



PLC Integration HRT25_2147

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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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_HRT25_2147" 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. FALSE: Read parameter 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). Siemens: 227 Weidmüller: 227 Other manufacturers: 255
TimeOut	Time	Time, after a Timeout-Error is triggered.

Tab. 3.2: Parameter INOUT

Parameter	Data type	Description
DeviceData	Leuze_type_HRT25_2147	Sensor data

See structure description of Leuze_type_HRT25_2147 in chapter 7.

Tab. 3.3: Parameter OUT

Parameter	Data type	Description
Done	Bool	Indicates whether data is valid.
Busy	Bool	Request in process. FALSE: Request is terminated TRUE: Request is being processed
Error	Bool	Error flag FALSE: No error 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_HRT25_2147". 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_HRT25_2147" 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_ HRT25_2147" 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_HRT25_2147 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

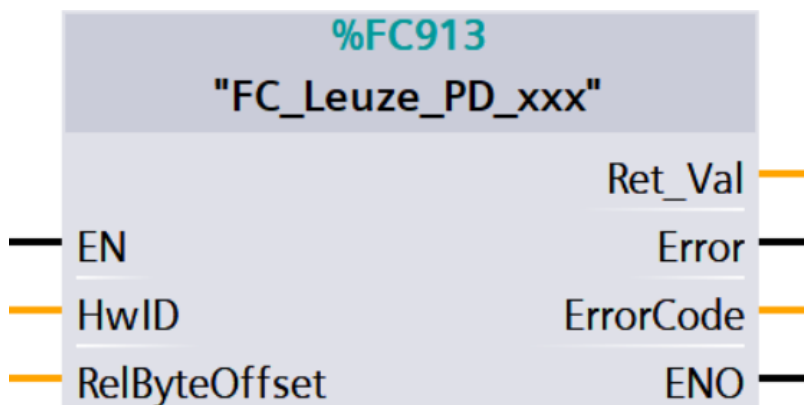


Fig. 5.1: Example of process data parsing function call

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.
ErrorCode	OUTPUT	WORD	Error code details see in the Siemens help system ("DPRD_DAT").
RET_VAL	OUTPUT	Leuze_type_PD_HRT25_2147	Reference to the instance of the data structure Leuze_type_PD_HRT25_2147. The structure includes the disaggregated values of the process data.

See structure description of Leuze_type_PD_HRT25_2147 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, 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).

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).

7 Data structures

Tab. 7.1: Leuze_type_HRT25_2147

Parameter name	Data type	Description
DeviceData.Selection.Commands.DeviceReset	Bool	[WRITE_ONLY] Device Reset
DeviceData.Selection.Commands.ApplicationReset	Bool	[WRITE_ONLY] Application Reset
DeviceData.Selection.Commands.RestoreFactorySettings	Bool	[WRITE_ONLY] Restore Factory Settings
DeviceData.Selection.Commands. ClearConfigurationReservationClearDsuploadflag	Bool	[WRITE_ONLY] Clear Configuration Reservation (Clear DsUploadFlag)
DeviceData.Selection.Commands. ReserveConfigurationForDsSetDsuploadflag	Bool	[WRITE_ONLY] Reserve Configuration for DS (Set DsUploadFlag)
DeviceData.Selection.Commands.Activation	Bool	[WRITE_ONLY] Activation
DeviceData.Selection.Commands.Deactivation	Bool	[WRITE_ONLY] Deactivation
DeviceData.Selection.Commands.TeachInOfQ1InObjectMode	Bool	[WRITE_ONLY] Teach-In of Q1 in Object Mode
DeviceData.Selection.Commands.TeachInOfQ2InObjectMode	Bool	[WRITE_ONLY] Teach-In of Q2 in Object Mode
DeviceData.Selection.Commands.TeachInOfQ1Q2LightSwitch	Bool	[WRITE_ONLY] Teach-In of Q1/Q2, Light Switch
DeviceData.Selection.Commands.TeachInOfQ1Q2DarkSwitch	Bool	[WRITE_ONLY] Teach-In of Q1/Q2, Dark Switch
DeviceData.Selection.DirectParameters1.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.DirectParameters1.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.DirectParameters1.Reserved_1	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.MasterCycleTime	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.MinCycleTime	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.MSequenceCapability	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.IoLinkVersionId	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1. ProcessDataInputLength	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1. ProcessDataOutputLength	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.VendorId1	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.VendorId2	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.DeviceId1	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.DeviceId2	Bool	[READ_ONLY]

