



# IO-Link Parameter Datasheet



Retroreflective area sensor



OGR4000-R305-2EP-IO\* series

Support: fa-info@pepperl-fuchs.com  
Internet: www.pepperl-fuchs.com  
DOCT-A5C6 - Version 1.00.000 / 2024-12-02

## General Information

### Device Identification

|           |                    |
|-----------|--------------------|
| Vendor ID | 1 (0x0001)         |
| Device ID | 1052673 (0x101001) |

### Communication Characteristics

|                                |                             |
|--------------------------------|-----------------------------|
| IO-Link revision               | V1.1 (specification V1.1.4) |
| IO-Link backward compatibility | n/a                         |
| Data transmission rate         | COM2 (38.4 kbit/s)          |
| Min. cycle time                | 2.3 ms                      |
| Process data input             | 1 byte                      |
| Process data output            | 2 bits                      |
| SIO mode support               | yes                         |
| Compatible master port type    | Class A, Class B (see NOTE) |

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

### Features

|                        |     |
|------------------------|-----|
| Data Storage           | Yes |
| Block Parameterization | Yes |

### Profile

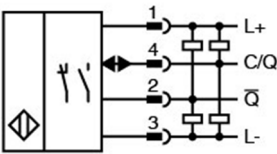
|                                    |                |
|------------------------------------|----------------|
| Smart Sensor – SSP 2.1             | 4 (0x0004)     |
| Identification and Diagnosis       | 16384 (0x4000) |
| Function Class – Sensor Control    | 32780 (0x800C) |
| Function Class – Locator           | 33025 (0x8101) |
| Function Class – Product URI       | 33026 (0x8102) |
| Function Class – Teach Recommended | 33027 (0x8103) |
|                                    |                |
|                                    |                |

## Supported Product Variants

| Product ID | Product Name                | Description                                                                              | Connector           |
|------------|-----------------------------|------------------------------------------------------------------------------------------|---------------------|
| 70154427   | OGR4000-R305-2EP-IO-V1      | R305, 4000 mm, active low (dark-on), configurable, antivalent output, M12 plug, 4-pin    | Plug, M12, 4-pin    |
| 70154431   | OGR4000-R305-2EP-IO-0,3M-V1 | R305, 4000 mm, active low (dark-on), configurable, antivalent output, M12 pigtail, 4-pin | Pigtail, M12, 4-pin |
| 70154432   | OGR4000-R305-2EP-IO         | R305, 4000 mm, active low (dark-on), configurable, antivalent output, cable 2 m, 4-pole  | Cable, 2m, 4-pin    |

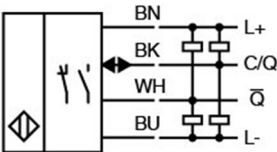
## Connection

### Connection Diagram



#### Plug/Pigtail, M12, 4-pin

- 1: Brown - +24V
- 2: White - Q2
- 3: Blue - 0V
- 4: Black - C/Q



#### Cable, 4-pin

- 1: Brown - +24V
- 2: White - Q2
- 3: Blue - 0V
- 4: Black - C/Q

## Process Data

### Process Data Input

| Octet | BitOffs | Name                        | Data type | Length | Value    | Unit | Description                                                                                                                                                                                                           |
|-------|---------|-----------------------------|-----------|--------|----------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0     | 0       | SSC –<br>Switching Signal   | Boolean   | 1 bit  | 0<br>1   |      | Indicates the detection status of a switching signal channel depending on sensor data and SSC Config.<br><i>Low</i><br><i>High</i>                                                                                    |
|       | 1       | DSC –<br>Compensation Alarm | Boolean   | 1 bit  | 0<br>1   |      | Indicates the current status of the compensation alarm. The alarm becomes active if the compensation reserve is at the limit and the sensor signal cannot be compensated anymore.<br><i>Inactive</i><br><i>Active</i> |
|       | 2       | MV –<br>Object Height       | UInteger  | 6 bit  | 0 ... 60 | mm   | Shows estimated height of the object resulting from the evaluation of the sensor beams.                                                                                                                               |

