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 conseivable 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).

General Description of Meters

Monitors

IQ Sensor Net

Analyzer

Sample Preparation

Samplers

Accessories

Measuring stations

NEW

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

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.
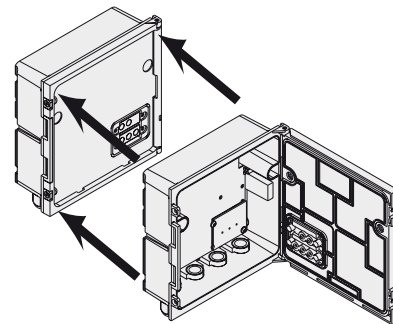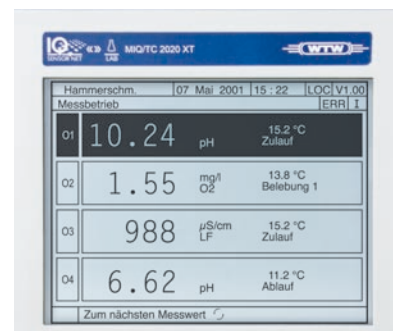
Distributed mounting of modules

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.

MIQ/T2020 or
MIQ/T2020 PLUS

MIQ/JB   MIQ/JB

SNCIQ (/UG)
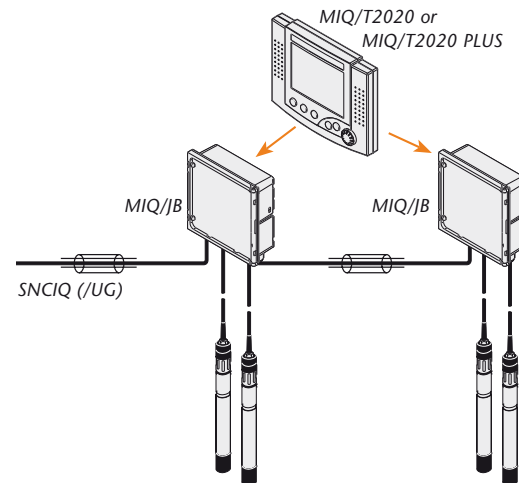
Measurement display

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.

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of Meters

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IQ SENSOR NET

Analyzer

Sample
Preparation

Samplers

Accessories

Measuring
stations

Principal system architecture IQ SENSOR NET System 2020 XT

IQ sensors/connecting modules

Max. 20 sensors

MIQ/JB
MIQ/JBR
Junction boxes

IQ SENSOR NET

MIQ/JB
MIQ/JBR
Junction boxes

IQ SENSOR NET

MIQ/IC2
mA input current box

2 × mA inputs

IQ SENSOR NET

Further
modules

Terminal-/Controller

MIQ/PS
MIQ/24 V
Central power
supply up to
6 modules/system

IQ SENSOR NET

MIQ/TC 2020 XT
Central unit permanently installed

Mobile Terminal
Same component – differently configured

MIQ/TC 2020 XT
2 further mobile terminals
can be docked onto any module
within the system

Output modules
analog/digital

MIQ/CR3
MIQ/C6
MIQ/R6
Analog output
modules (mA/relay)

