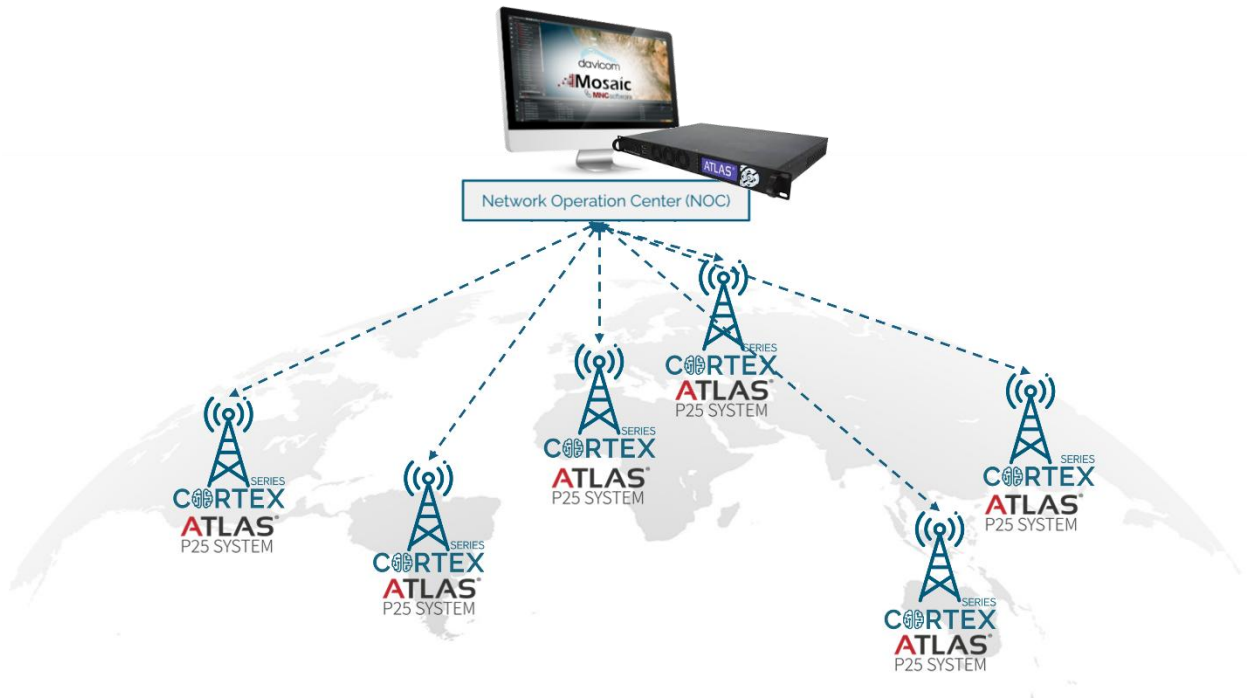
ATLAS P25 Alarm Monitoring System

How Davicom Extends Visibility Beyond the Radio Network

Davicom, a division of Comlab Telecommunications Inc.



What This Document Covers

This document explains how Davicom integrates with EF Johnson ATLAS P25 radio systems to provide a unified monitoring environment for public safety and LMR network operators. It is written for decision-makers, system owners, and operations staff who want to understand what the solution does, how it is structured, and the operational benefits it delivers.

The ATLAS P25 platform is a proven, purpose-built Land Mobile Radio system. What Davicom adds is comprehensive site-level intelligence and a single pane of glass through which operators can monitor not only the radio network, but also every supporting system at every remote site: power, RF performance, environment, timing, and network connectivity.

The Challenge: Two Worlds of Visibility

Every P25 LMR network has two distinct layers of operational data that matter to public safety organizations.

