Chemical and pharmaceutical
Solutions for industrial parks and production systems
Pioneering solutions for superior system availability

Phoenix Contact is your key partner with groundbreaking solutions in network and automation technology for the highest availability in the process industry – even under extreme conditions. We will provide you with confidential support with a network of specialists with a wealth of industry and region-specific experience. Based on our industry-wide expertise gathered over many years in the process industry, we develop technologies and concepts based on open standards in hardware and software for your applications. Our tailor-made and certified solutions ensure reliable system operations and increases in efficiency.
“System availability, modularization, and digitalization are becoming ever more important in the chemical and pharmaceutical industry. Phoenix Contact provides you with comprehensive solutions, products, and services. From control and network technology that can be integrated easily, through to space-saving safety and Ex i components. Our innovative migration and marshalling solutions as well as modular fieldbus systems reduce your running costs and increase your system availability.”

Wilfried Grote, Global Industry Manager
Industrial parks
To ensure the availability of production-critical supplies in industrial parks, Phoenix Contact provides you with a comprehensive range of concepts based on over 60,000 products and services.

For further information, see page 6 onwards

Production systems
To ensure the efficient and reliable operation of production systems, systems are increasingly being intelligently networked together. Learn more about our easy migration solutions and failsafe redundancy concepts.

For further information, see page 14 onwards
Solutions for industrial parks

Industrial parks provide companies in the chemical and pharmaceutical industry with optimum economical framework conditions and cost-reducing synergies. The availability and supply security of energies as well as a powerful infrastructure are significant factors for success in competing on an international level. Phoenix Contact provides you with a comprehensive range of more than 60,000 products. We develop tailor-made concepts with you to enable you to face the diverse and demanding challenges of an industrial park. This is complemented with consultation, engineering, and startup and provides you with failsafe and efficient solutions from a single source.
Overview: Industrial parks

**Infrastructure**
Monitoring and optimization solutions in the industrial park.

**Water/wastewater**
Solutions for water treatment and wastewater treatment based on manufacturer-independent automation system.

**Tank farms**
Solutions for the monitoring and control of tank systems of any size.
Solutions for industrial parks

Infrastructure

The long-term preservation and development of the transport and communications infrastructure is of great importance because end customers must rely on its performance. Phoenix Contact provides you with reliable solutions in the fields of energy data acquisition, WLAN wireless broadcast, trace heating monitoring, emergency showers, as well as the impact-free integration of additional signals for an asset management system. You thus achieve the highest availability of your systems, meaning that you can safely focus on your core business.

Your advantages

- Communication solutions for any infrastructure from a single source, thanks to a comprehensive portfolio, coupled with solution and industry expertise
- Easy energy measurement, thanks to suitable communication solutions
- Comprehensive approvals enable a high degree of flexibility, right through to potentially explosive areas
Leak monitoring
To be able to detect leaks, the pressure, temperature and flow must be determined along the entire pipeline. Wireless systems such as our Radioline solution can be used when the distances between the measuring stations and control center are not too far. For longer distances, transmission systems such as SHDSL modem or an mGuard security router are ideal. The router establishes a secure VPN connection via the Internet.

Trace heating monitoring
In many cases, trace heating is controlled autonomously and not monitored. With the solution from Phoenix Contact, you have a precise overview of the state of your medium at all times, e.g. simply via current measurement or further temperature monitoring. You thus achieve failsafe and economic utilization of the invested energy.

Energy management
Through the use of an appropriate energy management system, you can identify great potential cost savings for the cost-effective and environmentally sound operation of your machines and systems. A prerequisite here is the identification of the energy flows. Phoenix Contact provides monitoring solutions for energy and power measurement which can be scaled in line with requirements and which enable integration into existing systems.

