enables reliable use even in wet areas.

Order code IO-Link Master

IOL	4A	.	1243	41	.	1222	XX
	ⓐ			ⓑ			ⓒ

ⓐ *Number of ports / category*
4A = 4 x Class A

ⓑ *Protocol input*
41 = IO-Link

ⓒ *Protocol output*
A1 = EtherNet/IP
B1 = EtherCAT
C1 = PROFINET

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General technical data

Mechanical characteristics

Material housing		Aluminum alloy
Housing color		black anodized
Protection		IP67, epoxy full potting
Degree of pollution		3
Housing dimensions	WxHxD	155 x 30 x 31.9 mm
	mounting hole	ø 4.5 mm x 2
Weight		208 g
Working temperature range		-25 °C ... +70 °C
Storage temperature range		-40 °C ... +85 °C
Humidity		5% ... 95%
Atmospheric pressure		80 ... 106 KPa

Approvals

CE compliant in accordance with

EMV Directive	2014/30/EU
RoHS Directive	2011/65/EU

Dimensions

Dimensions in mm [inch]

15 [0,591]

21 [0,827]
16,8 [0,661]

23 [0,906]
3,5 [0,138]

155 [6,102]
148 [5,827]
3,5 [0,138]

31,9 [1,256]
30 [1,181]
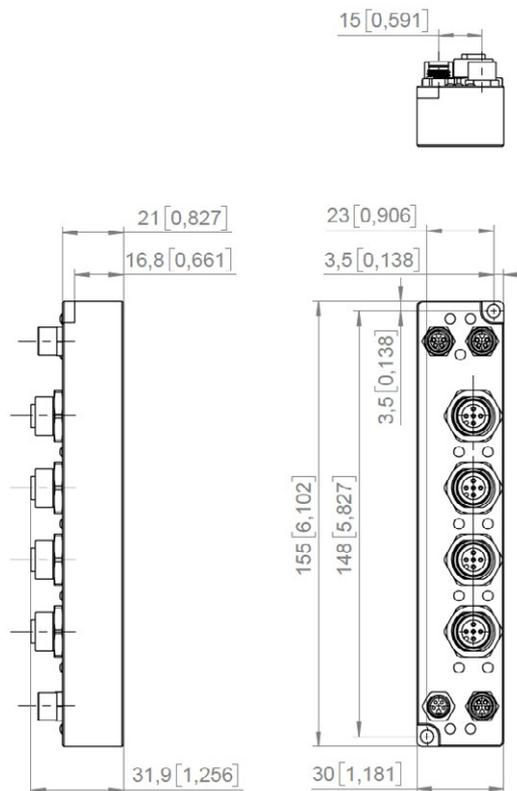
IO Modules

IO-Link Master	4 x Class A	EtherNet/IP / EtherCAT / PROFINET

Technical data – Supply voltage, ports PWR_IN + PWR_OUT

Electrical characteristics

Connection	1 x M8 connector, male 1 x M8 connector, female 4-pin + PE
Supply voltage system Us LEDs, controller, PHYs, L+ (C/Q)	18 … 30 V DC (typ. 24 V DC)
Supply voltage outputs Ua Digital Output DI/DO	18 … 30 V DC (typ. 24 V DC)
Total current Us/Ua	max. 4 A
Static operating current Us	≤ 150 mA
Overvoltage protection	yes
Reverse polarity protection	yes
Tightening torque	M8 0.5 Nm

ETH2   ETH1

X1

X2

X3

X4

PWR_IN   PWR IN   PWR OUT   **PWR_OUT**
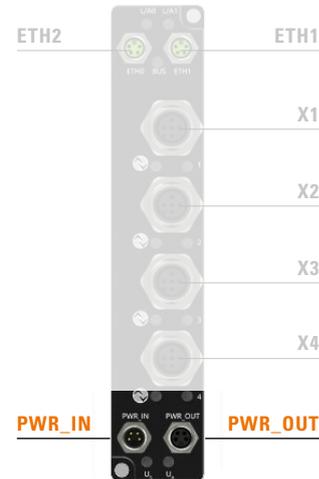
Terminal assignment

