



IO-Link Interface Description

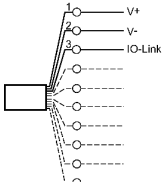

Sorio 3SV AS-i

EN

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1 Device variant

| | | |
|---|---|--|
| <p>Sorio 3SV AS-i</p> <p>Valve control top</p> |  <p>Wiring diagram showing connections for V+, V-, IO-Link, and four additional lines (indicated by dashed lines).</p> |  <p>Photograph of the Sorio 3SV AS-i valve control top, a blue and black industrial device.</p> |
|---|---|--|

2 Communication

| | |
|------------------------|--|
| Vendor ID | 1370 / Bytes 5-90 (hex: 05-5A) |
| Device ID | 4 / Bytes 0-4 (hex: 00-04) |
| Bit rate | COM2 |
| Minimum cycle time | 5 ms |
| SIO mode supported | Yes |
| Block parameterization | Yes |
| Data storage | Yes |
| Supported profiles | BLOB, Binary Large Objects Identification and Diagnosis |



NOTE:

If the Vendor ID and Device ID is referenced in your PLC system, then it is ensured that

- the connected Device type is correct
- the IO-Link datastorage is enabled
- your application is still able to work, even your Device has been exchanged with a successor model.



For process value update rate, as well as further information concerning sensor performance, see datasheet

3 Parameter overview

| Parameter | Index | Subindex | Type | Factory setting | page |
|----------------------------|-------|----------|--------------------|-------------------------------------|------|
| Vendor name | 16 | | StringT (11 Byte) | Definox SAS | 10 |
| Product Name | 18 | | StringT (14 Byte) | Sorio 3SV AS-i | 10 |
| Product Text | 20 | | StringT (17 Byte) | Valve control top | 10 |
| Serial Number | 21 | | StringT (12 Byte) | | 10 |
| Hardware Revision | 22 | | StringT (2 Byte) | | 10 |
| Firmware Revision | 23 | | StringT (16 Byte) | | 10 |
| Application-specific Tag | 24 | | StringT (32 Byte) | *** | 10 |
| Function Tag | 25 | | StringT (32 Byte) | *** | 10 |
| Location Tag | 26 | | StringT (32 Byte) | *** | 10 |
| Device Status | 36 | | UIntegerT (8 Bit) | 0 (Device is OK) | 13 |
| Process data input | 40 | | RecordT (32 Bit) | | 12 |
| Process data output | 41 | | RecordT (8 Bit) | | 12 |
| BLOB | 49 | | IntegerT (16 Bit) | -4096 (Teaching) | 24 |
| ProdDate | 65 | | StringT (4 Byte) | | 10 |
| Button lock | 70 | | UIntegerT (8 Bit) | 0 (disabled) | 14 |
| Interlock | 71 | | UIntegerT (8 Bit) | 0 (disabled) | 14 |
| Safety stop | 73 | | UIntegerT (8 Bit) | 1 (enabled) | 14 |
| Manual Setup Position | 75 | | UIntegerT (8 Bit) | | 13 |
| Reset type | 76 | | UIntegerT (8 Bit) | | 13 |
| Position tolerance band | 80 | | UIntegerT (8 Bit) | 16 (Tolerance: $\pm 1.6\text{mm}$) | 14 |
| Warning tolerance area | 81 | | UIntegerT (8 Bit) | 0 (No warning area) | 14 |
| Time Limit | 82 | | UIntegerT (16 Bit) | 10000 | 14 |
| Valve Cycle Counter Limit | 83 | | UIntegerT (32 Bit) | 0 | 14 |
| Water Hammer Counter Li... | 84 | | UIntegerT (16 Bit) | 0 | 15 |
| Operating Time Limit | 85 | | UIntegerT (16 Bit) | 0 | 15 |
| Travel Accumulator Limit | 86 | | UIntegerT (16 Bit) | 0 | 15 |
| Active events | 88 | | RecordT (32 Bit) | | 23 |
| RGB LED Mode/Intensity ... | 90 | | RecordT (16 Bit) | | 15 |
| Mode | 90 | 1 | UIntegerT (8 Bit) | 2 (Valve mode + error) | |
| Intensity | 90 | 2 | UIntegerT (8 Bit) | 100 (100%) | |
| RGB LED Settings | 91 | | RecordT (24 Bit) | | 16 |
| External RGB LED #1... | 91 | 1 | UIntegerT (8 Bit) | 1 (White) | |
| External RGB LED #2... | 91 | 2 | UIntegerT (8 Bit) | 1 (White) | |
| External RGB LED #3... | 91 | 3 | UIntegerT (8 Bit) | 1 (White) | |
| RGB LED colour | 92 | | RecordT (16 Bit) | | 17 |
| Locating | 92 | 1 | UIntegerT (8 Bit) | 6 (Blue Flashing) | |
| Warning | 92 | 2 | UIntegerT (8 Bit) | 7 (Yellow) | |
| RGB LED colour | 93 | | RecordT (24 Bit) | | 18 |
| Valve Energized | 93 | 1 | UIntegerT (8 Bit) | 3 (Green) | |
| Valve De-energized | 93 | 2 | UIntegerT (8 Bit) | 9 (Cyan) | |
| Without Position | 93 | 3 | UIntegerT (8 Bit) | 0 (OFF) | |
| RGB LED colour | 94 | | RecordT (16 Bit) | | 19 |
| Upper Seat Lift | 94 | 1 | UIntegerT (8 Bit) | 4 (Green Flashing) | |
| Lower Seat Lift | 94 | 2 | UIntegerT (8 Bit) | 10 (Cyan Flashing) | |
| Active Setup | 100 | | UIntegerT (8 Bit) | 0 (No Setup) | 13 |

3 Parameter overview

| Parameter | Index | Subindex | Type | Factory setting | page |
|----------------------------|-------|----------|--------------------|------------------------|------|
| Taught de-energized pos... | 101 | | RecordT (48 Bit) | | 20 |
| Sensor target posit... | 101 | 1 | IntegerT (16 Bit) | 0 (No Setup) | |
| Taught energized position | 102 | | RecordT (48 Bit) | | 20 |
| Sensor target posit... | 102 | 1 | IntegerT (16 Bit) | 0 (No Setup) | |
| Taught lower seat lift ... | 103 | | RecordT (48 Bit) | | 20 |
| Sensor target posit... | 103 | 1 | IntegerT (16 Bit) | 0 (No Setup) | |
| Taught upper seat lift ... | 104 | | RecordT (48 Bit) | | 20 |
| Sensor target posit... | 104 | 1 | IntegerT (16 Bit) | 0 (No Setup) | |
| External sensor logic | 104 | 3 | UIntegerT (8 Bit) | 0 (No external sensor) | |
| Stroke duration (energi... | 105 | | RecordT (96 Bit) | | 19 |
| SV1 | 105 | 1 | IntegerT (32 Bit) | 0 (No Setup) | |
| SV2 | 105 | 2 | IntegerT (32 Bit) | 0 (No Setup) | |
| SV3 | 105 | 3 | IntegerT (32 Bit) | 0 (No Setup) | |
| Stroke duration (de-ene... | 106 | | RecordT (96 Bit) | | 20 |
| SV1 | 106 | 1 | IntegerT (32 Bit) | 0 (No Setup) | |
| SV2 | 106 | 2 | IntegerT (32 Bit) | 0 (No Setup) | |
| SV3 | 106 | 3 | IntegerT (32 Bit) | 0 (No Setup) | |
| Alert Counters | 110 | | RecordT (64 Bit) | | 21 |
| Warnings | 110 | 1 | UIntegerT (32 Bit) | 0 | |
| Errors | 110 | 2 | UIntegerT (32 Bit) | 0 | |
| Teach Function Counter | 111 | | RecordT (48 Bit) | | 21 |
| Total Teach Counter | 111 | 1 | UIntegerT (32 Bit) | 0 | |
| Resettable Teach Co... | 111 | 2 | UIntegerT (16 Bit) | 0 | |
| Travel Accumulator | 112 | | RecordT (48 Bit) | | 21 |
| Total Travel Accumu... | 112 | 1 | UIntegerT (32 Bit) | 0 | |
| Resettable Travel A... | 112 | 2 | UIntegerT (16 Bit) | 0 | |
| Resettable Water Hammer... | 113 | | UIntegerT (16 Bit) | | 21 |
| Valve cycle counter | 114 | | RecordT (128 Bit) | | 22 |
| Resettable Valve Cy... | 114 | 1 | IntegerT (32 Bit) | 0 | |
| SV1 Cycle Counter | 114 | 2 | IntegerT (32 Bit) | 0 | |
| SV2 Cycle Counter | 114 | 3 | IntegerT (32 Bit) | 0 | |
| SV3 Cycle Counter | 114 | 4 | IntegerT (32 Bit) | 0 | |
| Latest energized positi... | 115 | | RecordT (80 Bit) | | 24 |
| #1 | 115 | 1 | IntegerT (16 Bit) | 0 (No Data) | |
| #2 | 115 | 2 | IntegerT (16 Bit) | 0 (No Data) | |
| #3 | 115 | 3 | IntegerT (16 Bit) | 0 (No Data) | |
| #4 | 115 | 4 | IntegerT (16 Bit) | 0 (No Data) | |
| #5 | 115 | 5 | IntegerT (16 Bit) | 0 (No Data) | |
| Latest de-energized pos... | 116 | | RecordT (80 Bit) | | 25 |
| #1 | 116 | 1 | IntegerT (16 Bit) | 0 (No Data) | |
| #2 | 116 | 2 | IntegerT (16 Bit) | 0 (No Data) | |
| #3 | 116 | 3 | IntegerT (16 Bit) | 0 (No Data) | |
| #4 | 116 | 4 | IntegerT (16 Bit) | 0 (No Data) | |
| #5 | 116 | 5 | IntegerT (16 Bit) | 0 (No Data) | |
| Latest energize time du... | 117 | | RecordT (160 Bit) | | 25 |

