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TURCK

LRS510...-LI2UPN8...
Radar Level Sensor

IO-Link Parameters – IO-Link Version 1.1

Contents

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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
- 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

This manual applies to the following radar level sensors:

- LRS510…-LI2UPN8…

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

If a port is configured in IOL mode, the IO-Link master tries to wake up 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 the IO-Link function block)
- via tool-based engineering using FDT/DTM (e.g. PACTware with the use of DTM or the IODD or the web demo and Turck configuration tool)

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 data is 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	524288 (0x80000)
IO-Link version	1.1
Bitrate	COM2 (38.4 kbit/s)
Minimum cycle time	5 ms
SIO supported	True
M-Sequence Capability	PREOPERATE = TYPE_1_V with 8 octets on-request data ISDU supported
Block Parameter	True
Data Storage	True
ProfileCharacteristic	

4.2 Process Input Data

The internal process data can be multiplied by a factor of 0.0001 to calculate the distance value, level value and volume value. The conversion does not depend on the unit.

Process value in the set unit = ProcessDataIn × 0.0001

The internal process data must be multiplied by a factor of 0.1 for the signal strength.

Signal strength in % = SignalStrength × 0.1

Name	Byte.Bit-Offset	Bit length	Subindex access supported	Data Type	Value	Description
Process data	0.4	28	False	Integer	-19999999… 134217727	
					3.0	Measurement value is filtered.
					3.1	Sensor muted
					134217723	Value underrun
					134217724	Value overrun
					134217725	Geometry error
					134217726	No target detected.
					134217727	Internal Error
Process data 1	3.0	1	False	Boolean	False/true	
Process data 2	3.1	1	False	Boolean	False/true	

4.3 Standard parameters

Name	Index hex. (dec.)	Sub-index hex. (dec.)	Subindex access supported	Access	Byte. Bit-Offset	Bit length	Data Type	Value	Default	Description
Min Cycle Time	0x0 (0)	0x3 (3)	True	Read	2.0	8	UInteger			
IO-Link Version ID	0x0 (0)	0x5 (5)	True	Read	4.0	8	UInteger		17	
Vendor ID 1	0x0 (0)	0x8 (8)	True	Read	7.0	8	UInteger			
Vendor ID 2	0x0 (0)	0x9 (9)	True	Read	8.0	8	UInteger			
Device ID 1	0x0 (0)	0xA (10)	True	Read	9.0	8	UInteger			
Device ID 2	0x0 (0)	0xB (11)	True	Read	10.0	8	UInteger			
Device ID 3	0x0 (0)	0xC (12)	True	Read	11.0	8	UInteger			
Standard Command	0x2 (2)	0x0 (0)	True	Write	0.0	8	UInteger	0… 253		System command
								128		Device Reset
								129		Application Reset
								130		Restore Factory Settings The VDMA/Turck menu selection is not reset.
								160		Reset lowest recorded level
								161		Reset highest recorded level
								253		Capture command for radar monitor
Parameter (write) Access Lock	0xC (12)	0x1 (1)	False	Read/ write	0.0	1	Boolean	False/ true		Device access locks
Data Storage Lock	0xC (12)	0x2 (2)	False	Read/ write	0.1	1	Boolean	False/ true		Device access locks
Local Para-meterization Lock	0xC (12)	0x3 (3)	False	Read/ write	0.2	1	Boolean	False/ true		Device access locks
Local User Interface Lock	0xC (12)	0x4 (4)	False	Read/ write	0.3	1	Boolean	False/ true		Device access locks
Vendor Name	0x10 (16)	0x0 (0)	True	Read	0.0	512	String		Turck	Vendor name
Vendor Text	0x11 (17)	0x0 (0)	True	Read	0.0	512	String		www. turck. com	Additional manufacturer information
Product Name	0x12 (18)	0x0 (0)	True	Read	0.0	512	String			Manufacturer's device designation

