



AIR-SEP®

Modbus RTU Interface (RS485)

Supplementary Instructions Manual

AS-MBRTU



Table of contents

1	General and notes	4
1.1	Liability and warranty	4
1.2	Symbols used	4
1.3	Intended use	5
2	Scope of supply	5
3	Modbus parameters	5
3.1	Settings (by use of optional interface)	7
3.1.1	Modbus settings	8
3.1.2	Modbus outputs	8
3.2	Settings (by use of AIR-SEP touchscreen colour display)	9
4	Connection of Modbus line	10

1. General and notes

The **AIR-SEP® Modbus RTU interface (RS485)** is an extension module and works only together with an AIR-SEP® SmartControl system (component of each AIR-SEP® device from type AS-T, year of production 2018 and younger).

The instructions below describe the procedure to be applied for factory installed interfaces. Retrofitting is basically possible but needs prior consultation with KOREX.

1.1 Liability and warranty

The interface comprises components and parts that are made according to the state of the art and the accepted safety rules. Nevertheless, dangers to the life of personnel or third parties may occur and the system or tangible assets can be impaired. No modifications of the interface must be made.

The manufacturer will accept no liability and warranty for damage caused by one or several reasons as set out below:

- Improper use of the interface.
- Incorrect commissioning, operation, maintenance, repair and installation.
- Non-observance of the safety information given by these instructions.
- Operating the interface although the safety facilities/protective devices provided are defective or installed improperly.
- Use of unauthorized spare parts and accessories.

1.2 Symbols used



WARNING! DANGER! CAUTION! ATTENTION!

Any non-observance of this safety information may cause personal injury or material damage.



WARNING!

Any non-observance of this safety information may cause electric shocks that may result in severe personal damage or even death.



WARNING!

The surface of the product may become so hot that persons may suffer burns when touching it.

1.3 Purpose of use

The Modbus RTU is used to read out data from firmly defined data areas of an AIR-SEP® device. The information which data can be found in which data area differs depending on the device. To be able to address the Modbus RTU, it is necessary to initially define the Modbus settings (Baud rate, parity and stop bits).

This module is solely suitable for the communication via RS485.

The communication takes place according to the Master-Slave method. It always starts from the master by way of a query. Every Slave has got an address to be assigned once. As soon as a Slave recognizes that its address has been addressed by the master, it will respond. The Slaves cannot communicate with each other. They can also not start a communication with the Master.

2. Scope of supply

The Modbus RTU, item No. AS-MBRTU is already fitted to the AIR-SEP device and comes with the following scope of supply:

- 1x this supplementary instructions manual
- 1x AIR-SEP® Modbus RTU interface (RS485)
(laterally fitted to the AIR-SEP® device already and installed in an optional electrical box resp.)
- 1x CAN-Bus cable (AIR-SEP® SmartControl system -> AIR-SEP® Modbus RTU interface (RS485))

3. Parameters

The following parameters are read out by the AIR-SEP® device and passed on to the relevant Modbus output.

Modbus-Ausgang			
1: Systemdruck / System pressure	Auto 1.81 bar	11: EIN/AUS / ON/OFF AIR-SEP control system ON/OFF	Auto AUS
2: Solldruck / Set pressure	Auto 1.80 bar	12: Pumpe1 / Pump 1	Auto AUS
3: Nachspeisevolumen / Resupply volume Control quantity per year and capacity resp.	Auto 90 l	13: Nachspeisung / Resupply	Auto AUS
4: Nachspeisemenge/Kapaz./ Resupply quantity /Capacity - Consumptions in current cycle	0 l	14: Sammelstörung / Collective fault	Auto EIN
5: Nächste Wartung in / Next service in	Auto 329 Tage	15: Wartung fällig! / Service required	Auto AUS
		16: Nachspeisung überwacht? Resupply monitored?	Auto Ja
		17: Nachspeisung gesperrt? Resupply blocked?	Auto Nein

20: Druckaufbau zu lange Timeout pressure build-up	Auto AUS	
21: Nachspeisung zu lange Resupply too long	Auto AUS	26: Pulse counter/Check magnetic valve
22: Nachspeisung zu häufig Resupply too frequent	Auto AUS	26: Impulszähler/MV prüfen MV = magntic valve
23: Nachsp./Kapaz. erschöpft Resupply /volume exhausted	Auto AUS	
24: Systemdruck zu hoch System pressure too high	Auto AUS	28: Reinigungslauf aktiv? Cleaning run active?

These parameters may deviate from your system. It is possible that parameters

- are assigned to a different output
- are available in a different form
- have been added or dropped completely.

The parameters actually available can be gathered from the Modbus output live at the controller.

3.1 Settings (by use of optional interface)

Settings are made via the touch display of the AIR-SEP® SmartControl system (ref. 3.2 p. 8) or the optional AIR-SEP® SmartControl interface (item No.: AS-SCI).

After having set the optional AIR-SEP® SmartControl interface the CAN Bus button gives access to the list of devices and interfaces available in the network.

