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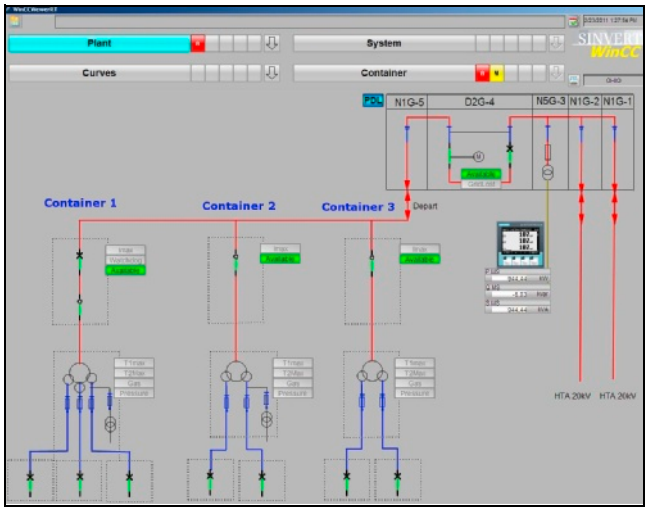
PV plant monitoring

For an instant, up-to-date overview and rapid intervention

PV plant monitoring with WinCC



Visualization and operation of photovoltaic plants with WinCC

WinCC (Windows Control Center) is a visualization system which runs on Microsoft Windows. It is used to monitor and control photovoltaic plants in which SINVERT inverters are installed.

WinCC provides all the functions required to visualize and operate PV plants, from the PV generator itself to the inverters and grid connection. It can also acquire data (e.g. energy yields) and store it on a long term basis, acquire, store and visualize alarms and messages, and provide data interfaces to external systems.

WinCC can run on a Microsoft Windows PC that is connected to the Industrial Ethernet network of the PV plant. Remote access to the WinCC visualization system is also possible over the Internet if the WinCC WebNavigator software has been installed (see graphic on page 16).

SINVERT WinCC enables consistently scalable plant configurations – from small PV power plants up to the GW range.

In addition, our visualization system can be configured easily and efficiently. The use of a standardized PV library allows customer-specific adaptations to be carried out. WinCC is configured individually according to customer requirements and specific features of the plant. For more information, please contact your regional sales partner.
www.siemens.com/sinvert/partner

The key features of WinCC are:

- A clearly designed user interface provides an instant overview of all key data of the managed plants, subplants and inverters, e.g. states, energy production, and income
- Graphical representation of the monitored data (see graphic on page 17)
- Graphics with configurable content for quick visual access to customized displays of received and/or calculated data, e.g. sorted according to day, month, year.
- Alarms and messages for quick and simple troubleshooting and for ensuring that remedial measures can be quickly taken to minimize loss of earnings
- Remote monitoring over the Internet with the WinCC/WebNavigator option
- Acquisition, long-term storage and display of current and historical data
- Export of archived data to Excel using the DataMonitor option
- Plant monitoring (e.g. detection and display of faults in the photovoltaic generator through section-by-section measurement of the whole plant)
- Safeguarding of yield and optimum protection by monitoring the insulation value
- Messaging services using email and text messaging with the WinCC/AlarmControlCenter option
- Fault messages can be specifically configured for customized operations management
- Establishment of as many as 128 user groups, each with up to 128 individual users, and assignment of different authorization levels to the users and/or user groups are possible
- Representation of monitored plants on a map

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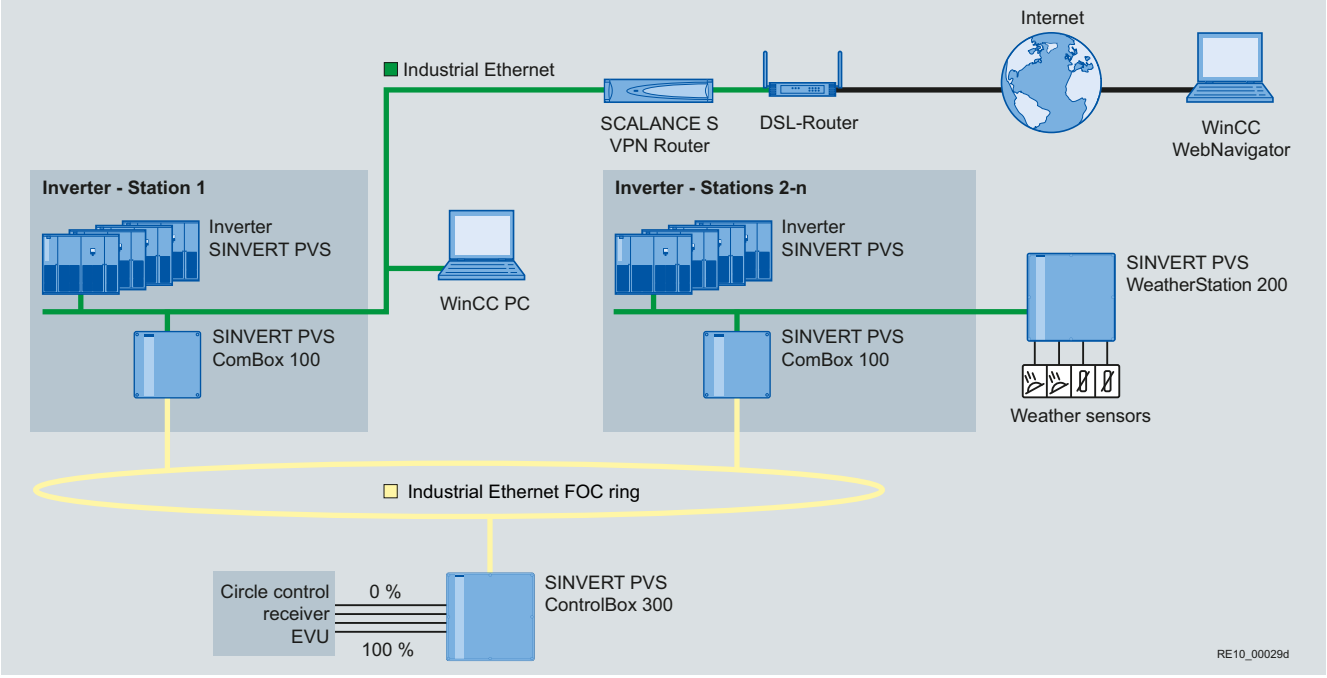
Establishing communication with PVS and system components

