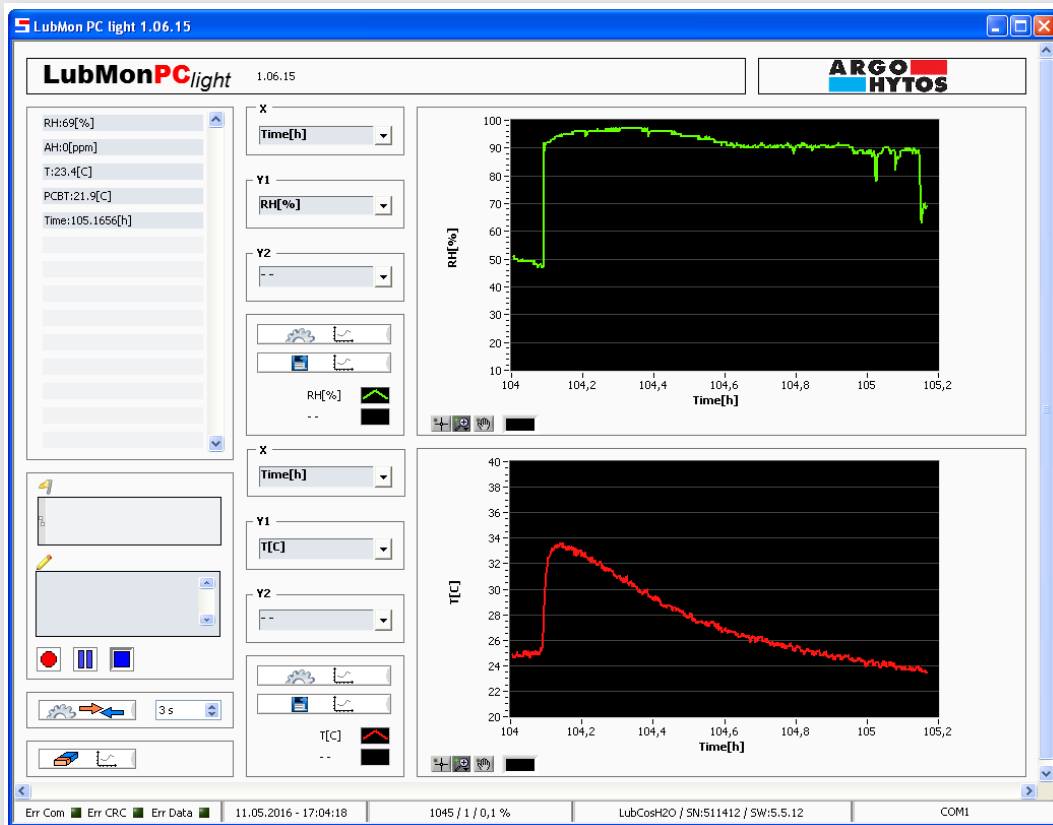


LubMonPC_{light}

SCSO 800-1000



PC visualization software for condition sensors

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LubMonPC_{light} is a National Instruments (NI) LabVIEW based program for reading, displaying and storing the data of the following condition sensors:

- › LubCos H₂O
- › LubCos H₂O+ II
- › LubCos Level
- › LubCos Vis+
- › OPCom Particle Monitor
- › OPCom FerroS

Range of functions:

- › Simple and understandable handling through a graphical user interface
- › Graphical data visualization based on two charts, each with two Y-axes and one X-axis
- › Flexible axes assignments with linear and logarithmic display of axis and zoom function
- › List display of current measurement data and units
- › Choice of interfaces (RS232 or Ethernet TCP / IP)
- › Recording and saving the data as text files in .txt-format with headers for measurement series and unit labels
- › Start, pause and stop function of the recording
- › Recording of the current time stamp and freely adjustable recording interval

2. System requirements

- › Windows XP or higher
- › Processor: Min. Pentium 200 MHz or equivalent processor, a Pentium III, Celeron with 600 MHz or an equivalent processor is recommended
- › Memory: Min. 64 MB, 256 MB recommended
- › Screen resolution: Min. 1024 x 768 pixel

Furthermore, the system requirements for the NI Runtime Engine system have to be taken into account.

3. Quick start

The following section describes the steps which must be taken for the initial commissioning of LubMonPC_{light} with an ARGO-HYTOS condition sensor. For this purpose, the following components are required:

- › PC / laptop with RS232 connection or alternatively a USB port, which serves as a measuring computer
- › Oil condition sensor LubCos or OPCOM II
- › Sensor cable (order number: SCSO 100-5030)
- › Power supply incl. cold-device plug (order number: SCSO 100-5080)
- › Software LubMonPC_{light} (www.argo-hytos.com)
- › In addition, when connected via USB: USB-RS232 converter with associated driver software (order number: 100-5040 SCSO)

The components must be prepared as follows:

A) Software installation LubMonPC_{light}

1. Unpack the LubMonPC_{light}.zip file on your computer.
2. Before starting of LubMonPC_{light}.exe, LabVIEW Runtime Engine (V2010) needs to be installed. This is included in the "fullsetup"-file which can be downloaded from the download section of ARGO-HYTOS (www.argo-hytos.com). If the LabVIEW Runtime Engine has already been installed, only the "executable" file is needed.