Parameter name	Data type	Description
DeviceData.Selection.DirectParameters1.Deviceld3	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.Reserved_13	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.Reserved_14	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.Reserved_15	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters2.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.DirectParameters2.DeviceSpecificParameter1	Bool	[READ_WRITE]
DeviceData.Selection.DirectParameters2.DeviceSpecificParameter2	Bool	[READ_WRITE]
DeviceData.Selection.DirectParameters2.DeviceSpecificParameter3	Bool	[READ_WRITE]
DeviceData.Selection.DirectParameters2.DeviceSpecificParameter4	Bool	[READ_WRITE]
DeviceData.Selection.DirectParameters2.DeviceSpecificParameter5	Bool	[READ_WRITE]
DeviceData.Selection.DirectParameters2.DeviceSpecificParameter6	Bool	[READ_WRITE]
DeviceData.Selection.DirectParameters2.DeviceSpecificParameter7	Bool	[READ_WRITE]
DeviceData.Selection.DirectParameters2.DeviceSpecificParameter8	Bool	[READ_WRITE]
DeviceData.Selection.DirectParameters2.DeviceSpecificParameter9	Bool	[READ_WRITE]
DeviceData.Selection.DirectParameters2.DeviceSpecificParameter10	Bool	[READ_WRITE]
DeviceData.Selection.DirectParameters2.DeviceSpecificParameter11	Bool	[READ_WRITE]
DeviceData.Selection.DirectParameters2.DeviceSpecificParameter12	Bool	[READ_WRITE]
DeviceData.Selection.DirectParameters2.DeviceSpecificParameter13	Bool	[READ_WRITE]
DeviceData.Selection.DirectParameters2.DeviceSpecificParameter14	Bool	[READ_WRITE]
DeviceData.Selection.DirectParameters2.DeviceSpecificParameter15	Bool	[READ_WRITE]
DeviceData.Selection.DirectParameters2.DeviceSpecificParameter16	Bool	[READ_WRITE]
DeviceData.Selection.StandardCommand	Bool	[WRITE_ONLY]
DeviceData.Selection.DeviceAccessLocks.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.VendorName	Bool	[READ_ONLY]
DeviceData.Selection.VendorText	Bool	[READ_ONLY]
DeviceData.Selection.ProductName	Bool	[READ_ONLY]
DeviceData.Selection.ProductId	Bool	[READ_ONLY]

Parameter name	Data type	Description
DeviceData.Selection.ProductText	Bool	[READ_ONLY]
DeviceData.Selection.SerialNumber	Bool	[READ_ONLY]
DeviceData.Selection.HardwareVersion	Bool	[READ_ONLY]
DeviceData.Selection.FirmwareVersion	Bool	[READ_ONLY]
DeviceData.Selection.ApplicationSpecificTag	Bool	[READ_WRITE]
DeviceData.Selection.DeviceStatus	Bool	[READ_ONLY]
DeviceData.Selection.StatusInformation.All	Bool	[READ_ONLY] all parameters of complex data type
DeviceData.Selection.ExtendedStatus.All	Bool	[READ_ONLY] all parameters of complex data type
DeviceData.Selection.DataStorageUploadFlag	Bool	[READ_ONLY] Priority of local changes according to configuration data stored in master DS
DeviceData.Selection.Reserved01	Bool	[READ_ONLY] Reserved For Future Use; Read Only Access
DeviceData.Selection.SwitchingOutputProperty	Bool	[READ_WRITE] General Behaviour of All Switching Outputs with No Available Measure Value
DeviceData.Selection.Q1SwitchingPoint_83	Bool	[READ_ONLY] Q1 Switching point from device teach
DeviceData.Selection.Q1LightDark	Bool	[READ_WRITE] Output Q1: Light or Dark Switching Selection: Light=Output Active (On) between SP1 and SP2
DeviceData.Selection.Q1Hysteresis	Bool	[READ_WRITE] Q1 Hysteresis
DeviceData.Selection.Q1EvaluationDepth	Bool	[READ_WRITE] Q1 Output Changes are Delayed By This Number of Unchanged Measurement Results
DeviceData.Selection.Q1HysteresisClass	Bool	[READ_WRITE] Q1 Hysteresis Adjustment (Raw, Medium or Fine)
DeviceData.Selection.Q1ReserveClass	Bool	[READ_WRITE] Q1 Reserve Adjustment (Raw, Medium or Fine)
DeviceData.Selection.Q2SwitchingPoint_92	Bool	[READ_ONLY] Q2 Switching point from device teach
DeviceData.Selection.Q2LightDark	Bool	[READ_WRITE] Output Q2: Light or Dark Switching Selection: Light=Output Active (On) between SP1 and SP2
DeviceData.Selection.Q2Hysteresis	Bool	[READ_WRITE] Q2 Hysteresis

Parameter name	Data type	Description
DeviceData.Selection.Q2EvaluationDepth	Bool	[READ_WRITE] Q2 Output Changes are Delayed By This Number of Unchanged Measurement Results
DeviceData.Selection.Q2HysteresisClass	Bool	[READ_WRITE] Q2 Hysteresis Adjustment (Raw, Medium or Fine)
DeviceData.Selection.Q2ReserveClass	Bool	[READ_WRITE] Q2 Reserve Adjustment (Raw, Medium or Fine)
DeviceData.Selection.Q1Reserve	Bool	[READ_WRITE] Q1 Reserve
DeviceData.Selection.Q2Reserve	Bool	[READ_WRITE] Q2 Reserve
DeviceData.Selection.MeasurementMode	Bool	[READ_WRITE] Application Specific Selection of Measurement Mode
DeviceData.Selection.FilterLength	Bool	[READ_WRITE] Application Specific Selection Filter length
DeviceData.Selection.FilterClass	Bool	[READ_WRITE] Application Specific Selection of Filter Class
DeviceData.Selection.Q1Setpoint_132	Bool	[READ_WRITE] Numerical determination of setpoint for Q1
DeviceData.Selection.Q2Setpoint_133	Bool	[READ_WRITE] Numerical determination of setpoint for Q2
DeviceData.Selection.FunctionButton1Level1	Bool	[READ_ONLY] Function Being Called When Button #1 Is Released After 2..7 Seconds
DeviceData.Selection.FunctionButton1Level2	Bool	[READ_ONLY] Function Being Called When Button #1 Is Released After 7..12 Seconds
DeviceData.Selection.FunctionButton1Level3	Bool	[READ_ONLY] Function Being Called When Button #1 Is Released After 12..17 Seconds
DeviceData.Selection.FunctionWireLevel1	Bool	[READ_ONLY] Function Being Called With Selection Width of 20..80 ms On Input Wire
DeviceData.Selection.FunctionWireLevel2	Bool	[READ_ONLY] Function Being Called With Low Pulse Width of 120..180 ms On Wire Input
DeviceData.Selection.FunctionWireLevel3	Bool	[READ_ONLY] Function Being Called With Low Pulse Width of 220..280 ms On Wire Input
DeviceData.Selection.FunctionWireLevel4	Bool	[READ_ONLY] Function Being Called With Low Pulse Width of 320..380 ms On Wire Input
DeviceData.Selection.FunctionWireLevel5	Bool	[READ_ONLY] Function Being Called With Low Pulse Width of 420..480 ms On Wire Input