Name	Index hex. (dec.)	Sub-index hex. (dec.)	Subindex access supported	Access	Byte. Bit-Offset	Bit length	Data Type	Value	Default	Description
Product ID	0x13 (19)	0x0 (0)	True	Read	0.0	512	String			ID
Product Text	0x14 (20)	0x0 (0)	True	Read	0.0	512	String		Radar level sensor	Device category
Serial Number	0x15 (21)	0x0 (0)	True	Read	0.0	128	String			Device serial number
Hardware Version	0x16 (22)	0x0 (0)	True	Read	0.0	512	String			Hardware revision
Firmware Version	0x17 (23)	0x0 (0)	True	Read	0.0	512	String			Firmware revision
Application Specific Tag	0x18 (24)	0x0 (0)	True	Read/ write	0.0	32	String		***	Any user generated content
Error Count	0x20 (32)	0x0 (0)	True	Read	0.0	16	UInteger			
Device status	0x24 (36)	0x0 (0)	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	0x25 (37)	0x0 (0)	False	Read	0.0	19	Array			
Process Data Input	0x28 (40)	0x0 (0)	True	Read	0.0	32	Process-DataIn Union			

4.4 Parameters

Name	Index hex. (dec.)	Sub-index hex. (dec.)	Subindex access supported	Access	Byte. Bit-Offset	Bit length	Data Type	Value	Default	Description
Function specific tag	0x19 (25)	0x0 (0)	True	Read/ write	0.0	256	String	NaN … NaN	***	
Location specific tag	0x1A (26)	0x0 (0)	True	Read/ write	0.0	256	String	NaN … NaN	***	
Operating hours	0x48 (72)	0x0 (0)	True	Read	0.0	32	UInteger	NaN … NaN		Total number of operating hours
Switching counter	0x49 (73)	0x0 (0)	True	Read	0.0	32	UInteger	NaN … NaN		Total number of switching cycles
Operating hours limit	0x4A (74)	0x0 (0)	True	Read/ write	0.0	32	UInteger	NaN … NaN	1000000	Operating hours alert limit
Switching counter limit	0x4B (75)	0x0 (0)	True	Read/ write	0.0	32	UInteger	NaN … NaN	1000000000	Alert limit for number of switching cycles
Output configuration 1	0x51 (81)	0x0 (0)	True	Read/ write	0.0	8	UInteger	0…3	0	Output function and switching logic
								0		Hysteresis mode, normally open
								1		Hysteresis mode, normally closed
								2		Windows mode, normally open
								3		Windows mode, normally closed

Name	Index hex. (dec.)	Sub-index hex. (dec.)	Subindex access supported	Access	Byte. Bit-Offset	Bit length	Data Type	Value	Default	Description
Output configuration 2	0x52 (82)	0x0 (0)	True	Read/ write	0.0	8	UInteger	0…15	4	Output function and switching logic
								0		Hysteresis mode, normally open
								1		Hysteresis mode, normally closed
								2		Windows mode, normally open
								3		Windows mode, normally closed
								4		Auto (4…20 mA/0…10 V)
								5		4…20 mA
								6		0…20 mA
								7		20…4 mA
								8		20…0 mA
								9		0…10 V
								10		0…5 V
								11		1…6 V
								12		10…0 V
								13		5…0 V
								14		6…1 V
								15		0.5…4.5 V
PNP/NPN auto-detection	0x53 (83)	0x0 (0)	True	Read/ write	0.0	8	UInteger	0…2	2	Switch polarity will be set according to connected load.
								0		PNP
								1		NPN
								2		Auto
Measurement quantity	0x54 (84)	0x1 (1)	False	Read/ write	0.0	8	UInteger	0…5	0	
								0		Distance
								1		Distance %
								2		Level
								3		Level %
								4		Volume
								5		Volume %
Length unit	0x54 (84)	0x2 (2)	False	Read/ write	1.0	8	UInteger	0…3	1	
								0		Millimeters
								1		Meters
								2		Inches
								3		Feet

