

# How the Microlab SMART Gateway Works

When faced with an emergency within a building, first responders depend upon a public safety, emergency responder radio communications system (ERRCS) DAS to provide high-quality radio coverage and network performance. Due to the urgency of emergency events, the Microlab SMART Passives System provides real-time monitoring and alarming capabilities to continuously ensure the integrity of life-safety DAS communications networks. The SMART Passives System is comprised of two innovative components from Microlab – the SMART Gateway and a network of SMART Couplers. This article will take a closer look at the SMART Gateway’s important role in providing relied upon mission-critical radio coverage.

The specially developed, 130-960 MHz broadband SMART Gateway is a hybrid passive and active diagnostic solution that is installed at a DAS head-end’s main RF source, such as a bidirectional amplifier (BDA) or a building’s dedicated repeater. Conventional two-way, analog or digital push-to-talk or trunked radio systems, as well as the diagnostic signaling, pass through the SMART Gateway, all while maintaining the integrity of emergency radio transmissions. The SMART Gateway is complemented by a network of SMART Couplers to realize the full capabilities of real-time public safety DAS monitoring (Figure 1).

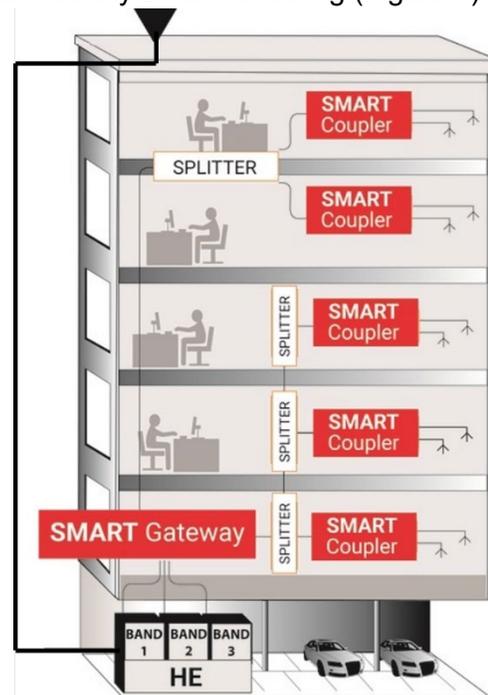


Figure 1: The SMART Gateway is located at the head-end’s RF source and is complemented by a network of SMART Couplers that replace passive DAS tappers and couplers.

The SMART Gateway is a key, head-end component within the SMART Passives System. To start, the SMART Gateway generates a calibrated, continuous wave (CW) tone in the industrial, scientific, and medical (ISM) band within 902-928 MHz. The calibration tone or carrier is used by

the SMART Couplers to measure the voltage standing wave ratio (VSWR) at each coupled and through port. The reference VSWR is continuously monitored and compared, providing proactive alarming by monitoring for any abnormalities that are indicative of a catastrophic failure, such as an open or short circuit that may be caused by cut or damaged RF coaxial transmission lines or disconnected antennas. A compromise in ERRCS DAS integrity would create a partial or complete loss of radio coverage. Building and fire codes stipulate 99% of a floor’s mission-critical areas have high-quality, dependable RF coverage. No dead zones would mean high signal strength and delivered audio quality (DAQ).

If, by chance, a failure is detected, the SMART Gateway is responsible for sending an alarm through SNMP traps by either email or SMS. The alert will contain the detecting SMART Coupler’s MAC address. Each SMART Coupler’s MAC address may be recorded on the DAS as-built drawings, providing an approximate location of the fault within the building to expedite troubleshooting and time to restoration. The SMART Gateway’s front panel has a normally closed, dry contact pair, alarm output that is tied to the building’s fire alarm system for further failure notification.

Users can connect a computer browser to the SMART Gateway to easily monitor all diagnostics and alarms within a convenient, multi-layered graphical user interface (GUI), as shown in Figure 2. The GUI displays all relevant data, such as network information of the SMART Coupler nodes, alarm statuses, along with time- and date-stamped VSWR measurements. In addition to VSWR, the SMART Passives System also monitors the RSSI RF power of the calibrated, 0 dBm = 1 mW CW test tone to ensure every component is functioning properly.

