Welcome

Soluciones para generación en las energías renovables Solar y Eólica

Antonio Gordillo IMA Septiembre - Diciembre 2020

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Webinars

Agenda

- Soluciones Solar
- Soluciones Eólica

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Webinar IMA Noviembre 2020

Soluciones para generación en las energías renovables: Solar y Eólica

Fecha	**25 Noviembre 2020**
Hora	9:00
Hora	
Duración	1 hora
Costo	gratuito

Descubra ahora más soluciones y elementos que pueden ser integrados y que Phoenix Contact le puede brindar en el cumplimiento de infraestructuras de energías renovables como la Eólica y la Solar

En este seminario serán explicados de forma sencilla tres soluciones específicas para brindar mayor visibilidad en datos y protección de las instalaciones y comportamiento en los aerogeneradores, así como explorar mayores protecciones, comunicación en la operación de paneles solares integrados en infraestructura de parques para lograr así mayor eficiencia de la energía.

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Soluciones

Solar

- Integrated PV Park Management System
- PV Surge Protection

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Solar park management by PHOENIX CONTACT

The power behind every efficient solar park

Solar park management by PHOENIX CONTACT

Strong solution partner behind every efficient solar park

From data acquisition at the field level all the way to feed-in control and visualization, we provide complete, seamless solutions for PV park management.

The combination of intelligent automation and comprehensive visualization tools enables you to continuously record and evaluate data from your solar park.

Our Integrated PV Park Management solution enables the extremely reliable and economic operation of PV systems.

Thanks to the open monitoring system, solar parks can be quickly and easily integrated and commissioned.

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The world's first solar park management system based on industry standards

Integrated PV Park Management

Start up your new solar park

50 % faster

using

Plug and Play

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Transfer

90 % PASTE

of existing planning

to new solar projects

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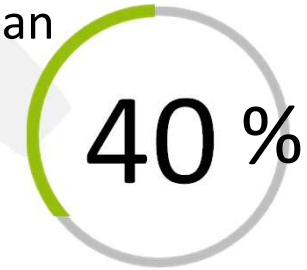
The world’s first solar park management system based on industry standards

Integrated PV Park Management

Reduce operation and maintenance costs
more than



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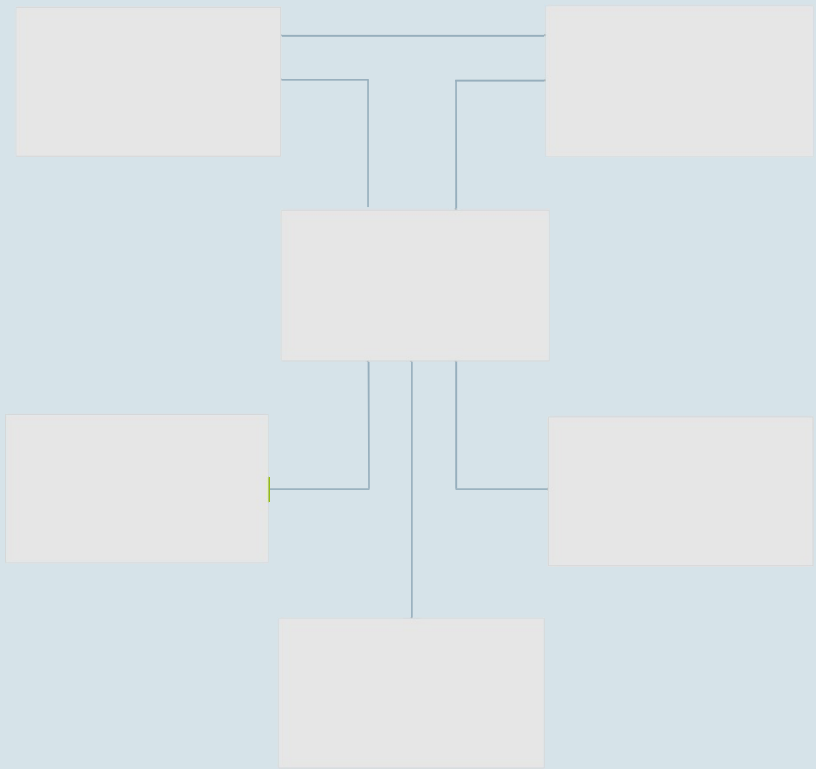
The world’s first solar park management system based on industry standards



Integrated PV Park Management

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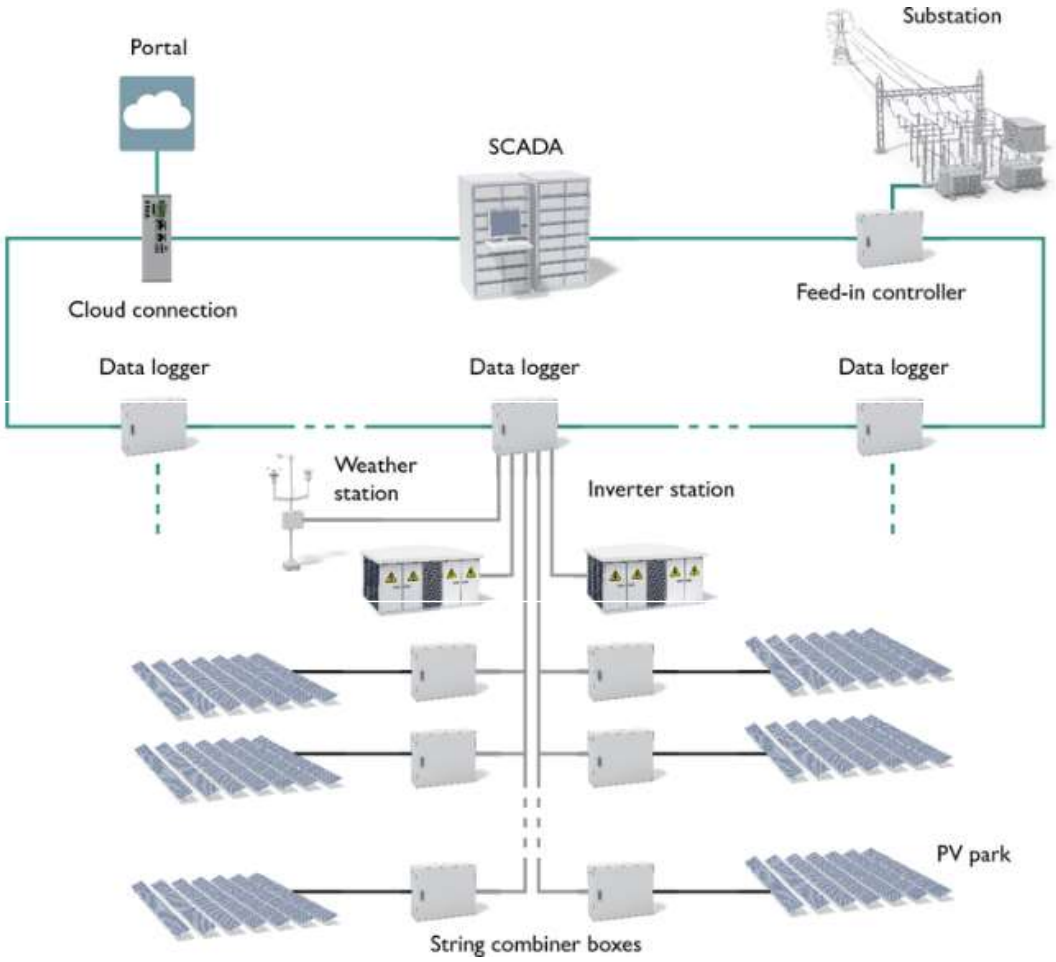
Integrated PV Park Management



Solutions for solar power

Strong solution partner behind every efficient solar park

Phoenix Contact, a global market leader headquartered in Germany, has been an expert provider of solutions and products in the solar power industry for many years.

Our group is synonymous with future-oriented components, systems, and solutions in the fields of electrical engineering, electronics, and automation.

A global network across more than 100 countries and our more than 16,500 employees ensure close proximity to our customers, which we believe is particularly important..

From ground-mounted systems to rooftop systems all the way to hybrid energy systems, Phoenix Contact ensures the reliable operation of your photovoltaic park through the use of continuous plant data collection and an optimized feed-in management system.

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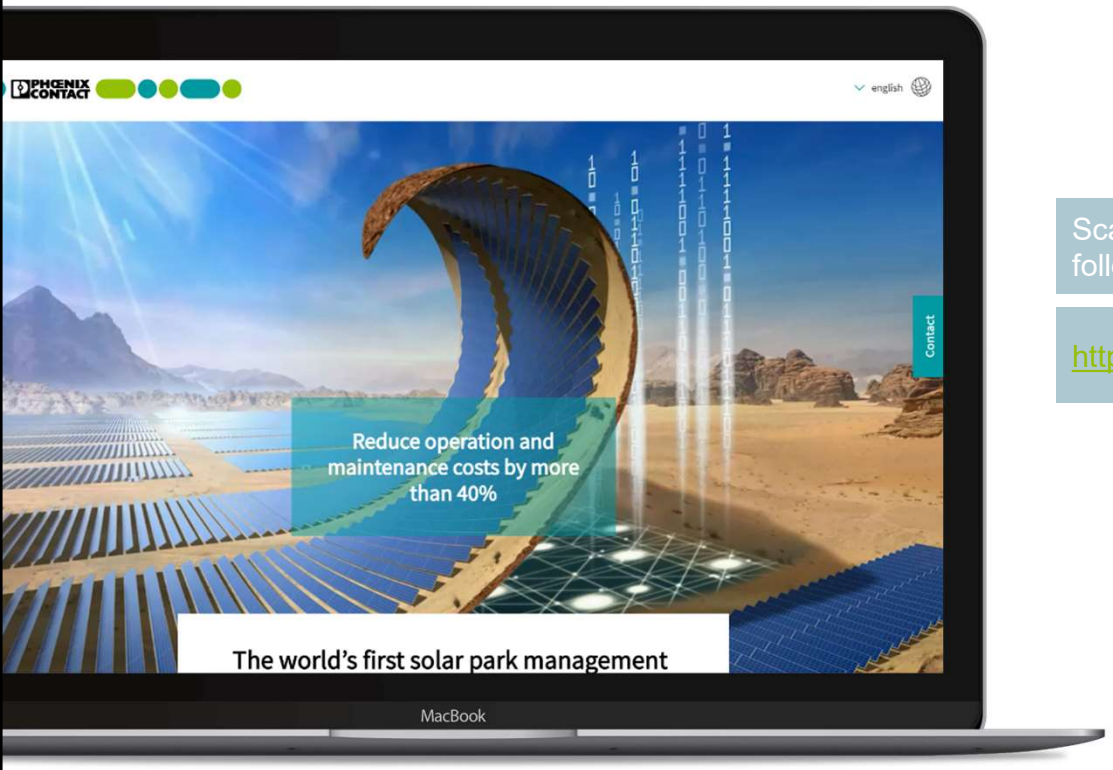
Find more information about Integrated PV Park Management



Scan the QR code to go to the website, or use the following link:

https://phoe.co/solarparkmanagement

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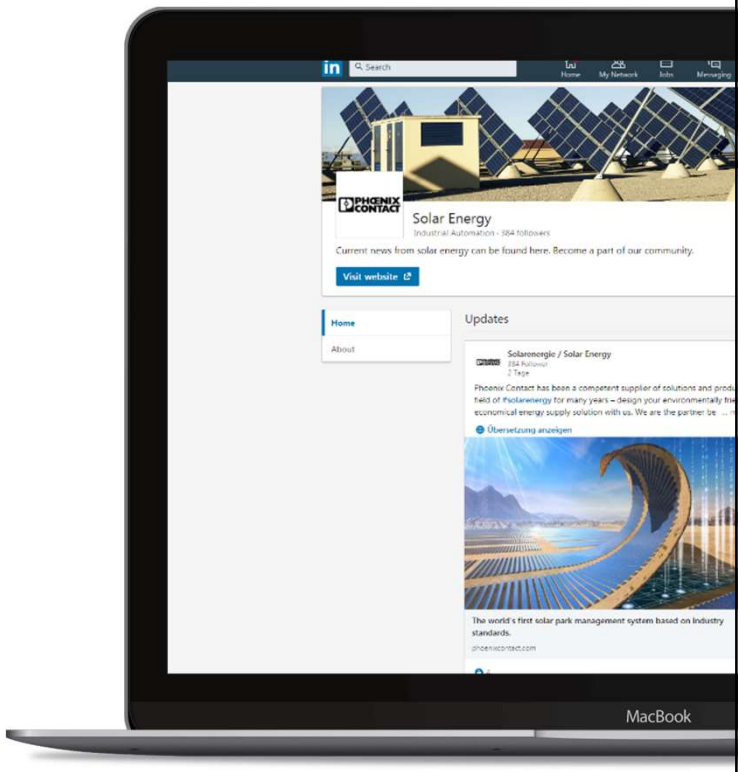
Solutions for solar power

Follow our showcase page on LinkedIn

Scan the QR code to go to the website, or use the following link:

https://phoe.co/solarenergy-linkedin



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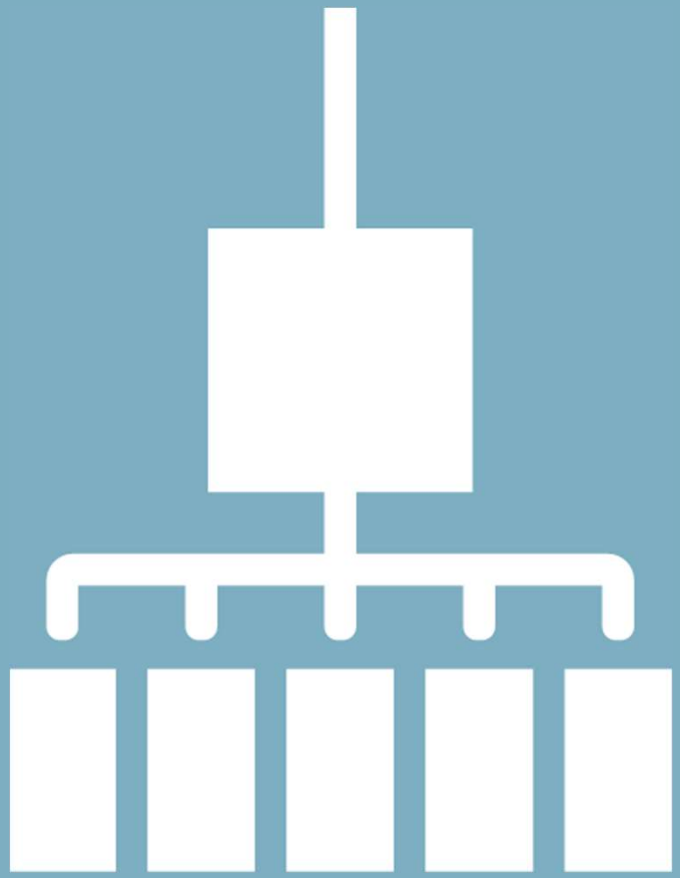
String combiner box