Name	Index hex. (dec.)	Sub-index hex. (dec.)	Subindex access supported	Access	Byte. Bit-Offset	Bit length	Data Type	Value	Default	Description
Volume unit	0x54 (84)	0x3 (3)	False	Read/ write	2.0	8	UInteger	0…4	0	
								0		Liters
								1		Cubic meters
								2		Cubic inches
								3		Cubic feet
								4		Gallons
Display actualization rate	0x55 (85)	0x0 (0)	True	Read/ write	0.0	8	UInteger	0…3	0	Display update period
								0		50 ms
								1		200 ms
								2		600 ms
								3		Display off
Output 1: Errorstate	0x56 (86)	0x0 (0)	True	Read/ write	0.0	8	UInteger	0…1	0	State of output switch 1 in case of error
								0		Switch inactive
								1		Switch active
Output 2: Errorstate	0x57 (87)	0x0 (0)	True	Read/ write	0.0	8	UInteger	0…1	0	State of output switch 2 in case of error
								0		Switch inactive
								1		Switch active
Virtual FH	0x59 (89)	0x1 (1)	False	Read/ write	0.0	28	Integer	-1999 9999 … 99999 999	50000	Measured value ÷ 10000 = Value in unit The values change if the unit is adjusted.
Virtual FL	0x59 (89)	0x2 (2)	False	Read/ write	4.0	28	Integer	-1999 9999 … 99999 999	75000	Measured value ÷ 10000 = Value in unit The values change if the unit is adjusted.
Display color	0x5A (90)	0x0 (0)	True	Read/ write	0.0	8	UInteger	0…7	0	Defines the display color and whether it should depend on switching states or levels.
								0		Green
								1		Red
								2		Green Out 1
								3		Red Out 1
								4		Green Out 2
								5		Red Out 2
								6		Green Virtual
								7		Red Virtual

Name	Index hex. (dec.)	Sub-index hex. (dec.)	Subindex access supported	Access	Byte. Bit-Offset	Bit length	Data Type	Value	Default	Description
Rotation of display	0x5B (91)	0x0 (0)	True	Read/ write	0.0	8	UInteger	0…1	0	Rotate the display to be readable from above.
								0		0°
								1		180°
SP/FH (Output 1)	0x60 (96)	0x1 (1)	False	Read/ write	0.0	28	Integer	-1999 9999 … 99999 999	50000	Measured value ÷ 10000 = Value in unit The values change if the unit is adjusted.
rP/FL (Output 1)	0x60 (96)	0x2 (2)	False	Read/ write	4.0	28	Integer	-1999 9999 … 99999 999	75000	Measured value ÷ 10000 = Value in unit The values change if the unit is adjusted.
SP/FH (Output 2)	0x61 (97)	0x1 (1)	False	Read/ write	0.0	28	Integer	-1999 9999 … 99999 999	50000	Measured value ÷ 10000 = Value in unit The values change if the unit is adjusted.
rP/FL (Output 2)	0x61 (97)	0x2 (2)	False	Read/ write	4.0	28	Integer	-1999 9999 … 99999 999	75000	Measured value ÷ 10000 = Value in unit The values change if the unit is adjusted.
Startpoint	0x62 (98)	0x1 (1)	False	Read/ write	0.0	28	Integer	-1999 9999 … 99999 999	3500	Measured value ÷ 10000 = Value in unit The values change if the unit is adjusted.
Endpoint	0x62 (98)	0x2 (2)	False	Read/ write	4.0	28	Integer	-1999 9999 … 99999 999	100000	Measured value ÷ 10000 = Value in unit The values change if the unit is adjusted.

