Operating manual

IQ SENSOR NET
System 184 XT



Modular multiparameter measuring system

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Accuracy when going to press

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1 Overview

1.1 How to use this system operating manual

Structure of the IQ SENSOR NET operating manual

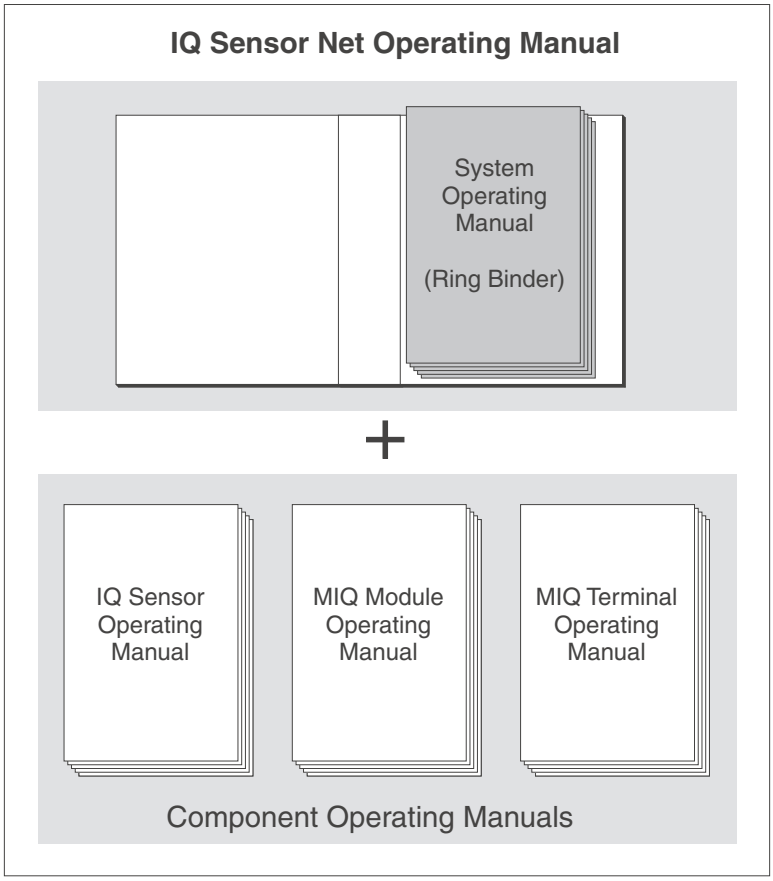


Fig. 1-1 Structure of the IQ SENSOR NET operating manual

The IQ SENSOR NET operating manual has a modular structure like the IQ SENSOR NET system itself. It consists of this 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 The IQ SENSOR NET system184 XT

1.2.1 Structure of the system

The IQ SENSOR NET is a modular measuring system for online analysis. Modular means that the essential functional units of the measuring system are distributed in components that can be individually compiled for special applications.

The essential functional units of the IQ SENSOR NET system 184 XT include:

- Terminal/controller
- IQ sensors
- Inputs (current inputs)
- Outputs (relay contacts, current outputs, valve outputs)
- Additional terminals (mobile terminals, software terminal)
- Help functions (e.g. power supply unit).

System communication

The functional units are connected with one another via a common line (Fig. 1-2). 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 the power supply and is not used in the system communication.

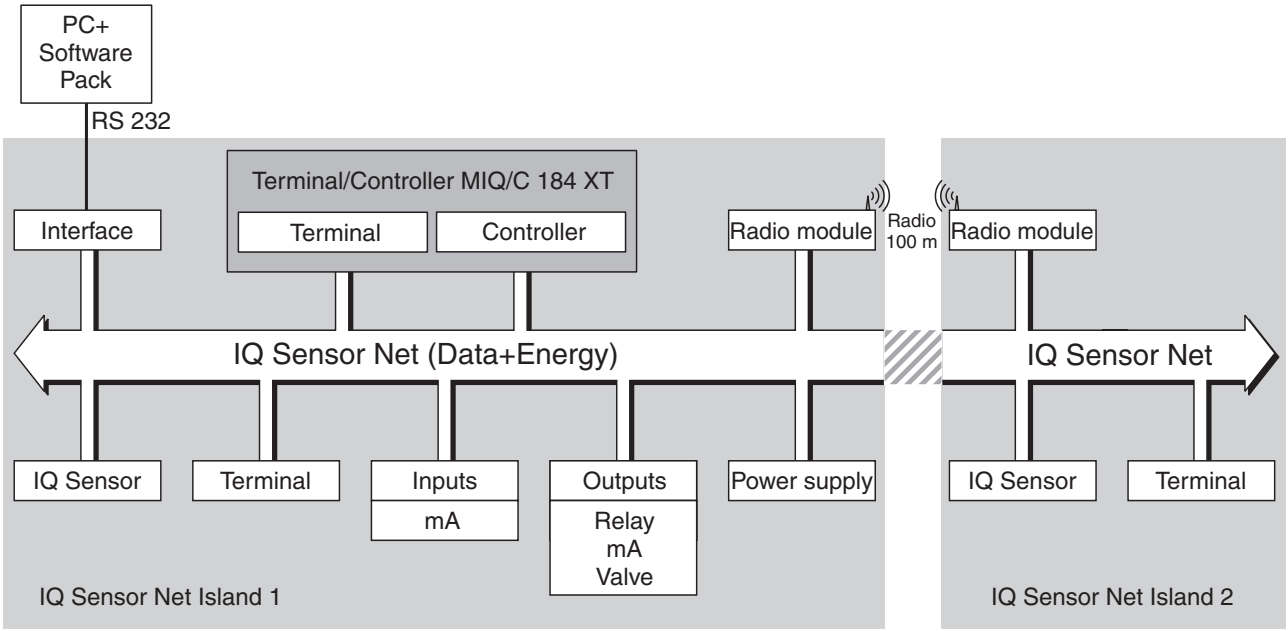


Fig. 1-2 Functional units of the IQ SENSOR NET

1.2.2 Functions in the IQ SENSOR NET

The functions of the IQ SENSOR NET are provided by the system (controller) and the retrofitting components. Details on the functions listed can be found in the relevant system or components operating manuals.

Function	Component
Alarm messages	System
Analog output	Current output module
Data logging	System
Data recording (PC)	IQ software pack
Data transmission (PC)	IQ software pack
Datalogger	IQ software pack
Data server	IQ software pack
Differential sensor	System
Frequency output	Relay output module
Limit monitor	Relay output module
Calibration history	System
List of outputs, list of sensors	System
Log book	System
Log book (messages from components)	IQ sensor Output module
Measured value representation (4 types)	System
Password	System
PID controller	Current output module
Pulse-width output	Relay output module
Sensor cleaning	Relay output module Valve module
Local settings	System
Daily load diagram, weekly load diagram, monthly load diagram	System
Monitoring functions (sensors, system)	Output module

1.2.3 Possible ways to communicate with the IQ SENSOR NET

Digital communication

The IQ SENSOR NET can communicate with humans and machines via different interfaces.

The overview of the following diagram explains:

- who can communicate with the IQ SENSOR NET
- what interfaces and components are required for this
- which functions are available with which interface

Available functions / **Who communicates with the IQ Sensor Net via which interface/ component**	Direct actions via the terminal user interface	Viewing/ transmitting current data: •Measured values • Status info •Alarm messages	Viewing/ transmitting logged data: •Measured values •Measured value status	System configuration, • save/ load • view • print	Calibration data, view/transmit
Human					
Terminal/Controller MIQ/C184 XT	X	X	X		X
Human + PC					
MIQ/IF232 + IQ software pack	X	X	X	X	X
Terminal MIQ/T2020 + Offline transfer station (MIQ/IF232 + power supply module) + IQ software pack			X		
Client + Server + PC ("data logger")					
MIQ/IF232 + IQ software pack (+ network)		X			X

Current and relay interfaces

In addition to the digital communication, output modules provide relay and current outputs. These can be used for control, feedback control and monitoring functions.

1.2.4 Components of the system 184 XT

Minimum configuration (basic components)

The following basic components are required for a 184 XT system:

- An MIQ/C184 XT terminal/controller
- A power supply module (e.g. MIQ/PS)
- At least one IQ sensor.

IQ sensors, main and secondary measured values

Sensors provide main measured values (e.g. pH, D. O. concentration, turbidity value...) and additionally, depending on the type, secondary measured values (e.g. temperature). In the System 184 XT, digital WTW single sensors and double sensors can be used:

- Single sensors provide a main measured value and normally a secondary measured value (example: TriOxmatic 700 IQ → D. O. + temperature).
- All active 0/4-20 mA inputs of the MIQ/IC2 input module rank among the single sensors. Via a 0/4-20 mA input, any external instruments can be connected to the IQ SENSOR NET via their current output. Each input provides a main measured value.
- Double sensors provide up to two main measured values and normally a secondary measured value (example: VARiON 700 IQ → ammonium + nitrate + temperature).

> Each main measured value occupies a sensor location in the IQ SENSOR NET. A double sensor with two active main measured values thus occupies two sensor locations. The available sensor locations can be occupied by any single or double sensors.

Extension components

The system can be adapted to fulfill different specifications by adding further components, e.g. by:

- Terminals. They are the operation and communication units for the IQ SENSOR NET. Available are:
  - MIQ/T2020 mobile terminals for operating the system from various measurement locations, e.g. for the calibration of IQ sensors on site
  - MIQ/T2020 PLUS mobile terminals. Like MIQ/T2020 but with additional redundant controller function. It maintains all essential operational functions in the case of a controller malfunction.
  - MIQ/T2020 PC software terminals. The connection to the PC can be established via the interface module MIQ/IF232 and the RS 232 interface on the PC .
- Output modules with relay, current and valve outputs. Valve outputs enable the time controlled, compressed air operated cleaning of the sensor.

Each current output, relay output and valve output occupies an output channel in the IQ SENSOR NET. The available output channels can be assigned to outputs arbitrarily.

- Power supply modules for power supply
- MIQ/JB and MIQ/JBR branching modules to branch the system and to connect IQ sensors and terminals
- MIQ/Blue PS radio modules for wireless connection within the IQ SENSOR NET.

Maximum configuration

Maximum configuration of the IQ SENSOR NET system 184 XT:

Component or resource	Maximum number
MIQ/C184 XT terminal/controller	1
Sensor locations, can be occupied by: – Single sensors – Double sensors – 0/4-20 mA inputs	12
Terminal locations, can be occupied by: – MIQ/T2020 – MIQ/T2020 PLUS – MIQ/T2020 PC software terminal.	2
Output channels, can be occupied by: – Current outputs – Relay outputs – Valve outputs	36
Power supply modules (e.g. MIQ/PS)	6
MIQ/JB branching modules	15
MIQ/JBR branching modules with integrated signal processing	2
MIQ/Blue PS radio modules	several transmission paths (see operating manual of the MIQ/Blue PS)

Connecting MIQ modules

There are two basic mounting variants for connecting the MIQ modules:

- **Stack mounting** - permanent mechanical and electrical connection. The housings of the MIQ modules are permanently mounted on one another to form a stack. No cabling is necessary.
- **Distributed mounting** - electrical connection via cable. Locally separated MIQ modules or module stacks are connected with one another via the SNCIQ or SNCIQ/UG cable.

The following diagram shows an IQ SENSOR NET system with two mounting variants (Fig. 1-3).

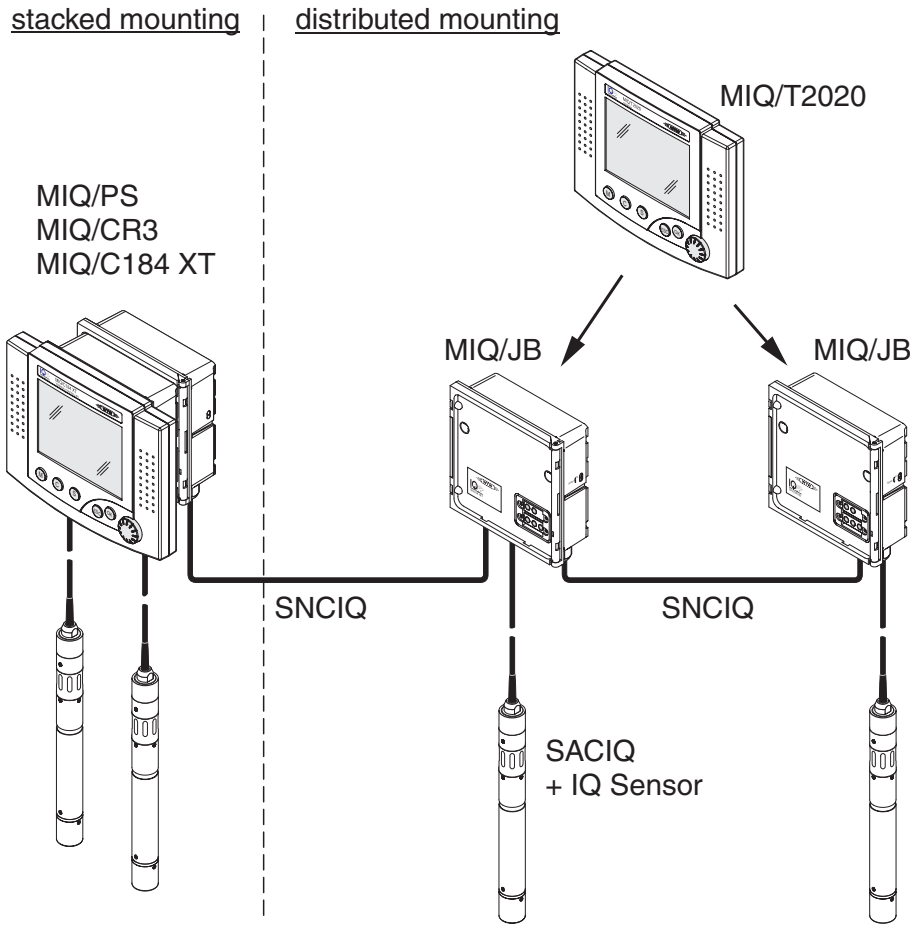


Fig. 1-3 Example of an IQ SENSOR NET system configuration

IQ sensors

Up to 12 IQ sensors of any type can be used in the 184 XT system. They can be connected to any MIQ module that has a free connection for the IQ SENSOR NET. The connection between the IQ sensor and MIQ module is made via the SACIQ sensor connection cable. The IQ sensor connection cable is connected with the plug head connector of the IQ sensor via a screwable socket to form a watertight connection. As a result, the IQ sensor can be quickly removed for maintenance activities and then connected again.

1.2.5 MIQ modules

Some of the IQ SENSOR NET components are so-called MIQ modules with different functions.

All MIQ modules have a standard housing with the following features (Fig. 1-4):

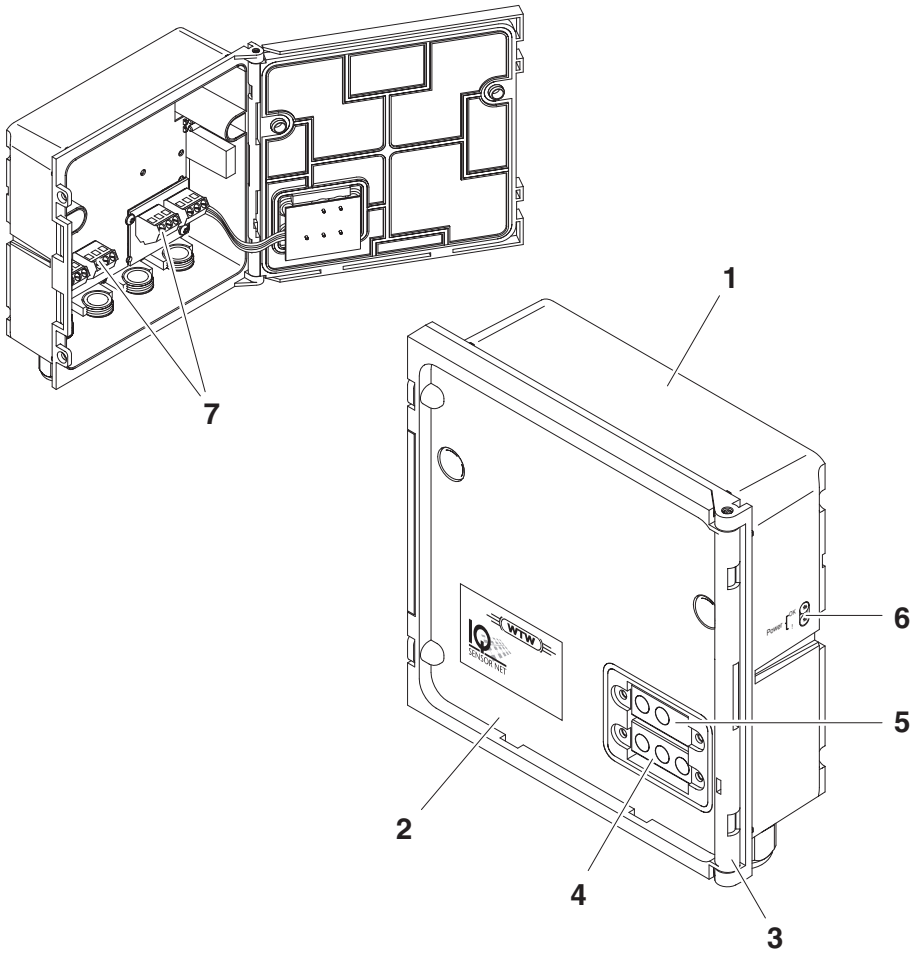


Fig. 1-4 MIQ module

1	Housing
2	Lid
3	Hinge
4	Contacts for voltage and communication
5	Contacts for the local identity function
6	Voltage LEDs
7	Terminal strip (example)

Common characteristics of the MIQ modules

- **Module lid with hinge**
  Due to its wide opening angle, the lid provides a large space for working inside the module (e.g. for connecting lines to the terminal strip).
- **Docking facility**
  MIQ modules can be mechanically docked onto one another. As a result, several MIQ modules can be mounted in the form of a stack to create a single unit (**stack mounting**). At the same time, docking enables the MIQ modules to be electrically connected with one another via the module contacts on the front and back so that no cabling is required. Even when it is part of a stack, each MIQ module can be opened. In addition, a terminal component can be docked onto each free lid front.
- **Terminal strip**
  Further IQ SENSOR NET components can be connected by cable to the terminal strip inside the housing (**distributed mounting**). The terminal strip enables IQ sensors to be connected via the SACIQ sensor connection cable or the IQ SENSOR NET can be further branched and extended here. Certain MIQ modules have a terminal strip with further specific connections (e.g. power connection, relay contacts, current outputs).
- **Local identity function**
  The local identity function is integrated in each MIQ module in the form of a memory chip. This memory chip can store information such as the designation of the measurement location and a specific selection of IQ sensors for the measured value display. This information is output when a terminal is docked and, thus, e.g. enables the rapid finding of local IQ sensors for calibration.
- **Voltage diagnosis via LEDs**
  Two LEDs, yellow and red, on the side of the housing are used to monitor the operational voltage of each MIQ module.

1.2.6 Terminal/Controller MIQ/C184 XT

The MIQ/C184 XT terminal/controller combines the functions of both controller and terminal. It is a basic component of the 184 XT system and must, therefore, always be present in the system. The terminal/ controller is connected with the system by docking on the free lid front of an MIQ module.

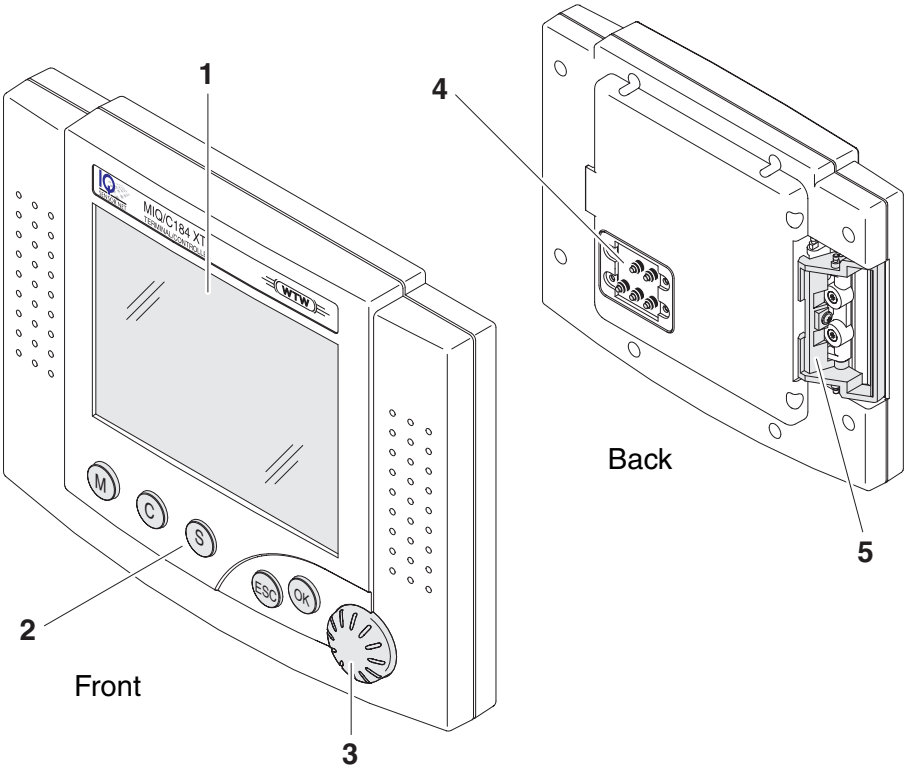


Fig. 1-5 MIQ/C184 XT **terminal/controller**

1	Graphical display
2	Keys
3	Rotary switch
4	Module contacts
5	Docking mechanism

The **controller function** takes over the following tasks:

- Control and monitoring of all IQ sensors
- Control and monitoring of all current and relay outputs
- Continuous diagnosis of the system, i.e. recording the information and error messages of all modules and entering them in the system log book (e.g.: voltage monitoring)
- Recording measured data in the fixed interval

The **terminal function** is the graphical user interface of the system. It is used for the following purposes:

- Display of measured values
- Display of calibration data
- Display of components lists (IQ sensors and outputs)
- Display of the log book entries
- Setting of IQ sensors, outputs, terminal characteristics, date, time, etc.

1.2.7 Behavior of the IQ SENSOR NET in case of power failure

- The system configuration (*Settings of sensors and diff. sensors* and *Settings of outputs and links*) is stored permanently
- All stored measured data remain permanently available
- Linked current outputs and relay outputs switch to the non-active condition.
  Current output: 0 mA current
  Relay output: Relays open
  For details, refer to the component operating manual of the current or relay output module.
- When the power supply is available again, the system is automatically restarted, starts working again and switches to the measured value display
- During the restart, an entry informing of the power failure is made in the log book.

1.2.8 Behavior of the IQ SENSOR NET if a components fails

- If the operating voltage is too low, the LEDs on the MIQ modules extinguish.
- If active components (e.g. sensors or output modules) cannot be contacted, an entry is made in the log book. The error symbol flashes on the display.
- The *Edit list of sensors* or *Edit list of outputs* display shows a question mark "?" for the component.

Component	Behavior
IQ sensor	● The configuration for the IQ sensor (*Settings of sensors and diff. sensors*) remains stored. ● Current measured values are not available. ● The measured value display shows *ERROR.*
MIQ modules	● If an active module fails, an entry is made in the log book. The error symbol flashes on the display.
Controller	● No current measured data can be displayed, processed or stored. ● If communication with the controller is disturbed, output modules activate the error behavior after 2 minutes (see component operating manual of the output module).
Output module	● The configuration for the output module (*Settings of outputs and links*) remains stored.
Terminal	● The measured value display is not updated. ● The display does not react to entries. ● The system continues working. ● Stored measured data and the system configuration remain stored.
Power supply module	like power failure (see section 1.2.7)

1.2.9 Availability of the system

As a basic principle, the IQ SENSOR NET offers a very high availability. This is achieved by

- The two-wire connection technique that is not interference-prone
- The digital signal transmission resulting from this
- Tools for error diagnosis
  - LEDs on the MIQ modules to check the available voltage
  - Log book messages with instructions to eliminate problems
- The possibility to simply assign substitute components for components to be exchanged.
  Replacing components is simple and can be performed very quickly (see section 7.4). The system configuration (*Settings of sensors and diff. sensors* and *Settings of outputs and links*) and the measured data are stored in the controller and remain stored when other components are used.

Preventive actions to optimize the availability of the system

If the requirements of the availability are especially high, you can further improve the availability of the system as follows:

- Install identical components in the system.
  If the requirements of the availability are high, components can be installed doubly in the system (exception: controller component).
- Guarantee the controller functioning with the aid of the MIQ/T2020 PLUS.
  The MIQ/T2020 PLUS has a redundant controller function. It maintains all essential functions of the system in the case of a controller malfunction and saves all settings. The controller operation starts automatically.
- Keep substitute components ready.
  The system automatically recognizes substitute components of active components (IQ sensors and the output modules). They are easily integrated in the system by assigning them as substitute components.
- Save the system configuration.
  The system configuration (*Settings of sensors and diff. sensors* and *Settings of outputs and links*) can be saved on a PC. The data is transmitted via the MIQ/IF232 interface module. The stored system configuration can be loaded from the PC on a substitute controller that might be necessary.

2 Safety instructions

This operating manual contains essential instructions that must be followed during the commissioning, operation and maintenance of the IQ SENSOR NET system. Thus, it is essential for the operator to read this component operating manual before carrying out any work with the system.

Some components such as IQ sensors and special MIQ modules are delivered with their own component operating manual. It is also important to read the SAFETY chapter in this manual. Keep the system and all component operating manuals in the vicinity of the IQ SENSOR NET system if possible.

General safety instructions

Safety instructions in this operating manual are indicated by the warning symbol (triangle) in the left column. The signal word (e.g. "Caution") indicates the danger level:



Warning
indicates instructions that must be followed precisely in order to prevent serious dangers to personnel.



Caution
indicates instructions that must be followed precisely in order to avoid slight injuries to personnel or damage to the instrument or the environment.

Other labels



Note
indicates notes that draw your attention to special features.



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

2.1 User qualification

Target group

The IQ SENSOR NET system 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 MIQ/PS power supply module to the power line (see MIQ/PS module manual).
- Connection of external, line voltage-carrying circuits to relay contacts (see module manual of the relay output module).

2.2 Authorized use

The authorized use of the IQ SENSOR NET system consists only of its use in online analysis.
Please observe the technical specifications according to chapter 8 TECHNICAL DATA. Only operation and running according to the instructions in this component operating manual is authorized.

Any other use is considered to be **unauthorized**. Unauthorized use invalidates any claims with regard to the guarantee.

2.3 General safety instructions

All components of the System IQ SENSOR NET are constructed and inspected in accordance with the relevant guidelines and norms for electronic instruments (see chapter 8 TECHNICAL DATA).
They left the factory in a safe and secure technical condition.

Function and operational safety

The failure-free function and operational safety of the IQ SENSOR NET components are only guaranteed if the generally applicable safety measures and the special safety instructions in this operating manual are followed during their use.

The failure-free function and operational safety of the IQ SENSOR NET components are only guaranteed under the environmental conditions that are specified in chapter 8 TECHNICAL DATA.

If IQ SENSOR NET components are transported from a cold environment into a warm environment, this can cause a functional malfunction through the formation of condensation. In this case, wait for the components to adjust to room temperature before recommissioning.

Safe operation

If safe operation is no longer possible, the IQ SENSOR NET must be taken out of operation and secured against inadvertent operation. Safe operation is no longer possible if components:

- have been damaged in transport
- have been stored under adverse conditions for a lengthy period of time
- are visibly damaged
- no longer operate as described in this manual.

If you are in any doubt, contact the supplier of your IQ SENSOR NET.

Obligations of the operator

The operator of the IQ SENSOR NET system must ensure that the regulations and guidelines listed below are followed when dealing with dangerous substances:

- EEC guidelines relating to safety at work
- National laws relating to safety at work
- Safety regulations
- Safety datasheets of the chemicals manufacturers.



Warning

A circuit (except for the line power supply), that is connected to an IQ SENSOR NET component, must not feed any voltages or currents that are not allowed. It has to be made sure that the circuit at any time meets all requirements of a *Limited circuit* or *Limited Power* as well as of *SELV* (Safety Extra Low Voltage). These include the following limiting value specifications:

- **AC voltage: max. 30 V effective / 42.4 V peak**
- **DC voltage: max. 60 V**
- **Current limit: max. 8 A**
- **Power output limitation: max. 150 VA**

3 Installation

3.1 Scopes of delivery

3.1.1 MIQ modules

The following parts are contained in the scope of delivery of an MIQ module:

- MIQ module
- 4 x screwed cable glands with seals and blind plugs
- 2 x ISO blind nuts M4
- 2 x cheese-head screws M4x16 with plastic washer
- 1 x contact base
- 2 x plastic tapping screws for fixing the contact base
- Operating manual.

3.1.2 Terminal/Controller

The following parts are contained in the scope of delivery of the MIQ/C184 XT terminal/controller:

- MIQ terminal
- Screw to fix the terminal on the MIQ module
- Operating manual.

3.2 Requirements of the measurement location

The respective measurement location of all IQ SENSOR NET components must meet the environmental conditions specified in section 8.1 GENERAL SYSTEM DATA.