Communication solutions for any infrastructure
Regardless of the overriding on-site conditions, you will find the right communication solution with Phoenix Contact. Depending on the type of signal and amount of data, together we will implement a reliable connection from the measuring point through to the control room.
Solutions for industrial parks

Tank farms

Tank farms often consist of different sized tanks, sometimes with a storage capacity of more than 30,000 m³. The continual filling and emptying of the tanks must be monitored, and reliable overflow protection must be installed. Automated valve position monitoring is essential for this purpose.

With reliable modular control and I/O systems, remote control and remote maintenance technology, as well as signal conditioners for the Ex area, Phoenix Contact provides a broad basis for the consistent automation of your storage tank systems.

Your advantages

☑ Tested safety with SIL-certified technology for overflow protection
☑ Standardized sensor communication with I/O technology in accordance with NAMUR
☑ One contact partner for tank and valve monitoring, thanks to a wide range of products as well as solution and industrial sector expertise
☑ Tested components with international Ex approvals
Level monitoring
For efficient tank farm management, you must have an overview of the filling levels, the temperature, and pressure at all times. A system of various sensors, in part in the Ex area, records the appropriate measured values. In order that you can transmit these signals, process them and react quickly, we provide you with the ideal package of control and communication technology.

Valve position monitoring
A valve position monitoring system based on NAMUR sensors provides an overview of your system at all times. You can also retrofit existing mechanical valves into this system. The respective valve position is transmitted to your control room reliably via a wireless system.

Overflow protection
Automatic tank filling provides numerous advantages. For absolutely reliable overflow protection, however, an independent safety system in accordance with functional safety (SIL) must be installed. You can thus ensure that the inflow valves are reliably switched in the event of an emergency. Phoenix Contact provides the ideal solution, with redundant control technology and safety components.

Scalable automation modules for tank monitoring
You can create an efficient fill-level control system with the wide range of SIL-certified technology for functional safety, Ex i signal conditioners, as well as modular control systems.

In addition to the fill-level control system, an overfill protective device is installed that controls the safety valve in the event of an emergency and stops the tank from being filled.
Solutions for industrial parks

Water and wastewater treatment plants

New process engineering technologies, IT security, and changes in maintenance present the operators of water treatment and waste water purification systems with new challenges.

Benefit from our technological edge, in which we rely on open interfaces from the control room through to the field level. With a globally networked team and cooperations with industry-specific partners, Phoenix Contact is your reliable partner for future-proof solutions.

Your advantages

✓ Easy integration, thanks to open and manufacturer-independent automation system
✓ Modular and compact data transmission solutions
✓ Holistic IT security support from industry professionals
✓ Comprehensive support throughout all project phases
Well automation
Wells for the supply of drinking water are found in both the industrial and municipal environment. With the WellControl solution, Phoenix Contact provides a turnkey control cabinet solution for controlling and monitoring wells. The fully programmed solution needs only to be connected to the power supply unit and it is ready for immediate use. A solution with the approach “configure instead of program”.

Wastewater purification
A modern water purification system is essential for sustainable water conservation and the protection of tomorrow’s drinking water. Our technologies and solutions help you to reduce costs, increase energy efficiency and support the latest approaches to maintenance and repair.

Preventive maintenance
Our PumpMonitor solution supports you in monitoring the status of your pumps and equipment. You are provided with information online regarding the status of the bearing vibrations, temperatures and potential sealing water leaks. You have an overview of the efficiency of your system at all times. Our solution enables the reduction of your energy costs through the continuous recording of mechanical, electrical and hydrodynamic measured values.

Secure data communication through to the control room and beyond
PROFINET enables easy integration of all decentral utilities, such as the sand and grease trap, into the system network. Signals from potentially explosive areas, such as the screening building, are acquired with the help of intrinsically safe input and output modules and then transmitted reliably to the control room. The resources of your system can be utilized efficiently via decentral system access. Protected access via security router also provides a secure connection. The PumpMonitor solution enables predictive maintenance and the optimization of your system.
Solutions for production systems

To ensure the security and availability of complex systems in the chemical and pharmaceutical industry, operators must plan and develop their systems in accordance with the latest levels of technology and the currently applicable standards. Superior and impact-free system availability and efficiency in the control system are achieved through the utilization of digital technologies and data. Phoenix Contact provides you with space-saving and customer-specific migration solutions with short setup times and failsafe redundancy concepts for economical and efficient system operation.
Overview: Production systems

**Communication solutions**
Solutions for marshalling analog signals and boxes for field connection via PROFIBUS PA and FOUNDATION Fieldbus.

