RUGGED TELEMETRY

WHITE PAPER

SCADA Connectivity Where Cellular Cannot Reach

How Mt. Olive Water Association brought remote tanks and pump stations in the Arkansas Ozarks online with satellite telemetry—without replacing the equipment already in service.



Rugged Telemetry CiQ.400 • CiQ.420 • Satellite Communications • AssetIQ

Summary

Mt. Olive Water Association delivers drinking water to roughly 6,200 people in eastern Washington County and neighboring Madison County, Arkansas—country where the Ozark Plateau breaks into the Boston Mountains. Some of its storage tanks and pump stations sit in wooded hollows and on ridgelines with **no cellular coverage at all.**

Rugged Telemetry installed **CiQ.400 tank controllers** and **CiQ.420 pump-station controllers** at those sites, connected them through **satellite communications**, and routed the data through its **AssetIQ** platform into the SCADA system Mt. Olive already operates. The remote sites are now part of the operating picture, and the pumps and instruments that were still doing their job stayed in place.

AT A GLANCE	
Utility	Mt. Olive Water Association, Elkins, Arkansas — member-owned nonprofit rural water association
Population served	About 6,200
Water supply	Treated surface water purchased from Madison County Water Facilities Board and the City of Fayetteville
Terrain	Boston Mountains of the Ozarks, with steep, forested valleys
Constraint	No cellular coverage at the remote tank and pump sites
Controllers	CiQ.400 (tank sites) and CiQ.420 (pump stations)
Communications	Satellite as the primary link
Data path	AssetIQ web and mobile access, with API integration into Mt. Olive's existing SCADA platform

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A Rural System in Mountain Country

Mt. Olive is a member-owned nonprofit organized under Arkansas's rural water association law (Act 114 of 1957) and headquartered in Elkins, just east of Fayetteville. It does not treat its own water. It buys treated water from Madison County Water Facilities Board and the City of Fayetteville—both supplied from Beaver Lake—and moves it through storage tanks, booster pump stations, and long runs of rural distribution line.

The geography is what makes that hard. The service area climbs from the Elkins area into the Boston Mountains, the highest and most rugged part of the Ozarks, where valleys run 500 to 1,550 feet deep. And the system keeps reaching farther out: the association's FY2024 audit describes a Pettigrew/Boston-area expansion in Madison County with a total estimated cost of about $11.7 million.

Every new tank and pump station is another asset operators need to see. In this terrain, many of them sit beyond the reach of any cell tower.



A Mt. Olive standpipe in the forested hills of northwest Arkansas.



Elevated storage in Mt. Olive's service area.

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The Problem: Dark Sites, Working Equipment

Mt. Olive faced two constraints at once.

There was no signal to improve. At the sites in question, the issue wasn't a weak signal or the wrong carrier—there was no cellular coverage. A standard cellular RTU had nothing to connect to, which left those sites operationally isolated from the rest of the system.

There was no reason to start over. Pumps and field instruments at these sites were still doing their job. Mt. Olive needed monitoring and communications built around that equipment, not a rip-and-replace project.

> *"Our system includes remote locations where cellular coverage is simply not available. We needed a communications approach that could connect those sites to our SCADA operations and give our team visibility without treating every location as an isolated site."*
>
> **— Ray Eaton, Manager, Mt. Olive Water Association**

WHAT THE SOLUTION HAD TO DO

- Communicate reliably from sites with no cellular coverage
- Wire into existing instruments and status signals at tanks and pump stations
- Deliver data into the SCADA platform operators already use
- Repeat easily as the system expands into more remote areas



Remote tank sites are part of the distribution system but can sit well beyond cellular coverage.

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The Solution: Three Layers

Rugged Telemetry split the job into three layers—controllers at the site, a satellite link, and a data platform that feeds the existing SCADA system. Each layer is matched to the site rather than forcing the site to fit the product.

LAYER 1

At the site: CiQ.400 and CiQ.420 controllers

Both controllers are touchscreen PLCs in weatherproof polycarbonate enclosures that accept the analog, digital, and relay signals a site already has. Control logic runs locally on the PLC, so the satellite link carries data and remote commands rather than the moment-to-moment control loop.



