



## IQ SENSOR NET

# Flexible through digital technology – The IQ SENSOR NET from WTW

### IQ SENSOR NET

- Digital modular multiparameter system
- Systems for decentralized single measuring points

### NEW

- **System 182 XT-4** – the perfect system for up to 4 sensors
- **Terminal/controller T 2020 XT** with USB interface
- **IQ-LabLink** – the direct connection to the laboratory meter

... for the entire range of online instrumentation

#### Universal:

One system for all parameters enables flexible and praxis orientated solutions.

#### Safe:

Fail-save digital sensors guarantee ideal process monitoring – dual processor technology for increased system stability.

#### Easy:

Plug & play connection for any IQ sensor – easy replacement of existing analog measuring stations – cost-saving through plain and easy installation (2-wire connection technology)

#### Future-proof:

Extendable any time – also for future sensors and components.

# IQ Systems

Single measuring stations or sensor network – an easy choice ...

The planning begins with a basic decision between 2 systems

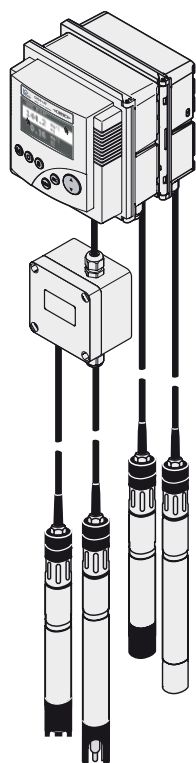
**Single point measuring system**  
System 182 (1 to 4 sensors)

**Sensor network**  
System 2020 XT (up to 20 sensors)

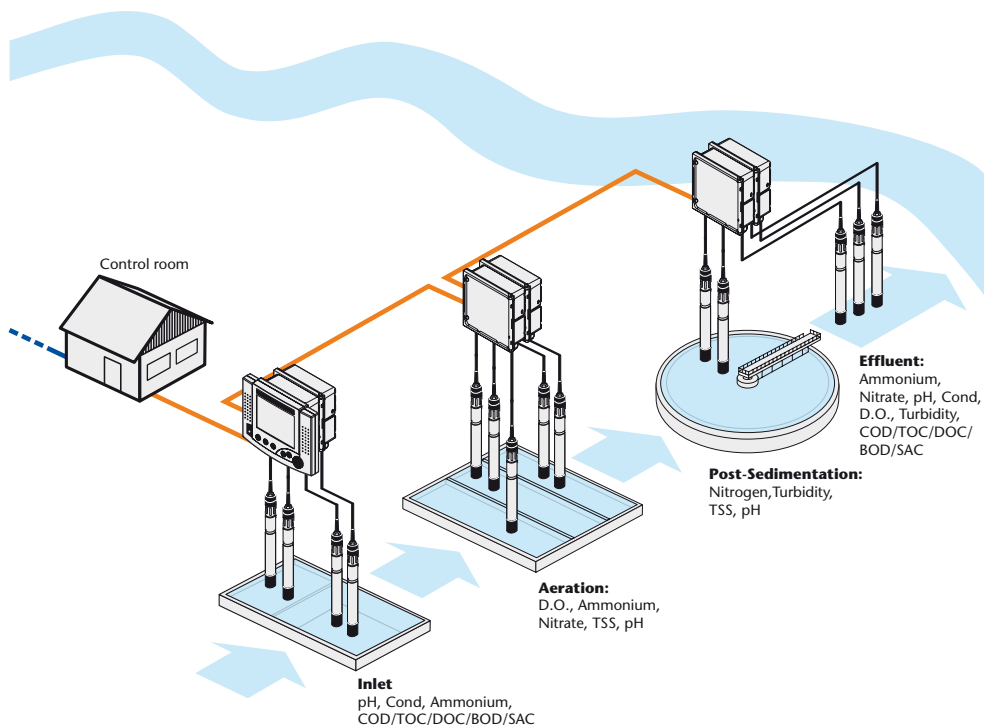


- Decentralized system for 1 to 4 sensors with integrated terminal.
- Models with integrated analog or digital outputs (i.e. RS-485/ field bus connections PROFIBUS or MODBUS) available

- Central (network) and decentralized system for up to 20 sensors possible – extendable by up to 3 terminal/ controller units for flexible installation within the network.
- Digital and/or analog outputs, can be combined and extended by modules and integrated within the network.



Example for a single point measuring system using 4 sensors

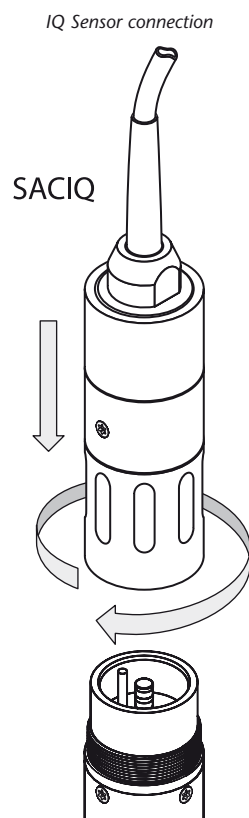


Example for a central network with system 2020 XT using 14 sensors

## Digital technology

Digital IQ sensors stand for:

- Long distances from sensors to measuring system
- Fail-safe transfer of signals
- Calibration data can be stored in the sensor
- Standardized plug connection directly at the sensor
- Calibration can be processed in the laboratory



Digital sensor  
(with inside view)



Laboratory pre-calibration of a digital sensor

# IQ Sensors

| IQ Sensors                   |  |       |
|------------------------------|--|-------|
| <i>please also see pages</i> |  |       |
| SensoLyt® 700 IQ (SW)        | pH/ORP assembly  | 19–22 |
| TriOxmatic® 700 IQ (SW)      | D.O. sensor  | 8–16  |
| TriOxmatic® 701 IQ           | D.O. sensor  | 8–16  |
| TriOxmatic® 702 IQ           | D.O. sensor  | 8–16  |
| FDO® 700 IQ (SW)             | Optical D.O. sensor  | 8–16  |
| TetraCon® 700 IQ (SW)        | Conductivity sensor  | 28–31 |
| VisoTurb® 700 IQ             | Turbidity sensor   | 34–37 |
| ViSolid® 700 IQ              | Suspended solids sensor  | 34–37 |
| VARION®Plus 700 IQ           | Combination sensor ammonium and nitrate (ISE)  | 44/45 |
| AmmoLyt®Plus 700 IQ          | Ammonium assembly (ISE)  | 46/47 |
| NitraLyt®Plus 700 IQ         | Nitrate assembly (ISE)   | 49/50 |
| NitraVis® 700/X IQ (TS)      | Optical nitrate probe with connection module MIQ/VIS   | 51    |
| CarboVis® 700/X IQ (TS)      | Optical COD/TOC/DOC/BOD/SAC probe with connection module MIQ/VIS                                 | 60/61 |
| NiCaVis® 700/5 IQ            | Optical probe for measurement of nitrate and COD/TOC/DOC/BOD/SAC, with connection module MIQ/VIS | 60/61 |



**pH**

**O<sub>2</sub>**

**Cond**

**Turb**

**TSS**

**NH<sub>4</sub><sup>+</sup>**

**NO<sub>3</sub><sup>-</sup>**

**COD**

**TOC**

**SAC**

**General Description of Meters**

**Monitors**

**IQ SENSOR NET**

**Analyzer**

**Sample Preparation**

**Samplers**

**Accessories**

**Measuring stations**



# The System 2020 XT – the modular solution for today and for the future

**Do you plan a sensor network with multiple sensors or to upgrade your installation step by step?**

The System 2020 XT represents the perfect solution for these challenges:

It is designed fully modular and will “keep on growing” at the pace of your growing demand. This flexibility makes the system very appealing also for small, medium-sized, but also for larger sewage plants. Any conceivable application can be fulfilled including discharge measuring with the parameters turbidity, pH, conductivity and temperature, furthermore the control of nitrification/denitrification and also complete sewage plant analytics being supported by one single system – at considerable low investment costs and highly economical operation – all accomplished by an easy to handle system.

## System 2020 XT

- USB interface
- Electronic-Key
- IQ-LabLink

### Important system features

- Up to 20 digital IQ sensors at user's choice may be connected
- Easy system expansion, no previous knowledge required
- Centralized power supply using a wide range power supply (100 – 240 VAC) or 24 V variant
- A nearly unlimited number of relays and analog outputs (0/4-20 mA) may be selected
- Digital outputs PROFIBUS DPV1 or MODBUS RTU
- Optional modem connection via analog or GSM modem
- Wireless connection via radio transmission
- Easy integration of existing measuring points by mA inputs



### Local identity function

The local identity function is integrated in each module with a memory element. With the configuration this memory element can carry all system relevant information i.e. location and description of measuring point as well as considering all connected sensors. When setting the terminal the complete information is displayed and enables i.e. fast identifying of sensors for calibration purposes.