**Modernization and digitalization**
Solutions for a three-level plan for a modern, digital system.

**Networks in process engineering**
Failsafe solutions for system networks, also based on SIL and ATEX components.
Solutions for production systems

Modernization and digitalization

In many production plants, control systems from different manufacturers and different generations are in use due to long runtimes. Accordingly, it becomes essential to modernize the processing plant and equipment.

The way to a modern digital plant is based on a three-step plan. The goal is to bring communications up to the state of the art so as to optimize maintenance processes, reduce unplanned failures, and make inspection rounds paperless.

Your advantages

- Reduction of marshalling costs, thanks to a reduction of control cabinets by up to 20%
- Entire signal marshalling concept from a single source
- Easy integration of existing and additional process data in the cloud
Level 1: Modernizing control engineering
Analyzing the current status of your systems is recommended in order to determine the right time for migration. Our automation technology experts will support you in the retrofitting of old to new. We take careful stock and consult with you to keep downtimes to a minimum.

Level 2: Paperless documentation
The next step for plant fitness takes place in the field, once the control engineering and MCR technology have been brought up to the state of the art. This is where the mix of smart system identification and industrial WLAN coverage combine to form the foundation for efficient maintenance processes. This can be introduced step-by-step.

Level 3: Combining measurement data with artificial intelligence
You can detect potential failures early through the collection of measurement data, and can therefore schedule the appropriate remedial actions and the corresponding downtimes. You can even postpone these until later, if necessary. Incorporating web services is an easy and secure way to generate added value.

Modernizing processing plants

Additional measurement points
You can integrate additional measurement points into your plant system via our Radioline system, for example. Thanks to secure wireless connection, extensive cable connections to remote measurement points are no longer necessary.

System extension
In order to lay the foundations for future expansions, the space available in the control cabinet must be utilized more efficiently. With our expertise, we will be glad to develop the right marshalling concept for your switch room.

Monitoring
The new trend towards NAMUR open architecture in process engineering enables measured values to be fed easily and securely into secondary systems for analysis. One potential method of implementing this is with HART gateways in connection with the ProFicloud.

Retrofitting/migration
Along with devices and connection technology, as well as control cabinet and field installation components, we provide you with consultation and engineering services for the right overall concept when retrofitting and migrating brownfield plants and systems.
Communication solutions

System availability is the key factor when integrating fieldbus systems for automation in process control systems. This applies both to PROFIBUS PA and FOUNDATION Fieldbus. As your partner with industry experience, Phoenix Contact provides you with scalable solutions: you increase your system availability by minimizing the effects of an error in the segment. You can, for example, replace or extend signal conditioners during an ongoing process without affecting the communication to the fieldbus nodes.

Your advantages

- Maximum availability in the event of an error, thanks to components with hot-swap capability
- Quick installation, thanks to the ready-to-mount, prewired field connection boxes
- Space-saving marshalling of many signals, thanks to compact wiring solutions such as Termination Carrier
Junction boxes
We provide junction boxes as ready-to-install control boxes with which you can realize a variety of connections at the field level. Junction boxes are either prefabricated and can be specifically adjusted by you or are fully equipped with all signal conditioners and completely wired. They are also suitable for use in the Ex area.

Solutions for PROFIBUS PA and FOUNDATION Fieldbus
Phoenix Contact provides ready-wired solutions for reliable and seamless communication via FOUNDATION Fieldbus and PROFIBUS PA. This allows you to save time during installation and ensures availability of the system, thanks to the hot-swap capability of the components. Versions with 24 V DC distribution are also available for 4-conductor fieldbus devices.

