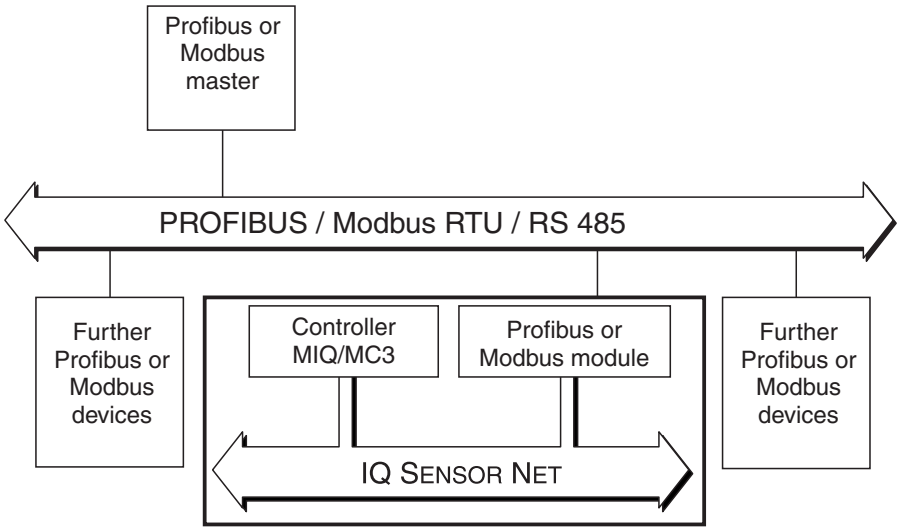
OPERATING MANUAL

ba77184e02 03/2018



MIQ/3-PR
MIQ/3-MOD

PROFIBUS, MODBUS RTU AND RS 485 CONNECTION FOR THE IQ SENSOR NET SYSTEM 2020 3G

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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 3G. Is contains the description of the MIQ/3-PR / MIQ/3-MOD module.

File this operating manual directly behind the system operating manual.

Structure of the IQ SENSOR NET operating manual

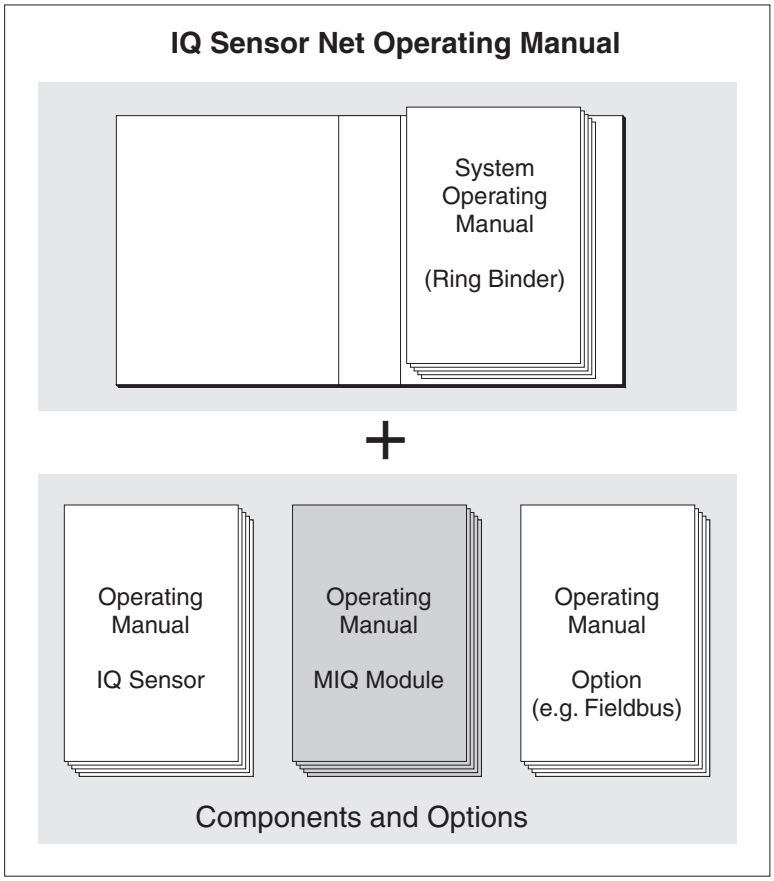


Fig. 1-1 Structure of the IQ SENSOR NET operating manual

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 Fieldbuses (PROFIBUS, Modbus) and the IQ SENSOR NET System 2020 3G

