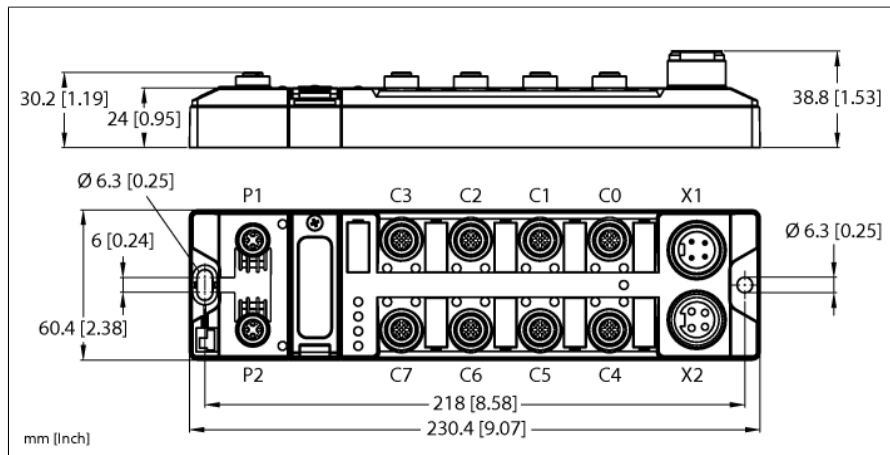


Compact Multiprotocol I/O Module for Ethernet

8 IO-Link Master Channels

4 Universal Digital PNP Channels, 2 A, Channel Diagnostics

TBEN-LH-8IOL



Type	TBEN-LH-8IOL
ID	100002195
Supply	
Supply voltage	24 VDC
Admissible range	18...30 VDC Total current max. 9 A per voltage group Total current V1 + V2 max. 11 A IO-Link 20.4...28.8 VDC
Voltage supply connection	7/8", 4-pin
Operating current	V1: max. 180 mA, min. 120 mA V2: min. 40 mA, max. 90 mA
Sensor/actuator supply	Supply from V1 Short-circuit proof, max. 4 A per slot C0 and C4, max. 2 A per slot C1–C3, C5–C7
Sensor/actuator supply	Class B supply from V2 Short-circuit proof, max. 4 A per slot C4 and C5, max. 2 A per slot C6 and C7
Electrical isolation	galvanic isolation of the voltage groups V1 and V2, voltages up to 500 VAC
Fault exclusion	Yes, acc. to EN ISO 13849-2, appendix D.2
System data	
Fieldbus transmission rate	10/100 Mbps
Fieldbus connection technology	2 × M12, 4-pin, D-coded
Protocol detection	automatic
Web server	Default: 192.168.xxx.xxx
Service interface	Ethernet via P1 or P2
Modbus TCP	
Addressing	Static IP, DHCP
Supported function codes	FC1, FC2, FC3, FC4, FC6, FC15, FC16, FC23
Number of TCP connections	8
Input register start address	0 (0x0000 hex)
Output register start address	2048 (0x0800 hex)

- PROFINET device, EtherNet/IP device or Modbus TCP server
- Integrated Ethernet switch
- Supports 10 Mbps/100 Mbps
- 2 × M12, 4-pin, D-coded, Ethernet fieldbus connection
- Glass fiber reinforced housing
- Shock and vibration tested
- Fully potted module electronics
- Protection classes IP65, IP67, IP69K
- 7/8" male connector for power supply, 4-pin
- Galvanically isolated voltage groups support passive safety
- M12 ports for IO-Link master, 5-pin
- IO-Link master port class A and port class B
- IO-Link Protocol 1.1
- Dieser Artikel darf nur für Honda-Projekte verwendet werden!

