

WIRELESS LINK SIMULATOR

TEXTRON Systems



Better, Faster, More Affordable Testing

The Wireless Link Simulator (WLS) by AAI Test & Training's Automated Test Equipment (ATE) group addresses the spectrum of radio simulation program requirements. It allows users to dynamically simulate networks of interconnected radios and interfering noise sources for repeatable system performance evaluation and scenario simulation.



RADIO WIRELESS LINK SIMULATOR

AAI Test & Training's ATE center of excellence is located in Austin, Texas. The team's WLS offers reliable, dynamic and repeatable test capability for up to 32 simultaneously interconnected radios in a non-blocking array of 1,024 simultaneous paths, with independent control of each path. Alternatively, the system can be configured as four independent networks of 16 simultaneous radios with 256 paths each.

The WLS runs time-synchronized scenarios using GPS to analyze radio operation over time under selected user profiles. Scenarios can

be developed and executed directly on the system's master control computer, or the system can be used to run commands received over a local area network using a remote controller.

Operators can create scenarios that dynamically control attenuation between radios to simulate rapidly moving vehicles, insert interfering noise and jamming signals, and synchronize scenarios with the radios under test and/or with other instrumentation.

Specifications

Radio interface:

- Frequency range 30-3,000 megahertz (MHz)
- Full- or half-duplex radio modes
- Radio transmitter power 10 watts (W) continuous wave (CW) or 100 W for 1 minute

Radio interconnections:

- 256 independent paths (four simultaneous sets) in 16 by 16 mode
- 1,024 independent paths (one set) in 32 by 32 mode

Radio-to-radio attenuation:

- Range less than 60 decibels (dB) to greater than 160 dB
- Resolution 1 dB
- Accuracy ± 1 dB
- Dynamic attenuation supports repeatable simulation of quickly changing conditions
 - ◆ Update rate greater than 100 hertz (Hz) for all attenuators in each rack
 - ◆ Update rate greater than 1 kilohertz for up to 25 percent of attenuators in each rack

Path-to-path isolation:

- Minimum of 40 dB to greater than 100 dB in 32 by 32 mode
- Minimum of 100 dB in 16 by 16 mode

Phase and amplitude balance:

- 30-450 MHz
 - ◆ Phase ± 10 degrees every 10 MHz bandwidth (BW)
 - ◆ Amplitude ± 1 dB every 10 MHz BW
- 450-1,000 MHz
 - ◆ Phase ± 10 degrees every 30 MHz BW
 - ◆ Amplitude ± 1 dB every 10 MHz BW
- 1,000-3,000 MHz
 - ◆ Phase ± 10 degrees every 50 MHz BW
 - ◆ Amplitude ± 1 dB every 10 MHz BW

Operating modes:

- Stand-alone, slave (remote controlled) and self test

GPS output ports:

- 32 (independent amplitude control)

GPS synchronization:

- Scenario timing software synchronized to GPS time
- Optional hardware provides absolute GPS time synchronization

CW noise interference signals:

- Frequency range 30-3,000 MHz
- Signal level 100 to 0 dBm in 1-dB steps
- Pulsed signals 0.1 microseconds to 500 milliseconds pulse width 1-5 M pulses per second (pps)
- 1-16 multi-tones within a 30-MHz BW
- Frequency hopping
 - ◆ Full frequency range less than or equal to 1,000 hops per second
 - ◆ Less than 150 microseconds settling time

Burst noise interference signals:

- Bandwidths
 - ◆ 30-100 MHz
 - ◆ 100-200 MHz
 - ◆ 200-450 MHz
 - ◆ 450-1,000 MHz
 - ◆ 1,000-2,000 MHz
 - ◆ 2,000-3,000 MHz
- Amplitude -100 to -170 dBm/Hz in 1-dB steps
- Pulse width 1-500 milliseconds
- Repetition rate 1-500 pps

Wideband noise interference signals:

- Bandwidths
 - ◆ 30-100 MHz
 - ◆ 100-200 MHz
 - ◆ 200-450 MHz
 - ◆ 450-1,000 MHz
 - ◆ 1,000-2,000 MHz
 - ◆ 2,000-3,000 MHz
- Amplitude -100 to -170 dBm/Hz in 1-dB steps

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