Termination Carrier
Up to 10,000 signals are generated in process technology systems. This increases the demand for efficient options for fast and error-free marshalling. System cabling and Termination Carriers from Phoenix Contact are the ideal wiring solution for the save-spacing and manageable connection of a large number of signals to the process control system.

Marshalling setup for intrinsically safe signals
Reduce the number of control cabinets by increasing the signal and packing density. With our solutions for signal marshalling, everything remains manageable and you save space – from the Ex area, to cross marshalling with interface modules, right through to I/O cards of the DCS. Innovative marking solutions, even for the Ex area, round off the package.
Solutions for production systems

Networks in process engineering

In process engineering systems, the result depends on a continually controlled process. It is important to monitor every part of the process precisely and to ensure seamless and failsafe data transmission from the sensor through to the control center. Phoenix Contact is synonymous with quality between the control level and the field. This means: acquiring, transmitting, converting, connecting, isolating, amplifying, and switching analog, binary, and digital signals reliably. Redundant network solutions ensure that this information is always available at the right place.

Your advantages

☑ Redundant and therefore failsafe communication networks from the sensor to the control center
☑ One point of contact for solutions with SIL and ATEX-certified components
☑ Uninterruptible power supply with redundant power supply units
Redundant networks
Irrespective of which transmission medium you use in your process, we have the right network components to enable you to set up a failsafe communication solution, for example with RSTP (Rapid Spanning Tree Protocol) or MRP (Media Redundancy Protocol). The basis for this includes the high-performance Gigabit switches, modems, controllers and media converters from Phoenix Contact.

Redundant power supplies
If the energy supply to system parts or individual components is briefly interrupted, this can lead to long and therefore costly production failures as a result of long process shutdown and startup times. Phoenix Contact provides consistent, redundant auxiliary voltage supplies from the mains through to every load.

Cyber security
The mGuard firewall routers securely protect your network against the many dangers that result from increased networking. Reliably protect your system against unauthorized access by using secure VPN connections with an integrated firewall. Deep Packet Inspection (DPI) also inspects the content of data packets and increases the safety level in the case of OPC Classic and Modbus/TCP communication.

High-availability system network

Security
In large-scale networked process systems, the reliable protection of the network against unauthorized access by people or malware is essential. We provide products and solutions for secure system networks in accordance with IEC 62443 and ISA-99, secure access solutions for external service engineers as well as Deep Packet Inspection for the highest possible security level.

Network redundancy
Process networks require a particularly high level of failsafe performance. Redundant network structures ensure that communication is maintained even in the event of an error.

Diagram:
- Control room
- Modular system
- mGuard
- NAT
- Switch
- Switch
- Firewall
- Service workstation
- Package unit e.g. compressor
- Operator interface
- Ethernet Cu
- VPN connection
- Ethernet FO
- mGuard
- Tank farm
Quality is no coincidence

It is only possible to ensure the quality of the entire product by keeping an eye on the smallest detail. For this reason, we not only manufacture our screws ourselves, but also develop tailor-made software and offer engineering services from industry professionals.

This allows us to secure our commercial and technological independence and gives us the freedom to develop new industrial solutions. You benefit from this because, for example, we are able to offer you pre-assembled control cabinet solutions. These are specially tailored to your industry and have all the necessary certification and approvals. For us, “Made by Phoenix Contact” means the best quality in every product, in every discussion, for the entire solution.
Quality is no coincidence

Engineering and control cabinet solutions

We set the highest standards for your industry solution: everything is tested and certified, from a prewired and preprogrammed control cabinet solution through to engineering services. Our industry experts advise you during every phase of your project cycle and, if required, take over the engineering of your system.

All Phoenix Contact components undergo intensive testing in the independent and accredited Phoenix Testlab. Control cabinet solutions are designed and engineered in accordance with the required standards and directives. You can therefore be sure that our finished solution products meet the highest demands.

