Solar power
Solutions for photovoltaics
Passionate about your industry
Customized complete solutions

Phoenix Contact, a global market leader in the field of electrical engineering, electronics, and automation, is your reliable partner in the solar industry. To ensure the efficiency of your systems in the long-term, our experts use their years of technical expertise and passion to focus on the challenges facing you. Excellent products which are intelligently combined to form innovative systems are at the heart of our solutions. Enriched with industry-specific features, we develop solutions which are rounded out by engineering, servicing, and training services.

Find out more with the web code

For detailed information, use the web codes provided in this brochure. Simply enter # and the four-digit number in the search field on our website.

Web code: #1234 (example)

Or use the direct link:
phoenixcontact.net/webcode/#1234
“Photovoltaics is also economical without state subsidies. Reasons for this include the decreasing system costs, the increasing degree of automation, and advancing standardization. Our international team tackles the challenges in local markets on a daily basis and continuously develops our photovoltaics solutions.”

Industry Management Solar Power
Ground-mounted systems
From a suitable, comprehensive cable solution to intelligent park management, Phoenix Contact offers all the components for efficient operation of your photovoltaic ground-mounted system.

Rooftop systems
Rooftop photovoltaic systems are susceptible to damage from lightning strikes. Thanks to our product range of ready-to-install string combiner boxes for rooftop systems, we offer long-term protection.

Hybrid energy systems
Hybrid energy systems are used more and more frequently in regions without reliable power distribution infrastructure. Our solutions ensure that the required amount of energy is available at all times.
Solutions for ground-mounted systems

Photovoltaics make a major contribution toward meeting the continually rising energy requirements. Interest in building increasingly larger and more powerful ground-mounted photovoltaic systems is on the rise worldwide. Networking, monitoring, and communication are indispensable in this regard, particularly in relation to constant network quality and maintenance in line with requirements. At the same time, for larger systems, the aim is easy and fast connection technology. Discover the advantages of Phoenix Contact solutions for yourself.
Overview: Ground-mounted systems

**String combiner**
Find the optimal design, thanks to comprehensive consultation and application-oriented analysis.

**Connection technology**
Easy cabling of the photovoltaics park with innovative and reliable connectors and cables.

**Park management**
Efficient automation, tracking and monitoring of ground-mounted systems.
Solutions for ground-mounted systems

Connection technology

From the photovoltaic panel and the string combiner box to the inverter – Phoenix Contact offers numerous cabling solutions that are perfectly tailored to the requirements for ground-mounted photovoltaic systems. These were designed with durability and quick and easy installation in mind. The DC connectors that can be assembled in the field can be mounted in just a few seconds without special tools. The high-quality components also contribute to high system availability, even in extreme weather conditions.

Your advantages

✓ Variety and flexibility, thanks to various conductor cross sections from 2.5 to 16 mm²
✓ UV, temperature, and weather-resistant design
✓ Future-oriented for voltages of up to 1,500 V
✓ Innovative spring connection for durable and reliable connections without special tools
Connecting and cabling
The innovative spring connection of the DC connectors enables cables from 2.5 to 16 mm² to be connected reliably and safely without special tools. This facilitates a particularly easy and fast on-site assembly.

Distribution
Y-distributors provide even more flexibility in photovoltaic cabling. Route adjacent strings to the inverter easily and inexpensively with only one string cable. Mounting with connectors is also possible. Customer-specific cable lengths are available on request.

Connecting building-integrated panels
One module junction box is used per position. Both module junction boxes are integrated into the building-integrated module and sealed with sealant. Their adaptable width enables module junction boxes to be integrated very easily.

Uniform connection technology from the photovoltaic panel through to feed-in
Connectors and cables facilitate fixed or flexible installation and are suitable for a temperature range of -40°C to +85°C.
Solutions for ground-mounted systems

String combiner: Expertise in design

In the steadily competitive environment of string combiner boxes, tested solutions provide a guarantee for customer satisfaction and yield optimization. The maximum yield of photovoltaic ground-mounted systems is a top priority. Phoenix Contact string combiner boxes enable the error-free operation of photovoltaic systems. Our team has extensive experience in international photovoltaic projects and develops customer-specific solutions with impressive technical and economic features.