Ethernet/IP	
Addressing	acc. to EtherNet/IP specification
Quick Connect (QC)	< 150 ms
min. RPI	2 ms
Device Level Ring (DLR)	supported
Class 3 connections (TCP)	3
Class 1 connections (CIP)	10
Input Assembly Instance	101
Output Assembly Instance	102
Configuration Assembly Instance	106

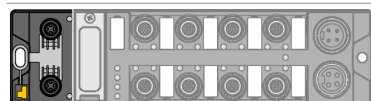
PROFINET	
Addressing	DCP
Conformance class	B (RT)
MinCycleTime	1 ms
Fast Start-Up (FSU)	< 150 ms
Diagnostics	acc. to PROFINET alarm handling
Topology detection	supported
Automatic addressing	supported
Media Redundancy Protocol (MRP)	supported

Digital inputs	
Number of channels	4 DXP + 8 SIO
Connectivity inputs	M12, 5-pin
Input type	PNP
Type of input diagnostics	Channel diagnostics
Switching threshold	EN 61131-2 type 3, PNP
Low-level signal voltage	< 5 V
High level signal voltage	> 11 V
Low level signal current	< 1.5 mA
High level signal current	> 2 mA
Input delay	0.05 ms
Electrical isolation	Galvanically isolated to the bus, voltages up to 500 VAC

Digital outputs	
Number of channels	4 DXP
Connectivity outputs	M12, 5-pin
Output type	PNP
Type of output diagnostics	Channel diagnostics
Output voltage	24 VDC from potential group
Output current per channel	2.0 A, short-circuit proof
Electrical isolation	galvanically isolated against P1/P2, voltages up to 500 VAC

IO-Link	
Number of channels	8
IO-Link	Pin 4 in IOL mode
IO-Link specification	V 1.1
IO-Link port type	Class A and Class B
Frame type	supports all specified frame types
Supported devices	Max. 32 bytes in/32 bytes out per port
Transmission rate	4.8 kbps (COM 1) / 38.4 kbps (COM 2) / 230 kbps (COM 3)

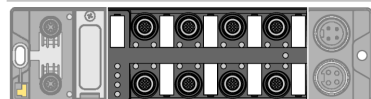
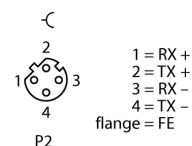
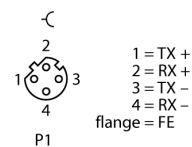
Standard/Directive conformity	
Vibration test	Acc. to EN 60068-2-6 Acceleration up to 20 g
Shock test	acc. to EN 60068-2-27
Drop and topple	acc. to EN 60068-2-31/IEC 60068-2-32
Electromagnetic compatibility	Acc. to EN 61131-2
Approvals and certificates	CE and UKCA FCC statement, UV resistant acc. to DIN EN ISO 4892-2A (2013)
UL Certificate	cULus LISTED 21 W2, Encl.Type 1 IND.CONT.EQ.
General Information	
Dimensions (W x L x H)	60.4 x 230.4 x 39 mm
Ambient temperature	-40...+70 °C
Storage temperature	-40...+85 °C
Altitude	Max. 5000 m
Protection class	IP65 IP67 IP69K
Housing material	PA6-GF30
Housing color	Black
Connector material	Nickel-plated brass
Window material	Lexan
Material screw	303 stainless steel
Material label	Polycarbonate
Halogen-free	yes
Mounting	2 mounting holes □ 6.3 mm



Note

Ethernet cable (example):
RSSD-RSSD-441-2M/S2174
Ident. no. 6914218

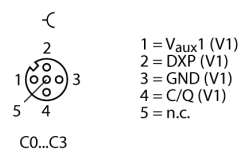
Ethernet



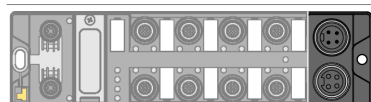
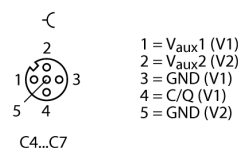
Note

Pin 1: V_{AUX1} can be deactivated via process data
Pin 4: IO-Link data or digital input (SIO mode)
C0...C3: IO-Link Master Class A
Pin 2: digital input or output (DXP)
C4...C7: IO-Link Master Class B
Pin 2: switchable class B supply (V_{AUX2})
Accessories:
Appropriate IO-Link cable for example:
ID No. 6625604 2m: RKC4T-2-RSC4T/TXL
ID No. 6625730 5 m: RKC4T-5-RSC4T/TXL
Further lengths and variants in the product catalog or on request

