



SPIRENT 8100 MOBILE DEVICE TEST SYSTEM

Location Technology Solution Test Packs

Automated test cases for repeatable A-GPS, A-GLONASS, and standalone GNSS performance and standards-based testing of Assisted GNSS (A-GNSS).

APPLICATIONS

Manufacturers:

- Research & Development
- Design Verification
- Performance Analysis
- Benchmarking
- Regression Test
- Conformance/Certification Test

Operators:

- Pre-Launch Evaluation
- Acceptance Test
- Mobile Applications Test

Spirent's 8100 Location Technology solution is the industry's leading choice for testing A-GNSS (A-GPS and A-GLONASS), standalone GNSS, and GNSS with ephemeris extension in mobile devices. With the widest coverage of Conducted and Over-The-Air (OTA) A-GNSS testing, it offers protocol verification, RF performance, conformance/certification testing and a baseband option to address chipset testing needs.

The 8100 UMTS Location Technology solution makes testing fast and easy. Employing Spirent's highly-capable GNSS Satellite Simulators (GSS6700 or GSS8000) and the industry-leading SR3420 and E2010S Network Emulators for UMTS and LTE help bring real-world satellite simulation into the lab. Powerful, easy-to-use software tools such as TestDrive test executive, GNSS scenario generation tools, and SMLC and SUPL server emulators enable customers to control and test complex scenarios quickly and reliably.

A scalable platform enables a wide range of testing needs and budgets to be met, from bench-top functional testing to a full-scale test solution, supporting both complete standards-based certification and comprehensive performance analysis. Here you will find our complete coverage of available test packs.

BENEFITS

- *Save time on custom test case creation*
 - Create and edit test cases in minutes with easy-to-use UI-based scripting engine
 - Flexible, network-grade UMTS base station emulation capability with real-time state machine engine
- *Minimize testing costs and reduce time-to-market*
 - Low entry cost with benchtop configurations
 - Minimal cost to create and maintain test cases
 - Automated test environment minimizes testing time and time-to-market
- *Improve return on investment*
 - Available as software upgrade option for existing 8100 systems



SPIRENT 8100 MOBILE DEVICE TEST SYSTEM

Location Technology Solution Test Packs

Scalability	Benchtop		Full System			Full System			Full System
Platform Options / Test Packs	A400	A750	A500/ A600*	B750U++	B500U++	B600**	B750	B500	B600
STANDARDS-BASED TESTS									
A-GPS RF Minimum Performance Test Packs									
34.171 RF Conformance tests (TM-LBS-3GPP-TS34.171)	✓	✓	✓	✓	✓	✓			
51.010 RF Conformance tests (TM-LBS-3GPP-TS51.010-MP)	✓	✓	✓	✓	✓	✓			
34.172 AGLONASS RF Conformance tests (TP-LBS-3GPP-TS34.172)	✓	✓	✓	✓	✓	✓			
51.010 AGLONASS RF Conformance tests (TP-LBS-3GPP-51.010-AGLO-M)	✓	✓	✓	✓	✓	✓			
37.571 AGNSS RF Conformance tests* (TM-LBS-3GPP37.571-1-AGNSS)				✓	✓	✓	✓	✓	✓
37.571 OTDOA RF Conformance tests* (TM-LBS-3GPP37.571-1-OTDOA)				✓	✓	✓	✓	✓	✓
CTIA A-GPS OTA Test Pack (TM-LBS-OTA)		✓	✓	✓	✓	✓	✓	✓	
CTIA(v3.2) LTE A-AGPS OTA tests (TP-LBS-LTE-OTA)				✓	✓	✓	✓	✓	
A-GPS Signaling Conformance: Control Plane Test Packs									
34.123 A-GPS SC tests (TM-LBS-3GPP-TS34.123-SIG)	✓	✓	✓	✓	✓	✓			
51.010 A-GPS SC tests (TM-LBS-3GPP-TS51.010-SIG)	✓	✓	✓	✓	✓	✓			
3GPP 37.571-2 LPP Signaling Conformance (TP-LBS-LPP-3GPP-36.571-2)				✓	✓	✓	✓	✓	✓
A-GPS Signaling Conformance: User Plane Test Packs									
OMA SUPLv1.0 ETS (TM-LBS-OMA-SUPL-V1.0)	✓	✓	✓	✓	✓	✓			
OMA SUPL V2.0 ETS Test Pack 1 (TM-LBS-OMA-SUPL-V2.0-TP1)		✓	✓	✓	✓	✓	✓	✓	✓
OMA SUPL V2.0 ETS Test Pack 2 (TM-LBS-OMA-SUPL-V2.0-TP2)		✓	✓	✓	✓	✓	✓	✓	✓
OMA SUPL V2.0 ETS Test Pack 3 (TP-LBS-SUPL-V2.0-TP3-R01)		✓	✓	✓	✓	✓	✓	✓	✓

