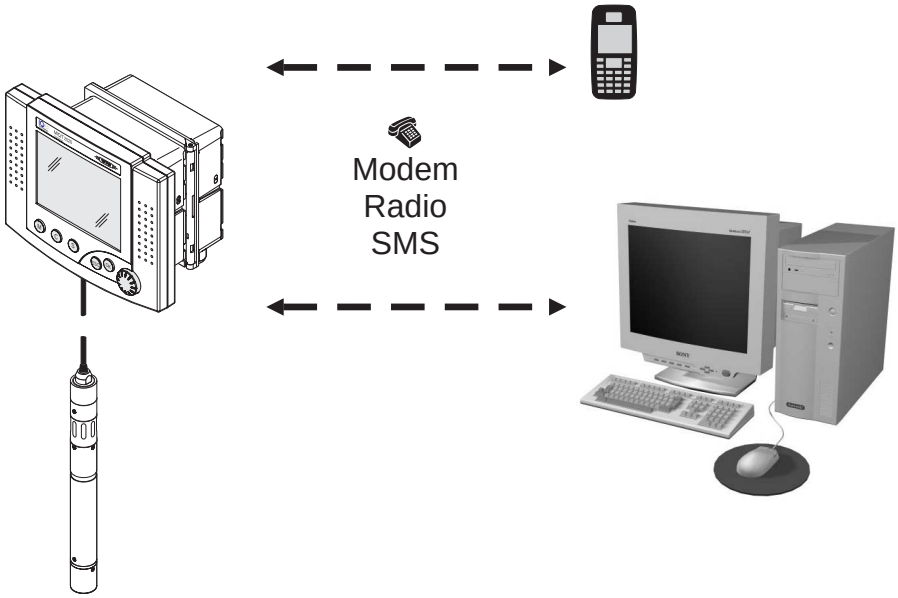
Operating Manual

IQ SENSOR NET
MIQ/MC(-A)-RS



(Remote) Data transmission to the IQ SENSOR NET System 2020 XT via
- fixed line telephone network
- mobile network
- radio link
- direct connection

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Accuracy when going to press

The use of advanced technology and the high quality standard of our instruments are the result of continuous development. Consequently, this may result in some differences between this operating manual and your instrument. Also, we cannot guarantee that there are absolutely no errors in this manual. Therefore, we are sure you will understand that we cannot accept any legal claims resulting from the data, figures or descriptions.

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Remote connection to the IQ SENSOR NET System 2020 XT

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1 Overview

1.1 How to use this component operating manual

The present operating manual complements the system operating manual for the IQ SENSOR NET system 2020 XT. It contains the description of the RS option of the MIQ/MC(-A)-RS controller.

File this operating manual directly behind the system operating manual.

