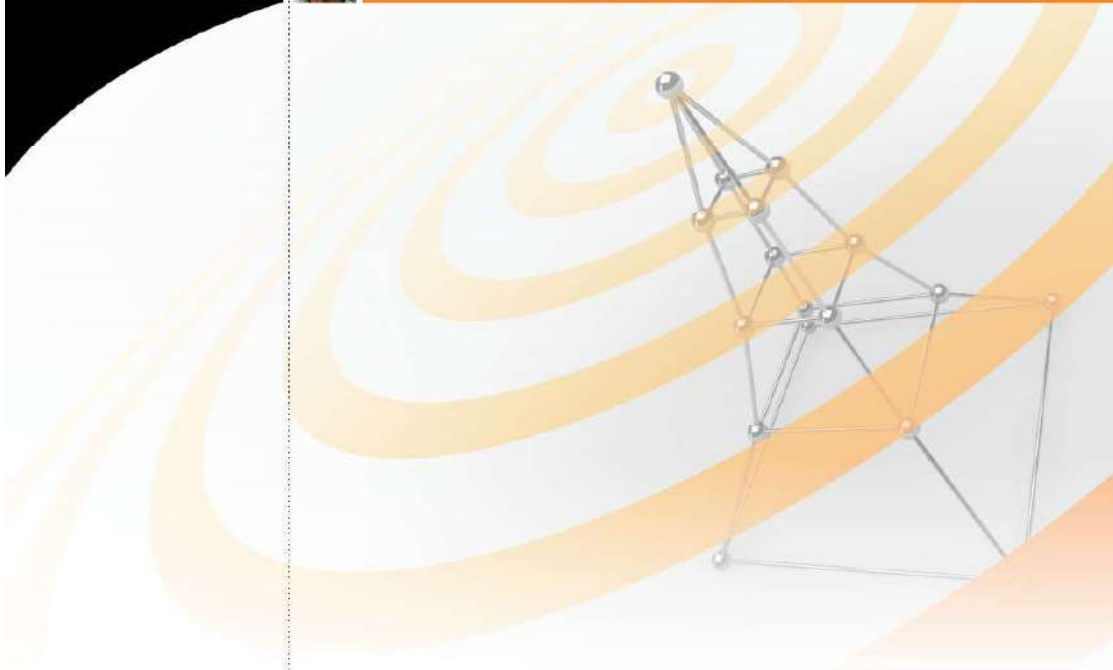# **A**TLAS™ System Solutions

Conventional | Trunked | Hybrid | Simulcast

P25

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EFJohns n
TECHNOLOGIES

ATLAS™ | System Solutions Overview

Land Mobile Radio (LMR) networks are an integral part of mission critical communications infrastructure. The EFJohnson ATLAS™ P25 solution offers public safety organizations and decision makers with the ultimate in solution flexibility, interoperability, and scalability in a unique and cost-effective manner. The ATLAS P25 system solution is comprehensive in scope with options for deploying various architectures including conventional, trunked, hybrid, and simulcast multi-site networks.

EFJohnson is committed to provide reliable turnkey solutions to our public safety customers. Our focus is on delivering end-to-end system capability and solution ownership including program management, design and installation services, maintenance and monitoring, training, and ongoing support.
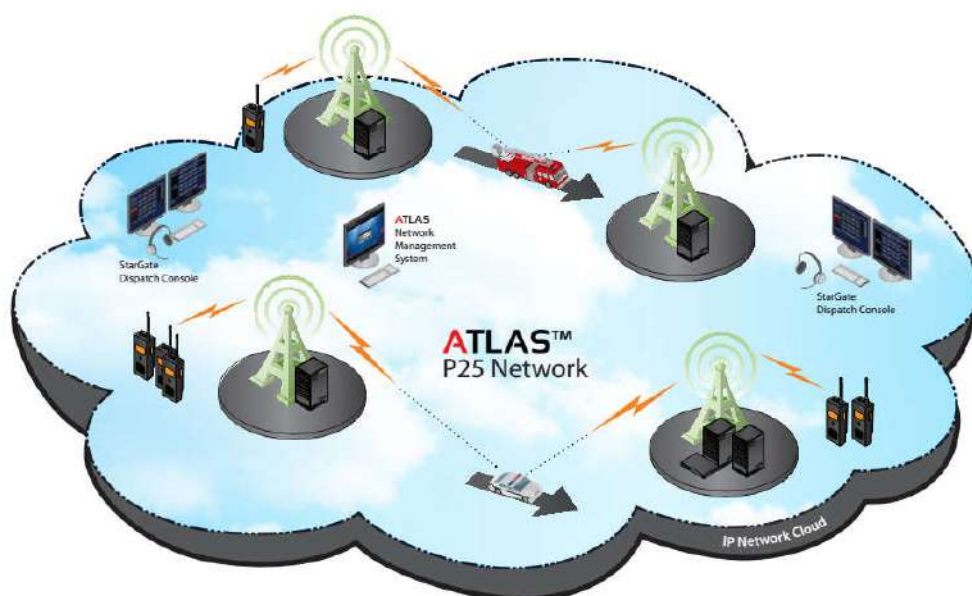
EFJohnson's ATLAS P25 infrastructure solution utilizes a unique, flexible, distributed, and scalable IP based architecture designed to meet mission critical needs. ATLAS system solutions are flexible and designed to fit the specific needs of each customer whether it is a greenfield system deployment, migration from proprietary technologies, or evolution from analog to a digital P25 system.