B) Software installation of the driver for the USB-RS232 converter for data acquisition via USB (If you do not use a converter, please continue with point D)

3. Now connect your USB-RS232 converter to your PC / laptop.
4. If the USB-RS232 converter is not known to the PC, the corresponding driver must be installed. Then follow the installation instructions of the operating system or the supplied driver CD.

C) Sensor connection for data acquisition via US

5. Connect the sensor cable with the M12 connector to the sensor.
6. Connect the 9-pin. D-Sub connector of the cable to the appropriate serial interface of the USB-RS232 converter.
7. Connect the USB connector of the USB-RS232 converter to an appropriate interface of your PC / laptop.
8. Connect the power supply and the sensor cable.
9. Now properly connect your power supply with the cold-device plug to the mains voltage. Your sensor is now ready for operation.

D) Sensor connection for data acquisition via RS232

10. Connect the sensor cable with the M12 connector to the sensor.
11. Connect the 9-pin. D-Sub connector of the cable to the appropriate serial interface of your PC / laptop.
12. Connect the power supply and the sensor cable.
13. Now properly connect your power supply with the cold-device plug to the mains voltage. Your sensor is now ready for operation.

E) Start the software

14. LubMonPC_{light} can be started by double-clicking on the file LubMonPC_{light}.exe.
15. Select the serial interface (COM) at which you have connected the sensor to the computer. If you do not use a USB-RS232 converter, this usually is COM 1.
16. When using a USB-RS232 converter, a new virtual COM port is created. Select this one. Optionally, you can check the assignment of the virtual COM port in the Windows Device Manager.
17. The incoming data and the identification of the sensor appear on the left side of the window. On the right side of the window, the data can be visualized in a diagram.

4. User interface

When starting LubMonPC_{light} a window with the user interface is opened (see Figure 1). In this window all measured data can be read and all adjustments can be made.

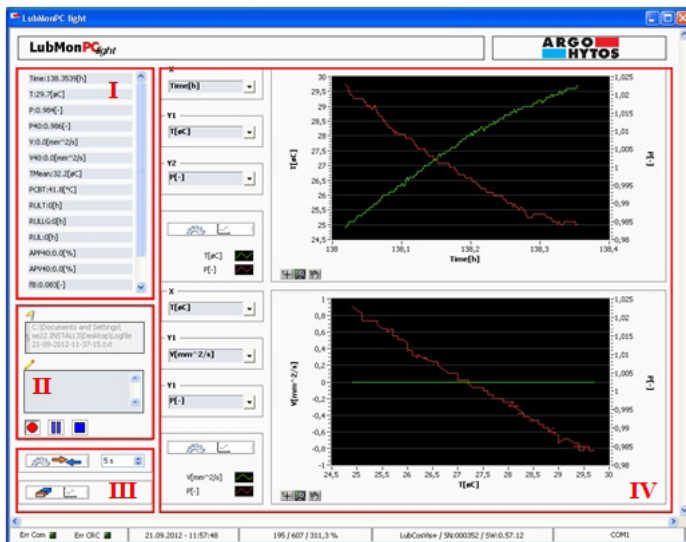


Figure 1: User interface LubMonPC_{light}

The user interface can be divided into the following four sectors (I-IV, Figure 1):

4.1 Sector I: List display of the current measurement values

Display of all parameters of the connected sensor with their units in square brackets.

More information on the individual measurements can be taken from the user manual of the respective sensor.

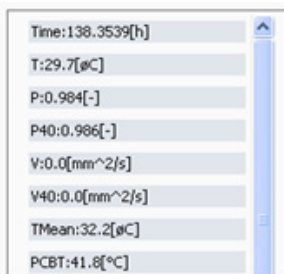


Figure 2: List display of the measurement values

4.2 Sector II: Recording of the measurement data

Storage path: Reproduction of the path and file name, selected via the start button.

Comment field: Ability to enter a comment. This is stored in the header of the log file. The input must be done before starting a recording.

Start: Starting a recording. A window opens in which the file path and the file name of the log file must be selected.

Pause: Temporary interruption of the recording. By pressing the key again, the recording will continue.

Stop: Stop recording.

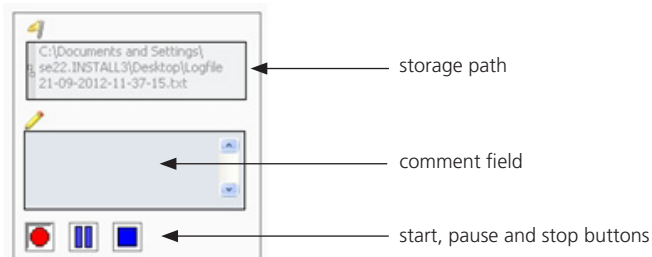


Figure 3: Recording of the measurement data

4.3 Communication and recording interval

Communication settings:
Select interface. See chapter 5.