### Process Data Output

| Octet | BitOffs | Name                          | Data type | Length | Value  | Unit | Description                                                                                                                                                                              |
|-------|---------|-------------------------------|-----------|--------|--------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0     | 0       | CSC.1 –<br>Sensor Control     | Boolean   | 1 bit  | 0<br>1 |      | Controls the sensor emitter. If disabled, a substitute value is applied to the process data.<br><i>Enabled</i><br><i>Disabled</i>                                                        |
|       | 1       | CSC.2 –<br>Evaluation Control | Boolean   | 1 bit  | 0<br>1 |      | Controls the signal evaluation. If disabled, signal evaluation is inhibited. The last evaluation state and value is maintained in the process data.<br><i>Enabled</i><br><i>Disabled</i> |

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

## Parameter Data

| Identification |                          |        |           |                     |                                         |                                                                                             |    |   |
|----------------|--------------------------|--------|-----------|---------------------|-----------------------------------------|---------------------------------------------------------------------------------------------|----|---|
| Index          | Parameter                | Access | Data type | Length              | Default                                 | Description                                                                                 | DS | R |
| 16<br>(0x10)   | Vendor Name              | ro     | String    | 13 byte             | Pepperl+Fuchs                           | The vendor name that is assigned to a Vendor ID.                                            |    |   |
| 17<br>(0x11)   | Vendor Text              | ro     | String    | 29 byte             | www.pepperl-fuchs.com/io-link           | Additional information about the vendor.                                                    |    |   |
| 18<br>(0x12)   | Product Name             | ro     | String    | max.<br>32 byte     | See table<br>Supported Product Variants | Complete product name.                                                                      |    |   |
| 19<br>(0x13)   | Product ID               | ro     | String    | max.<br>32 byte     | See table<br>Supported Product Variants | Vendor-specific product or type identification (e.g., item number or model number).         |    |   |
| 20<br>(0x14)   | Product Text             | ro     | String    | max.<br>32 byte     | Retroreflective area sensor             | Additional product information for the device.                                              |    |   |
| 21<br>(0x15)   | Serial Number            | ro     | String    | 14 byte             |                                         | Unique, vendor-specific identifier of the individual device.                                |    |   |
| 22<br>(0x16)   | Hardware Revision        | ro     | String    | 7 byte              | HW**.**                                 | Unique, vendor-specific identifier of the hardware revision of the individual device.       |    |   |
| 23<br>(0x17)   | Firmware Revision        | ro     | String    | 7 byte              | FW**.**                                 | Unique, vendor-specific identifier of the firmware revision of the individual device.       |    |   |
| 24<br>(0x18)   | Application Specific Tag | rw     | String    | max.<br>32 byte     | Your automation, our passion.           | Possibility to mark a device with user- or application-specific information.                | Y  | F |
| 25<br>(0x19)   | Function Tag             | rw     | String    | max.<br>32 byte     | ***                                     | Possibility to mark a device with function-specific information.                            | Y  | F |
| 26<br>(0x1A)   | Location Tag             | rw     | String    | max.<br>32 byte     | ***                                     | Possibility to mark a device with location-specific information.                            | Y  | F |
| 27<br>(0x1B)   | Product URI              | ro     | String    | max.<br>100<br>byte | https://pefu.de/<serial number>         | Provides a unique instance identification compliant to DIN-SPEC 91406.                      |    |   |
| 192<br>(0xC0)  | Installation Tag         | rw     | String    | max.<br>32 byte     | ***                                     | Possibility to mark the device with the installation or initial commissioning data or date. |    | F |

