



IO-Link Parameter Datasheet

Retroreflective sensor

OBR15M-R200-A5-IO* series

Support: fa-info@pepperl-fuchs.com
 Internet: www.pepperl-fuchs.com

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General Information

Device Identification

Vendor ID	1 (0x0001)
Device ID	1118754 (0x111222)

Communication Characteristics

IO-Link revision	V1.1 (specification V1.1.2)
IO-Link backward compatibility	V1.0
Data transmission rate	COM2 (38.4 kbit/s)
Min. cycle time	2.3 ms
Process data input	2 bit
Process data output	2 bit
SIO mode support	yes
Compatible master port type	Class A, Class B (see NOTE)

NOTE: For use at master with port class B, use 3-pole adapter or 3-wire cable.

Features

Data Storage	Yes
Block Parameterization	Yes

Profile

Identification and Diagnosis	16384 (0x4000)
Smart Sensor - SSP 2.4	7 (0x0007)

Supported Product Variants

Product ID	Product Name	Description	Connector
295670-100392	OBR15M-R200-A5-IO-V1	Detection range 0 .. 15 m, adjustable, high active (dark on), configurable, PNP, antivalent output, M12 plug, 4-pin	Plug, M12, 4-pin

Connection

Connection Diagram	Description
	<p>M8/M12, 4-pin</p> <p>1: Brown - +24V 2: White - Q2 3: Blue - 0V 4: Black - C/Q</p>

Process Data

Process Data Input

Sub	Name	Data type	Length	Bitoffs.	Value	Unit	Description
.1	SSC – Switching Signal	Boolean	1 bit	0	0 1		Indicates the detection status of an object or measurement value below/above a threshold. Low High
.2	DSC – Stability Alarm	Boolean	1 bit	1	0 1		Indicates that the operating reserve is below the predefined or configured stability alarm threshold. The application might run into an unstable operating condition. Low High

Process Data Output

Sub	Name	Data type	Length	Bitoffs.	Value	Unit	Description
.1	CSC – Sensor Control	Boolean	1 bit	0	0 1		Controls the sensor operation. If disabled, a substitute value is applied to the process data. Enabled Disabled
.2	CSC – Evaluation Control	Boolean	1 bit	1	0 1		Controls the signal evaluation. If disabled, signal evaluation is inhibited. The last evaluation state and value is maintained in the process data. Enabled Disabled

Parameter Data

Identification										
Index	Parameter	Access	Data type	Length	Default	Description	DS	R		
16 (0x10)	Vendor Name	ro	String	13 byte	Pepperl+Fuchs	The vendor name that is assigned to a Vendor ID.				
17 (0x11)	Vendor Text	ro	String	29 byte	www.pepperl-fuchs.com/io-link	Additional information about the vendor.				
18 (0x12)	Product Name	ro	String	max. 30 byte	See table Supported Product Variants	Complete product name.				
19 (0x13)	Product ID	ro	String	max. 16 byte	See table Supported Product Variants	Vendor-specific product or type identification (e.g., item number or model number).				
20 (0x14)	Product Text	ro	String	max. 30 byte	Retroreflective sensor	Additional product information for the device.				
21 (0x15)	Serial Number	ro	String	14 byte		Unique, vendor-specific identifier of the individual device.				
22 (0x16)	Hardware Revision	ro	String	7 byte	HW**.**	Unique, vendor-specific identifier of the hardware revision of the individual device.				
23 (0x17)	Firmware Revision	ro	String	7 byte	FW**.**	Unique, vendor-specific identifier of the firmware revision of the individual device.				
24 (0x18)	Application Specific Tag	rw	String	max. 32 byte	Your automation, our passion.	Possibility to mark a device with user- or application-specific information.	Y		F	
25 (0x19)	Function Tag	rw	String	max. 32 byte	***	Possibility to mark a device with function-specific information.	Y		F	
26 (0x1A)	Location Tag	rw	String	max. 32 byte	***	Possibility to mark a device with location-specific information.	Y		F	

Diagnosis											
Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
36 (0x24)	Device Status	ro	UInteger	8 bit		0	0 1 2 3 4		Indicator for the current device condition and diagnosis state. <i>Device is OK</i> <i>Maintenance required</i> <i>Out of specification</i> <i>Functional check</i> <i>Failure</i>		F
37 (0x25)	Detailed Device Status	ro	Array ⁵⁰	12 byte					List of all currently pending events in the device.		F
.1	Element 1		Octetstr	3 byte	64	0					
.2	Element 2		Octetstr	3 byte	48	0					
.3	Element 3		Octetstr	3 byte	24	0					
.4	Element 4		Octetstr	3 byte	0	0					
224 (0xE0)	Operating Hours	ro	UInteger	32 bit			0 .. 2 ³² -1	h	Shows the overall hours of operation since initial commissioning.		
225 (0xE1)	Temperature Indicator	ro	UInteger	8 bit		0	0 1 2 3 4		Indicates the operation at ambient temperatures close to or in excess of specification limits. <i>Operating condition OK</i> <i>Close to upper limit</i> <i>Upper limit exceeded</i> <i>Close to lower limit</i> <i>Lower limit exceeded</i>		