Port	M8 connector, 4-pin + PE				
PWR_IN, PWR_OUT supply voltage	Signal:	+V Us	+V Ua	0 V Us	0 V Ua
	Pin:	1	2	3	4

④ ②   ② ④
③ ①   ① ③

+V Us :   Supply voltage system, +24 V DC
+V Ua :   Supply voltage outputs, +24 V DC
0 V Us :   Supply voltage ground GND (0 V) system
0 V Ua :   Supply voltage ground GND (0 V) outputs

Cables and connectors / Supply voltage – ports PWR_IN + PWR_OUT

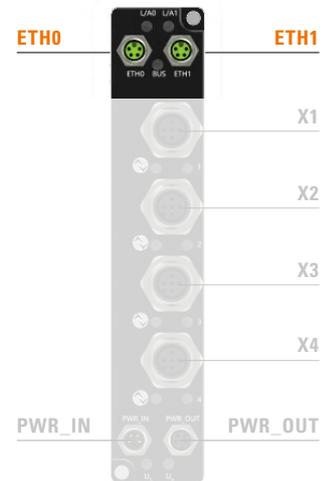|		Order no.
Preassembled cables	M8 male connector with external thread, 4-pin, straight single ended 2 m [6.56'] PUR cable	**05.00.60L1.K411.002M**
	M8 male connector with external thread, 4-pin, gerade M8 female connector with coupling, 4pinpolig, straight 2 m [6.56'] PUR cable	**05.00.60L1.K4K2.002M**

Further Kübler cables and connectors can be found at: kuebler.com/connection-technology

IO Modules

IO-Link Master	4 x Class A	EtherNet/IP / EtherCAT / PROFINET

Technical data – Ethernet data transmission, ports ETH0 + ETH1

Characteristics

Connection	2 x M8 connector, female 4-pin + PE
Physical layer	Ethernet
Transfer rate	10/100 Mbps, full duplex
Characteristic	conform to protocol
Alarm function	diagnostic alarm, process alarm
Cycle time, min.	1 ms
Tightening torque	M8 0.5 Nm

Terminal assignment

Port	M8-connector, 4-pin + shield				
ETH0, ETH1 Ethernet transmission	Signal:	TxD+	RxD+	TxD-	RxD-
	Pin:	1	2	3	4

Cables and connectors / Ethernet ports ETH0 + ETH1

		Order no.
Preassembled cables	M8 male connector with external thread, 4-pin, straight M8 male connector with external thread, 4-pin, straight 2 m [6.56'] PUR cable	**05.00.60M1.J4J4.002M**
	M8 male connector with external thread, 4-pin, right-angle M8 male connector with external thread, 4-pin, right-angle 2 m [6.56'] PUR cable	**05.00.60M1.J4J5.002M**
	M8 male connector with external thread, 4-pin, straight M12 male connector with external thread, 4-pin, D-codiert, straight 2 m [6.56'] PUR cable	**05.00.60M1.J444.002M**
	M8 male connector with external thread, 4-pin, straight RJ45 connector 2 m [6.56'] PUR cable	**05.00.60M1.J477.002M**

Further Kübler cables and connectors can be found at: kuebler.com/connection-technology

IO Modules

IO-Link Master	4 x Class A	EtherNet/IP / EtherCAT / PROFINET

Technical data – IO-Link interface, ports X1 ... X4

General IO-Link characteristics

IO-Link connections	M12 connector, femal 5-pin, A coded
IO-Link version	1.1
Transmission speed COM1 COM2 COM3	4.8 KBps 38.4 KBps 230.4 KBps
Port voltage	typ. 24 V DC (following Us)
Port current	max. 2 A (following Us)
Port Class Port X1 ... X4	4 x Class A
Data length of the ports max.	32 byte
Data transfer distance max.	≤ 100 m
IO-Link distance max.	≤ 20 m

