evoqua
WATER TECHNOLOGIES

WALLACE & TIERNAN® DATA MANAGEMENT PROCESS MONITORING SYSTEM

INSTRUCTION MANUAL

Please note

Original manual!

Contents

1. Introduction

1.1 Documentation

1.1.1 Target groups

This instruction manual is intended for installation, operating and maintenance personnel and contains information on installation, operation and servicing of the Process Monitoring System.

All persons working with the Process Monitoring System must have read and understood the instruction manual, especially the safety notes and instructions.

1.1.2 Documentation structure

This instruction manual contains important information for safe and reliable, trouble-free and economical operation of the Process Monitoring System. Observance of this information helps to prevent danger, cuts repair outlay and downtimes and also increases the reliability and service life of the Process Monitoring System.

The chapters Installation, Commissioning and Maintenance are intended only for trained and authorized service personnel. These chapters contain important information on the assembly, configuration, commissioning and start-up, maintenance and repair of the Process Monitoring System that should only be performed by this target group.

Please consult the table of contents and the index to quickly find the information you require.

1.2 Conventions

Please note

This instruction manual contains a number of notes with different priorities which are marked with icons.

Icon	Note	Signification
	*Danger!*	Imminent danger to life and limb; failure to remedy the situation will lead to serious or fatal injury.
	*Warning!*	Danger to life and limb; failure to remedy the situation may lead to serious or fatal injury.
	*Caution!*	Failure to observe this information may lead to moderately serious or minor injury or material damage.
	*Warning!*	Danger of electric shocks.
	*Please note*	These notes facilitate work with the unit.

2. Safety

2.1 Intended use

The Process Monitoring System is designed exclusively for recording and visualization of and remote access to the data of the Wallace & Tiernan measuring, control and process systems connected at the RS485 bus.

The operational safety of the Process Monitoring System is only guaranteed when it is put to its intended use. It may be used only for the purpose stipulated in the order and under the installation, operating and ambient conditions described in this instruction manual. All inspection and maintenance work must be performed at the prescribed intervals.

Compliance with the intended use of this device also includes reading of this instruction manual and observance of all instructions which it contains.

The owner bears full responsibility for any use of the unit which is not in keeping with the stipulated applications.

2.2 General Safety Instructions

The manufacturer places great value upon safety when working with the unit. This was already taken into account in the design of the system, by the integration of safety features.

Safety instructions

The safety instructions in this documentation must always be observed. These do not affect the validity of any additional national or works safety instructions.

Safety instructions on the device

All safety instructions attached to the device must be observed. They must always be complete and easily legible.

Technical standard

The device was constructed in accordance with the state of the art and all recognized technical safety-relevant regulations. However, if the device is used by untrained personnel, potentially fatal hazards may occur for the user or third parties during use of the device, and damage to the system and other equipment may also result. Work which is not described in this instruction manual may only be performed by authorized personnel.

Personnel

The owner of the overall system must ensure that only authorized and qualified specialized personnel is permitted to work with and on the device within their defined scope of competence.
„Authorized and specialized personnel" refers to trained technicians of the operator, the manufacturer and if applicable the service partner. Only qualified electricians may perform work on electrical components.

Spare parts / components

Correct operation of the device is only guaranteed if original spare parts and components are employed in the combination described in this instruction manual. If this is not observed, there is the risk of malfunction or damage to the device.

Modifications and extensions

Never attempt to perform any modifications, extensions or conversions on the unit that could have an adverse affect on safety.

Electrical power

All work on electrical components must be performed by electricians or personnel instructed by and working under the supervision of an electrician and in accordance with the acknowledged electrical engineering practices.

The control system must be closed during normal use. Connect cables in accordance with the wiring diagram.

Warning!

Risk of injury or death!

External voltages may be connected even with the operating voltage switched off. Switch the device off immediately in the event of malfunctions in the electrical power supply!

IT security

The manufacturer offers IT security mechanisms for its products to support secure system operation. Werecommend checking on a regular basis to see what information is available regarding IT safety developments for your products. Information on this can be found on the Internet.
For the safe operation of an installation, it is furthermore necessary to integrate the automation components into a holistic IT security concept which comprises the entire system and is in accordance with latest state of the art technology. In the process, implemented products deriving from other manufacturers should be taken into account.

Disposal

Ensure safe disposal of agents and replaced parts in accordance with environmental regulations.

2.3 Guarantee conditions

The following apply for compliance with the guarantee conditions:

- Installation and commissioning by manufacturer or trained and authorized personnel, e. g. of contracted companies
- Intended use
- The operation parameters and settings must be met
- The system may only be operated by instructed personnel
- Performance of the prescribed maintenance work
- The use of original spare parts

If any of the above conditions are not met, the guarantee is revoked.

2.4 Disclaimer statement

We expressly point out that we can accept no liability for damage arising from the installation and operation of these hardware and software components. This applies in particular to compatibility with software and hardware components selected by you.

We accept no liability for losses incurred by the purchaser (this applies in particular to loss of profit, data loss and interruption of operation) as a result of the use of the Process Monitoring System nor for any other damage. Installation is performed exclusively at the purchaser's own risk!

We have examined the content of this instruction manual for conformity with the hardware and software described. Nevertheless, deviations cannot be entirely ruled out, and we therefore cannot guarantee complete conformity. The information in this instruction manual is regularly reviewed, and any corrections which may become necessary are included in subsequent versions.

2.5 Defined phases of operation

Normal operation

Refrain from any work procedures which may impair safety!

Only operate the device with the housing closed!

Check the device at least once per day for outwardly visible signs of damage and defects! Report any changes (including changes in operating characteristics) to the relevant authority/person immediately!

Switch the device off immediately in the event of malfunctions! Have faults remedied immediately!

Installation and maintenance work

Perform all installation and maintenance work as instructed in this instruction manual and in the technical documentation for installed components!

Secure the device against being switched back on before performing installation or maintenance work!

Connect loose cables in accordance with the wiring diagram!

Always tighten loose threaded connections!

Where prescribed, de-energize all parts of the device on which inspection, maintenance or repair work is to be performed. Before commencing work, check that the components are de-energized.

Do not use aggressive cleaning agents (e.g. methylated spirits)! Clean using a damp cloth only.

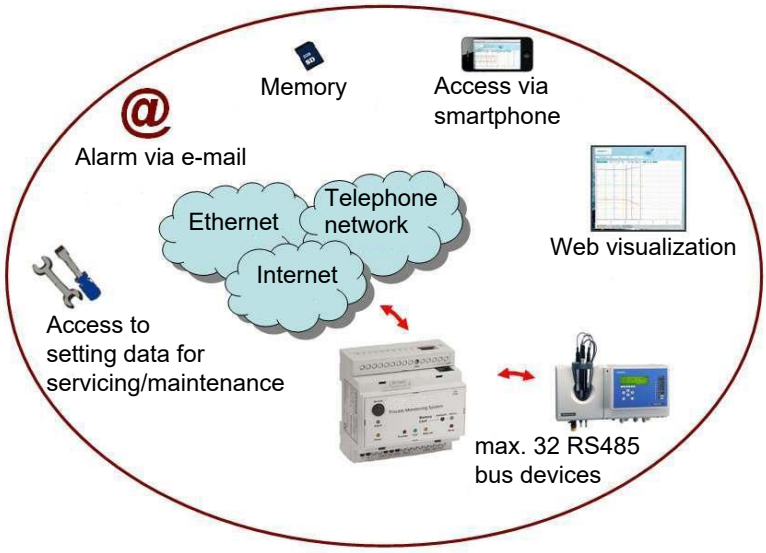
Ensure safe disposal of agents and replaced parts in accordance with environmental regulations.

3. Description

3.1 General

The Wallace & Tiernan Process Monitoring System is a web-technology-based visualization system for connection to Wallace & Tiernan measuring, control and process systems.

The Process Monitoring System is used for the remote diagnosis, collection, archiving and monitoring of process data in potable water, swimming pool and process water treatment plants.



3.2 Function

The data exchange between the Process Monitoring System and Wallace & Tiernan measuring, control and process systems is via a serial digital RS485 interface. The RS485 bus system records a wide variety of process parameters for the individual devices. Specific process parameters can be influenced via digital communication. Parameters such as setpoints, limit values etc. can be changed via the Process Monitoring System.

The Process Monitoring System is equipped with a LAN interface as standard and a WLAN USB key can be retrofitted as an option.

The memory of the Process Monitoring System is protected against power failure. Through web-enabled devices, parameters can be analyzed, visualized and changed via a browser. Data can be displayed in tabular or graphic format as a line diagram.
The Process Monitoring System automatically creates month files for each device connected to the bus. Access is via four user levels. The data are updated daily and can be downloaded via the web interface or copied directly from the memory card.
The Process Monitoring System also allows you to define alarm events which are displayed as messages in the message window and can also be sent to e-mail addresses as an event mail.
Firmware updates can be performed on-site via SD memory card.

The RS485 bus can be used for distances of up to 1200 meters.

The Process Monitoring System has an integrated web server to call up the measurement data for the connected devices. The web server pages can be visaulized with a standard browser via a LAN connection or via WLAN using a WLAN USB key.

Please note

The Process Monitoring System acts as a master on the RS485 bus and cannot be used with other measurement data recording systems, e.g. control rooms, CMS, OPC servers, SECO S7, at this interface.

3.3 Design

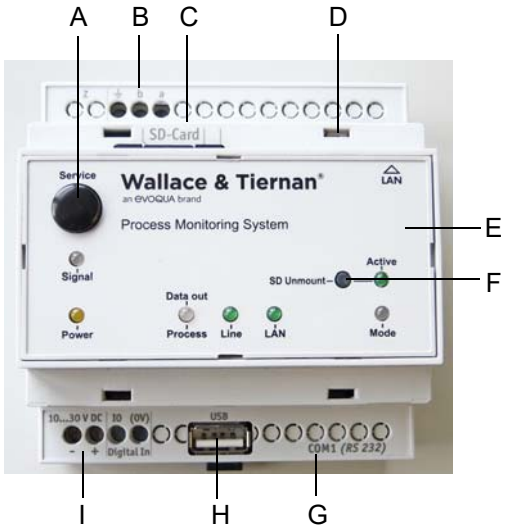
Essentially, the Process Monitoring System comprises:

- Housing with connecting terminals for mounting on a top-hat rail
- Front plate with signal and operating elements
- Integrated electronic system with web server
- Slot for SD memory card
- RS485 interface with screw terminals and integrated DIP switches for bus termination
- RS232 interface (not used, programming interface only)
- Ethernet connection
- Power supply
- USB-interface is used to connect a WLAN USB key

In addition, the Process Monitoring System in circuit-breaker housing comprises:

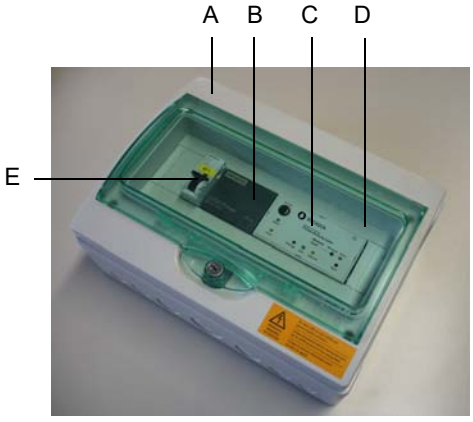
- Circuit-breaker housing with transparent cover and lock
- Power supply unit
- Circuit breaker

Process Monitoring System LAN (Example standalone device)



A Service button
B COM2 (RS485)
C Slot for SD memory card (max. 32 GB)
D Ethernet port (RJ45)
E Front plate with signal and operating elements
F Unmount button
G COM1 (RS232)
H USB port
I Power supply

Process Monitoring System installed in circuit-breaker housing and fully wired



A Circuit-breaker housing
B Power supply unit
C Process Monitoring System LAN
D Transparent cover with lock
E Circuit breaker

3.4 Versions

The Process Monitoring System is available in the following versions:

Article No.	Description
W3T230717	Process Monitoring System LAN as a standalone device with Ethernet interface, USB interface, universal power supply unit and accessories
W3T230719	Process Monitoring System LAN in circuit-breaker housing, fully wired, with integrated power supply unit and accessories

Following optional accessories are available:

Article No.	Description
W3T395573	WLAN USB key

Please note

Other manufacturer‘s WLAN-USB keys can not be used.

3.5 Technical Data

Process Monitoring System as standalone device

Dimensions (WxHxD)	88mm x 57mm x 91mm
Weight	approx. 200 g
Power supply	10 – 30 V DC 120mA at 24V

Process Monitoring System in circuit-breaker housing

Dimensions (WxHxD)	267mm x 200mm x 112mm
Weight	approx. 1.4 kg
Power supply	100 – 240 V AC ± 10 %, 50 – 60 Hz, 4.5 W

Insulation

Overvoltage category	2
Contamination level	2

Operational conditions

Ambient temperature	Operation: 0...+50°C Storage: -30...+70°C
Humidity	5...95% relative humidity, non-condensing
Environment	no direct exposure to sunlight
Air pressure	75 – 106 Kpa
max. altitude of installation	2000 m

Interfaces

RS232	Please note: This interface is not used on the customer side.
RS485	Threaded connection for RS485 not galvanically isolated from DC supply, termination integrated, activatable via DIP switch, max. transmission distance 1200 m
Ethernet connection	10/100 Base-T corresponding to IEEE 802.3 8P8C port (RJ45), shielded, min. galvanic isolation to device 1500 V
SD slot	max. 32 GB memory
USB port	Used to connect a WLAN USB key

Operating elements

Service button, Unmount button

Housing/installation

DIN-rail housing, on top-hat rail 35mm in acc. with EN50022, vertical or horizontal

Protection (Process Monitoring System as standalone device)

IP20

Protection (Process Monitoring System in circuit-breaker housing)

IP65

4. Installation

4.1 Scope of supply

Depending on the order, the following are included in the scope of supply:

Process Monitoring System as a standalone device:

- Process Monitoring System
- SD memory card
- Universal power supply unit
- Ethernet connection cable
- Instruction manual

Process Monitoring System in circuit-breaker housing:

- Process Monitoring System in circuit-breaker housing
- SD memory card
- Power supply unit
- Ethernet connection cable
- Installation accessories, dowels and screws
- Instruction manual

Optional accessories

- WLAN USB key

Please note

Other manufacturer‘s WLAN USB keys can not be used.

4.2 Transport and storage

Transport

The Process Monitoring System is dispatched in standard packaging. The packaged Process Monitoring System must be handled carefully during transport and must not be exposed to damp conditions or moisture.

Check that the transport packaging is undamaged. Notify the forwarding agent immediately of any damage. Failure to do so will invalidate any subsequent claims for damages. If the Process Monitoring System is damaged, please contact your dealer immediately.

Keep the packaging until the Process Monitoring System has been duly commissioned.

Storage

The Process Monitoring System must be stored in a dry place and protected against the elements.

4.3 Mechanical installation

Warning!

Danger of injury or damage to the device!

The Process Monitoring System must be installed by authorized and qualified technicians. All electrical work on the Process Monitoring System must be performed by qualified electricians. Modifications to the system beyond what is described in this manual are not permitted.

Please note

Compliance with requirements with regard to the environemt is a precondition for safe and reliable operation of the Process Monitoring System. Observe the relevant national and local regulations!

Installation location

- The Process Monitoring System may only be used in dry and clean rooms and is not suitable for outdoor installation.
- Protect the Process Monitoring System against moisture, sprayed water, exposure to heat and direct sunlight.
- Do not use the Process Monitoring System in environments containing combustible gases, vapors or dust or conductive dust.
- Do not expose the Process Monitoring System to jolting or strong vibration.

Mechanical installation

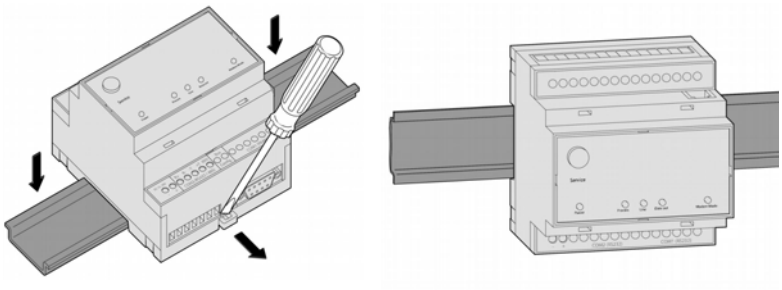
Please note

Mechanical installation differs depending on whether the Process Monitoring System is a standalone device or a device in circuit-breaker housing.

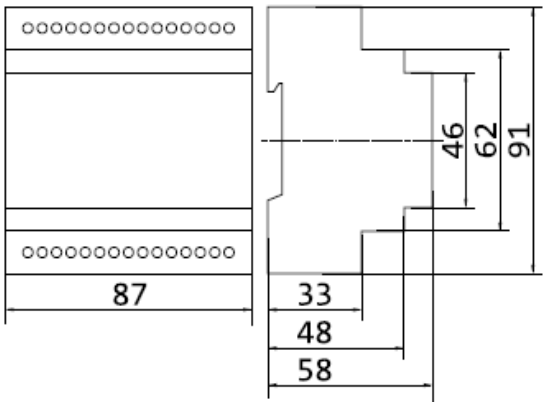
Process Monitoring System as a standalone device

Proceed as follows for mechanical installation of the Process Monitoring System as a standalone device:

1 Slide or snap the Process Monitoring System into place on a DIN rail (top-hat rail 35 x 15 mm or 35 x 7.5 mm in accordance with EN 50022), e.g. control cabinet installation.



Dimensions



Please note

All dimensions are given in millimeters.

2 Then perform electrical installation (see 4.4 “Electrical installation”).

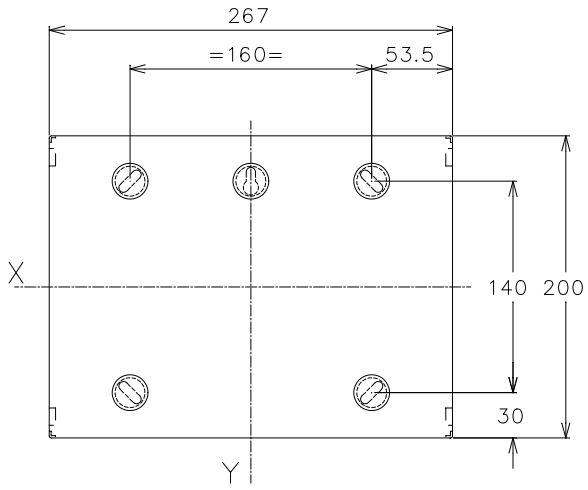
Process Monitoring System installed in circuit-breaker housing

Proceed as follows for mechanical installation of the Process Monitoring System in circuit-breaker housing:

1 Open the transparent cover of the Process Monitoring System in circuit-breaker housing.

2 Open the lid of the circuit-breaker housing. To do this, release the four screws on the lid and remove the lid.

3 Mount the circuit-breaker housing on the wall with the help of the drilling template below and the screws and dowels provided.



