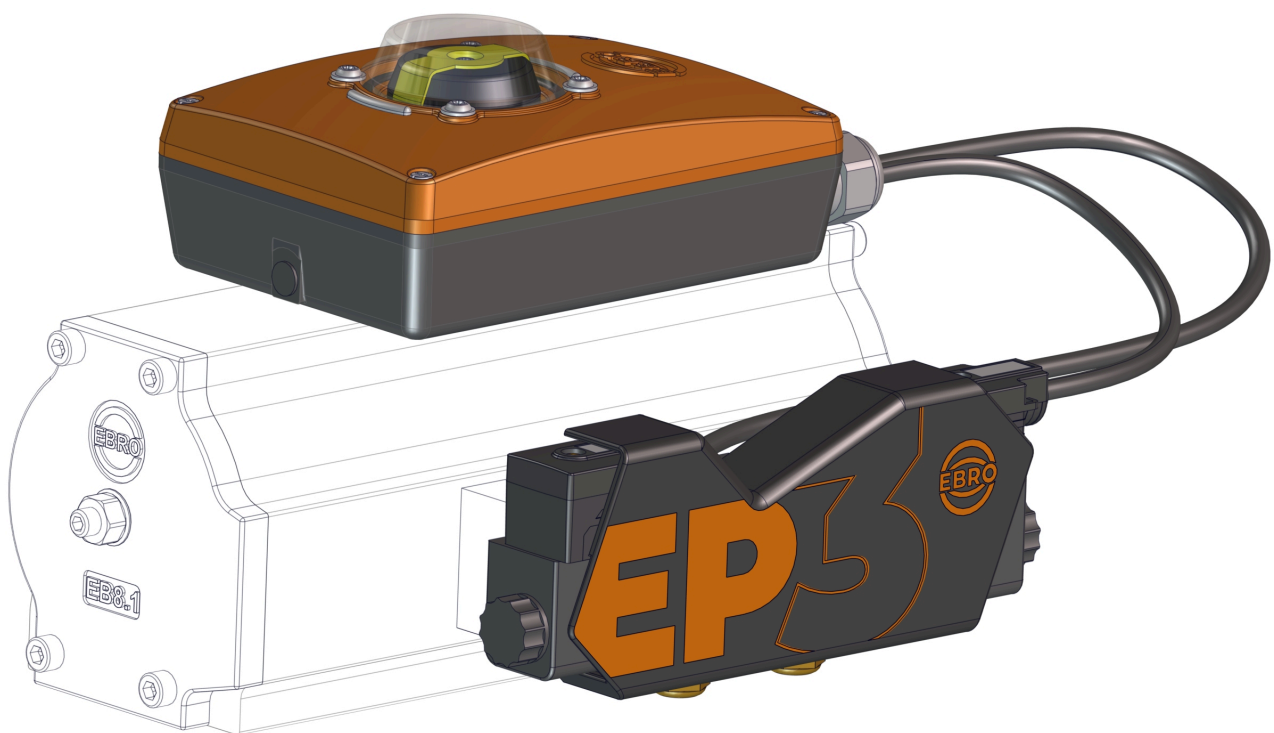


IO-Link Interface Description

EP3 Positioner

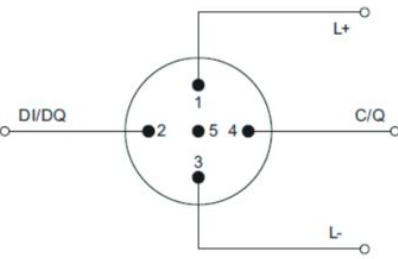


 **IO-Link**

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1 COMMUNICATION

Manufacturer ID	0x0587 h / 1415 d
Device ID	0x0C542F h / 807983 d
Bit rate	COM3
Min. cycle time	10 ms
Port configuration	Port Class A  1: L+ 2: N.C. 3: L- 4: IO-Link / SIO (Position CLOSE) 5: N.C. Port Class B Terminal connection only
SIO Mode	yes
Block parameterization	yes
Data storage	yes
IO-Link Version	1.1.3

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 PROCESSDATA INPUTS (PDIN)

