IO-Link Parameter Datasheet

Distance sensor

OMR60M-R200-2EP-IO* series

PEPPERL+FUCHS

IO-Link

Support: fa-info@pepperl-fuchs.com
Internet: www.pepperl-fuchs.com

DOCT-9036 - Version 1.00.000 / 2023-10-20

General Information

Device Identification	
Vendor ID	1 (0x0001)
Device ID	1121041 (0x111B11)

Features	
Data Storage	Yes
Block Parameterization	Yes

Communication Characteristics	
IO-Link revision	V1.1 (specification V1.1.3)
IO-Link backward compatibility	n/a
Data transmission rate	COM2 (38.4 kbit/s)
Min. cycle time	4.0 ms
Process data input	6 byte
Process data output	2 bit
SIO mode support	yes
Compatible master port type	Class A, Class B (see NOTE)

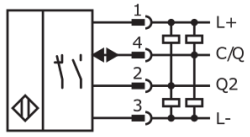
NOTE: For use at master with port class B, use 3-pole adapter or 3-wire cable.

Profile	
Identification and Diagnosis	16384 (0x4000)
Function Class – Product URI	33026 (0x8102)
Smart Sensor – SSP 4.2.1	20 (0x0014)
Function Class – Sensor Control	32780 (0x800C)

Supported Product Variants

Product ID	*Product Name*	*Description*	*Connector*
295670-100377	OMR60M-R200-2EP-IO-V31-L	Measurement range 0.2 .. 60 m, adjustable, active high, configurable, Q2 output, M8 plug, 4-pin	Plug, M8, 4-pin
295670-100388	OMR60M-R200-2EP-IO-V1-L	Measurement range 0.2 .. 60 m, adjustable, active high, configurable, Q2 output, M12 plug, 4-pin	Plug, M12, 4-pin

Connection

Connection Diagram	*Description*
	**Plug, M8/M12, 4-pin** 1: Brown - +24V 2: White - Q2 3: Blue - 0V 4: Black - C/Q

Process Data

Process Data Input

Sub	Name	Data type	Length	Bitoffs.	Value	Unit	Description
.1	MDC – Measurement Value	Integer	32 bit	16	0 .. 2147482880 *-2147483640* *2147483640* *2147483644*	mm	Shows the current measurement value. *Out of Range (-)* *Out of Range (+)* *No measurement data*
.2	MDC - Scale	Integer	8 bit	8	*-3*		Shows the multiplier for the measurement value of the sensor - 10exp(scale). *Resolution 1 mm*
.3	SSC.1 – Switching Signal	Boolean	1 bit	0	*0* *1*		Indicates the detection status of an object or measurement value below/above a threshold. *Low* *High*
.4	SSC.2 – Switching Signal	Boolean	1 bit	1	*0* *1*		Indicates the detection status of an object or measurement value below/above a threshold. *Low* *High*
.5	Signal Quality Indicator	UInteger	2 bit	2	*0* *1* *2* *3*		Shows the quality of the evaluated sensor signal. Quality drops with weak signal or interference. *Insufficient* *Acceptable* *Good* *Excellent*

Process Data Output

Sub	Name	Data type	Length	Bitoffs.	Value	Unit	Description
.1	CSC – Sensor Control	Boolean	1 bit	0	*0* *1*		Controls the sensor emitter. If disabled, a substitute value is applied to the process data. *Enabled* *Disabled*
.2	CSC – Evaluation Control	Boolean	1 bit	1	*0* *1*		Controls the signal evaluation. If disabled, signal evaluation is inhibited. The last evaluation state and value is maintained in the process data. *Enabled* *Disabled*

NOTE: The process data input content can also be read via parameter ‘Process Data Input’ at index 40 (0x28).
The process data output content can also be read via parameter ‘Process Data Output’ at index 41 (0x29).