IQ SENSOR NET

MIQ/IF 232
MIQ/RS
MIQ/PR
MIQ/MOD
MIQ/A-RS
MIQ/A-PR
MIQ/A-MOD
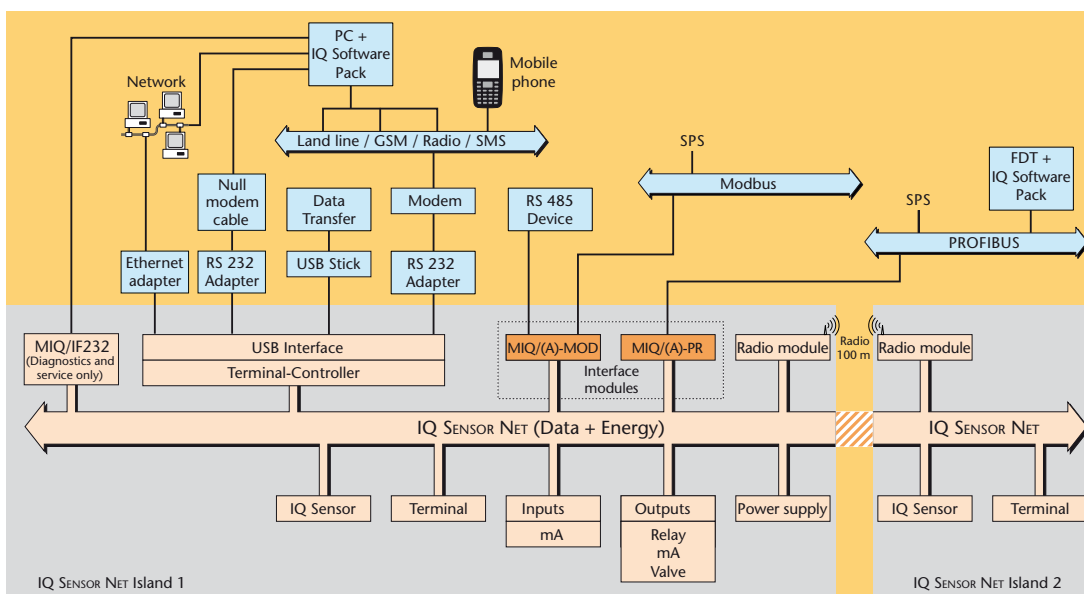Digital output
modules

1 0 1

SPS

Digital communication with the IQ Net

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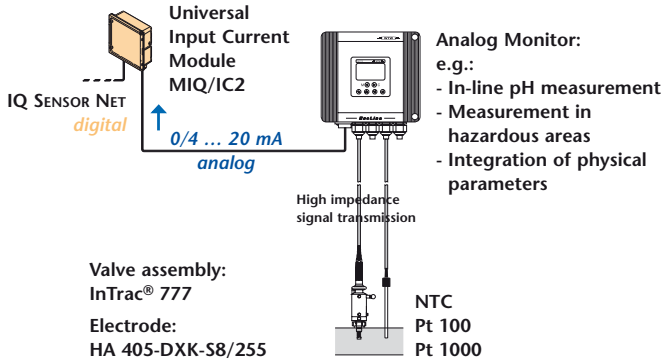RS-232 interface

MIQ/PR modul IQ
with PROFIBUS-DP connection

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

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

PC +
IQ Software
Pack

Network

Mobile
phone

Land line / GSM / Radio / SMS

SPS

Modbus

SPS

FDT +
IQ Software
Pack

PROFIBUS

Null
modem
cable

Data
Transfer

Modem

RS 485
Device

Ethernet
adapter

RS 232
Adapter

USB Stick

RS 232
Adapter

MIQ/IF232
(Diagnostics and
service only)

USB Interface

Terminal-Controller

MIQ/(A)-MOD

MIQ/(A)-PR

Radio module

Radio
100 m

Radio module

Interface
modules

IQ SENSOR NET (Data + Energy)

IQ SENSOR NET

IQ Sensor

Terminal

Inputs
mA

Outputs
Relay
mA
Valve

Power supply

IQ Sensor

Terminal

IQ SENSOR NET Island 1

IQ SENSOR NET Island 2

Additional
IQ SENSOR NET
islands possible.

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Example 1: Integration of an Analog Monitor

Universal Input Current Module MIQ/IC2

IQ Sensor Net *digital*

0/4 … 20 mA *analog*

Analog Monitor:
e.g.:
- In-line pH measurement
- Measurement in hazardous areas
- Integration of physical parameters

