



PLC Integration GSL04B_2522

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

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1 Legal information

1.1 Disclaimer

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2 About this document

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

2.1 Purpose of use

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

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

2.2 Target group

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

3 General use of function block

3.1 Short description

The function block "FB_Leuze_GSL04B_2522" simplifies the usage of Leuze IO-Link devices on Siemens S7-1200/S7-1500 (TIA-Portal V15.1 or higher) PLC controls. This FB supports IO-Link Masters which can be connected via PROFIBUS / PROFINET to the PLC system.

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

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

3.2 Calling and designation

The module can be called as a single-instance.



Fig. 3.1: Example of module call with single instance

3.3 Configuration

Tab. 3.1: Parameter IN

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

Tab. 3.2: Parameter INOUT

Parameter	Data type	Description
DeviceData	Leuze_type_GSL04B_2522	Sensor data

See structure description of Leuze_type_GSL04B_2522 in chapter 7.

Tab. 3.3: Parameter OUT

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

See structure description of Leuze_type_lolError in chapter 6.

3.4 Method of function

The function block uses the data structure "FB_Leuze_GSL04B_2522". The PLC data structure contains the values of all IO-Link variables. Before you can use it, the structure must be instantiated by a data block. Each IO-Link FB parameter has a data point representing it in this data structure. This data point will be actualized every time a read request was executed successfully.

The desired parameters can be selected via the input variables. Depending on the device definition, IO-Link parameters are read or writable. The input variable must be "RW" = FALSE to read parameter. The value that should be written can be defined in the data structure, as soon as the input parameter "RW" = TRUE. You start each transfer by calling up the "FB_Leuze_GSL04B_2522" with a positive trigger at the "Execute" input. As long as there is no valid answer the output "Busy" is TRUE. In the case that the chosen timeout period has elapsed a timeout error will be generated and the thread will be terminated. The "Done" = TRUE output shows that the transmission was successful. The outputs retain there states as long as there is no new positive trigger at the "Execute" input again.

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

3.5 Behavior when error occurs

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

4 Integration into the PLC project

The function block "FB_Leuze_GSL04B_2522" is a part of the TIA-Portal library. To get all relevant blocks into your PLC project, please open the library as a "global" library. Afterwards, the library elements can be copied into the currently opened project.

Integration step by step:

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

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

5 Process data parser function

The function FC_Leuze_PD_GSL04B_2522 simplifies the interpretation of composed IO-Link process data. This data is provided as a data structure on the PLC side. Some sensors supports different process data output. User must select mode of PD according to the sensors settings. Each sensor connected to Leuze IO-Link master has its own hardware ID. See Fig. 5.2.

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

5.1 Calling and designation



Fig. 5.1: Example of process data parsing function call

5.2 Configuration

Tab. 5.1: Parameters

Parameter name	Declaration	Data type	Description
HwID	INPUT	HW_IO	Hardware IO-Address of the IO-Link master (see HW-Configuration). For masters that do not use the Siemens PCT-Tool please use the HW IOAddress of the configured Master port.
RelByteOffset	INPUT	UINT	Relative start address of the IO-Link device on the IO-Link master port (see PCT-Tool -> Addresses -> Inputs Start). If the process date is mapped into a specified logical IO-Address, the relative byte offset = 0.
PDMode	INPUT	INT	Mode of the PD. User must select mode of PD according to the sensors settings.
ErrorCode	OUTPUT	WORD	Error code details see in the Siemens help system ("DPRD_DAT").
RET_VAL	OUTPUT	Leuze_type_PD_GSL04B_2522	Reference to the instance of the data structure Leuze_type_PD_GSL04B_2522. The structure includes the disaggregated values of the process data.

See structure description of Leuze_type_PD_GSL04B_2522 in chapter 7.



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

6 Error description

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

Tab. 6.1: Leuze_type_IolError description

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

Tab. 6.2: Error description for status

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

Tab. 6.3: Error description for ioLError

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

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

Tab. 6.4: Error description for ioLError

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

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

For additional information see the specification "IO-Link Communication" (www.IO-Link.com).

