

IO-Link Parameter Datasheet

Inductive distance sensor

NAB4-12GM*-E2-IO series

PEPPERL+FUCHS

IO-Link

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DOCT-9640A_ENG - Version 2.00.000 / 2025.10.10

General Information

Device Identification	
Vendor ID	1 (0x0001)
Device ID	2098947 (0x200703)

Features	
Data Storage	Yes
Block Parameterization	Yes

Communication Characteristics	
IO-Link revision	V1.1 (specification V1.1.4)
IO-Link backward compatibility	n/a
Data transmission rate	COM2 (38.4 kbit/s)
Min. cycle time	3,2 ms
Process data input	4 byte
Process data output	n/a
SIO mode support	Yes
Compatible master port type	Class A, Class B (see NOTE)

Device Profile	
Smart Sensor - SSP 4.1.1	16 (0x0010)
Identification & Diagnosis - I&D	16384 (0x4000)
Function Class - Multi Teach Two Value Extension	32785 (0x8011)
Function Class - Object Detection	32787 (0x8013)
Function Class - Product URI	33026 (0x8102)

NOTE: For use at IO-Link master port Class B, use 3-pole adapter or 3-wire cable.

Supported Product Variants

Product ID	*Product Name*	*Description*	*Connector*
70145056-0011	NAB4-12GM30-E2-IO	Measuring range 4 mm, resolution 0.01 mm, switching output, PNP, M12 threaded, metal housing, flush, cable, 3 pole	Cable, 3-pole
70145056-0012	NAB4-12GM30-E2-IO-V1	Measuring range 4 mm, resolution 0.01 mm, switching output, PNP, M12 threaded, metal housing, flush, M12 plug, 3-pin	Plug, M12, 3-pin

Connection

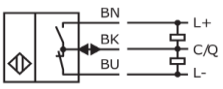
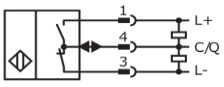
Connection Diagram	*Description*
	**Cable, 3-Wires** BN: Brown L+ BU: Blue L- BK: Black C/Q
	**Plug, M12, 3-pin** 1: Brown L+ 3: Blue L- 4: Black C/Q

Table of Contents

1. **Process Data**
   - Process Data Input ... 3
2. **Identification** ... 4
3. **Diagnosis**
   - Device Status ... 5
   - Detailed Device Status ... 5
   - Device Characteristics ... 5
   - Maintenance Monitor - Operating Time ... 5
   - Maintenance Monitor - SSC ... 5
   - Maintenance Monitor - Measurement ... 6
   - Maintenance Monitor - Temperature ... 6
   - Maintenance Monitor - Velocity 1 ... 6
   - Maintenance Monitor - Velocity 2 ... 7
   - Maintenance Monitor - Acceleration ... 7
   - Operating Hours ... 7
   - Temperature Indicator ... 7
   - Temperature Monitor ... 8
   - Power Monitor ... 8
   - Maintenance Diagnosis ... 9
   - MDC Descriptor ... 10
4. **Parameterization & Configuration**
   - TI Select ... 11
   - Teach Result ... 11
   - Teach Value ... 11
   - SSC.1 Param ... 11
   - SSC.1 Config ... 12
   - SSC.2 Param ... 12
   - SSC.2 Config ... 12
   - SSC.1 Config Extension ... 13
   - SSC.2 Config Extension ... 13
   - Velocity 1 Parameter ... 14
   - Velocity 1 Configuration ... 14
   - Velocity 2 Parameter ... 15
   - Velocity 2 Configuration ... 15
   - Acceleration Configuration ... 16
   - Evaluation Configuration - Signal Filter ... 16
   - I/O Configuration - C/Q Type ... 16
   - Event Configuration ... 17
   - Maintenance Config. - Operating Time ... 17
   - Maintenance Config. - SSC ... 17
   - Maintenance Config. - Measurement ... 18
   - Maintenance Config. - Temperature ... 18
   - Maintenance Config. - Velocity 1 ... 19
   - Maintenance Config. - Velocity 2 ... 19
   - Maintenance Config. - Acceleration ... 19
5. **Observation**
   - Observation Data ... 20
6. **Command Interface** ... 23
7. **Error Codes** ... 24

Process Data

Process Data Input

Octet	*Bitoffs.*	*Name*	*Data type*	*Length*	*Value*	*Unit*	*Description*
3	0	SSC.1 - Switching Signal	Boolean	1 bit	 *0* *1*		Indicates the detection status of a switching signal channel depending on process data and SSC.1 Param and SSC.1 Config. *Low* *High*
	1	SSC.2 - Switching Signal	Boolean	1 bit	 *0* *1*		Indicates the detection status of a switching signal channel depending on process data and SSC.2 Param and SSC.2 Config. *Low* *High*
	2	Reserved		2 bit			Reserved.
	4	DSC.1 - Maintenance Warning	Boolean	1 bit	 *0* *1*		Indicates that at least one of the configured maintenance limit values is reached or exceeded. *Inactive* *Active*
	5	DSC.2 - Velocity Warning	Boolean	1 bit	 *0* *1*		Indicates that the measured minimum or maximum velocity (for Velocity 1 or Velocity 2) is reached or outside the configured threshold values. *Inactive* *Active*
	6	DSC.3 - Acceleration Warning	Boolean	1 bit	 *0* *1*		Indicates that the measured minimum or maximum acceleration is reached or outside the configured threshold values. *Inactive* *Active*
	7	Reserved		1 bit			Reserved.
2	8	MDC - Scale	Integer	8 bit	*-5*		Shows the multiplier for the measurement value of the sensor - 10exp(scale).
0…1	16	MDC - Measurement Value	Integer	16 bit	*0,00…4,00 (0…400)* *32764*	mm	Shows the current measurement value of the sensing element. *No Measurement Data*