| Diagnosis     |                                  |        |                     |         |          |         |                             |      |                                                                                                                                                                                                                                                             |    |    |
|---------------|----------------------------------|--------|---------------------|---------|----------|---------|-----------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| Index<br>.sub | Parameter                        | Access | Data type           | Length  | Bitoffs. | Default | Value                       | Unit | Description                                                                                                                                                                                                                                                 | DS | R  |
| 36<br>(0x24)  | Device Status                    | ro     | UInteger            | 8 bit   |          | 0       | 0<br>1<br>2<br>3<br>4       |      | Indicator for the current device condition and diagnosis state.<br><i>Device is OK</i><br><i>Maintenance required</i><br><i>Out of specification</i><br><i>Functional check</i><br><i>Failure</i>                                                           |    | FA |
| 37<br>(0x25)  | Detailed Device Status           | ro     | Array <sup>SO</sup> | 12 byte |          |         |                             |      | List of all currently pending events in the device.                                                                                                                                                                                                         |    | FA |
| .1            | Element 1                        |        | Octetstr            | 3 byte  | 72       | 0       |                             |      |                                                                                                                                                                                                                                                             |    |    |
| .2            | Element 2                        |        | Octetstr            | 3 byte  | 48       | 0       |                             |      |                                                                                                                                                                                                                                                             |    |    |
| .3            | Element 3                        |        | Octetstr            | 3 byte  | 24       | 0       |                             |      |                                                                                                                                                                                                                                                             |    |    |
| .4            | Element 4                        |        | Octetstr            | 3 byte  | 0        | 0       |                             |      |                                                                                                                                                                                                                                                             |    |    |
| 224<br>(0xE0) | Operating Hours                  | ro     | UInteger            | 32 bit  |          |         | 0 ...<br>2 <sup>32</sup> -1 | h    | Shows the overall hours of operation since initial commissioning.                                                                                                                                                                                           |    |    |
| 225<br>(0xE1) | Temperature Indicator            | ro     | UInteger            | 8 bit   |          |         | 0<br>1<br>2<br>3<br>4       |      | Indicates the operation at ambient temperatures close to or in excess of specification limits.<br><i>Operating condition OK</i><br><i>Close to upper limit</i><br><i>Upper limit exceeded</i><br><i>Close to lower limit</i><br><i>Lower limit exceeded</i> |    |    |
| 226<br>(0xE2) | Temperature Monitor              | ro     | Record              | 9 byte  |          |         |                             |      | Contains parameters showing current and past conditions of temperature exposure since initial commissioning.                                                                                                                                                |    |    |
| .1            | Overtemperature Operating Hours  | ro     | UInteger            | 32 bit  | 40       |         | 0 ...<br>2 <sup>32</sup> -1 | h    | Shows the overall hours of powered operation above the specified temperature limit since initial commissioning.                                                                                                                                             |    |    |
| .2            | Overtemperature Exceeded Counter | ro     | UInteger            | 16 bit  | 24       |         | 0 ...<br>65535              |      | Shows the number of transitions to operating temperatures above the specified limit in powered operation since initial commissioning.                                                                                                                       |    |    |
| .3            | Maximum Operating Temperature    | ro     | Integer             | 8 bit   | 16       |         | -127 ...<br>128             | °C   | Shows the maximum observed temperature in powered operation since initial commissioning.                                                                                                                                                                    |    |    |
| .4            | Minimum Operating Temperature    | ro     | Integer             | 8 bit   | 8        |         | -127 ...<br>128             | °C   | Shows the minimum observed temperature in powered operation since initial commissioning.                                                                                                                                                                    |    |    |
| .5            | Device Operating Temperature     | ro     | Integer             | 8 bit   | 0        |         | -127 ...<br>128             | °C   | Shows the currently observed operating temperature of the device.                                                                                                                                                                                           |    |    |
| 227<br>(0xE3) | Power Monitor                    | ro     | Record              | 12 byte |          |         |                             |      | Contains parameters showing current and past conditions of power cycles since initial commissioning.                                                                                                                                                        |    |    |
| .1            | Power Cycle                      | ro     | UInteger            | 32 bit  | 96       |         | 0 ...<br>2 <sup>32</sup> -1 |      | Shows the number of power cycles since initial commissioning.                                                                                                                                                                                               |    |    |
| .2            | Maximum Uptime                   | ro     | UInteger            | 32 bit  | 64       |         | 0 ...<br>2 <sup>32</sup> -1 | s    | Shows the maximum observed powered operating time between power cycles in seconds since initial commissioning.                                                                                                                                              |    |    |
| .3            | Average Uptime                   | ro     | UInteger            | 32 bit  | 32       |         | 0 ...<br>2 <sup>32</sup> -1 | s    | Shows the average observed powered operating time between power cycles in seconds since initial commissioning.                                                                                                                                              |    |    |
| .4            | Uptime                           | ro     | UInteger            | 32 bit  | 0        |         | 0 ...<br>2 <sup>32</sup> -1 | s    | Shows the current operating time since the last power cycle in seconds.                                                                                                                                                                                     |    |    |