Structure of the IQ SENSOR NET operating manual

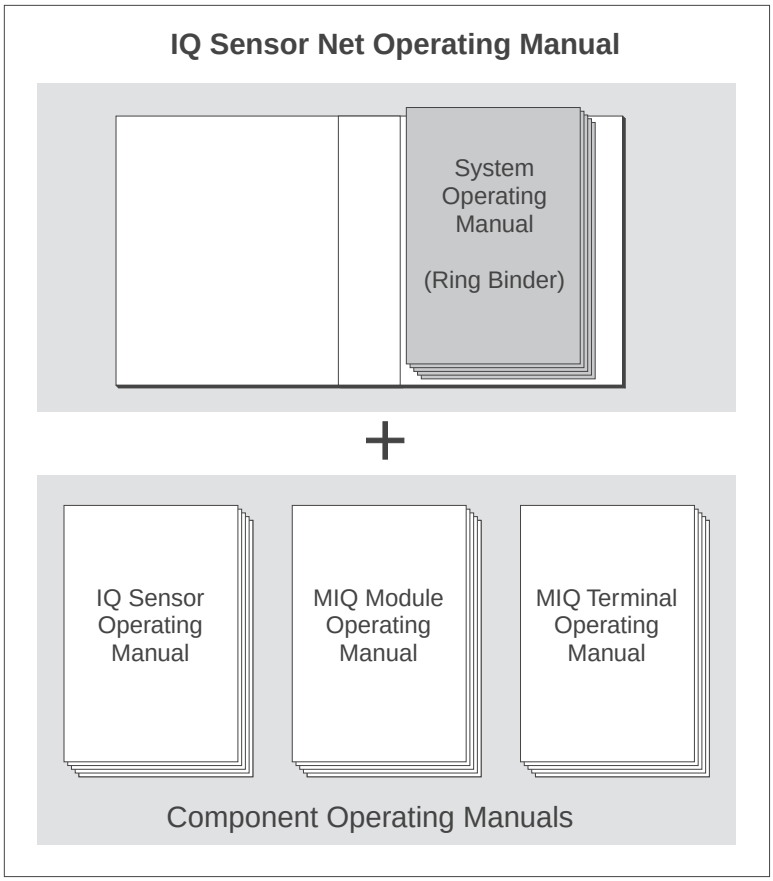


Fig. 1-1 Structure of the IQ SENSOR NET operating manual

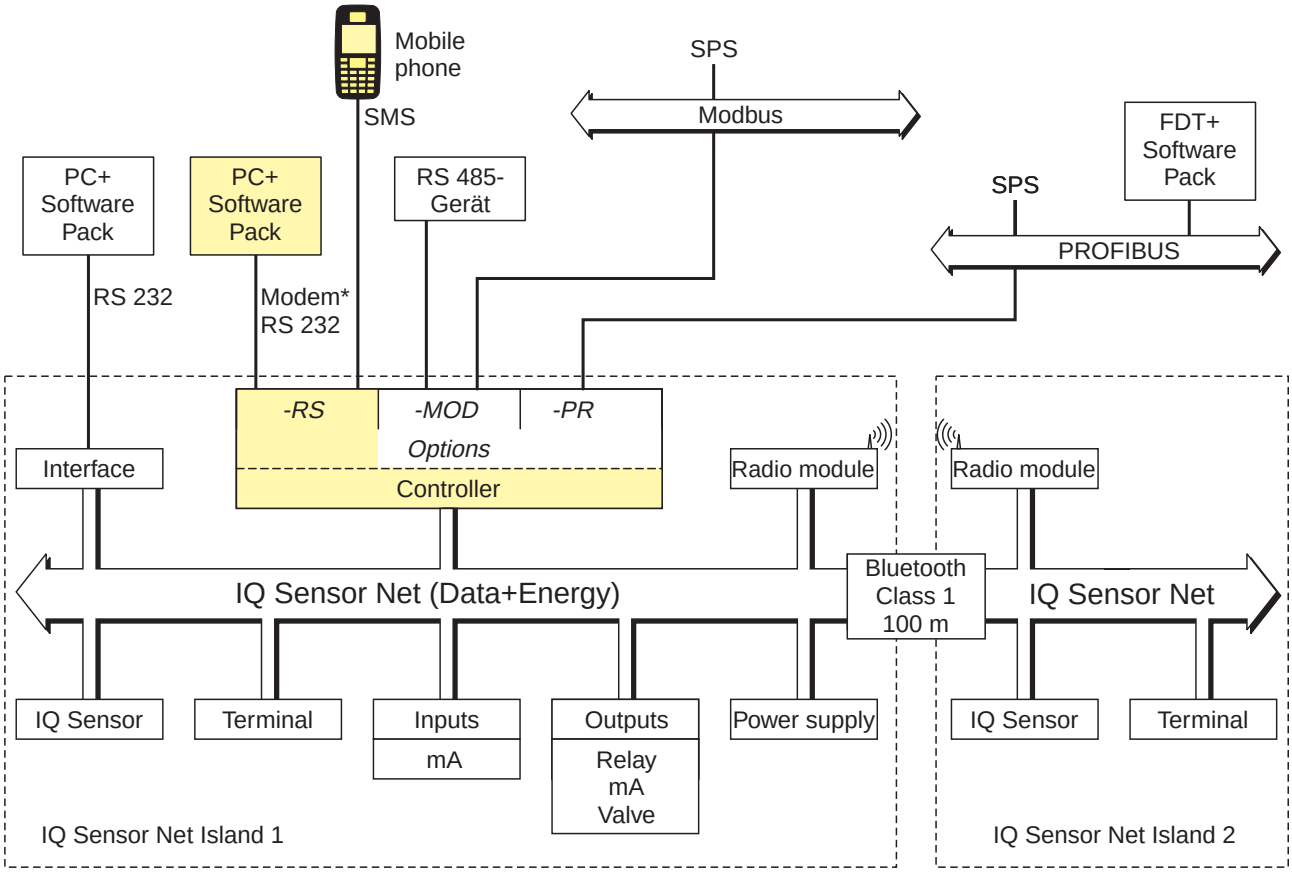
The IQ SENSOR NET operating manual has a modular structure like the IQ SENSOR NET system itself. It consists of the system operating manual and the operating manuals of all the components used.

The space in the ring binder behind the system operating manual is intended for filing the component operating manuals. Please file all component operating manuals here so that all information is quickly available in one location.

1.2 Remote data transmission to the IQ SENSOR NET System 2020 XT

General characteristics

The MIQ/MC(-A)-RS controller expands the IQ SENSOR NET by an interface for a modem. Thus it is possible to transmit data between the IQ SENSOR NET and a remote PC or mobile phone. The IQ SENSOR NET can be connected to the fixed line telephone network, the mobile telephone network or via a direct radio link. The connection to the IQ SENSOR NET can be online or offline via SMS.