Parameter Data

Identification

Index	Parameter	Access	Data type	Length	Default	Description	DS	R
16 (0x10)	Vendor Name	ro	String	13 byte	Pepperl+Fuchs	The vendor name that is assigned to a Vendor ID.		
17 (0x11)	Vendor Text	ro	String	29 byte	www.pepperl-fuchs.com/io-link	Additional information about the vendor.		
18 (0x12)	Product Name	ro	String	max. 32 byte	*See table Supported Product Variants*	Complete product name.		
19 (0x13)	Product ID	ro	String	max. 32 byte	*See table Supported Product Variants*	Vendor-specific product or type identification (e.g., item number or model number).		
20 (0x14)	Product Text	ro	String	max. 32 byte	Distance sensor	Additional product information for the device.		
21 (0x15)	Serial Number	ro	String	14 byte		Unique, vendor-specific identifier of the individual device.		
22 (0x16)	Hardware Revision	ro	String	7 byte	HW**.**	Unique, vendor-specific identifier of the hardware revision of the individual device.		
23 (0x17)	Firmware Revision	ro	String	7 byte	FW**.**	Unique, vendor-specific identifier of the firmware revision of the individual device.		
24 (0x18)	Application Specific Tag	rw	String	max. 32 byte	Your automation, our passion.	Possibility to mark a device with user- or application-specific information.	Y	F
25 (0x19)	Function Tag	rw	String	max. 32 byte	R200 series	Possibility to mark a device with function-specific information.	Y	F
26 (0x1A)	Location Tag	rw	String	max. 32 byte	***	Possibility to mark a device with location-specific information.	Y	F
27 (0x1B)	Product URI	ro	String	max. 100 byte	https://pefu.de/<serial number>	Provides a unique instance identification compliant to DIN-SPEC 91406.		

Diagnosis

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
36 (0x24)	Device Status	ro	UInteger	8 bit		0	*0* *1* *2* *3* *4*		Indicator for the current device condition and diagnosis state. *Device is OK* *Maintenance required* *Out of specification* *Functional check* *Failure*		FA
37 (0x25)	Detailed Device Status	ro	Array [S0]	12 byte					List of all currently pending events in the device.		FA
.1	Element 1		Octetstr	3 byte	72	0					
.2	Element 2		Octetstr	3 byte	48	0					
.3	Element 3		Octetstr	3 byte	24	0					
.4	Element 4		Octetstr	3 byte	0	0					
224 (0xE0)	Operating Hours	ro	UInteger	32 bit			0 .. 2^{32}-1	h	Shows the overall hours of operation since initial commissioning.		
225 (0xE1)	Temperature Indicator	ro	UInteger	8 bit			*0* *1* *2* *3* *4*		Indicates the operation at ambient temperatures close to or in excess of specification limits. *Operating condition OK* *Close to upper limit* *Upper limit exceeded* *Close to lower limit* *Lower limit exceeded*		
226 (0xE2)	Temperature Monitor	ro	Record [S0]	9 byte					Contains parameters showing current and past conditions of temperature exposure since initial commissioning.		
.1	Overtemperature Operating Hours	ro	UInteger	32 bit	40		0 .. 2^{32}-1	h	Shows the overall hours of powered operation above the specified temperature limit since initial commissioning.		
.2	Overtemperature Exceeded Counter	ro	UInteger	16 bit	24		0 .. 65535		Shows the number of transitions to operating temperatures above the specified limit in powered operation since initial commissioning.		
.3	Maximum Operating Temperature	ro	Integer	8 bit	16		-50 .. 125	°C	Shows the maximum observed temperature in powered operation since initial commissioning.		
.4	Minimum Operating Temperature	ro	Integer	8 bit	8		-50 .. 125	°C	Shows the minimum observed temperature in powered operation since initial commissioning.		
.5	Device Operating Temperature	ro	Integer	8 bit	0		-50 .. 125	°C	Shows the currently observed operating temperature of the device.		
227 (0xE3)	Power Monitor	ro	Record [S0]	12 byte					Contains parameters showing current and past conditions of power cycles since initial commissioning.		
.1	Power Cycle Counter	ro	UInteger	32 bit	96		0 .. 2^{32}-1		Shows the number of power cycles since initial commissioning (incremented on power-on).		
.2	Maximum Uptime	ro	UInteger	32 bit	64		0 .. 2^{32}-1	s	Shows the maximum observed powered operating time between power cycles in seconds since initial commissioning.		
.3	Average Uptime	ro	Integer	32 bit	32		0 .. 2^{32}-1	s	Shows the average observed powered operating time between power cycles in seconds since initial commissioning.		
.4	Uptime	ro	Integer	32 bit	0		0 .. 2^{32}-1	s	Shows the current operating time since the last power cycle in seconds.		
232 (0xE8)	Device Characteristic	ro	Record [S0]	10 byte					Shows relevant key characteristics of the device for use in applications.		
.1	Min. Detection Range	ro	Integer	32 bit	48	20		mm	Shows the value of the minimum specified detection range.		
.2	Max. Detection Range	ro	Integer	32 bit	16	60500		mm	Shows the value of the maximum specified detection range.		