| Diagnosis                   |                                    |               |                      |               |                 |                |              |             |                                                                                                                                                                                       |           |          |
|-----------------------------|------------------------------------|---------------|----------------------|---------------|-----------------|----------------|--------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| <i>Index</i><br><i>.sub</i> | <i>Parameter</i>                   | <i>Access</i> | <i>Data type</i>     | <i>Length</i> | <i>Bitoffs.</i> | <i>Default</i> | <i>Value</i> | <i>Unit</i> | <i>Description</i>                                                                                                                                                                    | <i>DS</i> | <i>R</i> |
| 176<br>(0xB0)               | Device Characteristic              | ro            | Record               | 6 byte        |                 |                |              |             | Shows relevant key characteristics of the device for use in applications.                                                                                                             |           |          |
|                             | .1 Min. Detection Range            | ro            | Integer              | 16 bit        | 32              | 0              |              | mm          | Shows the value of the minimum specified detection range.                                                                                                                             |           |          |
|                             | .2 Max. Detection Range            | ro            | Integer              | 16 bit        | 16              | 4000           |              | mm          | Shows the value of the maximum specified detection range.                                                                                                                             |           |          |
|                             | .3 Supply Current Requirement      | ro            | UInteger             | 16 bit        | 0               | 35             |              | mA          | Shows the maximum specified supply current for the device excluding load.                                                                                                             |           |          |
| 238<br>(0xEE)               | Device Operating State             | ro            | Record <sup>S0</sup> | 1 byte        |                 |                |              |             | Provides information on the current state of device operation depending on remote controlled signals or parameter settings.                                                           |           |          |
|                             | .1 Sensor Control                  | ro            | Boolean              | 1 bit         | 0               | 0              | 0<br>1       |             | Indicates if sensor operation is inhibited by any remote-control signal (process data or parameter value) or by an internal error condition.<br><br><i>Disabled</i><br><i>Enabled</i> |           |          |
|                             | .2 Local Control (in IO-Link mode) | ro            | Boolean              | 1 bit         | 1               | 0              | 0<br>1       |             | Indicates that local control elements are temporarily enabled for adjustment or teach-in in IO-Link mode.<br><br><i>Disabled</i><br><i>Enabled</i>                                    |           |          |
| 239<br>(0xEF)               | I/O Feature                        | ro            | UInteger             | 16 bit        |                 | 2              | 2            |             | Shows the supported I/O features of the device.<br><br><i>Second signal in- / output on pin 2 / white wire</i>                                                                        |           |          |