Please note

All dimensions are given in millimeters.

4 Fit the blind covers over the screws.

5 Then perform electrical installation (see 4.4 “Electrical installation”).

4.4 Electrical installation

Warning!

Danger of injury or damage to the device!

The Process Monitoring System must be installed by authorized and qualified technicians. Connect the Process Monitoring System in accordance with the wiring diagrams and the relevant national and local regulations.
Connect the system components as shown in the wiring diagrams (chapter 8. “Wiring diagram”).

Warning!

Danger of injury or damage to the device!

The Process Monitoring System is not equipped with a power switch and is in operation as soon as it is connected to the DC voltage supply. For this reason, an external switch or protective switch must be provided to allow disconnection of the power supply.

Caution!

Danger of injury or damage to the device!

A knowledge of the connected devices and machines with regard to their operation, electrical ratings, measuring signals, wiring, fuse protection and the applicable safety regulations is a precondition for safe and reliable commissioning.
Devices which are not correctly connected may be damaged or destroyed when they are switched on or during operation and may trigger malfunctions in other equipment. Make sure that measuring and control cables are not mixed up and that there is no contact between them. Do not connect or release live cables!

Please note

A C10A, B16A or C16A pre-fuse must be installed in the mains supply line when connecting the Process Monitoring System in circuit-breaker housing to a 230 V or 115 V supply.

Warning!

Danger of injury or damage to the device!

De-energize the Process Monitoring System before wiring it up.

The Process Monitoring System is equipped with a flexible voltage supply input for DC voltages of 10 – 30 volts. Take the power consumption into consideration during configuration. See chapter 3.5 “Technical Data”.

Electrical installation of the Process Monitoring System as a standalone device

Proceed as follows:

1 Connect the DC supply as shown in the wiring diagram for the Process Monitoring System (see chapter 8. “Wiring diagram”).

Please note

Observe the correct polarity of the voltage connections and correct dimensioning of the cable cross-sections (see chapter 3.5 “Technical Data” - Power consumption).

2 Wire the RS485 bus as specified (see chapter 8. “Wiring diagram” and chapter 4.6.1 “RS485 bus system” to chapter 4.6.4 “RS485 bus system installation”).

3 Plug the LAN connection cable into the LAN port (RJ45).

4 Insert the SD memory card.

5 Connect the WLAN USB key (optional) to USB port.

6 Then put the Process Monitoring System into operation (see chapter 4.5 “Initial commissioning” and chapter 4.6 “Setting up the Process Monitoring System, interfaces”).

Electrical installation of the Process Monitoring System in circuit-breaker housing

Proceed as follows:

1 Connect the power supply as shown in the wiring diagram (see chapter 8. “Wiring diagram”).

2 Wire the RS485 bus as specified (see chapter 8. “Wiring diagram” and chapter 4.6.1 “RS485 bus system” to chapter 4.6.4 “RS485 bus system installation”).

3 Install the LAN connection cable with the special cable gland provided and plug it into the LAN port (RJ45).

Please note

Ensure that all cable glands are correctly installed.

4 Insert the SD memory card.

5 Connect the WLAN USB key (optional) to USB port.

6 Replace the lid of the circuit-breaker housing and attach with the four screws.

7 Then put the Process Monitoring System into operation (see chapter 4.5 “Initial commissioning” and chapter 4.6 “Setting up the Process Monitoring System, interfaces”).

4.5 Initial commissioning

The Process Monitoring System can be operated with a LAN connection and/or a WLAN connection (if a WLAN USB key is installed). As a rule, commissioning is performed on-site via a network connection (see next chapter).

4.5.1 Commissioning the Process Monitoring System via LAN connection

Proceed as follows:

1 When the Process Monitoring System has been installed and electrically connected, connect the PC/laptop to the Process Monitoring System via patch cable (network cable provided - 1:1 or crossover). To do this, plug the network cable into the corresponding port.

2 Switch on the power supply.
After a self-test lasting approx. 13 seconds, the Process Monitoring System is ready for operation (see chapter 4.6.8 “Switching the device on Self-test”).

3 To put the Process Monitoring System into operation and configure it, the Process Monitoring System must first be configured via a direct network connection on the PC/laptop. For instructions on how to install a direct network connection to the Process Monitoring System, see chapter 4.6.9 “Direct network connection” and chapter 4.6.10 “Network connection in a LAN”.
If the Process Monitoring System is not to be installed in a network, a permanent direct connection between a PC/laptop and the Process Monitoring System can be used.

Please note

First, a fixed IP address in the same range as the Process Monitoring System must be set at the PC/laptop in order to establish a connection to the Process Monitoring System. See chapter 4.6.10 “Network connection in a LAN” to chapter 4.6.12 “Network setting under Windows 7”.

Example:

	Process Monitoring System	**Laptop/PC**
IP address	192.168.200.4 (factory setting)	192.168.200.1
Network mask	255.255.255.0 (factory setting)	255.255.255.0

4 Ensure that all Wallace & Tiernan measuring, control and process systems are correctly connected to the RS485 interface (see chapter 4.6.1 “RS485 bus system” to chapter 4.6.4 “RS485 bus system installation”).

Please note

Set the bus devices to bus operation.
No double assignment of bus addresses.
Observe the correct balancing and termination of the bus configuration.

5 Open the browser and enter the IP address „http://192.168.200.4." The Process Monitoring System start screen appears (see screenshot below), see chapter 5.2 “Login”.

6 Configure the Process Monitoring System. User level 3 must be accessed. To do this, enter the user name and password assigned at the factory:

User name	wt3
Password	9043

The „Setup" screen now appears.

Please note

To prevent unauthorized access by other users, the user levels and passwords set at the factory should be changed to customer-specific settings. See chapter 5.4.5 “Password settings”. You can document the settings in chapter 10. “Setting data”.

7 In the menu „Setup", open menu item „Basic settings". Set the language and current time. See chapter 5.4.2 “Basic settings”.

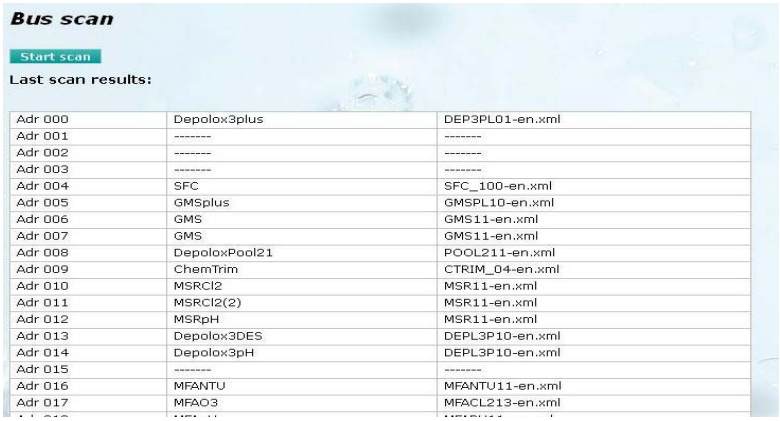
8 In the menu „Setup," open menu item „Bus scan" and perform a bus scan. To do this, click on „Start scan." See chapter 5.4.1 “Bus scan”.

Please note

With 32 bus devices, the bus scan may take up to seven minutes. The bus scan will be correspondingly shorter if there are fewer bus devices.

After the bus scan, a list of the connected devices is displayed. If no bus devices are displayed in the list after a bus scan, please refer to chapter 5.9 “Faults and remedy”.

Example view (see screenshot below) after a bus scan with several bus devices.



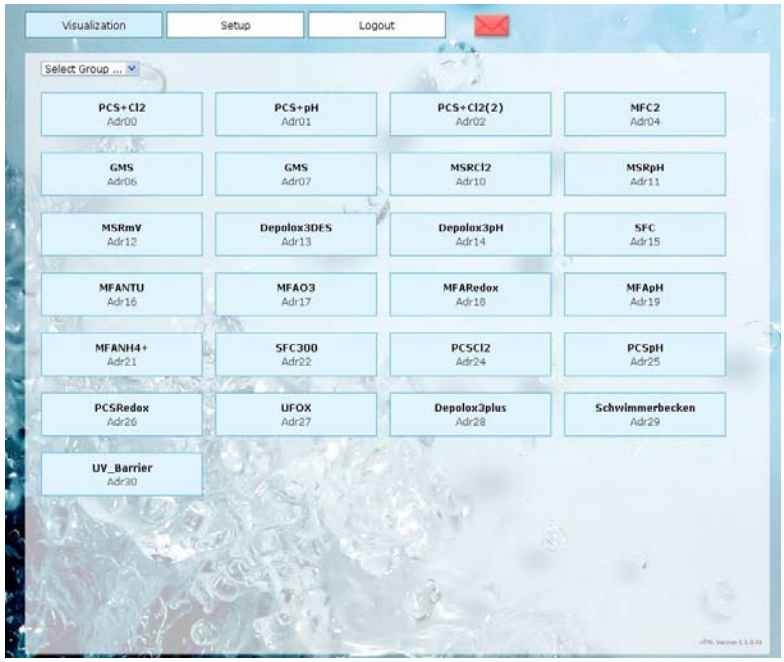
9 In the menu „Setup", open menu item „Name settings" and assign customer-specific names for the connected devices, e. g. „SFC - swimmer's pool." See chapter 5.4.6 “Name settings”. If no customer-specific names are assigned, the standard names of the devices will be displayed later.

10 Access the menu „Visualization". To do this, log out by clicking on the „Logout" button. The Process Monitoring System start screen now appears (see chapter 5.2 “Login”).

11 User level 2 must be accessed. To do this, enter user name and password. If they have not been changed by the customer, the user name and password set at the factory must be used:

User name	wt2
Password	9042

The detected devices now appear in the overview.



12 Device data, remote adjustment of parameters and trend display can now be viewed by clicking on one of the device buttons. See chapter 5.3 “„Visualization" menu”.

13 In order to operate the Process Monitoring System in a network, the IP configuration must be adjusted to the network. To do this, log out by clicking on the „Logout" button. The Process Monitoring System start screen now appears (see chapter 5.2 “Login”).

14 User level 4 must be accessed. To do this, enter user name and password. If they have not been changed by the customer, the user name and password set at the factory must be used:

User name	wt4
Password	9044

See chapter 5.4.11 “IP Configuration” to chapter “Setting the IP address of the Process Monitoring System with DHCP”.

Please note

Please contact the network administrator to adjust the network settings to network-specific settings!

15 Further settings on the Process Monitoring System, such as event configuration, mail settings etc., are described in detail in chapter 5. “Operation”.

16 After completing initial commissioning, click on „Logout" and if necessary.

17 In future, the Process Monitoring System will be accessed by entering the assigned IP address in the browser (see chapter 5.2 “Login”).

4.5.2 Commissioning the Process Monitoring System with a WLAN connection via an optional WLAN USB key

Proceed as follows:

1 When mechanical and eletrical installation of the Process Monitoring System has been completed and the WLAN USB key has been installed, it can be commissioned.

2 Ensure that all Wallace & Tiernan measuring, control and process systems are correctly connected to the RS485 interface (see chapter 4.6.1 “RS485 bus system” to chapter 4.6.3 “Settings for the DIP switches on the Process Monitoring System”).

Please note

Set the bus devices to bus operation.
No double assignment of bus addresses.
Observe the correct balancing and termination of the bus structure.

3 Switch on the power supply.
After a self-test lasting approx. 13 seconds, the Process Monitoring System is ready for operation (see chapter 4.6.8 “Switching the device on Self-test”).

4 Connect web-enabled device (tablet computers, smartphone, laptop computer, ect.) to the Process Monitoring System via WLAN. Following WLAN network must be used:

Network (Name)	PMS
Password	berlin2000

5 When the connection has been established, open the browser and enter the IP address „http://192.168.100.1." The Process Monitoring System start screen now appears; see chapter 5.2 “Login”.

6 Configure the Process Monitoring System. User level 3 must be accessed. To do this, enter user name and password. If they have not been changed by the customer, the user name and password set at the factory must be used:

User name	wt3
Password	9043

The „Setup" screen now appears.

7 The further procedure is described in chapter 4.5.1 “Commissioning the Process Monitoring System via LAN connection”, starting at point 7.

4.6 Setting up the Process Monitoring System, interfaces

4.6.1 RS485 bus system

The serial RS485 bus is configured as a symmetrical two-wire bus line in accordance with EIA RS485 (DIN66259 Part 4 and ISO 8482) which is suitable for long transmission lines (up to 1200 m) with a high transmission speed (19200 Baud).

It has the following characteristics:

- Data transmission is possible in both directions
- Data transmission via a two-wire line (half-duplex operation)
- Bus structure (addressable interface, up to 32 bus addresses)

The bus works with differential voltage signals. This ensures high immunity to interference.

Transmission is controlled in accordance with the master/slave principle. Communication is always controlled by a master (Process Monitoring System). Only the master can initiate communication. Without a control command from the master with the corresponding bus address, no bus device (slave) can begin communication.

RS485 bus devices

Wallace & Tiernan measuring, control and process systems can be connected to the Process Monitoring System via the RS485 bus. See following table.

Please note

Even if only one bus device on the RS485 bus is not galvanically isolated, the entire bus must be realized as a non floating bus structure!

potentially isolated	not galvanically isolated
• Electronic module 700 P (Process Monitoring System from Version 1.01.89) • Electronic module 700 M • DEPOLOX® Pool Version 1.06 and from Version 2.xx • MFC from Version 1.xx • SFC from Version 1.xx • TMS561 • Ezetrol touch • Witty Doscal • OSEC B-PAK • OSEC-A from Version 1.xx • Soprazon from Version 1.xx • OSEC-NXT from Version 1.xx • UFOX from Version 1.07 • UV Barrier from Version 2.00 • JETPAK from Version 1.xx with touch panel • DIOX-A 50-250 from Version 12-2015 with touch panel • DIOX-A 3/10 from Version 01-2016 with touch panel • MF485 from Version C_01/96 • PDI from Version A_04/93 • sopra-test premium 17 • STRANTROL Compact • Blu-Sentinel Pro • DEPOLOX® Pool Compact • BERMUDA-MSR 3 • ProReg 5 • OSEC®-L • soprazon-premium 19 • OSEC® Mini • DEPOLOX® 400 M	• PCS *plus* from Version 1.xx • Bermuda MSR/Sopra test (new)/Witty Pilot 2 from Version 2.xx • Ezetrol plus from Version 3.xx • PCS Plus E from Version 3.xx • GMS *plus* from Version 1.xx • GMS from Version A_06/01 • Depolox 3 plus (old) • Depolox 3 plus (new) from Version 1.xx • sopra-test (old 19” plug-in version) • Witty Pilot (old 19” plug-in version) • ProReg4 • PCU fuzzy from Version A_07/00 • MFA Cl_2, ClO_3, O_3, $KMnO_4$ from Version A_04/99 • MFA Cl-N from Version A_11/99 • MFA Cl++ from Version A_04/99 • MFA Fluoride from Version A_04/99 • MFA Conductivity from Version A_04/99 • MFA NTU from Version A_04/99 • MFA O_2 from Version A_04/99 • MFA pH from Version A_04/99 • MFA Redox from Version A_04/99 • MFA Temp. from Version A_04/99 • PCS from Version A_06/03 • PCS-ST from Version A_04/99 • MSR Control from Version C.07.03

4.6.2 RS485 interface on the Process Monitoring System (COM 2)

There are two ways to integrate the Process Monitoring System in an RS485 bus system:

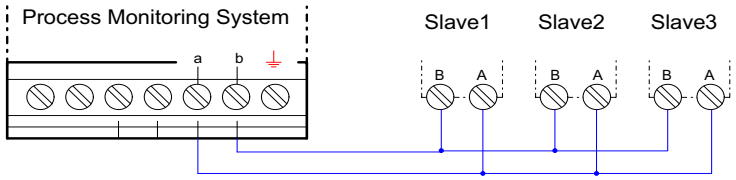
- Process Monitoring System at the front/back end of the bus
- Process Monitoring System between the bus devices

Process Monitoring System at the front end/back end of the bus

Please note

Observe the termination (terminating resistors at the front and back end of the bus) and balancing (resting potential)!
Balancing is not supported by the Process Monitoring System and must always be performed on a slave!

Example:
The Process Monitoring System is supplied with termination as standard, i.e. the Process Monitoring System is the first or last device in the bus structure.
In the example shown, slave 3 must be terminated correspondingly (i.e. terminated with 150 ohm terminating resistor), as it is the last device in the bus structure.
In addition, balancing must be ensured (only 1x in the bus) by one of the slaves (bus devices).
If a bus user is not available that is capable of achieving balance, an active bus terminator must be additionally installed (W2T547861).

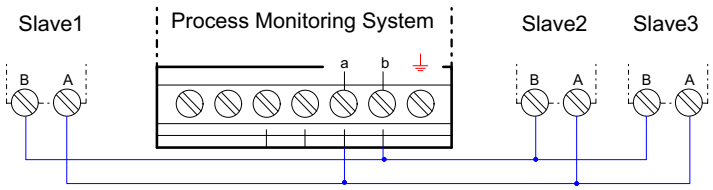


Process Monitoring System between the bus devices

Please note

In this installation, the DIP switches of the Process Monitoring System must be set to 2-wire RS485 without termination
(see chapter 4.6.3 “Settings for the DIP switches on the Process Monitoring System”).

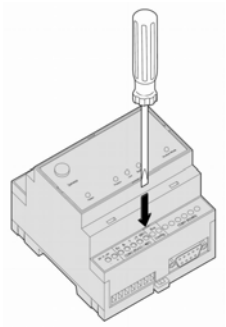
Example:
Termination by slave 1 and slave 3.
Balancing by a slave (bus device).
If a bus user is not available that is capable of achieving balance, an active bus terminator must be additionally installed (W2T547861).

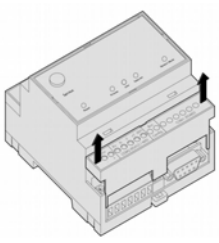


4.6.3 Settings for the DIP switches on the Process Monitoring System

A DIP switch is used to set the operating mode at the RS485 interface. This switch is located to the left of terminal COM2 and can be accessed after removing the cover COM2 (RS485).

Proceed as follows:





1. Insert a screwdriver (with a blade approx. 3 mm wide) into the cover slot of the RS485 connection and turn the screwdriver a short distance.
2. The terminal cover is released from the housing with an audible click and can be removed.
3. Set the DIP switch under the cover. See tables below.

DIP switch settings, Process Monitoring System Table 1

Operating mode	Switch 1	Switch 2	DIP
2-wire RS485 with termination	1	1	11
2-wire RS485 without termination	0	0	00

Please note

Balancing must be ensured via a bus device and cannot be performed via the Process Monitoring System (only termination possible).
The Process Monitoring System is supplied with termination as standard.