Communication via Industrial Ethernet and plant monitoring with WinCC



Integration of SINVERT PVS inverters into a photovoltaic plant with communication via an Ethernet network, solar PV plant control by means of the SINVERT PVS ControlBox 300, and monitoring with WinCC

The inverter stations have an Ethernet interface. If the inverter station is linked to an Ethernet network, this interface permits the exchange of data between the inverter station(s) and the WinCC visualization system on a Microsoft Windows PC. The data server on the ControlBox 300 collects the data from all the inverters.

Remote access to the WinCC visualization system is also possible over the Internet if the WinCC WebNavigator software has been installed.

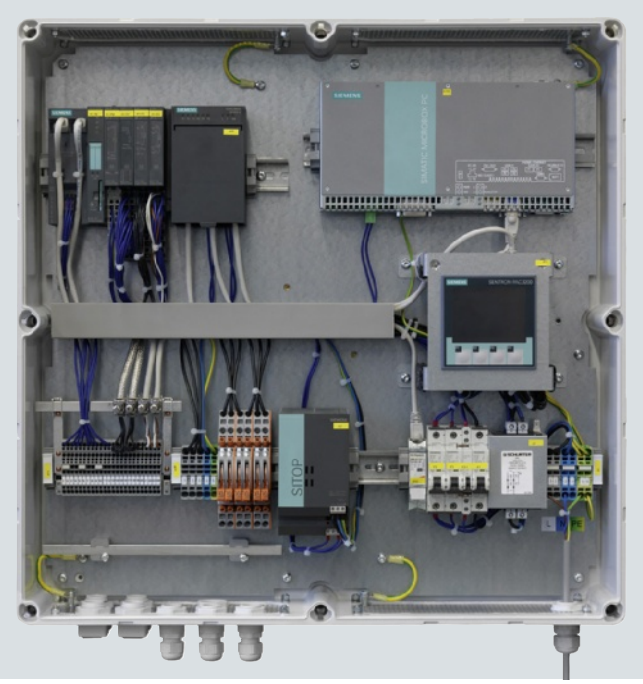
SINVERT PVS ComBox 100

The SINVERT PVS ComBox 100 communications box interconnects the inverter stations (in linear or ring topologies) with copper or fiber-optic LAN cabling and also connects network-capable components in the inverter stations, e.g. SINVERT PVS inverters.

The ComBox 100 has the following connection options:
- 4 x RJ45 ports
- 2 x fiber-optic ports, for cable lengths up to 5 km

SINVERT PVS ControlBox 300

The purpose of the SINVERT PVS ControlBox 300 is to regulate the active and reactive power of a photovoltaic plant containing SINVERT PVS inverters and to ensure compliance with legal requirements (according to the current amendment of the Renewable Energy Act (EEG), in force since January 2009).



