

PLC Integration KRT3B_2130

**IO - Link service data function block + process data parser function for
Module 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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Leuze electronic GmbH & Co. KG

In der Braike 1

D-73277 Owen / Germany

Phone: +49 7021 573-0

Fax: +49 7021 573-199

<http://www.leuze.com>

info@leuze.com

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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_KRT3B_2130" 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.

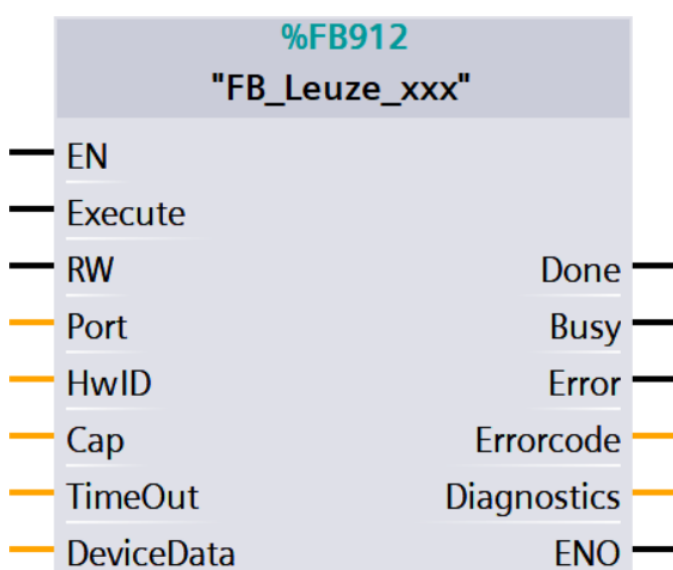


Fig. 3.1: Example of module call with single instance

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_KRT3B_2130	Sensor data

See structure description of Leuze_type_KRT3B_2130 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_KRT3B_2130". 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_KRT3B_2130" 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_KRT3B_2130" 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_KRT3B_2130 simplifies the interpretation of composed IO-Link process data. This data is provided as a data structure on the PLC side. 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

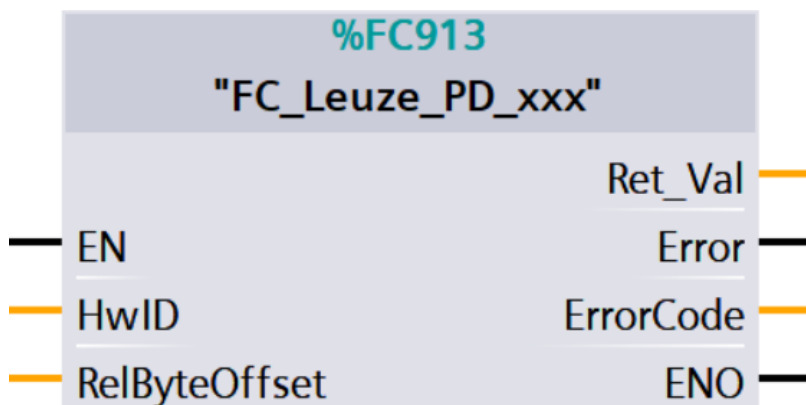


Fig. 5.1: Example of process data parsing function call

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.
ErrorCode	OUTPUT	WORD	Error code details see in the Siemens help system ("DPRD_DAT").
RET_VAL	OUTPUT	Leuze_type_PD_KRT3B_2130	Reference to the instance of the data structure Leuze_type_PD_KRT3B_2130. The structure includes the disaggregated values of the process data.

See structure description of Leuze_type_PD_KRT3B_2130 in chapter 7.