Parameter name	Data type	Description
DeviceData.Selection.FunctionWireLevel6	Bool	[READ_ONLY] Function Being Called With Low Pulse Width of 520..580 ms On Wire Input
DeviceData.Selection.FunctionWireLevel7	Bool	[READ_ONLY] Function Being Called With Low Pulse Width of 620..680 ms On Wire Input
DeviceData.Selection.FunctionWireLevel8	Bool	[READ_ONLY] Function Being Called With Low Pulse Width of 720..780 ms On Wire Input
DeviceData.Selection.FunctionWireLevel9	Bool	[READ_ONLY] Function Being Called With Low Pulse Width of 820..880 ms On Wire Input
DeviceData.Selection.FunctionWireLevel10	Bool	[READ_ONLY] Function Being Called With Low Pulse Width of 920..980 ms On Wire Input
DeviceData.Selection.FunctionWireLevel11	Bool	[READ_ONLY] Function Being Called With Low Pulse Width of 1020..1080 ms On Wire Input
DeviceData.Selection.FunctionWireLevel12	Bool	[READ_ONLY] Function Being Called With Low Pulse Width of 1120..1180 ms On Wire Input
DeviceData.Selection.StatusValue.All	Bool	[READ_ONLY] all parameters of complex data type
DeviceData.Selection.ReserveValue_2160	Bool	[READ_WRITE] Reserve value
DeviceData.Selection.ReserveValue_2161	Bool	[READ_WRITE] Reserve value
DeviceData.Selection.ReserveValue_2162	Bool	[READ_WRITE] Reserve value
DeviceData.Selection.ReserveValue_2163	Bool	[READ_WRITE] Reserve value
DeviceData.Data.Commands.DeviceReset	UInt	[WRITE_ONLY] Device Reset
DeviceData.Data.Commands.ApplicationReset	UInt	[WRITE_ONLY] Application Reset
DeviceData.Data.Commands.RestoreFactorySettings	UInt	[WRITE_ONLY] Restore Factory Settings
DeviceData.Data.Commands.ClearConfigurationReservationClearDsuploadflag	UInt	[WRITE_ONLY] Clear Configuration Reservation (Clear DsUploadFlag)
DeviceData.Data.Commands.ReserveConfigurationForDsSetDsuploadflag	UInt	[WRITE_ONLY] Reserve Configuration for DS (Set DsUploadFlag)
DeviceData.Data.Commands.Activation	UInt	[WRITE_ONLY] Activation
DeviceData.Data.Commands.Deactivation	UInt	[WRITE_ONLY] Deactivation
DeviceData.Data.Commands.TeachInOfQ1InObjectMode	UInt	[WRITE_ONLY] Teach-In of Q1 in Object Mode
DeviceData.Data.Commands.TeachInOfQ2InObjectMode	UInt	[WRITE_ONLY] Teach-In of Q2 in Object Mode

Parameter name	Data type	Description
DeviceData.Data.Commands.TeachInOfQ1Q2LightSwitch	UInt	[WRITE_ONLY] Teach-In of Q1/Q2, Light Switch
DeviceData.Data.Commands.TeachInOfQ1Q2DarkSwitch	UInt	[WRITE_ONLY] Teach-In of Q1/Q2, Dark Switch
DeviceData.Data.DirectParameters1.Reserved_1	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.MasterCycleTime	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.MinCycleTime	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.MSequenceCapability	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.IoLinkVersionId	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.ProcessDataInputLength	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.ProcessDataOutputLength	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.VendorId1	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.VendorId2	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.DeviceId1	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.DeviceId2	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.DeviceId3	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.Reserved_13	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.Reserved_14	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.Reserved_15	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter1	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter2	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter3	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter4	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter5	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter6	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter7	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter8	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter9	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter10	UInt	[READ_WRITE]