4.6.4 RS485 bus system installation

The RS485 bus consists of a maximum of 32 devices (slaves) and one master. The individual process devices (bus devices) must be parameterized for connection to the bus. The devices are also equipped with different bus connections. See the instruction manuals for the respective devices for details. The assignment of the bus addresses for the process devices must also be taken into consideration when setting up the bus. Some process devices require up to three bus addresses! Each bus address may only be assigned once within the bus system! The Process Monitoring System will not be able to establish communication if the same bus address is assigned to two or more bus devices. The Process Monitoring System is the master on the RS485 bus and therefore has no bus address.

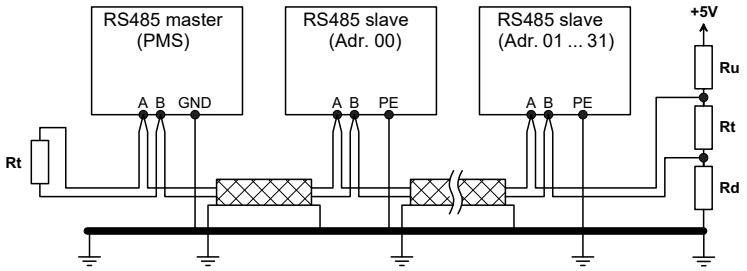
The maximum overall length for the cable is 1200 meters. To avoid reflection, the bus must be terminated with resistors at the ends of the lines. The two lines are supplied with a resting potential (balancing). This resting potential only needs to be provided by one bus device (Ru, Rd), e. g. DIP switch Ru+Rd on DEPOLOX Pool = ON.

The bus cable is always wired as a connection from device to device. The bus lines should always be routed directly to the terminals or to the connector of the bus device. Stub lines as a result of spatial conditions (e. g. bus devices in control cabinets) should be avoided where possible. Stub lines exceeding 0.30 m in length are not permissible.

A shielded, twisted two-wire cable (twisted pair) with a wire cross-section of at least 0.22 mm² (e.g. Li2YCY(TP) 2x0.22 mm² - Article No. W2T505559) must be used as the transmission medium.

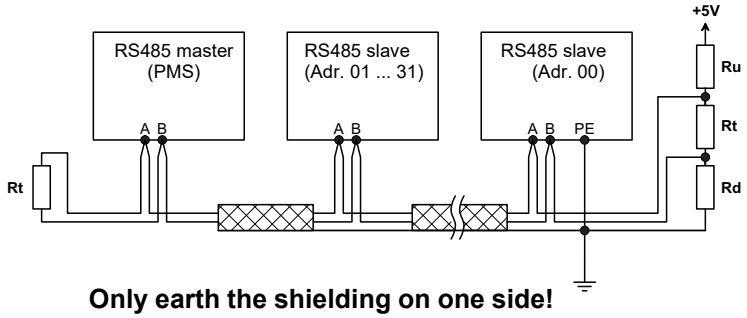
Non-floating bus structure

The RS485 interface of the Process Monitoring System is not galvanically isolated from the DC supply voltage. If a DC supply without galvanic isolation to earth is used (e. g. PELV), a non-floating bus structure is always required. This means that the shielding on both sides of the cable segments must be connected to the earthing. In addition, an earthing bar or a line with a cross-section of at least 6 mm² must be routed parallel to the bus line and must be connected with the shielding of the bus cable and with the PE connection at every bus device. The supply of the Process Monitoring System (GND) must also be connected to this earthing.



Floating RS485 bus structure

The RS485 interface of the Process Monitoring System is not galvanically isolated from the DC supply voltage. If a DC supply with galvanic isolation to earth is used for the Process Monitoring System (e. g. power supply unit) and if all bus devices are equipped with a floating RS485 interface, the bus structure can be installed as follows.



Only earth the shielding on one side!

Please note

A non-floating bus structure is required even if only one of the bus devices is not galvanically isolated from the bus system (e. g. PCS *plus*, MFA)!
If all bus devices are equipped with a floating RS485 interface, the bus structure can be installed as shown above under „Floating RS485 bus structure."

Bus termination and balancing

Each end of the overall bus cable must be equipped with an Rt bus terminating resistor. In addition, an Rd resistor against the data reference potential GND/PE and an Ru resistor against the supply voltage plus Vp must be installed at one point on the RS584 bus. These two balancing resistors ensure a resting potential on the line when no device is transmitting. Various Wallace & Tiernan bus devices can switch the balancing and terminating resistors via DIP switches.

If a bus user is not available that is capable of achieving balance, an active bus terminator must be additionally installed (W2T547861). This is supplied with 24 V DC power and makes a bus terminator available and achieves balance. The installation takes place at one end of the bus or the other. If necessary, the power supply can be connected parallel to power the process monitoring system (24 V DC).

The following values are recommended for these resistors:

- Rt 150 ohm +/- 2 % min. 0.25 W
- Ru 390 ohm +/- 2 % min. 0.25 W
- Rd 390 ohm +/- 2 % min. 0.25 W

The interface lines are referred to as line A and B. Each RS485 bus device is equipped with an interface for the connection of these lines.

The bus connections on the devices differ due to the various housing protection types.

The bus cable can be connected to the bus devices with terminals or, in exceptional cases, with 9-pin DSUB connectors.

4.6.5 RS232 interface COM1

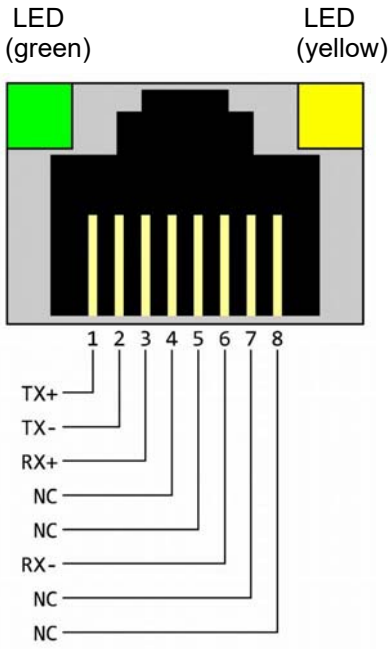
The RS232 interface COM1 (9-pin D-Sub-port) is present on all models. It is used at the factory as a programming interface. This interface is not intended for use by the customer.

4.6.6 Ethernet connection

The LAN interface integrated in the Process Monitoring System permits access to the data of the Process Monitoring System in several ways. With various router types on the market, for example WLAN routers, the data can be accessed via different web-enabled devices, e. g. tablet PCs and smartphones.
This instruction manual does not describe the installation and commissioning of the Process Monitoring System in combination with routers. The operator is responsible for this.

Please note

For security reasons, access to the Process Monitoring System should be limited to authorized personnel. Moreover, permanent non-secure connections via Internet or WLAN are not permissible. Secure connections can be established, for example, via a VPN-protected or encrypted WLAN connection. The Process Monitoring System only supports the unencrypted communication protocol http and is designed for operation within an Intranet (closed network). Please observe chapter 2.2 “General Safety Instructions” – “IT security”.



The Ethernet connection is designed in accordance with IEEE 802.3. It is an 8P8C port (frequently called an RJ45 port) and is shielded. It can be configured for connection to the hub or switch with a via 1:1-wired and shielded patch cable. Direct connection to a PC network card is established using a patch cable (1:1) or a crossover cable (crossover network cable). The LEDs displaying the interface status are mounted in the 8P8C port. The LEDs signify the following states:

green: lit	Ethernet connection established
green: flashing	Data transmission in progress
yellow: off	10 Base-T
yellow: lit	100 Base-T

The connection works in autonegotiation mode. The data transmission speed and full- or half-duplex are automatically defined with the connected switch/HUB.

The diagram adjacent to this text shows the RJ45 terminal assignment.

Ethernet configuration

The Process Monitoring System is supplied with a fixed IP address, i.e. initially, the Process Monitoring System can only be accessed via a fixed IP address.

IP address (factory setting)	192.168.200.4
Network mask	255.255.255.0

See chapter 5.4.11 “IP Configuration” for information on how to reset the network settings to the factory setting.

The MAC address can be found on a label on the underside of the Process Monitoring System.

4.6.7 SD memory card

The SD memory card is used to store data. Standard SD memory cards can be used. The system supports a maximum storage capacity of 32 GB. Cards with higher storage volume are not supported. Deactivate the write protection before inserting the card.

4.6.8 Switching the device on Self-test

Mechanical and electrical installation must be completed before switching on the Process Monitoring System for the first time.

Once the operating voltage is supplied, the Process Monitoring System performs a comprehensive self-test routine. All LEDs are switched on once and all areas of the memory are checked. During this time, the Process Monitoring System does not respond to a request for data!

The power LED lights up permanent when the supply voltage is applied. The LAN-LED lights up permanent when the Ethernet connection is installed.

4.6.9 Direct network connection

The direct network connection is always established between a PC/laptop with Ethernet interface (10/100MB/sec) and the Process Monitoring System, using the patch cable provided. A direct connection must be established for initial commissioning. As an alternative, the first start-up can also be started via an optional WLAN USB key (W3T395573), see 4.5.2 “Commissioning the Process Monitoring System with a WLAN connection via an optional WLAN USB key”.

Proceed as follows:

1 Assign a fixed IP address and network mask for the PC/laptop (see chapter 4.6.11 “Network installation under Windows XP” and chapter 4.6.12 “Network setting under Windows 7”). Only now is a data link to the Process Monitoring System established under the factory network settings.

Please note

The Process Monitoring System and the PC/laptop must always have the same network mask and IP addresses in the same address range. The IP addresses must not be identical.

Example:

	Process Monitoring System	**Laptop/PC**
IP address	192.168.200.4 (factory setting)	192.168.200.1
Network mask	255.255.255.0 (factory setting)	255.255.255.0

2 Start the browser, e. g. Firefox or Internet Explorer, and enter the IP address „http://192.168.200.4/" (factory setting). When the data link has been successfully established, the Login start screen appears.

3 If necessary, change the IP address and the network mask of the Process Monitoring System, see chapter 5.4.11 “IP Configuration”.

See chapter 5.4.11 “IP Configuration” for information on how to restore the network settings to the factory setting.

4.6.10 Network connection in a LAN

The Process Monitoring System is always preset to a fixed IP address and network mask at the factory. These are:

IP address	192.168.200.4
Network mask	255.255.255.0

Before the Process Monitoring System is connected to the network, the network settings must be adjusted to suit customer-specific requirements.

Proceed as follows:

1. Establish direct network connection with the PC/laptop, see chapter 4.6.9 “Direct network connection”.
2. Change the network settings of the Process Monitoring System via the web interface.
3. Change the IP address, network mask or DHCP operating mode of the Process Monitoring System, see chapter 5.4.11 “IP Configuration”.

Later, a data link to the Process Monitoring System can be established from any PC in the network. It is assumed that the PC to be used has already been installed in the network. The Process Monitoring System is connected to a network switch or hub using a patch cable. The required parameters (IP address, network mask, DHCP) must be provided by the network administrator.

See chapter 5.4.11 “IP Configuration” for information on how to restore the network settings to the factory setting.

Please note

To protect our system against third-party access, see chapter 2.2 “General Safety Instructions”.

4.6.11 Network installation under Windows XP

Under Windows XP, a network connection is automatically established as soon as a network card is detected in the PC. All you need to do is assign a fixed IP address and a network mask.

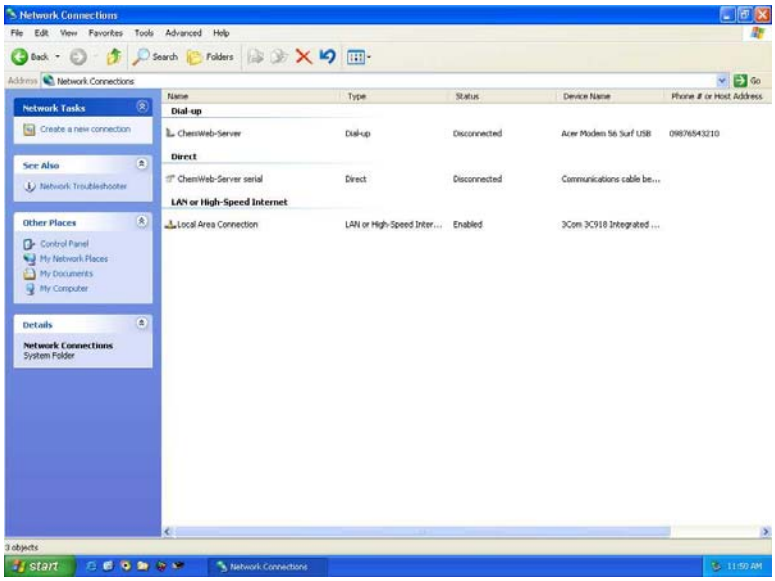
The network connection can be checked and adjusted (with category view) under „Control Panel" ==> „Network and Internet" ==> „Network Connections."

Windows XP with static (fixed) IP address

With this setting, the PC/laptop is always assigned a fixed IP address.

With Windows XP, it is also possible to set an alternative network configuration (see “Windows XP with an alternative configuration” on page 42.").

All network connections can be checked and adjusted in the window shown below.



Proceed as follows:

1. Highlight the LAN connection by clicking once on the left mouse key. On the left, the menu item „Change settings for this connection" appears.
2. Select the menu item „Change settings for this connection."

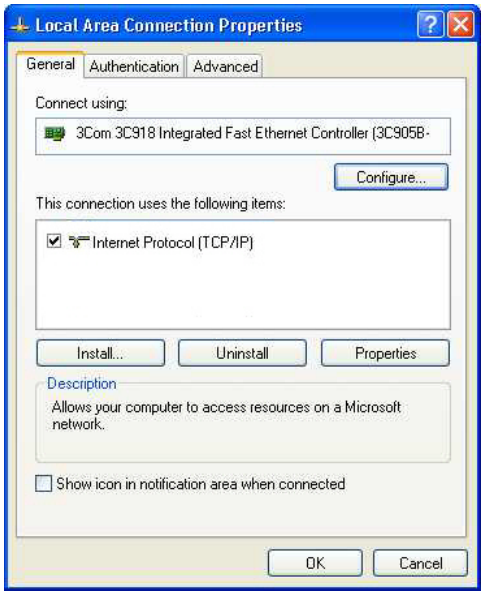
Please note

If the PC is connected to a network, there may be other elements present which must not be changed or deleted! In this case, consult your network administrator!

In the window below, only the element „Internet Protocol (TCP/IP)" is required. All other elements are not necessary for operation of the Process Monitoring System.

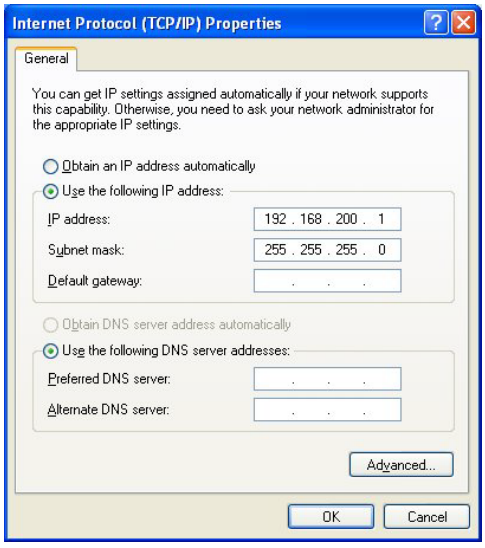
Proceed as follows:

1 Highlight the element „Internet Protocol TCP/IP" and click on „Properties."



2 Select the tab „General."

3 Select „Use the following IP address" and enter the following settings. A fixed IP address and network mask must be assigned. Do not change any other settings.



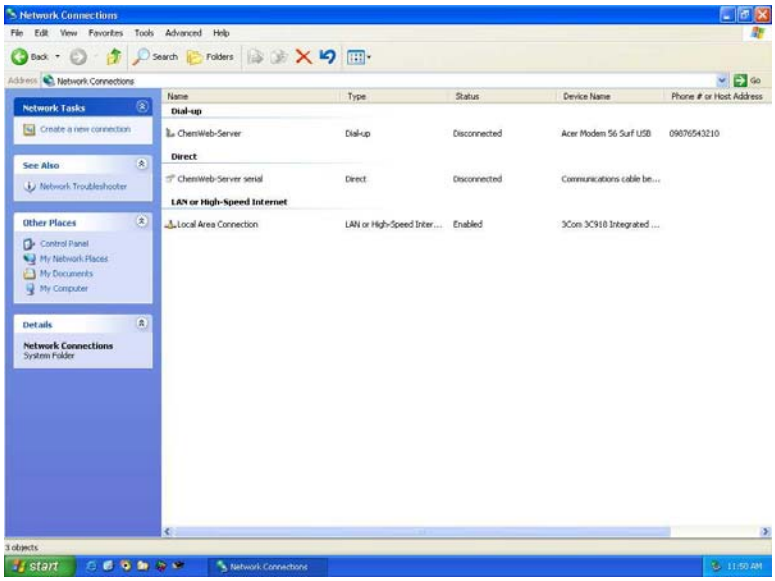
4 Confirm and save settings by clicking „OK" twice. With some Windows configurations, it is necessary to reboot Windows.

Windows XP with an alternative configuration

Windows XP allows you to define two different configurations, if, for example a notebook is used in different network environments. One applies when a DHCP server is available and the other uses a fixed IP address.

The network connection can be checked and adjusted (with category view) under „Control Panel" ==> „Network and Internet" ==> „Network Connections."

All network connections can be checked and adjusted in the window shown below.



Proceed as follows:

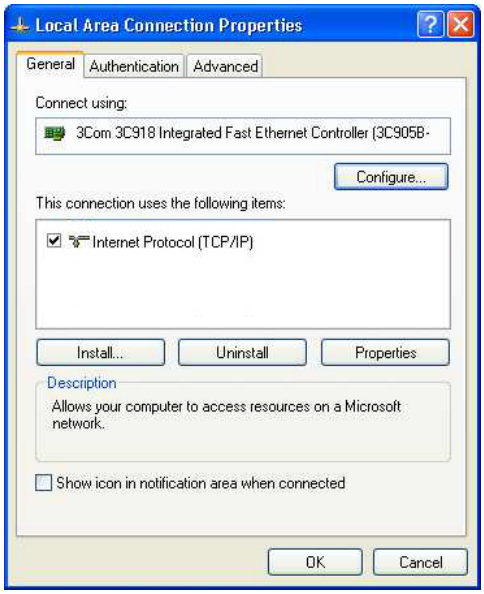
1 Highlight the LAN connection by clicking once on the left mouse key. On the left, the menu item „Change settings for this connection" appears.