Name	Index hex. (dec.)	Sub-index hex. (dec.)	Subindex access supported	Access	Byte. Bit-Offset	Bit length	Data Type	Value	Default	Description
Value at highest level	0x69 (105)	0x0 (0)	True	Read	0.0	28	Integer	-19999999 … 134217727		Measurement value at highest filling level
								134217723		Value underrun
								134217724		Value overrun
								134217725		Geometry error
								134217726		No target detected
								134217727		Internal Error
Value at lowest level	0x6A (106)	0x0 (0)	True	Read	0.0	28	Integer	-19999999 … 134217727		Measurement value at lowest filling level
								134217723		Value underrun
								134217724		Value overrun
								134217725		Geometry error
								134217726		No target detected.
								134217727		Internal Error
Damping (analog out)	0x70 (112)	0x0 (0)	True	Read/ write	0.0	16	UInteger	0… 800	0	Risetime and falltime (0 %/90 %) of analog output signal (suppress oscillation in control loops) Stepwise: 10 ms
Damping (switching)	0x71 (113)	0x0 (0)	True	Read/ write	0.0	16	UInteger	0… 800	0	Risetime and falltime (0 %/90 %) of analog output signal (suppress oscillation in control loops) Stepwise: 10 ms
Output 1: dSP/dFH	0x78 (120)	0x0 (0)	True	Read/ write	0.0	16	UInteger	0… 600	0	On switching delay/ switching delay at FH Stepwise: 100 ms
Output 1: dRP/dFL	0x79 (121)	0x0 (0)	True	Read/ write	0.0	16	UInteger	0… 600	0	Off switching delay/ switching delay at FL Stepwise: 100 ms

Name	Index hex. (dec.)	Sub-index hex. (dec.)	Subindex access supported	Access	Byte. Bit-Offset	Bit length	Data Type	Value	Default	Description
Output 2: dSP/ dFH	0x7A (122)	0x0 (0)	True	Read/ write	0.0	16	UInteger	0… 600	0	On switching delay/ switching delay at FH Stepwise: 100 ms
Output 2: dRP/dFL	0x7B (123)	0x0 (0)	True	Read/ write	0.0	16	UInteger	0… 600	0	Off switching delay/ switching delay at FL Stepwise: 100 ms
Tank geometry	0x88 (136)	0x1 (1)	False	Read/ write	0.0	8	UInteger	0…4	0	
								0		Vertical cylinder
								1		Horizontal cylinder
								2		Cone
								3		Sphere
								4		Volume/distance defined by user table
Diameter	0x88 (136)	0x2 (2)	False	Read/ write	1.0	32	UInteger	NaN … NaN	5642	Measured value ÷ 10000 = Value in unit The values change if the unit is adjusted.
Dished bottoms	0x88 (136)	0x3 (3)	False	Read/ write	5.0	8	UInteger	0…1	0	
								0		Flat ends
								1		Dished bottoms at both ends
Lowest filling level	0x88 (136)	0x4 (4)	False	Read/ write	6.0	28	Integer	-1999 9999 … 99999 999	0	
Highest filling level	0x88 (136)	0x5 (5)	False	Read/ write	10.0	28	Integer	-1999 9999 … 99999 999	96500	Measured value ÷ 10000 = Value in unit The values change if the unit is adjusted.
Sensor position	0x88 (136)	0x6 (6)	False	Read/ write	14.0	28	Integer	-1999 9999 … 99999 999	100000	Measured value ÷ 10000 = Value in unit The values change if the unit is adjusted.
Length of cylindrical tank	0x88 (136)	0x7 (7)	False	Read/ write	18.0	28	Integer	-1999 9999 … 99999 999	96500	Measured value ÷ 10000 = Value in unit The values change if the unit is adjusted.
Upper edge of cone	0x88 (136)	0x8 (8)	False	Read/ write	22.0	28	Integer	-1999 9999 … 99999 999	0	

