

RS485 Index Command List.

OM70 multi-spot.



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1 Introduction

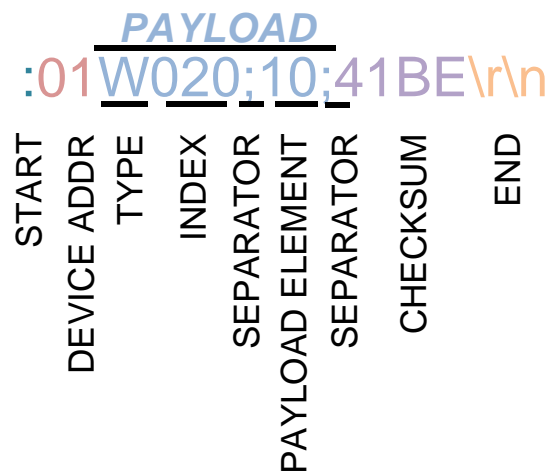
This manual supplements the manual "RS485 Protocol Structure" and is valid for the Baumer OM70 multi-spot sensors.

1.1 UART Interface Settings

Index Command	Value
Baud rate at power up	57600
Databits	8
Startbit	1
Stopbit	1
Parity	Even

2 Command Structure

An RS485 command is structured as follows.



The information to be transmitted is called PAYLOAD and has to be sent in a so-called frame so that the command can be recognized and processed.

This frame always has the same structure and contains a start, a device address, a PAYLOAD, a checksum and an end.

START	DEVICE ADDR	PAYLOAD	CHECKSUM	END
1 char	2 char	n char	4 char	2 char
:	01...99	Index Command List	****	\r\n

3 Index Command List

Values marked with * are the Factory settings

6 (0x6)	RW		Baudrate Communication baud rate	Stored in configuration yes
	0	UINT8	0 38'400 1 * 57'600 2 115'200	

Callouts: Index, Read/Write, Content, Can be stored, Empty, Offset, Data Type, Description (here 0 stands für 38400....)

3.1 Application Errors

0 (0x0)	R		Application error Contains the application error code of the last command. If an application error occurs, it is signalled using the underlying protocol. The error code has to be read immediately after the error is signalled. It will be overwritten by any other command.	Stored in configuration no
		UINT32	Application error 0 no error 1 value not accessible 99 argument out of range 100 distance out of range 101 angle out of range 102 flatness out of range 103 length out of range	

3.2 Device identification

1 (0x1)	R		Vendor info Vendor information	Stored in configuration no
		UINT32	Vendor id 1 Baumer Electric AG	
		STRING 65	Vendor name default: Baumer Electric AG	

2 (0x2)	R		Device info Device information	Stored in configuration no
		UINT32	Device id	
		UINT32	Product id Material number	
		STRING 65	Sensor type Eg. OXE7.E25T-MB3E.SIMD.A7	

		STRING 15	Serial number 1234567890AB
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3.3 Communication features

5 (0x5)	RW		Bus address	Stored in configuration yes
		UINT8	Bus address Value range: 1 ... 99	
6 (0x6)	RW		Baudrate	Stored in configuration yes
		UINT8	Communication baud rate Baudrate 0 38'400 1 * 57'600 2 115'200	

3.4 User interface features

10 (0xA)	RW		RS485 lock	Stored in configuration no
		UINT8	Access lock for RS485. If the lock is activated, the sensor can be controlled using the touch buttons and all RS485 commands will be rejected (except access to this index). If the lock is deactivated, the sensor can be controlled using RS485. In this case, all physical outputs (analog, switching and alarm out) will be deactivated and the LEDS will be set to a fixed state. RS485 lock 0 Lock deactivated 1 * Lock activated	
11 (0xB)	RW		Output reactivation	Stored in configuration yes
		UINT8	If enabled, the physical outputs (analog, switching and alarm out) will be re-enabled. Be aware that using physical outputs and RS485 simultaneously may lead to interferences. When RS485 lock is active, the outputs are also activated regardless of this index. Output reactivation 0 * Outputs deactivated 1 Outputs activated	
15 (0xF)	RW		Display language	Stored in configuration yes
		UINT8	Display language 0 * English 1 German 2 Italian 3 French	
16 (0x10)	RW		Display backlight	Stored in configuration yes