2 Select the menu item „Change settings for this connection."

In the window below, only the element „Internet Protocol (TCP/IP)" is required. All other elements are not necessary for operation of the Process Monitoring System.

Proceed as follows:

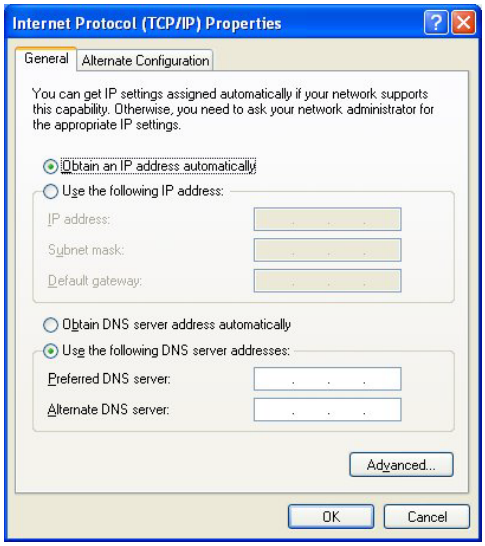
1 Highlight the element „Internet Protocol TCP/IP" and click on „Propertie".



Please note

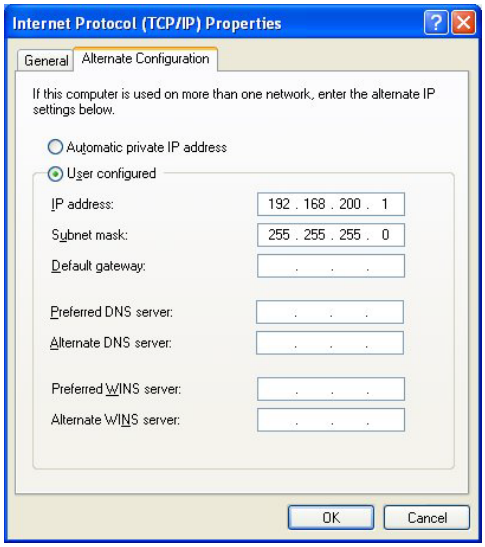
If the PC is connected to a network, there may be other elements present which must not be changed or deleted! In this case, consult your network administrator!

2 „Obtain an IP address automatically" must be selected.
A second tab, „Alternate Configuration" appears.



3 Select the tab „Alternate Configuration".

4 Select „User configured" and assign a fixed IP address and network mask. Do not change any other settings.



5 Confirm and save settings by clicking on „OK" twice. With some Windows configurations, it is necessary to reboot Windows.

4.6.12 Network setting under Windows 7

Under Windows 7, a network connection is automatically established as soon as a network card is detected in the PC. All you need to do is assign a fixed IP address and a network mask.

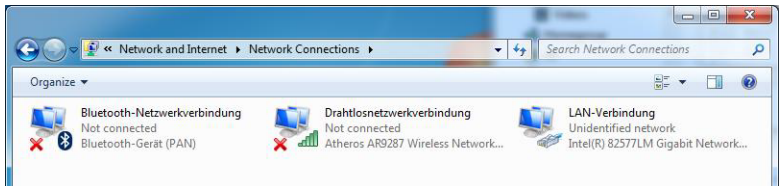
The network connection can be checked and adjusted (with category view) under „Control Panel" ==> „Network and Sharing Center" ==> „Change adapter settings."

Windows 7 with static (fixed) IP address

With this setting, the PC/laptop is always assigned a fixed IP address.

Under Windows 7, you can also set an alternative network configuration (see “Windows 7 with an alternative configuration”).

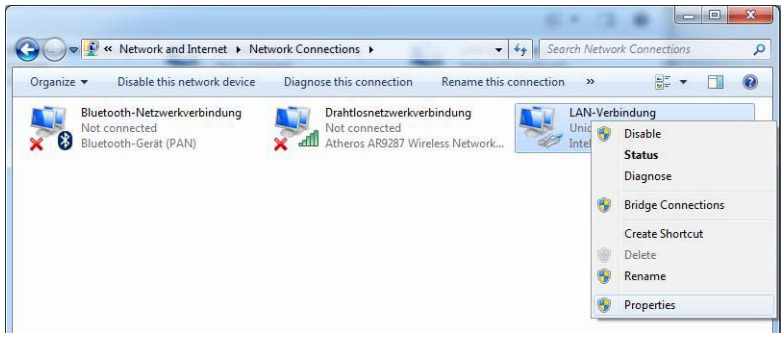
All network connections can be checked and adjusted in the window below (see screenshot below).



Proceed as follows:

1 Right-click on the connection to open a context menu.

2 Select the menu item „Properties" (see screenshot below).



3 Select the element „Internet Protocol Version 4 (TCP/IPv4)". Only the element „Internet Protocol Version 4 (TCP/IPv4)" is required, all other elements are not necessary for operation of the Process Monitoring System.

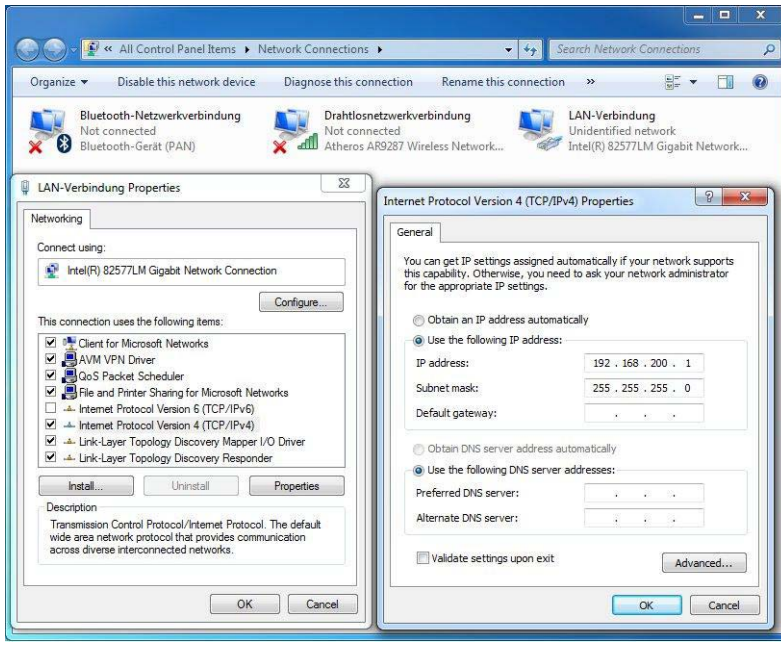
4 Click on „Properties" to configure the element „Internet Protocol Version 4(TCP/IPv4)".

Please note

If the PC is connected to a network, there may be other elements present which must not be changed or deleted! In this case, consult your network administrator!

5 Assign fixed IP address and network mask. Do not change any other settings.

6 Confirm and save settings by clicking on „OK" twice.
With some Windows configurations, it is necessary to reboot Windows.

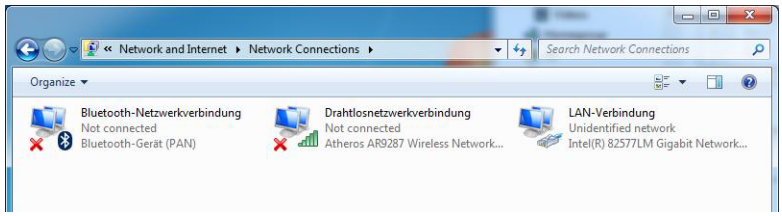


Windows 7 with an alternative configuration

Windows 7 allows you to define two different configurations, if, for example a notebook is used in different network environments. One configuration applies when a DHCP server is available and the other configuration uses a fixed IP address.

The network connection can be checked and adjusted (with category view) under „Control Panel" ==> „Network and Sharing Center" ==> „Change adapter settings."

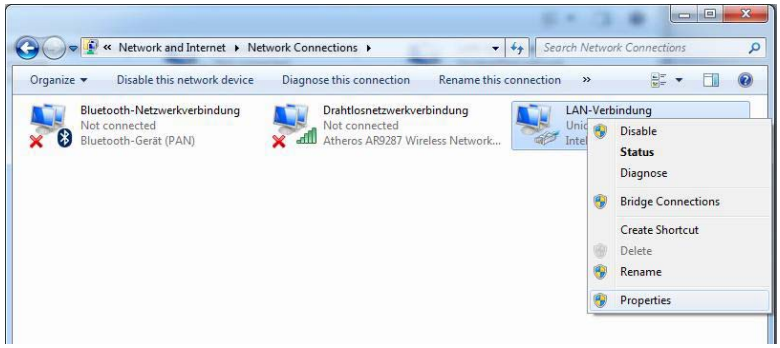
All network connections can be checked and adjusted in the window below (see screenshot below).



Proceed as follows:

1 Right-click on the connection to open a context menu.

2 Select the menu item „Properties" (see screenshot below).



3 Select the element „Internet Protocol Version 4 (TCP/IPv4)". Only the element „Internet Protocol Version 4 (TCP/IPv4)" is required, all other elements are not necessary for operation of the Process Monitoring System.

4 Click on „Properties" to configure the element „Internet Protocol Version 4(TCP/IPv4)."

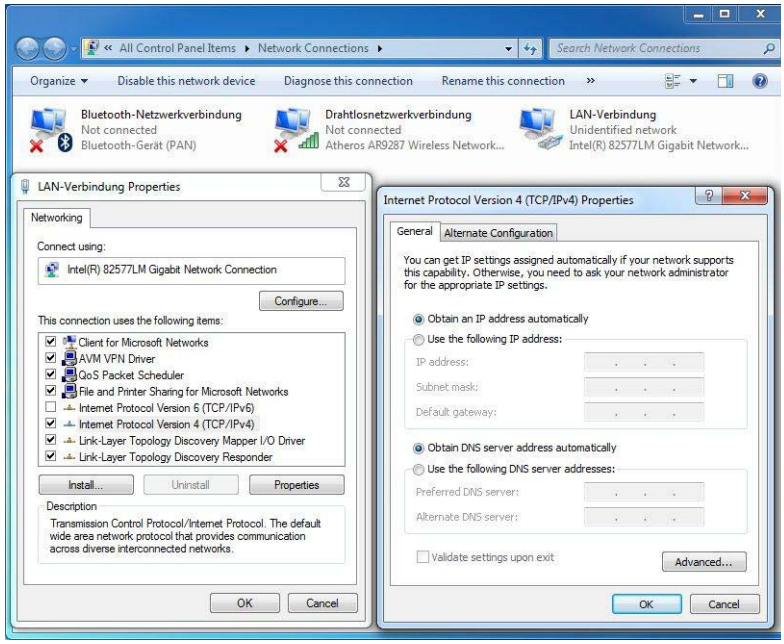
Please note

If the PC is connected to a network, there may be other elements present which must not be changed or deleted! In this case, consult your network administrator!

5 Assign fixed IP address and network mask. Do not change any other settings.

6 Confirm and save settings by clicking on „OK" twice. With some Windows configurations, it is necessary to reboot Windows.

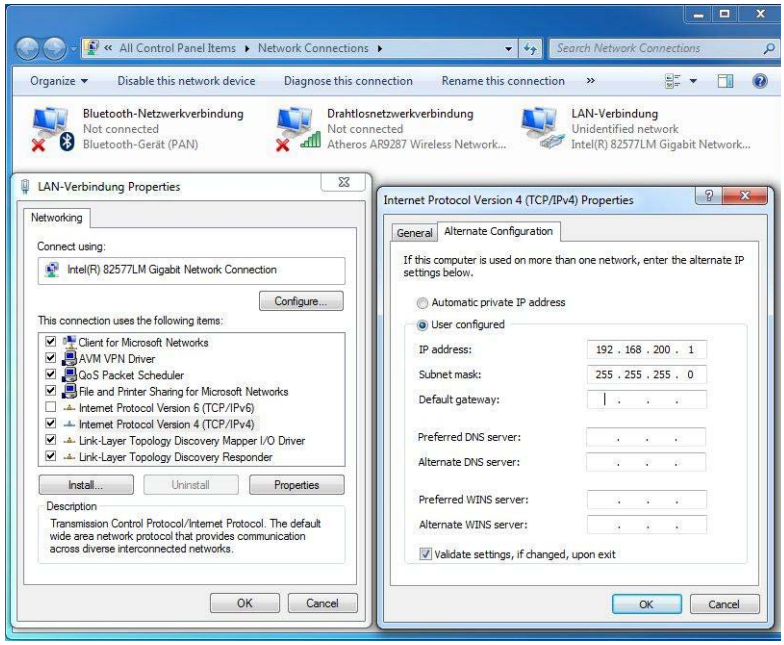
7 Select „Obtain an IP address automatically". A second tab, „Alternate Configuration" appears.



8 Select the tab „Alternate Configuratio".

9 Select „User configured" and assign a fixed IP address and network mask. Do not change any other settings.

10 Confirm and save settings by clicking on „OK" twice. With some Windows configurations, it is necessary to reboot Windows.



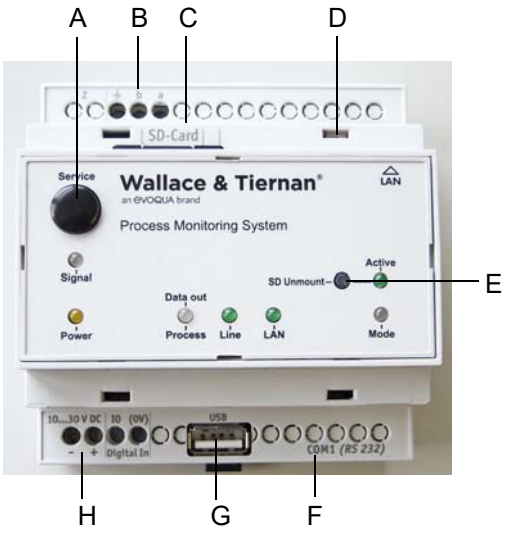
4.6.13 Resetting the IP configuration on the Process Monitoring System to factory setting

If the configuration of the network settings is faulty or lost, or in the event of problems with the settings, the factory setting can be restored. See chapter 5.6 “Restoring factory settings”.

5. Operation

5.1 Display and operating elements

The Process Monitoring System is equipped with the following display and operating elements:



Display and operating elements

Pos.	Description	Signification
A	Service button	Perform restart
B	COM2 (RS485)	Terminal strips for RS485 interface
C	SD card	Slot for the SD memory card (max. 32 GB)
D	Ethernet port with LEDs	Ethernet port (RJ45) with LEDs
E	Unmount button	Button for logout and removal of the SD memory card
F	COM1 (RS232)	9-pin D-Sub port (not be used)
G	USB port	Used to connect a WLAN USB key
H	10 – 30 VDC	Power supply (2 screw terminals)

Function LEDs

LED	Visual display	Signification
Power (yellow)	lights up yellow	Device ready for operation
	does not light up	No power supply
Process (red)	lights up red	Processing: generation of messages, changing of variables
	does not light up	Quiescent state, no process ongoing
Connect (green)	lights up green	Ethernet connection established
Data out (yellow)	lights up yellow	Messages for dispatch in the device
Signal	flashes red	Resetting IP configuration to factory setting
	lights up green	Lights up for two seconds when IP configuration was successfully reset
Active	does not light up	No SD memory card inserted
	lights up green	SD memory card inserted
	flashes green	WLAN USB key active
Mode (red)	lights up red	Local Transmode

5.2 Login

For operation and display of the data, an Internet browser that accepts Javascript (e. g. Internet Explorer Firefox) must be installed on the operating computer.
To access the Process Monitoring System with a smartphone or tablet PC via WLAN, the network in which the Process Monitoring System is integrated must be accessible via a WLAN router or as an alternative via a WLAN USB key.
For an overview of the operating systems and mobile end devices compatible with the Process Monitoring System, see chapter 11.1 “Tested browsers”. The overview also applies to remote access via the Internet. If the connection to the Process Monitoring System has been configured, its websites can be accessed, see chapter 4.5 “Initial commissioning”.
The Process Monitoring System supports four different user levels with defined rights. Proceed as follows to log in to the Process Monitoring System:

1 Start the operating computer and ensure that a network connection to the Process Monitoring System is available.

2 Start the Internet browser and enter the IP address in the address line. A distinction is made between a WLAN connection via WLAN USB key and a network connection.

Network connection

- In the case of a network connection, the IP address assigned by the network administrator or entered in the IP configuration must be entered in the browser. If the factory network setting is used, enter the IP address "http://192.168.200.4" in the browser.

WLAN connection via WLAN USB key

- In the case of a WLAN connection via WLAN USB key, enter the IP address "http://192.168.100.1" in the browser. Make sure that a connection to the WLAN-network „Process Monitoring System” is established, see 4.5.2 “Commissioning the Process Monitoring System with a WLAN connection via an optional WLAN USB key”.

Please note

Several connections are possible at the same time!

The following start screen appears (see screenshot below):

3 Enter User name and Password for login.

Please note

For security reasons, we recommend that you change the user name and the passwords, see chapter 5.4.5 “Password settings”.

There are four user levels, which are predefined at the factory.

User level 1

Only read rights are permitted on user level 1.

Possible read rights are:

- Viewing the online values
- Trend view
- Archive files
- System info
- Messages
- Bar graph view
- Group view

Please note

All other menu buttons are grayed out and inactive.

User level 1	User name:	wt1
	Password	9041

User level 2

User level 2 permits the same read rights as user level 1, plus the right to change the bus device settings:

- Remote device adjustment
- Permanent legend selection

User level 2	User name:	wt2
	Password	9042

User level 3

The following settings can be made in user level 3:

- Bus scan
- Basic settings
- ISP settings
- Mail settings
- Event configuration
- Password settings
- Name settings

The following read rights are possible:

- Messages
- System info
- Archive files

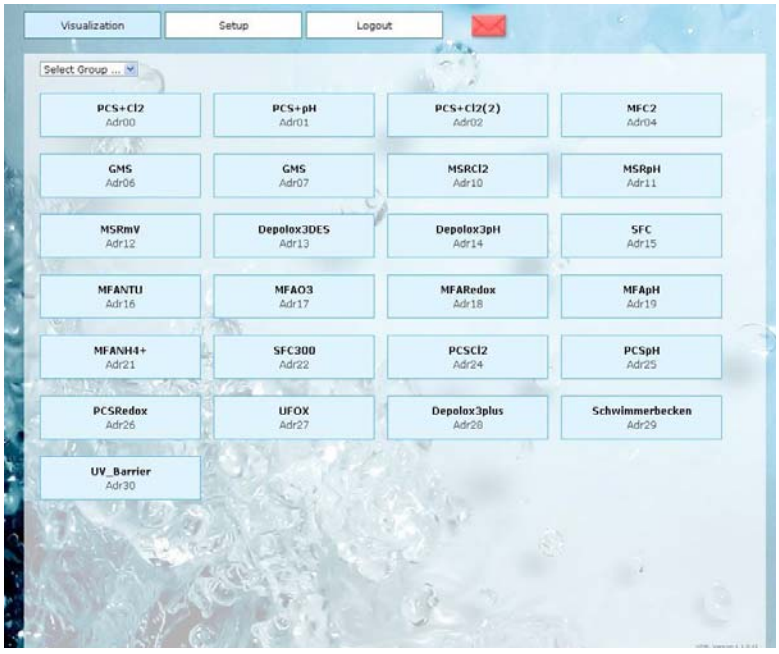
User level 3	User name:	wt3
	Password	9043

User level 4

User level 4 allows the same settings and views as user level 3. In addition, IP configuration can be performed.