System communication

The functional units of the IQ SENSOR NETSystem 2020 3G are connected with one another via a common line. The line consists of two wires and a shield. It transports digital information between the controller and the other modules. At the same time, the line is used to supply all modules with electrical voltage from a power supply unit. The power supply unit is only required for power supply and is not used in the system communication.

MIQ/3-PR

With the -PR option, the MIQ/3-PR module upgrades the system communication by an interface to the PROFIBUS master. Via this interface the data exchange with the PROFIBUS master takes place.

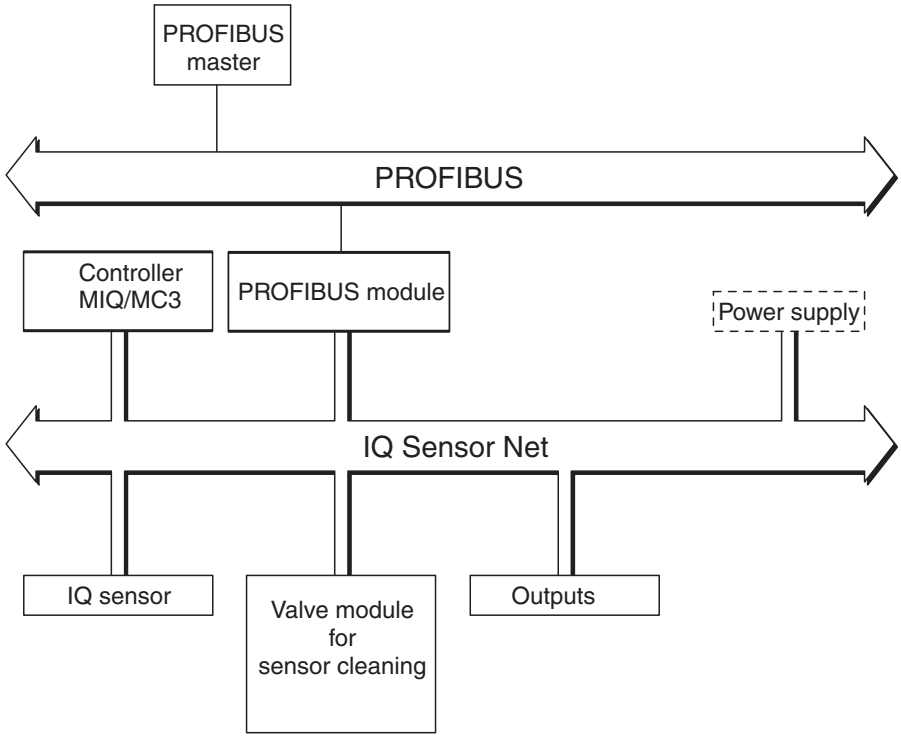


Fig. 1-2 Functional units of the IQ SENSOR NET with connection to the PROFIBUS

All other general information on components, functions and operation of the IQ SENSOR NET system System 2020 3G is given in the system operating manual.

MIQ/3-MOD The MIQ/3-MOD module upgrades the system communication by a Modbus interface. Via this interface, sensor data can be queried with the Modbus RTU protocol. The Modbus interface (RS 485) also enables a direct point-to-point connection from an IQ SENSOR NET system to a Modbus master (e.g. PC or PLC).