Diagnosis											
Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
232 (0xE8)	Device Characteristic	ro	Record ^{SO}	6 byte					Shows relevant key characteristics of the device for use in applications.		
	.1 Detection Range Min	ro	Integer	16 bit	32	10 (10)		mm	Shows the value of the minimum specified detection range. Calculation: gradient 0.1, offset 0.0		
	.2 Detection Range Max	ro	Integer	16 bit	16	15000 (15000)		mm	Shows the value of the maximum specified detection range. Calculation: gradient 1.0, offset 0.0		
	.3 Supply Current Requirement	ro	UInteger	16 bit	0	18 (18)		mA	Shows the maximum specified supply current for the device excluding load. Calculation: gradient 1.0, offset 0.0		
238 (0xEE)	Device Operating State	ro	Record ^{SO}	8 bit					Shows relevant key characteristics of the device for use in applications.		
	.1 Sensor Control	ro	Boolean	1 bit	0	0	0 1		Indicates if sensor operation is inhibited by any remote signal (process data, I/O signal or parameter value) or by an internal error condition. <i>Enabled</i> <i>Disabled</i>		
	.2 Local Control (in IO-Link mode)	ro	Boolean	1 bit	1	0	0 1		Indicates that local control elements are temporarily enabled for adjustment or teach-in in IO-Link mode. <i>Disabled</i> <i>Enabled</i>		
239 (0xEF)	I/O Feature	ro	UInteger	16 bit		2	0 2		Shows the supported I/O features of the device. <i>No additional I/O terminals available</i> <i>Second signal in- / output on pin 2 / white wire</i>		
127 (0x7F)	Indication Control	rw	Record ^{SO}	8 bit					Provides control functions for diagnosis purposes for indicators or display.		F
	.1 Locator Indication	rw	Boolean	1 bit	0	0	0 1		Enables a defined flashing pattern of the indicator LEDs for better spotting a sensor in field application. <i>Disabled</i> <i>Enabled</i>		F

Parameterization & Configuration											
Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
56 (0x38)	SSC Param - SP	rw	Integer	16 bit		1000	1 .. 1000		Defines the switchpoint within the detection range.	Y	F
57 (0x39)	SSC Config - Logic	rw	UInteger	8 bit		0	0 1		Defines the logical representation of the switching signal SSC in the process data. <i>High active</i> <i>Low active</i>	Y	F
64 (0x40)	SSC Config Ext – Delay One-Shot	rw	UInteger	8 bit		0	0 1 2 3 4		Defines a one-shot delay for the switching signal. With the the setting 'Auto', the delay time adapts to the IO-Link master cycle time. <i>Disabled</i> <i>Auto</i> <i>10 ms</i> <i>100 ms</i> <i>1 s</i>	Y	F
59 (0x3B)	Teach Result	ro	Record	8 bit					Shows the complete result information of the teach procedure including current state and result flags.		F
	.1 State	rw	UInteger	4 bit	0	0	0 1 4 5 7		Indicates the current state of the teach procedure. <i>Idle</i> <i>SP success</i> <i>Wait for command</i> <i>Busy</i> <i>Error</i>		F
	.2 Flag SP TP1	ro	Boolean	1 bit	4	0	0 1		Indicates the current teach result for the teach point. <i>Initial or not ok</i> <i>Ok</i>		F
	.3 Flag SP TP2	ro	Boolean	1 bit	5	0	0 1		Indicates the current teach result for the teach point. <i>Initial or not ok</i> <i>Ok</i>		F
68 (0x44)	DSC Config – Stability Alarm Threshold	rw	UInteger	8 bit		255	0 1 2 3 4 255		Defines a threshold for the operating reserve. The stability alarm is triggered, if the operating reserve drops below this threshold. <i>Inactive</i> <i>Factor 1.5</i> <i>Factor 2.0</i> <i>Factor 2.5</i> <i>Factor 3.0</i> <i>Factory default</i>	Y	F
69 (0x45)	DSC Config – Stability Alarm Logic	rw	UInteger	8 bit		0	0 1		Defines the logical behaviour of the stability alarm signal. <i>High active</i> <i>Low active</i>	Y	F