3 Parameter overview

| Parameter | Index | Subindex | Type | Factory setting | page |
|----------------------------|-------|----------|--------------------|-----------------|------|
| #1 | 117 | 1 | IntegerT (32 Bit) | 0 (No Data) | |
| #2 | 117 | 2 | IntegerT (32 Bit) | 0 (No Data) | |
| #3 | 117 | 3 | IntegerT (32 Bit) | 0 (No Data) | |
| #4 | 117 | 4 | IntegerT (32 Bit) | 0 (No Data) | |
| #5 | 117 | 5 | IntegerT (32 Bit) | 0 (No Data) | |
| Latest energize time du... | 118 | | RecordT (160 Bit) | | 26 |
| #1 | 118 | 1 | IntegerT (32 Bit) | 0 (No Data) | |
| #2 | 118 | 2 | IntegerT (32 Bit) | 0 (No Data) | |
| #3 | 118 | 3 | IntegerT (32 Bit) | 0 (No Data) | |
| #4 | 118 | 4 | IntegerT (32 Bit) | 0 (No Data) | |
| #5 | 118 | 5 | IntegerT (32 Bit) | 0 (No Data) | |
| Latest energize time du... | 119 | | RecordT (160 Bit) | | 26 |
| #1 | 119 | 1 | IntegerT (32 Bit) | 0 (No Data) | |
| #2 | 119 | 2 | IntegerT (32 Bit) | 0 (No Data) | |
| #3 | 119 | 3 | IntegerT (32 Bit) | 0 (No Data) | |
| #4 | 119 | 4 | IntegerT (32 Bit) | 0 (No Data) | |
| #5 | 119 | 5 | IntegerT (32 Bit) | 0 (No Data) | |
| Latest de-energize time... | 120 | | RecordT (160 Bit) | | 27 |
| #1 | 120 | 1 | IntegerT (32 Bit) | 0 (No Data) | |
| #2 | 120 | 2 | IntegerT (32 Bit) | 0 (No Data) | |
| #3 | 120 | 3 | IntegerT (32 Bit) | 0 (No Data) | |
| #4 | 120 | 4 | IntegerT (32 Bit) | 0 (No Data) | |
| #5 | 120 | 5 | IntegerT (32 Bit) | 0 (No Data) | |
| Latest de-energize time... | 121 | | RecordT (160 Bit) | | 27 |
| #1 | 121 | 1 | IntegerT (32 Bit) | 0 (No Data) | |
| #2 | 121 | 2 | IntegerT (32 Bit) | 0 (No Data) | |
| #3 | 121 | 3 | IntegerT (32 Bit) | 0 (No Data) | |
| #4 | 121 | 4 | IntegerT (32 Bit) | 0 (No Data) | |
| #5 | 121 | 5 | IntegerT (32 Bit) | 0 (No Data) | |
| Latest de-energize time... | 122 | | RecordT (160 Bit) | | 28 |
| #1 | 122 | 1 | IntegerT (32 Bit) | 0 (No Data) | |
| #2 | 122 | 2 | IntegerT (32 Bit) | 0 (No Data) | |
| #3 | 122 | 3 | IntegerT (32 Bit) | 0 (No Data) | |
| #4 | 122 | 4 | IntegerT (32 Bit) | 0 (No Data) | |
| #5 | 122 | 5 | IntegerT (32 Bit) | 0 (No Data) | |
| Operating Hours | 123 | | RecordT (80 Bit) | | 22 |
| Total | 123 | 1 | IntegerT (32 Bit) | 0 | |
| Resettable | 123 | 2 | UIntegerT (16 Bit) | 0 | |
| Timeout Error Counter | 124 | | RecordT (48 Bit) | | 22 |
| Total Main | 124 | 1 | UIntegerT (16 Bit) | 0 | |
| Total Upper Seat Lift | 124 | 2 | UIntegerT (16 Bit) | 0 | |
| Total Lower Seat Lift | 124 | 3 | UIntegerT (16 Bit) | 0 | |
| Resettable timeout Erro... | 125 | | RecordT (48 Bit) | | 22 |
| Resettable Main | 125 | 1 | UIntegerT (16 Bit) | | |
| Resettable Upper Se... | 125 | 2 | UIntegerT (16 Bit) | | |

3 Parameter overview

| Parameter | Index | Subindex | Type | Factory setting | page |
|------------------------|-------|----------|--------------------|-----------------|------|
| Resettable Lower Se... | 125 | 3 | UIntegerT (16 Bit) | | |
| Temperature | 126 | | RecordT (48 Bit) | | 23 |
| Current | 126 | 1 | IntegerT (16 Bit) | | |
| Minimum | 126 | 2 | IntegerT (16 Bit) | | |
| Maximum | 126 | 3 | IntegerT (16 Bit) | | |

4 System Commands



System Command information
 - Address: Index 2, Subindex 0
 - Datatype: UInteger (8 Bit)
 - AccessRight: Write Only

| System Commands | Text | Description |
|-----------------|---|--|
| 1 | Upload Start | Start block parameter upload |
| 2 | Upload End | End block parameter upload |
| 3 | Download Start | Start block parameter download |
| 4 | Download End | Stop block parameter download |
| 5 | Store | Finalize block parameterization and start Data Storage |
| 6 | Break | Cancel block parameterization |
| 130 | Restore Factory Settings | |
| 208 | Auto Setup | |
| 209 | Manual Setup position | |
| 210 | Manual Setup activation | |
| 211 | Setup abort | |
| 212 | Reset selected counter | |
| 240 | IO-Link 1.1 system test command 240, Event 8DFE appears | |
| 241 | IO-Link 1.1 system test command 241, Event 8DFE disappears | |
| 242 | IO-Link 1.1 system test command 242, Event 8DFF appears | |
| 243 | IO-Link 1.1 system test command 243, Event 8DFF disappears | |