* Land line, GSM, or separate radio link

Fig. 1-2 Remote data transmission with the MIQ/MC(-A)-RS

Connection options via mobile network, fixed line network and radio link

- IQ SENSOR NET (MIQ/MC(-A)-RS) <-> analog modem <-> fixed line telephone network <-> analog modem <-> PC
- IQ SENSOR NET (MIQ/MC(-A)-RS) <-> analog modem <-> fixed line telephone network <-> mobile network <-> GSM modem <-> PC
- IQ SENSOR NET (MIQ/MC(-A)-RS) <-> GSM modem <-> mobile network <-> fixed line telephone network <-> analog modem <-> PC
- IQ SENSOR NET (MIQ/MC(-A)-RS) <-> GSM modem <-> mobile network <-> GSM modem <-> PC
- IQ SENSOR NET (MIQ/MC(-A)-RS) <-> radio modem <-> air <-> radio modem <-> PC
- IQ SENSOR NET (MIQ/MC(-A)-RS) <-> GSM modem <-> SMS <-> mobile telephone
- IQ SENSOR NET (MIQ/MC(-A)-RS) <-> GSM modem <-> SMS <-> GSM modem <-> PC

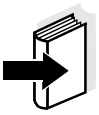


Note
A modem connection via the MIQ/T2020 PC software terminal counts as a terminal component. A maximum of three terminal components can be used in the IQ SENSOR NET at the same time. Only one modem connection can ever be made to the IQ SENSOR NET.

Functions that can be carried out

With the aid of the IQ SENSOR NET software pack, for example, the following functions can be carried out on a remote PC:

- (Remote) Operation/monitoring of the IQ SENSOR NET with the MIQ/T2020 PC software terminal.
  The software terminal has the same operating concept as other terminal components (e.g. MIQ/T2020). This means it is not necessary to "get used" to it when changing between the different types of terminal.
- (Remote) Data transmission of current measured data
- (Remote) Data transmission of stored measured data
- (Remote) Backup/loading of the IQ SENSOR NET system configuration



Note
Details of the operation of the software are given in the operating manual for the IQ SENSOR NET software pack. All other general information on components, functions and operation of the IQ SENSOR NET 2020 system is given in the system operating manual.

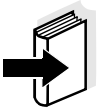
2 Safety instructions

Essential instructions that must be followed during the commissioning, operation and maintenance of the IQ SENSOR NET system are given in the system operating manual. It is essential for the operator to read this system operating manual before carrying out any work with the system.

Notes in this operating manual



Note
indicates notes that draw your attention to special features.



Note
indicates cross-references to other documents, e.g. component operating manuals.

3 Scope of delivery

In addition to the scope of delivery of the MIQ/MC(-A), the scope of delivery of the MIQ/MC(-A)-RS module contains:

- MIQ/MC(-A)-RS controller with mounted interface for a modem
- Operating manual for the modem option (-RS)
- IQ SENSOR NET Software Pack

4 Transmission via fixed line network and mobile network

4.1 Structure

Analog or GSM modems can be used for the transmission on the IQ SENSOR NET and PC side. With a GSM modem on the IQ SENSOR NET, measured values can be queried from the IQ SENSOR NET system and automatic alarm messages received via SMS.