Subindex	BitOff-set	Length (Bits)	Datatype	Description
1	0	8	UINT8	Device status: (0) Device is operating properly (1) Maintenance-Required (2) Outside-of-Specifications (3) Functional-Check (4) Failure
2	8	8	UINT8	Operating mode: (0) Positioner rotary actuator (1) Positioner linear actuator (2) 3 position mode rotary actuator (3) Mode Open / Close rotary actuator (4) Mode Open / Close linear actuator (5) Custom
3	16	8	UINT8	Operating status: (0) Hold position (1) Open (2) Close (3) AutoTune
4	24	16	UINT16	Valve position: 0,0 - 100,0 %
5	40	1	BOOL	SV1 - Status control solenoid valve connection 1: True = ON False = OFF
6	41	1	BOOL	SV2 - Status control solenoid valve connection 2: True = ON False = OFF
7	48	16	INT16	Acceleration sensor value 1 (set by ISDU): -160,0 -160,0 m/s ²
8	64	16	INT16	Acceleration sensor value 2 (set by ISDU): -160,0 -160,0 m/s ²
9	42	1	BOOL	Valve position CLOSED: True = ON False = OFF
10	43	1	BOOL	Valve position OPEN: True = ON False = OFF
11	44	1	BOOL	Fault / 3rd position: True = ON False = OFF
12	80	16	UINT16	Analog process input 1: 4,00 - 20,00 mA
13	96	16	UINT16	Analog process input 2: 4,00 - 20,00 mA

Subindex	BitOff-set	Length (Bits)	Datatype	Description
14	112	16	UINT16	Analog process input 1: 0,0 - 10,0 V
15	128	16	UINT16	Analog process input 2: 0,0 - 10,0 V
16	45	1	BOOL	Digital input 1: True = ON False = OFF
17	46	1	BOOL	Digital input 2: True = ON False = OFF
18	47	1	BOOL	Digital input 3: True = ON False = OFF

Tab. 1: Processdata inputs

4 PROZESSDATA OUTPUTS (PDOUT)

Subindex	BitOff-set	Length (Bits)	Datatype	Description
1	0	16	UINT16	Set valve position: 0,0 - 100,0 %
2	16	1	BOOL	Open / close valve (Config by ISDU): True = ON False = OFF
3	17	1	BOOL	Move to 3rd position / fail-safe position (Config by ISDU): True = ON False = OFF
4	18	1	BOOL	Stop valve movement: Stops the movement of the valve immediately True = ON False = OFF

Tab. 2: Prozessdata outputs

5 IDENTIFICATION

Index	Subindex	PISDU Name	Length (Byte)	Data type	Access	Factory setting	Description
16	0	Vendor name	32	STR	R	EBRO Armaturen Gebr. Bröer GmbH	
17	0	Vendor text	22	STR	R	www.ebro-armaturen.com	
18	0	Product name	3	STR	R	EP3	
19	0	Product-ID	7	STR	R	Article number Bsp.: 6151423	Corresponds to article number on type plate
20	0	Product text	63	STR	R	Positioner for valves with rotary actuators or linear actuators	
21	0	Serial number	8	STR	R	Serial number Bsp.: 00258746	Corresponds to serial number on QR code
22	0	Hardware version	4	STR	R	Hardware version E.g.: HW-V1.0	
23	0	Firmware version	4	STR	R	Firmware version E.g.: FW-V1.0	
24	0	Application Specific Tag	32	STR	R/W	***	Application specific
25	0	Function tag	32	STR	R/W	***	Device function
26	0	Location tag	32	STR	R/W	***	Installation place
198	0	Valve tag	32	STR	R/W	***	Valve type/article number

Index	Subindex	PISDU Name	Length (Byte)	Data type	Access	Factory setting	Description
199	0	Actuator tag	32	STR	R/W	***	Actuator type/article number

Tab. 3: Identification

6 DEVICE STATUS

Index	Subindex	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	12	ARR	R	-		List of all 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	-		
	...					-		
	20	Error_Warning_20	3	OCTSTR	R	-		

Tab. 4: Device status

7 SYSTEMCOMMANDS

Information: Address: Index 2, Subindex 0 - Datatype: UINT8 - Access: Write Only

Command	Text	Description
129	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.
130	Restore factory settings	The parameter of the device are reset to factory settings. This does not apply to certain defined parameters such as the operating hours counter, diagnostic data, etc. Note: A download of the data storage may be executed on the next power cycle and overwrite the factory default settings!
131	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!
160	Reset Bluetooth Password	Resets the Bluetooth connection password to factory setting "0000".
161	Reset switching cycle counter	Resetting the switching cycle counter (ISDU parameter: switching cycle counter).
162	Reset switching counters of SV1 and SV2	Resetting the counter of SV1+SV2 cycles.

