



## PLC Integration HT5xC\_6005

**IO - Link service data function block + process data parser function for Siemens S7-1200 / S7 - 1500 (TIA - Portal V15.1 or higher) PLC systems in combination with a PROFIBUS / PROFINET IO - Link Master**

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# Table of Contents

- 1 Legal information.....4**
  - 1.1 Disclaimer..... 4
- 2 About this document.....5**
  - 2.1 Purpose of use.....5
  - 2.2 Target group..... 5
- 3 General use of function block..... 6**
  - 3.1 Short description..... 6
  - 3.2 Calling and designation..... 6
  - 3.3 Configuration..... 6
  - 3.4 Method of function..... 7
  - 3.5 Behavior when error occurs.....7
- 4 Integration into the PLC project.....8**
- 5 Process data parser function..... 9**
  - 5.1 Calling and designation..... 9
  - 5.2 Configuration..... 9
- 6 Error description..... 11**
- 7 Data structures..... 14**
- 8 Parameter descriptions..... 26**
- 9 Technical specifications..... 32**
  - 9.1 General data..... 32

# 1 Legal information

## 1.1 Disclaimer

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## **2 About this document**

Please read this chapter carefully before working with this documentation and the Leuze IO-Link device.

### **2.1 Purpose of use**

These instructions have been designed for the technical personnel for the use of the IO-Link PLC blocks.

These instructions are intended to provide support during the commissioning of a Leuze IO-Link sensor using standard software from Siemens. The described module is part of this standard software.

### **2.2 Target group**

These instructions are addressed to programming engineers and the operators of machines and systems, which are operated by one or several IO-Link devices. They also address people, who connect the IO-Link device via an IO-Link-Master-Gateway to a PLC-Control for data exchange.

## 3 General use of function block

### 3.1 Short description

The function block "FB\_Leuze\_HT5xC\_6005" simplifies the usage of Leuze IO-Link devices on Siemens S7-1200/S7-1500 (TIA-Portal V15.1 or higher) PLC controls. This FB supports IO-Link Masters which can be connected via PROFIBUS / PROFINET to the PLC system.

The function block is device type-specific and thus only suitable for the appropriate Leuze IO-Link devices. The FB interprets the call-up of the acyclic service data between the PLC and the IO-Link device.

The IO-Link function block can only be used in combination with the listed helper functions / libraries.

### 3.2 Calling and designation

The module can be called as a single-instance.



Fig. 3.1: Example of module call with single instance

### 3.3 Configuration

Tab. 3.1: Parameter IN

| Parameter | Data type | Description  |
|-----------|-----------|--|
| Execute   | Bool      | Positive trigger: Start data transfer  |
| RW        | Bool      | Read or write the selected IO-Link parameter.<br>FALSE: Read parameter<br>TRUE: Write Parameter                                      |
| Port      | Int       | Number of the master port the IO-Link device is connected, starting with 1.  |
| HwID      | HW_IO     | Hardware IO-Address of the IO-Link master  |
| Cap       | DInt      | Client access point of the IO-Link function (IO-LinkMaster specific).<br>Siemens: 227<br>Weidmüller: 227<br>Other manufacturers: 255 |
| TimeOut   | Time      | Time, after a Timeout-Error is triggered.  |

Tab. 3.2: Parameter INOUT

| Parameter  | Data type             | Description |
|------------|-----------------------|-------------|
| DeviceData | Leuze_type_HT5xC_6005 | Sensor data |

See structure description of Leuze\_type\_HT5xC\_6005 in chapter 7.

Tab. 3.3: Parameter OUT

| Parameter   | Data type               | Description  |
|-------------|-------------------------|--|
| Done        | Bool                    | Indicates whether data is valid.   |
| Busy        | Bool                    | Request in process.<br>FALSE: Request is terminated<br>TRUE: Request is being processed              |
| Error       | Bool                    | Error flag<br>FALSE: No error<br>TRUE: Error detected  |
| ErrorCode   | Leuze_type_lolError     | Status of the function block   |
| Diagnostics | LIOLink_typeDiagnostics | Detailed diagnostic information of the FB. See description of Siemens Library for IO-Link (LIOLink). |

See structure description of Leuze\_type\_lolError in chapter 6.

## 3.4 Method of function

The function block uses the data structure "FB\_Leuze\_HT5xC\_6005". The PLC data structure contains the values of all IO-Link variables. Before you can use it, the structure must be instantiated by a data block. Each IO-Link FB parameter has a data point representing it in this data structure. This data point will be actualized every time a read request was executed successfully.

The desired parameters can be selected via the input variables. Depending on the device definition, IO-Link parameters are read or writable. The input variable must be "RW" = FALSE to read parameter. The value that should be written can be defined in the data structure, as soon as the input parameter "RW" = TRUE. You start each transfer by calling up the "FB\_Leuze\_HT5xC\_6005" with a positive trigger at the "Execute" input. As long as there is no valid answer the output "Busy" is TRUE. In the case that the chosen timeout period has elapsed a timeout error will be generated and the thread will be terminated. The "Done" = TRUE output shows that the transmission was successful. The outputs retain there states as long as there is no new positive trigger at the "Execute" input again.

The function block allows you to read or write multiple IO-Link parameters sequentially (multiselection). Please note that it may happen, that a single parameter can not be written. The function block aborts at this point and it is possible, that the IO-Link device contains an inconsistent set of parameters.

## 3.5 Behavior when error occurs

An error bit (Error) is set and an error code (Leuze\_type\_lolError) generated, if there is a spurious input value or an incorrect input connection of the FB. In this case, no further processing is carried out, until the input has been corrected.

## 4 Integration into the PLC project

The function block "FB\_Leuze\_HT5xC\_6005" is a part of the TIA-Portal library. To get all relevant blocks into your PLC project, please open the library as a "global" library. Afterwards, the library elements can be copied into the currently opened project.

### Integration step by step:

- Downloading the library
- Open the library in the "global" library tab
- Including the blocks of the Leuze library into your project (code-blocks and data type)
- Compiling the PLC project

| NOTICE  |  |
|---|--|
|  | If several devices connect to the IO-Link Master, you can only exchange acyclic data (service data) with one device at the same time. Due this restriction, the service data communication blocks must to be blocked against each other. |



## 5 Process data parser function

The function FC\_Leuze\_PD\_HT5xC\_6005 simplifies the interpretation of composed IO-Link process data. This data is provided as a data structure on the PLC side. Some sensors supports different process data output. User must select mode of PD according to the sensors settings. Each sensor connected to Leuze IO-Link master has its own hardware ID. See Fig. 5.2.

The function is device type-specific and thus only suitable for the appropriated Leuze IO-Link devices.