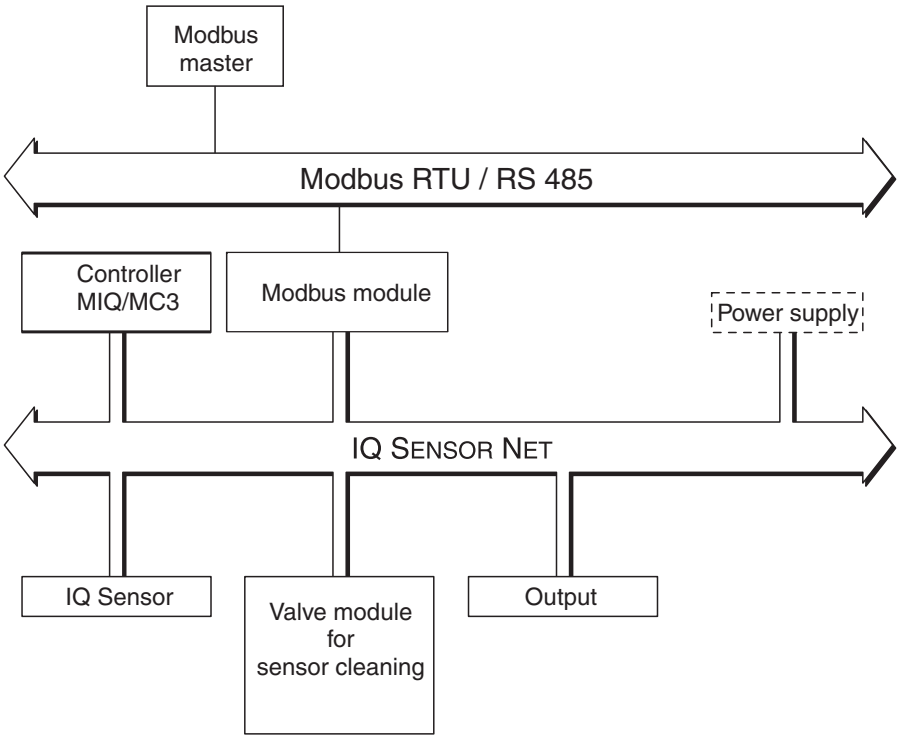


Fig. 1-3 Functional units of the IQ SENSOR NET with connection to the Modbus

All other general information on components, functions and operation of the IQ SENSOR NET system System 2020 3G is given in the system operating manual.

1.3 Compatibility to IQ SENSOR NET System 2020 XT controllers

The fieldbus modules MIQ/3-PR and MIQ/3-MOD are compatible to the IQ SENSOR NET System 2020 3G controllers (MIQ/MC3, MIQ/MC2, MIQ/TC 2020 XT).

2 Safety

2.1 Safety information

2.1.1 Safety information in the operating manual

This operating manual provides important information on the safe operation of the product. Read this operating manual thoroughly and make yourself familiar with the product before putting it into operation or working with it. The operating manual must be kept in the vicinity of the product so you can always find the information you need.

Important safety instructions are highlighted in this operating manual. They are indicated by the warning symbol (triangle) in the left column. The signal word (e.g. "CAUTION") indicates the level of danger:



WARNING
indicates a possibly dangerous situation that can lead to serious (irreversible) injury or death if the safety instruction is not followed.



CAUTION
indicates a possibly dangerous situation that can lead to slight (reversible) injury if the safety instruction is not followed.

NOTE
indicates a situation where goods might be damaged if the actions mentioned are not taken.

2.1.2 Safety signs on the product

Note all labels, information signs and safety symbols on the product. A warning symbol (triangle) without text refers to safety information in this operating manual.

2.1.3 Further documents providing safety information

The following documents provide additional information, which you should observe for your safety when working with the measuring system:

- Operating manuals of other components of the IQ SENSOR NET system (power supply modules, accessories)
- Safety datasheets of calibration and maintenance equipment (e.g. cleaning solutions).

2.2 Safe operation

2.2.1 Authorized use

The authorized use of the MIQ/3-PR or MIQ/3-MOD fieldbus module consists of its use as interface to a fieldbus. Only the operation and running according to the instructions and technical specifications given in this operating manual is authorized (see chapter 5 TECHNICAL DATA). Any other use is considered unauthorized.

2.2.2 Requirements for safe operation

Note the following points for safe operation:

- The product may only be operated according to the authorized use specified above.
- The product may only be operated under the environmental conditions mentioned in this operating manual.
- The product may only be supplied with power by the energy sources mentioned in this operating manual.
- The product may only be opened if this is explicitly described in this operating manual (example: connecting electrical lines to the terminal strip).