7 Data structures

Tab. 7.1: Leuze_type_ GSL04B_2522

Parameter name	Data type	Description
DeviceData.Selection.Commands.CmdDeviceReset	Bool	[WRITE_ONLY] Device Reset
DeviceData.Selection.Commands.CmdApplicationReset	Bool	[WRITE_ONLY] Application Reset
DeviceData.Selection.Commands.CmdRestoreFactorySettings	Bool	[WRITE_ONLY] Restore Factory Settings
DeviceData.Selection.Commands.CmdTeachApply	Bool	[WRITE_ONLY] Teach Apply
DeviceData.Selection.Commands.CmdSetpoint1SingleValueTeach	Bool	[WRITE_ONLY] Setpoint 1 Single Value Teach
DeviceData.Selection.Commands.CmdSetpoint2SingleValueTeach	Bool	[WRITE_ONLY] Setpoint 2 Single Value Teach
DeviceData.Selection.Commands.CmdTwoValueTeachTp1Sp1	Bool	[WRITE_ONLY] Two Value Teach TP1 SP1
DeviceData.Selection.Commands.CmdTwoValueTeachTp2Sp1	Bool	[WRITE_ONLY] Two Value Teach TP2 SP1
DeviceData.Selection.Commands.CmdTwoValueTeachTp1Sp2	Bool	[WRITE_ONLY] Two Value Teach TP1 SP2
DeviceData.Selection.Commands.CmdTwoValueTeachTp2Sp2	Bool	[WRITE_ONLY] Two Value Teach TP2 SP2
DeviceData.Selection.Commands.CmdSetpoint1DynamicTeachStart	Bool	[WRITE_ONLY] Setpoint 1 Dynamic Teach Start
DeviceData.Selection.Commands.CmdSetpoint1DynamicTeachStop	Bool	[WRITE_ONLY] Setpoint 1 Dynamic Teach Stop
DeviceData.Selection.Commands.CmdSetpoint2DynamicTeachStart	Bool	[WRITE_ONLY] Setpoint 2 Dynamic Teach Start
DeviceData.Selection.Commands.CmdSetpoint2DynamicTeachStop	Bool	[WRITE_ONLY] Setpoint 2 Dynamic Teach Stop
DeviceData.Selection.Commands.CmdTeachCancel	Bool	[WRITE_ONLY] Teach Cancel
DeviceData.Selection.Commands.CmdAdoptLocalAdjustment	Bool	[WRITE_ONLY] Adopt Local Adjustment
DeviceData.Selection.Commands.CmdResetDiagnosisInformation	Bool	[WRITE_ONLY] Reset Diagnosis Information
DeviceData.Selection.Commands.CmdDeactivation	Bool	[WRITE_ONLY] Deactivation
DeviceData.Selection.Commands.CmdActivation	Bool	[WRITE_ONLY] Activation
DeviceData.Selection.Commands.CmdSingleMeasurement	Bool	[WRITE_ONLY] Single measurement
DeviceData.Selection.DirectParameters1.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.DirectParameters1.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.DirectParameters1.Reserved_1	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.MasterCycleTime	Bool	[READ_ONLY]

Parameter name	Data type	Description
DeviceData.Selection.DirectParameters1.MinCycleTime	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.MSequenceCapability	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.IoLinkVersionId	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.ProcessDataInputLength	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.ProcessDataOutputLength	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.VendorId1	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.VendorId2	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.DeviceId1	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.DeviceId2	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.DeviceId3	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.Reserved_13	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.Reserved_14	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.Reserved_15	Bool	[READ_ONLY]
DeviceData.Selection.StandardCommand	Bool	[WRITE_ONLY]
DeviceData.Selection.DeviceAccessLocks.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.VendorName	Bool	[READ_ONLY]
DeviceData.Selection.VendorText	Bool	[READ_ONLY]
DeviceData.Selection.ProductName	Bool	[READ_ONLY]
DeviceData.Selection.ProductId	Bool	[READ_ONLY]
DeviceData.Selection.ProductText	Bool	[READ_ONLY]
DeviceData.Selection.FirmwareVersion	Bool	[READ_ONLY]
DeviceData.Selection.ApplicationSpecificTag	Bool	[READ_WRITE]
DeviceData.Selection.ErrorCount	Bool	[READ_ONLY]
DeviceData.Selection.DeviceStatus	Bool	[READ_ONLY]
DeviceData.Selection.TeachState.All	Bool	[READ_ONLY] all parameters of complex data type
DeviceData.Selection.Setpoint_60.All	Bool	[READ_WRITE] all parameters of complex data type

