



PC configuration software for condition sensors

LubMon Config

SCSO 800-1100

Version 1.00.12

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Introduction



2. Introduction

LubMon Config is a program based on National Instruments' (NI) LabVIEW for configuring, reading, displaying and saving data from the following condition sensors:

- LubCos H2O
- LubCos H2Oplus II
- LubCos Level
- OPCom II

Scope of functionality:

- Easy, intuitive handling provided by a graphic user interface
- Readout of measurement data and gradients, oil reference data and limit values, as well as calibration and configuration data
- Display of temperature compensation curves
- Readout of data from the sensor memory and export in .csv format with headers for measurement series and unit labelling
- Simple switching from CAN operation to RS232
- Password protected option to setup the sensor



3. System requirements

- Windows XP or later
- Processor: Minimum Pentium 200 MHz or comparable processor is recommended
- Pentium III, 600 MHz Celeron or comparable processor
- RAM: Minimum 64 MB, 256 MB recommended
- Screen resolution: Minimum 1024 × 768 pixels

In addition, the system requirements for the NI-Runtime-Engine must be taken into account.

Quick start



4. Quick start

The steps that must be executed for commissioning **LubMon Config** with an ARGO-HYTOS condition sensor 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. Oil condition sensor LubCos or OPCOM II
- 3. Sensor cable (order number: SCSO 100-5030)
- 4. Power supply including rubber connector (order number: SCSO 100-5080)
- 5. Software LubMon Config (www.argo-hytos.com)
- 6. <u>In addition for connection via USB:</u> USB to RS232 converter with associated driver software (order no: SCSO 100-5040)

The components must be prepared as follows:

A) Software installation LubMon Config

- 1. Unzip the **LubMon Config.zip** file on your computer.
- 2. Prior to running **LubMonPClight.exe**, the LabVIEW Runtime Engine (V2010) must be installed. The software is located in the "full setup" file, which can be downloaded from the ARGO-HYTOS download area (www.argo-hytos.com). If the LabVIEW Runtime Engine is already installed, only the executable file is required.

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 the USB to RS232 converter to your PC/laptop.
- 4. If the USB to RS232 converter is not recognised by 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 cable's D-sub connector to the appropriate serial interface of the USB to RS232 converter.
- 7. Connect the USB connector of the USB to RS232 converter to a suitable interface on your PC/laptop.
- 8. Connect the power supply unit and the sensor cable.
- 9. Now properly connect your power supply unit to the line voltage via the rubber connector for non-heating apparatus. Your sensor is now ready for operation.

Quick start



D) Sensor connection for data acquisition via RS232

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

E) Start the software

- 14. LubMon Config can be started by double-clicking on the LubMon Config.exe file.
- 15. 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.
- 16. 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 assignment of the virtual COM port in the Windows Device Manager.
- 17. The incoming data as well as the identification of the sensor are displayed on the left side of the window. The data can be visualised on the right side of the window in a diagram.

User interface



5. User interface

Upon starting LubMon Config, a user interface window is opened (comp. fig. 1). The current measurement data and sensor configuration can be read in this window. Experienced users can also use the password protected "Expert Mode" to change data.

