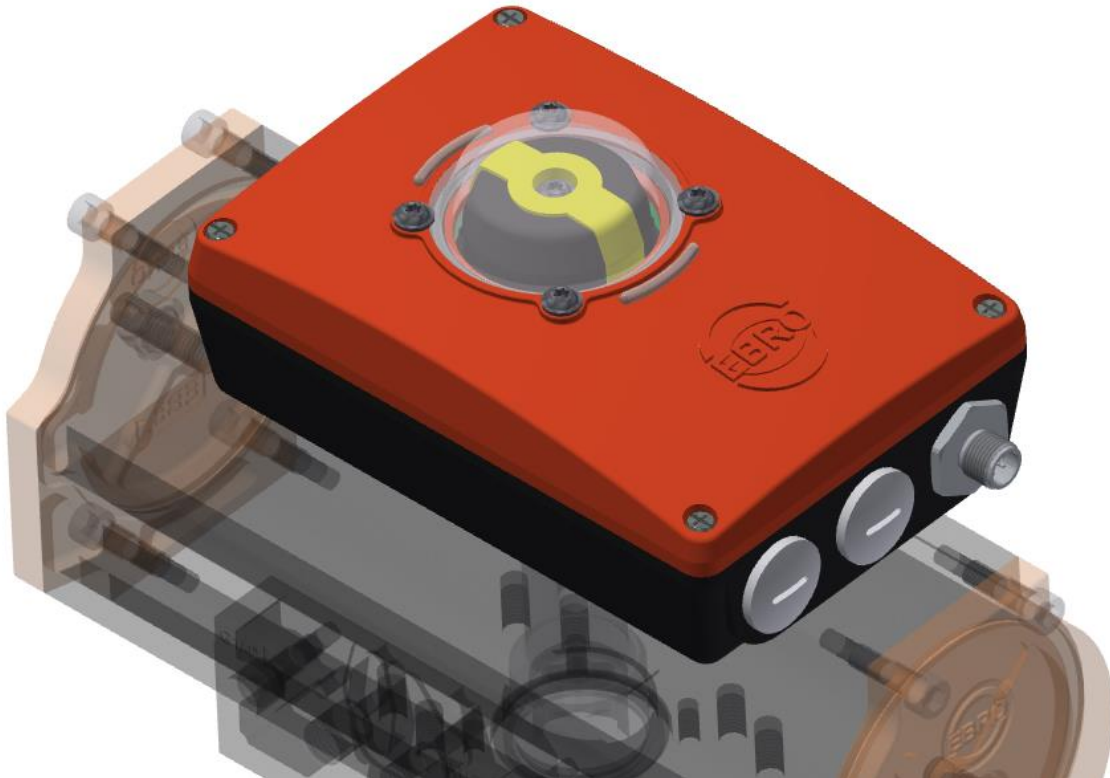


## SBU IO-LINK



---

Example illustrations, not all possible type variants are shown!

## IO-Link Interface Description

*English language version*

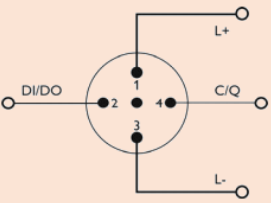
---

Revision: 00-06.21

## Table of Contents

1	Communication .....	3
2	List of Abbreviations.....	4
3	Process data .....	5
3.1	Process inputs (PDin, 10 Bytes) .....	5
3.2	Prozess outputs (PDout, 1 Byte).....	7
4	Identification .....	8
5	Device status.....	9
6	Systemcommands.....	10
7	Parameter .....	11
7.1	End position .....	11
7.2	Solenoid valve.....	12
7.3	Temperature .....	13
7.4	Acceleration .....	14
7.5	LED View .....	15
7.6	Process inputs .....	18
7.6.1	Digital process inputs .....	18
7.6.2	Analog process inputs .....	20
7.7	Collective fault.....	22
8	Diagnosis .....	25
9	Events .....	28