Query / recording interval:
Interval for the query of the sensor data, graphic representation and storage operation. The adjustment range is between 3 and 5000 seconds (default setting: 3 seconds).

Resetting the diagrams:
Delete both charts. A running record of data is not affected.



Figure 4: Setting for communication and recording interval

4.4 Graphic representation

Two identically structured chart windows are available. See the following figure.

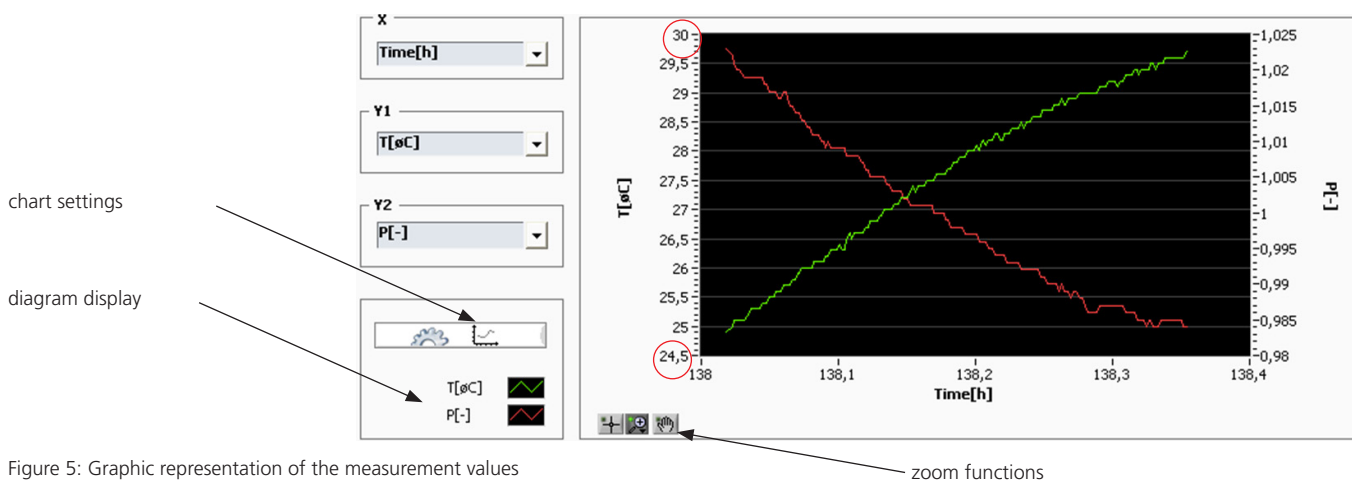


Figure 5: Graphic representation of the measurement values

In the left sector, the parameters to be displayed can be selected. For this, two Y-axes (Y1, Y2) and a common X-axis are available. The selection of the parameters to be displayed can be combined as desired.

Chart settings:

Adjusting the scaling for each axis. Possible settings:

- | | | | |
|---------|---------------------|----------------|--|
| linear: | Linear scaling | automatically: | Automatic adjustment of the scaling to the read parameter values. |
| log: | Logarithmic scaling | manually: | The minimum and maximum values of the scaling can be manually entered, directly on the axis by clicking.
See Figure 5, red mark |

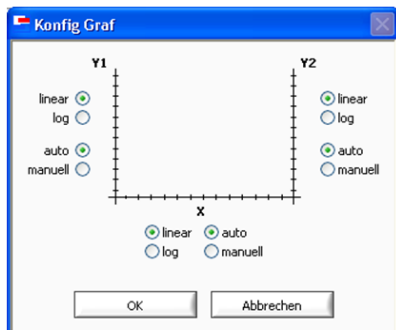


Figure 6: Chart settings

Diagram representation:

By clicking on the box a menu opens in which the line display can be customized. The setting opportunities are directly provided in the menu. See Figure 7.

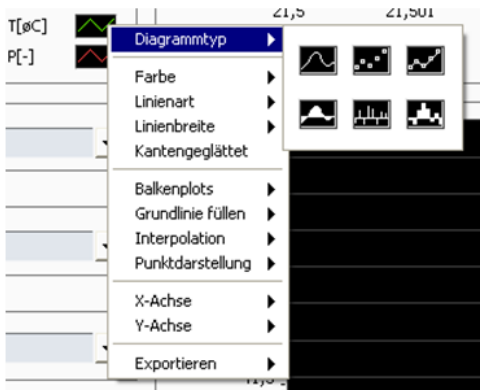


Figure 7: Menu for the diagram display

Another option is the direct export of the measurement data displayed in the diagram. This is also possible, if no measurement data recording was started.

Zoom function:

There are two-dimensional zoom functions at your disposal as well as horizontal and vertical zoom. Selective zooming-in or zooming-out is also possible.

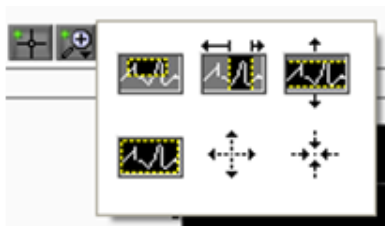


Figure 8: Zoom functions

4.5 Footer

The footer shows from left to right: Signal indicators for communication errors and transmission errors, date and time, number of successful and total transfers, and their percentage ratio, sensor name, serial number, software version and the selected interface (e.g. COM1).