Your advantages

☑ Application-oriented analysis and consultation
☑ Standardized tests in an accredited lab
☑ Reliability and durability, thanks to a temperature-optimized design
Consulting
During preliminary development clarification, all divisions work closely with our customers to implement the desired requirements in the best way possible. This allows the development process to be handled in a target-oriented and efficient way.

Checking and testing
The prototypes are subjected to electrical and mechanical testing in our own test laboratories. Temperature, climate, and vibration tests ensure the error-free function of the solutions in their intended environment.

Developing
Following completion of preliminary clarification, the design phase of our string combiner boxes gets underway. The results from specific tests and prototype testing are referenced to constantly optimize the switching device combination.

Temperature-optimized design
Thermography testing is performed in our in-house lab to detect possible hotspots and optimally arrange all components in the string combiner box. Failure due to thermal overload can therefore be eliminated.
Solutions for ground-mounted systems

String combiner: Extensive portfolio

Planners and installers have the challenge of achieving maximum availability and performance of photovoltaic systems in regions with varying climatic conditions. The important factors here are collecting and distributing string currents, protecting the individual modules against damage from lightning and surge voltages, and monitoring the performance of the system. We are able to meet these requirements with our extensive product range while also offering individual string combiner boxes in space-saving housings.

Your advantages

- Easy and safe current measurement without interrupting cables, thanks to Hall sensors
- Space-saving installation, thanks to the compact design
- Voltage measurement up to 1,500 V DC
- Reduced cabling effort, thanks to wireless transmission

Web code: #0914
Connection and protection
An extensive product portfolio provides the right terminal block for any application case. Fuse terminal blocks are ideal for protecting individual strings against reverse currents. Diode terminal blocks are specifically suited for using photovoltaic thin film, while the hybrid terminal block merges up to four strings without additional wiring effort.

Protection from surge voltage
Due to their size and exposed location, ground-mounted photovoltaic systems are particularly at risk from lightning currents and surge voltages. You can take preventive action with our components and increase the availability of your system significantly. The protective devices fulfill the EN 50539-11 and UL 1449 3rd Edition standards for surge protection in photovoltaic installations and are KEMA-certified.

Monitoring
Using Hall sensors, the current measuring module determines the characteristic data of your photovoltaic systems on a contact-free basis and forwards it to the communication module. Four- and eight-channel versions are available. With the voltage measurement module, you can measure DC voltages up to 1,500 V. The module is suitable for measurements in both grounded and isolated photovoltaic systems.

Park management
Data from park nodes can be output over serial RS-485 interfaces and transmitted wirelessly to the central park management system.

Since our Radioline system allows for the set-up of mesh networks, nodes can communicate with each other via repeater/slave stations.
Solutions for ground-mounted systems

Park management: Automation and networking

Use continuous plant data collection and intelligent data management to enhance the efficiency and yield of your photovoltaic system. The network infrastructure components from Phoenix Contact allow you to safely and reliably network your ground-mounted photovoltaic system. Thanks to intelligent automation and visualization tools, data from the ground-mounted system can be continuously recorded and evaluated. Furthermore, you can maintain ground-mounted systems remotely over public networks.

Your advantages

☑ Low engineering and operating costs, thanks to intelligent automation solutions
☑ Redundant and therefore failsafe networks
☑ Standardized data transmission in accordance with SunSpec® or IEC 61850
☑ Fast engineering, thanks to specific function blocks
Tracking
Increase the yield from your photovoltaic systems by systematically tracking photovoltaic panels. For this purpose, our hybrid motor starter offers four functions: forward running, reverse running, motor protection, and emergency stop. In comparison to mechanical contactors, our motor starter is significantly more durable, saves space, and can be wired quickly.

