



# Solutions for water management

# One system for all functions – Products and solutions for water treatment

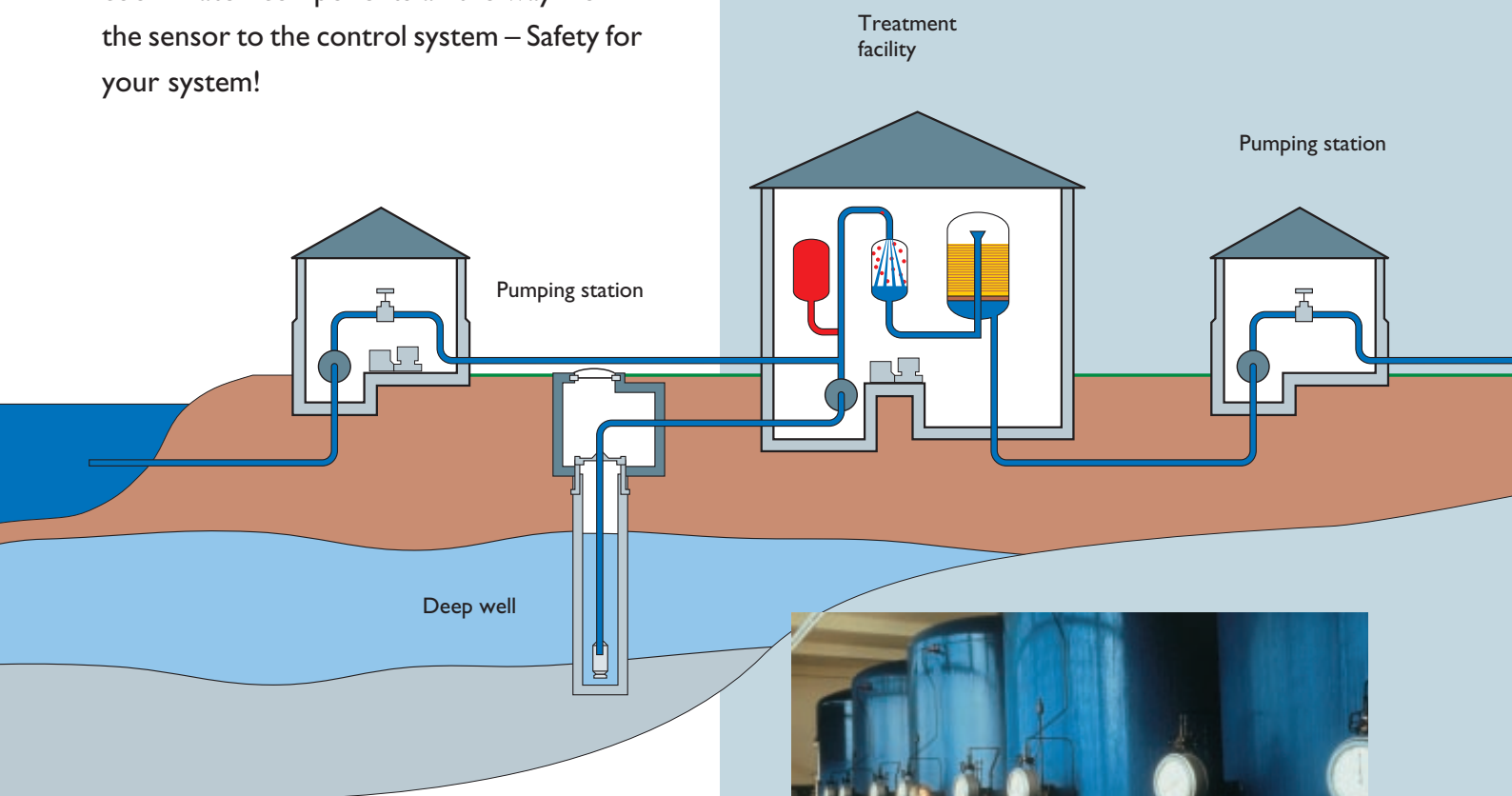
Effective treatment of water involves a technically complex interaction between the source, treatment facility and distribution system. Reliable interplay between measuring and automation technology in conjunction with a system-specific surge protection concept is the prerequisite for high plant availability.

Phoenix Contact has a concept of perfectly coordinated components all the way from the sensor to the control system – Safety for your system!



## ► Visualization

Have a clear grip of all the data



## ► Supply

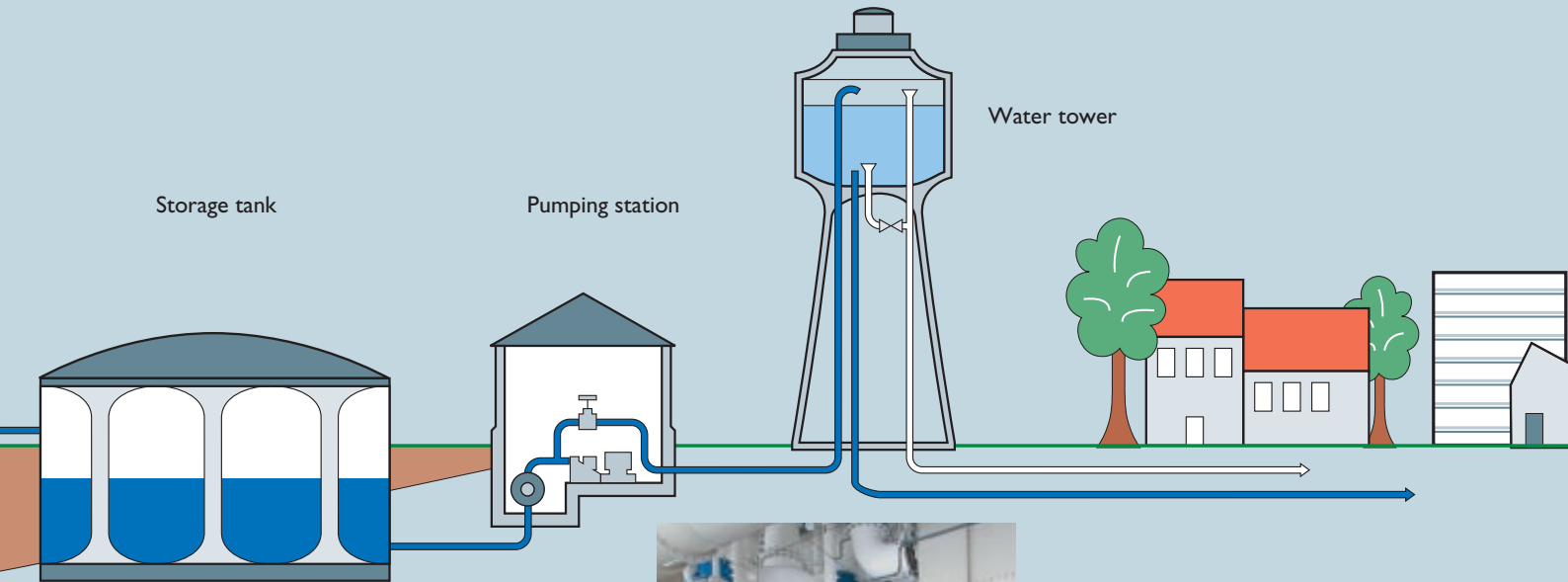
Reliable power supply for electrical systems



