

EN

OCP662X0135 OCP242X0135

High-Performance Distance Sensors



Interface Protocol

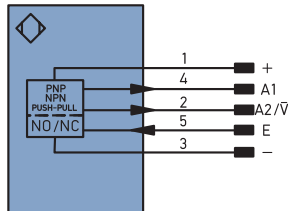
Settings and Queries via the RS-232 interface

The interface utilizes a software handshake procedure (see protocol specification below). All sensor settings can be selected digitally with a PC, and all values generated by the sensor can be read out at a PC.

Serial interface

The input serves as an RxD line and switching output 1 is used as a TxD line. The A232 Adapter Box must be interconnected for direct connection to the PC.

779



Note: A 5-pin Connection Line is necessary for communication.

The configuration can be made either with the following commands or easily by means of a software. Software for the interface for download under: www.wenglor.com

Interface configuration

Baud rate (Delivery status): 9.600 baud (other baud rates selectable, view page 6)

8 data bits, no parity, 1 stop bit

1. Connect the sensor over the wenglor®-Adapter Box A232 with PC, controller etc.:

View instructions of Adapter Box 232

2. Procedure of the interface operation:

- Set the rotary selector switch  to RUN
- Utilize our user-software to enter or query the sensor settings or enter the interface commands according to the protocol. Every interface command and every answer of the sensor starts with „/“ (ASCII 47) and ends with „.“ (ASCII 46). In case of an incorrect communication, the sensor emits a Negative Acknowledge character (ASCII 21). If a command is not closed with „.“, the sensor remains in wait state and does not give an answer or error message.
- Even with continuous query it should be adhered to a pause of 10 ms between two interface commands.

Protocol for Communications via the RS-232 Interface

Frame Layout for Data Transmission

Transmitting Partner	Characters (ASCII)		Receiving Partner	Frame Segment
Start Character	/ (ASCII 47)	→	Connect	Frame header
Length information	2 Byte	→	Connect	Frame header
Command Bytes	2 Byte	→		Frame header
1. Data Byte	2 Byte	→	Data information	User data
2. Data Byte	2 Byte	→		User data
..	..	→	Data information	User data
n. Data Byte	..	→	Data information	User data
Checksum (BCC)	2 Byte	→		Frame end
Stop bit	. (ASCII 46)	→	Disconnected	Frame end

Calculating the Checksum BCC (Block Check Character)

The Checksum is generated from an EXOR frame operation.

Start Character	Length	Command	Data	Checksum	Stop Character
/	02	0D	00	59	.
2FH	30H 32H	30H 44H	30H 30H	35H 39H	2EH

Data used to calculate the checksum

Calculating Example:

/	2FH	=	0010 1111
0	30H	=	0011 0000
	XOR	=	0001 1111
2	32H	=	0011 0010
	XOR	=	0010 1101
0	30H	=	0011 0000
	XOR	=	0001 1101
D	44H	=	0100 0100
	XOR	=	0101 1001
0	30H	=	0011 0000
	XOR	=	0111 1001
0	30H	=	0011 0000
	XOR	=	0101 1001

Program Example:

Start	
Transmitting Frame="/020D0059." (Example) Transmitting Frame Length=10 (in this example);	
checksum 0 0; n = 1;	
as long as: n < (Transmitting Frame Length - 3	
	Checksum = Checksum EXOR Transmitting Frame character (n)
	n = n + 1
End	

→ Checksum = 59H

Interface commands for OCP 5-pin

In the following commands is: x = place holder for entered and emitted values
qq = place holder for the Checksum

Sensor Settings

Sensor Reset: The reset sets the switching points back to delivery status and deactivates time delays, filter functions or extra hysteresis.

/000R4D. Answer: /020MRS51.

Foreground Teach Output 1:

/020T1149. Answer: /030MT1105.

Background Teach Output1:

/020T124A. Answer: /030MT1206.

Window Teach Output1:

/020T134B. Answer: /030MT1307.

Foreground Teach Output2:

/020T214A. Answer: /030MT2106.

Background Teach Output2:

/020T2249. Answer: /030MT2205.

External Foreground Teach Output1:

/020T144C. Answer: /030MT1400. External laser off is thus rendered inactive

External Background Teach Output1:

/020T154D. Answer: /030MT1501. External laser off is thus rendered inactive

External Window Teach Output1:

/020T164E. Answer: /030MT1602. External laser off is thus rendered inactive

Window Teach Output2:

/020T2348. Answer: /030MT2304.