## 1 Communication

<b>Vendor ID</b>	0x0587 h / 1415 d
<b>Device ID</b>	0x0A05F6 h / 656886 d
<b>Bit rate</b>	COM3
<b>Min. cycle time</b>	1 ms
<b>Port Configuration</b>	<p>Port Class A</p>  <p>             1: L+              2: DO (Position OPEN)              3: L-              4: IO-Link / SIO (Position CLOSED)              5: N.C         </p>
<b>SIO Mode</b>	Yes
<b>Block parameterization</b>	Yes
<b>Data storage</b>	Yes
<b>IO-Link Version</b>	1.1

## 2 List of Abbreviations

The following data types are used in this document:

Abbreviation	Signification
BOOL	BooleanT (1bit)
UINT8	UIntegerT (8bit)
INT8	IntegerT (8bit)
UINT16	UIntegerT (16bit)
UINT32	UIntegerT (32bit)
STR	StringT (Byte array max. 64 Bytes)
ARR	ArrayT of OctetStringT
OCTSTR	OctetStringT (1 Byte)

The following abbreviations are used for access authorization:

Abbreviation	Signification
R	Only read
R/W	Read / write

### 3 Process data

#### 3.1 Process inputs (PDin, 10 Bytes)

Sub-Index	BitOffset	Length (Bits)	Datatype	Description
1	0	8	UINT8	<b>Device status:</b> (0) Device is operating properly (1) Maintenance-Required (2) Outside-of-Specifications (3) Functional-Check (4) Failure
2	76	1	BOOL	<b>Valve CLOSED:</b> True (ON) = closed False (OFF) = not closed
3	77	1	BOOL	<b>Valve OPEN:</b> True (ON) = opened False (OFF) = not opened
4	74	1	BOOL	<b>Solenoid valve 1 triggered:</b> True (ON) = Solenoid valve 1 triggered False (OFF) = Solenoid valve 1 not triggered
5	75	1	BOOL	<b>Solenoid valve 2 triggered:</b> True (ON) = Solenoid valve 2 triggered False (OFF) = Solenoid valve 2 not triggered
6	24	16	UINT16	<b>Acceleration sensor value:</b> 0,0-160,0 m/s <sup>2</sup>

Sub-Index	BitOffset	Length (Bits)	Datatype	Description
7	40	16	UINT16	<b>Analog process input 1:</b> 4,00 mA – 20 mA Raw- resp. normalized value
8	56	16	UINT16	<b>Analog process input 2:</b> 4,00 mA – 20 mA Raw- resp. normalized value
9	72	1	BOOL	<b>Digital process input 1:</b> True = ON False = OFF
10	73	1	BOOL	<b>Digital process input 2:</b> True = ON False = OFF
11	8	8	UINT8	<b>Process value CLOSED:</b> 0-100 % Sensor damping in valve position CLOSED
12	16	8	UINT8	<b>Process value OPEN:</b> 0-100 % Sensor damping in valve position OPEN

## 3.2 Prozess outputs (PDout, 1 Byte)

Sub-Index	BitOffset	Length (Bits)	Datatype	Description
1	0	1	BOOL	<b>Control solenoid valve 1:</b> True = ON False = OFF
2	1	1	BOOL	<b>Control solenoid valve 2:</b> True = ON False = OFF

### 4 Identification

Index	Sub-Index	PISDU Name	Length (Byte)	Data type	Access	Factory setting	Description
16	0	Vendor name	32	STR	R	EBRO Armaturen Gebr. Bröeer GmbH	
17	0	Vendor text	22	STR	R	www.ebro-armaturen.com	
18	0	Product name	11	STR	R	SBU IO-LINK	
19	0	Produkt-ID	7	STR	R	Article number E.g.: <b>6151423</b>	Corresponds to article number on type plate
20	0	Product text	64	STR	R	Digital end position monitoring for rotary actuators and valves	
21	0	Serial number	8	STR	R	Serial number E.g.: <b>00235678</b>	Corresponds to serial number on QR code
22	0	Hardware version	4	STR	R	Hardware version E.g.: <b>HW-V0.1</b>	
23	0	Firmware version	4	STR	R	Hardware version E.g.: <b>FW-V0.1</b>	
24	0	Application Specific Tag	32	STR	R/W	***	Corresponds to plant code
25	0	Function Tag	32	STR	R/W	***	Device function
26	0	Location Tag	32	STR	R/W	***	Installation place



