



PLC Integration of HRT25_2146

IO-Link service data function block + process data parser function for Beckhoff (TwinCAT 3.x) PLC systems in combination with a EtherCAT IO-Link Master

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1 Legal information

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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_IOL_ HRT25_2146" simplifies the usage of Leuze IO-Link devices on Beckhoff (TwinCAT 3.x) PLC controls. This FB supports IO-Link Masters which can be connected via EtherCAT 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



Fig. 3.1: Example of module call

3.3 Configuration

Tab. 3.1: Parameter IN

Parameter	Data type	Description
bExecute	Bool	Positive trigger: Start data transfer
bRW	Bool	Read or write the selected IO-Link parameter. FALSE: Read parameter TRUE: Write Parameter
nPort	T_AmsPort	Port number of the ADS device.
sNetId	T_AmsNetID	String containing the AMS network identifier of the target device to which the ADS command is directed. Beckhoff EL6224/EP6224: AoeNetId of the IO-Link Master
nIdxGroup	UDInt	Index group number.
tTimeOut	Time	Time, after a Timeout-Error is triggered.

Tab. 3.2: Parameter INOUT

Parameter	Data type	Description
stDeviceData	ST_Leuze_IOL_ HRT25_2146	Sensor data

See structure description of ST_Leuze_IOL_ HRT25_2146 in chapter 7.

Tab. 3.3: Parameter OUT

Parameter	Data type	Description
bDone	Bool	Indicates whether data is valid.

Parameter	Data type	Description
bBusy	Bool	Request in process. FALSE: Request is terminated TRUE: Request is being processed
bError	Bool	Error flag FALSE: No error TRUE: Error detected
stErrorCode	ST_Leuze_IOL_Error	Status of the function block

See structure description of ST_Leuze_IOL_Error in chapter 6.

3.4 Method of function

The function block uses the data structure "ST_Leuze_IOL_HRT25_2146". 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 "bRW" = FALSE to read parameter. The value that should be written can be defined in the data structure, as soon as the input parameter "bRW" = TRUE. You start each transfer by calling up the "FB_Leuze_IOL_HRT25_2146" with a positive trigger at the "bExecute" input. As long as there is no valid answer the output "bBusy" 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 "bDone" = TRUE output shows that the transmission was successful. The outputs retain there states as long as there is no new positive trigger at the "bExecute" input again.

The function block allows you to read or write multiple IO-Link parameters sequentially (multi-selection). 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 (bError) is set and an error code (ST_Leuze_IOL_Error) 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_IOL_ HRT25_2146" is a part of the TwinCAT V3.x library. The library can be installed by using the Library Repository. Afterwards the library can be added to your project (References --> Add library...).

Integration step by step:

- Download the library
- Open the Library repository in Library Manager tab in Beckhoff TwinCAT
- Click Install... and select downloaded library
- Open Add library in Library Manager tab
- Find installed library under Leuze electronic GmbH + Co. KG

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 F_Leuze_PD_HRT25_2146 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.

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
aProcessData	INPUT	ARRAY OF BYTE	Raw process data of the IO-Link device.
nPDMMode	INPUT	INT	Mode of the PD. User must select mode of PD according to the sensors settings.
bError	OUTPUT	BOOL	Error flag FALSE: No error TRUE: Error detected
F_Leuze_PD_HRT25_2146	OUTPUT	ST_Leuze_PD_HRT25_2146	Reference to the instance of the data structure ST_Leuze_PD_HRT25_2146. The structure includes the disaggregated values of the process data.

See structure description of ST_Leuze_PD_HRT25_2146 in chapter 7.

6 Error description

The parameter "ErrorCode" can be interpreted using the PLC data type ST_Leuze_IOL_Error. This data type contains the following error information:

Tab. 6.1: ST_Leuze_IOL_Error description

Parameter name	Data type	Description
ErrorStatus.nBlockError	WORD	Error number representing FB where error occurred
ErrorStatus.nAdsReadError	UDINT	ADS read error code
ErrorStatus.nAdsWriteError	UDINT	ADS write error code
ErrorStatus.nIndex	INT	IO-Link index to which the error code refers
ErrorStatus.nSubIndex	INT	IO-Link sub-index to which the error code refers

Tab. 6.2: Error description for nBlockError

Error code (nBlockError)	Error description
0x0000	No error
0x8001	Time out error occurred
0x8002	No parameter selected
0x8003	Error in FB_Leuze_IOL_AdsReadWrite block

For additional information see the Beckhoff ADS Return Codes (<https://infosys.beckhoff.com>).