ETH2   ETH1
X1
X2
X3
X4
PWR_IN   PWR_OUT

Terminal assignment

Port	M12 connector, 5-pin, A coded				
	Signal:	L+	DI/DO	L-	C/Q	PE
X1 ... X4 IO-Link, Class A	Pin:	1	2	3	4	5
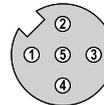
L+ : Supply voltage system (following Us)
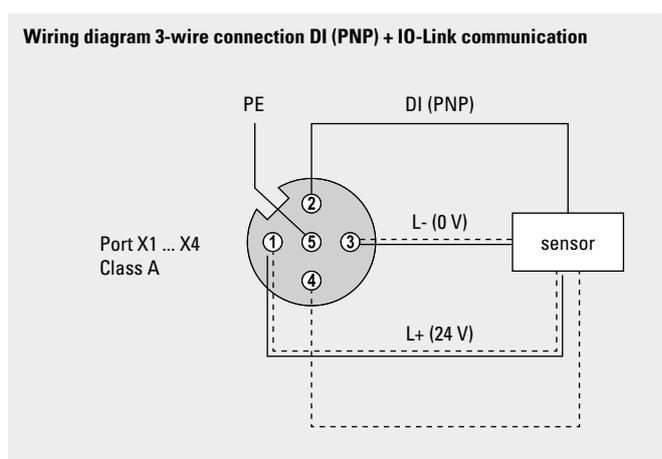L- : Supply voltage GND (0 V) system
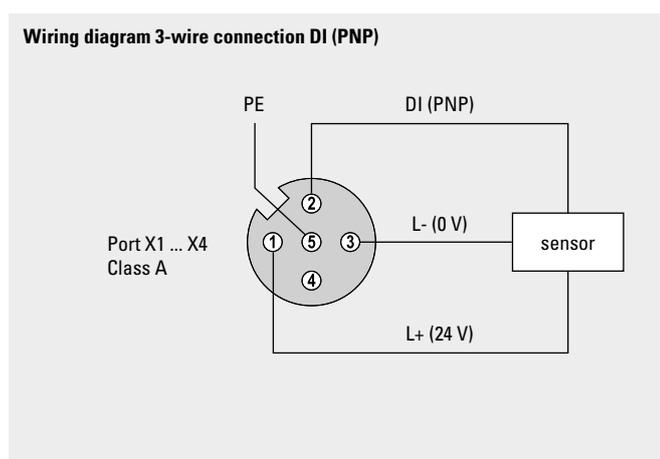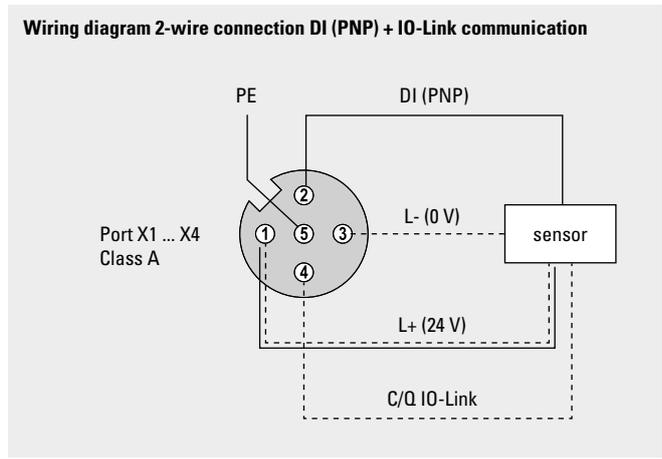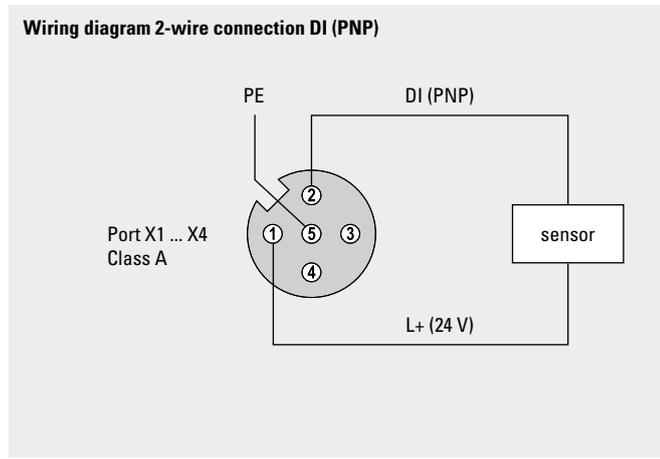C/Q : IO-Link communication
DI/DO : Digital input/output (PNP/NPN)

