WIKON
data logistics

AIRMO-1000

OPERATING INSTRUCTIONS
V1.5

Remote data transmission module

EN

Get in Touch

1 Content

2 General

- The AIRMO-1000 described in these operating instructions has been designed and manufactured according to the current state of the art. All components are subject to strict quality and environmental criteria during manufacture.
- These operating instructions provide important information on handling the device. A prerequisite for safe working is the observance of all specified safety notes and handling instructions.
- The local accident prevention regulations and general safety regulations applicable to the area of use of the device must be observed.
- The operating instructions are an integral part of the product and must be kept in the immediate vicinity of the device and accessible to qualified personnel at all times. The operating manual must be passed on to subsequent users or owners of the device.
- The qualified personnel must have carefully read and understood the operating instructions before starting any work.
- The general terms and conditions in the sales documents apply. We reserve the right to make technical changes.
- To use the online functionality of the AIRMO-1000, a valid service contract must be available.
- More information:

Internet address:	http://www.anova.com
Online Data Center:	https://www.global-datacenter.de
Online help:	https://www.global-datacenter.de/help/airmo1000_de.pdf
Application consultant:	Phone: +49 631 2057 770 Fax: +49 631 2057 7799
	Mail: info-eu@anova.com

2.1 Abbreviations, definitions

GPRS General Packet Radio Service
SMS Short Message Service

3 Structure and function

3.1 Overview

1 Pressure port for lower tank pressure
2 Pressure port for upper tank pressure
3 Power supply port
4 Antenna
5a LED for modem status
5b LED for device status
6 Position of reed contact
7 Serial number of the device

3.2 Description

The AIRMO-1000 has an integrated differential pressure sensor. By measuring the difference in pressure between the lower and upper connection of the tank, the filling level can be determined. The microcontroller in the AIRMO-1000 controls the measurement, evaluation and data transmission to the data center (server).
The AIRMO-1000 has no connection for an additional sensor. For compatibility reasons with the server and the apps, a second input channel is nevertheless transmitted. This is always set to '0'.
The AIRMO-1000 has an integrated LTE modem and transmits the data packets optionally via GPRS or sends SMS messages. The data center receives the data packets and offers extensive and individual options for data processing.
The AIRMO is powered by an external 24Vdc supply.
Information on the pin assignment and the power supply can be found in chapter "Technical data".

3.3 Scope of delivery

3.3.1 AIRMO-1000

The AIRMO-1000 is supplied fully assembled. The AIRMO includes the differential pressure sensor, control electronics, modem, antenna and an integrated SIM card.
For commissioning, the device is mounted on the tank, the two pressure connections are connected and finally the 24V power supply is established.

3.3.2 Mounting kit

The mounting kit includes all parts necessary for mounting on the tank and the production of the two pressure connections.

3.3.3 Solar option

The solar option consists of a solar module and a housing with charging - electronics and battery buffering.

3.3.4 Battery option

The battery option consists of a housing with integrated batteries.

4 Security

4.1 Explanation of symbols

WARNING!
... indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION!
... indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property and environmental damage.

Information
... highlights useful tips and recommendations, as well as information for efficient and trouble-free operation.

4.2 Intended use

The AIRMO-1000 is supplied with an integrated differential pressure sensor and modem. Opening the housing is not necessary and not permitted.
This device is not approved for use in potentially explosive atmospheres!
The AIRMO-1000 is designed and constructed exclusively for the intended use described here and may only be used accordingly.
The technical specifications in these operating instructions must be observed.
Improper handling or operation of the device outside the technical specifications requires immediate shutdown and inspection by an authorized service employee.
The device must be handled with the necessary care (protect from moisture, shocks, strong magnetic fields, static electricity and extreme temperatures, do not insert any objects into the device or openings).
Plugs and sockets must be protected from dirt.
Claims of any kind due to improper use are excluded.