NOTE: The process data input content can be accessed in addition over parameter ‘Process Data Input’ at index 40 (0x28)

Parameter Data

Identification

Index .sub	Parameter	Access	Data type	Length	Default	Description	DS	R
16 (0x10)	Vendor Name	ro	String	max. 32 byte	Pepperl+Fuchs	The vendor name that is assigned to a Vendor ID.		
17 (0x11)	Vendor Text	ro	String	max. 32 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	Inductive distance sensor	Additional product information for the device.		
21 (0x15)	Serial Number	ro	String	max. 16 byte		Unique, vendor-specific identifier of the individual device.		
22 (0x16)	Hardware Revision	ro	String	max. 8 byte	HW**.**	Unique, vendor-specific identifier of the hardware revision of the individual device.		
23 (0x17)	Firmware Revision	ro	String	max. 8 byte	SW**.**	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	***	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. 64 byte	https://pefu.de/<serial number>	Provides a unique instance identification compliant to DIN-SPEC 91406.		
192 (0xC0)	Installation Tag	rw	String	max. 32 byte	***	Provides the possibility to mark the device with the installation or initial commissioning data or date. Note: this entry will not be transferred to a new device on replacement.		F

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'.

R: Parameter marked with **'A'** are reset to the factory default value upon reception of the command 'Application Reset'.

R: Parameter marked with **'M'** are reset to the factory default value upon reception of the command 'Maintenance Reset'.

R: Parameter marked with **'V'** are reset to the factory default value upon reception of the command 'Velocity and Acceleration 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.

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]	18 byte					List of all currently pending events in the device.		FA
.1	Element 1	ro	OctetStr.	3 byte	120						FA
.2	Element 2	ro	OctetStr.	3 byte	96						FA
.3	Element 3	ro	OctetStr.	3 byte	72						FA
.4	Element 4	ro	OctetStr.	3 byte	48						FA
.5	Element 5	ro	OctetStr.	3 byte	24						FA
.6	Element 6	ro	OctetStr.	3 byte	0						FA
176 (0xB0)	Device Characteristics	ro	Record	6 byte					Shows the relevant key characteristics of the device for use in applications.		
.1	Measuring Range	ro	Integer	16 bit	32		*4,00* *(400)*	mm	Shows the value of the specified measuring range.		
.2	Measurement Resolution	ro	Integer	16 bit	16		*0,01* *(1)*	mm	Shows the measurement resolution within the specified measuring range.		
.3	Supply Current Requirement	ro	UInteger	16 bit	0			mA	Shows the maximum specified supply current for the device excluding load.		
216 (0xD8)	Maintenance Monitor - Operating Time	ro	UInteger	32 bit		0	*0 ... 2^{32} -1*	h	Shows the powered operating time since the last maintenance reset.		FA M
217 (0xD9)	Maintenance Monitor - SSC	ro	Record	8 byte		0			Provides information on the monitored switching signal channel (SSC) incidents since the last maintenance reset.		FA M
.1	SSC.1 Incident Count	ro	UInteger	32 bit	32		*0 ... 2^{32} -1*		Shows the number of switching signal channel 1 (SSC.1) incidents since the last maintenance reset.		FA M
.2	SSC.2 Incident Count	ro	UInteger	32 bit	0		*0 ... 2^{32} -1*		Shows the number of switching signal channel 2 (SSC.2) incidents since the last maintenance reset.		FA M