▶ **Remote monitoring**  
 Reliable control of remote stations



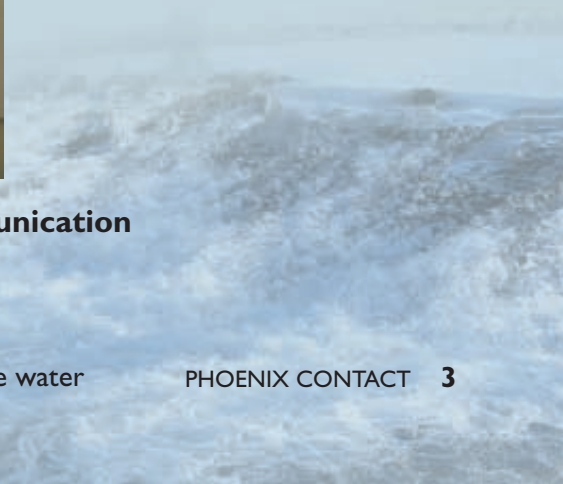
▶ **Controlling/Regulating**  
 Always in control of the process



▶ **Lightning protection**  
 Never giving surges a chance



▶ **Transmission/Communication**  
 Reliable transmission of sensitive process data



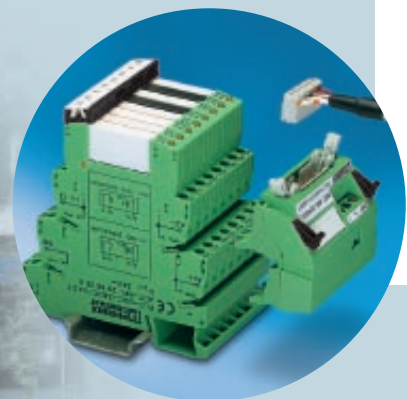
# Optimized components for the water treatment process

Reliable transmission of measured values, so that the automation solutions down the line can read them in and process them correspondingly – That is the prerequisite for an ideal water treatment process. FO converters with integrated monitoring of the transmission path, system-compliant surge protection circuits, as well as parameterizable measuring transducers with limit value monitoring guarantee a smooth transmission of operating data. System cabling provides a clear and organized connection between the control technology and the signal conductors. The process visualization system displays everything clearly on the screen in the control center. Ideal water treatment with Phoenix Contact!



## ► Protection Switching drives safely and monitoring pumps

Electronic motor starters with motor management (ELR-MM) not only ensure that drives are switched safely and without wear; using the integrated effective power measurement and motor management, pumps can also be protected against dry run and blocked filters. The motor becomes a sensor – even through a network.



## ► Controlling/Regulating Reliable switching

Coupling relays of the PLC range are compact, pluggable and can be connected directly to the PLC with our system cabling. That makes for well-organized control cabinets and facilitates troubleshooting in the event of operational malfunctions.



Well 1



► **Transmission/  
Communication**

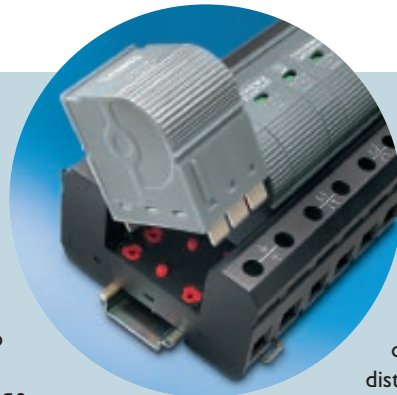
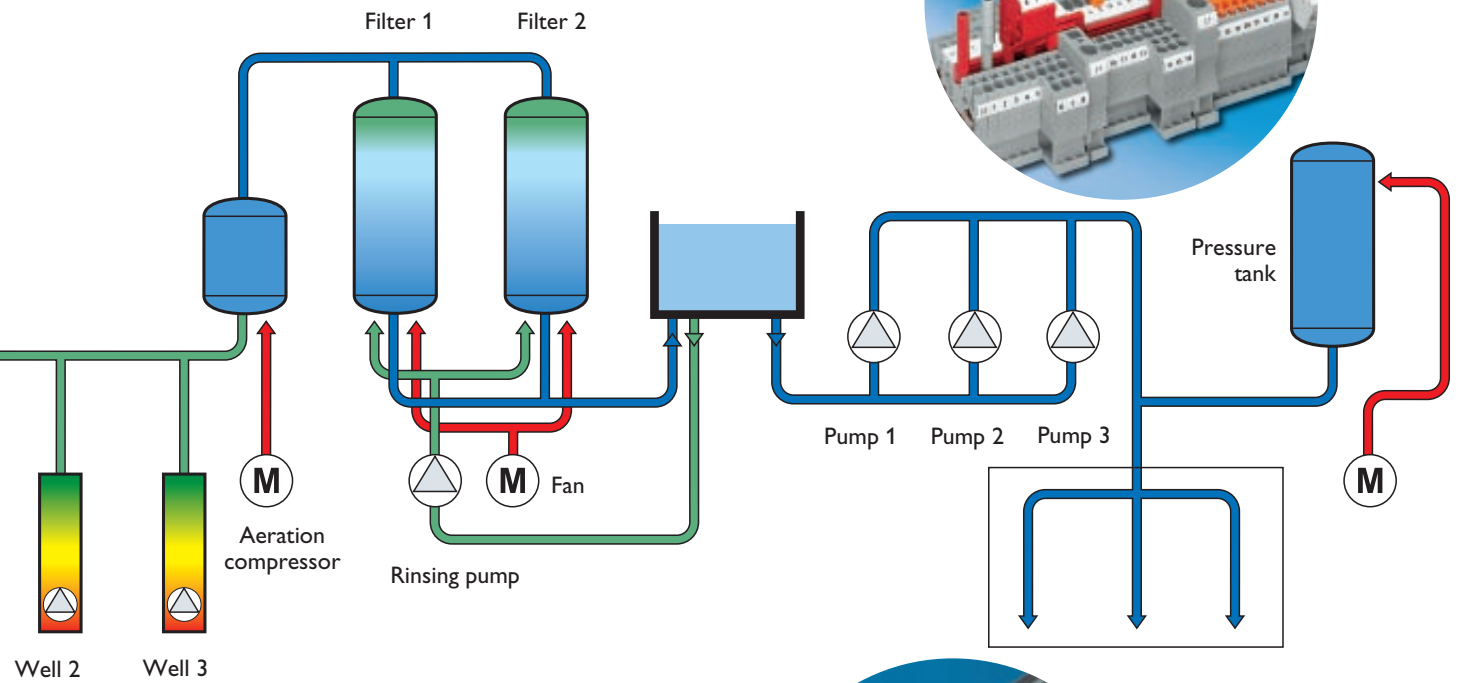
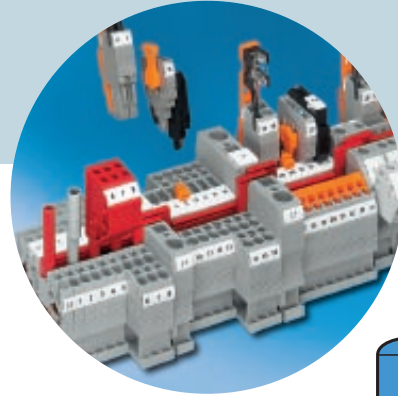
**Long transmission paths –  
Fast transmission of data**

One requirement does not necessarily rule out the other. Fiber optic converters from Phoenix Contact make long fiber optic distances possible and also monitor the transmission path for easy troubleshooting.