4.3 Misuse

WARNING!
Injuries due to misuse
Misuse of the device can lead to dangerous situations and injuries.

- Unauthorized modifications to the device are not permitted.
- Do not use the device in potentially explosive atmospheres.

Any use beyond the intended use or any other use is considered misuse.

Do not use this device in safety or emergency stop equipment.

4.4 Personnel qualification

WARNING!
Risk of injury due to insufficient qualification Improper handling can lead to considerable personal injury and damage to property.

- The activities described in these operating instructions may only be performed by qualified personnel with the qualifications described below.

Specialized personnel

Due to their technical training, knowledge of measurement and control technology and experience as well as knowledge of the country-specific regulations, applicable standards and guidelines, the specialist personnel authorized by the operator are able to carry out the work described and to recognize possible dangers independently.

4.5 Radiation exposure

CAUTION!
Radiation exposure

When data transmission is activated, a safety distance of > 10 cm from the antenna must be maintained.

4.6 Signage, safety markings

The operator is obliged to keep the signage legible.

4.7 Symbols

Before mounting and commissioning the device, it is essential to read the
read the operating instructions!

Devices with this marking comply with the applicable European directives.

Devices with this marking must not be disposed of with household waste. Disposal is carried out by return or by appropriate municipal authorities (see EU Directive 2012/19/EU).

5 Transport and storage

5.1 Transportation

Inspect the AIRMO-1000 for any transport damage. Report any obvious damage immediately.

CAUTION!
Damage due to improper transport
Improper transport can result in considerable material damage.

- When unloading the packages during delivery and internal transport, proceed with caution and observe the symbols on the packaging.
- For internal transport, follow the instructions in chapter "Packaging and storage".

5.2 Packing and storage

Do not remove the packaging until immediately before assembly.
Keep the packaging, as this provides optimum protection during transport (e.g. changing installation location, repair shipment).
Permissible conditions at the storage location:
Storage temperature: -40 ... +70 °C

6 Commissioning

Personnel:
The assembly of the device and the making of the pressure connections must be carried out by appropriately trained specialist personnel.
The electrical installation must be carried out by qualified electrical personnel.

Tools:
Socket wrench SW17 for mounting hexagon head screws M8

Observe the tightening torques of the screws in the sketches.
Only use original parts (see chapter "Accessories").

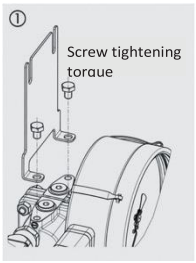
6.1 Mounting

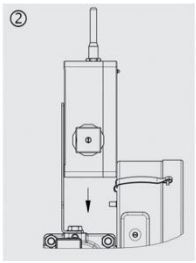
6.1.1 Mounting kit

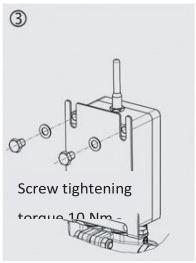
Material mounting kit
1 Mounting bracket
4 M8 hexagon head screws
1 Samson connection set (2 S-Pipes 6mm)

6.1.2 Mounting on the tank

- Fasten retaining plate to valve block with 2 screws.
- Fasten AIRMO-1000 to the retaining plate with 4 screws.





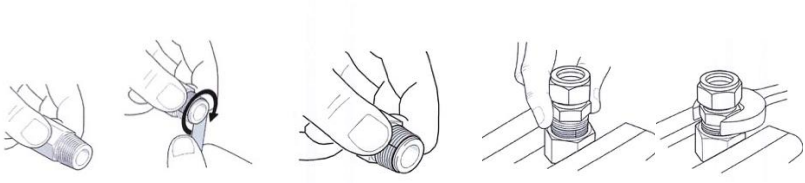


6.1.3 Making the pressure connections

a.) LET-LOK screw fittings on the differential pressure sensor and on the valve block

LET-LOK fittings are supplied assembled and finger-tight. If disassembled before use, dirt and other foreign matter may enter.