ATLAS™ | System Solutions Overview
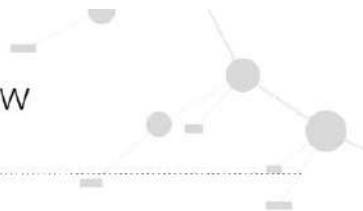
Wide Area Architecture

The ATLAS P25 solution is designed to offer seamless wide area connectivity to the public safety end user in a single or multi-site environment regardless of system type (conventional, trunked, or hybrid). This unique capability allows first responders and public safety users to communicate across site boundaries over the common IP network backbone and help alleviate manual interventions such as channel/talkgroup changes.

Fully Distributed Switchless Network

Fully distributed architecture enables maximum flexibility and scalability in network design and deployment. By eliminating expensive centralized core network and site equipment, the ATLAS P25 solution increases network reliability and eliminates single point of failure across the mission critical network architecture.

Decentralized Call Control and Switching Mobility

A key benefit of the ATLAS P25 distributed network architecture is the ability to distribute call control and switching functions across the wide area network. This enables the ATLAS system to track first responders and users across a wide area network and offer features like individual and group calls from a trunked network to a conventional system without the need for a dispatcher to patch calls across systems. In addition, users can experience seamless mobility and roaming capability across the network without relying on centralized switching.

Self-Discovery and Auto-Healing

The ATLAS P25 network solution distributes the call processing and subscriber database management across the multi-site network, thereby allowing independent site-to-site connectivity and call control. This enables the entire network to overcome network outages by being able to self-heal and operate as independent distributed networks when a particular part of the network experiences the outage. In addition, the distributed network also performs self-discovery when new sites are added to the network topology and can be invaluable to grow the network without any disruptions to the existing topology.

Multi-Protocol Interoperability, Migration, and Scalability

The ATLAS P25 solution includes several interoperability gateways and interfaces that allow legacy and proprietary networks to be seamlessly integrated through the dispatch console. In addition, the lack of a centralized control point in the architecture allows easy addition of new sites and equipment resulting in quicker deployments and less equipment to monitor. This leads to increased reliability and lower maintenance costs.

Shared Unified Network Management and Dispatch

The state-of-the-art web based network management system offers a unified solution to manage and configure all aspects of the ATLAS solution including conventional, trunked, hybrid, and simulcast systems. In addition, the StarGate™ Dispatch Console is a next generation console that provides interoperability via direct connection to P25 trunked and conventional systems, analog systems, paging systems, and a variety of other disparate systems via control stations.

Native IP Solution

Derived from standards-based IP technology, the ATLAS P25 solution offers a best-in-class solution, avoiding proprietary and expensive network components, while enhancing maintainability and interoperability across the P25 network.

ATLAS™ | Architecture Options

| System Architecture Feature Highlights	Conventional	Trunked	Hybrid	Simulcast
Cost Effective and Simple System Expansion	✔	✔	✔	✔
"Plug and Play" Scalability	✔	✔	✔	✔
P25 Mode	✔	✔	✔	✔
Analog Mode	✔	✔	✔	✔
Patch Free Call Routing Between Conventional and Trunked	--	--	✔	--

