

Your Global Automation Partner

TURCK

BCT...-M...-IOL

NCT...-M...-IOL

Capacitive Sensors



Contents

1	About This Manual	5
1.1	Target groups.....	5
1.2	Explanation of symbols used	5
1.3	Other documents	5
1.4	Feedback about these instructions.....	5
2	Notes on the Product.....	6
2.1	Product identification.....	6
2.2	Turck service.....	6
3	Software-Supported IO-Link Parameterization.....	7
4	IO-Link Parameters	8
4.1	General parameters	8
4.2	Process input data.....	9
4.3	Standard parameters.....	10
4.4	Parameters.....	13
5	Turck Subsidiaries - Contact Information	16

1 About This Manual

This manual describes the parameterization of devices using IO-Link. The manual contains general information on IO-Link and a list of the available parameters.

1.1 Target groups

These instructions are aimed at qualified personal and must be carefully read by anyone mounting, commissioning, operating, maintaining, dismantling or disposing of the device.

1.2 Explanation of symbols used

The following symbols are used in these instructions:



DANGER

DANGER indicates a dangerous situation with high risk of death or severe injury if not avoided.



WARNING

WARNING indicates a dangerous situation with medium risk of death or severe injury if not avoided.



CAUTION

CAUTION indicates a dangerous situation of medium risk which may result in minor or moderate injury if not avoided.



NOTICE

NOTICE indicates a situation which may lead to property damage if not avoided.



NOTE

NOTE indicates tips, recommendations and useful information on specific actions and facts. The notes simplify your work and help you to avoid additional work.



CALL TO ACTION

This symbol denotes actions that the user must carry out.



RESULTS OF ACTION

This symbol denotes relevant results of actions.

1.3 Other documents

Besides this document the following material can be found on the Internet at www.turck.com:

- Data sheet
- Quick Start Guide
- Instructions for use

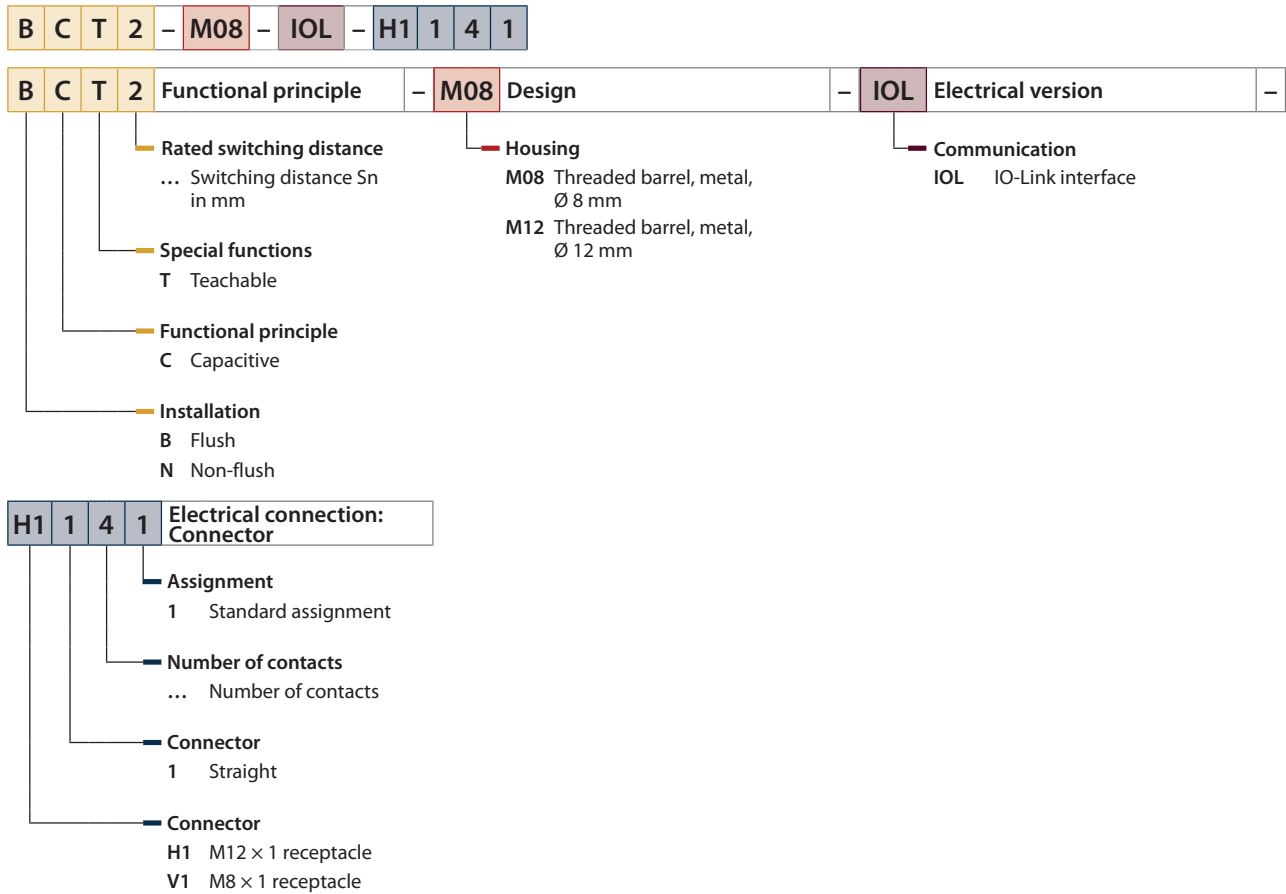
1.4 Feedback about these instructions

We make every effort to ensure that these instructions are as informative and as clear as possible. If you have any suggestions for improving the design or if some information is missing in the document, please send your suggestions to techdoc@turck.com.

2 Notes on the Product

2.1 Product identification

These instructions apply to the following capacitive sensors:



2.2 Turck service

Turck supports you with your projects, from initial analysis to the commissioning of your application. The Turck product database under www.turck.com contains software tools for programming, configuration or commissioning, data sheets and CAD files in numerous export formats.

The contact details of Turck subsidiaries worldwide can be found on p. [▶ 16].

3 Software-Supported IO-Link Parameterization

The ports of the IO-Link master can be configured in IO-Link mode (IOL) or in Standard IO mode (SIO).

If a port is set to SIO mode, the IO-Link master at this port behaves like a normal digital input. The connected IO-Link device transfers its conventional switching output to the IO-Link master – no communication takes place between the device and the IO-Link master.

If the port is configured in IOL mode, the IO-Link master tries to wake the connected IO-Link device via the "Wake-up Request". If the master receives a response from the IO-Link device, both devices start to communicate with each other. The communication parameters are exchanged first of all; the cyclic data exchange of the process data (process data objects) then starts.

When IO-Link communication (IOL mode) is active, both a cyclic and acyclic communication service is available.

There are two ways of setting the parameters via IO-Link:

- via on-request data objects (e.g. close to the PLC via IO-Link function block)
- via tool-based engineering via FDT/DTM (e.g. PACTware with the use of DTM or the IODD)

Device parameters (on-request data objects)

Device parameters are exchanged acyclically and on request of the IO-Link master. The IO-Link master always sends a request to the device first, then the device responds. This applies when the data is written into the device and also when read from the device. On-request data objects (ORDO) enable parameter values to be written into the device (write) or device states to be read from the device (read).

IO-Link configuration in PROFINET

SIDI (Simple IO-Link Device Integration) enables IO-Link devices in PROFINET applications to be configured directly in the programming environment (e.g. TIA Portal). The Turck IO-Link devices are integrated in the GSDML file of the TBEN, TBPN and FEN20 series IO-Link masters and can be set in the programming environment as submodules of a modular I/O system. The user has access here to all device properties and parameters.