- Before assembling the fittings, clean the male and female thread ends of the NPT threads.
- Wrap a sealing tape around the thread 2 to 2 ½ times.
  The first thread must remain free.
- Insert the screw fitting into the female thread and tighten finger-tight
- Tighten key tight



b.) Assemble pressure lines

- Insert the pipe into the LET-LOK fitting. Make sure that the pipe is tight against the fitting shoulder and that the nut is finger-tight.
- It is recommended to tighten only one mark on the hexagon of the nut up to the bolting body. This mark serves as an identification of the starting point and the proper tightening strength.
- Tighten the nut now. For ¼" (6mm) diameter and larger tubes, 1 ¼ turns of the nut are required. For tubes 3/16" (4mm) diameter and less, ¾ turns of nut are required.
- A test gauge is also available for checking the correct screw connection.

6.2 Electrical connection

The AIRMO-1000 is supplied with power via the M12 socket (B-coded) on the underside. The standard power supply is 24Vdc.
A suitable connection cable of 1m length is included.

First connect the connection cable to the power supply:

1	Brown	24Vdc
5	grey	GND

Then connect the connection cable (M12 connector) to the AIRMO.

The status LED should light up red for approx. 15 sec (restart). After that, the left LED starts flashing (network search). As soon as both LEDs light up green, the device is ready for operation.

Optionally, further energy supplies are possible:

Opt1:	Supply via external solar module
Opt2:	Supply with external battery module

6.3 Configuration

As soon as the AIRMO-1000 is supplied with power, communication with the online data center starts (LTE LED lights up green and flashes yellow-orange-yellow intermittently). A system test is performed and a status message is transmitted. The AIRMO is then ready for operation and can be configured in the online data center.
To configure the AIRMO-1000, the differential pressure at maximum tank level must be set on the data center. This parameter is transmitted from the data center to the device.

6.3.1 Online Data Center

Access data (login and password) are required to use the online data center.
The login takes place via:
https://www.global-datacenter.de
Detailed help on how to use the online data center is available at the following link.
https://www.global-datacenter.de/help/airmo1000_de.pdf

6.3.2 Setup Wizard

The setup wizard for the AIRMO-1000 can be accessed in the online data center under "Configuration". There, the required information about the measuring point and the operating mode of the AIRMO are requested in sequence. Help texts with additional information exist for the input fields.

The following information is required:

- Plant designation - e.g. installation site (free text)
- Tank designation - e.g. tag no. (free text)
- Operating mode - (overview see next page)
- Gas type - which medium is in the tank
- Max. Volume - Adjustable are e.g. 100% or also xxx m3 / liter / kg
- Max. Differential pressure - Maximum differential pressure with full tank
- Limits

7 Operation

7.1 Operating modes

7.1.1 24V power supply

SMS		GPRS
Mode = 00	**Mode = 02**	**Mode = 03**
Data logger inactive	Data logger interval 15 min	Data logger interval 15 min
Transmission at routine time (adjustable)	Transmission at routine call time (2x per day)	Transmission hourly
Consumption-dependent messages		
User-defined alarm thresholds		
Interrogation interval of the sensors: 1 min		
Device is permanently connected to the LTE network		

7.1.2 Solar operation

If the AIRMO is supplied via a solar module, the device is in battery mode and the battery is charged when exposed to sunlight.
The status LED flashes during charging. (From version 2.0)

7.1.3 Battery operation

SMS		GPRS
Mode = 00	**Mode = 02**	**Mode = 03**
Data logger inactive	Data logger interval 15 min	Data logger interval 15 min
Transmission at routine time (adjustable)	Transmission at routine call time (2x per day)	Transmission 2x per day
Consumption-dependent messages		
User-defined alarm thresholds		
Interrogation interval of the sensors: 15 min		
The device is connected to the LTE network only for sending a message		

In battery mode, the measurement of the pressure difference takes place every 15 minutes and data transmission every 12 hours.

