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FS100-...-2UPN8...
Flow Sensors

IO-Link Parameters – Firmware 1.1

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1 About these instructions

These instructions describe the parameterization of the flow sensor series FS1…2UPN8 with IO-Link. It contains the operation via IO-Link, information about IO-Link functions. and a list of all required IO-Link parameters.

1.1 Target groups

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

1.2 Explanation of symbols

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.

➥ **ACTION RESULT**
This symbol denotes relevant results of actions.

1.3 Additional 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
- IO-Link devices – user manual commissioning

1.4 Feedback on these instructions

We are committed to always keeping these instructions as informative and as clear as possible. Should you have any suggestions for a better design or any information is missing from the instructions, please send your suggestions to techdoc@turck.com.

2 Notes on the product

2.1 Product identification

These instructions apply to the following flow monotoring devices:
- FS100-…-2UPN8-…

2.2 Manufacturer and service

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

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Sales: +49 208 4952-380
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3 Software-supported IO-Link-parameterization

NOTE
Locking of the pushbutton guided menu
During the time the data processing device communicates via IO-Link, the pushbutton-guided menu is locked; this means, the parameters can no longer be changed via the pushbuttons. However, the process values can be accessed via the pushbuttons.

The ports of the IO-Link-master can be configured in the IO-Link-mode (IOL) or in the standard-IO-mode.
If a port is configured in the SIO-Mode, the IO-Link-Master on this port behaves like a normal digital input and 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 the 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 signal processor, both devices start to communicate with each other. First, the communication parameters are exchanged; then the cyclic data exchange of the process data (objects) starts.

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

Parameterization via IO-Link can occur in different ways:
- via on-request data objects (e. g., IO-Link-function block close to the control),
- 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 in an acyclical manner and upon the request of the IO-Link-Master. The IO-Link-Master always sends a request to the device first, then the device responds. This is the case when the data is written into the device and read from the device. With the help of the 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).

4 IO-Link parameters (firmware 1.1)

4.1 General parameters

The general parameter data is used to identify the sensors. This data can only be read.

Name	Index (dec.)	Index (hex.)	Access	Byte Length	Format	Default	Description
Vendor Name	16	0x10	Read	64	String UTF-8	Turck	
Vendor Text	17	0x11	Read	64	String UTF-8	www.turck.com	Additional manufacturer information
Product Name	18	0x12	Read	64	String UTF-8	–	Manufacturer's device designation, e.g. FS100-300L-30-2UPN8-H1141
Product ID	19	0x13	Read	40	String UTF-8	–	ID, e.g. 100000970
Product Text	20	0x14	Read	64	String UTF-8	Flow sensor	Device category
Serial Number	21	0x15	Read	16	String UTF-8	–	Device serial number
Hardware Revision	22	0x16	Read	16	String UTF-8	–	Hardware revision
Firmware Revision	23	0x17	Read	16	String UTF-8	–	Firmware revision
Application Specific Tag	24	0x18	Read/ write	32	String UTF-8	***	Any user generated content
Function Tag	25	0x19	Read/ write	32	String UTF-8	***	Any user generated content
Location Tag	26	0x1A	Read/ write	32	String UTF-8	***	Any user generated content

4.2 Process data (cyclic communication)

Name	Bit Offset	Bit Length	Format	Value	Description
Process Input Data	0	32	Record		Subindex access not supported
State Output 1 (Flow)	0	1	Boolean	False	Inactive
				True	Active
State Output 2 (Temperature)	1	1	Boolean	False	Inactive
				True	Active
Temperature Process Value	2	14	Integer	-2048	Invalid value
				-2047	Process value under limit
				-400…+1800	Temperature = process value × 0.1 °C
				2047	Process value over limit
Flow Process Value	16	16	Integer	-3	Invalid value
				-2	Process value over limit
				-1	Process value under limit
				0…20000	Relative flow = process value × 0.005 %

4.3 Standard parameters

Name	Index (dec.)	Index (hex.)	Access	Byte Length	Format	Value	Default	Description
Standard Command	2	0x02	Write	8	Uinteger	128	–	Device reset
						130	–	Restore factory settings
						160	–	Test event appears
						161	–	Test event disappears
						192	–	MAX/MIN: Teach upper limit (OUT1)
						193	–	MAX/MIN: Teach lower limit (OUT1)
						194	–	MAX/MIN: Teach switching point (OUT1)
						195	–	Quick: Teach switching point (OUT1)
						196	–	Back to Pre-Settings
Device Access Locks	12	0x0C	Read/ write	16	Record	0	0	Full access
						2	–	Data storage lock
						8	–	Local user interface lock
						10	–	Data storage- and user interface lock

4.4 Parameters

Name	Index (dec.)	Index (hex.)	Access	Byte Length	Format	Value	Default	Description
Transistor Type (OUT1)	80	0x50	Read/ write	8	Uinteger	0…3	1	Choose between output function Active High (PNP) or Active Low (NPN)
						0		Deactivated
						1		Auto-Detection
						2		PNP
						3		NPN
Switching Characteristic (OUT1))	81	0x51	Read/ write	8	Boolean	False/true	False	Choose between output characteristic Normally Open (NO) / Normally Closed (NC)
						False		Normally Open (NO)
						True		Normally Closed (NC)
MAX/MIN: Edit Switching Point Value (OUT1)	82	0x52	Read/ write	8	Integer	0…100	70	Relative switching point flow in % within lower and upper limit
MAX/MIN: Edit Lower Limit Value (OUT1)	90	0x5A	Read/ write	16	Integer	0…11450	4000	Lower limit flow value (absolute)
MAX/MIN: Edit Upper Limit Value (OUT1)	91	0x5B	Read/ write	16	integer	150…11600	6500	Upper limit flow value (absolute)
Teach-Mode	92	0x5C	Read/ write	8	UInteger	1…2	2	Chooses the desired Teach Mode
						1		Quick-Teach
						2		MAX/MIN-Teach
Quick: Edit Quick-Teach Value (OUT1)	93	0x5D	Read/ write	8	Integer	-45…+45	0	The teached switching point may be adjusted in 0.5 % steps (value × 0.1 %)
Transistor Type (OUT2)	96	0x60	Read/ write	8	UInteger	0…3	1	Choose between output function Active High (PNP) or Active Low (NPN)
						0		Deactivated
						1		Auto-Detection
						2		PNP
						3		NPN
Switching Characteristic (OUT2))	97	0x61	Read/ write	8	Boolean	False/true	False	Choose between output characteristic Normally Open (NO) / Normally Closed (NC)
						False		Normally Open (NO)
						True		Normally Closed (NC)
Edit Switching Point Value (OUT2)	98	0x62	Read/ write	16	Integer	-400…+1800	600	Switching point temperature = value × 0.1 °C
Units	112	0x70	Read/ write	8	Boolean	False/true	False	Units will be displayed metrical or imperial
						False		Metrical
						True		Imperial

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