User level 4	User name:	wt4
	Password	9044

4 Different views appear after login, depending on the user level (Example shows user level 1 and 2).



The following menus are possible:

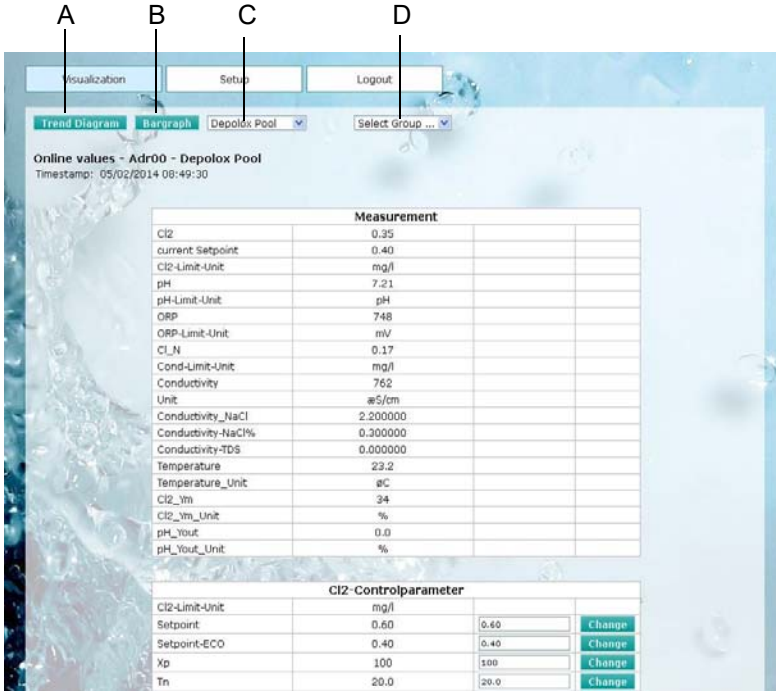
"Visualization" menu	All identified bus devices appear as buttons in user level 1 and 2. Select one of the devices to open the bar graph view of the selected device.
"Setup" menu	Various menu items are displayed depending on the user level. (see chapter 5.4 “„Setup" menu”).
"Logout" menu	Press the "Logout" button to log out from the current user level of the Process Monitoring System. The start screen then appears.
Drop-down menu "Select group"	The group view opens directly when selecting a group.

5.3 „Visualization" menu

All devices detected during the bus scan are displayed in the "Visualization" menu.
The device button is grayed out if the RS485 communication between process monitoring system and a bus user is faulty/defective or if the bus user is offline. Click the device button to display the "Bar graph view," see 5.3.3 “Bar graph view”.

5.3.1 Online view

All relevant measured values, status messages, errors, and other information of the respective device are displayed in the online view. The views are automatically updated. The displayed online values are device-dependent and the way they are displayed cannot be changed. This menu is available after login in user level 1 or 2.



A „Trend chart" button to switch to trend view
B „Bar graph" button to switch to bar graph view
C Drop-down menu for device selection
D Drop-down menu for group selection to switch to a group view

An input window and a "Change" button are displayed after each configurable value.

Please note

Login on user level 2 is required! Values cannot be changed on user level 1.

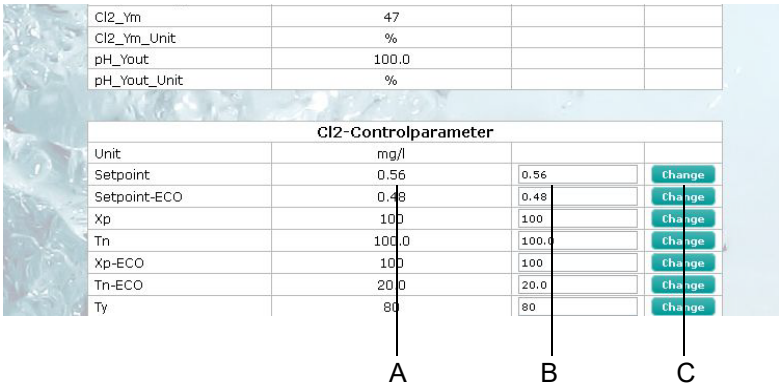
To change a parameter, overwrite the old value in the input window with the new value.

Proceed as follows:

1 Select input window (B) and overwrite the old value.

2 Click "Change" (C) to save the value.

The current value appears in column (A).
After entering the change, updating to the current value may take some time, depending on the number of bus devices or the number of devices connected to the RS485 bus.



Only encrypted entries are possible in many windows. Refer to the address reference list for these values.
You will find the address reference list for the respective device in its instruction manual.
Some values can only be set with a particular configuration of the device, e. g. the measuring ranges must be observed in the case of setpoints and limit values. Without this configuration, the desired value cannot be set.

5.3.2 Trend diagram

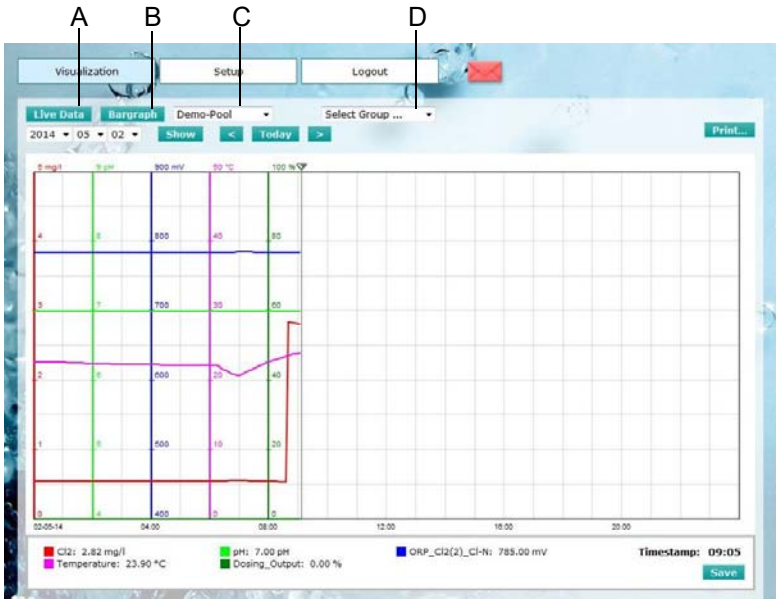
The trend view displays the device-specific measured values as a 24-hour day chart and can be enabled or disabled in the legend (below). The measured values are stored with a sample rate of five minutes. This menu is available after login in user level 1 and 2.

Proceed as follows:

1 In the bar graph, online, or group view, select a device and press the "Trend chart" button. The 24-hour day chart is displayed.

Please note

The measured values are stored automatically every hour in an archive file on the SD card. For each device on the bus, a new archive file is created monthly - see chapter 5.4.7 “Group Configuration - Multipool Visualization”.



A „Online values" button to switch to online view
B „Bar graph" button to switch to bar graph view
C Drop-down menu for device selection
D Drop-down menu for group selection to switch to a group view

2 Click in the chart with the left mouse button. A slider bar appears on the display and can be positioned at any temporal position.
The measured values, which correspond to the temporal position of the slider bar, are displayed on the left under the chart in the colors of the respective measured value.

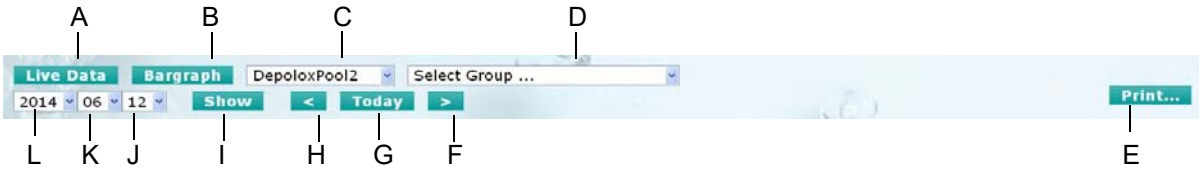
3 Select trend line and hide or show by clicking on the colored square.

☐ = off ■ = on

4 The selection can be permanently stored in user level 2. The hidden measured values no longer appear in the other views such as the bar graph view and group view.

5 Click on the "Print" button and the current trend chart is printed on the installed printer.

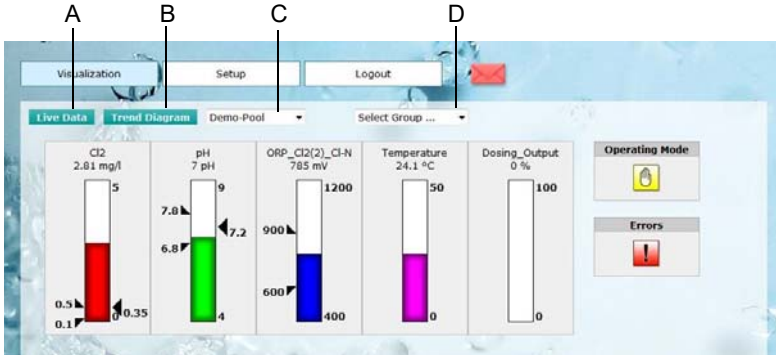
6 It is also possible to display archive data from the past. To do so, select the corresponding day, month, and year above the chart. After selecting a date, click "View" and the corresponding chart is loaded. The current daily chart is loaded with the "Today" button.



A Back to the online values
B Bar graph
C Select devices
D Select group
E Print
F Day ahead
G Trend display for the current day (at set server time)
H Day back
I Click on "Show" to display the selected day or
J device as a trend.
K Select day
L Select month
M Selection year

5.3.3 Bar graph view

The bar graph view displays the device-specific measured values that are also selected in the trend chart. The target values and the measuring range are displayed on the bar graphs depending on the bus user. The current measured value is displayed above the bar graph as a numeric value with unit. The manual/automatic operating mode is displayed as a symbol. Device errors are indicated with the "Exclamation point" symbol. A detailed error analysis is specified more precisely with the "Online values" view of the corresponding device.

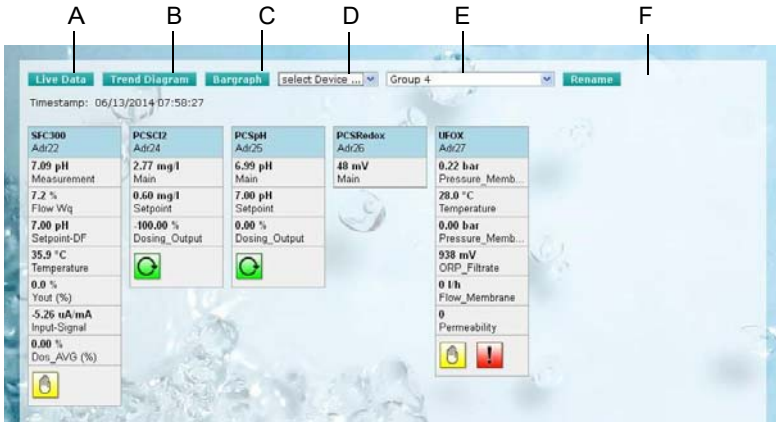


A „Online values" button to switch to online view
B „Trend chart" button to switch to trend view
C Drop-down menu for device selection
D Drop-down menu for group selection to switch to a group view

5.3.4 Multipool Visualization – Group Views

The device-specific measured values of up to seven devices are displayed as a table in the predefined group views of group 1 to 5. The displayed measured values correspond to the displayed values of the individual devices selected in the trend chart. Bus addresses are allocated to assign bus users to the individual group views, i.e., the devices are displayed with bus address in groups as follows:

Group 1	Bus addresses 0 to 6
Group 2	Bus addresses 7 to 13
Group 3	Bus addresses 14 to 20
Group 4	Bus addresses 21 to 27
Group 5	Bus addresses 28 to 31



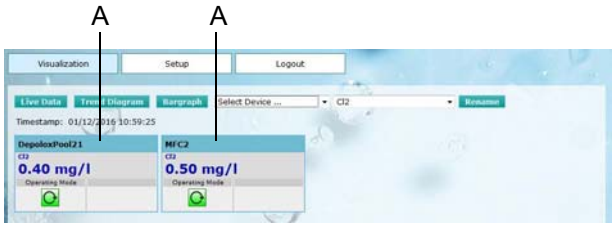
A „Online values" button to switch to online view
B „Trend chart" button to switch to trend view
C „Bar graph" button to switch to bar graph view
D Drop-down menu for device selection
E Drop-down menu for group selection to switch to a group view
F „Rename" button to rename the current group

In user level 2, a customer-specific name (max. 24 characters) can be defined for each group (1 – 5). Click "Rename" to rename the current group.

Up to 16 measured values or switching variables can be displayed in one view in the configurable group views.

Up to 10 freely configurable group views are available. Individual measured values (same values as in the trend graph and bar graph display) can be selected from all available bus users. In the Setup group configuration menu, each group in user level 3 or 4 can be configured.

Press button (A) to switch to the online view of the corresponding device.



Please note

If a group configuration has changed, it may be necessary to delete the browsing history of the used Internet browser as well. Otherwise, it may be possible that the group view is not correctly displayed.

5.4 „Setup" menu

5.4.1 Bus scan

In the menu "Setup" under menu item "Bus scan" all connected bus devices are automatically identified and the corresponding device views created. This menu is available after a login on user level 3 and 4.

A bus scan must be performed when a new bus device is connected at the RS485 interface, e. g. when recommissioning or adding further devices.

Please note

Before starting the bus scan, please ensure that the RS485 bus is correctly wired and that the bus addresses are set correctly at all devices. See the instruction manuals for the corresponding devices. Each bus address (max. 32) may only be assigned once on each bus.

Double assignment of addresses leads to malfunctions at the RS485 interface. Each device connected to the bus must appear in the scan results under the corresponding address. If this is not the case, check the bus structure and the address settings for the devices.

A bus scan can take up to seven minutes, depending on the number of bus devices connected (e. g. 32 bus devices). The scan will be correspondingly shorter if fewer devices are installed. Th scan list is not refreshed during the bus scan, but is displayed when the scan has been completed.

Please note the following special features of the bus scan.

initial bus scan

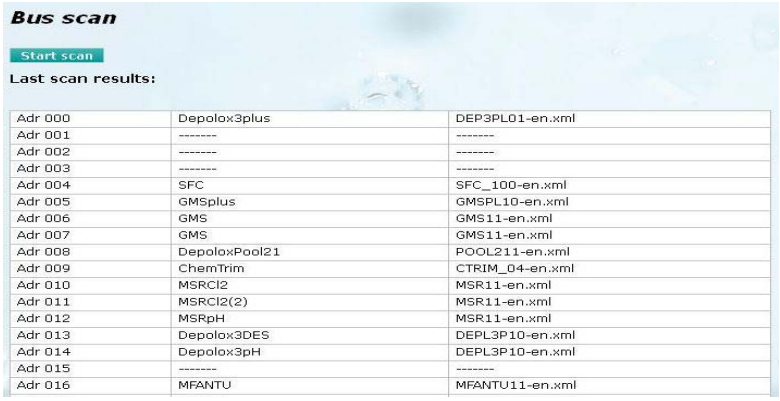
To carry out the initial bus scan (e. g. for a new installation), proceed as follows:

1 Click on "Bus scan" in the menu "Setup"

2 Then click "Start scan" The bus scan starts.

3 During the bus scan, the Process Monitoring System automatically queries all bus addresses to determine whether devices are connected. When all 32 addresses have been scanned, the corresponding configurations and views are created for all devices found. If the Process Monitoring System does not detect any devices or if it does not detect all devices, the RS485 bus structure and, if necessary, the address settings for the bus devices, should be checked again.

4 When the bus scan has been successfully completed, the further Process Monitoring System configurations can be performed, e .g. Event configuration.



Bus scan of systems already in operation

The following points must be observed when performing a bus scan on systems already in operation, e. g. when adding new devices:

If new devices are added to the RS485 bus, it is to be ensured that the applied bus addresses are not yet in use. Carry out the bus scan as described under "initial bus scan."

Please note

If bus addresses are switched from one bus to another and vice versa, the old archive files of the affected devices should be deleted from the SD memory card before the bus scan and saved to another storage media. Problems in the history of the trend display, such as no trend line display, may occur in case of non-compliance.

5.4.2 Basic settings

In the menu "Setup", under menu item "Basic settings", you can change the operating language of the web interface, the server name and time settings of the Process Monitoring System.
This menu is available after a login on user level 3 and 4.

Proceed as follows to make the settings:

1 Click on "Basic settings" in the menu "Setup".

Server name

2 Select the input window "Server name" and enter a name. Thi name always appears in the title bar of the browser window when the Process Monitoring System is accessed.

Language

3 Select the corresponding language (German / English / French) in the input window "Language".

4 Click "Submit" to save the settings.

Automatic time setting

5 Click on "Set Clock" to synchronize the clock of the Process Monitoring System and the PC.

The time for the Process Monitoring System can be set within a different time zone from that of the PC by entering the time shift in the window "Time shift adjust" (+/-0...12h).

Manual time setting

Proceed as follows to set the clock of the Process Monitoring System manually:

1 Set a checkmark in the field "Set time manually". The input windows for all date and time values are enabled.

2 Change the date and time settings.

3 Click on "Set Clock". Date and time are taken over.

Please note

The Process Monitoring System has no automatic switchover to summer/winter time! This needs to be done manually.

5.4.3 Mail settings

Data for sending E-mails, for example, with occurring events or daily messages, is entered in the „Setup" menu in the „Mail settings" menu item. A mail server (LAN mail server) or an Internet mail server can be used to send e-mails.

The process monitoring system supports unencrypted and encrypted e-mail transmission.