7 Data structures

Tab. 7.1: ST_Leuze_IOL_HRT25_2146

Parameter name	Data type	Description
stDeviceData.stSelection.stCommands.bDeviceReset	BOOL	[WRITE_ONLY] Device Reset
stDeviceData.stSelection.stCommands.bApplicationReset	BOOL	[WRITE_ONLY] Application Reset
stDeviceData.stSelection.stCommands.bRestoreFactorySettings	BOOL	[WRITE_ONLY] Restore Factory Settings
stDeviceData.stSelection.stCommands.bClearConfigurationReservationClearDsuploadflag	BOOL	[WRITE_ONLY] Clear Configuration Reservation (Clear DsUploadFlag)
stDeviceData.stSelection.stCommands.bReserveConfigurationForDsSetDsuploadflag	BOOL	[WRITE_ONLY] Reserve Configuration for DS (Set DsUploadFlag)
stDeviceData.stSelection.stCommands.bActivation	BOOL	[WRITE_ONLY] Activation
stDeviceData.stSelection.stCommands.bDeactivation	BOOL	[WRITE_ONLY] Deactivation
stDeviceData.stSelection.stCommands.bTeachInOfQ1InObjectMode	BOOL	[WRITE_ONLY] Teach-In of Q1 in Object Mode
stDeviceData.stSelection.stCommands.bTeachInOfQ2InObjectMode	BOOL	[WRITE_ONLY] Teach-In of Q2 in Object Mode
stDeviceData.stSelection.stCommands.bTeachInOfQ1Q2LightSwitch	BOOL	[WRITE_ONLY] Teach-In of Q1/Q2, Light Switch
stDeviceData.stSelection.stCommands.bTeachInOfQ1Q2DarkSwitch	BOOL	[WRITE_ONLY] Teach-In of Q1/Q2, Dark Switch
stDeviceData.stSelection.stDirectParameters1.bAll	BOOL	[READ_WRITE] all parameters of complex data type
stDeviceData.stSelection.stDirectParameters1.bAll	BOOL	[READ_WRITE] all parameters of complex data type
stDeviceData.stSelection.stDirectParameters1.bReserved_1	BOOL	[READ_ONLY]
stDeviceData.stSelection.stDirectParameters1.bMasterCycleTime	BOOL	[READ_ONLY]
stDeviceData.stSelection.stDirectParameters1.bMinCycleTime	BOOL	[READ_ONLY]
stDeviceData.stSelection.stDirectParameters1.bMSequenceCapability	BOOL	[READ_ONLY]
stDeviceData.stSelection.stDirectParameters1.bIoLinkVersionId	BOOL	[READ_ONLY]
stDeviceData.stSelection.stDirectParameters1.bProcessDataInputLength	BOOL	[READ_ONLY]
stDeviceData.stSelection.stDirectParameters1.bProcessDataOutputLength	BOOL	[READ_ONLY]
stDeviceData.stSelection.stDirectParameters1.bVendorId1	BOOL	[READ_ONLY]
stDeviceData.stSelection.stDirectParameters1.bVendorId2	BOOL	[READ_ONLY]
stDeviceData.stSelection.stDirectParameters1.bDeviceId1	BOOL	[READ_ONLY]
stDeviceData.stSelection.stDirectParameters1.bDeviceId2	BOOL	[READ_ONLY]