Diagnosis

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
218 (0xDA)	Maintenance Monitor - Measurement	ro	Record	12 byte					Provides information on the monitored measurement values and incidents since the last maintenance reset.		FA M
.1	Minimum Value	ro	Integer	32 bit	64		*0,00…4,00* *(0…400)* *2147483644*	mm	Shows the minimum observed measurement value since the last maintenance reset. *No Data*		FA M
.2	Maximum Value	ro	Integer	32 bit	32		*0,00…4,00* *(0…400)* *2147483644*	mm	Shows the maximum observed measurement value since the last maintenance reset. *No Data*		FA M
.3	Incident Count	ro	UInteger	32 bit	0		*0 ... 2^{32} -1*		Shows the number of incidents in which the configured maintenance measurement thresholds have been reached or cleared the thresholds since the last maintenance reset.		FA M
219 (0xDB)	Maintenance Monitor - Temperature	ro	Record	8 byte					Provides information on the monitored measurement values and incidents since the last maintenance reset.		FA M
.1	Minimum Temperature	ro	Integer	8 bit	56		*-50 ... +125*	°C	Shows the minimum observed temperature since the last maintenance reset.		FA M
.2	Maximum Temperature	ro	Integer	8 bit	48		*-50 ... +125*	°C	Shows the maximum observed temperature since the last maintenance reset.		FA M
.3	Incident Count	ro	UInteger	16 bit	32		*0 … 65535*		Shows the number of temperature transitions exceeding the configured temperature thresholds since the last maintenance reset.		FA M
.4	Incidents Operating Time	ro	UInteger	32 bit	0		*0 ... 2^{32} -1*	h	Shows the operating time at temperatures exceeding the configured temperature thresholds since the last maintenance reset.		FA M
220 (0xDC)	Maintenance Monitor - Velocity 1	ro	Record	4 byte					Provides information on the monitored values of the observed velocity 1 data since the last maintenance reset.		FA MV
.1	Minimum Value	ro	Integer	16 bit	16	32764	*1…3100* *(1…3100)* *32760* *-32760* *32764*	mm/s	Shows the minimum observed velocity since the last 'Maintenance Reset' or 'Velocity and Acceleration reset'. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
.2	Maximum Value	ro	Integer	16 bit	0	32764	*1…3100* *(1…3100)* *32760* *-32760* *32764*	mm/s	Shows the maximum observed velocity since the last 'Maintenance Reset' or 'Velocity and Acceleration reset'. *Out of range (+)* *Out of range (-)* *No Data*		FA MV

Diagnosis

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
221 (0xDD)	Maintenance Monitor - Velocity 2	ro	Record	4 byte					Provides information on the monitored values of the observed velocity 2 data since the last maintenance reset.		FA MV
.1	Minimum Value	ro	Integer	16 bit	16	32764	*1…3100* *(1…3100)* *32760* *-32760* *32764*	mm/s	Shows the minimum observed velocity since the last 'Maintenance Reset' or 'Velocity and Acceleration reset'. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
.2	Maximum Value	ro	Integer	16 bit	0	32764	*1…3100* *(1…3100)* *32760* *-32760* *32764*	mm/s	Shows the maximum observed velocity since the last 'Maintenance Reset' or 'Velocity and Acceleration reset'. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
222 (0xDE)	Maintenance Monitor - Acceleration	ro	Record	4 byte					Provides information on the monitored values of the observed acceleration data since the last 'Maintenance Reset' or 'Velocity and Acceleration reset'.		FA MV
.1	Minimum Value	ro	Integer	16 bit	16	32764	*-3270000…3270000* *(-32700…32700)* *32760* *-32760* *32764*	mm/s²	Shows the minimum observed acceleration since the last 'Maintenance Reset' or 'Velocity and Acceleration reset'. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
.2	Maximum Value	ro	Integer	16 bit	0	32764	*-3270000…3270000* *(-32700…32700)* *32760* *-32760* *32764*	mm/s²	Shows the maximum observed acceleration since the last 'Maintenance Reset' or 'Velocity and Acceleration reset'. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
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 operation at critical ambient temperatures or excess of specification limits. *Operating condition OK* *Close to upper limit* *Upper limit exceeded* *Close to lower limit* *Lower limit exceeded*		

Diagnosis

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
226 (0xE2)	Temperature Monitor	ro	Record	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 range since initial		
.2	Overtemperature Exceeded Counter	ro	UInteger	16 bit	24		*0 ... 2^{16} -1*		Shows the increment of overruns of the specified temperature range 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	16 byte					Contains parameters showing current and past conditions of power cycles since initial commissioning.		
.1	Power Cycles	ro	UInteger	32 bit	96		*0 ... 2^{32} -1*		Shows the number of power cycles since initial commissioning.		
.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	UInteger	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	UInteger	32 bit	0		*0 ... 2^{32} -1*	s	Shows the current operating time since the last power cycle in seconds.		

Diagnosis

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
235 (0xEB)	Maintenance Diagnosis	ro	Record [S0]	2 byte					Shows the current maintenance diagnosis status.		FA M
.1	Operating Conditions Warning	ro	Boolean	1 bit	0		*0* *Inactive* *1* *Active*		Indicates when a limit value for operating conditions in the parameter 'Maintenance Configuration - Operating Time' is reached. To reset use 'Maintenance Reset'.		FA M
.2	SSC Limit Values Warning	ro	Boolean	1 bit	1		*0* *Inactive* *1* *Active*		Indicates when a limit value for switching signal channel (SSC) conditions in the parameter 'Maintenance Configuration - SSC' is reached. To reset use 'Maintenance Reset'.		FA M
.3	Measurement Limit Values Warning	ro	Boolean	1 bit	2		*0* *Inactive* *1* *Active*		Indicates when a limit value for measurement conditions in the parameter 'Maintenance Configuration - Measurement' is reached. To reset use 'Maintenance Reset'.		FA M
.4	Temperature Conditions Warning	ro	Boolean	1 bit	3		*0* *Inactive* *1* *Active*		Indicates when a limit value for temperature conditions in the parameter 'Maintenance Configuration - Temperature' is reached. To reset use 'Maintenance Reset'.		FA M
.5	Velocity 1 Warning	ro	Boolean	1 bit	4		*0* *Inactive* *1* *Active*		Indicates when a limit value for velocity conditions in the parameter 'Maintenance Configuration - Velocity 1' is reached or exceeded. Use 'Maintenance Reset' or 'Velocity and Acceleration Reset' to reset the value.		FA MV
.6	Velocity 2 Warning	ro	Boolean	1 bit	5		*0* *Inactive* *1* *Active*		Indicates when a limit value for velocity conditions in the parameter 'Maintenance Configuration - Velocity 2' is reached or exceeded. Use 'Maintenance Reset' or 'Velocity and Acceleration Reset' to reset the value.		FA MV
.7	Acceleration Warning	ro	Boolean	1 bit	6		*0* *Inactive* *1* *Active*		Indicates when a limit value for acceleration conditions in the parameter 'Maintenance Configuration - Acceleration' is reached or exceeded. Use 'Maintenance Reset' or 'Velocity and Acceleration Reset' to reset the value.		FA MV

