



Remote interface

## **LubMon Connect**

SCSO 700-1000

Rev. 1.30.13

## Safety and operating instructions



**Read the safety instructions and operating instructions prior to commissioning!**

**Note:** Illustrations do not always precisely correspond to the original. No legal claim can be derived due to incorrect information. Product design is subject to change without notice.

For any questions please contact:

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**The device complies with CE requirements**

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## 2. Quick start

The steps that must be executed for commissioning the **LubMon Connect** gateway are described below.

### A) Installation of the CAN bus with LubMon Connect und compatible sensors

1. The Connection of the sensors and the Remote interface to the CAN bus is described in detail in **Chapter 7 – Commissioning the Gateway**. The order codes of the required accessories are also listed in this chapter.
2. The used sensors have to be configured according to the description of the respective sensor manuals.

### B) Software installation

3. The configuration software for **LubMon Connect** can be downloaded from the website [www.argo-hytos.com](http://www.argo-hytos.com). Installation is not required. The individual components of the software package are executable immediately after the .zip file is unpacked.

### C) Connecting the LubMon Connect to the internet

4. Establish a connection to the internet with **LubMon Connect**. Detailed information can be found in **Chapter 6 – Electrical connection** and **Chapter 7 – Commissioning the gateway**.

### D) LubMon Connect configuration

5. Connect your computer to the same network as the **LubMon Connect** and start the tool „**Ethernet\_Config.exe**“. The network settings of the **LubMon Connect** can be configured according to your requirements (cmp.: Chapter 7).
6. The tool „**RI\_Config.exe**“ can be used to configure the node ID and the CAN baud rate of the used sensors (cmp.: Chapter 7).

### E) Configuration remote portal

7. The configuration of the remote portal is described in **Chapter 8 – Remote Portal**.

### 3. Performance features

#### 3.1. General

The gateway **LubMon Connect** is a remote gateway for the connection of ARGO-HYTOS sensors via a CANopen interface. The data of the connected sensors is automatically transmitted to a web database, and can be displayed and exported using a web page.



**Figure 3.1: LubMon Connect**

Using the CAN bus and the CANopen protocol provides a simple, robust way to integrate the sensors into existing systems and to guarantee secure communication.

For communication with the Internet, the gateway provides an integrated Ethernet interface and an integrated GSM module. Communication can either take place via the local network, or, in the case of mobile or remote systems, using the highly developed global GSM network.

#### 3.2. Data loggers

**LubMon Connect** Communicates with a server on the Internet that is able to store all incoming data at programmable time intervals. The data can either be visualised online in graph form or exported for subsequent analyses. A data storage capacity of 100,000 records is available for each **LubMon Connect**. Once the memory has been exhausted, the oldest records are deleted automatically.

## 4. Technical data

### 4.1. General data

Data	Size	Unit
<b>Environmental conditions, operation:</b> Temperature Humidity	5..50 0...95	°C % r.H.
<b>Environmental conditions, storage:</b> Temperature Humidity	0..60 0...95	°C % r.H.
<b>Power supply</b>	12...28	VDC
<b>Power consumption</b>	Max. 0.3	A
<b>CAN interface</b> Connector Bus speeds Protocol	SUB-D9 100 / 125 / 250 / 500 CANopen	- kBaud -
<b>Ethernet interface</b> Connection type Speed Protocol	RJ45 10 / 100 UDP	- MBit -
<b>GSM</b> Antenna Transmission power @ 850/900 MHz Transmission power @ 1800/1900 MHz SIM card type Frequencies	Stub Antenna FME 2 1 Standard SIM card 1.8V / 3V 850 / 900 / 1800 / 1900 (quad-band EGSM)	- W W - MHz
<b>Optical displays</b> Power LED Ethernet LED	Green Yellow	
<b>Supported sensors</b>	LubCos H2Oplus II LubCos Level200 LubCos Level375 LubCos Level615 LubCos Vis+ OPCOM II Analog/CAN interface	

**Table 4.1: Technical data**

4.2. Dimensions

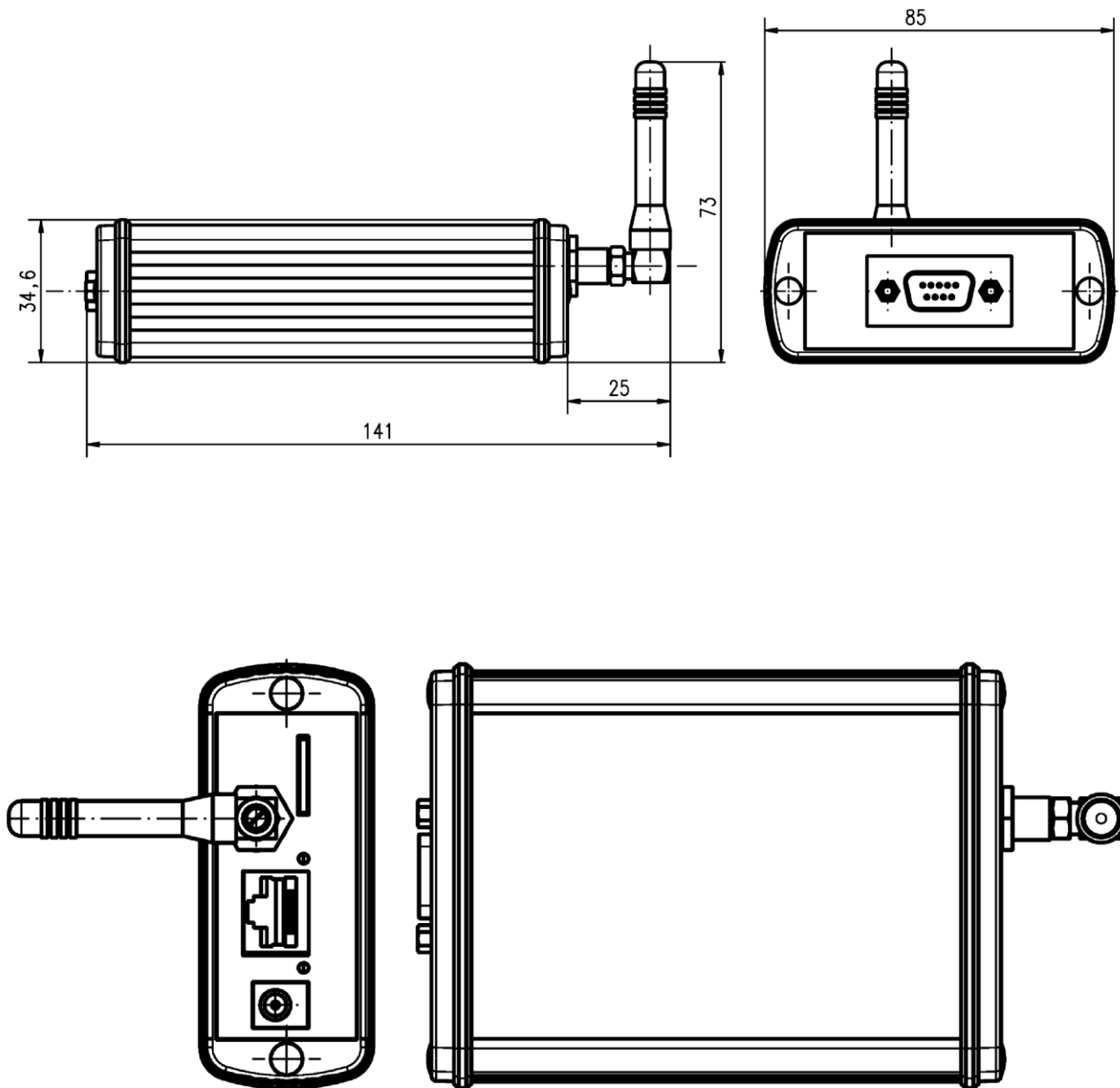
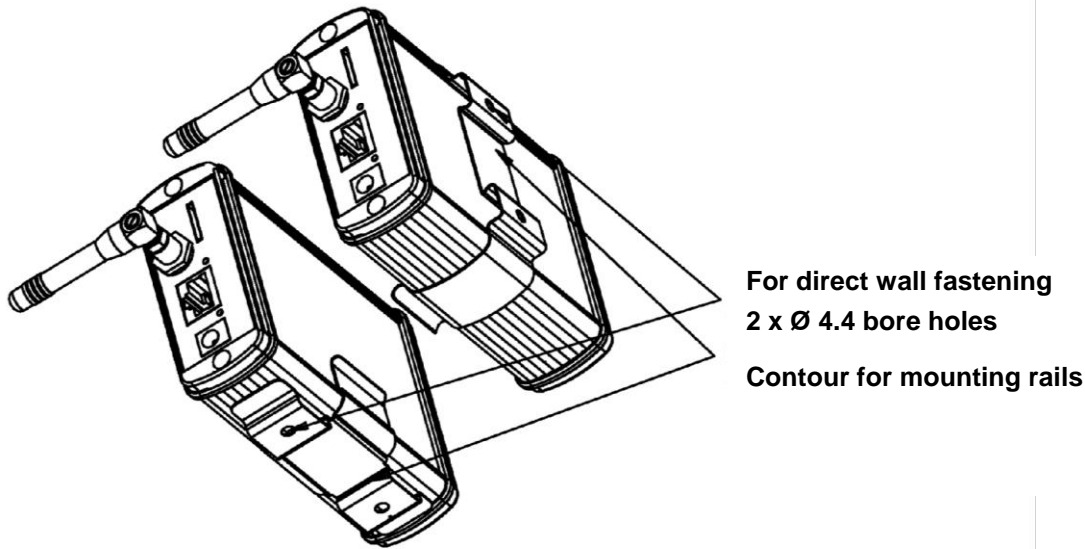


Figure 4.2: LubMon Connect gateway connecting dimensions



## 5. Installation

In order to facilitate integration and to make the connection as simple as possible, several attachment options are provided (cf.: **Figure 5.1**). In addition, a corresponding cable can be used to connect an external antenna. An optimal transmission position can be achieved through an appropriate choice of cable length.



