



ENABLING EMERGENCY COMMUNICATIONS INDOORS

Avari® VitalLink™ Series

PUBLIC SAFETY FAULT TOLERANT SYSTEM



Being able to communicate with public safety two-way radio systems in buildings is crucial for first responders to execute time-sensitive and mission-critical tasks to protect the public. Emergency Responder Communications Enhancement Systems (ERCES) are often installed to provide these necessary means of communication.

Avari Wireless's public safety digital Distributed Antenna System (DAS), known as the Avari VitalLink Series, provides a reliable, high-performance, and high availability system designed to support both current and future public safety communication requirements.

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Reliability is Critical

First responders require seamless radio coverage at all times and cannot afford to experience disruptions in communications for any reason. Staying connected at all times is a baseline requirement for an Emergency Responder Communication Enhancement System (ERCES).

According to the National Public Safety Telecommunications Council, a public safety grade communication network is recommended to have 99.999% availability which corresponds to a maximum of 5.26 minutes of downtime per year.

Although redundancy is not always a mandatory requirement, it is one factor to be considered to minimize single-point failures in a public safety wireless communications system to provide the desired reliability. The most basic form of network redundancy is duplicating the system in its entirety, 1:1 redundancy. Full system redundancy is ideal and very effective, but in many situations, it may not be an option due to space and cost.

In this article, an alternative and cost-effective method will be described - a fault-tolerant system.

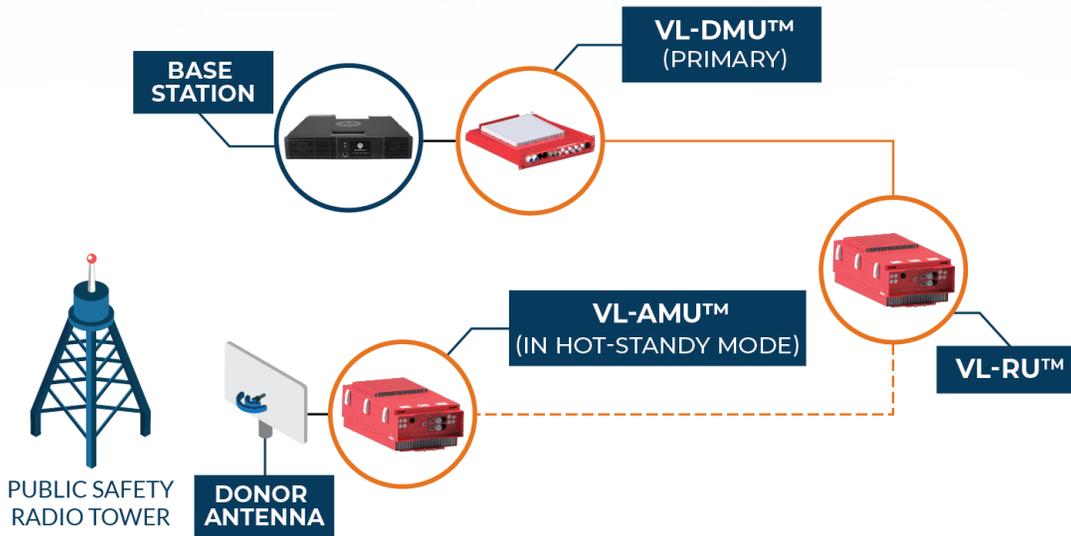
VitalLink™ Fault-Tolerant System

The Avari Wireless VitalLink Digital Distributed Antenna System (DAS) provides a software-enabled fault-tolerant architecture with headend redundancy and failover function. The Avari fault-tolerant solution offers varying degrees of equipment redundancy and coverage protection that can be tailored to the customers' specific needs and budgets. The solution ranges from providing redundant modules within the same equipment to having fully redundant headend equipment and eventually fully redundant remote units and passive antennae.