### 5.1 Calling and designation

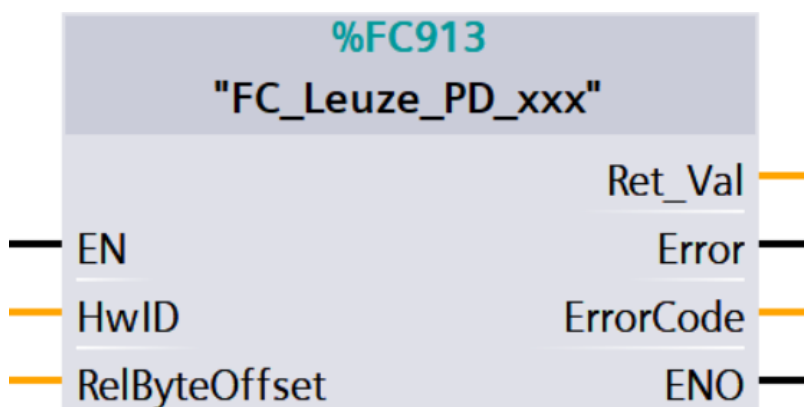


Fig. 5.1: Example of process data parsing function call

### 5.2 Configuration

Tab. 5.1: Parameters

| Parameter name | Declaration | Data type                | Description   |
|----------------|-------------|--------------------------|---|
| HwID           | INPUT       | HW_IO                    | Hardware IO-Address of the IO-Link master (see HW-Configuration). For masters that do not use the Siemens PCT-Tool please use the HW IOAddress of the configured Master port.   |
| RelByteOffset  | INPUT       | UINT                     | Relative start address of the IO-Link device on the IO-Link master port (see PCT-Tool -> Addresses -> Inputs Start). If the process date is mapped into a specified logical IO-Address, the relative byte offset = 0. |
| PDMode         | INPUT       | INT                      | Mode of the PD. User must select mode of PD according to the sensors settings. The PD Mode parameter only appears for some sensors.   |
| Error          | OUTPUT      | BOOL                     | Error flag FALSE: No error TRUE: Error detected   |
| ErrorCode      | OUTPUT      | WORD                     | Error code details see in the Siemens help system ("DPRD_DAT").   |
| RET_VAL        | OUTPUT      | Leuze_type_PD_HT5xC_6005 | Reference to the instance of the data structure Leuze_type_PD_HT5xC_6005. The structure includes the disaggregated values of the process data.  |

See structure description of Leuze\_type\_PD\_HT5xC\_6005 in chapter 7.



Fig. 5.2: Hardware ID for sensors connected to Leuze MD798 IO-Link master

## 6 Error description

The parameter "ErrorCode" can be interpreted using the PLC data type Leuze\_type\_IolError. This data type contains the following error information:

Tab. 6.1: Leuze\_type\_IolError description

| Parameter name      | Data type | Description   |
|---------------------|-----------|---|
| ErrorCode.status    | Word      | 16#0000–16#7FFF: Status of the FB,<br>16#8000–16#FFFF: Error codes  |
| ErrorCode.iolMError | Word      | IO-Link Master error (see IO-Link specification)  |
| ErrorCode.iolError  | Word      | IO-Link error. Contains the IOL_Error_Code the IOL_Add_Error_Code (see IO-Link specification) and the device specific error codes |
| ErrorCode.isduIndex | Int       | IO-Link Index (ISDU) to which the error code refers   |

Tab. 6.2: Error description for status

| Error code (status) | Error description  |
|---------------------|--|
| 0x0000              | Operation completed, no warning and no further details                                     |
| 0x7000              | No operation in progress (initial value)   |
| 0x7001              | First call after input of a new command (rising edge on "execute")                         |
| 0x7002              | Subsequent cal   |
| 0x8001              | Time out error occurred  |
| 0x8002              | No parameter selected  |
| 0x8201              | Unsupported port   |
| 0x8202              | Unsupported index  |
| 0x8203              | Unsupported subindex   |
| 0x8205              | The length at the "writeLen" parameter does not match the data record that will be written |
| 0x8401              | The IO-Link master has reported an error code, see "diagnostics"                           |
| 0x8402              | Received data record does not match operation  |
| 0x8403              | Operation could not be completed in the specified time                                     |
| 0x8600              | Internal state machine has reached an undefined state                                      |
| 0x8601              | System function WRREC reports an error, see "diagnostics"                                  |
| 0x8602              | System function RDREC reports an error, see "diagnostics"                                  |

Tab. 6.3: Error description for ioLError

| Error code (ioLError) | Error description   |
|-----------------------|---|
| 0x0000                | No error  |
| 0x0001 ... 0x06FF     | Reserved / Master specific  |
| 0x7000                | Unexpected Write request instead of read request / Invalid response PDU |
| 0x7001                | Decode error  |
| 0x7002                | Port occupied by another task   |
| 0x7003 ... 0x7FFF     | Reserved / Master specific  |
| 0x8000                | Timeout when IOL-Devices or IOL-Master port are busy                    |
| 0x8001                | IO-Link index > 32767   |
| 0x8002                | Port address beyond defined maximum                                     |
| 0x8003                | Port function not supported   |
| 0x8004                | Reserved / Master specific  |
| 0x8005                | Invalid length of the data that should be written (>232 / <1)           |
| 0x8006                | Reserved / Master specific  |
| 0x8007                | IO-Link subindex > 255  |
| 0x8008 ... 0x8051     | Reserved / Master specific  |
| 0x8052                | Error during acyclic data access (FB RDREC error)                       |
| 0x8053                | Error during acyclic data access (FB WRREC error)                       |
| 0x8054 ... 0x8FFFF    | Reserved / Master specific  |

For additional information see the technical specification "IO-Link Integration Part 1" ([www.profibus.com](http://www.profibus.com)).

Tab. 6.4: Error description for ioLError

| Error code (ioLError) | Error description                  |
|-----------------------|------------------------------------|
| 0x0000                | No error                           |
| 0x1000                | Master communication error         |
| 0x1100                | ISDU time out / Device event error |
| 0x5200                | Device checksum error              |
| 0x5600                | Device checksum error              |

| Error code (IoError) | Error description  |
|----------------------|--|
| 0x5700               | Master ISDU illegal service  |
| 0x5800               | Device error: Byte length does not fit to the chosen parameter   |
| 0x8000               | The requested service has been refused by the device application   |
| 0x8011               | Read write access to a not existing Index  |
| 0x8012               | Read write access to a not existing sub index  |
| 0x8020               | Parameter is not accessible for a read or write service due to the current state in the device                     |
| 0x8021               | Parameter is not accessible for a read or write service due to an ongoing local operation at the device            |
| 0x8022               | Parameter is not accessible for a read or write service due to an remote triggered state of the device application |
| 0x8023               | Write service tries to access a read-only parameter  |
| 0x8030               | Write service to a parameter outside its permitted range of values   |
| 0x8031               | Write service to a parameter above its specified value range   |
| 0x8032               | Write service to a parameter below its specified value range   |
| 0x8033               | Write service to a parameter above its specified length  |
| 0x8034               | Write service to a parameter below its predefined length   |
| 0x8035               | Write service with a command value not supported by the device application   |
| 0x8036               | Write service with a command value calling a device function not available due to the current state                |
| 0x8040               | The value via single parameter transfer collide with other actual parameter settings                               |
| 0x8041               | Inconsistent parameter set (at least an ISDU cannot be written)  |
| 0x8082               | The read or write service is refused due to a temporarily unavailable application                                  |
| 0x8100               | Unspecified  |
| 0x8101 ... 0x81FF    | Device specific (see device description)   |

For additional information see the specification "IO-Link Communication" ([www.IO-Link.com](http://www.IO-Link.com)).