3.3 Basic principles of installation

3.3.1 System planning

Overview of the planning steps

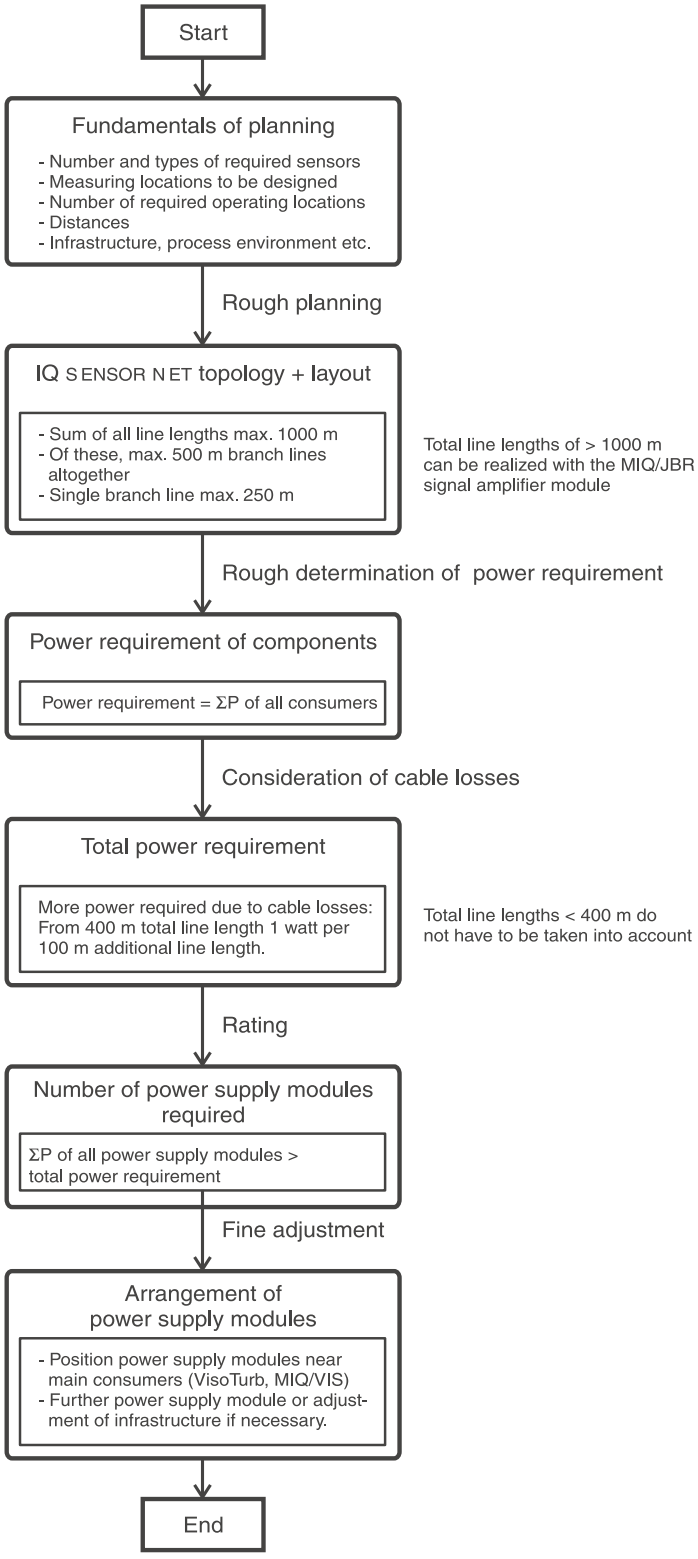


Fig. 3-1 System planning

3.4 Basic requirements for optimum installation

3.4.1 General information

The IQ SENSOR NET supplies all components with low voltage as well as digital communication via a shielded 2-wire line.

Due to this characteristic, the following factors must be taken into account in the planning of an IQ SENSOR NET system:

- Power consumption of all components (power rating). Primarily, this determines the number of power supply modules required (section 3.4.2).
- Distance of the components from one another. Large distances may require a further MIQ/PS power supply module and/or an MIQ/JBR signal amplifier module (section 3.4.3).
- Placement of the MIQ/PS power supply modules in the IQ SENSOR NET (effect on the power supply - section 3.4.3).



Caution
Only IQ SENSOR NET products may be used in the IQ SENSOR NET.

3.4.2 Drawing up the power rating

Power rating - why?

All components in the system require a specific level of electrical power for operation. Thus, it is necessary to draw up a power rating after selecting all the components. At the same time, this can determine whether the entire power requirement of all components (consumers) is covered by the existing MIQ power supply modules. If this is not the case, the power available in the system must be increased by further MIQ power supply modules.



Note
The power rating provides an initial guide value. In specific limiting cases, the power supply may be insufficient despite the positive power rating. Long cable lines, for example, result in additional power losses that may have to be compensated by further MIQ power supply modules. This can be checked for the planned installation by following section 3.4.3.

The total power requirement P of all consumers can be determined from the following table:

Power requirement of IQ SENSOR NET components

Component	Power requirement [W]
IQ sensors	
SensoLyt® 700 IQ (SW)	0.2
TriOxmatic® 700 IQ (SW)	0.2
TriOxmatic® 701 IQ	0.2
TriOxmatic® 702 IQ	0.2
CellOx® 700 IQ	0.2
TetraCon® 700 IQ (SW)	0.2
VisoTurb® 700 IQ	5.0
ViSolid® 700 IQ	2.0
AmmoLyt® 700 IQ	0.2
NitraLyt® 700 IQ	0.2
VARiON 700 IQ	0.2
NitraVis® 700/x IQ (TS) + MIQ/VIS	7.0
CarboVis® 700/x IQ (TS) + MIQ/VIS	7.0
NiCaVis® 700/5 IQ + MIQ/VIS	7.0
MIQ modules	
MIQ/JB	0
MIQ/JBR	0
MIQ/CR3	3.0
MIQ/C6	3.0
MIQ/R6	1.5
MIQ/IC2	0.2 + 2.2 W per connected WG 20 A2 power supply/isolator
MIQ/CHV	2.0
MIQ/CHV PLUS	1.0
MIQ/Blue PS	0.6
Terminal, Controller	
MIQ/C184 XT	3.0
MIQ/T2020	3.0
MIQ/T2020 PLUS	3.0
MIQ/IF232 (+ MIQ/T2020 PC)	0.2

Determining the number of MIQ power supply modules

From the value determined for the power requirement, determine the number of the MIQ power supply modules as follows:

Total power requirement P	Number of MIQ power supply modules
P ≤ 18 W	1
18 W < P ≤ 36 W	2
36 W < P ≤ 54 W	3
54 W < P ≤ 72 W	4
72 W < P ≤ 90 W	5
90 W < P ≤ 108 W	6

Sample configuration	Power requirement [W] (component)	Total power requirement P [W] (sum of the components)	Number of power supply modules required
1 MIQ/C184 XT	3.0	3.0	1
1 MIQ/T2020	3.0	6.0	1
1 VisoTurb® 700 IQ	5.0	11.0	1
1 MIQ/CR3	3.0	14.0	1
1 SensoLyt® 700 IQ	0.2	14.2	1
1 MIQ/CR3	3.0	17.2	1
1 MIQ/T2020	3.0	20.2	2

Note
The determined number of power supply modules required in the IQ SENSOR NET can increase if the cables are very long (see section 3.4.3).

Power supply with the aid of the MIQ/Blue PS radio module

The MIQ/Blue PS radio module can provide power for components with a total of up to 7 W power consumption on an IQ SENSOR NET island. The relevant details are given in the operating manual if the MIQ/Blue PS.

3.4.3 Effect of the cable length

The length of the cables in the IQ SENSOR NET affects

- the operating voltage available for a component
- the quality of data transmission.

Note
All information applies to SNCIQ cable material only. As regards the copper wire diameter and dielectric, this cable is especially designed for the combined energy and data transmission via great distances and ensures the lightning protection characteristics stated in chapter 8 TECHNICAL DATA.

Voltage drop due to cable lengths

Very long cables in the IQ SENSOR NET cause voltage drops with growing distance from the power supply module. If the voltage is under the limit values, further IQ power supply modules must be used to compensate.

Guideline

If the power supply modules are positioned in the vicinity of the main consumers and the total cable length is no more than 400 m, no additional cable losses have normally to be taken into account. Main consumers are components with a power consumption of 5 W or more.

Note
When determining the number of power supply modules required, the most unfavorable design has to be taken into account for mobile components (MIQ/T2020 and MIQ/T2020 PLUS). I. e., take into account

- the maximum number of mobile components and
- their greatest possible installation distance from the power supply module.

Determining the length of the cable section

A diagram is used to determine whether an additional MIQ power supply module is necessary for the planned installation. To do so, the length of the cable section must be determined.

A cable section is the longest continuous length of cable from an MIQ power supply module to a consumer. Sensor connection cables up to 15 m are not taken into account in this.

Example The following figure shows the length of the cable section L made up of the partial lengths L1, L2 and L3 as the cable section L4 is shorter than L3:

L = L1 + L2 + L3

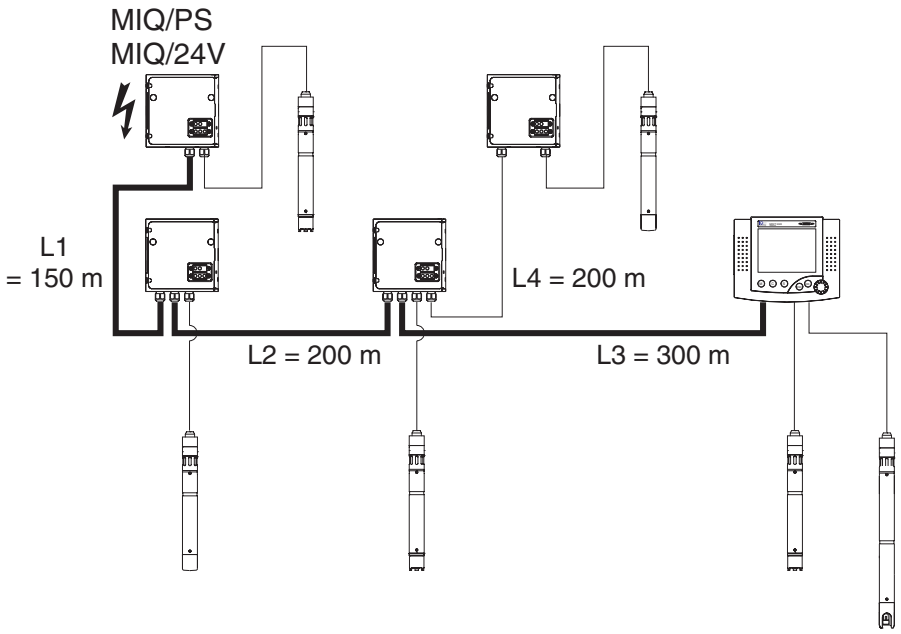


Fig. 3-2 Example of determining the cable section

Checking the power supply

1	Determine the length of the cable section for the planned installation.
2	Determine the sum of the power consumption of all consumers along the cable section (including IQ sensors).
3	Enter both determined values as a point in the following diagram.

Note
To make it easier it is assumed that all consumers are located at the end of the cable section.

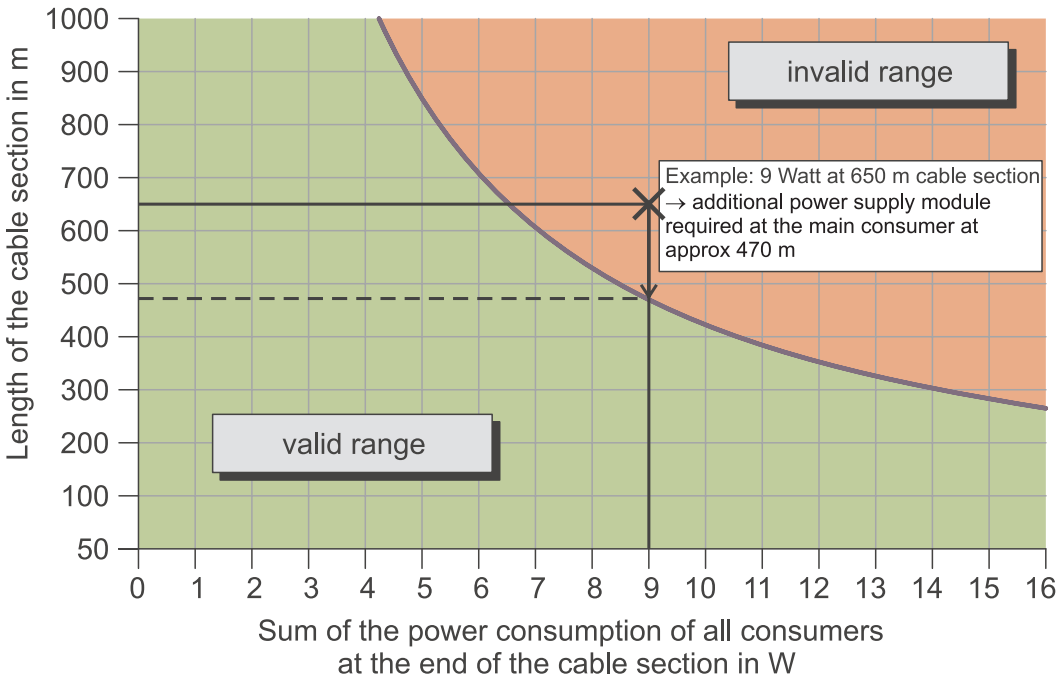


Fig. 3-3 Diagram to check the power supply

4	Evaluation: If the point is in the lower, valid range, no additional power supply module is required. If the point is in the upper, invalid range, an additional power supply module is required. Install this power supply module in the vicinity of the main consumers of this section, or, if not possible, - starting from the primary MIQ power supply module - approx. at that point of the section where the maximum cable length is exceeded (see following example).

Example

Problem:

Consumers with a total power requirement of 9 W are positioned on a cable section of 650 m. Is the power supply with one power supply module sufficient? At which point must a further power supply module be installed if necessary?

Proceeding:

- Enter both values as a point in the diagram (point "x" in Fig. 3-3).
- Result: the point is in the invalid range. I. e. the power supply is not sufficient.
- Draw down a vertical line from the point until the line crosses the limit between the upper and lower range. The intersecting point specifies the maximum cable length for the existing power requirement (at approx. 470 m). This is the place where the additional power supply module is required.
- If any main consumers are near the place, the power supply module should be installed in their vicinity (ideally, directly on them).

Note
After commissioning, you can check the voltage directly on the MIQ modules or on the terminal connections of the IQ sensors (see section 7.2.2). The limit values of the voltage levels can be found in the TECHNICAL DATA chapters of the following operating manuals:

- VisoTurb® 700 IQ and ViSolid® 700 IQ: sensor operating manual
- All other components: in this operating manual, in section 7.2.2 MEASURING THE VOLTAGE.

Note
For VisoTurb® 700 IQ, the cable length between the sensor and the next MIQ power supply module must not exceed 150 m.

Quality of data transmission

If the sum of all line lengths (including the SACIQ sensor connection cable) exceeds 1000 m, an MIQ/JBR signal amplifier module must be installed in the system. More details of this are given in the MIQ/JBR component operating manual.

3.4.4 Optimum installation of MIQ power supply modules

Basic rules

- If possible, install the MIQ power supply modules in the vicinity of the IQ SENSOR NET components with the highest power consumption (especially when using the VisoTurb ® 700 IQ). This also applies in the case of several MIQ power supply modules in the system.
- If a VisoTurb ® 700 IQ sensor is used, the distance to the next MIQ power supply module should not be more than 150 m.
- If possible, assemble the IQ SENSOR NET in a star configuration from the MIQ power supply modules.

3.4.5 Installation guidelines for lightning protection

When using IQ SENSOR NET measuring technique, especially at open air test sites, it must be sufficiently protected against surge voltages. Surge voltages are interferences caused by indirect effects of lightning events or switching procedures in the supply network system.

To be sufficiently protected against the detrimental effects of surge voltages, a concept consisting of the following protective measures is required:

- technical protective measures inside the instrument, and
- external protective measures of the installation environment .

With WTW online measuring technique, the technical protective measures inside the instrument are already integrated as the so-called lightning protection (see chapter 8 TECHNICAL DATA).

The exterior protective measures of the installation environment can be carried out observing the following guidelines:

1 All wires of the IQ SENSOR NET system have to be
a) installed without great distances, directly at the grounded metal installation constructions (rails, pipes, mounting stands and other).
b) run in the ground, especially with longer wires.

Background: the small distance from the grounded metal construction or the installation in the ground prevents the development of induction loops between the cable and the ground hazardous in the case of lightning strikes.

2 The SNCIQ or SNCIQ-UG cable material must be used exclusively. This cable material, especially the big cross-section of the cable shielding (1.5 mm²), is an important requirement for the safe discharge of lightning current without the development of unallowed high overvoltages along the line, which could damage the individual IQ SENSOR NET components. We strongly recommend not to use

any other cables, which normally have a considerably lower shielding wire cross-sections.

3 All metal installation constructions, i. e. rails, pipes, mounting stands and other, to which MIQ modules are attached, have to be connected to the local potential equalization system according to technical rules or to be individually grounded locally and sufficiently. With individual grounding, the installation construction has to be connected to the test solution by means of an auxiliary electrode. Metal control shafts/pipes that reach into the test solution can be ideally used for the grounding of the installation construction. Thus a target way for the main lightning current is created. This can prevent the main lightning current from being conducted to the test solution via the IQ IQ SENSOR NET cable and the valuable sensors.

4 The contacts of the MIQ modules always have to be protected with the respective contact covers when they are not used by terminal components. The contact covers improve the insulation against electric fields of a thunderstorm by enlarging air gaps and creepage distances.

5 We recommend to install a metal or nonmetal sun shield at each open air location of MIQ modules. Sun shields have a protective effect because the electrical field lines in the area of the MIQ module are advantageously formed, and they support the discharge of the lightning current via the installation construction.

6 The line voltage that supports the measuring system must correspond to overvoltage category II. Normally this is ensured by the public operators of the supply network systems. It must be ensured separately if the networks or power supply systems are run by the waste water treatment plant.

7 The IQ SENSOR NET safety and lightning protection concept is partly based on the high-quality protective insulation of the line power supply units and the total system. It neither has nor requires any protective ground conductor or ground connection.
Never connect any IQ SENSOR NET connections or metal sensor enclosures to the local ground and potential equalization system or to metal construction elements. Exceptions are the galvanically separated connections of the 0/4...20 mA interfaces and relay outputs used by the user.

8 Other lightning protection measures on the IQ SENSOR NET system, e.g. usage of expensive overvoltage conductors, are not required and would possibly cause radio interferences.

3.5 Connecting system components

3.5.1 General information

The IQ SENSOR NET system components are connected to form a functioning unit in the following ways:

- **Stacked mounting of MIQ modules**
  Up to three MIQ modules can be installed and mechanically connected with one another to form a stack at a single location. The contacts on the front and rear automatically create the electrical connection between the MIQ modules in the stack (section 3.5.2).
- **Distributed mounting of MIQ modules**
  Individual MIQ modules or an assembled module stack are installed at various locations (for example, a central control unit and an MIQ branching module for connecting IQ sensors at the edge of the basin). The spatial distance is bridged with the aid of the SNCIQ or SNCIQ/UG cable (section 3.5.3).
- **Connection of IQ sensors:**
  IQ sensors are connected to an MIQ module with the aid of the SACIQ cable. This cable is available in different lengths. The MIQ module must have a free SENSORNET connection on the terminal strip. On the sensor side, the connection is made via a plug that is standard for all IQ sensors (section 3.5.4).
- **Docking of a terminal unit:**
  A terminal unit is attached to the lid of a free MIQ module with the aid of a quick-release locking mechanism (section 3.5.5).



Caution

Distributed mounting is only allowed in a star configuration. The system must nowhere be closed to form a ring. Only use the assembly material provided for the installation.

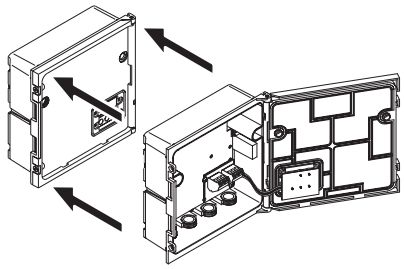
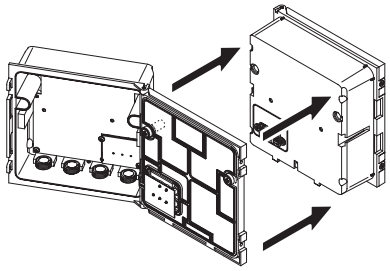
3.5.2 Stacked mounting of MIQ modules:

Caution

For optimum stability, a maximum of three MIQ modules can be mounted in any one stack. Only one MIQ power supply module may be mounted per module stack.

Mounting direction

MIQ modules can be stacked on top of one another from both sides. All the required installation materials are contained in the scope of delivery of the MIQ modules.

Variant 1 - stack expansion forwards. The back of an MIQ module is attached to the lid of another MIQ module (page 3-14).	
Variant 2: - stack expansion backwards. The lid of an MIQ module is attached to the back of another MIQ module (page 3-17).	

Which variant is suitable for a specific case depends on whether and how an MIQ module is already permanently installed at a location (e.g. on a wall or in a panel), among other factors.

Note

In the case of panel mounting, the front MIQ module can only be installed individually in the switch cabinet aperture. Only then can further MIQ modules be added to its back (variant 2). If necessary, dismantle the front MIQ module from an already mounted stack before mounting.

Materials required

- 2 x ISO blind nuts M4
- 2 x cheese-head screws M4x16 with plastic washer
- 1 x contact base with two plastic tapping screws.

Tools

- Phillips screw driver.

Both installation variants are described below. To dismantle a module stack, proceed in the reverse order to mounting the stack.

<u>Variant 1:</u> Stack expansion forwards

Preparing the stack mounting

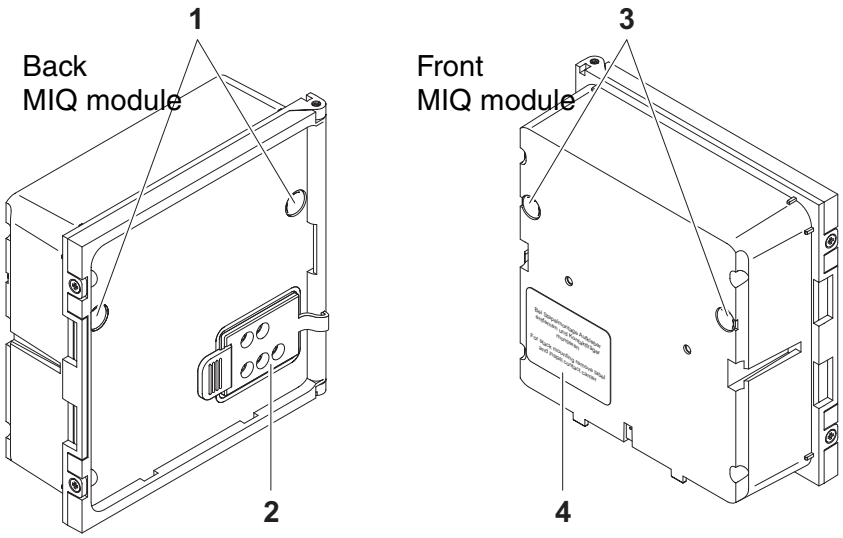


Fig. 3-4 Preparing MIQ modules for stack mounting (variant 1)

1	Remove the covers from the drilled mounting holes (pos. 1 and 3 in Fig. 3-4).
2	Remove the contact cover (pos. 2).
3	Pull off the adhesive label (pos. 4).

Mounting the contact base

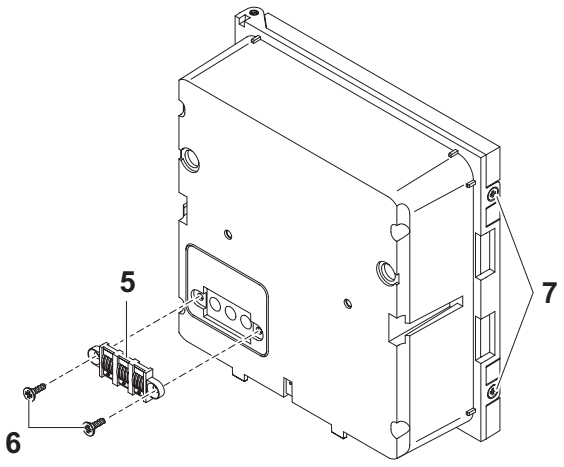


Fig. 3-5 Mounting the contact base (variant 1)

Caution

Only use the plastic tapping screws supplied for attaching the contact base. They ensure the correct fit.

4	Attach the contact base (pos. 5 in Fig. 3-5) on the front MIQ module with the two plastic tapping screws (pos. 6).
5	On the front MIQ module, remove the two countersunk screws (pos. 7 in Fig. 3-5) and swing open the module lid.

Premounting the ISO blind nuts

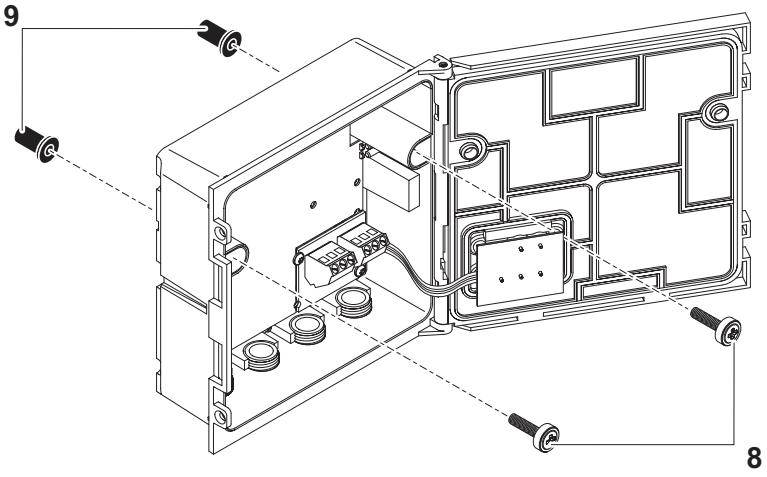


Fig. 3-6 Premounting the ISO blind nuts (variant 1)

6	Insert the cheese-head screws (pos. 8 in Fig. 3-6) with the plastic washers in the drilled mounting holes in the enclosure and loosely screw in the ISO blind nuts (pos. 9).

Stacking the MIQ modules

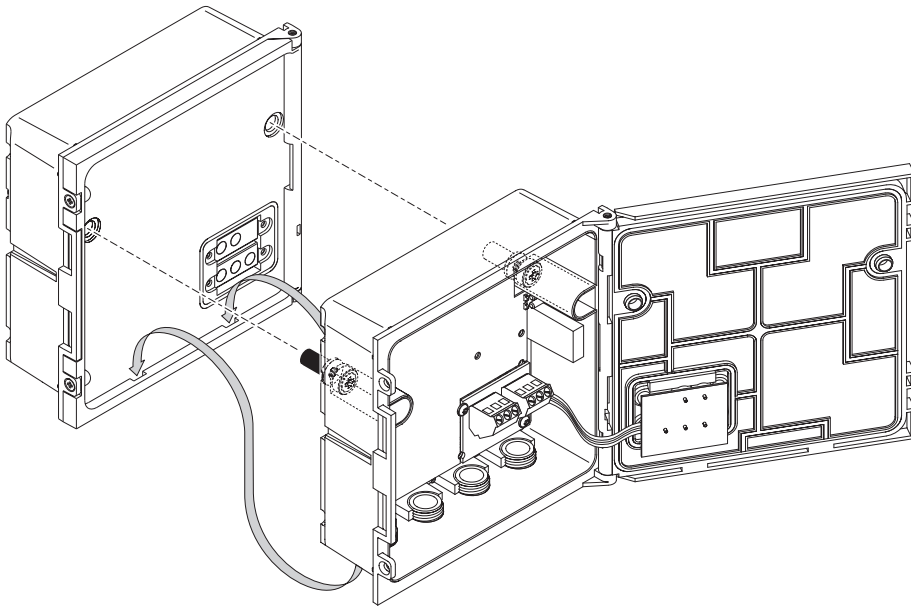


Fig. 3-7 Stacking the *MIQ modules (variant 1)*

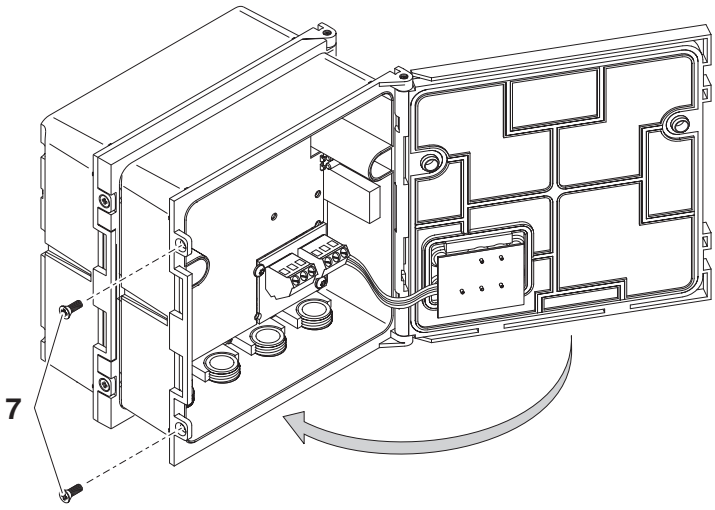


Fig. 3-8 Closing the enclosure (variant 1)

7	Attach the prepared MIQ module to the lid of the back MIQ module. At the same time, ensure that the two clips on the front MIQ module click into place in the lid of the back MIQ module. Subsequently, tighten the two screws (pos. 8 in Fig. 3-6).
8	Check the position of the SN terminator switch and correct it if necessary (see section 3.8.1).

