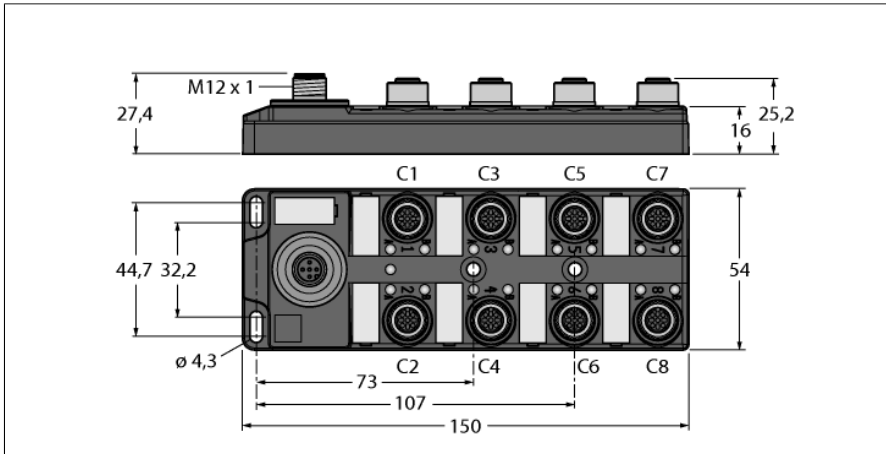


I/O Hub for Connecting Digital Signals to IO-Link Master

16 Universal Digital Channels, PNP

TBIL-M1-16DXP



Type	TBIL-M1-16DXP
ID	6814102
Supply	
Supply voltage	24 VDC
Admissible range	18...30 VDC V1 max 9 A V2 max 9 A V1+V2 max 11 A
Voltage supply connection	M12
Operating current	Max. 145 mA
Sensor/actuator supply	Class-A supply from V1 Short circuit-proof, 120 mA per slot
Power dissipation, typical	≤ 3.5 W
Digital inputs	
Number of channels	16 digital PNP inputs (EN 61131-2)
Connectivity inputs	M12
Type of input diagnostics	Group diagnostics
Low-level signal voltage	-3...5 VDC (EN 61131-2, type 1 and 3)
High level signal voltage	11...30 VDC (EN 61131-2, type 1 and 3)
Electrical isolation	inputs to FE 500VDC
Max. input current	7 mA
Digital outputs	
Number of channels	16 digital PNP outputs
Connectivity outputs	M12
Output type	PNP
Type of output diagnostics	Group diagnostics
Output voltage	24 VDC from supply voltage
Output current per channel	4 A total, 0.5 A per channel
Simultaneity factor	0.35
Load type	resistive, inductive, lamp load
Short-circuit protection	yes
Electrical isolation	outputs to FE 500 VDC

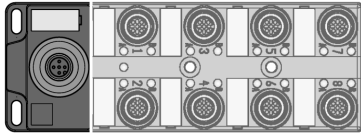
- IO-Link V1.1 Class A
- Glass fiber reinforced housing
- Shock and vibration tested
- Fully potted module electronics
- Protection classes IP65, IP67, IP69K
- ATEX Zone 2/22
- CCC-Ex
- 2 universal digital channels per slot
- I&M data sets support installation and maintenance
- IO-Link diagnostics for short circuit and supply voltage

IO-Link	
Connectivity IO-Link	1 × M12
IO-Link specification	V 1.1
IO-Link port type	Class A
Frame type	2.6
Transmission rate	COM 2 / 38.4 kbps
Programming	FDT/DTM, TBEN IOL master
Transmission physics	corresponds to 3-wire physics (PHY2)

