



## PLC Integration of ODT25B\_2149

**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


## 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\_IOL\_ ODT25B\_2149" 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_ ODT25B_2149	Sensor data

See structure description of ST\_Leuze\_IOL\_ ODT25B\_2149 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\_ODT25B\_2149". 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\_ODT25B\_2149" 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\_ODT25B\_2149" 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\_ODT25B\_2149 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. The PD Mode parameter only appears for some sensors.
bError	OUTPUT	BOOL	Error flag FALSE: No error TRUE: Error detected
F_Leuze_PD_ODT25B_2149	OUTPUT	ST_Leuze_PD_ODT25B_2149	Reference to the instance of the data structure ST_Leuze_PD_ODT25B_2149. The structure includes the disaggregated values of the process data.

See structure description of ST\_Leuze\_PD\_ODT25B\_2149 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\_ODT25B\_2149

Parameter name	Data type	Description
stDeviceData.stSelection.stCommands.bCmdDeviceReset	BOOL	[WRITE_ONLY] Device Reset
stDeviceData.stSelection.stCommands.bCmdRestoreFactorySettings	BOOL	[WRITE_ONLY] Restore Factory Settings
stDeviceData.stSelection.stCommands.bCmdClearConfigurationReservationClearDsuploadflag	BOOL	[WRITE_ONLY] Clear Configuration Reservation (Clear DsUploadFlag)
stDeviceData.stSelection.stCommands.bCmdReserveConfigurationForDsSetDsuploadflag	BOOL	[WRITE_ONLY] Reserve Configuration for DS (Set DsUploadFlag)
stDeviceData.stSelection.stCommands.bCmdActivation	BOOL	[WRITE_ONLY] Activation
stDeviceData.stSelection.stCommands.bCmdDeactivation	BOOL	[WRITE_ONLY] Deactivation
stDeviceData.stSelection.stCommands.bCmdTeachInOfQ1InObjectMode	BOOL	[WRITE_ONLY] Teach-In of Q1 in Object Mode
stDeviceData.stSelection.stCommands.bCmdTeachInOfQ2InObjectMode	BOOL	[WRITE_ONLY] Teach-In of Q2 in Object Mode
stDeviceData.stSelection.stCommands.bCmdTeachInOfQ1Q2LightSwitch	BOOL	[WRITE_ONLY] Teach-In of Q1/Q2, Light Switch
stDeviceData.stSelection.stCommands.bCmdTeachInOfQ1Q2DarkSwitch	BOOL	[WRITE_ONLY] Teach-In of Q1/Q2, Dark Switch
stDeviceData.stSelection.stDirectParametersPage1.bAll	BOOL	[READ_WRITE] all parameters of complex data type
stDeviceData.stSelection.stDirectParametersPage1.bReserved_1	BOOL	[READ_ONLY] ; Suffix "_1" (parameter index or subindex) added because of duplicate parameter names.
stDeviceData.stSelection.stDirectParametersPage1.bMasterCycleTime	BOOL	[READ_ONLY] Communication: Current communication cycle duration used by the master. This value defines the process data cycle.
stDeviceData.stSelection.stDirectParametersPage1.bMinCycleTime	BOOL	[READ_ONLY] Communication: Minimum communication cycle duration supported by the device. This value defines the lowest possible process data cycle.
stDeviceData.stSelection.stDirectParametersPage1.bMSequenceCapability	BOOL	[READ_ONLY] Communication: Information on the structure and the supported features of the communication messages.
stDeviceData.stSelection.stDirectParametersPage1.bIoLinkRevisionId	BOOL	[READ_ONLY] Communication: Identifier for the currently used communication protocol revision.

Parameter name	Data type	Description
stDeviceData.stSelection.stDirectParametersPage1. bProcessDataInputLength	BOOL	[READ_ONLY] Communication: Information on width and features of the process input data (Process Data from Device to Master).
stDeviceData.stSelection.stDirectParametersPage1. bProcessDataOutputLength	BOOL	[READ_ONLY] Communication: Information on width of the process output data (Process Data from Master to Device).
stDeviceData.stSelection.stDirectParametersPage1.bVendorId1	BOOL	[READ_ONLY] 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.
stDeviceData.stSelection.stDirectParametersPage1.bVendorId2	BOOL	[READ_ONLY] 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.
stDeviceData.stSelection.stDirectParametersPage1.bDeviceId1	BOOL	[READ_ONLY] 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.
stDeviceData.stSelection.stDirectParametersPage1.bDeviceId2	BOOL	[READ_ONLY] 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.
stDeviceData.stSelection.stDirectParametersPage1.bDeviceId3	BOOL	[READ_ONLY] 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.
stDeviceData.stSelection.stDirectParametersPage1. bReserved_13	BOOL	[READ_ONLY] ; Suffix "_13" (parameter index or subindex) added because of duplicate parameter names.