		UINT8	Display backlight 0 * 5 min Display backlight switched off after 5min inactivity. 1 10 min Display backlight switched off after 10min inactivity. 2 20 min Display backlight switched off after 20min inactivity. 3 Always on Display backlight is never switched off.
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17 (0x11)	RW		Touch button lock	Stored in configuration yes
		UINT8	Touch button lock 0 * Touch buttons not locked 1 Touch buttons locked	

3.5 Measurement features

20 (0x14)	RW		Measurement type selection	Stored in configuration yes
		UINT8	Measurement type selection Measurement type to use for all outputs (Analog output, Digital output, LED's). 10 * Distance (AVG) 11 Distance (MAX) 12 Distance (MIN)	

21 (0x15)	R		Measurement value Measurement value selected by the "Measurement type selection" index.	Stored in configuration no
		FLOAT32	Measurement value [mm]	
		UINT8	Quality Quality of the optical input signal. 0 Valid 1 Low signal 4 No signal	

22 (0x16)	R		All measurement values Get all available measurement values according to selected measurement type. This index can only be read if precision is set to "standard".	Stored in configuration no
		FLOAT32	Average	
		FLOAT32	Max	
		FLOAT32	Min	
		FLOAT32	Dummy	
		FLOAT32	Standard deviation	
		UINT8	Quality 0 Valid 1 Low signal 4 No signal	

30 (0x1E)	RW		Field of view Lateral measuring field	Stored in configuration yes
		INT16	Limit left Field of view left limitation [mm].	

		INT16	Limit right Field of view right limitation [mm].	
31 (0x1F)	W		Set field of view to MAX command Sets the field of view to its maximum values.	Stored in configuration no
		UINT8	Set field of view to MAX command 1 Set field of view to MAX	
32 (0x20)	RW		Object type Adjust the exposure time for either dark target objects or bright target objects. Selecting DarkObject will lead to a longer measurement cycle.	Stored in configuration yes
		UINT8	Object type 0 * Bright object 1 Dark object	
33 (0x21)	RW		Precision Adjust the filtering of the measured values.	Stored in configuration yes
		UINT8	Precision 0 * Standard 1 High 2 Very high	
34 (0x22)	RW		Laser off data hold If activated, the measurement will be suspended and the laser is switched off. All outputs will hold the current value. The diagnose mode (50) is disabled. If deactivated, the measurement will continue.	Stored in configuration no
		UINT8	Laser off data hold 0 * Measurement is running 1 Measurement is holding	

3.6 Output configuration

40 (0x28)	RW		Digital output configuration Settings of the digital output pin.	Stored in configuration yes
		FLOAT32	Switch point 1 [mm]	
		FLOAT32	Switch point 2 [mm]	
		UINT8	Digital output type 0 * Point 1 Window	
		UINT8	Digital output polarity 0 * Active high 1 Active low	
41 (0x29)	RW		Analog output configuration The analog output can be set as current or voltage output.	Stored in configuration yes
		UINT8	Analog output type 0 * Current 1 Voltage	

		UINT8	Analog output slope Slope of the analog characteristic curve. Can be positive (minimum output at minimum measurement value, fullscale output at maximum measurement value) or negative (vice versa). 0 * Positive 1 Negative	
42 (0x2A)	RW		Analog output scaling Points within the measuring range where the analog output value reaches its minimum/ full scale value (depends on "Analog output slope" setting).	Stored in configuration yes
		FLOAT32	Analog scaling near point [mm]	
		FLOAT32	Analog scaling far point [mm]	
43 (0x2B)	W		Set analog out scale to MAX command Sets the analog output scaling to its maximum values.	Stored in configuration no
		UINT8	Set analog out scale to MAX command 1 Set analog out scale to MAX.	