9	Close the lid of the front MIQ module and fix it with the two countersunk screws (pos. 7 in Fig. 3-8).

<u>Variant 2:</u> stack expansion backwards

Preparing the stack mounting

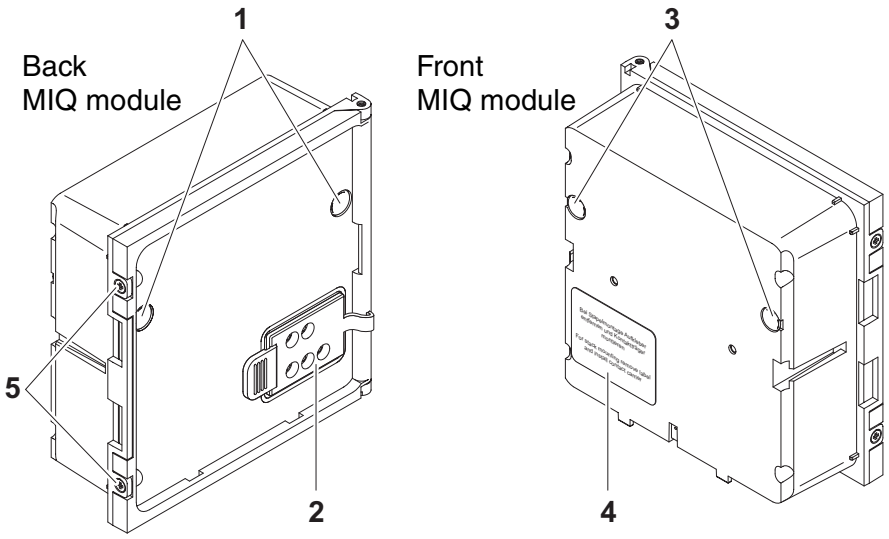


Fig. 3-9 Preparing the MIQ modules for stack mounting (variant 2)

1	Remove the covers from the drilled mounting holes (pos. 1 and 3 in Fig. 3-9).
2	Remove the contact cover (pos. 2).
3	Pull off the adhesive label (pos. 4).
4	On the back MIQ module, remove the two countersunk screws (pos. 5) and swing open the module lid.

Mounting the contact base

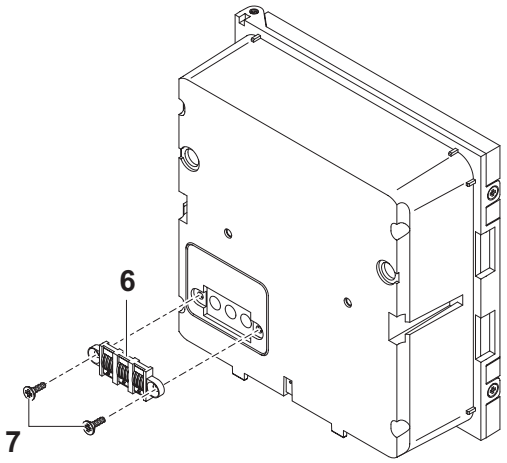


Fig. 3-10 Mounting the contact base (variant 2)



Caution

Only use the plastic tapping screws supplied for attaching the contact base. They ensure the correct fit.

5	Attach the contact base (pos. 6 in Fig. 3-10) on the front MIQ module with the two plastic tapping screws (pos. 7).

Premounting the ISO blind nuts

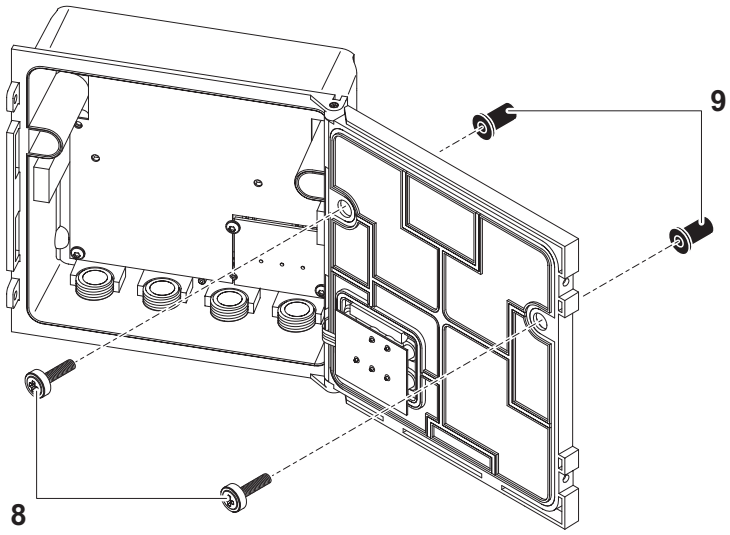


Fig. 3-11 Premounting the ISO blind nuts (variant 2)

6	Insert the cheese-head screws (pos. 8 in Fig. 3-11) with the plastic washers in the drilled mounting holes in the module lid and loosely screw in the ISO blind nuts (pos. 9).

Stacking the MIQ modules

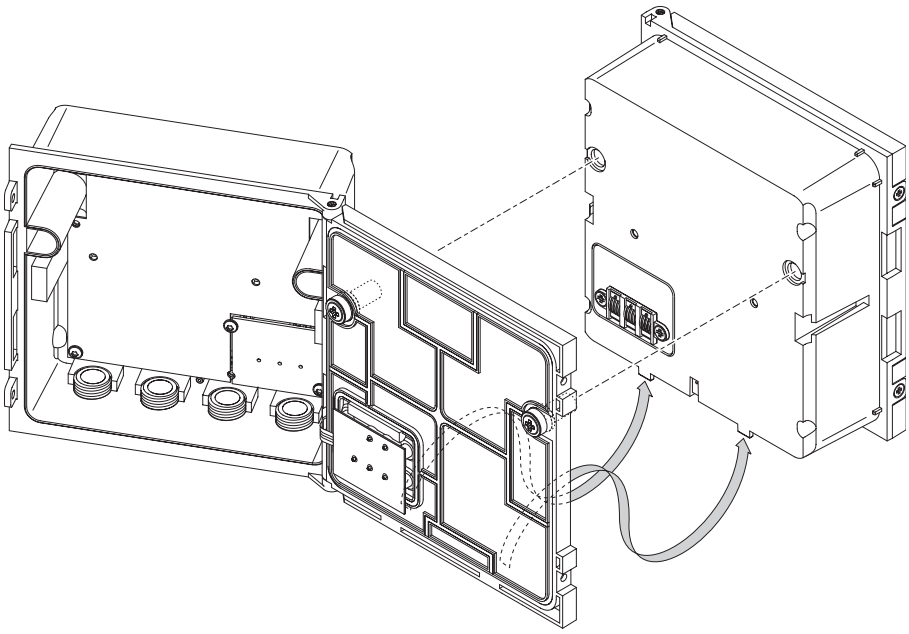


Fig. 3-12 Stacking the *MIQ modules (variant 2)*

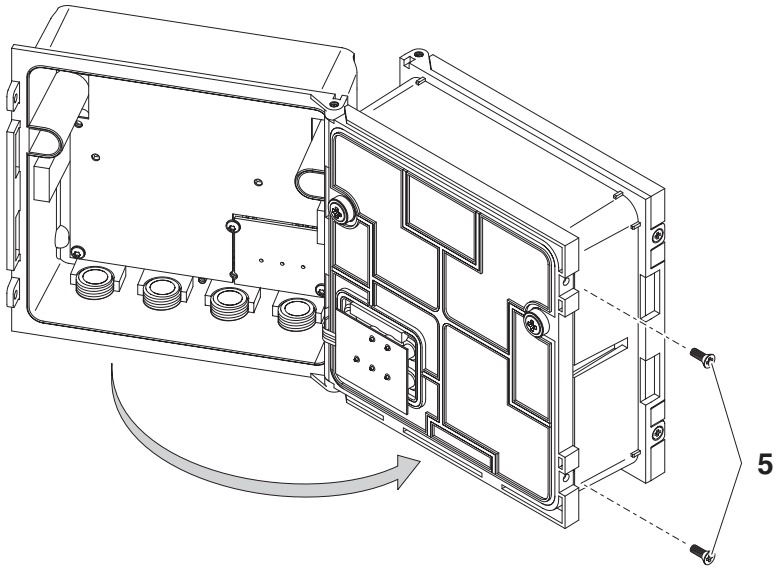


Fig. 3-13 Closing the enclosure (variant 2)

7	Attach the prepared MIQ module to the back of the front MIQ module. At the same time, ensure that the two clips on the front MIQ module click into place in the lid of the back MIQ module. Subsequently, tighten the two screws (pos. 8 in Fig. 3-11).

8	Check the position of the SN terminator switch and correct it if necessary (see section 3.8.1).
9	Close the back MIQ module and fix it with the two countersunk screws (pos. 5 in Fig. 3-13).

3.5.3 Distributed mounting of MIQ modules

General information

The following IQ SENSOR NET cables can be used for distributed mounting:

- SNCIQ cable
- SNCIQ/UG earth cable - suitable for underground laying according to VDE 01816, Part 2 and DIN/VDE 0891, Part 6.

The cables are delivered as piece goods (please specify length when ordering!).

Each MIQ module has a row of terminal strips in the housing. The two 3-fold terminal strips on the right are always reserved for the connection of further IQ SENSOR NET components (designation "SENSORNET 1" and "SENSORNET 2").

Some MIQ modules have additional "SENSORNET" connections ("SENSORNET 3" and "SENSORNET 4") on the left of the terminal strip.



Caution

The IQ SENSOR NET cable may only be connected to the SENSORNET connections. No wire of the cable may be connected with an external electrical potential. Otherwise, malfunctions could occur.

Materials required

- 1 x SNCIQ or SNCIQ/UG connection cable (see chapter 9 ACCESSORIES AND OPTIONS)
- Wire end sleeves for 0.75 mm^2 wire cross-section with matching crimping tool
- 1 x cable gland with seal (scope of delivery of MIQ module).

Tools

- Cable stripping knife
- Wire stripper
- Phillips screw driver
- Small screw driver.

Preparing the cable ends

1	Cut off the cable to the required length.
2	Remove approx. 45 mm of cable insulation (in the case of the SNCIQ/UG earth cable, remove both the inner and outer insulation).
3	Only for the SNCIQ/UG earth cable: strip the outer insulation for further 35 mm.
4	Shorten the exposed shielding braid up to the cable sheath.
5	Shorten the two fillers (plastic inlays) up to the cable sheath.
6	Bare the red and green wires and fit them with wire end sleeves.
7	Fit the filler stranded wire with a wire end sleeve.

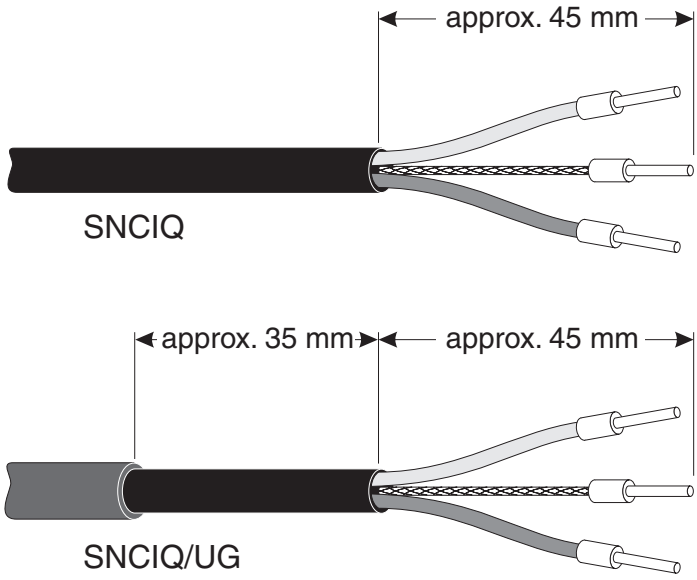


Fig. 3-14 Prepared cable end

Connecting the cables

The SNCIQ and SNCIQ/UG cables are connected to the terminal strip in the same way as the SACIQ sensor connection cable (see section 3.5.4):

1	Open the MIQ module.
2	Select any SENSORNET connection. At the same time, look out for the SENSORNET designation.

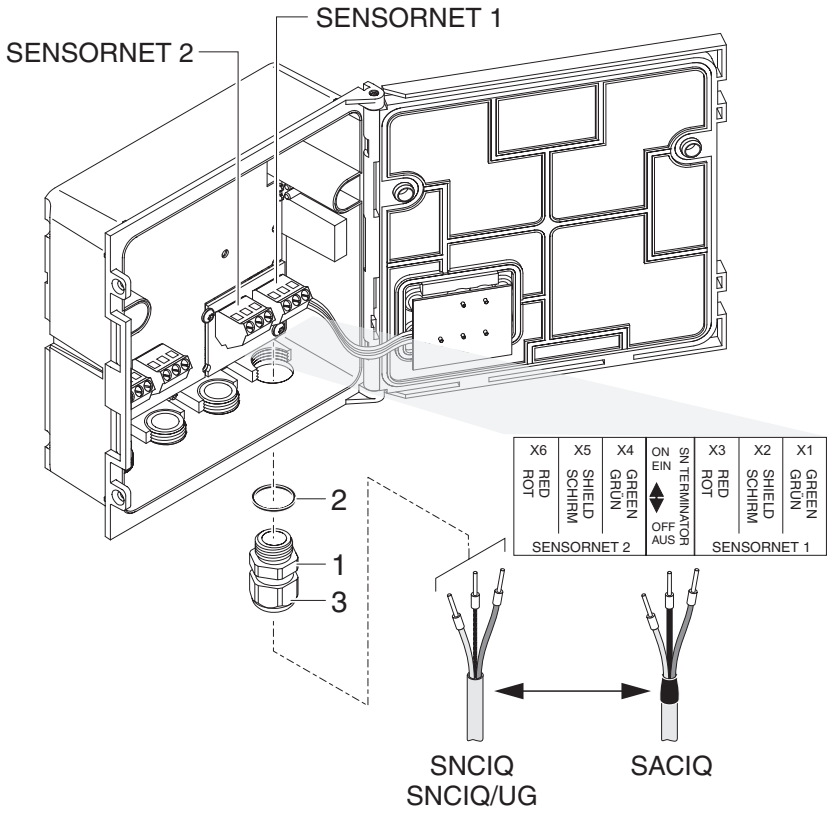


Fig. 3-15 Connecting cables to the MIQ module

3	Screw the cable gland (pos. 1 in Fig. 3-15) with the sealing ring (pos. 2) into the module housing.
4	Loosen the coupling ring (pos. 3 in Fig. 3-15).
5	Feed the cable through the cable gland into the module housing.
6	Connect the cable ends to the terminal strip. At the same time, look out for the designations of the terminals (red / shield / green).
7	Tighten the coupling ring (pos. 3 in Fig. 3-15).
8	Check the position of the SN terminator switch and correct it if necessary (see section 3.8.1).
9	Close the MIQ module.

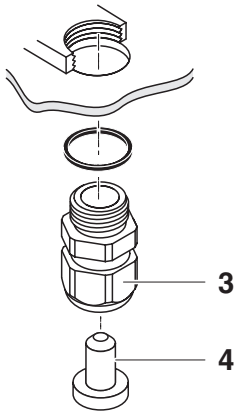


Fig. 3-16 Closing the cable opening

10	Screw the remaining cable glands with the sealing rings into the remaining free openings and close them with the enclosed blind plugs (pos. 4 in Fig. 3-16) and tighten the coupling ring (pos. 3) if they are not used.

3.5.4 Connecting IQ sensors

Materials required

- 1 x SACIQ connection cable (see chapter 9 ACCESSORIES AND OPTIONS)
- 1 x cable gland with seal

The module end of the connection cable already has the sheath removed in the factory and all the wires are fitted with wire end sleeves.

Tools

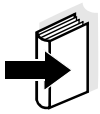
- Phillips screw driver
- Small screw driver.

Differentiating IQ sensors of the same type in the system

For the simpler correlation of measured value and measurement location, the system provides the option of giving each IQ sensor a user-defined name (see section 5.4.1). This name appears in the measured value display.

When the IQ sensor is delivered, the name is identical with the serial number. Therefore, after the initial commissioning, IQ sensors of the same type can only be differentiated by the serial number that appears on the measured value display. In order to prevent confusing the IQ sensors when assigning the name, you can proceed according to one of the two methods:

- Note the serial number of the IQ sensor at the respective measurement location before installation. Then, install all IQ sensors. After the commissioning, open the list of sensors on the controller. Then assign a suitable sensor name using the sensor type and the noted serial number.
- Disconnect the IQ sensors of the same type from the connection cables before commissioning the system. Then, put the system into operation. After the commissioning, connect the IQ sensors individually to the SACIQ connection cable. To do so, proceed step-by-step sensor for sensor. After each newly connected IQ sensor, select the *Edit list of sensors* menu on the terminal and assign a suitable sensor name to the sensor.



Note
The list of sensors and the assignment of sensor names is described in section 5.4.1 on page 5-5.

Connecting the SACIQ cable to the MIQ module

The connection of the SACIQ cable to the terminal strip of an MIQ module is described in section 3.5.3 (see CONNECTING THE CABLES, Seite 3-21).

Caution

The SACIQ sensor connection cable may only be connected to the SENSORNET connections. No wire of the cable may be connected with an external electrical potential. Otherwise, malfunctions could occur.

Connecting the sensor to the connection cable

1	Remove the protective caps from the plug connections of the IQ sensor and SACIQ sensor connection cable and keep them safe.
2	Plug the socket of the SACIQ sensor connection cable onto the plug head connector of the IQ sensor. At the same time, rotate the socket so that the pin in the plug head connector (1) clicks into one of the two holes in the socket.
3	Then, screw the coupling ring (2) of the IQ sensor connection cable on the IQ sensor up to the stop.

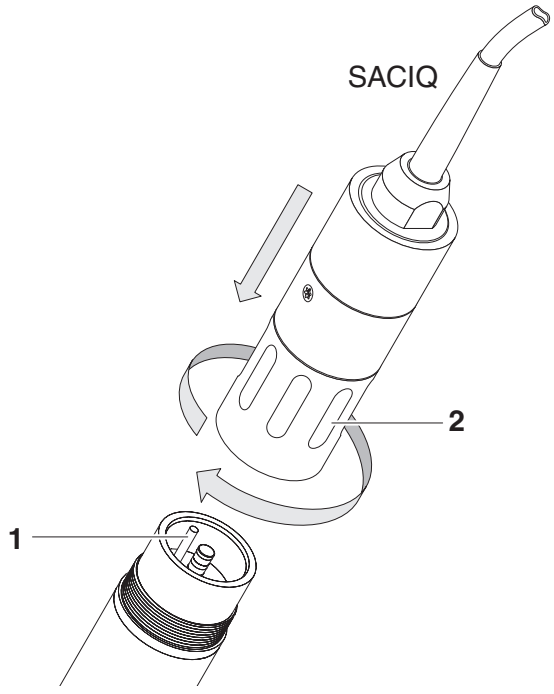


Fig. 3-17 Connecting the SACIQ cable with the IQ sensor

Note

For further instructions on the mounting of IQ sensors at the application location, please see the respective manuals (immersion depths, etc.).

3.5.5 Installing terminal components

The terminal component is the operating and control unit of the IQ SENSOR NET. It serves as an input and output device and is necessary to operate the IQ SENSOR NET.

You can install the following terminal components:

- MIQ/C184 XT terminal
- MIQ/T2020 terminal (see MIQ/T2020 component operating manual)
- MIQ/IF232 interface component with software terminal (see MIQ/IF232 component operating manual)

The terminal component is installed on the lid of any free MIQ module.

The MIQ/C184 XT terminal/controller component is docked onto the lid of any free MIQ module in the same way as the MIQ/T2020 mobile terminal.

The MIQ/C184 XT terminal/controller component has an integrated controller function. Therefore, in contrast to the mobile MIQ/T2020 terminal, it may not be removed while the system is running. To protect against any inadvertent removal, the MIQ/C184 XT terminal component can be secured with a locking screw.

Materials required - none -

Tools
- Phillips screw driver.

Docking the terminal component

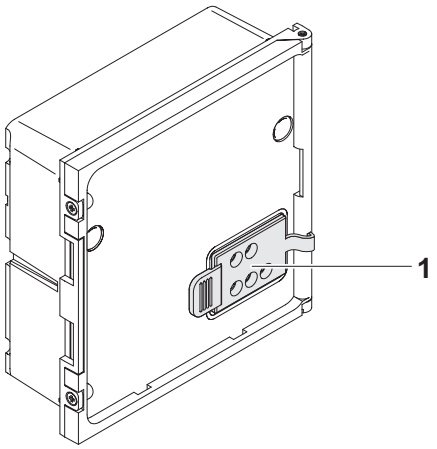


Fig. 3-18 Preparing the MIQ module for docking

1	Pull the cover off the contacts (pos. 1 in Fig. 3-18) on the lid of the MIQ module.

Note
For the temporary docking of a mobile terminal, do not remove the whole contact cover. Leave it hanging on the side of the MIQ module. After removing the terminal, replace the cover again to protect the contacts.

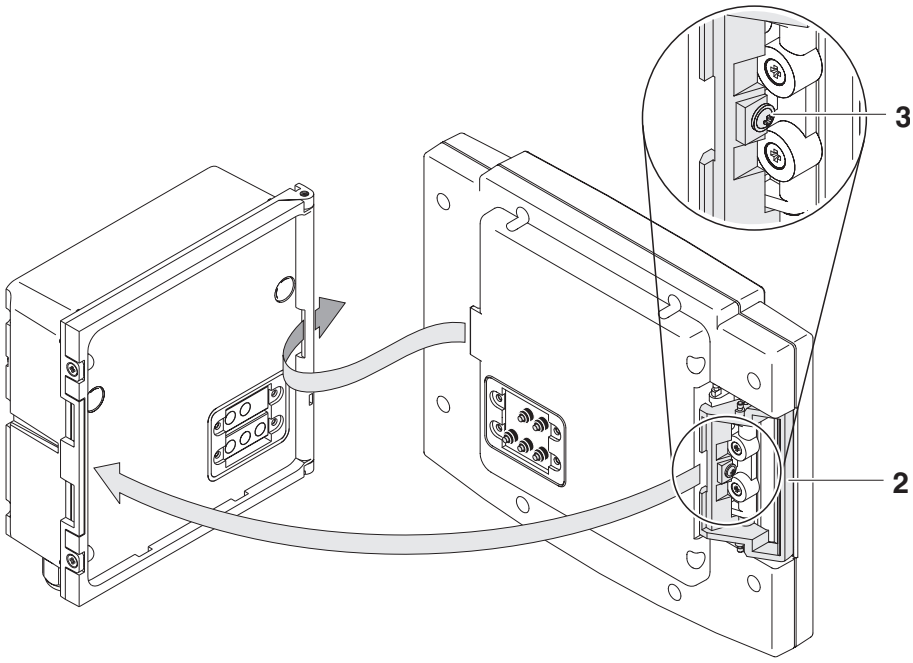


Fig. 3-19 Docking the terminal component

2	Attach the terminal component to the module lid. To do so, insert the flap on the back of the terminal into the slot on the door hinge of the MIQ module. Then, pull back the interlocking lever (pos. 2 in Fig. 3-19), place the terminal completely on the MIQ module and release the interlocking lever.
3	To protect any inadvertent removal of the terminal component, the interlocking lever can be fixed in place with the screw (pos. 3 in Fig. 3-19).

3.6 Installation of the MIQ modules at the installation location

3.6.1 General information

The IQ SENSOR NET system has a comprehensive program of mounting accessories, which can be used to adapt the installation to the most varied requirements.



Caution

MIQ modules installed outside must always be protected by a sun shield against the effects of the weather (snow, ice and direct solar radiation). Otherwise, malfunctions can result. Always mount MIQ modules vertically. Do not under any circumstances install MIQ modules without rain protection with the lid facing upwards (danger of retained humidity and penetration of moisture).

Installation options

The most important types of installation for MIQ modules and module stacks are described in the following chapters:

- **Mounting on a mounting stand with the SSH/IQ sun shield:**
  The SSH/IQ sun shield provides enough space for one unit of up to three stacked MIQ modules and a docked terminal (section 3.6.2).
- **Mounting on the SD/K 170 sun shield**
  The SD/K 170 sun shield provides enough space for a single MIQ module with a docked terminal. The sun shield can be mounted on round or square section pipes (e.g. rails) with the aid of the MR/SD 170 mounting kit (section 3.6.3).
- **Wall mounting:**
  The back MIQ module of a module stack or a single MIQ module is permanently screwed to a wall. For wall mounting, use the WMS/IQ mounting set (see chapter 9 ACCESSORIES AND OPTIONS).
- **Panel mounting:**
  The front MIQ module of a module stack or a single MIQ module is installed in the aperture of a panel. The aperture dimensions are 138 x 138 mm + 1 mm (maximum thickness 15 mm) according to DIN 43700 or IEC 473 (section 3.6.4).
- **Top hat rail mounting:**
  The back MIQ module of a module stack or a single MIQ module is mounted on a 35 mm top hat rail with the aid of a bracket in accordance with EN 50022, e.g. in a control cabinet. The connection can be released again with one simple movement (section 3.6.5).

Caution

No contact base may be mounted on the back of the module (danger of short-circuit!) if the module is mounted on a wall, a sun shield, or a top hat rail.

3.6.2 Mounting on a mounting stand with the SSH/IQ sun shield

Materials required

- SSH/IQ sun shield (see chapter 9 ACCESSORIES AND OPTIONS).

Tools

- 4 mm set screw wrench
- Phillips screw driver.

Mounting the sun shield on a mounting stand

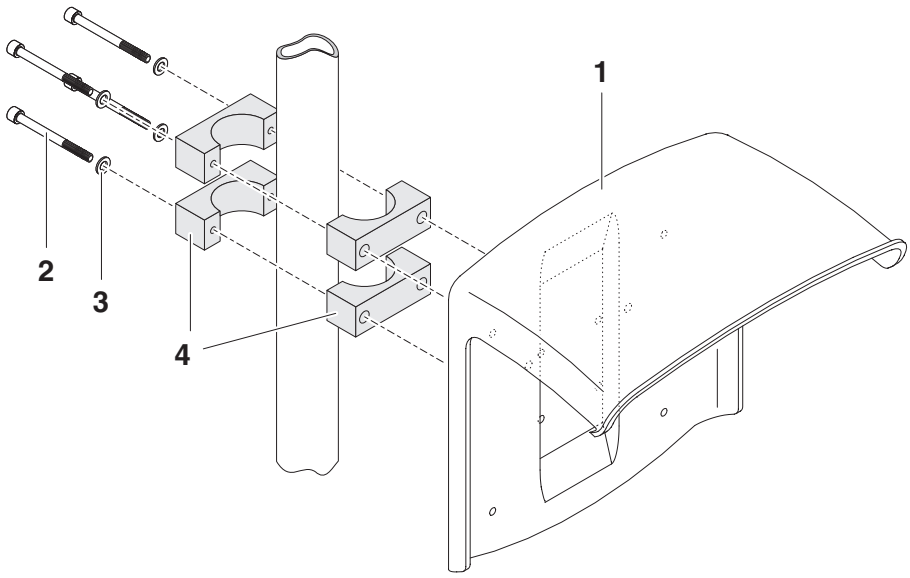


Fig. 3-20 Mounting the SSH/IQ sun shield on a mounting stand

1	Screw the sun shield (pos. 1 in Fig. 3-20) with the four hexsocket head screws (pos. 2), the washers (pos. 3) and the clamps (pos. 4) at the required height on the mounting stand from the back.

Premounting the ISO blind nuts

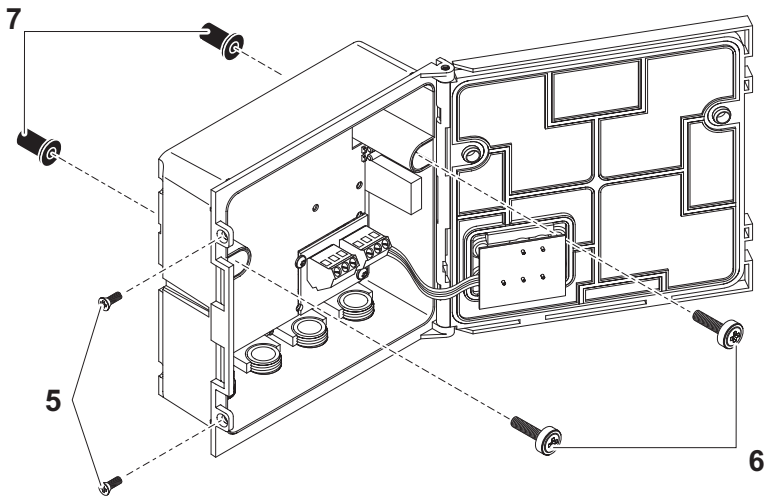


Fig. 3-21 Mounting the sun shield: Premounting the ISO blind nuts

2	Remove the two countersunk screws (pos. 5 in Fig. 3-21) and swing open the module lid.
3	Insert the cheese-head screws (pos. 6 in Fig. 3-21) with the plastic washers in the drilled mounting holes and loosely screw in the ISO blind nuts (pos. 7).

