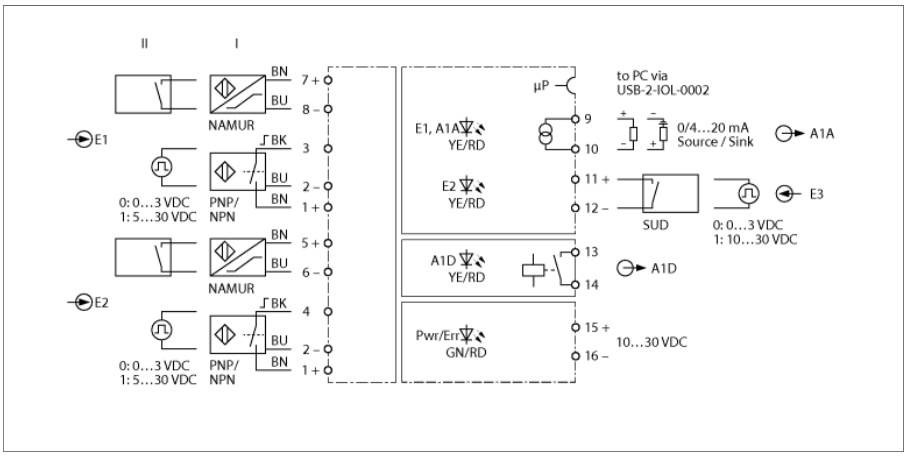
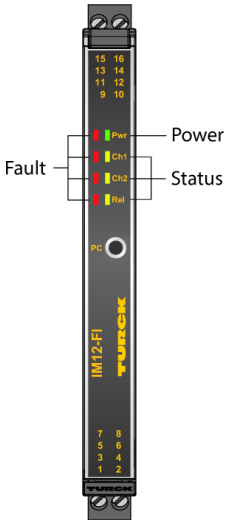
Frequency Transducer/Pulse Counter 1-channel IM12-FI01-1SF-1I1R-C0/24VDC





The frequency transducer/pulse counter IM12-FI01-1SF-1I1R-C0/24VDC transmits frequency signals up to 20000 Hz electrically isolated. In addition, limits, slip or forward/reverse run can be monitored. The devices are suitable for operation in zone 2.

The 1-channel device is equipped with two inputs for the connection of sensors acc. to EN 60947-5-6 (NAMUR) or potential-free contacts. A current output (0/4…20 mA) and an NO relay are available on the output side.

The device is parameterized via FDT and IODD with a PC. The current output can be set to 0/4…20 mA (source or sink optional). In accordance with the parameterization (E1, E2, E1-E2 or E2-E1), the input signals are provided as a 0/4…20 mA standard current signal. With the NO relay, either a limit value can be monitored on over/undershoot or a window. The start-up delay SUD is turned on via input E1, E2 or E3.

The devices have a green power LED (Pwr) and a red LED to indicate internal faults. For the input circuit there is a yellow and red status LED available. A fault in the input circuit leads to a flashing red LED according to NE44 and an internal fault to a steady read LED. The fault current can be adjusted to < 3.5 mA or > 21.5 mA. A yellow LED indicates the switching state of the limit value relay. A yellow LED indicates that the start-up delay is turned on.

The device can be used in safety circuits up to SIL2 (high and low demand according to IEC 61508) and meets the requirements of the NE21. It is equipped with removable screw terminals.

The device is equipped with removable screw terminals.

- Input circuits monitored for wire-break and short-circuit
- Parameterized via PC
- Complete galvanic isolation
- Removable screw terminals
- ATEX use in Zone 2, cUL
- SIL 2

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Type	IM12-FI01-1SF-1I1R-C0/24VDC
ID	7580225

Nominal voltage	24 VDC
Operating voltage U_B	10…30 VDC
Power consumption	≤ 3 W
Power dissipation, typical	≤ 1.7 W

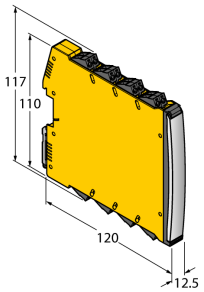
Monitoring range/Setting range	0.0006…1,200,000 rpm
NAMUR input	
NAMUR	EN 60947-5-6
No-load voltage	8.2 VDC
Short-circuit current	8.2 mA
Input resistance	1 kΩ
Cable resistance	≤ 50 Ω
Switch-on threshold	1.75 mA
Switch-off threshold	1.55 mA
Wire breakage threshold	≤ 0.06 mA
Short-circuit threshold	≥ 6.4 mA
3-wire input	
No-load voltage	12 VDC
0-signal	0...3VDC
1-signal	5...30 VDC
External signal source	
0-signal	0…3 VDC
1-signal	5…30 VDC

