Quickstart OPCom II

V1.06.13

Read the safety instructions and operating instructions prior to commissioning!

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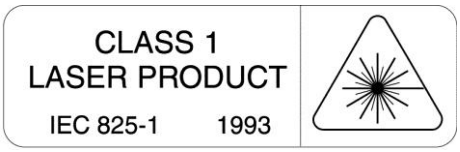
The device complies with CE requirements

Never remove the coverings. The device uses a laser with the potential to harm users.

OPCom II contains a laser sensor classified as a Class 1 product during normal use (pursuant to 21 CFR, subchapter J of the Health and Safety Act of 1968). This manual does not contain any service information regarding installed parts. Service should only be performed by trained service personnel.

OPCom II has been evaluated and tested in accordance with EN61010-1:1993, "Safety Requirements For Electrical Equipment For Measurement, Control, and Laboratory Use," IEC 825-1:1993, "Safety of Laser Products," and other relevant industry norms (e.g. ISO 4406, ISO 6149-2).

A sticker indicating the laser class pursuant to 21CFR has been applied to the device. A copy of this sticker can be seen in Image 1 below.



1. Quick start

The steps that must be executed for commissioning the particle monitor **OPCOM II** are described below. The following components are necessary for this:

1. PC/laptop with RS232 connection, or alternatively a USB connection, that serves as the measurement computer.
2. Particle monitor **OPCOM II** (order number: SPCO 300-1000)
3. Sensor cable to RS232 (order number: SCSO 100-5030)
4. Power supply unit incl. power connector (order no. SCSO 100-5080)
5. Software LubMon**PC**$_{light}$ (www.argo-hytos.com)
6. In addition for connection via USB: USB to RS232 converter with associated driver software (order no: SCSO 100-5040)

The **LubMonPC**$_{light}$ software can be downloaded from the web site **www.argo-hytos.com**. The components must be prepared as follows:

A) Software installation LubMonPC$_{light}$

1. Unpack the **LubMonPClight.zip** file on your computer.
2. Prior to starting **LubMonPClight.exe** installation of the LabVIEW Runtime Engine is required. This engine can also be downloaded from the download area of ARGO-HYTOS (**www.argo-hytos.com**).

B) Software installation of the driver for the USB to RS232 converter for data acquisition via USB (if you are not using a converter please continue with point D)

3. Now connect your USB to RS232 converter to your PC/laptop.
4. If the USB to RS232 converter is not known to the PC, the appropriate driver must be installed. To do this follow the installation instructions provided by the operating system or on the supplied driver CD.

C) Sensor connection for data acquisition via USB

5. Connect the sensor cable to the sensor with the M12 connector.
6. Connect the 9-pin D-sub connector of the cable to the appropriate serial interface of the USB to RS232 converter.
7. Connect the power supply unit and the sensor cable.
8. Now properly connect your power supply unit to the line voltage via the power connector. Your sensor is now ready for operation.

D) Sensor connection for data acquisition via RS232

9. Connect the sensor cable to the sensor with the M12 connector.
10. Connect the 9-pin D-sub connector of the cable to the appropriate serial interface of your PC/laptop.
11. Connect the power supply unit and the sensor cable.
12. Now properly connect your power supply unit to the line voltage via the rubber connector. Your sensor is now ready for operation.

E) Start the software

13. LubMon**PC**$_{light}$ can be started by double clicking on the **LubMonPClight.exe** file.
14. Select the serial interface (COM) to which you have connected the sensor on the computer. If you are not using a USB to RS232 converter, this is usually COM 1.
15. If you are using a USB to RS232 converter a new virtual COM port will be created. Select this COM port. If necessary you can check the allocation of the virtual COM port in the Windows Device Manager.
16. The incoming data as well as the identification of the sensor are displayed on the left side of the window. The data can be visualized on the right side of the window in a diagram.

2. Technical data

Sensor data		Range	Unit
Max. operating pressure		420 (dynamic) 600 (static)	bar bar
Operating temperature range fluid		-10 ... 60	°C
Operating temperature range environment		-10 ... 60	°C
Storage temperature range		-20 ... 80	°C
Ambient humidity		0 … 95 (noncondensing)	% r.H.
Resistance hydraulic fluid		Mineral and ester liquids, polyalphaolefins, diesel fuel	
Moistened, sealing materials		Stainless steel, sapphire, chrom, NBR	
Power supply		9 … 33	VDC
Max. power consumption		2	W
Outputs:	Current output Interfaces Alarm contact	4 ... 20 RS232, CANopen Open collector	mA - -
Connecting dimension:	Fluid Electrical	¼“, Minimess 16x2 M12x1 (8-pole)	
Permissible flow		50 … 400	ml/min
Measurement range according to ISO 4406:99 Degree of purity (measurement range) Degree of purity (calibrated range) Accuracy of measurement		 0 … 24 10…22 ± 1	 Scale number Scale number Scale number