Mounting the MIQ module under the sun shield

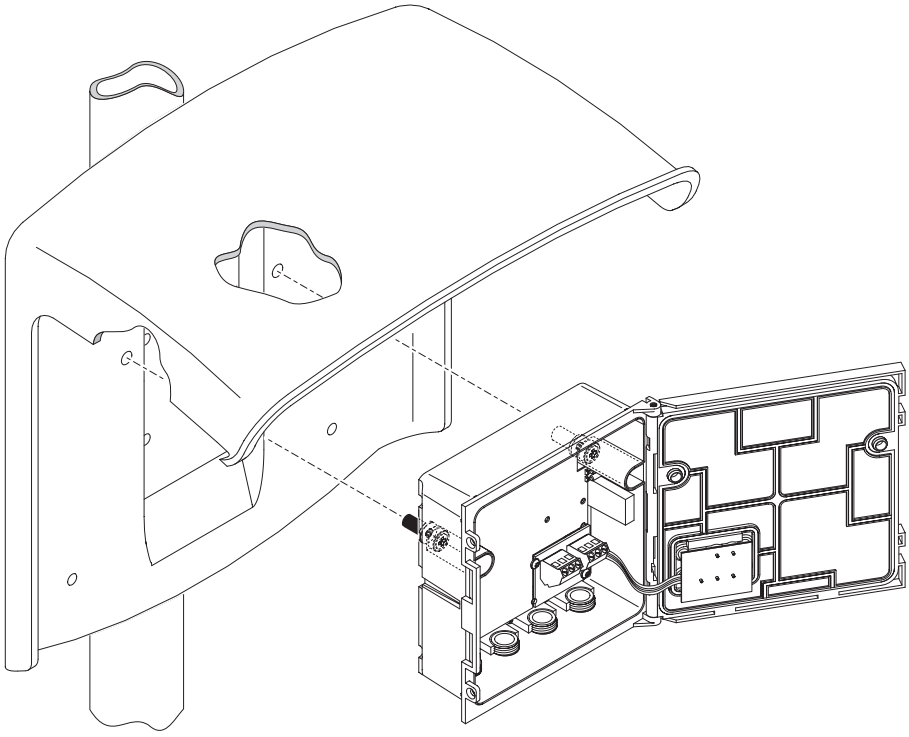


Fig. 3-22 Mounting the MIQ module on the SSH/IQ sun shield

4	Position the MIQ module on the sun shield and fix it into place with the two screws (pos. 6 in Fig. 3-21).
5	Close the module lid and fix it with the two countersunk screws (pos. 5 in Fig. 3-21).

3.6.3 Mounting under the SD/K 170 sun shield

If a single MIQ module is to be installed outside, it must be provided with a sun shield that protects it against the effects of weather. The SD/K 170 sun shield can be mounted directly on a wall, on a mounting stand or on a railing. The MR/SD 170 mounting kit is also required for mounting on a mounting stand or railing.

Note
How to mount the sun shield at the installation location is described in the instructions for the sun shield or mounting kit.

Materials required

- SD/K 170 sun shield (see chapter 9 ACCESSORIES AND OPTIONS)
- The MR/SD 170 mounting kit is also required for mounting the sun shield on a mounting stand or railing (see chapter 9 ACCESSORIES AND OPTIONS).

Tools

- Phillips screw driver.

Mounting the MIQ module under the sun shield

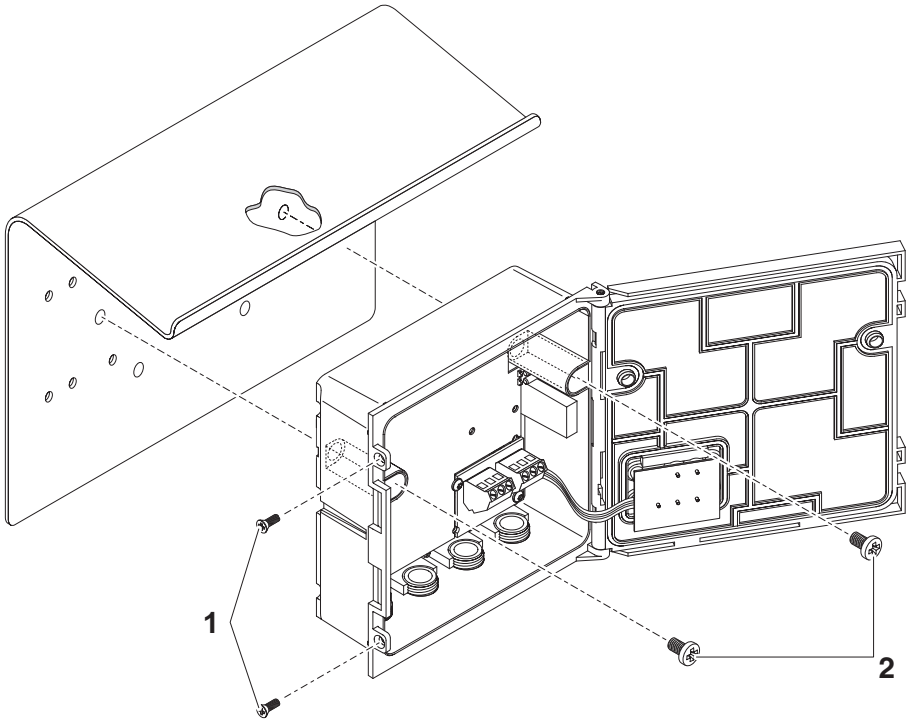


Fig. 3-23 Mounting the MIQ module on the SD/K 170 sun shield

1	Remove the two countersunk screws (pos. 1 in Fig. 3-23) and swing open the module lid.
2	Position the MIQ module on the sun shield and fix it into place with the two screws (pos. 2 in Fig. 3-23).
3	Close the module lid and fix it with the two countersunk screws (pos. 1 in Fig. 3-23).

3.6.4 Panel mounting

Note
The space required on the panel for a module stack is given in the dimension drawings in section 8.3.

Note
The front MIQ module of the preassembled module stack must be removed in order to install the stack. After the installation of the front MIQ module, the remaining part of the stack can be added to the installed MIQ module (see section 3.5.2 STACKED MOUNTING OF MIQ MODULES: - Variant 2).

Materials required

- PMS/IQ kit for panel mounting (see chapter 9 ACCESSORIES AND OPTIONS).

Tools

- 3 mm set screw wrench (contained in the panel installation kit).

Mounting the MIQ module on a panel

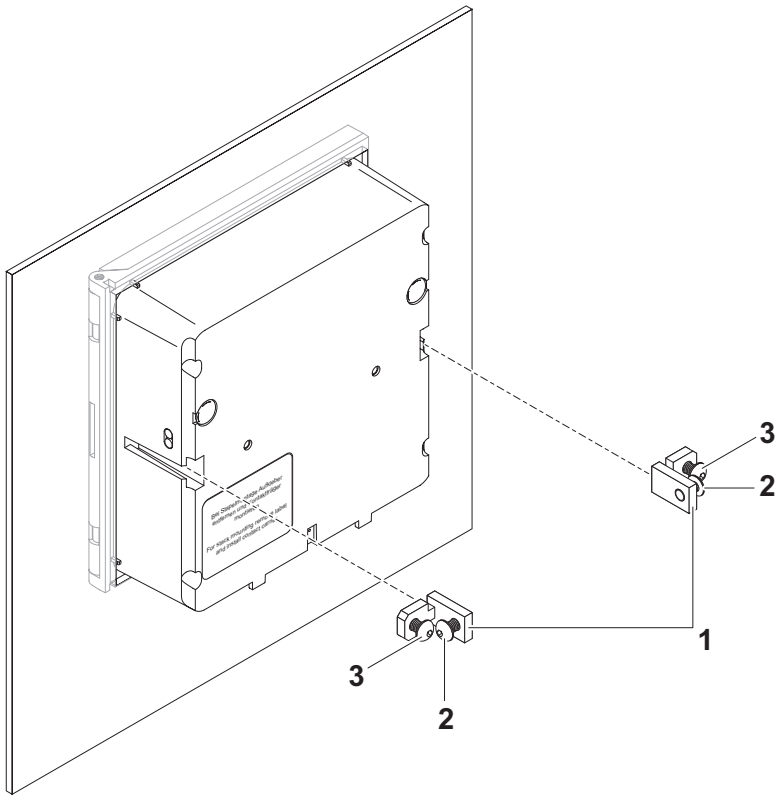


Fig. 3-24 Mounting the MIQ module on a panel

1	Insert the MIQ module in the panel aperture from the front.

2	Slightly unscrew the screws (pos. 2 and 3) of the two angle brackets (pos. 1 in Fig. 3-24), but do not remove them.
3	Push in the two angle brackets - as shown in Fig. 3-24 - into the lateral guides of the MIQ module up to the stop.
4	Tighten the screws (pos. 2).
5	Screw in the screws (pos. 3) until the screws rest snugly against the panel.

3.6.5 Top hat rail mounting

Materials required

- THS/IQ kit for top hat rail mounting (see chapter 9 ACCESSORIES AND OPTIONS).

Tools

- Phillips screw driver.

Mounting the MIQ module on a top hat rail

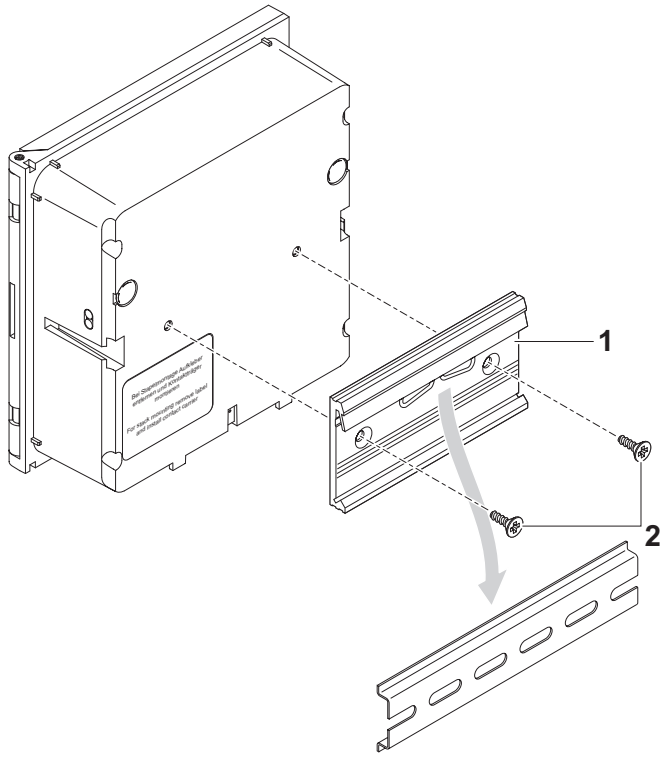


Fig. 3-25 Mounting the MIQ module on a top hat rail

1	Screw the clamping assembly (pos. 1 in Fig. 3-25) onto the back of the MIQ module with the two plastic tapping screws (pos. 2).
2	Attach the MIQ module onto the top hat rail from above using the clamping assembly and press against the rail until the clamping assembly clicks into place. The MIQ module can be moved sideways afterwards.
3	To unhook the MIQ module, press it downwards and pull it forwards at the bottom.

3.7 Connecting the voltage supply

Note
How to connect the voltage supply is comprehensively described in the operating manual of the MIQ power supply module.

3.8 Commissioning

3.8.1 Topology and terminator switch

For failure-free operation, the terminator switches (terminating resistors) must always be set to ON on two MIQ modules. On which modules this has to be done can be taken from the topology of the IQ SENSOR NET system:

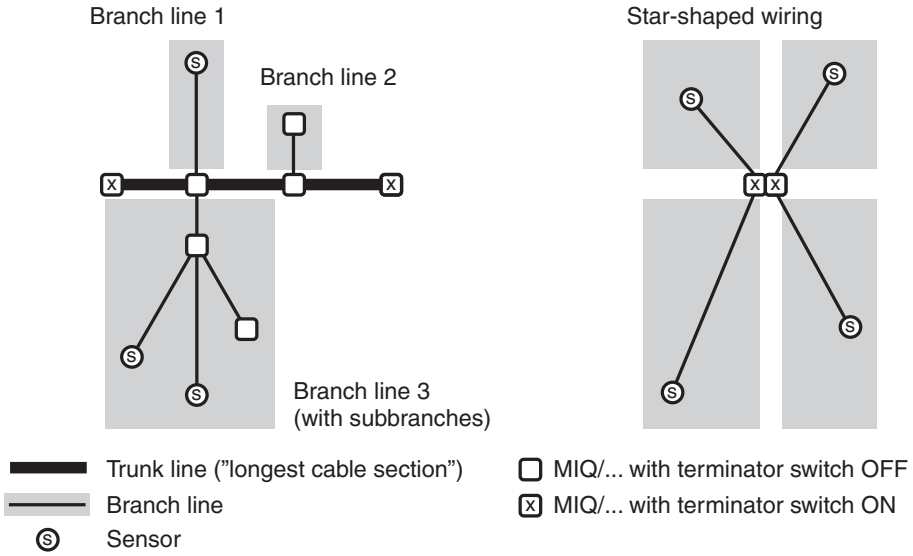


Fig. 3-26 Correct setting of the terminator switches

Main line Longest cable section with terminator switches at its ends.
The terminator switches on both ends must be set to ON.
If all MIQ modules are at one location, i. e. in a module stack, the length of the main line is zero (star-shaped wiring).

Branch line All lines that branch from the main line.
Branch lines can be branched further.



Note
In MIQ/S184 XT-H3 multiparameter measuring transmitters, the SN terminator switches of the two MIQ modules are set to ON in the delivery state. This is the correct setting provided that the system is not further branched. In the case of additional branching, the SN terminator switches must be newly set.

Example of determining the main line

The following figure shows the length of the main line L made up of the partial lengths L1, L2 and L3 as the cable section L4 is shorter than L3:

Length of the main line = L1 + L2 + L3

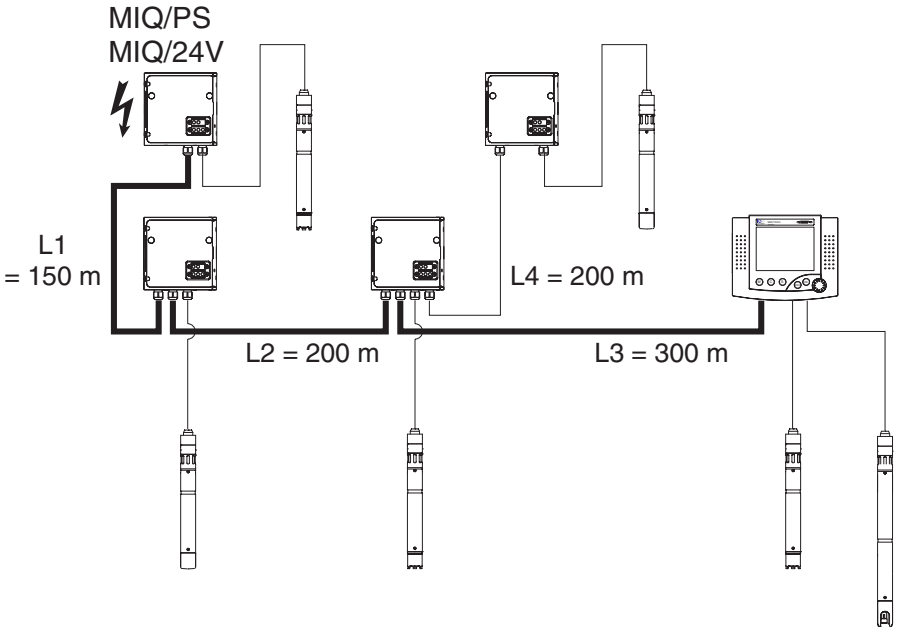


Fig. 3-27 Example of determining the length of the main line

Terminator switch

Terminator switches are located in each MIQ module between the two SENSORNET connections on the right of the terminal strip (designation "SN TERMINATOR"):

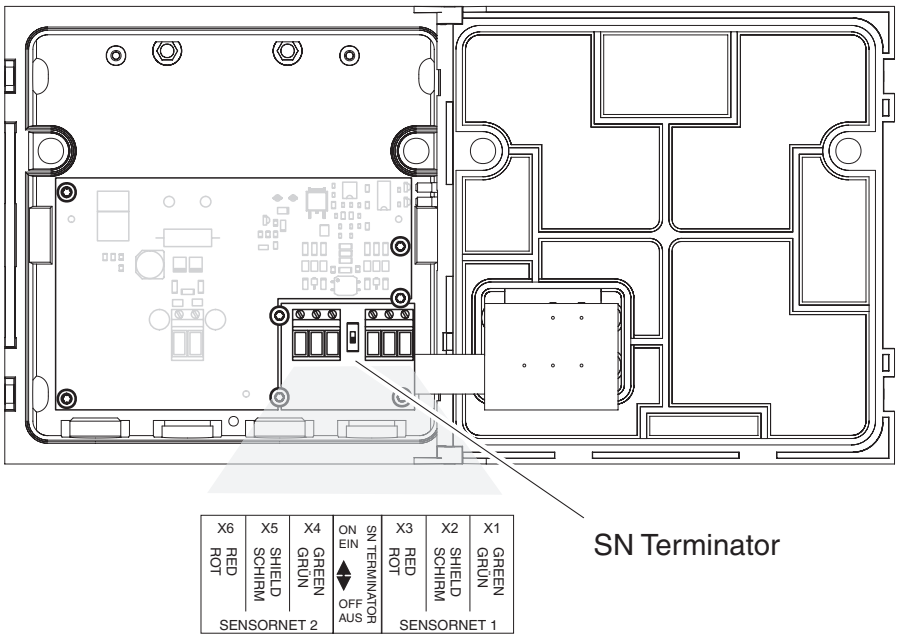


Fig. 3-28 Terminator switch

3.8.2 Start checklist and system start

Before starting the system, carry out the system check using the following checklist. Always carry out the check

- before the initial commissioning
- before any further commissioning if the system has been previously extended or modified.

Start checklist

1 Is the sum of the power consumption of the components smaller than the sum of the power delivery of all power supply modules (see section 3.3.1)?

2 Is a VisoTurb ® 700 IQ present in the system? Is the cable length between the VisoTurb ® 700 IQ and the power supply module max. 150 m?

3 Are all IQ SENSOR NET components correctly connected with one another (see section 3.5)?

4 Are all SN terminator switches correctly set (see section 3.8.1)?

5 Is the MIQ power supply module correctly connected to the voltage supply?

6 Do the line voltage and line frequency agree with the data on the name plate of the MIQ power supply module?

7 Are all IQ sensors ready for measuring, e.g. a D.O. sensor filled with electrolyte solution?

Starting the system Switch on the voltage supply of the MIQ power supply module(s).

Initial start phase

In the initial start phase, all IQ SENSOR NET components are automatically registered on the MIQ/C184 XT controller module and the terminal is initialized. Then, the system performs a self test. This process may last a few seconds. During this period, the following display appears:

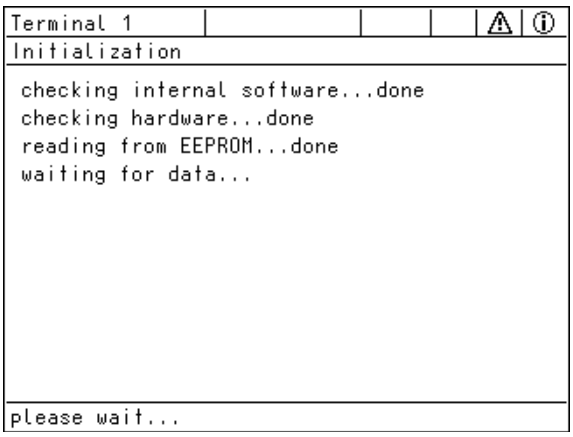


Fig. 3-29 Display during the initialization process

Second start phase

As soon as the terminal is successfully initialized, the measured value display appears (fourfold display). In the case of IQ sensors that are not yet providing measured values, "Init" appears temporarily:

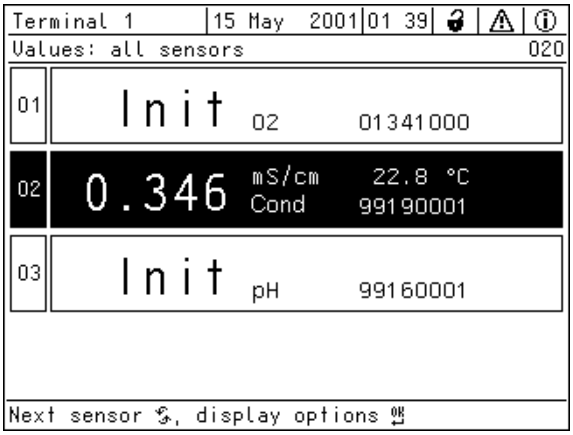


Fig. 3-30 Display after initialization of the terminal

Note
Assign a name to each IQ sensor after putting it into operation for the first time so you can identify it more easily. How to assign a sensor name is described in section 5.4.1 on page 5-5.

Note
If the system start failed, see chapter 7 WHAT TO DO IF ....

3.8.3 Checking the voltage supply

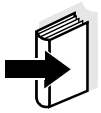
This test should always be performed:

- after the initial commissioning
- after any system extension or modification.

This test checks the power supply and the communication of the components after the system has been started.

Test procedure

1	Check the status of the LEDs on the MIQ power supply modules (Fig. 3-31): – Yellow lights upOperational voltage OK. The operational voltage supplied is constant and is max. 24 V. – Red lights upOperational voltage with power limitation. The operational voltage supplied is adjusted to the load conditions. – no LED lights up:Operational voltage too low. The operational voltage supplied is too low or the MIQ power supply module is defective.
2	Dock any existing MIQ/T2020 mobile terminal on the system as far away as possible from a MIQ power supply module (i.e. test of the power supply in the most unfavorable possible conditions)
3	Check the status of the LEDs on all MIQ modules (except for the MIQ power supply modules, see step 1) (Fig. 3-31): – Yellow lights upOperational voltage OK – Red lights upOperational voltage in warning range. The component is fully functional. However, any further slight drop in voltage can lead to failure – no LED lights up:Operational voltage in error range



Note
The relationship between the supply voltage, the LED status and the log book entries is described in the section 8.1 GENERAL SYSTEM DATA.

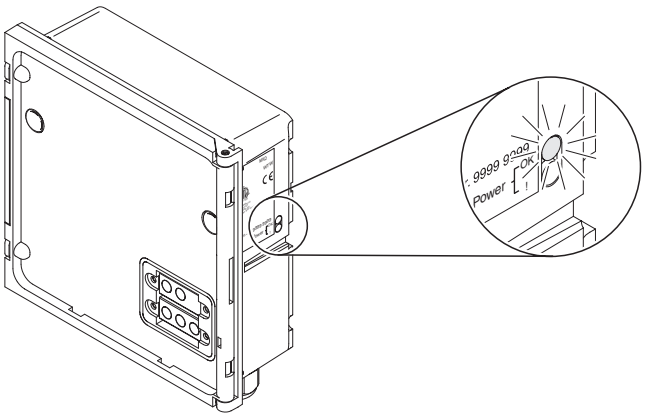


Fig. 3-31 Voltage LED on the MIQ module

Note
You can measure the voltage that is actually available at the MIQ modules or IQ sensors (see section 7.2.2).

4	Wait until the system start is completed and the measured value display appears.
5	If necessary, select another display language (see section 5.1 SELECTING THE LANGUAGE).
6	Check that all the IQ sensors are listed in the measured value display.
7	Check that all the MIQ output modules are listed in the *Edit list of outputs* menu (see section 5.6 EDITING THE LIST OF OUTPUTS).
8	If a component is not listed, carry out troubleshooting according to chapter 7 WHAT TO DO IF ....
9	Open the log book and acknowledge the messages. In the case of error messages, follow the instructions for clearing the error. For more details on the log book, see section 4.5.

3.9 System extension and modification

3.9.1 General information

The modular structure of the IQ SENSOR NET system makes it easy to carry out subsequent extensions and modifications. The system automatically identifies new active modules and includes them in the list of modules. Added IQ sensors immediately deliver measured values without the necessity for special settings.



Warning

When the system is switched on, if the MIQ/PS power supply module is opened, there is a danger to life due to possible hazard of electric shock from line voltage. There is also a danger to life inside the relay output modules (e.g. MIQ/ CR3) if voltages are applied to the relay contacts that may present a hazard of electric shock. Before opening the MIQ modules, switch off the system and all external voltages that present a hazard of electric shock and secure the system against being inadvertently switched on again.

Installation instructions

Note the following points in any system extension or modification:

- Before any extension or modification, check that the planned number of MIQ power supply modules is sufficient for the planned installation (see section 3.3.1 SYSTEM PLANNING)
- Before beginning the installation tasks, always switch off the system. Also, switch off all external voltages
- Clean the MIQ module stack to remove the worst of any dirt before taking it apart or opening it (see section 6.2 CLEANING)
- Before mounting the stack, check the contacts on the front and back of any MIQ modules that were already in use somewhere else. Clean any dirty contacts
- After any change to the system, check the setting of the SN terminator switches and adjust it if necessary (see section 3.8.1 TOPOLOGY AND TERMINATOR SWITCH).

Installing new components

Install new components as described in section 3.5 CONNECTING SYSTEM COMPONENTS. Then put the system into operation again (section 3.8 COMMISSIONING). Active modules are automatically recognized by the controller and included in the corresponding module lists.



Note
If a new component is not included, the maximum number of datasets (active and inactive datasets) may be exceeded.

The maximum number of datasets for IQ sensors is 12. For MIQ output modules, the maximum number of datasets (active and inactive datasets) is 6.

When this number of datasets is already stored, no further component can be installed.

If necessary, an inactive dataset has to be erased to make an extension possible (how to erase inactive datasets is described in section 5.4.3 or section 5.6.2).



Note
New modules are first registered on the system when the measured value display is opened.

Replacing components

The replacement of components is described in detail in section 7.4 REPLACING SYSTEM COMPONENTS.

4 Operation

4.1 Terminal/Controller MIQ/C184 XT

The MIQ/C184 XT terminal/controller is the operating unit and control unit of the IQ SENSOR NET.

4.2 Terminal

You can install the following terminal components:

- MIQ/C184 XT terminal/controller
- MIQ/T2020 terminal (see MIQ/T2020 component operating manual)
- MIQ/IF232 interface component with software terminal (see MIQ/IF232 component operating manual)

The terminal can be used to:

- Display measurement results
- Start calibration
- Perform system and terminal settings
- Display messages.

Note
To guarantee data safety within the IQ SENSOR NET, access to the following functions is only possible from one terminal at the same time:

- Opening the *Einstellungen/Settings* menu
- Start calibration
- Assigning IQ sensors or MIQ output modules as substitutes.

If one of these functions is already active at another terminal, a note appears on the display.

Note
The key symbols of the MIQ/T2020 terminal are used for all operating steps in this operating manual.
Details and differences when using the software terminal can be found in the MIQ/IF232 component operating manual.

4.2.1 Overview of the operating elements

This section gives basic information on the operation of the IQ IQ SENSOR NET system via the MIQ/C184 XT.

The terminal is equipped with a large display for the clear presentation of current measured values, the graph of measured values, status displays and message texts.

The IQ IQ SENSOR NET system is operated using the 5 keys Ⓜ,Ⓒ,Ⓢ,ESC,OK and the rotary switch ⟳.