Diagnosis											
Index .sub	***Parameter***	***Access***	***Data type***	***Length***	***Bitoffs.***	***Default***	***Value***	***Unit***	***Description***	***DS***	***R***
.3	Supply Current Requirement	ro	UInteger	16 bit	0	25		mA	Shows the maximum specified supply current for the device excluding load.		
238 (0xEE)	Device Operating State	ro	Record S0	8 bit					Shows relevant key characteristics of the device for use in applications.		
.1	Sensor Control	ro	Boolean	1 bit	0	0			Indicates if sensor operation is inhibited by any remote signal (process data, I/O signal or parameter value) or by an internal error condition.		
							0		*Enabled*		
							1		*Disabled*		
.2	Local Control (in IO-Link mode)	ro	Boolean	1 bit	1	0			Indicates that local control elements are temporarily enabled for adjustment or teach-in in IO-Link mode.		
							0		*Disabled*		
							1		*Enabled*		
239 (0xEF)	I/O Feature	ro	UInteger	16 bit		2			Shows the supported I/O features of the device.		
							2		*Second signal in- / output on pin 2 / white wire*		
127 (0x7F)	Indication Control	rw	Record S0	8 bit					Provides control functions for diagnosis purposes for indicators or display.		FA
.1	Locator Indication	rw	Boolean	1 bit	0	0			Enables a defined flashing pattern of the indicator LEDs for better spotting a sensor in field application.		FA
							0		*Disabled*		
							1		*Enabled*		
16512 (0x4080)	Measurement Data Channel Descriptor	ro	Record S0	11 byte					Descriptor containing characteristic data of the measurement data channel (process data MV).		
.1	Lower Value	ro	Integer	32 bit	56	200		mm	Shows the lower value of the measurement range.		
.2	Upper Value	ro	Integer	32 bit	24	60000		mm	Shows the upper value of the measurement range.		
.3	Unit Code	ro	UInteger	16 bit	8	1010			Shows the unique code for the physical unit.		
.4	Scale	ro	Integer	8 bit	0	-3			Shows the multiplier for measurement value - 10exp(scale).		

Parameterization & Configuration

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
60 (0x3C)	SSC.1 Param	rw	Record	8 byte					Defines the setpoint values for switching signal channel 1.	Y	FA
.1	SP1	rw	Integer	32 bit	32	9000	0 .. 120000	mm	Defines the setpoint 1 value for the switching signal channel.	Y	FA
.2	SP2	rw	Integer	32 bit	0	6000	0 .. 120000	mm	Defines the setpoint 2 value for the switching signal channel.	Y	FA
61 (0x3D)	SSC.1 Config	rw	Record	6 byte					Defines the configuration parameter for switching signal channel 1.	Y	FA
.1	Logic	rw	UInteger	8 bit	40	0	*0* *1*		Defines the logical representation of the switching signal SSC in the process data. *High active* *Low active*	Y	FA
.2	Mode	rw	UInteger	8 bit	32	2	*0* *1* *2* *3* *128*		Defines the evaluation mode for the switching signal SSC. *Deactivated* *Single point* *Window* *Two point* *Centered window*	Y	FA
.3	Hysteresis	rw	Integer	32 bit	0	15	0 .. 500	mm	Defines the hysteresis at the switch point. A higher hysteresis may help to improve the stability in critical applications.	Y	FA
62 (0x3E)	SSC.2 Param	rw	Record	8 byte					Defines the setpoint values for switching signal channel 2.	Y	FA
.1	SP1	rw	Integer	32 bit	32	8000	0 .. 120000	mm	Defines the setpoint 1 value for the switching signal channel.	Y	FA
.2	SP2	rw	Integer	32 bit	0	4000	0 .. 120000	mm	Defines the setpoint 2 value for the switching signal channel.	Y	FA
63 (0x3F)	SSC.2 Config	rw	Record	6 byte					Defines the configuration parameter for switching signal channel 2.	Y	FA
.1	Logic	rw	UInteger	8 bit	40	0	*0* *1*		Defines the logical representation of the switching signal SSC in the process data. *High active* *Low active*	Y	FA
.2	Mode	rw	UInteger	8 bit	32	2	*0* *1* *2* *3* *128*		Defines the evaluation mode for the switching signal SSC. *Deactivated* *Single point* *Window* *Two point* *Centered window*	Y	FA
.3	Hysteresis	rw	Integer	32 bit	0	15	0 .. 500	mm	Defines the hysteresis at the switch point. A higher hysteresis may help to improve the stability in critical applications.	Y	FA
64 (0x40)	SSC.1 Config Ext	rw	Record	5 byte					Provides configuration options for switching delay functions and timings for switching signal channel 1.	Y	FA
.1	Off delay	rw	UInteger	16 bit	24	0	0 .. 60000	ms	Defines the switching delay for an on-to-off transition of the switching signal (0: disabled).	Y	FA
.2	On Delay	rw	UInteger	16 bit	8	0	0 .. 60000	ms	Defines the switching delay for an off-to-on transition of the switching signal (0: disabled).	Y	FA
.3	Delay Mode	rw	UInteger	8 bit	0	0	*0* *1*		Selects between a combination of 'on' and 'off' delay times or 'on' and 'one-shot' delay times. *On / Off delay* *On delay / One shot*	Y	FA
65 (0x41)	SSC.2 Config Ext	rw	Record	5 byte					Provides configuration options for switching delay functions and timings for switching signal channel 2.	Y	FA