► **Transmission**

**All the connection technologies – One system**

For signal and power cabling, our CLIPLINE complete system has the right connection method for every application. From motor cabling with the screw connection system up to 240 mm<sup>2</sup> to the time-saving fast connection technology QT for signal wiring. Regardless of the solution you opt for, all the connection technologies can be combined with each other with the same accessories.



► **Protection**

**Never giving surge voltages a chance**

Effective protection against dangerous surge voltages is not only sensible for the data lines in distributed installations, but also for power. Flashtrab Compact, the new surge protection system provides reliable protection, even where there are different mains types.

► **Visualization**

**Always an eye on the process**

Monitoring levels and pump running times, pinpointing alarms precisely and sending a text message to the service engineer – These are just a few of the features of our visualization system.

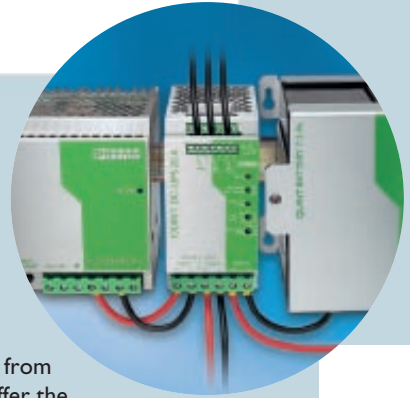


# Reliable networking of distributed systems

Distributed systems – Centralized control technology.

These are the challenges faced by MCR technology and the technology for the transmission of the measured values and operating messages over long distances. Phoenix Contact provides the corresponding communication media: Fiber optic converters, leased line or dial modems together and always with the matching surge protection devices – Everything from one system kit.

Your advantages: Continuity from measured value acquisition, via the local PLC, and on to displaying with the process visualization system in the control center.



## ► Supply

### No loss of data in the event of a power failure

Power supply units from Phoenix Contact offer the best solutions for the supply of 12 V, 24 V or 48 V systems. And if the mains supply does ever fail, the 24 V DC UPS system gives you the certainty that the controller can continue to function and then be shut down later in a controlled manner – without data being lost.



wireless

## ► Transmission/Communication

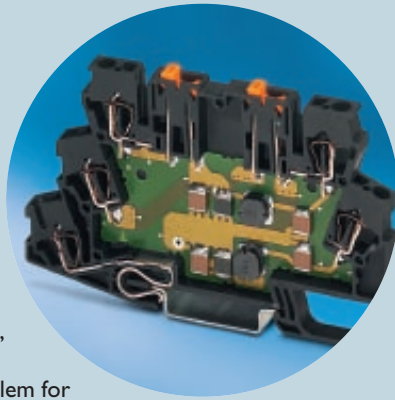
### Wireless transmission of signals

With the aid of wireless signal transmission, it is possible to overcome barriers and acquire signals where it is almost impossible to lay cables. The bidirectional system transmits both analog and digital signals. Extension modules are mounted in a row quickly and simply via the integrated bus foot. The system can be perfectly adapted to meet the special requirements of the application using the extension modules, each of which provides either four additional analog signals or eight additional digital signals.

► **Lightning protection**

**Protection against downtime caused by surge voltages**

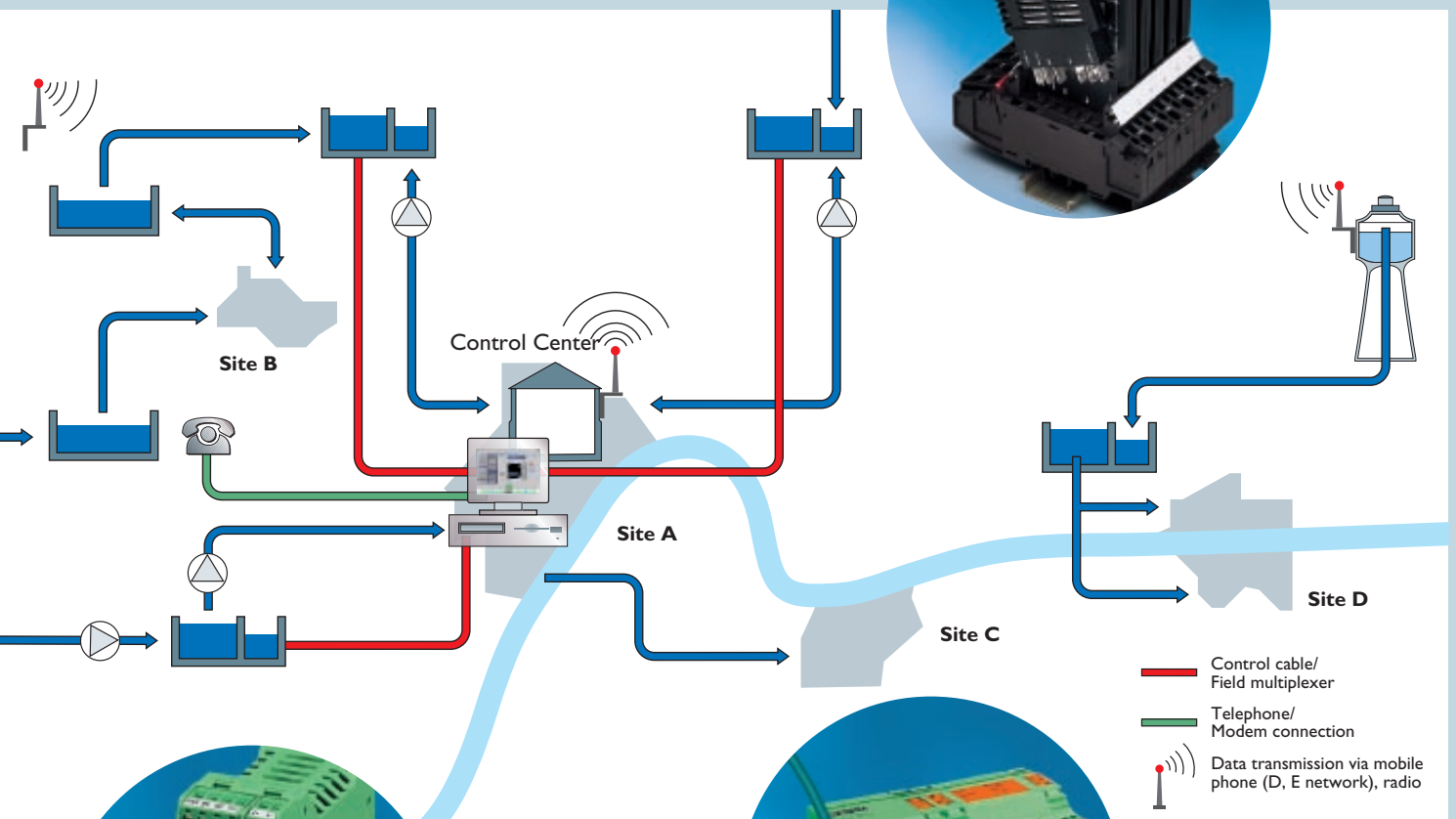
Wherever numerous cables meet, space becomes tight for surge protection components. No problem for the slim Termitrab surge arresters from Phoenix Contact. Each 6 mm slim terminal block hides a complete surge protection function for two conductors.