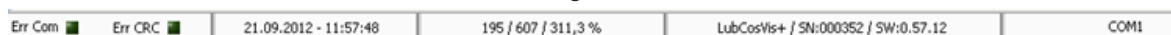


Figure 9: Footer - LubMonPC_{light}

Communication with a sensor can be done in two different ways. On the one hand via a serial COM interface (RS232), on the other hand over Ethernet via TCP / IP.

5.1 Serial interface

Interface parameters for the COM port such as the transmission speed cannot be changed. These are firmly implemented in the program. The number of sensors that can be connected to a PC depends on the number of available COM ports. However, only the measurement data from one sensor may be displayed in the LubMonPC_{light}. Nevertheless, it is possible to repeatedly open the program LubMonPC_{light} and thus display the measured data of several sensors simultaneously. To this end, the program can be copied to multiple folders and then be started.

Note:

Through the use of USB-to-serial converters, additional virtual COM ports can be created. This makes it possible to connect more sensors to a PC despite there is only one physically available COM port. Note that most commercially available USB-to-serial converter require installation of a driver. If the driver is installed correctly, the new virtual COM port can be selected in the user interface of the LubMonPC_{light}.

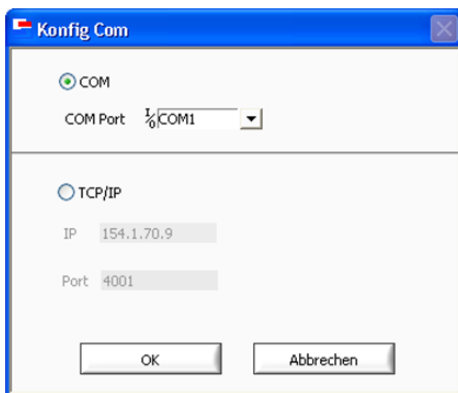


Figure 10: Selection of the COM port

5.2 Ethernet - TCP / IP

In addition to the direct connection via a serial interface, it is also possible to integrate a sensor via an Ethernet Gateway in a Local Area Network (LAN). LubMonPC_{light} can access the sensor, based on the set IP number at the Ethernet Gateway and the associated port number.

Example:

The Ethernet Gateway is assigned the user's IP number 154.1.70.9. The first COM port of the Ethernet Gateway receives the port number 4001, the second COM port the port number 4002 etc. In the LubMonPC_{light}, on the user interface, the IP (154.1.70.9) and the appropriate port number of the desired sensor have to be entered.

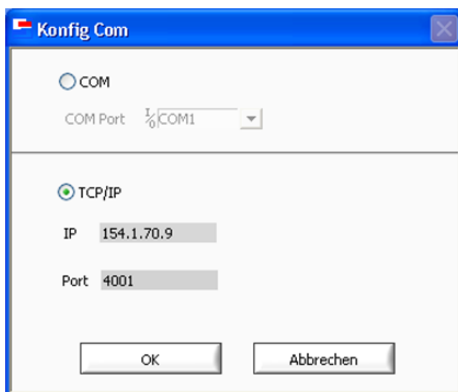


Figure 11: Configuration for TCP / IP

Note:

The appropriate configuration parameters of the Ethernet Gateway such as the baud rate and other COM settings must be set on the basis of the user manual.