Tab. 5: Systemcommands

8 PARAMETER

8.1 AutoTune

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory reset
66	0	Start AutoTune	1	UINT8	W	(255) ON	-	(255) ON	Starts AutoTune mode		x
67	0	AutoTune Status	1	UINT8	R	(0) Successful (1) Not initialized (2) AutoTune running (3) Failure	-	-	Current status of triggered 'Auto-Tune'		

Tab. 6: AutoTune

8.2 Acceleration

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory reset
68	0	Max. acceleration value	2	UINT16	R		m/s ²		Maximum measured acceleration value		x
69	0	Calibration acceleration sensor	1	UINT8	W	(255) ON	-	(255) ON	Accelerometer calibration (zero adjustment)		
70	0	Time base calculation accel- eration value 1 & 2	2	UINT16	R/W	10-5000	ms	50	Parameter defines the time period to be used in the calculation of acceleration values 1&2 (PDIn).		
73	0	Acceleration sensor value	2	UINT16	R	0,0-160,0	m/s ²		This parameter specifies the current amount of the resulting value of the acceleration sensor in m/s ² .		
74	0	Acceleration sensor value x-axis	2	INT16	R	-160-160	m/s ²		This parameter specifies the current value of the x-axis of the acceleration sensor in m/s ²		

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory reset
75	0	Acceleration sensor value y-axis	2	INT16	R	-160-160	m/s ²		This parameter specifies the current value of the y-axis of the acceleration sensor in m/s ²		
76	0	Acceleration sensor value z-axis	2	INT16	R	-160-160	m/s ²		This parameter specifies the current value of the z-axis of the acceleration sensor in m/s ²		

Tab. 7: Acceleration

8.2.1 Configuration Acceleration (Processdata)

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory reset
71	0	Acceleration value 1	2	UINT16	R/W	(0) Peak X-Axis (1) Peak Y-Axis (2) Peak Z-Axis (3) RMS X-Axis (4) RMS Y-Axis (5) RMS Z-Axis (6) RMS magnitude (x,y,z) (7) Peak-to-Peak X-Axis (8) Peak-to-Peak Y-Axis (9) Peak-to-Peak Z-Axis (10) Peak-to-Peak magnitude (x,y,z)	-	(6) RMS magnitude (x,y,z)	Configuration of the process value 'Acceleration sensor value 1'		x

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	Unit	Factory setting	Description	Data storage	Factory reset
72	0	Acceleration value 2	2	UINT16	R/W	(0) Peak X-Axis (1) Peak Y-Axis (2) Peak Z-Axis (3) RMS X-Axis (4) RMS Y-Axis (5) RMS Z-Axis (6) RMS magnitude (x,y,z) (7) Peak-to-Peak X-Axis (8) Peak-to-Peak Y-Axis (9) Peak-to-Peak Z-Axis (10) Peak-to-Peak magnitude (x,y,z)	-	(0) Peak X-Axis	Configuration of the process value 'Acceleration sensor value 2'		x

Tab. 8: Configuration Acceleration (Processdata)

8.3 LED display

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
77	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
78	0	LED colour position intermediate	1	UINT8	R/W	(0) Off (1) Blue (2) Green (3) Cyan (4) Red (5) Magenta (6) Yellow (7) White	-	(1) Blue	Setting the LED color for the status feedback "position intermediate"	x	x

Index	Subindex	ISDU Name	Lenght (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
79	0	LED colour Autotune mode	1	UINT8	R/W	(0) Off (1) Blue (2) Green (3) Cyan (4) Red (5) Magenta (6) Yellow (7) White	-	(3) Cyan	Setting the LED color for the status feedback "Autotune mode"	x	x
80	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	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
81	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
82	0	LED colour failure	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 "failure"	x	x
83	0	External control of LED	1	UINT8	R/W	(0) inactive (1) active	-	(0) inactive	LED display can be controlled by this external signal. The internal signal states are overwritten.	x	x

Index	Subindex	ISDU Name	Lenght (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
84	0	LED colour external	1	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

Tab. 9: LED display

8.4 Configuration

8.4.1 Modes selection

Index	Subindex	ISDU Name	Lenght (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
85	0	Configuration operation mode	1	UINT8	R/W	(0) Positioner rotary actuator (1) Positioner linear actuator (2) 3 position mode rotary actuator (3) Mode Open / Close rotary actuator (4) Mode Open / Close linear actuator (5) Custom	-	(0) Positioner rotary actuator	The mode is defined on the basis of the selected configuration. The modes are described in the rest of the documentation. Should the set parameters differ from the mode, the mode changes to 'Custom'.		