Feed-in
Distributed photovoltaic systems also need to play their part in ensuring high grid stability. PGS controllers record the voltage and reactive power present at grid connection points and determine the corresponding control values for the inverters. A hardware- and software-based solution from Phoenix Contact ensures that the engineering effort involved is kept to a minimum.

Automation and visualization
Continual control is the key to efficient photovoltaics park management. Phoenix Contact offers standard and customer-specific solutions for the automation and visualization of photovoltaic systems as well as innovative software products such as libraries for function blocks in accordance with IEC 61131. A variety of drivers for data loggers and interfaces for inverters complete the overall package.

Feed-in control for stable power grids
Along with the connection to the feed-in management system of the network operator, individual reactive power regulation poses a great challenge. The network parameters at the network connection point are recorded by measuring devices and transmitted to a central PGS controller. Then, the actuating values calculated from the reactive power regulator are transmitted to the inverter installed in the system.
Solutions for ground-mounted systems

Park management: Automation and visualization

Photovoltaic system operators need information about the energy efficiency and reliability of their ground-mounted system at all times. One possible measurement of this is the performance ratio, which indicates the ratio of the actual system yield to the theoretically possible yield. If this value decreases unexpectedly, this signifies a system error.

Your advantages

✔ Low engineering and operating costs, thanks to intelligent automation solutions
✔ Simple plug and play connection of weather sensors
✔ Optional sensor heating
✔ Suitable for every application: from a simple user interface to a SCADA solution
✔ Intuitive operation, thanks to the clear graphical user interface
Monitoring and control
Operating large photovoltaic systems requires continuous monitoring and control at the segment level. Our data logger assumes this function and records all relevant data about the ambient conditions and the inverter status. This data is transmitted to a higher-level SCADA system in the central control room.

Acquisition of meteorological data
Thanks to our extensive portfolio of environmental sensors that can be connected directly to our control system via Modbus, we provide you with compact weather stations tailored to your needs. The pre-configured sensors are immediately available to transmit weather data.

Data logging – For the efficient operation of large-scale photovoltaic systems
To ensure effective system monitoring in large photovoltaic systems, the currents of individual strings are monitored. The resulting data volume is recorded by Phoenix Contact data loggers.

Visualization
We offer flexible, easy-to-operate software to implement various visualization tasks. Thanks to HTML5, you just need a conventional browser to create a display of your photovoltaic system. Phoenix Contact also offers SCADA functionality and multi-touch support for convenient operation on smart devices.
Solutions for ground-mounted systems

Park management: SCADA and portal connectivity

SCADA (Supervisory Control and Data Acquisition) refers to computer-aided monitoring and control of technical processes. The visualization interface is used for interactions between humans and the machine. Visualizations with SCADA functions are impressive in terms of their scalability and versatility. In large photovoltaic systems, they are used for monitoring and operating complex processes.

Your advantages

☑ Makes technical management of large PV systems possible, thanks to portal connectivity
☑ Established standards for data formats and communication are supported by SCADA
☑ Optimum data availability, thanks to parallel storage in the portal and SCADA
☑ Easy startup, thanks to automatic configuration of all park devices
System overview and reporting

A PV installation must be continuously monitored to ensure economical system operation. Phoenix Contact provides components such as industrial firewalls, mobile routers, and modems to ensure secure connection with local data acquisition systems, monitoring portals, and operations management systems.

Data analysis in the cloud

Thanks to our cloud solutions, you can add cloud services to your existing PROFINET network. This makes it easy to access your photovoltaic system remotely. Services such as monitoring, reporting, calculations or predictive maintenance can also be used.

Continuous portal connection

To avoid data gaps in monitoring and reporting, data is automatically stored locally in the event that the Internet connection between the photovoltaic system and the portal is interrupted. Where necessary, open system interfaces enable connection to existing portals.

