



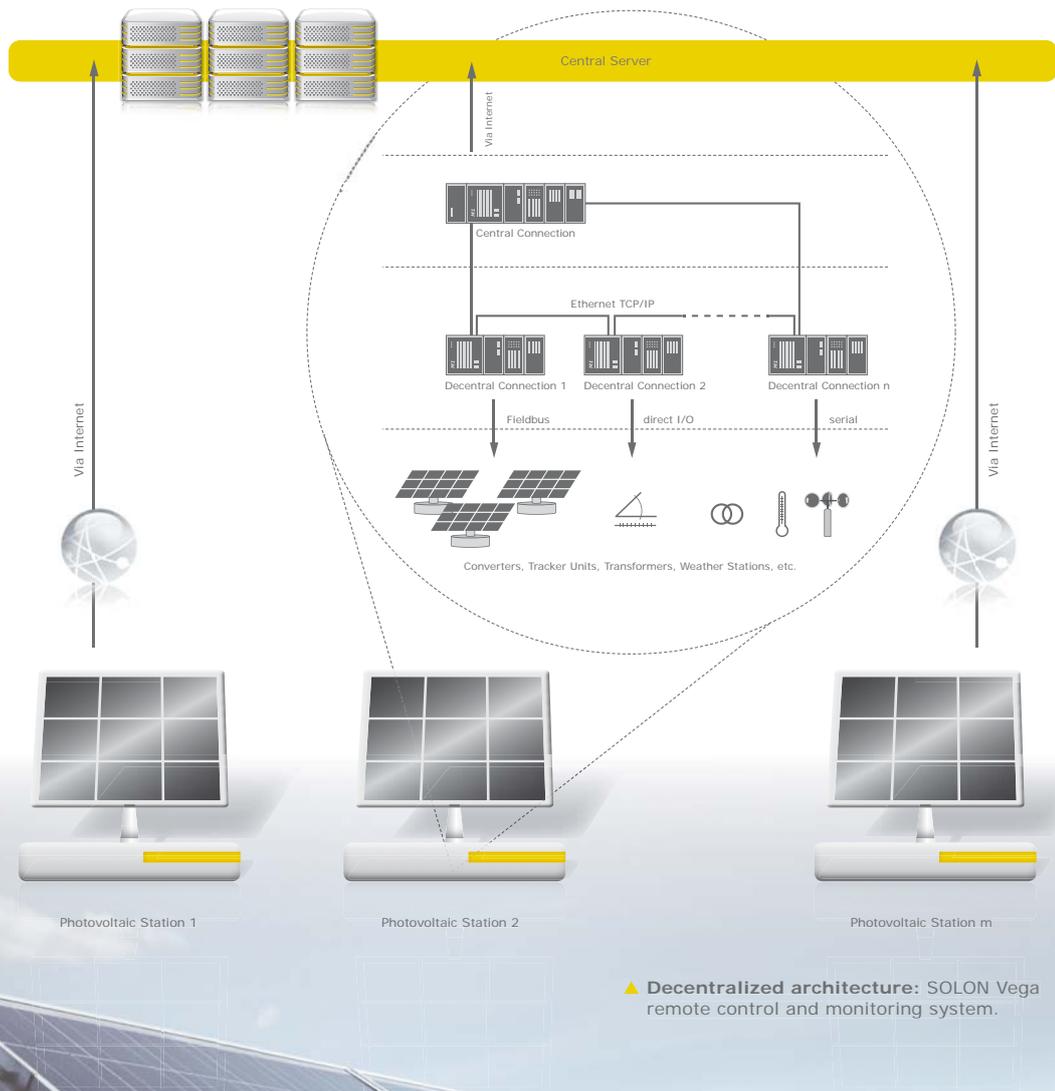
The yields in view

Seamless real-time communication from the central server to the substation



bachmann.





SOLON SE, headquartered in Berlin (Germany), is one of the leading manufacturers in Europe of solar modules and solar system technology, and is a specialist in the construction of turnkey photovoltaic power stations. The plant control implemented with the Bachmann M1 automation system enables the operator to control his power station reliably and thus optimize yields for the long term.

