Operating Manual

IQ SENSOR NET
Software Pack

- **(Remote) Operation and (remote) monitoring of the IQ SENSOR NET with the PC Terminal**
- **(Remote) Data transmission of current measurement data**
- **(Remote) Data transmission of stored measurement data**
- **(Remote) Backup/loading of the system configuration**
- **Network connection**
- **FDT integration and DTM implementation for Profibus**

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Note
The latest version of the present operating manual can be found on the Internet under www.WTW.com.

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1 Overview

1.1 How to use this component operating manual

Structure of the IQ SENSOR NET operating manual

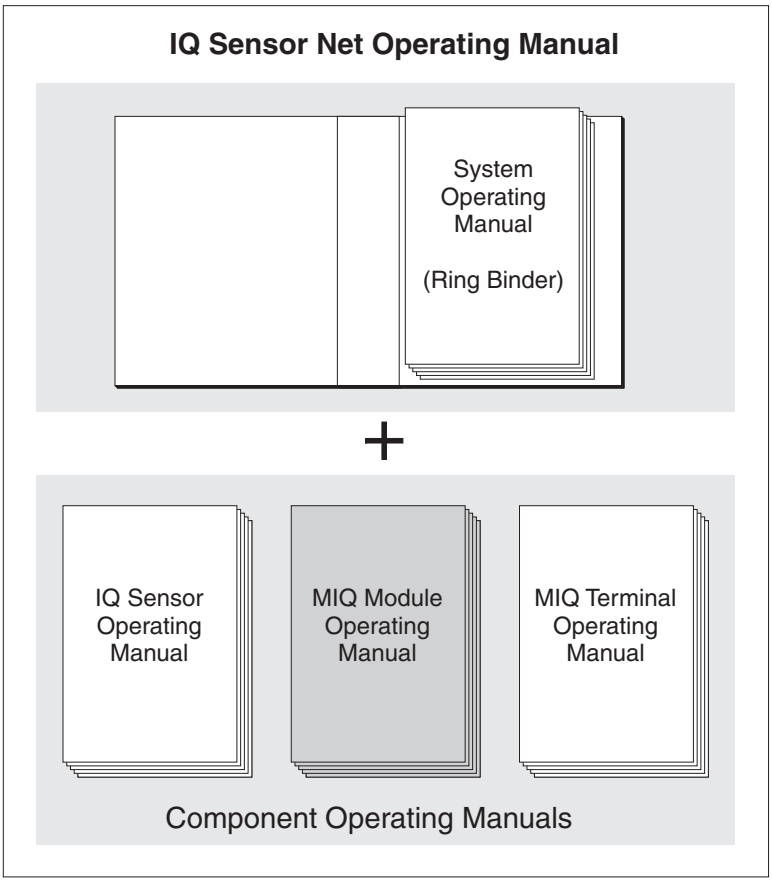


Fig. 1-1 Structure of the IQ SENSOR NET operating manual

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

Please file this component operating manual into the ring binder of the system operating manual.

1.2 Functions of the IQ SENSOR NET Software Pack

The IQ SENSOR NET Software Pack is a software collection for (remote) operation of the IQ SENSOR NET system on a PC. Among others, it includes the following programs:

- DatalogTransfer
- ConfigSaveLoad
- PC Terminal

The programs of the software collection can be used if the IQ SENSOR NET system has an interface to a PC.

This enables the following functions to be carried out from a (remote) PC:

(Remote) Operation / monitoring of the IQ SENSOR NET

The PC Terminal can perform all functions of a terminal (e.g. MIQ/T2020) on a PC. It has the same operating interface. Thus, it is not necessary to "get used to" the terminal when changing between the various terminal types (for details, see section 4).

(Remote) Data transmission of current measurement data

For this purpose the PC Terminal has a data server function which can be used to request the most important information from the IQ SENSOR NET system (for details, refer to section 6).

(Remote) Data transmission of stored measurement data

The (remote) data transmission can be carried out directly or indirectly (for details, see section 5).

- In the case of direct (remote) data transmission, the data are transmitted directly from the IQ SENSOR NET to a PC with, for example, the aid of the PC Terminal.
- In the case of indirect data transmission, the data are temporarily stored on a mobile memory device and then read out to the PC.

(Remote) Backup/ loading of the system configuration

The system configuration can be backed up on a PC from the IQ SENSOR NET and loaded from the PC onto an IQ SENSOR NET system (for details, see section 7).

FDT integration and DTM implementation for Profibus

The IQ SENSOR NET DTM (Device Type Manager) for Profibus contained in the software collection enables to integrate the IQ SENSOR NET system into an FDT (Field Device Tool) field device environment (for details see section 8).

2 Safety instructions

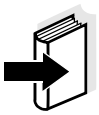
Always keep this component operating manual together with the system operating manual and all other component operating manuals in the vicinity of the IQ SENSOR NET system.

Directions

The following symbols indicate special features in the individual chapters of this operating manual:



Note
indicates notes that draw your attention to special features.



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

3 Installation

3.1 Scope of delivery

The following parts are included in the scope of delivery of the Software Pack:

- CD-ROM with software for the IQ SENSOR NET
- Operating manual.

3.2 Installing the IQ SENSOR NET Software Pack

3.2.1 Hardware requirements for the PC

Direct connection or modem connection

- AT-compatible computer with Pentium processor or higher
- At least 8 Mbytes RAM
- Hard disk with at least 10 Mbytes available memory
- VGA/SVGA graphic card with monitor
- CD-ROM drive
- For the connection via modem/radio modem:
  - Free serial interface (COM connection)
- Modem (fixed telephone network/analog, GSM, radio modem). Details on suitable modems are given in the respective remote connection operating manuals:
  - System 2020 (XT): ba64121e
  - System 2020 XT USB: ba75790e
- Connection cable (PC <--> modem)



Note
Preferably use an external modem with a USB interface or RS232 interface. With internal notebook modems, problems with the transmission speed can occur.

FDT/DTM application

- Profibus master module with DPV1 record, e.g. Profibus adapter by ifak system or Softing
- The hardware requirements of the PC are determined by the Profibus master and the FDT frame application. Further instructions can be found in the respective user information.

3.2.2 PC software requirements

Direct connection or modem connection

- Windows 95 or higher
- Only for the data server sample application:
  - Microsoft Excel 97 or higher
- With Windows NT/2000/XP operating system or higher: Administrator rights for the PC for program installation

FDT/DTM application

- FDT frame application, e.g. PACTware
  An fdtCONTAINER is available, e.g., from M & M Industrial Software Solutions (on the Internet under www.mm-software.com).
- Communication DTM (CommDTM) for the Profibus master module
- The software requirements of the PC are determined by the FDT frame application. Further instructions can be found in the user information of the frame application.

3.2.3 Hardware requirements of the IQ SENSOR NET

In order to connect the IQ SENSOR NET with a PC, the IQ SENSOR NET must have an interface to the PC.
Connection to the PC is possible via the following components:

Direct connection

System 184 (XT) and 2020 (XT)	System 2020 XT USB
– MIQ/IF232 interface module	– USB/RS232 adapter set MIQ/TM/SET and zero modem cable <u>For service purposes only:</u> – Interface module MIQ/IF232 (for service purposes only)

Modem connection

System 2020 (XT)	System 2020 XT USB
– Controller with MIQ/MC(-A)-RS modem interface	– USB/RS232 adapter set MIQ/TM/SET
Analog, GSM or radio modem	
With analog or GSM modem: analog telephone mainline or mobile telephone connection	



Note
You can also use a 9-pin D-Sub zero modem cable instead of a modem. In this operating manual, the term, "Modem connection" includes the zero modem cable connection.