**Figure 5.1: Installation options for LubMon Connect**

Please note the following guidelines with respect to the installation position and location of the device in order to ensure proper function.

- **LubMon Connect** is not protected against penetration by moisture and dust, meaning that a suitably shielded installation location should be chosen.
- The necessary environmental conditions and power supply must be provided (see Chapter 4 – Technical data).
- Network set-up and connection of the power supply must be performed by qualified personnel in order to ensure correct functioning!

## 6. Electrical connection

### 6.1. General, plus safety notices

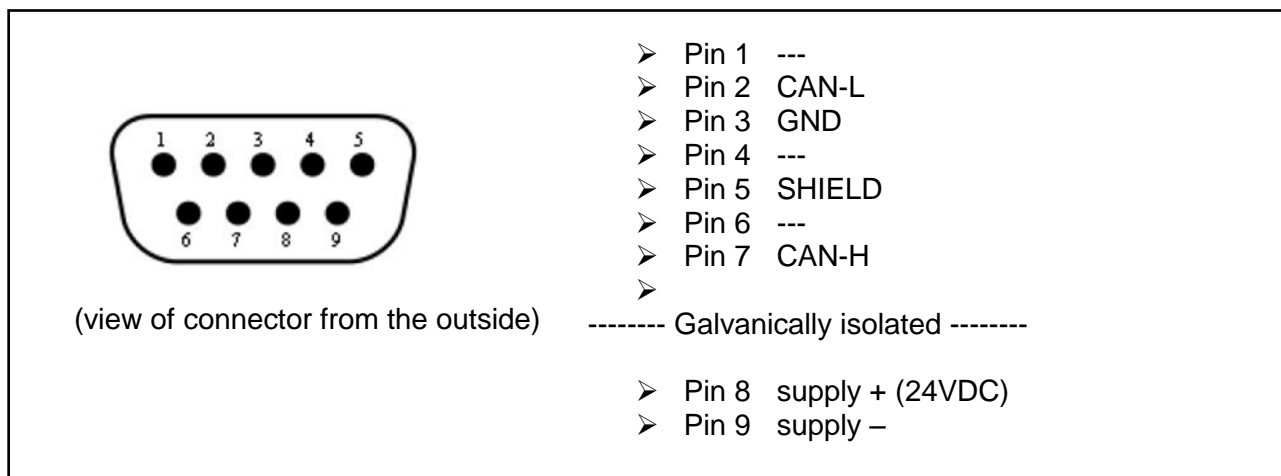


The electrical installation may only be performed by qualified professionals (trained electricians) with the power off and in accordance with the applicable standards and guidelines. The manufacturer will accept no responsibility in the event of improper installation.

Comply with national and international guidelines for setting up electrical equipment. (Power supply in accordance with EN50178, SELV, PELV, VDE0100-410/A1).

### 6.2. Sub-D connector

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



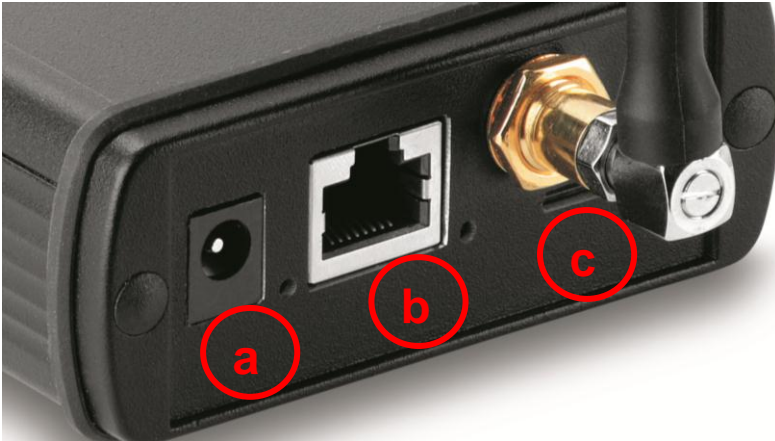
**Figure 6.1: Pin assignments for the CAN interface**

The permissible operating voltage is between 12V and 28 VDC. The sensor cable must be shielded.

**NOTE:** Pin 8 und Pin 9 are for the power supply of **LubMon Connect** and not for the power supply of the connected bus devices.

### 6.3. Power supply via jack plug

If not powered via CAN bus (Sub-D connector), a separate power supply (order code SCSO 100-5080) has to be connected to the jack plug (a) of the **LubMon Connect**.



*Figure 6.2: Connectors of LubMon Connect*

### 6.4. Ethernet connection

With a conventional patch cable connected to the Ethernet port (b), the **LubMon Connect** can be integrated in the company network

### 6.5. SIM card slot

To establish a connection via GSM with the **LubMon Connect**, a conventional SIM card can be inserted in the SIM card slot (c).

## 7. Commissioning the gateway

Verify that the device has been correctly installed and is securely connected to mains. The stipulations specified in Chapter 4.1, Chapter 5 and Chapter 6 must be satisfied for proper gateway functionality.

Gateway commissioning using the Ethernet interface and GSM connection is described below.

### 7.1. Data transmission

Depending on the infrastructure available, the gateway can be connected to the Internet either using a corporate network (Ethernet) or wireless network (GSM). Generally speaking, no additional costs are incurred when connecting via Ethernet, since the transferred data volumes are relatively small and will hardly make a difference in terms of the overall flow of data across a corporate network. However, it may be necessary to adapt the corporate network or the firewall and/or router. When connecting via GSM, a mobile phone card (what is referred to as a SIM card) and corresponding service contract is required to enable data transmission. Moreover, in this case the gateway needs to be installed so as to enable a wireless connection to the GSM network.

### 7.2. Connecting sensors to the gateway

The gateway communicates with the sensors of the CAN bus using the CANopen protocol. When connecting the sensor to the CAN bus, the cable specified for this purpose must be used in order to ensure reliable communication over the bus.

For details regarding how to configure the CANopen interface of the sensors used, please see the respective product manual. Make sure that the sensor's CANopen communication is activated and that different node IDs and identical baud rates have been configured. No additional expertise regarding CAN/CANopen is needed to configure and operate the sensors using **LubMon Connect**.

## Commissioning the gateway

The following figure shows the exemplary setting up of a CAN bus in combination with LubMon Connect.

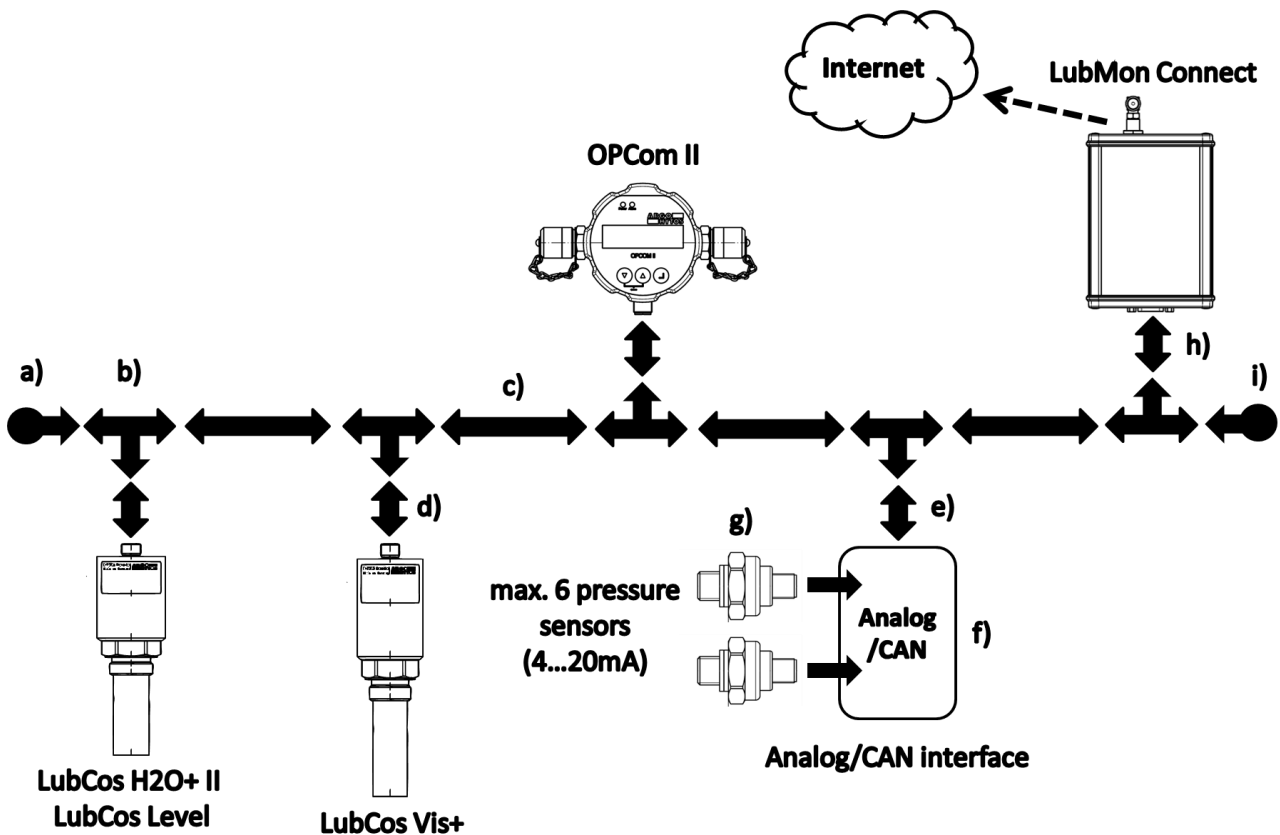


Figure 7.1: Setting up CANopen Bus with LubMon connect

Element	Description	Order code
a)	Termination Resistor ( <u>Female</u> ) for CAN-Bus.  Note: According to the used device configuration, the termination can be omitted, e.g. when the terminations in the OPro II or the Analog/CAN adapter are activated and both devices are placed on the end of the bus.	SCSO 700-5160
b)	T-Connector for CAN Bus, M12x5	SCSO 700-5140
c)	2m CAN cable: M12x5 Male → Female	SCSO 700-5120
d)	Sensor connector (M12x8) to CAN-Bus (M12x5) adapter	SCSO 700-5110