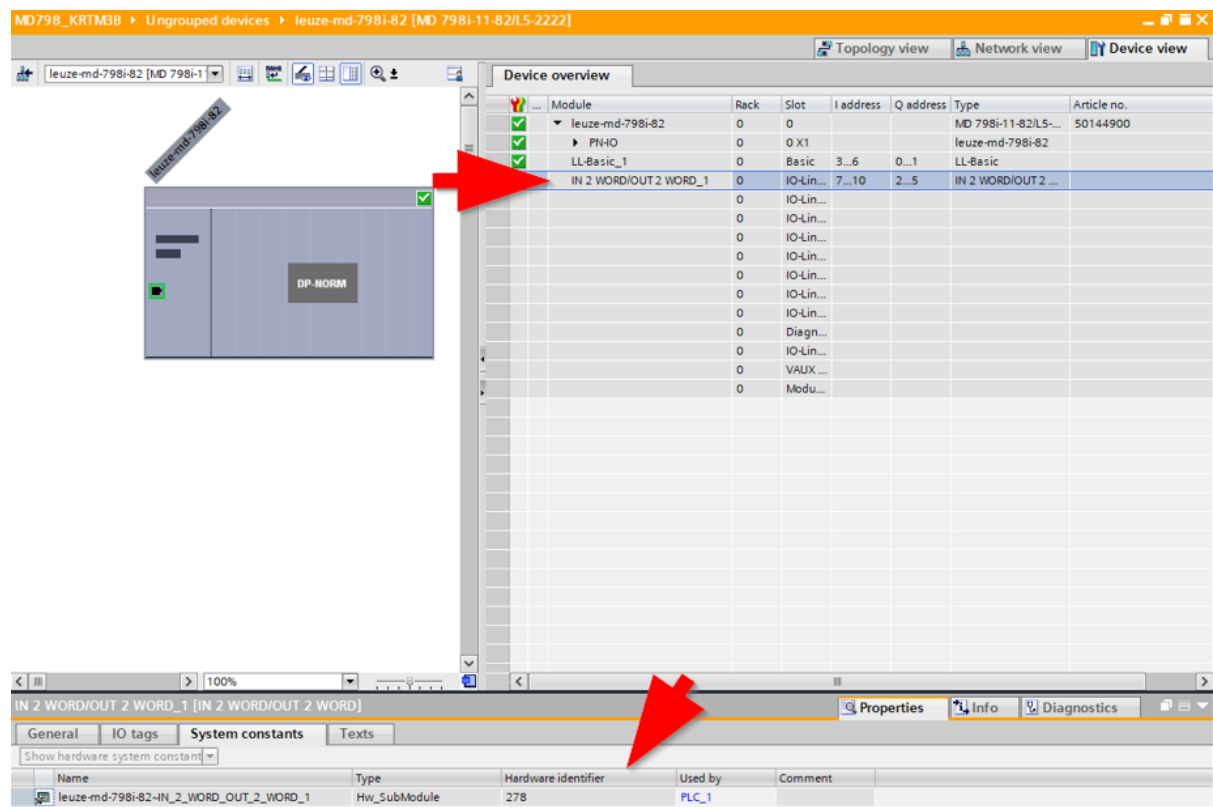


Fig. 5.2: Hardware ID for sensors connected to Leuze MD798 IO-Link master

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_KRT3B_2130

Parameter name	Data type	Description
DeviceData.Selection.Commands.DeviceReset	Bool	[WRITE_ONLY] Device Reset
DeviceData.Selection.Commands.ApplicationReset	Bool	[WRITE_ONLY] Application Reset
DeviceData.Selection.Commands.RestoreFactorySettings	Bool	[WRITE_ONLY] Restore Factory Settings
DeviceData.Selection.Commands.SensitivityIncreaseByOneStep	Bool	[WRITE_ONLY] sensitivity increase by one step
DeviceData.Selection.Commands.SensitivityDecreaseByOneStep	Bool	[WRITE_ONLY] sensitivity decrease by one step
DeviceData.Selection.Commands.Static2PointTeachStartWithBackground	Bool	[WRITE_ONLY] static 2-point teach start with background
DeviceData.Selection.Commands.Dynamic2PointTeachStartWithBackground	Bool	[WRITE_ONLY] dynamic 2-point teach start with background
DeviceData.Selection.Commands.TestFunction	Bool	[WRITE_ONLY] test function
DeviceData.Selection.Commands.Finalize2PointTeach	Bool	[WRITE_ONLY] finalize 2-point teach
DeviceData.Selection.Commands.SaveCurrentWorkingParameter	Bool	[WRITE_ONLY] save current working parameter
DeviceData.Selection.Commands.RestoreLastSavedWorkingParameter	Bool	[WRITE_ONLY] restore last saved working parameter
DeviceData.Selection.Commands.SaveCurrentWorkingParameterToMemoryIndex	Bool	[WRITE_ONLY] save current working parameter to memory index
DeviceData.Selection.Commands.LoadSavedWorkingParameterFromMemoryIndex	Bool	[WRITE_ONLY] load saved working parameter from memory index
DeviceData.Selection.DirectParameters1.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.DirectParameters1.Reserved_1	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.MasterCycleTime	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.MinCycleTime	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.MSequenceCapability	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.IoLinkVersionId	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.ProcessDataInputLength	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.ProcessDataOutputLength	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.VendorId1	Bool	[READ_ONLY]
DeviceData.Selection.DirectParameters1.VendorId2	Bool	[READ_ONLY]

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

Parameter name	Data type	Description
DeviceData.Selection.ProductName	Bool	[READ_ONLY]
DeviceData.Selection.ProductId	Bool	[READ_ONLY]
DeviceData.Selection.ProductText	Bool	[READ_ONLY]
DeviceData.Selection.SerialNumber	Bool	[READ_ONLY]
DeviceData.Selection.HardwareVersion	Bool	[READ_ONLY]
DeviceData.Selection.FirmwareVersion	Bool	[READ_ONLY]
DeviceData.Selection.ApplicationSpecificTag	Bool	[READ_WRITE]
DeviceData.Selection.EasytuneLockState	Bool	[READ_WRITE] EasyTune lock state
DeviceData.Selection.TeachButtonLockState	Bool	[READ_WRITE] button lock state
DeviceData.Selection.SwitchingOutput1Function	Bool	[READ_WRITE] inversion of the switching output 1
DeviceData.Selection.SwitchingOutput2Function	Bool	[READ_WRITE] function switching output 2
DeviceData.Selection.TimerUnit	Bool	[READ_WRITE] timer unit
DeviceData.Selection.FunctionOfTimerUnit	Bool	[READ_WRITE] function of timer unit
DeviceData.Selection.Time_76	Bool	[READ_WRITE] time
DeviceData.Selection.ColorsAtTeach	Bool	[READ_WRITE] selection of the transmitter color
DeviceData.Selection.PositionOfSwitchingThreshold1PointTeachIoLink	Bool	[READ_WRITE] sensitivity setting at static/dynamic 1-point teach - IO-Link
DeviceData.Selection.PositionOfSwitchingThreshold2PointTeachIoLink	Bool	[READ_WRITE] sensitivity setting at static/dynamic 2-point teach - IO-Link
DeviceData.Selection.PositionOfSwitchingThreshold1PointTeachButtonSensitivity1	Bool	[READ_WRITE] sensitivity setting at static/dynamic 1-point teach - button - sensitivity 1
DeviceData.Selection.PositionOfSwitchingThreshold1PointTeachButtonSensitivity2	Bool	[READ_WRITE] sensitivity setting at static/dynamic 1-point teach - button - sensitivity 2
DeviceData.Selection.PositionOfSwitchingThreshold2PointTeachButtonSensitivity1	Bool	[READ_WRITE] sensitivity setting at static/dynamic 2-point teach - button - sensitivity 1
DeviceData.Selection.PositionOfSwitchingThreshold2PointTeachButtonSensitivity2	Bool	[READ_WRITE] sensitivity setting at static/dynamic 2-point teach - button - sensitivity 2
DeviceData.Selection.AnalysisDepth	Bool	[READ_WRITE] number of scans considered for the switching output to toggle
DeviceData.Selection.WorkingParameter0.All	Bool	[READ_WRITE] all parameters of complex data type