5 Identification

| | | | | |
|---|--------------------------|-------------------|--------------------------|------------------|
| Vendor name | Index 16 | Subindex 0 | StringT (11 Byte) | ReadOnly |
| The vendor name that is assigned to a Vendor ID. | | | | |
| Factory setting | Definox SAS | | | |
| Product Name | Index 18 | Subindex 0 | StringT (14 Byte) | ReadOnly |
| Complete product name. | | | | |
| Factory setting | Sorio 3SV AS-i | | | |
| Product Text | Index 20 | Subindex 0 | StringT (17 Byte) | ReadOnly |
| Additional product information for the device. | | | | |
| Factory setting | Valve control top | | | |
| Serial Number | Index 21 | Subindex 0 | StringT (12 Byte) | ReadOnly |
| Unique, vendor-specific identifier of the individual device. | | | | |
| Hardware Revision | Index 22 | Subindex 0 | StringT (2 Byte) | ReadOnly |
| Unique, vendor-specific identifier of the hardware revision of the individual device. | | | | |
| Firmware Revision | Index 23 | Subindex 0 | StringT (16 Byte) | ReadOnly |
| Unique, vendor-specific identifier of the firmware revision of the individual device. | | | | |
| ProdDate | Index 65 | Subindex 0 | StringT (4 Byte) | ReadOnly |
| Production date (YYWW) | | | | |
| Application-specific Tag | Index 24 | Subindex 0 | StringT (32 Byte) | ReadWrite |
| Possibility to mark a device with user- or application-specific information. | | | | |
| Factory setting | *** | | | |
| Function Tag | Index 25 | Subindex 0 | StringT (32 Byte) | ReadWrite |
| Description of the device function | | | | |
| Factory setting | *** | | | |
| Location Tag | Index 26 | Subindex 0 | StringT (32 Byte) | ReadWrite |
| Description of the physical device location | | | | |
| Factory setting | *** | | | |

6 Observation

6.1 Process Data Input/Output

| Process data input | | RecordT (32 Bit) |
|--|------------------------------|--|
| Sensor target position | | IntegerT (16 Bit) |
| Current position of the magnet (Bitoffset: 16 / Length: 16). | | |
| Value range [mm] | (120 To 1180) * 0.1 32764 | (NoData) |
| LED array | | UIntegerT (5 Bit) |
| Current state of LED array (Bitoffset: 11 / Length: 5). | | |
| Value range | 0 | (No setup mode) |
| | 1 | (Status mode) |
| | 2 | (Auto setup) |
| | 4 | (Manual setup) |
| | 5 | (Pigging mode) |
| | 8 | (Tolerance mode) |
| | 9 | (Warning tolerance band (#9)) |
| | 10 | (Water hammer limit exceeded (#10)) |
| | 11 | (Position time limit exceeded (#11)) |
| | 12 | (Travel accumulator limit exceeded (#12)) |
| | 13 | (Valve cycle counter limit exceeded (#13)) |
| | 14 | (Operating time limit exceeded (#14)) |
| | 15 | (Locked button (#15)) |
| | 16 | (Sensor target missing (#16)) |
| | 17 | (Pilot valve issue (#17)) |
| | 18 | (Pneumatic part issue (#18)) |
| | 19 | (Setup sensor issue (#19)) |
| | 20 | (Position not reached (#20)) |
| | 21 | (Unexpected valve movement (#21)) |
| | 22 | (External sensor missing (#22)) |
| | 23 | (Solenoid valve 1 missing (#23)) |
| | 24 | (Solenoid valve 2 missing (#24)) |
| | 25 | (Solenoid valve 3 missing (#25)) |
| | 26 | (Interlock in effect (#26)) |
| | 27 | (Hardware fault (#27)) |
| | 28 | (Setup aborted (#28)) |
| | 29 | (Pigging configuration fault (#29)) |
| | 30 | (Low supply voltage (#30)) |
| | 31 | (Safety Stop active (#31)) |
| SV3 | | BooleanT |
| Current state of solenoid 3 (Bitoffset: 10 / Length: 1). | | |
| Value range | false | (inactive) |
| | true | (active) |
| SV2 | | BooleanT |
| Current state of solenoid 2 (Bitoffset: 9 / Length: 1). | | |
| Value range | false | (inactive) |
| | true | (active) |
| SV1 | | BooleanT |
| Current state of solenoid 1 (Bitoffset: 8 / Length: 1). | | |
| Value range | false | (inactive) |
| | true | (active) |
| LOW_L | | BooleanT |
| Lower seat lift (Bitoffset: 3 / Length: 1). | | |
| Value range | false | (inactive) |
| | true | (active) |
| UPP_L | | BooleanT |
| Upper seat lift (Bitoffset: 2 / Length: 1). | | |
| Value range | false | (inactive) |
| | true | (active) |

6 Observation

| EN | | | BooleanT | | |
|---|-------|------------------------|-------------------|------------------------|----|
| Main (energized) position (Bitoffset: 1 / Length: 1). | | | | | |
| Value range | false | (inactive) | true | (active) | |
| DE-EN | | | BooleanT | | |
| De-Energized position (Bitoffset: 0 / Length: 1). | | | | | |
| Value range | false | (inactive) | true | (active) | |
| Device status | | | UIntegerT (4 Bit) | | |
| Current device status, a copy of the variable [Device Status] in the process data channel (Bitoffset: 4 / Length: 4). | | | | | |
| Value range | 0 | (Device is OK) | 1 | (Maintenance required) | |
| | 2 | (Out of specification) | 3 | (Functional check) | |
| | 4 | (Failure) | | | |
| Sensor target position | | | | | |
| Word 0 | 15 | 14 | 13 | 12 | 11 |
| | 10 | 9 | 8 | 7 | 6 |
| | 5 | 4 | 3 | 2 | 1 |
| | 0 | | | | |
| LED array | | | | | |
| Word 2 | 15 | 14 | 13 | 12 | 11 |
| | 10 | 9 | 8 | 7 | 6 |
| | 5 | 4 | 3 | 2 | 1 |
| | 0 | | | | |

-n/a: Not available area. Used to cover structured process data mapping



Process data displayed according device sort order.
Please note: Siemens PLCs swap the high and low byte when using byte addressing.

| Process data output | | | RecordT (8 Bit) | |
|--|-------|-----------|-----------------|----------|
| Locate | | | BooleanT | |
| Locate the valve by visual feedback (Bitoffset: 3 / Length: 1). | | | | |
| Value range | false | (Disable) | true | (Enable) |
| Ext #1 | | | BooleanT | |
| External RGB LED #1 (Bitoffset: 4 / Length: 1). | | | | |
| Value range | false | (Disable) | true | (Enable) |
| Ext #2 | | | BooleanT | |
| External RGB LED #1 (Bitoffset: 5 / Length: 1). | | | | |
| Value range | false | (Disable) | true | (Enable) |
| Ext #3 | | | BooleanT | |
| External RGB LED #1 (Bitoffset: 6 / Length: 1). | | | | |
| Value range | false | (Disable) | true | (Enable) |
| <div><div>n/a</div><div>Ext #3</div><div>Ext #2</div><div>Ext #1</div><div>Locate</div><div>n/a</div></div> <div>Word 0<div><div></div><div>6</div><div>5</div><div>4</div><div>3</div><div></div><div></div><div></div></div></div> | | | | |

-n/a: Not available area. Used to cover structured process data mapping

7 Parameter

7.1 Commands

| Device Status | Index 36 | Subindex 0 | UIntegerT (8 Bit) | ReadOnly |
|---|-----------------------|------------------------|-------------------|----------|
| Indicator for the current device condition and diagnosis state. | | | | |
| Factory setting | 0 | (Device is OK) | | |
| Value range | 0 | (Device is OK) | | |
| | 1 | (Maintenance required) | | |
| | 2 | (Out of specification) | | |
| | 3 | (Functional check) | | |
| | 4 | (Failure) | | |
| | (5 To 255) (Reserved) | | | |

7.1.1 Setup

| Active Setup | Index 100 | Subindex 0 | UIntegerT (8 Bit) | ReadOnly |
|-------------------------------------|-----------|-------------------|-------------------|----------|
| Type of the currently active setup. | | | | |
| Factory setting | 0 | (No Setup) | | |
| Value range | 0 | (No Setup) | | |
| | 1 | (Auto Setup) | | |
| | 2 | (Manual Setup) | | |
| | 3 | (Pigging Mode) | | |

| Manual Setup Position | Index 75 | Subindex 0 | UIntegerT (8 Bit) | ReadWrite |
|---|----------|------------------------|-------------------|-----------|
| Select a setup position and write it to the device. Then bring valve in position and press the button below to teach the selected position. | | | | |
| Value range | 0 | (Main de-energized) | | |
| | 1 | (Main energized) | | |
| | 2 | (Upper seat energized) | | |
| | 3 | (Lower seat energized) | | |