Cables and connectors / IO-Link – ports X1 ... X4

		Order no.
Preassembled cables	M12 male connector with external thread, 4-pin, A coded, straight M12 female connector with coupling nut, 4-pin, A coded, straight 2 m PUR-Kabel	**05.00.6061.6462.002M**
	M12 male connector with external thread, 5-pin, A coded, straight M12 female connector with coupling nut, 5-pin, A coded, right-angle 2 m PUR-Kabel	**05.00.6061.6364.002M**
	M12 male connector with external thread, 5-pin, A coded, straight single-ended 2 m PVC-Kabel	**05.00.6091.A411.002M**
	M12 male connector with external thread, 5-pin, A coded, right-angle single-ended 2 m PVC-Kabel	**05.00.6091.A511.002M**
Connectors	M12 male connector with external thread, 4-pin, A coded, straight (metal/plastic)	**05.BS8141-0**
	M12 male connector with external thread, 5-pin, A coded, straight (metal/plastic)	**05.BS-8151-0/9**
	M12 male connector with external thread, 5-pin, A coded, right-angle (metal/plastic)	**05.BS-8251-0/9**

Further Kübler cables and connectors can be found at: kuebler.com/connection-technology

IO Modules

IO-Link Master	4 x Class A	EtherNet/IP / EtherCAT / PROFINET

Technical details – Ports X1 ... X4 (Class A) as digital inputs/outputs DI/DO

Used as an input for a digital sensor signal PNP

Wiring diagram 2-wire connection DI (PNP)

Wiring diagram 2-wire connection DI (PNP) + IO-Link communication

Wiring diagram 3-wire connection DI (PNP)

Wiring diagram 3-wire connection DI (PNP) + IO-Link communication

Input parameters ports X1 ... X4		
Port Class		4 x Class A
Input polarity		PNP
Input signal "0"	LOW	0.3 ... 5 V DC
Input signal "1"	HIGH	12 ... 30 V DC

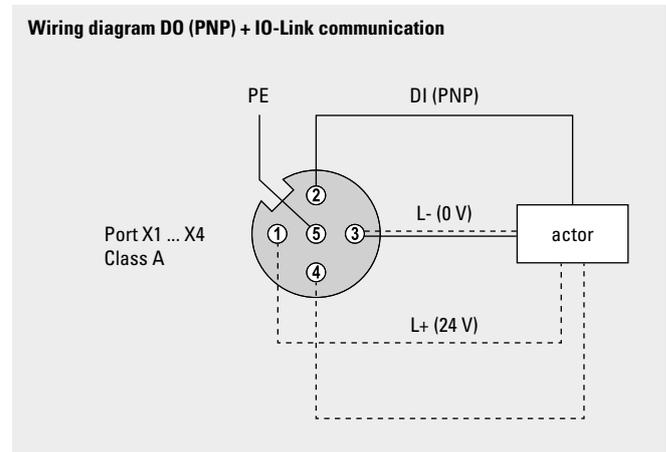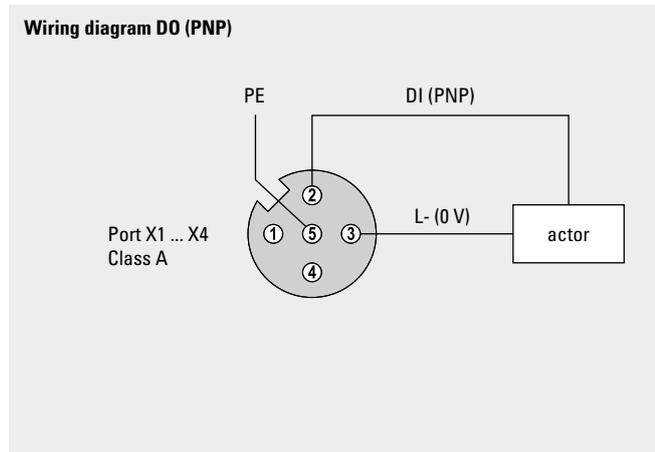Even if the connected sensor communicates via IO-Link, pin 2 can be used for a DI signal at the same time.