## Commissioning the gateway



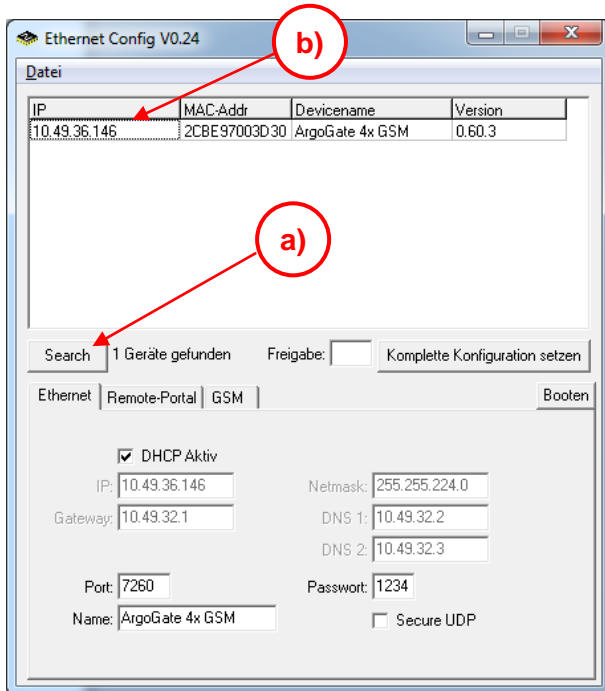
e)	CAN cable with free wires (about 0,3m). <u>Can also be used to connect the power supply to the CAN bus!</u>	SCSO 700-5130
f)	Analog/CAN adapter for detection of analog signals via CAN-Bus	SCSO 700-5060
g)	PSC pressure sensor Available for different pressure ranges (0...10Bar, 0...100Bar, 0...250Bar , 0...400Bar)	400 bar: PSC 400-1843 250 bar: PSC 250-1843 100 bar: PSC 100-1843 10 bar: PSC 010-1713
h)	Sub-D-9 to CAN adapter (M12x5)	SCSO 700-5050
i)	Termination Resistor ( <u>Male</u> ) for CAN-Bus. Note: According to the used device configuration, the termination can be omitted, e.g. when the terminations in the OPCom II or the Analog/CAN adapter are activated and both devices are placed on the end of the bus.	SCSO 700-5150
LubMon Connect	Remote-Interface	SCSO 700-1000
OPCom II	Particle monitor for measuring oil cleanliness factor	SPCO 300-1000
LubCos H2O+ II	Oil condition sensor for detection of temperature, relative humidity, conductivity and permittivity.	SCSO 100-1010
LubCos Level	Oil condition sensor for detection of temperature, relative humidity, conductivity and permittivity and oil level.  Available in different lengths (installation lengths 200mm, 375mm, 615mm)	LubCos Level 200: SCSO 150-1200 LubCos Level 375: SCSO 150-1375 LubCos Level 615: SCSO 150-1615
LubCos Vis+	Oil condition sensor for detection of temperature, viscosity and permittivity.	SCSO 200-1000
Power supply	For power supply of the <b>LubMon Connect</b> or the CAN bus.	SCSO 100-5080

**Table 7.1: Individual components for a CAN bus with LubMon Connect**

## Commissioning the gateway

### 7.3. Configuring gateway communication

The tool "**Ethernet\_Config.exe**" can be used to make basic configuration adjustments on the gateway. These adjustments are required to be able to send data to the web database over the gateway (cf.: Figure 7.2).



**Figure 7.2: "Ethernet\_Config.exe" tool for configuring the gateway.**

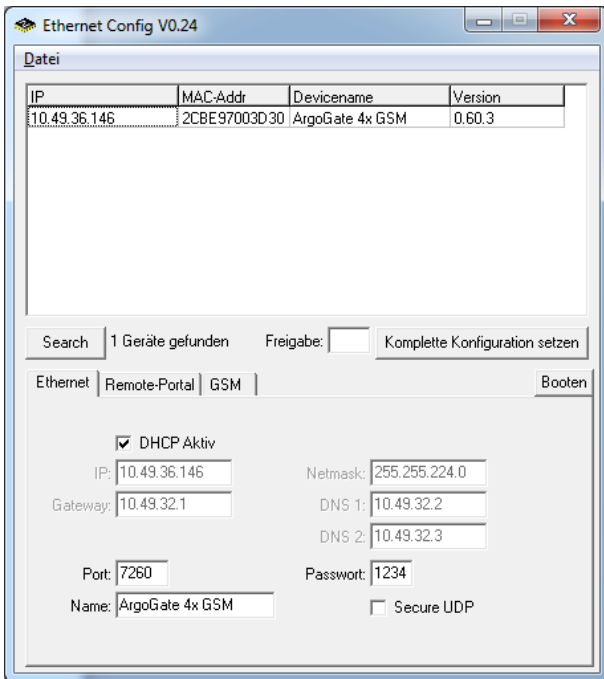
- a) Click "Search". All the gateways found will be listed in the upper area.
- b) Click on the gateway to be configured to load all the settings from the gateway and transfer them into the fields below.

The individual settings adjustments can now be made on the gateway. The settings are organised by topic on the tabs "Ethernet", "Remote portal" and "GSM" (cf.: Figure 7.3). The tabs are addressed in greater detail below.

#### **NOTE:**

For the configuration of the GSM interface, the **LubMon Connect** must be connected to a computer via Ethernet. After the configuration is done, there is no more cable connection necessary for data transmission.

## Commissioning the gateway



**Figure 7.3: View after selecting the gateway, "Ethernet" area.**

No forwarder is required for the gateway to communicate with the web portal, since all communication proceeds from the gateway. However, any firewall present on the network must permit the following communication:

- UDP packet from gateway port 8002 to port 22463 on the portal [argohytos.remoteportal.de](http://argohytos.remoteportal.de) (current static IP: 85.214.134.214).
- Portal's UDP response packet from portal port 22463 to gateway portal 8002.

"Ethernet" area	
Field	Meaning
DHCP active	If this option is active, the gateway retrieves the network settings from a DHCP server on the existing network
IP (only if DHCP is not active)	This is the gateway's IP on the network. In case of a fixed IP, it is important that the gateway is entered correctly and that both DNS servers are filled in correctly, since otherwise it will not be possible to send the packets to the portal. If there is only one DNS server, it should be entered in both fields.
Gateway (only if DHCP is not active)	The gateway is needed if packets are sent to recipients not located within its own subnet.



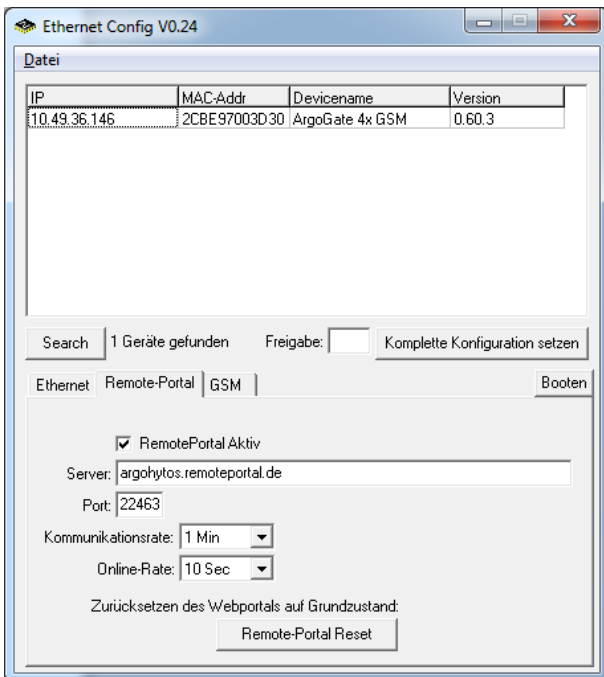
## Commissioning the gateway



Netmask (only if DHCP is not active)	The subnetmask is needed in order to find which part of the IPs has to be identical in order to belong to the corresponding subnet.
DNS1/DNS2 (only if DHCP is not active)	The DNS server(s) serve(s) to resolve Internet addresses. If there is only one DNS server, it should be entered in both fields.
Port	This port is used for application-dependent gateway configuration. This setting can normally be retained.
Password	The password is needed in order to be able to access the gateway via Ethernet. This is meant to prevent unauthorised access to the gateway over the Internet.
Secure UDP	If this option is active, the correct password needs to be entered under "Release" for each configuration setting (also using this tool) in order to be able to access the configuration.