► **Over current protection**

**Selective protection even over long distances**

To protect networked systems against too high currents, the ECP and TMCP circuit breakers from Phoenix Contact provide a combination of active current limiting and proven circuit breaker technology. In the case of long transmission distances, the circuit breakers with their ideal trigger characteristics ensure that the individual load is switched off fast and safely. When the load is switched off, the TMCP can send a signal to the control desk for remote querying.

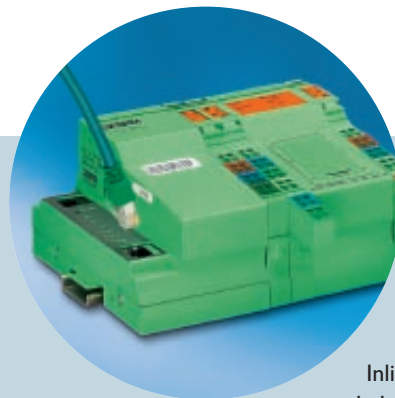


- Control cable/  
Field multiplexer
- Telephone/  
Modem connection
- Data transmission via mobile  
phone (D, E network), radio



► **Remote control**  
**Data transmission**  
**from distributed**  
**systems**

Information from the distributed systems has to be transmitted reliably to the central control rooms. Modem devices from Phoenix Contact guarantee reliable data transmission: they are mounted on the DIN rail and designed for industrial use.



► **Controlling/Regulating**  
**Controllers: Small, compact**  
**and powerful**

Small, compact, and yet powerful controllers like the ILC from Phoenix Contact with the modular Inline I/O system provide flexible and optimized control solutions for distributed installations. A matching software solution for telecontrol is included, making the exchange of data with the control room easy.

# AUTOMATIONWORX – Automation in distributed system structures

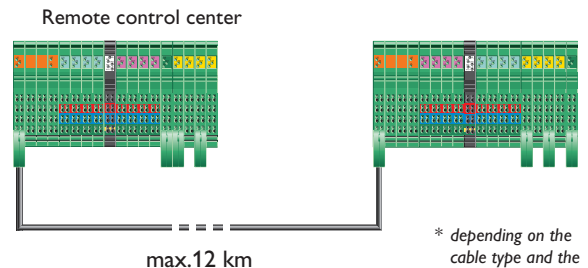
Integrating distributed sites, such as pumping stations, rainwater overflow tanks or reservoir towers is in water management systems a major aspect for a universal approach to the automation solution. Fieldbus systems and distributed controllers have become standard in the past years. Improved water management is achieved by simple and cost-effective expansion options as well as the increased availability of the entire system. The use of uniform automation components guarantees a universal data structure within the overall system.

← **MUX**



## Remote control without software configuration – Inline field multiplexer

Point-to-point data transmission of digital and analog signals via one single two conductor cable up to 12 km\* saves wiring expenses. It is also possible to use cables that have already been laid, but are not being used. Software-assisted configuration is not necessary.



\* depending on the  
cable type and the  
EMC environmental  
conditions

## Expanding the remote control station – No problem

Up to 8196 digital or 512 analog inputs or outputs can be connected directly or via a fieldbus. A wide variety of digital and analog input and output modules, motor control switches, temperature controllers or safety modules is available in IP20 or IP67. Also, it is possible to expand the remote control station by adding text and touch panels or industrial PCs. Open interfaces such as OPC allow communication with many SCADA systems.



## PC WORX

PC WORX is the common automation software for all field controllers (FC/RFC), and embedded controllers (ILC) from Phoenix Contact. Programming in acc. with IEC 61131, configuration and diagnostics of the complete system is here united in one software tool.

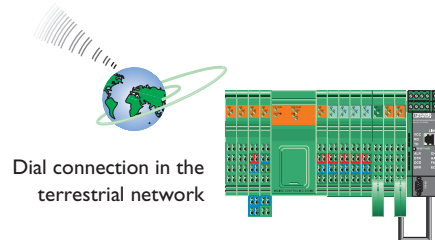
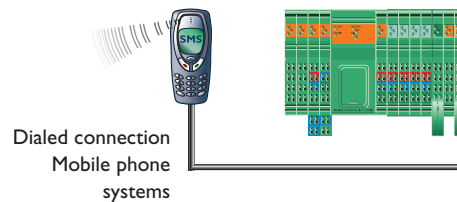
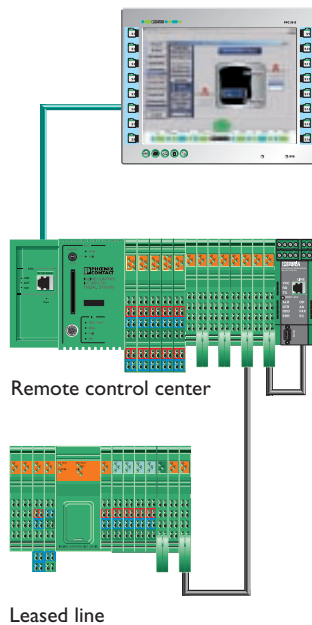


## Inline Controller

The Inline controller family is a modern, highly modular compact control system. The Inline controllers can be mounted in the control cabinet or in the terminal box and can be used as centralized and distributed controllers.

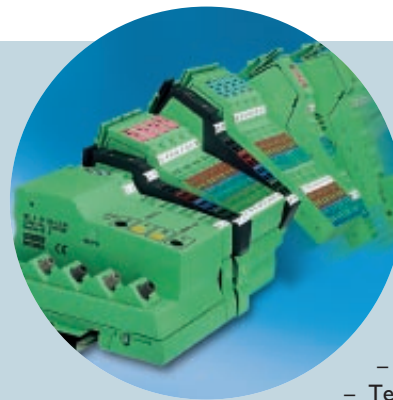


### ▶ AUTOMATIONWORX for remote systems



## AUTOMATIONWORX For remote systems – ReSy

Irrespective of whether leased lines, analog dial-up connections, ISDN, mobile phone or wireless data communication is used, Phoenix Contact controllers can be expanded into the modular remote control station. Efficiency means: Control technology and remote control station in one device. When adapted to your application, it is possible to set up a modular remote control station with the Inline automation toolkit.