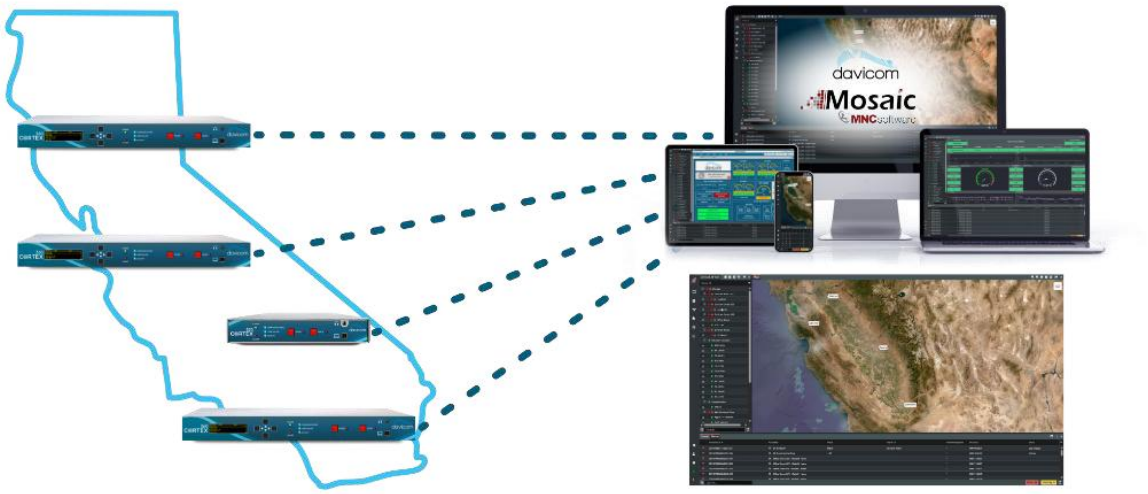
Layer	What it covers	Who manages it
Radio Network	Repeaters, channels, controllers, synchronization, trunking logic	EF Johnson ATLAS NMS
Site Infrastructure	Power systems, RF transmit chain, environmental sensors, network backhaul, GPS timing	Historically unmonitored, or managed in isolation

When a site goes down or degrades, the cause is more often a failed battery charger, a VSWR spike on an antenna, a temperature excursion, or a lost backhaul link than a fault in the radio equipment itself. Without visibility into site infrastructure, operators are blind to the real cause of outages and must dispatch field technicians to diagnose problems that could have been detected and resolved remotely.

The Davicom solution bridges this gap by adding a site monitoring layer alongside the ATLAS NMS, and unifying both data streams into a single operator interface.

Solution Architecture: Three Core Components

The monitoring architecture is built around three components that each play a distinct role. Together they provide end-to-end visibility from the NOC down to every sensor at every remote site.



ATLAS NMS

The ATLAS Network Management System is EF Johnson's native platform for managing the ATLAS LMR network. It monitors repeaters and controllers, collects radio-layer alarms and events, and manages network configuration. In a Davicom deployment, the ATLAS NMS retains its authoritative role over the radio network. Nothing changes in how EF Johnson manages the P25 infrastructure.

What changes is where ATLAS alarms are delivered. The ATLAS NMS forwards its alarms to Mosaic using standardized SNMP traps. From that point, operators manage all alarms in one place regardless of their source.

Davicom CORTEX RTUs

A Davicom CORTEX RTU is deployed at each remote repeater site. Since it is a general-purpose monitoring and control system, it continuously monitors every supporting subsystem through GPIO, Modbus, and SNMP connections to site equipment. The CORTEX RTU is the local intelligence layer: it knows the state of every circuit breaker, every antenna, the indoor temperature, and whether the generator has started.

Each CORTEX RTU monitors the following categories of site equipment. The parameters listed below reflect the full scope of what the platform supports. Actual monitoring at any given site is configured to match the equipment present and the operational requirements of the customer. Coverage will vary by site and deployment.

RF and Transmit Chain

- Forward power for each ATLAS channel, measured individually after the combiners
- Composite forward power, reflected power, and antenna VSWR with real-time trending
- Per-channel transmit status to confirm active RF output

Power Systems

- DC distribution panels with per-circuit voltage, current, and fuse status
- Power inverter input/output status, including VAC output
- UPS metrics: runtime, load percentage, input/output status
- Generator status and Automatic Transfer Switch (ATS) position
- AC failure detection with immediate alarm and escalation

Environmental and Facility

- Indoor temperature and humidity sensors
- HVAC system status
- Smoke detection and water leak detection
- Door contact sensors (open/closed)
- Dehydrator operation for pressurized transmission lines
- Tower lighting status where required

Network and Connectivity

- Ping reachability checks for ATLAS repeaters and controllers
- Network switch status and microwave backhaul radio RSSI levels
- Confirmation that MOSAIC and the ATLAS NMS remain reachable from the site
- Secondary validation layer independent of the ATLAS NMS

GPS and Timing Synchronization

- Number of satellites tracked by each GPS receiver
- Synchronization status for each timing source (in sync / holdover)
- Major and minor alarm states for Safran SecureSync and similar units
- SAS (GPS amplification) signal path monitoring where installed

A critical design feature is that CORTEX RTUs continue operating even when IP connectivity to the NOC is lost. Local conditions are still detected, logged, and displayed for any field technician who connects directly to the unit at the site. Monitoring does not stop when the backhaul goes down, so CORTEX RTUs log the key data required for system troubleshooting.