## 7 Data structures

Tab. 7.1: Leuze\_type\_HT5xC\_6005

| Parameter name  | Data type | Description   |
|---|-----------|---|
| DeviceData.Selection.Commands.CmdRestoreFactorySettings | Bool      | [WRITE_ONLY] Restore Factory Settings   |
| DeviceData.Selection.Commands.CmdBackToBox              | Bool      | [WRITE_ONLY] Back To Box  |
| DeviceData.Selection.Commands.CmdReserved_3             | Bool      | [WRITE_ONLY] reserved; Suffix "_3" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Selection.Commands.CmdReserved_4             | Bool      | [WRITE_ONLY] reserved; Suffix "_4" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Selection.Commands.CmdReserved_5             | Bool      | [WRITE_ONLY] reserved; Suffix "_5" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Selection.Commands.CmdReserved_6             | Bool      | [WRITE_ONLY] reserved; Suffix "_6" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Selection.Commands.CmdReserved_7             | Bool      | [WRITE_ONLY] reserved; Suffix "_7" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Selection.Commands.CmdReserved_8             | Bool      | [WRITE_ONLY] reserved; Suffix "_8" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Selection.Commands.CmdReserved_9             | Bool      | [WRITE_ONLY] reserved; Suffix "_9" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Selection.Commands.CmdReserved_10            | Bool      | [WRITE_ONLY] reserved; Suffix "_10" (parameter index or subindex) added because of duplicate parameter names. |
| DeviceData.Selection.Commands.CmdReserved_11            | Bool      | [WRITE_ONLY] reserved; Suffix "_11" (parameter index or subindex) added because of duplicate parameter names. |
| DeviceData.Selection.Commands.CmdReserved_12            | Bool      | [WRITE_ONLY] reserved; Suffix "_12" (parameter index or subindex) added because of duplicate parameter names. |

| Parameter name   | Data type | Description  |
|--|-----------|--|
| DeviceData.Selection.Commands.CmdReserved_13                   | Bool      | [WRITE_ONLY] reserved; Suffix "_13" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Selection.Commands.CmdReserved_14                   | Bool      | [WRITE_ONLY] reserved; Suffix "_14" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Selection.Commands.CmdReserved_15                   | Bool      | [WRITE_ONLY] reserved; Suffix "_15" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Selection.Commands.CmdReserved_16                   | Bool      | [WRITE_ONLY] reserved; Suffix "_16" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Selection.Commands.CmdReserved_17                   | Bool      | [WRITE_ONLY] reserved; Suffix "_17" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Selection.Commands.CmdClearObjectcount              | Bool      | [WRITE_ONLY] Clear ObjectCount   |
| DeviceData.Selection.DirectParametersPage1.All                 | Bool      | [READ_WRITE] all parameters of complex data type   |
| DeviceData.Selection.DirectParametersPage1.Reserved_1          | Bool      | [READ_ONLY] ; Suffix "_1" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Selection.DirectParametersPage1.MasterCycleTime     | Bool      | [READ_ONLY]<br>Communication: Current communication cycle duration used by the master. This value defines the process data cycle.                      |
| DeviceData.Selection.DirectParametersPage1.MinCycleTime        | Bool      | [READ_ONLY]<br>Communication: Minimum communication cycle duration supported by the device. This value defines the lowest possible process data cycle. |
| DeviceData.Selection.DirectParametersPage1.MSequenceCapability | Bool      | [READ_ONLY]<br>Communication: Information on the structure and the supported features of the communication messages.                                   |
| DeviceData.Selection.DirectParametersPage1.IoLinkRevisionId    | Bool      | [READ_ONLY]<br>Communication: Identifier for the currently used communication protocol revision.   |

| Parameter name   | Data type | Description   |
|--|-----------|---|
| DeviceData.Selection.DirectParametersPage1.ProcessDataInputLength  | Bool      | [READ_ONLY]<br>Communication:<br>Information on width and features of the process input data (Process Data from Device to Master).  |
| DeviceData.Selection.DirectParametersPage1.ProcessDataOutputLength | Bool      | [READ_ONLY]<br>Communication:<br>Information on width of the process output data (Process Data from Master to Device).  |
| DeviceData.Selection.DirectParametersPage1.VendorId1               | Bool      | [READ_ONLY]<br>Identification: Highest octet of the Vendor ID. Combined with the parameter Vendor ID 2, this parameter defines the 16-bit value of the unique Vendor ID as assigned by the IO-Link Community. |
| DeviceData.Selection.DirectParametersPage1.VendorId2               | Bool      | [READ_ONLY]<br>Identification: Lowest octet of the Vendor ID. Combined with the parameter Vendor ID 1, this parameter defines the 16-bit value of the unique Vendor ID as assigned by the IO-Link Community.  |
| DeviceData.Selection.DirectParametersPage1.DeviceId1               | Bool      | [READ_ONLY]<br>Identification: Highest octet of the Device ID. Combined with the parameters Device ID 2 and 3, this parameter defines the 24-bit value of the vendor-specific Device ID.                      |
| DeviceData.Selection.DirectParametersPage1.DeviceId2               | Bool      | [READ_ONLY]<br>Identification: Middle octet of the Device ID. Combined with the parameters Device ID 1 and 3, this parameter defines the 24-bit value of the vendor-specific Device ID.                       |
| DeviceData.Selection.DirectParametersPage1.DeviceId3               | Bool      | [READ_ONLY]<br>Identification: Lowest octet of the Device ID. Combined with the parameters Device ID 1 and 2, this parameter defines the 24-bit value of the vendor-specific Device ID.                       |
| DeviceData.Selection.DirectParametersPage1.Reserved_13             | Bool      | [READ_ONLY] ; Suffix "_13" (parameter index or subindex) added because of duplicate parameter names.  |