String combiner box

Thanks to Hall-effect sensor technology, string currents can be easily and reliably monitored without interruption

Our string combiner boxes are self-powered thanks to the integrated DC/DC converter, which means they do not require a separate power supply

The string combiner boxes can be very flexibly used with different park topologies, depending on customer requirements

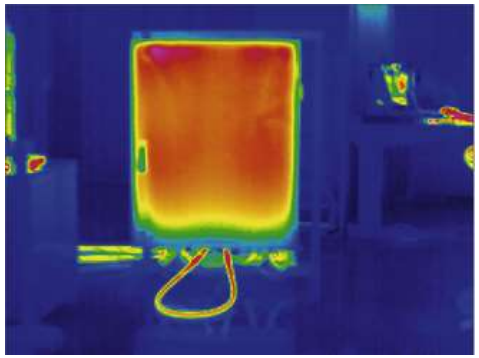
Integrated PV Park Management

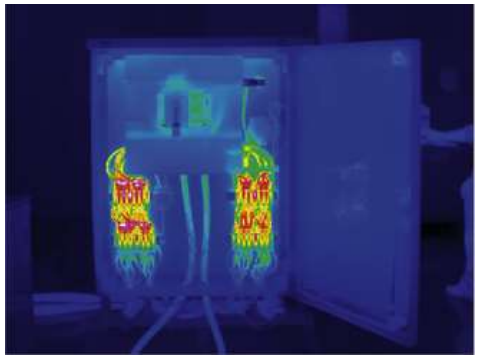
String combiner box

Space-saving installation through compact design

Current and voltage measurement up to 1500 V DC

Reliability and durability, thanks to a temperature-optimized design





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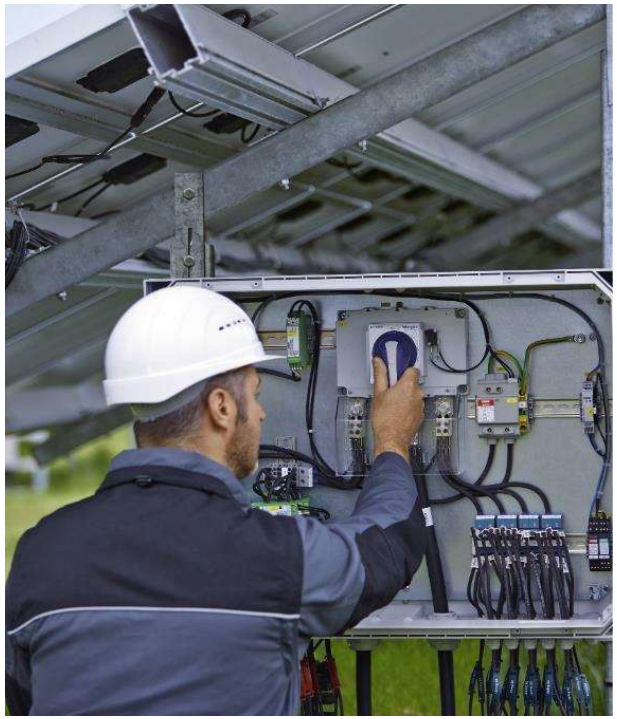
String monitoring

Maximizing power production

Minimizing operation and maintenance costs

Reliable detection of system errors

Fast and easy locating of failure points



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Master Slave Concept

Reduced cabling effort, thanks to wireless communication between the master and data logger

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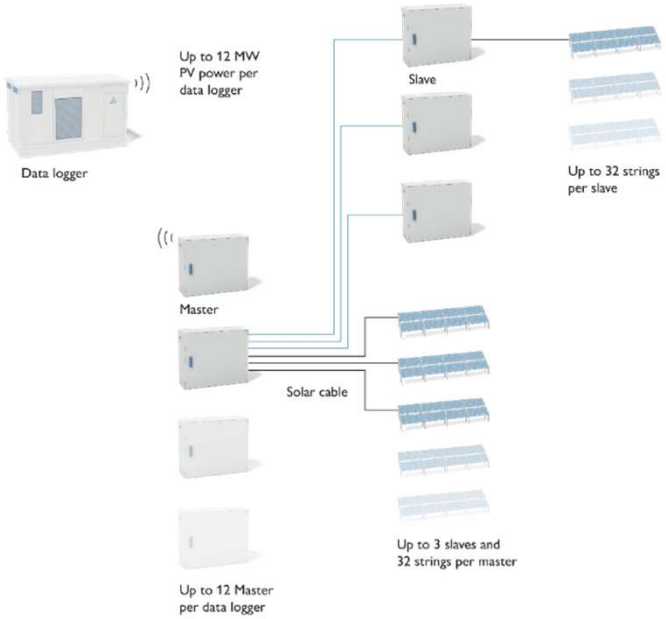
Low planning and startup costs, thanks to intelligent automation solution.



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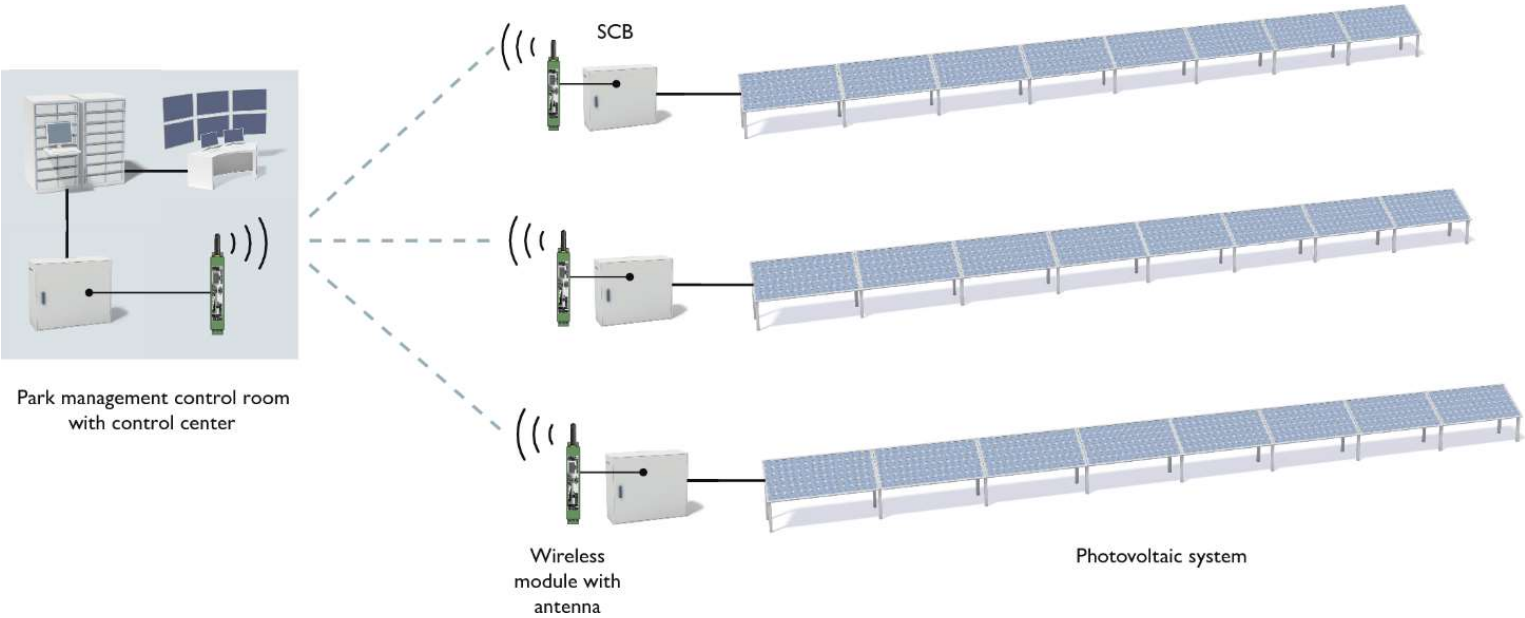
Wireless communication



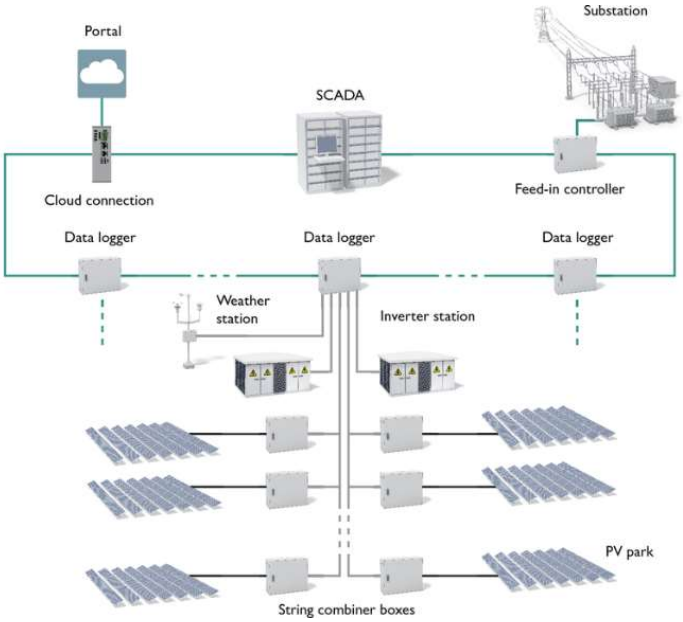
The world’s first solar park management system based on industry standards

Integrated PV Park Management

From the field level right through to the visualization of data in a portal, we have developed a scalable concept for the comprehensive operational management of the system portfolio.

Each of these solutions can be implemented individually, and, where necessary, adapted to the specific needs of the customer.

Together, the result is a holistic solution that intermeshes seamlessly, without the adaptation of interfaces.



Weather data acquisition

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Weather data acquisition

Easy installation

All sensors and accessories are available from the E-Shop

Reduced on-site cabling effort, as Modbus/RTU communication replaces the individual wiring of each analog sensor

Different communication interfaces can be configured with ease

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Weather data acquisition

Easy integration

Complies with the IEC 61724-1 Class A standard for large-scale PV parks

Modular sensors with automatic detection of all sensors

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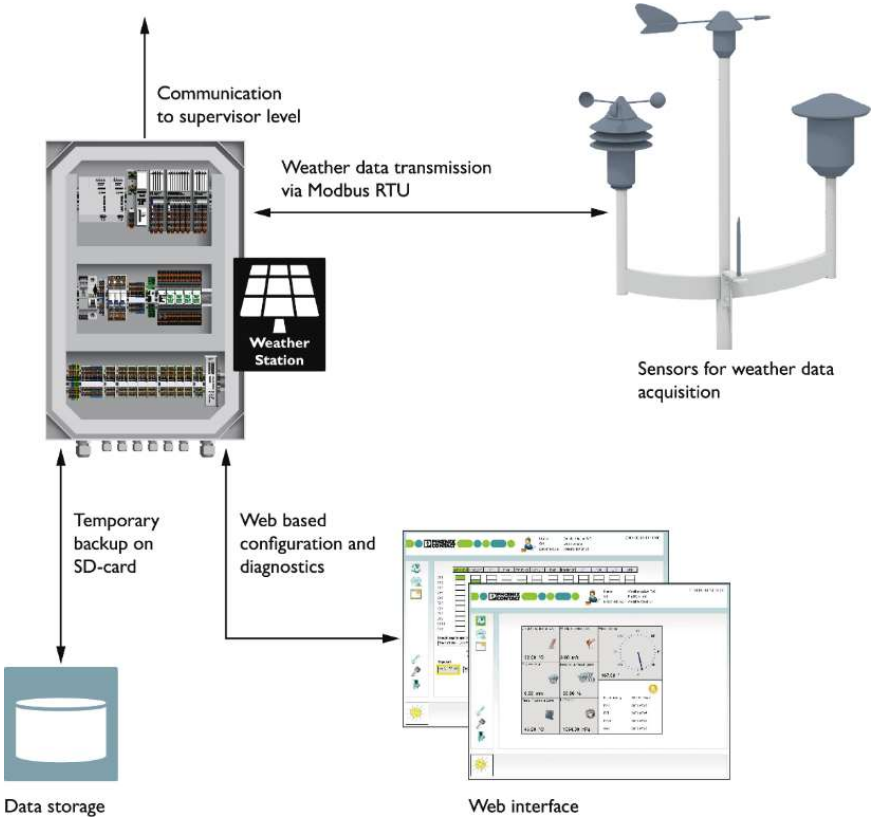
Weather data acquisition



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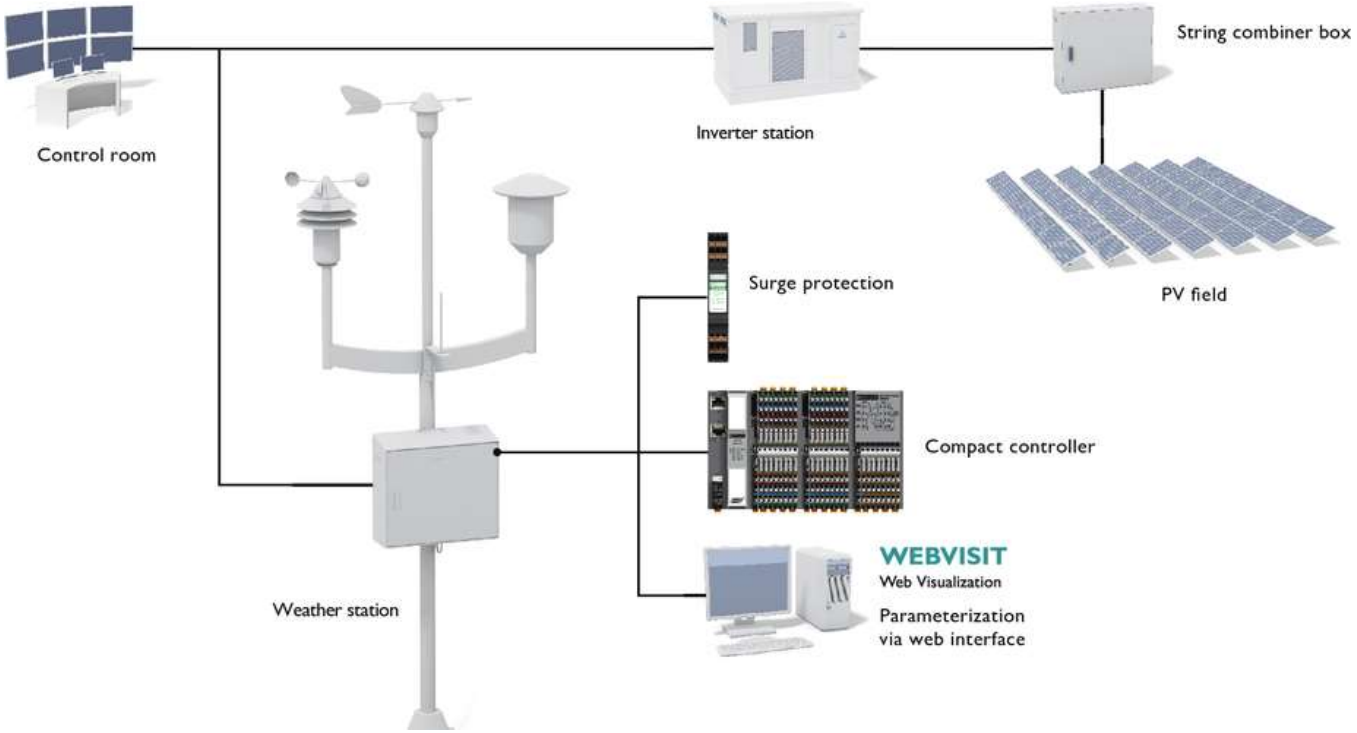
Weather data acquisition