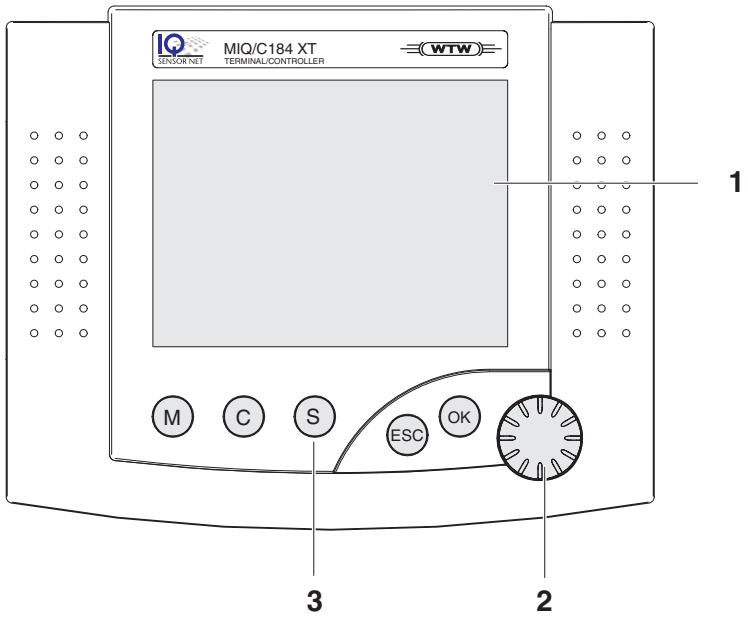


Fig. 4-1 View of the Terminal/Controller MIQ/C184 XT

1	Display (see section 4.2.2 DISPLAY)
2	Rotary switch (see section 4.2.4 ROTARY SWITCH)
3	5 keys Ⓜ,Ⓒ,Ⓢ,ESC,OK (see section 4.2.3 KEYS)

4.2.2 Display

The display contains the following information:

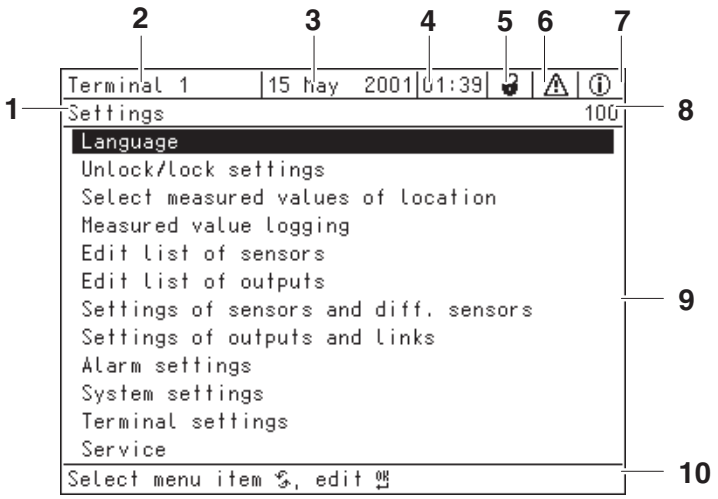


Fig. 4-2 View of the display

1	Name of the display
2	Name of the terminal
3	Date
4	Time
5	Lock safety setting: open (settings released) – System settings can be changed closed (settings locked) – All system settings can only be read
6	Error symbol ⚠: If the error symbol flashes, a new or unacknowledged error message is present in the log book that requires immediate action (see section 4.5.3).
7	Info symbol ⓘ: If the info symbol flashes, new or unacknowledged information is present in the log book (see section 4.5.3).
8	Number of the display
9	Display range for measured values, menus, lists, etc.
10	Help line with operating instructions

Measured value display

The measured value display contains the following information for each IQ sensor/differential sensor:

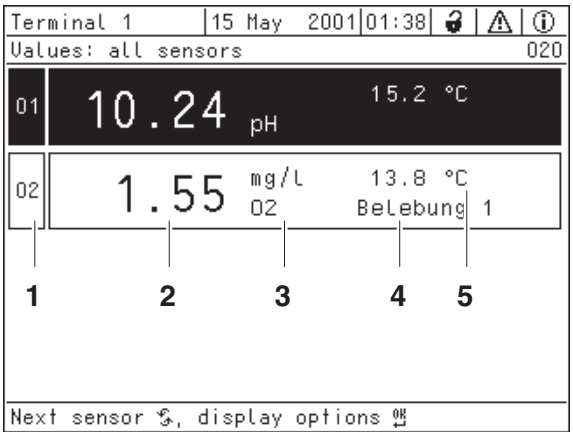


Fig. 4-3 Display - measured value display

1	Consecutive numbering of the measured values
2	Main measured value
3	Unit and parameter of the main measured value
4	Name of the sensor (to enter name: see section 5.4.1
5	Adjoining measured value with unit

Special displays

Init	Sensor is being initialized ● during commissioning or ● if a new IQ sensor is recognized that is not yet giving measured values
----	Invalid measured value
Cal	Sensor is being calibrated
Clean	Cleaning system active, sensor is offline
Error	Sensor is inactive or defective
OFL	Measuring range undercut or exceeded (overflow)
Display flashes	Sensor in maintenance condition

4.2.3 Keys

Key	Function
(M)	Display measured values
(C)	Start calibration of the IQ sensor selected in the measured value display
(S)	Open the *Einstellungen/Settings* menu
(ESC)	Change to the higher menu levels or abort entries without storing them
(OK)	Confirm selection

4.2.4 Rotary switch

Rotary switch	Function
(↻)	Highlight and select: ● Menu items ● Entries ● Columns or fields ● Letters or numerals



Note
The selection highlighted with the rotary switch is displayed as white text on a black background (reverse video).

4.3 General operating principles

The operation of the IQ SENSOR NET is standardized and user-friendly.

- Select an item with the rotary switch ⟲
  - Highlight individual elements in menus, lists and tables, e.g. menu entries, list elements, columns or fields
  - Select a setting in selection fields
  - Select a character in text entry fields
- Confirm a selection with the OK key.
- Break off an action and change to the next higher level with the ESC key.
- Start a calibration procedure with the C key.
- Switch to the settings with the S key.
- Change to the measured value display and break off current actions with the M key.

Note
Short operating instructions are given in the help line on the display.

Examples of the operating principles are given below:

- Navigation in menus, lists and tables (see chapter 4.3.1)
- Entering text and numerical values (see chapter 4.3.2)

Note
The key symbols of the MIQ/T2020 terminal are used for all operating steps in this operating manual.
Details and differences when using the software terminal can be found in the MIQ/IF232 component operating manual.

Note
If two or more terminals are used in a IQ SENSOR NET, access to the functions C and S is blocked when the functions are already being used on another terminal.

4.3.1 Navigating in menus, lists and tables

1	Open the *Einstellungen/Settings* menu with (S). Menus appear in the form of a list on the display, e.g. the *Einstellungen/Settings* menu shown here.

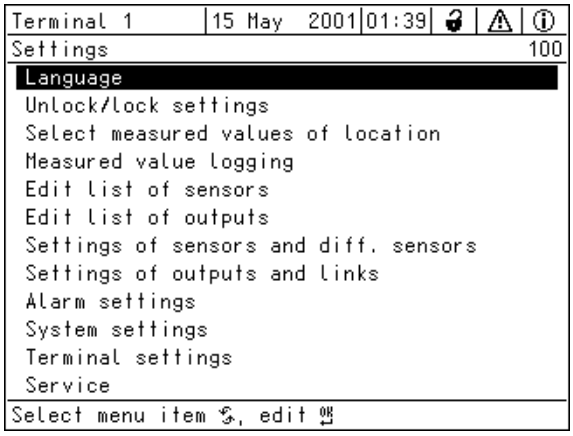


Fig. 4-4 Settings

2	Select a menu item (e.g. *System settings*) with (⟳). Move the highlighting (reverse video display, black background) in the list of menu items by turning the rotary switch (⟳).
3	Confirm the menu item (e.g. *System settings*) with (OK). The display (e.g. *System settings*) opens. Confirm the selection and move to a new display by pressing the (OK) key.
4	Return to a higher level with (ESC). or: Switch to the measured value display with (M).

4.3.2 Entering texts or numerals

You can assign names to IQ sensors, MIQ output modules, terminals and locations. Example: Entering a sensor name:

1	Open the *Einstellungen/Settings* menu with (S).
2	Select the *Edit list of sensors* menu item with (↻).
3	Confirm the menu item (e.g.*Edit list of sensors*) with (OK). The *Edit list of sensors* display opens. A column is highlighted.
4	Select the *Sensor name* column with (↻).
5	Confirm the column *Sensor name* with (OK). A sensor name is highlighted.
6	Select a sensor name with (↻).

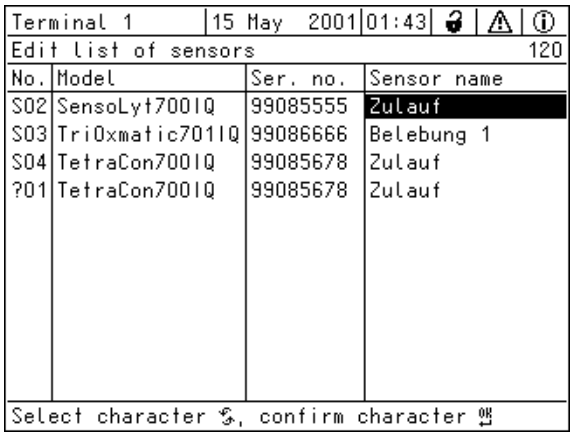


Fig. 4-5 Edit list of sensors

7	Confirm the selection with (OK). The name of the selected sensor is edited.

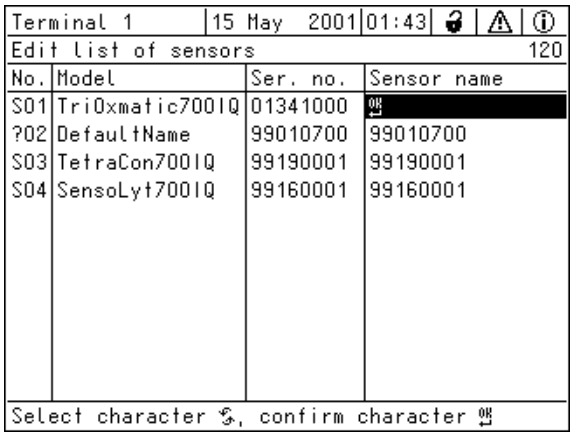


Fig. 4-6 Edit list of sensors

Note
The following letters, numerals and special characters can be entered:
AaBb..Zz0..9µ%&/()+-=><!?_ °.

8	Select a letter or numeral with ⟲.
9	Confirm the letters with OK. The character ↵ appears behind the last letter.

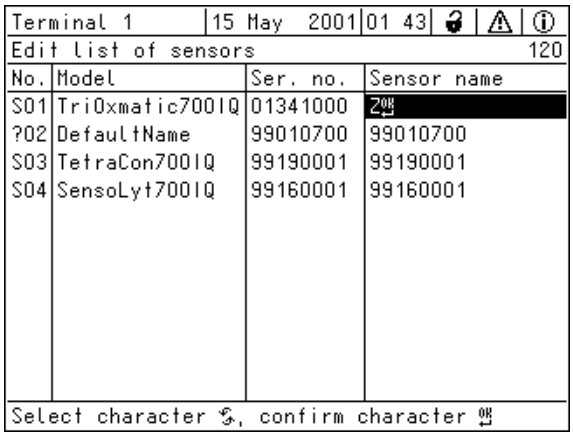


Fig. 4-7 Edit list of sensors

10	● Add a new character Select the character to be added with ⟳ and confirm with (OK). or ● Delete the last character Select the character ← with ⟳ and confirm with (OK). or ● Adopt the name Select the character ↵ with ⟳ and confirm with (OK).
11	Repeat steps 8 to 10 until the whole name has been entered.

Note
Break off entering the name with (ESC). The old name is retained.

4.4 Display of current measured values

Several options can be selected for displaying the measured values:

- *Measured values (1 sensor)*
  The measured value is shown numerically and as a bar graph on the *Measured values (1 sensor)* display (see section 4.4.1)
- *Measured values (4 sensors)*
  The *Measured values (4 sensors)* display provides an overview of a maximum of four IQ sensors or differential sensors (see section 4.4.2)
- *Measured values (8 sensors)*
  The *Measured values (8 sensors)* display provides an overview of a maximum of eight IQ sensors or differential sensors (see section 4.4.3)
- *Display local values or all values*
  Here you can switch between the display of the IQ sensors selected for the measurement location and the display of all the IQ sensors (see section 4.4.4).

Switch between the different display types as follows:

1	Call up the measured value display with (M).
2	Open the *Display options* menu with (OK).

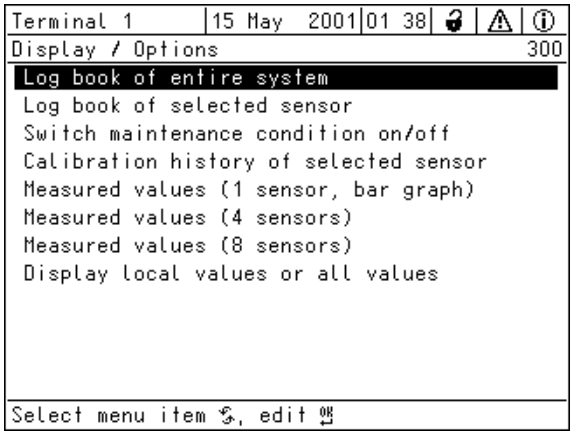


Fig. 4-8 Display/Options

3	Select a display type and confirm with (↕) and (OK). The selected display is activated.

4.4.1 Displaying a single measured value

The measured value is shown numerically and as a bar graph on the *Measured values (1 sensor)* display.

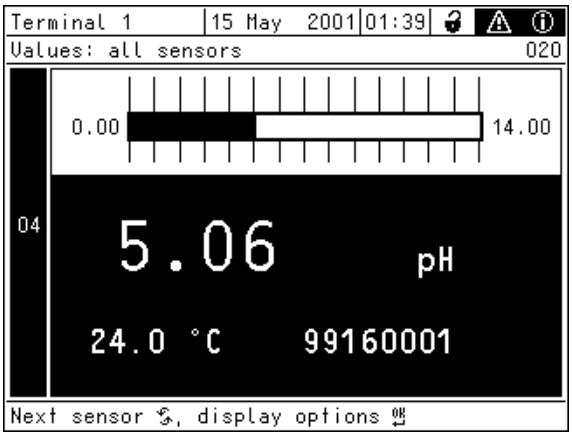


Fig. 4-9 Values: all sensors -> Measured values (1 sensor)

4.4.2 Displaying four measured values

Up to four measured values of IQ sensors or differential sensors are shown on the display at the same time.

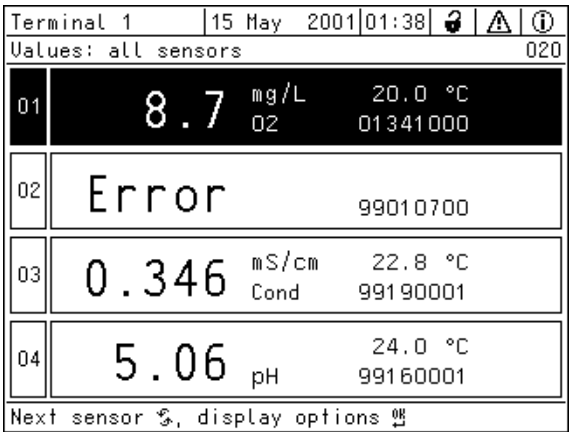


Fig. 4-10 Values: all sensors -> Measured values (4 sensors)

4.4.3 Displaying eight measured values

Up to six measured values of IQ sensors or differential sensors are shown on the display at the same time.

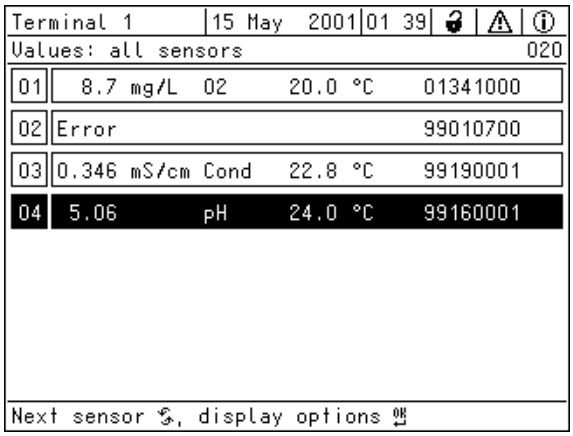


Fig. 4-11 Values: all sensors -> Measured values (8 sensors)

4.4.4 Displaying recorded measured values

If the measured value recording has been activated for an IQ sensor (see section 5.10), the temporal course of the recorded measured values can be displayed numerically and graphically.

The following display options are possible:

- *Monthly load of selected sensor* (graphic display)
- *Weekly load of selected sensor* (graphic display)
- *Daily load of selected sensor* (graphic display)
- *Measured value list of selected sensor* (numerical display)

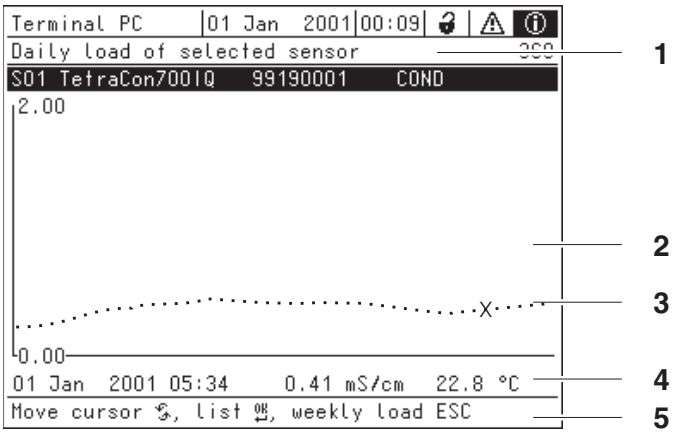


Fig. 4-12 Daily load of selected sensor (example)

1	Display
2	Range of the graphical display ● The time range (x axis) corresponds to the selected display option (1 day, 1 week, 1 month). ● The value range of the y-axis is automatically adjusted to min and max values
3	Position of the cursor (X)
4	Data about the position of the cursor (X) (Date, time, main measured value and adjoining measured value)
5	Navigation instructions

Displaying recorded measured values

1	Switch to the measured value display with (M).
2	Select an IQ sensor name with (↻).
3	Open the *Display options* menu with (OK).
4	Using (↻), select one of the display options, ● *Monthly load of selected sensor* ● *Weekly load of selected sensor* ● *Daily load of selected sensor* ● *Measured value list of selected sensor* and confirm with (OK). The selected option is displayed.

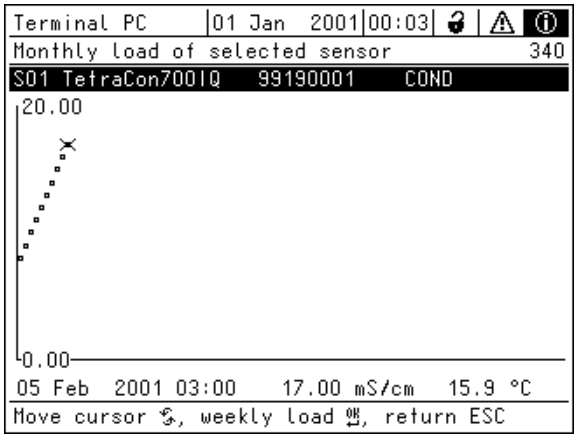


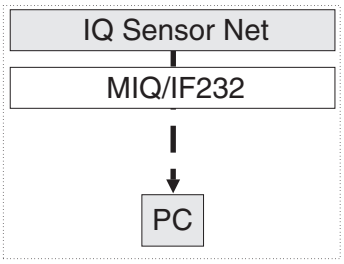
Fig. 4-13 Monthly load of selected sensor (example)

5	Using (↻), move the cursor (X) along the measured value curve. The cursor (X) marks the selected measured value.
6	Switch to the next display option with a shorter display period (OK). or Switch to the next display option with a longer display period (ESC).

4.4.5 Transmitting recorded measuring data to a PC

In the IQ SENSOR NET, you can log measured values of IQ sensors or differential sensors (see system operating manual, *Measured value logging*). The recorded measured values can be transmitted to a PC with the aid of the MIQ/IF232 component.

The following methods are available for this:

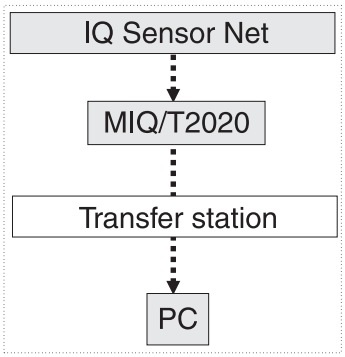


- **Direct data transmission (IQ SENSOR NET --> PC)**

  Direct data transmission is recommended if the PC can be operated in the vicinity of the IQ SENSOR NET.
  Direct data transmission can take place in two ways:

  – Transmitting recorded measuring data to the PC with the aid of the software terminal

  – Transmitting recorded measuring data to the PC with the aid of the *Data transfer* software



- **Indirect data transmission (IQ SENSOR NET -> MIQ/T2020 terminal --> PC)**

  Indirect data transmission is recommended if the PC cannot be operated in the vicinity of the IQ SENSOR NET.

  For indirect data transmission, a Transfer station with the MIQ/IF232 component is required as an accessory. Indirect data transmission consists of two steps:

  – Transmitting recorded sensor measuring data to the mobile MIQ/T2020 terminal.

  and

  – Transmitting temporarily stored measuring data from the MIQ/T2020 terminal to the PC with the aid of a Transfer station and the *Data transfer* software.

Starting the data transmission

Details on all kinds of data transmission are given in the MIQ/IF232 component operating manual.The MIQ/T2020 and MIQ/T2020 PC terminals contain the *Data transfer* menu item in the *Display options* menu. This is where you select the data for transmission to the MIQ/T2020 terminal or PC and start the transmission.

4.4.6 Display of the measured values of a measurement location or of all IQ sensors in the system

As soon as a terminal is docked onto a measurement location, the local measured value display becomes active. The IQ sensors selected for the measurement location appear on the measured value display (see section 5.7).

Switch between the measured values for the measurement location and all IQ sensors as follows:

1	Switch to the measured value display with (M).
2	Open the *Display options* menu with (OK).
3	Select and confirm the *Display local values or all values* menu item with (↻) and (OK). The measured value display switches between the display of the sensors at the measurement location and all sensors.

4.5 Messages and log book

The IQ SENSOR NET continuously monitors the status of the entire system. If the IQ SENSOR NET identifies system changes, a message appears. New messages can be recognized by the flashing information symbol or error symbol on the display.

All messages are recorded in the log book.

4.5.1 Message types

The system differentiates two types of messages:

- **Errors** ⚠
  Indicates a critical status in the system or an individual system component that requires immediate action.
  In the case of new error messages, the error symbol flashes on the display.
- **Information** ⓘ
  Information that does not require immediate action.
  In the case of new information, the info symbol flashes on the display.

Note
In the case of errors, immediately open the detailed message text in the log book and perform the recommended actions. If the actions have been performed, mark the message as read (see section 4.5.3).

4.5.2 Log book

The log book is a list with all the messages from all modules. The log book contains up to 1000 entries. If there are more than 1000 messages, the oldest entries are deleted.

New messages can be recognized by the flashing information symbol or error symbol. The log book always contains the latest message in the first position. They do not yet have a tick in the status field.

The flashing of the info or error symbol only stops after all detailed message texts in the log book have been opened and marked with a tick (✔) (see section 4.5.3).

Structure of the log book

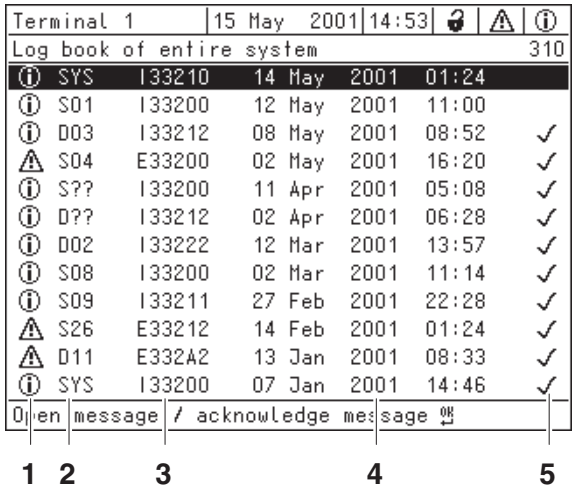


Fig. 4-14 Log book of entire system

1	Message category (error or info symbol)
2	Module that triggered the message. *SYS* system (controller) *S01* IQ sensor (number 01) *S??* IQ sensor (inactive, dataset deleted) *D01* MIQ output module (number 01) *D??* MIQ output module (inactive, dataset deleted)
3	Message code
4	Date and time of the message
5	Status field of the message ✔ message is acknowledged No tick message is not acknowledged

The system provides the following log books:

- *Log book of entire system*:
  List of all messages from all modules
- *Log book of selected sensor*:
  List of all messages from a single IQ sensor.

There is a detailed message text for each message of a module that is ready for operation. The detailed message text on each message is given in the log book (see section 4.5.3) and in the operating manual of the registering module.

Structure of the message code

The message code consists of 6 characters and can contain numerals and letters, e.g.: II2111.



Pos.	Information	Explanation
1 - 3	Short message form	The short form of the message contains the following information of the message: Category, type and type number
	1: possible categories	● Info message (I) ● Error message (E)
	2: possible types	● Calibration data (C) ● Installation and commissioning (I) ● Instructions for service and repair (S) ● Application instructions (A)
	3: Type number	Each type contains subtypes (0..9A..Z)
4 - 6	Module code	The three-digit module code designates the module that generated the message. The module code can be found in the chapter LISTS of the respective component operating manual.

Example: Message code II2111

The component "111" (Controller MIQ/C184 XT) sends a message with the short form message "II2".
This is an info message (I) of the type Installation (I) with the type number (2). The detailed message text of the short form message (II2) can be found in the log book and in the operating manual of the component that sent it.

Note
The detailed message text in the log book contains a precise description of the message code and, if required, any further actions.

The detailed message texts can also be found in the component operating manuals of the individual components.

Note
The log book shows the current status at the point of time that it was opened. If new messages arrive while a log book is open, these do not appear in the log book. As usual, you are informed of new messages by flashing info or error symbols. The current log book with the new messages can be viewed by closing and reopening the log book.

4.5.3 Viewing detailed message texts

1	Switch to the measured value display with (M).
2	Open the *Display options* menu with (OK).
3	Select and open the *Log book of entire system* with (OK). A list of log book entries appears.
4	Select and confirm a new log book entry (no tick) with (↻) and (OK). The message text with further information on the selected log book entry appears.

Terminal 1	15 May 2001	14 53			
Log book of entire system					310
ⓘ SYS	I33210	14 May	2001	01:24	
ⓘ S01	I33200	12 May	2001	11:00	
ⓘ D03	I33212	08 May	2001	08:52	✓
⚠ S04	E33200	02 May	2001	16:20	✓
ⓘ S??	I33200	11 Apr	2001	05:08	✓
ⓘ D??	I33212	02 Apr	2001	06:28	✓
ⓘ D02	I33222	12 Mar	2001	13:57	✓
ⓘ S08	I33200	02 Mar	2001	11:14	✓
ⓘ S09	I33211	27 Feb	2001	22:28	✓
⚠ S26	E33212	14 Feb	2001	01:24	✓
⚠ D11	E332A2	13 Jan	2001	08:33	✓
ⓘ SYS	I33200	07 Jan	2001	14:46	✓
Open message / acknowledge message OK					

Fig. 4-15 Log book of entire system

5	Acknowledge the message with (OK). A tick appears in the log book entry.

6	Leave the message text with ESC.

Note
Acknowledgment of a new message text in the log book marks the message as read. When all errors or information messages are acknowledged, the symbols no longer flash.

With the *Acknowledge all messages* function you can acknowledge all messages at the same time (see section 4.5.4).

Note
Message texts are stored in the components that caused them. Therefore, further information on a log book entry for an IQ sensor such as, e.g. calibration messages, instructions and help texts are only accessible in the case of connected components that are ready for operation.

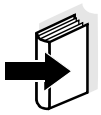
If a message text is not available because, e.g. a component is not connected with the system, you can look up the detailed text of the message as follows:

- Messages of the system are given in this operating manual (see section 10.2).
- Messages of a module are given in the respective component operating manual of the component.

4.5.4 *Acknowledge all messages*

1	Switch to the measured value display with M.
2	Open the *Einstellungen/Settings* menu with S.
3	Select and confirm the *Service* menu item with ↻ and OK.
4	Select and confirm the *Acknowledge all messages* menu item with ↻ and OK. A security prompt opens.
5	Select *Acknowledge* with ↻ and confirm with OK. All messages are acknowledged. Error symbol and info symbol do no longer flash.

4.6 Calibration data



Note
Details on calibration are given in the operating manual for the IQ sensor.

Each calibration of IQ sensors that are able to be calibrated causes an entry to be made in the log book. Log book entries contain the following information:

- Calibration date
- Calibration successful or not successful.

The detailed calibration data of the last calibrations are integrated in the *Calibration history of selected sensor* overview.



Note
All calibration data are stored in the IQ sensor. In order to view the calibration data of an IQ sensor, the IQ sensor must be connected to the IQ SENSOR NET and must be ready for operation.

4.6.1 Calibration entries in the log book

The date and time of a calibration are entered in the log book. The respective message text contains an indication as to whether a calibration was successful or not. The values determined with calibration can be viewed in the calibration history (see section 4.6.2).

1	Call up the measured value display with (M).
2	Highlight a sensor with (↻) and confirm with (OK). The *Display options* menu opens.
3	Select the *Log book of selected sensor* menu item with (↻) and confirm with (OK). Calibration entries in the log book are held in message code (ICxxxx and ECxxxx).
4	Select and open a calibration entry (ECxxxx or ICxxxx) with (↻) and (OK).
5	Leave the *Calibration history of selected sensor* with (M).

4.6.2 Calibration history

The calibration history contains the detailed calibration data of the last calibrations.

1	Call up the measured value display with (M).
2	Highlight a sensor with (⟳) and confirm with (OK). The *Display options* menu opens.
3	Select the *Calibration history of selected sensor* menu item with (⟳) and confirm with (OK). The calibration history with the results of the last calibrations opens.
4	Leave the *Calibration history of selected sensor* overview with (M).

4.7 Software status

The system gives information on the current versions of the software.