| Parameter name   | Data type | Description  |
|--|-----------|--|
| DeviceData.Selection.DirectParametersPage1.Reserved_14               | Bool      | [READ_ONLY] ; Suffix "_14" (parameter index or subindex) added because of duplicate parameter names.   |
| DeviceData.Selection.DirectParametersPage1.Reserved_15               | Bool      | [READ_ONLY] ; Suffix "_15" (parameter index or subindex) added because of duplicate parameter names.   |
| DeviceData.Selection.DirectParametersPage1.SystemCommand             | Bool      | [WRITE_ONLY]<br>Application: Command interface for devices without ISDU support. Validity and execution of commands are not confirmed.             |
| DeviceData.Selection.DirectParametersPage2.All                       | Bool      | [READ_WRITE] all parameters of complex data type   |
| DeviceData.Selection.DirectParametersPage2.DeviceSpecificParameter1  | Bool      | [READ_WRITE]   |
| DeviceData.Selection.DirectParametersPage2.DeviceSpecificParameter2  | Bool      | [READ_WRITE]   |
| DeviceData.Selection.DirectParametersPage2.DeviceSpecificParameter3  | Bool      | [READ_WRITE]   |
| DeviceData.Selection.DirectParametersPage2.DeviceSpecificParameter4  | Bool      | [READ_WRITE]   |
| DeviceData.Selection.DirectParametersPage2.DeviceSpecificParameter5  | Bool      | [READ_WRITE]   |
| DeviceData.Selection.DirectParametersPage2.DeviceSpecificParameter6  | Bool      | [READ_WRITE]   |
| DeviceData.Selection.DirectParametersPage2.DeviceSpecificParameter7  | Bool      | [READ_WRITE]   |
| DeviceData.Selection.DirectParametersPage2.DeviceSpecificParameter8  | Bool      | [READ_WRITE]   |
| DeviceData.Selection.DirectParametersPage2.DeviceSpecificParameter9  | Bool      | [READ_WRITE]   |
| DeviceData.Selection.DirectParametersPage2.DeviceSpecificParameter10 | Bool      | [READ_WRITE]   |
| DeviceData.Selection.DirectParametersPage2.DeviceSpecificParameter11 | Bool      | [READ_WRITE]   |
| DeviceData.Selection.DirectParametersPage2.DeviceSpecificParameter12 | Bool      | [READ_WRITE]   |
| DeviceData.Selection.DirectParametersPage2.DeviceSpecificParameter13 | Bool      | [READ_WRITE]   |
| DeviceData.Selection.DirectParametersPage2.DeviceSpecificParameter14 | Bool      | [READ_WRITE]   |
| DeviceData.Selection.DirectParametersPage2.DeviceSpecificParameter15 | Bool      | [READ_WRITE]   |
| DeviceData.Selection.DirectParametersPage2.DeviceSpecificParameter16 | Bool      | [READ_WRITE]   |
| DeviceData.Selection.SystemCommand                                   | Bool      | [WRITE_ONLY] Command interface for applications. A positive acknowledge indicates the complete and correct finalization of the requested function. |

| Parameter name                                     | Data type | Description   |
|--|-----------|---|
| DeviceData.Selection.DeviceAccessLocks.All         | Bool      | [READ_WRITE] all parameters of complex data type  |
| DeviceData.Selection.VendorName                    | Bool      | [READ_ONLY] The vendor name that is assigned to a Vendor ID.                                      |
| DeviceData.Selection.VendorText                    | Bool      | [READ_ONLY] Additional information about the vendor.  |
| DeviceData.Selection.ProductName                   | Bool      | [READ_ONLY] Complete product name.  |
| DeviceData.Selection.ProductId                     | Bool      | [READ_ONLY] Vendor-specific product or type identification (e.g., item number or model number).   |
| DeviceData.Selection.ProductText                   | Bool      | [READ_ONLY] Additional product information for the device.  |
| DeviceData.Selection.SerialNumber                  | Bool      | [READ_ONLY] Unique, vendor-specific identifier of the individual device.                          |
| DeviceData.Selection.HardwareRevision              | Bool      | [READ_ONLY] Unique, vendor-specific identifier of the hardware revision of the individual device. |
| DeviceData.Selection.FirmwareRevision              | Bool      | [READ_ONLY] Unique, vendor-specific identifier of the firmware revision of the individual device. |
| DeviceData.Selection.ApplicationSpecificTag        | Bool      | [READ_WRITE] Possibility to mark a device with user- or application-specific information.         |
| DeviceData.Selection.FunctionTag                   | Bool      | [READ_WRITE]  |
| DeviceData.Selection.LocationTag                   | Bool      | [READ_WRITE]  |
| DeviceData.Selection.DeviceStatus                  | Bool      | [READ_ONLY] Indicator for the current device condition and diagnosis state.                       |
| DeviceData.Selection.DetailedDeviceStatus.All      | Bool      | [READ_ONLY] all parameters of complex data type   |
| DeviceData.Selection.Config.All                    | Bool      | [READ_WRITE] all parameters of complex data type  |
| DeviceData.Selection.ObjectCount                   | Bool      | [READ_ONLY]   |
| DeviceData.Selection.OperationHours                | Bool      | [READ_ONLY]   |
| DeviceData.Selection.Setpoints.All                 | Bool      | [READ_ONLY] all parameters of complex data type   |
| DeviceData.Data.Commands.CmdRestoreFactorySettings | UInt      | [WRITE_ONLY] Restore Factory Settings   |
| DeviceData.Data.Commands.CmdBackToBox              | UInt      | [WRITE_ONLY] Back To Box  |

| Parameter name                          | Data type | Description   |
|---|-----------|---|
| DeviceData.Data.Commands.CmdReserved_3  | UInt      | [WRITE_ONLY] reserved; Suffix "_3" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Data.Commands.CmdReserved_4  | UInt      | [WRITE_ONLY] reserved; Suffix "_4" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Data.Commands.CmdReserved_5  | UInt      | [WRITE_ONLY] reserved; Suffix "_5" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Data.Commands.CmdReserved_6  | UInt      | [WRITE_ONLY] reserved; Suffix "_6" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Data.Commands.CmdReserved_7  | UInt      | [WRITE_ONLY] reserved; Suffix "_7" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Data.Commands.CmdReserved_8  | UInt      | [WRITE_ONLY] reserved; Suffix "_8" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Data.Commands.CmdReserved_9  | UInt      | [WRITE_ONLY] reserved; Suffix "_9" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Data.Commands.CmdReserved_10 | UInt      | [WRITE_ONLY] reserved; Suffix "_10" (parameter index or subindex) added because of duplicate parameter names. |
| DeviceData.Data.Commands.CmdReserved_11 | UInt      | [WRITE_ONLY] reserved; Suffix "_11" (parameter index or subindex) added because of duplicate parameter names. |
| DeviceData.Data.Commands.CmdReserved_12 | UInt      | [WRITE_ONLY] reserved; Suffix "_12" (parameter index or subindex) added because of duplicate parameter names. |
| DeviceData.Data.Commands.CmdReserved_13 | UInt      | [WRITE_ONLY] reserved; Suffix "_13" (parameter index or subindex) added because of duplicate parameter names. |
| DeviceData.Data.Commands.CmdReserved_14 | UInt      | [WRITE_ONLY] reserved; Suffix "_14" (parameter index or subindex) added because of duplicate parameter names. |