Integrated PV Park Management

Product overview

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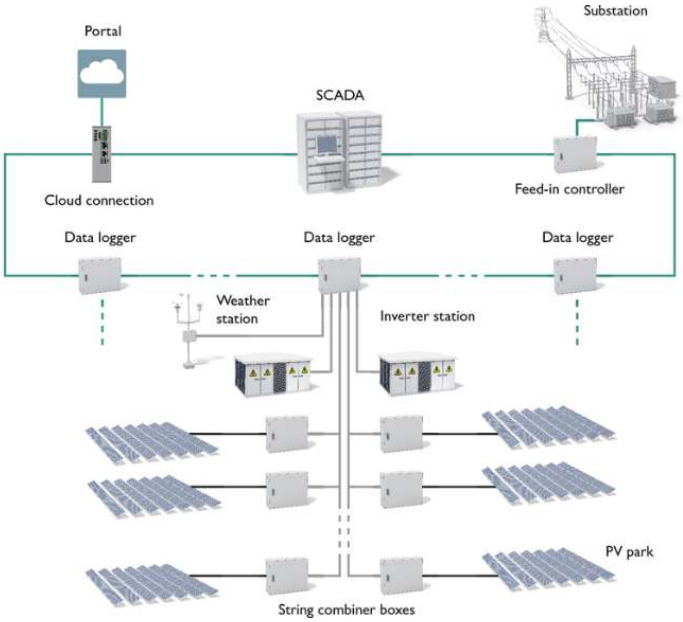

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Inverter communication

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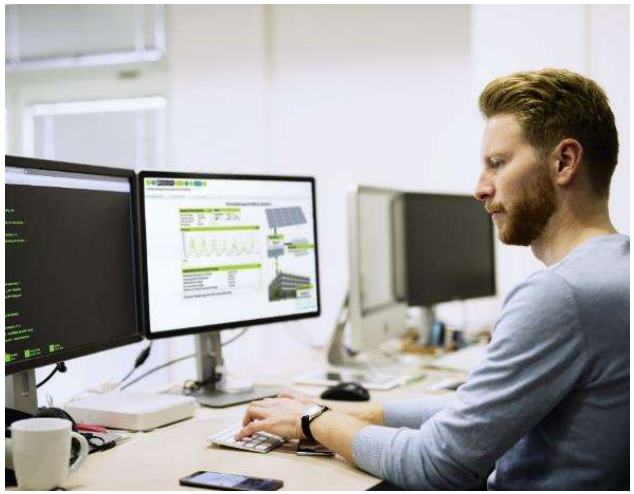
Inverter communication

SOLARWORX contains software libraries for PC Worx, our engineering software, which are ideal for the implementation of photovoltaics projects

Among other things, these libraries include ready-made function blocks for communicating with all common types of inverters

To keep engineering times and costs for the startup of photovoltaic systems at a minimum, we continuously develop new drivers and function blocks for the connection of environmental sensors and for photovoltaic tracking systems.



Scan the QR code to go to the compatibility list!

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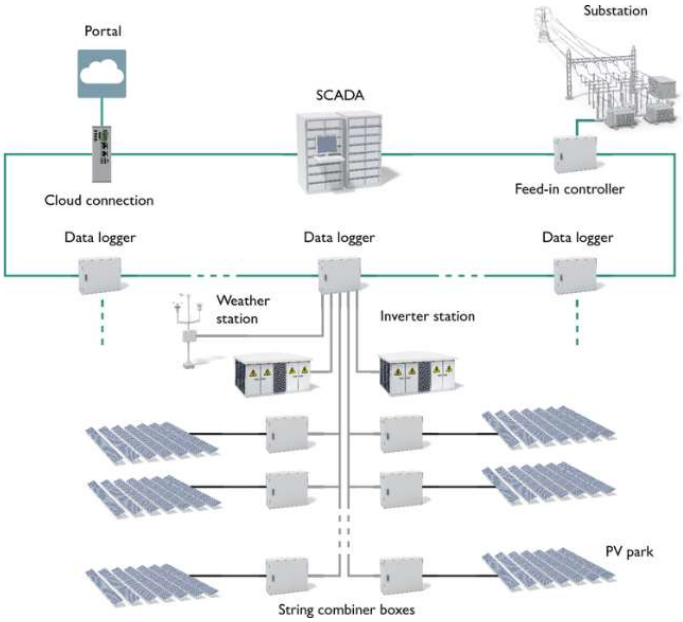

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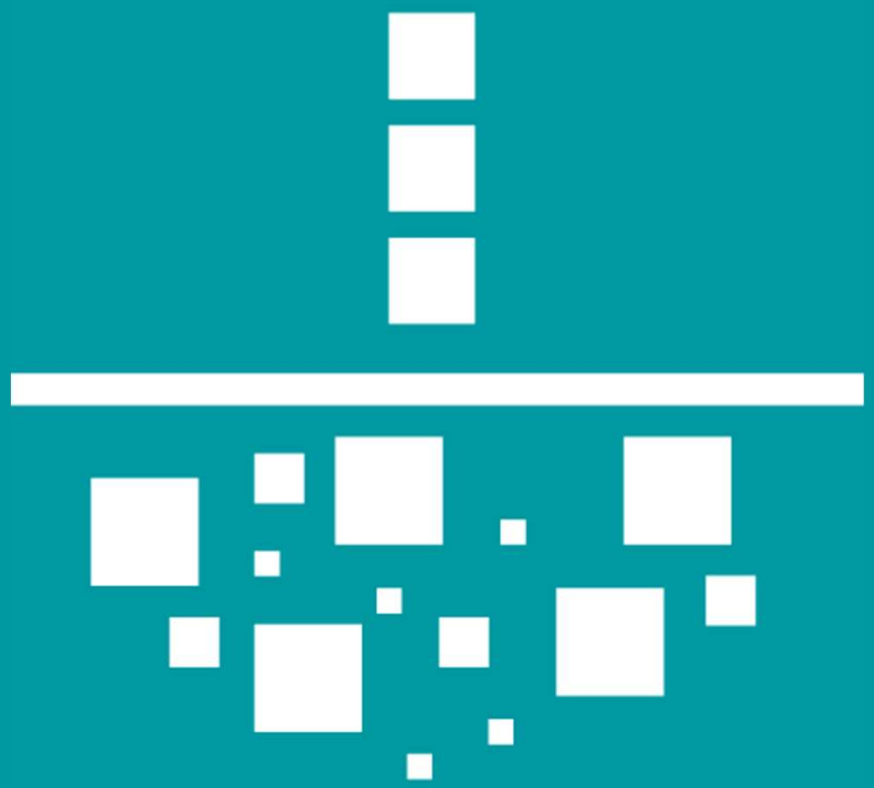
Data logger

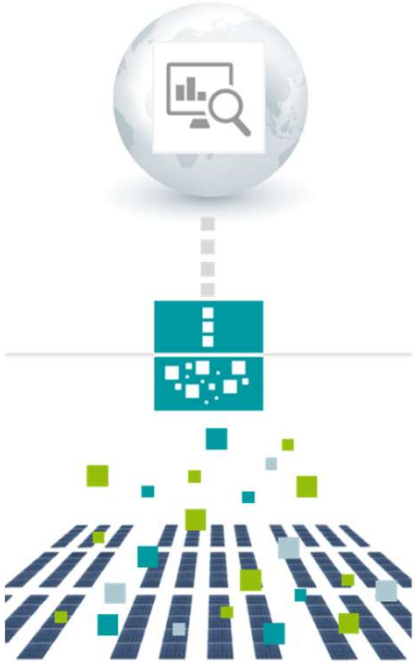


Collecting data for the efficient operation of large-scale PV systems

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

The data is transmitted to a higher-level data management system



Data logger

Auto Detection Mode

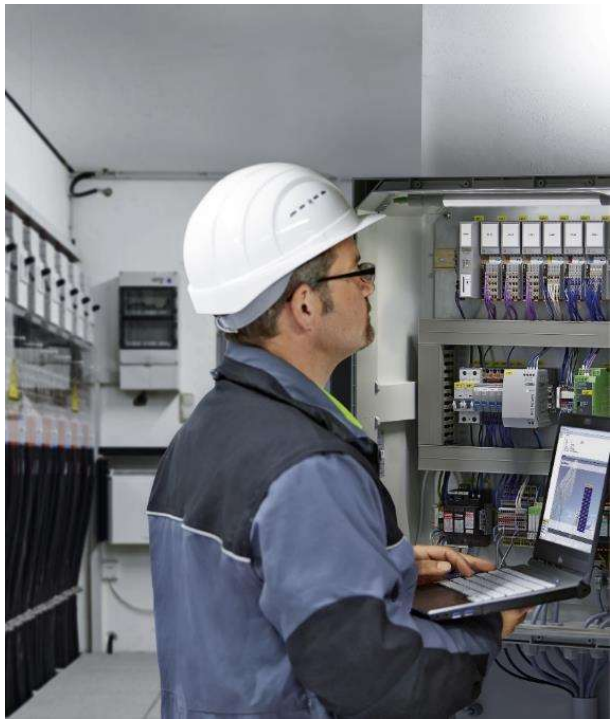
Significantly reduces the startup time

Less errors during configuration

Temporary data storage

Less faulty visualization and history data

Automatic data transmission when communication is reestablished



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Collect, process and transmit data

- Automatic detection mode of all park participants
- Avoidance of data gaps in visualization and history data thanks to temporary data storage
- Automatic data transfer to data management system
- Linking to different web portals through open interfaces possible

For further information on our switchgear and controlgear assembly for feed-in control, simply enter web code **#2437** in the search field on our website **phoenixcontact.com**

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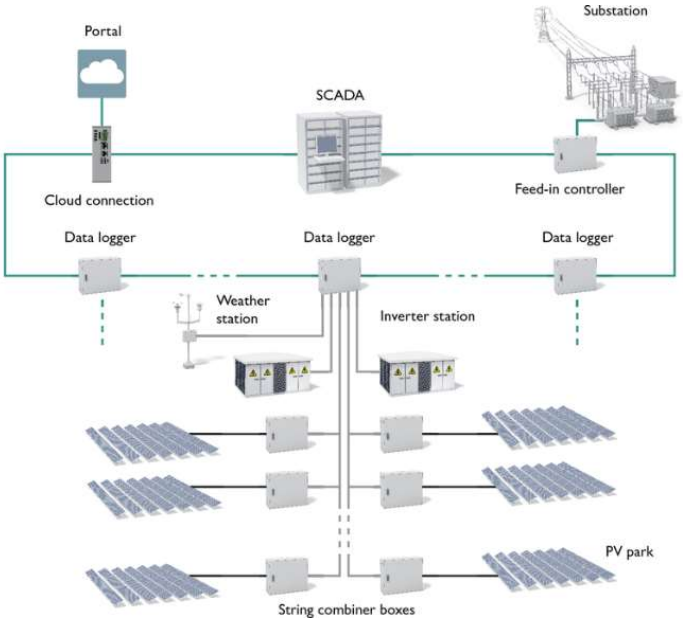

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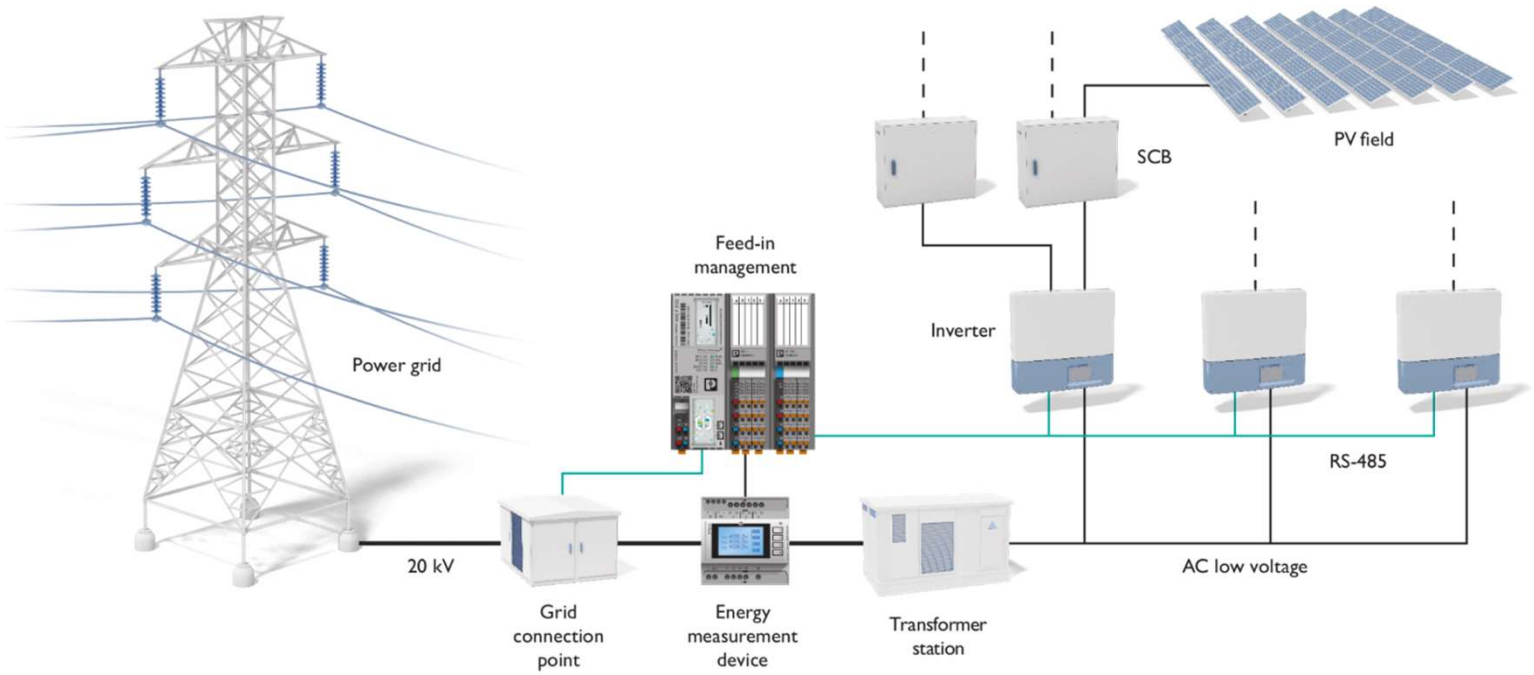
Feed-in management