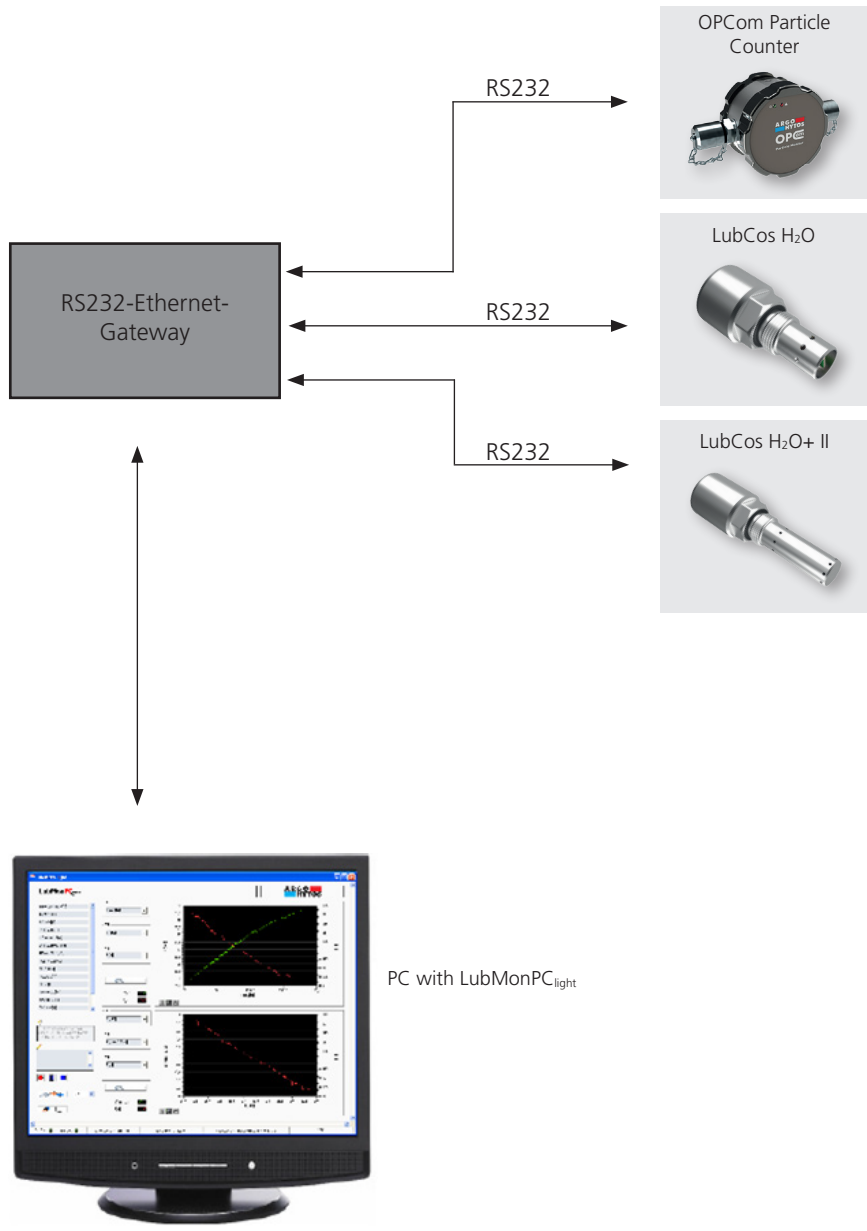
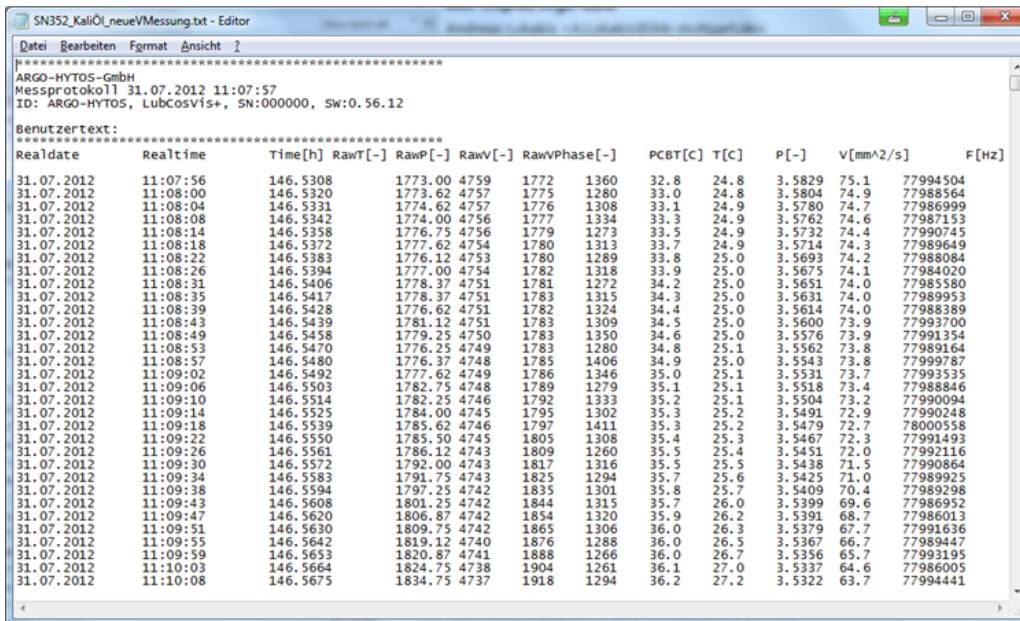


Figure 12: Network building - TCP / IP

6. Log files

After starting the measurement data recording via the red circle button (also see Chapter 4.2), a prompt appears. In this, the user is prompted to select a path for the log files folder. By default, the path of the project directory and the name "logfile<date>-<time>.txt" are indicated.