Parameter name	Data type	Description
stDeviceData.stSelection.stDirectParameters1.bDeviceId3	BOOL	[READ_ONLY]
stDeviceData.stSelection.stDirectParameters1.bReserved_13	BOOL	[READ_ONLY]
stDeviceData.stSelection.stDirectParameters1.bReserved_14	BOOL	[READ_ONLY]
stDeviceData.stSelection.stDirectParameters1.bReserved_15	BOOL	[READ_ONLY]
stDeviceData.stSelection.stDirectParameters2.bAll	BOOL	[READ_WRITE] all parameters of complex data type
stDeviceData.stSelection.stDirectParameters2.bDeviceSpecificParameter1	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParameters2.bDeviceSpecificParameter2	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParameters2.bDeviceSpecificParameter3	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParameters2.bDeviceSpecificParameter4	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParameters2.bDeviceSpecificParameter5	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParameters2.bDeviceSpecificParameter6	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParameters2.bDeviceSpecificParameter7	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParameters2.bDeviceSpecificParameter8	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParameters2.bDeviceSpecificParameter9	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParameters2.bDeviceSpecificParameter10	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParameters2.bDeviceSpecificParameter11	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParameters2.bDeviceSpecificParameter12	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParameters2.bDeviceSpecificParameter13	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParameters2.bDeviceSpecificParameter14	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParameters2.bDeviceSpecificParameter15	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParameters2.bDeviceSpecificParameter16	BOOL	[READ_WRITE]
stDeviceData.stSelection.bStandardCommand	BOOL	[WRITE_ONLY]
stDeviceData.stSelection.stDeviceAccessLocks.bAll	BOOL	[READ_WRITE] all parameters of complex data type
stDeviceData.stSelection.bVendorName	BOOL	[READ_ONLY]
stDeviceData.stSelection.bVendorText	BOOL	[READ_ONLY]
stDeviceData.stSelection.bProductName	BOOL	[READ_ONLY]
stDeviceData.stSelection.bProductId	BOOL	[READ_ONLY]

Parameter name	Data type	Description
stDeviceData.stSelection.bProductText	BOOL	[READ_ONLY]
stDeviceData.stSelection.bSerialNumber	BOOL	[READ_ONLY]
stDeviceData.stSelection.bHardwareVersion	BOOL	[READ_ONLY]
stDeviceData.stSelection.bFirmwareVersion	BOOL	[READ_ONLY]
stDeviceData.stSelection.bApplicationSpecificTag	BOOL	[READ_WRITE]
stDeviceData.stSelection.bDeviceStatus	BOOL	[READ_ONLY]
stDeviceData.stSelection.stStatusInformation.bAll	BOOL	[READ_ONLY] all parameters of complex data type
stDeviceData.stSelection.stExtendedStatus.bAll	BOOL	[READ_ONLY] all parameters of complex data type
stDeviceData.stSelection.bDataStorageUploadFlag	BOOL	[READ_ONLY] Priority of local changes according to configuration data stored in master DS
stDeviceData.stSelection.bReserved01	BOOL	[READ_ONLY] Reserved For Future Use; Read Only Access
stDeviceData.stSelection.bSwitchingOutputProperty	BOOL	[READ_WRITE] General Behaviour of All Switching Outputs with No Available Measure Value
stDeviceData.stSelection.bQ1LightDark	BOOL	[READ_WRITE] Output Q1: Light or Dark Switching Selection: Light=Output Active (On) between SP1 and SP2
stDeviceData.stSelection.bQ1Hysteresis	BOOL	[READ_WRITE] Q1 Hysteresis
stDeviceData.stSelection.bQ1EvaluationDepth	BOOL	[READ_WRITE] Q1 Output Changes are Delayed By This Number of Unchanged Measurement Results
stDeviceData.stSelection.bQ1HysteresisClass	BOOL	[READ_WRITE] Q1 Hysteresis Adjustment (Raw, Medium or Fine)
stDeviceData.stSelection.bQ1ReserveClass	BOOL	[READ_WRITE] Q1 Reserve Adjustment (Raw, Medium or Fine)
stDeviceData.stSelection.bQ2LightDark	BOOL	[READ_WRITE] Output Q2: Light or Dark Switching Selection: Light=Output Active (On) between SP1 and SP2
stDeviceData.stSelection.bQ2Hysteresis	BOOL	[READ_WRITE] Q2 Hysteresis
stDeviceData.stSelection.bQ2EvaluationDepth	BOOL	[READ_WRITE] Q2 Output Changes are Delayed By This Number of Unchanged Measurement Results