Name	Index hex. (dec.)	Sub-index hex. (dec.)	Subindex access supported	Access	Byte. Bit-Offset	Bit length	Data Type	Value	Default	Description
Lower edge of cone	0x88 (136)	0x9 (9)	False	Read/ write	26.0	28	Integer	-1999 9999 … 99999 999	0	
Diameter at upper edge of cone	0x88 (136)	0xA (10)	False	Read/ write	30.0	28	Integer	-1999 9999 … 99999 999	0	
Diameter at lower edge of cone	0x88 (136)	0xB (11)	False	Read/ write	34.0	28	Integer	-1999 9999 … 99999 999	0	
Signal strength	0x89 (137)	0x0 (0)	True	Read	0.0	16	UInteger	NaN … NaN		Signal strength in relation to standard target
Display unit	0x8A (138)	0x0 (0)	True	Read/ write	0.0	8	UInteger	0…1	1	
								0		Unit not displayed
								1		Unit displayed for 1 s after 4 s value
Custom geometry heigth nodes	0x8B (139)	0x0 (0)	False	Read/ write	0.0	512	Array	0… 134217724		
								134217723		Value underrun
								134217724		Value overrun
Custom geometry volume nodes	0x8C (140)	0x0 (0)	False	Read/ write	0.0	512	Array	0… 134217724		
								134217723		Value underrun
								134217724		Value overrun
Type of local menu	0x8F (143)	0x0 (0)	True	Read/ write	0.0	8	UInteger	0…1	0	Select the type of the sensors menu structure. The type of operator menu is retained after the reset to the factory setting.
								0		Turck standard menu
								1		VDMA menu

Name	Index hex. (dec.)	Sub-index hex. (dec.)	Subindex access supported	Access	Byte. Bit-Offset	Bit length	Data Type	Value	Default	Description
Signal amplitude filter mode	0x90 (144)	0x0 (0)	True	Read/ write	0.0	8	UInteger	0…3	0	Filter signals with amplitudes above max. or below min. amplitude.
								0		Disabled
								1		Max. enabled
								2		Min. enabled
								3		Min. & max. enabled
Max. signal amplitude	0x91 (145)	0x0 (0)	True	Read/ write	0.0	16	UInteger	100… 9999	1000	Signals with higher amplitude are ignored.
Min. signal amplitude	0x92 (146)	0x0 (0)	True	Read/ write	0.0	16	UInteger	100… 9999	100	Signals with lower amplitude are ignored.
Frontground suppression	0x94 (148)	0x0 (0)	True	Read/ write	0.0	16	UInteger	1500 … 50000	1500	Signals in front of this distance limit are ignored.
Background suppression	0x95 (149)	0x0 (0)	True	Read/ write	0.0	16	UInteger	1750 … 50250	50250	Signals behind this distance limit are ignored.
IO-Link-Index	0xA8 (168)	0x1 (1)	True	Read	0.0	16	UInteger	0… 193	0	Block transfer error details
								0		No error
								81		Configuration output 1
								82		Configuration output 2
								83		Polarity of switching outputs
								84		Units
								86		Errorstate output 1
								87		Errorstate output 2
								89		Display color setpoints
								90		Display color
								91		Rotation of display
								96		Setpoints output 1
								97		Setpoints output 2
								98		Analog startpoint/endpoint
								112		Damping (analog)
								113		Damping (switching)
								114		Temperature compensation mode
								115		Temperature compensation value
								118		Filter
								120		On switching delay/ switching delay at FH1

Name	Index hex. (dec.)	Sub-index hex. (dec.)	Subindex access supported	Access	Byte. Bit-Offset	Bit length	Data Type	Value	Default	Description
								121		Off switching delay/ switching delay at FL1
								122		On switching delay/ switching delay at FH1
								123		Off switching delay/ switching delay at FL2
								136		Geometry
								138		Display unit
								139		Custom geometry: Height nodes
								140		Custom geometry: Volume nodes
								142		Dynamic blindzone
								143		Menu mode
								144		Intensity filter mode
								145		Filter: Max. amplitude
								146		Filter: Min. amplitude
								148		Frontground suppression
								149		Background suppression
								192		Analog error delay (on)
								193		Analog error delay (off)
Error message	0xA8 (168)	0x2 (2)	True	Read	2.0	16	UInteger	0… 180	0	Block transfer error details
								0		No error
								1		Display brightness is to low.
								2		Display brightness is to high.
								3		Unknown display update rate
								4		Unknown display rotation setting
								5		Unknown display color setting
								6		Unknown value in the entry whether the unit of measurement should be displayed.
								7		Unknown length unit
								8		Unknown volume unit
								9		Unknown measurement mode
								30		Unknown polarity setting
								31		Unknown output 1 switch mode