Parameter name	Data type	Description
stDeviceData.stSelection.stDirectParametersPage1. bReserved_14	BOOL	[READ_ONLY] ; Suffix "_14" (parameter index or subindex) added because of duplicate parameter names.
stDeviceData.stSelection.stDirectParametersPage1. bReserved_15	BOOL	[READ_ONLY] ; Suffix "_15" (parameter index or subindex) added because of duplicate parameter names.
stDeviceData.stSelection.stDirectParametersPage1. bSystemCommand	BOOL	[WRITE_ONLY] Application: Command interface for devices without ISDU support. Validity and execution of commands are not confirmed.
stDeviceData.stSelection.stDirectParametersPage2.bAll	BOOL	[READ_WRITE] all parameters of complex data type
stDeviceData.stSelection.stDirectParametersPage2. bDeviceSpecificParameter1	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParametersPage2. bDeviceSpecificParameter2	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParametersPage2. bDeviceSpecificParameter3	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParametersPage2. bDeviceSpecificParameter4	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParametersPage2. bDeviceSpecificParameter5	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParametersPage2. bDeviceSpecificParameter6	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParametersPage2. bDeviceSpecificParameter7	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParametersPage2. bDeviceSpecificParameter8	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParametersPage2. bDeviceSpecificParameter9	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParametersPage2. bDeviceSpecificParameter10	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParametersPage2. bDeviceSpecificParameter11	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParametersPage2. bDeviceSpecificParameter12	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParametersPage2. bDeviceSpecificParameter13	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParametersPage2. bDeviceSpecificParameter14	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParametersPage2. bDeviceSpecificParameter15	BOOL	[READ_WRITE]
stDeviceData.stSelection.stDirectParametersPage2. bDeviceSpecificParameter16	BOOL	[READ_WRITE]
stDeviceData.stSelection.bSystemCommand	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
stDeviceData.stSelection.stDeviceAccessLocks.bAll	BOOL	[READ_WRITE] all parameters of complex data type
stDeviceData.stSelection.bVendorName	BOOL	[READ_ONLY] The vendor name that is assigned to a Vendor ID.
stDeviceData.stSelection.bVendorText	BOOL	[READ_ONLY] Additional information about the vendor.
stDeviceData.stSelection.bProductName	BOOL	[READ_ONLY] Complete product name.
stDeviceData.stSelection.bProductId	BOOL	[READ_ONLY] Vendor-specific product or type identification (e.g., item number or model number).
stDeviceData.stSelection.bProductText	BOOL	[READ_ONLY] Additional product information for the device.
stDeviceData.stSelection.bSerialNumber	BOOL	[READ_ONLY] Unique, vendor-specific identifier of the individual device.
stDeviceData.stSelection.bHardwareRevision	BOOL	[READ_ONLY] Unique, vendor-specific identifier of the hardware revision of the individual device.
stDeviceData.stSelection.bFirmwareRevision	BOOL	[READ_ONLY] Unique, vendor-specific identifier of the firmware revision of the individual device.
stDeviceData.stSelection.bApplicationSpecificTag	BOOL	[READ_WRITE] Possibility to mark a device with user- or application-specific information.
stDeviceData.stSelection.bDeviceStatus	BOOL	[READ_ONLY] Indicator for the current device condition and diagnosis state.
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.bQ1SwitchingPoint	BOOL	[READ_ONLY] Q1 Switching point from device teach
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

Parameter name	Data type	Description
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.bQ2SwitchingPoint	BOOL	[READ_ONLY] Q2 Switching point from device teach
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
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.bQ1Setpoint	BOOL	[READ_WRITE] Numerical determination of setpoint for Q1
stDeviceData.stSelection.bQ2Setpoint	BOOL	[READ_WRITE] Numerical determination of setpoint for Q2
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

Parameter name	Data type	Description
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
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; Suffix "_2160" (parameter index or subindex) added because of duplicate parameter names.