MOSAIC

MOSAIC is the centralized alarm management and operator console. It collects alarms and telemetry from all CORTEX RTUs via SNMP polling and traps, and receives ATLAS network alarms forwarded from the ATLAS NMS. Both streams are normalized and presented in a single interface.

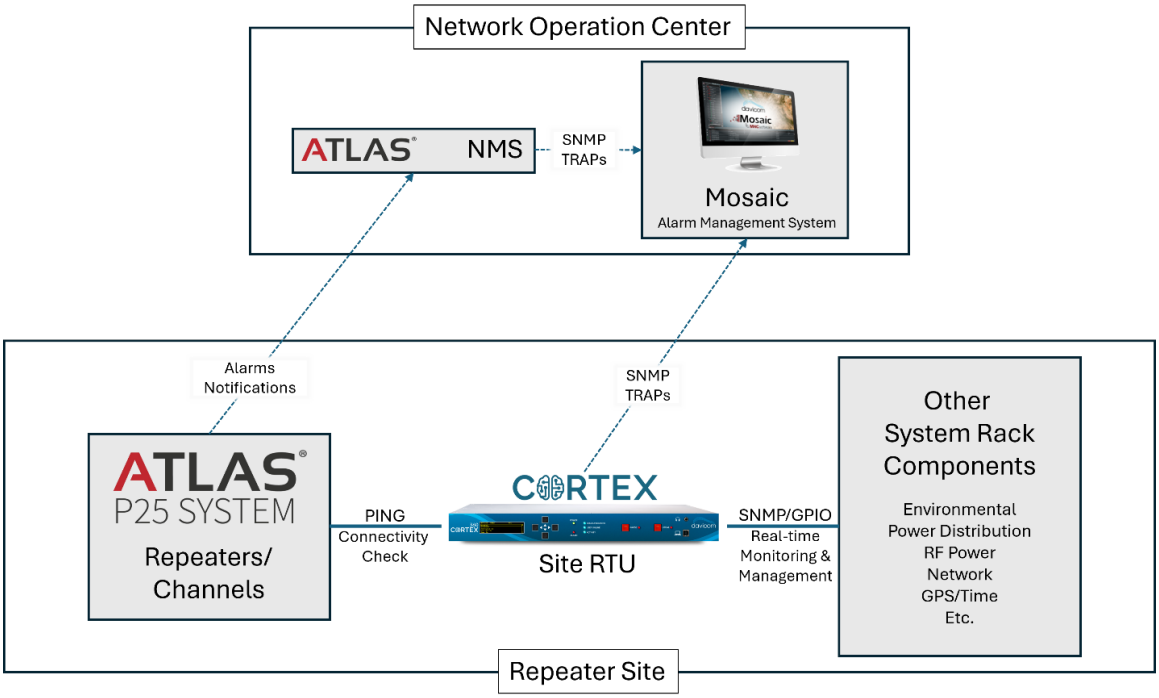
Operators use MOSAIC as their primary daily interface. Key capabilities include:

- A geographic map view showing all sites color-coded by current alarm severity (green, yellow, red)

- A real-time alarm panel listing all active alarms across the entire network with timestamps, severity, and duration
- Drill-down access from the map to any site, and from the site to any subsystem panel within the CORTEX RTU
- Alarm acknowledgment, annotation, and escalation workflows with full audit trail
- Historical charting of any monitored parameter, from indoor temperature to RF power to DC voltage
- Site reports covering the last 24 hours, 7 days, or 30 days, exportable to PDF, CSV, or Excel
- Role-based access control: read-only for viewers, full control for supervisors and administrators

How Alarms Flow Through the System

Understanding the alarm flow helps operators use the system confidently and diagnose issues efficiently. All alarm paths converge in MOSAIC, but they originate from two distinct sources.