Diagnosis

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
16512 (0x4080)	MDC Descriptor	ro	Record	11 byte					Descriptor for the characteristic of the measurement data channel (process data MV).		
.1	Lower Value	ro	Integer	32 bit	56		0		Shows the lower value of measurement range.		
.2	Upper Value	ro	Integer	32 bit	24		400		Shows the upper value of 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		-5		Shows the multiplier for measurement value - 10exp(scale).		

Parameterization & Configuration

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
58 (0x3A)	TI 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 [S0]	1 byte					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*		Indicates the current state of the teach procedure. *Idle* *SP1 success* *SP2 success* *SP12 success* *Wait for command* *Busy* *Error*		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
95 (0x95)	Teach Value	ro	Integer	16 bit		0		mm	Shows the last teach value that was determined during a teach procedure.		FA
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	3,40 (340)	*0,00…4,00* *(0…400)*	mm	Defines the setpoint 1 value for the switching signal channel.	Y	FA
.2	SP2	rw	Integer	32 bit	0	0,00 (0)	*0,00…4,00* *(0…400)*	mm	Defines the setpoint 2 value for the switching signal channel.	Y	FA

Parameterization & Configuration

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
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	1	*0* *1* *2* *3* *128*		Defines the evaluation mode for the switching signal SSC. *Deactivated (constant)* *Single point* *Window* *Two point* *Centered window*	Y	FA
.3	Hysteresis	rw	Integer	32 bit	0	0	*0,04…0,80 (4…80)* *0*	mm	Defines the hysteresis at the switchpoint. A higher hysteresis may help to increase stability in critical applications. *Standard (5% of sensing range)*	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	2,00 (200)	*0,00…4,00 (0…400)*	mm	Defines the setpoint 1 value for the switching signal channel.	Y	FA
.2	SP2	rw	Integer	32 bit	0	0,00 (0)	*0,00…4,00 (0…400)*	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	1	*0* *1* *2* *3* *128*		Defines the evaluation mode for the switching signal SSC. *Deactivated (constant)* *Single point* *Window* *Two point* *Centered window*	Y	FA
.3	Hysteresis	rw	Integer	32 bit	0	0	*0,04…0,80 (4…80)* *0*	mm	Defines the hysteresis at the switchpoint. A higher hysteresis may help to increase stability in critical applications. *Standard (5% of sensing range)*	Y	FA

Parameterization & Configuration

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
64 (0x40)	SSC.1 Config Extension	rw	Record	6 byte					Defines extended configuration options for switching signal channel 1 (SSC.1).	Y	FA
.1	SP Offset	rw	Integer	32 bit	16	1,00 (100)	*0,01…4,00 (1…400)*	mm	The setpoint (SP) offset defines the switch point of the sensor relative to the setpoint 1 in unit and resolution of the setpoint.	Y	FA
.2	Pulse Extension	rw	UInteger	8 bit	8	0	*0* *1* *2* *3* *4*		Extends the active state of the switching signal by the selected time. Auto: pulse extension based on master cycle time. *Off* *Auto* *10 ms* *100 ms* *1 s*	Y	FA
.3	Substitute Behaviour	rw	UInteger	8 bit	0	3	*0* *2* *3*		Defines the behavior of the switching signal if the measurement value is 'Out of range' or measurement is not possible. *Hold* *Active* *Inactive*	Y	FA
65 (0x41)	SSC.2 Config Extension	rw	Record	6 byte					Defines extended configuration options for switching signal channel 2 (SSC.2).	Y	FA
.1	SP Offset	rw	Integer	32 bit	16	1,00 (100)	*0,01…4,00 (1…400)*	mm	The setpoint (SP) offset defines the switch point of the sensor relative to the setpoint 1 in unit and resolution of the setpoint.	Y	FA
.2	Pulse Extension	rw	UInteger	8 bit	8	0	*0* *1* *2* *3* *4*		Extends the active state of the switching signal by the selected time. Auto: pulse extension based on master cycle time. *Off* *Auto* *10 ms* *100 ms* *1 s*	Y	FA
.3	Substitute Behaviour	rw	UInteger	8 bit	0	3	*0* *2* *3*		Defines the behavior of the switching signal if the measurement value is 'Out of range' or measurement is not possible. *Hold* *Active* *Inactive*	Y	FA