Conventional Systems

ATLAS conventional system solutions have a dedicated repeater channel for system user groups. Typically they are deployed in regions covering large geographic areas and/or have moderate quantities of users. Often these system user groups are organized based upon responsibility such as Fire, Police, EMS, Public Works, and Mutual Aid, and in many cases each of these groups have a corresponding dedicated repeater channel. The ATLAS conventional system provides mixed mode analog/P25 operation which allows a graceful, cost-effective radio migration strategy. Conversion to a P25 trunked system is made simple primarily via a software upgrade to the repeater channels.
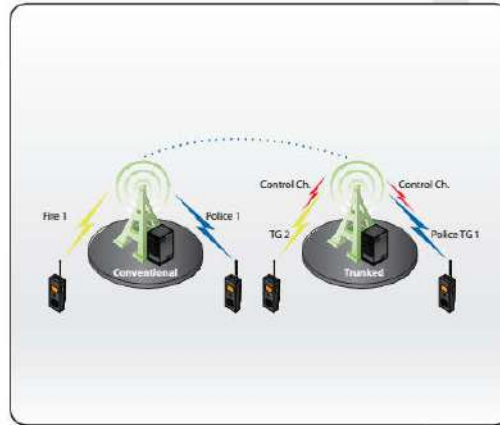

Trunked Systems

ATLAS trunked system solutions have a shared pool of repeater channels for use among system user talkgroups. Typically, they are deployed in regions covering moderate geographic areas and/or have large quantities of users. Often these system talkgroups are organized on a functional basis such as Fire, Police, EMS, Public Works, and Mutual Aid. In trunked systems, the repeater channels at each site are divided into a "control channel" and multiple "voice channels." The "control channel" registers the radio into the system and dynamically coordinates radio talkgroup PTT (push-to talk) with any available "voice channel." The shared pool of repeater channels facilitates more talkgroups and significantly more users than a dedicated repeater channel in a conventional system. The ATLAS trunked system is based upon industry-standard P25 operation which promotes interoperability and maximizes grant funding opportunities.


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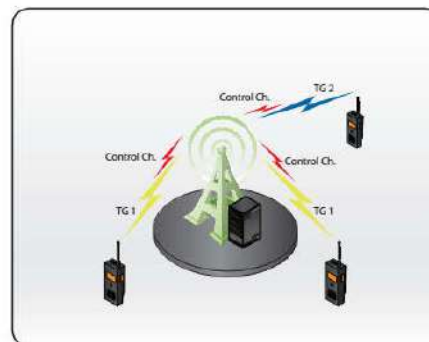
ATLAS™ | Architecture Options

Hybrid Systems

ATLAS hybrid system solutions are an industry first, unique implementation that combines conventional and trunked repeater channels into a single system. Typically, they are deployed in applications where both large and small quantities of users are found in separate geographic areas. With this system, users can be organized functionally such as Fire, Police, EMS, and Public Works, for either the conventional or trunked part of the system depending on need. The ATLAS hybrid system provides significant cost savings by applying trunked sites only where needed. With a simple method for converting repeater channels from conventional to trunked, initial investment is maximized and capacity can be expanded as required. Additionally, call routing between conventional and trunked system repeater channels is patch free, meaning that dispatch console assistance is not required to connect these disparate system types.

Simulcast Systems

ATLAS simulcast system solutions are configured for conventional or trunked operation. Typically they are deployed in regions covering moderate geographic areas, have limited frequencies available, and often require improved in-building radio coverage. Similar to other architecture options, these systems are organized on a functional basis such as Fire, Police, EMS, and Public Works. Simulcast systems have a single master site and multiple remote sites. The master site "synchronizes" the system timing so that calls are transmitted simultaneously at all sites for a given repeater channel, which reduces the quantity of frequencies needed for the system and simplifies frequency coordination. The ATLAS simulcast system supports analog conventional, P25 conventional, and P25 trunked operation. Auto discovery, tuning, and network delay compensation result in quicker system turn-up and reduced maintenance activities. Conversion from a P25 conventional simulcast system to a P25 trunked simulcast system is made simple primarily via a software upgrade to the repeater channels.
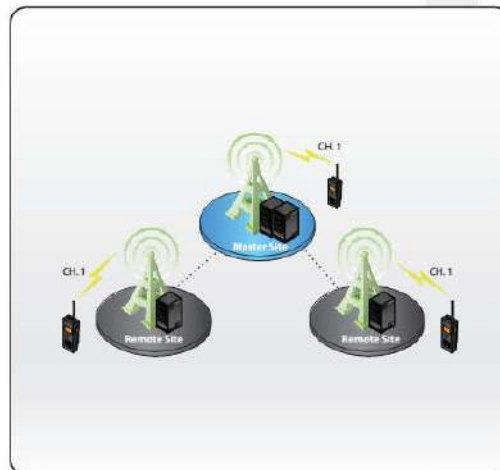
ATLAS™ | A Smarter Way to P25

The ATLAS solution uses an IP-based, fully distributed architecture allowing it to easily scale from a single site to a state-wide network. In addition, the fully distributed architecture eliminates the need for a central controller, which significantly increases system reliability, decreases cost, and ensures our customers are able to successfully execute their mission-critical tasks.