Name	Index hex. (dec.)	Sub-index hex. (dec.)	Subindex access supported	Access	Byte. Bit-Offset	Bit length	Data Type	Value	Default	Description
								32		Unknown output error state
								33		Output delay is to high
								34		Unknown output 2 mode
								35		Unknown output 2 mode
								36		Unknown output 2 mode
								37		Unknown output 2 mode
								38		A geometry error occurred at the switching point (SP).
								39		A geometry error occurred at the switching point (rP).
								40		The switching point rP is beyond the detection range limit.
								41		The distance between rP and SP is to small.
								42		The switching point SP is to close to the sensor.
								43		The distance between ASP and AEP is to small.
								44		The switching point ASP is to close to the sensor.
								45		The switching point AEP is beyond the detection range limit.
								47		Output damping value is to large
								60		Unknown menu type (Turck/VDMA)
								90		Lowest filling level is outside of detection range.
								91		Highest filling level is out-side of detection range.
								92		The distance between highest and lowest filling level is to small.
								93		Tank diameter is smaller than highest filling level.
								95		Tank length is smaller than highest filling level.
								96		Unknown value for tank bottom
								97		Unknown value for tank shape

Name	Index hex. (dec.)	Sub-index hex. (dec.)	Subindex access supported	Access	Byte. Bit-Offset	Bit length	Data Type	Value	Default	Description
								98		Upper edge of conical tank is below lower edge (hTop < hBot)
								99		Height node in custom tank geometry is to small.
								120		Frontground suppression is to low.
								121		Frontground suppression is to high.
								122		Background suppression is to low.
								123		Background suppression is to high.
								124		Unknown signal amplitude filter mode
								125		Minimum value for signal amplitude filter is to small.
								127		Minimum value for signal amplitude filter is to large.
								128		Minimum value for signal amplitude filter is to close the maximum filter value.
								129		Maximum value for signal amplitude filter is to small.
								130		Maximum value for signal amplitude filter is to large.
								131		Maximum value for signal amplitude filter is to close the minimum filter value.
								150		Unknown value for access locks
								151		Unknown IO-Link entry
								180		Frontend refused value
Menu lock password	0x95D (2397)	0x0 (0)	True	Write	0.0	16	UInteger	NaN … NaN	0	Password to unlock sensor menu

4.5 Events

Code	Type	Name	Description
16384	Error	Temperature fault	Overload
16912	Warning	Device temperature over-run	Clear source of heat.
20480	Error	Device hardware fault	Device exchange
20736	Error	General power supply fault	Check availability.
20752	Warning	Primary supply voltage over-run	Check tolerance.
20753	Warning	Primary supply voltage under-run	Check tolerance.
30480	Error	Short circuit	Check installation.
35856	Warning	Process variable range over-run	Process data uncertain
35888	Warning	Process variable range under-run	Process data uncertain
36001	Error	Overload	
36002	Error	Underload	
36003	Error	The sensor was unable to perform autodetection at output 2.	
36006	Notification	New maximum value recorded	
36007	Notification	New minimum value recorded	
36009	Error	Test event	
36011	Error	Test Event Error 1	
36015	Error	Critical error	The sensor encountered an critical error and needs to be replaced.
36016	Warning	Operating hours limit was reached	
36017	Warning	Switching counter limit was reached	
36048	Warning	Display ist unlocked	

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