CAN-Bus

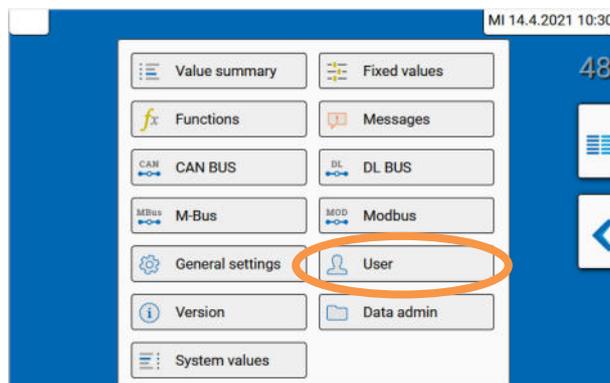


CAN-reload



Click the button of the Modbus RTU interface

A new browser window will pop up:



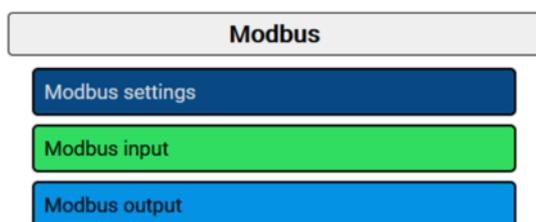
Click the "User" button and then "Technician" to register as a technician.

The expert password is: "1962"



Then, click the **blue arrow** to return to the main menu.

By using the "Modbus" button you can access the Modbus setting parameters



3.1.1 Modbus settings

For the device settings it is necessary to know the structure of the connected Modbus network. The Modbus RTU can be operated in the Master or Slave mode.

Modbus settings	
Master/Slave	Master
Baud rate	1200
Parity	Even
Stop bits	1

Modbus settings	
Master/Slave	Slave
Device	1
Baud rate	1200
Parity	Even
Stop bits	1

Baud rate setting range from 1 200 to 38 400 Baud
Parity choice: Even/ Uneven / None
Stop bits choice: 1 or 2

In the Slave mode it is additionally necessary to define the device number (1-247) of the bus converter in the Modbus network.

3.1.2 Modbus outputs

Modbus output 1	
CAN bus analogue 	
1: System pressure	
Measurement	
1.25 bar	
Type	Analogue
Designation	
User defined	
Systemdruck / System pressure	
Device	1
Function	6 - Preset single register
Address	0
Data type	16-bit signed integer
Byte order	Big-endian
Divisor	1
Factor	1
Transmission condition	
If change >	0.10 bar
Blocking time	10s
Send in intervals	No
Exception Code	No Respond

Exception Code displays

OK – The value query from the Slave device was successful.

No respond – No response from Slave device. Reasons: Modbus settings do not coincide with the Slave device, wrong Slave device number, faulty cabling or termination.

Other displays – Fault messages of Slave device

Special case: display of "Acknowledge" – Slave device needs some more time to process the value but shows that a value has been received. So, this display is no real fault message.

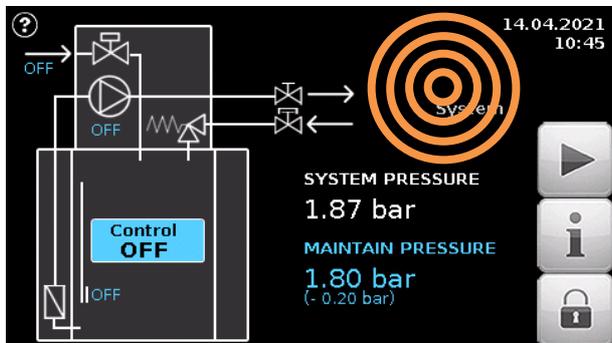
Modbus input and output in Slave mode

The displays in the Slave mode are identical with those of the Master mode except the Exception Code and the setting options of the device.

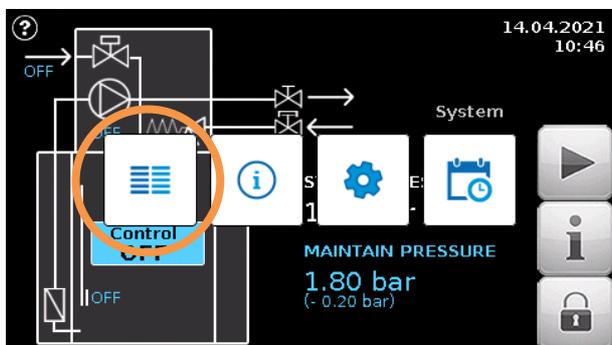
3.2 Settings (by use of touchscreen colour display)

Described below are the settings by use of the touch display of the AIR-SEP® SmartControl system.