* Advanced configuration required – includes either GSS8000 or GSS6700 with SimGEN GNSS configuration software (Base configuration – includes GSS6700 and SimReplayplus GNSS configuration software)

** Supported on 8100 Development Library

+ A-600 configuration supports all 8100 Radio Access Test Packs, in addition to all Location Technology Test Packs

++ This platform includes UMTS hardware and software in addition to Spirent's E2010S hardware and LTE software



SPIRENT 8100 MOBILE DEVICE TEST SYSTEM
Location Technology Solution Test Packs

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Platform Options / Test Packs	A400	A750	A500/ A600*	B750U++	B500U++	B600**	B750	B500	B600
PERFORMANCE TESTS									
Spirent Performance Test Packs									
Spirent Performance Tests (TM-LBS-SP-PERF)*		✓	✓	✓	✓	✓	✓	✓	✓
A-GLONASS Test Cases (TP-LBS-AGLO-SP-PERF)*		✓	✓	✓	✓	✓	✓	✓	✓
Spirent LPP A-GPS + OTDOA Hybrid Performance Test Pack (8100-CFG-LBS-LTE-SP-PERF)				✓	✓	✓	✓	✓	✓
Protocol /Signaling Performance Test Packs									
Spirent SUPL-Enhanced Tests (TM-LBS-OMA-SUPL-V1.0-ENH)	✓	✓	✓	✓	✓	✓			
Operator Acceptance Test Packs									
AT&T Cell Redirect Tests (TS-LBS-E911-REDIRECT-ATT)*		✓	✓						
AT&T Performance Test Pack (TS-LBS-2GCP-AGPS-PERF-ATT) (TS-LBS-3GCP-AGPS-PERF-ATT) (TS-LBS-SUPL-REL-ATT)*		✓	✓						
AT&T Advanced SUPL 1.0 Tests (TS-LBS-SUPL v1.0-ADV-ATT)*		✓	✓						
AT&T E911 CSFB Test Pack (TS-LBS-E911-CSFB-ATT)*				✓	✓	✓	✓	✓	✓
AT&T SUPL 2.0 Reliability Test Pack (TS-LBS-SUPL2.0-REL-ATT)*		✓	✓	✓	✓	✓	✓	✓	✓
AT&T 10776 TEST SUITES FOR LPP/A-GPS, LPP/OTDOA & VOLTE E911 (TS-LBS-E911-LPP-ATT-TS1)				✓	✓	✓	✓	✓	✓
T-Mobile 3G Control Plane Tests** (TS-LBS-3G-CP-TMO)*		✓	✓						
T-Mobile A-GPS Service Interaction Tests** (TP-UDL-TMO-SI-R01)*		✓	✓						
T-Mobile CSFB Test Pack (TP-LBS-E911-CSFB-TMO)				✓	✓	✓	✓	✓	✓
T-Mobile SUPL 2.0 Protocol Test Cases (TS-LBS-SUPL2.0-TTCN-TMO)		✓	✓	✓	✓	✓	✓	✓	✓
Verizon LTE Standalone GPS Tests (TP-LBS-LTE-VZW-TP1)*				✓	✓	✓	✓	✓	✓
Verizon LTE Standalone GPS OTA Tests (TP-LBS-LTE-STA-OTA)*				✓	✓	✓	✓	✓	✓
VERIZON SUPL 2.0 Protocol Test Pack (TP-SUPL2.0-CONF-VZW)				✓	✓	✓	✓	✓	✓

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** Supported on 8100 Development Library

+ A-600 configuration supports all 8100 Radio Access Test Packs, in addition to all Location Technology Test Packs

++ This platform includes UMTS hardware and software in addition to Spirent's E2010S hardware and LTE software



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Location Technology Solution Test Packs