SOLON designs and constructs large-scale power stations. They have an impressive system: Photovoltaic power stations can be built to any scale using a modular principle based on 1 MWp units in which all power station components such as photovoltaic modules, inverters and electrical layout are perfectly matched up. In this way the effects of scale can even be implemented in the erection of the power station, whilst shortening the time required for planning, construction and commissioning at the same time. Together with well thought out operation and correct plant maintenance, this produces a solar investment with maximum yields.

Guaranteed yields thanks to extensive monitoring

The company monitors the photovoltaic power stations worldwide for its customers. The SOLON Vega remote control and monitoring system also allows extensive diagnostics and remote maintenance of the plant right through to software updates at the lowest control level.

The SOLON Vega system supplies important plant data for the operators and investors of photovoltaic power stations. This includes voltage, generated power, yields, wind direction and speed, temperature, air humidity, module temperature and the alignment of the modules in the case of tracked systems. The operating states are diagnosed, reported and stored. This enables interventions to be made at the appropriate speed and also enables the long term evaluation of a plant. »In this way we can guarantee the optimum yield of the power station,« Stefan Berg, head of SCADA development at SOLON describes the key benefits.

Demanding requirements for the automation system

Remote solar park locations, with temperature differences of sometimes over 100 degrees between day and night temperatures require the use of extremely robust and condensation resistant components that offer a high level of availability. That's why SOLON relies on the coldclimate modules of the Bachmann M1 system for its SOLON Vega remote monitoring system, thus ensuring reliable operation with temperature peaks between -40°C and $+70^{\circ}\text{C}$ even with transient condensation.

Seamless communication

»We particularly appreciate the openness of the M1 system,« Berg states one of the key reasons for selecting the automation system. »The communication options via Ethernet and the convenient Java programming language enable fully seamless data consistency from the lowest level, the tracker, right through to SOLON's central server,« as Stefan Berg explained.



▲ Electronically controlled tracking units of solar modules reduce the shadowing of modules at dawn and dusk, thus improving the overall output of the power station.

Distributed intelligence

The power station modules are monitored and controlled by remote M1 systems. So-called <decentral connection> stations also integrate the different devices of the power station, such as inverters, weather stations, tracker units or transformers. All alarms are stored and evaluated in the remote units. Depending on requirements, the stations are fitted with ME or MX processors of the M1 automation system, DI216/4, AIO288 I/O modules as well as RS204 serial 4-port interface cards.

Central monitoring

All relevant information about the substations is then transferred to the power station controller, the <central connection> (CC), which is based on an MPC processor. The stations are connected via Ethernet. On this central unit up to 100 independent tasks are run simultaneously: As well as control tasks, these read the current park configuration, store the data of all modules and broadcast the relevant information to the entire power station (park). These tasks are implemented in different programming languages according to the requirements at hand. »The data from the central power station controller is sent securely via the Internet using an SSL-protected transmission to the central server at SOLON,« explains Stefan Berg. From here, the specialists at SOLON have worldwide access to all photovoltaic power stations and thus support the operators in monitoring and maintenance.

Future-proof operational control

»To ensure the quality of operational control, it is important that the remote control and monitoring system not only meets the requirements of current regulations and laws but is also capable of meeting future legal requirements quickly,« Stefan Berg describes the considerations at SOLON. The implementation of the MMS server to IEC61850 and IEC61400-25 on the M1 system is a significant unique selling point of the SOLON systems. »This ensures problem-free and future-proof integration in the higher-level system of the operator or energy supplier,« Stefan Berg explains.

Sustainable quality promise

Investors estimate the value of a photovoltaic power station in terms of optimum yields. To ensure this over the entire lifetime (normally planned at 20 to 25 years), the ideal operation of the power station is of enormous importance. »With our system components and the innovative SOLON Vega SCADA system, we are able to give this quality promise to our customers,« Stefan Berg continues. He adds: »In this respect, Bachmann is the ideal partner for us in order to set groundbreaking standards in industrial photovoltaic power generation.«