Network connection

System 2020 (XT)	System 2020 XT USB
– not possible	– USB/Ethernet adapter with Asix AX88772 chip set (example: Trendnet TU-ET100). – Ethernet cable

FDT/DTM application

System 2020 (XT)	System 2020 XT USB
– Controller MIQ/MC-(A)-PR	– Interface module MIQ-(A)-PR

3.2.4 Special software requirements with the 184 (XT) and 2020 (XT) systems

Direct connection

The controller software version 2.03 or higher is required for supporting the SensCheck function (sensor status bits) of the data server.
All other functions can be used unreservedly with older controller software versions.

Analog/GSM modem connection

- MIQ/MC(-A)-RS with software version 2.60 or higher.

Radio modem connection

- MIQ/MC(-A)-RS with software version 2.75 or higher.

FDT/DTM application

- MIQ/MC(-A)-PR with software version 2.60 or higher.

3.3 Installation under Windows

Installation on the hard disk:

- Insert the installation CD in the CD drive. The setup program starts automatically.
- If the setup program does not start automatically, proceed as follows:
  - Call up the Windows Explorer
  - Select the CD-ROM drive in the Explorer
  - Double-click on the "Install\Setup.exe" program.
- Follow the instructions of the setup program.

3.4 Starting the programs of the Software Pack

The programs of the IQS Software pack are in the Windows start menu under *IQS Software Pack*.



Note
This paragraph does not refer to the DTM. The IQ SENSOR NET DTM for Profibus is described in the chapter 8.

The programs of the IQ SENSOR NET Software Pack require a connection to the IQ SENSOR NET for many functions. The selection of the type of connection of the PC and IQ SENSOR NET is made in the *Verbindungseinstellungen/Connection settings* dialog window (see section 3.4.1).
This dialog window appears in all programs of the Software Pack that communicate with the IQ SENSOR NET during the start routine.

3.4.1 Establishing a connection to the IQ SENSOR NET

The *Verbindungseinstellungen/Connection settings* window appears during the start routine of the programs of the IQ SENSOR NET Software Pack. There you select the type of connection.

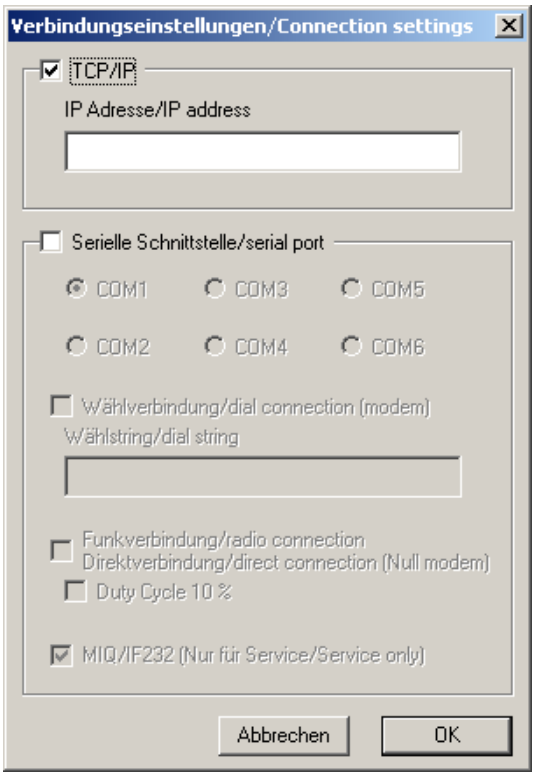


Fig. 3-1 Selecting the connection type

Note

The *Verbindungseinstellungen/Connection settings* window of the MIQ/T2020 PC program contains a timer.
After 10 seconds, a connection setup with the current settings is automatically started.
The timer is switched off if the type of connection (serial interface or modem) is changed.

How to establish the connection is described on the following pages:

- CONNECTION TO A NETWORK (TCP/IP), pages 3 - 6
- CONNECTION VIA AN ANALOG OR GSM MODEM, pages 3 - 6
- CONNECTION VIA RADIO MODEM OR ZERO MODEM CABLE, pages 3 - 8

Connection to a network (TCP/IP)

1	Enable the *TCP/IP* checkbox.
2	In the *IP address* field, enter the IP address of the MIQ/ TC 2020 XT controller. If the network provides a Domain Name Server (DNS) service, you can also enter the terminal name here.
3	Confirm with **<OK>**. The network connection to the IQ SENSOR NET is established.

Note
The IP address and further network settings for the MIQ/TC 2020 XT controller are set in the *System settings -> TCP/IP settings* menu.

Connection via an analog or GSM modem

1	Enable the *Serielle Schnittstelle/serial port* check box.
2	In the option field below select the COM connection to which the modem is connected.
3	Activate the check box, *Wählverbindung/dial connection (modem)* and enter the complete call number of the IQ SENSOR NET system in the *Wählstring/dial string* field.

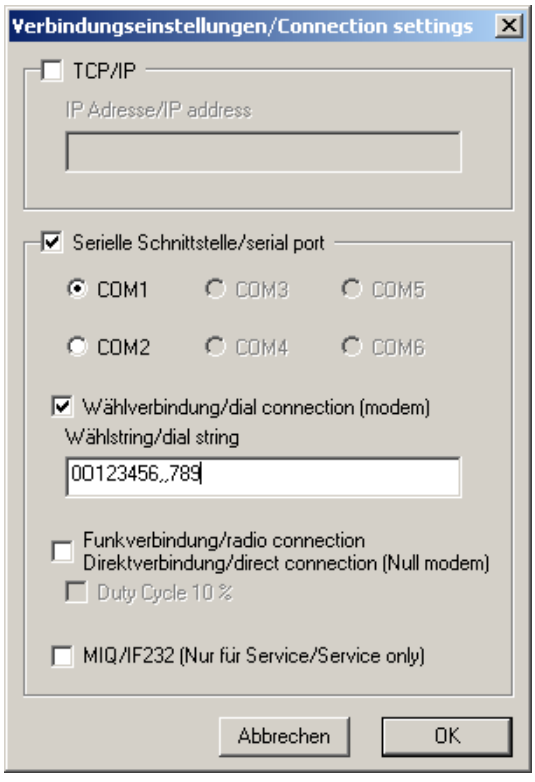


Fig. 3-2 Setting up the modem connection

Note
In the case of operation at extension lines of telephone systems, the following special features can occur:

- If the PC is connected via an extension line, it may be necessary to dial "0W" before the telephone number
- If the IQ SENSOR NET is connected via an extension line, it may be necessary to input commas (",,") before the extension line number. A comma causes a waiting time of 2 seconds.

4	Confirm with **<OK>.** The connection to the IQ SENSOR NET is established via the modem. The dialing process begins. The *Connect/Verbinden* window appears.