3.7 Diagnosis features

50 (0x32)	RW		Diagnose mode If diagnose mode is activated, the diagnosis features (live monitor and profile) can be used. During diagnose mode, all filters will be disabled and the outputs (analog and digital) will be set to fixed values. The standard measurement values are not accessible (index 21,22) and the laser can't be switched off (index 34).	Stored in configuration no
		UINT8	Diagnose mode 0 * Deactivated 1 Activated	
51 (0x33)	R		Live monitor The Live monitor values are based on the learned reference plane (Flex mount feature).	Stored in configuration no
		FLOAT32	Angle [deg]	
		FLOAT32	Center height [mm]	
		FLOAT32	Left edge rising [mm]	

3.8 Configuration storage features

200 (0xC8)	W		Load configuration command Loads the selected configuration to ram (current configuration). For permanent storage of the loaded values, the "Store configuration command" has to be used.	Stored in configuration no
		UINT8	Configuration number 0 Active config	

			1 Config 1 2 Config 2 3 Config 3
201 (0xC9)	W		Store configuration command Permanently stores the current configuration.
		UINT8	Configuration number 0 Active config Current configuration will be stored to the active configuration. 1 Config 1 Current configuration will be stored to Config 1. 2 Config 2 Current configuration will be stored to Config 2. 3 Config 3 Current configuration will be stored to Config 3.
202 (0xCA)	W		Reset to factory settings command All configurations will be reset to factory settings. The sensor will reboot after execution of this command.
		UINT8	Reset to factory settings command 0 Reset to factory settings
203 (0xCB)	R		Configuration 1 Values stored in configuration 1.
		UINT8	Measurement type selection Measurement type to use for all outputs (Analog output, Digital output, LED's). 10 * Distance (AVG) 11 Distance (MAX) 12 Distance (MIN)
		UINT8	Object type 0 * Bright object 1 Dark object
		UINT8	Precision 0 * Standard 1 High 2 Very high
		INT8	Dummy_1
		FLOAT32	Dummy_2
		FLOAT32	Dummy_3
		INT16	Limit left Field of view left limitation [mm].
		INT16	Limit right Field of view right limitation [mm].
		FLOAT32	Analog scaling near point [mm]
		FLOAT32	Analog scaling far point [mm]
		UINT8	Analog output type 0 * Current 1 Voltage
		UINT8	Analog output slope Slope of the analog characteristic curve. Can be positive (minimum output at minimum measurement value, fullscale output at maximum measurement value) or negative (vice versa). 0 * Positive 1 Negative
		UINT8	Digital output type 0 * Point

			1 Window
		UINT8	Digital output polarity 0 * Active high 1 Active low
		FLOAT32	Switch point 1 [mm]
		FLOAT32	Switch point 2 [mm]

204 (0xCC)	R		Configuration 2 Values stored in configuration 2.	Stored in configuration no
		UINT8	Measurement type selection Measurement type to use for all outputs (Analog output, Digital output, LED's). 10 * Distance (AVG) 11 Distance (MAX) 12 Distance (MIN)	
		UINT8	Object type 0 * Bright object 1 Dark object	
		UINT8	Precision 0 * Standard 1 High 2 Very high	
		INT8	Dummy_1	
		FLOAT32	Dummy_2	
		FLOAT32	Dummy_3	
		INT16	Limit left Field of view left limitation [mm].	
		INT16	Limit right Field of view right limitation [mm].	
		FLOAT32	Analog scaling near point [mm]	
		FLOAT32	Analog scaling far point [mm]	
		UINT8	Analog output type 0 * Current 1 Voltage	
		UINT8	Analog output slope Slope of the analog characteristic curve. Can be positive (minimum output at minimum measurement value, fullscale output at maximum measurement value) or negative (vice versa). 0 * Positive 1 Negative	
		UINT8	Digital output type 0 * Point 1 Window	
		UINT8	Digital output polarity 0 * Active high 1 Active low	
		FLOAT32	Switch point 1 [mm]	
		FLOAT32	Switch point 2 [mm]	

205 (0xCD)	R		Configuration 3 Values stored in configuration 3.	Stored in configuration no
		UINT8	Measurement type selection Measurement type to use for all outputs (Analog output, Digital output, LED's). 10 * Distance (AVG) 11 Distance (MAX) 12 Distance (MIN)	
		UINT8	Object type 0 * Bright object 1 Dark object	
		UINT8	Precision 0 * Standard 1 High 2 Very high	
		INT8	Dummy_1	
		FLOAT32	Dummy_2	
		FLOAT32	Dummy_3	
		INT16	Limit left Field of view left limitation [mm].	
		INT16	Limit right Field of view right limitation [mm].	
		FLOAT32	Analog scaling near point [mm]	
		FLOAT32	Analog scaling far point [mm]	
		UINT8	Analog output type 0 * Current 1 Voltage	
		UINT8	Analog output slope Slope of the analog characteristic curve. Can be positive (minimum output at minimum measurement value, fullscale output at maximum measurement value) or negative (vice versa). 0 * Positive 1 Negative	
		UINT8	Digital output type 0 * Point 1 Window	
		UINT8	Digital output polarity 0 * Active high 1 Active low	
		FLOAT32	Switch point 1 [mm]	
		FLOAT32	Switch point 2 [mm]	
206 (0xCE)	R		Active configuration Values stored in the active configuration (0).	Stored in configuration no
		UINT8	Measurement type selection Measurement type to use for all outputs (Analog output, Digital output, LED's). 10 * Distance (AVG) 11 Distance (MAX) 12 Distance (MIN)	