**Table 7.2: Settings for the "Ethernet" area**

The settings for the remote portal are illustrated in Figure 7.4 and explained in detail in **Table 7.3**.



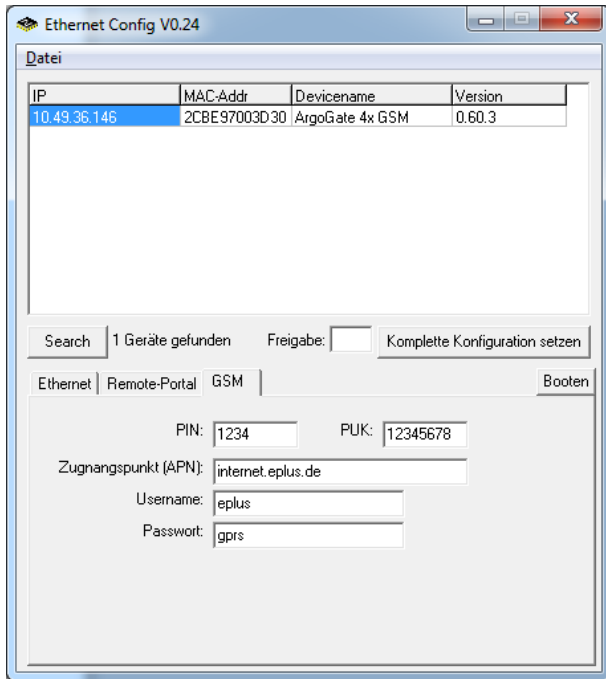
**Figure 7.4: View after selecting the gateway, "Remote portal" area**

"Remote portal" area	
Field	Meaning
Remote portal active	If this option is active, the remote interface sends packets to the portal at defined time intervals.
Server	The portal packets are sent to this server. The web address or an IP can be configured here (if there is a DNS server).
Port	This is the port on which the portal accepts packets from the remote interface.
Communication rate	Packets are sent to the portal at this time interval when no user is logged on.
Online rate	Packets are sent to the portal at this time interval when a user is logged on. This allows value changes and configuration changes to be communicated more quickly.
Remote portal reset	<p>If this button is activated, portal access is reset. But <b>BE CAREFUL</b>, because doing so has far-reaching consequences:</p> <ol style="list-style-type: none"> <li>1. All personal settings will be lost</li> <li>2. All data records, views and alerts will be deleted</li> <li>3. Any modified initial password will be reset to the as-delivered state</li> </ol> <p>Credit and rights will be retained.</p> <p>This function allows portal access to be reset if e.g.:</p> <ol style="list-style-type: none"> <li>1. The remote interface changes operating site (e.g. new system)</li> <li>2. No individual user password has been configured, and the initial password (system password) has been changed and lost</li> </ol>

**Table 7.3: Settings for the "Remote Portal" area**

## Commissioning the gateway

If the gateway has a GSM module, the settings for this module can be configured in the "GSM" area. (cf.: **Figure 7.5** and **Table 7.4**)



**Figure 7.5:** View after selecting the gateway, "GSM" area

"GSM" area	
Field	Meaning
PIN (optional, otherwise leave blank)	PIN of the SIM card, if there is an active PIN.
PUK (optional, otherwise leave blank)	PUK of the SIM card, if the PIN has been entered incorrectly three times.
Access point (APN)	Access point used to access the Internet. This setting is provider-dependent.
Username	Username for the Internet connection (defined by the provider)
Password	Password for the Internet connection (defined by the provider)

**Table 7.4:** Settings for the "GSM" area

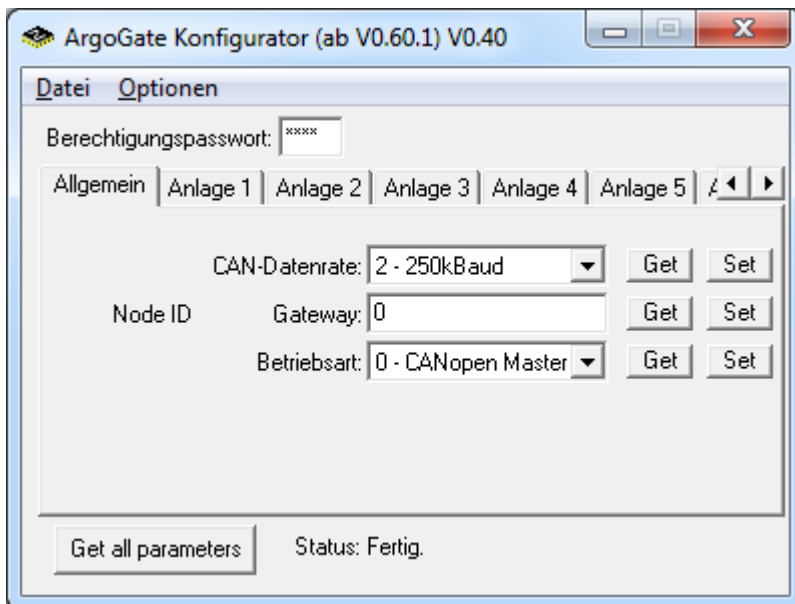
## Commissioning the gateway



The modified configuration can be imported to the gateway using the "Set complete configuration" button. If "Secure UDP" is active, the password for it also needs to be entered in "Release". After successful configuration and running "Search" again, it is recommended that the configuration in the gateway is reviewed once more.

### 7.4. Application dependent gateway configuration

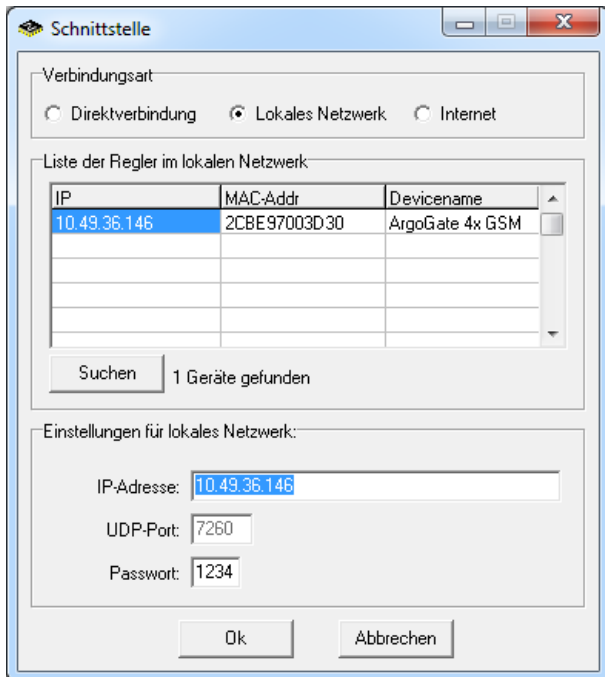
The tool "**RI\_Config.exe**" can be used to make application-dependent configuration adjustments on the gateway. These settings are needed for application-specific operation. Prior to configuration, the **LubMon Connect** firmware version needs to be selected. Firmware version 0.60.2 and lower does not offer support for the **LubCos Vis+** sensor. The configuration depends on the firmware version of the **LubMon Connect** you are using.



**Figure 7.6: View of tool "RI\_Config" after start**

Under Options → Interface, you can choose the connection type in the dialogue that follows (cf. **Figure 7.7**).

## Commissioning the gateway



**Figure 7.7: Options → Interface-window for selecting the interface to configure**

As with network configuration, it is possible to search for the gateway on the local network. If there is a direct connection to the PC, it is also possible to select this setting. Note: The PC may NOT be active on DHCP, or communication will not be reliable.

"General" area	
Field	Meaning
Authorisation password	2746
Node ID gateway	The NodeID of the gateway should normally be set to 1 (if the gateway is the master in the CANopen network). Each NodeID may only occur once on the network, value range: 1-127.
Operating mode	<p><b>CANopen master:</b> The gateway acts as a master on the system and sends NMT commands to all configured sensors for the operational condition, and also queries configured sensors' SDO entries.</p> <p><b>CANopen slave active:</b> The gateway does not send any NMT commands to the sensor, but does query active SDO entries for the configured sensors.</p> <p><b>CANopen slave passive:</b> The gateway does not send any NMT</p>

## Commissioning the gateway

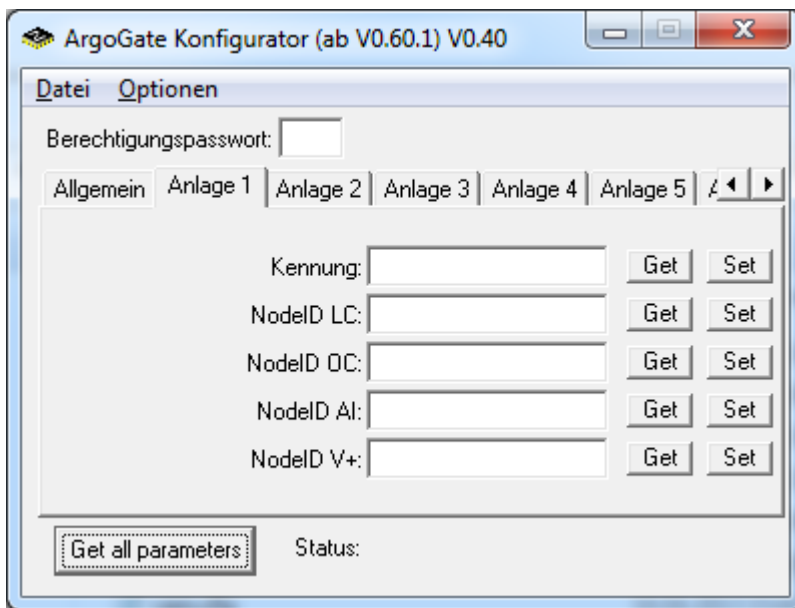


	<p>commands to the sensors, and does not actively query any SDO entries for the configured sensors. However, it does scan these when somebody else accesses these entries.</p> <p><b>100% passive:</b> The gateway does not send any NMT commands to the sensors, and does not actively query any SDO entries for the configured sensors. However, it does scan these when somebody else accesses these entries.</p>
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**Table 7.5: Settings for the "General" area**

With the slides "Anlage 1" to "Anlage 8" the identification code ("Kennung") and the node IDs of the connected sensors can be transmitted to the **LubMon Connect**.

