SPIRENT GSS5700

Wi-Fi Positioning Access Point Simulator

The new GSS5700 simulates Wi-Fi network elements to enable lab-based testing of the latest Wi-Fi positioning technology. The GSS5700 can work as a stand-alone test instrument, or in conjunction with Spirent's market-leading GPS/GNSS and automated location test products.
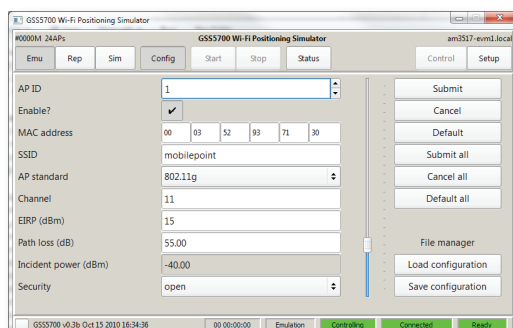
APPLICATIONS

Manufacturers:

- Research & Development
- Integration
- Design verification
- Performance analysis
- Benchmarking
- Regression Test

Operators:

- Pre-launch evaluation
- Software regression test
- Acceptance test

Wi-Fi positioning technology is becoming a "must have" element of location technology on consumer devices where a user's location is required quickly, accurately and to be available everywhere. While no single location technology meets this need, Wireless LAN (Wi-Fi) positioning, when used with other technologies (particularly GNSS and Cell-ID) in a hybrid solution, can play a major role in delivering a quality LBS user experience.

Already the world leader in GPS and Multi-GNSS (e.g. GPS and GLONASS) simulation and A-GNSS test solutions, Spirent has broadened its test capabilities to include Wi-Fi positioning. Spirent's GSS5700 Wi-Fi Positioning Simulator is a first-of-its-kind test tool that enables repeatable and reliable device testing to be carried out in the lab, reducing the need for costly and time-consuming field testing.

The GSS5700 enables simultaneous simulation of multiple Wi-Fi Access Points (APs), each of which can be configured and controlled independently. Advanced software features make it easy to create tests that replicate real-world scenarios, including advanced vehicle motion, adversarial situations and a user-definable AP database. The GSS5700 can also be combined with Spirent's range of GPS and multi-GNSS Simulation Systems to test true hybrid location performance.

The GSS5700 will also form an integral part of Spirent's 8100 (UMTS) and C2K-ATS (CDMA) Location Technology solutions, providing full automation of mobile device test scenarios and performance metrics.

BENEFITS

- *Reduce Time to Market* – test device performance under controlled, repeatable conditions in the lab, reducing the need for time-consuming field testing

- *Improve Wi-Fi Positioning Performance* – with a unique first-of-its-kind solution enabling testing under a wide range of conditions

- *Ensure Hybrid Location Performance* – validate hybrid GPS, Multi-GNSS and Wi-Fi positioning performance including hand-off and error conditions

Wi-Fi Positioning Access Point Simulator

KEY FEATURES

- Software suites provide powerful test definition tools and all modeling relevant to simulated motion of device under test and channel power level modeling

- Individual Wi-Fi access point characteristics, including location coordinates, MAC address, transmit ERP and channel number, can be imported or defined via a remote user interface and stored as an ASCII database

- Simulation of 12 APs in standard configuration. Expandable up to 24 in a single chassis and up to 48 APs with expansion chassis

- Full interoperability with Spirent's GSS6700 GPS/GLONASS/Galileo Simulation System and GSS6560 GPS Simulator plus other simulators running SimGEN software

- Supports Wi-Fi TCP/IP data connection via one AP

- Integration with Spirent's Location Technology solutions (LTS and PLTS) offers comprehensive, automated mobile device location performance testing (available H2 2011)
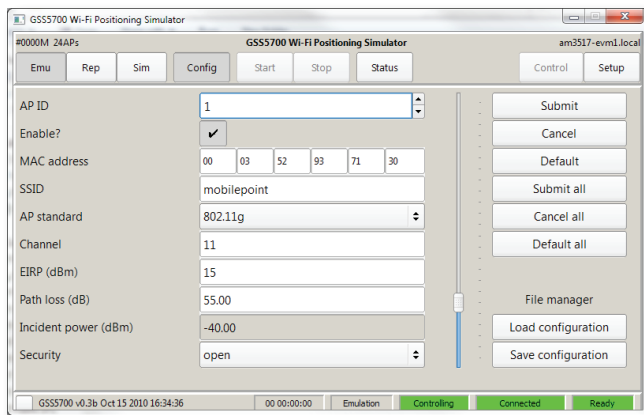
The GSS5700's user interface allows full interactive control (Emulation Mode).

OPERATING MODES

The GSS5700 is able to simultaneously reproduce the relevant beacon signaling associated with multiple APs and offers three operating modes:

Emulation Mode

The GSS5700 operates as a controllable instrument, where fundamental characteristics can be defined for each AP signal being received: MAC address, signal channel number and incident power level. Independent AP resources are available to enable emulation of all 14 possible 802.11 channels simultaneously. User interaction is via remote GUI, remote command API or the front-panel LCD screen.