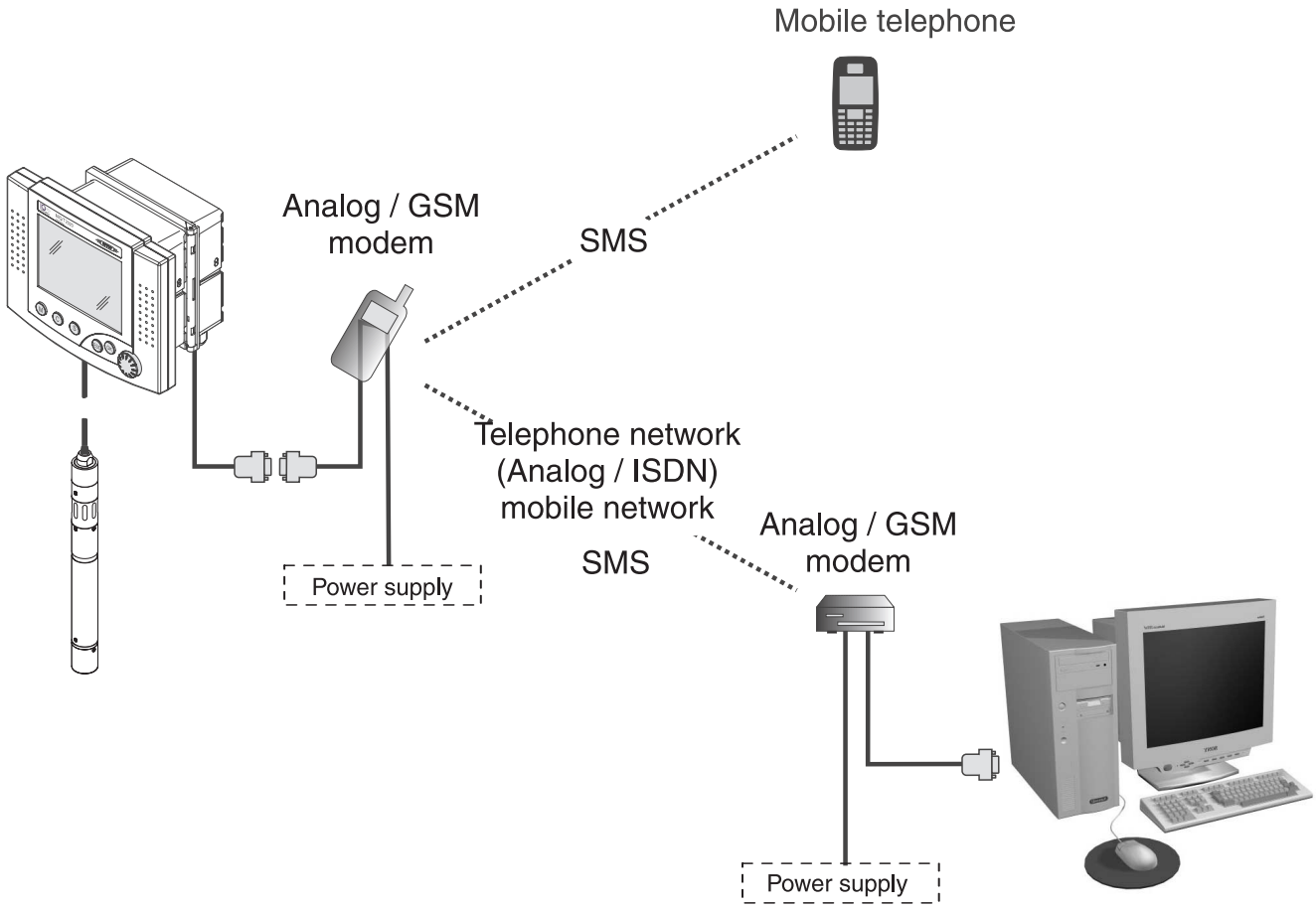


Fig. 4-1 (Remote) Data transmission with analog modems and GSM modems

Note
How to connect the modems to the IQ SENSOR NET and the PC is described in section 6 COMMISSIONING.

4.2 System requirements

4.2.1 Modem system requirements

The modems must meet the following requirements:

Analog modem

- Compatible to the Hayes (AT) standard
- serial RS232 interface (for modem on IQ SENSOR NET side)
- power supply unit, cable for data transmission
- analog telephone mainline with telephone number (for modem on IQ SENSOR NET side)

Recommendations:

IQ SENSOR NET side:	devolo MicroLink 56k i
PC side:	devolo MicroLink 56k ior Creatix V.90

GSM modem

- Compatible with the AT command set according to the GSM 07.07 specification
- serial RS232 interface (for modem on IQ SENSOR NET side)
- power supply unit, aerial, cable for data transmission
- country-specific mobile network (in Germany: D1 or D2)

Recommendation: Siemens TC35i or Siemens MC35i

4.2.2 IQ SENSOR NET system requirements

- MIQ/MC(-A)-RS controller
- IQ SENSOR NET - modem connection cable
  Prepare this connection cable yourself, e.g. using a 6-wire cable and an RS232 plug (see section 6).
- For SMS, software version from 2.85

4.2.3 PC system requirements

Hardware requirements

- AT-compatible computer with Pentium processor or higher (recommended: 500 MHz or higher)
- minimum 8 MByte RAM (recommended: 64 MByte or higher)
- Hard disk with at least 10 Mbytes available memory
- VGA/SVGA graphic card with monitor
- CD-ROM drive
- Connection cable (PC <--> modem)
- operable modem (see section 5.2.1)



Note
The use of an external modem with a USB or RS232 interface is preferable. In the case of internal notebook modems, problems with the transmission speed can occur.

Software requirements

- Windows 95 or higher
- IQ SENSOR NET Software Pack

4.3 Settings of a GSM modem on the IQ SENSOR NET side

The connected GSM modem has to be initialized so that the IQ SENSOR NET communicates with the GSM modem. For this the PIN of the GSM modem is required during the initial operation.

Initializing the modem

1	Open the *Einstellungen/Settings* menu with (S).
2	Select the *System settings* menu item with (↻) and confirm with (OK).
3	Select the GSM menu item with (↻) and confirm with (OK). On first operation the *GSM* dialog box with the prompt to enter the PIN opens up.

