Aclara

The TWACS® and Metrum® Cellular Advantage
Two Technologies, One Solution

Utilities face a daunting task when choosing a communications technology for advanced-metering infrastructure (AMI) and distribution automation. Co-ops, municipals and investor-owned utilities each have their own challenges with separate goals. And for each territory, there are different infrastructures, topographies, regulations, population densities, and more. These nuances lead to complex needs that require tailored solutions.

MAXIMIZE ADVANCED METERING INFRASTRUCTURE FOR ELECTRIC UTILITIES

As the utility industry's leader in the design, development, and deployment of utility data communication systems, Aclara® combines a customer-centric approach with the expertise gained from working with approximately 550 AMI customers to overcome both individual and shared challenges.

FEATURES AND BENEFITS

Aclara's proven reliability and innovation shows up in how the company enhances communications, increases customer satisfaction and creates a vision tailored for each utility. The Aclara portfolio of AMI systems equips and empowers utilities to build a solution—either with a single system or by combining them—that fits their needs for both today and the future:

- Enhanced Two-Way Automatic Communications System (eTWAC®) system: The industry's most proven power-line communications (PLC) technology and the most widely used AMI in the world.
- Metrum Cellular® solution: Private network solution that operates on commercial cellular infrastacture to offer utilities the highest performance, security, reliability, and control for their AMI system.

Systems in the Aclara AMI portfolio give utilities greater visibility into their data so they can cost effectively and reliably manage business processes, operations and serve customers. Built around its customers, Aclara's solutions provide economic flexibility with operational capability—all under the name of the most trusted partner in the electric utility space. Utilities can mix and match the complementing technologies to create the solution that's right for them.

INITIALLY DESIGNED AS A RAPID-RESPONSE LOAD-CONTROL SYSTEM, TWACS TECHNOLOGY MAKES EVERY BIT COUNT.

The system employs existing power-line infrastructure to communicate between the substation and meter endpoint—delivering industry-leading read performance of more than 99.7 percent. This bit-wise architecture enables the TWACS solution to demonstrate up to twice the level of efficiency versus competing technologies. In some cases, a single bit can provide intelligence from the network because the tight messaging system pulls far more information from the field faster than other popular messaging systems.

The technology's high efficiency sets the foundation for utilities to effectively manage customer data, reduce costs, enable innovation at their own speed—all while providing superior customer service. The TWACS solution sets the industry standard as the most successful protocol for utility network communications ever developed, due to its versatility, security, coverage, reliability and cost effectiveness.

VERSATILE

In 2013, the Electric Power Research Institute (EPRI) released a pair of technical papers to show how the world's utility companies use AMI. The Institute compiled 86 different applications for AMI solutions (ranging from simple meter reading to demand response to appliance health monitoring and more). Of this number, the TWACS system now supports all key applications defined by EPRI.

Beyond the TWACS technology's many uses, utilities can also use it in the widest variety of meters of any AMI vendor. The system distinguishes itself as vendor neutral—meaning modules will fit inside or can be attached to almost any vendor's meters or distribution automation equipment.

SECURE

The TWACS system is a physically secure communications technology that employs hard-to-hack messaging techniques. Any hacking attempt requires a physical connection to a power line—plus specialized equipment—to either read or spoof transmissions. Tight TWACS messaging makes the process extremely difficult as messages move with no breaks. And with all of its equipment housed in a hard-to-access substation, TWACS technology is often physically more secure than competing networks that distribute critical technology over wide geographic areas. The installed intelligence within the substation also enables TWACS technology to share communications to the substation from the operations center, avoiding issues around licensing frequencies, changing commercial network protocols, and needing to site and deploy equipment in the field.

COVERAGE

Working on existing data-transmission infrastructures, Aclara's TWACS solution can deliver 100 percent coverage of a service territory. No other technology matches its ability to provide long-range communications (more than 200 miles in one rural area). The TWACS solution covers territories that other technologies simply cannot reach in a secure, costeffective fashion.

RELIABLE

Aclara's TWACS solution isn't impacted by line of sight, building materials, distance between customers or other topology issues. Weather and trees pose no problems. The system seamlessly integrates into existing substations without adding additional points of failure such as towers, repeaters or line conditioners. And thanks to TWACS technology,

COST EFFECTIVE

The high efficiency of the TWACS system provides far more throughput than many other RF-related technologies.

"Messages on a mesh network can contain 20-times the overhead and addressing information of a PLC message—significantly increasing backhaul requirements."

And with no requirement for a new communications infrastructure overlay, using TWACS AMI means utilities don't need to build a communications group or hire technicians to operate the network.

Once the TWACS system is running, it can prove the saying "time is money" by saving utilities both. Electric utilities can:

- Create "working" groups of devices where outbound messages are heard by every device on a circuit path but only those in the addressed group respond. This means operators can preset groups of meters to retrieve a handful of meaningful readings instead of wading through thousands.

- See immediate topology information (including phasing and connectivity) and rapidly update operational technology systems and reduce the need to reenter the field.

- Confirm the position of switching equipment (including autonomous switches) to limit the need for sending inspectors.

COST EFFECTIVENESS

The Metrum Cellular solution relies on proven commercial cellular technology to free up resources and increase operational efficiencies. The system empowers electric utilities to:

- Generate low-latency responses from key pieces of distribution and substation automation equipment with its ability to be always on and connected.
- Eliminate the need for specialized communications engineers and network teams within the utility, reducing costs as using commercial cellular places the burden of network management outside the utility).
- Drive lower costs over the long term with growing LTE systems.
- Reduce manual-reading needs by allowing utilities to employ fill-in strategy that allows for easy expansion.
- Produce a full-fault record from a sectionalizer or relay faster than any other network, allowing utilities to find the root cause of an outage before a line truck even starts patrolling.

The combination of the TWACS and Metrum Cellular solutions provides utilities with a cost-effective and efficient solution to meet the requirements of a wide range of applications, including:

- **Line loss and CVR voltage management**
- **Demand response**
- **Billing and time-of-use pricing**
- **Prepay**
- **Revenue assurance**
- **Remote connect/disconnect**

What's more, Aclara's iiDEAS™ software solution adds to the effectiveness of Aclara's AMI solutions by managing operational and meter data in a common data repository that provides actionable information in a browser-based used interface.

With hundreds of customers using TWACS and Metrum Cellular technologies, Aclara's portfolio of AMI solutions deliver shared versatility, security, expansive coverage, reliability, and cost effectiveness around the world. The two technologies complement each other for utilities to create their own solutions, from the most rural of areas to the most urban of city landscapes.

Aclara is the only provider who can provide the two technologies under one brand with a single team to partner with utilities on planning, installation, and implementation. With a shared focus only on solutions, the Aclara AMI portfolio lets utility personnel concentrate on the deployment—not managing multiple vendors.

By combining the benefits of the TWACS and Metrum Cellular solutions, utilities can build a tailored solution for today and the future.