Maximum yield, thanks to security in photovoltaic systems

From data communication to feed-in management to visualization, Phoenix Contact offers a broad portfolio of products for secure and highly reliable operation of photovoltaic systems.

Productivity data at a glance, thanks to web visualization
Solutions for rooftop systems

Large roof surfaces with a slight incline provide ideal conditions for profitable photovoltaic system applications. As a result of declining panel prices and increasing energy costs, photovoltaic systems on private, commercial, and public buildings are becoming increasingly attractive, even without state subsidies.

To monitor the installations and provide permanent protection against lightning currents and surge voltages of all kinds, Phoenix Contact offers a wide range of products. For less optimal roof surfaces, micro inverters are a great alternative. The new connection system for micro inverters is great for universal use and particularly user-friendly.
Overview of rooftop systems

Monitoring and protecting
Reliably protect all types of rooftop photovoltaic systems against surge voltages and disconnect them if necessary.

Micro inverters
Connect your micro inverters on the AC and DC side so that there is a continuous connection.
Solutions for rooftop systems

Modular protection concept

To provide optimal protection of the various rooftop system parts from direct lightning strikes and surge voltages, it is necessary to use string combiner boxes. Phoenix Contact offers an extensive portfolio of various ready-to-install, directly connectable string combiner boxes for your rooftop systems.

Your advantages

✔ All sets in dust- and water-jet-proof housings (IP65)
✔ Fast installation, thanks to the pre-assembly of the photovoltaic sets
✔ Maximum degree of safety in case of maintenance or danger
✔ Standard-compliant switchgear assembly, thanks to compliance with DIN EN 61439
Protecting against surge voltages
With its pre-assembled sets, Phoenix Contact offers reliable system solutions that protect the inverters just upstream of the DC and AC voltage inputs. As a result, surge voltage couplings are diverted directly to the ground potential. Due to our coordinated scope of supply, new versions can be made available very quickly.

Connecting
For connection of the PV strings, string combiner boxes are equipped with either our SUNCLIX panel feed-throughs or with cable glands on Push-in terminals. SUNCLIX connectors from Phoenix Contact as well as Push-in terminal blocks combine the advantages of simple installation with reliable and maintenance-free connection.

Disconnecting and isolating
We offer both a fire department emergency shutdown or load disconnecting switch as well as surge protection in a single device. Using an emergency stop switch, it is possible to disconnect the photovoltaic system remotely, thus offering the greatest possible safety in case of maintenance or danger.

Consistently high quality, thanks to standardized production processes

Quick and flexible production
The various items are produced in a one-piece-flow line, enabling varying designs and batch sizes to be handled quickly and flexibly.

Everything at a glance
All the information necessary for production and quality assurance can be viewed at a glance. This guarantees a smooth production process.

High repeatability
Programmable torque screwdrivers are used to ensure uniform quality for each individual item.

Precise plant data collection
The ready-to-connect PV sets are tested extensively before being shipped out to ensure the conformity of the product in accordance with IEC 61439.
Solutions for rooftop systems

Micro inverters

Micro inverters are installed directly at the photovoltaic panels. This ensures that shadows or other performance-reducing events no longer affect other panels. This is used to achieve considerably greater yields. Complicated interconnections of the panels are no longer necessary. Are you looking for a universal, easy-to-install connection technology for your micro inverters? The connection system for micro inverters from Phoenix Contact was developed specifically to meet your requirements.

Your advantages

- Three-position, coded pin connector pattern (protection against polarity reversal)
- Maximum reliability, thanks to SUNCLIX contacts
- Use of micro inverters with 500 W output power possible
- Comprehensive connection system for the AC and DC side of your micro inverters
Device connection
With the SUNCLIX DC connectors as device plugs for micro inverters or for field assembly, you can also achieve high performance and maximum quality on the module side.

