SMART PASSIVES SOLUTIONS GUIDE

Microlab

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An Emergency Responder Radio Communications System (ERRCS), also known as a Public Safety or First Responder DAS (Distributed Antenna System), has been mandated by many municipalities for new buildings around the country. The municipal jurisdiction's code requirements are defined by the National Fire Protection Association (NFPA) and/or the International Fire Code (IFC).

Authorities Having Jurisdiction (AHJ) over ERRCS are recommending that all passive DAS networks be equipped with a remote monitoring system that detects faults in the passive network of RF coaxial cables, components, and antennas deep into a building. Typically, only the active components (BDA's and power supplies) are monitored.

Without real-time passive DAS monitoring and alarming, a Public Safety DAS may not be ready for life safety radio traffic. When the Public Safety DAS is commissioned an acceptance grid test is conducted. If the public safety DAS RF coverage passes in a brand-new building, a certificate of occupancy or CO will be granted by the AHJ. From the date of commissioning, it is typical for the AHJ to conduct annual testing of the DAS. Therein lies the problem for first responders that rely on the Public Safety DAS during emergency incidents. **It can be a year or more between a system's proof of performance testing.**

The probability of damage to RF coaxial transmission lines or components, disconnected antennas, and the like are high over the course of a year. This is due to building maintenance and enhancements including, plumbing, HVAC repair, security systems, and computer network cabling work. Something as simple as disconnecting an antenna and forgetting to re-connect it to DAS transmission line will compromise DAS integrity and impede proper radio performance.

SMART (System Monitor Alarm Report Technology) Passives System

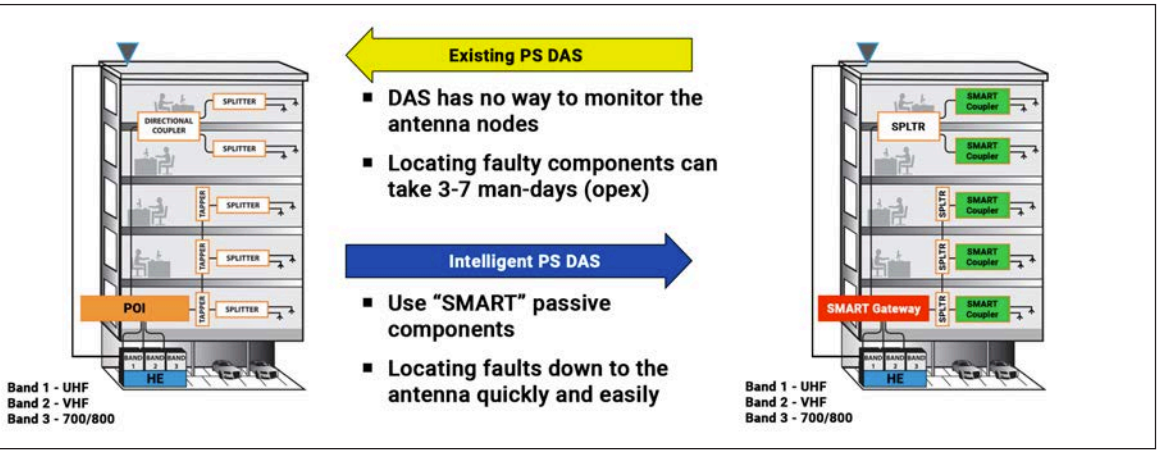
SMART Coupler

SMART Gateway

Microlab's **SMART (System Monitor Alarm Report Technology) Passives System** enables real-time performance monitoring of a Public Safety DAS structured cabling, RF components, and antennas deep into a building. The SMART System is made up of a SMART Gateway and SMART Couplers. The SMART Coupler was designed to replace common passive DAS tapper or coupler values. A building's DAS network of SMART Coupler nodes is complemented by a SMART Gateway at the head-end's main RF source.

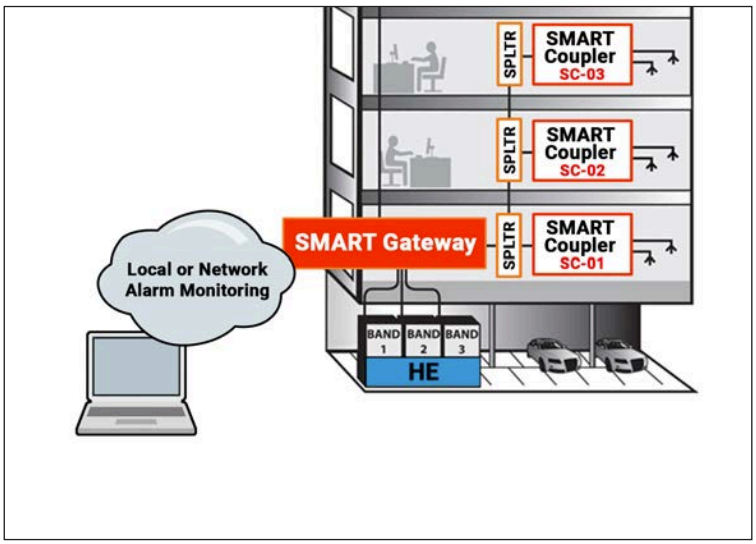
The real-time monitoring capabilities that the SMART Passives system provides will ensure that Public Safety DAS system integrators, AHJ's, building owners, and emergency services personnel can depend on the operation of their critical communication systems.

If the SMART Gateway loses DC power or an active I-IoT circuit board fails in a SMART Coupler, all emergency radio traffic will continue to pass through the DAS. The DAS will continue to perform, but the loss of real-time monitoring will be detected.



How Does the SMART Passives System Work?

The head-end's main RF source for a Public Safety DAS may be a building's dedicated repeater or a bi-directional amplifier (BDA). The RF source is connected to SMART Gateway while maintaining the integrity of radio transmission. The Gateway injects a DC bias into the passive DAS coaxial RF transmission lines to power the active portion of SMART Coupler. All diagnostics and communications between the Couplers and Gateway take place over the coaxial cabling. The SMART Couplers do not require local network or power connections within a building's ceiling, plenum, risers, or distribution paths.



A SMART Coupler uses a specially developed broadband, passive, coupler for 130 – 960 MHz that is enclosed with Industrial Internet of Things (I-IoT) active circuitry for communications and diagnostics. SMART Couplers measure the Voltage Standing Wave Ratio (VSWR) at each port based on a calibrated CW tone generated by the SMART Gateway. By storing and comparing the timestamped VSWR at each port, the SMART Coupler system continuously monitors for changes in VSWR proactively indicating failures such as an open or short circuit. The SMART Gateway then communicates the alarm via e-mail, SMS, or SNMP.

In the illustration above, the SMART System detects a change at Antenna 2. When the Gateway polls the SC-02 unit, it triggers an alarm that the DAS performance has been affected.

For more information, visit microlabtech.com/active-solution/smartcoupler.html

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