### Diagnosis via LEDs

Each module sideways shows 2 clearly visible LEDs (yellow/red) for diagnostic purposes. These LEDs signalize whether the according module is ready-to-operate (power supply/data communication).

# Terminal / Controller MIQ/TC 2020 XT



The terminal / controller MIQ/TC 2020 XT presents the core of each IQ SENSOR NET System 2020. Its new high-performance processor coordinates all tasks within the network. Via the USB interface an extremely fast data exchange via USB memory stick to any external system directly is possible. The system-status LED gives reliable and fast information regarding function and status of system.



When integrating two MIQ/TC 2020 XT in the system, the dual-processor function increases the system stability and therefore also availability of the entire system.

Can be operated as terminal and controller all-purpose solution (constantly installed) or as mobile terminal solution.

- Multi-functional USB interface
- IQ-LabLink function for easy data exchange with laboratory instruments
- Electronic-Key function with programmable access permission
- Increased system stability through dual-processor function
- Fast status information via LED
- Improved reading precision through special graphic display

**NEW**

Special, extremely bright display with clear glass covering

**NEW**

Status LED display



**NEW**

Multi-functional USB interface

**NEW**

New 4-directional control element

## Multi-functional USB interface

- IQ-LabLink function
- Electronic-Key function
- Storage of configuration
- Storage of calibration
- Logbook recording
- Storage of recorded data (data logging function)
- Software upload

## Status LED display

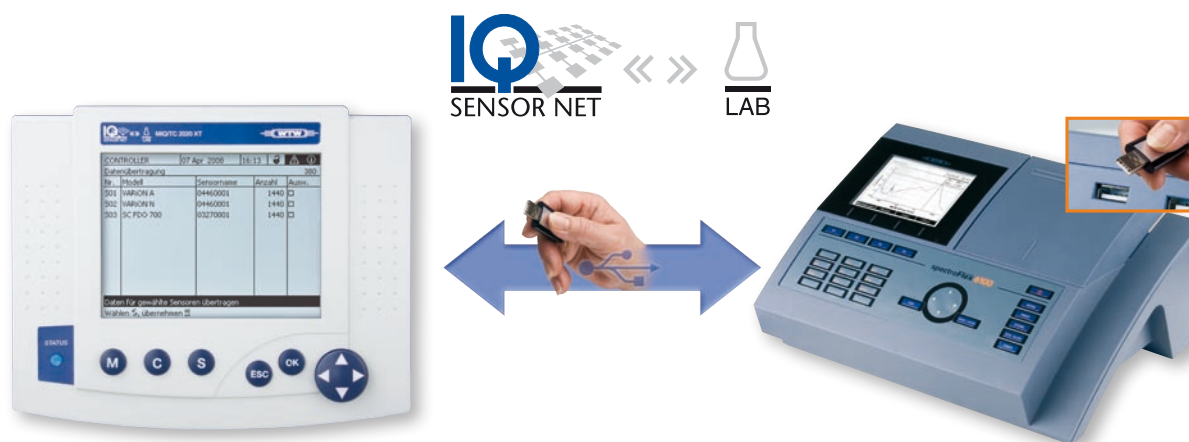
Each MIQ/TC 2020 XT terminal/controller shows a LED for diagnostic purposes on the front. This LED shows normal and malfunctions of the system at a glance.

## New 4-directional control element

- For even easier operation

# IQ-LabLink – the link to the world of laboratory

IQ-LabLink enables a save data exchange between the IQ SENSOR NET and the laboratory instrument. The exchange is processed via a common USB memory stick, serving as data medium between the Online system and the laboratory instrument. The condition is that both instruments feature this function and are equipped with a USB interface. The first WTW instruments to include this function are the two new photometers **spectroFlex 6100** and **spectroFlex 6600** (laboratory instruments) and the **terminal/controller MIQ/TC 2020 XT** with access to the IQ SENSOR NET.



## Application example: Matrix adaption with VARION®Plus

The multi-parameter sensor measures ammonium and nitrate at the same time. The ammonium measuring is dynamically compensated by the separate measuring of potassium. As every wastewater has its individual matrix, a precision-adaption is processed occasionally. The values for the matrix adaption are determined using a photometer and provided to the sensor. The value entry was processed manually up to now.

## Matrix adaption via IQ-LabLink

### Step 1, IQ terminal:

Automatic generating of job files on a USB memory stick with actual sensor values, parameters, description of measuring site and the automatic allocation of job reference number for a unique identification.

### Step 2, photometer:

After inserting the USB memory stick, the instrument identifies the job file, asks for the measurement with the according parameters, gives advice for supporting the correct operation, stores all determined data back on the job file and verifies the completeness.

### Step 3, IQ terminal:

Complete reading of data related to the matrix adaption by pressing one button, without any interruption of the online measuring.

## IQ-LabLink

### Advantages at a glance:

- Software supported routines for the safe data transfer from laboratory to online systems.
- Safe and easy allocation of online and laboratory measurement via job files and functions.
- Integrated help functions for correct processing.
- Check for completeness and plausibility.
- Complete reading of all data using one button without any interruption of the online measurement.

# Electronic-Key function with programmable access permission



## Electronic-Key function

- Protection against non-authorized access
- Individual access permission

### Function:

When the Electronic-Key function in the IQ SENSOR NET system is activated, the USB memory stick works like an electronic key giving access to the system.

A coded file is therefore stored on the USB memory stick. After reading the file access is activated to the system.

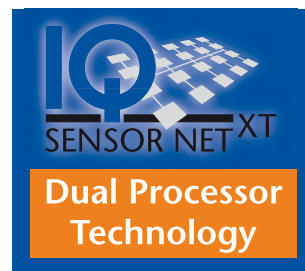
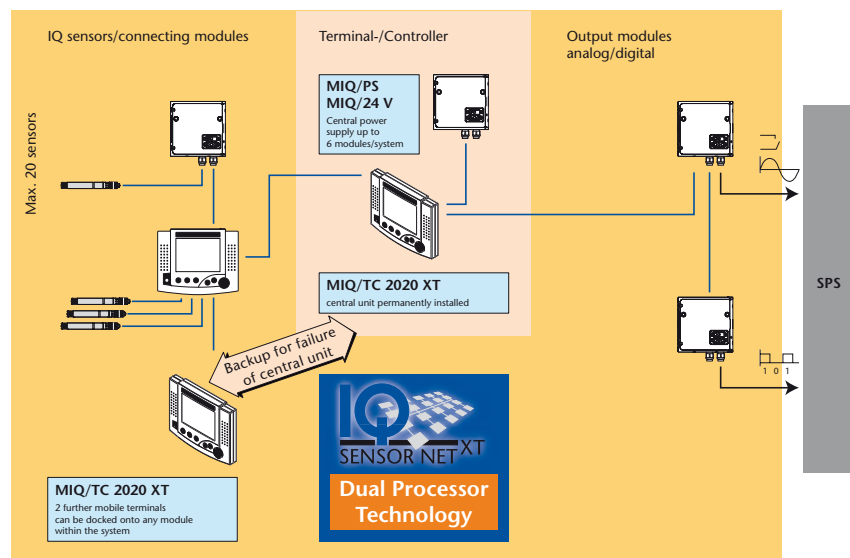
It is also possible, to release only certain functions in order to personalize access.





# Two processors – safety guaranteed

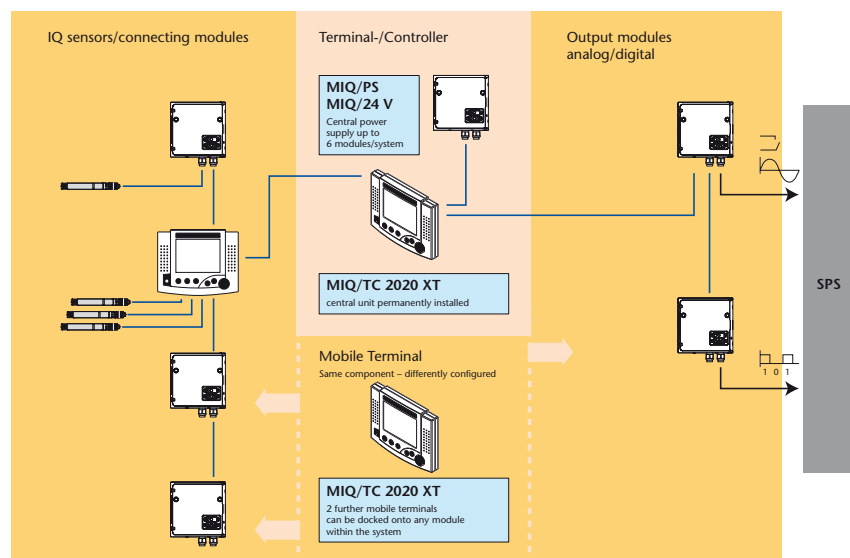
When a further terminal MIQ/TC 2020 XT is part of the constantly installed central unit (configured as mobile terminal unit) it doubles the security:



- In case of any failure regarding the central unit (terminal/controller function) the second unit fully automatically takes over both functions (goes fully automatically from the plain terminal operation to the terminal/controller operation).
- Status LED indicates any failures

## System architecture MIQ/TC 2020XT

The terminal/controller MIQ/TC 2020 XT can be operated as either terminal (permanently installed with the system) as also as mobile terminal. This function can easily be configured with the software by each user. The status LED indicates the selected function and informs about any possible incidents.