LubConfig											
LubCosH2O+ SN:2	200710	LubCont	fig _{1.04.12}	ARGO HYTOS							
%COM1 COM Common Comparison Serial Number 200710 SW# 1.18.12 Service Mode Expert Mode Close CAN/R5232 Assistant CRC CRC CRC CRC Close LubConfig											
Configuration/Data Temperature Compensation History Service Update Help/About											
Current Oil Data Current Gradients	Download Data/Configuration	Export Data/Configuration		III							
Time:2409.5491[h] Time:2409.5500[h] T:21.2[øC] PTG:0.00142[1/K]	Oil Reference Data	Limits	Calibration Data	Configuration							
P:1.1406[-] CTG:0.0492[p5/m/K] P40:1.167[-] HTG:0.0000[%/K] C:1196[p5/m] LGP40:0.000000[1/h] C40:3066[p5/m] LGC40:0.000000[5/ RH:49.0[%] LGT:0.00000[K/h] RH20:49.0[%] MGP40:0.000000[1/h] TMean:32.08[øC] MGC40:0.000000[1/h] RULT:932[h] SGC40:0.0000[[x/h] RULL:932[h] SGT:0.0000[[x/h] RUL:932[h] SGH20:0.0000[[x/h] APP40:0.0[%] CRC:f	RefStat 15 RefC40 0 RefP40 0 RefTG 0 RefTG 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	LimP40% 5 LimC40% 400 LimT 80 LimTMea 60 RULh 1000 RULf8 0,25 0 0 0 0 0 0 0 0	TOff -50,58 TFak 0,04939 HOff -993,58 HFak 0,140208 POff 0,22592 PFak 0,0000006399 COff 4319896,5 CFak -0,518065 0 0 0 0	AO1 40 AO2 40 ETrig 0 TrAu 255 ORef 30 COEN 1 MemInt 20 COSpd 125 COID 5 COHBeat 500 TPDO1ID 389							
APC40:0.0[%] FB:0.086[-] OAge:69[h] ERC: CRC:8				TPDO2ID 645 TPD01Ty 255 TPD02Ty 255 TPD01Ti 1000 TPD02Ti 1000 RULowr 0 0 0							

Fig. 1: User interface LubMon Config

The user interface can be divided into the following three areas (I-III, fig. 1):

5.1. Area I: Header

The header displays the connected sensor type (in fig. 1: *LubCos H2O+*) and the sensor serial number. In addition, the version number of the LubMon Config program in use is displayed (here: *1.04.12*).

5.2. Area II: Communications settings and program mode

On the left side the COM interface to which the sensor is connected can be selected. Transfer errors and checksum errors are indicated by the two signal lights to the right. For sensors that are normally operated in CANopen mode and are only connected to a PC using LubMon Config for data configuration or readout, the "CAN/RS232" button can be used to change the communication mode temporarily. To do so, follow the instructions in the pop-up window (see fig. 2).

User interface								
To activate R5232 follow the instructions: 1. Disconnect sensor from power supply 2. Click OK 3. Connect power to the sensor OK Abbrechen								

Fig. 2: Instructions - Switching from CANopen mode to RS232 mode

In the middle the serial number and software version of the connected sensor are displayed. By clicking on the button it is also possible to switch to "Service Mode" or "Expert Mode" to make changes to sensor configuration or calibration data. Since this is not relevant for normal users and also risks permanently destroying the calibration and configuration data, these areas are password-protected.

On the right you will also find the "Close LubMon Config" button that can be used to exit the program.

5.3. Area III: Configuration area

The configuration area forms the largest part of the user interface. Several tabs divide the configuration area into *Configuration/Data*, *Temperature Compensation*, *History*, *Service*, *Update* and *Help/About* (see fig. 3).

5.3.1. Configuration/Data

Current sensor measurement values and configuration data are read out by clicking *Download Data/Configuration*. By doing so the following data is displayed from right to left in list form:

- Current Oil Data,
- Current Gradients,
- Oil Reference Data,
- Limits,
- Calibration Data and
- Configuration.

The composition of this data is dependent on the connected sensor. The meaning of the individual parameters is described in the user manual for the given sensor.

RGO HYTOS

				HYTOS
Configuration/Data Temperature Compensation History	Service Update Help/Abo	ut		
Current Oil Data Current Gradients	Download Data/Configuration	Export Data/Configuration		
Time:2409.5491[h] Time:2409.5500[h] T:21.2[øC] PTG:0.00142[1/k] P:1.1406[-] CTG:0.0492[p5/m/k] P40:1.167[-] HTG:0.0000[%/k] C:1196[p5/m] LGP40:0.000000[1/h] C40:0.00000[p5/ LG7:0.0000[%/k] RH:49.0[%] LG7:0.0000[p5/ RH:49.0[%] LG7:0.0000[p5/ RH:20:49.0[%] MGP40:0.000000[1/k] Ruen:32.08[øC] MGC40:0.00000[p5/ PCBT:23.7[øC] SGP40:0.0000[p5/ RUL1:932[h] SGC40:0.0000[p5/m] RUL1:932[h] SGF40:0.0000[x/h] APP40:0.0[%] CRC:f APC40:0.0[%] CRC:f APC40:0.0[%] ERC: CRC:ő Image: Image	RefStat 15 RefC40 0 RefP40 0	LimP40% 5 LimC40% 400 LimC 40% 400 LimT 80 LimTMea 60 RULh 1000 RULh 1000 RULh 0,25 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Calibration Data TOff -50,58 TFak 0,04939 HOff -993,58 HFak 0,140208 POff 0,22592 PFak 0,0000006399 COff 4319896,5 CFak -0,518065 0 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0	Configuration AO1 40 AO2 40 ETrig 0 TrAu 255 ORef 30 COEN 1 MemInt 20 COSpd 125 COID 5 COHBeat 500 TPDO1ID 389 TPDO2ID 645 TPDO1Y 255 TPDO1I 1000 TPDO2IF 1000 RULown 0
	0	0	0	0