**NOTE:** Every machine supports only one LubCos H2O+ II or one LubCos Level, one LubCos Vis+, one OPCOM II and one Analog/CAN adapter.



**Figure 7.8: View for the selected tab "System 1"**

Area "System x"	
Field	Meaning
ID	Any number may be entered as the system identifier here.
NodeID LC	The NodeID of the connected LubCos H2Oplus II or Level sensor. Each NodeID may only occur once on the network, value range: 1-127.
NodeID OC	The NodeID of the connected OPCom II particle monitor. Each NodeID may only occur once on the network, value range: 1-127.
NodeID AI	The NodeID of the connected Analog/CANopen interface. Each NodeID may only occur once on the network, value range: 1-127.
NodeID V+	The NodeID of the connected LubCos Visplus sensor. Each NodeID may only occur once on the network, value range: 1-127.

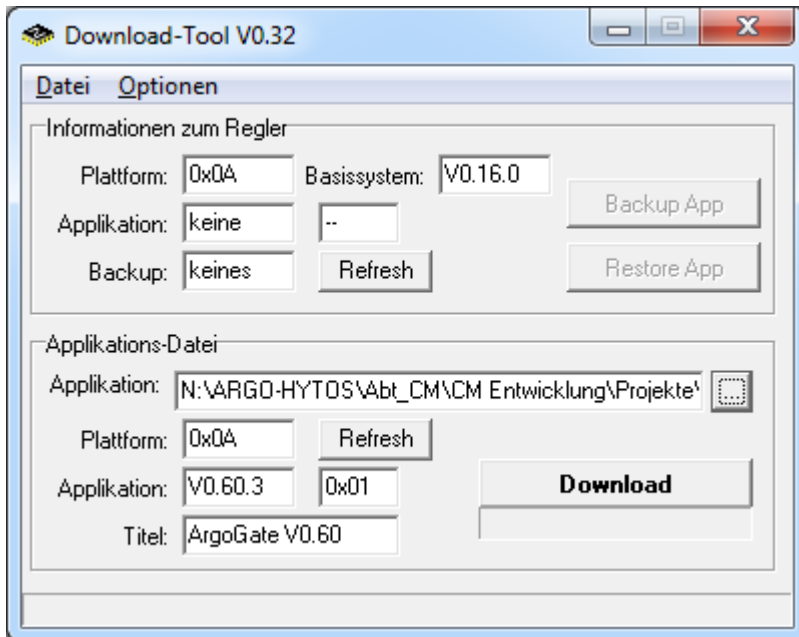
**Table 7.6: Settings for the "System x" area**

"Get all parameters" can be used to scan all parameters on the gateway.

The parameters can be set individually using the corresponding "Set" button. To do so, however, the authorisation password for protected variables needs to be entered above. If the new value is in the permissible range and the password is correct, the action will be successful, otherwise an error will display in "Status".

### 7.5. Firmware update

The download tool "**Download.exe**" can be used to update the gateway's firmware version. As described previously, to do so select the connection type under Options → Interface and then select the desired **LubMon Connect**.



**Figure 7.9: Download tool**

Under "Application file", click the "..." button under the "Application" sub-item in order to select the path of the new firmware version. The "Download" button is used to transfer the firmware version to the previously selected **LubMon Connect**.

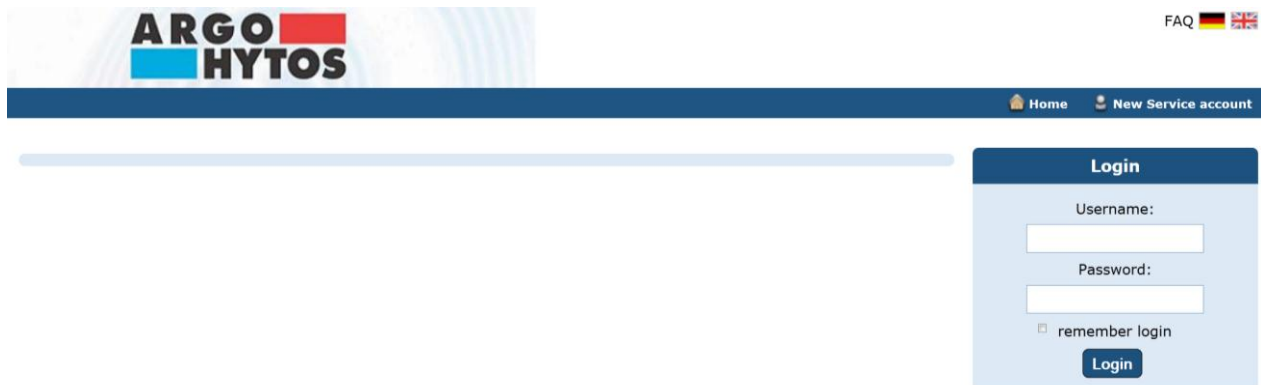
**Successful transfer of the file to the LubMon Connect is confirmed by a notification.**



## 8. Remote portal

### 8.1. Logon

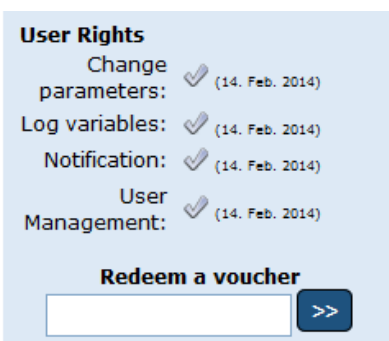
Access to data provided by the gateway takes place via a special portal <http://argohytos.remoteportal.de/> (cf.: **Figure 8.1**). The first time it is called, the MAC address printed on the **LubMon Connect** is used as the username. The password is printed on the enclosed insert.



**Figure 8.1: Logging on to the ARGO-HYTOS RemotePortal**

### 8.2. Enter license key

After first logon the user is asked to enter the license key for the use of the remote portal. This key is normally offered and sold with the gateway. This key is valid for one year. Then, a new key has to be bought for the further use of the portal. For the extension of the use of the remote portal, the key can be entered at any time under the menu item „User Profile“ → „Redeem a voucher“. Then, the use of the portal automatically extends for one more year.



**Figure 8.2: Menu item "User Profile"**

The license key is a combination of 8 letters and numbers. Note: The key entry field is case sensitive!

### 8.3. Setup

#### 8.3.1. System administration

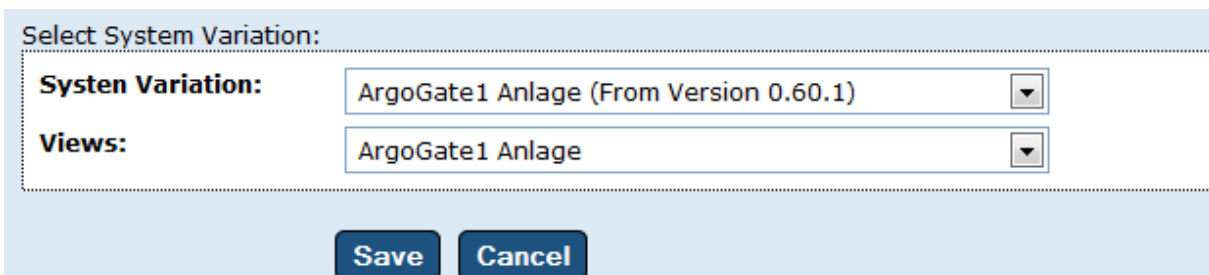
After initial logon you will see the message

**"No variant has been selected for this system yet".**

Click the "System Management" menu item to select the desired variant using the "Select System Variation" button. **The LubMon Connect** can support up to eight systems simultaneously.

Every system supports one **LubCos Vis+**, one **LubCos H2Oplus II** or **LubCos Level**, one **OPCom II**, as well as an analogue sensor connected via an analogue/CAN converter.

If e.g. four **LubCos Level** sensors are to be queried via the **LubMon Connect**, you will need to select "ArgoGate 4 systems" as the system variant. Each system can be used to query a **LubCos Level** and its data. In addition, other supported sensors can be connected and queried for each system to the extent that they are present and needed.



Select System Variation:

**System Variation:** ArgoGate1 Anlage (From Version 0.60.1)

**Views:** ArgoGate1 Anlage

Save Cancel

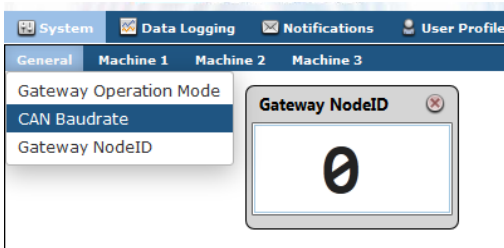
**Figure 8.3: Select system variation**

The corresponding view is automatically selected when choosing the system variation. Click "Save" to accept the system variant.