Tab. 10: Modes selection

8.4.2 Function digital in-/ outputs

8.4.2.1 Function digital inputs

Index	Subindex	ISDU Name	Lenght (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
86	0	Digital process input 1 - Function	1	UINT8	R/W	(0) inactive (1) Knife gate "Closed" (2) External process sensor	-	(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 position sensor is deactivated. Note: <i>With setting (1), the internal position path detection is deactivated.</i>	x	x
87	0	Digital process input 1 - Binary signal status	1	BOOL	R	(0) false (255) true	-	-	Status of the signal with the function 'External process sensor'		

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
88	0	Digital process input 2 - Function	1	UINT8	R/W	(0) inactive (1) Mode Open/Close (2) External process sensor (3) Stop valve movement	-	(0) inactive	Various functions can be assigned to this digital input. (1) Mode Open/close mode: this setting configures the valve unit as an 'open/close' unit. The positioner function is thus overwritten. HIGH signal = open valve LOW signal = close valve. (3) Stop valve movement stop: this setting configures a possible external 'stop command' and can stop the valve movement during operation.	x	x
89	0	Digital process input 2 - Binary signal status	1	BOOL	R	(0) false (255) true	-	-	Status of the signal with the function 'External process sensor'		

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
91	0	Digital process input 3 - Function	1	UINT8	R/W	(0) inactive (1) 3. position mode (2) Knife gate 'Open' (3) AutoTune	-	(0) inactive	(1) 3rd position positioning mode: allows the 3rd position to be approached when a 'High signal' is applied. The 3rd position is configured elsewhere. (2) Knife gate 'Open': 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 position sensor is deactivated. Note: <i>With setting (2), the internal position path detection is deactivated.</i> (3) AutoTune: AutoTune mode can be started when a 'high signal' is applied.	x	x

Index	Subindex	ISDU Name	Lenght (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
92	0	Digital process input 3 - Binary signal status	1	BOOL	R	(0) false (255) true	-	-	This parameter shows the logical status of digital input 3 as soon as the function (1) '3rd position positioning mode' or (3) AutoTune is set.		
90	0	Logic digital inputs 1+3	1	BOOL	R/W	(0) Low active (NC) (255) High active (NO)	-	(255) High active (NO)	Configuration switching function connected sensor (NO/NC) (Knive gate)		x

Tab. 11: Function digital inputs

8.4.2.2 Function digital outputs

Index	Subindex	ISDU Name	Lenght (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
93	0	Digital output 1 - Function	1	UINT8	R/W	(0) inactive (1) Feedback 'Closed'	-	(0) inactive	Assignment of a function to digital output output 1. There are two options to choose from. Deactivated or the logical feedback of the valve position <i>closed</i>	x	x
94	0	Logic digital output 1	1	BOOL	R	(0) Low active (NC) (255) High active (NO)	-	(255) High active (NO)	Setting logic Digital output 1 (NO/NC)		
95	0	Digital output 2 - Function	1	UINT8	R/W	(0) inactive (1) Feedback 'Open'	-	(0) inactive	Assignment of a function to digital output output 2. There are two options to choose from. Deactivated or the logical feedback of the valve position <i>open</i>	x	x
96	0	Logic digital output 2	1	BOOL	R/W	(0) Low active (NC) (255) High active (NO)	-	(255) High active (NO)	Setting logic Digital output 2 (NO/NC)		

Index	Subindex	ISDU Name	Lenght (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
97	0	Digital output 3 - Function	1	UINT8	R/W	(0) inactive (1) Collective fault (2) Feedback '3. Position'	-	(1) Collective fault	Assignment of a function to digital output output 3. There are three options to choose from. Deactivated, feedback of the 3rd valve position or the collective fault.	x	x
98	0	Logic digital output 3	1	BOOL	R/W	(0) Low active (NC) (255) High active (NO)	-	(255) High active (NO)	Setting logic Digital output 3 (NO/NC)		

Tab. 12: Function digital outputs

8.4.3 Function analog in-/ outputs

8.4.3.1 Function analog inputs

Index	Subindex	ISDU Name	Lenght (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
99	0	Analog input 1 - Function	1	UINT8	R/W	(0) inactive (1) Setpoint setting (2) External process input	-	(1) Setpoint setting	Various functions can be assigned to this analog input. Note: <i>With setting (1), the setpoint cannot be controlled via IO-Link. A different configuration must be set here so that the setpoint can be controlled via IO-Link.</i>		x
100	0	Analog process input 1 - calibration 4 mA / 0V	1	BOOL	R/W	(0) OFF (255) ON	-	(0) OFF	Adjustment 4mA / 0V of the analog input input 1.		
101	0	Analog process input 1 - calibration 20 mA / 10V	1	BOOL	R/W	(0) OFF (255) ON	-	(0) OFF	Adjustment 20mA / 10V of the analog input input 1.		

