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**TURCK**

# NCLS-30-UP6X-H1141

## Capacitive Limit Level Sensor

IO-Link Parameters – IO-Link Version 1.1



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# 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 a 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](http://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](mailto:techdoc@turck.com).

## 2 Information About the Product

### 2.1 Product Identification

These instructions apply to capacitive limit level sensors

- NCLS-30-UP6X-H1141

### 2.2 Manufacturer and service

Hans Turck GmbH & Co. KG  
Witzlebenstraße 7  
45472 Mülheim an der Ruhr  
Germany

Turck supports you with your projects, from initial analysis to the commissioning of your application. The Turck product database contains software tools for programming, configuration or commissioning, data sheets and CAD files in numerous export formats. You can access the product database at the following address: [www.turck.de/products](http://www.turck.de/products)

For further inquiries in Germany contact the Sales and Service Team on:

- Sales: +49 208 4952-380
- Technology: +49 208 4952-390

Outside Germany, please contact your local Turck representative.

### 3 Software-Supported IO-Link Parametrization

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

If a port is configured in SIO mode, the IO-Link master on this port behaves like a normal digital input. The connected IO-Link device sends the standard switching output to the IO-Link master – there is no communication between the device and the master.

If the port is configured in IOL mode, the IO-Link master tries to "wake" the connected IO-Link device using the "wake-up request." If the master receives a response from the signal processor, master and device start to communicate with each other. First the communication parameters are exchanged, and then the cyclic data exchange of process data (objects) starts.

In the case of active IO-Link communication (IOL mode), both cyclic and acyclic communication services are available.

Parameterization via IO-Link can occur in two different ways:

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

#### Device parameters (on-request data objects)

Device parameters are exchanged in an acyclic manner and upon the request of the IO-Link master. The IO-Link master always sends a request to the device first, and then the device responds. This is the case when the data is both written into the device and read from the device. With the help of on-request data objects (ORDO), the parameters can be written into the device (write) or the device status can be read from the device (read).

#### IO-Link configuration in PROFINET

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

## 4 IO-Link Parameters

### 4.1 General parameters

Parameter	Content
Vendor ID	317 (0x13D)
Device ID	917762 (0xE0102)
IO-Link version	1.1
Bitrate	COM2 (38.4 kbit/s)
Minimum cycle time	2.3 ms
SIO supported	True
M-Sequence Capability	PREOPERATE = TYPE_0 with 1 byte on-request data OPERATE = TYPE_0 with 1 byte on-request data 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
OUT 1/CQ	1.0	1	False	Boolean	false/true	
					false	inactive
					true	active
OUT 2/DO	1.1	1	False	Boolean	false/true	
					false	inactive
					true	active
Process value	0.2	14	False	Integer	0..150	

## 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...159		System command
										128		Device Reset
										129		Application Reset
										130		Restore Factory Settings
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			Ident-No.
Product Text	20	0x14	0	0x0	True	read	0.0	512	String			Device category
Serial Number	21	0x15	0	0x0	True	read	0.0	6	String		XX0000	Device serial number
Hardware Version	22	0x16	0	0x0	True	read	0.0	4	String		V1.3	Hardware revision
Firmware Version	23	0x17	0	0x0	True	read	0.0	4	String		V1.6	Firmware revision

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
Application Specific Tag	24	0x18	0	0x0	True	read/write	0.0	256	String		***	Any user generated content
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	0	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
Led-Mode	100	0x64	0	0x0	True	read/write	0.0	2	UInteger	0...1	0	configure Led-Mode
										0		LED lights up only when OUT 1 is active
										1		LED lights up only when OUT 1 is inactive
electronic temperature	152	0x98	0	0x0	True	read	0.0	8	Integer	-128...127		current electronic temperature
OUT 1/CQ output-mode	201	0xC9	0	0x0	True	read/write	0.0	2	UInteger	0...2	0	OUT 1 output-mode: PNP/NPN/PP
										0		PNP
										1		NPN
OUT 1/CQ output-logic	202	0xCA	0	0x0	True	read/write	0.0	2	UInteger	0...2	0	OUT 1 output-logic: NO or NC
										0		NO
										1		NC
OUT 1/CQ switch-on threshold	203	0xCB	0	0x0	True	read/write	0.0	8	UInteger	2...150	75	value must be min. 2% > OUT 1 switch-off threshold (value range: 2...150%)
OUT 1/CQ switch-on delay	204	0xCC	0	0x0	True	read/write	0.0	16	UInteger	0...9999	0	1/10 sec (value range: 0...999.9s)
OUT 1/CQ switch-off threshold	205	0xCD	0	0x0	True	read/write	0.0	8	UInteger	0...148	70	value must be min. 2% < OUT 1 switch-on threshold (value range: 0...148%)
OUT 1/CQ switch-off delay	206	0xCE	0	0x0	True	read/write	0.0	16	UInteger	0...9999	0	1/10 sec (value range: 0...999.9s)
OUT 2/DO output-mode	221	0xDD	0	0x0	True	read/write	0.0	2	UInteger	0...2	0	OUT 2 output-mode: PNP/NPN/PP

Name	Index (dec.)	Index (hex.)	Sub-index (dec.)	Sub-index (hex.)	Subindex access supported	Access	Byte. Bit Offset	Bit Len-gth	Data Type	Value	Default	Description
										0		PNP
										1		NPN
										2		PP
OUT 2/DO output-logic	222	0xDE	0	0x0	True	read/write	0.0	2	UInteger	0...2	0	OUT 2 output-logic: NO or NC
										0		NO
										1		NC
										2		PWM
OUT 2/DO switch-on threshold	223	0xDF	0	0x0	True	read/write	0.0	8	UInteger	2...150	75	value must be min. 2% > the OUT 2 switch-off threshold (value range: 2...150%)
OUT 2/DO switch-on delay	224	0xE0	0	0x0	True	read/write	0.0	16	UInteger	0...9999	0	1/10 sec (value range: 0...999.9s)
OUT 2/DO switch-off threshold	225	0xE1	0	0x0	True	read/write	0.0	8	UInteger	0...148	70	value must be min. 2% < OUT 2 switch-on threshold (value range: 0-148%)
OUT 2/DO switch-off delay	226	0xE2	0	0x0	True	read/write	0.0	16	UInteger	0...9999	0	1/10 sec (value range: 0...999.9s)

## 4.5 Events

<b>Code</b>	<b>Type</b>	<b>Name</b>	<b>Description</b>
20496	Error	Component malfunction	Repair or exchange
30480	Error	Short circuit	Check installation

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