2.2.3 Unauthorized use

The product must not be put into operation if:

- it is visibly damaged (e.g. after being transported)
- it was stored under adverse conditions for a lengthy period of time (storing conditions, see chapter 5 TECHNICAL DATA).

2.3 User qualification

Target group

The MIQ/3-PR or MIQ/3-MOD fieldbus module was developed for online analysis. Some maintenance activities, e.g. changing the membrane caps in D.O. sensors, require the safe handling of chemicals. Thus, we assume that the maintenance personnel is familiar with the necessary precautions to take when dealing with chemicals as a result of their professional training and experience.

Special user qualifications

The following installation activities may only be performed by a qualified electrician:

- Connection of the power supply module to the power supply.
- Connection of external, line voltage-carrying circuits to relay contacts (see module manual of the relay output module).

3 Installation

3.1 Scope of delivery

The scope of delivery of the fieldbus module (MIQ/3-PR or MIQ/3-MOD) comprises:

- MIQ/3-PR or MIQ/3-MOD
- Accessory set, including:
  - 4 x cable glands (clamping range 4.5-10 mm) with seals and blind plugs
  - 4 x ISO blind nuts M4 with suitable cheese-head screws and plain washers
  - 2 x countersunk screws M3x8 to close the module lid (+ 2 replacement screws)
  - 1 x contact base with fixing screws
- Operating manual MIQ/3-PR / MIQ/3-MOD.
- Operating manual IQ SENSOR NET fieldbus linking.

3.2 Installation in the IQ SENSOR NET

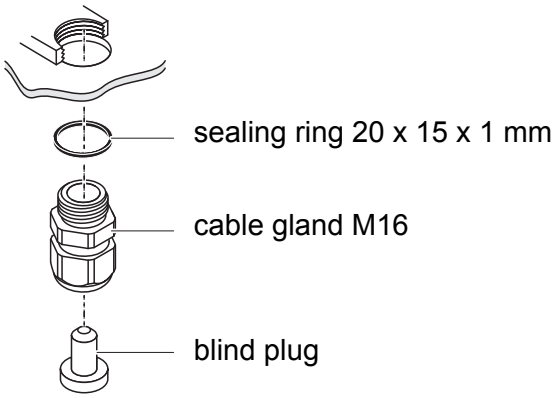
The IQ SENSOR NET provides a number of options for integrating the MIQ/3-PR / MIQ/3-MOD mechanically and electrically in the system (stacked mounting, distributed mounting, etc.). The various types of installation are described in detail in the INSTALLATION chapter of the system operating manual.

3.3 Electrical connections: General instructions

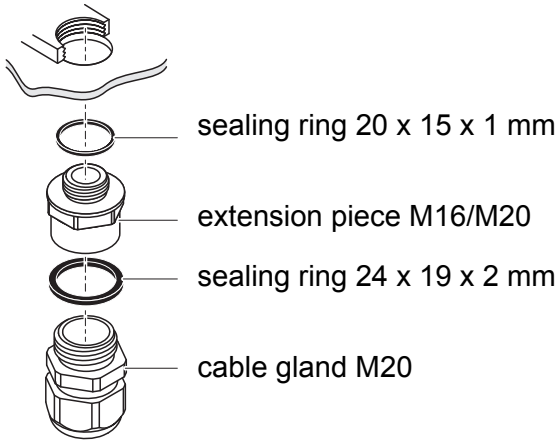
Cable glands

All electric cables are fed from below via prepared openings in the enclosure of the MIQ/3-PR / MIQ/3-MOD. Cable glands with different clamping ranges are included with the MIQ/3-PR / MIQ/3-MOD to provide sealing between the cable and enclosure as well as for strain relief. Select the matching cable gland for the respective cable diameter:

- **Small**, clamping range 4.5 to 10 mm. This cable gland is suitable for all IQ SENSOR NET sensor cables.



- **Large**, clamping range 7 to 13 mm. This cable gland is required for cable sheaths with an outside diameter of more than 10 mm and is screwed into the enclosure via an extension piece.



If necessary, you can order more large cable glands in a set of 4 pieces (Model EW/1, Order No. 480 051).