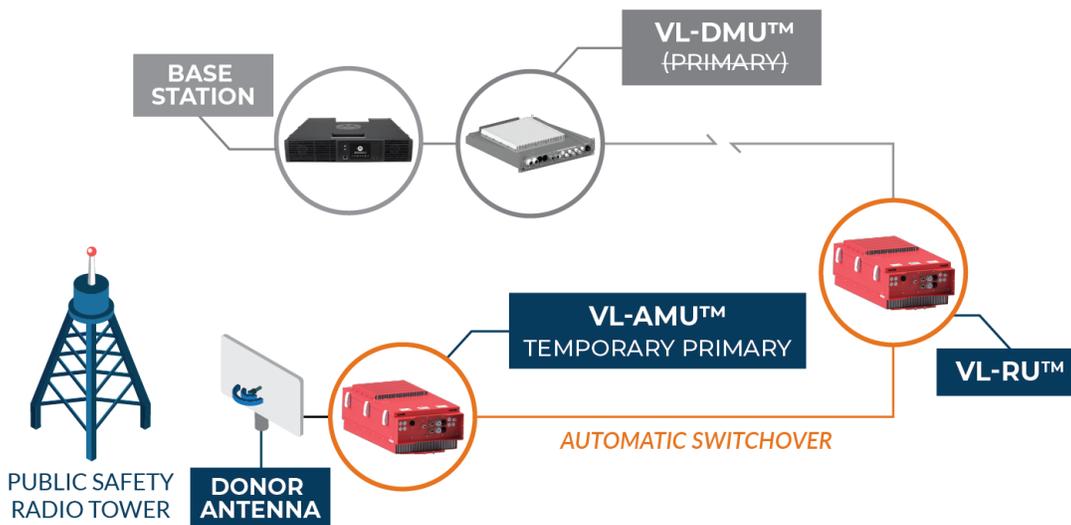
The partial redundancy approach described below is much more economical than putting in place a fully redundant set of remote units, yet it still provides highly effective coverage protection should an issue occur. To protect the headend which can be a single point of massive failure, a primary host and a secondary host with a diverse fiber path to all remote locations is necessary. Under normal operating mode, both the primary host and secondary host are feeding the same signal to the remote units via two diverse fiber paths. The remote units by default process the signals from the primary host and ignore the signal coming from the secondary host.

In the case of primary host failure, and/or primary fiber failure, the intelligent remote unit(s) will detect a loss of signal and automatically switch to process the signal from the secondary host and its optical link. When a remote unit fails, only coverage to a certain area is affected depending on how much coverage overlap is in the RF design. To further protect against remote unit failure, Avari offers redundant RF modules within the same remote unit. The automatic failover can be performed at the remote unit level as well as a module level.

NORMAL OPERATION



AUTOMATIC SWITCHOVER OPERATION



Intelligent Element Manager

The Avari VitalLink Element Manager (VL-EM™) is an intelligent controller that centralizes, streamlines and automates the management and control of the Avari digital public safety distributed antenna system.

It offers a user-friendly graphical interface for administrators and normal operators to perform their operations and maintenance tasks. The VL-EM™ continuously monitors the operating condition of the digital DAS network and reports alarms in real-time when faults are detected. It does not only provide basic failover capabilities when headend equipment fails or fiber gets cut, but it can also interact with external systems to analyze faults and determine the appropriate course of action in order to achieve self-healing. For example, it can interpret the type of signal source failure to determine if a complete headend failover is required or if only certain traffic channels need to be re-routed.

About Avari Wireless

In the event of a crisis, public safety personnel and first responders require reliable emergency responder radio coverage.

Being able to communicate with public safety two-way radio systems in buildings is crucial for first responders to execute time-sensitive and mission-critical tasks to protect the public. Emergency Responder Communications Enhancement Systems (ERCES) are often installed to provide these necessary means of communication.

Avari® Wireless's public safety digital Distributed Antenna System (DAS), known as the Avari® VitalLink™ Series, provides a reliable, high-performance, and high-availability system designed to support both current and future public safety communication requirements.

Avari's systems are enabling emergency communications indoors, which helps keep public safety personnel, first responders and the public alike safe.