Your advantages

✓ Expert advice from industry professionals
✓ Comprehensive support throughout all project phases
✓ Development of expertise through training courses for your employees
Engineering

Based on the typical phases of a chemical and pharmaceutical project, we provide support by working with you at each stage. Simply provide us with an outline of the application you would like to implement. We will then provide you with a technical concept that includes suitable hardware and software:

- Configuration
- Programming
- Visualization
- Coaching

Control cabinet solutions

Working together with our customers, we develop control cabinet solutions which, depending on the requirements, are ready to use or already prewired so that you can carry out final installation.

With a network of partners made up of proven control cabinet manufacturers, we can create industry solutions that satisfy the most stringent requirements. This means that high quality is ensured at every step of the development process.

A process-oriented, integrated management system based on the international standards DIN EN ISO 9001 and 14001 ensures that legislation and standards such as EC directives 2002/96/EC (WEEE) and 2002/95/EC (RoHS) as well as customer specifications are taken into consideration during product manufacturing.

Quality from planning through to production

During preliminary development clarification, all departments work closely with the customer. Following preliminary clarification and the design phase, a prototype undergoes specific tests. The knowledge gained is integrated into product optimization.

As a part of the project process, we provide support for the development of solutions: from initial planning and configuration, through the layout and design, right through to assessing and verifying the specified standards, as well as providing documentation and EPLAN-based circuit diagrams. Production planning and control then follows and, where appropriate, series production.
Quality is no coincidence

Our expertise for your safety and security

Phoenix Contact provides a comprehensive portfolio of services in the field of functional safety, ICS security, and industrial communication technology. We know and understand the expectations and demands placed on automation and network technology in your chemical and pharmaceutical projects. We will therefore provide you with advice, evaluate and plan on the basis of your application and implement the necessary measures.

Learn more about our services

We will provide you with flexible support so that you can concentrate on your core expertise. Feel free to call us or send us a message with your enquiry.
Hotline: +49 5281 946-5555
E-mail: services@phoenixcontact.com
Our range of services

Functional safety

Consultation
We provide advice in the planning and implementation of your system.
• Design of the safety lifecycle: standards and their implementation
• Machinery Directive
• Changes to machinery and systems

Engineering
To assess the safety integrity, we determine the SIL of the safety functions with the help of your technical documentation. These must be sufficiently robust to withstand random errors. In the case of Machinery Directive requirements, we implement the entire safety lifecycle process.

Seminars
Functional safety in the process industry in accordance with EN 61511:
• Risk analysis
• Safety lifecycle
• Creation of PLT safety functions

Safety application software:
• Demands on safety-related software
• Specification of safety requirements and software
• Realization of safety functions
• Development of function blocks

Product support
We will provide support regarding any Phoenix Contact safety hardware and software questions. You can contact our support team regarding anything – from the preliminary technical clarification, to planning and implementation, right through to operation.

24-hour Safety Hotline: +49 5271 946-2777
E-mail: safety-service@phoenixcontact.com

ICS security and industrial communication technology

Evaluation and planning
We offer you more than just a one-size-fits-all solution. In order to achieve your protection targets, we analyze your requirements and adapt them in accordance with relevant standards and directives. We will analyze your network and present optimization options for ensuring high availability.

Implementation
We will expose vulnerabilities in your security and your network to ensure greater transparency. We will support and advise you with regard to technical restructuring, or new demands on your system, from the field level to the company level.

Maintenance and support
Stable and reliable processes are essential for productivity, quality, and delivery reliability. With our support in the areas of security and Industrial Ethernet, we safeguard your production and thus minimize downtimes.