### Minimal system configuration 2020 XT (example):

- MIQ/TC-2020 XT configured as terminal/controller (permanently installed in the system)
- MIQ/PS power supply
- MIQ/CR 2 (analog) or MIQ/PR (digital) output module
- IQ sensor

### Optional extension possibility:

- 2 additional MIQ/TC 2020 XT configured as terminal (disconnectable and operatable as mobile units)
- Various further in- and output modules
- Further power supply (max. 6)
- Further IQ sensors (up to 20 IQ sensors)

# Features and functions

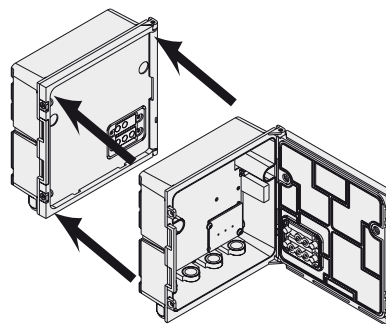
## Mechanical docking of a terminal

A Terminal TC 2020 XT can be easily connected to each module. The electrical contact for the power supply and data communication is made simultaneously with the mechanical connection.



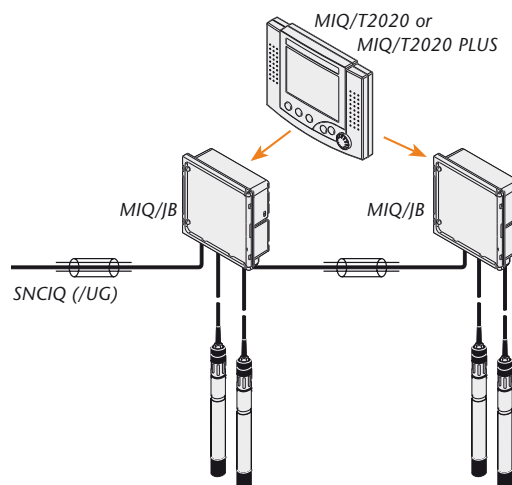
## Stack mounting of modules

Up to three modules can be mechanically connected to form a stack. Simultaneous mechanical and electrical connection to data and power transmission. The individual modules of the stack can be accessed at any time without dismantling the stack by simply undoing two lateral screws.



## Distributed mounting of modules

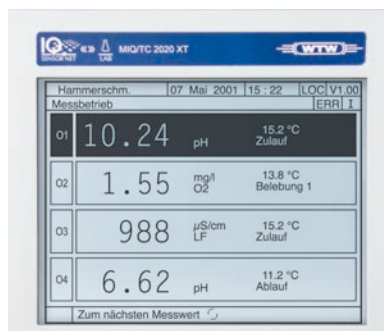
All modules can be installed anywhere in the system, both individually and in stacks. When not stacked, system components are connected via the 2-wire shielded SNCIQ Sensor Net cable. Each Sensor Net connection of a system component can be used to extend the IQ SENSOR NET cable. Furthermore, IQ sensors can also be connected directly to the Sensor Net terminals.



## Measurement display

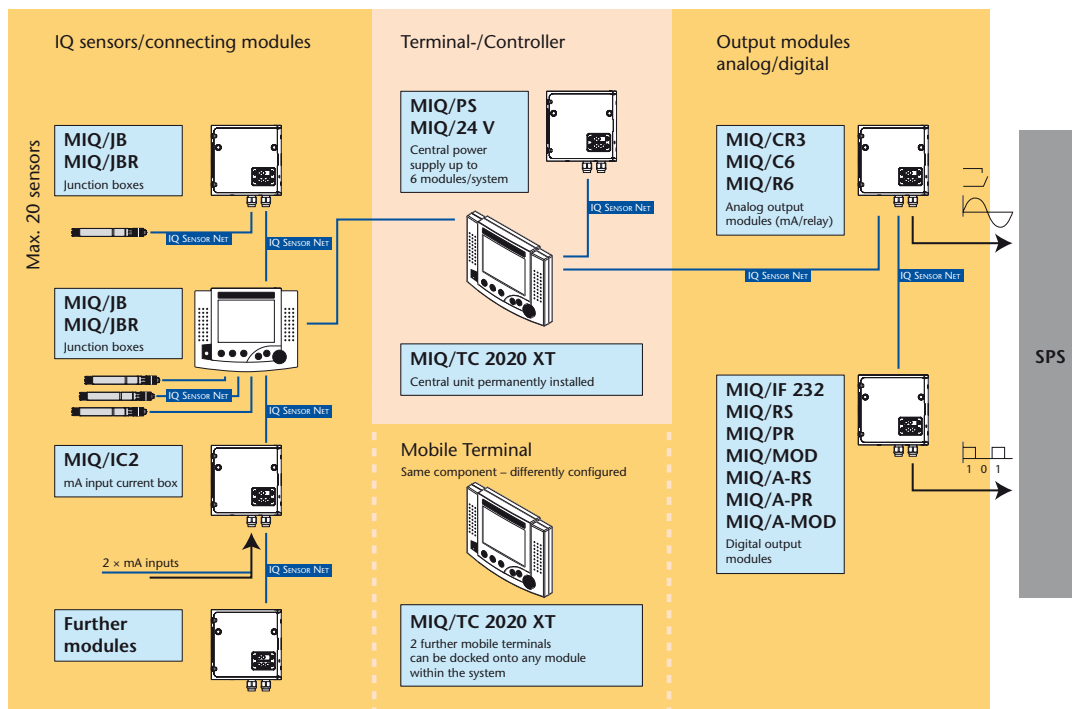
The user can configure the measurement display by selecting between a single, four-fold or multiple view – depending on the number of connected sensors. The freely definable designation of the measuring location is included on each view for easy identification.

Stored measured data can be optionally displayed as measuring value lists, daily, weekly or monthly graphs. The respective current measured value can be displayed by following the curve with the cursor.