ATLAS Network Alarms

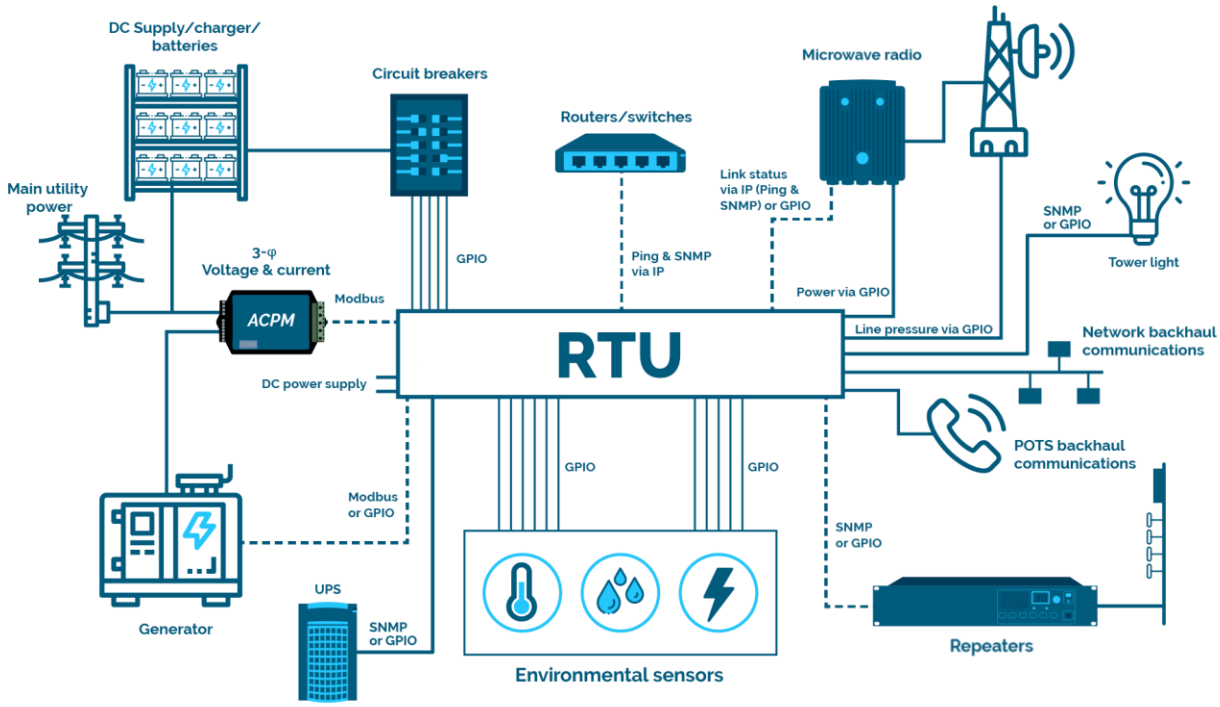
When an ATLAS repeater, controller, or channel experiences a fault, it sends a proprietary notification to the ATLAS NMS. The ATLAS NMS converts that notification into a standardized SNMP trap and forwards it to MOSAIC. MOSAIC presents the alarm with its description, severity, and any operator instructions configured in the system.

Operators can view the alarm, open the associated instructions, manually clear the alarm after confirming resolution, and review alarm history. All actions are timestamped and logged.

Site RTU Alarms

CORTEX RTUs generate alarms based on threshold crossings and state changes in the site equipment they monitor. These alarms are sent to MOSAIC as SNMP traps and also retrieved through regular polling. In MOSAIC, RTU alarms are displayed alongside ATLAS alarms in the same interface.

For RTU alarms, operators have additional tools: they can view alarm instructions, review historical occurrences, chart the parameter trend over time, and connect directly to the site CORTEX RTU for deeper investigation.



