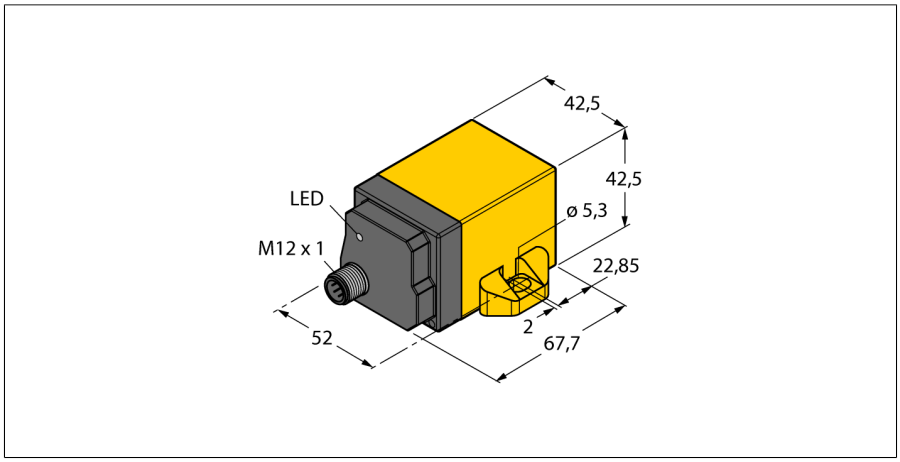
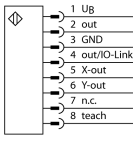
Inclinometer
For Use in Vehicle Electrical Systems
B2N360-Q42-E2LIUPN8X2-H1181/S97

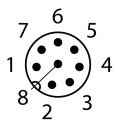


Type	B2N360-Q42-E2LIUPN8X2-H1181/S97
ID	1534117
Measuring principle	Acceleration
General data	
Resolution	16 bit
Measuring range	0…360°
Measuring range x-axis	0…360°
Measuring range y-axis	0…360°
Number of measuring axes	2
Repeat accuracy	≤ 0.07 % of full scale
	depending on the filter setting
Linearity deviation	≤ 0.3 % of full scale, applies in the functional area of upper or lower hemisphere
Temperature drift	≤ ± 0.015 %/K
Electrical data	
Operating voltage	7…30 VDC
	When using the analog outputs
Residual ripple	≤ 10 % U_{ss}
DC rated operational current	≤ 150 mA
Isolation test voltage	≤ 0.5 kV
Short-circuit protection	yes
Wire breakage/Reverse polarity protection	yes/ Complete
Communication protocol	IO-Link
Output function	8-pin, NO/NC, PNP/NPN, analog output
Voltage output	0…10 V
Current output	0…20 mA
	programmable via IO-Link, e.g. 4…20 mA
Load resistance voltage output	≥ 4.7 kΩ
Load resistance current output	≤ 0.4 kΩ
Sample rate	500 Hz
Load-dump protection (DIN ISO 7637-2)	Severity degree IV/Level 4
Current consumption	< 60 mA at 24 VDC

- Rectangular, plastic, PA12-GF30
- Status display via LEDs
- Parameterizable filter functions for different applications
- Parameterizable via teach pin
- Acceleration function ± 2 g, measuring range adjustable
- For vehicle electrical systems, 12 V and 24 V
- Increased interference immunity 30V/m following the e1 type approval
- Immune to conducted interference acc. to DIN ISO 7637-2 (SAE J 113-11)
- Extended temperature range
- High protection class IP68/IP69K
- 7 … 30 VDC supply voltage when using the analog outputs
- 10 … 30 VDC supply voltage when using the switching outputs
- Programmable current and voltage output functions
- All functions programmable via IO-Link / PACTware
- NC or NO switch functions, available as NPN or PNP version
- Process value for x and y-axis in the 16-bit IO-Link telegram
- M12 x 1 male, 8-pin
- Adapter cable RKC8.301T-1,5-RSC4T/ TX320 required for IO-Link communication

Wiring Diagram





Functional principle

The TURCK inclinometers incorporate a micromechanical pendulum, operating on the principle of MEMS technology (Mikro Elektro Mechanic Systems).

The pendulum basically consists of two 'plate' electrodes arranged in parallel with a dielectric placed in the middle. When the sensor is inclined, the dielectric in the middle moves, causing the capacitance ratio between both electrodes to change.

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IO-Link specification	V 1.1
Programming	FDT/DTM
Frame type	2.2
Included in the SIDI GSDML	Yes

Mechanical data	
Design	Rectangular, Q42
Dimensions	67.7 x 42.5 x 42.5 mm
Housing material	Plastic, PA12-GF30
Electrical connection	Connector, M12 × 1

Environmental conditions	
Ambient temperature	-40…+85 °C
	Acc. to UL approval to +70 °C
Vibration resistance	55 Hz (1 mm)
Shock resistance	30 g (11 ms)
Protection class	IP68
	IP69K
MTTF	159 years acc. to SN 29500 (Ed. 99) 40 °C

Power-on indication	LED, Green
Switching state	LED, Yellow

The downstream electronics evaluates this change in capacitance and generates a corresponding output signal.