Parameter name	Data type	Description
DeviceData.Selection.Setpoint_60.Bdc1q11	Bool	[READ_WRITE] threshold measurement value
DeviceData.Selection.Setpoint_60.Bdc1q12	Bool	[READ_WRITE] threshold measurement value
DeviceData.Selection.Switchpoint_61.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.Switchpoint_61.Logic	Bool	[READ_WRITE] switching information is transmitted in inverted or not inverted manner
DeviceData.Selection.Switchpoint_61.Mode	Bool	[READ_WRITE] operation mode for binary signal
DeviceData.Selection.Switchpoint_61.Hysteresis	Bool	[READ_WRITE]
DeviceData.Selection.Lot	Bool	[READ_ONLY] production lot
DeviceData.Selection.DeviceAdjustment	Bool	[READ_WRITE] Selection of local / remote adjustment
DeviceData.Selection.OnDelaySwitchingOutput	Bool	[READ_WRITE] on delay for the binary data channel
DeviceData.Selection.OffDelaySwitchingOutput	Bool	[READ_WRITE] off delay for the binary data channel
DeviceData.Selection.SwitchingOutput	Bool	[READ_WRITE] polarity of the switching output
DeviceData.Selection.SensorMode	Bool	[READ_WRITE] sensor tuning
DeviceData.Selection.Teachpoint.All	Bool	[READ_ONLY] all parameters of complex data type
DeviceData.Selection.Teachpoint.Tp1	Bool	[READ_ONLY] detected lower limit during teach-in procedure
DeviceData.Selection.Teachpoint.Tp2	Bool	[READ_ONLY] detected upper limit during teach-in procedure
DeviceData.Selection.ProcessDataLimits.All	Bool	[READ_ONLY] all parameters of complex data type
DeviceData.Selection.ProcessDataLimits.Lower	Bool	[READ_ONLY] lower limit after power-up or reset
DeviceData.Selection.ProcessDataLimits.Upper	Bool	[READ_ONLY] upper limit after power-up or reset
DeviceData.Selection.SwitchCounter	Bool	[READ_ONLY] number of switching after power-up or reset
DeviceData.Selection.Temperature	Bool	[READ_ONLY] Sensor temperature
DeviceData.Selection.TeachInQuality	Bool	[READ_ONLY] Last teach in Quality
DeviceData.Selection.SwitchpointPotentiometer	Bool	[READ_ONLY] position of the local sensibility switch
DeviceData.Selection.SwitchingOutputLogic	Bool	[READ_ONLY] local switching output logic
DeviceData.Data.Commands.CmdDeviceReset	UInt	[WRITE_ONLY] Device Reset

Parameter name	Data type	Description
DeviceData.Data.Commands.CmdApplicationReset	UInt	[WRITE_ONLY] Application Reset
DeviceData.Data.Commands.CmdRestoreFactorySettings	UInt	[WRITE_ONLY] Restore Factory Settings
DeviceData.Data.Commands.CmdTeachApply	UInt	[WRITE_ONLY] Teach Apply
DeviceData.Data.Commands.CmdSetpoint1SingleValueTeach	UInt	[WRITE_ONLY] Setpoint 1 Single Value Teach
DeviceData.Data.Commands.CmdSetpoint2SingleValueTeach	UInt	[WRITE_ONLY] Setpoint 2 Single Value Teach
DeviceData.Data.Commands.CmdTwoValueTeachTp1Sp1	UInt	[WRITE_ONLY] Two Value Teach TP1 SP1
DeviceData.Data.Commands.CmdTwoValueTeachTp2Sp1	UInt	[WRITE_ONLY] Two Value Teach TP2 SP1
DeviceData.Data.Commands.CmdTwoValueTeachTp1Sp2	UInt	[WRITE_ONLY] Two Value Teach TP1 SP2
DeviceData.Data.Commands.CmdTwoValueTeachTp2Sp2	UInt	[WRITE_ONLY] Two Value Teach TP2 SP2
DeviceData.Data.Commands.CmdSetpoint1DynamicTeachStart	UInt	[WRITE_ONLY] Setpoint 1 Dynamic Teach Start
DeviceData.Data.Commands.CmdSetpoint1DynamicTeachStop	UInt	[WRITE_ONLY] Setpoint 1 Dynamic Teach Stop
DeviceData.Data.Commands.CmdSetpoint2DynamicTeachStart	UInt	[WRITE_ONLY] Setpoint 2 Dynamic Teach Start
DeviceData.Data.Commands.CmdSetpoint2DynamicTeachStop	UInt	[WRITE_ONLY] Setpoint 2 Dynamic Teach Stop
DeviceData.Data.Commands.CmdTeachCancel	UInt	[WRITE_ONLY] Teach Cancel
DeviceData.Data.Commands.CmdAdoptLocalAdjustment	UInt	[WRITE_ONLY] Adopt Local Adjustment
DeviceData.Data.Commands.CmdResetDiagnosisInformation	UInt	[WRITE_ONLY] Reset Diagnosis Information
DeviceData.Data.Commands.CmdDeactivation	UInt	[WRITE_ONLY] Deactivation
DeviceData.Data.Commands.CmdActivation	UInt	[WRITE_ONLY] Activation
DeviceData.Data.Commands.CmdSingleMeasurement	UInt	[WRITE_ONLY] Single measurement
DeviceData.Data.DirectParameters1.Reserved_1	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.MasterCycleTime	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.MinCycleTime	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.MSequenceCapability	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.IoLinkVersionId	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.ProcessDataInputLength	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.ProcessDataOutputLength	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.VendorId1	UInt	[READ_ONLY]