ARGO

Fig. 3: "Configuration/Data" tab

User interface

The data readout will be exported as a .csv and a .xml file (Button *Export Data*) allowing them e.g. to be further processed in a spread sheet application (see also Chapter 6) or for potential subsequent transfer back to the sensor.

5.3.2. Temperature Compensation

On the "Temperature Compensation" tab a temperature histogram as well as a diagram with the support points distributed across the temperature range is displayed (for H2Oplus II these are permittivity, conductivity as well as relative humidity in tabular form).

The temperature histogram shows the dwell time in the respective temperature classes. The higher the value, the longer the sensor was operated in this temperature range.

The temperature support points are used to calculate the temperature-compensated values of e.g. permittivity (P40) or conductivity (C40). To do so, the sensor saves the values of P and C in various temperature classes and weights them according to the dwell time in the given class (max. 255). The regression line can be used to compute back to the reference temperature (40 °C). LubMon Config can be used to display this data (see fig. 3: right and centre diagrams).



Fig. 4: "Temperature Compensation" tab

For relative humidity on the other hand, only the humidity-temperature gradient and weighting are displayed in tabular form, but no diagram.

The display settings for the graphs can be opened by clicking the associated legend symbol (see fig. 5).



Fig. 5: Graph display

There are also various zoom functions available. These can be selected by clicking the magnifying glass symbol.

User interface





Fig. 6: Zoom functions

5.3.3. History

Given that the connected sensor supports the "store historical data" function (e.g. H2Oplus II or Visplus), these can be read out in the *History* area.

Click *Get Available History* to load the quantity and time period of the history records currently available from the sensor. These will then be displayed in the upper part of the window (see fig. 7). In this example, the sensor has recorded data from the start (0 hours) until the present time (325 hours). Thus, 1001 of the 6779 total available records were used.

Available Time Frame / h	-	_	_	_	_	_	_	_							
	Ů	25	50	75	100	125	150	175	200	225	250	275	300	325	;
Memory Load															1001/6779

Fig. 7: Time range of history data and number of records

The history selection function in the upper right can be used e.g. to select the setting *Time Base* (see fig. 8). This means that only the data configured using the "*Available Time Frame*" scale is read out from the history (in fig. 7 records are selected from 200 hours until the last dataset at 325 hours). The readout process itself is started by clicking at the *Download History* button. After the download is finished the data is displayed in the table below. The uppermost line indicates the allocation of the respective value to the measurement parameters as well as its unit.

If the entire history is to be loaded from the sensor, this can be done by making a corresponding selection on the time scale, or using the *Complete* setting in the history selection.