Parameter name	Data type	Description
stDeviceData.stSelection.bReserveValue_2161	BOOL	[READ_WRITE] Reserve value; Suffix "_2161" (parameter index or subindex) added because of duplicate parameter names.
stDeviceData.stSelection.bReserveValue_2162	BOOL	[READ_WRITE] Reserve value; Suffix "_2162" (parameter index or subindex) added because of duplicate parameter names.
stDeviceData.stSelection.bReserveValue_2163	BOOL	[READ_WRITE] Reserve value; Suffix "_2163" (parameter index or subindex) added because of duplicate parameter names.
stDeviceData.stSelection.bSensorMode	BOOL	[READ_WRITE] Sensor mode
stDeviceData.stData.stCommands.nCmdDeviceReset	UINT	[WRITE_ONLY] Device Reset
stDeviceData.stData.stCommands.nCmdRestoreFactorySettings	UINT	[WRITE_ONLY] Restore Factory Settings
stDeviceData.stData.stCommands.nCmdClearConfigurationReservationClearDsuploadflag	UINT	[WRITE_ONLY] Clear Configuration Reservation (Clear DsUploadFlag)
stDeviceData.stData.stCommands.nCmdReserveConfigurationForDsSetDsuploadflag	UINT	[WRITE_ONLY] Reserve Configuration for DS (Set DsUploadFlag)
stDeviceData.stData.stCommands.nCmdActivation	UINT	[WRITE_ONLY] Activation
stDeviceData.stData.stCommands.nCmdDeactivation	UINT	[WRITE_ONLY] Deactivation
stDeviceData.stData.stCommands.nCmdTeachInOfQ1InObjectMode	UINT	[WRITE_ONLY] Teach-In of Q1 in Object Mode
stDeviceData.stData.stCommands.nCmdTeachInOfQ2InObjectMode	UINT	[WRITE_ONLY] Teach-In of Q2 in Object Mode
stDeviceData.stData.stCommands.nCmdTeachInOfQ1Q2LightSwitch	UINT	[WRITE_ONLY] Teach-In of Q1/Q2, Light Switch
stDeviceData.stData.stCommands.nCmdTeachInOfQ1Q2DarkSwitch	UINT	[WRITE_ONLY] Teach-In of Q1/Q2, Dark Switch
stDeviceData.stData.stDirectParametersPage1.nReserved_1	UINT	[READ_ONLY] ; Suffix "_1" (parameter index or subindex) added because of duplicate parameter names.
stDeviceData.stData.stDirectParametersPage1.nMasterCycleTime	UINT	[READ_ONLY] Communication: Current communication cycle duration used by the master. This value defines the process data cycle.
stDeviceData.stData.stDirectParametersPage1.nMinCycleTime	UINT	[READ_ONLY] Communication: Minimum communication cycle duration supported by the device. This value defines the lowest possible process data cycle.

Parameter name	Data type	Description
stDeviceData.stData.stDirectParametersPage1.nMSequenceCapability	UINT	[READ_ONLY] Communication: Information on the structure and the supported features of the communication messages.
stDeviceData.stData.stDirectParametersPage1.nIoLinkRevisionId	UINT	[READ_ONLY] Communication: Identifier for the currently used communication protocol revision.
stDeviceData.stData.stDirectParametersPage1.nProcessDataInputLength	UINT	[READ_ONLY] Communication: Information on width and features of the process input data (Process Data from Device to Master).
stDeviceData.stData.stDirectParametersPage1.nProcessDataOutputLength	UINT	[READ_ONLY] Communication: Information on width of the process output data (Process Data from Master to Device).
stDeviceData.stData.stDirectParametersPage1.nVendorId1	UINT	[READ_ONLY] 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.
stDeviceData.stData.stDirectParametersPage1.nVendorId2	UINT	[READ_ONLY] 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.
stDeviceData.stData.stDirectParametersPage1.nDeviceId1	UINT	[READ_ONLY] 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.
stDeviceData.stData.stDirectParametersPage1.nDeviceId2	UINT	[READ_ONLY] 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.