Scalability	Benchtop		Full System			Full System			Full System
Platform Options / Test Packs	A400	A750	A500/ A600*	B750U++	B500U++	B600++	B750	B500	B600
Platform Options									
LBS OPEN API (8100-CFG-LBS-OPEN-API)	✓	✓	✓	✓	✓	✓	✓	✓	✓
LBS OTA OPEN API (8100-CFG-LBS-OTA-API)		✓	✓	✓	✓	✓	✓	✓	✓
Predicted Orbits (8100-CFG-LBS-EE1)*		✓	✓	✓	✓	✓	✓	✓	✓
Standalone GPS (8100-CFG-STA-GPS)		✓	✓	✓	✓	✓	✓	✓	✓
A-GNSS Development System (8100-CFG-LBS-ADS)	✓								
CTIA A-GPS OTA Conformance (8100-CFG-LBS-OTA-APP)		✓	✓	✓	✓	✓			
Spirent LTE Performance Test (8100-CFG-LBS-LTE-SP-PERF)*				✓	✓	✓	✓	✓	✓
Enable VoLTE E911 capability in E2010s (Requires 8100-CFG-VoLTE) (8100-CFG-VoLTE-E911)				✓	✓	✓	✓	✓	✓

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TEST PACKS & TEST COVERAGE	
Test Pack	Description
STANDARDS-BASED TESTS	
A-GPS RF Minimum Performance Test Packs	
TM-LBS-3GPP-TS34.171	TS34.171 A-GPS RF minimum performance test pack is validated according to GCF and PTCRB work item requirements. This test pack supports 3GPP TS34.171, covering all 6 test cases: Nominal Accuracy, Coarse Time Sensitivity, Fine Time Sensitivity, Dynamic Range, Multi-path performance and Moving Scenario to test measurement procedures in A-GPS-enabled UEs (FDD mode).
TM-LBS-3GPP-TS51.010-MP	TS51.010-MP A-GPS RF minimum performance test pack is validated according to GCF and PTCRB work item requirements. This test pack supports 3GPP TS51.010, covering all 5 test cases: Nominal Accuracy, Coarse Time Sensitivity, Fine Time Sensitivity, Dynamic Range and Multi-path performance to test measurement procedures for UEs that support A-GPS (FDD mode).
TM-LBS-3GPP-TS34.172	This test pack supports 3GPP TS34.172, covering all 6 test cases: Nominal Accuracy, Coarse Time Sensitivity, Fine Time Sensitivity, Dynamic Range, Multi-path performance and Moving Scenario to test measurement procedures in A-GNSS-enabled UEs (FDD mode).
TM-LBS-3GPP-51.010-AGLO-M	This test pack supports 3GPP TS51.010, covering all 5 test cases: Nominal Accuracy, Coarse Time Sensitivity, Fine Time Sensitivity, Dynamic Range and Multi-path performance to test measurement procedures for UEs that support A-GNSS (FDD mode).
TM-LBS-3GPP37.571-1-AGNSS	This test pack supports 3GPP TS37.571, covering the following A-GNSS test cases: Nominal Accuracy, Coarse Time Sensitivity, Dynamic Range, Multi-path performance to test measurement procedures in A-GPS-enabled UEs (FDD mode).
TM-LBS-3GPP37.571-1-OTDOA	This test pack supports 3GPP TS37.571, covering the following OTDOA test cases: FDD RSTD Measurement Reporting Delay, FDD RSTD Measurement Accuracy.
TM-LBS-OTA	This test pack supports the CTIA test plan, covering A-GPS OTA test cases to calculate TIS, UHIS, and PIGS. Spirent provides fully automatable A-GPS OTA testing solution that supports industry leading OTA Chamber solution providers to support CTIA test cases as recommended by the CTIA validation process.
A-GPS Signaling Conformance: Control Plane Test Packs	
TM-LBS-3GPP-TS34.123-SIG	TS34.123-SIG A-GPS signaling test pack is validated according to GCF and PTCRB work item requirements. This test pack supports 3GPP TS34.123 section 17.2, covering A-GPS and RRC protocol functionality while delivering assistance data in NILR, MOLR, MTLR A-GPS positioning sessions, either using UE-Based or UE-Assisted positioning methods.
TM-LBS-3GPP-TS51.010-SIG	TS51.010-SIG A-GPS signaling test pack is validated according to GCF and PTCRB work item requirements. This test pack supports 3GPP TS34.123 section 70 that covers A-GPS and RRLP protocol functionality while delivering assistance data in NILR, MOLR, MTLR A-GPS positioning sessions either using UE-Based or UE-Assisted positioning methods.