| Parameterization & Configuration |                                               |        |           |        |          |         |                         |      |                                                                                                                                                                                                                                                                                                      |    |    |
|----------------------------------|-----------------------------------------------|--------|-----------|--------|----------|---------|-------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| Index<br>.sub                    | Parameter                                     | Access | Data type | Length | Bitoffs. | Default | Value                   | Unit | Description                                                                                                                                                                                                                                                                                          | DS | R  |
| 56<br>(0x38)                     | SSC Param - SP                                | rw     | Integer   | 16 bit |          | 100     | 100                     | %    | The setpoint value is fixed at 100% for optimum detection.                                                                                                                                                                                                                                           | Y  | FA |
| 57<br>(0x39)                     | SSC Config - Logic                            | rw     | UInteger  | 8 bit  |          | 0       | 0<br>1                  |      | Defines the logical representation of the switching signal SSC in the process data.<br><i>High active</i><br><i>Low active</i>                                                                                                                                                                       | Y  | FA |
| 64<br>(0x40)                     | SSC Config Ext                                | rw     | Record    | 5 byte |          |         |                         |      | Provides configuration options for switching delay functions and timings for switching signal channel.                                                                                                                                                                                               | Y  | FA |
| .1                               | Off delay /<br>One-Shot delay                 | rw     | UInteger  | 16 bit | 24       | 0       | 0 ...<br>60000          | ms   | Defines the switching delay for an on-to-off transition or the minimum 'on' time after an off-to-on transition of the switching signal depending on the delay mode setting. (0: disabled).                                                                                                           | Y  | FA |
| .2                               | On Delay                                      | rw     | UInteger  | 16 bit | 8        | 0       | 0 ...<br>60000          | ms   | Defines the switching delay for an off-to-on transition of the switching signal. (0: disabled).                                                                                                                                                                                                      | Y  | FA |
| .3                               | Delay Mode                                    | rw     | UInteger  | 8 bit  | 0        | 0       | 0<br>1                  |      | Selects between a combination of 'on' and 'off' delay times or 'on' and 'one-shot' delay times.<br><i>On / Off delay</i><br><i>On delay / One shot</i>                                                                                                                                               | Y  | FA |
| 59<br>(0x3B)                     | Teach Result                                  | ro     | Record    | 1 byte |          |         |                         |      | Shows the complete result information of the teach procedure including current state and result flags.                                                                                                                                                                                               |    | FA |
| .1                               | State                                         | ro     | UInteger  | 4 bit  | 0        | 0       | 0<br>1<br>4<br>5<br>7   |      | Indicates the current state of the teach procedure.<br><i>Idle</i><br><i>SP Success</i><br><i>Wait for command</i><br><i>Busy</i><br><i>Error</i>                                                                                                                                                    |    | FA |
| .2                               | Flag SP TP1                                   | ro     | Boolean   | 1 bit  | 4        | 0       | 0<br>1                  |      | Indicates the current teach result for the teach point.<br><i>Initial or not ok</i><br><i>Ok</i>                                                                                                                                                                                                     |    | FA |
| .3                               | Flag SP TP2                                   | ro     | Boolean   | 1 bit  | 5        | 0       | 0<br>1                  |      | Indicates the current teach result for the teach point.<br><i>Initial or not ok</i><br><i>Ok</i>                                                                                                                                                                                                     |    | FA |
| 80<br>(0x50)                     | Teach Config – Operation Mode                 | rw     | UInteger  | 8 bit  |          | 0       | 0<br>1<br>2<br>3<br>255 |      | Selects the operation mode that is used after the teach-in has been performed.<br><i>Standard (contrast 20%)</i><br><i>High resolution (contrast 10%)</i><br><i>Standard with conveyor belt suppression</i><br><i>High Resolution with conveyor belt suppression</i><br><i>Custom contrast value</i> | Y  | FA |
| 81<br>(0x51)                     | Teach Config – Contrast Value All Other Beams | rw     | UInteger  | 8 bit  |          | 40      | 10 ...<br>90            | %    | Defines the contrast value for all other beams except the lowest beam of those beams that are enabled (not blanked) if the custom contrast value operation mode is used.                                                                                                                             | Y  | FA |
| 82<br>(0x52)                     | Teach Config – Contrast Value Lowest Beam     | rw     | UInteger  | 8 bit  |          | 40      | 10 ...<br>90            | %    | Defines the contrast value for the lowest beam of those beams that are enabled (not blanked) if the custom contrast value operation mode is used.                                                                                                                                                    | Y  | FA |