Parameter name	Data type	Description
stDeviceData.stData.stDirectParametersPage1.nDeviceId3	UINT	[READ_ONLY] 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.
stDeviceData.stData.stDirectParametersPage1.nReserved_13	UINT	[READ_ONLY] ; Suffix "_13" (parameter index or subindex) added because of duplicate parameter names.
stDeviceData.stData.stDirectParametersPage1.nReserved_14	UINT	[READ_ONLY] ; Suffix "_14" (parameter index or subindex) added because of duplicate parameter names.
stDeviceData.stData.stDirectParametersPage1.nReserved_15	UINT	[READ_ONLY] ; Suffix "_15" (parameter index or subindex) added because of duplicate parameter names.
stDeviceData.stData.stDirectParametersPage1.nSystemCommand	UINT	[WRITE_ONLY] Application: Command interface for devices without ISDU support. Validity and execution of commands are not confirmed.
stDeviceData.stData.stDirectParametersPage2.nDeviceSpecificParameter1	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParametersPage2.nDeviceSpecificParameter2	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParametersPage2.nDeviceSpecificParameter3	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParametersPage2.nDeviceSpecificParameter4	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParametersPage2.nDeviceSpecificParameter5	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParametersPage2.nDeviceSpecificParameter6	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParametersPage2.nDeviceSpecificParameter7	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParametersPage2.nDeviceSpecificParameter8	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParametersPage2.nDeviceSpecificParameter9	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParametersPage2.nDeviceSpecificParameter10	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParametersPage2.nDeviceSpecificParameter11	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParametersPage2.nDeviceSpecificParameter12	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParametersPage2.nDeviceSpecificParameter13	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParametersPage2.nDeviceSpecificParameter14	UINT	[READ_WRITE]

Parameter name	Data type	Description
stDeviceData.stData.stDirectParametersPage2. nDeviceSpecificParameter15	UINT	[READ_WRITE]
stDeviceData.stData.stDirectParametersPage2. nDeviceSpecificParameter16	UINT	[READ_WRITE]
stDeviceData.stData.nSystemCommand	UINT	[WRITE_ONLY] Command interface for applications. A positive acknowledge indicates the complete and correct finalization of the requested function.
stDeviceData.stData.stDeviceAccessLocks. bParameterWriteAccess	BOOL	[READ_WRITE] This lock prevents the write access to all read/write parameters of the device except for the parameter 'Device Access Locks'.
stDeviceData.stData.stDeviceAccessLocks.bDataStorage	BOOL	[READ_WRITE] This lock prevents the write access to the device parameters via the data storage mechanism.
stDeviceData.stData.stDeviceAccessLocks. bLocalParameterization	BOOL	[READ_WRITE] This lock prevents the device settings from being changed via local operating elements on the device.
stDeviceData.stData.stDeviceAccessLocks.bLocalUserInterface	BOOL	[READ_WRITE] This lock prevents the access to the device settings and display via a local user interface. The user interface is disabled.
stDeviceData.stData.sVendorName	STRING	[READ_ONLY] The vendor name that is assigned to a Vendor ID.
stDeviceData.stData.sVendorText	STRING	[READ_ONLY] Additional information about the vendor.
stDeviceData.stData.sProductName	STRING	[READ_ONLY] Complete product name.
stDeviceData.stData.sProductId	STRING	[READ_ONLY] Vendor-specific product or type identification (e.g., item number or model number).
stDeviceData.stData.sProductText	STRING	[READ_ONLY] Additional product information for the device.
stDeviceData.stData.sSerialNumber	STRING	[READ_ONLY] Unique, vendor-specific identifier of the individual device.
stDeviceData.stData.sHardwareRevision	STRING	[READ_ONLY] Unique, vendor-specific identifier of the hardware revision of the individual device.
stDeviceData.stData.sFirmwareRevision	STRING	[READ_ONLY] Unique, vendor-specific identifier of the firmware revision of the individual device.

Parameter name	Data type	Description
stDeviceData.stData.sApplicationSpecificTag	STRING	[READ_WRITE] Possibility to mark a device with user- or application-specific information.
stDeviceData.stData.nDeviceStatus	UINT	[READ_ONLY] Indicator for the current device condition and diagnosis state.
stDeviceData.stData.stExtendedStatus.bDeactivationFlag	BOOL	[READ_ONLY]
stDeviceData.stData.stExtendedStatus.bLaserErrorFlag	BOOL	[READ_ONLY]
stDeviceData.stData.stExtendedStatus.bSignalAmplitudeFlag	BOOL	[READ_ONLY]
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.nQ1SwitchingPoint	UINT	[READ_ONLY] Q1 Switching point from device teach
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.nQ2SwitchingPoint	UINT	[READ_ONLY] Q2 Switching point from device teach
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

Parameter name	Data type	Description
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
stDeviceData.stData.nFilterClass	UINT	[READ_WRITE] Application Specific Selection of Filter Class
stDeviceData.stData.nQ1Setpoint	UINT	[READ_WRITE] Numerical determination of setpoint for Q1
stDeviceData.stData.nQ2Setpoint	UINT	[READ_WRITE] Numerical determination of setpoint for Q2
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