User interface



Accelled a Warmer							C.1.1.1	bla tratana			Historyauswahl		
0 25 50 75 100 125 150 175 200 225 250 275 300 323													
Mem	orvioad	23 30 73 1	.00 123 130 1	75 200 225 25	0 273 300 32.	993/6779	Downloa	d History			🔿 Data Set Ba	O Data Set Base	
History Data													
History Data					_						-		
Time [h]	T[°C]	P[-]	P40 [-]	PTG [1/K]	C [pS/m]	C40 [pS/m]	CTG [pS/m/K]	RH [%]	H20 [%]	PCBT [°C]	RULT [h]		
0.3336	27.4	1.01479	1.01479	0.000000	41.6	44.6	0.00000	52.4	52.4	34.4	5000		
0.3378	29.6	1.01401	1.01401	0.000000	38.4	38.4	0.00000	44.8	44.8	35.1	5000		
0.3419	69.2	2.18222	2.18222	0.000000	88.5	88.5	0.00000	20.2	20.2	42.8	5000	1	
0.6669	65.4	2.17901	2.17901	0.000000	0.0	119.3	0.00000	26.5	26.5	62.1	5000		
1.0003	61.2	2.18368	2.18368	0.000000	97.9	90.2	0.00000	27.4	27.4	60.4	5000	1	
1.3336	56.7	2.18921	2.20856	-0.001158	91.6	87.7	0.00200	28.1	28.1	57.2	4999		
1.6669	52.9	2.19437	2.21008	-0.001221	93.2	103.6	0.00020	29.0	29.0	54.3	4999		
2.0003	49.5	2.19891	2.21080	-0.001250	105.8	99.1	0.00205	29.9	29.9	51.8	4999		
2.3336	46.8	2.20261	2.21131	-0.001274	101.0	103.5	-0.00277	30.8	30.8	49.8	4998	1	
2.6669	44.4	2.20721	2.21312	-0.001319	97.9	97.4	0.00305	31.1	31.1	48.1	4998	1	
3.0003	42.5	2.21003	2.21349	-0.001358	76.0	79.0	0.00692	31.6	31.6	46.6	4998	1	
3.3336	40.8	2.21242	2.21362	-0.001365	82.3	79.8	0.00461	32.3	32.3	45.3	4997		
3.6669	39.3	2.21449	2.21359	-0.001372	76.0	71.3	0.00780	32.7	32.7	44.2	4997		
4.0003	38.1	2.21629	2.21363	-0.001382	60.3	65.7	0.01284	33.1	33.1	43.2	4997		
5.0003	35.0	2.22078	2.21386	-0.001391	27.4	45.1	0.04278	34.7	34.7	40.8	4996		
5.6669	33.7	2.22277	2.21392	-0.001402	46.2	60.4	0.03757	35.0	35.0	39.8	4995		
6.0003	33.0	2.22374	2.21396	-0.001403	33.7	52.1	0.04207	35.5	35.5	39.3	4995	v	
<											>		

Fig. 8: "History" tab

The *Export History* button saves the downloaded history data to a .csv file for further processing, e.g. in a spread sheet application to display as a graph (see also Chapter 6 – Exporting files).

5.3.4. Service

Without entering a password for the service mode, the service area can only be used to read out, not to write data. In that case the buttons for changing the service configuration data are greyed and deactivated.

If the service mode is set the assignment of the analogue outputs, the CAN operating mode settings as well as limit values for the oil measurement data can be set. In addition, it is possible to notify the sensor that it has been placed in a new oil medium by activating the Service Mode (*Set new oil*). History data can also be deleted in Service Mode (*Delete History*).



Fig. 9: "Service" tab

5.3.5. Update

This area is currently not yet supported.

5.3.6. Help/About

This area contains the supported sensor types and the change log containing information about changes from version to version.



Fig. 10: "Help/About" tab

Communication



6. Communication

Communication with the sensor takes place via a serial COM interface. Sensors configured for CANopen can rapidly be switched over to RS232 operation using the method described in Chapter 5.2, allowing them to be read and configured using **LubMon Config**.

^I ∕COM1 ▼	СОМ
CAN/RS232 Assistant	CRC

Fig. 11: Selection of COM interface and switchover from CAN to RS232

Interface parameters for the COM port such as the baud rate or the stop bit cannot be changed, and do not need to be. Their implementation in the program is fixed. The interface parameters of the program for the COM port are as follows by default:

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

Note:

Additional virtual COM ports can be created using USB serial converters. This makes it possible to connect several sensors to a PC despite only one physically available COM port. Note that most commercially available USB serial converters require a driver to be installed. If the driver is installed correctly, the new virtual COM port can be selected in the LubMon Config user interface.

Exporting files



7. Exporting files

The current measurement values as well as the history data and displayed graphs can be exported as .csv files. These files contain the individual values separated by commas, and can be saved to a folder on a disk.