Parameterization & Configuration

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
80 (0x50)	Velocity 1 Parameter	rw	Record	8 byte					Defines the setpoint values for the velocity measurement window 1 for diagnosis signal channel 2.	Y	FA
.1	Measurement Window SP1	rw	Integer	32 bit	32	4,00 (400)	*0,00…4,00 (0…400)*	mm	Defines the setpoint 1 (SP1) value for the velocity measurement window.	Y	FA
.2	Measurement Window SP2	rw	Integer	32 bit	0	3,00 (300)	*0,00…4,00 (0…400)*	mm	Defines the setpoint 2 (SP2) value for the velocity measurement window.	Y	FA
81 (0x51)	Velocity 1 Configuration	rw	Record	5 byte					Defines the configuration parameter for the velocity measurement window 1 for diagnosis signal channel 2.	Y	FA
.1	Movement Direction	rw	UInteger	8 Bit	32	0	*0* *1*		Defines if the velocity is measured for a movement towards the sensor or a movement away from the sensor. Approaching sensor *Leaving sensor*	Y	FA
.2	Average 1	rw	UInteger	8 bit	24	2	*0* *1* *2* *3* *4* *5* *6*		Defines the number of velocity measurements which are used to calculate the average 1 value. *2* *4* *8* *16* *32* *64* *128*	Y	FA
.3	Average 2	rw	UInteger	8 bit	16	6	*0* *1* *2* *3* *4* *5* *6*		Defines the number of velocity measurements which are used to calculate the average 2 value. *2* *4* *8* *16* *32* *64* *128*	Y	FA
.4	Blanking Time	rw	UInteger	16 bit	0	0 (0)	*0…5000 (0…500)*	ms	Defines a time period after a successful velocity measurement during which no new velocity is measured.	Y	FA

Parameterization & Configuration

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
82 (0x52)	Velocity 2 Parameter	rw	Record	8 byte					Defines the setpoint values for the velocity measurement window 2 for diagnosis signal channel 2.	Y	FA
.1	Measurement Window SP1	rw	Integer	32 bit	32	3,00 (300)	*0,00…4,00 (0…400)*	mm	Defines the setpoint 1 (SP1) value for the velocity measurement window.	Y	FA
.2	Measurement Window SP2	rw	Integer	32 bit	0	2,00 (200)	*0,00…4,00 (0…400)*	mm	Defines the setpoint 2 (SP2) value for the velocity measurement window.	Y	FA
83 (0x53)	Velocity 2 Configuration	rw	Record	5 byte					Defines the configuration parameter for the velocity measurement window 2 for diagnosis signal channel 2.	Y	FA
.1	Movement Direction	rw	UInteger	8 bit	32	0	*0* *1*		Defines if the velocity is measured for a movement towards the sensor or a movement away from the sensor. Approaching sensor *Leaving sensor*	Y	FA
.2	Average 1	rw	UInteger	8 bit	24	2	*0* *1* *2* *3* *4* *5* *6*		Defines the number of velocity measurements which are used to calculate the average 1 value. *2* *4* *8* *16* *32* *64* *128*	Y	FA
.3	Average 2	rw	UInteger	8 bit	16	6	*0* *1* *2* *3* *4* *5* *6*		Defines the number of velocity measurements which are used to calculate the average 2 value. *2* *4* *8* *16* *32* *64* *128*	Y	FA
.4	Blanking Time	rw	UInteger	16 bit	0	0 (0)	*0…5000 (0…500)*	ms	Defines a time period after a successful velocity measurement during which no new velocity is measured.	Y	FA

Parameterization & Configuration

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
84 (0x54)	Acceleration Configuration	rw	Record	2 byte					Defines the configuration parameter for the acceleration measurement for diagnosis signal channel 3.	Y	FA
.1	Average 1	rw	UInteger	8 bit	8	2	*0* *1* *2* *3* *4* *5* *6*		Defines the number of acceleration measurements which are used to calculate the average 1 value. *2* *4* *8* *16* *32* *64* *128*	Y	FA
.2	Average 2	rw	UInteger	8 bit	0	6	*0* *1* *2* *3* *4* *5* *6*		Defines the number of acceleration measurements which are used to calculate the average 2 value. *2* *4* *8* *16* *32* *64* *128*	Y	FA
97 (0x61)	Evaluation Configuration - Signal Filter	rw	UInteger	8 bit		0	*0* *2* *3*		Defines a filter method for different application requirements. Note: The response time is reduced for the settings 'High accuracy'. The repeatability may be reduced for the setting 'High speed'. *Standard* *High accuracy* *High speed*	Y	FA
112 (0x70)	I/O Configuration - C/Q Type	rw	UInteger	8 bit		1	*0* *1*		Configures the type of output at pin 4 or at black wire. Note: For operation with an IO-Link Master in field application, set the type of output to 'push-pull' or to 'PNP'. *Output - Push-pull* *Output - PNP*	Y	FA