External Foreground Teach Output2:

External laser off is thus rendered inactive

/020T244F. Answer: /030MT2403.

External Background-Teach Output2:

External laser off is thus rendered inactive

/020T254E. Answer: /030MT2502.

External Window Teach Output2:

External laser off is thus rendered inactive

/020T264D. Answer: /030MT2601.

Set on-delay output 1:

/030Y1xxqq. Answer: /040MY1xxqq. xx = 00...99
Delay = xx times 10 ms

Example:

/030Y10074. Delay = 0 Answer: /040MY1003E.

/030Y10175. Delay = 10 ms Answer: /040MY1013F.

/030Y10276. Delay = 20 ms Answer: /040MY1023C.

/030Y10571. Delay = 50 ms Answer: /040MY1053B.

/030Y11075. Delay = 100 ms Answer: /040MY1103F.

/030Y12076. Delay = 200 ms Answer: /040MY1503B.

Set On-Delay Output2:

/030Y2xxqq.	Answer:	/040MY2xxqq.	xx =	00...99
			Delay =	xx times 10 ms

Example:

/030Y20077. Delay = 0 Answer: /040MY2003D.

/030Y20176. Delay = 10 ms Answer: /040MY2013C.

/030Y20275. Delay = 20 ms Answer: /040MY2023F.

/030Y20572. Delay = 50 ms Answer: /040MY20538.

/030Y21076. Delay = 100 ms Answer: /040MY2103F.

/030Y22075. Delay = 200 ms Answer: /040MY2203C.

Set Off-Delay Output1:

/030Z1xxqq. Answer: /040MZ1xxqq. xx = 00...99
Delay = xx times 10 ms

Example:

/030Z10077. Delay = 0 Answer: /040MZ1003D.

/030Z10176. Delay = 10 ms Answer: /040MZ1013C.

/030Z10275. Delay = 20 ms Answer: /040MZ1023F.

/030Z10572. Delay = 50 ms Answer: /040MZ10538.

/030Z11076. Delay = 100 ms Answer: /040MZ1103C.

/030Z12075. Delay = 200 ms Answer: /040MZ1203F.

Set Off-Delay Output2:

/030Z2xxqq.	Answer:	/040MZ2xxqq.	xx =	00...99
			Delay =	xx times 10 ms

Example:

/030Z20074. Delay = 0 Answer: /040MZ2003E.

/030Z20175. Delay = 10 ms Answer: /040MZ2013F.

/030Z20276.	Delay = 20 ms	Answer:	/040MZ2023C.
/030Z20571.	Delay = 50 ms	Answer:	/040MZ2053B.
/030Z21075.	Delay = 100 ms	Answer:	/040MZ2103F.
/030Z22076.	Delay = 200 ms	Answer:	/040MZ2203C.

Set Normally Open function Output1:

/020A115C. Answer: /030MA1110.

Set Normally Closed function Output1:

/020A105D. Answer: /030MA1011.

Normally Open function Output2 einstellen:

/020A215F. Answer: /030MA2113.

Normally Closed function Output2 einstellen:

/020A205E. Answer: /030MA2012.

Operate Outputs as PNP:

/020O0153. (O not 0) Answer: /020MO12E.

Operate Outputs as NPN:

/020O0250. (O not 0) Answer: /020MO22D.

Operate Outputs as Push-Pull:

/020O0351. (O not 0) Answer: /020MO32C.

Error Output to Output2 (NO):

/020A225C. Answer: /030MA2210.

External laser off at 24 V:

/020L0H29. External Teach-In is deactivated as a result.

Answer: /020L0Hqq.

External laser off at 0 V:

/020L0L2D. External Teach-In is deactivated as a result.

Answer: /020L0Lqq.

Deactivate external laser off:

/020L0D25. External Teach-In must be set again.

Answer: /020L0Dqq.

Deactivate Laser:

/020L0051. Answer: /020L0051.

Activate Laser:

/020L0150. Answer: /020L0150.