The data can then be opened and edited, e.g. in Microsoft Excel. This way, the history data can be used to generate graphs illustrating the measurement results. The procedure used to open a .csv file in Excel is detailed below:

Start e.g. Microsoft Excel 2010 and open the previously saved file. Make sure that "All files" or "Text files" is selected as the file type in the "Open" window (comp. Fig. 10).

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🖉 🖉 🖉 🖉 🖉 Benu	tzer 🕨 a.wippler 🕨 Desktop 🕨 VMWare Share 🕨 Export		ort durchsuchen	٩
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🛣 Microsoft Excel	A Name	Änderungsdatum	Тур	Größe
☆ Favoriten ■ Desktop ▶ Downloads ③ Zuletzt besucht	函 LubCosH2O+ SN 200760 history_2012-09-28_13-58-41.csv	28.09.2012 13:58	Microsoft Excel-C	12
 ⇒ Bibliotheken ➡ Bilder ➡ Dokumente → Musik ➡ Videos 				
👰 Computer				
LATITUDE E6430				
👝 Daten (D:)	▼			۱.
D	ateiname:	▼ Texto Iools ▼ Of	lateien (*.prn;*.txt;*.csv) fnen 🔽 Abbrech	ien

Fig. 12: Opening .csv files

After opening the file, the values are still stored continuously in the chart (see fig. 11) This can be changed by selecting the first column and clicking "Text in columns". The data in the .csv files is separated with tabulators, which is the default setting of MS Excel. It is possible to select different import options by clicking on "Next", or otherwise complete the process by clicking on "Finish".

Now the data will be displayed in correct tabular form with separated columns (see fig. 12).

Exporting files				05
				•••
		LubCosH2O+ SN 20	00760 history_2012-09-28_13	-58-41.csv - Mic
Datei Start Einfügen Seitenlayout Formeln Daten	Überprüfen Ansicht			
	Verbindungen Eigenschaften	₹↓ AZA ¥ Lösche	n 📰 übernehmen	→ <mark> </mark>
Aus Aus dem Aus Aus anderen Vorhandene Alle Access Web Text Ouellen Verbindungen aktualisieren 🦉	Verknüpfungen bearbeiten	Z Sortieren Filtern V Erweite	ert Spalten entf	likate Datenübei ernen 🔻
Externe Daten abrufen V	erbindungen	Sortieren und Filtern		
A1 • fr Time [h]T [°C]P [-]P40 [-]PTG	1/KIC [pS/mIC40 [pS/mIC]	TG [pS/m/K]RH [%]H20 [%]PCB	T [°C]RULT [h]RULLG [h]A	P [%]ErrC1Err
	F G	н	K	
1 Time [h]T [°CIP [-IP40 [-IPTG [1/K]C [pS/m]C40 [pS/m]CTG [pS	/m/K1RH [%1H20 [%1PCBT	I'CIRULT INIRULLG INIAP (%)E	rrC1ErrC2ErrC3ErrC4	
2 0,341969,22,182222,182220,00000088,588,50,0000020,220,242	850005000inf0x00000xc08	10x08100x0003CRC:		
3 0,666965,42,179012,179010,0000000,0119,30,0000026,526,562	150005000inf0x00000xc08	10x08000x0000CRC:e		
4 1,000361,22,183682,183680,00000097,990,20,0000027,427,460	450005000inf0x00000xc00	10x08000x0000CRC:c		
5 1,333656,72,189212,20856-0,00115891,687,70,0020028,128,157	,249994999inf0x00000xc0	010x00000x0000CRC:i		
6 1,666952,92,194372,21008-0,00122193,2103,60,0002029,029,05	54,349994999inf0x00000xc	0010x00000x0000CRC:Ò		
7 2,000349,52,198912,21080-0,001250105,899,10,0020529,929,95	51,849994999inf0x00000xc	0010x04000x0000CRC:»		
8 2,333646,82,202612,21131-0,001274101,0103,5-0,0027730,830,	849,849984998inf0x00000x	c0010x00000x0000CRC:~		
9 2,666944,42,207212,21312-0,00131997,997,40,0030531,131,148	3,149984998inf0x00000xc0	010x00000x0000CRC: <u>ý</u>		
10 3,000342,52,210032,21349-0,00135876,079,00,0069231,631,646	5,649984998inf0x00000xc0	010x00000x0000CRC:		
11 3,333640,82,212422,21362-0,00136582,379,80,0046132,332,348	,3499/499/inf0x00000xc0	010x00000x0000CRC:		
12 3,666939,32,214492,21359-0,00137276,071,30,0078032,732,744	1,249974997inf0x00000xc0	010x00000x0000CRC:i		
13 4,000338,12,216292,21363-0,00138260,365,70,0128433,133,143	3,2499749971nt0x00000xc0	010x00000x0000CRC:		
14 5,000335,02,220702,21300-0,00135127,445,10,0427034,734,740	0,049904990ini0x00000xc0	010x00000x0000CRC.0		
15 5,000533,72,222772,21352-0,00140240,200,40,0375735,035,035	3495545551110X00000XC0	010x00000x0000CRC.0		
17 6 333632 52 22/572 21/08-0 001/06/7 852 00 0360735 835 835	9/99/199/199/inf0x00000xc0	010x00000x0000CRC:2		
18 6 666932 02 225332 21407-0 00140638 454 40 0391836 036 038	549944994inf0x00000xc0	010x00000x0000CRC:ü		
19 7.000331.62.226012.21422-0.00140943.151.50.0370036.236.238	349944994inf0x00000xc0	010x00000x0000CRC:		
20 7,333631,12,226752,21428-0,00141030,649,10.0422936.636.637	,949934993inf0x00000xc0	010x08000x0000CRC:ö		
21 7,666930,92,227292,21433-0,00141222,843,80.0470237.037.037	,749934993inf0x00000xc0	010x00000x0000CRC:ù		
22 8,000330,62,227692,21444-0,00141430,643,00,0419237,137,137	,549934993inf0x00000xc0	010x00000x0000CRC:!!		
23 8,333630,42,228082,21455-0,00141630,641,40,0480237,737,737	,349924992inf0x00000xc0	010x00000x0000CRC: L		