General installation instructions

Observe the following points when attaching connecting wires to the terminal strip

- Shorten all wires to be used to the length required for the installation
- Always fit all the ends of the wires with wire end sleeves before connecting

them to the terminal strip

- Any wires that are not used and project into the enclosure must be cut off as closely as possible to the cable gland.
- Screw a small cable gland with sealing ring into each remaining free opening and close it with a blind plug.

Terminal strip

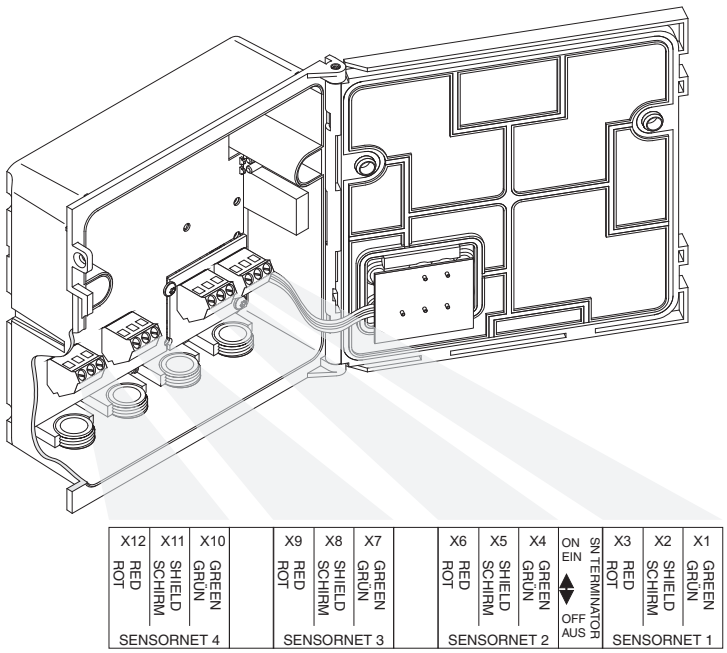


Fig. 3-1 Terminal strip of the MIQ/3-PR / MIQ/3-MOD

All SENSORNET connections are identical and can be used as required for extending/branching the cable section or for the connection of sensors.

4 Fieldbus interface

The MIQ/3-PR or MIQ/3-MOD field bus module enables to connect the IQ SENSOR NET System 2020 3G with all the sensors connected to it to the digital connection of a superordinate process control.

All other general information on components, functions and operation of the IQ SENSOR NET System 2020 3G is given in the system operating manual.

Details on communication with fieldbuses are given in the operating manual ba77010e ("IQ SENSOR NET fieldbus linking").



Further instructions for the installation and operation of a Modbus network are given on the Internet under www.Modbus.org.

Especially recommendable is the "Aufbaurichtlinie PROFIBUS/FMS" (installation guideline) issued by the PNO PROFIBUS user organization, (PNO order number 2.111) with many practical installation tips that apply to Modbus systems as well.