Parameter name	Data type	Description
DeviceData.Data.DirectParameters2.DeviceSpecificParameter11	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter12	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter13	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter14	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter15	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter16	UInt	[READ_WRITE]
DeviceData.Data.StandardCommand	UInt	[WRITE_ONLY]
DeviceData.Data.DeviceAccessLocks.ParameterWriteAccessLock	Bool	[READ_WRITE]
DeviceData.Data.DeviceAccessLocks.DataStorageLock	Bool	[READ_WRITE]
DeviceData.Data.DeviceAccessLocks.LocalParameterizationLock	Bool	[READ_WRITE]
DeviceData.Data.DeviceAccessLocks.LocalUserInterfaceLock	Bool	[READ_WRITE]
DeviceData.Data.VendorName	String	[READ_ONLY]
DeviceData.Data.VendorText	String	[READ_ONLY]
DeviceData.Data.ProductName	String	[READ_ONLY]
DeviceData.Data.ProductId	String	[READ_ONLY]
DeviceData.Data.ProductText	String	[READ_ONLY]
DeviceData.Data.SerialNumber	String	[READ_ONLY]
DeviceData.Data.HardwareVersion	String	[READ_ONLY]
DeviceData.Data.FirmwareVersion	String	[READ_ONLY]
DeviceData.Data.ApplicationSpecificTag	String	[READ_WRITE]
DeviceData.Data.DeviceStatus	UInt	[READ_ONLY]
DeviceData.Data.StatusInformation.Q1OutputState	Bool	[READ_ONLY]
DeviceData.Data.StatusInformation.Q2OutputState	Bool	[READ_ONLY]
DeviceData.Data.StatusInformation.Reserved	Bool	[READ_ONLY]
DeviceData.Data.StatusInformation.MeasureState	Bool	[READ_ONLY]
DeviceData.Data.StatusInformation.ReceivedSignal	Bool	[READ_ONLY]
DeviceData.Data.StatusInformation.WarningReducedAccuracy	Bool	[READ_ONLY]

Parameter name	Data type	Description
DeviceData.Data.StatusInformation.WarningAmbientNoise	Bool	[READ_ONLY]
DeviceData.Data.ExtendedStatus.DeactivationFlag	Bool	[READ_ONLY]
DeviceData.Data.ExtendedStatus.LaserErrorFlag	Bool	[READ_ONLY]
DeviceData.Data.ExtendedStatus.SignalAmplitudeFlag	Bool	[READ_ONLY]
DeviceData.Data.ExtendedStatus.TargetBrightness	UInt	[READ_ONLY]
DeviceData.Data.ExtendedStatus.TeachState	UInt	[READ_ONLY]
DeviceData.Data.DataStorageUploadFlag	UInt	[READ_ONLY] Priority of local changes according to configuration data stored in master DS
DeviceData.Data.Reserved01	UInt	[READ_ONLY] Reserved For Future Use; Read Only Access
DeviceData.Data.SwitchingOutputProperty	UInt	[READ_WRITE] General Behaviour of All Switching Outputs with No Available Measure Value
DeviceData.Data.Q1SwitchingPoint_83	UInt	[READ_ONLY] Q1 Switching point from device teach
DeviceData.Data.Q1LightDark	UInt	[READ_WRITE] Output Q1: Light or Dark Switching Selection: Light=Output Active (On) between SP1 and SP2
DeviceData.Data.Q1Hysteresis	UInt	[READ_WRITE] Q1 Hysteresis
DeviceData.Data.Q1EvaluationDepth	UInt	[READ_WRITE] Q1 Output Changes are Delayed By This Number of Unchanged Measurement Results
DeviceData.Data.Q1HysteresisClass	UInt	[READ_WRITE] Q1 Hysteresis Adjustment (Raw, Medium or Fine)
DeviceData.Data.Q1ReserveClass	UInt	[READ_WRITE] Q1 Reserve Adjustment (Raw, Medium or Fine)
DeviceData.Data.Q2SwitchingPoint_92	UInt	[READ_ONLY] Q2 Switching point from device teach
DeviceData.Data.Q2LightDark	UInt	[READ_WRITE] Output Q2: Light or Dark Switching Selection: Light=Output Active (On) between SP1 and SP2
DeviceData.Data.Q2Hysteresis	UInt	[READ_WRITE] Q2 Hysteresis
DeviceData.Data.Q2EvaluationDepth	UInt	[READ_WRITE] Q2 Output Changes are Delayed By This Number of Unchanged Measurement Results

Parameter name	Data type	Description
DeviceData.Data.Q2HysteresisClass	UInt	[READ_WRITE] Q2 Hysteresis Adjustment (Raw, Medium or Fine)
DeviceData.Data.Q2ReserveClass	UInt	[READ_WRITE] Q2 Reserve Adjustment (Raw, Medium or Fine)
DeviceData.Data.Q1Reserve	UInt	[READ_WRITE] Q1 Reserve
DeviceData.Data.Q2Reserve	UInt	[READ_WRITE] Q2 Reserve
DeviceData.Data.MeasurementMode	UInt	[READ_WRITE] Application Specific Selection of Measurement Mode
DeviceData.Data.FilterLength	UInt	[READ_WRITE] Application Specific Selection Filter length
DeviceData.Data.FilterClass	UInt	[READ_WRITE] Application Specific Selection of Filter Class
DeviceData.Data.Q1Setpoint_132	UInt	[READ_WRITE] Numerical determination of setpoint for Q1
DeviceData.Data.Q2Setpoint_133	UInt	[READ_WRITE] Numerical determination of setpoint for Q2
DeviceData.Data.FunctionButton1Level1	UInt	[READ_ONLY] Function Being Called When Button #1 Is Released After 2..7 Seconds
DeviceData.Data.FunctionButton1Level2	UInt	[READ_ONLY] Function Being Called When Button #1 Is Released After 7..12 Seconds
DeviceData.Data.FunctionButton1Level3	UInt	[READ_ONLY] Function Being Called When Button #1 Is Released After 12..17 Seconds
DeviceData.Data.FunctionWireLevel1	UInt	[READ_ONLY] Function Being Called With Selection Width of 20..80 ms On Input Wire
DeviceData.Data.FunctionWireLevel2	UInt	[READ_ONLY] Function Being Called With Low Pulse Width of 120..180 ms On Wire Input
DeviceData.Data.FunctionWireLevel3	UInt	[READ_ONLY] Function Being Called With Low Pulse Width of 220..280 ms On Wire Input
DeviceData.Data.FunctionWireLevel4	UInt	[READ_ONLY] Function Being Called With Low Pulse Width of 320..380 ms On Wire Input
DeviceData.Data.FunctionWireLevel5	UInt	[READ_ONLY] Function Being Called With Low Pulse Width of 420..480 ms On Wire Input
DeviceData.Data.FunctionWireLevel6	UInt	[READ_ONLY] Function Being Called With Low Pulse Width of 520..580 ms On Wire Input