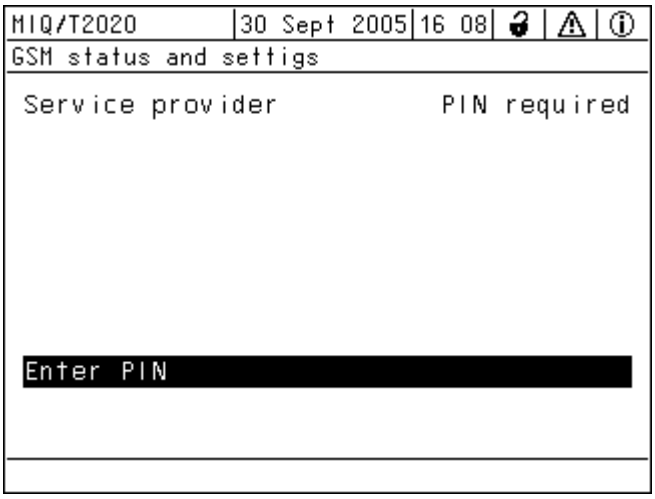


Fig. 4-2 Setting menu for the GSM modem

4	Confirm with OK.

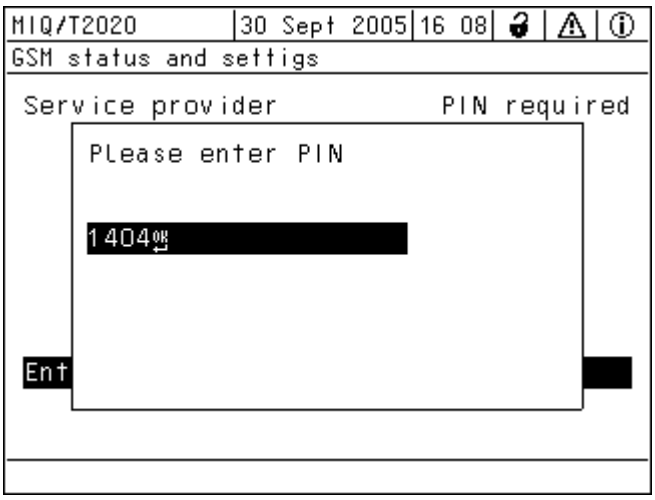


Fig. 4-3 Entering the PIN

5	Enter the PIN with ⟳ and OK and confirm with OK. The *GSM Status and settings* menu opens up.

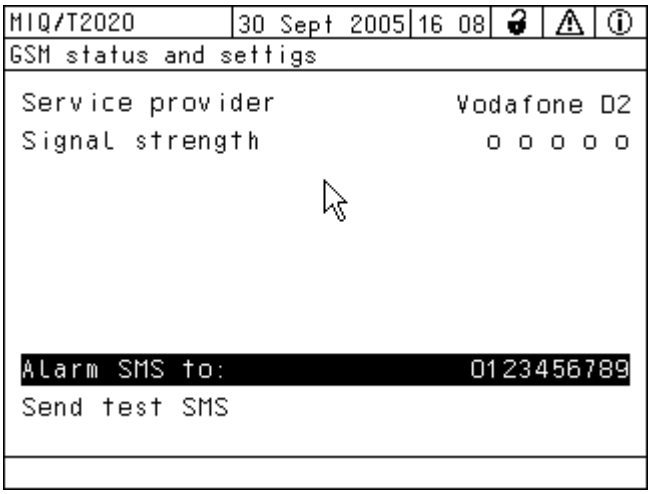


Fig. 4-4 Status and settings menu for GSM modem

Note
The entered PIN is stored in the IQ SENSOR NET. When the modem is put into operation again it is automatically initialized with the stored PIN. It will not be necessary to enter the PIN once again when calling up the *GSM Status and settings* menu.

Menu item	Selection/Values	Explanations
Service provider		Names the mobile network provider.
Signal strength	0 - 5 rings (○)	Quotes the strength of the modem receive signal (maximum reception = 5 rings)
Alarm SMS to:	Number of max. 20 digits	Here you name the telephone number of the receiver to whom the alarm SMS should be sent. The alarms are configured in the menu, *Alarm settings*. More detailed information on this is given in the system operating manual. If an alarm from the alarm list occurs, a corresponding SMS is sent.
Send test SMS		Here you can test the transmission with the aid of a test SMS to the receiver. To do so select this menu item and confirm with (OK).

4.4 Remote query of measured value via SMS

You can query current measured values with an operable GSM modem at the IQ SENSOR NET. To do so, send an SMS with the following texts to the phone number of the GSM modem.

Querying a single measured value

```
value xxxx y
```

with:

– xxxx = access password to the IQ SENSOR NET (lock/unlock settings)

– y = sensor number (one or two digits, e.g. "1" corresponds to sensor S01, "12" to sensor S12)

Querying all measured values

```
value xxxx all
```

A separate SMS is sent for each sensor.

5 Transmission via radio modem

5.1 Structure

The transmission via radio modems must be made with two similar radio modems:

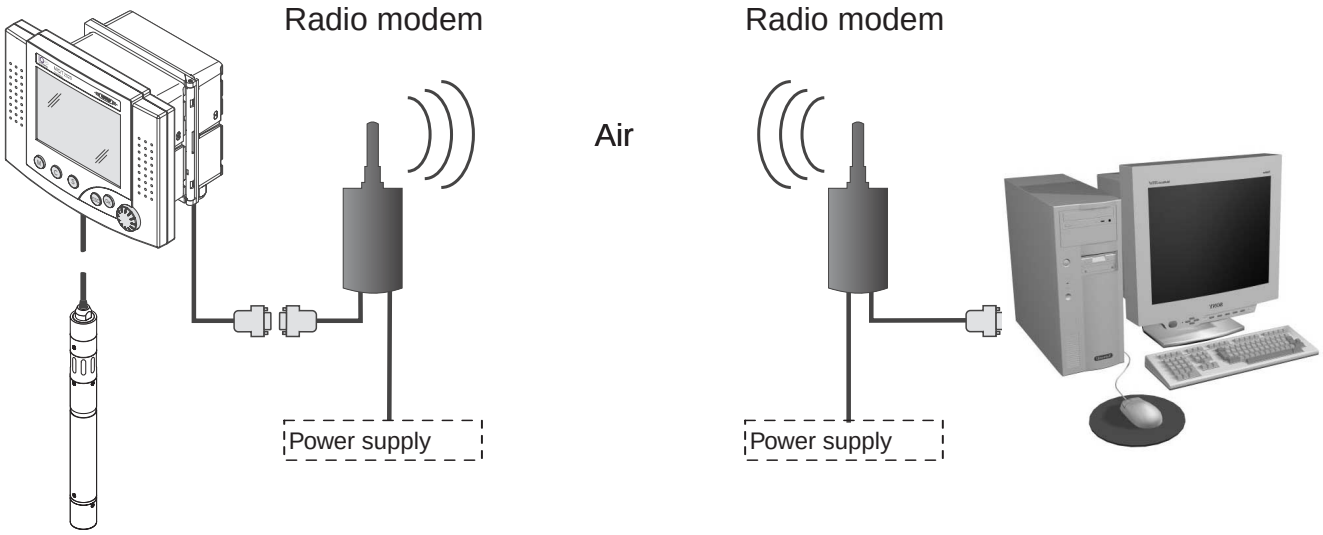


Fig. 5-1 (Remote) Data transmission with radio modems

Note
How to connect the radio modem to the IQ SENSOR NET and the PC is described in section 6 COMMISSIONING.

Influences on the transmission

The following factors have an impact on the radio transmission:

- Distance between sender and receiver
- Barriers between sender and receiver
- Sender power
- Sensitivity of the radio receiver
- Amplification power of the sending and receiving aerial
- Attenuation of the aerial cable
- Mounting height of the aerial
- Other interferences

Note
Further information and the suitable equipment in order to establish an optimum radio transmission is available from your specialist dealer. When establishing a radio transmission also observe the relevant national legal requirements, concerning e. g.:

- Restrictions when using a radio frequency and
- the possibly necessary purchase of a license for the use of a radio frequency.

In Germany, the regulatory authority for telecommunication and mail (Regulierungsbehörde für Telekommunikation und Post - RegTP) is responsible for the national legal requirements.

5.2 System requirements

5.2.1 System requirements of the radio modem

- Transparent data transmission
- serial RS232 interface
- power supply unit, aerial, cable for data transmission and line power connection
- data transmission rate of the radio link: min. 9600 bits/s

Recommendation: Radio modems by Satel (Satelline product series) with cable set for data transmission and line power connection (www.satel.fi)

5.2.2 IQ SENSOR NET system requirements

- MIQ/MC(-A)-RS controller
- IQ SENSOR NET - modem connection cable
  Prepare this connection cable yourself, e.g. using a 6-wire cable and an RS232 plug (see section 6).

5.2.3 PC system requirements

Hardware requirements

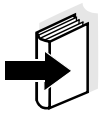
- AT-compatible computer with Pentium processor or higher (recommended: 500 MHz or higher)
- Minimum 8 MByte RAM (recommended: 64 MByte or higher)
- Hard disk with at least 10 Mbytes available memory
- VGA/SVGA graphic card with monitor
- CD-ROM drive
- Connection cable (PC <--> modem)
- Operable radio modem (see section 5.2.1)

Software requirements

- Windows 95 or higher
- IQ SENSOR NET Software Pack

5.3 Settings at the radio modems

For the data transmission between two radio modems to be error free, both radio modems (on the IQ SENSOR NET side and on the PC side) must be configured in the same way.



Note
Details on the configuration of your radio modem are given in the operating manual of your radio modem.

Some settings have to be done on the radio modem.
All settings must be identical on both modems.
The settings given as an example have to be adjusted accordingly.

Settings on the radio modem

Data transmission speed of the serial interface:	38400 bits/s
Start delay:	0 ms
Transmitting power: The required transmitting power depends e.g. on the local conditions.	e.g. 500 mW
Transmitting frequency: Certain national transmitting frequencies are allocated to individual transmitting powers.	e.g. range 869.400 - 869.650 MHz



Note
For the operation of radio transmissions, the national regulations and conditions for the use of radio frequencies always have to be observed.
Possible restrictions when using a radio frequency:

- Transmitting power
- Duty Cycle
- Channel band width (affects the transmission speed)
- Licenses



Note
Information on recommended radio modems (Satelline product series) and further accessories (cable for power supply and data transmission) is available from Satel or on the Internet under www.satel.fi.