Parameterization & Configuration

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
120 (0xC0)	Event Configuration	rw	Record S0	2 byte					Defines which event sources can trigger events.	Y	FA
.2	Warning - No Data	rw	Boolean	1 bit	1	0	*0* *1*		Enabled: an event is generated if sensor signals do not allow a valid evaluation or no measurement data are available. *Disabled* *Enabled*	Y	FA
.8	Warning - Maintenance Diagnosis	rw	Boolean	1 bit	7	0	*0* *1*		Enabled: an event is generated if the maintenance warning in the process data becomes active. *Disabled* *Enabled*	Y	FA
.9	Warning - Velocity Diagnosis	rw	Boolean	1 bit	8	0	*0* *1*		Enabled: an event is generated if the velocity warning in the process data becomes active. *Disabled* *Enabled*	Y	FA
.10	Warning - Acceleration Diagnosis	rw	Boolean	1 bit	9	0	*0* *1*		Enabled: an event is generated if the acceleration warning in the process data becomes active. *Disabled* *Enabled*	Y	FA
208 (0xD0)	Maintenance Config. - Operating Time	rw	UInteger	32 bit		0	*1 ... 2^{32}-1* *0*	h	Defines the limit value for the operating time. Once this limit value is reached, the maintenance warning in the process data is activated. *Disabled*	Y	FA
209 (0xD1)	Maintenance Config. - SSC	rw	Record	8 byte					Defines the maintenance limits for switching signal channel (SSC) incidents.	Y	FA
.1	SSC.1 Incident Count Limit Value	rw	UInteger	32 bit	32	0	*1 ... 2^{32}-1* *0*		Defines the limit value for the number of switching signal channel 1 (SSC.1) incidents. Once this limit value is reached, the maintenance warning in the process data is activated. *Disabled*	Y	FA
.2	SSC.2 Incident Count Limit Value	rw	UInteger	32 bit	0	0	*1 ... 2^{32}-1* *0*		Defines the limit value for the number of switching signal channel 2 (SSC.2) incidents. Once this limit value is reached, the maintenance warning in the process data is activated. *Disabled*	Y	FA

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
210 (0xD2)	Maintenance Config. - Measurement	rw	Record	12 byte					Defines the parameters for the monitoring of measurement value incidents and the maintenance limit values.	Y	FA
.1	Overrun Threshold	rw	Integer	32 bit	64	0,00 (0)	*0,01…4,00 (1…400)* *0*	mm	Defines the upper limit value for the measurement value. If the measurement value is above the configured limit value or reached the limit value, a measurement incident count is triggered in the maintenance monitor. *Disabled*	Y	FA
.2	Underrun Threshold	rw	Integer	32 bit	32	0,00 (0)	*0,01…4,00 (1…400)* *0*	mm	Defines the lower limit value for the measurement value. If the measurement value is below the configured limit value or reached the limit value, a measurement incident count is triggered in the maintenance monitor. *Disabled*	Y	FA
.3	Incident Count Limit Value	rw	UInteger	32 bit	0	0	*1 ... 2^{32} -1* *0*		Defines the limit value for the number of incidents with operation outside of the configured measurement overrun/underrun thresholds. Once this limit is reached, the maintenance warning in the process data is activated. *Disabled*	Y	FA
211 (0xD3)	Maintenance Config. - Temperature	rw	Record	8 byte					Defines the maintenance limit values for temperature incidents.	Y	FA
.1	Overrun Threshold	rw	Integer	8 bit	56	70	*-30…80 (-30…80)*	°C	Defines the upper limit value for the temperature value. If the measured temperature value is above the configured limit value, a temperature incident count and temperature incidents for the operating time are triggered in the maintenance monitor.	Y	FA
.2	Underrun Threshold	rw	Integer	8 bit	48	-25	*-30…80 (-30…80)*	°C	Defines the lower limit value for the temperature value. If the measured temperature value is below the configured limit value, a temperature incident count and temperature incidents for the operating time are triggered in the maintenance monitor.	Y	FA
.3	Incident Count - Limit Value	rw	UInteger	16 bit	32	0	*1…65535* *0*		Defines the limit value for the number of transitions to the outside of the configured range. Once this limit is reached, the maintenance warning in the process data is activated. *Disabled*	Y	FA
.4	Incidents Operating Time - Limit Value	rw	UInteger	32 bit	0	0	*1…2^{32} -1* *0*	h	Defines the limit value for the operating time outside of the configured range. Once this limit is reached, the maintenance warning in the process data *Disabled*	Y	FA