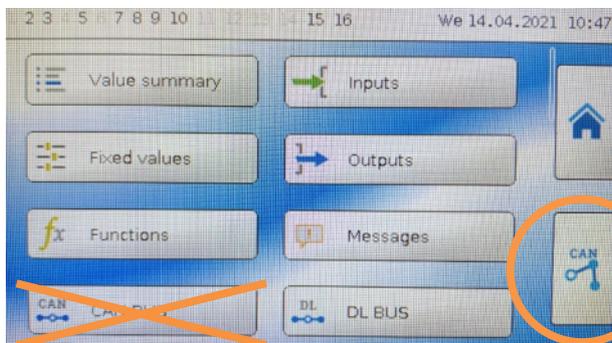
You are standing in front of the AIR-SEP device. Should the display be "black", touch the display 1x to "wake it up". You will see the following picture (deviations are possible):



Touch the display somewhere and keep your finger on the display for about 5 seconds (IMPORTANT).



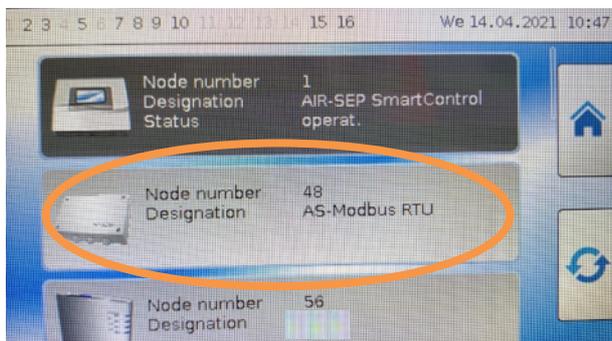
Four new buttons will occur. Touch the left button to get access to the backend.



Touch the button bottom right to get access to the CAN bus network.



If the button is shown in grey the CAN network contains no devices, there is a network failure or devices are in the start mode (status-LEDs are flashing green then).



Touch the Modbus RTU (node number 48, AS-Modbus RTU)



You are now on the user interface of the Modbus RTU.

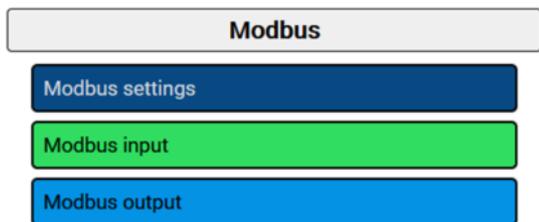
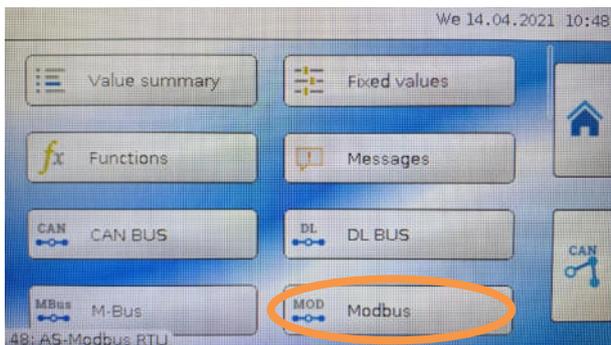
For checking purposes, you will find bottom left of the display the network number and the name: "AS-Modbus RTU"

Swipe upwards, touch the "User" button and then "Technician" to register as an technician.

The technician password is: "1962"

Then, click the **blue arrow** to return to the main menu again.

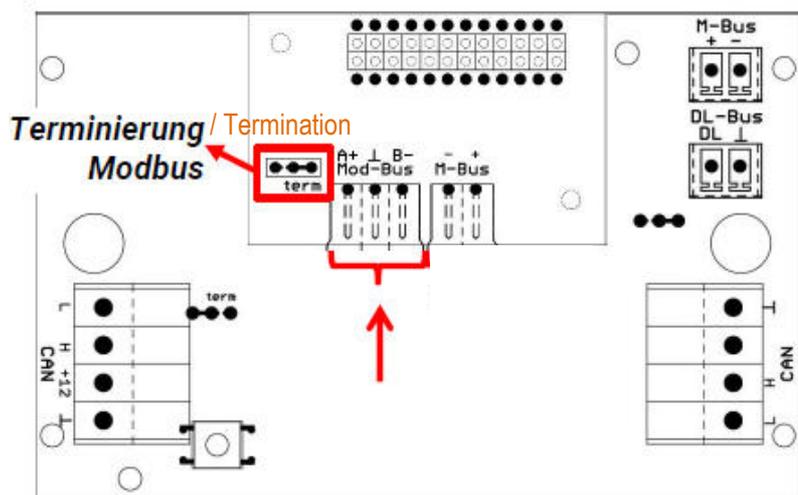
Via the "Modbus" you can access the Modbus setting parameters.



From here on follow the instructions of **3.1.1 Modbus-settings** from page 7.

4. Connection of Modbus line

Connection of Modbus line with due regard to the polarity (A+/1, B/-2).



Every Modbus network must be provided with a 120Ω bus termination at the first and last network subscriber (terminate by jumper). It means that a Modbus network always comes with two terminating resistors (at the end in each case).

The Modbus line needs to be laid in accordance with the Modbus guidelines.



KOREX Verfahrenstechnik GmbH
Talhofstrasse 30
82205 Gilching (Munich), Germany

Tel. +49 (0)8105-77822-10

Fax +49 (0)8105-77822-20

E-Mail: info@korex.de

Internet: www.korex.de