7.2 Display, operation

7.2.1 LED display

	Network		**Status**
Off	Modem off	off	Battery operation
Blink	Network search	flashing	Charging during solar operation
On	connected	on	24Vdc mains supply
Green	Transmission ok	green	OK
orange	Transmission active	orange	Warning
Red	Transmission error	red	Error

During the boot process, the status LED lights up red for 15s.

7.2.2 Manually triggering the data transmission

Manual triggering of a status message is possible by actuating the reed contact with a permanent magnet. The position of the reed contact is marked on the label. (Right side of the housing)
When the button is pressed, the power LED goes off briefly and then changes to orange (transmission active).

8 Interference

8.1 Power supply, measuring range

Malfunction	Cause	Measure
LED(s) do not light up	Lack of power supply. Supply voltage failed or battery module used up.	Check the power supply. If the battery module is used up, order a new battery module
Measured value deviation local display and online data center	Pressure range is not calibrated	The differential pressure when the tank is full (100%) can be set on the data center. Please use the setup wizard under Configuration.

8.2 Data transmission and data center

Malfunction	Cause	Measure
LED "LTE" flashes continuously	LTE signal too weak	Contact support
Login to the data center does not work	Login data not correct or not registered	Contact support
Online data center does not receive data	Problems with LTE transmission	Contact support
User-defined alarms and forwarding settings are not accepted.	Faulty configuration in the online data center	Contact support

For support in case of problems with data transmission or with the data center please contact the support of WIKON Kommunikationstechnik GmbH.

Tel: +49 631 205 777 0
Mail: support-eu@anova.com

8.3 Power supply failure

In the event of a power failure, the data center detects that no more routine calls are being received. The status of the system is then set to fault in the data center. Messages to the service personnel can be set on the data center.

9 Maintenance

The AIRMO-1000 is maintenance-free.

Necessary repairs are to be carried out exclusively by the manufacturer.
The replacement of the external battery module is excluded.
Only original parts may be used (see chapter "Accessories").

10 Disassembly

10.1 Disassembly

The AIRMO-1000 must be disassembled in the reverse order to that described in the chapter "Commissioning".

10.2 Return

Use the original packaging or suitable transport packaging to return the device.

To avoid damage:

1. Unscrew the antenna.
2. Place the unit with the insulation material in the packaging.
   Insulate evenly on all sides of the transport packaging.
3. If possible, add a bag of desiccant to the packaging.

Return instructions:
www.anova.com or
office-eu@anova.com

11 Technical data

Technical data	RDT module AIRMO
GSM frequenciesLTE frequencies	900, 1800 MHz B3, B8, B20
Max. Transmitting power	33 dBm (2 W)
Required RSSI level	-80 dBm (25%)
Energy supply UB	DC 24 V ±5 % Pmax: 5 W M12 x 1 connector, 5-pin, B-coding acc. to IEC 61076-2-101 Pin Color Assignment 1 brown 24 Vdc 5 grey GND
Permissible temperature range:	Storage: -40 ... +70 °C Operation: -20 ... +60 °C
Permissible humidity:	0 ... 95 % r. h. (non-condensing)
Protection class:	IP65 according to EN 60529 / IEC 60529
Dimensions	W x H x D: 100 x 240 x 81 mm with antenna and differential pressure sensor
Weight	Ca 1,4 kg
EC conformity	CE EN 55011 EN 61000 EN 301 489 EN 301 908

12 Accessories

Description	Order no.
AIRMO-1000	G0025400
Connection cable	B0020106
Mounting kit (retaining plate, 4 screws, connection set Samson)	G0025410
Connection set Samson	B0025410
Solar option	Upon request
Battery option	Upon request

13 Plant information

Serial number: _____

Phone number: _____

Plant name: _____

Mounting location: _____

_____

_____

Tank designation: _____

Operating mode: _____

Gas type: _____

Max. Volume: _____

Max. Differential pressure: _____