Parameter name	Data type	Description
stDeviceData.stSelection.bQ2HysteresisClass	BOOL	[READ_WRITE] Q2 Hysteresis Adjustment (Raw, Medium or Fine)
stDeviceData.stSelection.bQ2ReserveClass	BOOL	[READ_WRITE] Q2 Reserve Adjustment (Raw, Medium or Fine)
stDeviceData.stSelection.bQ1Reserve	BOOL	[READ_WRITE] Q1 Reserve
stDeviceData.stSelection.bQ2Reserve	BOOL	[READ_WRITE] Q2 Reserve
stDeviceData.stSelection.bMeasurementMode	BOOL	[READ_WRITE] Application Specific Selection of Measurement Mode
stDeviceData.stSelection.bFilterLength	BOOL	[READ_WRITE] Application Specific Selection Filter length
stDeviceData.stSelection.bFilterClass	BOOL	[READ_WRITE] Application Specific Selection of Filter Class
stDeviceData.stSelection.bFunctionButton1Level1	BOOL	[READ_ONLY] Function Being Called When Button #1 Is Released After 2..7 Seconds
stDeviceData.stSelection.bFunctionButton1Level2	BOOL	[READ_ONLY] Function Being Called When Button #1 Is Released After 7..12 Seconds
stDeviceData.stSelection.bFunctionButton1Level3	BOOL	[READ_ONLY] Function Being Called When Button #1 Is Released After 12..17 Seconds
stDeviceData.stSelection.bFunctionWireLevel1	BOOL	[READ_ONLY] Function Being Called With Selection Width of 20..80 ms On Input Wire
stDeviceData.stSelection.bFunctionWireLevel2	BOOL	[READ_ONLY] Function Being Called With Low Pulse Width of 120..180 ms On Wire Input
stDeviceData.stSelection.bFunctionWireLevel3	BOOL	[READ_ONLY] Function Being Called With Low Pulse Width of 220..280 ms On Wire Input
stDeviceData.stSelection.bFunctionWireLevel4	BOOL	[READ_ONLY] Function Being Called With Low Pulse Width of 320..380 ms On Wire Input
stDeviceData.stSelection.bFunctionWireLevel5	BOOL	[READ_ONLY] Function Being Called With Low Pulse Width of 420..480 ms On Wire Input
stDeviceData.stSelection.bFunctionWireLevel6	BOOL	[READ_ONLY] Function Being Called With Low Pulse Width of 520..580 ms On Wire Input
stDeviceData.stSelection.bFunctionWireLevel7	BOOL	[READ_ONLY] Function Being Called With Low Pulse Width of 620..680 ms On Wire Input

Parameter name	Data type	Description
stDeviceData.stSelection.bFunctionWireLevel8	BOOL	[READ_ONLY] Function Being Called With Low Pulse Width of 720..780 ms On Wire Input
stDeviceData.stSelection.bFunctionWireLevel9	BOOL	[READ_ONLY] Function Being Called With Low Pulse Width of 820..880 ms On Wire Input
stDeviceData.stSelection.bFunctionWireLevel10	BOOL	[READ_ONLY] Function Being Called With Low Pulse Width of 920..980 ms On Wire Input
stDeviceData.stSelection.bFunctionWireLevel11	BOOL	[READ_ONLY] Function Being Called With Low Pulse Width of 1020..1080 ms On Wire Input
stDeviceData.stSelection.bFunctionWireLevel12	BOOL	[READ_ONLY] Function Being Called With Low Pulse Width of 1120..1180 ms On Wire Input
stDeviceData.stSelection.stStatusValue.bAll	BOOL	[READ_ONLY] all parameters of complex data type
stDeviceData.stSelection.bReserveValue_2160	BOOL	[READ_WRITE] Reserve value
stDeviceData.stSelection.bReserveValue_2161	BOOL	[READ_WRITE] Reserve value
stDeviceData.stSelection.bReserveValue_2162	BOOL	[READ_WRITE] Reserve value
stDeviceData.stSelection.bReserveValue_2163	BOOL	[READ_WRITE] Reserve value
stDeviceData.stData.stCommands.nDeviceReset	UINT	[WRITE_ONLY] Device Reset
stDeviceData.stData.stCommands.nApplicationReset	UINT	[WRITE_ONLY] Application Reset
stDeviceData.stData.stCommands.nRestoreFactorySettings	UINT	[WRITE_ONLY] Restore Factory Settings
stDeviceData.stData.stCommands.nClearConfigurationReservationClearDsuploadflag	UINT	[WRITE_ONLY] Clear Configuration Reservation (Clear DsUploadFlag)
stDeviceData.stData.stCommands.nReserveConfigurationForDsSetDsuploadflag	UINT	[WRITE_ONLY] Reserve Configuration for DS (Set DsUploadFlag)
stDeviceData.stData.stCommands.nActivation	UINT	[WRITE_ONLY] Activation
stDeviceData.stData.stCommands.nDeactivation	UINT	[WRITE_ONLY] Deactivation
stDeviceData.stData.stCommands.nTeachInOfQ1InObjectMode	UINT	[WRITE_ONLY] Teach-In of Q1 in Object Mode
stDeviceData.stData.stCommands.nTeachInOfQ2InObjectMode	UINT	[WRITE_ONLY] Teach-In of Q2 in Object Mode
stDeviceData.stData.stCommands.nTeachInOfQ1Q2LightSwitch	UINT	[WRITE_ONLY] Teach-In of Q1/Q2, Light Switch
stDeviceData.stData.stCommands.nTeachInOfQ1Q2DarkSwitch	UINT	[WRITE_ONLY] Teach-In of Q1/Q2, Dark Switch
stDeviceData.stData.stDirectParameters1.nReserved_1	UINT	[READ_ONLY]
stDeviceData.stData.stDirectParameters1.nMasterCycleTime	UINT	[READ_ONLY]