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TEST PACKS & TEST COVERAGE	
Test Pack	Description
PERFORMANCE TESTS	
A-GPS Signaling Conformance: User Plane Test Packs	
TM-LBS-OMA-SUPL-V1.0	OMA-SUPL V1.0 test pack is validated according to GCF and PTCRB work item requirements. This test pack supports all Network Initiated (section 5.1) and Set Initiated test cases (section 5.2) of OMA-ETS-SUPL-V1_0-20090317-C.
TM-LBS-OMA-SUPL-V2.0-TP1	OMA-SUPL-V2.0-TP1 test pack supports 69 new test cases per OMA-ETS-SUPL-V2_0-20090505-D. All 69 test cases are based on the key features of SUPL 2.0 protocol such as “common part”, “single session”, “Triggered services”, “Timer expiry”, “Basic functionality” and “Notification and Verification”. These test cases are written in TTCN and executed in a TTCN based Test Executive: TTCN Work Bench Express.
TM-LBS-OMA-SUPL-V2.0-TP2	OMA-SUPL-V2.0-TP2 test pack supports 64 new test cases per OMA-ETS-SUPL-V2_0-20090505-D. All 64 test cases are based on the key features of SUPL 2.0 protocol such as "common part", "single session", "Triggered services", and "Timer expiry". These test cases are written in TTCN and executed in a TTCN based Test Executive: TTCN Work Bench Express.
Spirent Performance Test Packs	
TS-LBS-SP-PERF	A-GNSS performance test pack is a fully configurable and customizable test pack for A-GPS R&D testing. This test pack provides a generic test template and pre-configured test cases for Control Plane and User Plane A-GPS performance testing, for both 3G and 2G cellular network operating modes. Additional capabilities include support for 34.171 and 51.010 test cases over SUPL protocol.
TP-LBS-SP-AGLO-PERF	A-GLONASS performance test pack includes a configurable test template to create custom A-GLONASS test cases for R&D testing during device development. Configurable test parameters for the GLONASS scenario, position uncertainty, response time and variable assistance data values enable customized A-GLONASS performance testing.
Protocol / Signaling Performance Test Packs	
TM-LBS-OMA-SUPL-V1.0-ENH	SUPL Enhanced test pack enables advanced SUPL v1.0 protocol testing by supporting simulation of adversarial network conditions, session crossovers, conflicting sessions such as Set Initiated session interrupted by Network Initiated sessions. This test pack has several configurable parameters allowing users to create RRC connection reject, PDP Context Accept failures, emulate a delay in sending network messages, emulate corrupted message content, invalid message insertions, fall back positioning, TCP errors and Turn off GPS level randomly to emulate GPS positioning inside tunnels.

TEST PACKS & TEST COVERAGE	
Test Pack	Description
PERFORMANCE TESTS (CONT'D)	
Operator Acceptance Test Suites	
TS-LBS-E911-REDIRECT-ATT	AT&T E911 Cell Redirect test suite emulates an emergency call initiation in a 3G cell while it redirects it to a 2G cell before the call is connected. This test case verifies that the appropriate protocol (RRLP) based on the technology call is established in order to deliver the assistance data to device under test. The pass/fail criteria includes sigma1, sigma2 and response time limit (16sec) as per E911 standards.
TS-LBS-2GCP-AGPS-PERF-ATT	AT&T 2G A-GPS Performance test suite includes 3 test cases emulating a parking garage, deep urban canyon and sub-urban canyon GPS scenarios. Each test case offers 24 hours of testing with unique pass/fail criteria per session, covering 20 sessions per hour. Yield is set with respect to the GPS conditions under emulation, whereas response time limit, sigma1 and sigma2 are the same for all test cases.
TP-LBS-3GCP-AGPS-PERF-ATT	AT&T 3G A-GPS Performance test pack includes 3 test cases emulating parking garage, deep urban canyon, sub-urban canyon GPS scenarios. Each test case has 24 hours with 20 sessions for every hour with unique respective pass/fail criteria. Yield is set with respect to GPS conditions under emulation whereas response time limit, sigma1 and sigma 2 are the same for all test cases.
TS-LBS-SUPL-REL-ATT	AT&T miscellaneous SUPL test suite includes three test cases as described below: 1. Verify auto configuration of H-SLP address when SET-Initiated session is initiated by device under test if there is no H-SLP address stored in UICC or on internal memory of device under test. Pass/Fail Criteria: DUT should display position fix within the 50m horizontal uncertainty. 2. Fallback to standalone GPS positioning if SET Initiated SUPL session establishment fails. Pass/Fail Criteria: DUT should display position fix within the 50m horizontal uncertainty. 3. This test pack tests the UE SUPL stack reliability by emulating 250 NILR sessions, with 100% yield as pass/fail criteria.
TS-LBS-SUPL v1.0-ADV-ATT	AT&T Advanced SUPL v1.0 test suite includes 19 test cases based on Session Priority handling, Adversarial RRLP protocol errors, QoP errors, WAP PUSH and SMS concatenation. In addition to testing the robustness of SUPL stack, these scenarios are designed to test adversarial scenarios usually encountered in real world.
TS-LBS-E911-CSFB-ATT	AT&T E911 CSFB Test Pack includes 4 test cases for E911 test plan with CSFB from band 4/17 to band 2/5 when E911 call placed on LTE Network.
TS-LBS-SUPL2.0-REL-ATT	AT&T SUPL2.0 reliability Test Pack includes 4 new test cases to test SUPL2.0 reliability with Cold Start and Hot Start in LTE and WCDMA.
TS-LBS-3G-CP-TMO	T-Mobile A-GPS control performance test suite includes 5 test cases emulating outdoor, urban, mild indoor, deep indoor and vehicular GPS scenarios. Each test cases emulates 200 GPS sessions with pass/fail criteria set as follows: Yield: 95%; Response Time limit: 24sec; Sigma1: 50m; Sigma2: 150m.
TP-UDL-TMO-SI-R01	T-Mobile service interaction test pack includes 6 test cases for evaluating device functionality to simultaneously support GPS, data and voice services under various mobility conditions such as 3G-3G, 2G-2G, and 3G-2G handover in circuit switch and packet switch modes. Additional services such as FTP download can also be enabled while UE is performing GPS position fix. This test pack is supported by 8100 Development Library. For more details refer to 8100 Development Library data sheet.
TP-LBS-LTE-VZW-TP1	Verizon LTE LBS test pack includes 6 new test cases for evaluating device standalone GPS performance when performing bidirectional LTE data transfer. This test pack covers conducted test mode section of the test plan. Test cases covered in this test pack include GPS Accuracy Test-Tracking Mode-Hot Start, GPS Dynamic Range Test-Tracking Mode-Hot Start, GPS Sensitivity Test-Hot Start, GPS sensitivity Test (without Data Transfer)-Tracking Mode-Hot Start, GPS Acquisition Test-Cold Start, GPS MultiPath Test-Tracking Mode-Hot Start.
TP-LBS-LTE-STA-OTA	Verizon LTE Standalone GPS OTA test pack includes support for the VZW LTE LBS standalone tests.

