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TURCK

REM... | RES...

Encoder

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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 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
- Operating instructions

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 encoders:

- REM-...IOL...-H1141
- RES-...IOL...-H1141

2.2 Manufacturer and service

Hans Turck GmbH & Co. KG
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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

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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

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	786689 (0xC0101)
IO-Link version	1.1
Bitrate	COM3
Minimum cycle time	1 ms
SIO supported	False
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
Velocity	0.0	32	True	Integer		
Position Multiturn	4.0	32	True	UInteger		
Position Singleturn	8.0	16	True	UInteger		

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
										80		Start unlock- ing sequence
										81		Unlocking command 1
										82		Unlocking command 2
										128		Device reset
										129		Application reset
										130		Restore fact- ory 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 Para- meterization 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			Manufac- turer's device designation
Product ID	19	0x13	0	0x0	True	Read	0.0	512	String			Ident-No.

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
Product Text	20	0x14	0	0x0	True	Read	0.0	512	String		Absolute en- coder multi- turn	Device category
Serial Number	21	0x15	0	0x0	True	Read	0.0	128	String			Device serial number
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
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
Detailed Device Status	37	0x25	0	0x0	False	Read	0.0	12	Array			
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
Profile characteristic	13	0xD	0	0x0	False	Read	0.0	-1	Array	NaN... NaN		
Position Single-turn	14	0xE	1	0x1	False	Read	0.0	-1	Octet-String	NaN... NaN		
Position Multiturn	14	0xE	2	0x2	False	Read	3.0	-1	Octet-String	NaN... NaN		
Velocity	14	0xE	3	0x3	False	Read	6.0	-1	Octet-String	NaN... NaN		
Function tag	25	0x19	0	0x0	True	Read/ write	0.0	256	String	NaN... NaN		
Location tag	26	0x1A	0	0x0	True	Read/ write	0.0	256	String	NaN... NaN		
BLOB_ID	49	0x31	0	0x0	True	Read	0.0	16	Integer	0...0		
										0		Idle, no BLOB transfer active
Position Value	64	0x40	0	0x0	True	Read	0.0	32	UInteger	NaN... NaN		
Position Format	65	0x41	0	0x0	True	Read/ write	0.0	8	UInteger	0...0	0	
										0		Number of
Position Lower limit	66	0x42	0	0x0	True	Read/ write	0.0	32	UInteger	0... 42949 67295	0	
Position Upper limit	67	0x43	0	0x0	True	Read/ write	0.0	32	UInteger	0... 42949 67295	42949 67295	
Position Limit control	69	0x45	0	0x0	True	Read/ write	0.0	8	UInteger	0...1	1	
										0		Deactivated
										1		Activated
Raw position	76	0x4C	0	0x0	True	Read	0.0	64	UInteger	NaN... NaN		
Preset value	80	0x50	0	0x0	True	Read/ write	0.0	32	UInteger	0... 42949 67295	0	
Do position preset	81	0x51	0	0x0	True	Write	0.0	8	UInteger	1...1	1	
										1		Carry out position preset
Offset	82	0x52	0	0x0	True	Read	0.0	64	Integer	NaN... NaN		
Scaling control	87	0x57	0	0x0	True	Read/ write	0.0	8	UInteger	0...1	1	
										0		Deactivated
										1		Activated

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
Measuring units per revolution (MUR)	88	0x58	0	0x0	True	Read/ write	0.0	32	UInteger	1... 16384	16384	
Total measur- ing range (TMR)	89	0x59	0	0x0	True	Read/ write	0.0	64	UInteger	4... 42949 67296	42949 67296	
Endless shaft control	91	0x5B	0	0x0	True	Read/ write	0.0	8	UInteger	0...1 0 1	0	Deactivated Activated
Number of revolutions, nominator	92	0x5C	0	0x0	True	Read/ write	0.0	32	UInteger	1... 26214 4	26214 4	
Number of revolutions, divisor	93	0x5D	0	0x0	True	Read/ write	0.0	32	UInteger	1...409 6	1	
Velocity value	110	0x6E	0	0x0	True	Read	0.0	32	Integer	NaN... NaN		
Velocity format	111	0x6F	0	0x0	True	Read/ write	0.0	8	UInteger	1...5 1 2 3 4 5	3	Number/s Number/ms Revolutions/ min Revolutions/s Revolutions/h
Velocity filter integration time	112	0x70	0	0x0	True	Read/ write	0.0	16	UInteger	0...128	1	
Velocity filter bandwidth	113	0x71	0	0x0	True	Read/ write	0.0	16	UInteger	0...500	100	
Velocity lower limit	114	0x72	0	0x0	True	Read/ write	0.0	32	Integer	-1638 400... 16384 00	-6000	
Velocity upper limit	115	0x73	0	0x0	True	Read/ write	0.0	32	Integer	-1638 400... 16384 00	6000	
Velocity hysteresis	116	0x74	0	0x0	True	Read/ write	0.0	32	UInteger	0... 16384 00	0	
Velocity limit control	117	0x75	0	0x0	True	Read/ write	0.0	8	UInteger	0...1 0 1	1	Deactivated Activated
Acceleration value	125	0x7D	0	0x0	True	Read	0.0	32	Integer	NaN... NaN		