Simulation Mode

The GSS5700 dynamically re-creates an operational environment, simulating the device under test moving through a collection of static APs, with power level being a deterministic function of distance from the AP (path loss) and its transmit power. A stochastic 'fading' model may also be overlayed on the power profile. As in Emulated mode, the MAC address and channel number are user-defined but are contained in an AP database along with AP location and effective radiated power (ERP). APs are selected automatically and dynamically from those 'in-view' based on highest incident power. Test cases are managed via SimGEN and run-time AP-specific data is displayed on the SimGEN controller and front-panel LCD.

Replay Mode

The GSS5700 operates similarly to Simulation mode but determines AP selection and received power level directly from a time-ordered script of AP visibility and characteristics that is either derived from field observations or created artificially. Replay mode can also remotely stimulate SimGEN GNSS simulations. User interaction is via remote GUI, remote command API or the front-panel LCD screen.

The GSS5700's user interface software allows modeling path losses against an array of AP locations.
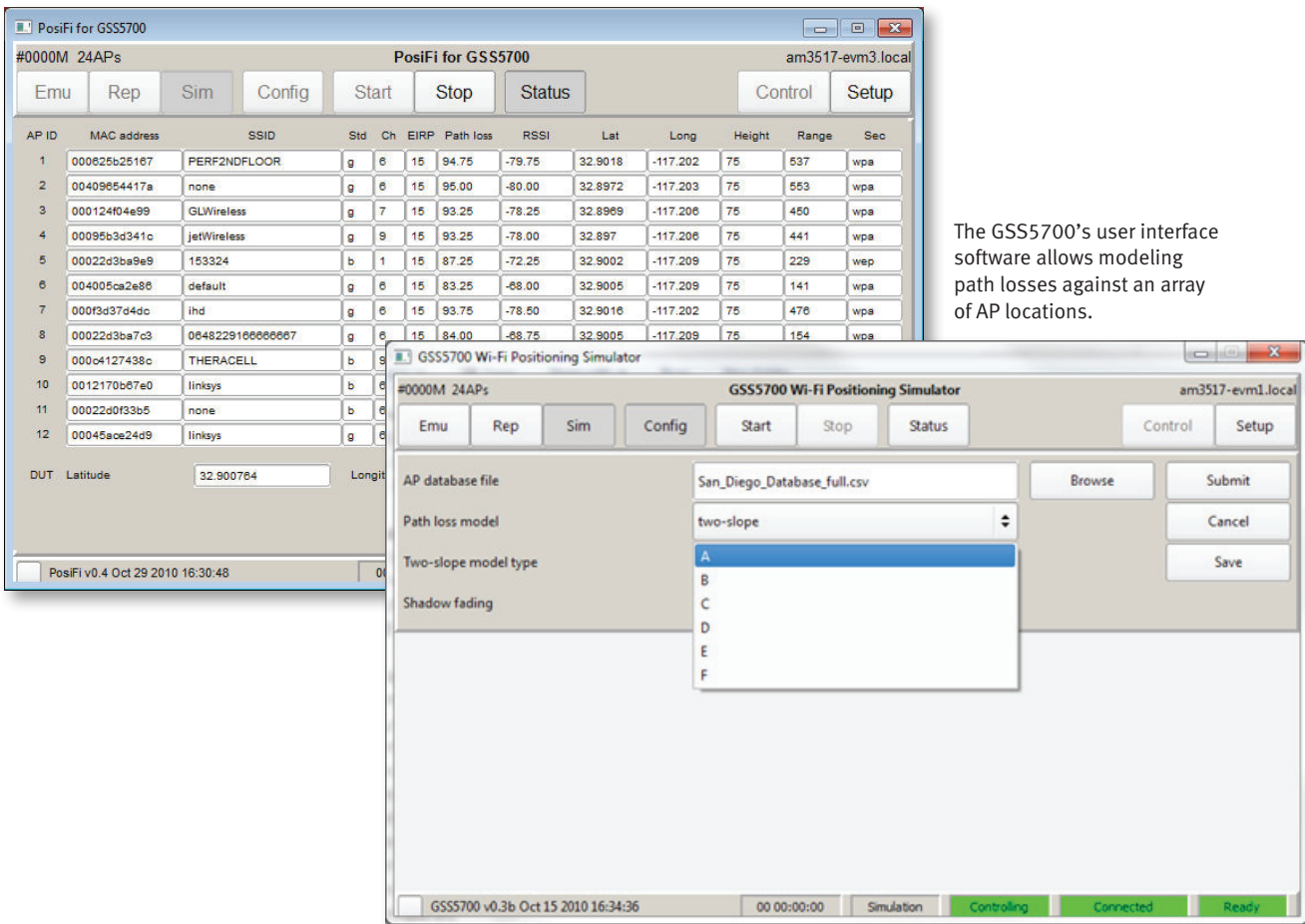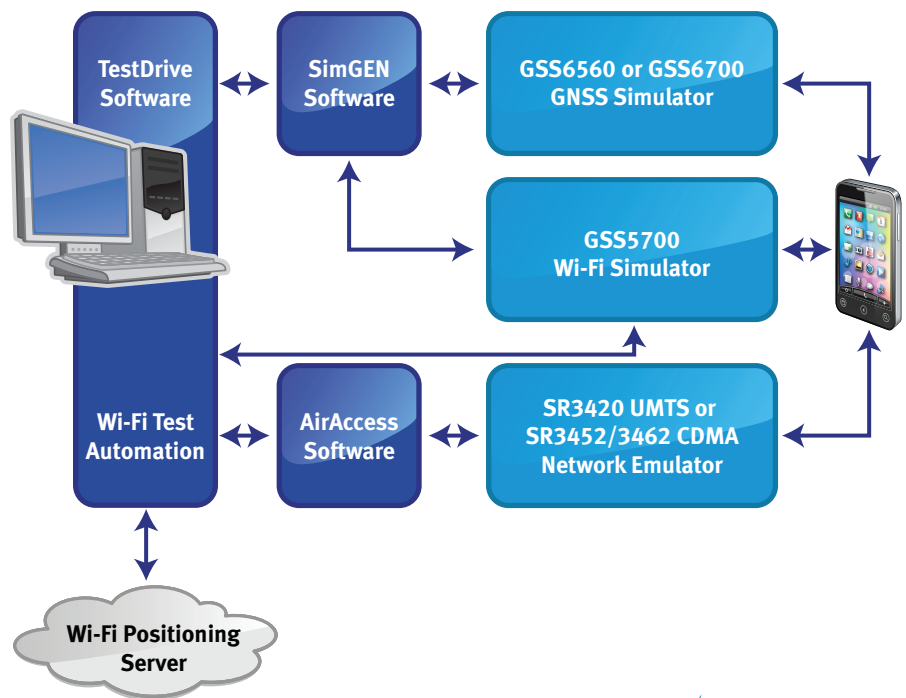
INTEGRATED DEVICE TESTING SOLUTION