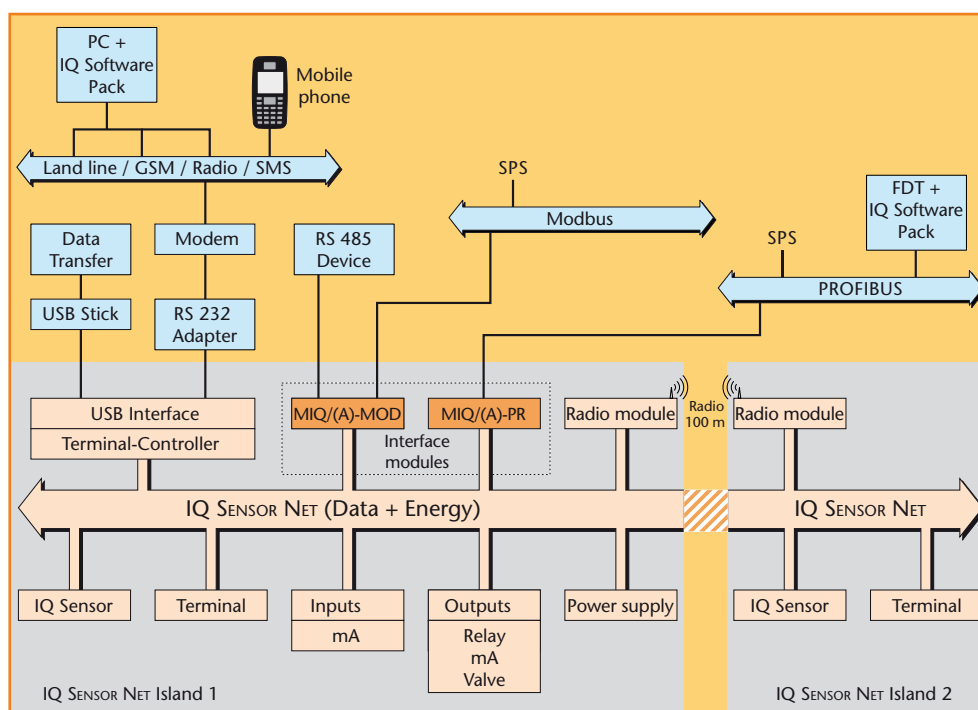


# Principal system architecture

## IQ SENSOR NET System 2020 XT



## Digital communication with the IQ Net



**MIQ/RS modul IQ**  
with modem compatible  
RS-232 interface

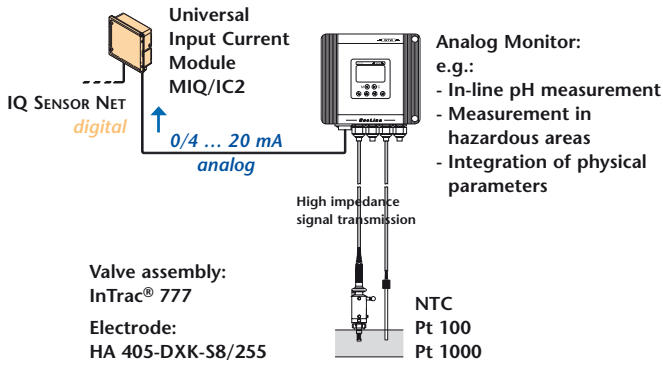
**MIQ/PR modul IQ**  
with PROFIBUS-DP connec-  
tion

**MIQ/MOD modul IQ**  
with MODBUS RTU/RS 485  
connection

**MIQ/Blue PS**  
for wireless connection and  
linking with the  
IQ SENSOR NET System

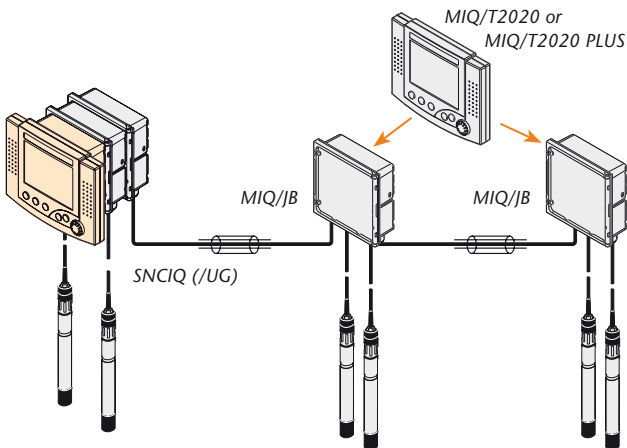
Additional IQ SENSOR NET  
islands possible.

### Example 1: Integration of an Analog Monitor

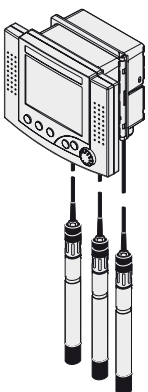


### Configuration example 1:

- 6 IQ sensors (each 2 measuring points)
- Large distances between 3 measuring points
- Mobile terminal can be connected to both
- MIQ/JB modules, for i.e. obtaining an additional measurement display or for processing a calibration on site.

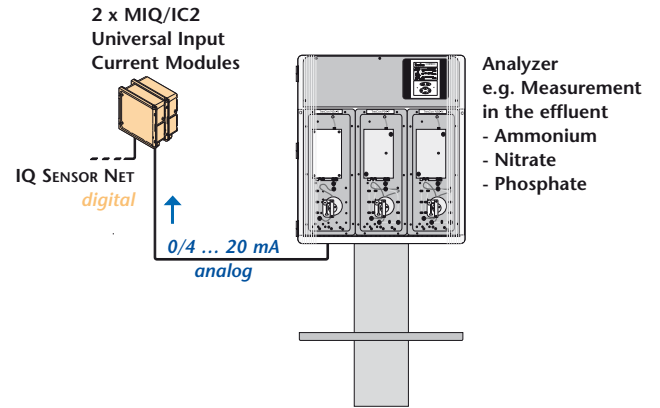


Example MIQ/ TC 2020 XT-H3 with decentralized assembly



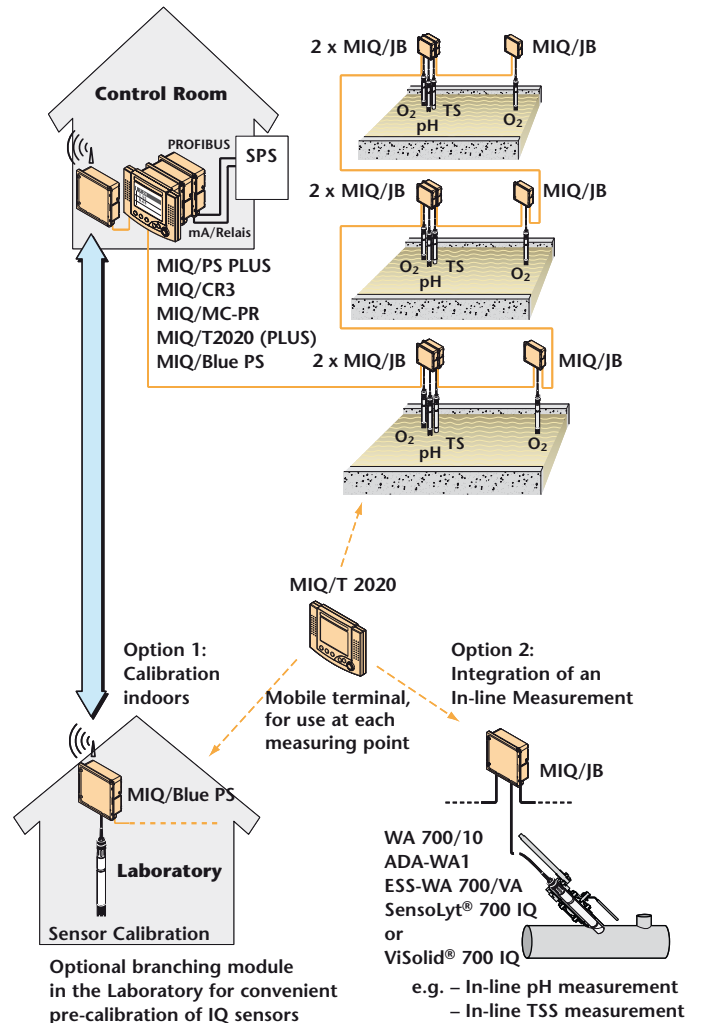
Example MIQ/ TC 2020 XT-H3

### Example 2: Integration of an Analyzer



### Configuration example 2:

**Monitoring of 3 aeration tanks with IQ SENSOR NET**  
(due to extremely large variety of system variants, only a small selection can be demonstrated and represented as configuration examples).





## General Technical Data System 2020 XT

### System

|  |  |
|--|--|
| <b>Certifications</b>                  | ETL, cETL (conforms with relevant UL and Canadian standards), CE   |
| <b>Electromagnetic Compatibility</b>   | EN 61326, Class B; FCC Class A, EMC for indispensable operation  |
| <b>Integrated Lightning Protection</b> | According to EN 61326 enhanced overvoltage protection for the entire system, implemented in each component   |
| <b>Connection Medium Cable</b>         | IQ SENSOR NET cable SNCIQ or SNCIQ/UG (underground cable with additional PVC coating):<br>2-wire with shield; 2 x 0.75 mm <sup>2</sup> ; Filler cord for easy connection of shield: 0.75 mm <sup>2</sup> ; pressure resistant to 10 bar  |
| <b>Connection Characteristics</b>      | Power supply and data transmission on these wires; resistant to polarity reversal with respect to switched shield and inner conductor (no damage); comprehensive EMC shield control; cable topology within IQ Sensor Net system as required, e.g. in the form of a line, tree, star, multiple star<br>Total cable length: max. 1.000 m/1094 yds (without signal amplifying), with signal amplifying module MIQ/JBR additional 1.000 m/1094 yds |
| <b>Connection Medium Radio</b>         | Radio transmission Class 1 with a range of 100 m/109 yds (max. 300 m/328 yds)  |
| <b>Connection Characteristics</b>      | Data transmission, separate power supply necessary for each island   |