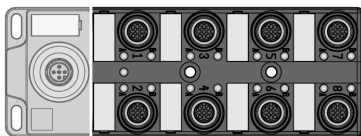
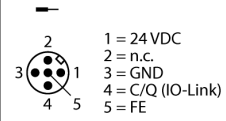
Standard/Directive conformity	
Vibration test	Acc. to EN 60068-2-6 Acceleration up to 20 g
Shock test	Acc. to EN 60068-2-27
Drop and topple	Acc. to IEC 60068-2-31/IEC 60068-2-32
Electromagnetic compatibility	Acc. to EN 61131-2:2007
Approvals and certificates	CE UKCA ATEX Zone 2/22 CCC-Ex UV resistant acc. to DIN EN ISO 4892-2A (2013)
UL Certificate	cULus LISTED 21 W2, Encl.type 1 IND.CONT.EQ.
Note on ATEX/IECEx	The Quick Start Guide with information on use in Ex areas must be observed.

General Information	
Dimensions (W x L x H)	54 x 150 x 27.4 mm
Ambient temperature	-40...+70 °C
Storage temperature	-40...+85 °C
Altitude	Max. 5000 m
Protection class	IP67 IP69K
MTTF	96 years acc. to SN 29500 (Ed. 99) 20 °C
Housing material	PA6-GF30
Mounting	4 mounting holes Ø 4.3 mm

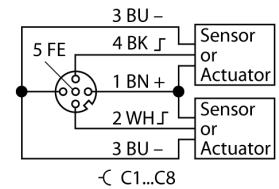
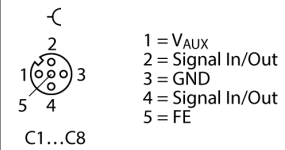
Pinning and wiring diagram



M12 x 1 IO-Link



M12 x 1 I/O Port



Module LED status

LED	Color	Status	Description
IO-Link	Green	OFF	Power off
		Flashing	IO-Link communication OK, valid process data is sent or received
	Red	ON	IO-Link communication or module error
		Flashing	IO-Link communication OK, invalid process data or diagnosis enabled

I/O LED Status

LED	Color	Status	Description
C1 A / B ... C8 A / B	Green	ON	Input or output active
		Flashing	Power overload at the corresponding port. Both port LEDs are flashing.
	Red	ON	Output active with overload / short circuit
		OFF	Input or output inactive

C ... = slot number, A / B = Signal LED (signal A = pin 4, B = signal pin 2)

Process Data Mapping

Details can be found in the manual.

	Byte	Bit 7 MSB	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0 LSB
Inputs	0	DI8 C4P2 (B)	DI7 C4P4 (A)	DI6 C3P2 (B)	DI5 C3P4 (A)	DI4 C2P2 (B)	DI3 C2P4 (A)	DI2 C1P2 (B)	DI1 C1P4 (A)
	1	DI16 C8P2 (B)	DI15 C8P4 (A)	DI14 C7P2 (B)	DI13 C7P4 (A)	DI12 C6P2 (B)	DI11 C6P4 (A)	DI10 C5P2 (B)	DI9 C5P4 (A)
Outputs	0	DO8 C4P2 (B)	DO7 C4P4 (A)	DO6 C3P2 (B)	DO5 C3P4 (A)	DO4 C2P2 (B)	DO3 C2P4 (A)	DO2 C1P2 (B)	DO1 C1P4 (A)
	1	DO16 C8P2 (B)	DO15 C8P4 (A)	DO14 C7P2 (B)	DO13 C7P4 (A)	DO12 C6P2 (B)	DO11 C6P4 (A)	DO10 C5P2 (B)	DO9 C5P4 (A)

C... = slot no., P... = pin no.

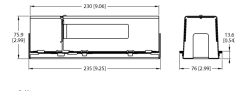
Diagnostics / Events

Class/Qualifier			Code	Description	
Mode	Type	Instance			
0xC0	0x30	0x04	0xF4 appears	0x5110	Supply voltage too high
0x80	0x30	0x04	0xB4 disappears	0x5110	
0xC0	0x30	0x04	0xF4 appears	0x5111	Supply voltage too low
0x80	0x30	0x04	0xB4 disappears	0x5111	
0xC0	0x30	0x04	0xF4 appears	0x7710	Short circuit to GND
0x80	0x30	0x04	0xB4 disappears	0x7710	
0xC0	0x30	0x04	0xF4 appears	0x5000	Hardware error
0x80	0x30	0x04	0xB4 disappears	0x5000	

