 <p>Opsytec Dr. Gröbel</p>	=====> Interface definition <=====
System:	PLC Sensor with digital interface
Document number:	ID800-Xxx-1

Interface definition

PLC.D

V1.0

Change history



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Version	Editor	Date	Change
1.0	Rau	26.11.2020	Translation

1 Programmierschnittstelle

Communication with PLC.D Sensor is via USB, RS485 or RS232 communication depending on the option selected.

The communication takes place as ASCII communication, which is shown in the following example "*Query measured value*":

- **Controller sends:** DS_MeasResult? {CR}{LF}
- **Sensor responds:** DS_FbMeasResult : 1.2345E+01 (CRC) {CR}{LF}

The PLC.D sends only after a software or hardware request from the control. An exception to this is the "Continuous measuring mode".

Only one command/query is processed at a time.



The communication is available after the initialization of the sensor. Depending on the version the initialization can take some seconds.

Definitions:

- Baud rate: 115200 baud
- Parity: None
- Data-Bits: 8
- Stop-Bit: 1

Type definition:

- **BOOL:** ASCII representation of the value: „1“ = TRUE; „0“ = FALSE
- **INT:** ASCII representation of the value: 12345
- **FLOAT:** ASCII representation of the value: 1.2345E+01
- **STRING:** ASCII representation of an alphanumeric character string
- **DATE:** ASCII representation of a date in DD.MM.YYYY format
- **ARRAY[1..8]** of separated by {Tab}

Unused digits for INT or FLOAT must be described with "0".

For example, the specification of the averages with 5 corresponds to 05 as the transfer value

Specifications for command structure:

- Separation of answers and values by {Tab}
- Command end by {CR}{LF}
- Command and data separation by ":" (no {Tab} before and after :)
- commands are executed with"!"
- request for data are executed with"?" at the end (no {Tab})

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- commands including data request are executed with"!?" at the end (no {Tab})
- For data that can be set (!?), the command (without data) is sent with ? to query the data. Example " DS_MeasAVG ":
 - Set: DS_MeasAVG:01!
 - Query: DS_MeasAVG?
- Command length limit to 200 characters
- Unintelligible commands are confirmed by:
- NACK:No such command!{CR}{LF}

Error Handling / Timeout:

- Timeout for command processing; default value: 200 ms
- Time interval for new transmission; default value: 200 ms

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2 Command overview

Verwendung	Befehl	Antwort	Wertebereich
Query serial number	DS_SerialNr?	DS_FbSerialNr : 123456 (CRC)	STRING
Query type number	DS_Type?	DS_FbType : 800 Axx (CRC)	STRING
Query spectral range	DS_Spectral?	DS_FbSpectral:UVA+ (CR)	STRING
Query firmware	DS_Firmware?	DS_FbFirmware : 01.03.25 (CRC)	V00.00.00 - 99.99.99
Command for resetting the PLC.D	DS_Reset	DS_FbReset (CRC)	-
Calibration date request	DS_CalibDate?	DS_FbCalibDate : 01.01.2020 (CRC)	DATE
Starting the measurement	DS_StartMeas	DS_FbStartMeas (CRC)	-
Request of the measurement result	DS_MeasResult	DS_FbMeasResult: 1.2345E+01 (CRC)	FLOAT
Request of the measuring mode	DS_DataMode	DS_FbDataMode:1 (CRC)	1: Software-Polling 2: Hardware-Trigger with transfer 3: Hardware-Trigger w/o transfer 4: continuously
Request of the unit	DS_Unit	DS_FbUnit: mW/cm ² (CRC)	STRING
Request of the measuring range	DS_Range	DS_FbRange: 10000 (CRC)	INTEGER
Request of the transmission interval	DS_ContTime	DS_FbContTime: 05m (CRC)	INTEGER + Time Character s: seconds (1-59) m: minutes (1-59) h: hours (1-24)
Request of averages	DS_MeasAVG	DS_FbMeasAVG: 04 (CRC)	INTEGER 1..99

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Checksumme:

All responses sent with data content are provided with a checksum (CRC-16). This is evaluated accordingly for correctness. The checksum is always at the end of the message, separated by TAB, which is part of the data to be checked.