AC connection technology
The AC-Y connector consists of two 3-pos. connections, which are connected to each other via the trunk line without the risk of polarity reversal. In addition to accommodating the trunk line, the coupling side also accommodates the drop line, which serves as a connection to the inverter.

Mains connection
The mains connectors provide the connecting link between the photovoltaic system and mains. Depending on the system structure, the mains can be connected via the plug or coupling side of the AC-Y connector. The free cable end is either connected in a distributor box or fed into a service panel via a cable sleeve.

Connecting micro inverters
When using micro inverters, each individual panel is always operated at the optimal operating point, regardless of whether this area is partially shaded at times or not. Additional yield of the overall system of up to 20% can be achieved by using micro inverters, as opposed to string inverter architectures. Connect your micro inverters on the DC and AC side with the Phoenix Contact connection system.
Solutions for hybrid energy systems

1.2 billion people worldwide have no access to electricity. As a result, diesel generators are used in many locations to produce the necessary, independent source of energy. However, the price of the fuel for these generators is continuously rising. The use of hybrid photovoltaic systems not only reduces this financial burden, it also lowers CO₂ emissions in a sustainable manner. In rural regions without a local power grid and in developing and emerging countries, hybrid photovoltaic systems are a cost-efficient and environmentally-friendly alternative for generating electricity far from corresponding grids.
Overview: Hybrid energy systems

Hybrid photovoltaic systems
Monitor and regulate energy quantities and provide them in a targeted manner.
Solutions for hybrid energy systems

Hybrid photovoltaic systems

Along with supplying private households, hybrid photovoltaic systems are also used in the industrial environment, for example for sea water desalination, in mining, in agricultural operations, and for supplying energy to remote holiday resorts. Hybrid photovoltaic systems are frequently installed under extreme climatic conditions. Therefore, along with the power generation units, the accumulator and the inverter, the devices required for controlling and regulating these units must also be able to withstand harsh ambient conditions.

Your advantages

- Enhanced efficiency of your hybrid photovoltaic system, thanks to the monitoring and acquisition of energy and performance data
- Model-based development with Matlab Simulink
- Stable power grids through the provision of control energy

Web code: #2028
measuring power

The power measurement terminal for the tried-and-tested Axioline F I/O system records all voltages, currents, and power generated by the hybrid photovoltaic systems. This means that you can obtain industry-proven automation and energy measurement components from a single source. The power measurement terminal enables analysis of alternating current values. Instantaneous values can be recorded and then evaluated.

load management

The small-scale controllers from Phoenix Contact can be used to control and monitor hybrid photovoltaic systems and achieve efficient energy management. If the load progression is known, the load management system can be developed based on models using Matlab Simulink and tested in the simulation environment. This allows the engineering effort to be reduced.

providing control energy

Feeding in heavily fluctuating renewable energies puts power grids through increasingly severe load tests. Since limiting the maximum power output in photovoltaic systems is not economical, operating reserve buffers are used more and more frequently. Our modular control system assumes the central management function for providing control energy.

energy supply even in remote regions

To ensure reliable operation of hybrid photovoltaic systems, all components of the system must be optimally coordinated. A Phoenix Contact small-scale controller can be used to control and regulate the entire application. It works like an energy manager and ensures that the energy quantities required by the consumer are available at the right place and at the right time.
Quality is no coincidence

It is only when you keep sight of every little detail that you can be sure of the quality of the entire product. 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 industry 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. “Made by Phoenix Contact.” For us, this 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 solution: everything is tested and certified from the pre-wired and pre-programmed control cabinet solution through to the engineering service. Our industry experts advise you during every phase of your project cycle, and if required, support the engineering of your system.

All Phoenix Contact components undergo intensive testing in the independent and accredited Phoenix test lab. Control cabinet solutions are designed and developed according to the required standards and directives. You can therefore be sure that our finished solution products satisfy the most stringent requirements.