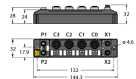
Device Parameters

ISDU	Sub-Index	Parameter Name	Access R: Read W: Write	Data Length	Data Type	
0x0C	0x02	Data Storage Lock	R/W	1Bit	Boolean	Lock Parameter Upload 0: Unlocked; 1: Locked Default: 0
0x10	0x00	Vendor Name	R	16 Bytes	String	TURCK
0x11	0x00	Vendor Text	R	32 Bytes	String	www.turck.com
0x12	0x00	Product Name	R	32 Bytes	String	TBIL-M1-16DXP
0x13	0x00	Product ID	R	16 Bytes	String	6814102
0x14	0x00	Product Text	R	32 Bytes	String	I/O HUB
0x15	0x00	Serial Number	R	16 Bytes	String	
0x17	0x00	FW Revision	R	16 Bytes	String	
0x18	0x00	Application Specific Tag	R/W	32 Bytes	String	Free text e.g for application name Default: ***
0x40	0x00	Parameter ID	R/W	4 Bytes	Unsigned 32	ID no. e.g. for module identification Default: 0x0000
0x41	0x00	Inverting Input	R/W	2 bytes	Unsigned 16	Inverting the input logic 0: Normal; 1: Inverted Default: 0x00
0x42	0x00	Activate Output	R/W	2 Bytes	Unsigned 16	Activate Output 0: Inactive; 1: Active Default: 0xFFFF
0x43	0x00	Impulse Stretching	R/W	16 Bytes	Unsigned 8	Expansion of input pulse 0: Off, 1-255; Basis: 10 ms Default: 0x00
0x44	0x00	Short Circuit Recovery	R/W	2 Bytes	Unsigned 16	Behaviour after short circuit output 0: Automatic 1: Controlled (output newly set) Default: 0x0000
0x45	0x00	Failsafe	R/W	2 Bytes	Unsigned 32	Behavior on communication loss 00: Output on 0 01: Output on 1 10: Last value 11: Reserved Default: 0x0000

Accessories

Type code	Ident-No.		Dimension drawing
TB-SG-L	100014865	Protective housing for TBEN-L and TBIL-M block I/O modules for use in ATEX Zone 2/22	 <p>The drawing shows two views of the protective housing. The top view is a rectangle with a width of 220.000 mm and a height of 71.2 mm. The bottom view shows a depth of 210.000 mm. A side view shows a height of 33.5 mm and a depth of 40.2 mm.</p>