If the **LubMon Connect** already communicates with the portal, only configurations which match to the actual variation of the system can be selected. For example: If the **LubMon Connect** is configured for 3 machines with tool „**RI\_Config.exe**“ before, only the machine variation „ArgoGate3 Anlagen“ is selectable.

### 8.3.2. Systems view

The "System" menu item can be used to select and display data for the individual systems. The "General" tab allows communications data for the **LubMon Connect** to be displayed. The tabs "System 1" to "System 4" can be used to select the data for the sensors allocated to the systems and display them in the graphical interface. Click on the parameter you want in order to display a corresponding box in the graphical interface.



**Figure 8.4: System view**

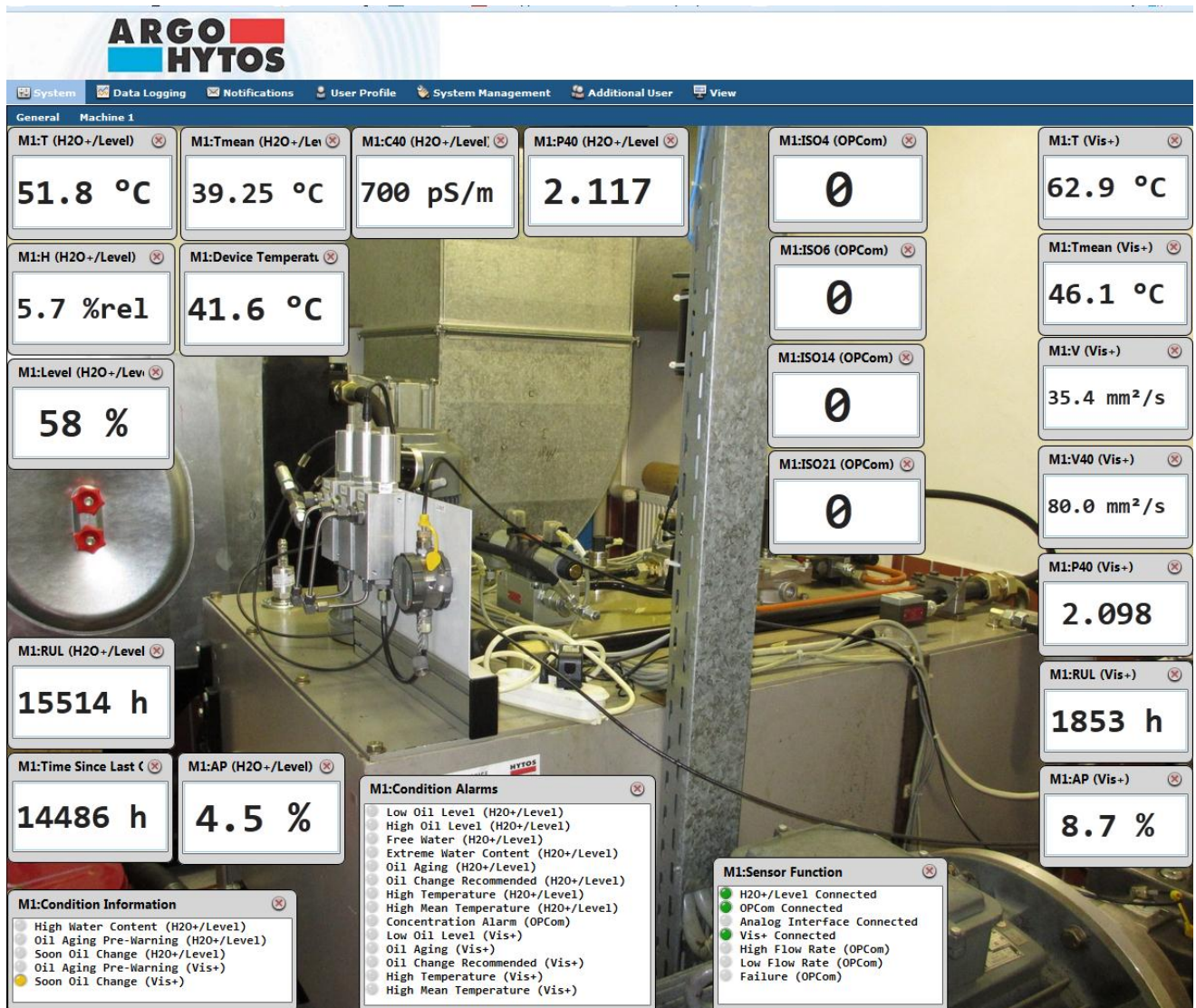
All the desired parameters can be displayed in the graphical interface. These are displayed in the form of a box whose position and size can be adjusted as needed. This allows users to create an individualised overview of relevant condition data.

The display can also be enhanced to include a background image. You can reach this function using the "View" menu item on the top menu bar.

*View* → choose variant → *Edit* → *Pre-defined view* → select system variant → *Search* → Select desired image → *Save*.

The "View" tab on the right side of the menu bar can also be used to switch between a graphical and tabular view. All supported parameters are displayed in the tabular view at all times, irrespective of whether a sensor providing the parameters in question is connected.

The example in **Figure 8.** shows one potential appearance for the graphical user interface.



**Figure 8.5:** Example for the view of a system

### 8.3.3. Adding additional users

The "Additional user" tab can be used to add additional users who are to be given e.g. restricted access to the remote portal. To do so, click "New user" and then enter the user data, i.e. the username and password. It is also possible to enter personal data and user rights, along with a view for the given user. Click "Save" to generate the user profile.

## Remote portal



**Login informations:**

**Username:**

**Password:**

Enter password for check:

---

**Personal Informations:**

**Company:**

**Firstname:**

**Lastname:**

---

**User Rights:**

Change parameters:

Log variables:

Notification:

Own view:

Notification:

Advanced administration:

---

**Settings:**

**View:**

**Restricted View:**

**Figure 8.6: Adding users**

Access data and personal data for a logged-in user can be changed using the "User profile" menu item, given that the user privileges needed to do so have been granted.

Under the menu item "View", the predefined views can be personalized with click on the button „Customize view" underneath the desired view. There, the individual parameters for the assigned users of the selected view can be masked with click on the cross symbol (see Figure 8.7).

**System menu structure:**

General	Machine 1
Gateway Operation... <input type="checkbox"/>	M1:Machine-ID <input type="checkbox"/>
CAN Baudrate <input type="checkbox"/>	M1:Sensor Type... <input type="checkbox"/>
Gateway NodeID <input type="checkbox"/>	M1:SN (H2O+/Level) <input type="checkbox"/>
	M1:Sensor Type... <input type="checkbox"/>

**Figure 8.3: Personalize view**

## 8.4. Data management

### 8.4.1. Data recording

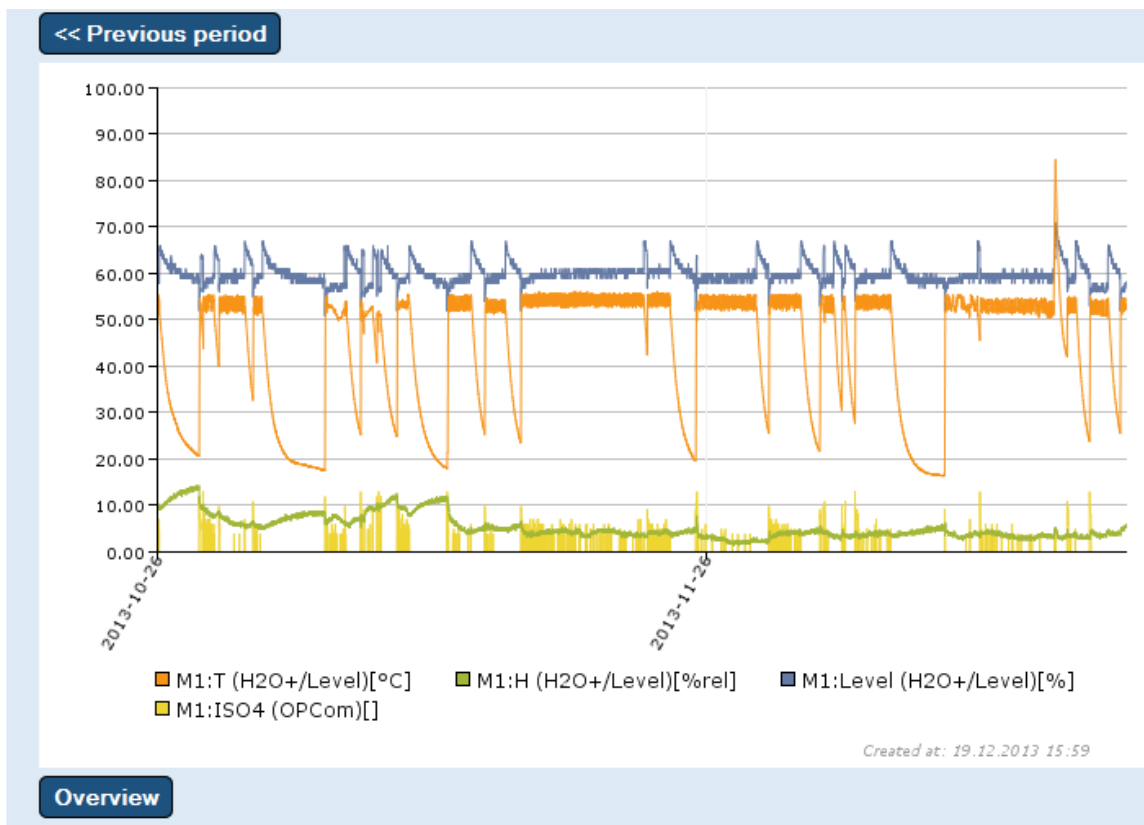
All data can be saved at regular intervals using the data recording feature. The available recording intervals are 1 min., 5 min., 10 min., 30 min., 1 hour and 24 hours. Simply select the desired parameters for each recording interval.

