

The Siemens logo is displayed in a bold, teal, sans-serif font. It is positioned within a white rectangular box that is part of a larger header section. The background of the entire page is a photograph of a utility pole with various electrical components, set against a clear blue sky with some green foliage visible in the lower right.

Reference

Industrial Communication

A Smart Grid vision comes to life

RUGGEDCOM WIN products enable CEPALCO to move toward a future of distribution automation

With a commitment to being responsive and dependable, Cagayan Electric Power and Light Company (CEPALCO) is the fourth largest electric service utility in the Philippines, serving a total customer base of more than 120,000 in Cagayan de Oro City, and the municipalities of Tagoloan, Villanueva and Jasaan in the province of Misamis Oriental.

To provide even better service to its customers, CEPALCO is planning for a future of distribution automation, with manual devices on the tops of poles being replaced by motorized and connected devices and service vehicles that will also be tied into the network. Specialized applications will be available, such as fault detection isolation and restoration, load balancing and power quality monitoring.

To facilitate these innovative features, CEPALCO has taken some major steps forward in recent years by using leading-edge technology, most notably a private fiber-optic communications infrastructure. The origins of this supervisory control and data acquisition (SCADA) network go back to 2009.

The challenge

Robust and secure broadband radio that is easy to install is needed to overcome difficult geography and climatic conditions.

Due to both urban and rural geographic factors, as well as difficult climatic conditions, CEPALCO realized there are limitations to its terrestrial network, especially in terms of last-mile connectivity with customers. There is a lot of widespread terrain to deal with that is not logistically suitable or economically feasible for fiber-optic cable. That includes rugged mountains and heavy vegetation in the rural regions of Mindanao, as well as dense urban environments with many large buildings in close proximity to one another.



RUGGEDCOM WIN delivers the benefits of carrier-grade 4G technology to critical infrastructure applications in harsh environments

[siemens.com/ruggedcom](https://www.siemens.com/ruggedcom)

There are also other obstacles in Mindanao, the second largest island in the Philippines. These include very hot temperatures, frequent and powerful storms and electromagnetic interference.

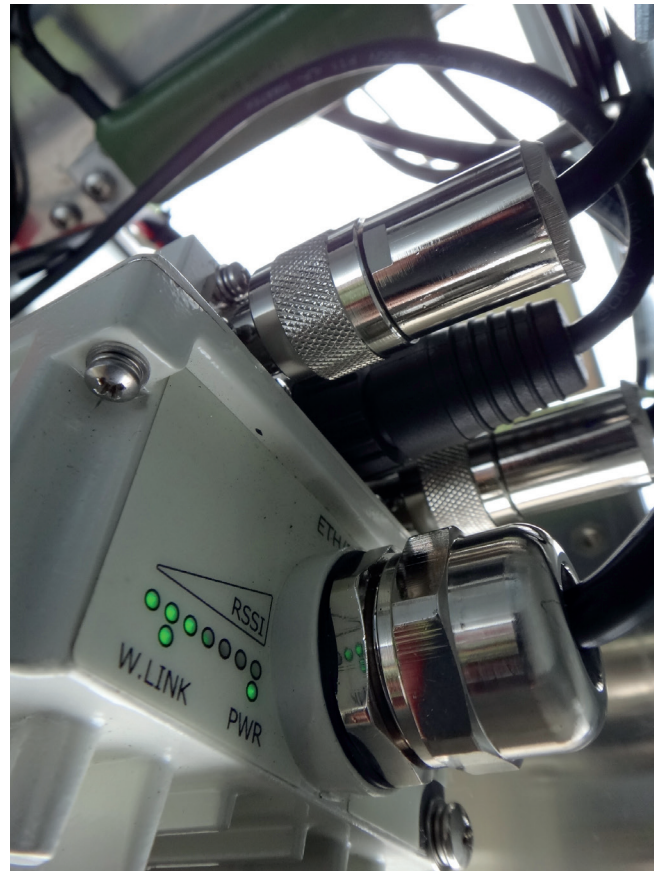
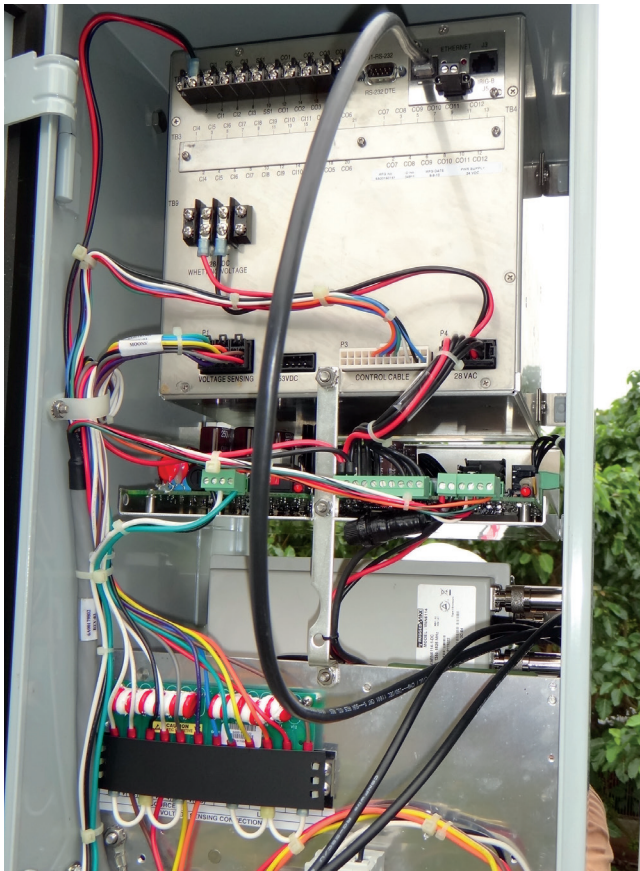
While wireless solutions are essential in establishing a fully functional network, not all wireless equipment is up to the task of overcoming these issues, which meant that it was critical to select the right vendor and the optimum products. A decision was made on how the utility would move forward in 2012.