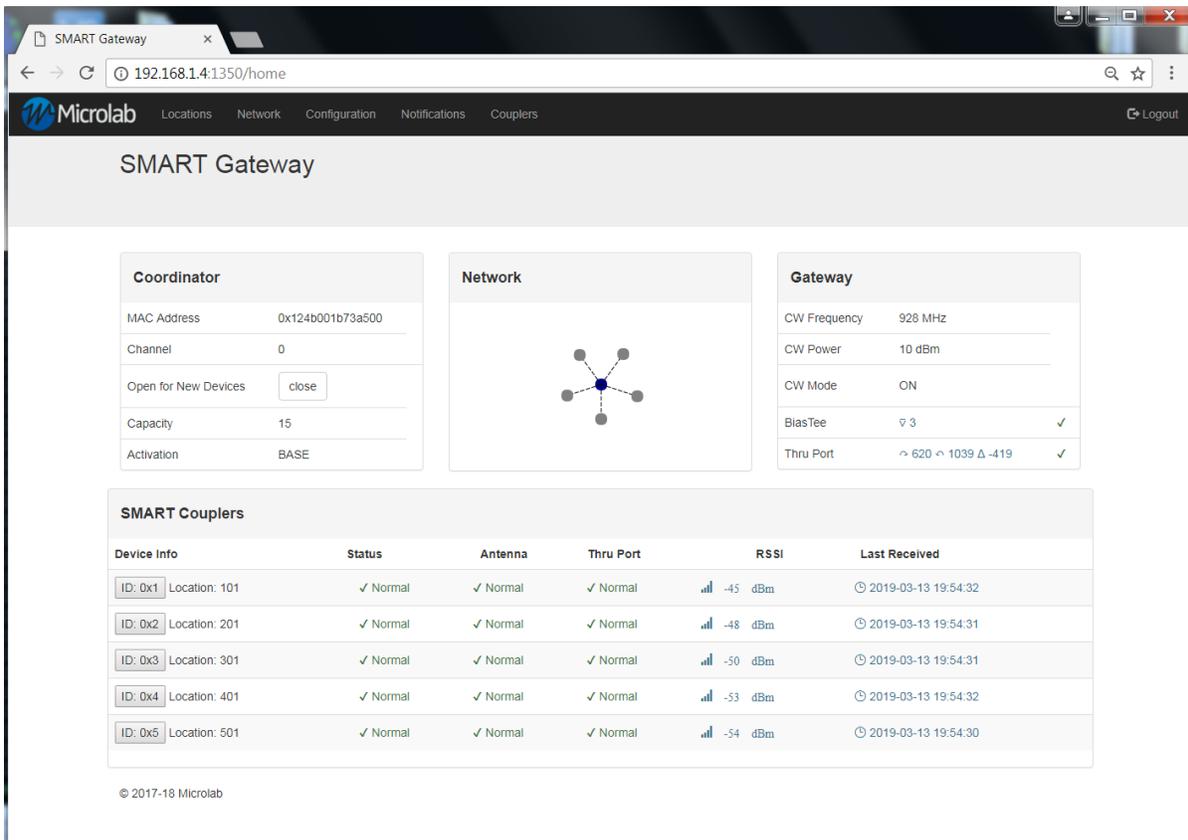


Figure 2: Example view of the SMART Gateway’s GUI.

The head-end's SMART Gateway provides DC power, all diagnostics, and communicates with the SMART Couplers through the DAS RF coaxial cabling. SMART Couplers do not require local AC/DC power or TCP/IP network connections at each coupler's location within a building.

Dependable, high-quality radio coverage for first responders is critical, and authorities having jurisdiction (AHJ), building owners, and system integrators must continuously maintain reliable public safety networks to meet this need. The Microlab SMART Passives System is here to uphold public safety DAS integrity by monitoring and reporting the health of important DAS infrastructure in real time, which is enabled by the innovative SMART Gateway and a series of SMART Couplers. To learn more about public safety DAS solutions from Microlab, head over to <https://microlabtech.com/lmr-public-safety>.