Parameter name	Data type	Description
DeviceData.Data.DirectParameters1.VendorId2	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.DeviceId1	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.DeviceId2	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.DeviceId3	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.Reserved_13	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.Reserved_14	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.Reserved_15	UInt	[READ_ONLY]
DeviceData.Data.StandardCommand	UInt	[WRITE_ONLY]
DeviceData.Data.DeviceAccessLocks.ParameterWriteAccessLock	Bool	[READ_WRITE]
DeviceData.Data.DeviceAccessLocks.DataStorageLock	Bool	[READ_WRITE]
DeviceData.Data.DeviceAccessLocks.LocalParameterizationLock	Bool	[READ_WRITE]
DeviceData.Data.DeviceAccessLocks.LocalUserInterfaceLock	Bool	[READ_WRITE]
DeviceData.Data.VendorName	String	[READ_ONLY]
DeviceData.Data.VendorText	String	[READ_ONLY]
DeviceData.Data.ProductName	String	[READ_ONLY]
DeviceData.Data.ProductId	String	[READ_ONLY]
DeviceData.Data.ProductText	String	[READ_ONLY]
DeviceData.Data.FirmwareVersion	String	[READ_ONLY]
DeviceData.Data.ApplicationSpecificTag	String	[READ_WRITE]
DeviceData.Data.ErrorCount	UInt	[READ_ONLY]
DeviceData.Data.DeviceStatus	UInt	[READ_ONLY]
DeviceData.Data.TeachState.Sp2TeachPointStatus	UInt	[READ_ONLY] indication for the success of a teach point setting
DeviceData.Data.TeachState.Sp1TeachPointStatus_2	UInt	[READ_ONLY] indication for the success of a teach point setting
DeviceData.Data.TeachState.TeachState_3	UInt	[READ_ONLY] indication of the current state of the teach-in procedure
DeviceData.Data.Setpoint_60.Bdc1q11	UInt	[READ_WRITE] threshold measurement value
DeviceData.Data.Setpoint_60.Bdc1q12	UInt	[READ_WRITE] threshold measurement value

Parameter name	Data type	Description
DeviceData.Data.Switchpoint_61.Logic	UInt	[READ_WRITE] switching information is transmitted in inverted or not inverted manner
DeviceData.Data.Switchpoint_61.Mode	UInt	[READ_WRITE] operation mode for binary signal
DeviceData.Data.Switchpoint_61.Hysteresis	UInt	[READ_WRITE]
DeviceData.Data.Lot	String	[READ_ONLY] production lot
DeviceData.Data.DeviceAdjustment	UInt	[READ_WRITE] Selection of local / remote adjustment
DeviceData.Data.OnDelaySwitchingOutput	UInt	[READ_WRITE] on delay for the binary data channel
DeviceData.Data.OffDelaySwitchingOutput	UInt	[READ_WRITE] off delay for the binary data channel
DeviceData.Data.SwitchingOutput	UInt	[READ_WRITE] polarity of the switching output
DeviceData.Data.SensorMode	UInt	[READ_WRITE] sensor tuning
DeviceData.Data.Teachpoint.Tp1	UInt	[READ_ONLY] detected lower limit during teach-in procedure
DeviceData.Data.Teachpoint.Tp2	UInt	[READ_ONLY] detected upper limit during teach-in procedure
DeviceData.Data.ProcessDataLimits.Lower	UInt	[READ_ONLY] lower limit after power-up or reset
DeviceData.Data.ProcessDataLimits.Upper	UInt	[READ_ONLY] upper limit after power-up or reset
DeviceData.Data.SwitchCounter	UInt	[READ_ONLY] number of switching after power-up or reset
DeviceData.Data.Temperature	Int	[READ_ONLY] Sensor temperature
DeviceData.Data.TeachInQuality	Int	[READ_ONLY] Last teach in Quality
DeviceData.Data.SwitchpointPotentiometer	UInt	[READ_ONLY] position of the local sensibility switch
DeviceData.Data.SwitchingOutputLogic	UInt	[READ_ONLY] local switching output logic