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
102	0	Analog input 2 - Function	1	UINT8	R/W	(0) inactive (1) Knife-gate valve position detection (2) External process input	-	(0) inactive	Various functions can be assigned to this analog input 2. Note: <i>If this analog input is configured with (1) Knife gate valve position detection, an externally connected distance measuring system is used as position detection. The internal position measuring system is thus deactivated.</i>		x
103	0	Analog process input 2 - calibration 4 mA / 0V	1	BOOL	R/W	(0) OFF (255) ON	-	(0) OFF	Adjustment 4mA / 0V of the analog input input 2		
104	0	Analog process input 2 - calibration 20 mA / 10V	1	BOOL	R/W	(0) OFF (255) ON	-	(0) OFF	Adjustment 20mA / 10V of the analog input input 2.		

Tab. 13: Function analog inputs

8.4.3.2 Function analog outputs

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
105	0	Analog output function	1	UINT8	R/W	(0) inactive (1) Actual-position	-	(1) Actual-position	Actual-position can be assigned to this analog output.		x
106	0	Analog output raw value	2	UINT16	R	-	mA/V	-	Raw analog value analog output		
107	0	Offset analog output 4mA	2	UINT16	R/W	0000 - 2100	mA	400	Adjustment of the lower value of the 4mA signal. The adjustment is absolute, which means that the analog signal can be adjusted manually here if necessary Note: <i>This parameter can be configured if DIP4 = OFF.</i>		x
108	0	Offset analog output 20mA	2	UINT16	R/W	0000 - 2100	mA	2000	Adjustment of the lower value of the 20mA signal. The adjustment is absolute, which means that the analog signal can be adjusted manually here if necessary		x

Index	Subindex	ISDU Name	Lenght (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
									Note: <i>This parameter can be configured if DIP4 = OFF.</i>		
208	0	Offset analog output 0V	2	UINT16	R/W	0000 - 0100	V	0	Adjustment of the lower value of the 0V signal. The adjustment is absolute, which means that the analog signal can be adjusted manually here if necessary Note: <i>This parameter can be configured if DIP4 = ON.</i>		x
209	0	Offset analog output 10V	2	UINT16	R/W	0000 - 0100	V	100	Adjustment of the lower value of the 10V signal. The adjustment is absolute, which means that the analog signal can be adjusted manually here if necessary		x

Index	Subindex	ISDU Name	Lenght (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
									Note: <i>This parameter can be configured if DIP4 = ON.</i>		

Tab. 14: Function analog outputs

8.4.4 Positioner and end position

8.4.4.1 Positioner

Index	Subindex	ISDU Name	Lenght (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
110	0	Deadband	1	UINT8	R/W	1,0- 10,0	%	3	Setting the deadband of the positioner controller. The AutoTune automatically calculates the deadband. This can be adjusted here.		x
111	0	Update time Set point	2	UINT16	R/W	50-2000	ms	500	The transfer of the setpoint for the positioner controller is subject to this update time.		x
112	0	Holding time for fine adjustment	2	UINT16	R/W	0 - 1000	ms	10	Setting Impulse for fine tuning adjustment. This value is calculated automatically by the Auto Tune, but can still be adjusted manually.		x

Tab. 15: Positioner

8.4.4.2 Positioner

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
113	0	Tight closing	1	BOOL	R/W	(0) inactive (255) active		(255) active	Tight-closing function can be activated / deactivated.		x
114	0	Limit value tight closing	1	UINT8	R/W	0-25	%	5	Threshold value of tight closing		x
115	0	Hysteresis tight closing	1	UINT8	R/W	0-20	%	5	Setting the hysteresis of the function tight-closing		x
116	0	Switching point valve position 'CLOSED'	1	UINT8	R/W	0-40	%	20	Switching point of the 'CLOSED' valve position		x
117	0	Switching point valve position 'OPEN'	1	UINT8	R/W	50-100	%	70	Switching point of the 'OPEN' valve position		x
118	0	Fail-Safe position	1	UINT8	R	(0) DA holding (1) DA opening (2) DA closing (3) SA opening (4) SA closing	-		Fail-safe position detected by Auto-Tune is made visible here		x
119	0	Failure detection reference value	1	BOOL	R/W	(0) inactive (255) active	-	(0) inactive	Activates the failure detection of the reference value (analog input)		x