Parameter name	Data type	Description
DeviceData.Data.FunctionWireLevel7	UInt	[READ_ONLY] Function Being Called With Low Pulse Width of 620..680 ms On Wire Input
DeviceData.Data.FunctionWireLevel8	UInt	[READ_ONLY] Function Being Called With Low Pulse Width of 720..780 ms On Wire Input
DeviceData.Data.FunctionWireLevel9	UInt	[READ_ONLY] Function Being Called With Low Pulse Width of 820..880 ms On Wire Input
DeviceData.Data.FunctionWireLevel10	UInt	[READ_ONLY] Function Being Called With Low Pulse Width of 920..980 ms On Wire Input
DeviceData.Data.FunctionWireLevel11	UInt	[READ_ONLY] Function Being Called With Low Pulse Width of 1020..1080 ms On Wire Input
DeviceData.Data.FunctionWireLevel12	UInt	[READ_ONLY] Function Being Called With Low Pulse Width of 1120..1180 ms On Wire Input
DeviceData.Data.StatusValue.StatusDeactivate	Bool	[READ_ONLY]
DeviceData.Data.StatusValue.ModeHysteresisAmplitude	Bool	[READ_ONLY]
DeviceData.Data.StatusValue.ModeHysteresisAmbient	Bool	[READ_ONLY]
DeviceData.Data.StatusValue.ModeAverageFilter	Bool	[READ_ONLY]
DeviceData.Data.StatusValue.ModeLinear	Bool	[READ_ONLY]
DeviceData.Data.StatusValue.DataError	Bool	[READ_ONLY]
DeviceData.Data.StatusValue.CommunicationsError	Bool	[READ_ONLY]
DeviceData.Data.StatusValue.PixelError	Bool	[READ_ONLY]
DeviceData.Data.StatusValue.LastPixelError	Bool	[READ_ONLY]
DeviceData.Data.StatusValue.AmbientError	Bool	[READ_ONLY]
DeviceData.Data.StatusValue.MinAmplitudeError	Bool	[READ_ONLY]
DeviceData.Data.StatusValue.DistanzOversize	Bool	[READ_ONLY]
DeviceData.Data.StatusValue.WarningAmplitudeOverflow	Bool	[READ_ONLY]
DeviceData.Data.StatusValue.WarningEpcWatchdog	Bool	[READ_ONLY]
DeviceData.Data.StatusValue.WarningAmplitudeLow	Bool	[READ_ONLY]
DeviceData.Data.StatusValue.WarningAmbientNoise	Bool	[READ_ONLY]
DeviceData.Data.ReserveValue_2160	UInt	[READ_WRITE] Reserve value

Parameter name	Data type	Description
DeviceData.Data.ReserveValue_2161	UInt	[READ_WRITE] Reserve value
DeviceData.Data.ReserveValue_2162	UInt	[READ_WRITE] Reserve value
DeviceData.Data.ReserveValue_2163	UInt	[READ_WRITE] Reserve value

Tab. 7.2: Leuze_type_PD_HRT25_2147

Parameter name	Data type	Description
FC_Leuze_PD_HRT25_2147.Q1OutputState	Bool	
FC_Leuze_PD_HRT25_2147.Q2OutputState	Bool	
FC_Leuze_PD_HRT25_2147.Reserved	Bool	
FC_Leuze_PD_HRT25_2147.MeasureState	Bool	
FC_Leuze_PD_HRT25_2147.ReceivedSignal	Bool	
FC_Leuze_PD_HRT25_2147.WarningReducedAccuracy	Bool	
FC_Leuze_PD_HRT25_2147.WarningAmbientNoise	Bool	