M12 × 1 I/O port



M12 × 1 I/O port



Note

Power supply cable (example):
RKM43-1-RSM43
Ident. no. 6914312

Voltage Supply 7/8"



Module Status LED

LED	Color	Status	Description
ETH1 / ETH2	Green	On	Ethernet Link (100 Mbps)
		Flashing	Ethernet communication (100 Mbps)
	yellow	On	Ethernet link (10 Mbps)
		Flashing	Ethernet communication (10 Mbps)
		Off	No Ethernet link
BUS	Green	On	Active connection to a master
		Flashing	Steady flashing: Ready Sequence of 3 flashes in 2 seconds: FLC/ARGE active
	Red	On	IP-address conflict or Restore Mode or Modbus timeout
		Flashing	Blink/Wink command active
	Green/Red	Alternating	Autonegotiation and/or waiting for DHCP/Boot-P addressing
		Off	Power off
ERR	Green	On	No diagnostics available
	Red	On	Diagnostics available
			Undervoltage diagnosis response is parameter dependent
PWR	Green	On	V ₁ and V ₂ power supply OK
	Red	On	V ₂ power supply off or V ₂ undervoltage
		Off	V ₁ power supply off or V ₁ undervoltage

LED Status I/O

LED	Color	Status	Description
LED 0, 2, 4, 6, 8, 10, 12, 14 IO-Link Port 1-8 IO-Link Mode	Green	Flashing	IO-Link communication, process data valid
	Red	Flashing	IO-Link communication, process data invalid
		ON	IO-Link supply OK, no IO-Link Communication
LED 0, 2, 4, 6, 8, 10, 12, 14 IO-Link Port 1-8 SIO Mode	Green	ON	Digital Input signal is present
		OFF	No input signal
	Red	ON	Digital input or output active
		ON	Output active with overload/short circuit
LED 1, 3, 5, 7 DXP	Green	ON	Digital input or output active
		ON	Output active with overload/short circuit
	Red	ON	Overload supply V _{AUX1}
		OFF	Input or output inactive
LED 9, 11, 13, 15 IO-Link Class B VAUX2	Green	ON	V _{AUX2} Active on Pin 2
		ON	V _{AUX2} Active on Pin 2 with overload/short circuit
	Red	ON	Overload supply V _{AUX1}
		OFF	V _{AUX2} Inactive on Pin 2

Process Data Mapping of the Single Protocols

For more details on the corresponding protocols see manual.