### Controller/Terminal

|  |   |
|--|---|
| <b>MIQ Module Coupling at Rear</b>     | Combined mechanical and electrical connection, for rapid coupling to MIQ modules  |
| <b>USB interface</b>                   | USB-A (host)  |
| <b>Display</b>                         | Graphic display; resolution: 320 x 240 pixel; visible area: 4.49 x 3.39 in. (114 x 86 mm), black/white, backlit   |
| <b>Control Functions/Function Keys</b> | 5 operating keys: 3 master keys for functions: Measurement (M), calibration (C), set/system settings (S),<br>2 keys for: confirmation/switching menu O.K. (OK), Escape (ESC)<br>4-directional button for rapid selection of software functions and input of alphanumeric values |
| <b>Datalogger</b>                      | MIQ/TC 2020 XT: Data memory for up to 525,600 data sets   |
| <b>Electric Supply</b>                 | Directly via the IQ SENSOR NET when coupled to MIQ module   |
| <b>Ambient Conditions</b>              | Operating temperature: -4 °F ... 131 °F (-20 °C ... +55 °C)<br>Storage temperature: -13 °F ... 149 °F (-25 °C ... +65 °C)   |
| <b>Housing Material</b>                | ASA (Acrylonitrile-Styrene-Acryloesterpolymer)  |
| <b>Protection Rating</b>               | IP 66 / equivalent to NEMA 4X (not suitable for conduit connection)   |
| <b>Dimensions (W x H x D)</b>          | 8.27 x 6.69 x 1.57 in. (210 x 170 x 40 mm)  |
| <b>Weight</b>                          | Approx. 1.54 pounds (0.7 kg)  |
| <b>Guaranty</b>                        | 3 years for defects of quality  |

### Modules

|   |  |
|---|--|
| <b>MIQ Module Coupling at Front</b>       | Combined mechanical and electrical connection for rapid docking and removal of the MIQ/T2020 (PLUS) terminal and the MIQ/C184 XT controller, and for docking additional modules  |
| <b>MIQ Module Coupling at Rear</b>        | Combined mechanical and electrical connection for docking additional modules, a total of 3 modules as a stack mounted unit   |
| <b>Cable Feeds</b>                        | 4 screw cable glands M 16 x 1.5  |
| <b>Terminal Connections</b>               | Screw terminal strips<br>Terminal area for solid conductors: 0.2 ... 4.0 mm <sup>2</sup><br>Terminal area for flexible conductors: 0.2 ... 2.5 mm <sup>2</sup><br>accessible by opening cover  |
| <b>IQ SENSOR NET Terminal Connections</b> | Terminal connections for the IQ SENSOR NET are available on each module and can be used as required:<br>- for connecting sensors<br>- as an input/output or for looping through/branching of the IQ SENSOR NET cable                       |
| <b>Other Functions</b>                    | Two LEDs, yellow and red, for monitoring the operating voltage of the IQ SENSOR NET; IQ SENSOR NET connection, resistant to reversed polarity; Integrated local identity function; Integrated switchable terminal resistor (SN terminator) |
| <b>Electric Supply</b>                    | Directly via the IQ SENSOR NET   |
| <b>Ambient Conditions</b>                 | Operating temperature: -4 ... 131 °F (-20 ... +55 °C);<br>Storage temperature: -13 ... 149 °F (-25 ... +65 °C)   |
| <b>Housing Material</b>                   | PC – 20 % GF (polycarbonate with 20 % fiberglass)  |
| <b>Protection Rating</b>                  | IP 66 / equivalent to NEMA 4X (not suitable for conduit connection)  |
| <b>Dimensions (W x H x D)</b>             | 5.67 x 5.67 x 2.05 in. (144 x 144 x 52 mm)   |
| <b>Weight</b>                             | Approx. 1.1 pounds (0.5 kg)  |
| <b>Guaranty</b>                           | 3 years for defects of quality   |

### Sensors

|   |   |
|---|---|
| <b>Mechanical Connections for Accessories</b> | Connection slot; Connection screw thread G 1"   |
| <b>IQ Sensor Connection Cable</b>             | Combined mechanical and electrical connection for rapid attachment and exchange of sensors. Consists of jack plug and pressure-resistant screw connection.<br>Cable lengths: 1.64 – 7.66 – 16.40 yds (1.5 – 7.0 – 15.0 m)/<br>21.87 – 54.68 – 109.36 yds (20 – 50 – 100 m) in sea water design available.<br>Storage temperature: -13 °F ... 149 °F (-25 °C ... +65 °C)<br>Operating temperature: -4 °F ... +131 °F (-20 °C ... +55 °C) |

## System components and functions

### Terminal/Controller

|                      | Model   | Function  | Order No. |
|----------------------|---|---|-----------|
| Central Control Unit | TC 2020 XT<br>(Operation in MODBUS: terminal/<br>controller)* | Central terminal/controller unit: is required to be installed once at any point, remains in the system, cannot be removed. Operation mode is shown through LED.   | 470 000   |
|                      | MIQ/TC 2020 XT-H3   | Multi-parameter measuring converter, consisting of the components MIQ/TC 2020 XT + MIQ/CR3 + MIQ/PS, 100 – 240 VAC main voltage, 3 analog outputs (0/4-20 mA) and 3 relay outputs, up to 20 free selectable IQ sensors can be connected | 470 016   |
|                      | MIQ/TC 2020 XT-H3 C6  | Multi-parameter measuring converter, consisting of the components MIQ/TC 2020 XT + MIQ/C6 + MIQ/PS, 100 – 240 VAC main voltage, 6 analog outputs (0/4-20 mA) up to 20 free selectable IQ sensors can be connected                       | 470 017   |

### MIQ Modules

|   | Model  | Function   | Order No.   |
|---|--|--|---|
| Power Supply                              | MIQ/PS for 100 – 240 VAC                                 | Depending on the power consumption up to 6 modules can be installed in the system.   | 480 004   |
|   | MIQ/24V for 24 VAC/24 VDC                                |  | 480 006   |
| Output Modules<br>(analog)                | MIQ/CR3 with 3 analog<br>(0/4-20 mA) and 3 relay outputs | With any combination   | 480 014   |
|   | MIQ/C6 with 6 analog outputs<br>(0/4-20 mA)              |  | 480 015   |
|   | MIQ/R6 with 6 relay outputs                              |  | 480 013   |
| Output Modules<br>(digital)               | MIQ/IF 232   | Software terminal MIQ/IF 232 provides full functionality of the hardware terminal MIQ/T 2020, additional functions: <ul style="list-style-type: none"> <li>Actual measuring data transferred to PC for further processing</li> <li>Stored data can be read offline</li> <li>View/save/load/print the system configuration</li> </ul> | 480 020   |
|   | with controller function:                                | without  |   |
|   | MIQ/MC   | MIQ/A  | Module IQ/Micro Controller  |
|   |  |  | 471 000   |
|   | MIQ/MC-A   |  | Module IQ with fully automatic air-pressure compensation  |
|   |  |  | 470 008   |
|   | MIQ/MC-RS  |  | Module IQ/Micro Controller with fully automatic air-pressure compensation   |
|   |  |  | 471 010   |
|   |  | MIQ/PR   | Module IQ/Micro Controller with modem adaptable RS 232 interface  |
|   |  |  | 470 002   |
|   | MIQ/MC-PR  |  | Module IQ with PROFIBUS-DP connection   |
|   |  |  | 470 004   |
|   |  | MIQ/MOD  | Module IQ/Micro Controller with PROFIBUS-DP connection  |
|   |  |  | 471 002   |
|   | MIQ/MC-MOD   |  | Module IQ with MODBUS RTU / RS 485 connection   |
|   |  |  | 470 006   |
|   | MIQ/MC-A-RS  |  | Module IQ/Micro Controller with MODBUS RTU / RS 485 connection  |
|   |  |  | 471 003   |
|   |  | MIQ/A-PR   | Module IQ/Micro Controller with fully automatic air-pressure compensation and modem adaptable RS 232 interface                          |
|   |  |  | 471 011   |
|   | MIQ/MC-A-PR  |  | Module IQ with fully automatic air-pressure compensation for O <sub>2</sub> sensors and PROFIBUS-DP connection                          |
|   |  |  | 470 011   |
|   |  | MIQ/A-MOD  | Module IQ with fully automatic air-pressure compensation for O <sub>2</sub> sensors and PROFIBUS-DP connection                          |
|   |  |  | 471 012   |
|   | MIQ/MC-A-MOD   |  | Module IQ with fully automatic air-pressure compensation for O <sub>2</sub> sensors and MODBUS RTU / RS 485 connection                  |
|   |  |  | 470 012   |
|   |  |  | Module IQ/Micro Controller with fully automatic air-pressure compensation for O <sub>2</sub> sensors and MODBUS RTU / RS 485 connection |
|   |  |  | 471 013   |
| Magnetic valve module                     | MIQ/CHV PLUS   | Magnetic valve module for automatic controlled cleaning via compressed air   | 480 018   |
| Linking modules                           | MIQ/JB   | MIQ/JB with 4 connections (for IQ Net or IQ sensors)   | 480 008   |
|   | MIQ/JBR  | MIQ/JBR, same as MIQ/JB additionally with amplifier signal for long cable distances (>1 km total length)   | 480 010   |
| Connecting module<br>Power input          | MIQ/IC2  | MIQ/IC2 with 2 inputs for 0/4-20 mA signals<br>Enables the connection of separate measuring transmitters and analyzers to the IQ Net   | 480 016   |
| Connecting module<br>for spectral sensors | MIQ/VIS  | For connecting CarboVis, NitraVis and NiCaVis sensors  | 481 029   |
| Radio communication<br>module             | MIQ/Blue PS  | For wireless connection and linking within the IQ SENSOR NET system  | 480 021   |