Realdate	Realtime	Time[h]	RawT[-]	RawP[-]	RawV[-]	RawVPhase[-]	PCBT[C]	T[C]	P[-]	V[mm ² /s]	F[Hz]
31.07.2012	11:07:56	146.5308	1773.00	4759	1772	1360	32.8	24.8	3.5829	75.1	77994504
31.07.2012	11:08:00	146.5320	1773.62	4757	1775	1280	33.0	24.8	3.5804	74.9	77988564
31.07.2012	11:08:04	146.5331	1774.62	4757	1776	1308	33.1	24.9	3.5780	74.7	77986999
31.07.2012	11:08:08	146.5342	1774.00	4756	1777	1334	33.3	24.9	3.5762	74.6	77987153
31.07.2012	11:08:14	146.5358	1776.75	4756	1779	1273	33.5	24.9	3.5732	74.4	77990745
31.07.2012	11:08:18	146.5372	1777.62	4754	1780	1313	33.7	24.9	3.5714	74.3	77989649
31.07.2012	11:08:22	146.5383	1776.12	4753	1780	1289	33.8	25.0	3.5693	74.2	77988084
31.07.2012	11:08:26	146.5394	1777.00	4754	1782	1318	33.9	25.0	3.5675	74.1	77984020
31.07.2012	11:08:31	146.5406	1778.37	4751	1781	1272	34.2	25.0	3.5651	74.0	77985580
31.07.2012	11:08:35	146.5417	1778.37	4751	1783	1315	34.3	25.0	3.5631	74.0	77989953
31.07.2012	11:08:39	146.5428	1776.62	4751	1782	1324	34.4	25.0	3.5614	74.0	77988389
31.07.2012	11:08:43	146.5439	1781.12	4751	1783	1309	34.5	25.0	3.5600	73.9	77993700
31.07.2012	11:08:49	146.5458	1779.25	4750	1783	1350	34.6	25.0	3.5576	73.9	77991354
31.07.2012	11:08:53	146.5470	1776.25	4749	1783	1280	34.8	25.1	3.5562	73.8	77989164
31.07.2012	11:08:57	146.5480	1776.37	4748	1785	1406	34.9	25.0	3.5543	73.8	77999787
31.07.2012	11:09:02	146.5492	1777.62	4749	1786	1346	35.0	25.1	3.5531	73.7	77993535
31.07.2012	11:09:06	146.5503	1782.75	4748	1789	1279	35.1	25.1	3.5518	73.4	77988846
31.07.2012	11:09:10	146.5514	1782.25	4746	1792	1333	35.2	25.1	3.5504	73.2	77990094
31.07.2012	11:09:14	146.5525	1784.00	4745	1795	1302	35.3	25.2	3.5491	72.9	77990248
31.07.2012	11:09:18	146.5539	1785.62	4746	1797	1411	35.3	25.2	3.5479	72.7	78005558
31.07.2012	11:09:22	146.5550	1785.50	4745	1805	1308	35.4	25.3	3.5467	72.3	77991493
31.07.2012	11:09:26	146.5561	1786.12	4743	1809	1260	35.5	25.4	3.5451	72.0	77992116
31.07.2012	11:09:30	146.5572	1792.00	4743	1817	1316	35.5	25.5	3.5438	71.5	77990864
31.07.2012	11:09:34	146.5583	1791.75	4743	1825	1294	35.7	25.6	3.5425	71.0	77989925
31.07.2012	11:09:38	146.5594	1797.25	4742	1835	1301	35.8	25.7	3.5409	70.4	77989298
31.07.2012	11:09:43	146.5608	1801.25	4742	1844	1315	35.7	26.0	3.5399	69.6	77986952
31.07.2012	11:09:47	146.5620	1806.87	4742	1854	1320	35.9	26.2	3.5391	68.7	77986013
31.07.2012	11:09:51	146.5630	1809.75	4742	1865	1306	36.0	26.3	3.5379	67.7	77991636
31.07.2012	11:09:55	146.5642	1819.12	4740	1876	1288	36.0	26.5	3.5367	66.7	77989447
31.07.2012	11:09:59	146.5653	1820.87	4741	1888	1266	36.0	26.7	3.5356	65.7	77993195
31.07.2012	11:10:03	146.5664	1824.75	4738	1904	1261	36.1	27.0	3.5337	64.6	77986005
31.07.2012	11:10:08	146.5675	1834.75	4737	1918	1294	36.2	27.2	3.5322	63.7	77994441

Figure 13: Display of measurement data in the log file

The text files can be opened with any text editor (see Figure 13). For graphic representation, the content can be exported in a standard spreadsheet program (e.g. Microsoft Excel).

The procedure to open a file in Excel is illustrated below using a .txt file. This requires, for example, the starting of Microsoft Excel 2010; then the previously saved file can be opened.

It should be noted that in the "Open" dialog, "All Files" or "Text Files" must be selected (see Figure 14). After clicking on "Open", Excel automatically starts the Text Import Wizard. Here just click on "Finish" and the data is presented in tabular form.

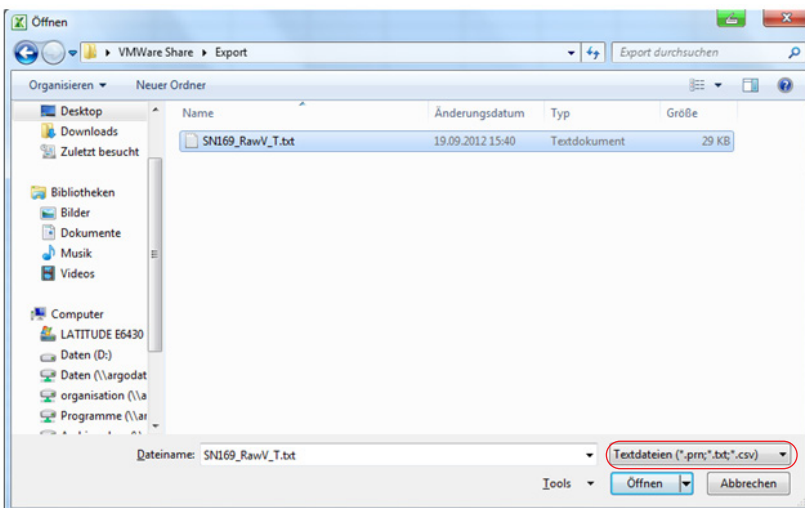


Figure 14: Opening of .txt-files

The data presented in tabular form (see Figure 15) can now be further processed and illustrated e.g. in charts.