Parameter name	Data type	Description
stDeviceData.stData.stDirectParameters1.nMinCycleTime	UINT	[READ_ONLY]
stDeviceData.stData.stDirectParameters1.nMSequenceCapability	UINT	[READ_ONLY]
stDeviceData.stData.stDirectParameters1.nIoLinkVersionId	UINT	[READ_ONLY]
stDeviceData.stData.stDirectParameters1.nProcessDataInputLength	UINT	[READ_ONLY]
stDeviceData.stData.stDirectParameters1.nProcessDataOutputLength	UINT	[READ_ONLY]
stDeviceData.stData.stDirectParameters1.nVendorId1	UINT	[READ_ONLY]
stDeviceData.stData.stDirectParameters1.nVendorId2	UINT	[READ_ONLY]
stDeviceData.stData.stDirectParameters1.nDeviceId1	UINT	[READ_ONLY]
stDeviceData.stData.stDirectParameters1.nDeviceId2	UINT	[READ_ONLY]
stDeviceData.stData.stDirectParameters1.nDeviceId3	UINT	[READ_ONLY]
stDeviceData.stData.stDirectParameters1.nReserved_13	UINT	[READ_ONLY]
stDeviceData.stData.stDirectParameters1.nReserved_14	UINT	[READ_ONLY]
stDeviceData.stData.stDirectParameters1.nReserved_15	UINT	[READ_ONLY]
stDeviceData.stData.stDirectParameters2.nDeviceSpecificParameter1	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParameters2.nDeviceSpecificParameter2	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParameters2.nDeviceSpecificParameter3	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParameters2.nDeviceSpecificParameter4	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParameters2.nDeviceSpecificParameter5	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParameters2.nDeviceSpecificParameter6	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParameters2.nDeviceSpecificParameter7	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParameters2.nDeviceSpecificParameter8	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParameters2.nDeviceSpecificParameter9	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParameters2.nDeviceSpecificParameter10	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParameters2.nDeviceSpecificParameter11	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParameters2.nDeviceSpecificParameter12	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParameters2.nDeviceSpecificParameter13	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParameters2.nDeviceSpecificParameter14	UINT	[READ_WRITE]