4.7.1 Software status of the controller and terminal

1	Call up the measured value display with (M).
2	Open the *Einstellungen/Settings* menu with (S).
3	Select the *Service* menu item with (↻) and confirm with (OK). The *Service* dialog window opens.
4	Select the *Software versions* menu item with (↻) and confirm with (OK). The *Software versions* dialog window opens.

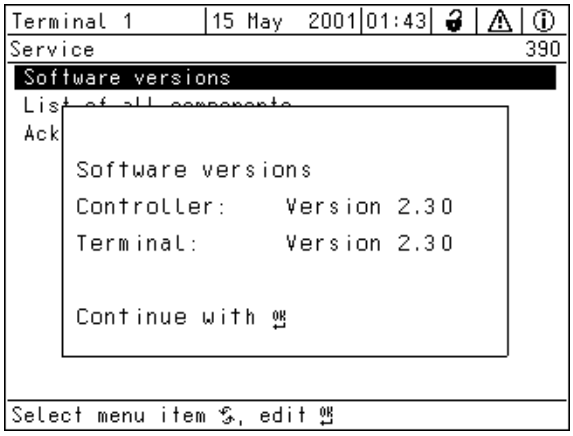


Fig. 4-16 Service -> Software versions

5	Leave the *Software versions* dialog window with (M) or (OK).

4.7.2 Software status of all components

1	Call up the measured value display with (M).
2	Open the *Einstellungen/Settings* menu with (S).
3	Select the *Service* menu item with (↻) and confirm with (OK). The *Service* dialog window opens.
4	Select the *List of all components* menu item with (↻) and confirm with (OK). The *List of all components* dialog window opens.

Terminal PC | 01 Jan 2001 | 01:04 | 🔒 | ⚠ | ⓘ

List of all components 393

No.	Model	Ser. no.	Softw. vers.
SYS	Controller	01450001	2.00
SYS	Terminal	01450002	2.01
S01	TetraCon700IQ	01450003	2.02
D02	MIQCR3	01450004	2.03
?03	TriOxmatic701IQ	01450005	2.04
	TetraCon700IQ	99180006	1.05

Return ESC, scroll ↻

Fig. 4-17 List of all components

5	Leave the *List of all components* dialog window with (M) or (OK).

4.8 Status info of sensors and outputs

The display of the instrument status provides a simple overview of the current modes of sensors (sensor info) and outputs in the IQ SENSOR NET.

The status display can be reached in the *Einstellungen/Settings/ Service/List of all components* menu (see section 4.7).

1	Call up the *List of all components* (see section 4.7).
2	Select the required component with ⟲ and confirm with OK. ● Output module: The *Status of output channels* window opens up (for details, refer to the operating manual of the output module). ● Sensor: The sensor info opens up (for details, refer to the operating manual of the selected sensor).

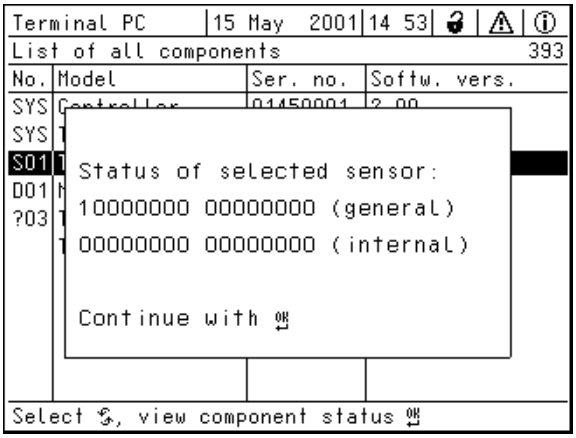


Fig. 4-18 List of all components with sensor info

3	Leave the *Status of output channels* dialog window with M or OK.

4.9 General course when calibrating, cleaning, servicing or repairing an IQ sensor

When an IQ sensor is calibrated, cleaned, serviced or repaired, the maintenance condition for the relevant IQ sensor should always be switched on.

In the maintenance condition

- the system does not react to the current measured value or the condition of the selected IQ sensor
- linked outputs are frozen
- IQ sensor errors do not prompt changes in the conditions of linked outputs.

The maintenance condition for IQ sensors is automatically activated

- during calibration. After calibration the IQ sensor remains in the maintenance condition until the maintenance condition is switched off manually (see section 4.9.3)
- during a compressed-air cleaning cycle.

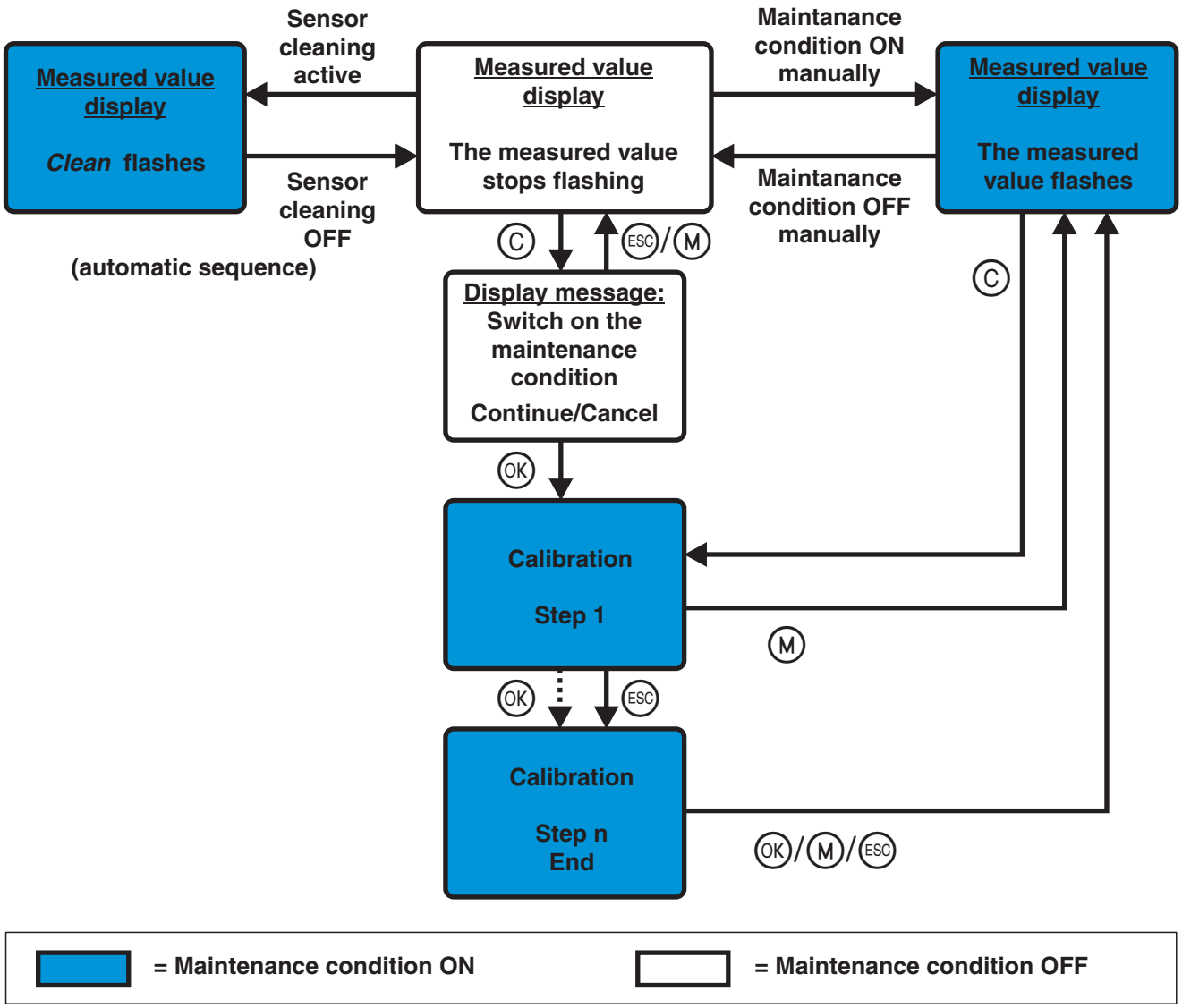
Therefore, keep to the following course when you calibrate, clean, service or repair an IQ sensor.

Course

1	Switch on the maintenance condition for the IQ sensor (see section 4.9.2). The display of the sensor in the measured value display flashes.
2	Pull the sensor out of the sample.
3	Perform the calibration in the laboratory, cleaning, maintenance or repair (removing and replacing) of the sensor (about these topics, see the component operating manual of the corresponding sensor).
4	Submerse the sensor in the sample again.
5	Wait until the measured value does no longer change.
6	Switch off the maintenance condition for the sensor (see section 4.9.3). The display of the sensor in the measured value display does no longer flash.

4.9.1 Maintenance condition of IQ sensors

The following diagram gives you an overview of when an IQ sensor is in the maintenance condition.



4.9.2 Switching on the maintenance condition

Switch on the maintenance condition manually when you want to clean, service or repair (remove and replace) an IQ sensor.

1	Call up the measured value display with Ⓜ.
2	Select the sensor you want to switch on the maintenance condition for with ⟳. The display of the sensor in the measured value display does not flash.
3	Open the *Display options* menu with OK.
4	Select the *Switch maintenance condition on/off* menu item with ⟳ and confirm with OK. A window that informs you about the maintenance condition opens up.
5	Confirm *Continue* with OK. The selected sensor is in the maintenance condition. Linked outputs are frozen.
6	Call up the measured value display with Ⓜ. The display of the sensor in the measured value display flashes.

Subsequently, perform the cleaning, maintenance or repair work (removal and replacement).

When you have finished calibrating, cleaning, servicing or repairing the sensor, switch off the maintenance condition manually (see section 4.9.3).

4.9.3 Switching off the maintenance condition

1	Call up the measured value display with (M).
2	Select the sensor you want to switch off the maintenance condition for with (⟳). The display of the sensor in the measured value display flashes.
3	Open the *Display options* menu with (OK).
4	Select the *Switch maintenance condition on/off* menu item with (⟳) and confirm with (OK). A window that informs you about the maintenance condition opens up.
5	Confirm *Continue* with (OK). The maintenance condition of the selected sensor is switched off. Linked outputs are released.
6	Call up the measured value display with (M). The display of the sensor in the measured value display does not flash.

Note
If a power failure occurs, the outputs automatically are in the non-operative condition (relays: open, current output: 0 A; see component operating manual of the output module). After the end of the power failure the outputs work as defined by the user again.

If a power failure occurs while an IQ sensor that is linked with an output is in the maintenance condition, the current and relay outputs work as defined by the user after the maintenance condition has been switched off only (see section 4.9.3).

5 Settings/setup

5.1 Selecting the language

A list shows all the available system languages.

1	Open the *Einstellungen/Settings* menu with (S).
2	Select the *Language* menu item with (↻) and confirm with (OK). The *Language* display opens.

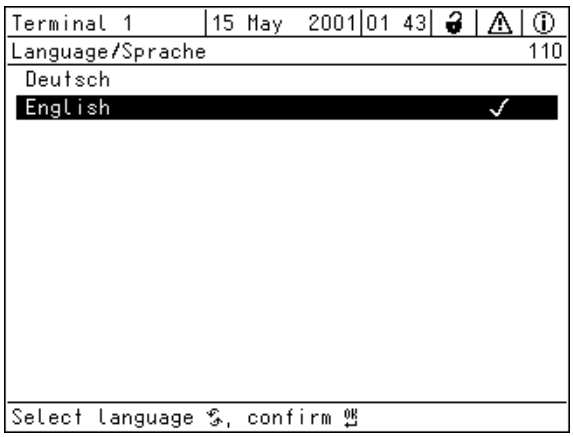


Fig. 5-1 Language

3	Select a language from the list with (↻) and confirm with (OK). The active language is marked with a tick.
4	Switch to the higher menu level with (ESC). or: Switch to the measured value display with (M).

Note
If the selected system language is not available in a component, all indications of this component (e.g. sensor, controller, terminal, output module) appear in the standard language, German. To activate the selected system language for this component, a software update of the component is required. Contact WTW.

5.2 Terminal settings

The available terminal settings depend on the terminal installed. The following terminals can be used:

- MIQ/C184 XT terminal/controller

The terminal settings with the MIQ/C184 XT terminal/controller include:

- *Terminal name*, user-defined
- *Illumin. brightness*
- *Display contrast*

1	Open the *Einstellungen/Settings* menu with (S).
2	Select the *Terminal settings* menu item with (↻) and confirm with (OK). The *Terminal settings* display opens.

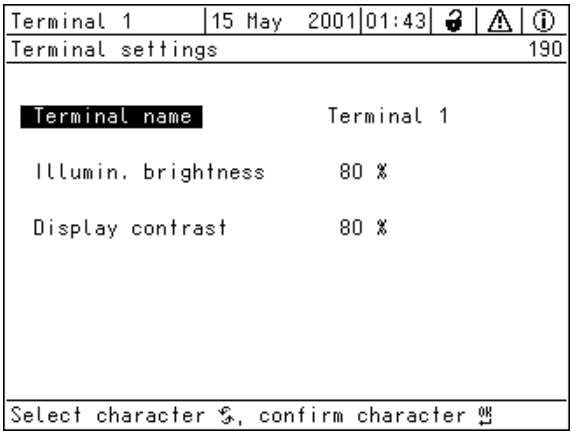


Fig. 5-2 Terminal settings

Terminal name

The name of the terminal appears in the top left corner of the display. 15 characters are available for the name.

3	Select the *Terminal name* menu item with ⟲ and confirm with (OK).
4	Enter the terminal name with ⟲ and (OK) and confirm with (OK) (see also section 4.3.2).

Illumination brightness

The illumination brightness can be continuously adjusted.

5	Select the *Illumin. brightness* menu item with ⟲ and confirm with (OK).
6	Select a brightness level and confirm with ⟲ and (OK).

Display contrast

The display contrast can be continuously adjusted.

7	Select the *Display contrast* menu item with ⟲ and confirm with (OK).
8	Select a contrast level and confirm with ⟲ and (OK).

5.3 Releasing or locking settings

Password protection can be switched on or off with the *Unlock/lock settings* function. The current setting is displayed in the safety field. The lock symbol is open or closed. Before any change of the release setting, a password query appears.

Note
If the closed lock symbol can be seen on the display, all system settings are locked.

1	Open the *Einstellungen/Settings* menu with (S).
2	Select the *Unlock/lock settingsSystem settings* menu item with (↕) and confirm with (OK). The *Unlock/lock settings* dialog window opens.

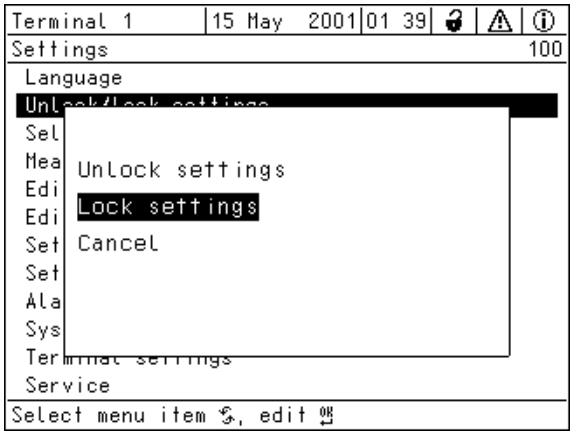


Fig. 5-3 Settings -> Unlock/lock settings

3	Select a function with (↕) and (OK) and confirm with (OK). The dialog window for entering the password opens.
4	Enter the valid password with (↕) and (OK) and confirm with (OK). The setting is changed.

Note
Forgotten the password? You can display the valid password on the screen (see section 11.1).

5.4 Editing the list of sensors

The *Edit list of sensors* display provides an overview of all IQ sensors, differential sensors and inactive datasets (see section 7.4.2).

In the *Edit list of sensors* display, you can:

- assign sensor names (see section 5.4.1)
- delete inactive datasets (see section 5.4.1)
- change the order of the display of measured values on the measured value display (see section 5.4.2).

5.4.1 Entering / editing a name for an IQ sensor

For the easier identification of the IQ sensors and differential sensors, you can assign an individual name to each IQ sensor.

1	Open the *Einstellungen/Settings* menu with (S).
2	Select the *System settings -> Edit list of sensors* menu item with (↻) and confirm with (OK). The *Edit list of sensors* display opens.
3	Highlight the *Sensor name* column with (↻) and confirm with (OK).
4	Highlight the name of a sensor with (↻) and confirm with (OK).

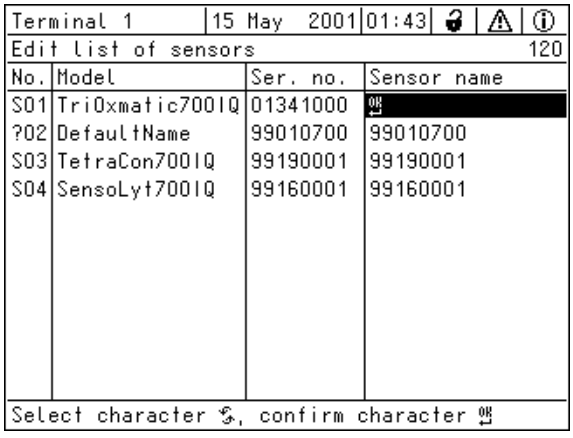


Fig. 5-4 Edit list of sensors

5	Enter the name with (↻) and (OK) and confirm with (OK) (see section 5.4.1).

5.4.2 Changing the display position

The numbering of the sensors is generated by the system. The order of the sensors in the measured value display and in the *Edit list of sensors* overview can be individually determined.

1	Open the *Einstellungen/Settings* menu with (S).
2	Select the *System settings -> Edit list of sensors* menu item with (↻) and confirm with (OK). The *Edit list of sensors* display opens.
3	Highlight the *Model* column with (↻) and confirm with (OK).
4	Highlight a *Model* with (↻) and confirm with (OK). A dialog window opens.

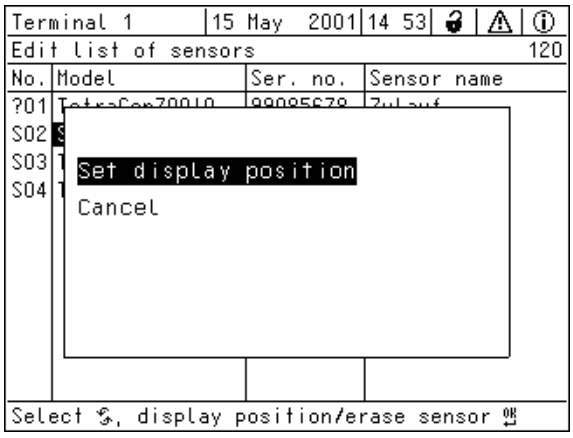


Fig. 5-5 Edit list of sensors -> Set display position

5	Select the *Set display position* menu item with (↻) and confirm with (OK). A dialog window opens.
6	Select the required number for the display position with (↻) and confirm with (OK). The sensor is displayed at the new position in the list of sensors. The other sensors are moved accordingly.

5.4.3 Erasing inactive sensor datasets

An inactive dataset for an IQ sensor arises if the controller receives no signals from a registered IQ sensor. The *Error* display appears on the measured value display instead of a measured value. Inactive datasets can be recognized by a question mark, e.g. "?01" in the *Edit list of sensors* overview.

An inactive dataset can be reactivated by assigning it, e.g. to an IQ sensor of the same type (see section 7.4.2). All settings are retained. If you no longer require these data, you can erase them. All the data and settings belonging to this IQ sensor, as well as differential sensors and the link with an output, are erased by this action.

1	Open the *Einstellungen/Settings* menu with (S).
2	Selelect the *System settings -> Edit list of sensors* menu item with (↻) and confirm with (OK). The *Edit list of sensors* display opens.
3	Highlight the *Model* column with (↻) and confirm with (OK).
4	Highlight a *Model* with (↻) and confirm with (OK).

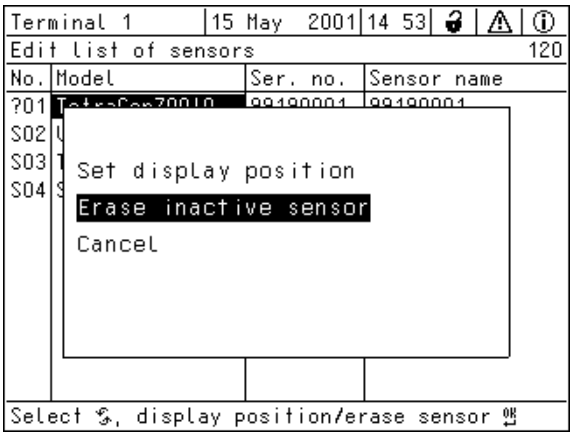


Fig. 5-6 Edit list of sensors -> Erase inactive sensor

5	Select *Erase inactive sensor* with (↻) and confirm with (OK). The dialog window for the security prompt appears.
6	Select *Erase inactive sensor* with (↻) and confirm with (OK). The inactive sensor is erased.

5.5 Setting up IQ sensors/differential sensors

5.5.1 Creating a differential sensor

A differential sensor is a virtual sensor. It shows the differential value of two IQ sensors that measure the same parameter and have the same settings. This is used to display the difference, e.g. before and after a water treatment.

Differential IQ sensors can be recognized in the *Edit list of sensors* overview in the *Ser. no.* field by the specification of the two sensors involved.

A link with another IQ sensor in the *Settings of sensors and diff. sensors* menu can be recognized in the *&* field by the sensor number of the linked sensor.

1	Open the *Einstellungen/Settings* menu with (S).
2	Select the *System settings -> Settings of sensors and diff. sensors* menu item with (↻) and confirm with (OK). The *Settings of sensors and diff. sensors* display opens.
3	Select a sensor with (↻) and confirm with (OK). The display for the selection of the second sensor opens.

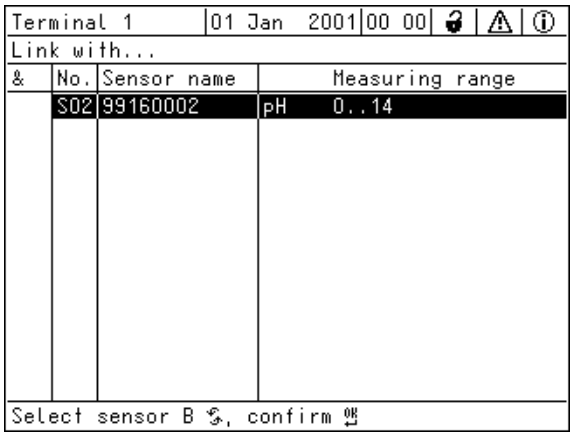


Fig. 5-7 Settings of sensors and diff. sensors -> Link with...

4	Select a sensor with (↻) and confirm with (OK). The sensors are linked. The link in both sensors is entered in the *Edit list of sensors* overview. The linked sensor is created as a new sensor and also appears in the measured value display.

5.5.2 Erasing a differential sensor

If a differential sensor is no longer required, it can be erased from the list of sensors.

1	Open the *Einstellungen/Settings* menu with Ⓢ.
2	Select the *System settings -> Settings of sensors and diff. sensors* menu item with ⟲ and confirm with Ⓞ. The *Settings of sensors and diff. sensors* display opens.
3	Highlight the column with ⟲ and confirm with Ⓞ.
4	Highlight a differential sensor with ⟲ and confirm with Ⓞ.

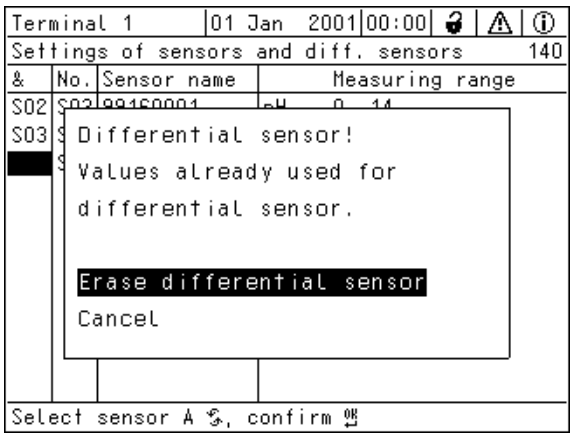
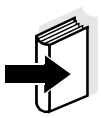


Fig. 5-8 Settings of sensors and diff. sensors -> Erase differential sensor

5	Select *Erase differential sensor* with ⟲ and confirm with Ⓞ. The differential sensor is erased.

5.5.3 Adjusting the settings for sensors/differential sensors

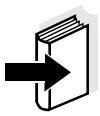
Sensor settings include the measured parameter, measuring range and, if necessary, compensations.



Note
General steps for the selection of sensor settings are given below. Details on sensor settings are given in the operating manual for the IQ sensor.

1	Open the *Einstellungen/Settings* menu with Ⓢ.

2	Select the *System settings -> Settings of sensors and diff. sensors* menu item with ⟲ and confirm with (OK). The *Settings of sensors and diff. sensors* display opens.
3	Highlight the *Measuring range* column with ⟲ and confirm with (OK). An information window opens up.



Note
If the measuring mode or measured parameter are changed, a link of the sensor with a relay is erased!

4	Confirm the information with (OK). The *Link with...* display opens.

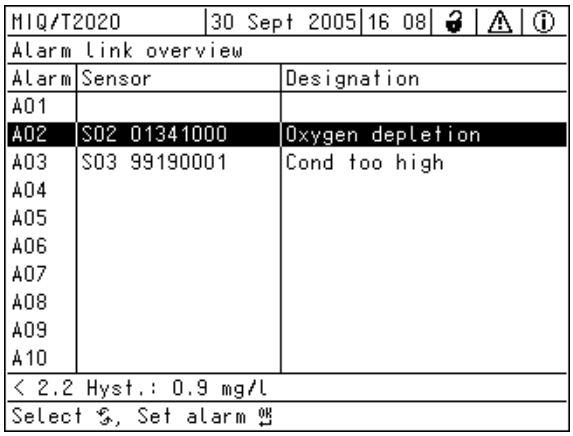


Fig. 5-9 Settings of sensors and diff. sensors

5	Select a sensor with ⟲ and confirm with (OK). The current settings are displayed.

5.6 Editing the list of outputs

The *Edit list of outputs* display provides an overview of all outputs, links and inactive datasets (see section 7.4.3).

In the *Edit list of outputs* display, you can:

- assign output names (see section 5.4.1) and
- erase inactive datasets (see section 5.4.2).

5.6.1 Entering / editing the name of an output

For the easier identification of the outputs, you can assign an individual name to each output in the *Edit list of outputs* display.

1	Open the *Einstellungen/Settings* menu with (S).
2	Select the *System settings -> Edit list of outputs* menu item with (↻) and confirm with (OK). The *Edit list of outputs* overview opens.
3	Highlight a name in the *Name* column with (↻) and confirm with (OK).

Terminal 1	15 May 2001	14:53			
Edit list of outputs					130
No.	Model/Channel	Ser. no.	Name		
D01	ADCR/C1	12345678			
D01	ADCR/C2	12345678	O2-Belebung		
D01	ADCR/C3	12345678	O2-Belebung		
D01	ADCR/R1	12345678	GW Lüfter I		
D01	ADCR/R2	12345678	GW Lüft II		
D01	ADCR/R3	12345678	GW Lüft III		
?02	ADCR/R1	22222222	GW1 Trübung		
?02	ADCR/R2	22222222	GW2 Trübung		
D03	ADCR/C1	66666666	Schlammpgl		
D03	ADCR/C2	66666666	Trüb Abl		
D03	ADCR/R1	66666666	Trüb Zul		
Select character ↻, confirm character					

Fig. 5-10 Edit list of outputs -> enter a name

4	Enter the name with (↻) and (OK) and confirm with (OK) (see also section 4.3.2).

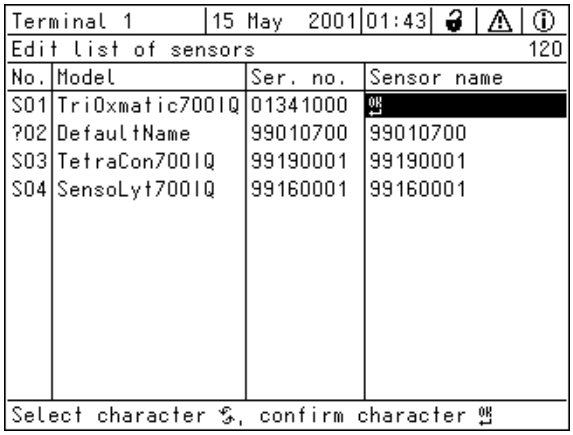


Fig. 5-11 Edit list of sensors

5.6.2 Erasing an inactive dataset for an MIQ output module

An inactive dataset for an MIQ output module arises if the system receives no signals from a registered MIQ output module. Inactive datasets can be recognized by a question mark, e.g. "?01" in the *Edit list of outputs* overview.

An inactive dataset can be reactivated by assigning it, e.g. to an MIQ output module of the same type (see section 7.4.3). All settings are retained. If you no longer require the stored data, you can erase them.

1	Open the *Einstellungen/Settings* menu with (S).
2	Select the *System settings -> Edit list of outputs* menu item with (↻) and confirm with (OK). The *Edit list of outputs* display opens.
3	Highlight the *Model/Channel* column with (↻) and confirm with (OK). This column can only be highlighted if an inactive dataset (?xx) is present.
4	Highlight a *Model/Channel* with (↻) and confirm with (OK).