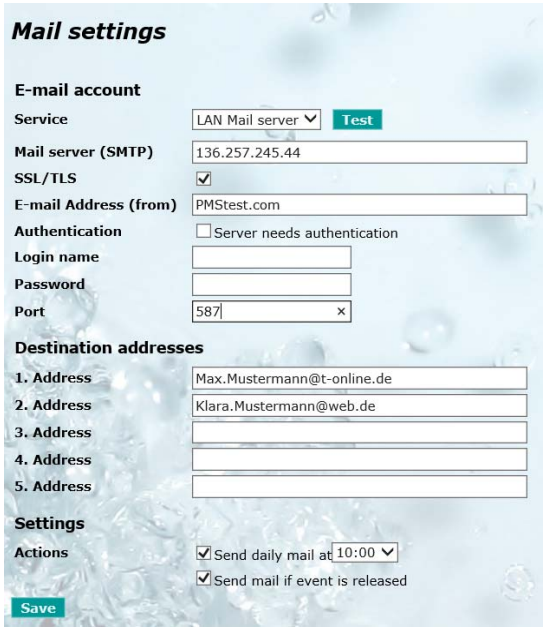


Image 1 Example: encrypted e-mail transmission

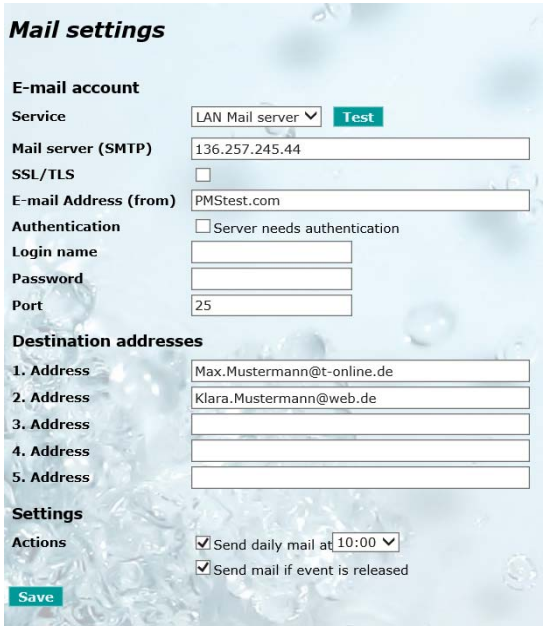


Image 2 Example: unencrypted e-mail transmission

Follow these steps for customer-side mail settings:

1 In the filed „Service”, the setting „LAN mail Server” (SMTP server) is preset.

2 In the field „Mail server (SMTP)”, enter the name of the e-mail server or the IP address in case of a local LAN mail server.
See the following list of possible Internet mail servers allowing setup of an e-mail account (without SSL encryption):
SX Mail = smtp.sxmail.de (as of April 2014)
Smart-Mail = smtp.smart-mail.de (as of April 2014)
etc.
Standard providers are available for sending E-mails via SSL encryption, e.g. T-Online, web.de, ect .

Please note

Contact the network administrator to enter the access data of the e-mail server if you select „LAN Mail server".

3 In the filed „SSL/TLS”, select unencrypted or encrypted e-mail transmission.

☐	unencrypted
☑	encrypted

4 Enter the name of the sender of the e-mail in the window "E-mail Adress (from)". This address appears as the name of the sender when the event mail is received.

5 In the windows „Authentication/Login name/Password", enter the login data you received from your e-mail account provider.
For example: Login name = e-mail address
Password = test

6 In the field „Port”, enter the port number of the outgoing port.

25	Standard port for unencrypted e-mail transmission
587	Standard port for encrypted e-mail transmission

7 Enter the e-mail destination addresses in the windows under "Destination addresses". In these input windows, you can specify up to five e-mail addresses to which the generated e-mails are to be sent.

Please note

Please make sure that entries are made in consecutive windows with no empty address windows in between.

8 Enter the desired settings in the windows under „Settings Actions".

- In the window „Send daily mail at", define the time at which you wish to receive an info e-mail every day.
- In the window „Send mail if event is released", specify whether you wish to be notified by e-mail of preset events.

To configure the process monitoring system for sending e-mails, for example, using a DSL router, the following settings are required:

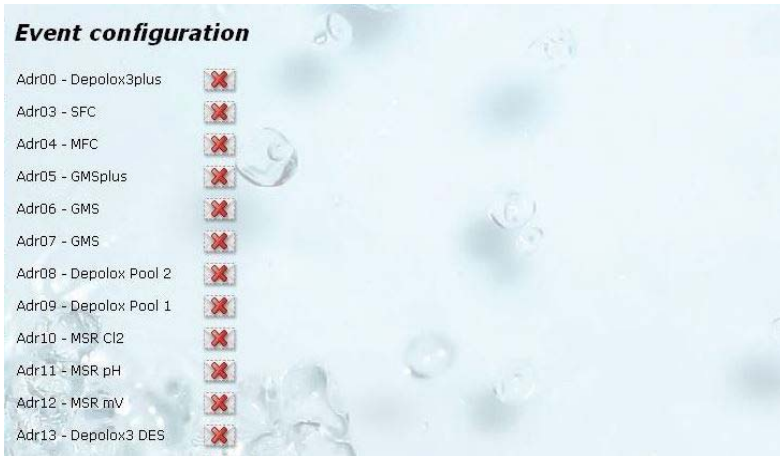
Service	LAN mail server
E-mail server (SMT)	smtp.sxmail.de (example)
E-mail address (from)	PMS@test.com (example)
Server requires authentication	Select
User name	User1 (example)
Password	Password1 (example)
IP configuration	DHCP is possible

A static IP address is recommended to access the process monitoring system with this address locally via Ethernet, e.g.:

IP address	192.168.2.103
Subnet mask	255.255.255.0
Gateway	192.168.2.1 (IP address of the router itself)

5.4.4 Event configuration

In the menu „Setup", under menu item „Event configuration", you can define events for each bus device; these events appear in the window „Messages" and are also sent as an e-mail if the selection „Send mail if event is released" is activated. Events are, for example, the switching of alarm relays, error messages, the activation of digital inputs etc. at the bus devices.



The symbol after each bus device means:


Events are already defined for this bus device.


No events are defined for this bus device.

Proceed as follows:

1 Click on the symbol for a bus device to display its event configuration.
This page contains different events for each bus device which can trigger notification by e-mail and an entry in the message window.

As an example, the window below shows an event configurati-

on for the DEPOLOX® Pool.

Explanations

Relay8 (=Alarm 1)	Configured as Cl_2 min. and max. alarm for the DEPOLOX® Pool. As soon as the relay is activated (Alarm Value = 1), the event is triggered at the Process Monitoring System.
Relay7 (=Alarm 2)	Configured as pH min. and max. alarm for the DEPOLOX® Pool. As soon as the relay is activated (Alarm Value = 1), the event is triggered at the Process Monitoring System.
Digital-Input1	Activated as event and becomes active as soon as Alarm Value = 0 is detected (sample water inflow too low).
Device Errors	If the input field "Activate" next to Device Errors is selected, an event is triggered whenever an error occurs at a device, and the error code is displayed in the message window/saved in the event e-mail.

2 In the input window "Description", enter a suitable description for the respective event (e. g. Sample water failure at Digital-Input1).

3 The input in the window „Alarm Value" defines the value at which the event triggers a notification e-mail.

4 The selection window „Activate" releases the occurrence to trigger an event or a message.

5 At „Device Errors", a message is always triggered when an error message occurs at the respective device.

6 Click „Save" to save the entries.

Please note

A message and an entry in the message window due to an event are only triggered at intervals of five minutes. Events which occur and are deleted again in between cannot be recorded!

5.4.5 Password settings

The individual user names and passwords are defined in the menu "Setup" under menu item "Password settings". There are four user levels for the Process Monitoring System.

Please note

If the customer-specific user names and passwords are lost, they cannot be retrieved. Contact the manufacturer in this case.

Please note

For safety reasons, the user levels and passwords set at the factory should be changed to customer-specific settings!

User level 1:

Factory settings	User name	wt1
	Password	9041

User level 2:

Factory settings	User name	wt2
	Password	9042

User level 3:

Factory settings	User name	wt3
	Password	9043

User level 4:

Factory settings	User name	wt4
	Password	9044

Proceed as follows to define a new password:

1 Enter the old password in the input window "Old Password". Please observe the corresponding user level.

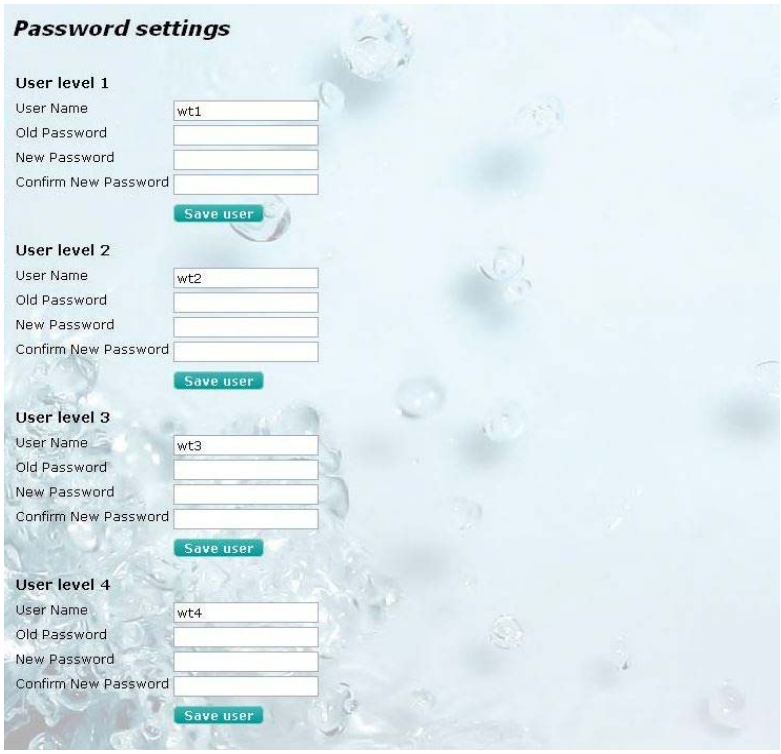
2 Click input window "New Password" and enter a new password.

3 Click input window "Confirm New Password" and enter the new password again.

4 Click on "Save user" to save the password changes.

Please note

Password changes are possible only after a login in user level 3 and 4.
To reset the password to the factory setting, see chapter 5.4.11 “IP Konfiguration”.



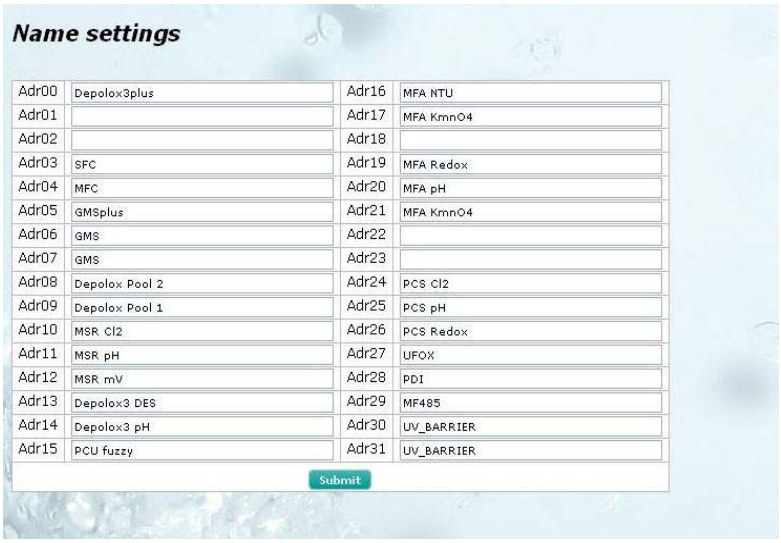
5.4.6 Name settings

In the menu "Setup" under menu item "Name settings", you can enter customer-specific device names for clearer identification on-site, e. g. children's pool, swimmer's pool.

After a bus scan, the system device names are entered.
The names defined in this menu appear in the visualization report after login.

Proceed as follows:

1. Enter a user-configured name in the input window.
   The maximum possible length is 30 characters per address.
2. Click on "Submit" to save the device names. The device names entered appear on the device overview in the visualization window.



5.4.7 Group Configuration - Multipool Visualization

Up to 10 custom measurement overviews can be compiled in the "Setup" menu in the "Group configuration" menu item. This means that it is possible to depict the values of several pools in a multipool view. Individual data points (measured values from the trend graph or bargraph view) can be selected by each bus user (address 0 to 31). The corresponding data point can be renamed as needed for the group view with the "Name" parameter. Variables are automatically marked in the "Symbols" parameter, for example, those that can be used as switching variables for control.

Proceed as follows:

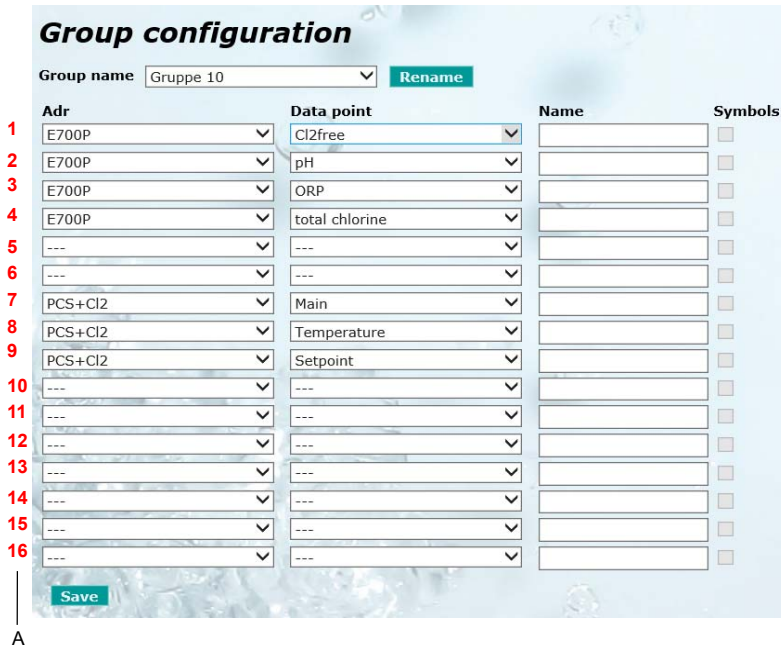
1. Select the corresponding group listed in the "Group name" input field.
2. Press the "Rename" button and type a custom name.
3. Press the "Save" button to save the user-defined name.
4. Select desired measurement values and device names (max. 16 per group) with the "Adr" and "Data point" selection. If necessary, change the device name in the "Name" column. Select any device with the bus address 0 to 31 in Adr.
5. Press the "Save" to save the settings.

   The order of the measured values in the group view is from left to right. Up to four values are displayed next to each other in up to four rows.

Please note

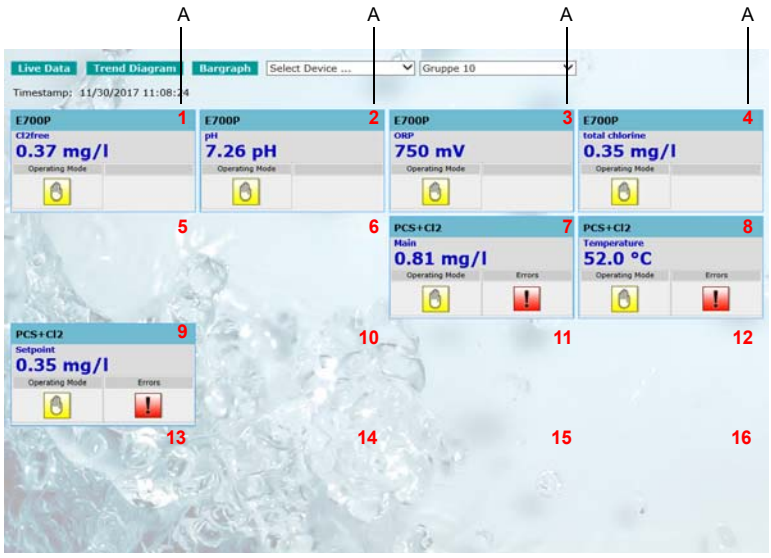
If a group configuration has changed, it may be necessary to delete the browsing history of the used Internet browser as well. Otherwise, it may be possible that the group view is not correctly displayed.

6 Then press the "Logout" button and close browser. Open the homepage again and log into user level 1 or 2. Check the generated group whether it is displayed correctly. Repeat steps 1 to 5 if changes are to be made.



A Group numbers are not displayed

If single values are not assigned, no value will be shown at this point, for example 1 „E700P” = 1 „displayed E700P”. If single values are not assigned, no value will be shown at this point, for example 5 „not assigned” = 5 „no indicator”.



A Group numbers are not displayed

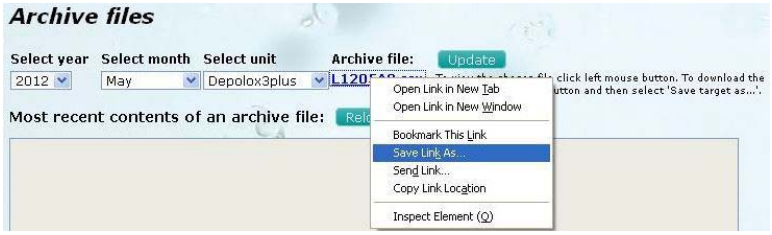
5.4.8 Archive files

In the menu „Setup", under menu item „Archive files", archive data for the connected bus devices can be downloaded from the Process Monitoring System and saved to the PC or opened in Excel or other programs.

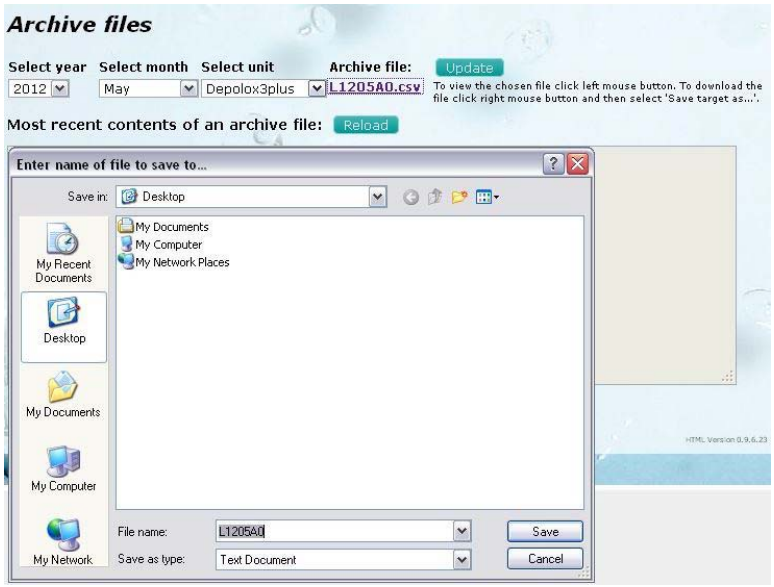
These measured values are automatically saved to an archive file on the SD memory card at one-hour intervals. An archive file is created for each bus device address at monthly intervals.
The name of the archive file is defined by the selection of the year, month and bus address.

Proceed as follows:

1. Click „Update" (only for download of a file for the current month) to save the latest measurement data to the archive files before downloading.
2. Then click on the corresponding button, „Select year" or „Select month" or „Select unit" and select the desired data.
3. Right-click on the file name under „Archive file". The context menu „Save Link As" opens.