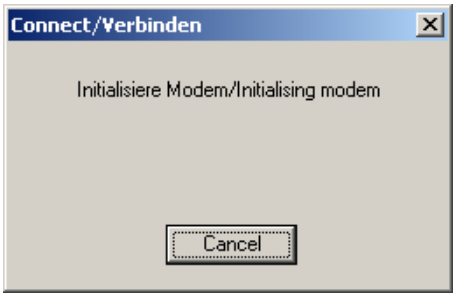


Fig. 3-3 Modem initialization

Note
You can cancel the dialing process with the *Cancel* key**.**

5	The main window of the started program appears after the connection has been successfully established.

Note
The settings that have led to a successful connection setup are stored and automatically appear with the next program start.

Connection via radio modem or zero modem cable

1	Enable the *Serielle Schnittstelle/serial port* check box.
2	In the option field below select the COM connection to which the modem is connected.
3	Enable the *Funkverbindung/radio connection bzw. Direktverbindung/direct connection (Null modem)* check box.

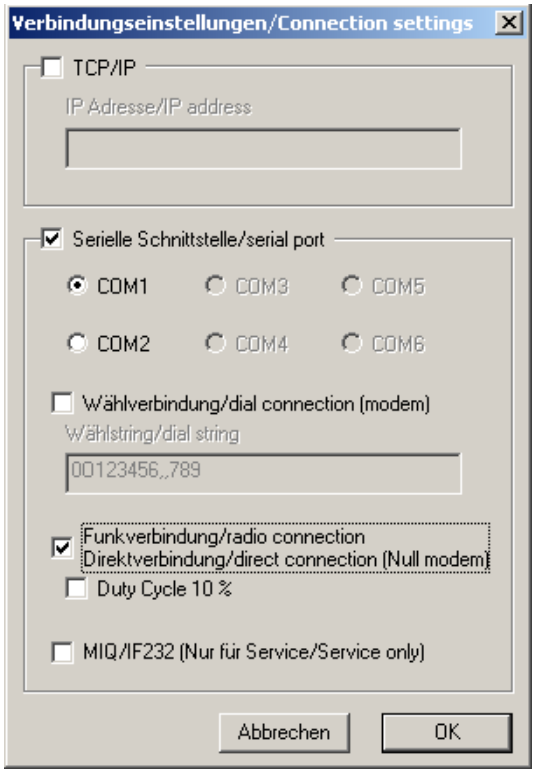


Fig. 3-4 Setting up a radio modem connection

Note

For a radio connection it may be necessary to enable the *Duty Cycle 10%* check box (depending on the transmission frequency/output).

When establishing a radio link observe the relevant national legal requirements.

In Germany, the "Regulierungsbehörde für Telekommunikation und Post" (RegTP - regulation authority for telecommunication and mail) is responsible.

4	Confirm with **<OK>**. The connection to the IQ SENSOR NET is established via the radio modem.

5 The main window of the started program appears after the connection has been successfully established.



Note
The settings that have led to a successful connection setup are stored and automatically appear with the next program start.

3.4.2 Terminating the connection to the IQ SENSOR NET

The connection to the IQ SENSOR NET is automatically terminated if the program which was used to make the connection is terminated. This also applies to connections via a modem.

If there is any unexpected malfunction of the connection, it is recommended to check the status of the modem.



Note
If the connection is made via a modem, you can check the status of the modem (online/offline) (see documentation of your modem).

3.5 Terminating the programs of the Software Pack

The programs of the IQ SENSOR NET Software Pack are terminated via the **x** command button in the title bar of the window.

1	Close the window with **x**. Any existing connection to the IQ SENSOR NET is terminated at the same time.

4 PC Terminal

4.1 Introduction

Data server function

The PC Terminal can be used as a data server. Thus, for example, the PC can be used as a data logger to save the measurement data from the IQ SENSOR NET system.

Terminal function

At the same time, the PC Terminal is an operating unit for the IQ SENSOR NET.

The terminal can be used to:

- Display measured values
- Start calibration
- Perform system and terminal settings
- Display messages
- Transmit stored measurement data to a PC.



Note
In order to ensure the integrity of the data in the IQ SENSOR NET, the following functions can only ever be accessed from one of the connected terminals:

- Open the *Einstellungen/Settings* menu.
- Start calibration
- Assign sensors or output modules as replacements.

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

4.2 Starting the PC Terminal

1	In the Windows start menu, start the *IQS Software Pack -> PC Terminal* program. The *Verbindungseinstellungen/Connection settings* window appears.

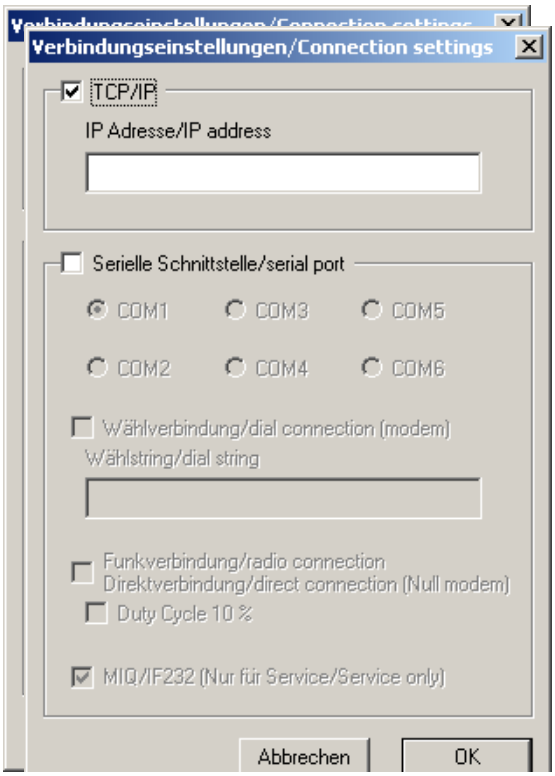


Fig. 4-1 Selecting the connection type

2	Select a connection to the IQ SENSOR NET (see section 3.4.1).

Note
Use only one PC Terminal in the IQ SENSOR NET.

4.3 Terminal window

After the *PC Terminal* program was started and the connection established, the terminal window appears.

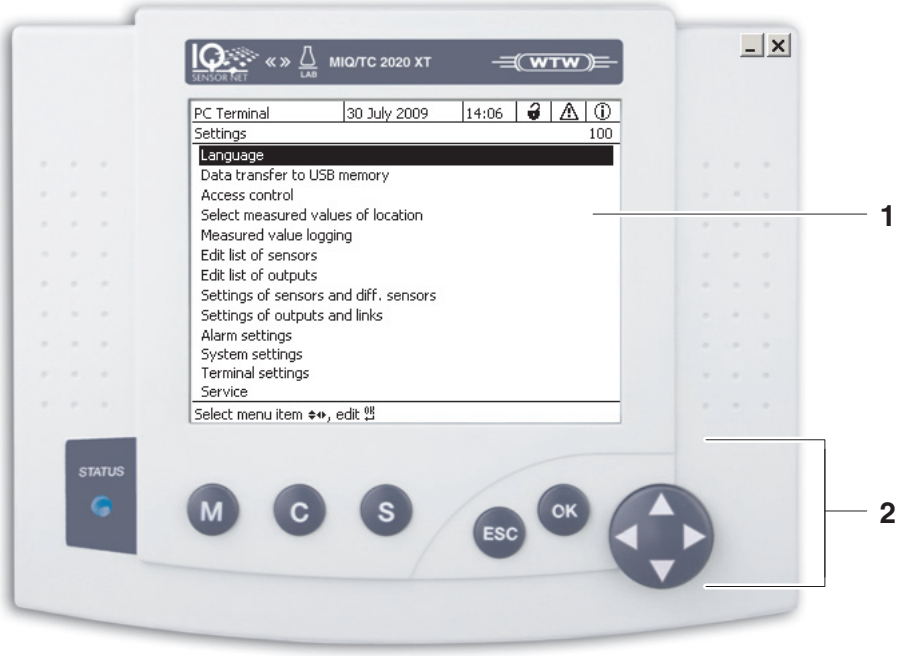


Fig. 4-2 Terminal window (example)

1	Display
2	Operating panel with buttons

The individual display contents and operating options depend on the respective IQ SENSOR NET system type. More detailed information is given in the chapter "Operation" of the relevant system operating manual.