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	
Device Reset			UIntegerT	128	W	Device Reset
Application Reset			UIntegerT	129	W	Application Reset
Restore Factory Settings			UIntegerT	130	W	Restore Factory Settings
Clear Configuration Reservation (Clear DsUploadFlag)			UIntegerT	160	W	Clear Configuration Reservation (Clear DsUploadFlag)
Reserve Configuration for DS (Set DsUploadFlag)			UIntegerT	161	W	Reserve Configuration for DS (Set DsUploadFlag)
Activation			UIntegerT	176	W	Activation
Deactivation			UIntegerT	177	W	Deactivation
Teach-In of Q1 in Object Mode			UIntegerT	197	W	Teach-In of Q1 in Object Mode
Teach-In of Q2 in Object Mode			UIntegerT	198	W	Teach-In of Q2 in Object Mode
Teach-In of Q1/Q2, Light Switch			UIntegerT	212	W	Teach-In of Q1/Q2, Light Switch
Teach-In of Q1/Q2, Dark Switch			UIntegerT	213	W	Teach-In of Q1/Q2, Dark Switch
Direct Parameters 1	0	0	RecordT		RW	
Reserved	0	1	UIntegerT		R	
Master Cycle Time	0	2	UIntegerT		R	
Min Cycle Time	0	3	UIntegerT		R	
M-Sequence Capability	0	4	UIntegerT		R	
IO-Link Version ID	0	5	UIntegerT	17	R	
Process Data Input Length	0	6	UIntegerT		R	
Process Data Output Length	0	7	UIntegerT		R	
Vendor ID 1	0	8	UIntegerT		R	
Vendor ID 2	0	9	UIntegerT		R	
Device ID 1	0	10	UIntegerT		R	
Device ID 2	0	11	UIntegerT		R	

Parameter	Index	Subindex	Data type	Default	AR	Description
Device ID 3	0	12	UIntegerT		R	
Reserved	0	13	UIntegerT		R	
Reserved	0	14	UIntegerT		R	
Reserved	0	15	UIntegerT		R	
Standard Command	0	16	UIntegerT	128	W	(0 ... 63): Reserved 128: Device Reset 129: Application Reset 130: Restore Factory Settings (131 ... 159): Reserved
Direct Parameters 2	1	0	RecordT		RW	
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	

Parameter	Index	Subindex	Data type	Default	AR	Description
Standard Command	2	0	UIntegerT	128	W	(0 ... 63): Reserved 128: Device Reset 129: Application Reset 130: Restore Factory Settings (131 ... 159): Reserved 160: Clear Configuration Reservation (Clear DsUploadFlag) 161: Reserve Configuration for DS (Set DsUploadFlag) 176: Activation 177: Deactivation 197: Teach-In of Q1 in Object Mode 198: Teach-In of Q2 in Object Mode 212: Teach-In of Q1/Q2, Light Switch 213: Teach-In of Q1/Q2, Dark Switch
Device Access Locks	12	0	RecordT		RW	
Parameter (write) Access Lock	12	1	BooleanT		RW	
Data Storage Lock	12	2	BooleanT		RW	
Local Parameterization Lock	12	3	BooleanT		RW	
Local User Interface Lock	12	4	BooleanT		RW	
Vendor Name	16	0	StringT		R	
Vendor Text	17	0	StringT		R	
Product Name	18	0	StringT		R	
Product ID	19	0	StringT		R	
Product Text	20	0	StringT		R	
Serial Number	21	0	StringT		R	
Hardware Version	22	0	StringT		R	
Firmware Version	23	0	StringT		R	
Application Specific Tag	24	0	StringT		RW	
Device Status	36	0	UIntegerT		R	0: Device is OK 1: Maintenance required 2: Out of specification 3: Functional check 4: Failure (5 ... 255): Reserved
Status Information	71	0	RecordT		R	Process Input Data with Status Information
Q1 Output State	71	1	BooleanT		R	False: Q1 Off True: Q1 On
Q2 Output State	71	2	BooleanT		R	False: Q2 Off True: Q2 On
reserved	71	3	BooleanT		R	False: no function True: no function

Parameter	Index	Subindex	Data type	Default	AR	Description
Measure State	71	4	BooleanT		R	False: No Measure (Startup, Teach or Deactivated) True: Measure is Running
Received Signal	71	5	BooleanT		R	False: No Signal: no measure value available True: Signal and measurement value available
Warning: reduced accuracy	71	6	BooleanT		R	False: No Warning True: Warning
Warning: Ambient noise	71	7	BooleanT		R	False: No Warning True: Warning
Extended Status	72	0	RecordT		R	Deactivation and Error Status, Warning Details, Teach State
Deactivation Flag	72	1	BooleanT		R	False: Laser is On, Measure is Running True: Laser is Off, No Measure
Laser Error Flag	72	2	BooleanT		R	False: No Laser Error True: Laser Error
Signal Amplitude Flag	72	3	BooleanT		R	False: Amplitude out of Range True: Amplitude in Range
Target Brightness	72	4	UIntegerT		R	0: In Range 1: Too Light 2: Too Dark
Teach State	72	5	UIntegerT		R	0: Idle, No Teach Since Power Up 5: Busy, Teach is Running 7: Idle, Last Teach Failed 13: Idle, Last Teach Succeeded
Data Storage Upload Flag	73	0	UIntegerT		R	Priority of local changes according to configuration data stored in master DS 0: clear (No Upload Request for local Sensor Data) 128: set (Upload Request for local Sensor Data is set)
Reserved01	75	0	UIntegerT		R	Reserved For Future Use; Read Only Access
Switching Output Property	82	0	UIntegerT		RW	General Behaviour of All Switching Outputs with No Available Measure Value 0: Switching Off 1: Switching On 2: Unchanged
Q1 Switching point	83	0	UIntegerT		R	Q1 Switching point from device teach (0 ... 3000)
Q1 Light/Dark	85	0	UIntegerT		RW	Output Q1: Light or Dark Switching Selection: Light=Output Active (On) between SP1 and SP2 0: Light Switching 1: Dark Switching
Q1 Hysteresis	87	0	UIntegerT		RW	Q1 Hysteresis (0 ... 1000)
Q1 Evaluation Depth	89	0	UIntegerT		RW	Q1 Output Changes are Delayed By This Number of Unchanged Measurement Results (0 ... 100)