Parameterization & Configuration

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
.1	Off delay	rw	UInteger	16 bit	24	0	0 .. 60000	ms	Defines the switching delay for an on-to-off transition of the switching signal (0: disabled).	Y	FA
.2	On Delay	rw	UInteger	16 bit	8	0	0 .. 60000	ms	Defines the switching delay for an off-to-on transition of the switching signal (0: disabled).	Y	FA
.3	Delay Mode	rw	UInteger	8 bit	0	0	*0* *1*		Selects between a combination of 'on' and 'off' delay times or 'on' and 'one-shot' delay times. *On / Off delay* *On delay / One shot*	Y	FA
66 (0x42)	SSC.1 Config Ext – SP Offset	rw	Integer	32 bit		500	10 .. 12000	mm	Defines the offset of the switch point relative to the setpoint for switching signal channel 1.	Y	FA
67 (0x43)	SSC.2 Config Ext – SP Offset	rw	Integer	32 bit		500	10 .. 12000	mm	Defines the offset of the switch point relative to the setpoint for switching signal channel 2.	Y	FA
58 (0x3A)	Teach Select	rw	UInteger	8 bit		1	*1* *2*		Selects the switching signal channel for which a teach procedure will be applied. *SSC.1* *SSC.2*		FA
59 (0x3B)	Teach Result	ro	Record	8 bit					Shows the complete result information of the teach procedure including current state and result flags.		FA
.1	State	ro	UInteger	4 bit	0	0	*0* *1* *2* *3* *4* *5* *7* *12* *13* *14*		Indicates the current state of the teach procedure. *Idle* *SP1 success* *SP2 success* *SP1, SP2 success* *Wait for command* *Busy* *Error* *Measurement offset success* *AO SP1 success* *AO SP2 success*		FA
.2	Flag SP1 TP1	ro	Boolean	1 bit	4	0	*0* *1*		Indicates the current teach result for the teach point. *Initial or not ok* *Ok*		FA
.3	Flag SP1 TP2	ro	Boolean	1 bit	5	0	*0* *1*		Indicates the current teach result for the teach point. *Initial or not ok* *Ok*		FA
.4	Flag SP2 TP1	ro	Boolean	1 bit	6	0	*0* *1*		Indicates the current teach result for the teach point. *Initial or not ok* *Ok*		FA
.5	Flag SP2 TP2	ro	Boolean	1 bit	7	0	*0* *1*		Indicates the current teach result for the teach point. *Initial or not ok* *Ok*		FA
97 (0x61)	Eval Config – Signal Filter	rw	UInteger	8 bit		0	*0* *1* *2* *3* *4* *5*		Defines the grade of filtering in the signal evaluation. A higher filtering improves stability in critical applications but increases the response time. *3 ms* *6 ms* *12 ms* *25 ms* *50 ms* *100 ms*	Y	FA
98 (0x62)	Eval Config - Measurement Offset	rw	Integer	32 bit		0	*-60000 .. 60000*	*mm*	Defines the offset of the measurement value for setting of a zero reference or calibration of mounting tolerances.	Y	FA