7.1.2 Reset Options

| Reset type | Index 76 | Subindex 0 | UIntegerT (8 Bit) | ReadWrite |
|--|----------|---------------------------------|-------------------|-----------|
| Select the counter to be resetted and write it to the device. Then press the button below to perform the selected reset. | | | | |
| Value range | 0 | (Travel Accumulator Reset) | | |
| | 1 | (Valve Cycle Counter Reset) | | |
| | 2 | (Operation Time Reset) | | |
| | 3 | (Teaching Counter Reset) | | |
| | 4 | (Time Error Counter Main Reset) | | |
| | 7 | (Water Hammer Counter Reset) | | |

7.2 Settings

| Device Status | Index 36 | Subindex 0 | UIntegerT (8 Bit) | ReadOnly |
|---|-----------------------|------------------------|-------------------|----------|
| Indicator for the current device condition and diagnosis state. | | | | |
| Factory setting | 0 | (Device is OK) | | |
| Value range | 0 | (Device is OK) | | |
| | 1 | (Maintenance required) | | |
| | 2 | (Out of specification) | | |
| | 3 | (Functional check) | | |
| | 4 | (Failure) | | |
| | (5 To 255) (Reserved) | | | |

7 Parameter

7.2.1 Device Settings

| Button lock | Index 70 | Subindex 0 | UIntegerT (8 Bit) | ReadWrite |
|---------------------------------|----------|-------------------|-------------------|-----------|
| Enable/disable the button lock. | | | | |
| Factory setting | 0 | (disabled) | | |
| Value range | 0 | (disabled) | | |
| | 1 | (enabled) | | |

| Interlock | Index 71 | Subindex 0 | UIntegerT (8 Bit) | ReadWrite |
|-------------------------------|----------|-------------------|-------------------|-----------|
| Enable/disable the interlock. | | | | |
| Factory setting | 0 | (disabled) | | |
| Value range | 0 | (disabled) | | |
| | 1 | (enabled) | | |

| Safety stop | Index 73 | Subindex 0 | UIntegerT (8 Bit) | ReadWrite |
|--|----------|------------------|-------------------|-----------|
| Safety Stop prevents unit from mechanical damage if magnet target moves out of highest possible range. | | | | |
| Factory setting | 1 | (enabled) | | |
| Value range | 0 | (disabled) | | |
| | 1 | (enabled) | | |

7.2.2 Tolerance and Warning Settings

| Position tolerance band | Index 80 | Subindex 0 | UIntegerT (8 Bit) | ReadWrite |
|---|-----------|----------------------------|-------------------|-----------|
| Selection of available tolerance ranges. Same limit for all positions. Settings below 2.5mm are not applicable for warning tolerance area less than 40% and vice versa. | | | | |
| Factory setting | 16 | (Tolerance: ±1.6mm) | | |
| Value range | 10 | (Tolerance: ±1.0mm) | | |
| | 16 | (Tolerance: ±1.6mm) | | |
| | 25 | (Tolerance: ±2.5mm) | | |
| | 50 | (Tolerance: ±5.0mm) | | |
| | 100 | (Tolerance: ±10.0mm) | | |

| Warning tolerance area | Index 81 | Subindex 0 | UIntegerT (8 Bit) | ReadWrite |
|--|----------|--------------------------|-------------------|-----------|
| Warning area of position tolerance band (min. 0.5mm). Settings below 40% are not applicable for tolerance band less than 2.5mm and vice versa. | | | | |
| Factory setting | 0 | (No warning area) | | |
| Value range | 0 | (No warning area) | | |
| | 10 | (Warning area: 10%) | | |
| | 20 | (Warning area: 20%) | | |
| | 30 | (Warning area: 30%) | | |
| | 40 | (Warning area: 40%) | | |
| | 50 | (Warning area: 50%) | | |

| Time Limit | Index 82 | Subindex 0 | UIntegerT (16 Bit) | ReadWrite |
|--|----------------------|------------|--------------------|-----------|
| Tolerance range of stroke movement timing. | | | | |
| Factory setting | 10000 | | | |
| Value range [s] | (0 To 60000) * 0.001 | | | |

| Valve Cycle Counter Limit | Index 83 | Subindex 0 | UIntegerT (32 Bit) | ReadWrite |
|--|--------------------|------------|--------------------|-----------|
| Limit of resettable Valve Cycles Counter to trigger warning. | | | | |
| Factory setting | 0 | | | |
| Value range | (0 To 2000000) * 1 | | | |

7 Parameter

| Water Hammer Counter Limit | Index 84 | Subindex 0 | UIntegerT (16 Bit) | ReadWrite |
|--|------------------|------------|--------------------|-----------|
| Limit of resettable Water Hammer Counter to trigger warning. | | | | |
| Factory setting | 0 | | | |
| Value range | (0 To 65000) * 1 | | | |

| Operating Time Limit | Index 85 | Subindex 0 | UIntegerT (16 Bit) | ReadWrite |
|--|------------------|------------|--------------------|-----------|
| Limit of resettable Operating Time to trigger warning. | | | | |
| Factory setting | 0 | | | |
| Value range [h] | (0 To 65000) * 1 | | | |

| Travel Accumulator Limit | Index 86 | Subindex 0 | UIntegerT (16 Bit) | ReadWrite |
|--|------------------|------------|--------------------|-----------|
| Limit of resettable Travel Accumulator to trigger warning. | | | | |
| Factory setting | 0 | | | |
| Value range [m] | (0 To 65000) * 1 | | | |

7.2.3 RGB LED Settings

| RGB LED Mode/Intensity Settings | Index 90 | Subindex 0 | RecordT (16 Bit) | ReadWrite |
|--------------------------------------|------------|--------------------------------|-------------------|-----------|
| Sets the RGB LED mode and intensity. | | | | |
| Mode | | Subindex 1 | UIntegerT (8 Bit) | |
| Select mode of RGB LED. | | | | |
| Factory setting | 2 | (Valve mode + error) | | |
| Value range | 0 | (Namur mode) | | |
| | 1 | (Valve mode) | | |
| | 2 | (Valve mode + error) | | |
| | 3 | (Valve mode + error + warning) | | |
| | 4 | (External Fixed colour) | | |
| | 5 | (Off) | | |
| Intensity | | Subindex 2 | UIntegerT (8 Bit) | |
| Intensity of the RGB LED. | | | | |
| Factory setting | 100 | (100%) | | |
| Value range | 0 | (0%) | | |
| | 10 | (10%) | | |
| | 20 | (20%) | | |
| | 30 | (30%) | | |
| | 40 | (40%) | | |
| | 50 | (50%) | | |
| | 60 | (60%) | | |
| | 70 | (70%) | | |
| | 80 | (80%) | | |
| | 90 | (90%) | | |
| | 100 | (100%) | | |

| RGB LED Settings | Index 91 | Subindex 0 | RecordT (24 Bit) | ReadWrite |
|---------------------------------|----------|------------|------------------|-----------|
| Settings of the RGB LED output. | | | | |