### 5 Device status

Index	Sub-Index	PISDU Name	Length (Byte)	Datatype	Access	Factory setting	Value range	Description
36	0	Device status	1	UINT8	R	-	0 = Device is OK 1 = Maintenance Required 2 = Outside-of Specifications 3 = Functional-Check 4 = Failure	Information on device status (diagnosis)
37	0	Detailed device status	33	ARR	R	-		Information about currently pending events in the device. Turning off or resetting the device resets the contents of all array elements.
	1	Error_Warning_1	3	OCTSTR	R	-	All Octets 0x00: No Error / no Warning  Octet 1: Event-Qualifier  Octet 2, 3: EventCode	
	2	Error_Warning_2	3	OCTSTR	R	-		
	...					-		
	11	Error_Warning_11	3	OCTSTR	R	-		

## 6 Systemcommands

Command	Description
130	Restore factory settings
160	Resets the Bluetooth connection password to factory setting "0000"
161	Resetting the switching cycle counter (ISDU parameter: switching cycle counter)

## 7 Parameter

### 7.1 End position

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
77	0	Logic digital output end position "CLOSED"	1	UINT8	R/W	(0) Low active (NC) (1) High active (NO)	-	(1) High active (NO)	Setting logic (NO/NC) Digital output end position "CLOSED"	x	x
78	0	Switching point sensor position "CLOSED"	1	UINT8	R/W	10-100	%	20	Switching point of the "CLOSED" position	x	x
79		Logic digital output end position "OPEN"	1	UINT8	R/W	(0) Low active (NC) (1) High active (NO)	-	(1) High active (NO)	Setting logic (NO/NC) Digital output end position "OPEN"	x	x
80		Switching point sensor position "OPEN"	1	UINT8	R/W	10-100	%	20	Switching point of the "OPEN" position	x	x

### 7.2 Solenoid valve

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
81	0	Logic control of solenoid valve 1	1	UINT8	R/W	(0) Low active (NC) (1) High active (NO)	-	(1) High active (NO)	Setting logic (NO/NC) of the control of the solenoid valve 1		x
82	0	Logic solenoid valve 1 input	1	UINT8	R/W	(0) Low active (NC) (1) High active (NO)	-	(1) High active (NO)	Setting input signal (NO/NC) of solenoid valve 1		x
83	0	Logic control of solenoid valve 2	1	UINT8	R/W	(0) Low active (NC) (1) High active (NO)	-	(1) High active (NO)	Setting logic (NO/NC) of the control of the solenoid valve 2		x
84	0	Logic solenoid valve 2 input	1	UINT8	R/W	(0) Low active (NC) (1) High active (NO)	-	(1) High active (NO)	Setting input signal (NO/NC) of solenoid valve 2		x
85	0	Solenoid valve type	1	UINT8	R/W	(0) Monostabil (1) Bistabil	-	(0) Monostabil	Setting the connected solenoid valve type		x

### 7.3 Temperature

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
86	0	Temperature	1	INT8	R		°C	-	Current device / ambient temperature		
87	0	Min. temperature	1	INT8	R		°C	-	Minimum measured device / ambient temperature		
88	0	Max. temperature	1	INT8	R		°C	-	Maximum measured device / ambient temperature		

### 7.4 Acceleration

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
89	0	Acceleration sensor value	2	UINT16	R		m/s <sup>2</sup>	-	Acceleration sensor value last 5 seconds		x
90	0	Max. acceleration value	2	UINT16	R		m/s <sup>2</sup>	-	Maximum measured acceleration value		x
91	0	Calibration acceleration sensor	1	BOOL	R/W	(false)OFF (true) ON	-	(false) OFF	Accelerometer calibration (zero adjustment)		x

### 7.5 LED View

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
92	0	Activate / Deactivate LED display	1	UINT8	R/W	(0) Inactive (1) Active	-	(1) Active	Internal states are shown on the display (activate / deactivate). External control is always possible.	x	x
93	0	LED colour position CLOSED	1	UINT8	R/W	(0) Off (1) Blue (2) Green (3) Cyan (4) Red (5) Magenta (6) Yellow (7) White	-	(2) Green	Setting the LED color for the status feedback "position CLOSED"	x	x

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
94	0	LED colour position OPEN	1	UINT8	R/W	(0) Off (1) Blue (2) Green (3) Cyan (4) Red (5) Magenta (6) Yellow (7) White	-	(6) Yellow	Setting the LED color for the status feedback "position OPEN"	x	X
95	0	LED colour fault	1	UINT8	R/W	(0) Off (1) Blue (2) Green (3) Cyan (4) Red (5) Magenta (6) Yellow (7) White	-	(4) Red	Setting the LED color for the status feedback "fault"	x	x
96	0	External control of LED		UINT8	R/W	(0) Inactive (1) Active	-	(0) Inactive	LED display can be controlled by this external signal. The internal signal states are overwritten.		