The checksum is defined as follows:

Typ: CRC-16
CRC Polynomial: 0x8005
Init CRC value: 0x0000
Final XOR value: 0x0000
Reflect data (byte): No
Reflect CRC (word): No
Example (ASCII): 123456789
Ergebnis: 0xFEE8

The checksum is omitted for the commands to the PLC.D sensor.

The checksum is always at the end of the answers. Example:

Command to set averaging to 5:

DS_MeasAVG:05!?

Answer (spaces are tabs):

DS_FbMeasAVG:05 0xE4ED

Further examples are given below. The checksum here is only given as an example.

DS_MeasAVG?

DS_FbMeasAVG:05{Tab}0xE4ED

DS_MeasAVG:05!?

DS_FbMeasAVG:05{Tab}0xE4ED

DS_SerialNr?

DS_FbSerialNr:987654{Tab}0x02DF

DS_StartMeas?

DS_FbStartMeas{Tab}0xBE37

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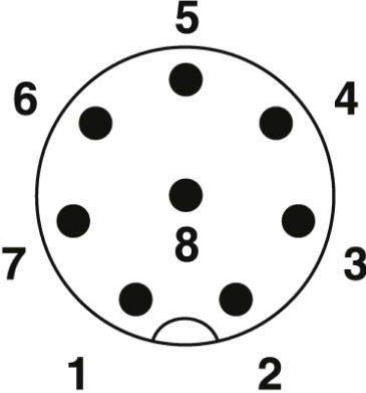
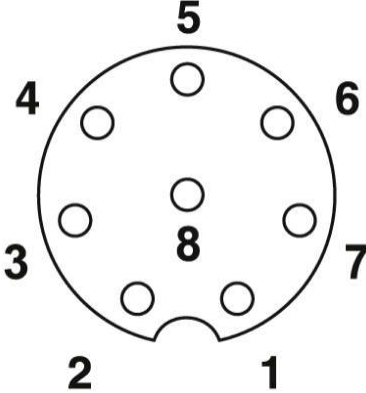


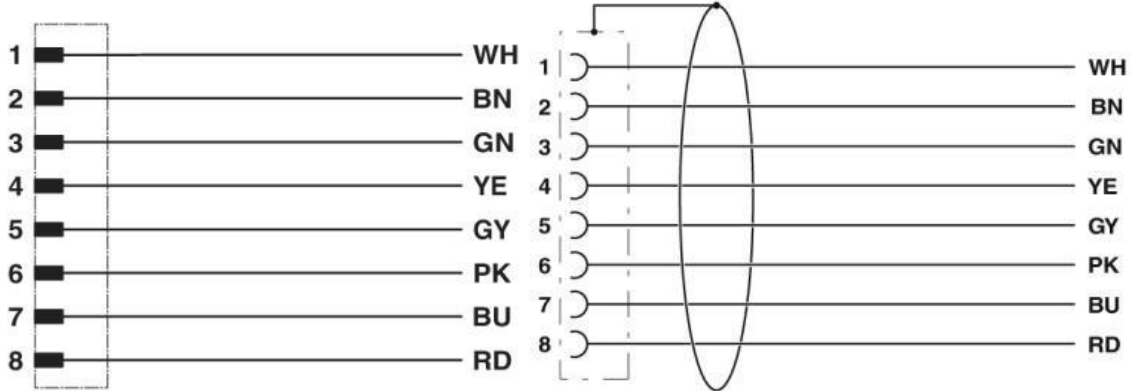
Individual functions are not available for every firmware. Therefore always check the firmware version too.

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3 Hardware-interface

3.1 Connector

Receptacle connectors (installed in PLC.D) SACC-DSI-M8MS-8CON-M8/0,5 1424230 Phoenix Contact	Sensor-/Aktor-cable Cabel, 1,5 m 920314-1.5 cable, 3 m 920314-3 cable, 5 m 920314-5 cable, 10 m 920314-10
	



3.2 Wire assignment

PIN	Color		Signal V2
1	WH	White	Data Ready(O)
2	BN	Brown	+24V
3	GN	Green	RX+ / RS485 / RX RS232
4	YE	Yellow	RX- / RS485
5	GY	Gray	TX- / RS485
6	PK	Pink	TX+ / RS485 / TX RS232
7	BU	Blue	GND
8	RD	Red	Trigger Input (I)