Parameter name	Data type	Description
DeviceData.Selection.WorkingParameter1.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter2.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter3.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter4.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter5.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter6.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter7.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter8.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter9.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter10.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter11.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter12.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter13.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter14.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter15.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter16.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter17.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter18.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter19.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter20.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter21.All	Bool	[READ_WRITE] all parameters of complex data type

Parameter name	Data type	Description
DeviceData.Selection.WorkingParameter22.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter23.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter24.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter25.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter26.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter27.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter28.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter29.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.WorkingParameter.All	Bool	[READ_WRITE] all parameters of complex data type
DeviceData.Selection.TeachButtonFunction.All	Bool	[READ_ONLY] all parameters of complex data type
DeviceData.Selection.ActiveTransmitter	Bool	[READ_WRITE] active transmitter
DeviceData.Selection.Amplification	Bool	[READ_WRITE] amplification setting
DeviceData.Selection.BackgroundValue	Bool	[READ_WRITE] background value
DeviceData.Selection.MarkValue	Bool	[READ_WRITE] mark value
DeviceData.Selection.HighSwitchingThreshold	Bool	[READ_WRITE] upper value of the switching threshold including hysteresis, relative to the reference value
DeviceData.Selection.LowSwitchingThreshold	Bool	[READ_WRITE] lower value of the switching threshold including hysteresis, relative to the reference value
DeviceData.Selection.BackgroundOffsetValue	Bool	[READ_WRITE] is determined from the background signal at static 1-point teach
DeviceData.Selection.NumberOfMarks	Bool	[READ_WRITE] internal mark counter, can be reset to 0
DeviceData.Selection.WorkingParameterMemoryIndex	Bool	[READ_WRITE] working parameter memory index
DeviceData.Selection.MeasuredValue	Bool	[READ_ONLY] measured value
DeviceData.Data.Commands.DeviceReset	UInt	[WRITE_ONLY] Device Reset

Parameter name	Data type	Description
DeviceData.Data.Commands.ApplicationReset	UInt	[WRITE_ONLY] Application Reset
DeviceData.Data.Commands.RestoreFactorySettings	UInt	[WRITE_ONLY] Restore Factory Settings
DeviceData.Data.Commands.SensitivityIncreaseByOneStep	UInt	[WRITE_ONLY] sensitivity increase by one step
DeviceData.Data.Commands.SensitivityDecreaseByOneStep	UInt	[WRITE_ONLY] sensitivity decrease by one step
DeviceData.Data.Commands.Static2PointTeachStartWithBackground	UInt	[WRITE_ONLY] static 2-point teach start with background
DeviceData.Data.Commands.Dynamic2PointTeachStartWithBackground	UInt	[WRITE_ONLY] dynamic 2-point teach start with background
DeviceData.Data.Commands.TestFunction	UInt	[WRITE_ONLY] test function
DeviceData.Data.Commands.Finalize2PointTeach	UInt	[WRITE_ONLY] finalize 2-point teach
DeviceData.Data.Commands.SaveCurrentWorkingParameter	UInt	[WRITE_ONLY] save current working parameter
DeviceData.Data.Commands.RestoreLastSavedWorkingParameter	UInt	[WRITE_ONLY] restore last saved working parameter
DeviceData.Data.Commands.SaveCurrentWorkingParameterToMemoryIndex	UInt	[WRITE_ONLY] save current working parameter to memory index
DeviceData.Data.Commands.LoadSavedWorkingParameterFromMemoryIndex	UInt	[WRITE_ONLY] load saved working parameter from memory index
DeviceData.Data.DirectParameters1.Reserved_1	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.MasterCycleTime	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.MinCycleTime	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.MSequenceCapability	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.IoLinkVersionId	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.ProcessDataInputLength	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.ProcessDataOutputLength	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.VendorId1	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.VendorId2	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.DeviceId1	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.DeviceId2	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.DeviceId3	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.Reserved_13	UInt	[READ_ONLY]

Parameter name	Data type	Description
DeviceData.Data.DirectParameters1.Reserved_14	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters1.Reserved_15	UInt	[READ_ONLY]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter1	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter2	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter3	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter4	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter5	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter6	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter7	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter8	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter9	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter10	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter11	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter12	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter13	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter14	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter15	UInt	[READ_WRITE]
DeviceData.Data.DirectParameters2.DeviceSpecificParameter16	UInt	[READ_WRITE]
DeviceData.Data.StandardCommand	UInt	[WRITE_ONLY]
DeviceData.Data.DeviceAccessLocks.ParameterWriteAccessLock	Bool	[READ_WRITE]
DeviceData.Data.DeviceAccessLocks.DataStorageLock	Bool	[READ_WRITE]
DeviceData.Data.DeviceAccessLocks.LocalParameterizationLock	Bool	[READ_WRITE]
DeviceData.Data.DeviceAccessLocks.LocalUserInterfaceLock	Bool	[READ_WRITE]
DeviceData.Data.VendorName	String	[READ_ONLY]
DeviceData.Data.VendorText	String	[READ_ONLY]
DeviceData.Data.ProductName	String	[READ_ONLY]
DeviceData.Data.ProductId	String	[READ_ONLY]