Integrated PV Park Management

Feed-in management



Feed-in management

Certified feed-in control

Order designation: **SOL-SA-PCU-41XX**
Order No.: **1114234**

M.O.E. GmbH
Zertifizierungsstelle
Akkreditiert nach
DIN EN ISO/ IEC 17065: 2013

M.O.E. MOELLER OPERATING ENGINEERING
CERTIFICATION · MEASUREMENT · INSPECTION

Komponenten-zertifikat

Nr.: MOE 18-EZE-0014-04
Revision: 0.0

Hersteller / Typ	Phoenix Contact Electronics GmbH / SOL-SA-PCU-41XX
Komponententyp	EZA-Regler für Typ 1 und 2 EZA
Technische Daten	siehe Tabelle 2-1
VDE- Anwendungsrichtlinie	VDE-AR-N 4110:2018-11 VDE-AR-N 4120:2018-11
Zertifizierungsprogramm	FGW Technische Richtlinie Nr. 8 Rev. 9
Mitgeltende Normen / Richtlinien	FGW Technische Richtlinien Teil 3 Rev. 25 FGW Technische Richtlinien Teil 4 Rev. 9

Der oben genannte EZA-Regler erfüllt die Anforderungen der VDE-AR-N 4110:2018-11 und VDE-AR-N 4120:2018-11.

Die Hinweise gemäß Tabelle 4-2 sind zu beachten.

Der Hersteller hat die Zertifizierung des Qualitätsmanagementsystems seiner Fertigungsstätte nach ISO 9001 nachgewiesen.

Das Zertifikat beinhaltet folgende Angaben:

- Technische Daten des EZA-Reglers und die gültige Softwareversion;
- den schematischen Aufbau des EZA-Reglers;
- zusammengefasste Angaben zu den Eigenschaften des EZA-Reglers;

Das Zertifikat besteht aus 16 Seiten und folgendem Anhang:

- Anhang I: Evaluierungsbericht MOE-18-EZE-0014-03

Das Zertifikat ist gültig bis Datum (03.12.2024).

Itzehoe, 04.12.2019

04.12.2019 — **Jan-Martin Mohrdieck, M.Eng.**
Stellv. Leiter der Zertifizierungsstelle

04.12.2019 — **Mathias Morawe, M.Sc.**
Seniorexperte der Zertifizierungsstelle

M.O.E. GmbH Zertifizierungsstelle, Fraunhoferstraße 3, 25524 Itzehoe, info@moe-service.com

Das Zertifikat darf auszugsweise nur mit schriftlicher Zustimmung der M.O.E. GmbH vervielfältigt werden und ist nur mit den auf dem oben aufgeführten Anhängen gültig.

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Feed-in Management

Contributing to grid stability

- Reliable system operation and simple grid connection by meeting all technical connection requirements
- Intelligent automation solutions ensure low engineering and operating costs
- Thanks to the pre-programmed software, you can quickly put power generation plants into operation
- Open interfaces enable customer-specific extensions

For further information on our switchgear and controlgear assembly for feed-in control, simply enter web code **#2438** in the search field on our website **phoenixcontact.com**

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Application area VDE-AR-N 4110:2018-11

- To be used when connecting and operating customer systems (supply and generation systems, storage systems, mixing systems, as well as chargers for electric vehicles) to/on the public medium-voltage grid
  - Mains frequency: 50 Hz
  - Mains voltage: >1 kV to <60 kV
- To be used when the connection of the customer system is located in a customer's low-voltage grid, which is connected to the public medium-voltage grid via the mains transformer and the connecting cables
- These technical connection rules only fully apply for generation systems and storage systems from a maximum (installed) active power of ≥135 kW respectively.
- Run and certify generation systems with a maximum installed active power <135 kW independently of the connection to the public energy supply network in accordance with VDE-AR-N 4105:2018-11.

Application area VDE-AR-N 4120:2018-11

- To be used when connecting and operating customer systems (supply and generation systems, storage systems, mixing systems, as well as chargers for electric vehicles) to/on the public high-voltage grid
  - Mains frequency: 50 Hz
  - Mains voltage: ≥60 kV to <150 kV
- To be used when the connection of the customer system is located in the customer’s medium-voltage grid, which is connected to the public high-voltage grid via the mains transformer and the connecting cables.
- This does not apply if the connection of the customer system is located in the customer’s high-voltage grid, which is connected to the public extra-high voltage grid via the grid transformer and the connecting cables. In this case, VDE-AR-N 4130:2018-11 will apply.

What Is PLCnext Technology?

Our Answer: An Open Ecosystem for Limitless Automation

PLCnext Technology in a nutshell

Software Store & Digital Marketplace for Automation

PLCnext Technology
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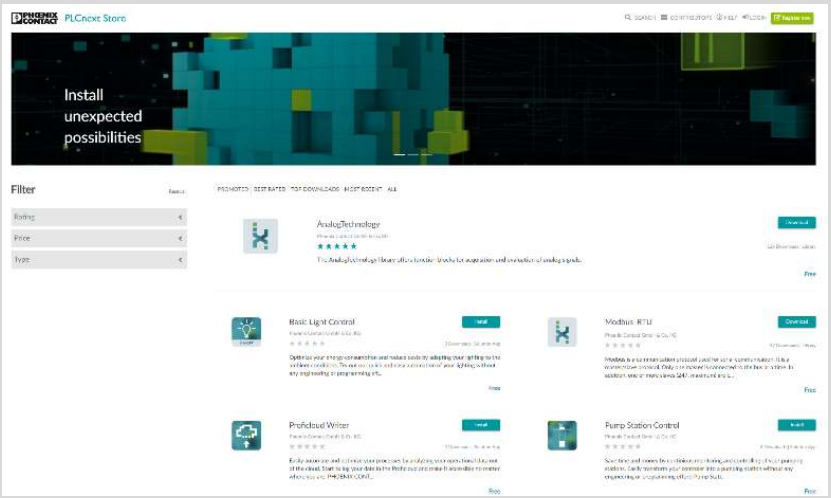

Software Store for Automation

Apps for functional extension of PLCnext control and PLCnext Engineer

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Cnext Store

Software Store for Automation

Apps for functional extension of PLCnext Control and PLCnext Engineer

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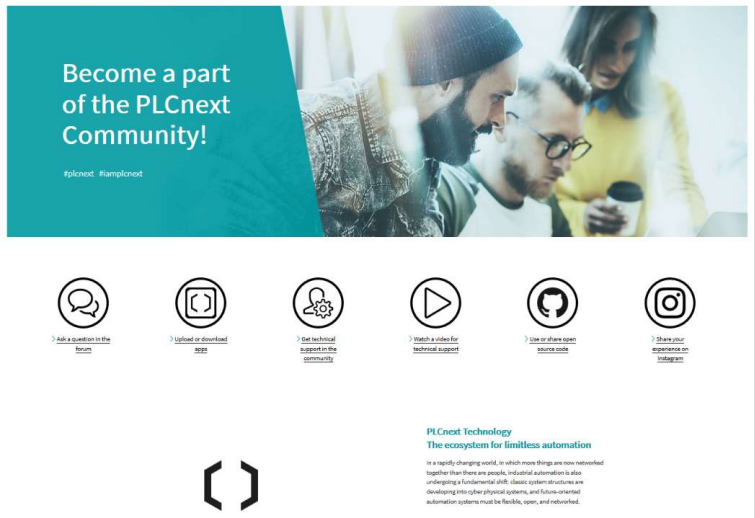
User Collaboration & Resources



User Collaboration & Resources

Information, support, and helpful resources about PLCnext Technology including FAQs, forums, tutorials and a GitHub presence

PLCnext Technology in a nutshell

The Open Ecosystem for Limitless Automation

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PLCnext Technology
enhance your automation thinking

PLCnext Control	PLCnext Engineer	PLCnext Store	PLCnext Community
Open Control Platform	**Engineering Software**	**Software Store for Automation**	**User Collaboration & Resources**
PLCs in various performance classes including PLCnext Runtime System and accessories for PLCnext Technology	Engineering tool for commissioning, configuring, and programming PLCnext Controls	Apps for functional extension of PLCnext Control and PLCnext Engineer	Information, support, and helpful resources about PLCnext Technology including FAQs, forums, tutorials and a GitHub presence

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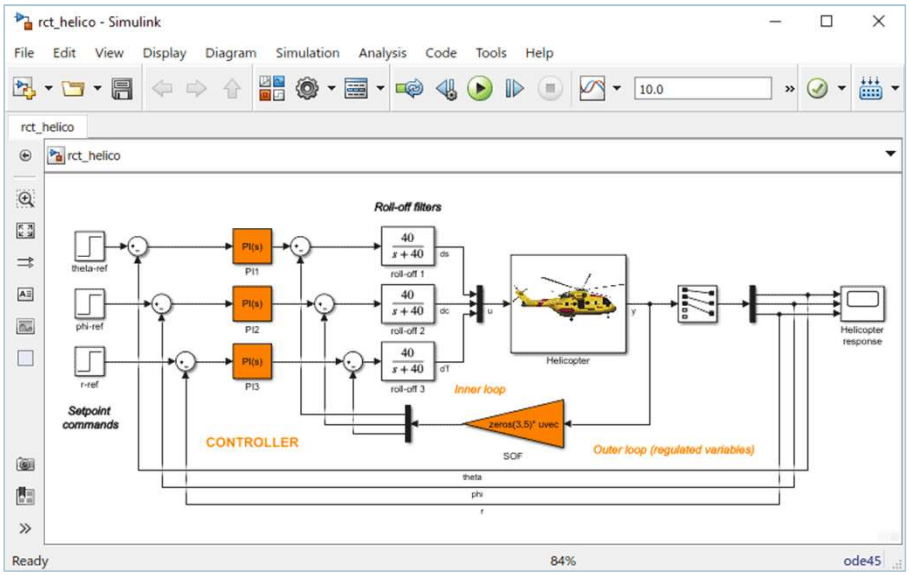
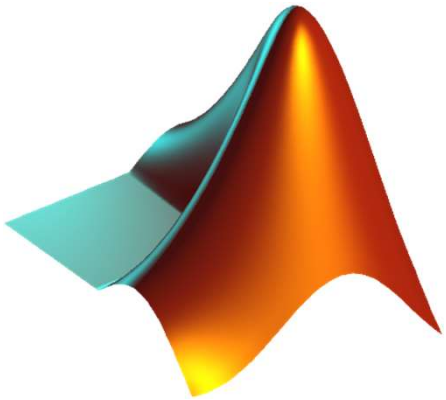
Feed-in management

MATLAB Simulink





Seamless integration of model-based design & development with MATLAB Simulink

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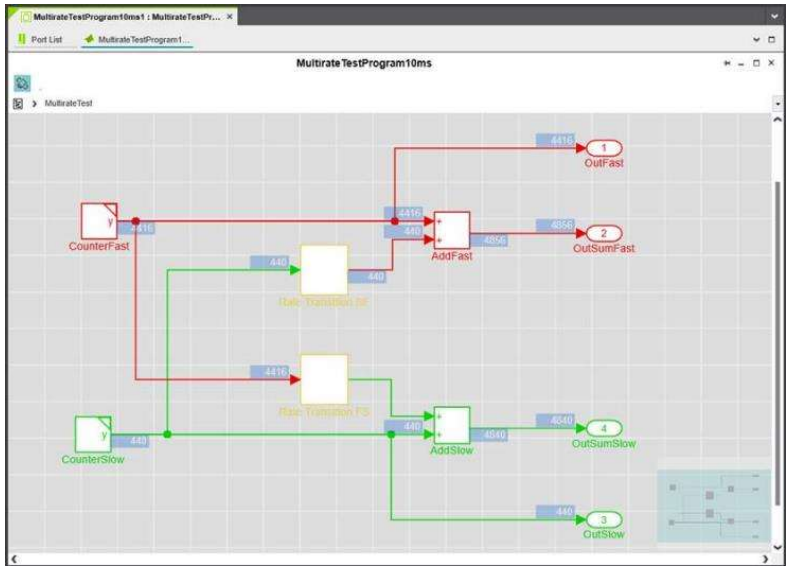
Feed-in management

MATLAB Simulink & PLCnext Engineer



Seamless integration of model based design & development with MATLAB Simulink and PLCnext Engineer.