7 Parameter

| External RGB LED #1 colour | | Subindex 1 | UIntegerT (8 Bit) |
|--|----------|-------------------|-------------------|
| RGB LED colour of external control #1. | | | |
| Factory setting | 1 | (White) | |
| Value range | 0 | (OFF) | |
| | 1 | (White) | |
| | 2 | (White Flashing) | |
| | 3 | (Green) | |
| | 4 | (Green Flashing) | |
| | 5 | (Blue) | |
| | 6 | (Blue Flashing) | |
| | 7 | (Yellow) | |
| | 8 | (Yellow Flashing) | |
| | 9 | (Cyan) | |
| | 10 | (Cyan Flashing) | |
| | 11 | (Purple) | |
| | 12 | (Purple Flashing) | |
| | 13 | (Red) | |
| | 14 | (Red Flashing) | |

| External RGB LED #2 colour | | Subindex 2 | UIntegerT (8 Bit) |
|--|----------|-------------------|-------------------|
| RGB LED colour of external control #2. | | | |
| Factory setting | 1 | (White) | |
| Value range | 0 | (OFF) | |
| | 1 | (White) | |
| | 2 | (White Flashing) | |
| | 3 | (Green) | |
| | 4 | (Green Flashing) | |
| | 5 | (Blue) | |
| | 6 | (Blue Flashing) | |
| | 7 | (Yellow) | |
| | 8 | (Yellow Flashing) | |
| | 9 | (Cyan) | |
| | 10 | (Cyan Flashing) | |
| | 11 | (Purple) | |
| | 12 | (Purple Flashing) | |
| | 13 | (Red) | |
| | 14 | (Red Flashing) | |

| External RGB LED #3 colour | | Subindex 3 | UIntegerT (8 Bit) |
|--|----------|-------------------|-------------------|
| RGB LED colour of external control #3. | | | |
| Factory setting | 1 | (White) | |
| Value range | 0 | (OFF) | |
| | 1 | (White) | |
| | 2 | (White Flashing) | |
| | 3 | (Green) | |
| | 4 | (Green Flashing) | |
| | 5 | (Blue) | |
| | 6 | (Blue Flashing) | |
| | 7 | (Yellow) | |
| | 8 | (Yellow Flashing) | |
| | 9 | (Cyan) | |
| | 10 | (Cyan Flashing) | |
| | 11 | (Purple) | |
| | 12 | (Purple Flashing) | |
| | 13 | (Red) | |
| | 14 | (Red Flashing) | |

| RGB LED colour | Index 92 | Subindex 0 | RecordT (16 Bit) | ReadWrite |
|-------------------------------|----------|------------|------------------|-----------|
| Choice of colours of RGB LED. | | | | |

7 Parameter

| Locating | Subindex 1 | UIntegerT (8 Bit) |
|--------------------------------------|------------|------------------------|
| RGB LED colour of locating function. | | |
| Factory setting | 6 | (Blue Flashing) |
| Value range | 0 | (OFF) |
| | 1 | (White) |
| | 2 | (White Flashing) |
| | 3 | (Green) |
| | 4 | (Green Flashing) |
| | 5 | (Blue) |
| | 6 | (Blue Flashing) |
| | 7 | (Yellow) |
| | 8 | (Yellow Flashing) |
| | 9 | (Cyan) |
| | 10 | (Cyan Flashing) |
| | 11 | (Purple) |
| | 12 | (Purple Flashing) |
| | 13 | (Red) |
| | 14 | (Red Flashing) |

| Warning | Subindex 2 | UIntegerT (8 Bit) |
|-----------------------------|------------|-------------------|
| RGB LED colour of warnings. | | |
| Factory setting | 7 | (Yellow) |
| Value range | 0 | (OFF) |
| | 1 | (White) |
| | 2 | (White Flashing) |
| | 3 | (Green) |
| | 4 | (Green Flashing) |
| | 5 | (Blue) |
| | 6 | (Blue Flashing) |
| | 7 | (Yellow) |
| | 8 | (Yellow Flashing) |
| | 9 | (Cyan) |
| | 10 | (Cyan Flashing) |
| | 11 | (Purple) |
| | 12 | (Purple Flashing) |
| | 13 | (Red) |
| | 14 | (Red Flashing) |

| RGB LED colour | Index 93 | Subindex 0 | RecordT (24 Bit) | ReadWrite |
|--|----------|----------------|-------------------|-----------|
| Choice of colours of RGB LED. | | | | |
| Valve Energized | | Subindex 1 | UIntegerT (8 Bit) | |
| RGB LED colour of energized position. | | | | |
| Factory setting | 3 | (Green) | | |
| Value range | 0 | (OFF) | | |
| | 1 | (White) | | |
| | 3 | (Green) | | |
| | 5 | (Blue) | | |
| | 7 | (Yellow) | | |
| | 9 | (Cyan) | | |
| | 11 | (Purple) | | |
| | 13 | (Red) | | |
| Valve De-energized | | Subindex 2 | UIntegerT (8 Bit) | |
| RGB LED colour of de-energized position. | | | | |
| Factory setting | 9 | (Cyan) | | |
| Value range | 0 | (OFF) | | |
| | 1 | (White) | | |
| | 3 | (Green) | | |
| | 5 | (Blue) | | |
| | 7 | (Yellow) | | |
| | 9 | (Cyan) | | |
| | 11 | (Purple) | | |
| | 13 | (Red) | | |

7 Parameter

| Without Position | Subindex 3 | UIntegerT (8 Bit) |
|--|------------|-------------------|
| RGB LED colour while moving or outside tolerance band. | | |
| Factory setting | 0 | (OFF) |
| Value range | 0 | (OFF) |
| | 1 | (White) |
| | 3 | (Green) |
| | 5 | (Blue) |
| | 7 | (Yellow) |
| | 9 | (Cyan) |
| | 11 | (Purple) |
| | 13 | (Red) |

| RGB LED colour | Index 94 | Subindex 0 | RecordT (16 Bit) | ReadWrite |
|--|----------|-------------------------|-------------------|-----------|
| Choice of colours of RGB LED. | | | | |
| Upper Seat Lift | | Subindex 1 | UIntegerT (8 Bit) | |
| RGB LED colour indicating upper seat lift. | | | | |
| Factory setting | 4 | (Green Flashing) | | |
| Value range | 0 | (OFF) | | |
| | 1 | (White) | | |
| | 2 | (White Flashing) | | |
| | 3 | (Green) | | |
| | 4 | (Green Flashing) | | |
| | 5 | (Blue) | | |
| | 6 | (Blue Flashing) | | |
| | 7 | (Yellow) | | |
| | 8 | (Yellow Flashing) | | |
| | 9 | (Cyan) | | |
| | 10 | (Cyan Flashing) | | |
| | 11 | (Purple) | | |
| | 12 | (Purple Flashing) | | |
| | 13 | (Red) | | |
| | 14 | (Red Flashing) | | |

| | | | | |
|--|-----------|------------------------|-------------------|--|
| Lower Seat Lift | | Subindex 2 | UIntegerT (8 Bit) | |
| RGB LED colour indicating lower seat lift. | | | | |
| Factory setting | 10 | (Cyan Flashing) | | |
| Value range | 0 | (OFF) | | |
| | 1 | (White) | | |
| | 2 | (White Flashing) | | |
| | 3 | (Green) | | |
| | 4 | (Green Flashing) | | |
| | 5 | (Blue) | | |
| | 6 | (Blue Flashing) | | |
| | 7 | (Yellow) | | |
| | 8 | (Yellow Flashing) | | |
| | 9 | (Cyan) | | |
| | 10 | (Cyan Flashing) | | |
| | 11 | (Purple) | | |
| | 12 | (Purple Flashing) | | |
| | 13 | (Red) | | |
| | 14 | (Red Flashing) | | |

8 Diagnosis

8.1 Diagnosis

| Device Status | Index 36 | Subindex 0 | UIntegerT (8 Bit) | ReadOnly |
|---|-----------------------|------------------------|-------------------|----------|
| Indicator for the current device condition and diagnosis state. | | | | |
| Factory setting | 0 | (Device is OK) | | |
| Value range | 0 | (Device is OK) | | |
| | 1 | (Maintenance required) | | |
| | 2 | (Out of specification) | | |
| | 3 | (Functional check) | | |
| | 4 | (Failure) | | |
| | (5 To 255) (Reserved) | | | |