# EBRO SBU IO-LINK

## IO-Link Interface Description

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
97	0	LED color external		UINT8	R/W	(0) Off (1) Blue (2) Green (3) Cyan (4) Red (5) Magenta (6) Yellow (7) White	-	(0) Off	External control of LED color	x	x

### 7.6 Process inputs

Two additional digital and two additional analog inputs are available. These can be used at terminal X2 (see wiring diagram). The digital inputs only process a 24VDC potential. The analog terminals, exclusively a standard signal of 4-20mA.

#### 7.6.1 Digital process inputs

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
98	0	Digital process input 1 - Function	1	UINT8	R/W	(0) inactive (1) external endposition CLOSED (24VDC signal) (2) external binary process input (24VDC Signal)	-	(0) inactive	Switching the process input between an external position signal (e.g. for T-slot sensors for gate valves) and binary sensors (e.g. for intermediate positions). With setting (1), the internal Hall position sensor is deactivated. With setting (2), the Hall sensor is still used for position detection of the valve position.	x	x
99	0	Digital process input 1 - Binary signal status	1	BOOL	R	(false)OFF (true) ON	-	-	Status of the signal with the function 2 external binary process input (24VDC signal)		

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
100	0	Digital process input 2 - Function	1	UINT8	R/W	(0) inactive (1) external endposition OPEN (24VDC signal) (2) external binary process input (24VDC Signal)	-	(0) inactive	Switching the process input between an external position signal (e.g. for T-slot sensors for gate valves) and binary sensors (e.g. for intermediate positions). With setting (1), the internal Hall position sensor is deactivated. With setting (2), the Hall sensor is still used for position detection of the valve position..	x	x
101	0	Digital process input 2 - Binary signal status	1	BOOL	R	(false)OFF (true) ON	-	-	Status of the signal with the function 2 external binary process input (24VDC signal)		
102	0	Logic external limit position (Sensors)	1	BOOL	R/W	(0) Low active (NC) (1) High active (NO)	-	(1) High active (NO)	Configuration switching function connected sensor (NO/NC)	x	x

### 7.6.2 Analog process inputs

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
103	0	Analog process input 1 - Analog raw data	2	UINT16	R		mA	-	Analog process input as unnormalized raw value. Analog signal 4-20mA. When using an external process sensor, the maximum current consumption must not exceed 40 mA. When using two sensors, max. 20 mA each is permissible.		
104	0	Analog process input 1 - calibration 4 mA	1	UINT8	R/W	(false)OFF (true)ON	-	(false)OFF	Adjustment of the analog process input lower limit (4 mA)		x
105	0	Analog process input 1 - calibration 20 mA	1	UINT8	R/W	(false)OFF (true)ON	-	(false)OFF	Adjustment of the analog process input upper limit (20 mA)		x
106	0	Analog process input 2 - Analog raw data	2	UINT16	R		mA	-	Analog process input as unnormalized raw value. Analog signal 4-20mA. When using an external process sensor, the maximum current consumption must not exceed 40 mA. When using two sensors, max. 20 mA each is permissible.		