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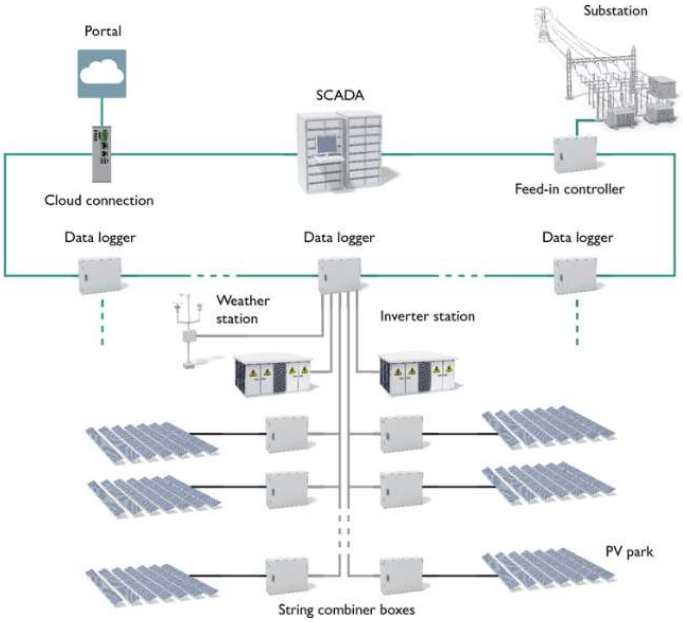

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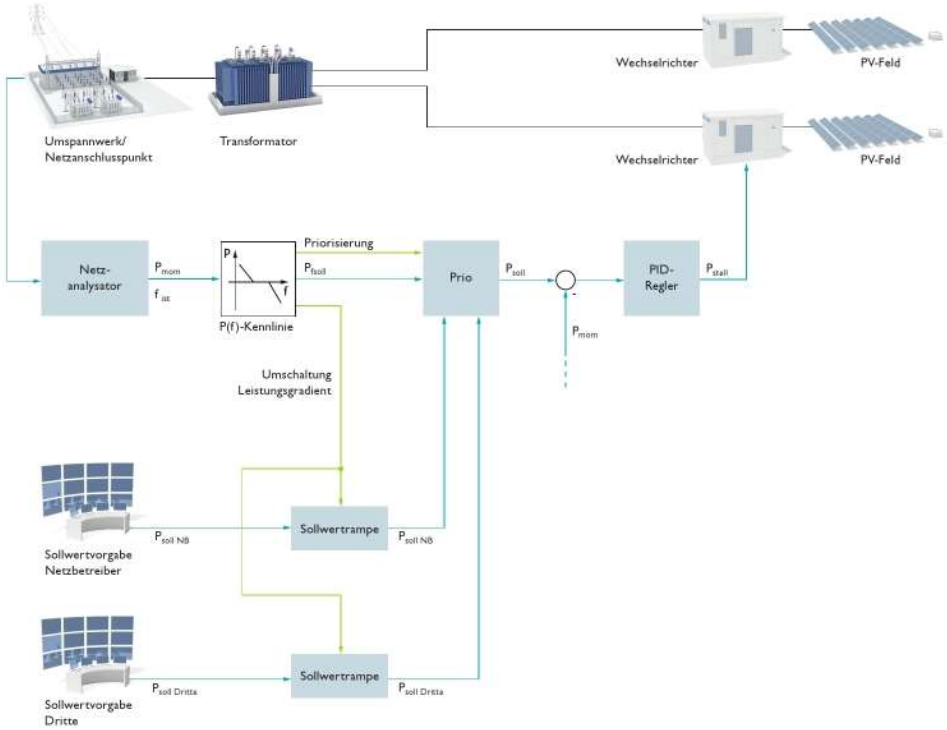
Feed-in management

Real Power 0 – 100 %

Aim of this procedure: The generation system regulates the real power in dependence of setpoint definitions of third parties and in consideration of supply continuity management.



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Feed-in management

Real Power/ Frequency

Aim of this procedure: The generation system regulates the real power at the network connection point in dependence of the current mains frequency of the primary distribution network.

Feed-in management

Reactive Power/ Voltage

Aim of this procedure: At the network connection point, the generation system exchanges reactive power with the network in dependence of the current operating voltage of the primary distribution network.

Feed-in management

Reactive Power/ Real Power

Aim: The generation system feeds reactive power (in Mvar) – predetermined by the network operator – into the network, independent of the real power supply.

Visualization in a portal

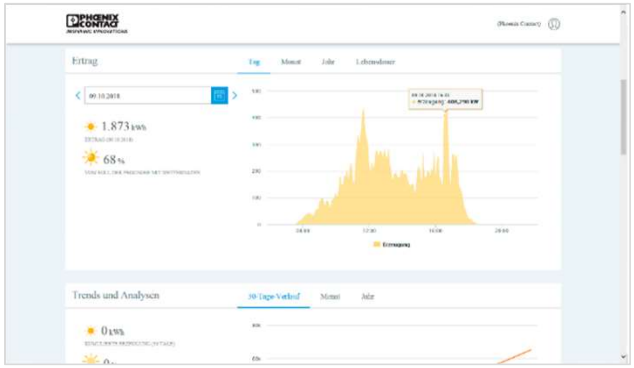
Integrated PV Park Management

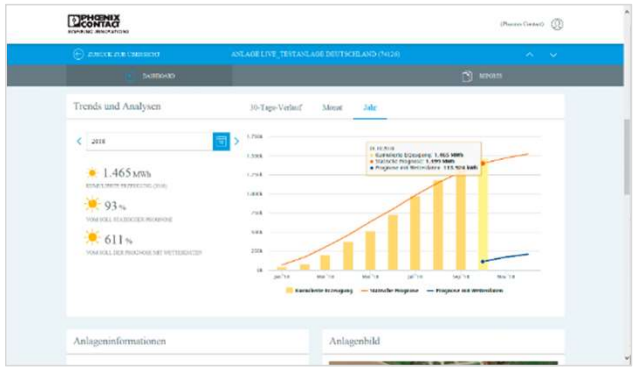
Portal connection

All assets at a glance, thanks to portal dashboard

An overview is provided of various PV systems, hosted in the highly secure data center

Optimum overview of production data, plus commercial reports





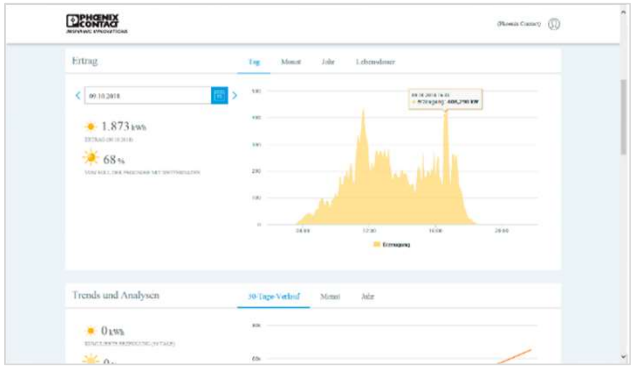
Integrated PV Park Management

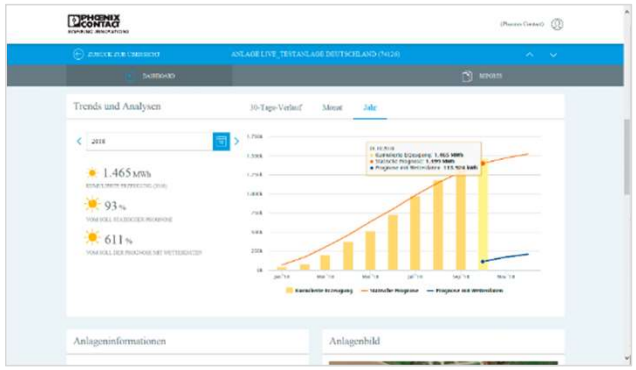
Portal connection

Easy startup by means of automatic detection of all park devices

Reduced maintenance costs, thanks to the automated failure algorithm

Available as an option: customer-specific dashboard for custom corporate identity





PHOENIX CONTACT
INSPIRING INNOVATIONS

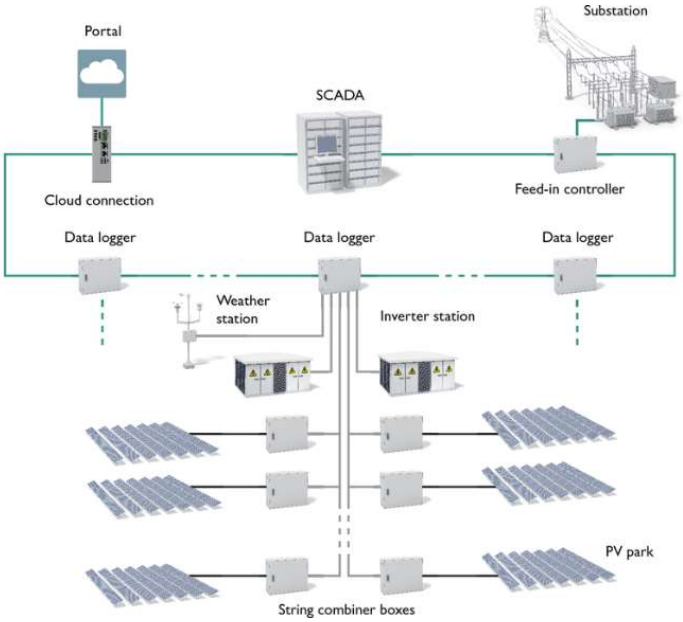
The world’s first solar park management system based on industry standards

Integrated PV Park Management

From the field level right through to the visualization of data in a portal, we have developed a scalable concept for the comprehensive operational management of the system portfolio.

Each of these solutions can be implemented individually, and, where necessary, adapted to the specific needs of the customer.

Together, the result is a holistic solution that intermeshes seamlessly, without the adaptation of interfaces.



Our services

Integrated PV Park Management

Our services

Concept creation

Model-based software development

Project support

PV Solutions:

PV-sets

< 100 KWp

Protection
Merge of String

SCB

> 1 MWp

Protection
Merge of String
Monitoring
String disconnection

Surge protection PV – SETS / SCB String Combiner Box

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INSPIRING INNOVATIONS

Roof

PV-sets

PV – Sets explanation

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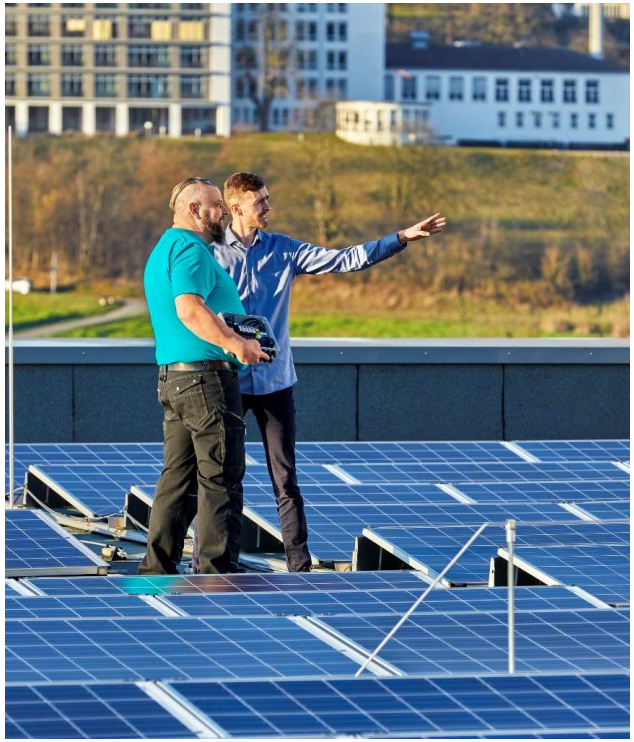
INSPIRING INNOVATIONS

Industry solar power

Surge protection for photovoltaic systems

- Solar power is an essential source of renewable energy.
- Decreasing system costs mean that photovoltaic power generation systems are attractive.
- In order to provide optimum protection against overvoltages for the various system parts such as PV panels, inverters, and battery storage systems, surge protection must be used.



PHOENIX CONTACT
INSPIRING INNOVATIONS

Surge protection for photovoltaic rooftop systems

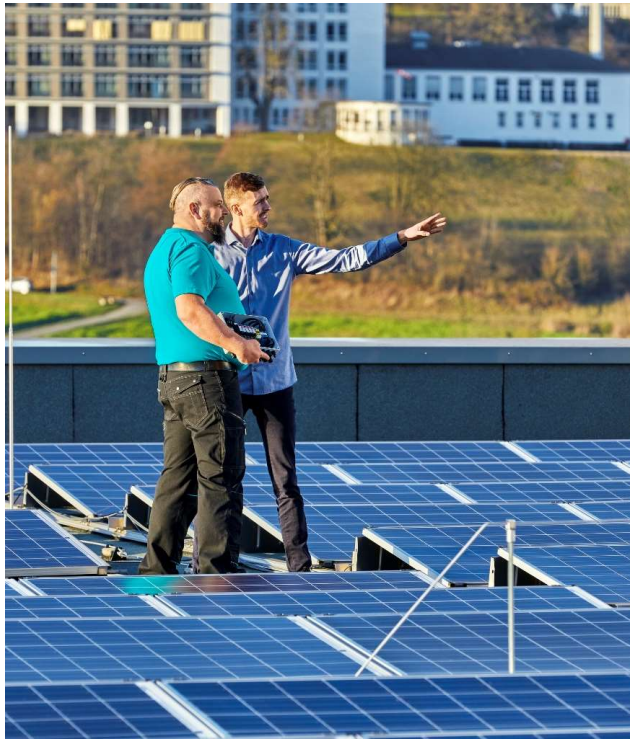
Directives for lightning and surge protection

HD 60364-7-712:2016

Harmonized standard developed by CENELEC on behalf of the European Commission. It describes how to plan and install PV systems.

DIN EN 61643-32

describes the selection criteria for DC and AC protective devices in photovoltaic systems. The contents of both standards have been incorporated into the national standards of many European countries.



PHOENIX CONTACT
INSPIRING INNOVATIONS

Surge protection for photovoltaic rooftop systems

Directives for lightning and surge protection

Country/ Region	Installation of PV systems	DC surge protection	AC surge protection
Europe	HD 60364-7-712	DIN EN 61643-32	
Germany	DIN VDE 0100-712	DIN EN 62305-3 Beiblatt 5	DIN VDE 0100-443
Switzerland	SN 411000 (NIN)	SN EN 62305 SN 411000 (NIN)	SN EN 62305-4 SN 411000 (NIN)
Austria	OVE-Richtlinie: R 6-2-1 OVE-Richtlinie: R 6-2-2 OVE-Richtlinie: R 6-3	ÖVE/ÖNORM EN 62305-3	OVE E 8101
Netherlands	NEN 1010:1015-712	NEN-EN 62305-3	NEN 1010:1015-440
Poland	PN-HD 60364-7-712	-	PN-HD 60364-4-443 PN-HD 60364-5-534
Belgium	AREI 2020	-	AREI 2020

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INSPIRING INNOVATIONS

Surge protection for photovoltaic rooftop systems

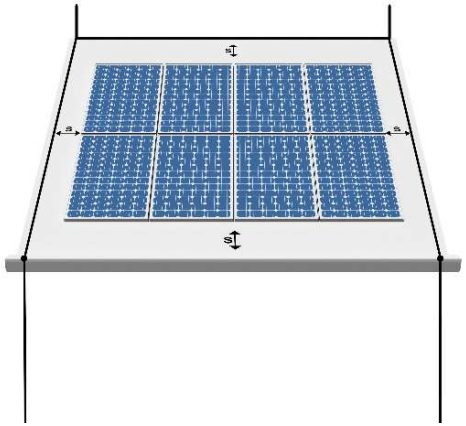
Selection surge protection devices

As per **DIN EN 61643-32**, a distinction is made between three application scenarios which determine the appropriate protection that should be selected:

Building without external lightning protection

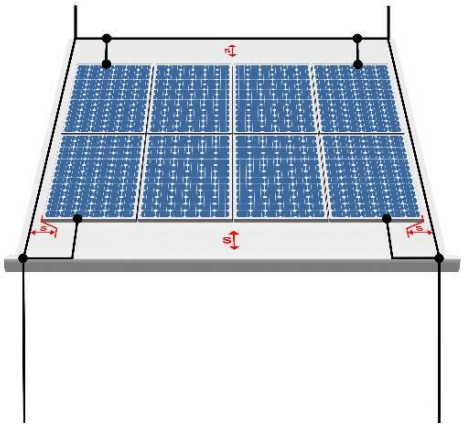
Building with external lightning protection

The separation distance “s” is maintained.