5 Technical data

5.1 General data

Dimensions

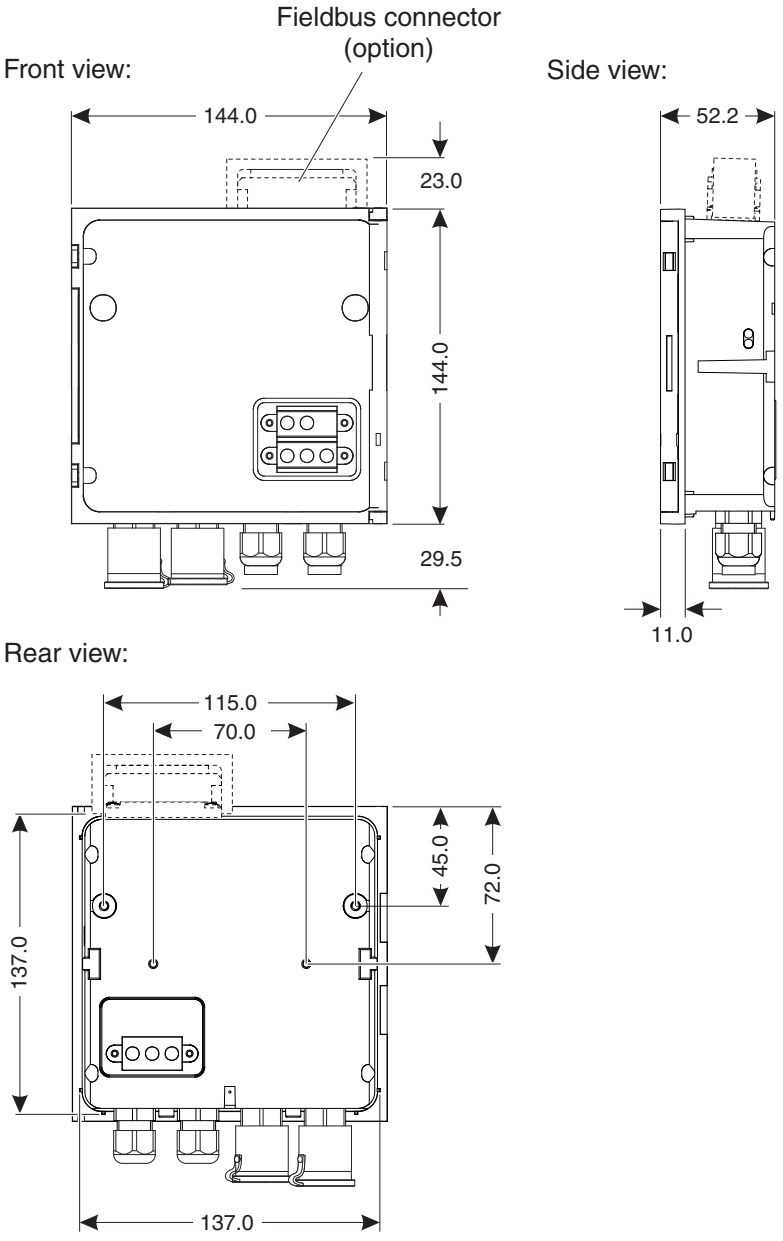


Fig. 5-1 Dimension drawing of MIQ module (dimensions in mm)

Mechanical structure

Maximum number of MIQ modules in a module stack	3
Enclosure material	Polycarbonate with 20 % glass fiber

	Weight	Approx. 0.5 kg
	Type of protection	IP 66 (not suitable for conduit connection).
Cable glands	Suitable for cable sheath diameter	4.5 - 10 mm or 9.0 - 13 mm
Ambient conditions	Temperature	
	Mounting/installation/ maintenance	+ 5 °C ... + 40 °C (+ 41 ... +104 °F)
	Operation	- 20 °C ... + 55 °C (- 4 ... + 131 °F)
	Storage	- 25 °C ... + 65 °C (- 13 ... + 149 °F)
	Relative humidity	
	Mounting/installation/ maintenance	≤ 80 %
	Yearly average	≤ 90 %
	Dew formation	Possible
	Site altitude	Max. 2000 m above sea level
Meter safety	Applicable norms	– EN 61010-1 – UL 61010-1 – CAN/CSA C22.2#61010-1
EMC product and system characteristics	EN 61326	EMC requirements for electrical resources for control technology and laboratory use – Resources for industrial areas, intended for indispensable operation – Interference emission limits for resources of class A
	System lightning protection	Noticeably extended qualitative and quantitative protective characteristics as opposed to EN 61326
	FCC, class A	

5.2 MIQ/3-PR / MIQ/3-MOD

Electrical data

Nominal voltage	Max. 24 VDC via the IQ SENSOR NET (for details, see chapter TECHNICAL DATA of the IQ SENSOR NET system operating manual).
Power consumption	3.0 W
Protective class	III

Terminal connections

IQ SENSOR NET connections	2 2 additional SENSORNET terminators that can be activated (terminating resistors)
Terminal type	Screw-type terminal strip, accessible by raising the lid
Terminal ranges	Solid wires: 0.2 ... 4.0 mm^2 AWG 24 ... 12 Flexible wires: 0.2 ... 2.5 mm^2
Cable feeds	4 cable glands M16 x 1.5 on the underside of the module

USB connection USB-A socket for software updates

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1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

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