8.1.1 Setup Data

| Active Setup | Index 100 | Subindex 0 | UIntegerT (8 Bit) | ReadOnly |
|-------------------------------------|-----------|-------------------|-------------------|----------|
| Type of the currently active setup. | | | | |
| Factory setting | 0 | (No Setup) | | |
| Value range | 0 | (No Setup) | | |
| | 1 | (Auto Setup) | | |
| | 2 | (Manual Setup) | | |
| | 3 | (Pigging Mode) | | |

| Stroke duration (energize) | Index 105 | Subindex 0 | RecordT (96 Bit) | ReadOnly |
|---|-------------------|-------------------|-------------------|----------|
| Taught stroke duration of solenoid valves to energize. | | | | |
| SV1 | | Subindex 1 | IntegerT (32 Bit) | |
| Taught stroke duration of solenoid valve 1 to energize. | | | | |
| Factory setting | 0 | (No Setup) | | |
| Value range [ms] | (1 To 100000) * 1 | (No Setup) | | |
| | 0 | | | |
| SV2 | | Subindex 2 | IntegerT (32 Bit) | |
| Taught stroke duration of solenoid valve 2 to energize. | | | | |
| Factory setting | 0 | (No Setup) | | |
| Value range [ms] | (1 To 100000) * 1 | (No Setup) | | |
| | 0 | | | |
| SV3 | | Subindex 3 | IntegerT (32 Bit) | |
| Taught stroke duration of solenoid valve 3 to energize. | | | | |
| Factory setting | 0 | (No Setup) | | |
| Value range [ms] | (1 To 100000) * 1 | (No Setup) | | |
| | 0 | | | |

| Stroke duration (de-energize) | Index 106 | Subindex 0 | RecordT (96 Bit) | ReadOnly |
|--|-------------------|-------------------|-------------------|----------|
| Taught stroke duration of solenoid valves to de-energize. | | | | |
| SV1 | | Subindex 1 | IntegerT (32 Bit) | |
| Taught stroke duration of solenoid valve 1 to de-energize. | | | | |
| Factory setting | 0 | (No Setup) | | |
| Value range [ms] | (1 To 100000) * 1 | (No Setup) | | |
| | 0 | | | |
| SV2 | | Subindex 2 | IntegerT (32 Bit) | |
| Taught stroke duration of solenoid valve 2 to de-energize. | | | | |
| Factory setting | 0 | (No Setup) | | |
| Value range [ms] | (1 To 100000) * 1 | (No Setup) | | |
| | 0 | | | |

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| SV3 | Subindex 3 | IntegerT (32 Bit) |
|--|-------------------|-------------------|
| Taught stroke duration of solenoid valve 3 to de-energize. | | |
| Factory setting | 0 | (No Setup) |
| Value range [ms] | (1 To 100000) * 1 | (No Setup) |
| | 0 | |

| Taught de-energized position | Index 101 | Subindex 0 | RecordT (48 Bit) | ReadOnly |
|---|---------------------|-------------------|-------------------|----------|
| Position saved in last setup of de-energized. | | | | |
| Sensor target position | | Subindex 1 | IntegerT (16 Bit) | |
| Sensor target position set at last setup. | | | | |
| Factory setting | 0 | (No Setup) | | |
| Value range [mm] | (120 To 1180) * 0.1 | (No Setup) | | |
| | 0 | | | |

| Taught energized position | Index 102 | Subindex 0 | RecordT (48 Bit) | ReadOnly |
|--|---------------------|-------------------|-------------------|----------|
| Position saved in last setup of energized. | | | | |
| Sensor target position | | Subindex 1 | IntegerT (16 Bit) | |
| Sensor target position set at last setup. | | | | |
| Factory setting | 0 | (No Setup) | | |
| Value range [mm] | (120 To 1180) * 0.1 | (No Setup) | | |
| | 0 | | | |

| Taught lower seat lift position | Index 103 | Subindex 0 | RecordT (48 Bit) | ReadOnly |
|---|---------------------|-------------------|-------------------|----------|
| Last taught lower seat lift. | | | | |
| Sensor target position | | Subindex 1 | IntegerT (16 Bit) | |
| Sensor target position set at last setup. | | | | |
| Factory setting | 0 | (No Setup) | | |
| Value range [mm] | (120 To 1180) * 0.1 | (No Setup) | | |
| | 0 | | | |

| Taught upper seat lift position | Index 104 | Subindex 0 | RecordT (48 Bit) | ReadOnly |
|---|---------------------|-------------------|-------------------|----------|
| Last taught upper seat lift. | | | | |
| Sensor target position | | Subindex 1 | IntegerT (16 Bit) | |
| Sensor target position set at last setup. | | | | |
| Factory setting | 0 | (No Setup) | | |
| Value range [mm] | (120 To 1180) * 0.1 | (No Setup) | | |
| | 0 | | | |

| | | | | |
|--|----------|-----------------------------|-------------------|--|
| External sensor logic | | Subindex 3 | UIntegerT (8 Bit) | |
| External sensor logic/state at last upper seat lift setup. | | | | |
| Factory setting | 0 | (No external sensor) | | |
| Value range | 0 | (No external sensor) | | |
| | 1 | (No external sensor) | | |
| | 2 | (High active) | | |
| | 3 | (Low active) | | |

8.2 Diagnostic Data

| Device Status | Index 36 | Subindex 0 | UIntegerT (8 Bit) | ReadOnly |
|---|-----------------------|------------------------|-------------------|----------|
| Indicator for the current device condition and diagnosis state. | | | | |
| Factory setting | 0 | (Device is OK) | | |
| Value range | 0 | (Device is OK) | | |
| | 1 | (Maintenance required) | | |
| | 2 | (Out of specification) | | |
| | 3 | (Functional check) | | |
| | 4 | (Failure) | | |
| | (5 To 255) (Reserved) | | | |

8 Diagnosis

| Alert Counters | Index 110 | Subindex 0 | RecordT (64 Bit) | ReadOnly |
|--------------------------------|----------------|------------|--------------------|----------|
| Counters of triggered alerts. | | | | |
| Warnings | | Subindex 1 | UIntegerT (32 Bit) | |
| Counter of triggered warnings. | | | | |
| Factory setting | 0 | | | |
| Value range | (0 To 2000000) | | | |
| Errors | | Subindex 2 | UIntegerT (32 Bit) | |
| Counter of triggered errors. | | | | |
| Factory setting | 0 | | | |
| Value range | (0 To 2000000) | | | |

| Teach Function Counter | Index 111 | Subindex 0 | RecordT (48 Bit) | ReadOnly |
|---|----------------|------------|--------------------|----------|
| Count the amount of teach functions (setups). | | | | |
| Total Teach Counter | | Subindex 1 | UIntegerT (32 Bit) | |
| Count the total amount of teach functions. | | | | |
| Factory setting | 0 | | | |
| Value range | (0 To 2000000) | | | |
| Resettable Teach Counter | | Subindex 2 | UIntegerT (16 Bit) | |
| Count the amount of teach functions since last reset. | | | | |
| Factory setting | 0 | | | |
| Value range | (0 To 65000) | | | |

| Travel Accumulator | Index 112 | Subindex 0 | RecordT (48 Bit) | ReadOnly |
|-------------------------------------|--------------------|------------|--------------------|----------|
| Travel distance in meter. | | | | |
| Total Travel Accumulator | | Subindex 1 | UIntegerT (32 Bit) | |
| Total distance in meter. | | | | |
| Factory setting | 0 | | | |
| Value range [m] | (0 To 2000000) * 1 | | | |
| Resettable Travel Accumulator | | Subindex 2 | UIntegerT (16 Bit) | |
| Distance in meter since last reset. | | | | |
| Factory setting | 0 | | | |
| Value range [m] | (0 To 65000) * 1 | | | |

| Resettable Water Hammer Counter | Index 113 | Subindex 0 | UIntegerT (16 Bit) | ReadOnly |
|---|--------------|------------|--------------------|----------|
| Count the amount of water hammers since last reset. | | | | |
| Value range | (0 To 65000) | | | |

| Valve cycle counter | Index 114 | Subindex 0 | RecordT (128 Bit) | ReadOnly |
|--|----------------|------------|-------------------|----------|
| Energize/De-energize cycle counter. | | | | |
| Resettable Valve Cycle Counter | | Subindex 1 | IntegerT (32 Bit) | |
| Sum of all valve cycles on all SVs since last reset. | | | | |
| Factory setting | 0 | | | |
| Value range | (0 To 2000000) | | | |
| SV1 Cycle Counter | | Subindex 2 | IntegerT (32 Bit) | |
| Total valve cycles of SV1. | | | | |
| Factory setting | 0 | | | |
| Value range | (0 To 2000000) | | | |