*All IQ sensors are connectable; for ordering information see each parameter chapter. An overview of all connectable sensors can be found in our brochure "Product Details".*

*\*Via the software adjustable by user.*



# IQ SENSOR NET performance data

All components within the system require a specific electric power supply. Due to the enormous flexibility of the system, an infinite number of variations is conceivable. Therefore, a balance sheet must be drawn up after selecting the components. This is easily done by totaling the power consumption of the individual components and checking whether the sum exceeds the power provided by a particular power supply unit. If so, the available power can be increased by installing additional or more powerful power supply units.

| Power consumption in Watts | Number of power supply units |
|----------------------------|------------------------------|
| <b>MIQ/PS</b>              |                              |
| ≤ 18 Watt                  | 1 power supply unit          |
| 18 - 36 Watt               | 2 power supply units         |
| 36 - 54 Watt               | 3 power supply units         |
| 55 - 72 Watt               | 4 power supply units         |
| 73 - 90 Watt               | 5 power supply units         |
| 91 - 108 Watt              | 6 power supply units         |

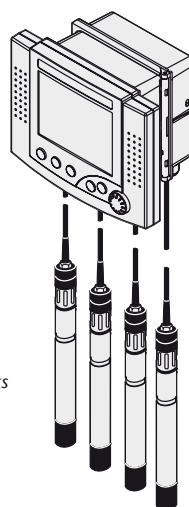
Additional cable losses generally do not need to be taken into account for installations where the main consumers are near (<164 yds/150 m) the next power supply and the overall cable length does not exceed 437 yds (400 m). In systems with greater cable lengths, approx. 1 watt of power loss per additional 109 yds (100 m) of cable have to be considered. These standard values apply when using specified IQ SENSOR NET cable SNCIQ.

## Example

| Outlet measurement with the following parameters:<br>turbidity, pH, dissolved oxygen, conductivity and temperature | Components:        | Power consumption or power supply | One power supply unit MIQ/PS is sufficient for the complete system consisting of four connected sensors.<br><br>The system comprises a buffer/reserve of approx. 9 watt. The system can be accordingly extended sensors and components. |
|--|--------------------|-----------------------------------|---|
|  | MIQ/PS             | +18,0 Watt                        |   |
|  | MIQ/TC 2020 XT     | -3,0 Watt                         |   |
|  | MIQ/C6             | -3,0 Watt                         |   |
|  | VisoTurb® 700 IQ   | -1,5 Watt                         |   |
|  | SensoLyt® 700 IQ   | -0,2 Watt                         |   |
|  | TriOxmatic® 700 IQ | -0,2 Watt                         |   |
|  | TetraCon® 700 IQ   | -0,2 Watt                         |   |
|  | <b>Total</b>       | <b>Σ: +9,4 Watt</b>               |   |

MIQ/TC2020 XT  
+ MIQ/PS  
+ MIQ/C6 (6 x mA)  
+ 4 IQ sensors

Multi-parameter monitor for any  
4 parameters, with 6 analog outputs



## Configuration and Performance Data

### IQ Sensors

| Type                    | Description  | Power Consumption/ W                |
|-------------------------|--|-------------------------------------|
| SensoLyt® 700 IQ (SW)   | pH/ORP assembly  | ⇒ 0.2                               |
| TriOxmatic® 700 IQ (SW) | D.O. sensor  | ⇒ 0.2                               |
| TriOxmatic® 701 IQ      | D.O. sensor  | ⇒ 0.2                               |
| TriOxmatic® 702 IQ      | D.O. sensor  | ⇒ 0.2                               |
| FDO® 700 IQ (SW)        | Optical D.O. sensor  | ⇒ 0.7                               |
| TetraCon® 700 IQ (SW)   | Conductivity sensor  | ⇒ 0.2                               |
| VisoTurb® 700 IQ        | Turbidity sensor   | ⇒ 1.5<br>(without ultrasonic ⇒ 0.3) |
| ViSolid® 700 IQ         | Suspended solids sensor  | ⇒ 1.5                               |
| VARION®Plus 700 IQ      | Double sensor ammonium and nitrate (ISE)   | ⇒ 0.2                               |
| AmmonoLyt®Plus 700 IQ   | Ammonium assembly (ISE)  | ⇒ 0.2                               |
| NitraLyt®Plus 700 IQ    | Nitrate assembly (ISE)   | ⇒ 0.2                               |
| NitraVis® 700/X IQ (TS) | Optical nitrate probe with connection module MIQ/VIS   | ⇒ 7.0                               |
| CarboVis® 700/5 IQ (TS) | Optical COD/TOC/DOC/BOD/SAC probe with connection module MIQ/VIS                                 | ⇒ 7.0                               |
| NiCaVis® 700/5 IQ       | Optical probe for measurement of nitrate and COD/ TOC/DOC/BOD/SAC with connection module MIQ/VIS | ⇒ 7.0                               |

### Output modules analog

| Type         | Description   | In total there are 48 output channels/ system available | Power Consumption/ W |
|--------------|---|---|----------------------|
|              | Each mA-output, each relays with one module is considered as 1 channel.     | Number of occupied output channels                      |                      |
| MIQ/CR3      | IQ / current relay 3 module. with 3 analog outputs and 3 relay outputs each | 6   | ⇒ 3.0                |
| MIQ/C6       | IQ / current 6 module with 6 analog outputs                                 | 6   | ⇒ 3.0                |
| MIQ/R6       | Module IQ/ Relays 6 with 6 analog outputs                                   | 6   | ⇒ 1.5                |
| MIQ/CHV PLUS | Module IQ/ Cleaning Head Valve for automatically controlled cleaning        | 1   | ⇒ 1.0                |

### Output modules digital

| Type             | Description   | Power Consumption/ W |
|------------------|---|----------------------|
| MIQ/MC(-A)(-RS)  | Module IQ with modem adaptable RS 232 interface                   | ⇒ 1.5                |
| MIQ/(MC)(-A)-PR  | Module IQ with PROFIBUS-DP connection                             | ⇒ 3.0                |
| MIQ/(MC)(-A)-MOD | Module IQ with MODBUS RTU / RS 485 connection                     | ⇒ 3.0                |
| MIQ/Blue PS      | Module IQ for wireless connection within the IQ SENSOR NET system | ⇒ 0.6                |
| MIQ/IF232        | IQ / software terminal module                                     | ⇒ 0.2                |

### Power input connection module mA

| Type      | Description   | Power Consumption/ W      |
|-----------|---|---------------------------|
| MIQ/IC2** | IQ / input current 2, module with 2 inputs for 0 / 4 - 20 mA signals<br>**each occupied current input is counted as IQ sensor | ⇒ 0.2*                    |
| MIQ/IB    | IQ / junction box module  | ⇒ 0.0 (non-active module) |
| MIQ/IBR   | IQ / junction box repeater module   | ⇒ 0.2                     |

### Terminal-Controller

| Type           | Description                              | Power Consumption/ W |
|----------------|--|----------------------|
| MIQ/TC 2020 XT | Terminal / controller for system 2020 XT | ⇒ 3.0                |

### Power supply modules

| Type    | Description  | Power Output/ W |
|---------|--|-----------------|
| MIQ/PS  | IQ / power supply module for input power with wide range power supply unit for 100 - 240 VAC input voltage | 18 ⇒            |
| MIQ/24V | IQ / 24 V module for input power with 24 VAC or 24 VDC input voltage                                       | 18 ⇒            |

Attention: Please consider power consumption of SNCIQ cable: 1 W per 100 m/109 yds (for cable lengths above 400 m/437 yds)  
\*(+2.2 W per connected power supply/isolator)






# System 182

Up to 4 digital sensors can be connected to this system – insofar the system 182 is perfectly designated for the operation or completion of single measuring points at wastewater plants:

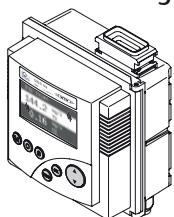
## System 182

- 1 to 4 sensors
- Digital outputs
- All IQ sensors can be connected

- Up to 4 sensors can be connected out of a variety of 19 available digital sensors
- pH, ORP, D.O., conductivity, temperature and turbidity/ suspended solids, nutrient parameters ammonium, nitrate and COD can therefore be measured directly, in-situ
- Power supply through wide range mains converter (100-240 VAC) or 24 V alternative.
- Digital outputs PROFIBUS DP or MODBUS RTU
- Analog model with up to 5 analog outputs and 6 relays

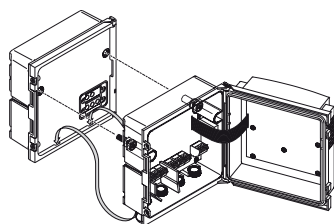
| Module                              | DIQ/S 182  | DIQ/S 182 XT  | DIQ/S 182 XT-4   |
|-------------------------------------|--|---|--|
|                                     |  |  |  |
| Max. number of sensors              | 2  | 2   | 4  |
| Plug connection for Bus             | Plug connection for Bus<br>2 x mA (0) 4 - 20 mA<br>3 x relay                       | DIQ/S 182 XT<br>4 x mA (0) 4 - 20 mA<br>5 x relay                                   | DIQ/S 182 XT-4<br>5 x mA (0) 4 - 20 mA<br>6 x relay                                  |
| Models with digital output PROFIBUS | DIQ/S 182 PR<br>Plug connection for Bus<br>3 x relay                               | —   | DIQ/S 182 XT-4/ PR<br>Plug connection for Bus<br>3 x relay                           |
| Models with digital output MODBUS   | DIQ/S 182 PR<br>Plug connection for Bus<br>3 x relay                               | —   | DIQ/S 182 XT-4/ PR<br>Plug connection for Bus<br>3 x relay                           |

## Display of measurement value and navigation



- Single or double display with or without additional measuring parameter (i.e. temperature)
- Simultaneous display of status for all relays and power outputs in one overview

## Sensor connection and system extensions



- Any IQ sensor will be automatically recognized by the system and displayed after connection.
- On demand, an additional main power supply can be connected to extend power for sensors with an increased power consumption.
- With stack-mounting, both the mechanical and electrical connect is established.
- Cable lengths of up to 250 m within the system.

## Linking module for sensors and magnetic valve modules for compressed-air cleaning



- (DIQ/JB): Connection of a second or further distant IQ sensor
- (DIQ/CHV): Integrated magnetic valve is directly controlled by a relay of the transmitter

# Configuration Options for System 182

## Example 1

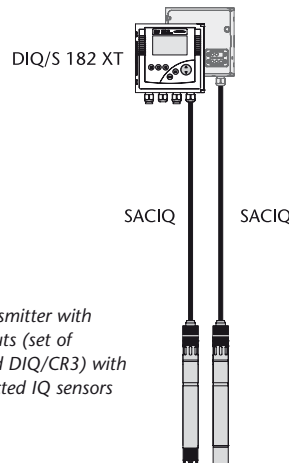
| Configuration Example | Order No.     |
|-----------------------|---------------|
| DIQ/S 182             | 472 000       |
| SACIQ-7,0             | 480 042       |
| IQ Sensor             | user selected |



Transmitter with 1 direct connected IQ sensor

## Example 2

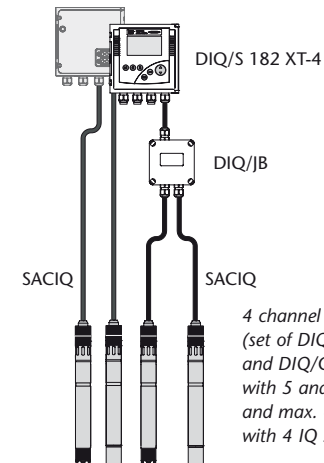
| Configuration Example | Order No.     |
|-----------------------|---------------|
| DIQ/S 182 XT          | 472 001       |
| 2 x SACIQ-7,0         | 480 042       |
| 2 IQ Sensors          | user selected |



2 channel transmitter with 4 analog outputs (set of DIQ/S 182 and DIQ/CR3) with 2 direct connected IQ sensors

## Example 3

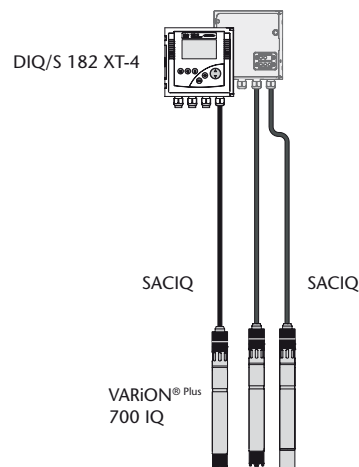
| Configuration Example | Order No.     |
|-----------------------|---------------|
| DIQ/S 182 XT-4        | 472 015       |
| 4 x SACIQ-7,0         | 480 042       |
| DIQ/JB                | 472 005       |
| 4 IQ Sensors          | user selected |



4 channel transmitter (set of DIQ/S 182 and DIQ/CR3) with 5 analog outputs and max. 6 relays with 4 IQ sensors

## Single measuring point with analog outputs

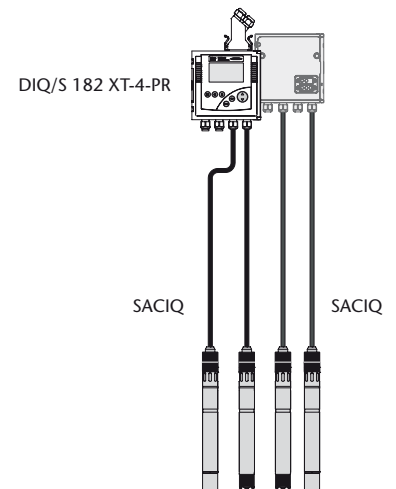
| Configuration Example | Order No.     |
|-----------------------|---------------|
| DIQ/S 182 XT-4        | 472 015       |
| 3 x SACIQ-7,0         | 480 042       |
| VARiON®Plus 700 IQ    | 107 066       |
| 2 IQ Sensors          | user selected |



4 channel transmitter (set of DIQ/S 182 and DIQ/CR3) with 5 analog outputs and max. 6 relays with 3 IQ sensors

## Single measuring point PROFIBUS / MODBUS

| Configuration Example | Order No.     |
|-----------------------|---------------|
| DIQ/S 182 XT-4-PR     | 472 017       |
| 4 x SACIQ-7,0         | 480 042       |
| 4 IQ Sensors          | user selected |



4 channel transmitter (set of DIQ/S 182 and MIQ/JB) with 3 relays and PROFIBUS-DPA connection with 4 IQ Sensors

## General Technical Data System 182

### System

|  |   |
|--|---|
| <b>Certifications</b>                  | ETL, cETL (conforms with relevant UL and Canadian standards), CE  |
| <b>Electromagnetic Compatibility</b>   | EN 61326,<br>Emission: Class B,<br>EMC for indispensable operation,<br>FCC Class A  |
| <b>Integrated Lightning Protection</b> | According to EN 61326 enhanced overvoltage protection for the entire system   |
| <b>Connection Medium Cable</b>         | IQ SENSOR NET cable SNCIQ or SNCIQ/UG (underground cable with additional PVC coating):<br>2-wire with shield; 2 x 0.75 mm <sup>2</sup> ;<br>filler cord for easy connection of shield: 0.75 mm <sup>2</sup> ;<br>pressure resistant to 10 bar   |
| <b>Connection Characteristics</b>      | Power supply and data transmission on these wires; resistant to polarity reversal with respect to switched shield and inner conductor (no damage); comprehensive EMC shield control;<br>Cable topology within the IQ SENSOR NET system as required, e.g. in the form of a line, tree, star; total cable length max. 273 yds/250 m |
| <b>Connection Medium Radio</b>         | Radio transmission with a range of 100 m/109 yds (max. 300 m/328 yds)   |
| <b>Connection Characteristics</b>      | Data transmission, separate power supply necessary for each island  |