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
Acceleration format	126	0x7E	0	0x0	True	Read/ write	0.0	8	UInteger	1...3	3	
										1		Number/s ²
										2		Number/ms ²
										3		Revolutions/s ²
Acceleration filter integra- tion time	127	0x7F	0	0x0	True	Read/ write	0.0	16	UInteger	0...128	1	
Acceleration filter band- width	128	0x80	0	0x0	True	Read/ write	0.0	16	UInteger	0...500	100	
Acceleration lower limit	129	0x81	0	0x0	True	Read/ write	0.0	32	Integer	-2147 48352 0... 21474 83520	-27852	
Acceleration upper limit	130	0x82	0	0x0	True	Read/ write	0.0	32	Integer	-2147 48352 0... 21474 83520	27852	
Acceleration hysteresis	131	0x83	0	0x0	True	Read/ write	0.0	32	UInteger	0... 21474 83520	0	
Acceleration limit control	132	0x84	0	0x0	True	Read/ write	0.0	8	UInteger	0...1	1	
										0		Deactivated
										1		Activated
Temperature value	140	0x8C	0	0x0	True	Read	0.0	16	Integer	NaN... NaN		
Temperature format	141	0x8D	0	0x0	True	Read/ write	0.0	8	UInteger	0...1	0	
										0		°C (Celsius)
										1		°F (Fahrenheit)
Temperature lower limit	142	0x8E	0	0x0	True	Read/ write	0.0	16	Integer	-40... 212	-40	
Temperature upper limit	143	0x8F	0	0x0	True	Read/ write	0.0	16	Integer	-40... 212	100	
Temperature hysteresis	144	0x90	0	0x0	True	Read/ write	0.0	16	UInteger	0...212	2	
Temperature limit control	145	0x91	0	0x0	True	Read/ write	0.0	8	UInteger	0...1	1	
										0		Deactivated
										1		Activated
Temperature min	147	0x93	0	0x0	True	Read	0.0	16	Integer	NaN... NaN		
Temperature max	148	0x94	0	0x0	True	Read	0.0	16	Integer	NaN... NaN		

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
Temperature min / max re- set	149	0x95	0	0x0	True	Write	0.0	8	UInteger	1...1 1	1	Temperature min./max. reset
Device status flags	155	0x9B	0	0x0	True	Read	0.0	16	UInteger	NaN... NaN		
Operating hours	165	0xA5	0	0x0	True	Read	0.0	32	UInteger	NaN... NaN		
Process data switch	225	0xE1	0	0x0	True	Read/ write	0.0	8	UInteger	16...16 16	16	Turck profiles (PosST/ PosMT/Velo)
Pin2 configur- ation	230	0xE6	0	0x0	True	Read/ write	0.0	32	UInteger	NaN... NaN	0	
Firmware checksum	251	0xFB	0	0x0	True	Read	0.0	128	String	NaN... NaN		
Direction of rotation	260	0x10 4	0	0x0	True	Read/ write	0.0	8	UInteger	0...1 0 1	0	Clockwise Counter clock- wise
Factory reset	271	0x10F	0	0x0	True	Write	0.0	8	UInteger	1...1 1	1	Factory reset
Multiturn reset	273	0x11 1	0	0x0	True	Write	0.0	8	UInteger	1...1 1	1	Multiturn reset
Set zero point + multiturn reset	275	0x11 3	0	0x0	True	Write	0.0	8	UInteger	1...1 1	1	Set zero point + multiturn reset
FW_Password 1	1734	0x43 BD	0	0x0	True	Write	0.0	512	String	NaN... NaN		
HW_ID_Key 2	1734	0x43 BE	0	0x0	True	Read	0.0	512	String	NaN... NaN		
Bootmode status 3	1734	0x43 BF	0	0x0	True	Read	0.0	8	UInteger	0...1 0 1		Bootloader is inactive Bootloader is active

4.5 Events

Code	Type	Name	Description
0	Notification	No malfunction	
4096	Error	General malfunction	Unknown error
16912	Warning	Device temperature over-run	Clear source of heat
16928	Warning	Device temperature under-run	Insulate device
20480	Error	Device hardware fault	Device Exchange
25376	Error	Parameter error	Check data sheet and values
36000	Warning	Position out of range	
36001	Warning	Velocity out of range	
36002	Warning	Acceleration out of range	
36005	Error	Memory (FRAM) checksum failure	

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