ARGO

Fig. 13: Opened .csv file with history data

The data is displayed in tabular form with separated columns (see fig. 12) and can be illustrated e.g. using graphs.

🗶 🚽	17 • (° •	- -						LubCo	osH2O+ SN 200	760 history_2	012-09-28_13-5	58-41.csv - Micro	soft Excel					
Datei	Start	Einfügen	Seitenlayout	Formein	Daten Ü	berprüfen A	nsicht											
Aus Access	Aus dem /	Aus Aus andere Quellen *	n Vorhanden Verbindung	ne All Jen aktualis	e ieren + 🖙 Verk	rindungen nschaften nüpfungen bearl	2↓ Z↓	Sortieren Filter	K Löschen Erneut ü Erweiter	ibernehmen t	Text in Spalten	kate Datenüberp	rüfung Konsolidieren Wa	wäre-wenn-Analys	e Gruppie	ren Gruppierun aufheben	g Teilergebni	●클 Detail anzeigen ■클 Detail ausblenden
	Exte	erne Daten abrufe	en		Verbind	lungen		Sortiere	n und Filtern				Datentools			(Sliederung	5
	A1	• (°	fx Time [h]															
	A	B	С	D	E	F	G	H		J	K	L	M N	0	Р	Q	R	S
1 Tir	ne [h]	T[°C] P	[-] P4	40 [-]	PTG [1/K]	C [pS/m] C	40 [pS/m]	CTG [pS/m/KF	RH [%]	H20 [%]	PCBT [°C]	RULT [h]	RULLG [h] AP [%]	ErrC1	ErrC2	ErrC3	ErrC4	
2	0,3419	69,2	2,18222	2,18222	0	88,5	88,5	0	20,2	20,2	2 42,1	8 5000	5000 inf	0×0000	0xc081	0×0810	0x0003	CRC:"
3	0,6669	65,4	2,17901	2,17901	0	0	119,3	0	26,5	26,8	5 62,	1 5000	5000 inf	0×0000	0xc081	0x0800	0×0000	CRC:e
4	1,0003	61,2	2,18368	2,18368	0	97,9	90,2	0	27,4	27,4	1 60,4	4 5000	5000 inf	0x0000	0xc001	0x0800	0x0000	CRC:c
5	1,3336	56,7	2,18921	2,20856	-0,001158	91,6	87,7	0,002	28,1	28,	1 57,3	2 4999	4999 inf	0x0000	0xc001	0x0000	0x0000	CRC:i
6	1,6669	52,9	2,19437	2,21008	-0,001221	93,2	103,6	0,0002	29	29	54,	3 4999	4999 inf	0x0000	0xc001	0x0000	0x0000	CRC:0
1	2,0003	49,5	2,19891	2,2108	-0,00125	105,8	99,1	0,00205	29,9	29,9	51,	8 4999	4999 inf	0x0000	0xc001	0x0400	0x0000	CRC:»
8	2,3336	46,8	2,20261	2,21131	-0,001274	101	103,5	-0,00277	30,8	30,8	49,	8 4998	4998 int	0x0000	0xc001	0x0000	0x0000	CRC:~
9	2,6669	44,4	2,20/21	2,21312	-0,001319	97,9	97,4	0,00305	31,1	31,1	48,	1 4998	4998 int	0×0000	0xc001	0x0000	0x0000	CRC:y
10	3,0003	42,5	2,21003	2,21349	-0,001356	/6	79	0,00692	31,6	31,0	40,	6 4996	4996 Int	0x0000	0xc001	0x0000	0x0000	CRU:
11	3,3330	40,0	2,21242	2,21362	-0,001365	02,3	79,0	0,00461	32,3	32,	45,	3 4997	4997 Int 4007 inf	0x0000	0xc001	0x0000	0x0000	CRC:
12	3,0009	39,3	2,21449	2,21359	-0,001372	60.2	71,3	0,0076	32,7	32,1	44,	2 4997	4997 Int 4007 inf	0x0000	0xc001	0x0000	0x0000	CRCI
14	4,0003	36,1	2,21023	2,21303	-0,001382	27.4	45.1	0.04278	34.7	34.3	7 40	2 4337	4996 inf	0x0000	0xc001	0x0000	0x0000	CRC.¢