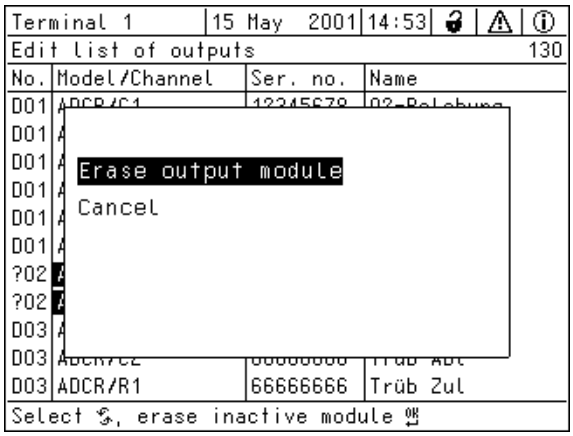


Fig. 5-12 Edit list of outputs -> Erase output module

5	Select *Erase output module* with (↻) and confirm with (OK). The dialog window for the security prompt appears.
6	Select *Erase output module* with (↻) and confirm with (OK). The output is erased.

5.6.3 Output links/settings

Note
The procedure and possible settings for linking outputs with sensors are given in the operating manual of the respective output module.

5.7 Settings for a measurement location

Primarily, the settings for a measurement location simplify the calibration of IQ sensors if several IQ sensors of the same type are operated on the system. The option of hiding IQ sensors on the measured value display that are not operated at the measurement location helps to find IQ sensors at the measurement location quickly.

Measurement location-related settings become effective as soon as a terminal is docked on an MIQ module. Measurement location-related settings include:

- the location name (module name)
- the selection of the sensors for the measured value display.

1	Open the *Einstellungen/Settings* menu with (S).
2	Select the *System settings -> Select measured values of location* menu item with (↻) and confirm with (OK). The *Location display* opens.

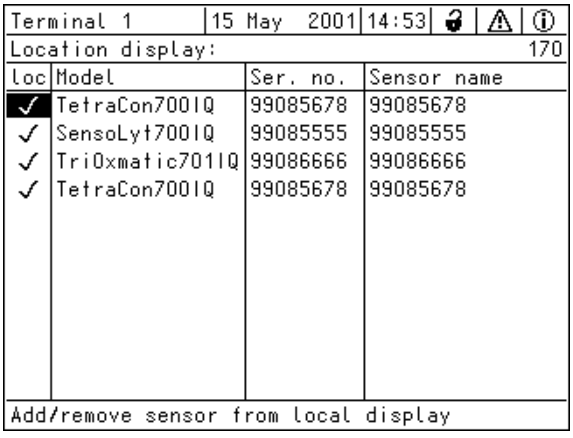


Fig. 5-13 Location display

Entering the name of a measuring location

The name of the measurement location is displayed in the line with the name of the display. 15 characters are available for the name of the measurement location.

3	Select the name of the display *Select measured values of location* with ⟲ and confirm with (OK).
4	Enter the terminal name with ⟲ and (OK) and finally confirm with (OK) (see also section 4.3.2).

Selecting sensors for the measured value display on the measurement location

The measured value display provides the option of displaying either all sensors or a selection of sensors (see section 4.4.4).

As soon as a terminal is docked on any MIQ module, the selected sensors at the measurement location are displayed. All sensors for the display at the measurement location are activated in the delivery state.

The sensors are selected in the *Select measured values of location* menu. This selection is stored in the MIQ module on which the terminal is docked.

5	Select and confirm sensors for the local measured value display with ⟲ and (OK). This sets or removes a tick (✔) for the individual sensors. Sensors selected for the display are marked with a tick (✔).

5.8 Alarm settings

5.8.1 General information

Under this menu item you can specify reactions on certain alarm events.

An alarm event is when a certain measured value (limiting value) of a sensor is exceeded or undercut. You can configure up to 20 alarm events.

Alarm events can be relayed as follows:

- as a message on the display
- as a relay action (with corresponding output module)



Note
An alarm message via display or relay cannot be acknowledged or switched off. An alarm only disappears if the cause for the alarm was eliminated or the *Alarm settings* were changed or erased.

5.8.2 Setting up / editing alarms

1	Open the *Einstellungen/Settings* menu with (S).
2	Select the *Alarm settings* menu item with (↻) and confirm with (OK). The *Alarm link overview* dialog window opens. Alarms that have already been set up have entries in the *Sensor* column.

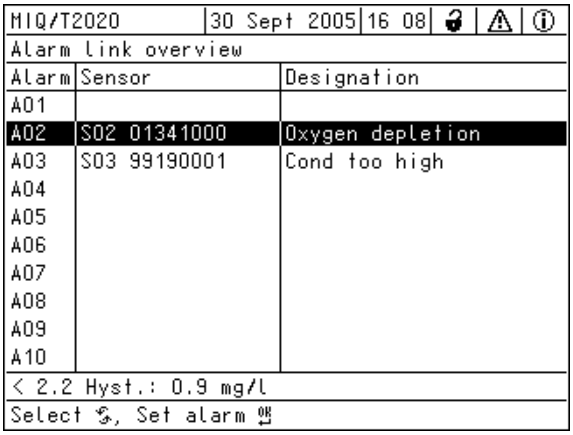


Fig. 5-14 Alarm settings -> Alarm link overview

Note
In the *Sensor* column, the sensor number (corresponding to the list of sensors) and series number is named.

3	Select an alarm *A01* to *A20* to be edited with (↻). To set up a new alarm without entry select in the *Sensor* column. Then confirm with (OK). When a new alarm is set up a list with all sensors appears first. Alarm links that are already available can be erased or edited (for editing continue with step 5).

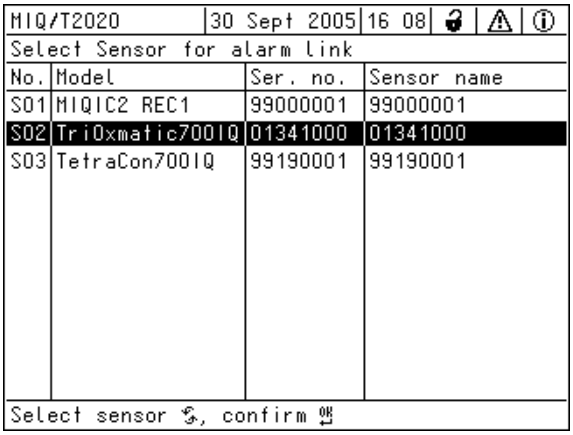


Fig. 5-15 Select Sensor for alarm link

4	To set up a new alarm, select a sensor from the list with ⟲ and confirm with OK. The *Set alarm link* display opens.

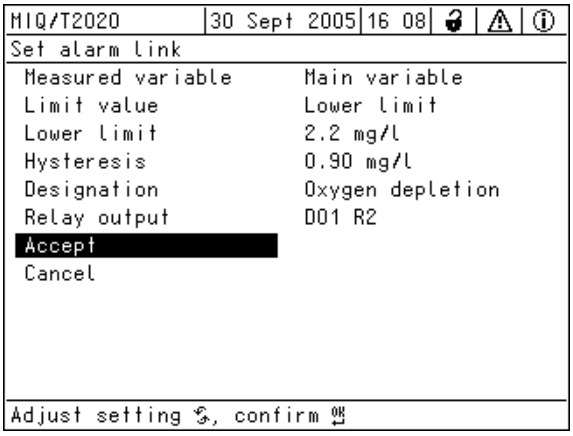


Fig. 5-16 Set alarm link

5	Edit the setting table. The required operating steps are described in detail in section 4.3 GENERAL OPERATING PRINCIPLES.

Alarm links setting table

Menu item	Selection/Values	Explanations
Measured variable	• *Main variable* • *Adjoining variable*	*Main variable* designates the actual measured parameter of the sensor (e.g. pH, oxygen, etc.). *Adjoining variable* designates an additional measured parameter (e.g. temperature).
Limit value	• *Lower limit* • *Upper limit*	Type of the alarm event. *Lower limit*: An alarm is triggered if the defined limit value is undercut. *Upper limit*: An alarm is triggered if the defined limit value is exceeded.
Lower limit / *Upper limit*	*within the measuring range (sensor-dependent)*	Limit value for the alarm event
Hysteresis	*0 - 10 % of the measuring range*	Hysteresis for the limit value
Designation	(max. 20 characters)	User-defined designation for easier identification in the alarm message (display).
Relay output	Dxx / .../Ry *...* *...* *...* *No relay output*	Opens a list with all relay outputs where the *Alarm contact* is set. Dxx: number of the output module .../Ry: relay output channel Here you can select a relay output. When the alarm event occurs, it carries out the specified action (Open or Close). Details see section 5.8.3 ALARM OUTPUT TO DISPLAY.
Accept		The settings are taken over in the setting table by pressing (OK). The display switches to the next higher level.
Cancel		The display switches to the next higher level without storing the new settings.

5.8.3 Alarm output to display

When an alarm event occurs, a window with a text message appears.

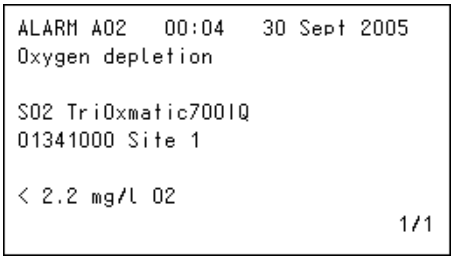


Fig. 5-17 Example of an alarm message on the display

The alarm message contains the following information:

- Line 1: Alarm no. Axx and time and date of the alarm event
- Line 2: User-defined designation
- Line 3: Sensor number and model name of the sensor that triggered the alarm event
- Line 4: Series number and name of the sensor that triggered the alarm event
- Line 5: Description of the event with specification of the limiting value:
  "<" = undercut
  ">" = exceeded

Operating instructions

If there are several alarm messages indicated on the display, you can scroll through he messages with ⟲. This can be recognized from the page number in the right lower corner. The latest message is always on the first position.

Pressing Ⓜ hides the alarm messages and switches to the measured value display. After one minute the alarm messages appear again if what caused them is still present.

5.8.4 Alarm output as relay action

The relay outputs of the IQ SENSOR NET can be configured so a relay action is triggered when an alarm event occurs (Open or Close). For this the *Alarm contact* function must be set for the relay output in the *Settings of outputs and links*.

The *Alarm contact* function is only available for relays that are not linked with a sensor. If necessary, an existing link must be erased. For details please refer to the operating manual of the output module.

5.9 System settings

System settings include:

- *Change password* (see section 5.9.1).
- *Language* (see section 5.1)
- *Date/Time* (see section 5.9.2)
- *Loc. altitude* (see section 5.9.3)

5.9.1 Changing the password

A password protects the system settings against inadvertent changes. The password must always be entered in order to change the release of the settings.

The password is set to 1000 in the delivery state.

1	Open the *Einstellungen/Settings* menu with Ⓢ.
2	Using ⟲ and Ⓞ, select and confirm the *System settings -> Change password* menu item. The *Change password* dialog window opens.

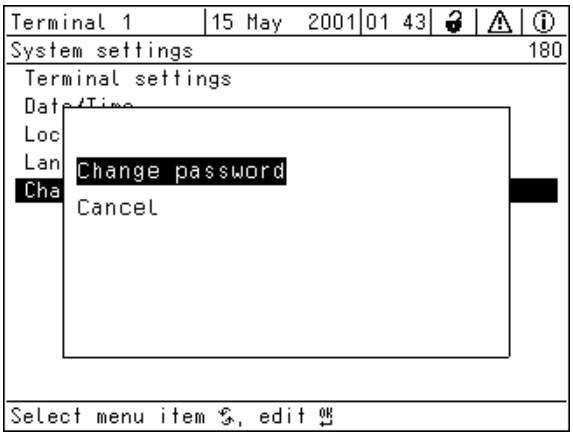


Fig. 5-18 System settings -> Change password

3	Select the *Change password* menu item with ⟲ and confirm with Ⓞ. The dialog window for entering the password opens.
4	Enter the new password with ⟲ and Ⓞ and confirm with Ⓞ. The setting is changed.

Note
Forgotten the password? You can display the valid password on the screen (see section 11.1).

5.9.2 Setting the date and time

The real time clock is used for the display of date and time in the measured value display and in log book entries.

1	Open the *Einstellungen/Settings* menu with Ⓢ.
2	Using ⟲ and Ⓞ, select and confirm the *System settings* -> *Date/Time* menu item. The *Date/Time* display opens.
3	Select *Set date* or *Set time* with ⟲.
4	Confirm the selection with Ⓞ. A field is highlighted, e.g. *Year*.

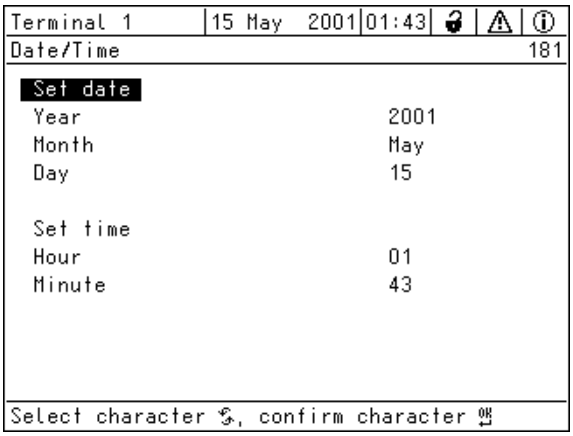


Fig. 5-19 Date/Time

5	Select and confirm a number with ⟲ and Ⓞ. The next field is highlighted, e.g. *Month*.
6	Complete the entries on the display *Date/Time*.

Note
The clock in the MIQ/C184 XT cannot be bridged in case of power failures. After a power failure, the clock starts precisely at the time of the failure.A message and an entry in the log book provide information on the power failure and the necessity for resetting the clock.

5.9.3 Site altitude / setting the medium air pressure

Note
The entry of the measurement location altitude or air pressure is only necessary for the operation of an IQ oxygen sensor.

Air pressure values in a range of 500 to 1100 mbar can be set.

1	Open the *Einstellungen/Settings* menu with (S).
2	Select the *System settings -> Location altitude/Air pressure* menu item with (↻) and confirm with (OK). The *Location altitude/Air pressure* display opens.

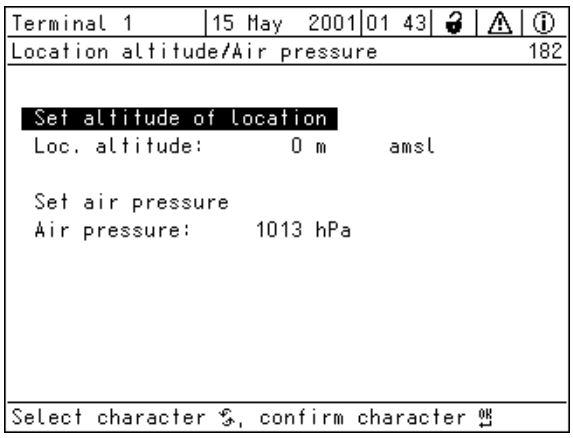


Fig. 5-20 Location altitude/Air pressure

3	Select and confirm the menu item *Set altitude of location* or *Set air pressure* with (↻) and (OK).
4	Change and confirm the values for *Loc. altitude* or *Air pressure* with (↻) and (OK).

5.10 *Measured value logging*

With the *Measured value logging* setting you can record and store measured values of IQ sensors or differential sensors.

You can display the stored measured values

- as a list or
- display the temporal course of the stored measured values graphically (see section 4.4.4).
- display the stored measured values to a PC.

The system allocates memory blocks to an IQ sensor for the *Measured value logging*. With a recording interval of 1 measurement dataset per minute, a recording duration of 1 day per memory block is possible. 1830 memory blocks are available and can be distributed to the sensors.

The recording duration directly depends on the recording interval. If a recording duration of 0 d is set for a sensor, there is no memory block allocated to the IQ sensor. The *Dur.* setting also contains the number of the allocated memory blocks (see table).

Recording interval	**Possible recording durations with the given recording interval**					
1 min	0 d	1 d	2 d	3 d	...	18 d
5 min	0 d	5 d	10 d	15 d	...	90 d
10 min	0 d	10 d	20 d	30 d	...	180 d
15 min	0 d	15 d	30 d	45 d	...	270 d
30 min	0 d	30 d	60 d	90 d	...	540 d
60 min	0 d	60 d	120 d	180 d	...	1080 d
Number of allocated memory blocks	**0**	**1**	**2**	**3**	**...**	18

Minimum recording duration

1 day with a recording interval of 1 min and one allocated memory block.

Maximum recording duration

1080 days with a recording interval of 60 min and 18 allocated memory blocks for a sensor.

If several sensors are recorded at the same time, the number of memory blocks available for one sensor decreases and, therefore, the longest possible recording duration decreases as well.

5.10.1 Setting the recording interval (*dt*) and recording duration (*Dur.*)

1	Open the *Einstellungen/Settings* menu with (S).
2	Select the *Measured value logging* menu item with (↻) and confirm with (OK). The *Measured value logging* display opens. It contains a list of all sensors and inactive sensors.

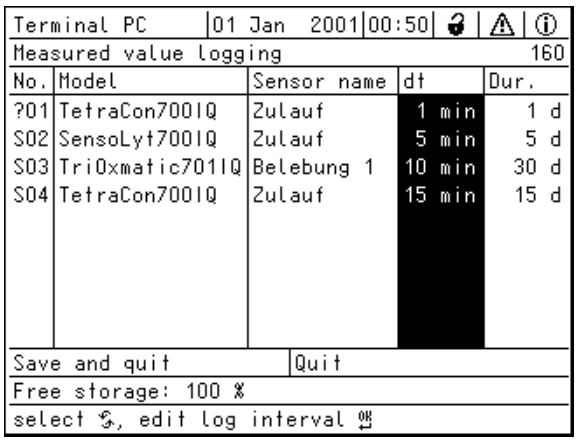


Fig. 5-21 Measured value logging

3	Highlight the *dt* column with (↻) and confirm with (OK).
4	Select a sensor with (↻) and confirm with (OK).
5	Select the recording interval with (↻) and (OK). When the recording interval is changed, the recording duration changes at the same time (*Dur.*), because the recording duration results from the recording interval due to a fixed number of memory blocks.
6	Switch to the selection of columns with (ESC).
7	Highlight the *Dur.* column with (↻) and confirm with (OK).
8	Select a sensor with (↻) and confirm with (OK).
9	Select the recording duration with (↻) and (OK). The recording duration is always increased or decreased in the same steps.

Note
The percentage of the memory blocks not yet allocated is shown on the display. If all memory blocks have already been allocated (*Free storage*: 0%), the number of memory blocks allocated to another IQ sensor may have to be reduced.

When the number of memory blocks for a sensor is reduced, the memory block with the oldest data is erased. All other data is retained.

Note
For inactive IQ sensors, the *Dur.* setting can only be reduced.

10	Switch to the selection of columns with ESC.
11	Highlight the *Save and quit* column with ↻ and confirm with OK. The changes are stored. The *Einstellungen/Settings* display opens.

Note
If the changes made for recording duration or recording interval should not be stored, select and confirm the *Quit* field with ↻ and OK.

6 Maintenance and cleaning

6.1 Maintenance

Maintenance activities

Component	Maintenance
IQ sensors	Depending on the type of sensor (see the component operating manual of the sensor)
Other components	No maintenance required

6.2 Cleaning

MIQ modules and control units

Clean components mounted in the open of gross contamination as necessary. We recommend to clean the worst of the dirt on the MIQ module and the area around it each time before opening in order to prevent gross contamination from entering the open enclosure.

To clean the module, wipe the housing surfaces with a damp, lint-free cloth. If compressed air is available on site, blow off the worst of the dirt beforehand. Keep the housing closed while doing so.



Caution
The enclosure and the window of the display are made of plastic. Therefore, avoid any contact with acetone or similar cleaning agents. Any splashes must be wiped off immediately.



Caution
Never use high-pressure cleaners to clean components of the IQ SENSOR NET.

IQ sensors

The cleaning of the IQ sensors depends greatly on the respective application. Instructions for this are given in the respective component operating manual.

A valve module for the compressed air-operated cleaning of sensors is available as an accessory.

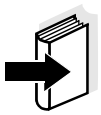
7 What to do if ...

7.1 Information on errors

Log book

The IQ SENSOR NET system performs a comprehensive cyclical self test during operation. While doing so, the system identifies all states that deviate from normal operation and enters corresponding messages in the log book (information or error message).

With the aid of the log book, you can call up instructions on how to clear the error directly on the terminal. The log book is described in detail in section 4.5 MESSAGES AND LOG BOOK.



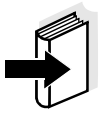
Note
Information on possible errors in IQ sensors and MIQ output modules is given in the chapter WHAT TO DO IF ... of the respective component operating manual.

7.2 Diagnosing faults in the voltage supply

7.2.1 Options for checking the voltage

The following options are available for checking the correct voltage supply of the individual components:

- **Checking the log book entries**
  Log book entries can only be generated by components with a processor (e.g. IQ sensors and MIQ output modules). The log book entries contain information on how to clear errors. For more details on the log book, see section 4.5.
- **Checking the LED status on the MIQ module housing**
  This check is described within the framework of the commissioning in section 3.8.3 CHECKING THE VOLTAGE SUPPLY.
- **Measuring the voltage on the MIQ modules**
  (see section 7.2.2 MEASURING THE VOLTAGE).



Note
The relationship between the supply voltage, the LED status and the log book entries is described in the section 8.1 GENERAL SYSTEM DATA.

7.2.2 Measuring the voltage

If an MIQ module shows an error condition (both LEDs off), this can be due to the following causes:

- The voltage supply has been interrupted
- The available voltage is not sufficient; the voltage is below the warning range.

These two cases can be differentiated with a voltmeter.

Measuring points of MIQ modules

The supply voltage is tapped at the following points (Fig. 7-1 on page 7-3):

- Outside on the free contacts on the front of the SENSORNET module
- Inside on the SENSORNET connections of the terminal strip (see section 7.2.2 MEASURING THE VOLTAGE).

Measuring points for IQ sensors

The supply voltage is measured on the MIQ module to which the IQ sensor is connected via the SACIQ sensor connection cable.

Systematic voltage measurement

Dock all mobile MIQ/T 2020 (PLUS) components onto the modules with greatest distance to the next power supply module. Begin measuring the voltage at the MIQ modules that are directly connected with an MIQ power supply module. Continue to measure the voltage systematically to the end of each cable section, i. e. along the voltage drop. Thus, in combination with the log book entries, you can narrow down the error location.



Warning

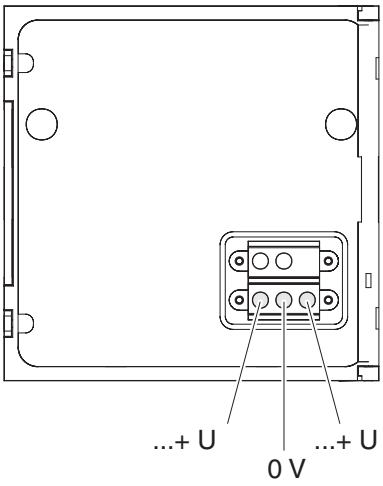
If the MIQ/PS power supply module is opened during operation, there is a danger to life due to possible hazard of electric shock. There is also a danger to life from voltages that may present a hazard of electric shock on the relay contacts of open MIQ output modules (e.g. MIQ/CR3). Note the following points in the case of voltage measurement during operation:

- **The voltage measurement may not be performed on the open MIQ/PS power supply module. The MIQ/PS may only be opened when the line voltage is switched off.**
- **The voltage measurement at an open MIQ output module with relays may only be performed if all external voltages have been previously switched off.**
- **Secure all voltages that have been switched off against being switched on again for the duration of the work.**

Note
Safe voltage measurement is possible on the module contacts on the outside of MIQ/PS and relay output modules (see Fig. 7-1).

Tapping points for measuring the voltage

Front:



SENSORNET connections on the terminal strip (example):

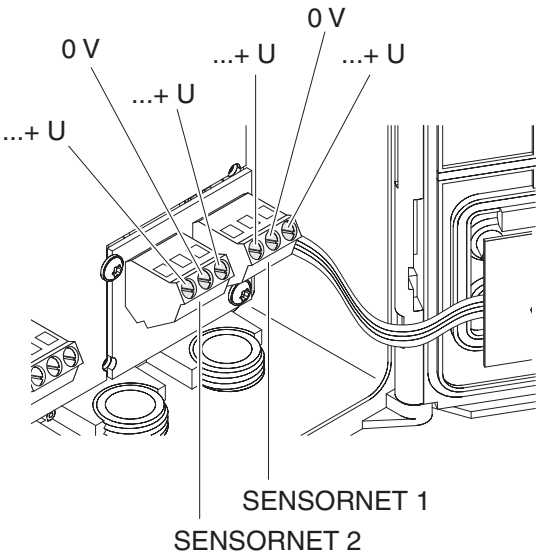


Fig. 7-1 Tapping points for measuring the voltage

Note
The supply voltage (...+ U) must be measurable at both SENSORNET wires, i. e. left and right of the shielding. Otherwise, the functioning of the component is not ensured. Admissible values for the internal voltage supply (+U) are given in section 8.1.

7.2.3 Tips for clearing errors in the voltage supply



Note
Admissible values for the internal voltage supply (+U) are given in section 8.1.

Supply voltage not present or in the warning or error range

Cause	Remedy
– Number of power MIQ power supply modules is not sufficient	– Check power rating. If necessary, install another MIQ power supply module (for details of how to do this, see section 3.4.2 DRAWING UP THE POWER RATING).
– Cable section is too long	– Check length of the cable section. If necessary, install another MIQ power supply module (for details of how to do this, see section 3.4.3 EFFECT OF THE CABLE LENGTH).
– Electrical connection between MIQ power supply module and component is defective (distributed mounting)	– Check cable connection step-by-step starting with the MIQ power supply module, and replace defective cable sections. – Check contacts on the MIQ modules (stack mounting). Clean any dirty contacts. Carefully bend back contact springs that have been pressed flat or bent (pay attention to sufficient spring tension). – Tighten on screws on the terminals.

Malfunctions despite adequate supply voltage on both +U V wires

Cause	Remedy
– Signal transmission faulty	– For terminal components, check/correct their seating on the MIQ module. – Check the log book for error messages (for details on the log book, see section 4.5). – Check/correct the position of the SN terminator switches (for the correct settings, see section 3.8.1). – Check the total line length within the IQ SENSOR NET. For a total line length of more than 1000 m, an MIQ/JBR signal amplifier module is required.
– Component is defective	– Check the log book for error messages (for details on the log book, see section 4.5). – If no log book entry exists, send the component back.

Component is not registered on the system despite sufficient supply voltage on both +U V wires (with no error message)

Cause	Remedy
IQ sensors	
– IQ sensor connection cable is not correctly connected or defective	– Check IQ sensor cable connection on the terminal strip. – Check IQ sensor cable and, if necessary, replace it. Another IQ sensor can be used for the test.
– IQ sensor is defective	– Test IQ sensor at another measurement location. – If IQ sensor still does not function, contact WTW.
Other components	
– Component is defective	– If possible, test component at another measurement location. – If component still does not function, contact WTW.

7.3 Other errors

VisoTurb 700 IQ: Sensor switches itself on and off periodically after having been put into operation

Cause	Remedy
– The available power is sufficient to initialize the IQ sensor, but not to operate the cleaning system. As soon as the cleaning system is switched on, communication with the controller is interrupted.	– Install a further MIQ power supply module in the vicinity of the VisoTurb 700 IQ. – Switch off the ultrasound

The system does no longer react on entries

Cause	Remedy
– System error	Reset the system: – Remove the Terminal/ Controller and dock it again after 10 s or: – Switch off the power supply and switch it on again after 10 s

"Error" in the measured value display

Cause	Remedy
– Communication with the IQ Sensor interrupted	– Check the cable connection
– Error in the IQ sensor	– Disconnect the IQ sensor and reconnect it after 10 s

Local settings cannot be displayed

Cause	Remedy
– The contacts of two MIQ modules are not correctly connected to each other	– Clean the contacts

"no sensor" in the measured value display though an IQ sensor is connected

Cause	Remedy
– Local display has been set up and the IQ sensor is not included in the local display	– Add the sensor to the local display (see section 5.7) – Switch to the *All sensors* display with *Display local values or all values* (see section 4.4.6)

The selected system language was not activated for all components

Cause	Remedy
– A system language was selected that is not available in at least one component (sensor, controller, terminal, output module). The standard language, German, was activated instead of the selected system language.	– Contact WTW, a software update is required for the respective components

7.4 Replacing system components

Note
It is always possible to replace components and assign a substitute if the software state of the substitute component is as high or higher as the software version of the original component.

7.4.1 Replacing passive components

Passive components include all components that the controller cannot recognize.
These include:

- MIQ power supply modules
- MIQ branching module
- Cables (SNCIQ, SACIQ).

Warning
If the MIQ/PS power supply module is opened during operation, there is a danger to life due to possible hazard of electric shock. The MIQ/PS may only be opened when the line voltage is switched off. Secure the line voltage against being switched on again.

Only ever replace components when the IQ SENSOR NET system is switched off. Defective components are removed in the reverse order to the installation (see chapter 3 INSTALLATION).