Index	Subindex	ISDU Name	Lenght (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
210	0	Failure detection Communication	1	UINT8	R/W	(0) hold (1) close (2) open (3) 3rd. Position	-	(0) hold	Activates the failure detection of the communication (IO-Link)		x
120	0	3rd position / safety position	1	UINT8	R/W	0-100	%	0	Setting a 3rd position / safety position. This defined position is approached in the following states: 1. a signal is present at digital input 3, provided it is configured as "(1) 3rd position mode".		x

Index	Subindex	ISDU Name	Lenght (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
									2. when failure detection is activated and the reference value is no longer present 3. Activation of the process data 'Move to 3rd position / fail-safe position'		

Tab. 16: Positioner

8.4.5 Mode switch

Index	Subindex	ISDU Name	Lenght (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
121	0	3rd position control mode	1	UINT8	R/W	(0) inactive (1) active	-	(0) inactive	By activating this parameter, the process data PDOOut 'Move to 3rd position / fail-safe position' can be used. If deactivated, it is not possible to use of the PDOOut mentioned.		x
122	0	Mode open/close	1	UINT8	R/W	(0) inactive (1) active	-	(0) inactive	By activating this parameter, the process data PDOOut 'Valve open/ close' can be used. In addition, activation deactivates the setting set-point specification in the process data (PDOOut) and conventional control via analog input 1 is no longer possible.		x

Tab. 17: Mode switch

8.5 Collective fault

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
124	0	Limit value switching cycle counter	4	UINT32	R/W	0 - 4.000.000.000	n	0	Configuration of the maximum switching cycles (resettable by SystemCommand)	x	x
125	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
126	0	Total limit value switching cycle counter	4	UINT32	R/W	0 - 4.000.000.000	n	0	Configuration of the maximum switching cycles Total (non-resettable)	x	x
127	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
128	0	Limit value solenoid valve switching	4	UINT32	R/W	0 - 4.000.000.000	n	0	Configuration of the maximum solenoid valve switching	x	x
129	0	Limit value solenoid valve switching in collective fault	1	UINT8	R/W	(0) inactive (1) active	-	(0) inactive	Activate/deactivate max. value solenoid valve switching in collective fault	x	x

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
The following 8 parameters are only displayed in a submenu in IODD Interpreter if the Open/Close mode is set to 'active' and the 3rd position is set to 'inactive'.											
130	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
131	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
132	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
133	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
134	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

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
135	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
136	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
137	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
138	0	Excess temperature	1	INT8	R/W	25-70	°C	70	Setting the upper temperature limit	x	x
139	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
140	0	Under temperature	1	INT8	R/W	-20-25	°C	-20	Setting the lower temperature limit	x	x
141	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

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
142	0	Max. permissible acceleration value	1	UINT8	R/W	0-160	m/s ²	160	Switching point alarm acceleration overrun	x	x
143	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
144	0	Max. permissible acceleration value 1	1	UINT8	R/W	0-160	m/s ²	160	Switching point alarm acceleration value 1 overrun	x	x
145	0	Alarm acceleration value 1 overrun in collective fault	1	UINT8	R/W	(0) inactive (1) active	-	(0) inactive	Activate/deactivate acceleration value 1 overrun in collective fault	x	x
146	0	Max. permissible acceleration value 2	1	UINT8	R/W	0-160	m/s ²	160	Switching point alarm acceleration value 2 overrun	x	x
147	0	Alarm acceleration value 2 overrun in collective fault	1	UINT8	R/W	(0) inactive (1) active	-	(0) inactive	Activate/deactivate acceleration value 2 overrun in collective fault	x	x
152	0	Delay collective fault	4	UINT32	R/W	0-1200000	ms	0	Time delay for signalling the collective fault	x	x

Tab. 18: Collective fault

8.6 Diagnosis

8.6.1 Diagnosis

Index	Subindex	ISDU Name	Lenght (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
153	0	Operating hours counter	4	UINT32	R	-	s	-	Operating hours counter in the switched-on state		
154	0	Switching cycle counter	4	UINT32	R	-	n	-	Number of switching cycles (since last reset)		x
155	0	Total switching cycle counter	4	UINT32	R	-	n	-	Number of switching cycles of the device		
156	0	Counter power failure	4	UINT32	R	-	n	-	Number of power failure		
157	0	Counter solenoid valve 1 operations	4	UINT32	R	-	n	-	Number of solenoid valve copera-tions SV1		
158	0	Counter solenoid valve 2 operations	4	UINT32	R	-	n	-	Number of solenoid valve operations SV2		
159	0	Total switching counter solenoid valve	4	UINT32	R	-	n	-	Total number of switching operations Solenoid valve coils		