High impedance signal transmission

Valve assembly: InTrac® 777

Electrode: HA 405-DXK-S8/255

NTC
Pt 100
Pt 1000

Example 2: Integration of an Analyzer

2 x MIQ/IC2 Universal Input Current Modules

IQ Sensor Net *digital*

0/4 … 20 mA *analog*

Analyzer e.g. Measurement in the effluent
- Ammonium
- Nitrate
- Phosphate
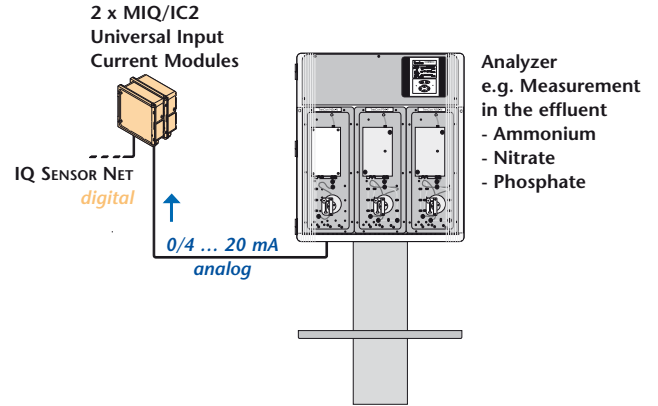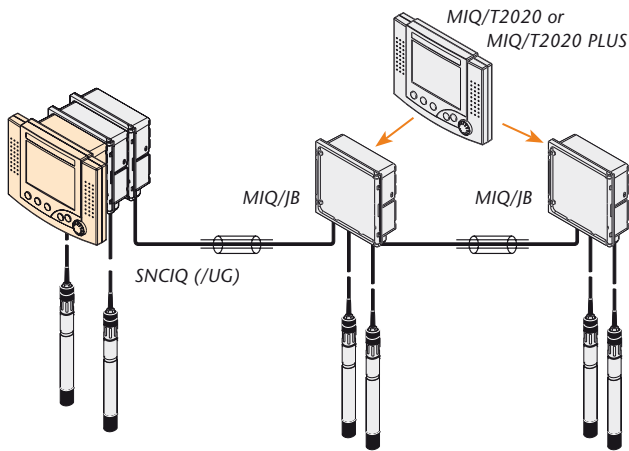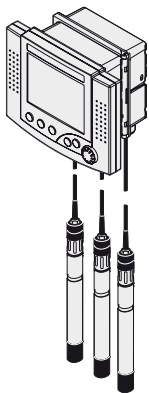
Configuration example 1:

- 6 IQ sensors (each 2 measuring points)

- Large distances between 3 measuring points

- Mobile terminal can be connected to both

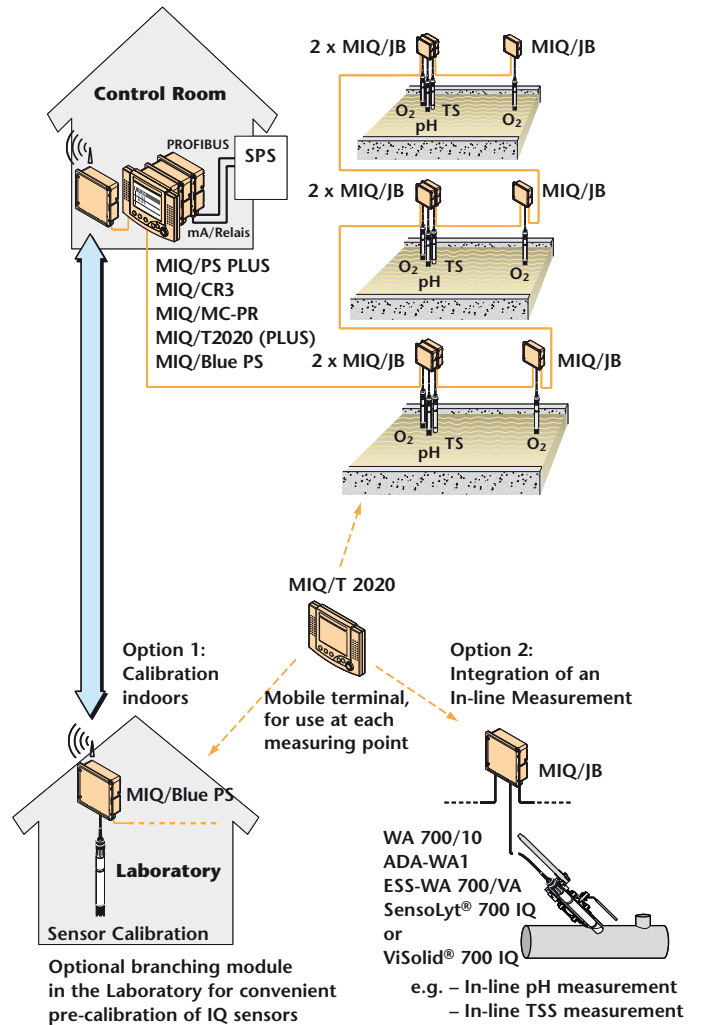- MIQ/JB modules, for i.e. obtaining an additional measurement display or for processing a calibration on site.

