With its A-GNSS Over-the-Air (OTA) test solutions, Spirent brings A-GNSS expertise and industry leadership to an OTA test environment. The OTA test pack option offers full automation of all A-GNSS OTA tests in the latest release of the CTIA Test Plan for Wireless Device Over-the-Air Performance, including A-GLONASS testing requirements. Customizable parameters enable test time optimization, as well as testing beyond the requirements of industry standards.

OTA test capability is supported on Spirent’s Location Technology Solution (LTS) for UMTS and LTE devices and Position Location Test System (PLTS) for CDMA devices. A combined LTS/PLTS system is also supported, enabling testing of UMTS, CDMA, and LTE devices in a single solution.

The Spirent solutions are supported by automation software from the leading suppliers of radiated test solutions: SATIMO’s SMM (for UMTS and CDMA) and ETS-Lindgren’s EMQuestTM (for UMTS, CDMA and LTE).

As an option, Custom Chamber Integration is available through Spirent Professional Services, whereby a customer-supplied chamber and associated hardware can be integrated with the Spirent A-GNSS OTA solution.

Applications

Test Labs

- Testing to the CTIA OTA Test Plan, including A-GLONASS requirements
- Operator-specific OTA testing
- Future standards-based OTA testing

Device Manufacturers

- GNSS antenna characterization and performance benchmarking
- Impact of antenna placement and device form factor
- Degradation due to interference of A-GNSS and other radiation sources
**Benefits**

- **Comprehensive radiated GNSS antenna testing**—OTA testing measures the true radiated GNSS performance of mobile devices, unlike conducted testing where GNSS signals bypass the GNSS antenna and key RF components

- **Automated CTIA A-GNSS OTA testing**—Full automation executes all the test procedures required by the CTIA Test Plan with minimum user intervention

- **Flexible parameters maximize test efficiency**—Optimize test time by modifying parameters and scheduling only the tests that are needed

- **Testing capability beyond industry standards**—Extensive customization options enable advanced performance testing

**Key Features**

- Fully supports CTIA’s A-GNSS OTA Test Plan v3.5 including new A-GLONASS requirements

- Supports OTA performance testing beyond CTIA Test Plan requirements

- Uses standard cellular signaling channels for direct over-the-air measurements

- Conducts tests using standard positioning protocols as required by the specific cellular technology: LPP for LTE; RRLP for GSM; RRC for WCDMA, and; IS-801 for CDMA.

- Supports reliable operation with SUPL2.0 using RRLP and LPP protocol

- Supported by ETS-Lindgren’s EMQuest™ automation software

- Supported by SATIMO’s SMM automation software

- OTA Open API option for advanced customization and test case development

- Allows easy integration of Spirent’s PLTS and LTS for a combined CDMA, UMTS, and LTE A-GNSS OTA test solution

- Scalable to industry-leading coverage of conducted A-GNSS conformance and performance test capability for UMTS, CDMA and LTE devices

*GPS antenna pattern testing at different angles of arrival and signal polarizations.*
### Technical Specifications

#### Anechoic Chamber Requirements

- Anechoic chamber with turntable/positioning system, GNSS antenna, and cellular communication antenna
- Typical GNSS OTA path loss range: 30-60dB. Note: Max. 60dB OTA Loss supported
- Linearly polarized GNSS antenna, able to transmit two orthogonal polarizations supporting the frequency 1575.42 MHz
- Minimum of one cellular antenna (two antenna configuration also supported)
- Uplink Limiting Amplifier
- Turntable or other method of changing angle of arrival

### The CTIA Test Plan

Spirent’s OTA test solutions automate the CTIA’s OTA Test Plan for A-GNSS, which includes the following key steps:

- Establish the **Antenna Pattern** by radiating a reference GNSS Signal to the Device Under Test (DUT) and varying the angle of arrival in two planes using the chamber’s positioning system
- Carry out a **Linearization** procedure to characterize and remove any non-linearities introduced by the DUT’s measurements
- Measure **Radiated Sensitivity** by lowering the GPS signal until the DUT is unable to meet the performance requirements of the Test Plan
- Calculate Total **Isotropic Sensitivity (TIS)**, **Upper Hemispheric Isotropic Sensitivity (UHIS)** and **Partial Isotropic GNSS Sensitivity (PIGS)**, metrics which combine the Antenna Pattern and Radiated Sensitivity
- Test **Intermediate Channel Degradation (ICD)** to establish A-GNSS performance across a range of cellular channels likely to be encountered by the DUT while roaming

Spirent features support for the latest CTIA OTA test plan v3.5, which includes A-GNSS OTA TIS measurements over LTE using the SUPL 2.0 protocol.

### List of Spirent A-GNSS OTA solutions approved and placed on the CTIA Authorized Equipment List:

- Spirent UMTS+GSM A-GNSS
- Spirent CDMA A-GPS
- ETS-Lindgren’s EMQuest™ & Spirent UMTS+GSM+LTE A-GNSS
- ETS-Lindgren’s EMQuest™ & Spirent CDMA A-GPS
- Satimo SMM & Spirent UMTS+LTE A-GNSS
- Satimo SMM & Spirent CDMA A-GNSS

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**GNSS antenna pattern illustrating the impact of a human head and hand.**
Spirent 8100 Mobile Device Test System
A-GNSS Over-the-Air Test Solutions

About Spirent Communications

Spirent Communications (LSE: SPT) is a global leader with deep expertise and decades of experience in testing, assurance, analytics and security, serving developers, service providers, and enterprise networks.

We help bring clarity to increasingly complex technological and business challenges.

Spirent’s customers have made a promise to their customers to deliver superior performance. Spirent assures that those promises are fulfilled.

For more information, visit: www.spirent.com

System Requirements

<table>
<thead>
<tr>
<th>Option</th>
<th>All OTA test options are available on the following LTS configurations: 8100-A500, 8100-B500, 8100-A600, 8100-A750, and 8100-B750</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTS + PLTS</td>
<td>LTE, UMTS and CDMA devices can be tested on a single solution by upgrading any of the following PLTS configurations with: 8100-A750 (LTS) C2K-CFG[6, 7, 8, 9, 12, 13, and 14]-SYS</td>
</tr>
</tbody>
</table>

Spirent A-GNSS OTA Test Solutions

<table>
<thead>
<tr>
<th>Solution</th>
<th>Option</th>
<th>UMTS Devices (LTS)</th>
<th>CDMA Devices (PLTS)</th>
<th>LTE Devices (LTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8100-LTS (UMTS &amp; LTE Devices)</td>
<td>SATIMO SMM</td>
<td>8100-CFG-LBS-OTA-APP</td>
<td>PLTS-API</td>
<td>N/A</td>
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<tr>
<td>PLTS (CDMA Devices)</td>
<td></td>
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<tr>
<td>Custom Chamber Integration*</td>
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</table>

Ordering Information

Due to the modularity and wide range of available 8100 Mobile Device Test System configurations, please contact your regional Spirent sales representative for detailed ordering information.

Contact Us

For more information, call your Spirent sales representative or visit us on the Web at www.spirent.com/ContactSpirent.

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