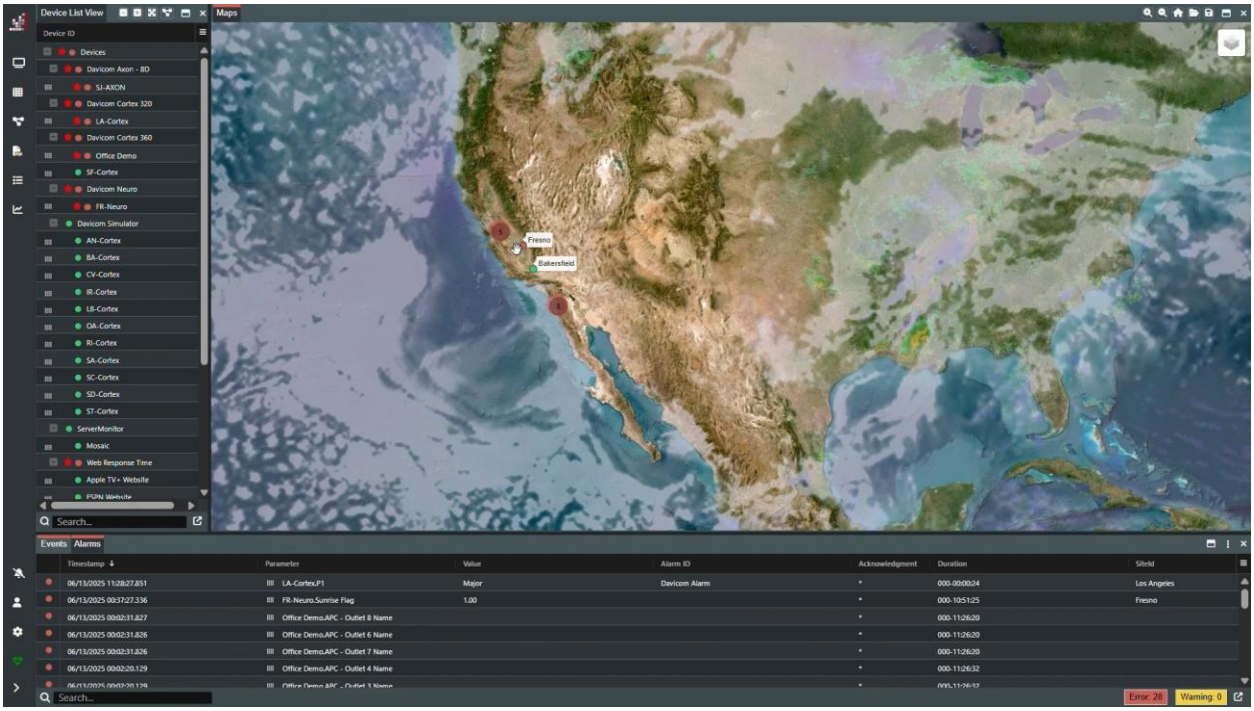
Cross-Validation

Because the CORTEX RTU independently monitors network reachability of ATLAS repeaters, the system provides a cross-validation layer. If a repeater goes offline and cannot report its own fault to the ATLAS NMS, the RTU will still detect the loss of IP connectivity and generate an independent alarm in MOSAIC. This dual-path architecture reduces blind spots and increases confidence in alarm accuracy.