## Inline – The Automation Kit

With Inline, you put together the automation functions required to suit your personal needs. For this purpose, there are such functions as:

- Digital and analog inputs and outputs
- Counters and circuit breakers
- Temperature regulating functions
- Pneumatics

# Convince yourselves of our competence!

## Oerbke waterworks

### Vertical integration of all data via Interbus and Ethernet

The Oerbke water treatment plant in Lüneburger Heide is a federally owned drinking water treatment plant responsible for the military facilities on the military training site in Bergen, as well as the town of Fallingbostal with the foods industries Kraft Foods and Eckes-Granini. As part of the modernization

of one works, all the data that occurs is transmitted fast and smoothly from the different parts of the plant right into the commercial department of the district council. The automation concept implemented involves Ethernet connections from the host computer to the main PLC, as well as distributed mini controllers in the various sites. Even the wells have been

integrated with remote control technology in the overall concept.



## Böhl-Iggelheim

### Remote control technology for drinking water supply

Drinking water is supplied to the municipality of Böhl-Iggelheim, west of Ludwigshafen, via three main stations: A pumping station with main well, a water tower and the well. between these three stations. However, there are no data

lines available. No problem for automation technology from Phoenix Contact. In all three stations, there are autonomous automation stations of the same type for the local automation tasks. The stations consist of an intelligent remote field controller with connected digital and analog I/O modules.

This is where the process data is read in or out. A wireless data modem is responsible for the remote transmission of data between the stations.



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# Convince yourselves of our competence!

## Purification plant in Bad Salzflen

**Complete protection against surge voltages**  
The water purification plant in Bad Salzflen has been operating with a high degree of automation for many years. In the past, however, the surge protection was not modernized in line with this technology, a fact that involved many interruptions in operation and led to a great amount of servicing. In conjunction with Phoenix Contact, a comprehensive surge protection concept was compiled – designed to match the particular features of the water treatment plant in Bad Salzflen.

Competent service from a single source!

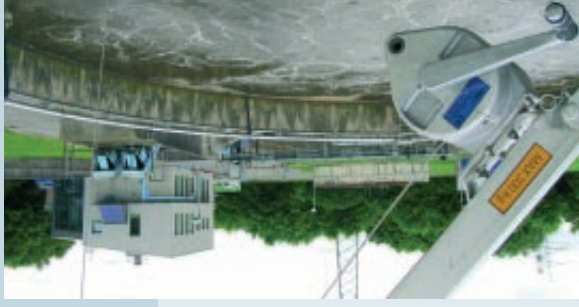


## Water treatment plant Möllbergen

### Monitoring pump stations via analog telephone lines

The fully biological sewage treatment plant Möllbergen in North Rhine-Westphalia treats the waste water of four southern districts of Porta Westfalica, the equivalent of a capacity of 12,000 average inhabitant values. During the last modernization, the aeration technology, the technology for preliminary purification and the technology for the removal of water from the sludge were replaced, and electrical and automation technology upgraded to comply with the state of the art. Not only the entire water treatment plant, but also distributed pump stations and

storm-water reservoirs are controlled, monitored and protected with technology from Phoenix Contact.



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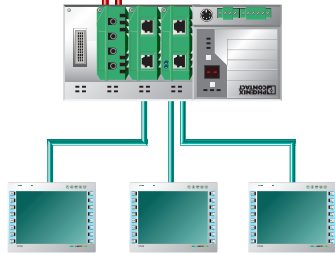
INSPIRING INNOVATIONS



## Industrial Ethernet networking

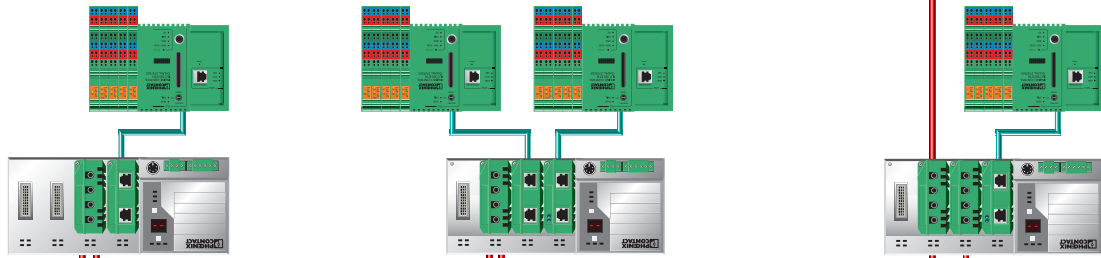
### Inflow

For small automated units, the Modular Managed Switch can be adapted to the plant-specific requirements. Here is an example of twisted pair networking to the higher-level fiber optic network.



All the plant information comes together at the control room switch. Here, the option of redundant power supply is particularly important, to increase the availability of all the plant information.

### Control room



**Secondary treatment**  
Redundant data transmission provides top availability of the network.

To ensure that the most cost-efficient solution is chosen, interface modules for twisted pair, glass fiber and HCS fiber data transmission are combined.

### Primary treatment

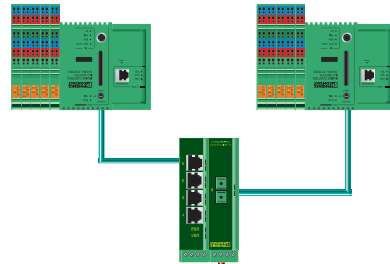
Our embedded controllers such as ILC 350/370 with PROFINET connection reliably control the entire process.

### Problems with planning and project planning?

The specialists from Phoenix Contact will be pleased to offer you support. Get in touch with us. solutions@phoenixcontact.com

### Mechanical cleaning

Depending on the system and data structure and of course also bearing expenses in mind, it is often sensible to include unmanaged switches in the overall concept. These components also offer the possibility of data transmission via TP, glass, HCS or polymer fiber.



— Ethernet TP

— Ethernet FO

### Always the right solution:

**Modular, managed Factory Line switches**  
Adaption to the particular connection requirement – The Modular Managed Switch from the Ethernet range by Phoenix Contact can do just that: number of positions, connector and transmission medium. It is the first industrial switch that can be expanded seamlessly from eight to 24 ports. There are interface modules for twisted pairs, glass fiber or the polymer and HCS fibers, with which the switch can be adapted to each particular application.

Waste water treatment

PHOENIX CONTACT 9

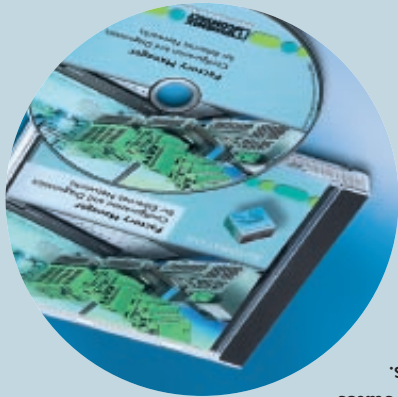
# Ethernet – industrial standard in waste water management

In sewage and waterworks, it is usual to control individual sections with separate PLCs for availability reasons. In the past, proprietary systems were used for networking these controllers. Nowadays, industrial Ethernet is performing this function more and more often. As in the office world, infrastructure components (e.g. switches) are used for networking. The demands placed on these components with regard to availability, immunity to interference, modularity and installation in harsh industrial environments are higher though.