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
107	0	Analog process input 2 - calibration 4 mA	1	UINT8	RW	(false)OFF (true) ON	-	(false)OFF	Adjustment of the analog process input lower limit (4 mA)		x
108	0	Analog process input 2 - calibration 20 mA	1	UINT8	RW	(false)OFF (true) ON	-	(false)OFF	Adjustment of the analog process input upper limit (20 mA)		x

### 7.7 Collective fault

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
109	0	Logic digital output "Failure"	1	UINT8	R/W	(0) Low active (NC) (1) High active (NO)	-	(1) High active (NO)	Setting logic (NO/NC) Digital output "collective fault"	x	x
110	0	Limit value switching cycle counter	4	UINT32	R/W	0-1.000.000.000	-	0	Configuration of the maximum switching cycles (resettable counter value)	x	x
111	0	Limit value switching cycle counter in collective fault	1	UINT8	R/W	(0) inactive (1) active	-	(1) active	Activate/deactivate max. switching cycles in collective fault	x	x
112	0	Total limit value switching cycle counter	4	UINT32	R/W	0-1.000.000.000	-	0	Configuration of the maximum switching cycles Total (non-resettable counter value)	x	x
113	0	Total limit value switching cycle counter in collective fault	1	UINT8	R/W	(0) inactive (1) active	-	(0) inactive	Activate/deactivate max. switching cycles in collective fault	x	x
114	0	Runtime monitoring max. opening time	4	UINT32	R/W	0-1200000	ms	1200000	Configuration of the limit value for runtime monitoring of the maximum opening time	x	x
115	0	Runtime monitoring max. opening time in collective fault	1	UINT8	R/W	(0) inactive (1) active	-	(1) active	Activate/deactivate runtime monitoring max. opening time in collective fault	x	x

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
116	0	Runtime monitoring min. opening time	4	UINT32	R/W	0-1200000	ms	0	Configuration of the limit value for runtime monitoring of the minimum opening time	x	x
117	0	Runtime monitoring min. opening time in collective fault	1	UINT8	R/W	(0) inactive (1) active	-	(0) inactive	Activate/deactivate runtime monitoring minimum opening time in collective fault	x	x
118	0	Runtime monitoring max. closing time	4	UINT32	R/W	0-1200000	ms	1200000	Configuration of the limit value for runtime monitoring of the maximum closing time	x	x
119	0	Runtime monitoring max. closing time in collective fault	1	UINT8	R/W	(0) inactive (1) active	-	(1) active	Activate/deactivate runtime monitoring max. closing time in collective fault	x	x
120	0	Runtime monitoring min. closing time	4	UINT32	R/W	0-1200000	ms	0	Configuration of the limit value for runtime monitoring of the minimum closing time	x	x
121	0	Runtime monitoring min. closing time in collective fault	1	UINT8	R/W	(0) inactive (1) active	-	(0) inactive	Activate/deactivate runtime monitoring minimum closing time in collective fault	x	x
122	0	Excess temperature	1	INT8	R/W	25 - 70	°C	70	Setting the upper temperature limit	x	x
123	0	Alarm upper temperature limit in collective fault	1	UINT8	R/W	(0) inactive (1) active	-	(0) inactive	Activate/deactivate temperature overflow in collective fault	x	x

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
124	0	Under temperature	1	INT8	R/W	-20 - 25	°C	-20	Setting the lower temperature limit	x	x
125	0	Alarm lower temperature limit in collective fault	1	UINT8	R/W	(0) inactive (1) active	-	(0) inactive	Activate/deactivate temperature undercut in collective fault	x	x
126	0	Max. permissible acceleration value	1	UINT8	R/W	5-160	m/s <sup>2</sup>	160	Switching point alarm acceleration overrun	x	x
127	0	Alarm acceleration overrun in collective fault	1	UINT8	R/W	(0) inactive (1) active	-	(0) inactive	Activate/deactivate acceleration overrun in collective fault	x	x
128	0	Delay collective fault	4	UINT32	R/W	0-1200000	ms	0	Time delay for signalling the collective fault	x	x



## 8 Diagnosis

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
129	0	Operating hours counter	4	UINT32	R		s	-	Operating hours counter in the switched-on state	x	
130	0	Switching cycle counter	4	UINT32	R		-	-	Number of switching cycles (since last reset)	x	x
131	0	Total switching cycle counter	4	UINT32	R		-	-	Number of switching cycles of the device	x	
132	0	Counter power failure	4	UINT32	R		-	-	Number of power failure		
133	0	to1 - Reaction time solenoid valve 1	4	UINT32	R		ms	-	Time recording when controlling / switching off the MV1 until leaving the current end position "CLOSED"	x	x
134	0	to2 - Runtime open	4	UINT32	R		ms	-	Time recording when leaving the end position "CLOSED" until reaching the end position "OPEN"	x	x
135	0	to3 - Total Runtime Open	4	UINT32	R		ms	-	Sum of times to1 and to2 (activate/deactivate solenoid valve 1 until the end position "OPEN" is reached)	x	x
136	0	tc1 - Reaction time solenoid valve 1	4	UINT32	R		ms	-	Time recording when controlling / switching off the MV1 until leaving the current end position "OPEN"	x	x
137	0	tc2 - Runtime close	4	UINT32	R		ms	-	Zeiterfassung beim Verlassen der Endlage „AUF“ bis zum Erreichen der Endlage „ZU“	x	x