INPUT	WORD	Bit 7/15	Bit 6/14	Bit 5/13	Bit 4/12	Bit 3/11	Bit 2/10	Bit 1/9	Bit 0/8
Input Word	0	Reserved	Reserved	Reserved	Reserved	C3 DXP Input Active	C2 DXP Input Active	C1 DXP Input Active	C0 DXP Input Active
		C7 PIN4 DI	C6 PIN4 DI	C5 PIN4 DI	C4 PIN4 DI	C3 PIN4 DI	C2 PIN4 DI	C1 PIN4 DI	C0 PIN4 DI
	1	Reserved	Reserved	Reserved	FCE	COM	V2	V1	Diag
		C7 IOL Port 8 Data Valid	C6 IOL Port 7 Data Valid	C5 IOL Port 6 Data Valid	C4 IOL Port 5 Data Valid	C3 IOL Port 4 Data Valid	C2 IOL Port 3 Data Valid	C1 IOL Port 2 Data Valid	C0 IOL Port 1 Data Valid
	IO-Link process input data								
	2	C0 IOL Port 1 Input Data Word 0							
	3	C0 IOL Port 1 Input Data Word 1							
	4	C1 IOL Port 2 Input Data Word 0							
	5	C1 IOL Port 2 Input Data Word 1							
	6	C2 IOL Port 3 Input Data Word 0							
	7	C2 IOL Port 3 Input Data Word 1							
	8	C3 IOL Port 4 Input Data Word 0							
	9	C3 IOL Port 4 Input Data Word 1							
	10	C4 IOL Port 5 Input Data Word 0							
	11	C4 IOL Port 5 Input Data Word 1							
	12	C5 IOL Port 6 Input Data Word 0							
	13	C5 IOL Port 6 Input Data Word 1							
	14	C6 IOL Port 7 Input Data Word 0							
	15	C6 IOL Port 7 Input Data Word 1							
	16	C7 IOL Port 8 Input Data Word 0							
	17	C7 IOL Port 8 Input Data Word 1							
	structure depends on channel parameterization								
	18	C0 IOL Port 1 Input Data Word 0							
	34	C1 IOL Port 2 Input Data Word 0							
	50	C2 IOL Port 3 Input Data Word 0							
	66	C3 IOL Port 4 Input Data Word 0							
	82	C4 IOL Port 5 Input Data Word 0							
	98	C5 IOL Port 6 Input Data Word 0							
	114	C6 IOL Port 7 Input Data Word 0							
	130	C7 IOL Port 8 Input Data Word 0							
OUTPUT	BYTE	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output Word	0	Disable C7 IOL	Disable C6 IOL	Disable C5 IOL	Disable C4 IOL	Disable C3 IOL	Disable C2 IOL	Disable C1 IOL	Disable C0 IOL
		Activate C3 DXP	Activate C2 DXP	Activate C1 DXP	Activate C0 DXP	Enable C3 DXP	Enable C2 DXP	Enable C1 DXP	Enable C0 DXP
	1	-	C3 IOL Map B0	-	C2 IOL Map B0	-	C1 IOL Map B0	-	C0 IOL Map B0
		-	C7 IOL Map B0	-	C6 IOL Map B0	-	C5 IOL Map B0	-	C4 IOL Map B0
	2	Turn off VAUX1Pin1 C7 Ch14	Turn off VAUX1Pin1 C6 Ch12	Turn off VAUX1Pin1 C5 Ch10	Turn off VAUX1 Pin1 C4 Ch8	Turn off VAUX1Pin1 C3 Ch6, 7	Turn off VAUX1Pin1 C2 Ch4, 5	Turn off VAUX1Pin1 C1 Ch2, 3	Turn off VAUX1Pin1 C0 Ch0, 1
		Turn off VAUX2Pin2 C7 Ch15	Turn off VAUX2Pin2 C6 Ch13	Turn off VAUX2Pin2 C5 Ch11	Turn off VAUX2Pin2 C4 Ch9	Reserved	Reserved	Reserved	Reserved
	3	C7 16 Word Transfer	C6 16 Word Transfer	C5 16 Word Transfer	C4 16 Word Transfer	C3 16 Word Transfer	C2 16 Word Transfer	C1 16 Word Transfer	C0 16 Word Transfer
		Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
	IO-Link process output data								
	4	C0 IOL Port 1 Output Data Word 0							
	5	C0 IOL Port 1 Output Data Word 1							
	6	C1 IOL Port 2 Output Data Word 0							
	7	C1 IOL Port 2 Output Data Word 1							
	8	C2 IOL Port 3 Output Data Word 0							
	9	C2 IOL Port 3 Output Data Word 1							
	10	C3 IOL Port 4 Output Data Word 0							
	11	C3 IOL Port 4 Output Data Word 1							
	12	C4 IOL Port 5 Output Data Word 0							
	13	C4 IOL Port 5 Output Data Word 1							
	14	C5 IOL Port 6 Output Data Word 0							

15	C5 IOL Port 6 Output Data Word 1
16	C6 IOL Port 7 Output Data Word 0
17	C6 IOL Port 7 Output Data Word 1
18	C7 IOL Port 8 Output Data Word 0
19	C7 IOL Port 8 Output Data Word 1
structure depends on channel parameterization	
20	C0 IOL Port 1 Output Data Word 0 — 16WD Enabled
35	C0 IOL Port 1 Output Data Word 15 — 16WD Enabled
:::	
132	C7 IOL Port 8 Output Data Word 0 — 16WD Enabled
147	C7 IOL Port 8 Output Data Word 15 — 16WD Enabled