The solution

Only RUGGEDCOM products from Siemens could deliver the quality and reliability required. Mr. Luisito Dagoc is Communications Services and Support Section Head at CEPALCO, responsible for the organization's SCADA network.

Knowing the importance of rugged durability given the physical challenges for the wireless networking equipment, he reflected on an experience in late 2011 with RUGGEDCOM switches. "We had very bad flooding and most of our facilities were underwater," he explains. "We dried all of our equipment, and nothing worked except for one switch, which was the only thing we had from RUGGEDCOM. We were so surprised that it still worked, and this certainly says a lot about the performance of RUGGEDCOM switches."

That was one of the main reasons why Mr. Dagoc and his colleagues were comfortable pursuing Siemens RUGGEDCOM WiMAX technology. They did some rigorous testing of the recommended 1.5 GHz Point-to-Multipoint Radio products with high-power and mobility features, carefully checking metrics such as Internet connectivity and streaming video quality.



RUGGEDCOM WIN5114 fits into a tight cabinet thanks to its compact, robust and flexible design

"We traveled by car to all the difficult places – places with no line of sight in mountainous areas, in the city around high buildings, where the signal is not very strong," he explains, noting they also tested the equipment while driving in the vehicle, which replicates what is needed for CEPALCO's fleet of service technicians who would be constantly on the road and need to be integrated into the network from their moving vehicles.

"I was convinced that when comparing it to other suppliers, Siemens WiMAX solution was the best. It was the perfect design."

So the choice was clear to go with the RUGGEDCOM WIN series of products – the first broadband wireless product portfolio designed for private networks, delivering the benefits of carrier-grade 4G technology to critical infrastructures in harsh environments. These are products with the latency and utility-grade quality of service that were essential.

In October of 2012, CEPALCO purchased RUGGEDCOM WIN broadband wireless base stations, wireless subscriber units, and various Ethernet switches. More equipment was purchased in the following two years, including routers.

The results

With its 4G private network, CEPALCO now has its own infrastructure, with full control over the network and no dependence on third-party providers. The network is reliable, completely secure and has dedicated channel availability during emergencies. In addition, all the communications are IP-based (WAN and MAN), so multiple applications can be run over one common architecture. Best of all, Mr. Dagoc adds, it all comes with outstanding after-sales support, which he believes is the hallmark of Siemens.