## Full range of Ethernet application options

Simple project planning and installation, system and long-term availability – This is not a problem for the Ethernet-based automation solutions from Phoenix Contact. Startup and diagnostics for Ethernet networks and their infrastructure is carried out with Factory Manager. This software is in a position to check connections, operating and data transmission modes at any time and can even detect critical system states before the device fails. Using an SNMP OPC server, all received process data are transferred to the PC application in the office and field level.



## Factory Line switches with standard functions

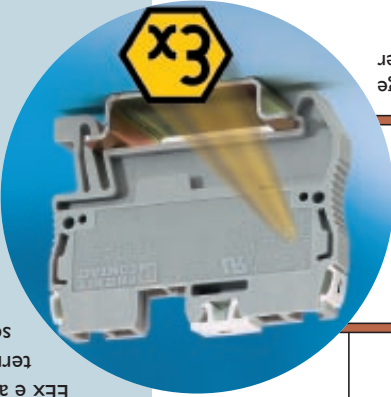
The Factory Line standard FL Switch SF series of switches allows you to expand networks fast and inexpensively. Thanks to the flat housing form and the high port density, the switches are predestined for universal and distributed use. Industrial devices have eight or 16 ports, whereby up to two ports are designed in multimode glass fiber. The copper cables support transmission rates of 10 Mbps and 100 Mbps. A low glass fiber cables rates of 100 Mbps. A low price does not necessarily rule out a wide performance range: Startup and maintenance time is reduced by the redundant power supply and the signaling contacts; the copper port variants provide autocrossing and auto negotiation functions.



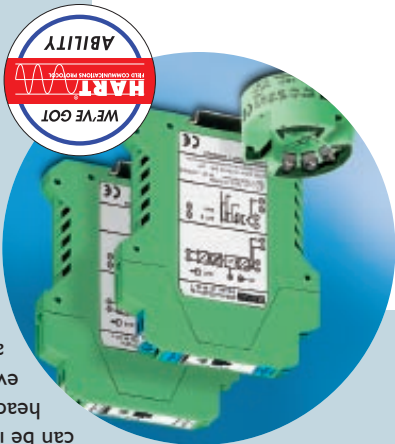
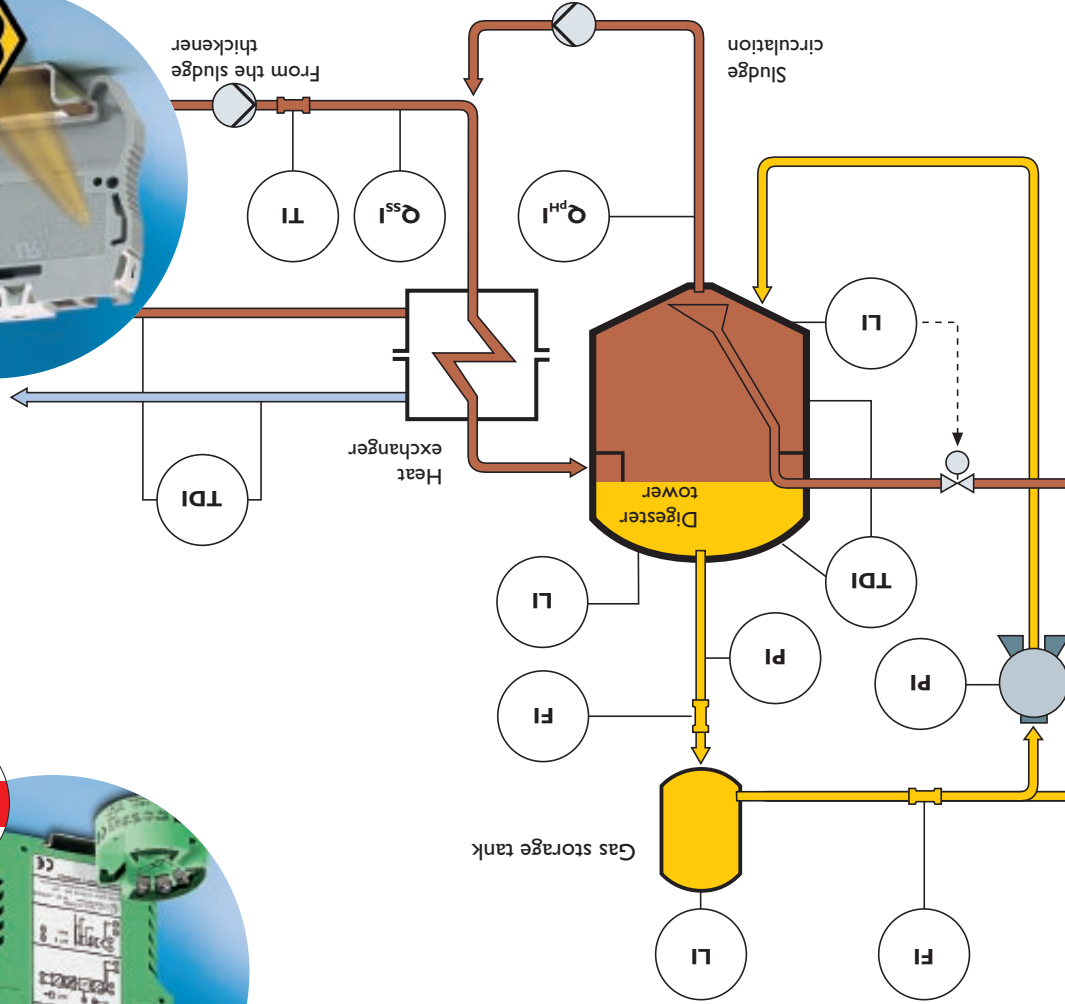


Tempcon, the autonomous regulating module from Phoenix Contact not only offers the option of regulating up to four different control circuits independently of one another, but is also particularly suitable for regulating temperature, since the temperature signals can be connected directly to the module. The device can be parameterized quickly via a serial interface using the corresponding software.

▶ **Controlling/Regulating**  
**Distributed regulation**



▶ **Transmission**  
**Signal and power cabling in the Ex area**  
For the potentially explosive area in systems, Phoenix Contact offers Ex e approved modular terminal blocks with screw, spring-cage, leg spring, and fast connection systems.



▶ **Transmission/Communication**  
**Space-saving temperature monitoring**  
Head-mounted temperature transducers for PT100 or thermocouple measurements can be installed in the connecting heads with very little space – even in potentially explosive areas. Configuration takes place from the control system using the HART® protocol.

▶ **Supply**  
For the installation of 24 V power supply units in the potentially explosive area, Phoenix Contact has the perfect solution with Quint power supply units (5 A, 10 A) for Zone 2.