Tab. 7.2: Leuze_type_PD_GSL04B_2522

Parameter name	Data type	Description
FC_Leuze_PD_GSL04B_2522.MeasurementValue	UInt	
FC_Leuze_PD_GSL04B_2522.Stability	Bool	
FC_Leuze_PD_GSL04B_2522.SwitchStateBdc1Q1	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
Teach Apply			UIntegerT	64	W	Teach Apply
Setpoint 1 Single Value Teach			UIntegerT	65	W	Setpoint 1 Single Value Teach
Setpoint 2 Single Value Teach			UIntegerT	66	W	Setpoint 2 Single Value Teach
Two Value Teach TP1 SP1			UIntegerT	67	W	Two Value Teach TP1 SP1
Two Value Teach TP2 SP1			UIntegerT	68	W	Two Value Teach TP2 SP1
Two Value Teach TP1 SP2			UIntegerT	69	W	Two Value Teach TP1 SP2
Two Value Teach TP2 SP2			UIntegerT	70	W	Two Value Teach TP2 SP2
Setpoint 1 Dynamic Teach Start			UIntegerT	71	W	Setpoint 1 Dynamic Teach Start
Setpoint 1 Dynamic Teach Stop			UIntegerT	72	W	Setpoint 1 Dynamic Teach Stop
Setpoint 2 Dynamic Teach Start			UIntegerT	73	W	Setpoint 2 Dynamic Teach Start
Setpoint 2 Dynamic Teach Stop			UIntegerT	74	W	Setpoint 2 Dynamic Teach Stop
Teach Cancel			UIntegerT	79	W	Teach Cancel
Adopt Local Adjustment			UIntegerT	160	W	Adopt Local Adjustment
Reset Diagnosis Information			UIntegerT	163	W	Reset Diagnosis Information
Deactivation			UIntegerT	164	W	Deactivation
Activation			UIntegerT	165	W	Activation
Single measurement			UIntegerT	166	W	Single measurement
IO-Link 1.1 system test command 240, Event 8DFE appears			UIntegerT	240	W	IO-Link 1.1 system test command 240, Event 8DFE appears
IO-Link 1.1 system test command 241, Event 8DFE disappears			UIntegerT	241	W	IO-Link 1.1 system test command 241, Event 8DFE disappears

Parameter	Index	Subindex	Data type	Default	AR	Description
IO-Link 1.1 system test command 242, Event 8DFF appears			UIntegerT	242	W	IO-Link 1.1 system test command 242, Event 8DFF appears
IO-Link 1.1 system test command 243, Event 8DFF disappears			UIntegerT	243	W	IO-Link 1.1 system test command 243, Event 8DFF disappears
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	
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		W	(0 ... 63): Reserved 128: Device Reset 129: Application Reset 130: Restore Factory Settings (131 ... 159): Reserved

Parameter	Index	Subindex	Data type	Default	AR	Description
Standard Command	2	0	UIntegerT		W	(0 ... 63): Reserved 128: Device Reset 129: Application Reset 130: Restore Factory Settings (131 ... 159): Reserved 64: Teach Apply 65: Setpoint 1 Single Value Teach 66: Setpoint 2 Single Value Teach 67: Two Value Teach TP1 SP1 68: Two Value Teach TP2 SP1 69: Two Value Teach TP1 SP2 70: Two Value Teach TP2 SP2 71: Setpoint 1 Dynamic Teach Start 72: Setpoint 1 Dynamic Teach Stop 73: Setpoint 2 Dynamic Teach Start 74: Setpoint 2 Dynamic Teach Stop 79: Teach Cancel 160: Adopt Local Adjustment 163: Reset Diagnosis Information 164: Deactivation 165: Activation 166: Single measurement 240: IO-Link 1.1 system test command 240, Event 8DFE appears 241: IO-Link 1.1 system test command 241, Event 8DFE disappears 242: IO-Link 1.1 system test command 242, Event 8DFF appears 243: IO-Link 1.1 system test command 243, Event 8DFF disappears
Device Access Locks	12	0	RecordT		RW	
Parameter (write) Access Lock	12	1	BooleanT	0	RW	
Data Storage Lock	12	2	BooleanT		RW	
Local Parameterization Lock	12	3	BooleanT	0	RW	
Local User Interface Lock	12	4	BooleanT		RW	
Vendor Name	16	0	StringT	Leuze electronic GmbH + Co. KG	R	
Vendor Text	17	0	StringT	The Sensor People	R	
Product Name	18	0	StringT		R	
Product ID	19	0	StringT		R	
Product Text	20	0	StringT		R	
Firmware Version	23	0	StringT		R	
Application Specific Tag	24	0	StringT		RW	
Error Count	32	0	UIntegerT		R	