MIQ/T2020 or MIQ/T2020 PLUS

MIQ/JB

MIQ/JB

SNCIQ (/UG)

Example MIQ/ TC 2020 XT-H3 with decentralized assembly

Example MIQ/ TC 2020 XT-H3

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).

2 x MIQ/JB   MIQ/JB

Control Room

O₂ TS pH   O₂

PROFIBUS   SPS

2 x MIQ/JB   MIQ/JB

mA/Relais

O₂ TS pH   O₂

MIQ/PS PLUS
MIQ/CR3
MIQ/MC-PR
MIQ/T2020 (PLUS)
MIQ/Blue PS   2 x MIQ/JB   MIQ/JB

O₂ TS pH   O₂

MIQ/T 2020

Option 1: Calibration indoors

Mobile terminal, for use at each measuring point

Option 2: Integration of an In-line Measurement

MIQ/JB

MIQ/Blue PS

Laboratory

WA 700/10
ADA-WA1
ESS-WA 700/VA
SensoLyt® 700 IQ
or
ViSolid® 700 IQ

Sensor Calibration

Optional branching module in the Laboratory for convenient pre-calibration of IQ sensors

**e.g. – In-line pH measurement
– In-line TSS measurement**

General Technical Data System 2020 XT

System

Certifications	ETL, cETL (conforms with relevant UL and Canadian standards), CE
Electromagnetic Compatibility	EN 61326, Class B; FCC Class A, EMC for indispensable operation
Integrated Lightning Protection	According to EN 61326 enhanced overvoltage protection for the entire system, implemented in each component
Connection Medium Cable	IQ SENSOR NET cable SNCIQ or SNCIQ/UG (underground cable with additional PVC coating): 2-wire with shield; 2 x 0.75 mm^2; Filler cord for easy connection of shield: 0.75 mm^2; pressure resistant to 10 bar
Connection Characteristics	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 Total cable length: max. 1.000 m/1094 yds (without signal amplifying), with signal amplifying module MIQ/JBR additional 1.000 m/1094 yds
Connection Medium Radio	Radio transmission Class 1 with a range of 100 m/109 yds (max. 300 m/328 yds)
Connection Characteristics	Data transmission, separate power supply necessary for each island

Controller/Terminal

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

Modules

MIQ Module Coupling at Front	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
MIQ Module Coupling at Rear	Combined mechanical and electrical connection for docking additional modules, a total of 3 modules as a stack mounted unit
Cable Feeds	4 screw cable glands M 16 x 1.5
Terminal Connections	Screw terminal strips Terminal area for solid conductors: 0.2 ... 4.0 mm^2 Terminal area for flexible conductors: 0.2 ... 2.5 mm^2 accessible by opening cover

IQ SENSOR NET Terminal Connections	Terminal connections for the IQ SENSOR NET are available on each module and can be used as required:
	               - for connecting sensors
	               - as an input/output or for looping through/branching of the IQ SENSOR NET cable

Other Functions	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)
Electric Supply	Directly via the IQ SENSOR NET
Ambient Conditions	Operating temperature: -4 … 131 °F (-20 … +55 °C); Storage temperature: -13 … 149 °F (-25 … +65 °C)
Housing Material	PC – 20 % GF (polycarbonate with 20 % fiberglass)
Protection Rating	IP 66 / equivalent to NEMA 4X (not suitable for conduit connection)
Dimensions (W x H x D)	5.67 x 5.67 x 2.05 in. (144 x 144 x 52 mm)
Weight	Approx. 1.1 pounds (0.5 kg)
Guaranty	3 years for defects of quality

Sensors

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