Your advantages

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

No matter the challenges you face when implementing your photovoltaic project, we will be glad to support you. Simply provide us with an outline of the application you would like to implement and we will 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 pre-wired so that you can carry out the final installation. With a network of partners made up of proven control cabinet manufacturers, we can create specific industry solutions that satisfy the most stringent requirements.

This means that high quality is ensured in 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. A temperature test, for example, enables hotspots to be detected. As a result, all components can be arranged in an optimal way. Failure due to thermal overload can therefore be eliminated. The prototypes are subjected to electrical and mechanical testing in our own test laboratories. Climate and vibration tests ensure that the solutions operate error-free in the intended installation environments.
Quality is no coincidence

Our expertise for your safety and security

Phoenix Contact offers a comprehensive portfolio of services in the area of functional safety, ICS security, and industrial communication technology. We know and understand the requirements placed on automation and network technology in your photovoltaic system. 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 inquiry.
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 6155:
• Risk analysis
• Safety lifecycle
• Creation of PLT safety functions

Safety application software:
• Requirements for safety-related software
• Specification of safety requirements and software
• Implementation of safety functions
• Development of function blocks

We will accompany you through the entire safety lifecycle for your applications

Our experts are on hand to assist you and share their extensive technological expertise

Product support
We provide support in the event of any questions you may have regarding Phoenix Contact safety hardware and software. You can contact our support team about anything – from preliminary technical clarification, through 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. To achieve your protection objectives, we analyze your requirements and adapt them in accordance with relevant standards and directives. We will analyze your network and present optimization options to ensure high availability.

Implementation
We uncover vulnerabilities in your security and your network for greater transparency in your photovoltaic system. We will support and advise you with regard to technical restructuring, or new requirements for your system – from field level to 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 share this knowledge with you in our seminars:
• Ethernet basics
• Security principles and awareness
• Product training
• Customized workshops

We will support you in the creation of your customized protection level
Quality is no coincidence

Service and support

Implement your photovoltaic projects even more quickly and efficiently. Whether you operate, plan, produce or maintain systems – Phoenix Contact provides support via its telephone and online service as well as industry experts on site. Numerous seminars are available for training your employees, either at 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 small customization to a completely new product development – the Phoenix Contact service team will focus on your specific requirements. With many years of experience in the area of photovoltaics, we will support you step-by-step in creating an individual solution.

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

After sales service
Our service network will assist you during installation, startup, and operation at all times. Contact us on the free hotline for 24-hour 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. Based 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 offers innovative products and solutions for all aspects of photovoltaics. The basis for these solutions is the wide range of industrially-tested connection and automation technology. Intelligently combined, these products become systems for a variety of functions such as control, remote monitoring or measuring values. Inspiring industry solutions are created, thanks to industry expertise, longstanding experience, and consideration of special requirements.
Excellent products

**Photovoltaic connectors**
From connection technology for photovoltaic panels through DC connectors for field cabling to device connection for signals, data, and power.

**Power supplies**
With the DC/DC converters from the UNO POWER range, the control cabinet is supplied directly from the photovoltaic system. This saves on installation costs and increases the efficiency of the system.

**DC monitoring**
The monitoring system provides reliable information regarding the performance of your photovoltaic system. Faults can be quickly localized and rectified.

**Controllers**
Modular small-scale controllers for the automation of devices from photovoltaic ground-mounted systems right through to systems for autonomous energy supply.

**Surge protection**
You can now obtain lightning current and surge protection for photovoltaic systems with new protective devices that are designed for a generator voltage of up to 1,500 V DC.

**AC monitoring**
Network-capable energy measuring devices and the new Axioline F series power measurement module record and monitor electrical characteristics of photovoltaic systems on the AC side.

**Wireless modules**
Radioline is the new wireless system for radio communication in PV systems. It transmits I/O signals or serial data and is therefore very versatile.

**Software**
Software is the key to efficient automation. Phoenix Contact offers software from configuration to system operation.

For further information on solar power, simply scan the QR code.
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 17,400 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