| Parameterization & Configuration |                                  |               |                      |               |                 |                |                                           |             |                                                                                                                                                                                                                                                                                                                                                      |           |          |
|----------------------------------|----------------------------------|---------------|----------------------|---------------|-----------------|----------------|-------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| <i>Index</i><br><i>.sub</i>      | <i>Parameter</i>                 | <i>Access</i> | <i>Data type</i>     | <i>Length</i> | <i>Bitoffs.</i> | <i>Default</i> | <i>Value</i>                              | <i>Unit</i> | <i>Description</i>                                                                                                                                                                                                                                                                                                                                   | <i>DS</i> | <i>R</i> |
| 83<br>(0x53)                     | Alignment mode                   | rw            | UInteger             | 8 bit         |                 | 0              | 0<br>1                                    |             | Provides the ability to enable the alignment mode. If enabled, a bright light spot is activated to facilitate alignment of the sensor to the reflector. An event is triggered, if enabled. After a power cycle the feature will be disabled.<br><i>Disabled</i><br><i>Enabled</i>                                                                    |           | FA       |
| 97<br>(0x61)                     | Eval Config – Signal Filter      | rw            | UInteger             | 8 bit         |                 | 0              | 0<br>1<br>2<br>3<br>4<br>5                |             | Defines the grade of filtering in the signal evaluation. A higher filtering improves stability in critical applications but increases the response time.<br><i>Filter time factor 1</i><br><i>Filter time factor 2</i><br><i>Filter time factor 4</i><br><i>Filter time factor 8</i><br><i>Filter time factor 16</i><br><i>Filter time factor 32</i> | Y         | FA       |
| 98<br>(0x62)                     | Eval Config - Compensation       | rw            | Record               | 2 byte        |                 |                |                                           |             | Defines the signal compensation characteristics.                                                                                                                                                                                                                                                                                                     | Y         | FA       |
|                                  | .1 Mode                          |               | UInteger             |               | 8               | 1              | 0<br>1                                    |             | Defines the operation mode of the signal compensation.<br>Off<br>Continuous                                                                                                                                                                                                                                                                          | Y         | FA       |
|                                  | .2 Timing                        |               | UInteger             |               | 0               | 0              | 0<br>1<br>2<br>3                          |             | Defines the timing characteristics of the signal compensation if it is enabled.<br>Standard<br>Slow<br>Fast<br>Manufacturer specific (reserved)                                                                                                                                                                                                      | Y         | FA       |
| 99<br>(0x63)                     | Eval Config – Beam Blanking Zone | rw            | UInteger             | 8 bit         |                 | 0              | 0b ...<br>11111b<br>(decimal<br>0 ... 31) |             | Defines which beams are blanked. If the corresponding bit is set to '1', beam blanking is activated and the beam is switched off. Bits 0 to 4 represent beams 1 to 5 respectively.                                                                                                                                                                   | Y         | FA       |
| 104<br>(0x68)                    | PD Output Config                 | rw            | Record <sup>S0</sup> | 1 byte        |                 |                |                                           |             | Defines which PD Output data are enabled to control the sensor function.                                                                                                                                                                                                                                                                             | Y         | FA       |
|                                  | .1 Sensor Control                | rw            | Boolean              | 1 bit         | 0               | 0              | 0<br>1                                    |             | Enabled: The sensor function is controlled via process data output. A '1' at 'PD Output - Sensor Control' disables the sensor. Object detection is inhibited.<br><i>Disabled</i><br><i>Enabled</i>                                                                                                                                                   | Y         | FA       |
|                                  | .2 Evaluation Control            | rw            | Boolean              | 1 bit         | 0               | 0              | 0<br>1                                    |             | Enabled: The signal evaluation is controlled via process data output. A '1' at 'PD Output - Evaluation Control' inhibits signal evaluation. The last evaluation state is maintained.<br><i>Disabled</i><br><i>Enabled</i>                                                                                                                            | Y         | FA       |