Buttons and shortcuts

Button	Shortcut	Function
	M	<**M**> Display measured values
	C	<**C**> Start calibration of the sensor selected in the measured value display
	S	<**S**> Open the *Einstellungen/Settings* menu
	Esc	<**ESC**> Change to the higher menu level or abort entries without storing them
	Return	<**OK**> Confirm selection
 or mouse wheel	Up arrow Down arrow	**<▲><▼>** Highlight and select: ● Menu items ● Entries ● Columns or fields ● Letters or numerals The **<▲>** and **<▼>** buttons correspond in their function to the rotary switch of an IQ SENSOR NET terminal.



Note
When using a wheel mouse, the mouse wheel can also be used instead of the **<▲>** and **<▼>** buttons. The highlighted selection is displayed as white text on a black background (reverse video).

Character entries via the PC keyboard

Alphanumeric character strings (such as sensor names) can be conveniently entered by means of the PC keyboard. You can correct the entry using the backspace key. Using the Esc key, you can leave the input level at any time and the old name is restored. With the enter key you take over the new name and complete the entry.

5 (Remote) Data transmission to a PC

5.1 Transmitting data

(Remote) data transmission can transmit recorded measured data directly onto a PC with the aid of the *DataLogTransfer* (remote) data transmission software.

Procedure

1	In the Windows start menu, start the *IQS Software Pack -> DataLogTransfer*. The *Settings/Einstellungen* window appears.



Fig. 5-1 Setting the language

2	Select the language. The *Verbindungseinstellungen/ Connection settings* window appears.

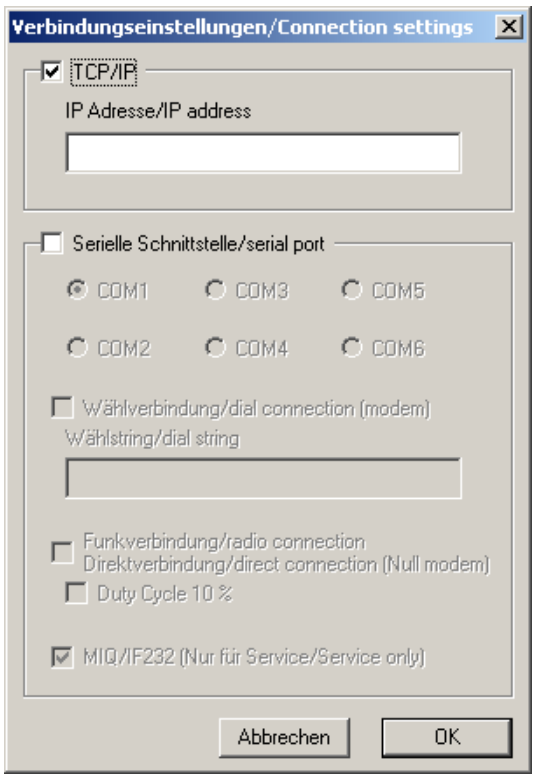


Fig. 5-2 Selecting the connection type

3	Select a connection to the IQ SENSOR NET (see section 3.4.1). The window, *Data transfer IQ Sensor Net --> PC* appears in the selected language.

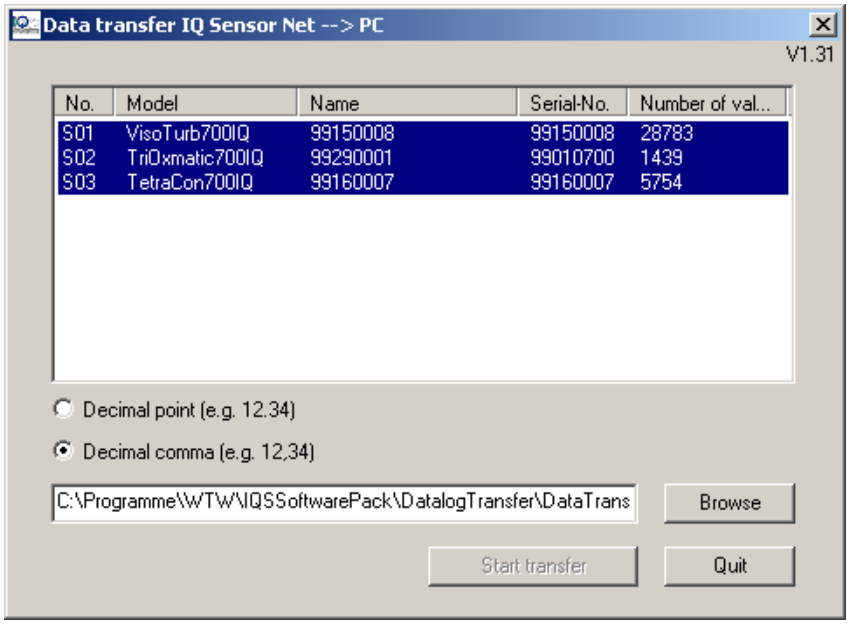


Fig. 5-3 Selection of sensors

4	Change the selection of sensors. ● To select a sensor: Click on a sensor. ● To select several sensors: Click on the sensors while pressing the *Ctrl* key.
5	Select the decimal separator for the data storage.

Note
The setting for the decimal separator should correspond to the setting in the operating system. The preselection is the setting of the last program start. The setting in the operating system is displayed during the first program start.

6	Select the memory location with *Browse*. The Windows dialog *Save file as* opens.
7	Start (remote) data transmission with *Start transfer*. The progress of the (remote) data transfer is displayed in the *Number of values* column. The measurement data are stored in CSV data format.
8	If necessary, erase the measurement data memory for the selected sensors and restart the recording of the measurement data with *Restart recording*.
9	Terminate the *DataLogTransfer* program with *Quit*.

Note
You can cancel a running (remote) data transmission with *Quit*. No other functions are available.

5.2 Data format of the transmitted measurement data

The transmitted measurement data are stored in a separate file in CSV data format for each sensor. The file name (e. g. S03_*TriOxmatic700IQ_1.csv)* is automatically assigned and includes:

- sensor number (e.g. S03)
- sensor model (e.g. TriOxmatic700IQ)
- consecutive number.