4 IO-Link Parameters

4.1 General parameters

Parameter	Content
Vendor ID	317 (0x13D)
Device ID	917764 (0xE0104)
IO-Link version	1.1
Bitrate	COM2 (38.4 kbit/s)
Minimum cycle time	5 ms
SIO supported	True
M-Sequence Capability	ISDU supported
Block Parameter	True
Data Storage	True
ProfileCharacteristic	

4.2 Process input data

Name	Byte.Bit-offset	Bit length	Subindex access supported	Data Type	Value	Description
Sensor signal	0.0	16	False	Integer	-32760...32764	
					-32760	Out of Range (-)
					32760	Out of Range (+)
					32764	No measurement data
Switching output status	3.0	1	False	Boolean	false/true	
					false	Output inactive
					true	Output active

4.3 Standard parameters

Name	Index (dec.)	Index (hex.)	Sub-index (dec.)	Sub-index (hex.)	Subindex access supported	Access	Byte. Bit-offset	Bit length	Data Type	Value	Default	Description
Min Cycle Time	0	0x0	3	0x3	True	read	2.0	8	UInteger			
IO-Link Version ID	0	0x0	5	0x5	True	read	4.0	8	UInteger		17	
Vendor ID 1	0	0x0	8	0x8	True	read	7.0	8	UInteger			
Vendor ID 2	0	0x0	9	0x9	True	read	8.0	8	UInteger			
Device ID 1	0	0x0	10	0xA	True	read	9.0	8	UInteger			
Device ID 2	0	0x0	11	0xB	True	read	10.0	8	UInteger			
Device ID 3	0	0x0	12	0xC	True	read	11.0	8	UInteger			
Standard Command	2	0x2	0	0x0	True	write	0.0	8	UInteger	0...243		System command
										64		Two Value Teach apply
										65		Single Value Teach start
										66		Single Value Teach start
										67		Two Value Teach without object (teachpoint 1)
										68		Two Value Teach with object (teachpoint 2)
										69		Setpoint 2 Two Value Teach without object (teachpoint 1)
										70		Setpoint 2 Two Value Teach with object (teachpoint 2)
										71		Dynamic Teach start
										72		Dynamic Teach stop
73		Setpoint 2 Dynamic Teach start										
74		Setpoint 2 Dynamic Teach stop										

Name	Index (dec.)	Index (hex.)	Sub-index (dec.)	Sub-index (hex.)	Subindex access supported	Access	Byte. Bit-offset	Bit length	Data Type	Value	Default	Description
										75		Setpoint 1 Single Value Teach Object
										76		Setpoint 1 Single Value Teach Empty
										79		Teach cancel
										128		Device Reset
										129		Application Reset
										130		Restore Factory Settings
										163		Reset diagnostic information
Parameter (write) Access Lock	12	0xC	1	0x1	False	read/write	0.0	1	Boolean	false/true		Device access locks
Data Storage Lock	12	0xC	2	0x2	False	read/write	0.1	1	Boolean	false/true		Device access locks
Local Parameterization Lock	12	0xC	3	0x3	False	read/write	0.2	1	Boolean	false/true		Device access locks
Local User Interface Lock	12	0xC	4	0x4	False	read/write	0.3	1	Boolean	false/true		Device access locks
Vendor Name	16	0x10	0	0x0	True	read	0.0	512	String		Turck	Vendor name
Vendor Text	17	0x11	0	0x0	True	read	0.0	512	String		www.turck.com	Additional manufacturer information
Product Name	18	0x12	0	0x0	True	read	0.0	512	String			Manufacturer's device designation
Product ID	19	0x13	0	0x0	True	read	0.0	512	String			ID
Product Text	20	0x14	0	0x0	True	read	0.0	512	String		capacitive proximity switch	Device category
Hardware Version	22	0x16	0	0x0	True	read	0.0	512	String			Hardware revision
Firmware Version	23	0x17	0	0x0	True	read	0.0	512	String			Firmware revision
Application Specific Tag	24	0x18	0	0x0	True	read/write	0.0	256	String		***	Any user generated content
Error Count	32	0x20	0	0x0	True	read	0.0	16	UInteger			

Name	Index (dec.)	Index (hex.)	Sub- index (dec.)	Sub- index (hex.)	Subindex access supported	Access	Byte. Bit- offset	Bit length	Data Type	Value	Default	Description
Device Status	36	0x24	0	0x0	True	read	0.0	8	UInteger	0...		
										255		
										0		Device is OK
										1		Maintenance required
										2		Out of specification
3		Functional check										
4		Failure										
Process Data Input	40	0x28	0	0x0	True	read	0.0	32	Process- DataIn- Union			