15	5,6669	33.7	2 22277	2 21300	-0.001402	46.2	60.4	0.03757	36	34	30	8 4995	4995 inf	0×0000	0xc001	0×0000	0x0000	CRC:à
16	6,0003	33	2 22374	2 21396	-0.001402	33.7	62.1	0.04207	36.6	36.4	39	3 4995	4995 inf	0×0000	0xc001	0×0000	0x0000	CRC-1
17	6 3336	32.5	2 22457	2 21408	-0.001406	47.8	52	0.03607	35.8	35.8	3 38	9 4994	4994 inf	0x0000	0xc001	0x0000	0x0000	CRC:ò
18	6 6669	32	2 22533	2 21407	-0.001406	38.4	54.4	0.03918	36	3(38	5 4994	4994 inf	0×0000	0xc001	0x0000	0x0000	CRC:0
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	0×0000	0xc001	0×0000	0×0000	CRC:
20	7.3336	31.1	2.22675	2,21428	-0.00141	30.6	49.1	0.04229	36.6	36.6	37.	9 4993	4993 inf	0×0000	0xc001	0x0800	0x0000	CRC:ö
21	7,6669	30.9	2.22729	2,21433	-0.001412	22.8	43.8	0.04702	37	3	7 37.	7 4993	4993 inf	0x0000	0xc001	0x0000	0x0000	CRC:ù
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	0xc001	0x0000	0x0000	CRC:!!
23	8,3336	30,4	2,22808	2,21455	-0,001416	30,6	41,4	0,04802	37,7	37,1	7 37,3	3 4992	4992 inf	0x0000	0xc001	0x0000	0x0000	CRC: L
24	8,6669	30,2	2,22851	2,21467	-0,001416	21,2	46,9	0,04802	37,5	37,5	5 37,	1 4992	4992 inf	0x0000	0xc001	0x0000	0x0000	CRC:ø
25	9,0003	30	2,22888	2,2147	-0,001416	24,3	46,8	0,04802	37,6	37,6	5 3	7 4992	4992 inf	0×0000	0xc001	0x0000	0x0000	CRC:
26	9,3336	29,8	2,22928	2,21484	-0,001416	27,5	44,2	0,04802	38	38	3 36,	9 4991	4991 inf	0×0000	0xc001	0x0000	0x0000	CRC:ô
27	9,6669	29,6	2,22959	2,21493	-0,001416	25,9	50,2	0,04802	38,6	38,6	5 36,	7 4991	4991 inf	0x0000	0xc001	0x0000	0x0000	CRC:Ý
28	10,0003	29,5	2,22992	2,2149	-0,001427	24,3	38,4	0,04797	38,5	38,5	5 36,	6 4991	4991 inf	0x0000	0xc001	0x0000	0x0000	CRC:Ç
29	10,3336	29,3	2,23016	2,21481	-0,001433	32,2	40,8	0,04437	38,5	38,6	5 36,4	4 4990	4990 inf	0x0000	0xc001	0x0000	0x0000	CRC:Þ
30	10,6669	29,1	2,23048	2,21489	-0,001434	19,6	41,2	0,0504	38,8	38,8	3 36,3	3 4990	4990 inf	0x0000	0xc001	0x0000	0x0000	CRC:Æ
31	11,0003	29	2,23075	2,21497	-0,001435	19,6	35,3	0,05031	38,8	38,8	3 36,3	2 4990	4990 inf	0×0000	0xc001	0x0000	0x0000	CRC:Ü
32	11,3336	28,8	2,23109	2,21498	-0,001436	24,3	43,6	0,0475	39,1	39,1	1 3	6 4989	4989 inf	0×0000	0xc001	0×0000	0x0000	CRC:Ă
33	11,6669	28,7	2,23133	2,21511	-0,001437	30,6	46,2	0,04456	39,4	39,4	1 35,	9 4989	4989 inf	0×0000	0xc001	0x0000	0x0000	CRC:1
34	12,0003	28,6	2,23151	2,21511	-0,001438	21,2	40	0,04915	39,4	39,4	1 35,	8 4989	4989 inf	0×0000	0xc001	0x0800	0x0000	CRC:0
35	12.3336	28.4	2.23177	2.2151	-0.001438	5.5	42.3	0.0662	39.6	39.6	5 35.	6 4988	4988 inf	0×0000	0xc001	0x0800	0x0000	CRC:i