### Monitors

|   |   |
|---|---|
| <b>Display</b>                            | Graphic display; resolution: 128 x 64 pixel;<br>visible area: 2.83 x 1.57 in. (72 x 40 mm),<br>black/white, backlit   |
| <b>Control Functions/Function Keys</b>    | 5 operating keys: 3 master keys for functions:<br>measurement (M), calibration (C), set/system settings (S),<br>2 keys for: confirmation/switching menu O.K. (OK), escape (ESC)<br>2 knobs for rapid selection of software functions and input of alpha-numeric values (up), (down) |
| <b>Electric Supply</b>                    | 100 ... 240 VAC (50/60 Hz), 24 V AC/DC  |
| <b>MIQ Module Coupling at Rear</b>        | Combined mechanical and electrical connection for docking additional modules,<br>additionally max. 2 modules as stack mounted unit  |
| <b>Cable Feeds</b>                        | 4 screw cable glands M 16 x 1.5   |
| <b>Terminal Connections</b>               | Screw terminal strips<br>Terminal area for solid conductors: 0.2 ... 4.0 mm <sup>2</sup><br>Terminal area for flexible conductors: 0.2 ... 2.5 mm <sup>2</sup><br>accessible by opening cover   |
| <b>IQ SENSOR NET Terminal Connections</b> | Terminal connections for the IQ SENSOR NET for connecting sensors   |
| <b>Ambient Conditions</b>                 | Operating temperature: -4 °F ... 131 °F (-20 °C ... +55 °C);<br>Storage temperature: -13 °F ... 149 °F (-25 °C ... +65 °C)  |
| <b>Housing Material</b>                   | PC – 20 % GF (polycarbonate with 20 % fiberglass)   |
| <b>Protection Rating</b>                  | IP 66 / equivalent to NEMA 4X (not suitable for conduit connection)   |
| <b>Dimensions (W x H x D)</b>             | 5.67 x 5.67 x 3.74 in. (144 x 144 x 95 mm)<br>(DIQ/S 182 XT: 5.67 x 5.67 x 5.63 in. / 144 x 144 x 143 mm) /<br>DIQ modules: 3.74 x 3.74 x 2.28 in. ( 95 x 95 x 58 mm)   |
| <b>Weight</b>                             | DIQ 182: approx. 2.2 pounds (1 kg)<br>DIQ/S 182 XT and<br>DIQ/S 182 XT-4: approx. 3.31 pounds (1.5 kg)  |
| <b>Guaranty</b>                           | 3 years for defects of quality  |

### Sensors

|   |  |
|---|--|
| <b>Mechanical Connections for Accessories</b> | Connection slot; connection screw thread G 1"  |
| <b>IQ Sensor Connection Cable</b>             | Combined mechanical and electrical connection for rapide attachment and exchange of sensors. Consists of jack plug and pressure-resistant screw connection.<br>Cable lengths: 1.64 – 7.66 – 16.40 yds (1.5 – 7.0 – 15.0 m)/<br>21.87 – 54.68 – 109.36 yds (20 – 50 – 100 m) in sea water design available.<br>Storage temperature: -13 °F ... 149 °F (-25 °C ... +65 °C)<br>Operating temperature: -4 °F ... +131 °F (-20 °C ... +55 °C) |

## Ordering Information System 182

|  |   | Order No.        |
|--|---|------------------|
| <b>Monitors</b>                                    |   |                  |
| DIQ/S 182  | Dual IQ/system 182, Universal Transmitter for connection of 2 digital IQ sensors with 2 analog outputs (0/4-20 mA) and 3 relays   | 472 000          |
| DIQ/S 182 XT                                       | Dual IQ/ system 182, Universal Transmitter for connection of 2 digital IQ sensors, with 4 analog outputs (0/4-20 mA) and 5 relays   | 472 001          |
| DIQ/S 182-PR                                       | Dual IQ/system 182, Universal Transmitter for connection of 2 digital IQ sensors, with 3 relays and PROFIBUS-DP connection  | 472 002          |
| DIQ/S 182-MOD                                      | Dual IQ/system 182, Universal Transmitter for connection of 2 digital IQ sensors, with 3 relays and MODBUS RTU/RS 485 connection  | 472 003          |
| DIQ/S 182/24V                                      | Dual IQ/system 182, Universal Transmitter for connection of 2 digital IQ sensors, with 2 analog outputs (0/4-20 mA) and 3 relays, for 24 V AC/DC power supply   | 472 010          |
| DIQ/S 182 XT/24V                                   | Dual IQ/ system 182, Universal Transmitter for connection of 2 digital IQ sensors, with 4 analog outputs (0/4-20 mA) and 5 relays, for 24 V AC/DC power supply  | 472 011          |
| DIQ/S 182-PR/24V                                   | Dual IQ/system 182, Universal Transmitter for connection of 2 digital IQ sensors, with 3 relays and PROFIBUS-DP connection, for 24 V AC/DC power supply   | 472 012          |
| DIQ/S 182-MOD/24V                                  | Dual IQ/system 182, Universal Transmitter for connection of 2 digital IQ sensors, with 3 relays and MODBUS RTU/RS 485 connection, for 24 V AC/DC power supply   | 472 013          |
| DIQ/S 182 XT-4                                     | Dual 182 XT-4 system for connecting 4 digital sensors with 5 analog outputs (0/4 - 20 mA) and max 6 relays. Delivery scope DIQ/S with DIQ/CR3   | 472 015          |
| DIQ/S 182 XT-4 - PR                                | Dual 182 XT-4 system for the connection of 4 digital sensors with 3 relays and PROFIBUS-DP connection, delivery scope DIQ/S 182 with MIQ/JB   | 472 017          |
| DIQ/S 182 XT-4 - MOD                               | Dual 182 XT-4 system for the connection of 4 digital sensors with 3 relays and MODBUS RTU / RS-485 connection, delivery scope DIQ/S 182 with MIQ/JB   | 472 019          |
| DIQ/S 182 XT-4/24V                                 | Dual 182 XT-4 system for the connection of 4 digital sensors with 5 analog outputs (0/4 - 20 mA) and max 6 relays for the 24 V AC/DC power supply, delivery scope DIQ/S 182/24V with DIQ/CR3                  | 472 021          |
| DIQ/S 182 XT-4 - PR/24V                            | Dual 182 XT-4 system for the connection of 4 digital sensors with 3 relays and PROFIBUS-DP connection for 24V AC/DC power supply, delivery scope DIQ/S 182 24V with MIQ/JB                                    | 472 023          |
| DIQ/S 182 XT-4 - MOD/24V                           | Dual 182 XT-4 system for the connection of 4 digital sensors with 3 relay outputs and MODBUS RTU / RS 485 connection for 24 V AC/DC power supply, deliver scope DIQ/S 182/24V with MIQ/JB                     | 472 024          |
| <b>DIQ Modules</b>                                 |   | <b>Order No.</b> |
| DIQ/JB   | Dual IQ/Junction box for connection of a second or a further IQ sensor to the Universal Transmitter DIQ/S 182 (system 182)  | 472 005          |
| DIQ/CHV  | Dual IQ/Cleaning Head Valve for automatic air cleaning controlled by a relay for system 182 (relay and compressed air supply external)  | 472 007          |
| MS/DIQ   | Mounting plate for up to 2 DIQ modules (DIQ/CHV and DIQ/JB)   | 472 009          |
| <b>MIQ Module and Cables for System Supplement</b> |   | <b>Order No.</b> |
| MIQ/Blue PS SET                                    | Module IQ/Radio transmission, for wireless connection within the IQ SENSOR NET system, for system 182, 184 XT and 2020 XT. SET with two pairwise preconfigured modules  | 480 021          |
| MIQ/VIS  | Module IQ/VIS for connecting one UV/VIS probe NitraVis®/CarboVis®/NiCaVis® 700 IQ to the IQ SENSOR NET, fo system 2020 XT, 184 XT and 182   | 481 029          |
| MIQ/PS   | Module IQ/Power Supply, wide-range power supply for system 182, 2020 XT and 184 XT, power output max. 18 W  | 480 004          |
| MIQ/24V  | Module IQ/24V, power supply for 24 VAC / 24 VDC input voltage, for system 182, 2020 XT and 184 XT, power output max. 18 W   | 480 006          |
| SNCIQ  | Specific two-wire IQ SENSOR NET cable with shield for safe power/information transfer within the IQ SENSOR NET system. Please indicate cable length in m when ordering (unit: m)                              | 480 046          |
| SNCIQ/UG   | Specific two-wire IQ SENSOR NET cable with shield for safe power/information transfer within the IQ SENSOR NET system, esp. for use in underground. Please indicate cable length in m when ordering (unit: m) | 480 047          |
| <b>Mounting Material for Monitors</b>              |   | <b>Order No.</b> |
| SSH/IQ   | Sun shield for mounting of IQ SENSOR NET modules and series 171/170 monitors to mounting stands   | 109 295          |
| PMS/IQ   | Kit for panel mounting of IQ SENSOR NET modules   | 480 048          |
| THS/IQ   | Kit for top hat rail mounting of IQ SENSOR NET modules  | 480 050          |
| WMS/IQ   | Kit for wall mounting of IQ SENSOR NET modules  | 480 052          |
| SD/K 170   | Sun shield for outdoor installation of junction boxes (e.g. junction boxes KI/pH 170) or an IQ SENSOR NET module  | 109 284          |
| MR/SD 170  | Mounting kit for attaching of sun shields to pipes  | 109 286          |