| Parameter name  | Data type | Description  |
|---|-----------|--|
| DeviceData.Data.Commands.CmdReserved_15                       | UInt      | [WRITE_ONLY] reserved; Suffix "_15" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Data.Commands.CmdReserved_16                       | UInt      | [WRITE_ONLY] reserved; Suffix "_16" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Data.Commands.CmdReserved_17                       | UInt      | [WRITE_ONLY] reserved; Suffix "_17" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Data.Commands.CmdClearObjectcount                  | UInt      | [WRITE_ONLY] Clear ObjectCount   |
| DeviceData.Data.DirectParametersPage1.Reserved_1              | UInt      | [READ_ONLY] ; Suffix "_1" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Data.DirectParametersPage1.MasterCycleTime         | UInt      | [READ_ONLY]<br>Communication: Current communication cycle duration used by the master. This value defines the process data cycle.                      |
| DeviceData.Data.DirectParametersPage1.MinCycleTime            | UInt      | [READ_ONLY]<br>Communication: Minimum communication cycle duration supported by the device. This value defines the lowest possible process data cycle. |
| DeviceData.Data.DirectParametersPage1.MSequenceCapability     | UInt      | [READ_ONLY]<br>Communication: Information on the structure and the supported features of the communication messages.                                   |
| DeviceData.Data.DirectParametersPage1.IoLinkRevisionId        | UInt      | [READ_ONLY]<br>Communication: Identifier for the currently used communication protocol revision.   |
| DeviceData.Data.DirectParametersPage1.ProcessDataInputLength  | UInt      | [READ_ONLY]<br>Communication: Information on width and features of the process input data (Process Data from Device to Master).                        |
| DeviceData.Data.DirectParametersPage1.ProcessDataOutputLength | UInt      | [READ_ONLY]<br>Communication: Information on width of the process output data (Process Data from Master to Device).                                    |

| Parameter name                                    | Data type | Description   |
|---|-----------|---|
| DeviceData.Data.DirectParametersPage1.VendorId1   | UInt      | [READ_ONLY]<br>Identification: Highest octet of the Vendor ID. Combined with the parameter Vendor ID 2, this parameter defines the 16-bit value of the unique Vendor ID as assigned by the IO-Link Community. |
| DeviceData.Data.DirectParametersPage1.VendorId2   | UInt      | [READ_ONLY]<br>Identification: Lowest octet of the Vendor ID. Combined with the parameter Vendor ID 1, this parameter defines the 16-bit value of the unique Vendor ID as assigned by the IO-Link Community.  |
| DeviceData.Data.DirectParametersPage1.DeviceId1   | UInt      | [READ_ONLY]<br>Identification: Highest octet of the Device ID. Combined with the parameters Device ID 2 and 3, this parameter defines the 24-bit value of the vendor-specific Device ID.                      |
| DeviceData.Data.DirectParametersPage1.DeviceId2   | UInt      | [READ_ONLY]<br>Identification: Middle octet of the Device ID. Combined with the parameters Device ID 1 and 3, this parameter defines the 24-bit value of the vendor-specific Device ID.                       |
| DeviceData.Data.DirectParametersPage1.DeviceId3   | UInt      | [READ_ONLY]<br>Identification: Lowest octet of the Device ID. Combined with the parameters Device ID 1 and 2, this parameter defines the 24-bit value of the vendor-specific Device ID.                       |
| DeviceData.Data.DirectParametersPage1.Reserved_13 | UInt      | [READ_ONLY] ; Suffix "_13" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Data.DirectParametersPage1.Reserved_14 | UInt      | [READ_ONLY] ; Suffix "_14" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Data.DirectParametersPage1.Reserved_15 | UInt      | [READ_ONLY] ; Suffix "_15" (parameter index or subindex) added because of duplicate parameter names.  |

| Parameter name  | Data type | Description  |
|---|-----------|--|
| DeviceData.Data.DirectParametersPage1.SystemCommand             | UInt      | [WRITE_ONLY]<br>Application: Command interface for devices without ISDU support. Validity and execution of commands are not confirmed.             |
| DeviceData.Data.DirectParametersPage2.DeviceSpecificParameter1  | UInt      | [READ_WRITE]   |
| DeviceData.Data.DirectParametersPage2.DeviceSpecificParameter2  | UInt      | [READ_WRITE]   |
| DeviceData.Data.DirectParametersPage2.DeviceSpecificParameter3  | UInt      | [READ_WRITE]   |
| DeviceData.Data.DirectParametersPage2.DeviceSpecificParameter4  | UInt      | [READ_WRITE]   |
| DeviceData.Data.DirectParametersPage2.DeviceSpecificParameter5  | UInt      | [READ_WRITE]   |
| DeviceData.Data.DirectParametersPage2.DeviceSpecificParameter6  | UInt      | [READ_WRITE]   |
| DeviceData.Data.DirectParametersPage2.DeviceSpecificParameter7  | UInt      | [READ_WRITE]   |
| DeviceData.Data.DirectParametersPage2.DeviceSpecificParameter8  | UInt      | [READ_WRITE]   |
| DeviceData.Data.DirectParametersPage2.DeviceSpecificParameter9  | UInt      | [READ_WRITE]   |
| DeviceData.Data.DirectParametersPage2.DeviceSpecificParameter10 | UInt      | [READ_WRITE]   |
| DeviceData.Data.DirectParametersPage2.DeviceSpecificParameter11 | UInt      | [READ_WRITE]   |
| DeviceData.Data.DirectParametersPage2.DeviceSpecificParameter12 | UInt      | [READ_WRITE]   |
| DeviceData.Data.DirectParametersPage2.DeviceSpecificParameter13 | UInt      | [READ_WRITE]   |
| DeviceData.Data.DirectParametersPage2.DeviceSpecificParameter14 | UInt      | [READ_WRITE]   |
| DeviceData.Data.DirectParametersPage2.DeviceSpecificParameter15 | UInt      | [READ_WRITE]   |
| DeviceData.Data.DirectParametersPage2.DeviceSpecificParameter16 | UInt      | [READ_WRITE]   |
| DeviceData.Data.SystemCommand                                   | UInt      | [WRITE_ONLY] Command interface for applications. A positive acknowledge indicates the complete and correct finalization of the requested function. |
| DeviceData.Data.DeviceAccessLocks.ParameterWriteAccess          | Bool      | [READ_WRITE] This lock prevents the write access to all read/write parameters of the device except for the parameter 'Device Access Locks'.        |
| DeviceData.Data.DeviceAccessLocks.DataStorage                   | Bool      | [READ_WRITE] This lock prevents the write access to the device parameters via the data storage mechanism.  |

