

Customer Success Story



RENOVABLES SAMCA

*Highly reliable data communications networks help
to ensure problem-free operation at twin sites*



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Westermo solution maximises availability of Spanish solar power plants

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For a solar power plant to be profitable, it must produce at maximum capacity at all times. All parts of the plant must work as planned and there must be back-up systems should unexpected problems arise. Helping to meet this requirement, Westermo was commissioned to create a highly reliable data communications network, which included 290 industrial Ethernet switches, to maximise systems for availability at the La Florida and La Dehesa thermal solar power plants in south-western Spain.

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“Plant availability is essential. Any interruptions to the communications affect our ability to generate power,” explained Renovables SAMCA’s César Labarga, Electrical engineer and Project Manager for the solar field control system who was responsible for implementing the network at both plants.

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control systems, and this is what we were provided by Westermo.” La Florida and La Dehesa are both concentrating solar power (CSP) plants, owned and operated by Renovables SAMCA. The plants are identical in size, construction and function. Each has a capacity of 49.9 MWe and supplies electricity for more than 45,000 homes. A CSP plant uses large mirrors to capture the sun’s rays and focus the beam on a pipe containing oil. The heated oil is then pumped to the power plant, where the heat is converted into steam to drive a turbine. Each plant has more than 225,000 mirrors, grouped in 672 solar collectors which are continually adjusted via a control unit to follow the sun’s path to maximise efficiency. Should data communications between the collectors and the control room stop, the collectors are automatically set to safe mode, which means they stop transferring energy. It is therefore essential to have a reliable data network.

Labarga put it simply: “We needed a reliable system that could guarantee full availability, even in the event of a network link failure.”

In addition to the critical requirements of network reliability and availability, Renovables SAMCA also needed the network equipment to be

installed very quickly. A number of suppliers and solutions were considered, but as Labarga explained: “Of all the companies we talked to, Westermo’s proposition was the simplest and best solution. The network topology offered the greatest reliability and the support offered by Westermo gave us great confidence in the solution.”

Westermo’s network topology was designed around a central dual gigabit fibre optic ring using 25 Westermo RedFox managed Industrial Ethernet switches. Nine sub rings consisting of 120 Westermo Lynx switches were added to reach out to the different parts of the plant. Each sub ring was configured to create a primary and a back-up link to the central ring. All individual rings in the network run the Westermo FRNT ring protocol which enables 20 ms reconfiguration of the network in the event of link (cable or switch) failure. Because La Florida and La Dehesa are identical, the same solution could be installed at each plant.

Renovables SAMCA wanted a very quick and smooth installation process. To support this Westermo built, configured and tested the entire network in advance in its laboratory in Sweden. The two complete networks, including all of the 290 switches, were mounted on a huge ‘network wall’, enabling the network to be fully configured and tested prior to installation at the two plants.

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maintaining the control systems for the two solar fields, were invited to Westermo's facility in Sweden to receive a short training session on the equipment and to oversee the FAT (Factory Acceptance Test). This enabled them to evaluate the solution and make sure it met their requirements. The network was put through thousands of tests, with errors simulated to enable the network configuration to be fully proved. The solution was extremely reliable and the recovery from any errors was extremely fast.

"Having Westermo configure all devices beforehand was essential to this project. We needed a solution that was both easy to install and very reliable. The fully pre-configured Westermo solution was thoroughly tested and worked perfectly," said Labarga.

The Westermo devices were carefully labelled before they were sent to the customer to help simplify the installation process. Each pre-configured switch was placed exactly where it would be installed prior to the process starting. The installation process was extremely efficient, with all 290 switches installed and both networks up and running in just a number of hours.

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Ray Lock, from the Westermo Network Applications team, who was on site to assist in the installation process and also perform the SAT (Site Acceptance Test), said: "This was a very well thought-out solution, right from the choice of products and network design through to the network testing and implementation."

When performing maintenance at the power plants the normal procedure requires that parts of the communications network be shut down periodically. This continually tests the resilience of the network configuration, but since the equipment was successfully installed there have been no reported problems or serious incidents.

"Having installed the Westermo devices successfully, we are now very happy with how the network is performing. It is a really stable and reliable solution and the continued support from Westermo has ensured that we have had no problems," said Labarga.

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