In the window which now appears, you can save the archive file to the desired drive on your PC.



Please note

An archive file cannot be deleted in this way!

The archive files are CSV files (Comma Separated Values) which can be subsequently processed with, for example, Microsoft Excel.

Please note

The Process Monitoring System uses a period as decimal separator. In order to display the data correctly in Excel, a period must be set as decimal separator and a comma as thousand separator there.

The archive files can be opened or copied directly from the SD memory card using an SD card reader. The archive files are stored on the SD memory card in the directory „ARCHIVE". The archive file name is structured as follows:

L12 07 A0.csv

A B C

A Year
B Month
C RS485 bus address

An archive file is created for each bus device for each month. The size of the archive file depends on the respective bus device. A maximum size of 500KB per bus device and per month is required. This means that an annual data volume of approx. 6MB per bus device can be expected.

Backup copies of the archive files must be regularly saved to another storage medium or to a PC drive. To ensure that there is sufficient storage space available on the SD memory card, archive files for which backup copies have already been created and which are, for example, one to two years old, should be deleted from the SD memory card (see chapter 5.4.9 “SD memory card”). To ensure reliable operation over the long term, we recommend replacing the SD memory card once per year. The Process Monitoring System can no longer be operated if the storage capacity of the SD memory card is exhausted!

Please note

The Process Monitoring System must be switched off before installing or removing the SD memory card (or the Unmount button on the Process Monitoring System pressed to log out the SD memory card from the Process Monitoring System).

5.4.9 SD memory card

The SD memory card can be read out using any card reader that supports SD memory cards. It depicts the content of the card as a normal drive on which the files are stored. The stored archive can be copied from the SD memory card to other drives or deleted. The archive data are stored in the folder „ARCHIVE" on the SD memory card.

Please note

The folder "ARCHIVE" must not be deleted!

The SD memory card does not contain any program files necessary for the operation of the Process Monitoring System. It is used solely for storing data. The functionality of the Process Monitoring System is not guaranteed if it is operated without an SD memory card. The Process Monitoring System supports SD memory cards with a storage capacity of up to 32 GB (formatted to FAT16 or FAT32).

Please note

For security reasons and to prevent data loss, the SD memory card should be replaced annually.

The SD memory card is replaced as follows:

1. Switch off the device or press the Unmount button while the device is in operation, for example using a pen or a small screwdriver. The LED "Active" goes out.
2. Press the SD memory card to release it and remove it.
3. Insert a new SD memory card. Make sure that the write protection for the card is not activated.
4. Perform a bus scan to create the required archive directories on the memory card, see chapter 5.4.1 “Bus scan”.
5. Switch the device on.

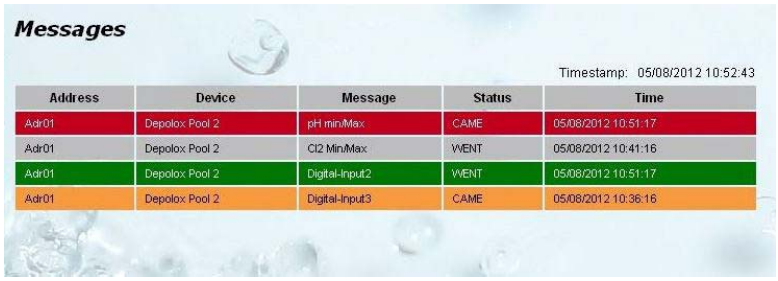
Please note

The Process Monitoring System must be switched off before installing or removing the SD memory card (or the Unmount button on the Process Monitoring System must be pressed to log out the SD memory card from the Process Monitoring System). Backup copies should be made of the data (archive files) on the old SD memory card.

5.4.10 Messages

All current event messages and the related information, e.g. time, date, status, device and bus address are displayed in the menu "Setup" under the menu item "Messages". These messages are updated every five minutes. Only messages defined as events are generated (see chapter 5.4.4 “Event configuration”).

Pending messages are also indicated by a red envelope in all views. When you click on the symbol, you are switched directly to the message view.



The labelling of the messages has the following meaning:

Backg-round color	Status	Signification
red	CAME	This message occurred during the last scan.
orange	CAME	This message occurred before the last scan and is still pending.
green	WENT	This message no longer occurred during the last scan.
gray	WENT	This message no longer occurred before the last scan and is dis-played for the next 30 minutes.

If the events are configured for e-mail dispatch, all messages in the message window are sent.

5.4.11 IP Configuration

The network parameters are set in the menu "Setup" under the menu item "IP Configuration". This menu is for setting the network parameters and is only available after login on user level 4.

To adjust the IP address, the network mask or the DHCP operating mode of the Process Monitoring System to local network characteristics, a direct connection must be established between the Process Monitoring System and the PC during initial commissioning (see also chapter 4.5 “Initial commissioning”).

The "IP Configuration" can also be changed under an existing, already configured network setting or via a modem connection.

Proceed as follows:

1 In the browser, enter the IP address under which the Process Monitoring System is installed in the network.
The factory setting for the IP address is "192.168.200.4".
The start screen is now displayed in the browser window.

2 Dial in under user level 4.
Factory setting: User name: wt4 / Password: 9044

3 The desired settings can be made in the menu "Setup" under the menu item "IP Configuration". The further settings (with/ without DHCP) are described below. Depending on the desired operating mode, one of these two network settings must be configured.

Setting the IP address of the Process Monitoring System without DHCP

Please note

Contact the network administrator to obtain the required setting.

1 Deselect "Use DHCP".

2 Enter a valid IP address and subnet mask in the input window (if necessary Gateway, DNS1 and DNS2 address).

3 Click "Save" to save the settings.

Please note

Once the network parameters have been entered and saved, the Process Monitoring System is only available under the changed address settings! Make a note of the new settings on the Process Monitoring System (label on the side) and in chapter 10. “Setting data”.

The Process Monitoring System can now be reached via the IP address assigned by the network administrator. This IP address must be entered in the browser in order to access the Process Monitoring System.

Please note

If the IP configuration was changed incorrectly and access to the process monitoring system is no longer possible, the IP configuration can be reset to factory setting. See chapter 5.4.12 “System info”.

Setting the IP address of the Process Monitoring System with DHCP

Please note

Contact the network administrator to obtain the required setting.

The network administrator must reserve a fixed IP address on the DHCP server. To do this, the administrator requires the MAC address (see the label on the underside of the Process Monitoring System). The DHCP server then always assigns the same IP address to the Process Monitoring System.

To operate the Process Monitoring System as a network device with DHCP, proceed as follows:

1 Select "Use DHCP".

2 Enter a host name in the input window "Host Name".

3 Click "Save" to confirm the data.

4 Unplug the network cable from the Process Monitoring System and connect the Process Monitoring System with the customer-side network.

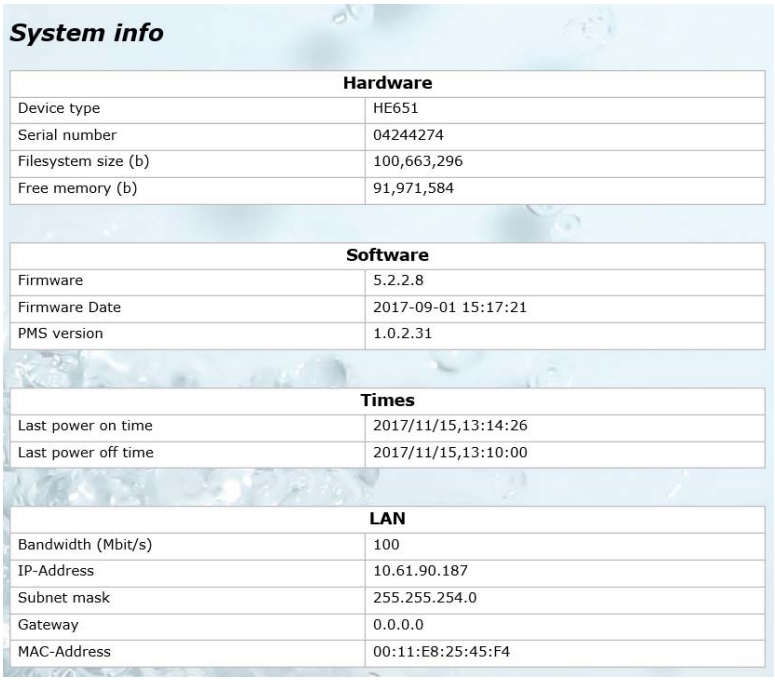
The Process Monitoring System can now be reached via the IP address assigned by the network administrator. This IP address must be entered in the browser in order to access the Process Monitoring System.
Make a note of the new settings on the Process Monitoring System (label on the side) and in chapter 10. “Setting data”.

Please note

If the IP configuration was changed incorrectly and access to the process monitoring system is no longer possible, the IP configuration can be reset to factory setting. See chapter 5.7 “Firmware update”.

5.4.12 System info

Menu item "System Info" in the menu "Setup" displays all network configuration data and information on the Process Monitoring System version.



System info

Hardware	
Device type	HE651
Serial number	04244274
Filesystem size (b)	100,663,296
Free memory (b)	91,971,584

Software	
Firmware	5.2.2.8
Firmware Date	2017-09-01 15:17:21
PMS version	1.0.2.31

Times	
Last power on time	2017/11/15,13:14:26
Last power off time	2017/11/15,13:10:00

LAN	
Bandwidth (Mbit/s)	100
IP-Address	10.61.90.187
Subnet mask	255.255.254.0
Gateway	0.0.0.0
MAC-Address	00:11:E8:25:45:F4

Essentially, the Process Monitoring System comprises a firmware and a web application. The firmware is the operating system on which the web application runs. The example above shows firmware version 5.2.2.8. The web application version is displayed on the bottom right, e. g. HTML Version 1.0.2.31. Both the firmware and the web application can be updated via the SD memory card. See chapter 5.7 “Firmware update”.

5.5 Logout

With the "Logout" button, the user terminates the current session and logs out. The user must also log out with the "Logout" button before logging in on another user level.

5.6 Restoring factory settings

It is possible to reset the IP configuration and the passwords of the process monitoring system back to the factory settings. This is necessary if settings are unknown or incorrectly applied.

Please note

The SD card with the file CONF_DEF.TXT must be inserted for the reset. This file is created automatically during the first successful opening of the Web application. If the file was deleted, it can be downloaded from the Evoqua homepage in the download area.

This process also deletes the version ID of the Web application. This version ID prevents repeated programming of the Web application with the same version under normal circumstances. Deleting the version ID makes it possible to update or program the Web application again with the same version.
This means that the update files (config.txt and tam_fw.bin) must be deleted from the SD memory card after an update.

Follow these steps to restore the factory settings:

1. While the process monitoring system is running, press the service button and keep it depressed for 10 seconds until the process LED lights up red and the signal LED flashes red.
2. Then release the service button. Once the switch is complete, the signal LED lights up green for two seconds. The process monitoring system then carries out a restart (reset) and restores the factory settings of the network configuration and the passwords. The version ID of the Web application is also deleted. Other settings such as event configuration, name settings, ISP settings are not reset.

To change the IP configuration again, see chapter 4.5 “Initial commissioning” and chapter 5.4.11 “IP Configuration”.

To change the password settings again, see chapter 5.4.5 “Password settings”.

5.7 Firmware update

The firmware of the Process Monitoring System and the web application can be updated with an SD memory card. When a new version is available, it can be downloaded from the download area of the Evoqua Homepage. More information and downloads can be found on:

www.evoqua.com
Search: Firmware

Please note

A firmware update resets the process monitoring system to factory settings. All settings, e.g., IP configuration, event configuration, bus scan, etc. must be entered again. If necessary, make a note of all settings in Setup before the update.

The update of the process monitoring system requires the use of an industrial SD memory card (article no. W2T806599) with fast access times. The standard memory cards included in the scope of supply are not suitable due to the required higher access times.

An update can be necessary if new functions or also improvements are available that were not yet available upon delivery of the process monitoring system.

The firmware is saved under the file name "Tixi.Gate_FW.tar.gz". To update the firmware, proceed as follows:

1. Copy "Tixi.Gate_FW.tar.gz" to a FAT16- or FAT32-formatted SD memory card (max. storage capacity 32 GB).
2. Switch the Process Monitoring System off.
3. Insert the SD memory card with the firmware file into the SD slot of the Process Monitoring System.
4. Switch the device on again.
5. The new firmware is read in, during which time the LED‘s light up or flash. This process takes approx. 4 minutes. The device then performs a restart. If the Process Monitoring System beeps once, the update is completed.

Please note

Do not switch off the power supply to the Process Monitoring System while the update is being performed!

5.8 Process Monitoring System, updating the web application

An update of the web application can be necessary if new bus users are available that were not yet available upon delivery of the process monitoring system, if improvements have been carried out, or new functions have been integrated. Provided that a new version is available, it can be downloaded from the homepage in the download area.

Before updating the web application on the Process Monitoring System, a Factory Reset must be performed to delete the current web application. Make sure the necessary update file (config.txt) is available.

Please note

During a firmware update, the Process Monitoring System is restored to the factory setting. All settings such as IP configuration, event configuration, bus scan etc. must be performed again. If necessary, all settings must be noted in Setup prior to the update.

Deleting the web application

Proceed as follows to delete the web application:

1. Switch the Process Monitoring System off and wait five seconds.
2. Press the Service button, hold it pressed and switch the Process Monitoring System back on.
3. Hold the Service button pressed until the Power LED flashes.
4. Release the Service button and then press it again until the Power LED flashes rapidly.
5. Release the Service button, and the Process Monitoring System will then restart.

Please note

Access to the Process Monitoring System websites is now no longer possible! The web application has been deleted.

Loading the web application

To upload a new web application to the Process Monitoring System, proceed as follows:

1. Switch the Process Monitoring System off.
2. Remove the SD memory card.
3. Copy the new web application "config.txt" to the SD memory card (no subdirectory, write protection inactive).
4. Insert the SD memory card with the config.txt file into the Process Monitoring System.
5. Switch the Process Monitoring System on.

   The Process Monitoring System now performs a restart and reads in the new configuration/web application.
   This process takes approx. 3 to 4 minutes. There must be no power failure, and the Process Monitoring System must not be switched off while the update is running. During the update, the Signal LED flicker alternately.
   When the process has been completed, the Process Monitoring System makes a bleeping noise and performs a restart.
   The Process Monitoring System has now been restored to the factory settings and must be re-configured (IP Settings, Bus scan, etc.). See 4.5 “Initial commissioning”.

Please note

After updating the firmware and Web application, the update files should be deleted again from the SD memory card. We recommend using a dedicated SD memory card for the update (industrial SD card, see chapter 7. “Spare parts”).

Failed Web application

What to do if the update of the Web application may have failed?

First, delete the Web application. Refer to “Failed Web application” on page 89 for details on how to do this.

To repeat the update (with the same Web application version), you must delete the version ID stored internally in the process monitoring system.

Proceed as follows:

1. Download the ZIP file "CONF-DEF.ZIP" from our homepage.
2. Unpack you the ZIP file "CONF-DEF.ZIP".
3. Rename the unzipped file 'CONF_DEF.TXT" to "config.txt".
4. Copy the renamed file "config.txt" to the SD memory card (not to a subdirectory, read-only disabled).
5. Disable process monitoring system.
6. Insert SD memory card into the SD slot of the process monitoring system.
7. Switch the device on again.

The following is carried out:

- After the reboot, the version ID is deleted. The Active LED lights up red during this process and the signal LED will flash red.
- The process is complete once the process monitoring system beeps and the Active LED is green again (duration: 20 seconds).
- Then the Web application can be reloaded. Refer to “Loading the web application” on page 88 for details.

Please note

The update of the process monitoring system requires the use of an industrial SD memory card (article no. W2T806599) with fast access times. The standard memory cards included in the scope of supply are not suitable due to the required higher access times.

5.9 Faults and remedy

Errors The following table shows and explains errors which may occur. If you cannot remedy the problem yourself, please contact your service partner.

Errors	Cause	Remedy
Bus scan - no device found.	RS485 bus line A and B swapped.	Swap RS485 bus line A and B and perform bus scan again.
	Bus termination and balancing not correctly installed.	Check bus structure.
	Devices not set to bus operation.	Set bus operation, check bus addresses.
No display on device (all LEDs off).	No supply voltage.	Check supply voltage.
Start screen for login is not displayed.	Network connection not correctly configured or incorrect IP address was entered in the browser.	Check network settings. Check IP address; if necessary reset the IP configuration of the Process Monitoring System to the factory setting and reconfigure.
Bus devices are grayed out in the visualization overview.	RS485 bus structure faulty. Bus address changed at the devices, addresses assigned twice.	Check bus structure. Check bus addresses. If necessary, perform bus scan again.
Excel File contains, for example, the following: HTTP/1.0 404 Not Found Pragma: non-cache Expires: Mon, 01 Jan 1990 00:00:00 GMT Content-Type: text/xml Content-Length: 161 <?xml version="1.0" ?> <D> >ErrNo _="-110"/> <ErrTxt _="stream is not open"> <Line _="549"/> <Module _="RemovFile"/> <Class _="TXRemovableFile"/> </D>	Error while downloading an archive file. No data present, i.e. no device is entered in the bus list at this bus address or the SD memory card is not inserted.	Insert SD memory card in the slot.

Errors	Cause	Remedy
Trend chart is displayed only for the current day.	Bus scan was performed before the SD memory card was inserted in the process monitoring system. (The "ARCHIVE" folder has not been created on the SD memory card. The "ARCHIVE" folder is created during the bus scan.)	Carry out a bus scan (SD memory card must be inserted) or create an "ARCHIVE" folder on the SD memory card and click the "Update" button under Setup-> Archive files (see also 5.4.9 “SD memory card”).
	Bus addresses were switched and a bus scan was carried out. The old archive data was not deleted from the SD memory card.	Save archive files of the affected devices from the SD memory card to a different storage media and then delete the data on the SD memory card. Carry out another bus scan.

6. Service

Please note

Liability for defects can only be accepted if maintenance work is performed as prescribed. The corresponding standards, regulations and pertinent local regulations must be complied with.

Maintenance intervals

Activity	Period / Interval	Chapter
Check function	Daily	5. "Operation"
Check device for damage	Daily	
Data backup	every 3 months	5.4.7 "Group Configuration - Multipool Visualization" and 5.4.9 "SD memory card"
Replace memory card	annually	5.4.9 "SD memory card"

7. Spare parts

Warning!