| Parameter name  | Data type | Description   |
|---|-----------|---|
| DeviceData.Data.DeviceAccessLocks.LocalParameterization | Bool      | [READ_WRITE] This lock prevents the device settings from being changed via local operating elements on the device.                        |
| DeviceData.Data.DeviceAccessLocks.LocalUserInterface    | Bool      | [READ_WRITE] This lock prevents the access to the device settings and display via a local user interface. The user interface is disabled. |
| DeviceData.Data.VendorName                              | String    | [READ_ONLY] The vendor name that is assigned to a Vendor ID.  |
| DeviceData.Data.VendorText                              | String    | [READ_ONLY] Additional information about the vendor.  |
| DeviceData.Data.ProductName                             | String    | [READ_ONLY] Complete product name.  |
| DeviceData.Data.ProductId                               | String    | [READ_ONLY] Vendor-specific product or type identification (e.g., item number or model number).   |
| DeviceData.Data.ProductText                             | String    | [READ_ONLY] Additional product information for the device.  |
| DeviceData.Data.SerialNumber                            | String    | [READ_ONLY] Unique, vendor-specific identifier of the individual device.  |
| DeviceData.Data.HardwareRevision                        | String    | [READ_ONLY] Unique, vendor-specific identifier of the hardware revision of the individual device.   |
| DeviceData.Data.FirmwareRevision                        | String    | [READ_ONLY] Unique, vendor-specific identifier of the firmware revision of the individual device.   |
| DeviceData.Data.ApplicationSpecificTag                  | String    | [READ_WRITE] Possibility to mark a device with user- or application-specific information.   |
| DeviceData.Data.FunctionTag                             | String    | [READ_WRITE]  |
| DeviceData.Data.LocationTag                             | String    | [READ_WRITE]  |
| DeviceData.Data.DeviceStatus                            | UInt      | [READ_ONLY] Indicator for the current device condition and diagnosis state.   |
| DeviceData.Data.DetailedDeviceStatus.Item_1             | String    | [READ_ONLY] List of all currently pending events in the device.   |
| DeviceData.Data.Config.PdInputConfiguration             | UInt      | [READ_WRITE] Configuration of process data content  |
| DeviceData.Data.Config.Reserved_2                       | Bool      | [READ_WRITE] reserved; Suffix "_2" (parameter index or subindex) added because of duplicate parameter names.                              |

| Parameter name                               | Data type | Description  |
|--|-----------|--|
| DeviceData.Data.Config.PdOutputConfiguration | Bool      | [READ_WRITE]<br>Configuration of CSC (sensor control)  |
| DeviceData.Data.Config.Out2Function          | UInt      | [READ_WRITE]   |
| DeviceData.Data.Config.Reserved_5            | UInt      | [READ_WRITE] reserved;<br>Suffix "_5" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Data.Config.DelayFunction         | UInt      | [READ_WRITE] Operating function of the internal delay unit   |
| DeviceData.Data.Config.DelayTimeBase         | UInt      | [READ_WRITE] Time base of the internal delay unit: 1ms, 10ms, 100ms, 1000ms                                      |
| DeviceData.Data.Config.DelayMultiplier       | UInt      | [READ_WRITE] Multiplier of the internal delay unit: 1-15 * delay time base                                       |
| DeviceData.Data.Config.Reserved_9            | Bool      | [READ_WRITE] reserved;<br>Suffix "_9" (parameter index or subindex) added because of duplicate parameter names.  |
| DeviceData.Data.Config.Reserved_10           | Bool      | [READ_WRITE] reserved;<br>Suffix "_10" (parameter index or subindex) added because of duplicate parameter names. |
| DeviceData.Data.Config.Reserved_11           | Bool      | [READ_WRITE] reserved;<br>Suffix "_11" (parameter index or subindex) added because of duplicate parameter names. |
| DeviceData.Data.Config.Reserved_12           | Bool      | [READ_WRITE] reserved;<br>Suffix "_12" (parameter index or subindex) added because of duplicate parameter names. |
| DeviceData.Data.Config.Reserved_13           | Bool      | [READ_WRITE] reserved;<br>Suffix "_13" (parameter index or subindex) added because of duplicate parameter names. |
| DeviceData.Data.Config.SscLogic              | Bool      | [READ_WRITE] SSC logic: adjusting the switching behavior of the switching signal channel                         |
| DeviceData.Data.Config.Reserved_15           | Bool      | [READ_WRITE] reserved;<br>Suffix "_15" (parameter index or subindex) added because of duplicate parameter names. |
| DeviceData.Data.Config.DelayUnit             | Bool      | [READ_WRITE]<br>Enable/disable internal delay unit (based on object)   |
| DeviceData.Data.ObjectCount                  | UInt      | [READ_ONLY]  |
| DeviceData.Data.OperationHours               | UInt      | [READ_ONLY]  |



| Parameter name                | Data type | Description  |
|-------------------------------|-----------|--|
| DeviceData.Data.Setpoints.Sp1 | UInt      | [READ_ONLY] Defines the setpoint 1 value for the switching signal channel. |
| DeviceData.Data.Setpoints.Sp2 | UInt      | [READ_ONLY] Defines the setpoint 2 value for the switching signal channel. |

Tab. 7.2: Leuze\_type\_PD\_HT5xC\_6005

| Parameter name                                   | Data type | Description |
|--|-----------|-------------|
| FC_Leuze_PD_HT5xC_6005.Mode_0.SscSwitchingSignal | Bool      |             |
| FC_Leuze_PD_HT5xC_6005.Mode_0.Warning            | Bool      |             |
| FC_Leuze_PD_HT5xC_6005.Mode_0.Status             | Bool      |             |
| FC_Leuze_PD_HT5xC_6005.Mode_1.SscSwitchingSignal | Bool      |             |
| FC_Leuze_PD_HT5xC_6005.Mode_1.MeasurementValue   | UInt      |             |