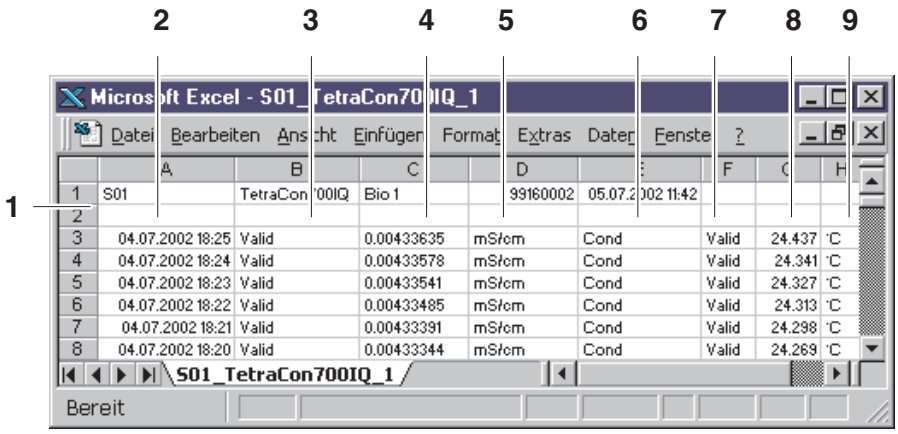
Note
If you want to use the Microsoft Excel program to work with the data, we recommend to open the CSV file using the Microsoft Excel program. Thus, the file is correctly imported into columns.



Note
The measured values are transmitted unprocessed. Therefore, the measured values may have a number of decimal places that exceeds the display accuracy of the respective sensor.

When you want to display and process the transmitted measured values, it may be required to limit the number of digits (e.g. by rounding).

Example of a CSV file after being imported into Microsoft Excel



Line 1	**1**	Identification of the measurement data (from left to right): – Sensor number (Sxx) – Sensor model – Sensor name – Serial number (sensor) – Date and time of the file save
Line 3 - n	**2**	Date and time of the measured value save
	3	Measured value status
	4	Measured value
	5	Unit of the measured value
	6	Measured parameter
	7	Measured value status of the secondary measured value
	8	Secondary measured value
	9	Unit of the secondary measured value

6 (Remote) Data transmission of current measurement data

6.1 Overview

Function of the data server

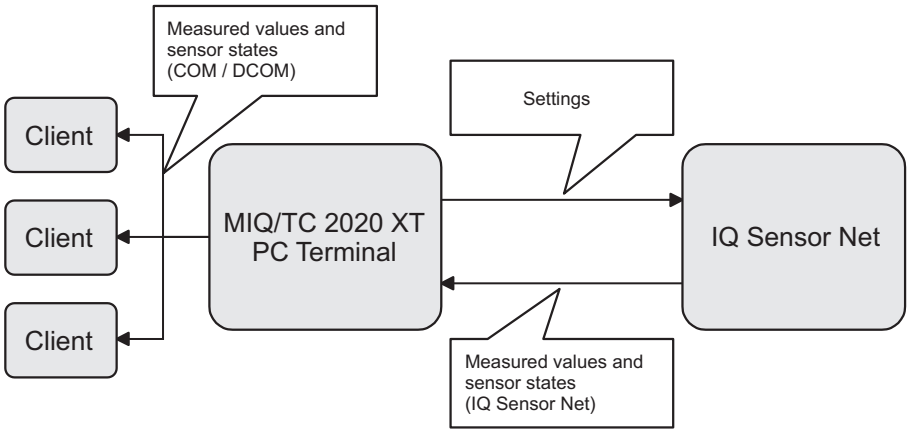


Fig. 6-1 Function of the data server

The most important information from the IQ SENSOR NET can be made available for client applications with the aid of the integrated data server. This includes:

- Sensor identity number
- Sensor serial number
- Sensor model designation
- Sensor name given by the user
- Sensor status
- Measured value status
- Measured value of main measured parameter with unit
- Measured value of secondary measured parameter with unit
- Calibration data of the sensor

The client application can also access the data server via a network if Windows has the Windows component, DCOM object model (distributed component object model).

Note
A detailed description of all possibilities is given in the appendix of this operating manual.

6.2 Application example: Data logging by means of an Excel client

If you have Microsoft Excel 97 or higher, you can call up the "IQDataServer.xls" file. The file is located in the program directory under ...\WTW\IQSSoftwarePack\IQDataServer\Excel_Sample... .

The Excel table has a simple integrated data recording function (data logger). It can be started immediately as soon as the PC Terminal is connected to the IQ SENSOR NET.

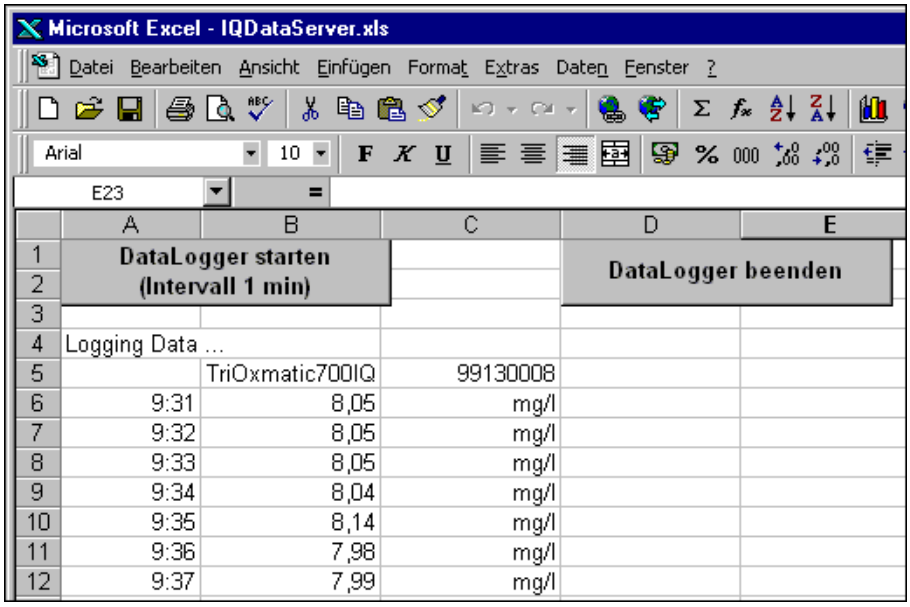


Fig. 6-2 Application example: Data logger by means of an Excel client

The application example has deliberately been kept very simple. It is merely intended to show the principle of how a data logger can be set up with the aid of the data server function. However, the application example can also be used as the basis of a professional data logger under Excel.

6.3 Network data server via DCOM

In order to access the data server over a network, you must make some entries in the Windows registry on the server and client PC. The *IQDataServerDCOM.reg* registration file is in the ...\WTW\IQSSoftwarePack\IQDataServer\ program sub-directory. Open this file with a text editor and enter the name of the server the Software Pack is installed on (entry, "RemoteServerName"). Then close the file and execute it with a double click. Thus all necessary registration entries are automatically carried out (REGEDIT4 syntax).



Note
To change the Windows registry and for DCOM configuration, you must be registered on the PC as an administrator. If necessary, contact your administrator.

Before the connection can be set up, the following basic settings have to be made for the *MIQT2020.IQDataServer* application in the DCOM configuration. Execute the *Dcomcnfg.exe* program to make the settings.

On the server	Allocate access authorization to the data server for the client In addition, with Windows 95: Set the registry setting [HKEY_LOCAL_MACHINE\Software\Microsoft\OLE] "EnableRemoteConnections" to ="Y"
On the client	Select the computer on which the data server will be carried out
Server and client	Set protocols, connections and safety settings depending on the operating system and network



Note
The DCOM configuration menus are dependent on the Windows operating system. The exact details are given in the Windows help.