6 Commissioning

6.1 Connecting the (radio) modem to the IQ SENSOR NET

Materials required

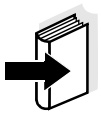
- shielded 6-wire cable (maximum length: 10 m)
- 9-pole D-Sub female connector (RS232) for the connection of individual wires
- 6 wire end sleeves

Connecting the cable to the plug

1	Strip the wires on one end of the connection cable.
2	Connect 6 wires of the cable to the pins of the 9-pole D-Sub male connector according to the pin assignment.

Terminal assignment

The pins on the IQ SENSOR NET must be connected to the pins of the modem plug.



Note
The pin assignment of your (radio) modem is given in the operating manual of your (radio) modem.

Example

Pin assignment on the IQ SENSOR NET with allocation to a 9-pole D-Sub male connector (RS232).

Pin IQS*	Name	Function	Pin D**
1	RxD	Received Data	2
2	TxD	Transmitted Data	3
3	GND R232	Signal ground	5
4	RTS & DTR	Request to Send & Data Terminal Ready (2 wires --> 1 terminal)	7 4
5	CTS	Clear to Send	8

*) Pin assignment for terminal connection on the IQ SENSOR NET
**)Pin assignment for a 9-pole D-Sub plug connection (RS232)

3	Cut off the excess wires.
4	Connect the cable shield to the plug enclosure.
5	Connect the plug.

Preparing the connection cable for connection to the MIQ/MC(-A)-RS

6	Carefully remove the connection cable insulation for approx. 15 mm.
7	Cut off the excess wires.
8	Strip the insulation of the wires of the connection cable on the side of the MIQ/MC(-A)-RS for a length of approx. 5 mm.
9	Twist the wires of the connection cable and slide on wire end sleeves.

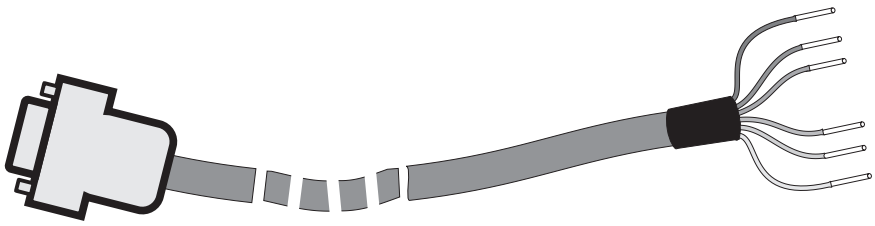


Fig. 6-1 Connection cable with RS232 plug

Connecting the connection cable to the MIQ/MC(-A)-RS

1	Screw the MIQ/MC(-A)-RS module open.
2	Connect the wires of the connection cable to the terminal connections of the modem connection according to the terminal assignment.

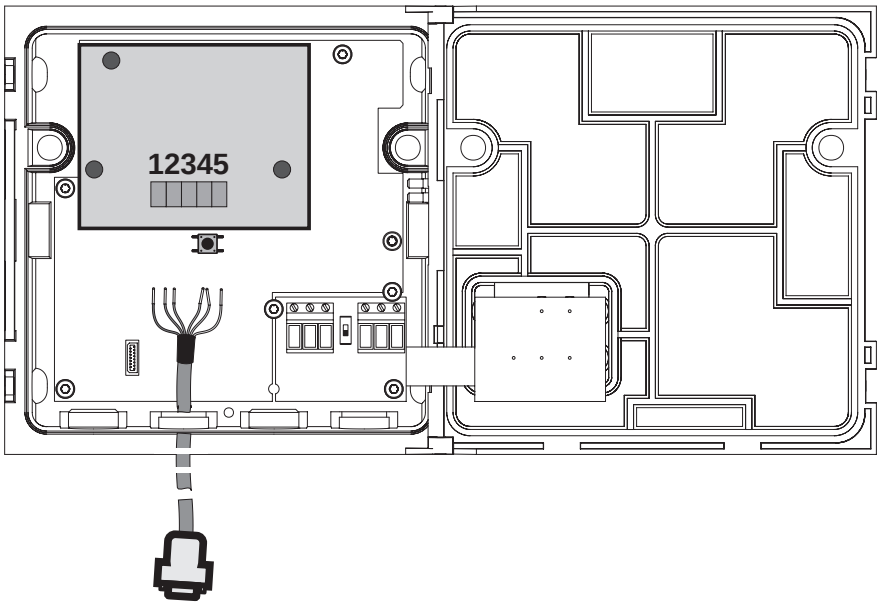


Fig. 6-2 MIQ/MC(-A)-RS with terminal connection for a modem

Terminal assignment

Pin	Name	Function
1	RxD	Received Data
2	TxD	Transmitted Data
3	GND R232	Signal ground
4	RTS & DTR	Request to Send & Data Terminal Ready (connect both wires to this terminal)
5	CTS	Clear to Send

3	Check the entire cable connection from the terminal strip up to the pins of the D-Sub male connector.
4	Screw the MIQ/MC(-A)-RS module shut.
5	Connect the connection cable to the (radio) modem.
6	Prepare the (radio) modem for operation according to the operating manual.
7	Attach the power supply for the IQ SENSOR NET according to the system operating manual.