Parameter name	Data type	Description
DeviceData.Data.ProductText	String	[READ_ONLY]
DeviceData.Data.SerialNumber	String	[READ_ONLY]
DeviceData.Data.HardwareVersion	String	[READ_ONLY]
DeviceData.Data.FirmwareVersion	String	[READ_ONLY]
DeviceData.Data.ApplicationSpecificTag	String	[READ_WRITE]
DeviceData.Data.EasytuneLockState	Bool	[READ_WRITE] EasyTune lock state
DeviceData.Data.TeachButtonLockState	Bool	[READ_WRITE] button lock state
DeviceData.Data.SwitchingOutput1Function	UInt	[READ_WRITE] inversion of the switching output 1
DeviceData.Data.SwitchingOutput2Function	UInt	[READ_WRITE] function switching output 2
DeviceData.Data.TimerUnit	Bool	[READ_WRITE] timer unit
DeviceData.Data.FunctionOfTimerUnit	UInt	[READ_WRITE] function of timer unit
DeviceData.Data.Time_76	UInt	[READ_WRITE] time
DeviceData.Data.ColorsAtTeach	UInt	[READ_WRITE] selection of the transmitter color
DeviceData.Data.PositionOfSwitchingThreshold1PointTeachIoLink	UInt	[READ_WRITE] sensitivity setting at static/dynamic 1-point teach - IO-Link
DeviceData.Data.PositionOfSwitchingThreshold2PointTeachIoLink	UInt	[READ_WRITE] sensitivity setting at static/dynamic 2-point teach - IO-Link
DeviceData.Data.PositionOfSwitchingThreshold1PointTeachButtonSensitivity1	UInt	[READ_WRITE] sensitivity setting at static/dynamic 1-point teach - button - sensitivity 1
DeviceData.Data.PositionOfSwitchingThreshold1PointTeachButtonSensitivity2	UInt	[READ_WRITE] sensitivity setting at static/dynamic 1-point teach - button - sensitivity 2
DeviceData.Data.PositionOfSwitchingThreshold2PointTeachButtonSensitivity1	UInt	[READ_WRITE] sensitivity setting at static/dynamic 2-point teach - button - sensitivity 1
DeviceData.Data.PositionOfSwitchingThreshold2PointTeachButtonSensitivity2	UInt	[READ_WRITE] sensitivity setting at static/dynamic 2-point teach - button - sensitivity 2
DeviceData.Data.AnalysisDepth	UInt	[READ_WRITE] number of scans considered for the switching output to toggle
DeviceData.Data.WorkingParameter0.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter0.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter0.BackgroundValue	UInt	[READ_WRITE]

Parameter name	Data type	Description
DeviceData.Data.WorkingParameter0.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter0.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter0.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter0.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter1.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter1.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter1.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter1.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter1.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter1.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter1.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter2.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter2.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter2.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter2.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter2.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter2.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter2.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter3.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter3.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter3.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter3.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter3.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter3.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter3.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter4.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter4.Amplification	UInt	[READ_WRITE]

Parameter name	Data type	Description
DeviceData.Data.WorkingParameter4.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter4.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter4.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter4.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter4.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter5.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter5.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter5.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter5.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter5.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter5.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter5.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter6.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter6.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter6.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter6.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter6.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter6.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter6.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter7.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter7.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter7.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter7.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter7.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter7.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter7.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter8.ActiveTransmitter	UInt	[READ_WRITE]

Parameter name	Data type	Description
DeviceData.Data.WorkingParameter8.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter8.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter8.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter8.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter8.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter8.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter9.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter9.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter9.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter9.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter9.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter9.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter9.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter10.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter10.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter10.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter10.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter10.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter10.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter10.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter11.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter11.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter11.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter11.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter11.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter11.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter11.BackgroundOffsetValue	UInt	[READ_WRITE]

Parameter name	Data type	Description
DeviceData.Data.WorkingParameter12.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter12.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter12.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter12.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter12.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter12.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter12.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter13.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter13.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter13.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter13.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter13.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter13.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter13.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter14.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter14.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter14.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter14.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter14.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter14.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter14.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter15.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter15.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter15.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter15.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter15.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter15.LowSwitchingThreshold	UInt	[READ_WRITE]

Parameter name	Data type	Description
DeviceData.Data.WorkingParameter15.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter16.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter16.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter16.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter16.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter16.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter16.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter16.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter17.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter17.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter17.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter17.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter17.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter17.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter17.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter18.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter18.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter18.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter18.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter18.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter18.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter18.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter19.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter19.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter19.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter19.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter19.HighSwitchingThreshold	UInt	[READ_WRITE]

Parameter name	Data type	Description
DeviceData.Data.WorkingParameter19.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter19.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter20.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter20.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter20.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter20.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter20.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter20.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter20.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter21.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter21.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter21.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter21.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter21.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter21.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter21.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter22.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter22.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter22.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter22.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter22.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter22.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter22.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter23.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter23.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter23.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter23.MarkValue	UInt	[READ_WRITE]

Parameter name	Data type	Description
DeviceData.Data.WorkingParameter23.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter23.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter23.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter24.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter24.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter24.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter24.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter24.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter24.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter24.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter25.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter25.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter25.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter25.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter25.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter25.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter25.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter26.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter26.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter26.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter26.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter26.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter26.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter26.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter27.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter27.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter27.BackgroundValue	UInt	[READ_WRITE]