Parameterization & Configuration											
Index .sub	***Parameter***	***Access***	***Data type***	***Length***	***Bitoffs.***	***Default***	***Value***	***Unit***	***Description***	***DS***	***R***
99 (0x63)	Eval Config – Smart Hold	rw	UInteger	8 bit		0	*0* *1*		Reduces the noise of the distance value that is output at a standstill. The measurement remains active. *Disabled* *Enabled*	Y	FA
104 (0x68)	PD Output Config	rw	Record [S0]	1 byte					Defines which PD Output data are enabled to control the sensor function.	Y	FA
.1	Sensor Control	rw	UInteger	1 bit	0	0	*0* *1*		Enabled: The sensor function is controlled via process data output. A '1' at 'PD Output - Sensor Control' disables the sensor emitter. Distance measurement is disabled. *Disabled* *Enabled*	Y	FA
.2	Evaluation Control	rw	UInteger	1 bit	0	0	*0* *1*		Enabled: The signal evaluation is controlled via process data output. A '1' at 'PD Output - Evaluation Control' inhibits signal evaluation. The last evaluation state is maintained. *Disabled* *Enabled*	Y	FA
120 (0x78)	Event Config	rw	Record [S0]	2 byte					Defines which event sources can trigger events.	Y	FA
.2	Warning – No Measurement Data	rw	Boolean	1 bit	1	0	*0* *1*		Enabled: An event is generated if sensor signals do not allow a valid processing of measurement values or data are not available. *Disabled* *Enabled*	Y	FA
.9	Warning – Sensor Disabled	rw	Boolean	1 bit	8	0	*0* *1*		Enabled: An event is generated if the sensor is set to a disabled mode by a remote control signal (process data, I/O signal or parameter value) or by an internal error condition. *Disabled* *Enabled*	Y	FA
113 (0x71)	I/O Config – I/Q Type	rw	UInteger	8 bit		0	*0* *1* *4* *5* *6*		Defines the output or input characteristic at pin 2 or white wire. *Factory default* *Output - Push-pull* *High impedance* *Input – High active* *Input – Low active*	Y	FA
117 (0x75)	I/O Config – Output Function	rw	UInteger	8 bit		0	*0* *1* *2* *3* *255*		Defines the specific function at the additional I/O terminal if configured as output. *Factory default* *Antivalent* *Equivalent* *SSC2 - switching signal* *Inactive (constant)*	Y	FA
118 (0x76)	I/O Config – Input Function	rw	UInteger	8 bit		0	*0* *1*		Defines the specific function at the additional I/O terminal if configured as input. *Factory default* *Test mode (emitter off)*	Y	FA
125 (0x7D)	Device Operation	rw	UInteger	8 bit		0	*0* *1*		Allows setting the device into different operational states e.g. for diagnosis purposes. After a power cycle or communication restart the feature will be reset to normal operation. *Normal operation* *Sensor emitter disabled*		FA

Parameterization & Configuration											
Index .sub	***Parameter***	***Access***	***Data type***	***Length***	***Bitoffs.***	***Default***	***Value***	***Unit***	***Description***	***DS***	***R***
126 (0x7E)	UI Control	rw	Record S0	8 bit					Provides possibilities for controlling the functionality of the user interface or local control elements.		FA
.1	Local Control (in IO-Link mode)	rw	Boolean	1 bit	1	0	*0* *1*		During IO-Link communication local control is generally inhibited. Setting this parameter to 'Enabled' allows for adjustment or teach-in over local control elements. After a power cycle or communication restart the feature will be disabled. *Disabled* *Enabled*		FA
12 (0x0C)	Device Access Locks	rw	Record S0	2 byte					The access to the device parameters can be restricted by setting appropriate flags within this parameter.	Y	FA
.3	Local Parameterization	rw	Boolean	1 bit	1	0	*0* *1*		This lock prevents the device settings from being changed via local operating elements on the device. *Unlocked* *Locked*	Y	FA

Observation											
Index .sub	***Parameter***	***Access***	***Data type***	***Length***	***Bitoffs.***	***Default***	***Value***	***Unit***	***Description***	***DS***	***R***
36 (0x24)	Device Status	ro	UInteger	8 bit		0			Indicator for the current device condition and diagnosis state. *See Diagnosis – Device Status*		FA
236 (0xEC)	Observation Data	ro	Record [S0]	11 byte					Provides a set of relevant data suitable for observation purposes.		
.1	MDC – Measurement Value	ro	Integer	32 bit	56	0	0 .. 2147482880 *-2147483640* *2147483640* *2147483644*	mm	Shows the current measurement value. *Out of range (-)* *Out of range (+)* *No measurement data*		
.2	DSC – Signal Quality Indicator	ro	UInteger	8 bit	48	0	*0* *1* *2* *3*		Shows the quality of the evaluated sensor signal. Quality drops with weak signal or interference. *Insufficient* *Acceptable* *Good* *Excellent*		
.3	SSC.1 – Switching Signal	ro	UInteger	8 bit	40	0	*0* *1*		Indicates the detection status of an object or measurement value below/above a threshold. *Low* *High*		
.4	SSC.2 – Switching Signal	ro	UInteger	8 bit	32	0	*0* *1*		Indicates the detection status of an object or measurement value below/above a threshold. *Low* *High*		
.5	Teach Value	ro	Integer	32 bit	0	0	0 .. 2147482880	mm	Shows the teach value which has been determined in the last teach procedure.		