The Operator Experience

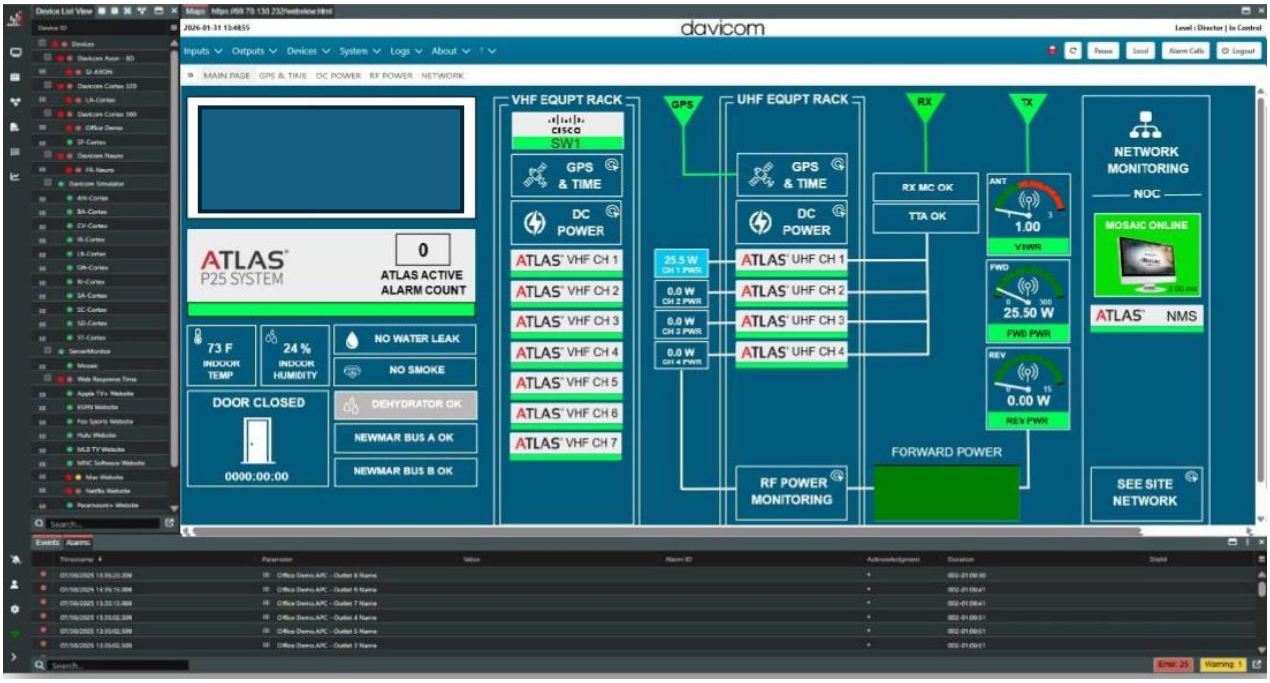
Starting the Day

When an operator logs into MOSAIC, the default view is a geographic map showing all sites. Sites with no active alarms are green. Sites with warning-level conditions are yellow. Sites with critical alarms are red. The operator immediately knows the overall health of the network without reading a single alarm.



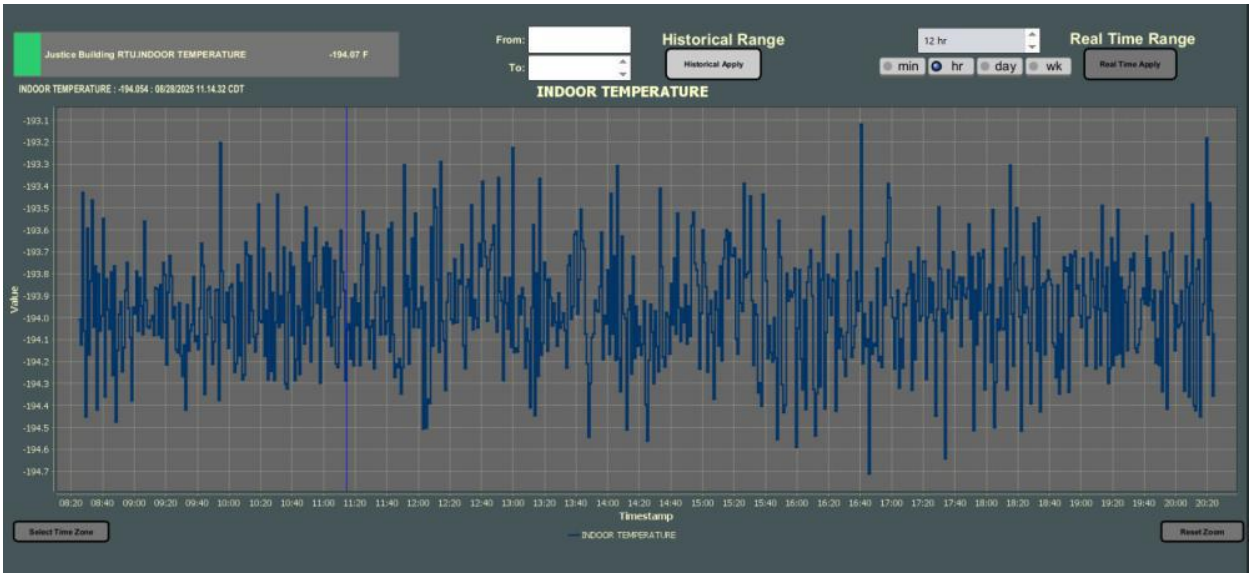
Investigating an Alarm

When a red site appears on the map, the operator right-clicks to access the site options. From there they can view all active alarms for that site, organized by source (ATLAS NMS or site RTU). Each alarm includes its description, severity, and duration. Operator instructions are available with one click. If more detail is needed, the operator can connect directly to the CORTEX RTU at that site and drill into the RF power panel, the DC distribution panel, the GPS panel, or the network panel.



Reviewing History

Any monitored parameter can be charted over time. An operator investigating a recurring VSWR alarm can pull up weeks of trend data to determine whether the problem is gradual degradation or intermittent. Site reports provide a structured summary of all alarm activity over any defined period, useful for post-incident review and for sharing status with EF Johnson support.



Network Architecture Flexibility

The Davicom solution supports both consolidated and segmented network architectures.