Parameter name	Data type	Description
DeviceData.Data.WorkingParameter27.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter27.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter27.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter27.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter28.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter28.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter28.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter28.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter28.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter28.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter28.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter29.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter29.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter29.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter29.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter29.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter29.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter29.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter.ActiveTransmitter	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter.Amplification	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter.BackgroundValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter.MarkValue	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter.HighSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter.LowSwitchingThreshold	UInt	[READ_WRITE]
DeviceData.Data.WorkingParameter.BackgroundOffsetValue	UInt	[READ_WRITE]
DeviceData.Data.TeachButtonFunction. FunctionTeachButtonLevel0	UInt	[READ_ONLY] at key depression <200ms
DeviceData.Data.TeachButtonFunction. FunctionTeachButtonLevel1	UInt	[READ_ONLY] at key depression >200ms ... <2s

Parameter name	Data type	Description
DeviceData.Data.TeachButtonFunction. FunctionTeachButtonLevel2	UInt	[READ_ONLY] at key depression >2sec ... <7sec
DeviceData.Data.TeachButtonFunction. FunctionTeachButtonLevel3	UInt	[READ_ONLY] at key depression >7s ... <12s
DeviceData.Data.TeachButtonFunction. FunctionTeachButtonLevel4	UInt	[READ_ONLY] at key depression >12s
DeviceData.Data.ActiveTransmitter	UInt	[READ_WRITE] active transmitter
DeviceData.Data.Amplification	UInt	[READ_WRITE] amplification setting
DeviceData.Data.BackgroundValue	UInt	[READ_WRITE] background value
DeviceData.Data.MarkValue	UInt	[READ_WRITE] mark value
DeviceData.Data.HighSwitchingThreshold	UInt	[READ_WRITE] upper value of the switching threshold including hysteresis, relative to the reference value
DeviceData.Data.LowSwitchingThreshold	UInt	[READ_WRITE] lower value of the switching threshold including hysteresis, relative to the reference value
DeviceData.Data.BackgroundOffsetValue	UInt	[READ_WRITE] is determined from the background signal at static 1-point teach
DeviceData.Data.NumberOfMarks	UInt	[READ_WRITE] internal mark counter, can be reset to 0
DeviceData.Data.WorkingParameterMemoryIndex	UInt	[READ_WRITE] working parameter memory index
DeviceData.Data.MeasuredValue	UInt	[READ_ONLY] measured value

Tab. 7.2: Leuze_type_PD_KRT3B_2130

Parameter name	Data type	Description
FC_Leuze_PD_KRT3B_2130.MeasurementValue_11	UInt	
FC_Leuze_PD_KRT3B_2130.ActiveTransmitter	UInt	
FC_Leuze_PD_KRT3B_2130.SwitchingThreshold	UInt	
FC_Leuze_PD_KRT3B_2130.SensorOperation	Bool	
FC_Leuze_PD_KRT3B_2130.MeasurementValue_0	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
sensitivity increase by one step			UIntegerT	192	W	sensitivity increase by one step
sensitivity decrease by one step			UIntegerT	193	W	sensitivity decrease by one step
static 2-point teach start with background			UIntegerT	195	W	static 2-point teach start with background
dynamic 2-point teach start with background			UIntegerT	197	W	dynamic 2-point teach start with background
test function			UIntegerT	198	W	test function
finalize 2-point teach			UIntegerT	207	W	finalize 2-point teach
save current working parameter			UIntegerT	224	W	save current working parameter
restore last saved working parameter			UIntegerT	225	W	restore last saved working parameter
save current working parameter to memory index			UIntegerT	226	W	save current working parameter to memory index
load saved working parameter from memory index			UIntegerT	227	W	load saved working parameter from memory index
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	

Parameter	Index	Subindex	Data type	Default	AR	Description
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
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		W	(0 ... 63): Reserved 128: Device Reset 129: Application Reset 130: Restore Factory Settings (131 ... 159): Reserved 192: sensitivity increase by one step 193: sensitivity decrease by one step 195: static 2-point teach start with background 197: dynamic 2-point teach start with background 198: test function 207: finalize 2-point teach 224: save current working parameter 225: restore last saved working parameter 226: save current working parameter to memory index 227: load saved working parameter from memory index
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	
EasyTune lock state	70	0	BooleanT	false	RW	EasyTune lock state False: off True: on
teach button lock state	71	0	BooleanT	false	RW	button lock state False: off True: on

Parameter	Index	Subindex	Data type	Default	AR	Description
switching output 1 function	72	0	UIntegerT	0	RW	inversion of the switching output 1 0: true on mark 1: true on background
switching output 2 function	73	0	UIntegerT	0	RW	function switching output 2 0: inverted switching output 1 1: equal switching output 1
timer unit	74	0	BooleanT	false	RW	timer unit False: off True: on
function of timer unit	75	0	UIntegerT	3	RW	function of timer unit 1: on delay 2: off delay 3: pulse stretching 4: pulse suppression
time	76	0	UIntegerT	200	RW	time (1 ... 50000)
colors at teach	77	0	UIntegerT	7	RW	selection of the transmitter color 1: red 2: green 4: blue 3: red, green 5: red, blue 6: green, blue 7: all
position of switching threshold, 1-point teach, IO-Link	78	0	UIntegerT	256	RW	sensitivity setting at static/dynamic 1-point teach - IO-Link
position of switching threshold, 2-point teach, IO-Link	79	0	UIntegerT	50	RW	sensitivity setting at static/dynamic 2-point teach - IO-Link 6: very close to the mark = 6% 12: close to the mark = 12% 25: toward mark = 25% 50: in the middle between the mark and background = 50% 70: in direction of the background = 70% 82: close to the background = 82% 90: very close to the background = 90% (7 ... 11), (13 ... 24), (26 ... 49), (51 ... 69), (71 ... 81), (83 ... 89), (91 ... 94)
position of switching threshold, 1-point teach, button, sensitivity 1	80	0	UIntegerT	256	RW	sensitivity setting at static/dynamic 1-point teach - button - sensitivity 1
position of switching threshold, 1-point teach, button, sensitivity 2	81	0	UIntegerT	128	RW	sensitivity setting at static/dynamic 1-point teach - button - sensitivity 2