Set Switching-On Point for Output 1:

/060S1xxxxqq. The switching-off point is calculated automatically via the hysteresis.
 Answer: /020MS132.
 xxxxx: Value in 1/100 mm

Set Switching-On Point for Output 2:

/060S2xxxxqq. The switching-off point is calculated automatically via the hysteresis.
 Answer: /020MS231.
 xxxxx: Value in 1/100 mm

Set switching-off point for output 1:

For flexible setting of the switching-off point resp. diminution of the switching hysteresis with the use of the filter function. Check switching function on sufficient hysteresis afterwards.

/060S3xxxxxqq.

Acceptance: /020MS330.

Refuse: /020XS325.

xxxx: Value in 1/100 mm

Set switching-off point for output 2:

For flexible setting of the switching-off point resp. diminution of the switching hysteresis with the use of the filter function. Check switching function on sufficient hysteresis afterwards.

/060S4xxxxxqq.

Acceptance: /020MS437.

Refuse: /020XS422.

xxxx: Value in 1/100 mm

Preset window, middle, output 1:

/060S5xxxxxqq.

Acceptance: /020MS536.

xxxx: Value in 1/100 mm

qq: Checksum resolution from /060S5xxxxx

Preset window, middle, output 2:

/060S6xxxxxqq.

Acceptance: /020MS635.

xxxx: Value in 1/100 mm

qq: Checksum resolution from /060S6xxxxx

Preset Window Width output1:

/060S7xxxxxqq.

Acceptance: /020MS734.

xxxx: Value in 1/100 mm

qq: Checksum resolution from /060S7xxxxx

Preset Window Width output 2:

/060S8xxxxxqq.

Acceptance: /020MS83B.

xxxx: Value in 1/100 mm

qq: Checksum resolution from /060S8xxxxx

Amplify Hysteresis at output 1: Reasonable e.g. in case of vibrations of the object.

/060H10xxxxqq.

Answer: /020MH129.

xxxx: Extra hysteresis in 1/100 mm

Amplify Hysteresis at output 2: Reasonable e.g. in case of vibrations of the object.

/060H20xxxxqq.

Answer: /020MH22A.

xxxx: Extra hysteresis in 1/100 mm

Set Maximal Exposure Time: The sensor adjusts – up to a maximal value – its exposure time resp. light pulse time automatically to the detected object. In case of e. g. black or glossy objects it can be reasonable to increase this time. The reduction of the exposure time can be useful if the sensor is pointed towards light sources. (delivery status OCP242: 1000; OCP662: 2000).

/060cr0xxxxqq.

Answer: /060Mc0xxxxqq.

xxxx: maximum exposure time (allowed 100...8000)

Example:

/060cr0800030.

Answer: /060Mc080000F.

Set mean value filter for measured value acquisition:

/020FSxxqq. xx: 02-99 Number of measured values for continuous mean value filter; xx: 00 filter deactivated

Example:

/030FS0009.	Filter switched off	Answer:	/030MF0017.
/030FS020B.	2 measured values utilized	Answer:	/030MF0215.
/030FS040D.	4 measured values utilized	Answer:	/030MF0413.
/030FS0801.	8 measured values utilized	Answer:	/030MF081F.
/030FS160E.	16 measured values utilized	Answer:	/030MF1610.
/030FS3208.	32 measured values utilized	Answer:	/030MF3216.
/030FS640B.	64 measured values utilized	Answer:	/030MF6415.

Change baud rate

The baud rate of the sensor is standardized with 9.600 baud. If you want to change the baud rate, proceed as follows. Open your hyper terminal and take the following settings: Baud rate: 9.600, Data bit: 8, Stop bit: 1, Parity: none, Flow control: none. In order to change the baud rate, enter the following commands corresponding your desired baud rate.

The new baud rate is activated after the supply voltage is applied anew.

Function	Send Frame to the Sensor	Response Frame from the Sensor
Baud rate to 9600 Baud	/030?BR201.	/030Ade2qq.
Baud rate to 19200 Baud	/030?BR300.	/030Ade3qq.
Baud rate to 38400 Baud	/030?BR407.	/030Ade4qq.
Baud rate to 57600 Baud	/030?BR506.	/030Ade5qq.
Baud rate to 115200 Baud	/030?BR605.	/030Ade6qq.