SINVERT PVS ControlBox 300

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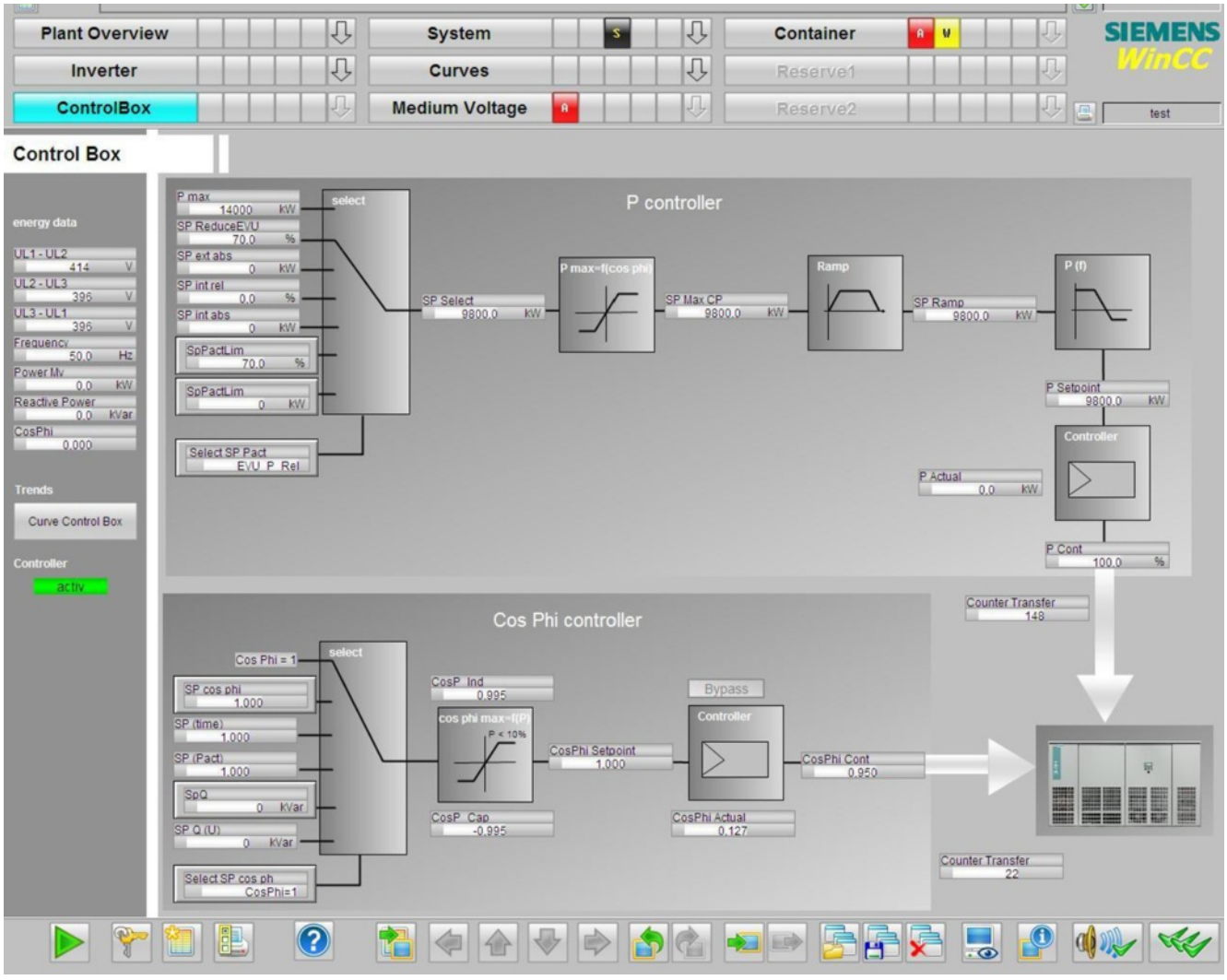

Regulation of the PV plant according to BDEW Guideline and the current amendment of the Renewable Energy Act (EEG) by means of SINVERT PVS ControlBox 300 displayed with WinCC

The "Generating Plants in the Medium-Voltage Grid" BDEW guideline stipulates this requirement for all systems feeding in at the medium-voltage level. Its primary benefit is that it enables grid operators to limit the output of the plant by remote means in accordance with § 6 of the Renewable Energy Act 2009.

The ControlBox 300 offers a wide range of open-loop and closed-loop control functions, e.g.:

- Specification of a fixed active power for all individual SINVERT PVS inverters in the PV plant, e.g. setpoint value = 2 MW (active power fixed value)
- Specification of a fixed reactive power for all individual SINVERT PVS inverters in the PV plant, e.g. setpoint value = 100 kvar inductive (reactive power fixed value)
- Specification of a fixed power factor cos φ for all individual SINVERT PVS inverters in the PV plant, e.g. setpoint value = -0.95
- Regulation of the active power for the individual SINVERT PVS inverters in the PV plant as a function of the active power actually measured at the grid infeed point, to 0%, 30%, 60%, and 100% of the rated active power of the PV plant. (Active power reduction in accordance with § 6 of the Renewable Energy Act
- Regulation according to Q(U) characteristic
- Regulation according to Q(t) characteristic
- Regulation according to P(f) characteristic
- Ramps for system ramp-up and ramp-down, i.e. continuously approaching the setpoint

The SINVERT PVS ControlBox 300 offers the following connection options:

- SIMATIC components with digital inputs
- SENTRON PAC3200 Power Monitoring Device for measuring actual values at the grid feed-in point
- 4 x RJ45 ports
- 2 x fiber-optic ports, for cable lengths up to 5 km

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Order No.: E86060-T1818-A101-A2-7600
MP.R3.XT.0000.00.2.07 / Dispo 46371
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Printed in Germany
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