Parameter	Index	Subindex	Data type	Default	AR	Description
position of switching threshold, 2-point teach, button, sensitivity 1	82	0	UIntegerT	50	RW	sensitivity setting at static/dynamic 2-point teach - button - sensitivity 1 6: very close to the mark = 6% 12: close to the mark = 12% 25: toward mark = 25% 50: in the middle between the mark and background = 50% 70: in direction of the background = 70% 82: close to the background = 82% 90: very close to the background = 90% (7 ... 11), (13 ... 24), (26 ... 49), (51 ... 69), (71 ... 81), (83 ... 89), (91 ... 94)
position of switching threshold, 2-point teach, button, sensitivity 2	83	0	UIntegerT	12	RW	sensitivity setting at static/dynamic 2-point teach - button - sensitivity 2 6: very close to the mark = 6% 12: close to the mark = 12% 25: toward mark = 25% 50: in the middle between the mark and background = 50% 70: in direction of the background = 70% 82: close to the background = 82% 90: very close to the background = 90% (7 ... 11), (13 ... 24), (26 ... 49), (51 ... 69), (71 ... 81), (83 ... 89), (91 ... 94)
analysis depth	84	0	UIntegerT	2	RW	number of scans considered for the switching output to toggle (1 ... 10)
working parameter 0	100	0	RecordT		RW	working parameter 0
active transmitter	100	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	100	2	UIntegerT		RW	
background value	100	3	UIntegerT		RW	
mark value	100	4	UIntegerT		RW	
high switching threshold	100	5	UIntegerT		RW	
low switching threshold	100	6	UIntegerT		RW	

Parameter	Index	Subindex	Data type	Default	AR	Description
background offset value	100	7	UIntegerT		RW	
working parameter 1	101	0	RecordT		RW	working parameter 1
active transmitter	101	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	101	2	UIntegerT		RW	
background value	101	3	UIntegerT		RW	
mark value	101	4	UIntegerT		RW	
high switching threshold	101	5	UIntegerT		RW	
low switching threshold	101	6	UIntegerT		RW	
background offset value	101	7	UIntegerT		RW	
working parameter 2	102	0	RecordT		RW	working parameter 2
active transmitter	102	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	102	2	UIntegerT		RW	
background value	102	3	UIntegerT		RW	
mark value	102	4	UIntegerT		RW	
high switching threshold	102	5	UIntegerT		RW	
low switching threshold	102	6	UIntegerT		RW	
background offset value	102	7	UIntegerT		RW	
working parameter 3	103	0	RecordT		RW	working parameter 3
active transmitter	103	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	103	2	UIntegerT		RW	
background value	103	3	UIntegerT		RW	
mark value	103	4	UIntegerT		RW	
high switching threshold	103	5	UIntegerT		RW	
low switching threshold	103	6	UIntegerT		RW	
background offset value	103	7	UIntegerT		RW	
working parameter 4	104	0	RecordT		RW	working parameter 4

Parameter	Index	Subindex	Data type	Default	AR	Description
active transmitter	104	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	104	2	UIntegerT		RW	
background value	104	3	UIntegerT		RW	
mark value	104	4	UIntegerT		RW	
high switching threshold	104	5	UIntegerT		RW	
low switching threshold	104	6	UIntegerT		RW	
background offset value	104	7	UIntegerT		RW	
working parameter 5	105	0	RecordT		RW	working parameter 5
active transmitter	105	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	105	2	UIntegerT		RW	
background value	105	3	UIntegerT		RW	
mark value	105	4	UIntegerT		RW	
high switching threshold	105	5	UIntegerT		RW	
low switching threshold	105	6	UIntegerT		RW	
background offset value	105	7	UIntegerT		RW	
working parameter 6	106	0	RecordT		RW	working parameter 6
active transmitter	106	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	106	2	UIntegerT		RW	
background value	106	3	UIntegerT		RW	
mark value	106	4	UIntegerT		RW	
high switching threshold	106	5	UIntegerT		RW	
low switching threshold	106	6	UIntegerT		RW	
background offset value	106	7	UIntegerT		RW	
working parameter 7	107	0	RecordT		RW	working parameter 7
active transmitter	107	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	107	2	UIntegerT		RW	

Parameter	Index	Subindex	Data type	Default	AR	Description
background value	107	3	UIntegerT		RW	
mark value	107	4	UIntegerT		RW	
high switching threshold	107	5	UIntegerT		RW	
low switching threshold	107	6	UIntegerT		RW	
background offset value	107	7	UIntegerT		RW	
working parameter 8	108	0	RecordT		RW	working parameter 8
active transmitter	108	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	108	2	UIntegerT		RW	
background value	108	3	UIntegerT		RW	
mark value	108	4	UIntegerT		RW	
high switching threshold	108	5	UIntegerT		RW	
low switching threshold	108	6	UIntegerT		RW	
background offset value	108	7	UIntegerT		RW	
working parameter 9	109	0	RecordT		RW	working parameter 9
active transmitter	109	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	109	2	UIntegerT		RW	
background value	109	3	UIntegerT		RW	
mark value	109	4	UIntegerT		RW	
high switching threshold	109	5	UIntegerT		RW	
low switching threshold	109	6	UIntegerT		RW	
background offset value	109	7	UIntegerT		RW	
working parameter 10	110	0	RecordT		RW	working parameter 10
active transmitter	110	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	110	2	UIntegerT		RW	
background value	110	3	UIntegerT		RW	
mark value	110	4	UIntegerT		RW	