Sample Rate	
1 minute	No variables are selected.
5 minutes	No variables are selected.
10 minutes	<ul style="list-style-type: none"> <li>• M1:T (H2O+/Level)</li> <li>• M1:Tmean (H2O+/Level)</li> <li>• M1:H (H2O+/Level)</li> <li>• M1:Level (H2O+/Level)</li> <li>• M1:AP (H2O+/Level)</li> <li>• M1:RUL (H2O+/Level)</li> <li>• M1:P40 (H2O+/Level)</li> <li>• M1:C40 (H2O+/Level)</li> <li>• M1:T (Vis+)</li> <li>• M1:Tmean (Vis+)</li> <li>• M1:AP (Vis+)</li> <li>• M1:RUL (Vis+)</li> <li>• M1:P40 (Vis+)</li> <li>• M1:V (Vis+)</li> <li>• M1:V40 (Vis+)</li> <li>• M1:Device Temperatur (H2O+/Level)</li> <li>• M1:Device Temperatur (Vis+)</li> <li>• M1:ISO4 (OPCom)</li> <li>• M1:ISO6 (OPCom)</li> <li>• M1:ISO14 (OPCom)</li> <li>• M1:ISO21 (OPCom)</li> <li>• M1:Condition Information   High Water Content (H2O+/Level)</li> <li>• M1:Condition Information   Oil Aging Pre-Warning (H2O+/Level)</li> <li>• M1:Condition Information   Soon Oil Change (H2O+/Level)</li> <li>• M1:Condition Information   Oil Aging Pre-Warning (Vis+)</li> <li>• M1:Condition Information   Soon Oil Change (Vis+)</li> <li>• M1:Condition Alarms   Low Oil Level (H2O+/Level)</li> <li>• M1:Condition Alarms   High Oil Level (H2O+/Level)</li> <li>• M1:Condition Alarms   Free Water (H2O+/Level)</li> <li>• M1:Condition Alarms   Extreme Water Content (H2O+/Level)</li> <li>• M1:Condition Alarms   Oil Aging (H2O+/Level)</li> <li>• M1:Condition Alarms   Oil Change Recommended (H2O+/Level)</li> <li>• M1:Condition Alarms   High Temperature (H2O+/Level)</li> <li>• M1:Condition Alarms   High Mean Temperature (H2O+/Level)</li> <li>• M1:Condition Alarms   Concentration Alarm (OPCom)</li> <li>• M1:Condition Alarms   Low Oil Level (Vis+)</li> <li>• M1:Condition Alarms   Oil Aging (Vis+)</li> <li>• M1:Condition Alarms   Oil Change Recommended (Vis+)</li> <li>• M1:Condition Alarms   High Temperature (Vis+)</li> <li>• M1:Condition Alarms   High Mean Temperature (Vis+)</li> <li>• M1:Sensor Function   Low Flow Rate (OPCom)</li> <li>• M1:Time Since Last Oil Change (H2O+/Level)</li> </ul>
30 minutes	No variables are selected.
1 hour	No variables are selected.
24 hours	No variables are selected.

**Figure 8.4: Selecting the parameters to be recorded**

Use the "Export" button to select as many of the recorded parameters as is desired and save them to a .CSV file.

Use the "Display curves" button to select parameters from which a graph from among the recorded parameters is to be generated. An example is shown in the figure below.



**Figure 8.5: Graphical display of recorded data**

#### 8.4.2. Notifications

The "Notifications" menu item can be used to issue notifications in the form of e-mail or SMS regarding system errors or the crossing of defined values. For text messaging via SMS the corresponding rights have to be acquired in the form of a license key. This key can be bought by ARGO-HYTOS and authorizes the portal to send 50 text messages. The key can be entered under "User Profile" → „Redeem a voucher“.

In addition, it is possible to perform a configuration ensuring that the user will receive a daily report by e-mail. It is possible to make settings so that notifications will be sent in the event of communication errors, expiration of portal access privileges, as well as protocol warnings.

It is also possible to define a limit value for each variable. This limit value will be monitored, with a notification sent whenever the actual value exceeds or falls short of it.

Likewise, it is possible to transmit a daily report with defined parameters to give the user an overview of relevant data. An example of how to configure monitoring of certain parameters is shown on the next page.

# Remote portal



**Notifications**

System notifications:

Type	Condition	Email	SMS	Fax	Timeframe		
Connection errors		This notification is not active				Setup	Delete
Expire rights	10 days	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Monday-Sunday	Setup	Delete
Log exceed		This notification is not active				Setup	Delete

Supervision of values:

Variable	Notification if	Email	SMS	Fax	Timeframe		
Low Oil Level (H2O+/Level)	on	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Monday-Sunday	Edit	Delete
High Temperature (H2O+/Level)	on	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Monday-Sunday	Edit	Delete
High Temperature (Vis+)	on	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Monday-Sunday	Edit	Delete
Low Oil Level (H2O+/Level)	on	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Monday-Sunday	Edit	Delete

[New Notification](#)

Daily email report:

There are no reports.

[New report](#)

Figure 8.6: Setting up notifications

**Notifications**

Supervised Variable:

**Variable:** M1:Condition Alarms | Low Oil Level (H2O+/Level)

**Notify if:**  "on"  "off"

Notification:

Email:

SMS:

Fax:

Notifications will be sent within the following timeframe:

Days of week:  Monday  Tuesday  Wednesday  Thursday  Friday  Saturday  Sunday

Begin:

End:

Lock time:

[Save](#) [Cancel](#)

Figure 8.7: Setting up monitoring of parameters



## 9. Parameter overview

The sensors connected to LubMon Connect display a whole slew of measured, derived and calculated parameters. The following tables give a review of the parameters of the individual sensors that can be displayed in the remote portal.

#	Parameter name	Unit	Description
1	Time Since Last Oil Change	h	Time since last oil change (oil age)
2	T	°C	Temperature of the fluid
3	Tmean	°C	Mean temperature of the fluid since start of learning process / indication of new oil filling
4	RH	%	Relative Humidity of the fluid
5	Level	%	Oil level referred to measurement range (only Level sensors)
6	Aging Progress	%	Aging Progress
7	RUL	h	Remaining useful lifetime
8	P40	-	Relative permittivity of the fluid, compensated to 40°C fluid temperature
9	C40	pS/m	Conductivity of the fluid, compensated to 40°C fluid temperature
10	Device Temperature	°C	Temperature of the sensor device

**Table 9.1: Parameters - LubCos H2O+ II / LubCos Level**

#	Parameter name	Unit	Description
1	T	°C	Temperature of the fluid
2	Tmean	°C	Mean temperature of the fluid since start of learning process / indication of new oil filling
3	Aging Progress	%	Aging Progress
4	RUL	h	Remaining Useful Lifetime
5	P40	-	Relative permittivity of the fluid, compensated to 40°C fluid temperature
6	Viscosity	mm <sup>2</sup> /s	Actual viscosity of the fluid
7	V40	mm <sup>2</sup> /s	Viscosity of the fluid, compensated to 40°C fluid temperature
8	Device Temperature	°C	Temperature of the sensor device

**Table 9.2: Parameters - LubCos Vis+**

## Parameter overview



#	Parameter name	Unit	Description
1	ISO4	-	4µm cleanliness factor according to ISO 4406:99
2	ISO6	-	6µm cleanliness factor according to ISO 4406:99
3	ISO14	-	14µm cleanliness factor according to ISO 4406:99
4	ISO21	-	21µm cleanliness factor according to ISO 4406:99

**Table 9.3: Parameters - OPCom**

Furthermore, the connected sensors submit condition information, condition alarms and sensor function alarms, which are described in the following tables.