# Controlling processes in the digester tower with PHOENIX CONTACT

For the highly explosive atmosphere in the digester tower, Phoenix Contact has an extensive range of products with Ex

certification: Modular terminal blocks, power

supply units that are installed in the Ex area,

or intrinsically safe galvanic isolators with

optional integrated surge protection

elements ensure that the processes in the

digester tower run smoothly. The

occurrence of dangerous differences in

potential or even arc sparkovers is avoided

by a lightning and surge protection concept

designed for your system and consisting of

external and internal lightning protection,

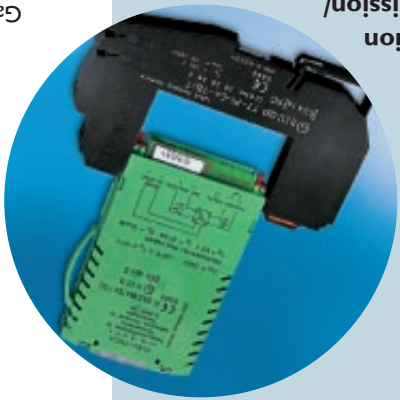
equipotential bonding and grounding system.



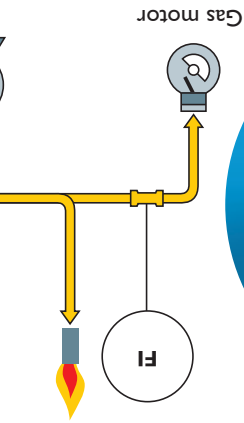
- ▶ Protection
- ▶ Transmission/Communication

**Flexibility in the face of varying requirements**

Safe isolation from the potentially explosive area and surge protection for the signals included – integrated in the base terminal block – This is offered by the Process Interface product range. By separating the base terminal block and the electronics unit, it is possible to react flexibly to a wide range of requirements.



For the removal of water from sludge



## ▶ Protection in the potentially explosive area

The Teritrab TT modular terminal blocks from Phoenix Contact with multi-stage surge protection, protect 0 - 20 mA or 0 - 10 V signals effectively against surge voltages. Certification for the potentially explosive area is naturally included.





► **Remote control**  
**Wireless communication**

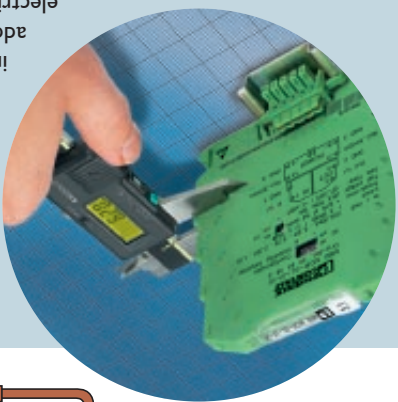
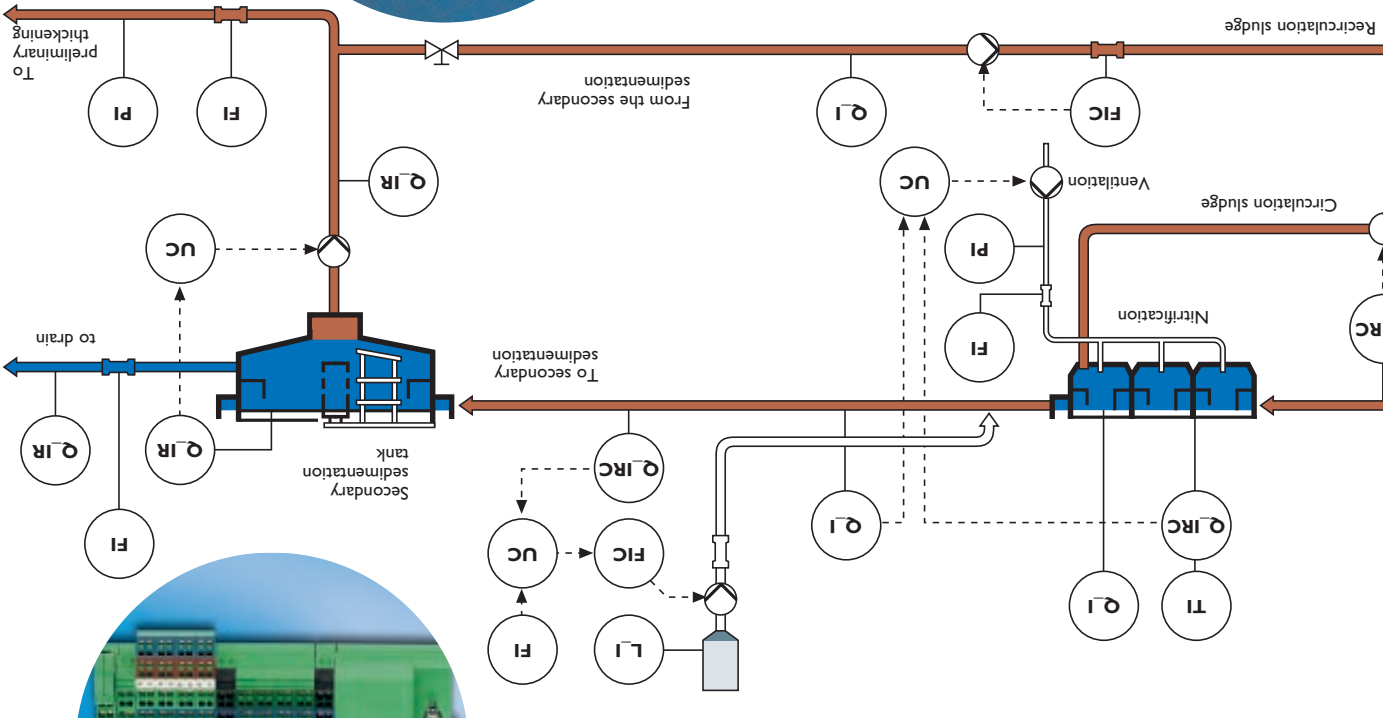
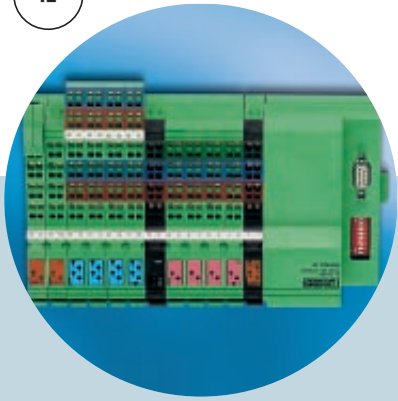
Would you like to use wireless transmission to carry measured values and signals from various points in the system to the central controller, so that you do not need to worry about cable ducts, sliprings and spare cables? No problem for Interface Wireless!

Reliable signal transmission that is easy to extend.



► **Controlling/Regulating**  
**Distributed data acquisition**

Distributed input or output of signals via different fieldbus systems – The inline system kit has numerous digital and analog modules for just this purpose. A modular system that can be put together and added to as needed or fitted with a distributed controller guarantees the availability of your system with integrated channel-specific diagnostics.



► **Transmission/Communication**  
**Measurement signal**  
**Conditioning**  
Matching different signals to the PLC, suppressing interferences, connecting additional devices, or providing electrical isolation – MINI Analog fulfills all these functions to a minimum of space.



► **Protection**  
**Increases availability**  
Measuring instruments mounted in exposed positions on the tanks are particularly at risk during a storm. Surge arresters protect the signal line and power supply – A pluggable and space-saving combination in one arrester.