Function accessories

Type code	Ident-No.		Dimension drawing
TBEN-S2-4IOL	6814024	Compact multiprotocol I/O module, 4 IO-Link Master 1.1 Class A, 4 universal PNP digital channels 0.5 A	 <p>The drawing shows a top view of the module with dimensions: 112 mm width and 44 mm height. Pin headers are labeled with 'A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'J', 'K', 'L', 'M', 'N', 'O', 'P', 'Q', 'R', 'S', 'T', 'U', 'V', 'W', 'X', 'Y', 'Z', 'AA', 'AB', 'AC', 'AD', 'AE', 'AF', 'AG', 'AH', 'AI', 'AJ', 'AK', 'AL', 'AM', 'AN', 'AO', 'AP', 'AQ', 'AR', 'AS', 'AT', 'AU', 'AV', 'AW', 'AX', 'AY', 'AZ', 'BA', 'BB', 'BC', 'BD', 'BE', 'BF', 'BG', 'BH', 'BI', 'BJ', 'BK', 'BL', 'BM', 'BN', 'BO', 'BP', 'BQ', 'BR', 'BS', 'BT', 'BU', 'BV', 'BW', 'BX', 'BY', 'BZ', 'CA', 'CB', 'CC', 'CD', 'CE', 'CF', 'CG', 'CH', 'CI', 'CJ', 'CK', 'CL', 'CM', 'CN', 'CO', 'CP', 'CQ', 'CR', 'CS', 'CT', 'CU', 'CV', 'CW', 'CX', 'CY', 'CZ', 'DA', 'DB', 'DC', 'DD', 'DE', 'DF', 'DG', 'DH', 'DI', 'DJ', 'DK', 'DL', 'DM', 'DN', 'DO', 'DP', 'DQ', 'DR', 'DS', 'DT', 'DU', 'DV', 'DW', 'DX', 'DY', 'DZ', 'EA', 'EB', 'EC', 'ED', 'EE', 'EF', 'EG', 'EH', 'EI', 'EJ', 'EK', 'EL', 'EM', 'EN', 'EO', 'EP', 'EQ', 'ER', 'ES', 'ET', 'EU', 'EV', 'EW', 'EX', 'EY', 'EZ', 'FA', 'FB', 'FC', 'FD', 'FE', 'FF', 'FG', 'FH', 'FI', 'FJ', 'FK', 'FL', 'FM', 'FN', 'FO', 'FP', 'FQ', 'FR', 'FS', 'FT', 'FU', 'FV', 'FW', 'FX', 'FY', 'FZ', 'GA', 'GB', 'GC', 'GD', 'GE', 'GF', 'GG', 'GH', 'GI', 'GJ', 'GK', 'GL', 'GM', 'GN', 'GO', 'GP', 'GQ', 'GR', 'GS', 'GT', 'GU', 'GV', 'GW', 'GX', 'GY', 'GZ', 'HA', 'HB', 'HC', 'HD', 'HE', 'HF', 'HG', 'HH', 'HI', 'HJ', 'HK', 'HL', 'HM', 'HN', 'HO', 'HP', 'HQ', 'HR', 'HS', 'HT', 'HU', 'HV', 'HW', 'HX', 'HY', 'HZ', 'IA', 'IB', 'IC', 'ID', 'IE', 'IF', 'IG', 'IH', 'II', 'IJ', 'IK', 'IL', 'IM', 'IN', 'IO', 'IP', 'IQ', 'IR', 'IS', 'IT', 'IU', 'IV', 'IW', 'IX', 'IY', 'IZ', 'JA', 'JB', 'JC', 'JD', 'JE', 'JF', 'JG', 'JH', 'JI', 'JJ', 'JK', 'JL', 'JM', 'JN', 'JO', 'JP', 'JQ', 'JR', 'JS', 'JT', 'JU', 'JV', 'JW', 'JX', 'JY', 'JZ', 'KA', 'KB', 'KC', 'KD', 'KE', 'KF', 'KG', 'KH', 'KI', 'KJ', 'KK', 'KL', 'KM', 'KN', 'KO', 'KP', 'KQ', 'KR', 'KS', 'KT', 'KU', 'KV', 'KW', 'KX', 'KY', 'KZ', 'LA', 'LB', 'LC', 'LD', 'LE', 'LF', 'LG', 'LH', 'LI', 'LJ', 'LK', 'LL', 'LM', 'LN', 'LO', 