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
138	0	tc3 - Total Runtime close	4	UINT32	R		ms	-	Sum of the times tc1 and tc2 (activate/deactivate solenoid valve 1 until the end position "CLOSED" is reached)	x	x
139	0	Hall Sensor raw data Pos. CLOSE	4	UINT32	R		mV	-	Hall Sensor Raw value in the last end position CLOSED	x	x
140	0	Hall Sensor raw data Pos. OPEN	4	UINT32	R		mV	-	Hall Sensor Raw value in the last end position OPEN	x	x
141	0	Number of exceeded temperature	1	UINT8	R		-	-	Number of exceeded temperature	x	X
142	0	Number of temperature undershoots	1	UINT8	R		-	-	Number of temperature undershoots	x	x
143	0	Number of runtime overruns "OPEN"	1	UINT8	R		-	-	Number of runtime overruns "OPEN"	x	x
144	0	Number of runtime underruns "OPEN"	1	UINT8	R		-	-	Number of runtime underruns "OPEN"	x	x
145	0	Number of runtime overruns "CLOSED"	1	UINT8	R		-	-	Number of runtime overruns "CLOSED"	x	x
146	0	Number of runtime underruns "CLOSED"	1	UINT8	R		-	-	Number of runtime underruns "CLOSED"	x	x
147	0	Number of acceleration overruns	1	UINT8	R		-	-	Number of exceedances of set permissible acceleration value	x	x
148	0	Parameterisation disabled via Bluetooth	1	BOOL	R	(false)OFF (true) ON	-	-	Parameterisation disabled, local Bluetooth connection active	x	x

Index	Sub-Index	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory Reset
149	0	Mounting orientation	1	UINT8	R	(0) horizontal (1) vertical (2) undefined	-	-	<p>Mounting position of the valve</p> <p>A previous calibration of the accelerometer is necessary to determine the installation position.</p> <p>(2) undefined = with an inclined installation position of the valve</p>	x	x

## 9 Events

Event Code	Status text	Device status	Type	Condition
0x1800	Device malfunction	Error	3 (Functional-Check)	Failure of an internal component (Hall sensor, temperature sensor, acceleration sensor, microcontroller or Bluetooth)
0x1801	Permitted device temperature exceeded	Warning	2 (Outside-of-Specifications)	Set limit value "Temperature exceeded" is exceeded
0x1802	The device temperature falls below the permissible	Warning	2 (Outside-of-Specifications)	The set limit value "Temperature undercut" is below the permissible
0x1803	Open runtime exceeded	Warning	2 (Outside-of-Specifications)	Set limit value "Runtime monitoring max. opening time" is exceeded
0x1804	Close runtime exceeded"	Warning	2 (Outside-of-Specifications)	Set limit value "Runtime monitoring max. closing time" is exceeded
0x1805	Open underflow limit	Warning	2 (Outside-of-Specifications)	The set limit value "Runtime monitoring min. opening time" has been underflew
0x1806	Close below the runtime	Warning	2 (Outside-of-Specifications)	The set limit value "Runtime monitoring min. closing time" has been underflew
0x1809	Switching cycle counter limit reached	Warning	1 (Maintenance-Required)	Set limit value "switching cycle counter" is exceeded

Event Code	Status text	Device status	Type	Condition
0x180A	Limit switching cycle counter reached	Warning	1 (Maintenance-Required)	Set limit value "Total switching cycle counter" is exceeded
0x180B	Accelerometer limit exceeded	Warning	2 (Outside-of-Specifications)	Set limit value "Max. permissible acceleration value" is exceeded
0x180C	Bluetooth active	Warning	0 (Device is operating properly)	Bluetooth connection to mobile device is active