Parameter name	Data type	Description
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
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]

Parameter name	Data type	Description
stDeviceData.stData.stStatusValue.bWarningAmbientNoise	BOOL	[READ_ONLY]
stDeviceData.stData.nReserveValue_2160	UINT	[READ_WRITE] Reserve value; Suffix "_2160" (parameter index or subindex) added because of duplicate parameter names.
stDeviceData.stData.nReserveValue_2161	UINT	[READ_WRITE] Reserve value; Suffix "_2161" (parameter index or subindex) added because of duplicate parameter names.
stDeviceData.stData.nReserveValue_2162	UINT	[READ_WRITE] Reserve value; Suffix "_2162" (parameter index or subindex) added because of duplicate parameter names.
stDeviceData.stData.nReserveValue_2163	UINT	[READ_WRITE] Reserve value; Suffix "_2163" (parameter index or subindex) added because of duplicate parameter names.
stDeviceData.stData.nSensorMode	UINT	[READ_WRITE] Sensor mode

Tab. 7.2: ST\_Leuze\_PD\_ODT25B\_2149

Parameter name	Data type	Description
ST_Leuze_PD_ODT25B_2149.nMdcMeasurementValue	INT	
ST_Leuze_PD_ODT25B_2149.nMdcScale	INT	
ST_Leuze_PD_ODT25B_2149.bSsc1SwitchingSignal	BOOL	
ST_Leuze_PD_ODT25B_2149.bSsc2SwitchingSignal	BOOL	
ST_Leuze_PD_ODT25B_2149.bMeasure	BOOL	
ST_Leuze_PD_ODT25B_2149.bSignal	BOOL	
ST_Leuze_PD_ODT25B_2149.bWarning	BOOL	
ST_Leuze_PD_ODT25B_2149.bAmbientNoise	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	Command interface for applications. A positive acknowledge indicates the complete and correct finalization of the requested function.
Device Reset			UIntegerT	128	W	Device 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 - 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.
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).

Parameter	Index	Subindex	Data type	Default	AR	Description
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	128	W	Application: Command interface for devices without ISDU support. Validity and execution of commands are not confirmed.  (0 ... 63): Reserved 128: Device Reset 129: Application Reset 130: Restore Factory Settings 131: Back-to-box (132 ... 159): Reserved
Direct Parameters - Page 2	1	0	RecordT		RW	A set of parameters for devices without ISDU support.
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	

Parameter	Index	Subindex	Data type	Default	AR	Description
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	128	W	<p>Command interface for applications. A positive acknowledge indicates the complete and correct finalization of the requested function.</p> <p>128: Device Reset  130: Restore Factory Settings  (0 ... 63): Reserved  (132 ... 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</p>
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	<p>This lock prevents the write access to all read/write parameters of the device except for the parameter 'Device Access Locks'.</p> <p>True: Locked  False: Unlocked</p>
Data Storage	12	2	BooleanT		RW	<p>This lock prevents the write access to the device parameters via the data storage mechanism.</p> <p>True: Locked  False: Unlocked</p>
Local Parameterization	12	3	BooleanT		RW	<p>This lock prevents the device settings from being changed via local operating elements on the device.</p> <p>True: Locked  False: Unlocked</p>

Parameter	Index	Subindex	Data type	Default	AR	Description
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.  True: Locked False: Unlocked
Vendor Name	16	0	StringT		R	The vendor name that is assigned to a Vendor ID.
Vendor Text	17	0	StringT		R	Additional information about the vendor.
Product Name	18	0	StringT		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		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.
Device Status	36	0	UIntegerT		R	Indicator for the current device condition and diagnosis state.
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

Parameter	Index	Subindex	Data type	Default	AR	Description
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)
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: -

Parameter	Index	Subindex	Data type	Default	AR	Description
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)
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

Parameter	Index	Subindex	Data type	Default	AR	Description
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
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

Parameter	Index	Subindex	Data type	Default	AR	Description
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
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



Parameter	Index	Subindex	Data type	Default	AR	Description
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
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
Sensor mode	2302	0	UIntegerT	0	RW	Sensor mode  0: normal mode 1: pixel mode

## 9 Technical specifications

### 9.1 General data

Tab. 9.1: Sensor and IODD version

IODD version	V1.0
IODD release date	2022-06-20
Device family	Scanner with Distance Data
Device ID	2149
Device name	ODT25B L6X.32
Device variants	ODT25B/L6X.32-2500-S12 (50148589), ODT25B/L6X.32-2500,200-S12 (50149096)