Full integration of the GSS5700 with Spirent's Location Technology Solution for UMTS, LTE and PLTS for CDMA testing will be offered in the 2nd half of 2011. This will enable complete, automated testing of mobile device performance that makes use of Wi-Fi positioning techniques.

The integrated solution roadmap includes testing the following positioning capabilities in the presence of Wi-Fi signals:

- Wi-Fi Positioning performance:
  accuracy, sensitivity, time-to-first-fix (TTFF), yield

- Hybrid Positioning performance:
  determination of the measurement parametrics listed above when GNSS and Wi-Fi signals are being received simultaneously

- Wi-Fi Measurement performance:
  time to capture AP, sensitivity, dynamic range

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TECHNICAL SPECIFICATIONS

Standards supported:	802.11b/g
Modulation:	CCK, OFDM (for Probe Request/Response protocol) BPSK, QPSK, 16-QAM and 64-QAM (for data port AP)
Frequency band:	2.4GHz
Operating channels:	1- 14 (11 North America, 13 Europe, 14 Japan-802.11b only)

Number of access points:	12, independent
	    Expandable to 24 in a single chassis
	    Expansion chassis supported to enable up to 48 APs

AP power control:	-40 to -100dBm (AP ERP = 0dBm) -25 to -85dBm (AP ERP = +15dBm) Uplink/Downlink Path loss = 40dB to 100dB Distance control equivalent = 1m to 1000m at 2.4GHz (Free-space loss model)
Power resolution:	0.25dB for Path Loss 1dB for ERP
Power accuracy:	1dB
Update rate:	4Hz (power level), 1Hz or 0.1Hz (AP selection) - Simulation mode 1Hz – Replay mode
Signalling implemented	Beacon frame (transmitted at 10Hz) Probe response (to DUT) TCP/IP data port over a single open access Wi-Fi channel
Connectivity	
Primary RF output:	Coaxial 'N' type socket
Control	Ethernet RJ45, TCP/IP
Data Port	Ethernet RJ45, TCP/IP
AC Power	100-240V, 50/60Hz, 80W (typical)
Physical	
Dimensions	19 inch, 3U format (also suitable for benchtop) 449 mm x 446 mm x 133 mm (W x D x H) (17.75 inch x 17.76 inch x 5.25 inch)
Weight	10.0 kg (22.0 lb)

ORDERING INFORMATION

Please contact your regional Spirent sales representative for detailed ordering information.

SPIRENT GLOBAL SERVICES

Spirent Global Services provides a variety of professional services, support services and education services — all focused on helping customers meet their complex testing and service assurance requirements. For more information, visit the Global Services website at www.spirent.com/gs or contact your Spirent sales representative.

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