8 Diagnosis

| | | | | |
|--|--------------------|-------------------|--------------------|----------|
| SV2 Cycle Counter | Subindex 3 | IntegerT (32 Bit) | | |
| Total valve cycles of SV2. | | | | |
| Factory setting | 0 | | | |
| Value range | (0 To 2000000) | | | |
| SV3 Cycle Counter | Subindex 4 | IntegerT (32 Bit) | | |
| Total valve cycles of SV3. | | | | |
| Factory setting | 0 | | | |
| Value range | (0 To 2000000) | | | |
| Operating Hours | Index 123 | Subindex 0 | RecordT (80 Bit) | ReadOnly |
| Device operating hours | | | | |
| Total | | Subindex 1 | IntegerT (32 Bit) | |
| Total operating hours of the device. | | | | |
| Factory setting | 0 | | | |
| Value range [h] | (0 To 2000000) * 1 | | | |
| Resettable | | Subindex 2 | UIntegerT (16 Bit) | |
| Operating hours since last reset. | | | | |
| Factory setting | 0 | | | |
| Value range [h] | (0 To 65000) * 1 | | | |
| Timeout Error Counter | Index 124 | Subindex 0 | RecordT (48 Bit) | ReadOnly |
| Counting violations of stroke time limit. | | | | |
| Total Main | | Subindex 1 | UIntegerT (16 Bit) | |
| Counting the main timeout error. | | | | |
| Factory setting | 0 | | | |
| Value range | (0 To 65000) | | | |
| Total Upper Seat Lift | | Subindex 2 | UIntegerT (16 Bit) | |
| Counting the upper seat lift timeout error. | | | | |
| Factory setting | 0 | | | |
| Value range | (0 To 65000) | | | |
| Total Lower Seat Lift | | Subindex 3 | UIntegerT (16 Bit) | |
| Counting the lower eat lift timeout error. | | | | |
| Factory setting | 0 | | | |
| Value range | (0 To 65000) | | | |
| Resettable timeout Error Counter | Index 125 | Subindex 0 | RecordT (48 Bit) | ReadOnly |
| Counting violations of stroke time limit since last reset. | | | | |
| Resettable Main | | Subindex 1 | UIntegerT (16 Bit) | |
| Counting the main timeout error since last reset. | | | | |
| Value range | (0 To 65000) | | | |
| Resettable Upper Seat Lift | | Subindex 2 | UIntegerT (16 Bit) | |
| Counting the upper seat lift timeout error since last reset. | | | | |
| Value range | (0 To 65000) | | | |
| Resettable Lower Seat Lift | | Subindex 3 | UIntegerT (16 Bit) | |
| Counting the lower seat lift timeout error since last reset. | | | | |
| Value range | (0 To 65000) | | | |
| Temperature | Index 126 | Subindex 0 | RecordT (48 Bit) | ReadOnly |
| Temperature monitoring | | | | |

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| | | |
|-----------------------------|------------------|-------------------|
| Current | Subindex 1 | IntegerT (16 Bit) |
| Current core temperature | | |
| Value range [°C] | (-20 To 100) * 1 | |
| Minimum | Subindex 2 | IntegerT (16 Bit) |
| Minimum temperature to date | | |
| Value range [°C] | (-20 To 100) * 1 | |
| Maximum | Subindex 3 | IntegerT (16 Bit) |
| Maximum temperature to date | | |
| Value range [°C] | (-20 To 100) * 1 | |

| Active events | Index 88 | Subindex 0 | RecordT (32 Bit) | ReadOnly |
|--|----------|-------------------|------------------|----------|
| Bit mask of current pending IO-Link events | | | | |
| 0x8DFF | | bitOffset 5 | BooleanT | |
| Test Event 2 | | | | |
| Factory setting | 0 | (Inactive) | | |
| Value range | 0 | (Inactive) | | |
| | 1 | (Active) | | |
| 0x8DFE | | bitOffset 4 | BooleanT | |
| Test Event 1 | | | | |
| Factory setting | 0 | (Inactive) | | |
| Value range | 0 | (Inactive) | | |
| | 1 | (Active) | | |
| 0x4220 | | bitOffset 2 | BooleanT | |
| Temperature underrun | | | | |
| Factory setting | 0 | (Inactive) | | |
| Value range | 0 | (Inactive) | | |
| | 1 | (Active) | | |
| 0x4210 | | bitOffset 1 | BooleanT | |
| Temperature overrun | | | | |
| Factory setting | 0 | (Inactive) | | |
| Value range | 0 | (Inactive) | | |
| | 1 | (Active) | | |
| 0x5010 | | bitOffset 0 | BooleanT | |
| Component malfunction | | | | |
| Factory setting | 0 | (Inactive) | | |
| Value range | 0 | (Inactive) | | |
| | 1 | (Active) | | |

| BLOB | Index 49 | Subindex 0 | IntegerT (16 Bit) | ReadOnly |
|---------------------------------|--------------|-------------------|-------------------|----------|
| Status of data package readout. | | | | |
| Factory setting | -4096 | (Teaching) | | |
| Value range | 0 | (Idle) | | |
| | -4096 | (Teaching) | | |
| | -4097 | (Position) | | |
| | -4098 | (Events) | | |
| | -4099 | (Counter) | | |

8 Diagnosis

8.3 Latest valve state information

| Device Status | Index 36 | Subindex 0 | UIntegerT (8 Bit) | ReadOnly |
|---|-----------------------|------------------------|-------------------|----------|
| Indicator for the current device condition and diagnosis state. | | | | |
| Factory setting | 0 | (Device is OK) | | |
| Value range | 0 | (Device is OK) | | |
| | 1 | (Maintenance required) | | |
| | 2 | (Out of specification) | | |
| | 3 | (Functional check) | | |
| | 4 | (Failure) | | |
| | (5 To 255) (Reserved) | | | |

| Latest energized position (main) | Index 115 | Subindex 0 | RecordT (80 Bit) | ReadOnly |
|----------------------------------|---------------------|------------------|-------------------|----------|
| FIFO: last 5 energized positions | | | | |
| #1 | | Subindex 1 | IntegerT (16 Bit) | |
| Latest energized position #1 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [mm] | (120 To 1180) * 0.1 | (No Data) | | |
| | 0 | (No Data) | | |
| #2 | | Subindex 2 | IntegerT (16 Bit) | |
| Latest energized position #2 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [mm] | (120 To 1180) * 0.1 | (No Data) | | |
| | 0 | (No Data) | | |
| #3 | | Subindex 3 | IntegerT (16 Bit) | |
| Latest energized position #3 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [mm] | (120 To 1180) * 0.1 | (No Data) | | |
| | 0 | (No Data) | | |
| #4 | | Subindex 4 | IntegerT (16 Bit) | |
| Latest energized position #4 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [mm] | (120 To 1180) * 0.1 | (No Data) | | |
| | 0 | (No Data) | | |
| #5 | | Subindex 5 | IntegerT (16 Bit) | |
| Latest energized position #5 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [mm] | (120 To 1180) * 0.1 | (No Data) | | |
| | 0 | (No Data) | | |

| Latest de-energized position | Index 116 | Subindex 0 | RecordT (80 Bit) | ReadOnly |
|-------------------------------------|---------------------|------------------|-------------------|----------|
| FIFO: last 5 de-energized positions | | | | |
| #1 | | Subindex 1 | IntegerT (16 Bit) | |
| Latest de-energized position #1 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [mm] | (120 To 1180) * 0.1 | (No Data) | | |
| | 0 | (No Data) | | |
| #2 | | Subindex 2 | IntegerT (16 Bit) | |
| Latest de-energized position #2 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [mm] | (120 To 1180) * 0.1 | (No Data) | | |
| | 0 | (No Data) | | |