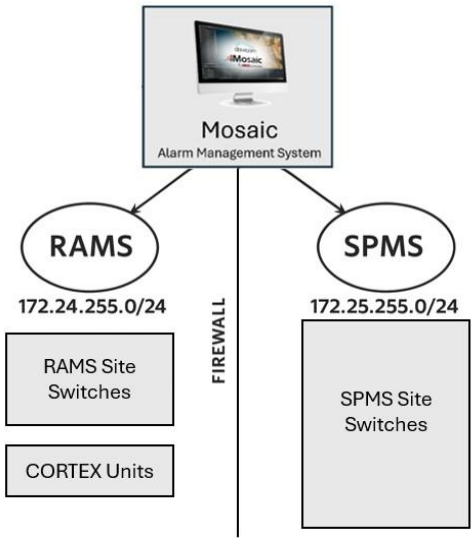
Consolidated Networks

When the radio access network and the core management network share a common IP domain, MOSAIC communicates with all CORTEX RTUs and the ATLAS NMS directly. This is the simplest deployment model.

Segmented Networks with Firewall Separation

Many public safety deployments require strict separation between the Radio Access Network (RAN) and the Core Infrastructure Network. In these architectures, a firewall separates the two domains. CORTEX RTUs reside on the RAN side and cannot communicate directly with devices on the core side.

MOSAIC resolves this by maintaining connections to both subnets simultaneously. It monitors RAN-side switches and CORTEX RTUs through one network interface, and core-side infrastructure through another, providing unified visibility across the firewall boundary without compromising security policy.



Deployment Strengths

Template-Driven Deployment

- All CORTEX RTUs are configured from standardized templates, ensuring uniform behavior across every site. Adding a new site means applying the existing template, not engineering from scratch.

Site Autonomy During Outages

- CORTEX RTUs continue monitoring and logging locally even when the backhaul connection to the NOC is lost. Site conditions are not invisible during network disruptions.

Single Operator Console

- MOSAIC consolidates radio network alarms and site infrastructure alarms into one interface. Operators do not need to switch between tools or learn multiple systems.

Preservation of ATLAS NMS Authority

- The ATLAS NMS remains the authoritative system for P25 network management. Davicom extends visibility without altering EF Johnson control of the radio network.

Scalable Architecture

- The system grows incrementally. New sites, additional sensors, and expanded monitoring scope can be added at any time without redesigning the core platform.

Reference Deployment: Pacific Northwest Public Safety Network

A public safety agency operating an EF Johnson ATLAS P25 LMR network deployed Davicom CORTEX 360 RTUs at each of its remote repeater sites, with MOSAIC serving as the centralized operator console at the primary NOC. The network covers a large geographic service area with multiple unmanned tower sites requiring continuous remote monitoring.

The deployment covers RF power monitoring across VHF and UHF equipment racks, DC distribution panels per site with per-circuit current and voltage, GPS timing units with satellite tracking and synchronization status, microwave backhaul radios with RSSI monitoring,

managed network switches on both RAN and core network segments, and full environmental monitoring including temperature, humidity, smoke, water intrusion, and door sensors.

ATLAS NMS alarms are forwarded to MOSAIC as SNMP traps, giving operators a unified view of both radio network events and site infrastructure conditions. The CORTEX RTU at each site also displays the current ATLAS active alarm count, so a technician connected locally at the site can see not only site conditions but also how many network-level alarms are active for that location.

The architecture was deployed using standardized templates, enabling consistent configuration across all sites and reducing commissioning time significantly. The system is fully operational and continues to provide real-time monitoring and alarm management for the agency's public safety communications operations.

Conclusion

Public safety organizations that operate ATLAS P25 networks already have strong radio network management through the ATLAS NMS. What Davicom adds is the site intelligence layer that has traditionally been invisible: the power systems, RF transmit chain, environmental conditions, backhaul links, and GPS timing that ultimately determine whether a repeater site stays on the air.

By combining the CORTEX RTU at each site with MOSAIC as the central operator console, Davicom creates a unified monitoring environment where every alarm from every layer of the network reaches the operator through a single interface, with the context and tools needed to understand the problem, respond quickly, and validate the resolution.

The result is faster incident response, fewer unnecessary site dispatches, better accountability through complete alarm history and reporting, and a monitoring foundation that grows with the network.

Davicom, a division of Comlab Telecommunications Inc.
davicom.com | lcuierrier@comlab.com