Key Products

Notable RUGGEDCOM products currently being used by CEPALCO include:

RUGGEDCOM WIN7015 – this high-power, broadband wireless base station meets CEPALCO's need for a long-range deployment in harsh environments. The WIN7015 is designed to deliver maximum coverage where regulations permit high-power operation.

RUGGEDCOM WIN5114 – a broadband wireless subscriber unit with external radio frequency connectors for use in fixed or mobile applications in harsh environments, with hardware that can be used in ambient temperatures of up to +75°C, plug-and-play installation and maintenance-free operation.

RUGGEDCOM RX1500 – a cost-efficient, utility-grade layer 2 and layer 3 switch and router. This device is ideal for power utilities, with its hot-swappable modular design that delivers absolute minimum Mean-Time-to-Repair, future proofing and multiple WAN, serial and Ethernet options that can be chosen at order time or can be installed after deployment.

RUGGEDCOM RX5000 – a high port density, utility-grade layer 2 and layer 3 switch and router. With its modular platform that can be replaced in the field, this device is ideal for utility backbone applications, and allows multiple WAN, serial and Ethernet options to be selected.

RUGGEDCOM RS900G – designed to operate reliably in harsh environments and to be installed at almost any location. Users of this utility-grade, fully managed Ethernet switch benefit from its dual-fiber-optic gigabit Ethernet ports and eight fast Ethernet copper ports.

RUGGEDCOM RS400 – this utility-grade serial interface device features an integrated four-port serial server, four-port managed Ethernet switch and optional V90 modem. Able to interconnect multiple types of intelligent electronic devices (IEDs) that have different communication protocols, it reduces overall system costs and minimizes the capital expenditure for new equipment.

RUGGEDCOM i800 family – these compact, fully managed Ethernet switches are designed to operate reliably in harsh environments, with an emphasis on flexibility. This means that users can choose from managed or unmanaged, regular or extended temperature, fiber optic or copper interfaces and fast or Gigabit Ethernet.

RUGGEDCOM RMC30 – a utility grade, two-port serial-to-Ethernet server specifically designed to operate in electrically harsh and climatically demanding environments. This device offers both an RS232 port and an RS485/422 port – that can be used simultaneously – via a solid screw-type terminal block.

"During deployment we were very happy to have Siemens personnel support us with the installation. They taught us how to activate and operate the equipment and we certainly appreciated the after-sales support we received and continue to receive," he stated, noting that with other brands they tested, the troubleshooting was nowhere near as responsive or effective as what Siemens provided.

The future

Mr. Dagoc says work is now underway to plan CEPALCO's network requirements for the next decade, including implementation of a smart grid with enhanced customer service, fewer outages and reduced energy consumption. "We are supporting a full Smart Grid program," he explains, referring to a long-term vision of fewer customer outages, faster repairs, reduced energy consumption and new purchasing paradigms for power consumers. "We expect to achieve this using some RUGGEDCOM products. Presently, we are planning the automation of the meters in our facilities – and studying what is involved to implement this.

At some time in the future, we're going to have to install equipment in individual houses."



RUGGEDCOM WIN wireless subscriber units are specifically designed for point-to-multipoint broadband wireless access applications

Case study at-a-glance

Customer: established in 1923, CEPALCO is the fourth largest electric utility in the Philippines, serving more than 120,000 customers

Challenge: sophisticated fiber-optic communications infrastructure is required for the utility's distribution automation initiative, but difficult terrain and climatic conditions necessitate the use of a robust wireless broadband solution for the network.

Solution: RUGGEDCOM WIN series of products, including a RUGGEDCOM WIN7015 base station, RUGGEDCOM WIN5114 fixed subscriber unit, RUGGEDCOM WIN5114 mobile subscriber unit and RUGGEDCOM wireline products, including RX5000, RX1500, RS900G, RS400, i800 family, and RMC30.

Results: full control over a private 4G network that is reliable, available, secure and can run multiple applications on a single architecture

Future: CEPALCO's distribution automation enabled by RUGGEDCOM products means a future of fewer outages with faster repairs and reduced total energy consumption

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FAV-570-2015-PD-PA-V01

Case Study
Produced in Canada

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