8 Diagnosis

| #3 | Subindex 3 | IntegerT (16 Bit) |
|---------------------------------|---------------------|-------------------|
| Latest de-energized position #3 | | |
| Factory setting | 0 | (No Data) |
| Value range [mm] | (120 To 1180) * 0.1 | (No Data) |
| | 0 | |
| #4 | Subindex 4 | IntegerT (16 Bit) |
| Latest de-energized position #4 | | |
| Factory setting | 0 | (No Data) |
| Value range [mm] | (120 To 1180) * 0.1 | (No Data) |
| | 0 | |
| #5 | Subindex 5 | IntegerT (16 Bit) |
| Latest de-energized position #5 | | |
| Factory setting | 0 | (No Data) |
| Value range [mm] | (120 To 1180) * 0.1 | (No Data) |
| | 0 | |

| Latest energize time duration SV1 | Index 117 | Subindex 0 | RecordT (160 Bit) | ReadOnly |
|---|-------------------|------------|-------------------|----------|
| FIFO: last 5 energize time durations of SV1 | | | | |
| #1 | | Subindex 1 | IntegerT (32 Bit) | |
| Latest energize time duration SV1 #1 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| #2 | | Subindex 2 | IntegerT (32 Bit) | |
| Latest energize time duration SV1 #2 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| #3 | | Subindex 3 | IntegerT (32 Bit) | |
| Latest energize time duration SV1 #3 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| #4 | | Subindex 4 | IntegerT (32 Bit) | |
| Latest energize time duration SV1 #4 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| #5 | | Subindex 5 | IntegerT (32 Bit) | |
| Latest energize time duration SV1 #5 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |

| Latest energize time duration SV2 | Index 118 | Subindex 0 | RecordT (160 Bit) | ReadOnly |
|---|-----------------------|------------|-------------------|----------|
| FIFO: last 5 energize time durations of SV2 | | | | |
| #1 | | Subindex 1 | IntegerT (32 Bit) | |
| Latest energize time duration SV2 #1 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) * 1 | | | |
| | 0 | (No Data) | | |

8 Diagnosis

| | | | | |
|--|-------------------|-------------------|-------------------|----------|
| #2 | Subindex 2 | IntegerT (32 Bit) | | |
| Latest energize time duration SV2 #2 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| #3 | Subindex 3 | IntegerT (32 Bit) | | |
| Latest energize time duration SV2 #3 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| #4 | Subindex 4 | IntegerT (32 Bit) | | |
| Latest energize time duration SV2 #4 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| #5 | Subindex 5 | IntegerT (32 Bit) | | |
| Latest energize time duration SV2 #5 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| Latest energize time duration SV3 | Index 119 | Subindex 0 | RecordT (160 Bit) | ReadOnly |
| FIFO: last 5 energize time durations of SV3 | | | | |
| #1 | Subindex 1 | IntegerT (32 Bit) | | |
| Latest energize time duration SV3 #1 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| #2 | Subindex 2 | IntegerT (32 Bit) | | |
| Latest energize time duration SV3 #2 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| #3 | Subindex 3 | IntegerT (32 Bit) | | |
| Latest energize time duration SV3 #3 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| #4 | Subindex 4 | IntegerT (32 Bit) | | |
| Latest energize time duration SV3 #4 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| #5 | Subindex 5 | IntegerT (32 Bit) | | |
| Latest energize time duration SV3 #5 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| Latest de-energize time duration SV1 | Index 120 | Subindex 0 | RecordT (160 Bit) | ReadOnly |
| FIFO: last 5 de-energize time durations of SV1 | | | | |

8 Diagnosis

| | | | | |
|--|------------------------|------------------|-------------------|--|
| #1 | | Subindex 1 | IntegerT (32 Bit) | |
| Latest de-energize time duration SV1 #1 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) 0 | * 1 (No Data) | | |
| #2 | | Subindex 2 | IntegerT (32 Bit) | |
| Latest de-energize time duration SV1 #2 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) 0 | * 1 (No Data) | | |
| #3 | | Subindex 3 | IntegerT (32 Bit) | |
| Latest de-energize time duration SV1 #3 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) 0 | * 1 (No Data) | | |
| #4 | | Subindex 4 | IntegerT (32 Bit) | |
| Latest de-energize time duration SV1 #4 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) 0 | * 1 (No Data) | | |
| #5 | | Subindex 5 | IntegerT (32 Bit) | |
| Latest de-energize time duration SV1 #5 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) 0 | * 1 (No Data) | | |
| Latest de-energize time duration SV2 | | | | |
| FIFO: last 5 de-energize time durations of SV2 | | | | |
| #1 | | Subindex 1 | IntegerT (32 Bit) | |
| Latest de-energize time duration SV2 #1 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) 0 | * 1 (No Data) | | |
| #2 | | Subindex 2 | IntegerT (32 Bit) | |
| Latest de-energize time duration SV2 #2 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) 0 | * 1 (No Data) | | |
| #3 | | Subindex 3 | IntegerT (32 Bit) | |
| Latest de-energize time duration SV2 #3 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) 0 | * 1 (No Data) | | |
| #4 | | Subindex 4 | IntegerT (32 Bit) | |
| Latest de-energize time duration SV2 #4 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) 0 | * 1 (No Data) | | |
| #5 | | Subindex 5 | IntegerT (32 Bit) | |
| Latest de-energize time duration SV2 #5 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) 0 | * 1 (No Data) | | |

8 Diagnosis

| Latest de-energize time duration SV3 | Index 122 | Subindex 0 | RecordT (160 Bit) | ReadOnly |
|--|-------------------|------------------|-------------------|----------|
| FIFO: last 5 de-energize time durations of SV3 | | | | |
| #1 | | Subindex 1 | IntegerT (32 Bit) | |
| Latest de-energize time duration SV3 #1 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| #2 | | Subindex 2 | IntegerT (32 Bit) | |
| Latest de-energize time duration SV3 #2 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| #3 | | Subindex 3 | IntegerT (32 Bit) | |
| Latest de-energize time duration SV3 #3 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| #4 | | Subindex 4 | IntegerT (32 Bit) | |
| Latest de-energize time duration SV3 #4 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |
| #5 | | Subindex 5 | IntegerT (32 Bit) | |
| Latest de-energize time duration SV3 #5 | | | | |
| Factory setting | 0 | (No Data) | | |
| Value range [ms] | (1 To 2147483647) | * 1 | | |
| | 0 | (No Data) | | |

9 Events

| Code | Device status | PQ* | Class | Name | Description |
|------------------|--------------------------|-------|---------|-----------------------------|---|
| 0x4210 16912d | 2 (Out of specification) | valid | Warning | Device temperature overrun | Clear source of heat |
| 0x4220 16928d | 2 (Out of specification) | valid | Warning | Device temperature underrun | Insulate device |
| 0x5010 20496d | 3 (Functional check) | valid | Error | Component malfunction | Repair or exchange |
| 0x8DFE 36350d | 1 (Maintenance required) | valid | Warning | Test Event 1 | Event appears by setting index 2 to value 240, Event disappears by setting index 2 to value 241 |
| 0x8DFF 36351d | 1 (Maintenance required) | valid | Warning | Test Event 2 | Event appears by setting index 2 to value 242, Event disappears by setting index 2 to value 243 |



Events are raised by the device itself to notify irregular device states
 PQ* = Process data quality

10 Error types

| Code | Name | Description |
|------------------|---------------------------------------|---|
| 0x8000 32768d | Device application error - no details | Service was denied by the technology-specific application. No detailed root-cause information is available. |
| 0x8011 32785d | Index not available | Read or write access attempt to a non-existing index. |
| 0x8012 32786d | Subindex not available | Read or write access attempt to a non-existing subindex of an existing index. |
| 0x8020 32800d | Service temporarily not available | Parameter not accessible due to the current state of the technology-specific application. |
| 0x8023 32803d | Access denied | Write access to a read-only parameter or read access to write-only parameter. |
| 0x8030 32816d | Parameter value out of range | Written parameter value is outside of the permitted value range. |
| 0x8033 32819d | Parameter length overrun | Written parameter is longer than specified. |
| 0x8034 32820d | Parameter length underrun | Written parameter is shorter than specified. |
| 0x8035 32821d | Function unavailable | Written command is not supported by the technology-specific application |
| 0x8036 32822d | Function temporarily unavailable | Written command is unavailable due to the current state of the technology-specific application. |
| 0x8040 32832d | Invalid parameter set | Written single parameter value collides with other existing parameter settings. |
| 0x8041 32833d | Inconsistent parameter set | Parameter set inconsistencies at the end of block parameter transfer. Device plausibility check failed. |
| 0x8082 32898d | Application not ready | Read or write access denied. The technology-specific application is temporarily unavailable. |



Error types are used for the ISDU response. Values unequal '0' indicate the cause of a failed ISDU read or write service.