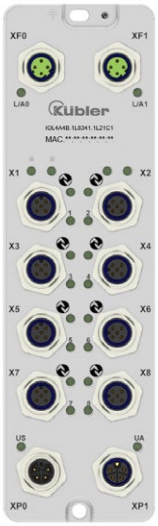
IO-Link Master	4 x Class A / 4 x Class B	EtherNet/IP / EtherCAT / PROFINET



Simple connection for any Ethernet protocol.

Different variants for the EtherNet/IP, EtherCAT and PROFINET protocols with 4 Class A and 4 Class B ports.
Existing field devices that send classic switching signals can also be operated in SIO mode via the Class A ports.

EtherNet/IP
EtherCAT Conformance tested
PROFINET
RoHS
IO-Link

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)
- 4 IO-Link Ports Class B:
  for IO-Link communication with additional power supply for energy-intensive actuators
- 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 ⓐ	4B ⓑ	.	1L83	41 ⓒ	.	1L21	XX ⓓ

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

ⓑ *Number of ports / category*
4B = 4 x Class B

ⓒ *Protocol input*
41 = IO-Link

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

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

General technical data

Mechanical characteristics

Material housing		Aluminum alloy
Protection		IP67, epoxy full potting
Degree of pollution		3
Housing dimensions	WxHxD mounting hole	205 x 60 x 34.4 mm 1 x ø 4.5 mm / 1 x ø 5.5 mm
Weight		515 g [18.17 oz]
Working temperature range		-25 °C ... +70 °C [-13°F ... 158°F]
Storage temperature range		-40 °C ... +85 °C [-40°F ... 185°F]
Humidity		5% ... 95%
Atmospheric pressure		80 ... 106 KPa

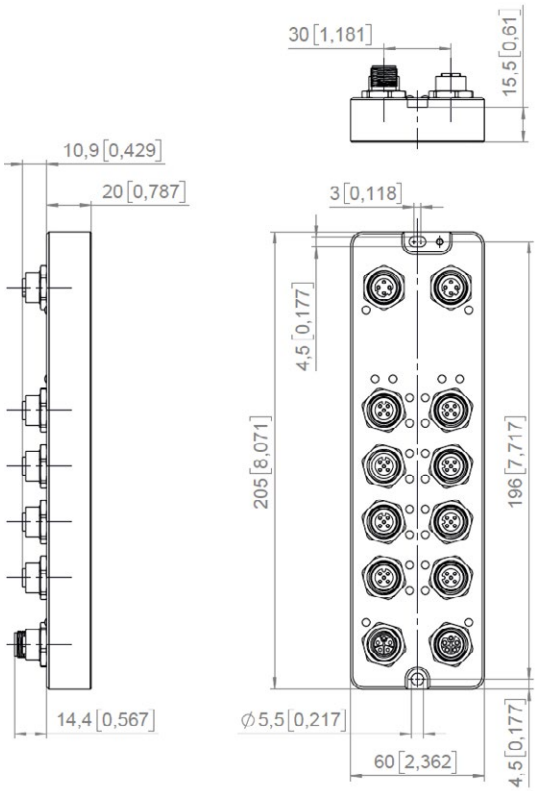
Approvals

CE compliant in accordance with

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

Dimensions

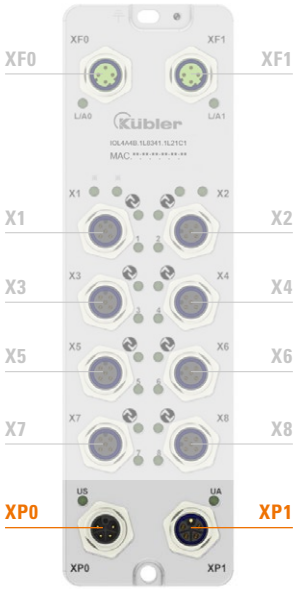
Dimensions in mm [inch]



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

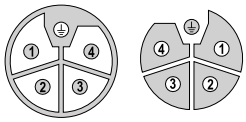
Technical data – Supply voltage, ports XP0 + XP1

Electrical characteristics		
Connection		1 x M12 connector, male 1 x M12 connector, female 5-pin, L coded
Supply voltage system Us LEDs, controller, PHYs, L+ (C/Q)		18 ... 30 V DC (typ. 24 V DC)
Supply voltage outputs Ua Digital Output (Class A), L2+ (Class B)		18 ... 30 V DC (typ. 24 V DC)
Total current Us/Ua		max. 12 A
Static operating current Us		≤ 150 mA
Overvoltage protection		yes
Reverse polarity protection		yes
Tightening torque	M12	0.5 Nm



Terminal assignment

Port	M12-connector, 5-pin, L coded					
XP0, XP1 supply voltage	Signal:	+V Us	0 V Us	0 V Ua	+V Ua	PH
	Pin:	1	2	3	4	⏚