| Parameterization & Configuration |                                    |        |                      |        |          |         |                              |      |                                                                                                                                                                                                                                                                                                   |    |    |
|----------------------------------|------------------------------------|--------|----------------------|--------|----------|---------|------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| Index<br>.sub                    | Parameter                          | Access | Data type            | Length | Bitoffs. | Default | Value                        | Unit | Description                                                                                                                                                                                                                                                                                       | DS | R  |
| 120<br>(0x78)                    | Event Config                       | rw     | Record <sup>S0</sup> | 2 byte |          |         |                              |      | Defines which event sources can trigger events.                                                                                                                                                                                                                                                   | Y  | FA |
|                                  | .1 Warning – Compensation Alarm    | rw     | Boolean              | 1 bit  | 0        | 0       | 0<br>1                       |      | Enabled: An event is triggered if the compensation reserve is at the limit and the sensor signal cannot be compensated anymore.<br><br>Disabled<br>Enabled                                                                                                                                        | Y  | FA |
|                                  | .2 Warning – No Measurement Data   | rw     | Boolean              | 1 bit  | 1        | 0       | 0<br>1                       |      | Enabled: An event is triggered if a valid processing of measurement values is not possible because the sensor is currently in alignment mode.<br><br>Disabled<br>Enabled                                                                                                                          | Y  | FA |
|                                  | .9 Warning – Sensor Disabled       | rw     | Boolean              | 1 bit  | 8        | 0       | 0<br>1                       |      | Enabled: An event is triggered if the sensor is set to a disabled mode (emitters are off) by a remote-control signal (process data or parameter value) or by an internal error condition.<br><br>Disabled<br>Enabled                                                                              | Y  | FA |
| 113<br>(0x71)                    | I/O Config – I/Q Type              | rw     | UInteger             | 8 bit  |          | 0       | 0<br>1<br>4                  |      | Defines the output characteristic at pin 2 or white wire.<br><br>Factory default<br>Output - Push-pull<br>High impedance                                                                                                                                                                          | Y  | FA |
| 117<br>(0x75)                    | I/O Config – Output Function       | rw     | UInteger             | 8 bit  |          | 0       | 0<br>1<br>2<br>3<br>4<br>255 |      | Defines the specific function at the additional I/O terminal if configured as output.<br><br>Factory default<br>Antivalent SSC switching signal<br>Equivalent SSC switching signal<br>Antivalent DSC compensation alarm signal<br>Equivalent DSC compensation alarm signal<br>Inactive (constant) | Y  | FA |
| 125<br>(0x7D)                    | Device Operation                   | rw     | UInteger             | 8 bit  |          | 0       | 0<br>1                       |      | Allows setting the device into different operational states e.g. for diagnosis purposes. After a power cycle or communication restart the feature will be reset to normal operation.<br><br>Normal operation<br>Sensor disabled (emitters off)                                                    |    | FA |
| 126<br>(0x7E)                    | UI Control                         | rw     | Record <sup>S0</sup> | 1 byte |          |         |                              |      | Provides possibilities for controlling the functionality of the user interface or local control elements.                                                                                                                                                                                         |    | FA |
|                                  | .1 Local Control (in IO-Link mode) | rw     | Boolean              | 1 bit  | 1        | 0       | 0<br>1                       |      | During IO-Link communication local control is generally inhibited. Setting this parameter to 'Enabled' allows for adjustment or teach-in over local control elements. After a power cycle or communication restart the feature will be disabled.<br><br>Disabled<br>Enabled                       |    | FA |
| 12<br>(0x0C)                     | Device Access Locks                | rw     | Record <sup>S0</sup> | 2 byte |          |         |                              |      | The access to the device parameters can be restricted by setting appropriate flags within this parameter.                                                                                                                                                                                         | Y  | FA |
|                                  | .3 Local Parameterization          | rw     | Boolean              | 1 bit  | 1        | 0       | 0<br>1                       |      | This lock prevents the device settings from being changed via local operating elements on the device.<br><br>Unlocked<br>Locked                                                                                                                                                                   | Y  | FA |