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
212 (0xD4)	Maintenance Config. - Velocity 1	rw	Record	4 byte					Defines the maintenance limit values for velocity 1 incidents.	Y	FA
.1	Overrun Threshold	rw	Integer	16 bit	16	32767	*1…3100* *(1…3100)* *32767*	mm/s	Defines the threshold for velocity overrun incidents. If the measurement value reaches or exceeds the configured threshold, the velocity warning in the process data is activated. *Disabled*	Y	FA
.2	Underrun Threshold	rw	Integer	16 bit	0	32767	*1…3100* *(1…3100)* *32767*	mm/s	Defines the threshold for velocity underrun incidents. If the measurement value reaches or falls below the configured threshold, the velocity warning in the process data is activated. *Disabled*	Y	FA
213 (0xD5)	Maintenance Config. - Velocity 2	rw	Record	4 byte					Defines the maintenance limit values for velocity 2 incidents.	Y	FA
.1	Overrun Threshold	rw	Integer	16 bit	16	32767	*1…3100* *(1…3100)* *32767*	mm/s	Defines the threshold for velocity overrun incidents. If the measurement value reaches or exceeds the configured threshold, the velocity warning in the process data is activated. *Disabled*	Y	FA
.2	Underrun Threshold	rw	Integer	16 bit	0	32767	*1…3100* *(1…3100)* *32767*	mm/s	Defines the threshold for velocity underrun incidents. If the measurement value reaches or falls below the configured threshold, the velocity warning in the process data is activated. *Disabled*	Y	FA
214 (0xD6)	Maintenance Config. - Acceleration	rw	Record	4 byte					Defines the maintenance limit values for acceleration incidents.	Y	FA
.1	Overrun Threshold	rw	Integer	16 bit	16	32767	*-3270000…3270000* *(-32700…32700)* *32767*	mm/s²	Defines the threshold for acceleration overrun incidents. If the measurement value reaches or exceeds the configured threshold, the acceleration warning in the process data is activated. *Disabled*	Y	FA
.2	Underrun Threshold	rw	Integer	16 bit	0	32767	*-3270000…3270000* *(-32700…32700)* *32767*	mm/s²	Defines the threshold for acceleration underrun incidents. If the measurement value reaches or falls below the configured threshold, the acceleration warning in the process data is activated. *Disabled*	Y	FA

Observation

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
236 (0xEC)	Observation Data	ro	Record	37 byte					Provides a set of relevant data suitable for observation purposes.		FA
.1	MDC - Measurement Value	ro	Integer	16 bit	280	*32764*	0,00…4,00 (0…400) *32764*	mm	Shows the current measurement value of the sensing element. *No Measurement Data*		FA
.2	SSC.1 - Switching Signal	ro	UInteger	8 bit	272	0	 *0* *1*		Indicates the detection status of a switching signal channel depending on process data and SSC.1 Param and SSC.1 Config. *Low* *High*		FA
.3	SSC.2 - Switching Signal	ro	UInteger	8 bit	264	0	 *0* *1*		Indicates the detection status of a switching signal channel depending on process data and SSC.2 Param and SSC.2 Config. *Low* *High*		FA
.4	DSC.1 - Maintenance Warning	ro	UInteger	8 bit	256	0	 *0* *1*		Indicates that at least one of the configured maintenance limit values is reached or exceeded. *Inactive* *Active*		FA M
.5	DSC.2 - Velocity Warning	ro	UInteger	8 bit	248	0	 *0* *1*		Indicates that the measured minimum or maximum velocity (for Velocity 1 or Velocity 2) is reached or outside the configured threshold values. *Inactive* *Active*		FA MV
.6	DSC.3 - Acceleration Warning	ro	UInteger	8 bit	240	0	 *0* *1*		Indicates that the measured minimum or maximum acceleration is reached or outside the configured threshold values. *Inactive* *Active*		FA MV
.7	Last Velocity 1 Measurement	ro	Integer	16 bit	224	32764	*1…3100* *(1…3100)* *32760* *-32760* *32764*	mm/s	Shows the last valid velocity measurement for velocity measurement window 1. Use 'Maintenance Reset' or 'Velocity and Acceleration Reset' to reset the value. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
.8	Average 1 Velocity 1	ro	Integer	16 bit	208	32764	*1…3100* *(1…3100)* *32760* *-32760* *32764*	mm/s	Average 1 for velocity 1. Until the defined number of measurements is reached 'No data' is shown. Use 'Maintenance Reset' or 'Velocity and Acceleration Reset' to reset the value. *Out of range (+)* *Out of range (-)* *No Data*		FA MV

Observation

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
.9	Average 2 Velocity 1	ro	Integer	16 bit	192	32764	*1…3100 (1…3100)* *32760* *-32760* *32764*	mm/s	Average 2 for velocity 1. Until the defined number of measurements is reached 'No data' is shown. Use 'Maintenance Reset' or 'Velocity and Acceleration Reset' to reset the value. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
.10	Minimum Value Velocity 1	ro	Integer	16 bit	176	32764	*1…3100 (1…3100)* *32760* *-32760* *32764*	mm/s	Shows the minimum observed velocity 1 since the last maintenance reset, or velocity and acceleration reset. The displayed values derive from the maintenance monitor. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
.11	Maximum Value Velocity 1	ro	Integer	16 bit	160	32764	*1…3100 (1…3100)* *32760* *-32760* *32764*	mm/s	Shows the maximum observed velocity 1 since the last maintenance reset, or velocity and acceleration reset. The displayed values derive from the maintenance monitor. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
.12	Last Velocity 2 Measurement	ro	Integer	16 bit	144	32764	*1…3100 (1…3100)* *32760* *-32760* *32764*	mm/s	Shows the last valid velocity measurement for velocity measurement window 2. Use 'Maintenance Reset' or 'Velocity and Acceleration Reset' to reset the value. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
.13	Average 1 Velocity 2	ro	Integer	16 bit	128	32764	*1…3100 (1…3100)* *32760* *-32760* *32764*	mm/s	Average 1 for velocity 2. Until the defined number of measurements is reached 'No data' is shown. Use 'Maintenance Reset' or 'Velocity and Acceleration Reset' to reset the value. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
.14	Average 2 Velocity 2	ro	Integer	16 bit	112	32764	*1…3100 (1…3100)* *32760* *-32760* *32764*	mm/s	Average 2 for velocity 2. Until the defined number of measurements is reached 'No data' is shown. Use 'Maintenance Reset' or 'Velocity and Acceleration Reset' to reset the value. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
.15	Minimum Value Velocity 2	ro	Integer	16 bit	96	32764	*1…3100 (1…3100)* *32760* *-32760* *32764*	mm/s	Shows the minimum observed velocity 2 since the last maintenance reset, or velocity and acceleration reset .The displayed values derive from the maintenance monitor. *Out of range (+)* *Out of range (-)* *No Data*		FA MV