Table 2.1: Technical data

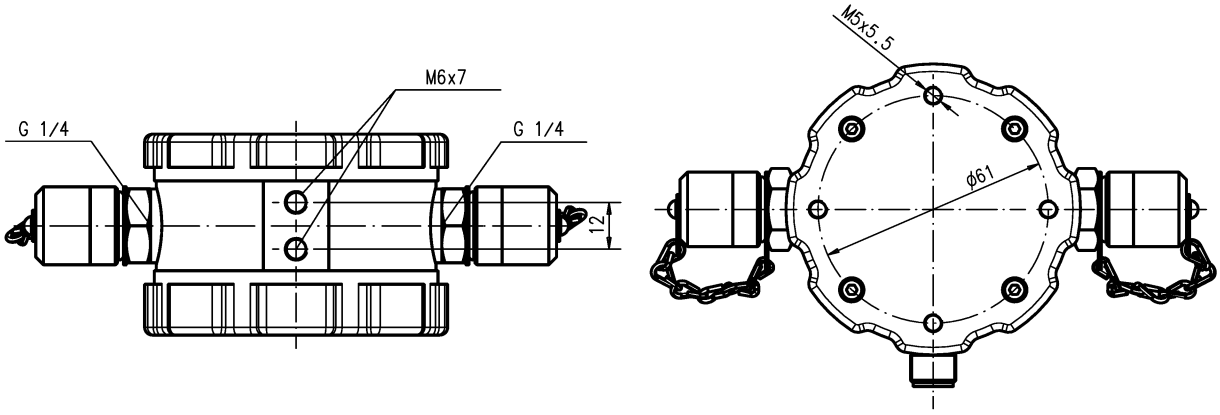


Fig 2.1: Dimensional drawing OPCOM II

3. Installation

- Hydraulically the OPCOM II has to be connected to the pressure line respectively in bypass flow (50…400 ml/min).
- Adjust the flow rate by orifices and flow control valve (accessories).
- Within the menu (sensor parameter/flow) the current flow can be checked.
- Abrupt changes of the cross section, orifices, valves, and pumps at the inlet of the OPCOM have to be avoided in order to reduce de-aeration and accumulation of contaminants
- The length of the pressure line has to be selected carefully. Long lines and low flow rates might lead to particle sedimentation. Moreover the pressure loss is highly dependent on the viscosity. At low temperatures this might result in low flow rates and an insufficient flow through the OPCOM II. In contrast, long pressure lines might be reasonable in case of free air within the oil. Thus needed time for the solution of the air is provided.
- Steep and fast pressure gradients should be avoided in order to gain an exact measurement result.
- Sampling should be performed at a characteristic location
- The factory setting of the sampling time is 1 minute by default. In case of very clean oil this time can be changed.

4. Electrical connection

Only a qualified electrician should install the device. Comply with national and international guidelines for setting up electrical equipment.

Power supply in accordance with EN50178, SELV, PELV, VDE0100-410/A1.

Incorrect connection of the device can lead to damages!

De-energize the system for the installation and connect the device as follows:

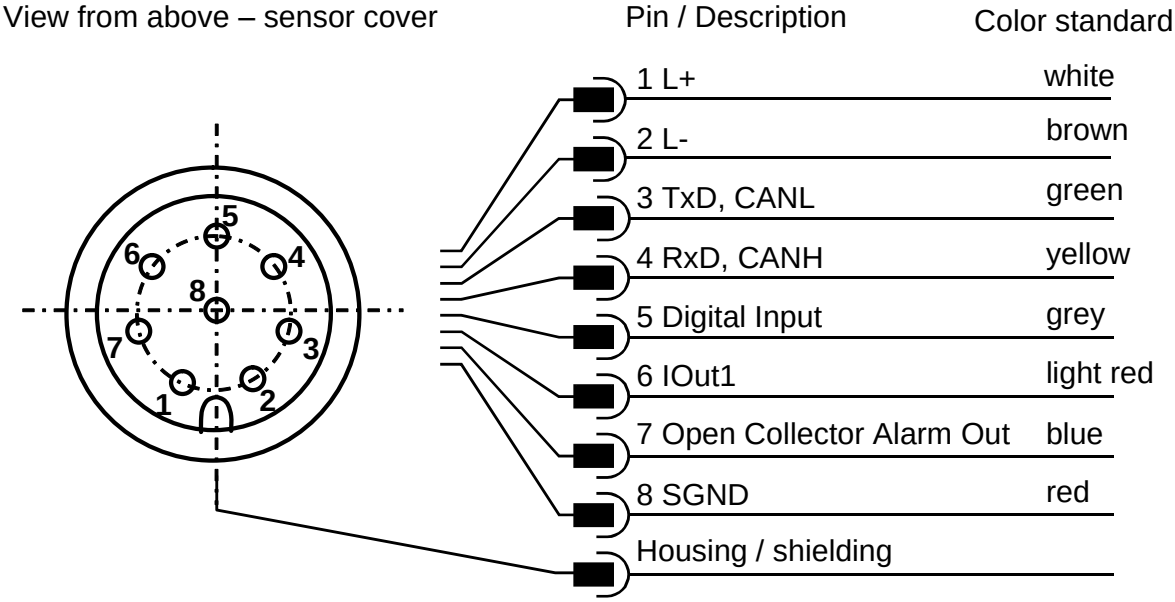


Fig 4.1: Pin assignment of the connector

The permissible operating voltage is between 9 VDC and 33 VDC. The sensor cable must be shielded. To achieve IP67 degree of protection, only use suitable connectors and cable.

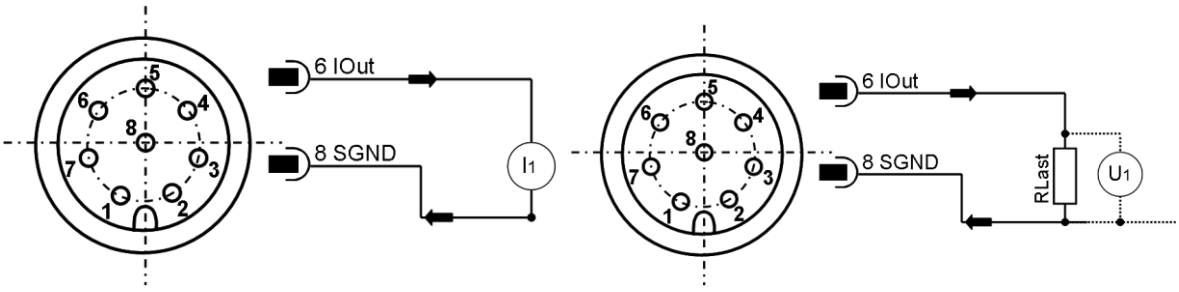


Fig 4.2: Measuring the analog 4..20 mA outputs with an without load resistor

Current should be measured with a suitable current measurement device, in accordance with Fig. 4.2. The maximum load is 250 Ω. More details can be read within the manual.

The calculation of the ordinal numbers *ON* by means of the analog current *I* can be performed according to the following equation:

Output	Equation	Number
Ordinal number / cleanliness	$OZ = \frac{26}{16mA} \cdot I / mA - \frac{26}{4}$	*(4-1)*

Fig 4.3: Calculating the scale number or purity class based on the current

Pursuant to ISO 4406:99, the current range covers scale numbers from 0 to 26. A current value of 4 mA would correspond to a scale number of 0, whereas 20 mA would correspond to a scale number of 26.

I_{out} in mA	4	12	20
Ordnial number	0	13	26

Fig 4.4: Table for calibrating the PLC's current inputs

5. Communication

- Baud rate: 9600
- Data bits: 8
- Parity: none
- Stop bits: 1
- Flow controll: none

#	Command format	Meaning	Reply format
1	RVal[CR]	Reading all measured values with subsequent check sum (CRC)	$Time:x.xxx[h];T:xx.x[°C]; ....;CRC:x[CR][LF]
2	RID[CR]	Reading of identification with subsequent check sum (CRC)	$ARGO-HYTOS;SType; SN:xxxxx;...;CRC:x[CR][LF]
3	RCon[CR]	Reading of configuration parameters with subsequent CRC	$AO1:x;…; CRC:x[CR][LF]
4	RMemO[CR]	Reading of memory organisation (header), names and units	$Time [h]; T [°C]; P [-];P40 [-];PTG [1/K]; … [CR][LF]
5	RMem[CR]	Reading of complete memory, including header	$Time [h]; T [°C]; P [-]; … …[CR][LF]…;... [CR][LF]…
6	RMemH-n[CR]	Read memory of the recent *n* hours	$Time [h]; T [°C]; P [-];P40[1/K];…; CRC:x[CR][LF]…

Table 5.1: Reading commands

For additional information on CAN-communication and the digital channels please refer to the manual. www.argo-hytos.com