4.4 Parameters

Name	Index (dec.)	Index (hex.)	Sub-index (dec.)	Sub-index (hex.)	Subindex access supported	Access	Byte. Bit Offset	Bit length	Data Type	Value	Default	Description
SP2 teach point state	59	0x3B	1	0x1	False	read	0.6	2	UInteger	0...3		Teach status
										0		Teachpoint 1 and 2 not taught or not successful
										1		Teachpoint 1 successfully taught
										2		Teachpoint 2 successfully taught
SP1 teach point status	59	0x3B	2	0x2	False	read	0.4	2	UInteger	0...3		Teach status
										0		Teachpoint 1 and 2 not taught or not successful
										1		Teachpoint 1 successfully taught
										2		Teachpoint 2 successfully taught
Teach status of teachpoint 1 and 2	59	0x3B	3	0x3	False	read	0.0	4	UInteger	0...7		Teach status
										0		Idle
										1		Switchpoint Set
										2		Switchpoint 2 Set
										3		Switchpoint 1+2 Set
										4		Wait for Command
										5		Busy
										6		Reserved
7		Error										
Current switchpoint value	60	0x3C	1	0x1	True	read/write	0.0	16	UInteger	0...5000		Switching output

Name	Index (dec.)	Index (hex.)	Sub-index (dec.)	Sub-index (hex.)	Subindex access supported	Access	Byte. Bit Offset	Bit length	Data Type	Value	Default	Description
Current switchpoint value	60	0x3C	2	0x2	True	read/write	2.0	16	UInteger	0...5000	0	Switching output
function	61	0x3D	1	0x1	True	read/write	0.0	8	UInteger	0...1	0	Switching output
										0		Normally open
										1		Normally closed
mode	61	0x3D	2	0x2	True	read/write	1.0	8	UInteger	0...3	1	Switching output
										0		Deactivated
										1		Single point mode
										2		Window mode
										3		Two point mode
hysteresis value	61	0x3D	3	0x3	True	read/write	2.0	16	UInteger	1...2	1	Switching output
										1		10 % of signal maximum
										2		20 % of signal maximum
Lot	64	0x40	0	0x0	True	read	0.0	128	String	NaN ... NaN		Lot
Switching out-put switch-on delay	66	0x42	0	0x0	True	read/write	0.0	16	UInteger	0...10000	0	Switching out-put switch-on delay
Switching out-put switch-off delay	67	0x43	0	0x0	True	read/write	0.0	16	UInteger	0...10000	0	Switching out-put switch-off delay
Switching output mode	70	0x46	0	0x0	True	read/write	0.0	8	UInteger	1...2	2	Switching output mode
										1		NPN
										2		PNP
Sensing mode	73	0x49	0	0x0	True	read/write	0.0	8	UInteger	0...2	0	Sensing mode
										0		Standard
										1		Precision
										2		Speed
Current teach point 1	80	0x50	1	0x1	True	read	0.0	16	UInteger	NaN ... NaN		Teach point

Name	Index (dec.)	Index (hex.)	Sub-index (dec.)	Sub-index (hex.)	Subindex access supported	Access	Byte. Bit Offset	Bit length	Data Type	Value	Default	Description
Current teach point 2	80	0x50	2	0x2	True	read	2.0	16	UInteger	NaN ... NaN		Teach point
Minimum	84	0x54	1	0x1	True	read	0.0	16	UInteger	NaN ... NaN		Sensor signal
Maximum	84	0x54	2	0x2	True	read	2.0	16	UInteger	NaN ... NaN		Sensor signal
Switching cycle count	85	0x55	0	0x0	True	read	0.0	32	UInteger	NaN ... NaN		Switching cycle count
Current internal temperature	86	0x56	0	0x0	True	read	0.0	16	Integer	NaN ... NaN		Current internal temperature
Teach quality	87	0x57	0	0x0	True	read	0.0	8	UInteger	0...3 0 1 2 3		Teach quality Undefined Success Repeat Error
Operating hours	93	0x5D	0	0x0	True	read	0.0	32	UInteger	NaN ... NaN		Operating hours
Power-on cycle count	94	0x5E	0	0x0	True	read	0.0	32	UInteger	NaN ... NaN		Power-on cycle count
Maximum internal temperature	96	0x60	0	0x0	True	read	0.0	16	Integer	NaN ... NaN		Maximum internal temperature