Time [h]	P [h]	P40 [l]	PFG [1/K]	C [p(S/m)]	G	C40 [p(S/m)]	CTG [p(S/m)/K/RH [%]]	H2O [%]	PCBT [°C]	RULT [h]	RULLG [h]	AP [%]	Enc1	Enc2	Enc3	Enc4	CRC
2	0.3419	69.2	2.18222	2.18222	0	88.5	88.5	0	20.2	20.2	42.8	5000	5000 inf	0x0000	0x0010	0x0003	CRC-
3	0.6669	65.4	2.17901	2.17901	0	0	119.3	0	26.5	26.5	62.1	5000	5000 inf	0x0000	0x0010	0x0000	CRC-e
4	1.0003	61.2	2.18368	2.18368	0	97.8	99.2	0	27.4	27.4	60.4	5000	5000 inf	0x0000	0x0010	0x0000	CRC-c
5	1.3336	56.7	2.18921	2.20856	-0.00158	91.6	87.7	0.002	28.1	28.1	57.2	4999	4999 inf	0x0000	0x0001	0x0000	CRC-i
6	1.6669	52.9	2.19437	2.21008	-0.00121	93.2	103.6	0.002	29	29	54.3	4999	4999 inf	0x0000	0x0001	0x0000	CRC-0
7	2.0003	49.5	2.19891	2.2156	-0.00125	105.8	99.1	0.0026	29.9	29.9	51.8	4999	4999 inf	0x0000	0x0001	0x0000	CRC-+
8	2.3336	46.8	2.20261	2.21131	-0.00124	101	103.5	-0.00277	30.8	30.8	49.8	4998	4998 inf	0x0000	0x0001	0x0000	CRC-
9	2.6669	44.4	2.20721	2.21312	-0.001319	97.9	97.4	0.00305	31.1	31.1	48.1	4998	4998 inf	0x0000	0x0001	0x0000	CRC-y
10	3.0003	42.5	2.21003	2.21349	-0.001358	76	79	0.00692	31.6	31.6	46.6	4998	4998 inf	0x0000	0x0001	0x0000	CRC-*
11	3.3336	40.8	2.21242	2.21362	-0.001365	82.3	79.8	0.00461	32.3	32.3	45.3	4997	4997 inf	0x0000	0x0001	0x0000	CRC-]
12	3.6669	39.3	2.21449	2.21359	-0.001372	76	71.3	0.0078	32.7	32.7	44.2	4997	4997 inf	0x0000	0x0001	0x0000	CRC-]
13	4.0003	38.1	2.21629	2.21363	-0.001382	60.3	66.7	0.01284	33.1	33.1	43.2	4997	4997 inf	0x0000	0x0001	0x0000	CRC-]
14	5.0003	36	2.22078	2.21386	-0.001391	27.4	46.1	0.04278	34.7	34.7	40.8	4996	4996 inf	0x0000	0x0001	0x0000	CRC-e
15	5.6669	33.7	2.22277	2.21392	-0.001402	46.2	60.4	0.03757	35	35	39.8	4995	4995 inf	0x0000	0x0001	0x0000	CRC-6
16	6.0003	33	2.22374	2.21396	-0.001403	33.7	52.1	0.04207	35.5	35.5	39.3	4995	4995 inf	0x0000	0x0001	0x0000	CRC-1
17	6.3336	32.5	2.22457	2.21408	-0.001406	47.8	52	0.03607	35.8	35.8	38.9	4994	4994 inf	0x0000	0x0001	0x0000	CRC-6
18	6.6669	32	2.22533	2.21407	-0.001406	38.4	54.4	0.03918	36	36	38.5	4994	4994 inf	0x0000	0x0001	0x0000	CRC-u
19	7.0003	31.6	2.22601	2.21422	-0.001409	43.1	51.5	0.037	36.2	36.2	38.3	4994	4994 inf	0x0000	0x0001	0x0000	CRC
20	7.3336	31.1	2.22675	2.21426	-0.00141	30.6	49.1	0.04229	36.6	36.6	37.9	4993	4993 inf	0x0000	0x0001	0x0000	CRC-0
21	7.6669	30.9	2.22729	2.21433	-0.001412	22.8	43.8	0.04702	37	37	37.7	4993	4993 inf	0x0000	0x0001	0x0000	CRC-u
22	8.0003	30.6	2.22769	2.21444	-0.001414	30.6	43	0.04192	37.1	37.1	37.5	4993	4993 inf	0x0000	0x0001	0x0000	CRC-#
23	8.3336	30.4	2.22806	2.21455	-0.001416	30.6	41.4	0.04802	37.7	37.7	37.3	4992	4992 inf	0x0000	0x0001	0x0000	CRC-1
24	8.6669	30.2	2.22851	2.21467	-0.001416	21.2	46.9	0.04802	37.5	37.5	37.1	4992	4992 inf	0x0000	0x0001	0x0000	CRC-e
25	9.0003	30	2.22888	2.2147	-0.001416	24.3	46.8	0.04802	37.6	37.6	37	4992	4992 inf	0x0000	0x0001	0x0000	CRC
26	9.3336	29.8	2.22928	2.21484	-0.001416	27.5	44.2	0.04802	38	38	36.9	4991	4991 inf	0x0000	0x0001	0x0000	CRC-8
27	9.6669	29.6	2.22959	2.21493	-0.001416	29.9	50.2	0.04802	38.6	38.6	36.7	4991	4991 inf	0x0000	0x0001	0x0000	CRC-Y
28	10.0003	29.5	2.22992	2.2149	-0.001427	24.3	38.4	0.04797	38.5	38.5	36.6	4991	4991 inf	0x0000	0x0001	0x0000	CRC-Ç
29	10.3336	29.3	2.23016	2.21481	-0.001433	32.2	40.8	0.04437	38.5	38.5	36.4	4990	4990 inf	0x0000	0x0001	0x0000	CRC-P
30	10.6669	29.1	2.23048	2.21489	-0.001434	19.6	41.2	0.05044	38.8	38.8	36.3	4990	4990 inf	0x0000	0x0001	0x0000	CRC-E
31	11.0003	29	2.23075	2.21497	-0.001438	19.6	35.3	0.05031	38.8	38.8	36.2	4990	4990 inf	0x0000	0x0001	0x0000	CRC-Ú
32	11.3336	28.8	2.23109	2.21498	-0.001436	24.3	43.6	0.0475	39.1	39.1	36	4989	4989 inf	0x0000	0x0001	0x0000	CRC-A
33	11.6669	28.7	2.23133	2.21511	-0.001437	30.6	46.2	0.04456	39.4	39.4	35.9	4989	4989 inf	0x0000	0x0001	0x0000	CRC-
34	12.0003	28.6	2.23151	2.21511	-0.001438	21.2	40	0.04915	39.4	39.4	35.8	4989	4989 inf	0x0000	0x0001	0x0000	CRC-Ó
35	12.3336	28.4	2.23177	2.2151	-0.001438	5.5	42.3	0.0662	39.6	39.6	35.6	4988	4988 inf	0x0000	0x0001	0x0000	CRC-i