Parameter	Index	Subindex	Data type	Default	AR	Description
Q1 Hysteresis Class	90	0	UIntegerT		RW	Q1 Hysteresis Adjustment (Raw, Medium or Fine) 0: Raw 1: Medium 2: Fine 255: -
Q1 Reserve Class	91	0	UIntegerT		RW	Q1 Reserve Adjustment (Raw, Medium or Fine) 0: Raw 1: Medium 2: Fine 255: -
Q2 Switching point	92	0	UIntegerT		R	Q2 Switching point from device teach (0 ... 3000)
Q2 Light/Dark	94	0	UIntegerT		RW	Output Q2: Light or Dark Switching Selection: Light=Output Active (On) between SP1 and SP2 0: Light Switching 1: Dark Switching
Q2 Hysteresis	96	0	UIntegerT		RW	Q2 Hysteresis (0 ... 1000)
Q2 Evaluation Depth	98	0	UIntegerT		RW	Q2 Output Changes are Delayed By This Number of Unchanged Measurement Results (0 ... 100)
Q2 Hysteresis Class	99	0	UIntegerT		RW	Q2 Hysteresis Adjustment (Raw, Medium or Fine) 0: Raw 1: Medium 2: Fine 255: -
Q2 Reserve Class	100	0	UIntegerT		RW	Q2 Reserve Adjustment (Raw, Medium or Fine) 0: Raw 1: Medium 2: Fine 255: -
Q1 Reserve	110	0	UIntegerT		RW	Q1 Reserve (0 ... 1000)
Q2 Reserve	111	0	UIntegerT		RW	Q2 Reserve (0 ... 1000)
Measurement Mode	114	0	UIntegerT		RW	Application Specific Selection of Measurement Mode 0: Low 1: Normal 2: Ambient light suppression
Filter Length	130	0	UIntegerT		RW	Application Specific Selection Filter length (0 ... 200)

Parameter	Index	Subindex	Data type	Default	AR	Description
Filter Class	131	0	UIntegerT		RW	Application Specific Selection of Filter Class 0: Off 1: Raw 2: Medium 3: Fine 255: -
Q1 Setpoint	132	0	UIntegerT		RW	Numerical determination of setpoint for Q1 (0 ... 3000)
Q2 Setpoint	133	0	UIntegerT		RW	Numerical determination of setpoint for Q2 (0 ... 3000)
Function Button #1 Level #1	187	0	UIntegerT		R	Function Being Called When Button #1 Is Released After 2..7 Seconds 0: No Function 1: Teach-In of Q1 in Object Mode 2: Teach-In of Q2 in Object Mode 3: Toggle Q1/Q2 Light/Dark Switching 4: Light Switching Q1/Q2 5: Dark Switching Q1/Q2 6: No Function
Function Button #1 Level #2	188	0	UIntegerT		R	Function Being Called When Button #1 Is Released After 7..12 Seconds 0: No Function 1: Teach-In of Q1 in Object Mode 2: Teach-In of Q2 in Object Mode 3: Toggle Q1/Q2 Light/Dark Switching 4: Light Switching Q1/Q2 5: Dark Switching Q1/Q2 6: No Function
Function Button #1 Level #3	189	0	UIntegerT		R	Function Being Called When Button #1 Is Released After 12..17 Seconds 0: No Function 1: Teach-In of Q1 in Object Mode 2: Teach-In of Q2 in Object Mode 3: Toggle Q1/Q2 Light/Dark Switching 4: Light Switching Q1/Q2 5: Dark Switching Q1/Q2 6: No Function
Function Wire Level #1	200	0	UIntegerT		R	Function Being Called With Selection Width of 20..80 ms On Input Wire 0: No Function 1: Teach-In of Q1 in Object Mode 2: Teach-In of Q2 in Object Mode 3: Toggle Q1/Q2 Light/Dark Switching 4: Light Switching Q1/Q2 5: Dark Switching Q1/Q2 6: No Function

Parameter	Index	Subindex	Data type	Default	AR	Description
Function Wire Level #2	201	0	UIntegerT		R	Function Being Called With Low Pulse Width of 120..180 ms On Wire Input 0: No Function 1: Teach-In of Q1 in Object Mode 2: Teach-In of Q2 in Object Mode 3: Toggle Q1/Q2 Light/Dark Switching 4: Light Switching Q1/Q2 5: Dark Switching Q1/Q2 6: No Function
Function Wire Level #3	202	0	UIntegerT		R	Function Being Called With Low Pulse Width of 220..280 ms On Wire Input 0: No Function 1: Teach-In of Q1 in Object Mode 2: Teach-In of Q2 in Object Mode 3: Toggle Q1/Q2 Light/Dark Switching 4: Light Switching Q1/Q2 5: Dark Switching Q1/Q2 6: No Function
Function Wire Level #4	203	0	UIntegerT		R	Function Being Called With Low Pulse Width of 320..380 ms On Wire Input 0: No Function 1: Teach-In of Q1 in Object Mode 2: Teach-In of Q2 in Object Mode 3: Toggle Q1/Q2 Light/Dark Switching 4: Light Switching Q1/Q2 5: Dark Switching Q1/Q2 6: No Function
Function Wire Level #5	204	0	UIntegerT		R	Function Being Called With Low Pulse Width of 420..480 ms On Wire Input 0: No Function 1: Teach-In of Q1 in Object Mode 2: Teach-In of Q2 in Object Mode 3: Toggle Q1/Q2 Light/Dark Switching 4: Light Switching Q1/Q2 5: Dark Switching Q1/Q2 6: No Function
Function Wire Level #6	205	0	UIntegerT		R	Function Being Called With Low Pulse Width of 520..580 ms On Wire Input 0: No Function 1: Teach-In of Q1 in Object Mode 2: Teach-In of Q2 in Object Mode 3: Toggle Q1/Q2 Light/Dark Switching 4: Light Switching Q1/Q2 5: Dark Switching Q1/Q2 6: No Function
Function Wire Level #7	206	0	UIntegerT		R	Function Being Called With Low Pulse Width of 620..680 ms On Wire Input 0: No Function 1: Teach-In of Q1 in Object Mode 2: Teach-In of Q2 in Object Mode 3: Toggle Q1/Q2 Light/Dark Switching 4: Light Switching Q1/Q2 5: Dark Switching Q1/Q2 6: No Function