# Solutions for measurement and control technology

In order to guarantee reliable functioning of the plant at all times, the requirements pertaining to the quality and operational reliability of the components used in measurement and control must be high. No matter whether you wish to protect measured values and signals from process surge voltages, transmit, condition or process interference – Phoenix Contact provides you with solutions and components that are perfectly tailored to your needs, for fault-free round-the-clock operation.

**Waste water purification** requires ever more accurate and sensitive measurement technology. Phoenix Contact ensures that all the plant components interact reliably.

## ▶ Controlling/Regulating Seamless and fast data transmission

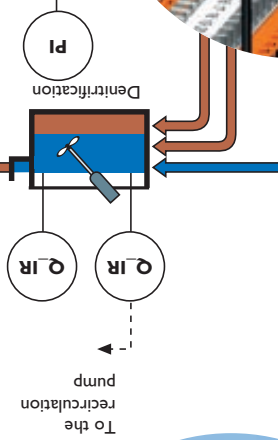
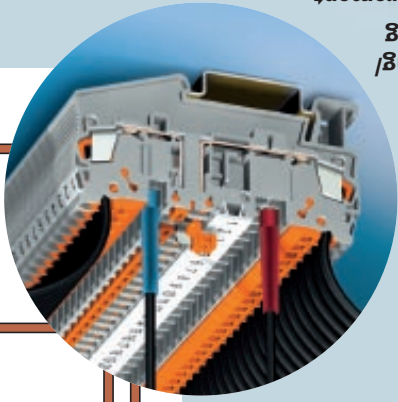
The S-MAX all-in-one machine control system is a high-end system that combines functions for open and closed-loop control, operation and monitoring, and communication with the management system. Two Ethernet ports and a host of other interfaces such as Interbus, Profibus, USB etc. make the S-MAX an all-round talent.



## ▶ Controlling/Regulating

### Simple measurement

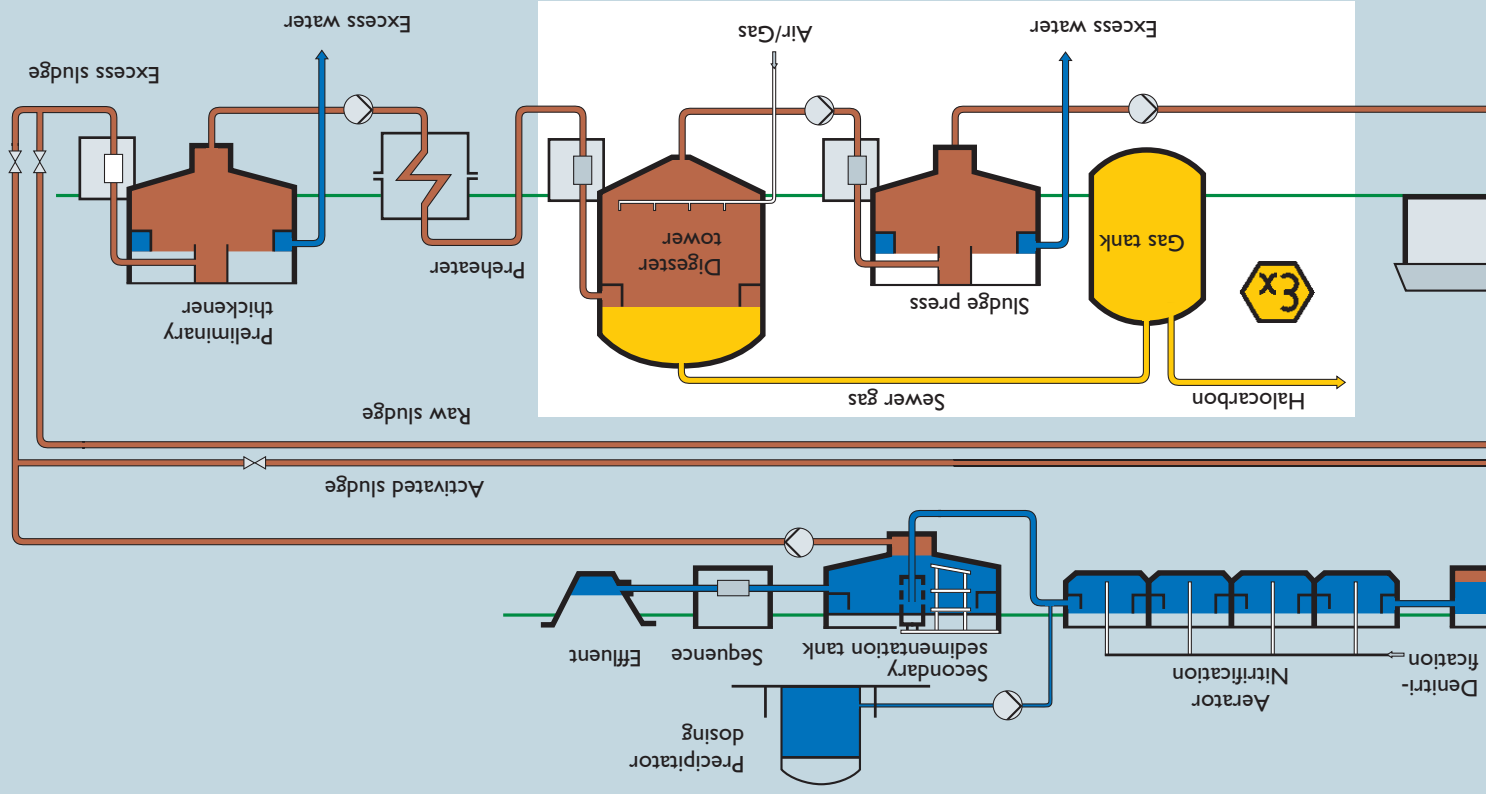
To check the pump on startup and for maintenance, measuring instruments can simply be looped in with knife disconnect terminal blocks. The standardized disconnect zone in the CLIPLINE complete system also allows the component or fuse plugs to be used to protect the signals.



▶ Transmission/Communication  
Reliable transmission of  
sensitive process data



▶ Supply  
Reliable power supply for  
electrical systems



▶ Controlling/Regulating  
Always in control of the process



▶ Protection  
Never giving surge  
voltages a chance



# One system for all functions – Products and solutions for waste water management

Growing requirements in the field of waste water management result in constantly rising cost pressure and increasing system complexity. This makes innovative, flexible and reliable system concepts necessary.

Regardless of whether it is in the field or control cabinet:

Phoenix Contact offers seamless

system solutions for all applications in serial or parallel signal and data

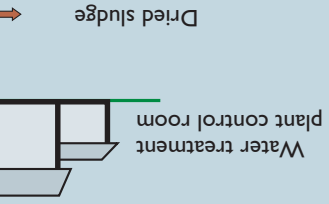
transmission – from process control through to process visualization, from the sensor to the control system. This

guarantees maximum system reliability, high system availability and inexpensive

automation technology.

Phoenix Contact – Your partner for future-oriented, reliable waste water management.

## Remote control Reliable monitoring of remote stations



## Visualization Have a clear grip of all the data



# Solutions for waste water management