Parameter name	Data type	Description
stDeviceData.stData.stDirectParameters2. nDeviceSpecificParameter15	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParameters2. nDeviceSpecificParameter16	UINT	[READ_WRITE]
stDeviceData.stData.nStandardCommand	UINT	[WRITE_ONLY]
stDeviceData.stData.stDeviceAccessLocks. bParameterWriteAccessLock	BOOL	[READ_WRITE]
stDeviceData.stData.stDeviceAccessLocks.bDataStorageLock	BOOL	[READ_WRITE]
stDeviceData.stData.stDeviceAccessLocks. bLocalParameterizationLock	BOOL	[READ_WRITE]
stDeviceData.stData.stDeviceAccessLocks. bLocalUserInterfaceLock	BOOL	[READ_WRITE]
stDeviceData.stData.sVendorName	STRING	[READ_ONLY]
stDeviceData.stData.sVendorText	STRING	[READ_ONLY]
stDeviceData.stData.sProductName	STRING	[READ_ONLY]
stDeviceData.stData.sProductId	STRING	[READ_ONLY]
stDeviceData.stData.sProductText	STRING	[READ_ONLY]
stDeviceData.stData.sSerialNumber	STRING	[READ_ONLY]
stDeviceData.stData.sHardwareVersion	STRING	[READ_ONLY]
stDeviceData.stData.sFirmwareVersion	STRING	[READ_ONLY]
stDeviceData.stData.sApplicationSpecificTag	STRING	[READ_WRITE]
stDeviceData.stData.nDeviceStatus	UINT	[READ_ONLY]
stDeviceData.stData.stStatusInformation.bQ1OutputState	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusInformation.bQ2OutputState	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusInformation.bReserved	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusInformation.bMeasureState	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusInformation.bReceivedSignal	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusInformation. bWarningReducedAccuracy	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusInformation.bWarningAmbientNoise	BOOL	[READ_ONLY]
stDeviceData.stData.stExtendedStatus.bDeactivationFlag	BOOL	[READ_ONLY]
stDeviceData.stData.stExtendedStatus.bLaserErrorFlag	BOOL	[READ_ONLY]
stDeviceData.stData.stExtendedStatus.bSignalAmplitudeFlag	BOOL	[READ_ONLY]

Parameter name	Data type	Description
stDeviceData.stData.stExtendedStatus.nTargetBrightness	UINT	[READ_ONLY]
stDeviceData.stData.stExtendedStatus.nTeachState	UINT	[READ_ONLY]
stDeviceData.stData.nDataStorageUploadFlag	UINT	[READ_ONLY] Priority of local changes according to configuration data stored in master DS
stDeviceData.stData.nReserved01	UINT	[READ_ONLY] Reserved For Future Use; Read Only Access
stDeviceData.stData.nSwitchingOutputProperty	UINT	[READ_WRITE] General Behaviour of All Switching Outputs with No Available Measure Value
stDeviceData.stData.nQ1LightDark	UINT	[READ_WRITE] Output Q1: Light or Dark Switching Selection: Light=Output Active (On) between SP1 and SP2
stDeviceData.stData.nQ1Hysteresis	UINT	[READ_WRITE] Q1 Hysteresis
stDeviceData.stData.nQ1EvaluationDepth	UINT	[READ_WRITE] Q1 Output Changes are Delayed By This Number of Unchanged Measurement Results
stDeviceData.stData.nQ1HysteresisClass	UINT	[READ_WRITE] Q1 Hysteresis Adjustment (Raw, Medium or Fine)
stDeviceData.stData.nQ1ReserveClass	UINT	[READ_WRITE] Q1 Reserve Adjustment (Raw, Medium or Fine)
stDeviceData.stData.nQ2LightDark	UINT	[READ_WRITE] Output Q2: Light or Dark Switching Selection: Light=Output Active (On) between SP1 and SP2
stDeviceData.stData.nQ2Hysteresis	UINT	[READ_WRITE] Q2 Hysteresis
stDeviceData.stData.nQ2EvaluationDepth	UINT	[READ_WRITE] Q2 Output Changes are Delayed By This Number of Unchanged Measurement Results
stDeviceData.stData.nQ2HysteresisClass	UINT	[READ_WRITE] Q2 Hysteresis Adjustment (Raw, Medium or Fine)
stDeviceData.stData.nQ2ReserveClass	UINT	[READ_WRITE] Q2 Reserve Adjustment (Raw, Medium or Fine)
stDeviceData.stData.nQ1Reserve	UINT	[READ_WRITE] Q1 Reserve
stDeviceData.stData.nQ2Reserve	UINT	[READ_WRITE] Q2 Reserve
stDeviceData.stData.nMeasurementMode	UINT	[READ_WRITE] Application Specific Selection of Measurement Mode
stDeviceData.stData.nFilterLength	UINT	[READ_WRITE] Application Specific Selection Filter length