+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
PH : Shield

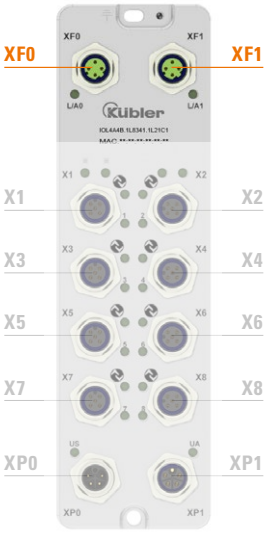
Cables and connectors / Supply voltage – ports XP0 + XP1		Order no.
Preassembled cables	M12 female connector with coupling nut, 4-pin + PE, L coded, straight single ended 2 m [6.56'] PUR cable	**05.00.60K1.M411.002M**
	M12 female connector with coupling nut, 4-pin + PE, L coded, straight M12 male connector with external thread, 4-pin + PE, L coded, straight 2 m [6.56'] PUR cable	**05.00.60K1.M4M2.002M**
Connectors	M12 female connector with coupling nut, 4-pin + PE, L coded, straight (metal/plastic)	**8.0000.5216.0000**
	M12 male connector with external thread, 4-pin + PE, L coded, straight (metal/plastic)	**8.0000.5211.0000**

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

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

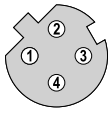
Technical data – Ethernet data transmission, ports XF0 + XF1

Characteristics		
Connection		2 x M12 connector, female 4-pin, D coded
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	M12	0.5 Nm



Terminal assignment

Port	M12 connector, 4-pin, D coded				
XF0, XF1 Ethernet transmission	Signal:	TxD+	RxD+	TxD-	RxD-
	Pin:	1	2	3	4



Cables and connectors / Ethernet – Anschlüsse XF0 + XF1

		Order no.
Preassembled cables	M12 male connector with external thread, 4-pin, D coded, straight M12 male connector with external thread, 4-pin, D coded, straight 2 m [6.56'] PUR cable	**05.00.6031.4444.002M**
	M12 male connector with external thread, 4-pin, D coded, straight M12 male connector with external thread, 4-pin, D coded, right-angle 2 m [6.56'] PUR cable	**05.00.6031.4544.002M**
	M12 male connector with external thread, 4-pin, D coded, straight RJ45 connector 2 m [6.56'] PUR cable	**05.00.6031.7444.002M**

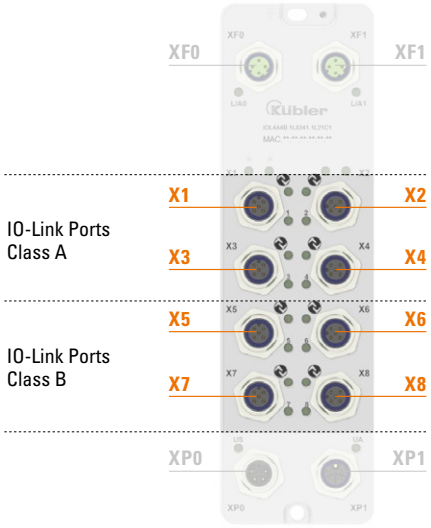
Further Kübler cables and connectors can be found at: kuebler.com/connection-technology

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

Technical data – IO-Link interface, ports X1 ... X8

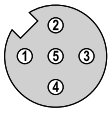
General IO-Link characteristics

IO-Link connections		M12 connector, female 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 Port X5 ... X8	4 x Class A 4 x Class B
Data length of the ports max.		32 byte
Data transfer distance max.		≤ 100 m
IO-Link distance max.		≤ 20 m



Terminal assignment

Port	M12 connector, 5-pin, A coded					
X1 ... X4 IO-Link, Class A	Signal:	L+	DI/DO	L-	C/Q	PE
X5 ... X8 IO-Link, Class B	Signal:	L+	2L+	L-	C/Q	2L-
	Pin:	1	2	3	4	5



L+ : Supply voltage system (following Us)
L- : Supply voltage GND (0 V) system
2L+ : Supply voltage outputs (following Ua)
2L- : Supply voltage GND (0 V) outputs
C/Q : IO-Link communication
DI/DO : Digital input/output (PNP/NPN)

Cables and connectors / IO-Link – ports X1 ... X8

		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**

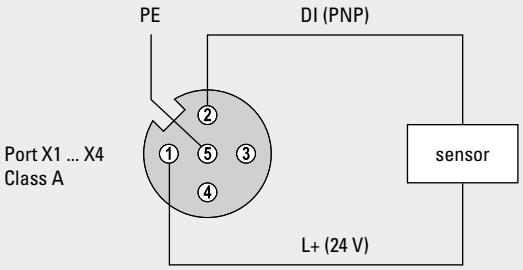
Further Kübler cables and connectors can be found at: kuebler.com/connection-technology

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

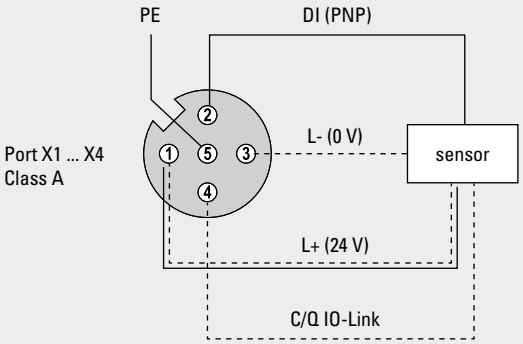
Technical details – Ports X1 ... X4 (Class A) as digital inputs/outputs DI/DO