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
160	0	to1 - Reaction time solenoid valve 1	4	UINT32	R	-	ms	-	Runtime when activating/deactivating the SV1 until leaving the current end position		x
161	0	tot1 - Last runtime direction opening	4	UINT32	R	-	ms	-	Total running time until the "OPENED" end position is reached		x
162	0	tc2 - Reaction time solenoid valve 2	4	UINT32	R	-	ms	-	Runtime when activating/deactivating the SV2 until leaving the current end position		x
163	0	tct2 - Last runtime direction closing	4	UINT32	R	-	ms	-	Total running time until the "CLOSED" end position is reached		x
164	0	Number of exceeded temperature	1	UINT8	R	-	n	-	Number of exceeded temperature		x
165	0	Number of temperature undershoots	1	UINT8	R	-	n	-	Number of temperature undershoots		x
166	0	Number of acceleration overruns	1	UINT8	R	-	n	-	Number of exceedances of set permissible acceleration value		x
167	0	Number of acceleration overruns value 1	1	UINT8	R	-	n	-	Number of exceedances of the set Limit value Acceleration value 1		x

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
168	0	Number of acceleration overruns value 2	1	UINT8	R	-	n	-	Number of exceedances of the set Limit value Acceleration value 2		x
169	0	Number of AutoTune starts	1	UINT8	R	-	n	-	Number of AutoTune operations		
170	0	Parameterisation disabled - Bluetooth active	1	BOOL	R/W	(0) false (255) true	-	-	Parameterisation disabled, local Bluetooth connection active		
171	0	Dip switch 1 - Automatic / Manual	1	BOOL	R/W	(0) false (255) true	-	-	Logical status of dip switch 1		
172	0	Dip switch 2 - Reverse setpoint input	1	BOOL	R/	(0) false (255) true	-	-	Logical status of dip switch 2		
173	0	Dip switch 3 - 'Close' direction of rotation	1	BOOL	R/	(0) false (255) true	-	-	Logical status of dip switch 3		
174	0	Dip switch 4 - selection signal type 4-20mA / 0-10V	1	BOOL	R	(0) false (255) true	-	-	Logical status of dip switch 4		
175	0	Temperature	1	INT8	R	-	°C	-	Current device / ambient temperature		
176	0	Min. temperature	1	INT8	R	-	°C	-	Minimum measured device / ambient temperature		

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
177	0	Max. temperature	4	INT8	R	-	°C	-	Maximum measured device / ambient temperature		
178	0	Raw value current angle position	2	UINT16	R	0 - 360,0	°	-	Current angle position (raw angle)		
179	0	Raw value set end stop CLOSED	2	UINT16	R	0 - 360,0	°	-	Stored raw angle "End position CLOSED" since the last AutoTune		x
180	0	Raw value set end stop OPENED	2	UINT16	R	0 - 360,0	°	-	Stored raw angle "End position OPENED" since the last AutoTune		x
181	0	Mounting orientation	1	UINT8	R	(0) horizontal (1) vertical (2) undefined	-	-	Mounting position of the valve A previous calibration of the accelerometer is necessary to determine the installation position. (2) undefined = with an inclined installation position of the valve		x

Tab. 19: Diagnosis

8.6.2 Error

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
182	0	Error-code 1 - Analog input 1 signal <3,2mA	1	BOOL	R	(0) false (255) true	-	-	Analog input 1 current value below 3.2mA		
183	0	Error-code 2 - Analog input 1 signal >20,8mA	1	BOOL	R	(0) false (255) true	-	-	Analog input 1 current value above 20.8mA		
184	0	Error-code 3 - Analog input 1 signal >12V	1	BOOL	R	(0) false (255) true	-	-	Analog input 1 voltage value above 12V		
185	0	Error-code 4 - Analog input 2 signal <3,2mA	1	BOOL	R	(0) false (255) true	-	-	Analog input 2 Current value below 3.2mA		
186	0	Error-code 5 - Analog input 2 signal >20,8mA	1	BOOL	R	(0) false (255) true	-	-	Analog input 2 current value above 20.8mA		
187	0	Error-code 6 - Analog input 2 signal >12V	1	BOOL	R	(0) false (255) true	-	-	Analog input 2 voltage value above 12V		
188	0	Error-code 7 - Power supply signal >28,8V	1	BOOL	R	(0) false (255) true	-	-	Power supply above 28.8V		