Query Sensor Settings and Values

Query Sensor Version:

/000V49. Answer: /070V8a:bbccqq.
 a: Software version
 bb: Sensor group
 cc: Sensor type

Single Emission of Distance Values:

/020D0e0C. Answer: /060Dxxxxxnqq.
 xxxxx: Distance Value in 1/100mm
 n: ASCII-Character NUL (hex: 00)

Activate Permanent Emission of Distance Values:

/020D0p19. Answer: /040D0P:134. Start of Permanent Distance Value Emission in format of the Single Emission (see above).
 xxxxx: Distance Value in 1/100 mm

Deactivate Permanent Emission of Distance Values:

/020D0a08. Answer: /040D0P:035. End of Permanent Distance Value Emission.

Query Off-Delay Time for Output 1:

/020WZ121. Answer: /050WZ10xxqq.
 xx times 10 ms: Off-Delay Time for Output A1 in ms

Query Off-Delay Time for Output 2:

/020WZ222.

Answer: /050WZ20xxqq.

xx times 10 ms: Off-Delay Time for Output A2 in ms

Query On-Delay Time for Output A1:

/020WZ323.

Answer: /050WZ30xxqq.

xx times 10 ms: On-Delay Time for Output A1 in ms

Query On-Delay Time for Output A2:

/020WZ424.

Answer: /050WZ40xxqq.

xx times 10 ms: On-Delay Time for Output A2 in ms

Query Switching-On Point for Output A1:

/020WC138.

Answer: /070WC1xxxxxqq.

xxxxx: Switching-On Point for Output A1 in 1/100 mm

Query Switching-On Point for Output A2:

/020WC23B.

Answer: /070WC2xxxxxqq.

xxxxx: Switching-On Point for Output A2 in 1/100 mm

Query Switching-Off Point for Output A1:

/020WD13F.

Answer: /070WD1xxxxxqq.

xxxxx: Switching-Off Point for Output A1 in 1/100 mm

Query Switching-Off Point for Output A2:

/020WD23C.

Answer: /070WD2xxxxxqq.

xxxxx: Switching-Off Point for Output A2 in 1/100 mm

Query window middle for Output1:

/020WC33A.

Answer: /070WC3xxxxxqq.

xxxxx: window middle for Output1 in 1/100 mm

Query window middle for Output2:

/020WC43D.

Answer: /070WC4xxxxxqq.

xxxxx: window middle for Output2 in 1/100 mm

Query Window Width for Output1:

/020WC53C.

Answer: /070WC5xxxxxqq.

xxxxx: Window Width for Output1 in 1/100 mm

Query Window Width for Output2:

/020WC63F.

Answer: /070WC6xxxxxqq.

xxxxx: Window Width for Output2 in 1/100 mm

Query Teach Mode for Output A1:

/020WT12F.

Answer: /030WT1xqq. x=1 if VT, x=2 if HT

Query Teach Mode for Output A2:

/020WT22C.

Answer: /030WT2xqq. x=1 if VT, x=2 if HT

Query Normally Open/ Normally Closed function for Output A1:

/020WA13A. Answer: /030WA1xqq. x=0 if NC, x=1 if NO

Query Normally Open/ Normally Closed function for Output A2:

/020WA239.	Answer:	/030WA2xqq.
	x=0	if NC
	x=1	if NO

Query Error Status:

/020WE33C.	Answer:	/030WEfxqq.
	x=0	no error
	x=1	error
	f=1	Error Output indicates Error Status
	f=0	Error Output indicates Normal Status

Query Operating Mode of the Outputs:

/020WO336. (O not 0)	Answer:	/020WOxqq.
	x=1	if PNP
	x=2	if NPN
	x=3	if Push-Pull

Query Switching Mode of the outputs:

/020WQ328.	Answer:	/040WQabcqq.
	a:	Switching mode output A1
	b:	Switching mode output A2
	c:	Switching mode error output

Query Maximal Exposure Time:

/020WM334. Answer: /060WM0xxxxqq.
xxxx: Maximum Exposure Time

Query number measurement values for filter:

/020WF33F	Answer	/040WF0xxqq.
	xx:	Number of measurement values for filter

Query additional hysteresis for switch-on point Output1:

/020WV12D. Answer: /060WV1xxxxqg.

Query additional hysteresis for switch-on point Output2:

/020WV22E. Answer: /060WV2xxxxqq.

Query external laser off:

/020WL036. Answer: /020WLxqq.
x = H if 24 V, x = L if 0 V, x = D inactive at external laser off