The Benefits of Distributed Architecture

1. **Expandability (multi-site, multiple system types, multi-channel)**

   - Ability to start small then add more equipment to expand as needed
   - When upgrading, purchases can be spread out to match budget cycle (rather than having to purchase expensive central controllers up-front)
   - System is cost-effective initially and remains cost-effective as the system grows; there is no big switch to buy up-front
   - Dynamic discovery allows easier addition of new system equipment without affecting the operation of current equipment
   - Utilizing system gateways enables reuse of existing equipment and interoperability with the current system, allowing easier migration
   - Future-proof the investment - expand the system without completely replacing it
   - Flexible expansion – add trunking sites to a conventional system without changing rest of the system

2. **Scalability (network & site capacity)**

   - Distributed control allows customers to increase capacity by adding sites, not expanding the central switch
   - With distributed traffic management there is no additional bandwidth requirement for existing sites as new sites are added, ensuring minimal impact as system capacity grows

3. **Reliability and Resilience**

   - Use of a distributed architecture provides multiple levels of redundancy as each site is capable of performing wide area system functions
   - The ATLAS P25 solution goes beyond eliminating single points of failure by providing a fully distributed and fully redundant system at no additional cost
   - In the event of a natural disaster, the ATLAS solution can continue to provide full wide area functionality between connected system components when parts of the network are down due to lack of network connectivity
   - Uses patented auto discovery mechanisms to self-heal as network connections are reestablished without manual intervention

EFJohnson's patented distributed system architecture provides unparalleled expandability, scalability, reliability, and resilience that is difficult to duplicate using a traditional centralized architecture. The ATLAS P25 System Solution is designed to provide customers the most flexibility and lowest cost of ownership in the industry.

The ATLAS P25 Systems Solution was selected as an Association of Public Safety Communications Officials (APCO) "Hot Product."

ATLAS™ | Product Components

ATLAS™ 4000 Base Stations/Repeaters

The ATLAS 4000 series products offer the capability to deploy the full gamut of P25 solutions including conventional, trunked, simulcast, and hybrid systems. The base station/repeater line is designed to build out the ATLAS distributed architecture system solution in a cost-effective and scalable manner.

Available in VHF, UHF, 700, and 800 MHz bands, these stations offer market-leading analog and P25 mixed-mode capabilities in a robust, reliable, and compact form factor. Each repeater is equipped with a Voter Comparator and a Simulcast Manager (for 4200 Multimode Simulcast Station) eliminating the need for additional voting/simulcast operation hardware.

ATLAS™ 6100/6200 Network Management System (NMS)

The ATLAS NMS is a state-of-the-art web based network management system that provides centralized network management functionality for all EFJohnson infrastructure products. A fully redundant solution with web based client access, the ATLAS NMS offers unified management and deployment of configuration to all infrastructure solutions including conventional systems, trunked systems, StarGate™ consoles, and gateways. The ATLAS NMS is available in two options: ATLAS 6100 Basic NMS for small systems and ATLAS 6200 Advanced NMS for larger systems.
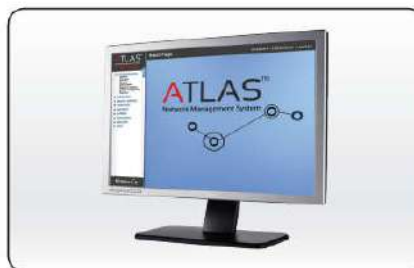
StarGate™ 7000 Dispatch Console

The StarGate™ Dispatch Console is a next generation console that provides interoperability via direct connection to P25 trunked and conventional systems, analog systems, paging systems, Multi-Net® systems, and connection to other disparate systems via control stations. The StarGate console is IP based and fully distributed with no requirement for central control equipment, allowing extensive scalability and expansion and with no single point of failure.

ATLAS™ 8000 Gateways/Interfaces

The ATLAS 8000 series gateways and interfaces provide IP based fully integrated solutions to support all the interoperability and interface capabilities across all the system types including conventional, trunked, hybrid, and simulcast solutions. In addition, the ATLAS 8000 gateways offer distributed call control, mobility functions, and also provide diverse interoperability solutions to interface multiple system types with the StarGate console.