| Observation   |                                    |        |           |         |          |         |                         |      |                                                                                                                                                                                                                                                                                                           |    |    |
|---------------|------------------------------------|--------|-----------|---------|----------|---------|-------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| Index<br>.sub | Parameter                          | Access | Data type | Length  | Bitoffs. | Default | Value                   | Unit | Description                                                                                                                                                                                                                                                                                               | DS | R  |
| 36<br>(0x24)  | Device Status                      | ro     | UInteger  | 8 bit   |          | 0       |                         |      | Indicator for the current device condition and diagnosis state. See <i>Diagnosis – Device Status</i>                                                                                                                                                                                                      |    | FA |
| 236<br>(0xEC) | Observation Data                   | ro     | Record    | 10 byte |          |         |                         |      | Provides a set of relevant data suitable for observation purposes.                                                                                                                                                                                                                                        |    |    |
| .1            | Signal Level                       | ro     | Integer   | 16 bit  | 64       | 0       |                         | %    | Shows the lowest normalized signal level (relative signal level to teach-in reference) among the beams enabled (not blanked).                                                                                                                                                                             |    |    |
| .2            | Lowest Beam Teach-In Signal Level  | ro     | UInteger  | 16 bit  | 48       | 0       |                         | %    | Shows the normalized switch-off (object detected) signal level of the lowest beam of the enabled (not blanked) beams, which has been determined after the last successful teach-in procedure.                                                                                                             |    |    |
| .3            | Compensation Reserve               | ro     | UInteger  | 16 bit  | 32       | 0       |                         | %    | Shows the compensation reserve as a percentage difference between the current and the maximum compensation level for the beam with the lowest reserve.                                                                                                                                                    |    |    |
| .4            | Successful Teach-In Operation mode | ro     | UInteger  | 8 bit   | 24       | 0       | 0<br>1<br>2<br>3<br>255 |      | Shows the operation mode that is used since the last successful teach-in procedure.<br><i>Standard (contrast 20%)</i><br><i>High resolution (contrast 10%)</i><br><i>Standard with conveyor belt suppression</i><br><i>High Resolution with conveyor belt suppression</i><br><i>Custom contrast value</i> |    |    |
| .5            | Object Height                      | ro     | UInteger  | 8 bit   | 16       | 0       |                         | mm   | Shows the estimated object height resulting from the evaluation of the sensor beams.                                                                                                                                                                                                                      |    |    |
| .6            | DSC – Compensation Alarm           | ro     | UInteger  | 8 bit   | 8        | 0       | 0<br>1                  |      | Indicates the current status of the compensation alarm. The alarm becomes active if the compensation reserve is at the limit and the sensor signal cannot be compensated anymore.<br><i>Inactive</i><br><i>Active</i>                                                                                     |    |    |
| .7            | SSC – Switching Signal             | ro     | UInteger  | 8 bit   | 0        | 0       | 0<br>1                  |      | Indicates the detection status of a switching signal channel depending on sensor data and SSC Config.<br><i>Low</i><br><i>High</i>                                                                                                                                                                        |    |    |

NOTE 1: The parameter data provide the attributes DS (Data Storage) and R (Reset behavior). The following rules apply:

DS: Parameter marked with 'Y' (yes) are exchanged with the master via the data storage mechanism.

R: Parameter marked with 'F' are reset to the factory default value upon reception of the command 'Back-to-box'.

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

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

## Command Interface

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

| Command Value | Command           | Description                                                                                                                                                                                                                                     |
|---------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 65<br>(0x41)  | Teach SP          | Determine setpoint in a single teach procedure.<br>The new setpoint value is automatically applied after successful execution.                                                                                                                  |
| 126<br>(0x7E) | Locator Start     | The visual indicators of the device are switched to the localization display pattern, which makes it easier to spot a device in an application.                                                                                                 |
| 127<br>(0x7F) | Locator Stop      | The localization indication pattern is stopped. The optical indicators of the device will show again the device specific states of operation.                                                                                                   |
| 129<br>(0x81) | Application Reset | The parameters of the technology-specific application are set to default values. Identification parameter remain unchanged. An upload to the data storage of the master will be executed, if activated in the port configuration of the master. |
| 131<br>(0x83) | Back-to-box       | The parameters of the device are set to factory default values and communication will be inhibited until the next power cycle. Note: Directly detach the device from the master port!                                                           |

## Error Codes

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

## Event Codes

| Code              | Type    | Name                                                      | Description                                             |
|-------------------|---------|-----------------------------------------------------------|---------------------------------------------------------|
| 36160<br>(0x8D40) | Warning | Compensation alarm - compensation reserve is at the limit | Check sensor adjustment or clean surface.               |
| 36161<br>(0x8D41) | Warning | Measurement not possible, sensor in alignment mode        | Align sensor to reflector and check parameter settings. |
| 36163<br>(0x8D43) | Warning | Ambient temperature outside specified temperature range   | Check sensor environment.                               |
| 36224<br>(0x8D80) | Warning | Sensor operation disabled                                 | Object detection or measurement is not possible.        |