NOTE 1: The parameter data provide the attributes DS (Data Storage) and R (Reset behavior). The following rules apply:
DS: Parameter marked with 'Y' (yes) are exchanged with the master via the data storage mechanism.
R: Parameter marked with 'F' are reset to the factory default value upon reception of the command 'Back-to-box'.
Parameter marked with 'A' are reset to the factory default value upon reception of the command 'Application Reset'.

NOTE 2: Parameter with datatype Record or Array, which are marked with 'S0' can only be accessed over subindex 0 (whole parameter object). Subindex access to single items is not possible.

Command Interface

Index	Parameter	Access	Data type	Length	Value	Description
2 (0x02)	System Command	wo	UInteger	8 bit	See command value	Command interface for applications. A positive acknowledge indicates the complete and correct finalization of the requested function.

Command Value	Command	Description
129 (0x81)	Application Reset	The parameters of the technology-specific application are set to default values. Identification parameter remain unchanged. An upload to the data storage of the master will be executed, if activated in the port configuration of the master.
131 (0x83)	Back-to-box	The parameters of the device are set to factory default values and communication will be inhibited until the next power cycle. Note: Directly detach the device from the master port!
65 (0x41)	Teach SP1	Determine setpoint 1 in a single teach procedure. The new setpoint 1 value is automatically applied after successful execution.
66 (0x42)	Teach SP2	Determine setpoint 2 in a single teach procedure. The new setpoint 2 value is automatically applied after successful execution.
170 (0xAA)	Teach Measurement Offset	Determine the measurement offset within a specific installation setup. The new measurement offset is automatically applied after successful execution.

Error Codes

Code	Additional code	Name	Description
128 (0x80)	17 (0x11)	Index not available	Read or write access attempt to a non-existing index.
128 (0x80)	18 (0x12)	Subindex not available	Read or write access attempt to a non-existing subindex of an existing index.
128 (0x80)	32 (0x20)	Service temporarily not available	Parameter not accessible due to the current state of the technology-specific application.
128 (0x80)	33 (0x21)	Service temporarily not available - local control	Parameter not accessible. The device is currently in an ongoing, locally controlled operation.
128 (0x80)	34 (0x22)	Service temporarily not available - device control	Parameter not accessible. The technology-specific application is currently in a remotely triggered operation.
128 (0x80)	35 (0x23)	Access denied	Write access to a read-only parameter or read access to write-only parameter.
128 (0x80)	48 (0x30)	Parameter value out of range	Written parameter value is outside of the permitted value range.
128 (0x80)	49 (0x31)	Parameter value above limit	Written parameter value is above its specified value range.
128 (0x80)	50 (0x32)	Parameter value below limit	Written parameter value is below its specified value range.
128 (0x80)	51 (0x33)	Parameter length overrun	Written parameter is longer than specified.
128 (0x80)	52 (0x34)	Parameter length underrun	Written parameter is shorter than specified.
128 (0x80)	53 (0x35)	Function not available	Written command is not supported by the technology-specific application.
128 (0x80)	54 (0x36)	Function temporarily unavailable	Written command is unavailable due to the current state of the technology-specific application.
128 (0x80)	64 (0x40)	Invalid parameter set	Written single parameter value collides with other existing parameter settings.
128 (0x80)	65 (0x41)	Inconsistent parameter set	Parameter set inconsistencies at the end of block parameter transfer. Device plausibility check failed.
129 (0x81)	129 (0x81)	Invalid combination of setpoint and measurement offset values	Measurement offset and setpoint setting result in a switch point outside of the specified measurement range. Check values.

Event Codes

Code	Type	Name	Description
20480 (0x5000)	Error	Device hardware fault	Exchange device
36161 (0x8D41)	Warning	Measurement not possible, invalid data	Check sensor adjustment or target position.
36163 (0x8D43)	Warning	Temperature outside specified temperature range	Check sensor environment.
36224 (0x8D80)	Warning	Sensor operation disabled	Object detection or measurement is not possible.