Spirent™
Federal Systems

PNT X
Accelerate & Simplify PNT Testing

Spirent PNT X is a revolutionary positioning, navigation and timing (PNT) simulator that addresses the increasing complexity of the PNT environment. This all-in-one solution generates all GNSS constellations, RF threats, and signals of opportunity available for comprehensive test coverage and realism.

In an era when compromising on PNT performance is not an option, PNT X delivers new patented capabilities, simplified software for configuring complex test scenarios, and critical simulation integrity to ensure trustworthy results.

New Benchmark for Performance

- Unrivaled 2 kHz configurable simulation iteration rate – 2 ms latency in HIL applications
- 100 kHz update rate for spinning vehicles
- Precise simulation of high dynamic motion – up to 350 Mach
- Our highest-ever signal fidelity
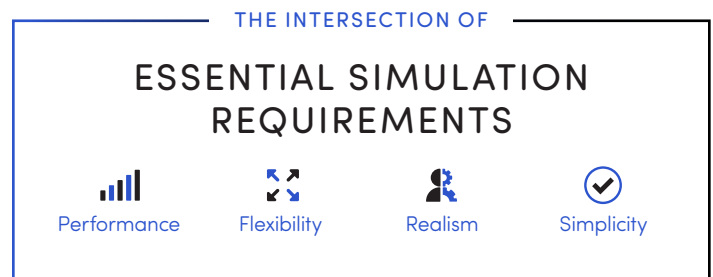- Full signal performance met under all simulation conditions

Flexibility

- Embedded Python IDE to develop software add-ons and automate testing
- Remote control libraries available for different programming languages via gRPC
- On-the-fly reconfiguration of constellations and signals
- Extensive data logging and post-processing tools
- Native signal interference capabilities supporting configurable CW, FM, AM, PM, wideband AWGN, BPSK, CW pulses, Chirp, and matched spectrum
- Support for multiple spoofers with independent noise patterns in a single scenario
- Record or replay I/Q data - and apply patented I/Q spatial awareness for highly realistic I/Q replay

Purpose-designed Hardware

- Dual combined RF output
- 10 individual RF outputs for multi-antenna and multi-vehicle wavefront simulation
- Flexible software-defined hardware architecture for infinite scalability
- Modern approach to signal generation – assuring the right technology for every application
- Optimized in-field upgradability

Precise Models

- 3D environment modeling for real-time obscuration and multipath
- Realistic LEO and MEO orbital models for constellation ephemeris and device-under-test (DUT) trajectories
- Tx and Rx antenna gain and phase patterns
- Configurable ionosphere and troposphere
- Scintillation and solar weather
- High-dynamics vehicle motion
- Coherent inertial sensor simulation
- DGPS corrections

THE INTERSECTION OF

ESSENTIAL SIMULATION REQUIREMENTS

Performance   Flexibility   Realism   Simplicity

Unrivaled test experience and support

- Regional technical support network
- Regular software updates
- Application notes and test methodologies available via online knowledge base
- Test scenario packs
- Professional PNT testing services

Full GNSS Support

Whether testing multi-frequency or multi-constellation receivers, the flexible software-defined architecture of the PNT X is easily configurable to meet all testing needs. Supports enhanced services such as Galileo OSNMA and HAS.

Secure Signals

PNT X supports GPS-Directorate-approved MNSA M-Code, Regional Military Protection (RMP), AES M-Code and server-based SDS M-Code. Galileo FOC authorized testing is supported with PRS and CS signals.

Beyond L-Band

PNT X incorporates S-band radio cards and enhanced realism via I/Q spatial awareness to support existing GNSS regional signals and new PNT signals and applications such as lunar and LEO.

Custom Signal Generation

Easily generate custom waveforms, noise, interference, or non-current ICD SIS at RF using the PNT X flexible signal simulation feature (FLEX) or directly injecting I/Q data (SimIQ).

LEO PNT Models

PNT X includes accurate LEO satellite models that take into account complex gravitational effects and physical properties such as atmospheric drag. Testing signals broadcast to and from LEO satellites has never been so realistic.

Inertial Simulation

PNT X enables performance testing of integrated and embedded GPS/inertial systems (IGIs and EGIs) in the lab. SimINERTIAL provides real-time emulation of inertial sensor outputs, with all inertial and GNSS signals coherently generated to match the simulated vehicle trajectory.

I/Q Spatial Awareness

The new Spirent-patented I/Q spatial awareness capability provides further control over I/Q-defined signals in the scenario, enabling highly realistic NAVWAR jamming and other-sensor simulation.

Spatial awareness superimposes real-time power level and doppler offsets onto I/Q data based on transmitter-to-receiver 3D position.

3D Environment

PNT X introduces embedded 3D environmental modeling, enabling obscuration and multipath effects for all PNT signals and frequencies based on realistic 3D-world models.

Receive real-time visual feedback of dynamic spoofers and jammers in the scenario.

Navigation Warfare

From jamming to spoofing, PNT X offers a broad range of interference signal options to represent an array of threat sources. It also supports noise generation with variable bandwidth and can be configured to support multiple fully independent and dynamic interference sources. PNT X enables unparalleled CRPA testing through precise phase-aligned wavefronts.

Environmental Social & Governance (ESG)

Spirent's Positioning Technology business unit has been committed to ESG good practice and improvement since achieving ISO14001:2015 Environmental Managemental System certification in 2004.

ESG is a priority for Spirent across all aspects of our business, from sustainable buildings and sustainable product design to sustainable supply chain, manufacturing and shipping/export processes. As is best practice, we follow a continuous improvement process in respect of ESG.

Many of Spirent's test solutions rely on physical test equipment used in situ by our customers. We are working to reduce the lifecycle impacts of our products, and the environments in which they are used, in a number of ways:

- Designing for environment and end of life, including compliance with all legal requirements;
- Reducing the size, weight, noise and power use of our products;
- Visualization and the development of Test-as-a-Service via PNT Professional Services;
- Improving utilization and automation; and
- In-field servicing and upgrades.

We use formal sustainability metrics in the product development process.

For more specific information on how ESG applies to our PNT test solutions, please contact your Spirent representative. For more information on Spirent initiatives, visit corporate.spirent.com/sustainability.

About Spirent Positioning Technology

Spirent enables innovation and development in the GNSS (global navigation satellite system) and additional PNT (positioning, navigation and timing) technologies that are increasingly influencing our lives.

Our clients promise superior performance to their customers. By providing comprehensive and tailored test and assurance solutions, Spirent assures that our clients fulfill that promise.

Why Spirent?

Across five decades Spirent has brought unrivaled power, control and precision to positioning, navigation and timing technology. Spirent is trusted by the leading developers across all segments to consult and deliver on innovative solutions, using the highest quality dedicated hardware and the most flexible and intuitive software on the market.

Spirent delivers

- Ground-breaking features proven to perform
- Flexible and customizable SDR technology for future-proofed test capabilities
- World-leading innovation, redefining industry expectations
- First-to-market with new signals and ICDs
- Signals built from first principles — giving the reliable and precise truth data you need
- Unrivaled investment in customer-focused R&D
- A global customer support network with established experts

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**

US Government/Defense
+1-801-785-1448
info@spirentfederal.com

Americas 1-800-SPIRENT
+1-800-774-7368
sales@spirent.com

Europe and the Middle East
+44 (0) 1293 767979
emeainfo@spirent.com

Asia and the Pacific
+86-10-8518-2539
salesasia@spirent.com