'LP', 'LQ', 'LR', 'LS', 'LT', 'LU', 'LV', 'LW', 'LX', 'LY', 'LZ', 'MA', 'MB', 'MC', 'MD', 'ME', 'MF', 'MG', 'MH', 'MI', 'MJ', 'MK', 'ML', 'MM', 'MN', 'MO', 'MP', 'MQ', 'MR', 'MS', 'MT', 'MU', 'MV', 'MW', 'MX', 'MY', 'MZ', 'NA', 'NB', 'NC', 'ND', 'NE', 'NF', 'NG', 'NH', 'NI', 'NJ', 'NK', 'NL', 'NM', 'NN', 'NO', 'NP', 'NQ', 'NR', 'NS', 'NT', 'NU', 'NV', 'NW', 'NX', 'NY', 'NZ', 'OA', 'OB', 'OC', 'OD', 'OE', 'OF', 'OG', 'OH', 'OI', 'OJ', 'OK', 'OL', 'OM', 'ON', 'OO', 'OP', 'OQ', 'OR', 'OS', 'OT', 'OU', 'OV', 'OW', 'OX', 'OY', 'OZ', 'PA', 'PB', 'PC', 'PD', 'PE', 'PF', 'PG', 'PH', 'PI', 'PJ', 'PK', 'PL', 'PM', 'PN', 'PO', 'PP', 'PQ', 'PR', 'PS', 'PT', 'PU', 'PV', 'PW', 'PX', 'PY', 'PZ', 'QA', 'QB', 'QC', 'QD', 'QE', 'QF', 'QG', 'QH', 'QI', 'QJ', 'QK', 'QL', 'QM', 'QN', 'QO', 'QP', 'QQ', 'QR', 'QS', 'QT', 'QU', 'QV', 'QW', 'QX', 'QY', 'QZ', 'RA', 'RB', 'RC', 'RD', 'RE', 'RF', 'RG', 'RH', 'RI', 'RJ', 'RK', 'RL', 'RM', 'RN', 'RO', 'RP', 'RQ', 'RR', 'RS', 'RT', 'RU', 'RV', 'RW', 'RX', 'RY', 'RZ', 'SA', 'SB', 'SC', 'SD', 'SE', 'SF', 'SG', 'SH', 'SI', 'SJ', 'SK', 'SL', 'SM', 'SN', 'SO', 'SP', 'SQ', 'SR', 'SS', 'ST', 'SU', 'SV', 'SW', 'SX', 'SY', 'SZ', 'TA', 'TB', 'TC', 'TD', 'TE', 'TF', 'TG', 'TH', 'TI', 'TJ', 'TK', 'TL', 'TM', 'TN', 'TO', 'TP', 'TQ', 'TR', 'TS', 'TT', 'TU', 'TV', 'TW', 'TX', 'TY', 'TZ', 'UA', 'UB', 'UC', 'UD', 'UE', 'UF', 'UG', 'UH', 'UI', 'UJ', 'UK', 'UL', 'UM', 'UN', 'UO', 'UP', 'UQ', 'UR', 'US', 'UT', 'UU', 'UV', 'UW', 'UX', 'UY', 'UZ', 'VA', 'VB', 'VC', 'VD', 'VE', 'VF', 'VG', 'VH', 'VI', 'VJ', 'VK', 'VL', 'VM', 'VN', 'VO', 'VP', 'VQ', 'VR', 'VS', 'VT', 'VU', 'VV', 'VW', 'VX', 'VY', 'VZ', 'WA', 'WB', 'WC', 'WD', 'WE', 'WF', 'WG', 'WH', 'WI', 'WJ', 'WK', 'WL', 'WM', 'WN', 'WO', 'WP', 'WQ', 'WR', 'WS', 'WT', 'WU', 'WV', 'WW', 'WX', 'WY', 'WZ', 'XA', 'XB', 'XC', 'XD', 'XE', 'XF', 'XG', 'XH', 'XI', 'XJ', 'XK', 'XL', 'XM', 'XN', 'XO', 'XP', 'XQ', 'XR', 'XS', 'XT', 'XU', 'XV', 'XW', 'XX', 'XY', 'XZ', 'YA', 'YB', 'YC', 'YD', 'YE', 'YF', 'YG', 'YH', 'YI', 'YJ', 'YK', 'YL', 'YM', 'YN', 'YO', 'YP', 'YQ', 'YR', 'YS', 'YT', 'YU', 'YV', 'YW', 'YX', 'YY', 'YZ', 'ZA', 'ZB', 'ZC', 'ZD', 'ZE', 'ZF', 'ZG', 'ZH', 'ZI', 'ZJ', 'ZK', 'ZL', 'ZM', 'ZN', 'ZO', 'ZP', 'ZQ', 'ZR', 'ZS', 'ZT', 'ZU', 'ZV', 'ZW', 'ZX', 'ZY', 'ZZ'.</p>