Parameter	Index	Subindex	Data type	Default	AR	Description
high switching threshold	110	5	UIntegerT		RW	
low switching threshold	110	6	UIntegerT		RW	
background offset value	110	7	UIntegerT		RW	
working parameter 11	111	0	RecordT		RW	working parameter 11
active transmitter	111	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	111	2	UIntegerT		RW	
background value	111	3	UIntegerT		RW	
mark value	111	4	UIntegerT		RW	
high switching threshold	111	5	UIntegerT		RW	
low switching threshold	111	6	UIntegerT		RW	
background offset value	111	7	UIntegerT		RW	
working parameter 12	112	0	RecordT		RW	working parameter 12
active transmitter	112	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	112	2	UIntegerT		RW	
background value	112	3	UIntegerT		RW	
mark value	112	4	UIntegerT		RW	
high switching threshold	112	5	UIntegerT		RW	
low switching threshold	112	6	UIntegerT		RW	
background offset value	112	7	UIntegerT		RW	
working parameter 13	113	0	RecordT		RW	working parameter 13
active transmitter	113	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	113	2	UIntegerT		RW	
background value	113	3	UIntegerT		RW	
mark value	113	4	UIntegerT		RW	
high switching threshold	113	5	UIntegerT		RW	
low switching threshold	113	6	UIntegerT		RW	

Parameter	Index	Subindex	Data type	Default	AR	Description
background offset value	113	7	UIntegerT		RW	
working parameter 14	114	0	RecordT		RW	working parameter 14
active transmitter	114	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	114	2	UIntegerT		RW	
background value	114	3	UIntegerT		RW	
mark value	114	4	UIntegerT		RW	
high switching threshold	114	5	UIntegerT		RW	
low switching threshold	114	6	UIntegerT		RW	
background offset value	114	7	UIntegerT		RW	
working parameter 15	115	0	RecordT		RW	working parameter 15
active transmitter	115	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	115	2	UIntegerT		RW	
background value	115	3	UIntegerT		RW	
mark value	115	4	UIntegerT		RW	
high switching threshold	115	5	UIntegerT		RW	
low switching threshold	115	6	UIntegerT		RW	
background offset value	115	7	UIntegerT		RW	
working parameter 16	116	0	RecordT		RW	working parameter 16
active transmitter	116	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	116	2	UIntegerT		RW	
background value	116	3	UIntegerT		RW	
mark value	116	4	UIntegerT		RW	
high switching threshold	116	5	UIntegerT		RW	
low switching threshold	116	6	UIntegerT		RW	
background offset value	116	7	UIntegerT		RW	
working parameter 17	117	0	RecordT		RW	working parameter 17

Parameter	Index	Subindex	Data type	Default	AR	Description
active transmitter	117	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	117	2	UIntegerT		RW	
background value	117	3	UIntegerT		RW	
mark value	117	4	UIntegerT		RW	
high switching threshold	117	5	UIntegerT		RW	
low switching threshold	117	6	UIntegerT		RW	
background offset value	117	7	UIntegerT		RW	
working parameter 18	118	0	RecordT		RW	working parameter 18
active transmitter	118	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	118	2	UIntegerT		RW	
background value	118	3	UIntegerT		RW	
mark value	118	4	UIntegerT		RW	
high switching threshold	118	5	UIntegerT		RW	
low switching threshold	118	6	UIntegerT		RW	
background offset value	118	7	UIntegerT		RW	
working parameter 19	119	0	RecordT		RW	working parameter 19
active transmitter	119	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	119	2	UIntegerT		RW	
background value	119	3	UIntegerT		RW	
mark value	119	4	UIntegerT		RW	
high switching threshold	119	5	UIntegerT		RW	
low switching threshold	119	6	UIntegerT		RW	
background offset value	119	7	UIntegerT		RW	
working parameter 20	120	0	RecordT		RW	working parameter 20
active transmitter	120	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	120	2	UIntegerT		RW	

Parameter	Index	Subindex	Data type	Default	AR	Description
background value	120	3	UIntegerT		RW	
mark value	120	4	UIntegerT		RW	
high switching threshold	120	5	UIntegerT		RW	
low switching threshold	120	6	UIntegerT		RW	
background offset value	120	7	UIntegerT		RW	
working parameter 21	121	0	RecordT		RW	working parameter 21
active transmitter	121	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	121	2	UIntegerT		RW	
background value	121	3	UIntegerT		RW	
mark value	121	4	UIntegerT		RW	
high switching threshold	121	5	UIntegerT		RW	
low switching threshold	121	6	UIntegerT		RW	
background offset value	121	7	UIntegerT		RW	
working parameter 22	122	0	RecordT		RW	working parameter 22
active transmitter	122	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	122	2	UIntegerT		RW	
background value	122	3	UIntegerT		RW	
mark value	122	4	UIntegerT		RW	
high switching threshold	122	5	UIntegerT		RW	
low switching threshold	122	6	UIntegerT		RW	
background offset value	122	7	UIntegerT		RW	
working parameter 23	123	0	RecordT		RW	working parameter 23
active transmitter	123	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	123	2	UIntegerT		RW	
background value	123	3	UIntegerT		RW	
mark value	123	4	UIntegerT		RW	

Parameter	Index	Subindex	Data type	Default	AR	Description
high switching threshold	123	5	UIntegerT		RW	
low switching threshold	123	6	UIntegerT		RW	
background offset value	123	7	UIntegerT		RW	
working parameter 24	124	0	RecordT		RW	working parameter 24
active transmitter	124	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	124	2	UIntegerT		RW	
background value	124	3	UIntegerT		RW	
mark value	124	4	UIntegerT		RW	
high switching threshold	124	5	UIntegerT		RW	
low switching threshold	124	6	UIntegerT		RW	
background offset value	124	7	UIntegerT		RW	
working parameter 25	125	0	RecordT		RW	working parameter 25
active transmitter	125	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	125	2	UIntegerT		RW	
background value	125	3	UIntegerT		RW	
mark value	125	4	UIntegerT		RW	
high switching threshold	125	5	UIntegerT		RW	
low switching threshold	125	6	UIntegerT		RW	
background offset value	125	7	UIntegerT		RW	
working parameter 26	126	0	RecordT		RW	working parameter 26
active transmitter	126	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	126	2	UIntegerT		RW	
background value	126	3	UIntegerT		RW	
mark value	126	4	UIntegerT		RW	
high switching threshold	126	5	UIntegerT		RW	
low switching threshold	126	6	UIntegerT		RW	