Building with external lightning protection

The separation distance “s” is not maintained.

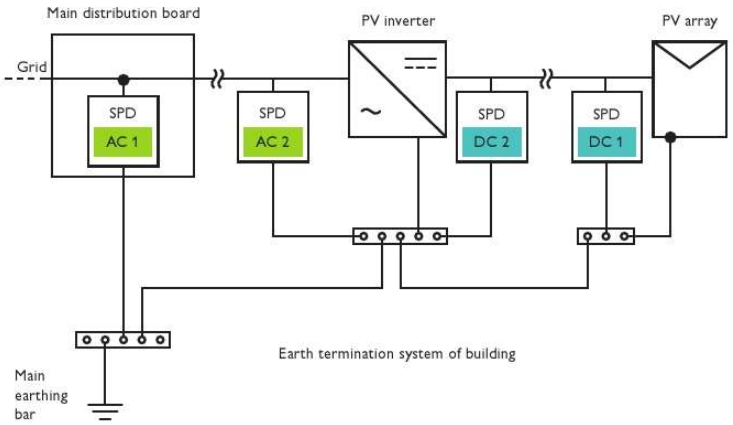


PHOENIX CONTACT
INSPIRING INNOVATIONS

Surge protection for photovoltaic rooftop systems

Building without external lightning protection

DC 1	**DC surge protection in the proximity of the PV panels**	**Type 2** A surge protective device is not required here if the cable length between “DC 1” and “DC 2” is less than 10 m.
DC 2	**DC surge protection in the proximity of the inverter**	**Type 2**
AC 1	**AC surge protection on the AC side of the inverter**	**Type 2** A surge protective device is not required here if the cable length between “AC 1” and “AC 2” is less than 10 m.
AC 2	**AC surge protection in the main distribution**	**Type 2**

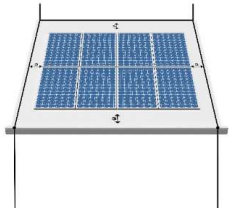


PHOENIX CONTACT
INSPIRING INNOVATIONS

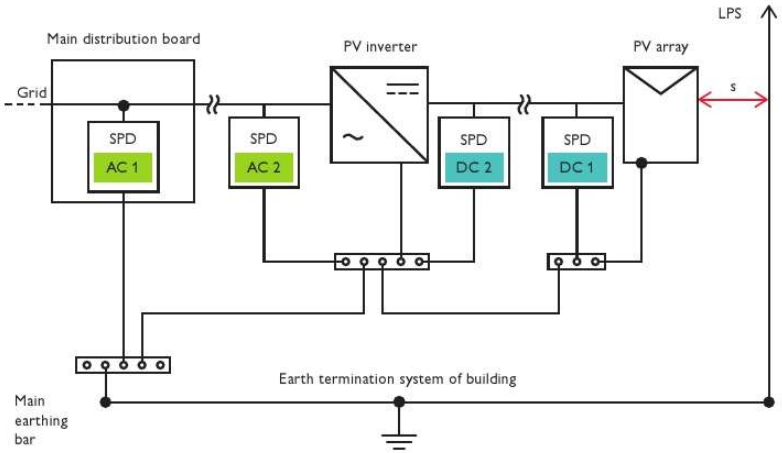
Surge protection for photovoltaic rooftop systems

Building with external lightning protection

The separation distance “s” is maintained.



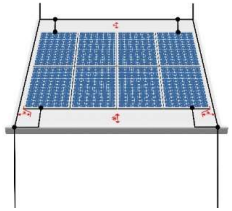
DC 1	**DC surge protection in the proximity of the PV panels**	**Type 2** A surge protective device is not required here if the cable length between “DC 1” and “DC 2” is less than 10 m.
DC 2	**DC surge protection in the proximity of the inverter**	**Type 2**
AC 1	**AC surge protection on the AC side of the inverter**	**Type 2** A surge protective device is not required here if the cable length between “AC 1” and “AC 2” is less than 10 m.
AC 2	**AC surge protection in the main distribution**	**Type 1**



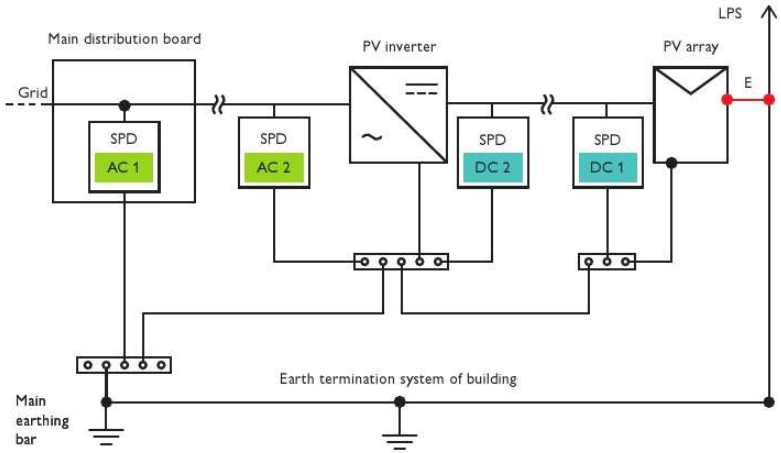
Surge protection for photovoltaic rooftop systems

Building with external lightning protection

The separation distance “s” is <u>not</u> maintained.



DC 1	**DC surge protection in the proximity of the PV panels**	**Type 1** A surge protective device is not required here if the cable length between “DC 1” and “DC 2” is less than 10 m.
DC 2	**DC surge protection in the proximity of the inverter**	**Type 1**
AC 1	**AC surge protection on the AC side of the inverter**	**Type 1** A surge protective device is not required here if the cable length between “AC 1” and “AC 2” is less than 10 m.
AC 2	**AC surge protection in the main distribution**	**Type 1**



PHOENIX CONTACT
INSPIRING INNOVATIONS

Surge protection for photovoltaic rooftop systems

Tailor-made portfolio

DC 1 | DC 2

Flexible and fast installation

With the string combiner boxes, our PV sets, all the necessary field connectors are always included as well.

DC 1 | DC 2

Safe connection technology

PV strings with ferrules can be wired without using tools by means of Push-in connection terminal blocks.

DC 1

Additional safety

Our PV sets with integrated fireman's switch enable the external disconnection of the PV panels from the rest of the system.

AC 1 | AC 2

Comprehensive portfolio

Whether a 3-conductor or 1-conductor system, and whatever the supply system configuration, we offer a broad portfolio for the protection of the AC side.
.

TC

High data availability

As per DIN EN 61643-32, the telecommunications and data cables must be protected if the PV installation is equipped with surge protection.

PHOENIX CONTACT
INSPIRING INNOVATIONS

Surge protection for photovoltaic rooftop systems

Surge protection for the DC side

DC 1 DC 2

The whole product overview of our string combiner boxes with more than 60 variants you will find online! Visit our website at **phoenixcontact.com** and enter the following web code in the search field: **#2268**

Our PV sets

- Production in Germany
- Available from stock
- Worldwide shipping
- Corresponding accessories

PHOENIX CONTACT
INSPIRING INNOVATIONS

Surge protection for photovoltaic rooftop systems

Surge protection for the DC side

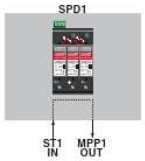
DC 1 | DC 2

Complete product overview on website with **#2268**

Small selection from our portfolio

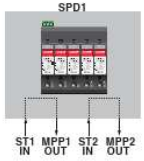
SOL-SC-1ST-0-DC-1MPPT-1001
Order No. 2404298

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 1
- Current per string: 40 A (I_{max})
- Number of outputs: 1
- Number of supported MPP trackers: 1
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 130 x 180 x 111 mm



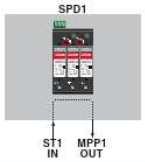
SOL-SC-1ST-0-DC-2MPPT-1000SE
Order No. 1101176

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 1 (per MPP tracker)
- Current per string: 40 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 254 x 180 x 111 mm



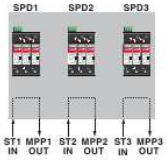
SOL-SC-1ST-0-DC-1MPPT-1000
Order No. 1182566

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 1
- Current per string: 40 A (I_{max})
- Number of outputs: 1
- Number of supported MPP trackers: 1
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 130 x 180 x 111 mm



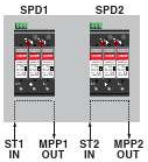
SOL-SC-1ST-0-DC-3MPPT-1001
Order No. 2404301

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 1 (per MPP tracker)
- Current per string: 40 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 3
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 254 x 180 x 111 mm



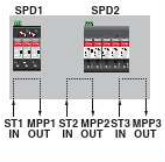
SOL-SC-1ST-0-DC-2MPPT-1001
Order No. 2404299

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 1 (per MPP tracker)
- Current per string: 40 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 180 x 180 x 111 mm



SOL-SC-1ST-0-DC-3MPPT-1000SE
Order No. 1182571

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 1 (per MPP tracker)
- Current per string: 40 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 3
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 361 x 254 x 111 mm



* SUNCLIX connectors included

PHOENIX CONTACT
INSPIRING INNOVATIONS

Surge protection for photovoltaic rooftop systems

Surge protection for the DC side

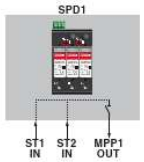
DC 1 | DC 2

Complete product overview on website with **#2268**

Small selection from our portfolio

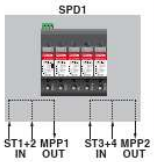
SOL-SC-2ST-0-DC-1MPPT-1101
Order No. 2404297

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 2
- Current per string: 16 A (I_{max})
- Number of outputs: 1
- Number of supported MPP trackers: 1
- Switching capacity: 32 A/1000 V DC
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 180 x 180 x 111 mm



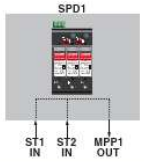
SOL-SC-2ST-0-DC-2MPPT-1001SE
Order No. 1016813

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 254 x 180 x 111 mm



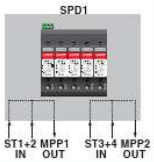
SOL-SC-2ST-0-DC-1MPPT-1000
Order No. 1016811

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 2
- Current per string: 20 A (I_{max})
- Number of outputs: 1
- Number of supported MPP trackers: 1
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 180 x 180 x 111 mm



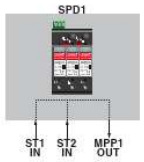
SOL-SC-2ST-0-DC-2MPPT-1000SE
Order No. 1016812

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 254 x 180 x 111 mm



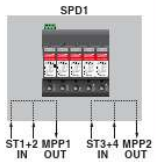
SOL-SC-2ST-0-DC-1MPPT-2000
Order No. 1055626

Technical data
- Surge protective device: type T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 2
- Current per string: 20 A (I_{max})
- Number of outputs: 1
- Number of supported MPP trackers: 1
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 180 x 180 x 111 mm



SOL-SC-2ST-0-DC-2MPPT-2000SE
Order No. 1055628

Technical data
- Surge protective device: type T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 254 x 180 x 111 mm



* SUNCLIX connectors included

PHOENIX CONTACT
INSPIRING INNOVATIONS

Surge protection for photovoltaic rooftop systems

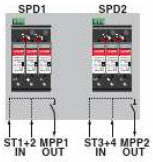
Surge protection for the DC side

DC 1 | DC 2

Complete product overview on website with **#2268**

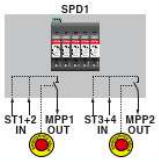
SOL-SC-2ST-0-DC-2MPPT-1101
Order No. 2404569

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- Switching capacity: 32 A/1000 V DC (per MPP tracker)
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 361 x 254 x 111 mm



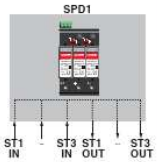
SOL-SC-2ST-0-DC-2MPPT-1300FS
Order No. 1137059

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- Switching capacity: 50 A/1000 V DC (per MPP tracker)
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 400 x 400 x 200 mm



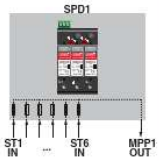
SOL-SC-3ST-0-DC-1MPPT-1001EQ
Order No. 1064363

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 3
- Current per string: 13.3 A (I_{max})
- Number of outputs: 3
- Number of supported MPP trackers: 1
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 180 x 180 x 111 mm



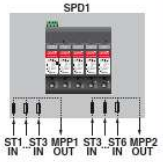
SOL-SC-6ST-0-DC-1MPPT-1010
Order No. 1113128

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 6
- Current per string: 10 A (I_{max})
- Number of outputs: 1
- Number of supported MPP trackers: 1
- String fuse: midget/10.3 x 38 (not included)
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 361 x 254 x 111 mm



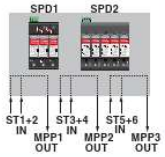
SOL-SC-3ST-0-DC-2MPPT-1011SE
Order No. 1042281

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 3 (per MPP tracker)
- Current per string: 12 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- String fuse: midget/10.3 x 38 (12 A included)
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 361 x 254 x 111 mm



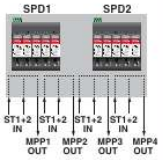
SOL-SC-2ST-0-DC-3MPPT-1000SE
Order No. 1053613

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 3
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 361 x 254 x 111 mm



SOL-SC-2ST-0-DC-4MPPT-1000SE
Order No. 1081867

Technical data
- Surge protective device: type T1/T2
- System voltage: 1000 V DC (U_{max})
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 4
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 361 x 254 x 111 mm



* SUNCLIX connectors included

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INSPIRING INNOVATIONS

Surge protection for photovoltaic rooftop systems

Request your individual string combiner box

Please provide us with the following information:

Inverter type

_____

Number of strings per MPP tracker

- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ other:

Maximum string voltage

1000 V DC

Surge protection type

- ○ T2
- ○ T1/ T2

Cable entry system IN

- ○ Cable gland
- ○ SUNCLIX

Cable entry system OUT

- ○ Cable gland
- ○ SUNCLIX

DC switch disconnector

- ○ Fireman‘s switch
- ○ None
- ○ DC switch disconnector

Number of MPP trackers

- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

Maximum String current (A)

_____

Connection cross section IN (mm)

_____

Connection cross section OUT (mm)

_____

String fuse

- ○ +/-
- ○ +
- ○ Ohne

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Weitere Informationen auf
Website unter **#0291**

Surge protection for photovoltaic rooftop systems

Surge protection for the AC side

AC 1 | AC 2

Type 1/type 2 combined lightning current and surge arrester	**For 3-phase power supply networks**		**For 1-phase power supply networks**
When it comes to lightning discharge or direct lightning strikes, our type 1/type 2 combined lightning current and surge arresters provide the best protection for your installations.			
Type designation	FLT-SEC-P-T1-3S-350/25-FM	FLT-SEC-ZP-3S-255/7,5	FLT-SEC-P-T1-1S-350/25-FM
Order number	2905421	1074741	2905415
Type 2 surge protection device	**For 3-phase power supply networks**		**For 1-phase power supply networks**
Switching operations are far and away the most common cause of overvoltage. Type 2 surge protective devices provide effective protection against these dynamic disturbance variables.			
Type designation	VAL-SEC-T2-3S-350-FM		VAL-SEC-T2-1S-350-FM
Order number	2905340		2905333

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Surge protection for photovoltaic rooftop systems

Surge protection for interfaces on the inverter

TC

	For digital signals	For RS-485 (2-wire)
All conventional inverters use an RS-485 data interface as well as digital inputs and outputs; these can be protected effectively against overvoltage.		
Type designation	2 x TTC-6P-2X1-F-M-24DC-PT-I	TTC-6P-3-HF-F-M-12DC-UT-I
Order number	2906794	2906786
	In accordance with Class EA (CAT6$_A$), for Gigabit Ethernet (up to 10 Gbps)	
Signal interfaces are particularly sensitive to overvoltage. You should therefore use our surge protection with components that are powerful and respond quickly.		
Type designation	DT-LAN-CAT.6+	
Order number	2881007	

More information
with web code **#0291**

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Antonio Gordillo November 2020 IMA Mexico

Thank you

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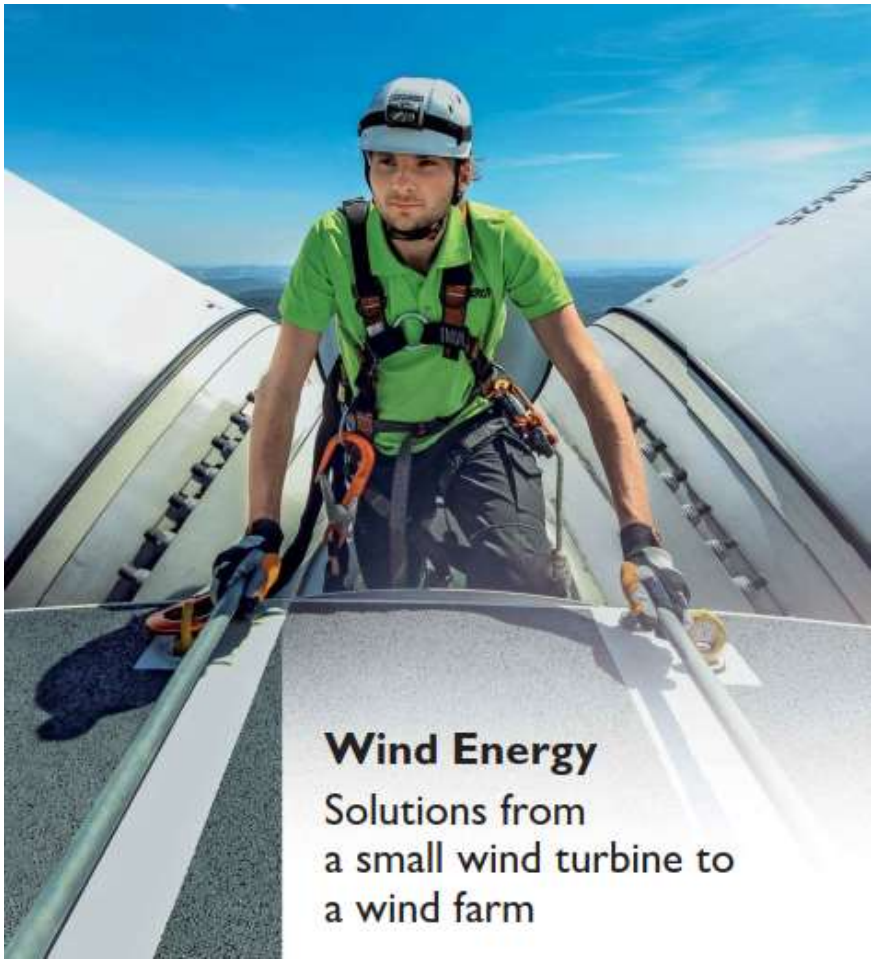

PHOENIX CONTACT
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Wind Solutions

Wind turbine

From the base of the tower to the rotor blade, the most stringent requirements are placed on the electronic and automation components used in a wind turbine generator (WTG).

Phoenix Contact offers consistent solutions for the reliable automation of all turbines, whether in the tropics or in the polar regions.

Wind farms

The systems that control and monitor a wind farm must perform to a high level. For automation this means: high data volumes, redundant system configuration, secure network technology and software, as well as detailed monitoring.

Offshore wind farm

Offshore WTGs do not just have to be equipped to deal with variations in temperature, their electrical equipment must also be resistant to salt spray. Unplanned maintenance must also be avoided at all costs.

Small wind turbine

When it comes to the automation of small wind turbines (SWTs), Phoenix Contact offers cost-effective comprehensive solutions that allow you to equip your application quickly and reliably.

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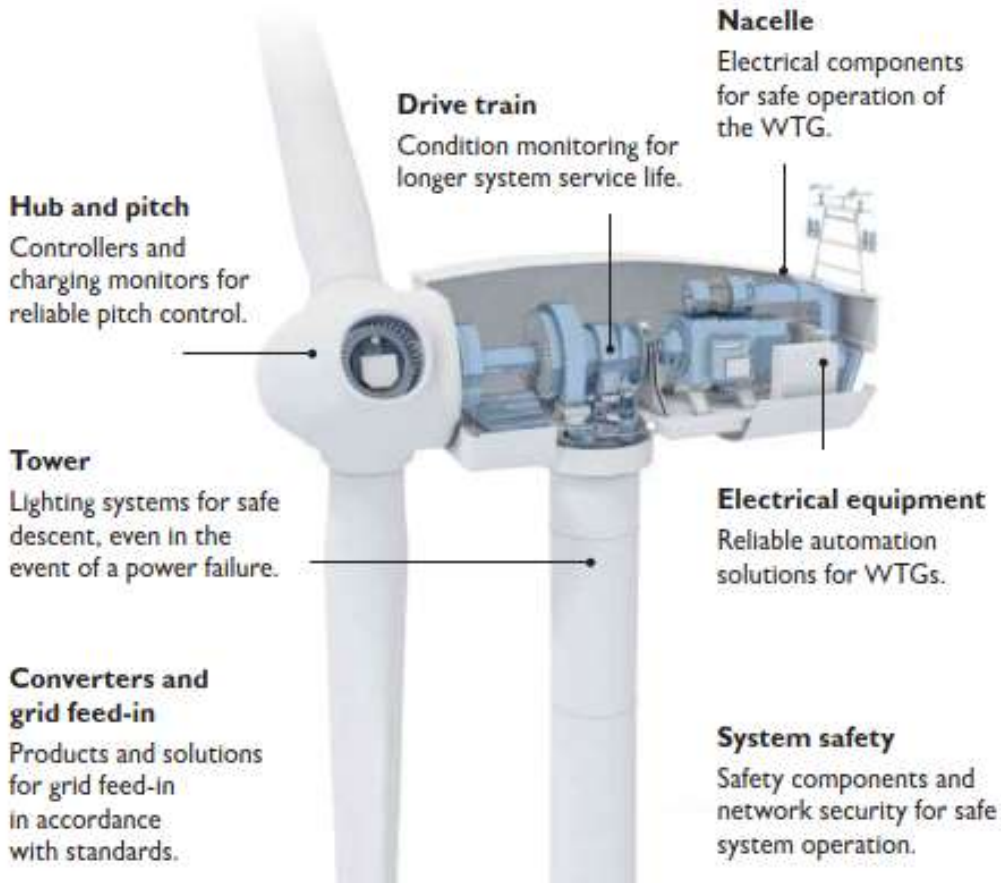
Wind Turbines

Overview



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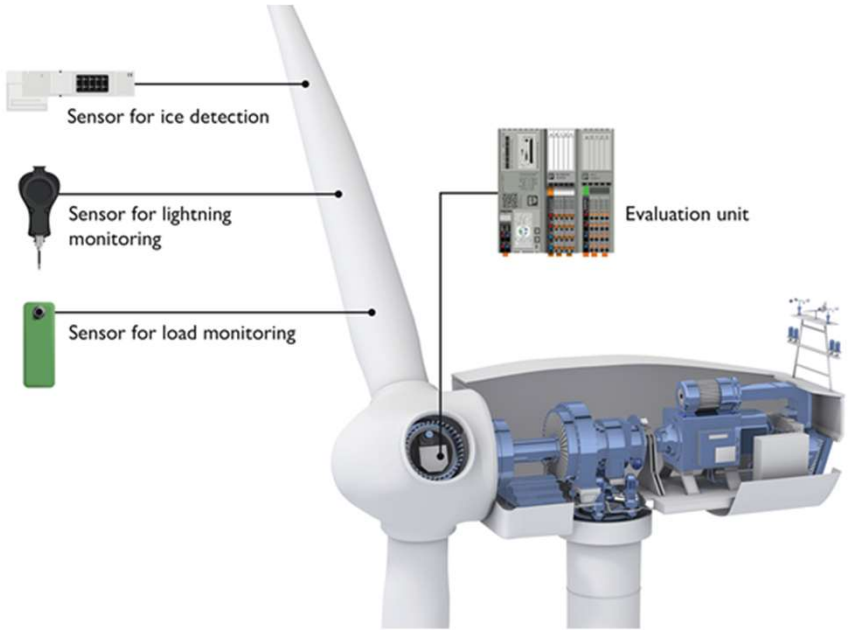
Product applications solutions

Wind Solutions

- Electrical Equipment
- Tower Lighting
- Rotor Blade Tension Monitoring
- Lightning Monitoring System
- Hub and pitch nacelle
- Safety
- ICE detection
- Grid Monitoring Protection Controller
- Converts and grid feed in



Wind Energy

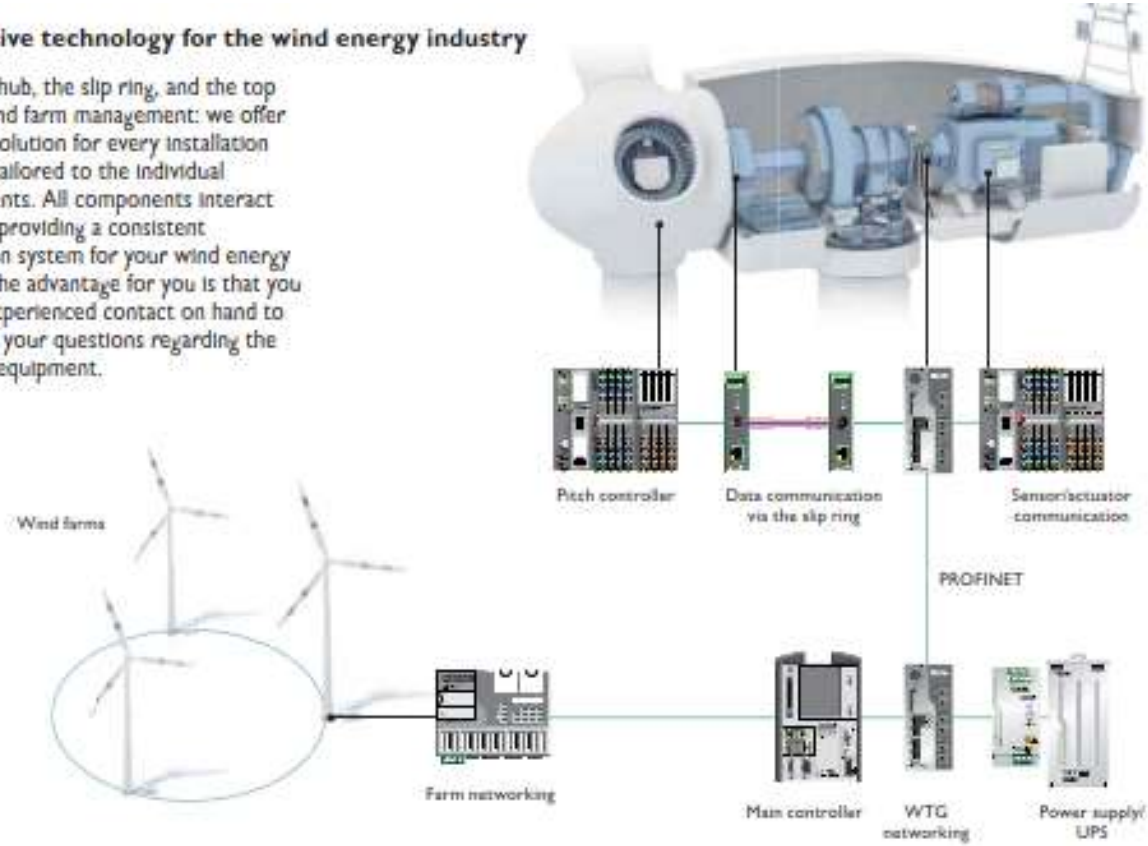
PHOENIX CONTACT
INSPIRING INNOVATIONS

Wind Solutions

Electrical Equipment

Impressive technology for the wind energy industry

From the hub, the slip ring, and the top box to wind farm management: we offer the ideal solution for every installation location, tailored to the individual requirements. All components interact perfectly, providing a consistent automation system for your wind energy project. The advantage for you is that you have an experienced contact on hand to answer all your questions regarding the electrical equipment.