## 8 Parameter descriptions

Tab. 8.1: IODD parameter descriptions

(AR - Access Rights, R - Read only, W - Write only, RW - Read and Write, NS - Not specified)

| Parameter                  | Index | Subindex | Data type | Default | AR | Description   |
|----------------------------|-------|----------|-----------|---------|----|---|
| Commands                   |       |          | RecordT   |         | W  | Command interface for applications. A positive acknowledge indicates the complete and correct finalization of the requested function. |
| Restore Factory Settings   |       |          | UIntegerT | 130     | W  | Restore Factory Settings  |
| Back To Box                |       |          | UIntegerT | 192     | W  | Back To Box   |
| reserved                   |       |          | UIntegerT | 161     | W  | reserved  |
| reserved                   |       |          | UIntegerT | 162     | W  | reserved  |
| reserved                   |       |          | UIntegerT | 163     | W  | reserved  |
| reserved                   |       |          | UIntegerT | 164     | W  | reserved  |
| reserved                   |       |          | UIntegerT | 165     | W  | reserved  |
| reserved                   |       |          | UIntegerT | 166     | W  | reserved  |
| reserved                   |       |          | UIntegerT | 167     | W  | reserved  |
| reserved                   |       |          | UIntegerT | 168     | W  | reserved  |
| reserved                   |       |          | UIntegerT | 169     | W  | reserved  |
| reserved                   |       |          | UIntegerT | 170     | W  | reserved  |
| reserved                   |       |          | UIntegerT | 171     | W  | reserved  |
| reserved                   |       |          | UIntegerT | 172     | W  | reserved  |
| reserved                   |       |          | UIntegerT | 173     | W  | reserved  |
| reserved                   |       |          | UIntegerT | 174     | W  | reserved  |
| reserved                   |       |          | UIntegerT | 175     | W  | reserved  |
| Clear ObjectCount          |       |          | UIntegerT | 176     | W  | Clear ObjectCount   |
| Direct Parameters - Page 1 | 0     | 0        | RecordT   |         | RW | Comprises the required parameters defining the communication characteristics and identifiers for device validation.                   |
| Reserved                   | 0     | 1        | UIntegerT |         | R  |   |
| Master Cycle Time          | 0     | 2        | UIntegerT |         | R  | Communication: Current communication cycle duration used by the master. This value defines the process data cycle.                    |

| Parameter                  | Index | Subindex | Data type | Default | AR | Description   |
|----------------------------|-------|----------|-----------|---------|----|---|
| Min Cycle Time             | 0     | 3        | UIntegerT |         | R  | Communication: Minimum communication cycle duration supported by the device. This value defines the lowest possible process data cycle.   |
| M-Sequence Capability      | 0     | 4        | UIntegerT |         | R  | Communication: Information on the structure and the supported features of the communication messages.   |
| IO-Link Revision ID        | 0     | 5        | UIntegerT | 17      | R  | Communication: Identifier for the currently used communication protocol revision.   |
| Process Data Input Length  | 0     | 6        | UIntegerT |         | R  | Communication: Information on width and features of the process input data (Process Data from Device to Master).  |
| Process Data Output Length | 0     | 7        | UIntegerT |         | R  | Communication: Information on width of the process output data (Process Data from Master to Device).  |
| Vendor ID 1                | 0     | 8        | UIntegerT |         | R  | Identification: Highest octet of the Vendor ID. Combined with the parameter Vendor ID 2, this parameter defines the 16-bit value of the unique Vendor ID as assigned by the IO-Link Community.  |
| Vendor ID 2                | 0     | 9        | UIntegerT |         | R  | Identification: Lowest octet of the Vendor ID. Combined with the parameter Vendor ID 1, this parameter defines the 16-bit value of the unique Vendor ID as assigned by the IO-Link Community.   |
| Device ID 1                | 0     | 10       | UIntegerT |         | R  | Identification: Highest octet of the Device ID. Combined with the parameters Device ID 2 and 3, this parameter defines the 24-bit value of the vendor-specific Device ID.   |
| Device ID 2                | 0     | 11       | UIntegerT |         | R  | Identification: Middle octet of the Device ID. Combined with the parameters Device ID 1 and 3, this parameter defines the 24-bit value of the vendor-specific Device ID.  |
| Device ID 3                | 0     | 12       | UIntegerT |         | R  | Identification: Lowest octet of the Device ID. Combined with the parameters Device ID 1 and 2, this parameter defines the 24-bit value of the vendor-specific Device ID.  |
| Reserved                   | 0     | 13       | UIntegerT |         | R  |   |
| Reserved                   | 0     | 14       | UIntegerT |         | R  |   |
| Reserved                   | 0     | 15       | UIntegerT |         | R  |   |
| System Command             | 0     | 16       | UIntegerT |         | W  | Application: Command interface for devices without ISDU support. Validity and execution of commands are not confirmed.<br><br>(0 ... 63): Reserved<br>128: Device Reset<br>129: Application Reset<br>130: Restore Factory Settings<br>131: Back-to-box<br>(132 ... 159): Reserved |
| Direct Parameters - Page 2 | 1     | 0        | RecordT   |         | RW | A set of parameters for devices without ISDU support.   |

| Parameter                    | Index | Subindex | Data type | Default | AR | Description   |
|------------------------------|-------|----------|-----------|---------|----|---|
| Device-specific Parameter 1  | 1     | 1        | UIntegerT |         | RW |   |
| Device-specific Parameter 2  | 1     | 2        | UIntegerT |         | RW |   |
| Device-specific Parameter 3  | 1     | 3        | UIntegerT |         | RW |   |
| Device-specific Parameter 4  | 1     | 4        | UIntegerT |         | RW |   |
| Device-specific Parameter 5  | 1     | 5        | UIntegerT |         | RW |   |
| Device-specific Parameter 6  | 1     | 6        | UIntegerT |         | RW |   |
| Device-specific Parameter 7  | 1     | 7        | UIntegerT |         | RW |   |
| Device-specific Parameter 8  | 1     | 8        | UIntegerT |         | RW |   |
| Device-specific Parameter 9  | 1     | 9        | UIntegerT |         | RW |   |
| Device-specific Parameter 10 | 1     | 10       | UIntegerT |         | RW |   |
| Device-specific Parameter 11 | 1     | 11       | UIntegerT |         | RW |   |
| Device-specific Parameter 12 | 1     | 12       | UIntegerT |         | RW |   |
| Device-specific Parameter 13 | 1     | 13       | UIntegerT |         | RW |   |
| Device-specific Parameter 14 | 1     | 14       | UIntegerT |         | RW |   |
| Device-specific Parameter 15 | 1     | 15       | UIntegerT |         | RW |   |
| Device-specific Parameter 16 | 1     | 16       | UIntegerT |         | RW |   |
| System Command               | 2     | 0        | UIntegerT |         | W  | <p>Command interface for applications. A positive acknowledge indicates the complete and correct finalization of the requested function.</p> <p>130: Restore Factory Settings<br/> (0 ... 63): Reserved<br/> (132 ... 159): Reserved<br/> 192: Back To Box<br/> 161: reserved<br/> 162: reserved<br/> 163: reserved<br/> 164: reserved<br/> 165: reserved<br/> 166: reserved<br/> 167: reserved<br/> 168: reserved<br/> 169: reserved<br/> 170: reserved<br/> 171: reserved<br/> 172: reserved<br/> 173: reserved<br/> 174: reserved<br/> 175: reserved<br/> 176: Clear ObjectCount</p> |