5 Turck Subsidiaries - Contact Information

Germany	Hans Turck GmbH & Co. KG Witzlebenstraße 7, 45472 Mülheim an der Ruhr www.turck.de
Australia	Turck Australia Pty Ltd Building 4, 19-25 Duerdin Street, Notting Hill, 3168 Victoria www.turck.com.au
Belgium	TURCK MULTIPROX Lion d'Orweg 12, B-9300 Aalst www.multiprox.be
Brazil	Turck do Brasil Automação Ltda. Rua Anjo Custódio Nr. 42, Jardim Anália Franco, CEP 03358-040 São Paulo www.turck.com.br
China	Turck (Tianjin) Sensor Co. Ltd. 18,4th Xinghuazhi Road, Xiqing Economic Development Area, 300381 Tianjin www.turck.com.cn
France	TURCK BANNER S.A.S. 11 rue de Courtalin Bat C, Magny Le Hongre, F-77703 MARNE LA VALLEE Cedex 4 www.turckbanner.fr
Great Britain	TURCK BANNER LIMITED Blenheim House, Hurricane Way, GB-SS11 8YT Wickford, Essex www.turckbanner.co.uk
India	TURCK India Automation Pvt. Ltd. 401-403 Aurum Avenue, Survey. No 109 /4, Near Cummins Complex, Baner-Balewadi Link Rd., 411045 Pune - Maharashtra www.turck.co.in
Italy	TURCK BANNER S.R.L. Via San Domenico 5, IT-20008 Bareggio (MI) www.turckbanner.it
Japan	TURCK Japan Corporation Syuuhou Bldg. 6F, 2-13-12, Kanda-Sudacho, Chiyoda-ku, 101-0041 Tokyo www.turck.jp
Canada	Turck Canada Inc. 140 Duffield Drive, CDN-Markham, Ontario L6G 1B5 www.turck.ca
Korea	Turck Korea Co, Ltd. B-509 Gwangmyeong Technopark, 60 Haan-ro, Gwangmyeong-si, 14322 Gyeonggi-Do www.turck.kr
Malaysia	Turck Banner Malaysia Sdn Bhd Unit A-23A-08, Tower A, Pinnacle Petaling Jaya, Jalan Utara C, 46200 Petaling Jaya Selangor www.turckbanner.my

Mexico	Turck Comercial, S. de RL de CV Blvd. Campestre No. 100, Parque Industrial SERVER, C.P. 25350 Arteaga, Coahuila www.turck.com.mx
Netherlands	Turck B. V. Ruiterlaan 7, NL-8019 BN Zwolle www.turck.nl
Austria	Turck GmbH Graumanngasse 7/A5-1, A-1150 Wien www.turck.at
Poland	TURCK sp.z.o.o. Wroclawska 115, PL-45-836 Opole www.turck.pl
Romania	Turck Automation Romania SRL Str. Siriului nr. 6-8, Sector 1, RO-014354 Bucuresti www.turck.ro
Russian Federation	TURCK RUS OOO 2-nd Pryadilnaya Street, 1, 105037 Moscow www.turck.ru
Sweden	Turck Sweden Office Fabriksstråket 9, 433 76 Jonsered www.turck.se
Singapore	TURCK BANNER Singapore Pte. Ltd. 25 International Business Park, #04-75/77 (West Wing) German Centre, 609916 Singapore www.turckbanner.sg
South Africa	Turck Banner (Pty) Ltd Boeing Road East, Bedfordview, ZA-2007 Johannesburg www.turckbanner.co.za
Czech Republic	TURCK s.r.o. Na Brne 2065, CZ-500 06 Hradec Králové www.turck.cz
Turkey	Turck Otomasyon Ticaret Limited Sirketi Inönü mah. Kayisdagi c., Yesil Konak Evleri No: 178, A Blok D:4, 34755 Kadiköy/ Istanbul www.turck.com.tr
Hungary	TURCK Hungary kft. Árpád fejedelem útja 26-28., Óbuda Gate, 2. em., H-1023 Budapest www.turck.hu
USA	Turck Inc. 3000 Campus Drive, USA-MN 55441 Minneapolis www.turck.us

TURCK

Over 30 subsidiaries and over
60 representations worldwide!

100028648 | 2021/06



www.turck.com