8	Provide the power supply to the (radio) modem according to the operating manual of the (radio) modem. Thus, the IQ SENSOR NET is ready for communication via a (radio) modem.

6.2 Preparing the PC for transmission

The following preparations for a (radio) modem connection with the IQ SENSOR NET are required on the PC:

9	Connect the (radio) modem to the PC (see operating manual of the modem).
10	Install the IQ SENSOR NET Software Pack on the PC (see operating manual of the IQ SENSOR NET Software Pack).

7 Direct connection IQ SENSOR NET <-> PC

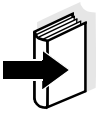
You can also directly connect the modem connection cable (see section 6.1) to a PC via a 9-pole standard zero modem cable. Thus it is possible on site, for example, to load measuring data on a PC quickly and without any expensive remote connection. The IQ SENSOR NET Software Pack serves as the PC communication software.



Note
9-pole standard zero modem cables are available via the computer specialist trade.

Establishing a direct connection

- Disconnect the modem connection cable from the (radio) modem.
- Using the zero modem cable, connect the plug of the modem connection cable to the RS 232 interface (COM port) of the PC.
- Start the MIQ/T2020 PC software terminal on the PC.
- In the start routine of the MIQ/T2020 PC, select the *Radio link* transmission type. Deactivate the Duty Cycle 10 % check box to achieve the maximum speed. Then press *OK*. The connection is established.



Note
For more information please refer to the operating manual of the IQ SENSOR NET Software Pack.

8 What to do if ...

Note
Errors of analog modems or GSM modems caused by the modem or country-specific features concerning the entry of the telephone number are not taken into account here.

Connection to the IQ SENSOR NET is not established

Cause	Remedy
– Telephone number entered incorrectly or incompletely (analog modem or GSM modem)	– Check telephone number – Pay attention to special country-specific features concerning modem operation – Pay attention to special features during operation on telephone systems
– Faulty devices, e.g. – Modems – MIQ/MC(-A)-RS	– Replace devices

Transmission to the IQ SENSOR NET is faulty

Cause	Remedy
– Wiring of the connections is faulty	– Check/correct the wiring of the connections to the terminal strip
– Modem interface of the MIQ/MC(-A)-RS defective	– Send the MIQ/MC(-A)-RS to WTW
– Cable is faulty	– Check the cable
– Modem defective	– Replace the modem
– COM connection of the PC incorrectly configured	– Activate the FIFO buffer (if possible) – Set the receive buffer to the highest value (if possible)

Cause	Remedy
– Transmission quality insufficient (radio modem)	– Distance between radio modems too great – Transmitting power too low – Aerial insufficient or defective – Weather impact Further notes can be found in the operating manual of your radio modem.
– Malfunction due to other transmitters (radio modem)	– select other frequency

Transmission is canceled

Cause	Remedy
– Line quality insufficient (analog modem or GSM modem)	– Redial – Check the telephone connections – on the side of the IQ SENSOR NET – on the side of the PC – Test the transmission speed by means of a data transmission with a PC on the side of the IQ SENSOR NET
– Modem unsuitable	– Check the suitability of the modem (to do so, contact your dealer)

9 Technical data

General technical data for the IQ SENSOR NET and the MIQ/MC component are given in the system operating manual of the 2020 XT system.

The general technical data of the MIQ/MC(-A)-RS controller are the same as the technical data of the MIQ/MC controller.

The MIQ/MC(-A)-RS controller additionally contains a modem interface (M) with a clamping connection for a modem.

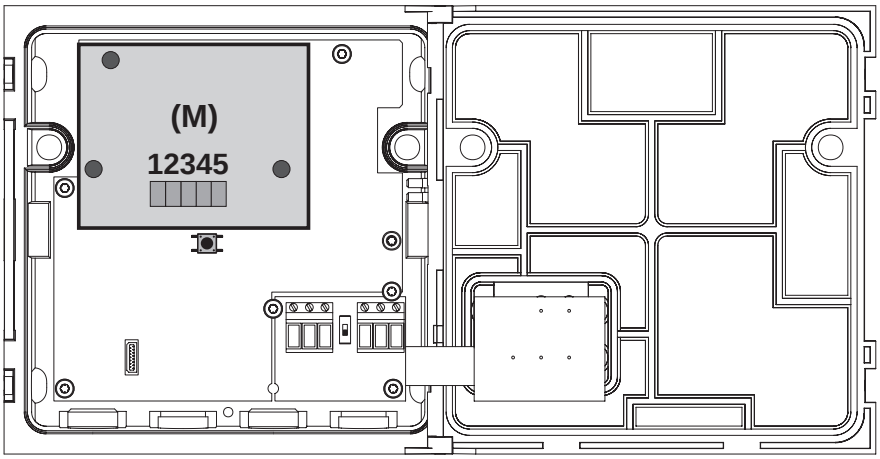


Fig. 9-1 Module with clamping connection for a modem

The assignment of the terminal is given in section 6.

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