7 Loading and saving an IQ SENSOR NET system configuration

7.1 General information

The system configuration comprises the following data:

- *Settings of sensors and diff. sensors*
- *Settings of outputs and links*
- *Edit list of sensors*
- *Edit list of outputs*
- *Measured value recording* (data logger settings)
- *Language*
- *Access control*
- *Alarm settings*
- *System settings*

In the IQ SENSOR NET, the system configuration is stored in the controller.

ConfigSaveLoad

With the *ConfigSaveLoad* program, you can

- save the system configuration of the IQ SENSOR NET in a configuration file on a PC, and
- load a system configuration to the IQ SENSOR NET system from a PC
- view the configuration data on the screen
- print the configuration data

The configuration file stored on the PC has the extension, *.cfg.

Requirements to perform a *ConfigSaveLoad*

- General system requirements (see section 3.2)
- IQ SENSOR NET (from controller version 2.04)

7.2 Transmitting a configuration

Procedure

In the Windows start menu, start the *IQS Software Pack -> ConfigSaveLoad*. The empty *ConfigSaveLoad* window appears:

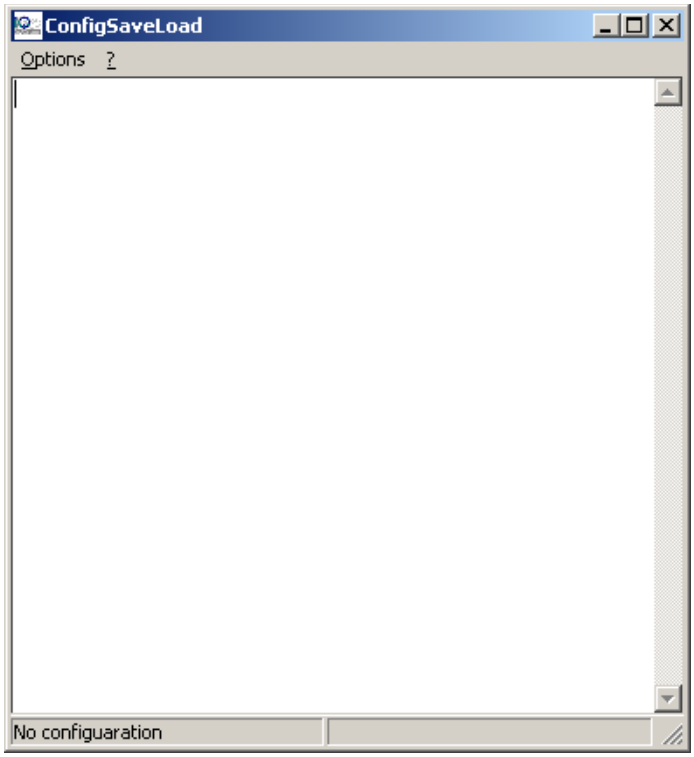


Fig. 7-1 ConfigSaveLoad window after the start

Note

To be able to use the following functions, all terminals at the IQ SENSOR NET system (including PC Terminal MIQ/T2020 PC) have to be in the measured value display.

You have the following options now:

- To download the system configuration of the IQ SENSOR NET, click the menu item, *Options->Read settings of the IQS* and then select the connection to the IQ SENSOR NET (similar to section 3.4.1). The system configuration is displayed in the window. Subsequently, you can store the system configuration (file name extension, *.cgf) in a directory of your choice with the *Options->Save configuration to file* menu item.
- To load a stored system configuration on the IQ SENSOR NET, call up the *Options-> Load configuration from file* menu item and select the required configuration file. The selected system configuration is displayed in the window. Subsequently you can load the system configuration to the IQ SENSOR NET with the menu item, *Options-> Write settings to IQS* (the selection of the connection is done similar

to section 3.4.1).

Example of a displayed system configuration

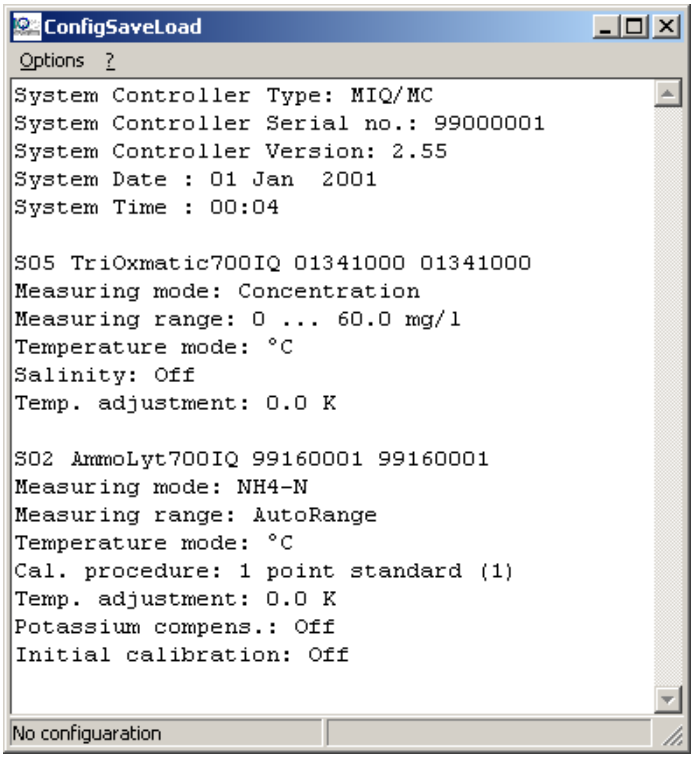


Fig. 7-2 Display of a system configuration in the window

Note

Depending on the Windows country version, special characters of certain languages are possibly not correctly presented on the display or printout. This is a mere presentation problem and does not affect the saving or loading of configuration data. The system configuration will always be presented and printed error-free if you set the language of the IQ SENSOR NET to *German* or *English* before performing the *ConfigSaveLoad*.

Printing

You can print the data in the window using the menu item, *Options-> Print*.

8 FDT integration and DTM implementation for Profibus

8.1 General information

The IQ SENSOR NET DTM was developed for FDT frame applications, e. g. PACTware.

Functions of the IQ SENSOR NET DTM

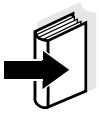
- The IQ SENSOR NET DTM uses the noncyclical Profibus communication for FDT/DTM.
- The cyclical communication runs unchanged and in parallel
- For this reason, the commissioning tool can be operated in parallel to the cyclical communication of the automation tool (PLC).

Further sources of information on FDT/DTM

The following sources (e.g. in the Internet) provide more detailed information on FDT/DTM technology. There you will also find an overview of the current development in this field:

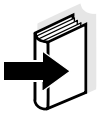
- PACTware Consortium e. V. - Konsortium der Open Source Rahmenapplikation PACTware (Process Automation Configuration Tool).
- PNO - Profibus Nutzerorganisation e. V. (Profibus user organization)
- ZVEI - Zentralverband Elektrotechnik- und Elektronikindustrie e. V. (Central Association of the Electrical Engineering and Electronics Industry)

8.2 Hardware and software requirements



Note
The hardware and software requirements for the IQ SENSOR NET DTM are given in section 3.2.

8.3 Installation of the IQ SENSOR NET DTM



Note
The IQ SENSOR NET DTM is automatically installed along with the Software Pack. The installation is described in section 3.2.