IO-Link Master	4 x Class A	EtherNet/IP / EtherCAT / PROFINET

Technical details – Ports X1 ... X4 (Class A) as digital inputs/outputs DI/DO

Used as an output for a digital actor signal PNP

Wiring diagram DO (PNP)

Wiring diagram DO (PNP) + IO-Link communication

Output parameters ports X1 ... X4	
Port Class	4 x Class A
Output polarity	PNP
Output current	max. 2 A, pro Kanal
Port protection	short-circuit protection (PIN1, PIN 3), overload protection
Load type	general use and resistive, pilot duty

Even if the connected sensor communicates via IO-Link, pin 2 can be used simultaneously for a DO signal or a supply voltage for an actuator.

| IO-Link Master | 4 x Class A | EtherNet/IP / EtherCAT / PROFINET |

LED status display

ETH0, ETH1

BUS

(1 ... 4) DI/DO

(1 ... 4) C/Q

Ua

Us
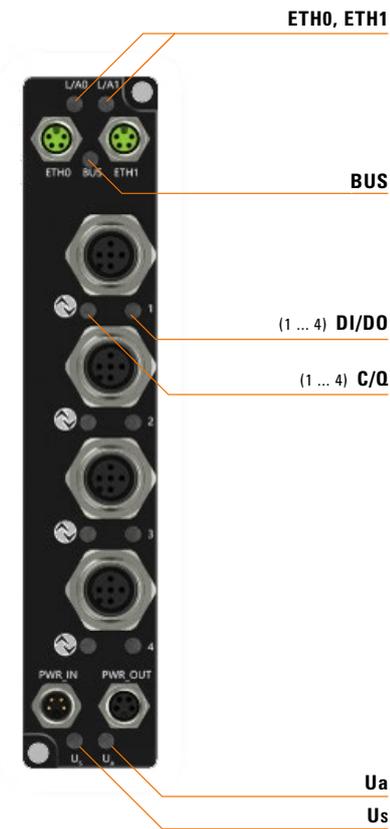
LED Abbreviation		Status Description	Solution
ETH0, ETH1 Ethernet communication	🟢	Continuous light green: connection created – data exchange not active	Check the network connection from the IO-Link master to the control unit
	🟡	Blinking green/yellow: Connection created, data exchange active	
	⚪	Off: no connection	Check the network connection from the IO-Link master to the control unit
BUS (System error)	🔴	Continuous light red: Configuration and connection are inconsistent / module error	
	🔴	Blinking red: Error device name, IP address, configuration	Check the network connection from the IO-Link master to the control unit
	⚪	Off: Normal status	
DI/DO	🟢	Continuous light green: signal/voltage is applied to pin 2	
	🔴	Continuous light red: short circuit / excessive current	Check connected device or pin 2, 3
C/Q (IO-Link communication)	🟢	Continuous light green: port in operation	
	🟢	Fast blinking green: port is connected	Check the connection to the IO-Link sensor/actuator
	🟢	Slow blinking green: connection is being prepared	Port is configured, but no IO-Link sensor/actuator is connected
	⚪	Off: port deactivated	
	🔴	Blinking red: Short circuit of the power supply	Check pin 1+3
Us / Ua power supply	🟢	Continuous light green: power supply is normal	
	🔴	Continuous light red: - Us connections reversed - Ua not connected - voltage too low or too high	Check power supply connections