Output circuits	
Output current	Source/sink (10…30 V) 0/4…20 mA
Load resistance current output	≤ 0.8 kΩ
Output circuits (digital)	1 x relay (change-over)
Output switching voltage relay	≤ 30 VDC / ≤ 250 VAC
Switching current per output	≤ 2 A
Switching capacity per output	≤ 500 VA/60 W
Switching frequency	≤ 15 Hz
Contact quality	AgNi

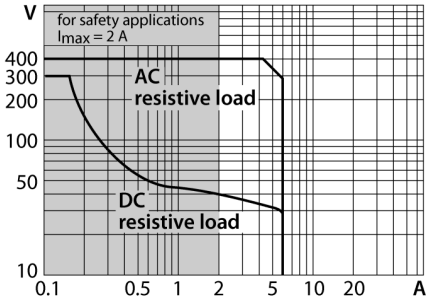
Response characteristic	
Reference temperature	23 °C
Measuring accuracy current output (including linearity, hysteresis and repeatability)	± 10 µA
Temperature drift	≤ 0.0025 % of full scale/K

Galvanic isolation	
Test voltage	2.5 kV RMS
E1,E2-E3	375 V peak value acc. to EN 60079-11
E1,E2 supply voltage	375 V peak value acc. to EN 60079-11
A1A supply voltage	300 V RMS acc. to EN 50178 and EN 61010-1
E3 supply voltage	375 V peak value acc. to EN 60079-11
A1A-A1D	300 V RMS acc. to EN 50178 and EN 61010-1
A1A-E3	300 V RMS acc. to EN 50178 and EN 61010-1

Dimensions



Output relay – Load curve



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Important note	For Ex-applications the values specified in the corresponding Ex certificates (ATEX, IECEx, UL, etc.) apply.
Important note	If the device is used in applications to achieve functional safety according to IEC 61508, the safety manual must be used. Information in the data sheet are not valid for functional safety.
Use in SIL safety circuits	SIL 2 acc. to IEC 61508

Displays/Operating elements	
Operational readiness	Green
Switching state	Yellow
Error indication	red

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Mechanical data		
Protection class	IP20	
Flammability class acc. to UL 94	V-0	
Ambient temperature	-25…+70 °C	
Storage temperature	-40…+80 °C	
Dimensions	120 x 12.5 x 117 mm	
Weight	179 g	
Mounting instructions	DIN rail (NS35)	
Housing material	Plastic, Polycarbonate/ABS	
Electrical connection	Removable screw terminals, 2-pin	
Terminal cross-section	0.2…2.5 mm² (AWG: 24…14)	
Tightening torque	0.5 Nm	
Tightening torque	4.43 LBS-Inch	
Environmental conditions	Operating height	Up to 2000 m above sea level
	Pollution degree	II
	Surge/Overvoltage category	II (EN 61010-1)
	Standards used	
	Voltage resistance and insulation	
		EN 50178
		EN 61010-1
		EN 50155
		GL VI-7-2
	Shock	
		EN 61373 class B
		EN 50155
		GL VI-7-2
		EN 60068-2-6
		EN 60068-2-27
	Temperature	
		EN 60068-2-1 Ad
		EN 50155
		GL VI-7-2
		EN 60068-2-2 Bd
		EN 60068-2-1
	Air humidity	
		EN 60068-2-38
	EMC	
		EN 50155
		GL VI-7-2
		NE21
		EN 61326-1
		EN 61326-3-1
		EN 61000-4-2
		EN 61000-4-3
		EN 61000-4-4
		EN 61000-4-5
		EN 61000-4-6
		EN 61000-4-11
		EN 61000-4-29
		EN 55011
		EN 55016
		EN 50121-3-2
		EN 61000-6-2

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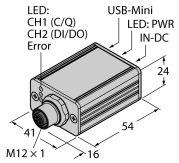
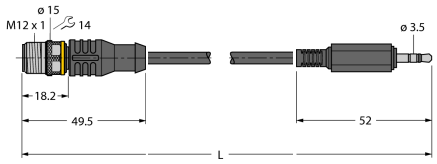
Accessories

Type code	Ident no.		Dimension drawing
USB-2-IOL-0002	6825482	IO-Link Master with integrated USB port	
IOL-COM/3M	7525110	IO-Link communication line for connecting IO-Link devices to an IO-link master via a 3.5-mm jack plug	
IMX12-SC-2X-4BK	7580940	Screw terminals for IM(X)12 modules; included in delivery: 4 pcs. of 2-pin black terminals	
IMX12-CC-2X-4BK	7580942	Spring terminals for IM(X)12 modules; included in delivery: 4 pcs. black terminals, 2-pin	

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