TEST PACKS & TEST COVERAGE	
Test Pack	Description
PERFORMANCE TESTS (CONT'D)	
Platform Options	
8100-CFG-LBS-OPEN-API	Using the LBS Open API, advanced R&D the customers can design, develop and implement test cases according to their specific requirements. The LBS open API provides dual functionality of offering a low-level API interface to control Spirent equipment, while enabling A-GPS testing. Use case examples for LBS Open API include: - Effect of Bluetooth and WiFi interference on the A-GPS antenna - Advanced OTA methodologies - Integration with test equipment not otherwise supported
8100-CFG-LBS-OTA-API	The platform option provides all required API's specific to testing A-GPS Over-The-Air (OTA). LBS OTA API also enables integration of the Spirent solution with third third-party chambers other than ETS-Lindgren and SATIMO (e.g. Howland), that do not currently offer an integrated support option for Spirent A-GPS OTA solutions.
8100-CFG-LBS-EE1	LBS-EE1 is a new platform option supporting GPS performance testing for GPS chipsets which support Qualcomm's proprietary "predicted orbit" approach. Spirent EE1 software option enables complete automation of predicted orbits testing and helps shorten the test time from a week to just 3-4 hours.
8100-CFG-STA-GPS	STA-GPS enables fully automated approach for standalone GPS testing. Also this platform option provides statistical analysis for key KPI's such as Horizontal Error and Response Time. Fully automated approach is enabled by Spirent UDM/UTS interface implementation between device under test and Test Controller PC.
8100-CFG-LBS-ADS	The A-GNSS Development Solution option provides all required capabilities for A-GPS and A-GLONASS chipset technology development testing. It offers powerful test executive software and supports all industry-standards test cases and assistance/signalling data provided over a generic API interface.
8100-CFG-LBS-OTA-APP	LBS-OTA-APP platform option is the CTIA A-GPS OTA Conformance test and includes OTA drivers and core A-GPS OTA software options that can be integrated with ETS/SATIMO A-GPS OTA solutions. Spirent provides fully automatable A-GPS OTA testing solution in partnership with Industry leading OTA solution providers via 8100-CFG-LBS-OTA-APP. Using EMQuest™/SAM as front end interface LBS-OTA-APP enables all CTIA test cases as recommended by CTIA validation process.
8100-CFG-LBS-LTE-SP-PERF	Spirent LTE Positioning Performance Test option includes support for LTE Location performance testing with SUPL2.0 in LTE with RRLP.

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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