Parameterization & Configuration											
Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
104 (0x68)	PD Output Config	rw	Record ^{SO}	2 byte					Defines which PD Output data are enabled to control the sensor function.	Y	F
.1	Sensor Control	rw	UInteger	1 bit	0	0	0 1		Enabled: The sensor function is controlled via process data output. A '1' at 'PD Output - Sensor Control' disables the sensor. Object detection is inhibited. <i>Disabled</i> <i>Enabled</i>	Y	F
.2	Evaluation Control	rw	UInteger	1 bit	0	0	0 1		Enabled: The signal evaluation is controlled via process data output. A '1' at 'PD Output - Evaluation Control' inhibits signal evaluation. The last evaluation state is maintained. <i>Disabled</i> <i>Enabled</i>	Y	F
120 (0x78)	Event Config	rw	Record ^{SO}	2 byte					Defines which event sources can trigger events.	Y	F
.1	Warning – Stability Alarm	rw	Boolean	1 bit	1	0	0 1		Enabled: An event is generated if the operating reserve is below a predefined or configured threshold. <i>Disabled</i> <i>Enabled</i>	Y	F
.3	Warning – Signal Error	rw	Boolean	1 bit	8	0	0 1		Enabled: An event is generated if sensor signals are not valid due to e.g. interferences or inconsistent acquisition values. <i>Disabled</i> <i>Enabled</i>	Y	F
.9	Warning – Sensor Disabled	rw	Boolean	1 bit	8	0	0 1		Enabled: An event is generated if the sensor is set to a disabled mode by a remote control signal (process data, I/O signal or parameter value) or by an internal error condition. <i>Disabled</i> <i>Enabled</i>	Y	F
113 (0x71)	I/O Config – I/Q Type	rw	UInteger	8 bit		0	0 1 4 5 6		Configures the output or input characteristic at pin 2 or white wire. <i>Factory default</i> <i>Output - Push-pull</i> <i>High impedance</i> <i>Input – High active</i> <i>Input – Low active</i>	Y	F
117 (0x75)	I/O Config – Output Function	rw	UInteger	8 bit		0	0 1 2 3 255		Defines the specific function at the additional I/O terminal if configured as output. <i>Factory default</i> <i>Antivalent</i> <i>Equivalent</i> <i>Stability alarm</i> <i>Inactive (constant)</i>	Y	F
118 (0x76)	I/O Config – Input Function	rw	UInteger	8 bit		0	0 1 2		Defines the specific function at the additional I/O terminal if configured as input. <i>Factory default</i> <i>Test mode</i> <i>Teach-in</i>	Y	F
125 (0x7D)	Device Operation	rw	UInteger	8 bit		0	0 1		Allows setting the device into different operational states e.g. for diagnosis purposes. After a power cycle or communication restart the feature will be reset to normal operation. <i>Normal operation</i> <i>Sensor disabled</i>		F

Parameterization & Configuration											
<i>Index</i> <i>.sub</i>	<i>Parameter</i>	<i>Access</i>	<i>Data type</i>	<i>Length</i>	<i>Bitoffs.</i>	<i>Default</i>	<i>Value</i>	<i>Unit</i>	<i>Description</i>	<i>DS</i>	<i>R</i>
126 (0x7E)	UI Control	rw	Record ^{SO}	2 byte					Provides possibilities for controlling the functionality of the user interface or local control elements.		F
.1	Local Control (in IO-Link mode)	rw	Boolean	1 bit	1	0	0 1		During IO-Link communication local control is generally inhibited. Setting this parameter to 'Enabled' allows for adjustment or teach-in over local control elements. After a power cycle or communication restart the feature will be disabled. <i>Disabled</i> <i>Enabled</i>	Y	F
12 (0x0C)	Device Access Locks	rw	Record ^{SO}	2 byte					The access to the device parameters can be restricted by setting appropriate flags within this parameter.	Y	F
.2	Data Storage	rw	Boolean	1 bit	1	0	0 1		This lock prevents the write access to the device parameters via the data storage mechanism. Note: This feature is implemented only for compatibility reasons. Do not set this flag to 'Locked', as this will inhibit the function Data Storage between master and device and lead to an unintended system behavior. <i>Unlocked</i> <i>Locked</i>	Y	F
.3	Local Parameterization	rw	Boolean	1 bit	1	0	0 1		This lock prevents the device settings from being changed via local operating elements on the device. <i>Unlocked</i> <i>Locked</i>	Y	F