Used as an input for a digital sensor signal PNP

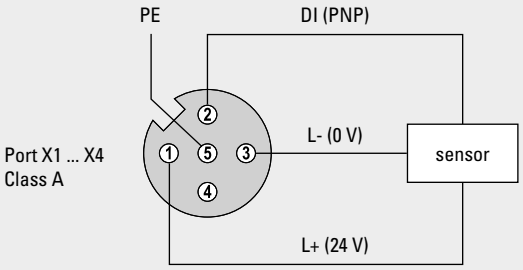
Wiring diagram 2-wire connection DI (PNP)



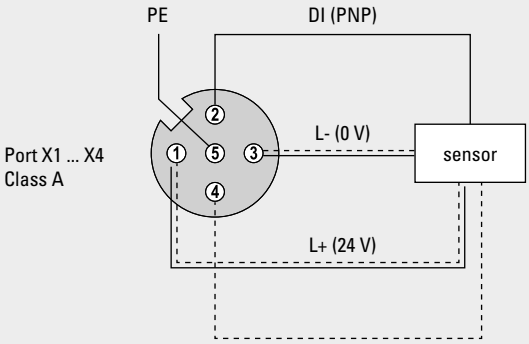
Wiring diagram 2-wire connection DI (PNP) + IO-Link communication



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

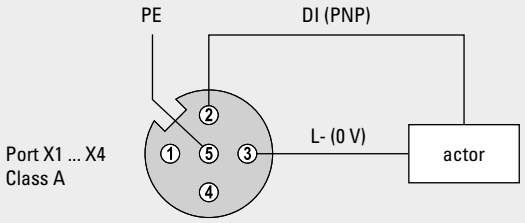
Even if the connected sensor communicates via IO-Link, pin 2 can be used for a DI signal at the same time.

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

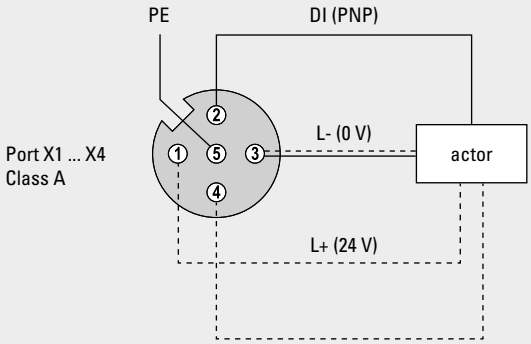
Technical details – Ports X1 ... X4 (Class A) as digital inputs/outputs DI/DO

Used as an output for a digital actor signal PNP

Wiring diagram DO (PNP)



Wiring diagram DO (PNP) + IO-Link communication

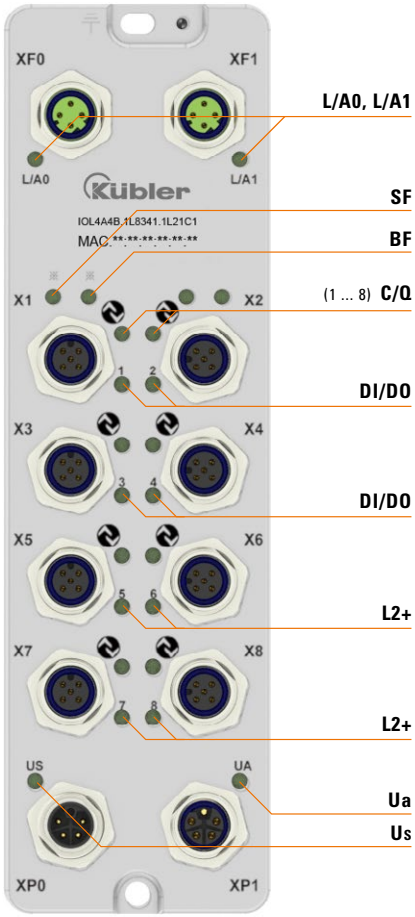


Output parameters ports X1 ... X4	
Port Class	4 x Class A
Output polarity	PNP
Output current	max. 2 A, per channel
Port protection	short-circuit protection (PIN1, PIN 3), overload protection
Load type	general use and resistive, pilot duty

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 / 4 x Class A | EtherNet/IP / EtherCAT / PROFINET

LED status display



LED Abbreviation		Status Description	Solution
L/A0, L/A1 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
SF (System error)	●	Continuous light green: normal status	
	●	Continuous light red: failure of the module	Check whether the IO-Link master is connected
	✳	Blinking green: module not configured	Check the configuration in the program and the PLC download status
BF (Bus error)	●	Continuous light green: normal status	
	✳	Blinking red: data interruption	Check the network connection to the control unit
	✳	Blinking green: no data connection	Check the network connection to the control unit
DI/DO (Class A) **2L+** (Class B)	●	Continuous light green: signal/voltage is applied to pin 2	
	●	Continuous light red: short circuit / excessive current	Check connected device or pin 2
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