7.4.2 Adding and replacing IQ sensors

Inactive datasets of IQ sensors

If an IQ sensor is removed from the system, its settings remain stored in the IQ SENSOR NET controller. A "?" appears in the left column of the *Edit list of sensors* menu. This indicates an "inactive dataset". A dataset contains the following information:

- Serial number of the IQ sensor (and, with it, the type of sensor)
- Display position
- All sensor settings including differential sensor
- All characteristics of the link with an output.

If no suitable inactive dataset is available, a newly connected IQ sensor is automatically recognized as a new module and added to the list of sensors (see section 3.9 SYSTEM EXTENSION AND MODIFICATION).

Note
The maximum number of data sets (active and inactive datasets) for IQ sensors is limited to 12 in the IQ SENSOR NET system 184 XT. When this number is reached, no further IQ sensor can be installed. If necessary, an inactive dataset has to be erased to make an extension possible.

Note
The current calibration data of the IQ sensor is always stored in the sensor. If an IQ sensor is connected that is ready for operation and calibrated, this can be used immediately without the need for recalibration.

Note
To erase inactive datasets, see section 5.4.3.

If an IQ sensor is connected to the system when an inactive dataset is present, the following cases are possible:

Case 1:

The serial number of the IQ sensor is identical with the serial number of an inactive dataset.	The connected IQ sensor is automatically assigned to the inactive dataset and starts to operate again. Example: Maintenance or repair. This mechanism ensures that all IQ sensors retain their settings and links if an IQ sensor was removed for maintenance, or if the system was temporarily switched off.

Case 2:

The type of sensor is identical with the type of sensor in an inactive dataset (or several inactive datasets), but the serial numbers differ.	Operator intervention is required here. The connected IQ sensor can: – be assigned to the inactive dataset (or one of the inactive datasets). Example: Replacing an IQ sensor. Make sure that the substitute sensor has at least the software status of the active IQ sensor. – be included as a new module in the list of the sensors. The operating sequence to do this is described below.

Operating sequence in case 2

1	Connect a new IQ sensor.
2	Change to the measured value display with (M). The module database is updated. The following display appears (example):

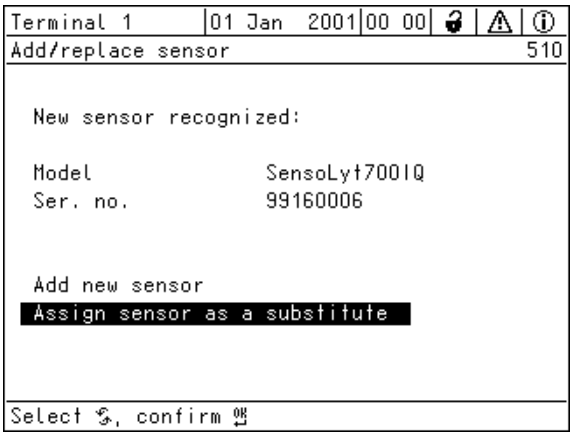


Fig. 7-2 Add/replace sensor

3	Select the required option with (↻) and confirm with (OK). – If *Add new sensor* was selected, the system changes directly to the measured value display. As soon as the IQ sensor is ready for operation, it delivers a measured value. – If *Assign sensor as a substitute* was selected, a list of matching inactive datasets appears:

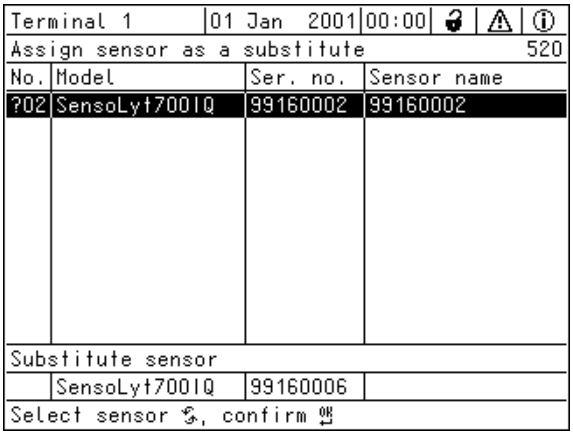


Fig. 7-3 Assign sensor as a substitute

4	Select the required inactive dataset with ⟳ and confirm with (OK). The system changes to the measured value display. The IQ sensor takes over all settings of the inactive dataset. As soon as the IQ sensor is ready for operation, it delivers a measured value.

7.4.3 Adding and replacing MIQ output modules



Warning
There is also a danger to life from voltages that may present a hazard of electric shock on the relay contacts of open MIQ output modules (e.g. MIQ/CR3). MIQ output modules with relays may only be opened if all external voltages have previously been switched off. Secure all external voltages against being switched on again for the duration of the work.



Note
When replacing MIQ modules make sure that the substitute module has at least the software status of the active module.

Only replace MIQ output modules (all MIQ modules with relay contacts and/or electrical signal outputs) when the IQ SENSOR NET system is switched off. Defective MIQ output modules are removed in the reverse order to the installation. The installation is described in the INSTALLATION chapter of the respective component operating manual.

Inactive datasets in MIQ output modules

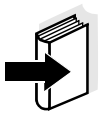
If an MIQ output module is removed from the system, its settings remain stored in the IQ SENSOR NET controller. A "?" appears in the left column (= inactive dataset) of the *Edit list of outputs* menu. The dataset contains the following information:

- All settings of the relays
- All settings of the current outputs.

If no inactive dataset is available, a newly connected MIQ output module is automatically recognized as a new module and added to the list of outputs (see section 3.9 SYSTEM EXTENSION AND MODIFICATION).



Note
The maximum number of data sets (active and inactive datasets) for MIQ output modules is limited to 6 in the IQ SENSOR NET system 184 XT. When this number is reached, no further MIQ output module can be installed. If necessary, an inactive dataset has to be erased to make an extension possible.



Note
To erase inactive datasets, see section 5.6.2.

If an MIQ output module is connected to the system when an inactive dataset is present, the following cases are possible:

Case 1:

The serial number of the MIQ output module is identical with the serial number in an inactive dataset.	The connected MIQ output module is automatically assigned to the inactive dataset and starts to operate again. Example: In the case of repair.

Case 2:

The type of the MIQ output module is identical with the type in an inactive dataset (or several inactive datasets), but the serial numbers differ.	Operator intervention is required here. The connected MIQ output module can: – be assigned to the inactive dataset (or one of the inactive datasets). Example: Replacing an MIQ output module. – be included as a new module in the list of outputs. The operating sequence to do this is described below.

Operating sequence in case 2

1	Remove the (defective) MIQ output module. The output module is removed in the reverse order to the installation. The installation is described in the INSTALLATION chapter of the respective component operating manual.
2	Install the new MIQ output module (INSTALLATION chapter of the respective component operating manual).
3	Change to the measured value display with Ⓜ. The module database is updated. The following display appears (example):

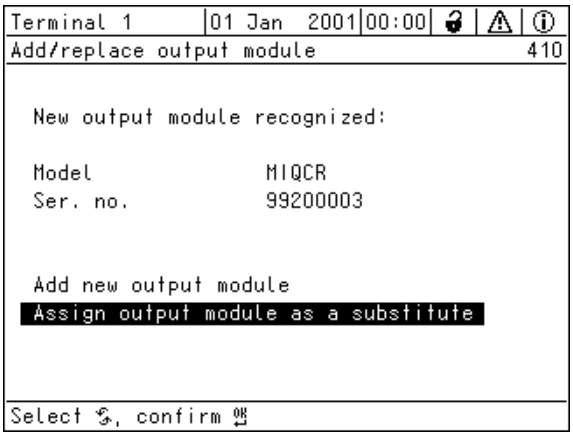


Fig. 7-4 Add/replace output module

4	Select the required option with ⟲ and confirm with OK. – If *Add new output module* was selected, the system changes directly to the measured value display. – If *Assign output module as a substitute* was selected, a list of the matching inactive datasets appears:

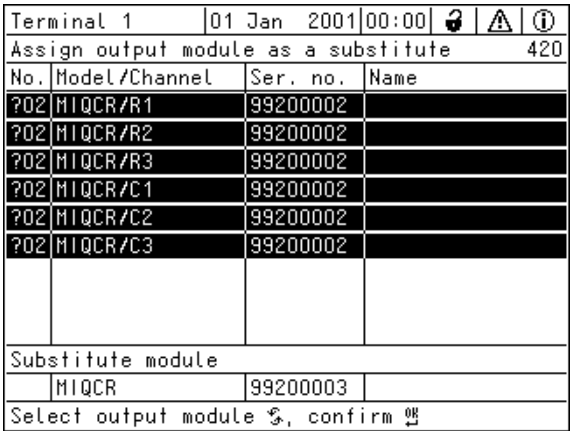


Fig. 7-5 Assign output module as a substitute

5	Select the required inactive dataset with ⟲ and confirm with OK. The system changes to the measured value display. The MIQ output module takes over all settings of the inactive dataset.

8 Technical data

8.1 General system data

Test marks

cETLus, CE

Ambient conditions

Temperature	
Operation	- 20 °C ... + 55 °C (- 4 ... 131 °F)
Storage	- 25 °C ... + 65 °C (- 13 ... 149 °F)
Relative humidity	
Yearly average	≤ 90 %
Dew formation	Possible

Site altitude	Max. 2000 m above sea level

Electrical data

Nominal voltage of the power supply	See operating manual of the MIQ power supply modules used
Protective class	II
Overvoltage category	II
Maximum power consumption	Depending on the number of MIQ power supply modules
Number of MIQ power supply modules in an IQ SENSOR NET system	Up to 6, depending on the total power requirement of the system (see section 3.3 BASIC PRINCIPLES OF INSTALLATION)
Voltage monitoring	– Optically via 2 LEDs on each MIQ module – Additional monitoring of all components by the controller software



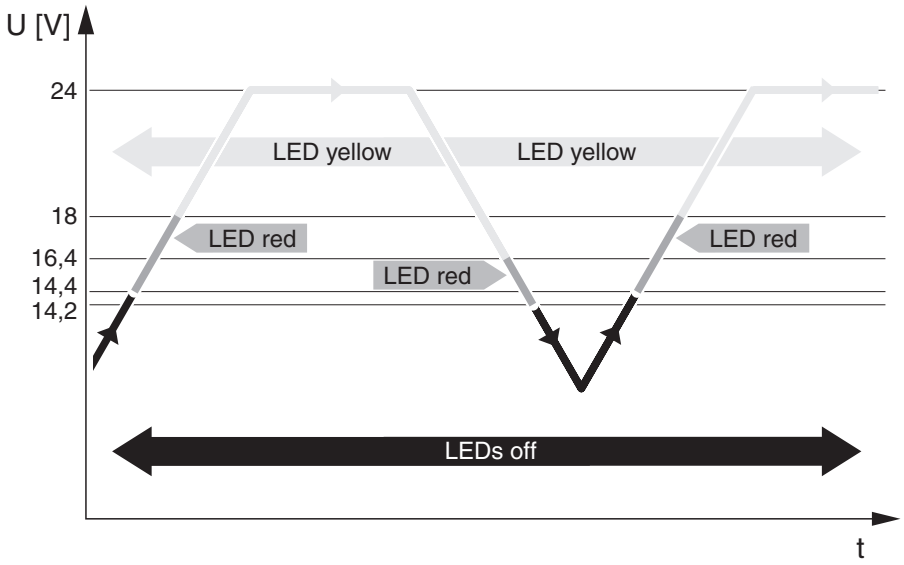
Warning

A circuit (except for the power supply connections), that is connected to an IQ SENSOR NET component, must not feed any voltages or currents that are not allowed. It has to be made sure that the circuit at any time meets all requirements of a *Limited circuit* or *Limited Power* as well as of *SELV* (Safety Extra Low Voltage). These include the following limiting value specifications:

- **AC voltage: max. 30 V effective / 42.4 V peak**
- **DC voltage: max. 60 V**
- **Current limit: max. 8 A**
- **Power output limitation: max. 150 VA**

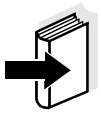
Internal voltage supply

Relationship between the supply voltage U, the LED status on the MIQ module and the log book entries (Fig. 8-1):



LED state	Log book
LED yellow	No entry (= OK)
LED red	1st error message
Both LEDs off	2nd error message (or switch-off)

Fig. 8-1 Relationship of supply voltage - LED states - log book



Note
The VisoTurb® 700 IQ and ViSolid® 700 IQ sensors have different voltage levels for the upper limits of the warning range. These are given in the technical data of the respective component operating manuals. Instructions of how to measure the actual supply voltage on individual IQ SENSOR NET components are given in this operating manual in section 7.2 DIAGNOSING FAULTS IN THE VOLTAGE SUPPLY.

Instrument safety

Applicable norms	– EN 61010-1 – UL 3111-1 – CAN/CSA C22.2 No. 1010.1

EMC product and system characteristics

EN 61326	EMC requirements for electrical resources for control technology and laboratory use – Interference immunity according to EN 61326/A1 table A.1 – Resources for industrial areas, intended for indispensable operation – Interference emission limits for resources of class B
System lightning protection	Noticeably extended qualitative and quantitative protective characteristics as opposed to EN 61326/A1 table A.1
FCC, class A	

FCC Class A Equipment Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



Note
Any combination of IQ SENSOR NET products in a user-specific system fulfills these listed EMC characteristics.

8.2 General data of MIQ modules

Note
Technical data on special MIQ modules are given in the respective operating manuals.

Dimensions

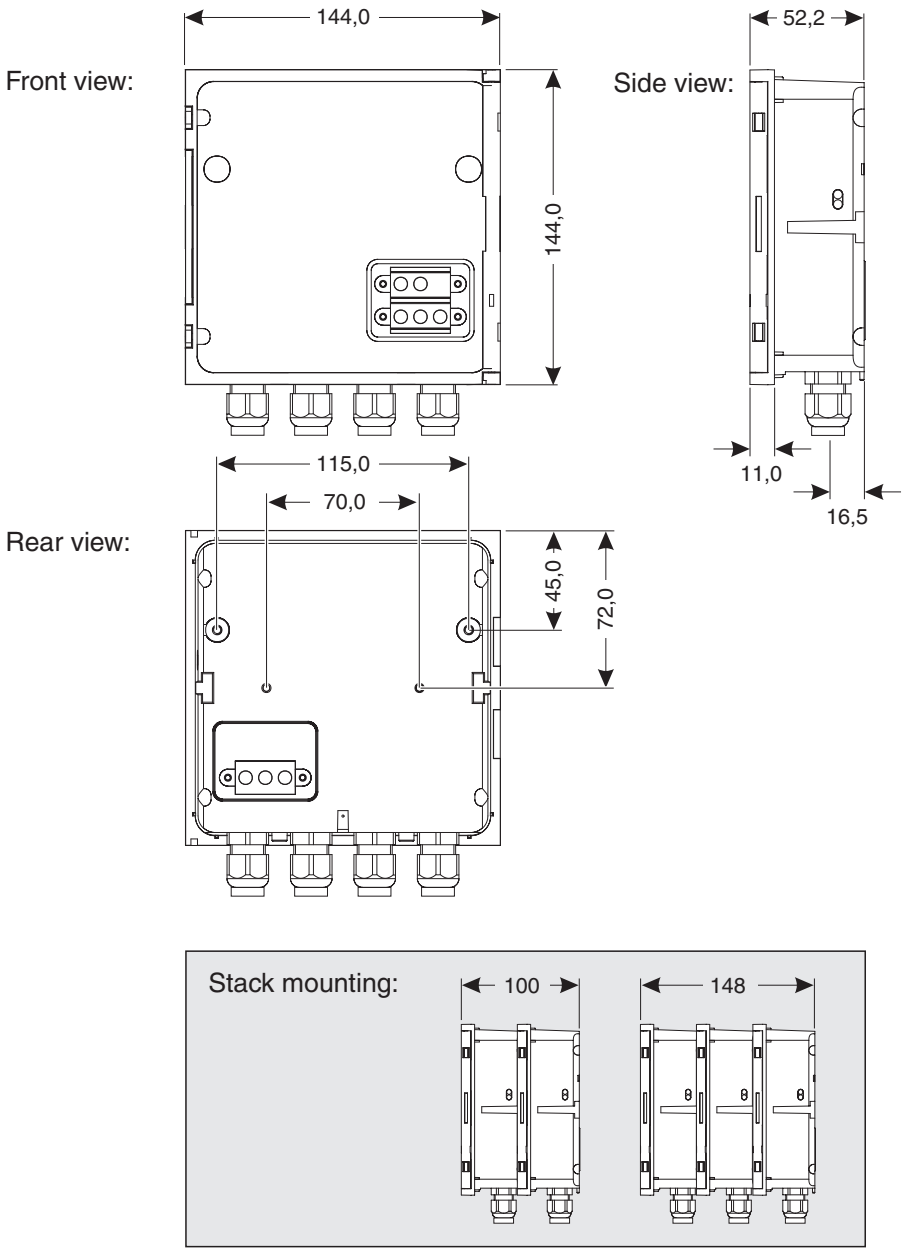


Fig. 8-2 Dimension drawing of MIQ module (dimensions in mm)

Mechanical construction	Maximum number of MIQ modules in a module stack	3 plus terminal/controller component
	Housing material	Polycarbonate with 20 % glass fiber
	Weight	Approx. 0.5 kg
	Type of protection	– IP 66 – In accordance with NEMA 4X MIQ modules are not suitable for conduit connection – NEMA 3S
Electrical data	Nominal voltage	Max. 24 VDC via the IQ SENSOR NET (for details, see section 8.1 GENERAL SYSTEM DATA)
	Power consumption	Module-dependent (see section 3.4.2 DRAWING UP THE POWER RATING)
Terminal connections	IQ SENSOR NET connections	At least two in each MIQ module. Additional connectable SENSORNET terminator (terminating resistor)
	Further connections	Module-dependent
	Terminal type	Screw-type terminal strip, accessible by opening 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

8.3 Terminal/Controller MIQ/C184 XT

Dimensions

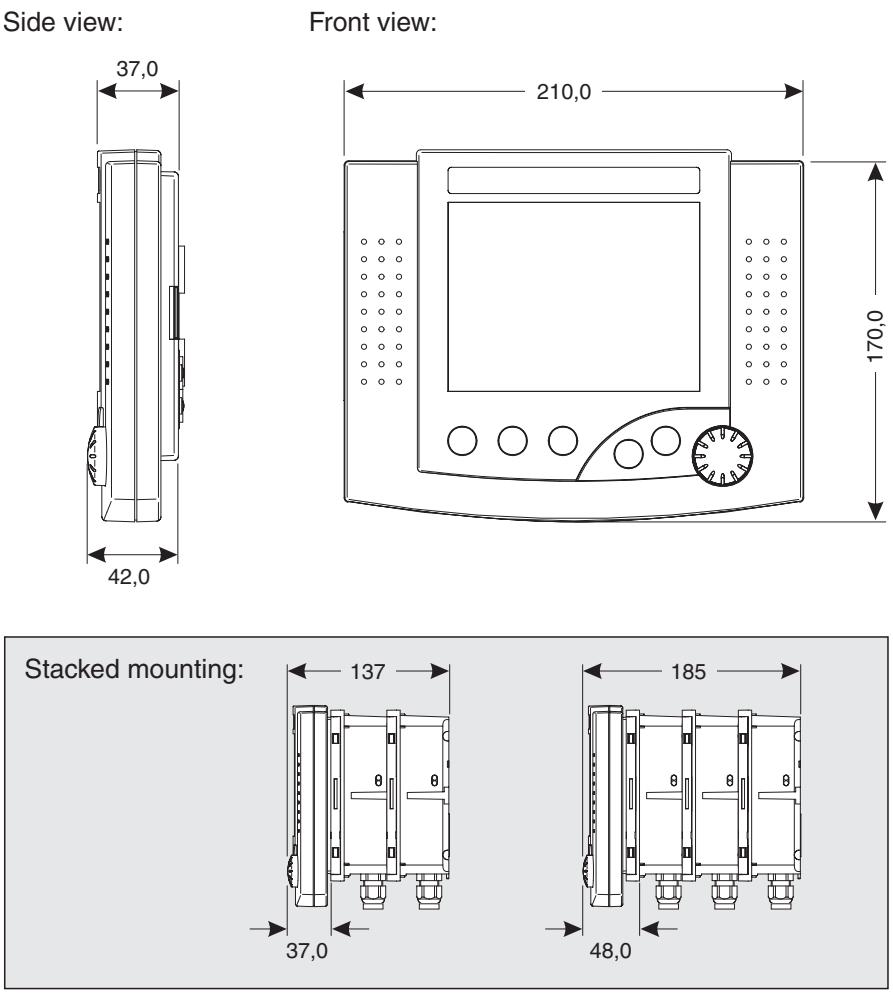


Fig. 8-3 Dimensional drawing of the Terminal/Controller MIQ/C184 XT (dimensions in mm)

Mechanical construction

Housing material	ASA (Acrylonitrile Styrene Acrylesterpolymer)
Weight	Approx. 0.7 kg
Type of protection	– IP 66 – In accordance with NEMA 4X The terminal/controller is not suitable for conduit connection – NEMA 3S

Electrical data

Supply voltage	Max. 24 VDC via the IQ SENSOR NET (for details, see section 8.1 GENERAL SYSTEM DATA)
Power consumption	3.0 W

Air pressure

Setting range	500 mbar ... 1100 mbar

8.4 Space required by mounted components

Wall mounting and top hat rail mounting

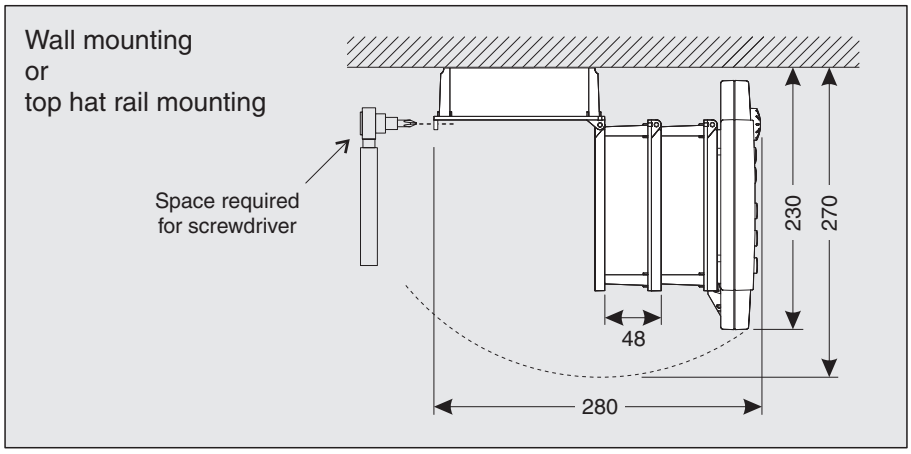


Fig. 8-4 Space required for wall and top hat rail mounting: (dimensions in mm)

Panel mounting

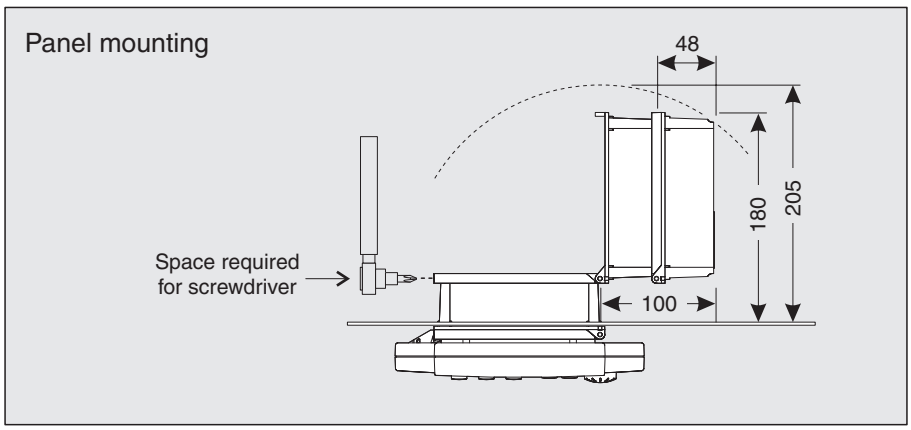
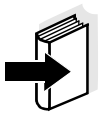


Fig. 8-5 Space required for panel mounting (dimensions in mm)

9 Accessories and options

Description	Model	Order no.
IQ SENSOR NET cable - please specify required length in m when ordering	SNCIQ SNCIQ/UG	480 046 480 047
IQ sensor connection cable – 1.5 m – 7.0 m – 15.0 m	 SACIQ-1.5 SACIQ-7.0 SACIQ-15.0	 480 040 480 042 480 044
Sun shield for a unit of up to three stacked MIQ modules plus docked terminal	SSH/IQ	109 295
Sun shield for a single MIQ module plus docked terminal	SD/K 170	109 284
Mounting kit for fixing the SD/K 170 sun shield on horizontal or vertical pipes	MR/SD 170	109 286
Kit for wall mounting of a MIQ module	WMS/IQ	480 052
Set for panel mounting of MIQ modules; switch panel aperture 138 x 138 mm according to DIN 43700 or IEC 473 (max. thickness 15 mm)	PMS/IQ	480 048
Kit for mounting of MIQ modules on a 35 mm top hat rail in accordance with EN 50022	THS/IQ	480 050



Note
Other accessories for the IQ SENSOR NET are given in the WTW catalog or in the Internet.

10 Indexes

On the following pages, you will find the following indexes:

- Index of all displays (see section 10.1)
- Explanation of the message codes (see section 10.2)

10.1 Index of all displays

This index contains a selection of displays showing important indications or settings.

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10.2 Explanation of the message codes

The log book contains a list with all the messages from all modules. Each message consists of message code, date and time. You can obtain more detailed information by opening the full message text (see section 4.5).

The full message text comes from the component that has triggered the message. Therefore, these texts are only available from components which are connected to the system and ready for operation.

If a message text is not available, because the component is not connected to the system, you can look up the texts of the messages in the operating manual of the respective component.

The following lists contain the message codes and the related message texts that are shown on the display. Error messages and info messages are listed separately.

General explanations on the subjects of messages, message codes and log book are given in section 4.5 of this system operating manual.

10.2.1 Error messages

Message code	Message text
EI4111	*Max. components of this component type exceeded* *Danger of system overload* ** Check and adapt the components for this type*
EI5111	*Component cannot be reached or not present* ** Component has been removed from the system, insert component again* ** Connex. to component cut.,* *Check sys. installation acc. to op. manual*
EI6111	*Incompatible terminal software* ** Contact WTW*
EI7111	*Incompatible controller software* ** Contact WTW*
EI8111	*Connection to the component instable* ** Check installation and cable lengths,* *Follow installation instructions* ** Set SN terminator switch acc. to operating manual* ** Check environmental effects* ** Component defective, contact WTW*
EI9111	*Power failure occurred* ** Check date and time and, if necessary, adjust them*

10.2.2 Info messages

Message code	Message text
II1111	*Language not available,* *Default language German* ** Contact WTW*
II2111	*New IQ Sensor Net component identified*
II3111	*New IQ Sensor Net component recorded* ** See component lists*
II4111	*IQ Sensor Net component recorded as replacement component* ** See component lists*
II5111	*Link sensor - output has been erased* ** if necessary, link sensor again*
II9111	*Date and time have been set*

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11 Appendix (store separately if required)

11.1 Forgotten the password?

Proceed as follows to show the currently valid password on the display:

1	Open the *Einstellungen/Settings* menu with Ⓢ.
2	Select the *Change passwordSystem settings* menu item with ⟲ and confirm with Ⓞ. The *Change password* dialog window opens.

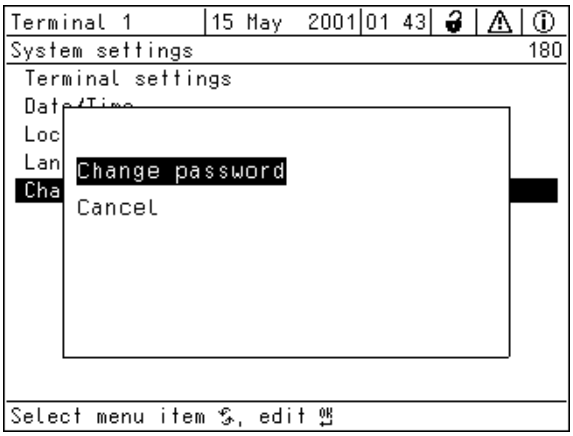


Fig. 11-1 System settings -> Change password

3	First press Ⓒ, then press Ⓢ. The current password is displayed.

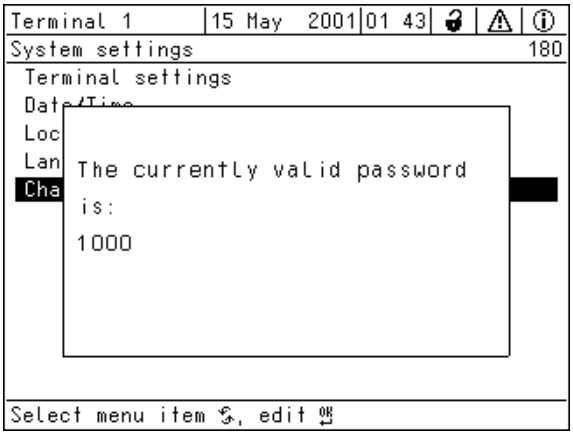


Fig. 11-2 System settings -> Display password

4	Quit the display of the password with (OK).

11.2 Default password

When the Terminal/Controller is delivered, the password is set to 1000.



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