Parameter	Index	Subindex	Data type	Default	AR	Description
Function Wire Level #8	207	0	UIntegerT		R	Function Being Called With Low Pulse Width of 720..780 ms On Wire Input 0: No Function 1: Teach-In of Q1 in Object Mode 2: Teach-In of Q2 in Object Mode 3: Toggle Q1/Q2 Light/Dark Switching 4: Light Switching Q1/Q2 5: Dark Switching Q1/Q2 6: No Function
Function Wire Level #9	208	0	UIntegerT		R	Function Being Called With Low Pulse Width of 820..880 ms On Wire Input 0: No Function 1: Teach-In of Q1 in Object Mode 2: Teach-In of Q2 in Object Mode 3: Toggle Q1/Q2 Light/Dark Switching 4: Light Switching Q1/Q2 5: Dark Switching Q1/Q2 6: No Function
Function Wire Level #10	209	0	UIntegerT		R	Function Being Called With Low Pulse Width of 920..980 ms On Wire Input 0: No Function 1: Teach-In of Q1 in Object Mode 2: Teach-In of Q2 in Object Mode 3: Toggle Q1/Q2 Light/Dark Switching 4: Light Switching Q1/Q2 5: Dark Switching Q1/Q2 6: No Function
Function Wire Level #11	210	0	UIntegerT		R	Function Being Called With Low Pulse Width of 1020..1080 ms On Wire Input 0: No Function 1: Teach-In of Q1 in Object Mode 2: Teach-In of Q2 in Object Mode 3: Toggle Q1/Q2 Light/Dark Switching 4: Light Switching Q1/Q2 5: Dark Switching Q1/Q2 6: No Function
Function Wire Level #12	211	0	UIntegerT		R	Function Being Called With Low Pulse Width of 1120..1180 ms On Wire Input 0: No Function 1: Teach-In of Q1 in Object Mode 2: Teach-In of Q2 in Object Mode 3: Toggle Q1/Q2 Light/Dark Switching 4: Light Switching Q1/Q2 5: Dark Switching Q1/Q2 6: No Function
Status value	2120	0	RecordT		R	Status Value
Status Deactivate	2120	1	BooleanT		R	False: Off True: On
Mode: Hysteresis Amplitude	2120	2	BooleanT		R	False: Off True: On
Mode: Hysteresis Ambient	2120	3	BooleanT		R	False: Off True: On
Mode: Average Filter	2120	4	BooleanT		R	False: Off True: On
Mode: Linear	2120	5	BooleanT		R	False: - True: On

Parameter	Index	Subindex	Data type	Default	AR	Description
Data Error	2120	6	BooleanT		R	False: - True: On
Communications Error	2120	7	BooleanT		R	False: - True: On
Pixel Error	2120	8	BooleanT		R	False: - True: On
Last Pixel Error	2120	9	BooleanT		R	False: - True: On
Ambient Error	2120	10	BooleanT		R	False: - True: On
min Amplitude Error	2120	11	BooleanT		R	False: - True: On
Distanz oversize	2120	12	BooleanT		R	False: - True: On
Warning: Amplitude overflow	2120	13	BooleanT		R	False: - True: On
Warning: EPC Watchdog	2120	14	BooleanT		R	False: - True: On
Warning: Amplitude low	2120	15	BooleanT		R	False: - True: On
Warning: Ambient Noise	2120	16	BooleanT		R	False: - True: On
Reserve value	2160	0	UIntegerT	0	RW	Reserve value
Reserve value	2161	0	UIntegerT	0	RW	Reserve value
Reserve value	2162	0	UIntegerT	0	RW	Reserve value
Reserve value	2163	0	UIntegerT	0	RW	Reserve value

9 Technical specifications

9.1 General data

Tab. 9.1: Sensor and IODD version

IODD version	V1.2
IODD release date	2021-2-17
Device family	Scanner with Background Suppression
Device ID	2147
Device name	HRT 25B L6.32
Device variants	HRT 25B/L69.32-2500-S12 (50142300), HRT 25B/L69.32-2500 (50142314), HRT 25B/L6X.32-2500-S12 (50142307), HRT 25B/L6X.32-2500 (50142317), HRT 25B/L6T.32-2500-S12 (50142302), HRT 25B/L6T.32-2500 (50142316)