Parameter	Index	Subindex	Data type	Default	AR	Description
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
Teach State	59	0	RecordT		R	indication of the current state of the teach-in procedure and teach point setting
SP2 teach point Status	59	1	UIntegerT	0	R	indication for the success of a teach point setting 0: Teachpoint 1 and 2 not taught or not successful 1: Teachpoint 1 successfully taught 2: Teachpoint 2 successfully taught 3: Teachpoint 1 and 2 successfully taught
SP1 teach point Status	59	2	UIntegerT	0	R	indication for the success of a teach point setting 0: Teachpoint 1 and 2 not taught or not successful 1: Teachpoint 1 successfully taught 2: Teachpoint 2 successfully taught 3: Teachpoint 1 and 2 successfully taught
Teach State	59	3	UIntegerT		R	indication of the current state of the teach-in procedure 0: Idle 1: Switchpoint Set 2: Switchpoint 2 Set 3: Switchpoint 1+2 Set 4: Wait for Command 5: Busy 6: Reserved 7: Error
Setpoint	60	0	RecordT		RW	threshold measurement value of a sensor for the edge of a binary output signal
BDC1Q1 1	60	1	UIntegerT	50	RW	threshold measurement value (4 ... 88)
BDC1Q1 2	60	2	UIntegerT	50	RW	threshold measurement value (4 ... 88)
Switchpoint	61	0	RecordT		RW	mode, logic and hysteresis for binary data channel 1
Logic	61	1	UIntegerT	0	RW	switching information is transmitted in inverted or not inverted manner 0: low active 1: high active
Mode	61	2	UIntegerT	1	RW	operation mode for binary signal 0: Deactivated 1: Single point mode 2: Window mode 3: Two point mode
Hysteresis	61	3	UIntegerT	0	RW	(0 ... 20)

Parameter	Index	Subindex	Data type	Default	AR	Description
Lot	64	0	StringT		R	production lot
Device Adjustment	65	0	UIntegerT	1	RW	Selection of local / remote adjustment 0: Remote 1: Local
On delay switching output	66	0	UIntegerT	0	RW	on delay for the binary data channel (0 ... 10000)
Off delay switching output	67	0	UIntegerT	0	RW	off delay for the binary data channel (0 ... 10000)
Switching Output	70	0	UIntegerT	0	RW	polarity of the switching output 0: PP 1: NPN 2: PNP
Sensor Mode	73	0	UIntegerT	0	RW	sensor tuning 0: Standard 1: Precision 2: Power 3: Speed
Teachpoint	80	0	RecordT		R	Values detected during teach
TP1	80	1	UIntegerT		R	detected lower limit during teach-in procedure
TP2	80	2	UIntegerT		R	detected upper limit during teach-in procedure
Process data limits	84	0	RecordT		R	Process data limit values
lower	84	1	UIntegerT		R	lower limit after power-up or reset
upper	84	2	UIntegerT		R	upper limit after power-up or reset
Switch counter	85	0	UIntegerT		R	number of switching after power-up or reset
Temperature	86	0	IntegerT		R	Sensor temperature
Teach-In Quality	87	0	IntegerT	0	R	Last teach in Quality 0: OK 1: OK 2: Not OK 3: Not OK
Switchpoint Potentiometer	90	0	UIntegerT		R	position of the local sensibility switch
switching output logic	91	0	UIntegerT		R	local switching output logic 0: low active 1: high active

9 Technical specifications

9.1 General data

Tab. 9.1: Sensor and IODD version

IODD version	V1.0
IODD release date	2021-11-18
Device family	Fork sensor for object detection
Device ID	2522
Device name	GSL04B/1
Device variants	GSL04B/1.1-30-M8.3 (50146187), GSL04B/1.1-50-M8.3 (50146188), GSL04B/1.1-80-M8.3 (50146189), GSL04B/1.1-120-M8.3 (50146190)