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Wind Solutions

Tower Lighting

QDP

PLD T

SAI

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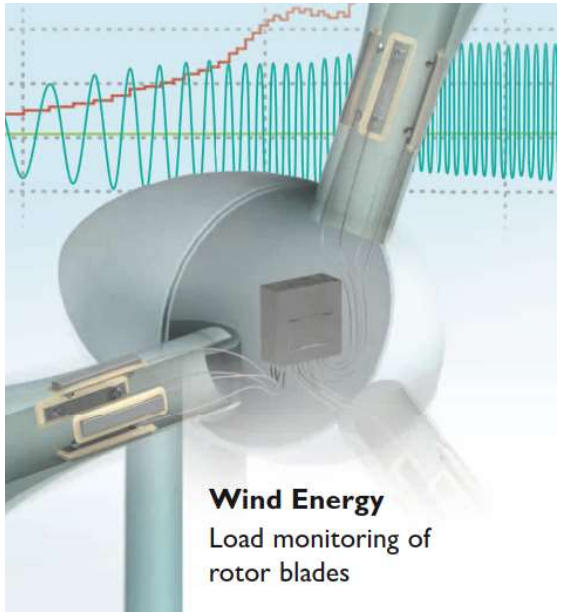
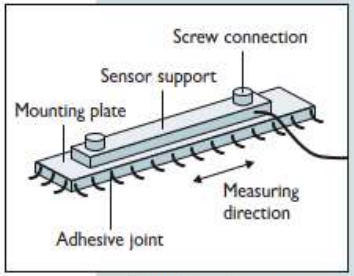
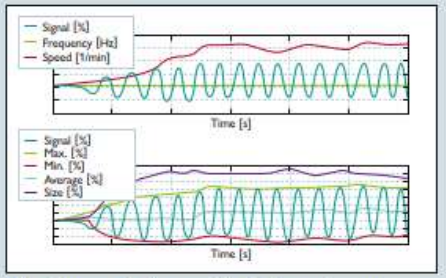
Wind Solution

Rotor Blade Tension Monitoring





Vibration-resistant sensors measure the expansion



The data analysis provides information about the blade condition

The rotor blades are subject to large dynamic forces which can lead to structural damages over the service life of the blades. Damages can be recognized early by continuously monitoring loads and vibrations. These data allow a perfect load-based regulation of the wind power plant, thereby reducing the stress on the blades to a minimum.

Your advantages at a glance:

- Proactive rotor blade monitoring
- Early detection of damages
- Optimized load control
- Reliable operation under harsh ambient conditions
- Open system for optimum integration
- Remote service capability, easy integration in remote service infrastructures
- Recording of load spectrum
- 4 digital outputs, e.g. as alarm output for threshold violations
- Providing all measured data for analysis purposes

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Wind Solution

Blade Intelligent System

Blade Intelligence System

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Wind Solution

LMS Lightning Monitoring System

The Lightning Monitoring System LM-S from Phoenix Contact captures lightning strikes and analyzes the peak current, specific energy and charge of lightning surge currents. It consists of sensors for the down conductors of a lightning protection system and the analyzer. The calculated data are easily accessible via the integrated web interface at any time from any place. This data provides lightning strike information of the facility and enable preventive maintenance. Based on data from the LM-S system, measures can be taken quickly to avoid consequential damage and downtime. If the effect is classified as noncritical, unnecessary maintenance or service work can be avoided. In structures that are not significantly affected, but have lightning-related sites, LM-S can be used for lightning research.

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Application Lightning Monitoring System 2012

LMS around the world

Phoenix Contact wins HERMES AWARD 2012 with LM-S

This award is an international award for outstanding innovative development performance. The award ceremony took place on 22 April 2012 as part of the opening celebration of Hannover Messe.

HERMES AWARD 2012

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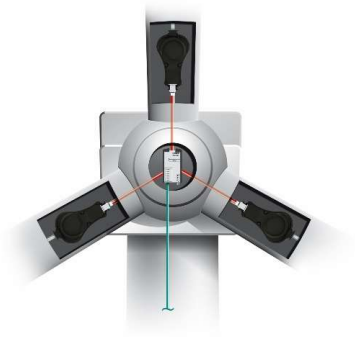
Wind Solution

LMS



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Wind Solution

LMS

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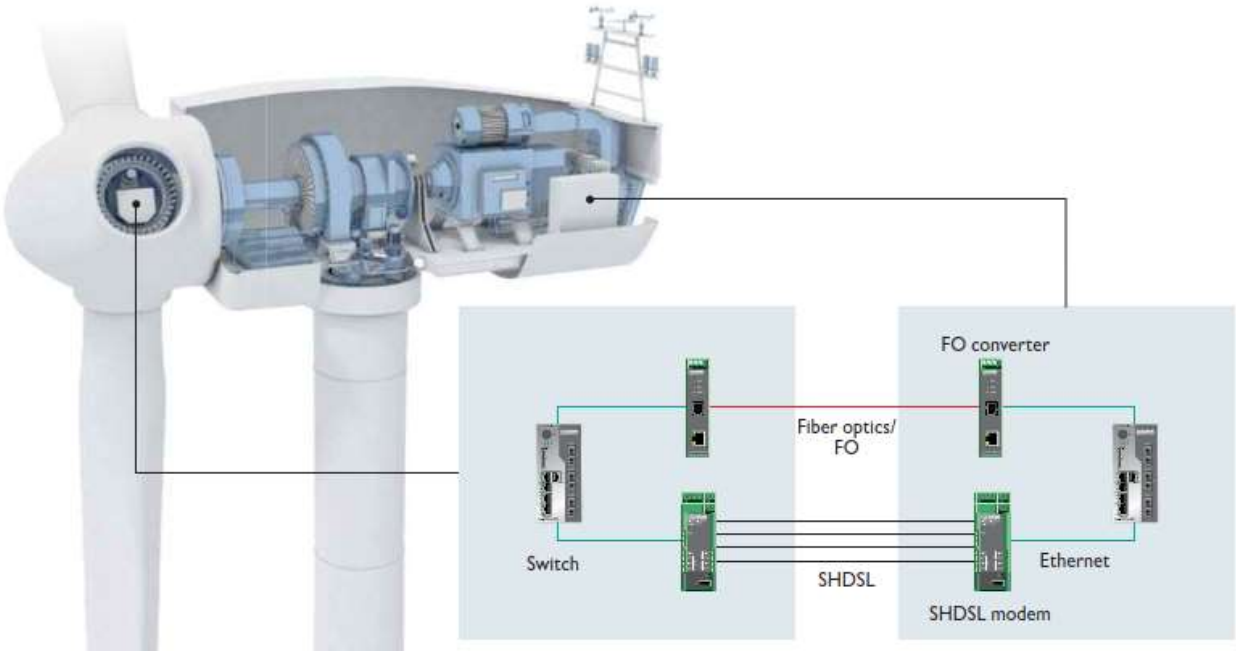
Wind Solutions

Hub and pitch

High-availability technology for pitch control

Ensure maximum availability for controlling the pitch servomotors by using uninterruptible power supplies from Phoenix Contact. We have worked together with our partners in the wind industry to develop charge controllers for accumulators or capacitors which operate reliably even under the harsh conditions in the hub. This ensures that the rotor blades can operate in emergency mode even in the event of fluctuations or interruptions in the power supply.



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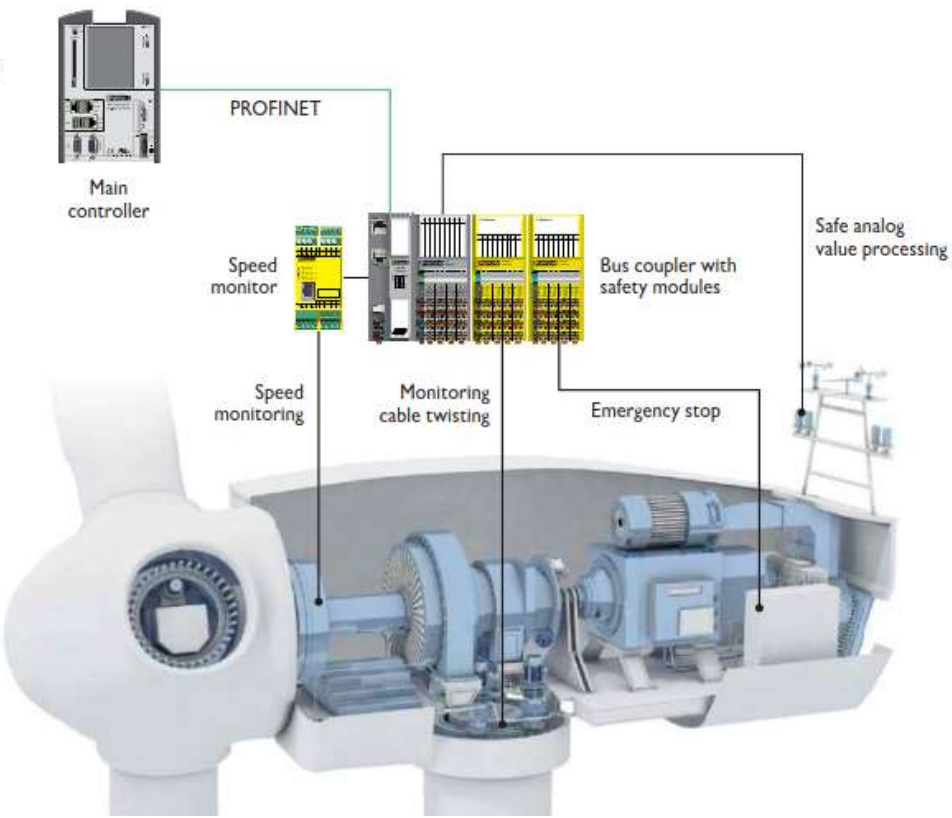
Wind Solution

Safety

Safe monitoring of the WTG

Safe monitoring of a wide range of signals is a challenge when controlling WTGs. Thanks to the comprehensive portfolio of safety products from Phoenix Contact, you can also implement the high requirements set by machinery directives for wind energy.



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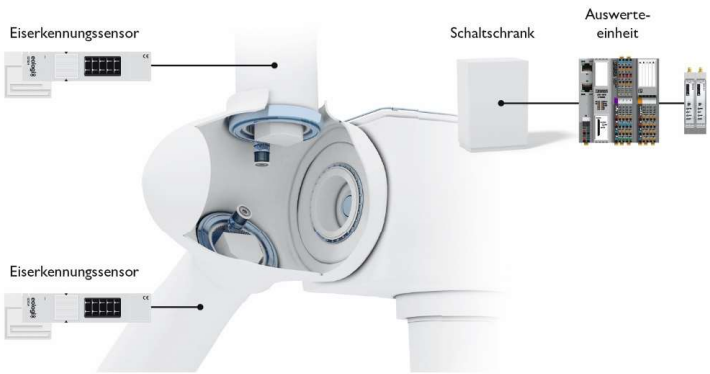
Wind Solution

ICE Detection



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Grid monitoring protection controller

Intelligent network and system protection for low-voltage networks

To ensure the stability of networks, the low-voltage directive VDE-AR-N 4105 specifies certain protection devices for systems for power generation. To meet the requirements, Phoenix Contact offers a type-approved network and system protection for wind energy whose conformity has been confirmed by an independent testing institute.

The network protection device ensures that the power generation plant is electrically isolated within 200 milliseconds as soon as voltage and frequency of the supply network exit the tolerance range.

Order No.	Type	Description
2403153	WIL-SC-GMPC-SET1	Network protection device, 1 energy measurement terminal
2403154	WIL-SC-GMPC-SET2	Network protection device, 2 energy measurement terminals

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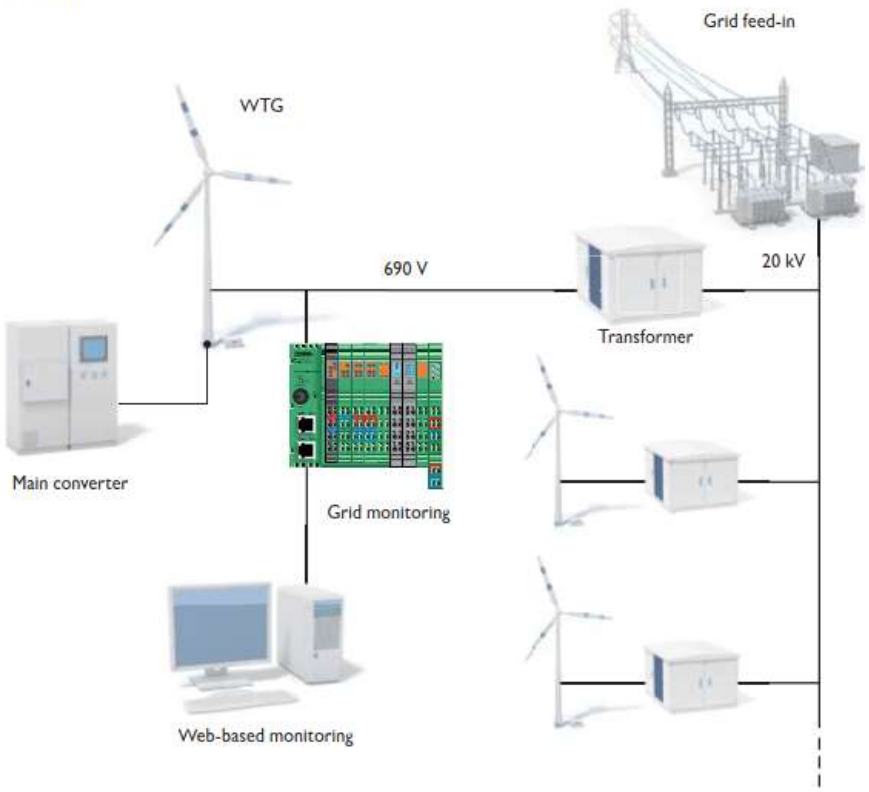
Wind Solution

Converts and grid feed in

Standard-compliant energy feed-in at all times

Modern WTGs also have the task of compensating for mains fluctuations and therefore increasing the stability of the network. They must meet the network connection requirements that are based on VDE-AR-N 4105 in Germany, for example. Also, they must integrate mains and plant protection, which acquires the condition values of the network and implements emergency shutdown in accordance with defined procedures, if necessary.

In line with these requirements, the operation of the WTG must be consistently ensured and the main network must be continuously monitored at the same time. Solutions for feed-in management from Phoenix Contact can be used to continuously monitor the power supply network, enabling the plant control system to respond to events in the network.



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Wind

Some solutions

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Wind

Solutions

Wind energy: solutions for rotor blade monitoring

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Webinar IMA 2020

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