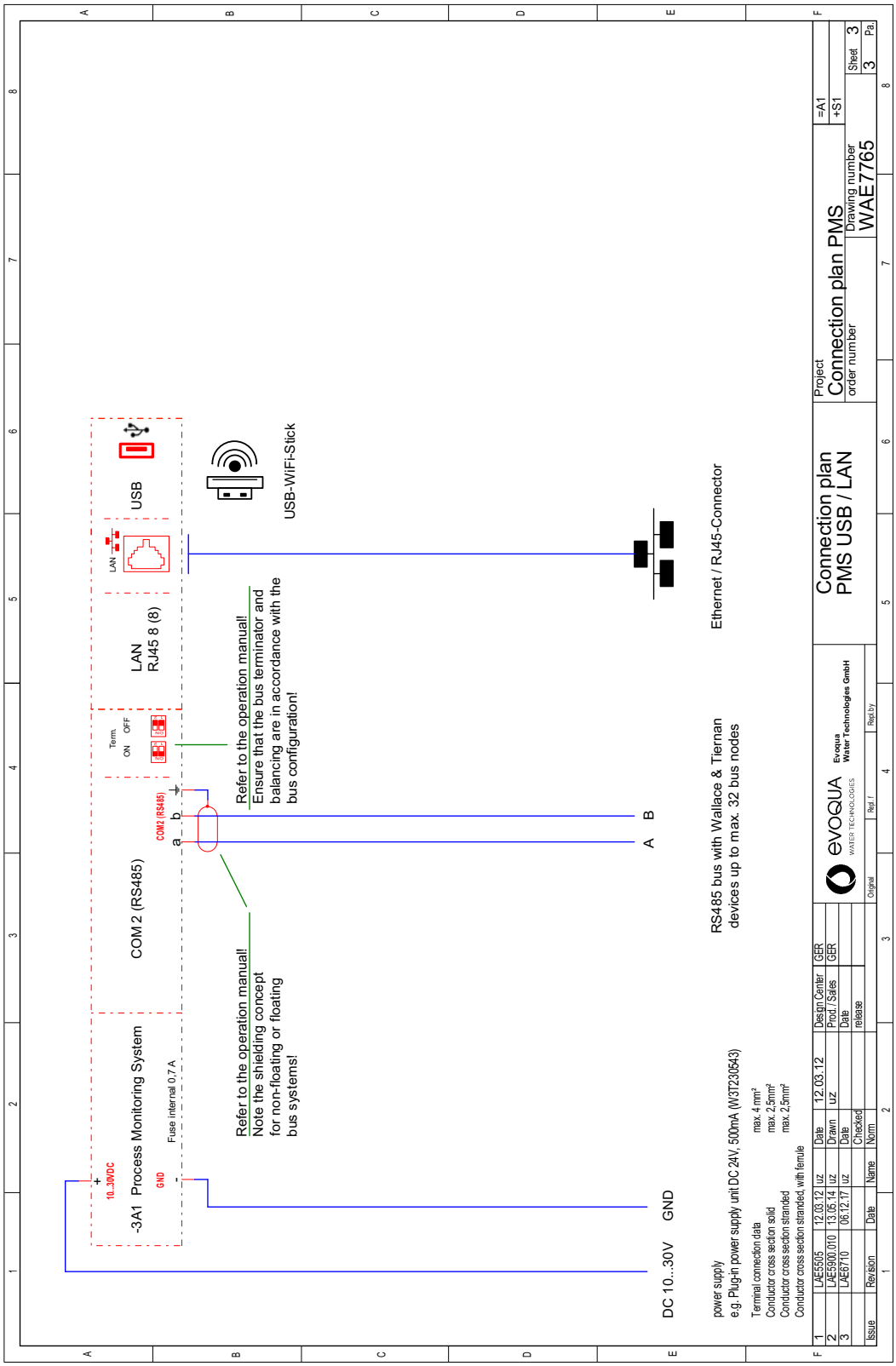
For safety reasons, use only original spare parts. Please contact our customer service department for details.

Article No.	Description
W3T395278	Process Monitoring System LAN
W3T395573	WLAN USB key
W3T230717	Process Monitoring System LAN, complete with power supply and accessories
W3T230719	Process Monitoring System LAN in circuit-breaker housing
W3T168569	SD memory card 128MB - 2 GB (empty)
W3T410448	Industrial SD card 2 GB with latest firmware and Web application to update the process monitoring system (USB/LAN)
W2T806599	Industrial SD card 2 GB (empty)
W2T540151	Connection cable RJ11/RJ11, 3 m
W2T540152	Connection cable TAE-N/RJ11, 3 m
W2T540153	Patch cable RJ45 SF/UTP, 2 m
W3T230543	Universal power supply unit 100-240V / 24VDC
W2T505408	Integrated power supply for sub-distribution (Logo Power) IN: AC:100- 240V OUT: DC 24V / 1.3 A
W2T505559	RS485 data cable
W2T507492	RS485 terminating resistor, single Rt (150 Ohm)

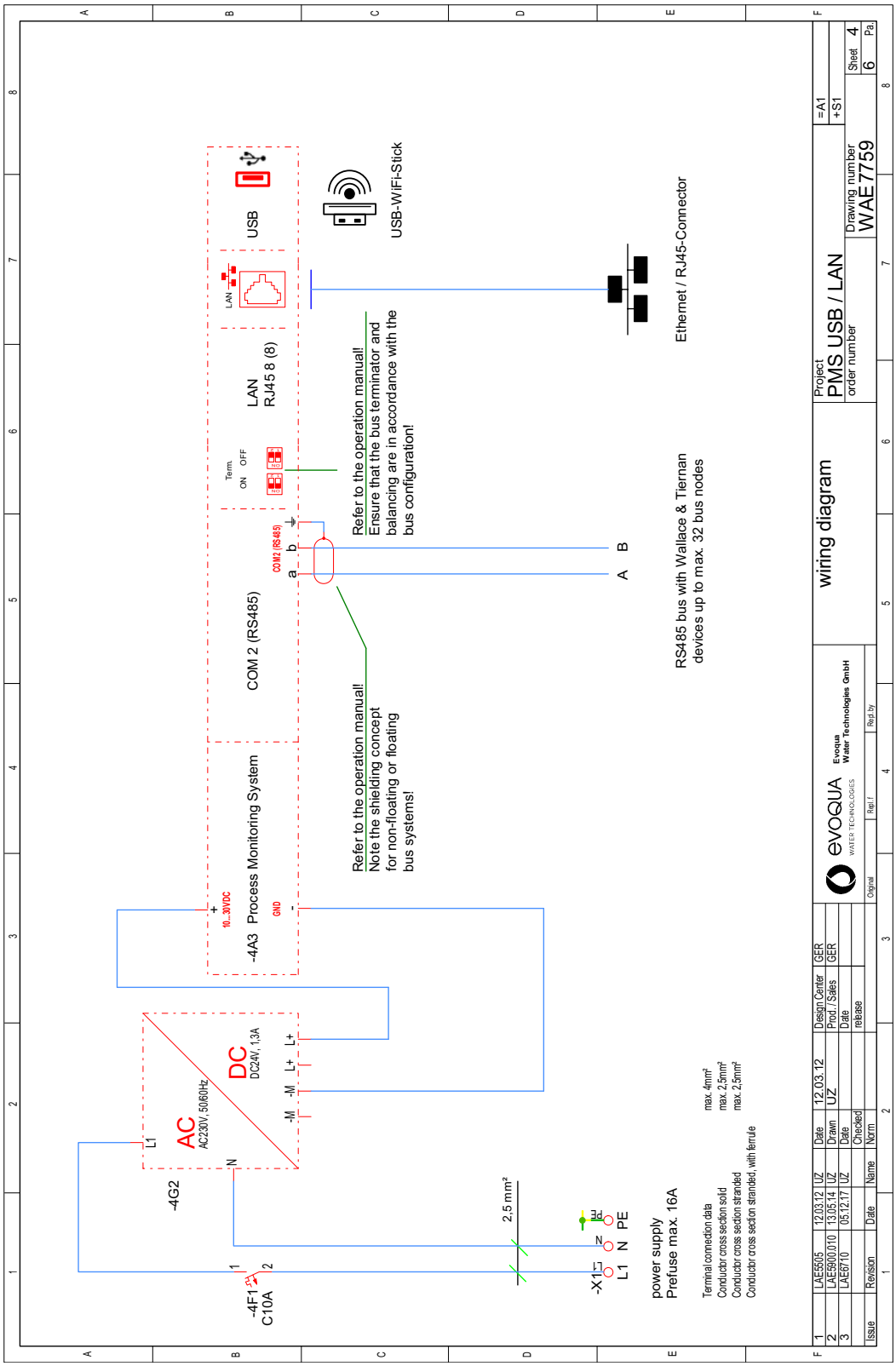
Article No.	Description
W2T547861	Active bus terminator for 24 V DC power and top hat rail assembly
W3T238912	Instruction manual - Process Monitoring System, German
W3T238913	Instruction manual - Process Monitoring System, English
W3T238915	Instruction manual - Process Monitoring System, French

8. Wiring diagram

8.1 Process Monitoring System LAN as a standalone device (W3T230717)



8.2 Process Monitoring System LAN in circuit-breaker housing (W3T230719)



9. Certificates

EVOQUA

EG-Konformitätserklärung
EC Declaration of Conformity
Déclaration CE de conformité

No. MAE1501

Ausgabe/*issue*/**édition** 04

Hersteller/*Manufacturer*/**Constructeur:**	Evoqua Water Technologies GmbH
Anschrift/*Address*/**Adresse:**	Auf der Weide 10, D-89312 Günzburg
Produktbezeichnung: *Product description:* **Description du produit:**	Process Monitoring System

Das bezeichnete Produkt stimmt in der von uns in Verkehr gebrachten Ausführung mit den Vorschriften folgender europäischer Richtlinien überein:
The product described above in the form as delivered is in conformity with the provisions of the following European Directives:
Le produit désigné est conforme, dans la version que nous avons mise en circulation, avec les prescriptions des directives européennes suivantes :

2014/30/EU — Richtlinie des Europäischen Parlaments und des Rates vom 26. Februar 2014 zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit.
Directive of the European Parliament and of the Council of 26 February 2014 on the approximation of the laws of the Member States relating to electromagnetic compatibility.
Directive du Parlement européen et du Conseil du 26 février 2014 relative au rapprochement des législations des Etats membres concernant la compatibilité électromagnétique.

2014/35/EU — Richtlinie des Europäischen Parlaments und des Rates vom 26. Februar 2014 zur Angleichung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen.
Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.
Directive du Parlement européen et du Conseil du 26 février 2014 concernant le rapprochement des législations des Etats membres relatives au matériel électrique destiné à être employé dans certaines limites de tension.

CE-Kennzeichnung / *CE marking* / **Marquage CE**: 2017

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Ausgabe : 13.05.2014
Dokument: VD130-1_CE_Konformitätserklärung.doc

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Seite 1 von 2

Die Konformität mit den Richtlinien wird nachgewiesen durch die Einhaltung der in der Nachweisdokumentation aufgelisteten Normen.
Evidence of conformity to the Directives is assured through the application of the standards listed in the relevant documentation.
La conformité avec les directives est assurée par le respect des normes listés dans la documentation téchnique correspondante.

Benannte Person für technische Unterlagen:
Authorized person for the technical file:
Personne désignée pour la documentation technique:

Name / *name* / **nom:** Evoqua Water Technologies GmbH

Adresse / *address* / **adresse:** Auf der Weide 10, D-89312 Günzburg

Günzburg, den / *the* 2017-12-04

Evoqua Water Technologies GmbH

Klaus Andre Technischer Leiter / *Director Engineering*	Unterschrift *signature* / **signature**	Helmut Fischer Leiter QM / *Quality Manager*	Unterschrift *signature* / **signature**

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie nach §443 BGB. Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.
This declaration certifies the conformity to the specified directives but does not imply any warranty for properties. The safety documentation accompanying the product shall be considered in detail..
La présente déclaration atteste de la concordance avec les directives citées, elle n'offre cependant pas de garantie quant à la nature ou la durabilité selon l'article 443 du code civil allemand. Les consignes de sécurité de la documentation du produit fournie sont à respecter.

10.Setting data

Please note

To prevent unauthorized access by other users, the user levels and passwords set at the factory should be changed to customer-specific settings.
Please make a note of your customer-specific settings.

10.1 IP Configuration

IP address		
Subnet Mask		
Gateway		
DNS 1		
DNS 2		
Host Name		
DHCP used	☐ yes	☐ no

10.2 Mail settings

Service		
Mail server (SMTP)		
E-mail address (from)		
Authentication	☐ yes	☐ no
User name		
Password		
Destination addresses (1 – 5)		
Actions	☐ Send daily mail at _____	
	☐ Send mail if event is released	

10.3 User levels

Please note

Keep these password settings in a safe place!

For security reasons, we recommend that you change the user name and the passwords.

User level 1:

	Factory setting	Customer-specific setting
User name	wt1	
Password	9041	

User level 2:

	Factory setting	Customer-specific setting
User name	wt2	
Password	9042	

User level 3:

	Factory setting	Customer-specific setting
User name	wt3	
Password	9043	

User level 4:

	Factory setting	Customer-specific setting
User name	wt4	
Password	9044	

11.Appendix

11.1 Tested browsers

The following systems and web browsers were tested with the Process Monitoring System:

- Windows Internet Explorer from IE10
- Mozilla Firefox from Version 13.0
- Apple Safari from Version 5
- Google Chrome from Version 20
- iPhone4/4S
- iPad 2, iPad 3
- Android 4

The listed browsers display all views of the Process Monitoring System correctly and allow all necessary operations. Other browsers or browsers under other operating systems (e.g. Linux) were not tested and may cause errors in the depiction or operation of the Process Monitoring System.

We recommend: Firefox from Version 30

11.2 Explanation of terms

Autonegotiation	Autonegotiation is a process that allows two connected Ethernet network ports (e.g. PC connected to Process Monitoring System or hub / switch connected to Process Monitoring System) to automatically negotiate and configure the maximum possible transmission speed and duplex mode
Duplex mode	In principle, communication between two devices can be effected in simplex, half-duplex or full-duplex mode. In simplex mode, communication is one-sided and only transmission is possible. In half-duplex mode, the devices transmit and receive alternately, while in full-duplex mode, they can transmit and receive simultaneously (e.g. telephone).
Client-server architecture	System with "distributed intelligence" in which the client establishes a connection to a server in order to request services provided by the server. Some server applications can serve several clients simultaneously.
10BaseT - 10Mbit/s BASEband twisted pair	The wiring configuration is star-shaped, with the cables proceeding from a hub as the central active component. Twisted pair cabling of at least category 3 with 100 ohm impedance is used, whereby data are transmitted separately according to transmit and receive direction. 8-pin RJ45 connectors are used. The maximum length of a segment (= line from the hub to the terminal device) is 100 m.
100BaseT- 100mbit/s	General designation for the three 100-mbit/s Ethernet standards via twisted-pair cable: 100BASE-TX, 100BASE-T4 and 100BASE-T2. As with 10BASE-T, the maximum segment length is 100 meters. Here, too, 8-pin RJ45 connectors are used.
BootP - Boot Protocol	This older protocol for booting PCs without a hard drive via the network is the precursor of DHCP. Modern DHCP servers still support BootP requests. Today, BootP is primarily used to assign an IP address to embedded systems. To do this, a reserved entry must be defined on the DHCP server assigning a fixed IP address to the MAC address of the embedded system.
Browser	Client program with a graphic user interface allowing the user to display websites and use other services in the Internet.

CGI - Common Gateway Interface	The CGI is responsible for the interaction between the web client (visitor to the website) and the web server or programs and scripts stored there. With the Process Monitoring System, logon with CGI user name and password is always required.
Client	Computers or applications using the services of so-called servers. Such services can, for example, be the provision of HTTP and FTP.
DHCP - Dynamic Host Configuration Protocol	Dynamic assignment of IP addresses from an address pool. DHCP is used to automatically assign an IP address to network devices in a TCP/IP network.
Ethernet	Ethernet is the most commonly used technology for local networks. At present, transmission rates of 10 megabit/s, 100 megabit/s (Fast Ethernet), 1000 megabit/s (Gigabit Ethernet) to 10 gigabit/s are specified.
MAC address	The unique physical address of a network component in the Ethernet.
Firewall	A firewall is a network component which, in a similar manner to a router, connects an internal network (Intranet) to a public network (e.g. Internet). Access to the respective other network can be limited or completely blocked, depending on the direction of access and the authentication and identification of the network device. A further function can be the encrypting of data, for example if the public network is used only as a transfer route between two geographically separated parts of an Intranet.
FTP - File Transfer Protocol	FTP is a protocol based on TCP/IP allowing the transfer of entire files between two network devices.
Gateway	Like routers, gateways connect different networks with each other. While a router connects the physical types of the networks (e.g. Ethernet/ISDN) but does not affect the actual protocol (e.g. TCP/IP), gateways allow access to networks controlled by different protocols (e.g. from TCP/IP to profibus). A gateway thus also has the function of translating between different communication protocols.
HTML - Hypertext-Markup-Language	Markup language which uses key words to define how content is displayed in the browser, where multimedia elements are located, which elements are linked and how they are linked.
HTTP - Hypertext Transfer Protocol	The HTTP protocol is based on TCP and regulates the requesting and transfer of web content between the HTTP server and the browser. HTTP is thus the most commonly used protocol in the Internet today.

Hub	A hub, often also referred to as a star coupler, allows the connection of several network devices in a star configuration. Data packets received at one port are output to all other ports. In addition to hubs for 10BaseT (10mbit/s) and 100BaseT (100mbit/s), there are so-called autosensing hubs which automatically detect whether the connected end device works with 10 or 100mbit/s.
ICMP - Internet Control Message Protocol	The ICMP protocol is used to transfer status information and error messages between IP network nodes.
Internet	The Internet is currently the largest global network providing an almost unlimited communications infrastructure for the connected network devices. Using TCP/IP, the network devices can avail themselves of the services offered in the Internet, for example e-mail, FTP, HTTP etc., independent of the platform.
Intranet	A closed network (for example, in a company), within the confines of which the network devices can use typical Internet services such as e-mail, FTP, HTTP etc. As a rule, it is also possible to access the Internet from the Intranet via a router or firewall.
IP - Internet Protocol	Protocol allowing connection of devices located in different networks.
IP address	The IP address is a 32-bit number uniquely identifying each network device in the Internet or Intranet. It consists of a Net ID and a Host ID.
LAN - Local Area Network	Local network within a limited area using a rapid transmission media such as Ethernet.
Router	Routers connect two different networks. In contrast to bridges, which decide which data packets are to be passed on on the basis of the Ethernet address, routers make this decision based on the IP address.
Switch	Like a hub, a switch allows several network devices to be connected in a star configuration. A switch "learns" the Ethernet address of the network device connected at a port and forwards only those data packets that are addressed to this network device. In addition to switches for 100Base T (100mbit/s), there are so-called autosensing switches that automatically detect whether the connected network device works with 10 or 100mbit/s.
TCP - Transmission Control Protocol	TCP is based on IP and ensures not only the connection of the devices during data transmission but also the integrity of the data and the correct sequence of the data packets.

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