Parameter	Index	Subindex	Data type	Default	AR	Description
background offset value	126	7	UIntegerT		RW	
working parameter 27	127	0	RecordT		RW	working parameter 27
active transmitter	127	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	127	2	UIntegerT		RW	
background value	127	3	UIntegerT		RW	
mark value	127	4	UIntegerT		RW	
high switching threshold	127	5	UIntegerT		RW	
low switching threshold	127	6	UIntegerT		RW	
background offset value	127	7	UIntegerT		RW	
working parameter 28	128	0	RecordT		RW	working parameter 28
active transmitter	128	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	128	2	UIntegerT		RW	
background value	128	3	UIntegerT		RW	
mark value	128	4	UIntegerT		RW	
high switching threshold	128	5	UIntegerT		RW	
low switching threshold	128	6	UIntegerT		RW	
background offset value	128	7	UIntegerT		RW	
working parameter 29	129	0	RecordT		RW	working parameter 29
active transmitter	129	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	129	2	UIntegerT		RW	
background value	129	3	UIntegerT		RW	
mark value	129	4	UIntegerT		RW	
high switching threshold	129	5	UIntegerT		RW	
low switching threshold	129	6	UIntegerT		RW	
background offset value	129	7	UIntegerT		RW	
working parameter	130	0	RecordT		RW	working parameter

Parameter	Index	Subindex	Data type	Default	AR	Description
active transmitter	130	1	UIntegerT		RW	0: red 1: green 2: blue
amplification	130	2	UIntegerT		RW	
background value	130	3	UIntegerT		RW	
mark value	130	4	UIntegerT		RW	
high switching threshold	130	5	UIntegerT		RW	
low switching threshold	130	6	UIntegerT		RW	
background offset value	130	7	UIntegerT		RW	
teach button function	150	0	RecordT		R	teach button function
function teach button level 0	150	1	UIntegerT		R	at key depression <200ms 0: no function 1: EasyTune sensitivity + 2: EasyTune sensitivity - 3: static 1-point teach - sensitivity 1 4: static 1-point - sensitivity 2 5: static 2-point teach - sensitivity 1 6: static 2-point teach - sensitivity 2 7: dynamic 2-point teach - sensitivity 1 8: dynamic 2-point teach - sensitivity 2 9: function switching output 1 12: timer module on / off
function teach button level 1	150	2	UIntegerT		R	at key depression >200ms ... <2s 0: no function 1: EasyTune sensitivity + 2: EasyTune sensitivity - 3: static 1-point teach - sensitivity 1 4: static 1-point - sensitivity 2 5: static 2-point teach - sensitivity 1 6: static 2-point teach - sensitivity 2 7: dynamic 2-point teach - sensitivity 1 8: dynamic 2-point teach - sensitivity 2 9: function switching output 1 12: timer module on / off
function teach button level 2	150	3	UIntegerT		R	at key depression >2sec ... <7sec 0: no function 1: EasyTune sensitivity + 2: EasyTune sensitivity - 3: static 1-point teach - sensitivity 1 4: static 1-point - sensitivity 2 5: static 2-point teach - sensitivity 1 6: static 2-point teach - sensitivity 2 7: dynamic 2-point teach - sensitivity 1 8: dynamic 2-point teach - sensitivity 2 9: function switching output 1 12: timer module on / off

Parameter	Index	Subindex	Data type	Default	AR	Description
function teach button level 3	150	4	UIntegerT		R	at key depression >7s ... <12s 0: no function 1: EasyTune sensitivity + 2: EasyTune sensitivity - 3: static 1-point teach - sensitivity 1 4: static 1-point - sensitivity 2 5: static 2-point teach - sensitivity 1 6: static 2-point teach - sensitivity 2 7: dynamic 2-point teach - sensitivity 1 8: dynamic 2-point teach - sensitivity 2 9: function switching output 1 12: timer module on / off
function teach button level 4	150	5	UIntegerT		R	at key depression >12s 0: no function 1: EasyTune sensitivity + 2: EasyTune sensitivity - 3: static 1-point teach - sensitivity 1 4: static 1-point - sensitivity 2 5: static 2-point teach - sensitivity 1 6: static 2-point teach - sensitivity 2 7: dynamic 2-point teach - sensitivity 1 8: dynamic 2-point teach - sensitivity 2 9: function switching output 1 12: timer module on / off
active transmitter	170	0	UIntegerT		RW	active transmitter 0: red 1: green 2: blue
amplification	171	0	UIntegerT		RW	amplification setting
background value	172	0	UIntegerT		RW	background value
mark value	173	0	UIntegerT		RW	mark value
high switching threshold	174	0	UIntegerT		RW	upper value of the switching threshold including hysteresis, relative to the reference value
low switching threshold	175	0	UIntegerT		RW	lower value of the switching threshold including hysteresis, relative to the reference value
background offset value	176	0	UIntegerT		RW	is determined from the background signal at static 1-point teach
number of marks	177	0	UIntegerT	0	RW	internal mark counter, can be reset to 0
working parameter memory index	178	0	UIntegerT	0	RW	working parameter memory index (0 ... 29)
measured value	200	0	UIntegerT	0	R	measured value

9 Technical specifications

9.1 General data

Tab. 9.1: Sensor and IODD version

IODD version	V1.4
IODD release date	2018-3-19
Device family	Contrast sensor
Device ID	2130
Device name	KRTM 3B / 55
Device variants	KRTM 3B/L6.1121-S8 (50135163), KRTM 55/L6.1121,200-S12 (50135164), Markscanner / 107987993 (50138267)