8.4 Connection setup

Before the first connection setup

For the connection, the Profibus address on the Profibus module in the MIQ/MC-(A)-PR has to agree with the Profibus address adjusted in the IQ SENSOR NET DTM.

Open the MIQ/MC-(A)-PR and take the Profibus address from the two rotary switches on the Profibus module in the MIQ/MC-(A)-PR, or set the rotary switches anew. The left switch indicates the tens column, the right switch indicates the ones column of the address. Enter the Profibus address in the DTM.

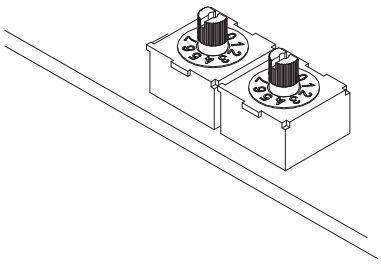


Fig. 8-1 Address rotary switch on the Profibus module in the MIQ/MC-(A)-PR

All further steps are given in the user information of the frame application.

Operating instructions for PACTware

Setting the Profibus address:

- Highlight the IQ SENSOR NET DTM in the project window using the mouse.
- Open the menu, *Instrument data-> Additional functions-> PROFIBUS address.*
- Enter the Profibus address in the input field and confirm with the *Accept* button.

(Note: You can also open the *Instrument data->Parameters* menu by clicking on the IQ SENSOR NET DTM with the right mouse button)

8.5 Parameterization

To be able to parameterize the IQ SENSOR NET, the connection to the IQ SENSOR NET controller has to be established. Access to the IQ SENSOR NET parameters is possible via the DTM terminal.

DTM terminal

The DTM terminal is the user interface of the IQ SENSOR NET DTM. It is operated in the same way as the PC Terminal with the following differences:

- With the DTM terminal, it is not possible to save and load the system configuration using the *ConfigSaveLoad* program. Accordingly, the DTM terminal window does not have a menu bar. The system configurations are transmitted with the tools of the frame application
- The DTM terminal window has a header area with additional information on the instrument identification
- For safety reasons, the possibility to start a calibration is blocked.
- With the DTM terminal, the network dataserver via DCOM is not available

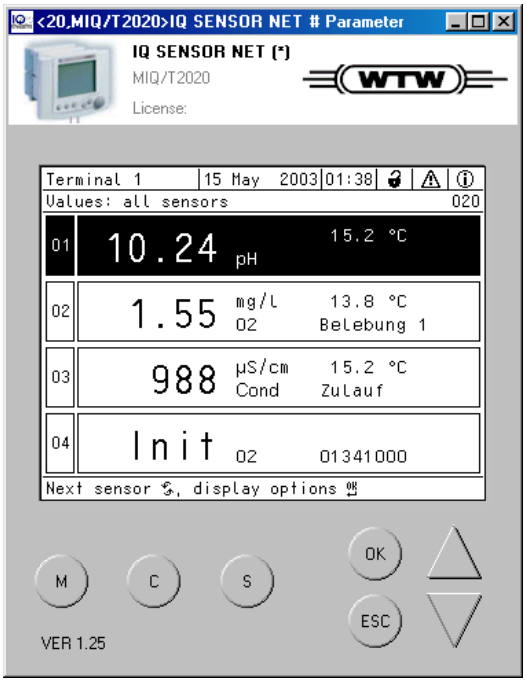


Fig. 8-2 IQ Sensor Net DTM terminal when connected

Loading, viewing and printing the IQ SENSOR NET system configuration

Operating instructions for PACTware

Calling the DTM terminal:

- Highlight the IQ SENSOR NET DTM in the project window using the mouse.
- Open the menu, *Instrument data->Parameters*. The DTM terminal is opened.

Reading and printing the system configuration from the IQ SENSOR NET system:

- Highlight the IQ SENSOR NET DTM in the project window using the mouse.
- Open the menu, *Instrument data-> Load from device.* The system configuration is loaded from the IQ SENSOR NET.
- Open the menu, *Instrument data-> Additional functions-> IQS configuration View /Print*. The system configuration is displayed in a window.
- You can print the system configuration using the *Print* button

(Note: You can also open the *Instrument data->Parameters* menu by clicking on the IQ SENSOR NET DTM with the right mouse button)

Note
To read out the system configuration, the DTM terminal and all other terminals on the IQ SENSOR NET system must be in the measured value display.

The operation of the IQ SENSOR NET via the DTM terminal is similar to that of the PC Terminal (see chapter 4 of this operating manual).

If the DTM and IQ SENSOR NET system are disconnected, the IQ SENSOR NET logo is displayed in the display area of the terminal window:

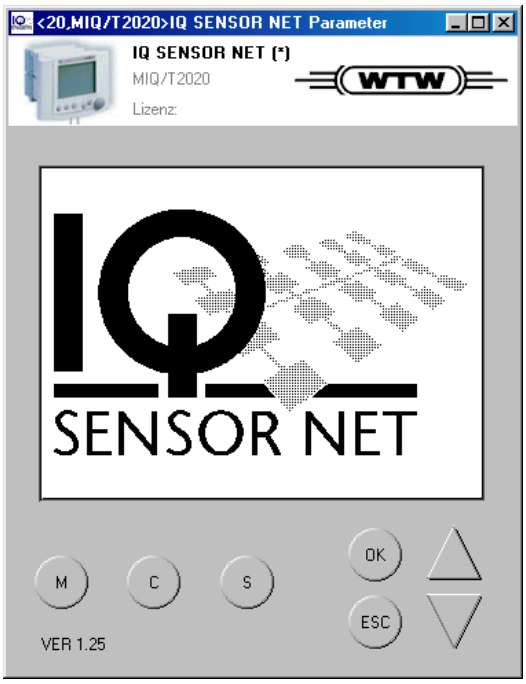


Fig. 8-3 IQ Sensor Net DTM terminal when disconnected

Note
A connected DTM terminal is a terminal component of the IQ SENSOR NET system. Please note that in one IQ SENSOR NET system a maximum of three terminal components (MIQ/T2020 (PLUS), software terminal or DTM terminal) can be installed. On a PC, only one software terminal or DTM terminal can communicate with an IQ SENSOR NET system.

Note
To be able to use the "IQS Configuration View/Print" function under PACTware, you have to carry out the "Load from device" function first.

Data transmission from the IQ SENSOR NET to external programs

Using the software terminal as a data server

As an automation server, the "MIQ/T2020 PC" software terminal provides OLE objects of the "IQDataServer" class. Different types of clients can access these objects. They provide an interface that is simple to use in order to request the most important information from an IQ SENSOR NET system.

The following table lists the properties and procedures of an IQDataServer object.