| Parameter                | Index | Subindex | Data type | Default                        | AR | Description   |
|--------------------------|-------|----------|-----------|--------------------------------|----|---|
| Device Access Locks      | 12    | 0        | RecordT   |                                | RW | The access to the device parameters can be restricted by setting appropriate flags within this parameter.   |
| Parameter Write Access   | 12    | 1        | BooleanT  |                                | RW | This lock prevents the write access to all read/write parameters of the device except for the parameter 'Device Access Locks'.<br><br>True: Locked<br>False: Unlocked |
| Data Storage             | 12    | 2        | BooleanT  |                                | RW | This lock prevents the write access to the device parameters via the data storage mechanism.<br><br>True: Locked<br>False: Unlocked                                   |
| Local Parameterization   | 12    | 3        | BooleanT  |                                | RW | This lock prevents the device settings from being changed via local operating elements on the device.<br><br>True: Locked<br>False: Unlocked                          |
| Local User Interface     | 12    | 4        | BooleanT  |                                | RW | This lock prevents the access to the device settings and display via a local user interface. The user interface is disabled.<br><br>True: Locked<br>False: Unlocked   |
| Vendor Name              | 16    | 0        | StringT   | Leuze electronic GmbH + Co. KG | R  | The vendor name that is assigned to a Vendor ID.  |
| Vendor Text              | 17    | 0        | StringT   | The Sensor People              | R  | Additional information about the vendor.  |
| Product Name             | 18    | 0        | StringT   | HT5xCLx/LG                     | R  | Complete product name.  |
| Product ID               | 19    | 0        | StringT   |                                | R  | Vendor-specific product or type identification (e.g., item number or model number).   |
| Product Text             | 20    | 0        | StringT   | Diffuse Sensor with BGS        | R  | Additional product information for the device.  |
| Serial Number            | 21    | 0        | StringT   |                                | R  | Unique, vendor-specific identifier of the individual device.  |
| Hardware Revision        | 22    | 0        | StringT   |                                | R  | Unique, vendor-specific identifier of the hardware revision of the individual device.   |
| Firmware Revision        | 23    | 0        | StringT   |                                | R  | Unique, vendor-specific identifier of the firmware revision of the individual device.   |
| Application-specific Tag | 24    | 0        | StringT   | ***                            | RW | Possibility to mark a device with user- or application-specific information.  |
| Function Tag             | 25    | 0        | StringT   | ***                            | RW |   |
| Location Tag             | 26    | 0        | StringT   | ***                            | RW |   |
| Device Status            | 36    | 0        | UIntegerT |                                | R  | Indicator for the current device condition and diagnosis state.   |
| Detailed Device Status   | 37    | 0        | ArrayT    |                                | R  | List of all currently pending events in the device.   |

| Parameter               | Index | Subindex | Data type    | Default | AR | Description   |
|-------------------------|-------|----------|--------------|---------|----|---|
|                         | 37    | 0        | OctetStringT |         | R  |   |
| Config                  | 64    | 0        | RecordT      |         | RW |   |
| PD input configuration  | 64    | 1        | UIntegerT    | 0       | RW | Configuration of process data content<br>0: Default<br>1: Measurement value   |
| reserved                | 64    | 2        | BooleanT     | 0       | RW | reserved<br>False: reserved (0)   |
| PD output configuration | 64    | 3        | BooleanT     | 0       | RW | Configuration of CSC (sensor control)<br>False: CSC is deactivation<br>True: CSC is activation                                |
| Out2 function           | 64    | 4        | UIntegerT    | 0       | RW | 0: Inverted switching output<br>1: Switching output   |
| reserved                | 64    | 5        | UIntegerT    | 0       | RW | reserved<br>0: reserved (0)   |
| Delay function          | 64    | 6        | UIntegerT    | 1       | RW | Operating function of the internal delay unit<br>0: On delay<br>1: Off delay<br>2: Pulse stretching<br>3: Pulse suppression   |
| Delay time base         | 64    | 7        | UIntegerT    | 1       | RW | Time base of the internal delay unit:<br>1ms, 10ms, 100ms, 1000ms<br>0: 1ms<br>1: 10ms<br>2: 100ms<br>3: 1000ms               |
| Delay multiplier        | 64    | 8        | UIntegerT    | 1       | RW | Multiplier of the internal delay unit: 1-15<br>* delay time base  |
| reserved                | 64    | 9        | BooleanT     | 0       | RW | reserved<br>False: reserved (0)   |
| reserved                | 64    | 10       | BooleanT     | 0       | RW | reserved<br>False: reserved (0)   |
| reserved                | 64    | 11       | BooleanT     | 0       | RW | reserved<br>False: reserved (0)   |
| reserved                | 64    | 12       | BooleanT     | 0       | RW | reserved<br>False: reserved (0)   |
| reserved                | 64    | 13       | BooleanT     | 0       | RW | reserved<br>False: reserved (0)   |
| SSC logic               | 64    | 14       | BooleanT     | 1       | RW | SSC logic: adjusting the switching behavior of the switching signal channel<br>False: Out is no object<br>True: Out is object |
| reserved                | 64    | 15       | BooleanT     | 0       | RW | reserved<br>False: reserved (0)   |

| Parameter       | Index | Subindex | Data type | Default | AR | Description  |
|-----------------|-------|----------|-----------|---------|----|--|
| Delay unit      | 64    | 16       | BooleanT  | 0       | RW | Enable/disable internal delay unit (based on object)<br>False: Disabled<br>True: Enabled |
| Object count    | 70    | 0        | UIntegerT |         | R  |  |
| Operation hours | 71    | 0        | UIntegerT |         | R  |  |
| Setpoints       | 73    | 0        | RecordT   |         | R  | Setpoints for the switching signal channel.  |
| SP1             | 73    | 1        | UIntegerT |         | R  | Defines the setpoint 1 value for the switching signal channel.                           |
| SP2             | 73    | 2        | UIntegerT |         | R  | Defines the setpoint 2 value for the switching signal channel.                           |

# 9 Technical specifications

## 9.1 General data

Tab. 9.1: Sensor and IODD version

|                   |   |
|-------------------|---|
| IODD version      | V1.0  |
| IODD release date | 2023-03-31  |
| Device family     | HT5xC   |
| Device ID         | 6005  |
| Device name       | HT5xCLx/LG  |
| Device variants   | HT53CL1/LG-M8 (50148175), HT55CL1/LG-M8 (50148209), HT55CL1/LG-200-M12 (50148210), HT55CL1/LG-5000 (50148211) |