CiQ.400

TANK SITES

Monitors storage level and site conditions, and handles local alarming and control at elevated tanks.

- 7-inch touchscreen PLC
- 8 analog inputs, 10 digital inputs
- 8 relay outputs, 2 NPN outputs
- AC powered; 14 × 12 × 6 in. enclosure



CiQ.420

PUMP STATIONS AND PRVS

Runs pump and valve logic locally, with flow and suction/discharge pressure monitoring.

- 7-inch touchscreen PLC
- 8 analog inputs, 2 analog outputs
- 8 digital inputs, 8 digital outputs
- Lead/lag rotation, multiple VFD modes, Do Not Operate windows

LAYER 2

The link: Satellite communications

Each controller communicates over a satellite network. At Mt. Olive, satellite is the **primary** path, not a backup. Because it doesn't depend on towers, a site can be connected wherever its antenna has a view of the sky—including locations the system hasn't reached yet. Where cellular is available, the same controllers can be ordered in a hybrid LTE/satellite configuration.

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LAYER 3

The data: AssetIQ and the existing SCADA system

Site data arrives in Rugged Telemetry's AssetIQ platform, which operators can use from a browser or mobile app for monitoring and control. AssetIQ also exposes the data through an API, which is how it reaches Mt. Olive's existing third-party SCADA platform. The remote sites appear alongside the rest of the system instead of on a separate screen.



From remote site to operator: CiQ controllers → satellite → AssetIQ → API → Mt. Olive's SCADA platform.

HOW DATA MOVES

1. **Sense.** Instruments at the tank or pump station produce signals—level, pressure, flow, run status, alarms.
2. **Control.** The CiQ.400 or CiQ.420 reads those signals, runs local logic, and queues the configured data points.
3. **Transmit.** Satellite communications carry the data from the site.
4. **Present.** AssetIQ makes the data available on web and mobile.
5. **Integrate.** The API passes the data to Mt. Olive's SCADA platform, where operators review conditions and decide whether a field response is needed.

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IN THE FIELD



A Rugged Telemetry controller installed alongside a pump station's Franklin Electric drive panels.



A technician at the controller inside a Mt. Olive pump station.

What Changed for Mt. Olive

- **Previously dark sites are visible.** Data from tanks and pump stations with no cellular coverage now reaches operators.
- **Equipment stayed in service.** Controllers were added alongside existing pumps and instruments.
- **One operating view.** Remote-site data flows into the SCADA platform Mt. Olive already uses, with AssetIQ web and mobile access as well.
- **A pattern for growth.** As the system extends deeper into Madison County, new sites can be connected the same way, regardless of cell coverage.

> *"The solution gave us a path to modernize remote-site communications while working with the system infrastructure we already had in place."*
>
> **— Ray Eaton, Manager, Mt. Olive Water Association**

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Lessons for Other Rural Utilities

01

Start with the site, not the network.

Confirm real coverage at each asset. Where there is none, plan satellite as the primary link from day one.

02

Add a layer; don't replace a system.

Controllers that accept existing analog, digital, and relay signals let a utility modernize one site at a time.

03

Put data where operators already work.

API integration into the existing SCADA platform avoids a second, disconnected dashboard.

Facing the same coverage gap?

Rugged Telemetry can assess communications conditions, field signals, and SCADA integration at each of your sites, and recommend cellular, satellite, or hybrid connectivity to match.

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ABOUT RUGGED TELEMETRY

Based in Danville, Kentucky, Rugged Telemetry designs and builds industrial IoT monitoring, control, and communications systems for water, wastewater, and tank-monitoring applications. Its pump-station and tank controllers include built-in telemetry over cellular, satellite, or hybrid links, and its cloud platform integrates with existing SCADA software.

SOURCES

Utility background: Mount Olive Water Association 2023 Consumer Confidence Report (Arkansas Department of Health); Mount Olive Water Association Audited Financial Statements, February 29, 2024 (Arkansas Legislative Audit); population served per EPA Safe Drinking Water Information System (PWS AR0000668). Terrain: Boston Mountains regional overview (Wikipedia) and Encyclopedia of Arkansas. Product information: Rugged Telemetry.

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