Figure 15: Tabular presentation of measurement data

Note:

Opening the log files during operation of the LubMonPC_{light} is possible. After closing, the data continues to be stored there.

Error: No communication with sensor LubMonPC _{light}	
Possible cause	Recommended measures
› Cable is not properly connected	▶ First please check the correct electrical connection of the sensor or of the data and power cable. Please take the prescribed pin assignment into account
› Cable wrong or defective	▶ Only use data cable, recommended by ARGO-HYTOS.
› Incorrect COM port has been selected	▶ Check and correct the selection of the COM port (for example, COM1).
› RS232 interface of the sensor is not activated	▶ Activate the RS232 interface temporarily or permanently with the help of "LubMon Config" or a terminal program (e.g. Windows Hyper Terminal). For more detailed information please refer to the documentation of the respective sensor.

8. Accessories

Description	Order No.
<p>Power supply</p> <ul style="list-style-type: none"> › Power supply for connection to pre-fabricated data cable SCSO 100-5030 	SCSO 100-5080
<p>Cable socket</p> <ul style="list-style-type: none"> › 8-pin › Shielded M12 socket suitable for cable diameter 6.8 mm › Protection class IP67 › Temperature range -40 °C ... 85 °C 	SCSO 100-5010
<p>Pre-fabricated data cable</p> <ul style="list-style-type: none"> › Shielded sensor cable › Protection class IP67 › Temperature range -20 °C ... 85 °C › Oil-resistant › Side 1 - molded sensor plug › Side 2 - 8 single strands 	SCSO 100-5020
<p>Pre-fabricated data cable for computer connection / D-Sub connector 9 pin</p> <ul style="list-style-type: none"> › Shielded sensor cable › Protection class IP67 › Temperature range -20 °C ... 85 °C › Oil-resistant › Side 1 - molded sensor plug › Side 2 - 9-pin D-sub connector / DC plug for power supply (power supply must be ordered separately) 	SCSO 100-5030
<p>USB / serial adapter</p> <ul style="list-style-type: none"> › Adapter for implementing serial RS232 interface to "Universal Serial Bus" (USB). › With the Universal Serial Bus it is possible to address multiple sensors simultaneously. 	SCSO 100-5040

9. Contact address

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