Seminars
Due to attack dynamics, awareness is becoming increasingly important. With our Cyber Security Center of Excellence in Berlin, we also have in-depth expertise in the area of industrial cyber security. We would be happy to convey this knowledge in our seminars:
• Ethernet basics
• Security principles and awareness
• Product training
• Customized workshops
Quality is no coincidence

Service and support

Implement your chemical and pharmaceutical projects more quickly and efficiently. Irrespective of whether you operate, plan, produce or maintain systems – Phoenix Contact provides telephone and online service support as well as industry experts on site. Numerous seminars are available for training your employees, either at the Phoenix Contact headquarters or on site at your company. As part of our after sales service, we provide expert advice regarding any aspect of your products and solutions.

Your advantages

- Expert advice from industry professionals
- Comprehensive support throughout all project phases
- Development of expertise through training courses for your employees
Customer-specific solutions
From a slight adjustment through to a completely new development – the Phoenix Contact service team is geared to your requirements. With many years of experience in the chemical and pharmaceutical industry, we will support you step-by-step in creating an individual solution.

Knowledge and information
Phoenix Contact provides the training programs that you need: whether compact evening seminars, expert seminars over several days, webinars or e-learning. Classification into Basic, Advanced, and Individual simplifies assignment.

After sales
Our service network will assist you during installation, startup, and operation at all times. Contact us on the free hotline for 24 h product support. In the event of an emergency, we can provide you with replacement parts outside of office hours.
Hotline: +49 5281 946-2888

Local expertise
Phoenix Contact supports you worldwide with professional service and support for all aspects of products, services, and solutions. Depending on the requirements, we ensure the fast replacement of products or support you in the event of problems by patching into your system. Our experts are familiar with the regional conditions and specific challenges of your industry. We will be happy to provide support all over the world with our close network of automation experts. Contact us for more information.
Quality is no coincidence

Inspiring industry solutions thanks to excellent products

Phoenix Contact provides you with innovative solutions for all industrial park, production system, and package unit applications. The basis for these solutions is a broad range of connection and automation technology. Intelligently combined, these products become systems for a variety of functions such as for control, remote monitoring, and measurement recording. Inspiring industry solutions are created, thanks to industry expertise, longstanding experience, and consideration of special requirements.
Excellent products

Measurement and control technology
We offer a comprehensive range of signal conditioners, such as the compact MACX analog EX modules, for all signal acquisition applications in potentially explosive areas.

PLCnext Technology
With its integrated gateway, our new PLCnext AXC F 2152 control platform allows an easy cloud connection for process data from the field.

Power supplies
We provide uninterruptible power supplies and redundancy modules for the maximum availability of your processes in the chemical and pharmaceutical industry.

Safe coupling relays
Reliable signal coupling must be ensured in the event of an emergency. Phoenix Contact offers coupling relays with force-guided contacts for this.

Surge protection
Increase your system availability with intelligent surge protection for all applications, from the power supply to measurement, control, and communication technology.

System cabling
Bring old control systems in line with state-of-the-art technology using refit adapters from Phoenix Contact.

Fieldbus components
Save costs with ready-wired control cabinets for field connection via PROFIBUS PA or FOUNDATION Fieldbus. You will also find further fieldbus systems on our homepage.

Terminal blocks
Save time and space: our range of modular terminal blocks provides quick and easy to operate connection technology that is tailored for use in your process application.

mGuard security routers
The security router satisfies the high hardware demands of the process industry, such as a temperature range of -40°C to +70°C, and with IECEx and ATEX Zone 2 approvals. The software includes mGuard security functions and supports OPC and NAT.

Inspiring industry solutions
Excellent products
In dialog with customers and partners worldwide

Phoenix Contact is a globally present, Germany-based market leader. Our group is synonym for future-oriented components, systems, and solutions in the fields of electrical engineering, electronics, and automation. A global network across more than 100 countries, and 16,500 employees ensure a close proximity to our customers, which we believe is particularly important.

The wide variety of our innovative products makes it easy for our customers to find future-oriented solutions for different applications and industries. We especially focus on the fields of energy, infrastructure, process and factory automation.

You will find our complete product range at:

phoenixcontact.com