Index	Subindex	ISDU Name	Length (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
189	0	Error-code 8 - Error angle sensor	1	BOOL	R	(0) false (255) true	-	-	Error angle sensor		
190	0	Error-code 9 -Error acceleration sensor	1	BOOL	R	(0) false (255) true	-	-	Error acceleration sensor		
191	0	Error-code 10 - Error Autotune detection Fail-Safe	1	BOOL	R	(0) false (255) true	-	-	Error Fail-safe detection		
192	0	Error-code 11 - Error Autotune Auto-Tune end position	1	BOOL	R	(0) false (255) true	-	-	Error end stops		
193	0	Error-code 12 - Error Autotune setting actuating speed	1	BOOL	R	(0) false (255) true	-	-	Error in actuating speed		
194	0	Error-code 13 - Error Autotune switch-off points dw_ao/ac	1	BOOL	R	(0) false (255) true	-	-	Error switch-off points positioner		
195	0	Error-code 14 - Error Autotune check accuracy	1	BOOL	R	(0) false (255) true	-	-	Error positioner accuracy		
196	0	Error-code 15 - Error Autotune T_fine o/c	1	BOOL	R	(0) false (255) true	-	-	Error fine adjustment positioner		

Index	Subindex	ISDU Name	Lenght (Byte)	Datatype	Access	Value range	unit	Factory setting	Description	Data storage	Factory reset
197	0	Error-code 16 - Error Autotune Max. Accuracy	1	BOOL	R	(0) false (255) true	-	-	Error maximum accuracy positioner		
207	0	Error-code 17 - Error magnetic field reference run	1	BOOL	R	(0) false (255) true	-	-	Error calibration magnetic field		

Tab. 20: Error

9 EVENTS

Event code	Status text	Device status	Type	Condition
0x1800	Device error	(4) Failure	Error	Failure of an internal component (Hall sensor, temperature sensor, acceleration sensor, microcontroller or Bluetooth)
0x1801	Permissible device temperature exceeded	(2) Out-of-Specifications	Warning	Set limit value 'Excess temperature' is exceeded
0x1802	Permissible device temperature fallen below	(2) Out-of-Specifications	Warning	Set limit value 'Under temperature' is below the permissible
0x1803	Runtime overrun 'open'	(2) Out-of-Specifications	Warning	Set limit value 'Runtime monitoring max. opening time' is exceeded
0x1804	Runtime overrun 'close'	(2) Out-of-Specifications	Warning	Set limit value 'Runtime monitoring max. closing time' is exceeded
0x1805	Runtime underrun 'open'	(2) Out-of-Specifications	Warning	Set limit value 'Runtime monitoring min. opening time' has been underflow
0x1806	Runtime underrun 'close'	(2) Out-of-Specifications	Warning	Set limit value 'Runtime monitoring min. closing time' has been underflow

Event code	Status text	Device status	Type	Condition
0x1809	Limit value 'switching cycle counter' reached	(1) Maintenance-Required	Warning	Set limit value 'Limit value switching cycle counter' is exceeded
0x180A	Limit value 'total switching cycle counter' reached	(1) Maintenance-Required	Warning	Set limit value 'Total limit value switching cycle counter' is exceeded
0x180B	Limit value of acceleration value (RMS) exceeded	(2) Out-of-Specifications	Warning	Set limit value 'Max. permissible acceleration value' is exceeded
0x180C	Limit value of solenoid valve exceeded	(1) Maintenance-Required	Warning	Set limit value 'Limit value solenoid valve switching' is exceeded
0x180D	Failure AutoTune	(0) Device is operating properly	Notification	AutoTune has not been successful
0x180E	Bluetooth active	(0) Device is operating properly	Notification	Bluetooth connection to mobile device is active
0x180F	Limit value of acceleration value 1 exceeded	(2) Out-of-Specifications	Warning	Set limit value 'Max. permissible acceleration value 1' is exceeded

Event code	Status text	Device status	Type	Condition
0x1810	Limit value of acceleration value 2 exceeded	(2) Out-of-Specifications	Warning	Set limit value 'Max. permissible acceleration value 2' is exceeded
0x1811	Limit value of analog input 1 fallen below	(2) Out-of-Specifications	Warning	Analog input 1 signal below 3.2mA
0x1812	Limit value of analog input 2 fallen below	(2) Out-of-Specifications	Warning	Analog input 2 signal below 3.2mA
0x1813	Limit value of analog input 1 exceeded	(2) Out-of-Specifications	Warning	Analog input 1 signal above 20.8mA / 12V
0x1814	Limit value of analog input 2 exceeded	(2) Out-of-Specifications	Warning	Analog input 2 signal above 20.8mA / 12V
0x1815	Regulator instable	(0) Device is operating properly	Notification	Positioner requires too many iterations to reach dead zone

Tab. 21: Events