		UINT8	Object type 0 * Bright object 1 Dark object
		UINT8	Precision 0 * Standard 1 High 2 Very high
		INT8	Dummy_1
		FLOAT32	Dummy_2
		FLOAT32	Dummy_3
		INT16	Limit left Field of view left limitation [mm].
		INT16	Limit right Field of view right limitation [mm].
		FLOAT32	Analog scaling near point [mm]
		FLOAT32	Analog scaling far point [mm]
		UINT8	Analog output type 0 * Current 1 Voltage
		UINT8	Analog output slope Slope of the analog characteristic curve. Can be positive (minimum output at minimum measurement value, fullscale output at maximum measurement value) or negative (vice versa). 0 * Positive 1 Negative
		UINT8	Digital output type 0 * Point 1 Window
		UINT8	Digital output polarity 0 * Active high 1 Active low
		FLOAT32	Switch point 1 [mm]
		FLOAT32	Switch point 2 [mm]

4 Example commands

Example commands with standard Device Address (01).

Command	Description
:01W010;0;E9C3\r\n	RS485 lock deactivated
:01R002;3955\r\n	Device Info (Article number, sensor type...)
:01R006;F957\r\n	Check Baud rate
:01W006;2;C1FF\r\n	Set Baud rate to 2 = 115'200
:01W011;1;85C3\r\n	Reactivate analog and digital sensor outputs
:01R021;09F4\r\n	Get the measuring value
:01R022;F9F4\r\n	Requesting all measuring values
:01W020;10;41BE\r\n	Set measurement type to DISTANCE (AVG)
:01W020;11;D1BF\r\n	Set measurement type to DISTANCE (MAX)
:01W020;12;21BF\r\n	Set measurement type to DISTANCE (MIN)
:01W032;0;91BB\r\n	Set object type bright
:01W032;1;01BA\r\n	Set object type dark
:01W201;0;37FE\r\n	Store active configuration permanent to sensor
:01W202;0;73FE\r\n	Reset to factory settings

5 Appendix

5.1 Dependencies

Because some commands are dependent on one another, they can be executed only if certain settings were configured in advance. Important: Before RS485 commands can be sent, RS485 must be unlocked via the command :01W010;0;E9C3V\n (010 RS485 lock).

Index no.	Index description	Input configuration				Output			
		locked	unlocked	off	on	Standard	not Standard	Standard	not Standard
10	RS485 lock								
50	Diagnose mode								
34	Laser off data hold			running	hold				
33	Precision			Standard	not Standard	Standard	not Standard		
0	Application error								
1	Vendor info								
2	Device info								
5	Bus address								
6	Baudrate								
10	RS485 lock								
11	Output reactivation								
15	Display language								
16	Display backlight								
17	Touch button lock								
20	Measurement type selection								
21	Measurement value								
22	All measurement values								
30	Field of view								
31	Set field of view to max command								
32	Object type								
33	Precision								
34	Laser off data hold								
40	Digital out configuration								
41	Analog out configuration								
42	Analog out scale								
43	Set analog out scale to max command								
50	Diagnose mode								
51	Live monitor								
200	Load configuration command								
201	Store configuration command								
202	Reset to factory settings command								
203	Configuration 1								
204	Configuration 2								
205	Configuration 3								
206	Active Configuration								

Legend:
 Index locked
 Index unlocked

6 History of changes

Date	Version	Description
24.11.2015	1.0	Document created
07.06.2017	1.1	Chapter example commands implemented
17.01.2018	1.2	Dependency matrix changed



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