Observation											
Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
36 (0x24)	Device Status	ro	UInteger	8 bit		0			Indicator for the current device condition and diagnosis state. <i>See Diagnosis – Device Status</i>		F
236 (0xEC)	Observation Data	ro	Record ^{S0}	6 byte					Provides a set of relevant data suitable for observation purposes.		
	.1 MDC – Measurement Value	ro	UInteger	16 bit	40	0	0.0 .. 600.0 (0 .. 6000) -32760 32760 32764	mm	Shows the current measurement value. Calculation: gradient 0.1, offset 0.0 <i>Out of range (-)</i> <i>Out of range (+)</i> <i>No measurement data</i>		
	.2 DSC – Signal Quality Indicator	ro	UInteger	8 bit	32	0	0 1 2 3		Shows the quality of the evaluated sensor signal. Quality drops with weak signal or interference. <i>Insufficient</i> <i>Acceptable</i> <i>Good</i> <i>Excellent</i>		
	.3 SSC – Switching Signal	ro	UInteger	8 bit	24	0	0 1		Indicates the detection status of an object or measurement value below/above a threshold. <i>Low</i> <i>High</i>		
	.4 DSC – Stability Alarm	ro	UInteger	8 bit	16	0	0 1		Indicates that the operating reserve is below the predefined or configured stability alarm threshold. The application might run into an unstable operating condition. <i>Low</i> <i>High</i>		
.5	Teach Value	ro	Integer	16 bit	0	0	0 .. 1000		Shows the teach value which has been determined in the last teach procedure.		

NOTE 1: The parameter data provide the attributes DS (Data Storage) and R (Reset behavior). The following rules apply:

DS: Parameter marked with 'Y' (yes) are exchanged with the master via the data storage mechanism.

R: Parameter marked with 'F' are reset to the default value upon reception of the command 'Restore Factory Settings'.

NOTE 2: Parameter with datatype Record or Array, which are marked with 'S0' can only be accessed over subindex 0 (whole parameter object). Subindex access to single items is not possible.

Command Interface

Index	Parameter	Access	Data type	Length	Value	Description
2 (0x02)	System Command	wo	UInteger	8 bit	See command value	Command interface for applications. A positive acknowledge indicates the complete and correct finalization of the requested function.

Command Value	Command	Description
130 (0x82)	Restore Factory Settings	The parameter of the device are reset to factory settings. Note: A download of the data storage may be executed on the next power cycle and overwrite the factory default settings!
65 (0x41)	Teach SP	Determine setpoint in a single teach procedure. The new setpoint value is automatically applied after successful execution.

Error Codes

Code	Additional code	Name	Description
128 (0x80)	17 (0x11)	Index not available	Read or write access attempt to a non-existing index.
128 (0x80)	18 (0x12)	Subindex not available	Read or write access attempt to a non-existing subindex of an existing index.
128 (0x80)	32 (0x20)	Service temporarily not available	Parameter not accessible due to the current state of the technology-specific application.
128 (0x80)	33 (0x21)	Service temporarily not available - local control	Parameter not accessible. The device is currently in an ongoing, locally controlled operation.
128 (0x80)	34 (0x22)	Service temporarily not available - device control	Parameter not accessible. The technology-specific application is currently in a remotely triggered operation.
128 (0x80)	35 (0x23)	Access denied	Write access to a read-only parameter or read access to write-only parameter.
128 (0x80)	48 (0x30)	Parameter value out of range	Written parameter value is outside of the permitted value range.
128 (0x80)	49 (0x31)	Parameter value above limit	Written parameter value is above its specified value range.
128 (0x80)	50 (0x32)	Parameter value below limit	Written parameter value is below its specified value range.
128 (0x80)	51 (0x33)	Parameter length overrun	Written parameter is longer than specified.
128 (0x80)	52 (0x34)	Parameter length underrun	Written parameter is shorter than specified.
128 (0x80)	53 (0x35)	Function not available	Written command is not supported by the technology-specific application.
128 (0x80)	54 (0x36)	Function temporarily unavailable	Written command is unavailable due to the current state of the technology-specific application.
128 (0x80)	64 (0x40)	Invalid parameter set	Written single parameter value collides with other existing parameter settings.
128 (0x80)	65 (0x41)	Inconsistent parameter set	Parameter set inconsistencies at the end of block parameter transfer. Device plausibility check failed.

Event Codes

Code	Type	Name	Description
36160 (0x8D40)	Warning	Stability alarm - operating reserve too low	Check sensor adjustment or clean surface.
36162 (0x8D42)	Warning	Signal acquisition disturbed	Check for excessive signal interference in sensor environment.
36163 (0x8D43)	Warning	Temperature outside specified temperature range	Check sensor environment.
36224 (0x8D80)	Warning	Sensor operation disabled	Object detection or measurement is not possible.