#	Condition information	Description
1	High Water content (H2O+/Level)	Measured Water Content of the oil exceeded 50% (H2O+/Level)
2	Oil Aging Pre-Warning (H2O+/Level)	Aging Progress (AP) exceeded 66% (H2O+/Level)
3	Soon Oil Change (H2O+/Level)	Calculated remaining useful lifetime of the oil is below 15% of the reference lifetime (H2O+/Level)
4	Oil Aging Pre-Warning (Vis+)	Aging Progress (AP) exceeded 66% (Vis+)
5	Soon Oil Change (Vis+)	Calculated remaining useful lifetime of the oil is below 15% of the reference lifetime (Vis+)

**Table 9.4: Condition information**

#	Condition alarms	Description
1	Low Oil Level (H2O+/Level)	LubCos H2O+ II / LubCos Level is measuring in free air (permittivity < 2)
2	High Oil Level (Level)	Measured oil level of LubCos Level is higher than maximum level threshold
3	Free Water (H2O+/Level)	Measured water content of LubCos H2O+ II / LubCos Level is higher than 95%
4	Extreme Water Content (H2O+/Level)	Measured water content of LubCos H2O+ II /

## Parameter overview



		LubCos Level is higher than 70%
5	Oil Aging (H2O+/Level)	Aging Progress (AP) of LubCos H2O+ II / LubCos Level is higher than 100%
6	Oil Change Recommended (H2O+/Level)	Calculated remaining useful lifetime of the oil is below 0 hours (H2O+/Level)
7	High Temperature (H2O+/Level)	Oil temperature is higher than maximum oil temperature (H2O+/Level)
8	High Mean Temperature (H2O+/Level)	Mean Oil temperature is higher than maximum mean oil temperature (H2O+/Level)
9	Concentration Alarm (OPCom)	Particle concentration is outside of measuring range
10	Low Oil Level (Vis+)	LubCos Vis+ is measuring in free air (permittivity < 2)
11	Oil Aging (Vis+)	Aging Progress (AP) of LubCos Vis+ is higher than 100%
12	Oil Change Recommended (Vis+)	Calculated remaining useful lifetime of the oil is below 0 hours (Vis+)
13	High Temperature (Vis+)	Oil temperature is higher than maximum oil temperature (Vis+)
14	High Mean Temperature (Vis+)	Mean Oil temperature is higher than maximum mean oil temperature (Vis+)

**Table 9.5: Condition alarms**

## Parameter overview



#	Sensor function	Description
1	H2O+/Level Connected	LubCos H2O+ II or LubCos Level connected via CAN
2	OPCom Connected	OPCom connected via CAN
3	Analog Interface Connected	Analog interface connected via CAN
4	Vis+ Connected	LubCos Vis+ connected via CAN
5	High Flow Rate (OPCom)	Flow Rate of the OPCom is higher than specified
6	Low Flow Rate (OPCom)	Flow Rate of the OPCom is lower than specified
7	Failure (OPCom)	Measuring values not plausible or failure in sensor hardware (OPCom)

**Table 9.6: Sensor function**

The system settings provide the opportunity to save additional information of the system.

#	System settings	Description
1	Oil Type	The used oil type can be selected.
2	System Volume	The volume of the system can be signed in into this field.

**Table 9.7: System settings**

With the Thresholds/Parameters settings the RUL calculation can be configured and the alarm thresholds can be set.

#	Thresholds/Parameters	Description
1	Permittivity Change [%]	Maximum Change of Permittivity of the oil in percent (for RUL calculation)
2	Conductivity Change [%]	Maximum Change of Conductivity of the oil in percent (for RUL calculation)
3	Max. Temperature [°C]	Maximum Temperature (for alarm display)

## Parameter overview



4	Max. Mean Temperature [°C]	Maximum Mean Temperature (for alarm display)
5	Level Threshold Low Level [%]	Low Level Threshold (for alarm display)
6	Level Threshold High Level [%]	High Level Threshold (for alarm display)
7	RUL Load Factor	Reference load factor based on temperature load (for RUL calculation)
8	RUL Reference Lifetime	Reference lifetime of the oil (for RUL calculation)
9	RUL Reference Permittivity	Reference permittivity of the oil (for RUL calculation)
10	RUL Reference Conductivity	Reference conductivity of the oil (for RUL calculation)
11	New Oil Added	After filling with new oil, the reference values for permittivity and conductivity are cleared with this button and a new learning process is started
12	RUL Overwrite	Use a fix value for the Remaining Useful Lifetime (no calculation)

**Table 9.8: Thresholds/Parameters (H2O+/Level)**

#	Thresholds/Parameters	Description
1	Permittivity Change [%]	Maximum Change of Permittivity of the oil in percent (for RUL calculation)
2	Viscosity Change [%]	Maximum Change of Viscosity of the oil in percent (for RUL calculation)
3	Max. Temperature [°C]	Maximum Temperature (for alarm display)
4	Max. Mean Temperature [°C]	Maximum Mean Temperature (for alarm display)
5	Level Threshold Low Level [%]	Low Level Threshold (for alarm display)
6	Level Threshold High Level [%]	High Level Threshold (for alarm display)
7	RUL Load Factor	Reference load factor based on temperature load (for RUL calculation)

## Parameter overview



8	RUL Reference Lifetime	Reference Lifetime of the oil (for RUL calculation)
9	RUL Reference Permittivity	Reference Permittivity of the oil (for RUL calculation)
10	RUL Reference Viscosity	Reference Viscosity of the oil (for RUL calculation)
11	New Oil Added	After filling with new oil, the reference values for permittivity and conductivity are cleared with this button and a new learning process is started
12	RUL Overwrite	Use a fix value for the Remaining Useful Lifetime (no calculation)

**Table 9.9: Thresholds/Parameters (Vis+)**

## 10. Troubleshooting

<b>Error:</b> No sensor communication via CAN	
<b>Cause</b>	<b>Step</b>
<ul style="list-style-type: none"> <li>▪ Cable is not correctly connected</li> </ul>	<ul style="list-style-type: none"> <li>▪ First ensure that the electrical connections of the sensor, i.e. the data cable and power cable, have been correctly connected. Ensure that the connection is configured as prescribed.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Wrong cable or cable is defective</li> </ul>	<ul style="list-style-type: none"> <li>▪ If possible use the ARGO-HYTOS data cable</li> </ul>
<ul style="list-style-type: none"> <li>▪ Operating voltage is outside of the prescribed range</li> </ul>	<ul style="list-style-type: none"> <li>▪ Operate the sensor in the range between 12 and 28 VDC.</li> </ul>
<ul style="list-style-type: none"> <li>▪ CAN interface of the connected sensors is not activated</li> </ul>	<ul style="list-style-type: none"> <li>▪ Activate the CAN interface using either LubConfig or a terminal program as described in the sensor manuals.</li> </ul>
<ul style="list-style-type: none"> <li>▪ CAN interface of the LubMon Connect / the connected sensors is not configured properly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Check your CAN settings. The configuration of the LubMon connect is depending on the configuration of the sensors. Use the same baud rate and activate the CAN mode of the sensors. Be sure to use an own node ID for every device.</li> </ul>

<b>Error:</b> No communication via Ethernet	
<b>Cause</b>	<b>Step</b>
<ul style="list-style-type: none"> <li>▪ Cable is not correctly connected</li> </ul>	<ul style="list-style-type: none"> <li>▪ Check the correct electrical connection of the Ethernet cable. Please mind the specified pin assignment.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Firewall blocks data transmission / reception</li> </ul>	<ul style="list-style-type: none"> <li>▪ Release the following packages in your firewall: UDP package from Gateway Port 8002 to Port 22463 of the portal <a href="http://argohytos.remoteportal.de">argohytos.remoteportal.de</a> (static IP: 85.214.134.214). UDP response package of</li> </ul>

the portal from Port 22463 of the portal to Port 8002 of the Gateway.

**Error:** *No communication via GSM*

<b>Cause</b>	<b>Step</b>
<ul style="list-style-type: none"> <li>▪ No SIM card inserted</li> </ul>	<ul style="list-style-type: none"> <li>▪ Insert a working SIM card in the SIM card slot and configure the connection as mentioned in this manual.</li> </ul>
<ul style="list-style-type: none"> <li>▪ PIN / PUK not correct</li> </ul>	<ul style="list-style-type: none"> <li>▪ Check the correct diction of the PIN / PUK.</li> </ul>



## 11. Accessories

### Anchoring clip for slim side

Description: Anchoring clip for the slim side of the **LubMon Connect** (acc. to Figure 5.1)

Order code: SCSO 700-5010

### Anchoring clip for wide side

Description: Anchoring clip for the wide side of the **LubMon Connect** (acc. to Figure 5.1)

Order code: SCSO 700-5020

#### **NOTE:**

More accessories are listed in **Chapter 7 – Commissioning the Gateway** (Table 7.1).

Contact address



## 12. Contact address

ARGO-HYTOS GMBH  
Produktbereich Sensor- & Messtechnik  
Industriestraße 9  
D-76703 Kraichtal-Menzingen

Tel. +49-7250-76-0  
Fax +49-7250-76-575  
E-mail: [info.de@argo-hytos.com](mailto:info.de@argo-hytos.com)

### **13. EG declaration of conformity**

The manufacturer

**ARGO-HYTOS GMBH**  
**Industriestraße 9**  
**D-76703 Kraichtal**

hereby declares that the product described below

**Remote-Interface LubMon Connect (SCSO 700-1000)**

satisfy the following EC directive:

**EMC Directive 2004/108/EEC**

Harmonised standards:

**DIN EN 61326-1: 2006**  
**DIN EN 61326-2-2: 2006**  
**DIN EN 55011: 2007 + A2: 2007**  
**DIN EN 61000-3-2: 2006**  
**DIN 61000-3-3: 1995 + A1: 2001 + A2: 2005**  
**DIN EN 61000-4-2: 2009**  
**DIN EN 61000-4-4: 2004**  
**DIN EN 61000-4-5: 2006**  
**DIN 61000-4-6: 2009**  
**DIN 61000-4-11: 2004**  
**DIN 61010-1: 2001**  
**RICHTLINIE 2006/95/EG**

The declaration applies for all identical copies of the product that are manufactured according to the included development, design, and manufacturing drawings and descriptions, which are a component of this declaration.

Kraichtal, 25 November 2013



Dr. Marcus Fischer  
Technical Director

## 14. Change Log

17.04.2013: V1.10.13 – Konformitätserklärung und Change Log hinzugefügt, Kapitel über die darstellbaren Parameter erstellt, Verbesserungen in Kapitel 10 (Fehlerbehebung), diverse allgemeine Ergänzungen und Verbesserungen. /AW

25.11.2013: V1.20.13 – Verbesserungen in Kapitel 9 (Fehlerbehebung), neue Screenshots in Kapitel 7, neues Anschlussbild in Kapitel 7, Zubehörliste aktualisiert, Quickstart aktualisiert /AW