Observation

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
.16	Maximum Value Velocity 2	ro	Integer	16 bit	80	32764	*1…3100* *(1…3100)* *32760* *-32760* *32764*	mm/s	Shows the maximum observed velocity 2 since the last maintenance reset, or velocity and acceleration reset. The displayed values derive from the maintenance monitor. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
.17	Last Acceleration Measurement	ro	Integer	16 bit	64	32764	*-3270000…3270000* *(-32700…32700)* *32760* *-32760* *32764*	mm/s²	Shows the last valid acceleration measurement. Use 'Maintenance Reset' or 'Velocity and Acceleration Reset' to reset the value. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
.18	Average 1 Acceleration	ro	Integer	16 bit	48	32764	*-3270000…3270000* *(-32700…32700)* *32760* *-32760* *32764*	mm/s²	Average 1 for acceleration. Until the defined number of measurements is reached 'No data' is shown. Use 'Maintenance Reset' or 'Velocity and Acceleration Reset' to reset the value. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
.19	Average 2 Acceleration	ro	Integer	16 bit	32	32764	*-3270000…3270000* *(-32700…32700)* *32760* *-32760* *32764*	mm/s²	Average 2 for acceleration. Until the defined number of measurements is reached 'No data' is shown. Use 'Maintenance Reset' or 'Velocity and Acceleration Reset' to reset the value. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
.20	Minimum Value Acceleration	ro	Integer	16 bit	16	32764	*-3270000…3270000* *(-32700…32700)* *32760* *-32760* *32764*	mm/s²	Shows the minimum observed acceleration since the last maintenance reset, or velocity and acceleration reset. The displayed values derive from the maintenance monitor. *Out of range (+)* *Out of range (-)* *No Data*		FA MV
.21	Maximum Value Acceleration	ro	Integer	16 bit	0	32764	*-3270000…3270000* *(-32700…32700)* *32760* *-32760* *32764*	mm/s²	Shows the maximum observed acceleration since the last maintenance reset, or velocity and acceleration reset. The displayed values derive from the maintenance monitor. *Out of range (+)* *Out of range (-)* *No Data*		FA MV

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*
64 (0x40)	Teach Apply	Calculate and apply setpoint.
65 (0x41)	Teach SP1	Determine setpoint 1 in a single teach procedure.
66 (0x42)	Teach SP2	Determine setpoint 2 in a single teach procedure.
67 (0x43)	Teach SP1 TP1	Determine teachpoint 1 for setpoint 1.
68 (0x44)	Teach SP1 TP2	Determine teachpoint 2 for setpoint 1.
69 (0x45)	Teach SP2 TP1	Determine teachpoint 1 for setpoint 2.
70 (0x46)	Teach SP2 TP2	Determine teachpoint 2 for setpoint 2.
79 (0x4F)	Teach Cancel	Cancel ongoing teach procedure.
129 (0x81)	Application Reset	The parameter 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 parameter 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!
176 (0xB0)	Maintenance reset	The maintenance status and monitoring data are reset.
177 (0xB1)	Velocity & Acceleration Reset	The velocity and acceleration status and velocity and acceleration data are reset as 'sub reset' of maintenance reset.

Error Codes

Code	*Parameter*	*Name*	*Description*
128 (0x80)	00 (0x00)	Device application error – no details	This ErrorType shall be used if the requested service has been refused by the Device application and no detailed information of the incident is available.
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.

Event Codes

Code	*Type*	*Name*	*Description*
20496 (0x5010)	Error	Hardware error	non recoverable hardware misbehavior. Change device.
36096 (0x8D00)	Warning	Maintenance diagnosis	A maintenance cycle is required. One of the configured limit values for a maintenance cycle is exceeded. For details, check the parameter 'Maintenance Diagnosis'. Use 'Maintenance Reset' to reset this event.
36112 (0x8D10)	Warning	Velocity diagnosis	A maintenance cycle is required. One of the configured velocity limit values is reached or exceeded. For details, check the parameter 'Maintenance Diagnosis'. Use 'Velocity and Acceleration Reset' or 'Maintenance Reset' to reset this event.
36113 (0x8D11)	Warning	Acceleration diagnosis	A maintenance cycle is required. One of the configured acceleration limit values is reached or exceeded. For details, check the parameter 'Maintenance Diagnosis'. Use 'Velocity and Acceleration Reset' or 'Maintenance Reset' to reset this event.
36161 (0x8D41)	Warning	No data	Measurement not possible, no measurement data available. Check sensor adjustment or target position.
36163 (0x8D43)	Warning	Temperature range exceeded	Ambient temperature outside specified temperature range. Check sensor environment for heat sources.