IQDataServer		
Properties		
Connected	BOOL	**True** if the terminal is connected with and recognized by the IQ SENSOR NET This property can be used to check whether the data server is ready for data transmission. If **Connected** has the value **False**, the data cannot be updated. If the connection to the IQ SENSOR NET is interrupted, the **Connected** property changes after a delay of approx. 2 minutes.
MaxId	Int16	specifies the highest possible theoretical sensor ID used in the IQ SENSOR NET (SXX number in the overview, 'Editing the list of sensors'). The smallest possible sensor ID is 1.
Id	Int16	specifies the ID of the sensor to which the following properties refer. The client uses the setting of the ID to select the sensor from which it would like to request data. If the ID in the IQ SENSOR NET system is not allocated, the **SensorState** property has the value **SENS_UNUSEDID**
SerialNo	Int32	8-digit number containing the serial number of the sensor 0 indicates an ID that is not used
SensorModel	String (BTSR)	Model designation of the sensor, e.g. "TriOxmatic 701IQ" "N/A" indicates an ID that is not used
SensorState	enumSensorState	Current sensor function where the following values are possible: 0 = SENS_UNUSEDID, unused ID 1 = SENS_INACTIVE, sensor is inactive 2 = SENS_MEASURE, sensor is measuring 3 = SENS_CALIBRATE, sensor is being calibrated 4 = SENS_ERROR, sensor is in the error condition 5 = SENS_MAINTENANCE, maintenance state of the sensor

IQDataServer		
Properties		
MPState	enumValueState	Measured value status of the main parameter which can have the following values: 1 = VAL_VALID, MV (measured value) valid, MV present if **SensorState** is equal to **SENS_MEASURE** 2 = VAL_OFL, MV outside the measuring range, no MV present if **SensorState** is equal to **SENS_MEASURE** 3 = VAL_INVALID, MV invalid, no MV present if **SensorState** is equal to **SENS_ERROR** 4 = VAL_MISS, MV missing, no MV present if **SensorState** is equal to **SENS_UNUSEDID**, **SENS_INACTIVE**, **SENS_CALIBRATE** or **SENS_MAINTENANCE**
MPValue	float	Measured value of main parameter 0 if **MPState** is not equal to **VAL_VALID**
MPUnit	String (BTSR)	Unit of the main parameter, e.g. "mg/l" The unit is dependent on the selected measuring range and measuring mode. The possible units are listed in the documentation of the respective sensor. "N/A" if **MPState** is not equal to **VAL_VALID**
MPSpec	String (BTSR)	More detailed specification of the measured variable of the main parameter, e.g. "O2" in the TriOxmatic or "SiO2" in the VisoTurb "N/A" if **MPState** is not equal to **VAL_VALID**
SPState	enumValueState	Measured value status of the secondary parameter where the following values are possible: 1 = VAL_VALID, MV valid, MV present if **SensorState** is equal to **SENS_MEASURE** 2 = VAL_OFL, MV outside the measuring range, no MV present if **SensorState** is equal to **SENS_MEASURE** 3 = VAL_INVALID, MV invalid, no MV present if **SensorState** is equal to **SENS_ERROR** 4 = VAL_MISS, MV missing, no MV present if **SensorState** is equal to **SENS_UNUSEDID**, **SENS_INACTIVE**, **SENS_CALIBRATE**, **SENS_MAINTENANCE** or if no secondary parameter is supplied
SPValue	float	Measured value of secondary parameter (temperature in most sensors) 0 if **SPState** is not equal to **VAL_VALID**

IQDataServer		
Properties		
SPUnit	String (BTSR)	Unit of the secondary parameter "N/A" if **SPState** is not equal to **VAL_VALID**
SensorInfo	Int32 (bit field)	The individual status bits indicate sensor-specific messages (how the bits are assigned to the sensor messages is detailed in the next table).
SensorName	String (BTSR)	Sensor name specified by the user, e.g. "Inlet" "N/A" indicates an unused ID
Methods		
UpdateSensorData		fills the properties with the current values. After a call of UpdateSensorData, the properties related to a sensor remain constant until the next call is made or the **Id** property is changed.
ShowInterface		shows the operator interface of the software terminal (parameter is set to True), or hides it (parameter is set to False).
GetCalibrationData		returns the string that is otherwise displayed while the calibration results of the respective sensor are shown on the terminal display. The Id property specifies an unused ID or an inactive sensor where a string with the value "Error" is returned. If communication problems arise during the transmission of the calibration results (the string is always currently fetched from the respective sensor), a string with the value "Error Communication" is returned.

Status bits of the sensors (sensor info)

The status bits of the sensors are available as of controller software version 2.03 or higher.

Sensor	Bit			
	0	1	2	3 ... 31
VisoTurb 700 IQ	Component hardware defective	Measurement interferred	Ultrasound cleaning system has failed	- / -
ViSolid 700 IQ	Component hardware defective	Measurement interferred	Ultrasound cleaning system has failed	- / -
SensoLyt 700 IQ	Component hardware defective	Glass broken	- / -	- / -
TetraCon 700 IQ	Component hardware defective	- / -	- / -	- / -
TriOxmatic 700 IQ	Component hardware defective	Electrolyte supply is depleted	Membrane head damaged	- / -
TriOxmatic 701 IQ	Component hardware defective	Electrolyte supply is depleted	Membrane head damaged	- / -
TriOxmatic 702 IQ	Component hardware defective	Electrolyte supply is depleted	- / -	- / -
AmmoLyt 700 IQ	Component hardware defective	- / -	- / -	- / -

Legend: - / - = not used

Note
The status info has to be evaluated individually for each bit.

The meaning of the status bits and basic information on the evaluation of the status info can also be found in the Lists/Status info chapters of the latest sensor operating manuals (from date of issue 12/2002).

The status info of sensors can also be displayed on a terminal of the IQ Sensor Net (see IQ Sensor Net operating manual, from date of issue 12/2002).

Instructions for use:

Except for the Id property, the properties cannot be changed by the client.

The terminal starts automatically as soon as an instance of an IQDataServer object is created and is automatically terminated when the last instance is released. This takes all active clients into account. Thus, only one software terminal is ever active at any one time.

Example:

```
Client1 creates an instance of the IQDataserver
       -> the software terminal is started and makes an object available
Client2 creates also an instance
       -> the already active software terminal makes an object available
Client1 releases the instance that is used
       -> the software terminal continues to remain active
Client2 releases its instance
       -> the software terminal is terminated
```

Each time the terminal is started, this must first be recognized on the IQ SENSOR NET system in order to provide sensor data (the Connected property is then True). Furthermore, the setting of the serial COM port used is required. Thus, some time will pass until the terminal can make data available. Therefore, it is sensible to create at least one long-term instance of the IQDataServer in a client application in order to prevent any unnecessary closing down and restarting of the terminal. It is possible to request the data of all sensors with only one IQDataServer object. To do so, the Id property is simply set with the ID of the sensor of interest, and, as a result, the object contains the current properties of this sensor.

Example in Visual Basic:

```
Dim DataServer As Object
DataServer = CreateObject("MIQT2020.IQDataServer")  'Create instance
DataServer.Id = 7
' Read property of the sensor with ID 7
DataServer.Id = 8
' Read property of the sensor with ID 8
```

Important:

Only after a call of the UpdateSensorData() method or a change of the Id property do the properties of the IQDataServer object contain the current values.

The installation directory of the software terminal contains examples of how the IQDataServer objects are used with VBA (\IQDataServer\Excel_Sample\IQDataServer.xls, a very simple data logger) and with Visual C++ and MFC (\IQDataServer \Dll_Sample\IQDataServer.dsw, a DLL that encapsulates the functionality of an IQDataServer object). The \IQDataServer directory contains a type library ("MIQT2020.tlb") that is suitable for the IQDataServer.

Selecting the COM port for the serial interface to the MIQ/IF232

In order to enable an automated start of the terminal, the last selected port number is stored in the Windows registry and used as the default value for the next start. If no other port is selected within 10 seconds, the terminal attempts to set up the connection to the IQ SENSOR NET via this preselected port.

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