Fig. 14: Tabular display of history data

Troubleshooting



8. Troubleshooting

Error: No sensor communication with LubMon Config								
Cause	Step							
 Cable is not correctly connected 	 First ensure that the electrical connections of the sensor, i.e. the data cable and power cable, have been properly established. Ensure that the connection is configured as described. 							
 Wrong cable or cable is defective 	 Use only the data cables recommended by ARGO-HYTOS. 							
 Wrong COM port selected 	 Check and correct the selection of the COM port (e.g. COM1) 							
 No communication with the sensor 	 Please check that no other program is running that uses the same serial interface. 							
 Sensor RS232 interface not activated 	 Activate the RS232 interface temporarily or permanently using "LubMon Config" or a terminal program (e.g. Windows Hyperterminal). More detailed information is available in the documentation for the given sensor. 							

Accessories



9. Accessories

Power supply unit

Description: Power supply unit for connecting to prefabricated data cable SCSO 100-5030

Order number: SCSO 100-5080

Line socket

Description: 8-pin, shielded M12 cable socket suitable for cable diameters of 6 to 8 mm, protection class IP67, temperature range -40 °C to 85 °C

Order number: SCSO 100-5010

Pre-assembled data cable

Description: Shielded sensor cable, protection class IP67, temperature range -20 °C to 85 °C, oil-resistant, page 1 - extrusion die sensor plug, page 2 - 8 single-strand

Order number: SCSO 100-5020

Pre-assembled data cable for computer connection / D-Sub connector 9-pin

Description: Shielded sensor cable, protection class IP67, temperature range -20 °C to 85 °C, oil-resistant, page 1 -extrusion die sensor plug, page 2-9-pin D-sub socket / hollow connector for power supply (power supply unit must be ordered separately!)

Order number: SCSO 100-5030

USB/serial adapter

Description: Adapter for conversion of serial RS232 interface to "Universal Serial Bus" (USB). With the Universal Serial Bus it is possible to address multiple sensors concurrently.

Order number: SCSO 100-5040

Contact address



10. Contact address

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