Parameter name	Data type	Description
stDeviceData.stData.nFilterClass	UINT	[READ_WRITE] Application Specific Selection of Filter Class
stDeviceData.stData.nFunctionButton1Level1	UINT	[READ_ONLY] Function Being Called When Button #1 Is Released After 2..7 Seconds
stDeviceData.stData.nFunctionButton1Level2	UINT	[READ_ONLY] Function Being Called When Button #1 Is Released After 7..12 Seconds
stDeviceData.stData.nFunctionButton1Level3	UINT	[READ_ONLY] Function Being Called When Button #1 Is Released After 12..17 Seconds
stDeviceData.stData.nFunctionWireLevel1	UINT	[READ_ONLY] Function Being Called With Selection Width of 20..80 ms On Input Wire
stDeviceData.stData.nFunctionWireLevel2	UINT	[READ_ONLY] Function Being Called With Low Pulse Width of 120..180 ms On Wire Input
stDeviceData.stData.nFunctionWireLevel3	UINT	[READ_ONLY] Function Being Called With Low Pulse Width of 220..280 ms On Wire Input
stDeviceData.stData.nFunctionWireLevel4	UINT	[READ_ONLY] Function Being Called With Low Pulse Width of 320..380 ms On Wire Input
stDeviceData.stData.nFunctionWireLevel5	UINT	[READ_ONLY] Function Being Called With Low Pulse Width of 420..480 ms On Wire Input
stDeviceData.stData.nFunctionWireLevel6	UINT	[READ_ONLY] Function Being Called With Low Pulse Width of 520..580 ms On Wire Input
stDeviceData.stData.nFunctionWireLevel7	UINT	[READ_ONLY] Function Being Called With Low Pulse Width of 620..680 ms On Wire Input
stDeviceData.stData.nFunctionWireLevel8	UINT	[READ_ONLY] Function Being Called With Low Pulse Width of 720..780 ms On Wire Input
stDeviceData.stData.nFunctionWireLevel9	UINT	[READ_ONLY] Function Being Called With Low Pulse Width of 820..880 ms On Wire Input
stDeviceData.stData.nFunctionWireLevel10	UINT	[READ_ONLY] Function Being Called With Low Pulse Width of 920..980 ms On Wire Input
stDeviceData.stData.nFunctionWireLevel11	UINT	[READ_ONLY] Function Being Called With Low Pulse Width of 1020..1080 ms On Wire Input
stDeviceData.stData.nFunctionWireLevel12	UINT	[READ_ONLY] Function Being Called With Low Pulse Width of 1120..1180 ms On Wire Input

Parameter name	Data type	Description
stDeviceData.stData.stStatusValue.bStatusDeactivate	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusValue.bModeHysteresisAmplitude	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusValue.bModeHysteresisAmbient	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusValue.bModeAverageFilter	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusValue.bModeLinear	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusValue.bDataError	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusValue.bCommunicationsError	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusValue.bPixelError	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusValue.bLastPixelError	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusValue.bAmbientError	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusValue.bMinAmplitudeError	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusValue.bDistanzOversize	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusValue.bWarningAmplitudeOverflow	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusValue.bWarningEpcWatchdog	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusValue.bWarningAmplitudeLow	BOOL	[READ_ONLY]
stDeviceData.stData.stStatusValue.bWarningAmbientNoise	BOOL	[READ_ONLY]
stDeviceData.stData.nReserveValue_2160	UINT	[READ_WRITE] Reserve value
stDeviceData.stData.nReserveValue_2161	UINT	[READ_WRITE] Reserve value
stDeviceData.stData.nReserveValue_2162	UINT	[READ_WRITE] Reserve value
stDeviceData.stData.nReserveValue_2163	UINT	[READ_WRITE] Reserve value

Tab. 7.2: ST_Leuze_PD_HRT25_2146

Parameter name	Data type	Description
ST_Leuze_PD_HRT25_2146.bQ1OutputState	BOOL	
ST_Leuze_PD_HRT25_2146.bQ2OutputState	BOOL	
ST_Leuze_PD_HRT25_2146.bReserved	BOOL	
ST_Leuze_PD_HRT25_2146.bMeasureState	BOOL	
ST_Leuze_PD_HRT25_2146.bReceivedSignal	BOOL	

Parameter name	Data type	Description
ST_Leuze_PD_HRT25_2146.bWarningReducedAccuracy	BOOL	
ST_Leuze_PD_HRT25_2146.bWarningAmbientNoise	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 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 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: -
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
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

Parameter	Index	Subindex	Data type	Default	AR	Description
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
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

Parameter	Index	Subindex	Data type	Default	AR	Description
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
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

Parameter	Index	Subindex	Data type	Default	AR	Description
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	2146
Device name	HRT 25B L6X
Device variants	HRT 25B/L6X.31-2500-S12 (50132275), HRT 25B/L6X.31-2500 (50132278)