12 V Bordnetz						
Impuls	**1**	**2a**	**3a**	**3b**	**4**	**5**
Schärfegrad	III	III	III	III	III	IV
Ausfallkriterium	C	A	A	A	C	C

24 V Bordnetz						
Impuls	**1**	**2a**	**3a**	**3b**	**4**	**5**
Schärfegrad	III	III	III	III	III	IV
Ausfallkriterium	C	A	A	A	A	C

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Programming instructions

Parameters	Teach input	LED
Zero point offset (see notes)	Bridge Pin 3 (GND) and Pin 8 for 5 s	Status LED (yellow) flashes, after 1 s steady, after 3 s flashes, after 5 s steady
Measuring range start, X-axis (see notes)	Bridge Pin 1 (U_B) and Pin 8 for 1 s	Status LED (green) flashes, after 1 s steady
Measuring range end, X-axis (see notes)	Bridge Pin 1 (U_B) and Pin 8 for 3 s	Status LED (green) flashes, after 1 s steady, after 3 s flashes
Measuring range start, Y-axis (see notes)	Bridge Pin 3 (GND) and Pin 8 for 1 s	Status LED (yellow) flashes, after 1 s steady
Measuring range end, Y-axis (see notes)	Bridge Pin 3 (GND) and Pin 8 for 3 s	Status LED (yellow) flashes, after 1 s steady, after 3 s flashes
Pre-set mode Angle	Bridge Pin 1 (U_B) and Pin 8 for 10 s You must set a further teach input within 10 s or the device exits this mode automatically	Status LED (green) flashes, after 10 s steady
-10° … +10°	Bridge Pin 3 (GND) and Pin 8 once briefly	LED (yellow) flashes once
-45° … +45°	Bridge Pin 3 (GND) and Pin 8 twice briefly	LED (yellow) flashes twice
-60° … +60°	Bridge Pin 3 (GND) and Pin 8 three times briefly	LED (yellow) flashes three times
-85° … +85°	Bridge Pin 3 (GND) and Pin 8 four times briefly	LED (yellow) flashes four times
Pre-set mode Function	Bridge Pin 1 (U_B) and Pin 8 for 10 s You must set a further teach input within 10 s or the device exits this mode automatically	Status LED (green) steady, after 10 s flashes
Mode 1 “upper hemisphere”, default setting	Bridge Pin 1 (U_B) and Pin 8 once briefly	LED (green) flashes once
Mode 2 “lower hemisphere”	Bridge Pin 1 (U_B) and Pin 8 twice briefly	LED (green) flashes twice
Mode 3, 2 x 360°	Bridge Pin 1 (U_B) and Pin 8 three times briefly	LED (green) flashes three times
Mode 4, X: 0…360°, Y: off	Bridge Pin 1 (U_B) and Pin 8 four times briefly	LED (green) flashes four times
Mode 5, Y: 0…360°, X: off	Bridge Pin 1 (U_B) and Pin 8 five times briefly	LED (green) flashes five times
Filter setting mode	Bridge Pin 3 (GND) and Pin 8 for 10 s You must set a further teach input within 10 s or the device exits this mode automatically	Status LED (yellow) steady, after 10 s flashes
24 Hz, default setting	Bridge Pin 3 (GND) and Pin 8 once briefly	LED (yellow) flashes once
15 Hz	Bridge Pin 3 (GND) and Pin 8 twice briefly	LED (yellow) flashes twice
Most effective filter setting	Bridge Pin 3 (GND) and Pin 8 three times briefly	LED (yellow) flashes three times
Default setting	Bridge Pin 3 (GND) or Pin 1 (UB) and Pin 8 for 15 s	LED flashes fast after 15 s

Note:

Please note that with changing the zero point you also change the start and end point of the measuring range accordingly. Furthermore, it is not possible to offset the zero point in the "upper hemisphere" and "lower hemisphere" mode, since this would cause the measuring range to partially exceed the defined spread of 0°…±90° or rather 90°… 270°. This must also be observed when programming the start and end point.

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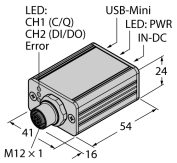
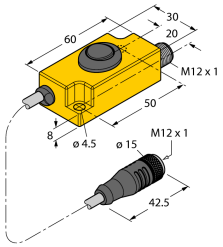
Function accessories

Type code	Ident no.		Dimension drawing
USB-2-IOL-0002	6825482	IO-Link Master with integrated USB port	
TX3-Q20L60	6967118	Teach adapter for 8-pin sensors	

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