BROCHURE

PNT Xe

Easy-to-use, economical,
lab-to-field PNT simulator

SPECIAL PREVIEW
Launching October 2025
Specifications Subject to Change

Spirent™
Federal Systems

BROCHURE
Spirent Federal Systems

PNT Xe

Easy-to-use, Economical PNT Simulator Expands Testing Throughout Development, Verification, and Production

- GPS M-Code capability with unclassified AES-M
- Workflow-based interface shortens learning curve
- RF integrity and trusted results for any budget
- Agile testing for rapid iterations & deployment

Key Features at a Glance

PNT Xe produces high-fidelity GNSS signals via a single combined RF output to the device under test (DUT).

- All global and regional GNSS constellations supported
- Single or dual-frequency testing
- Unclassified military signals with GPS AES M-Code and P-Code
- Options for jamming and live-sky injection testing for spoofing
- 2U, low SWaP-C portable platform with an embedded controller for use in a rack, on a desktop, or in the field

Scale Operations and Efficiency

CHALLENGE:

Large, advanced simulation systems are in high demand and often fully booked, leaving many engineers without timely access. Teams need a user- and budget-friendly test platform to increase opportunities to test, without compromising RF quality.

SOLUTION:

PNT Xe brings high-fidelity simulation to more engineers in more project phases. Its targeted software provides the capabilities needed, while reducing costs to meet efficiency initiatives.

The **Scenario Assistant** workflow simplifies and speeds up test scenario creation and modification:

- Helps new team members or novice users onboard quickly, saving time and resources—no simulation expertise required
- Minimizes the risk of human error for meaningful and accurate test results

No more coordinating schedules around a limited number of lab simulators. With PNT Xe, every engineer can run tests directly from their own desk.

Why Choose PNT Xe?

PNT Xe is built on the same proven architecture as Spirent Federal's flagship system, PNT X, and runs on SimGEN®, the industry's most trusted simulation engine, delivered through a streamlined, user-friendly interface tailored for efficient test execution.

- Across 5 decades, Spirent has set the standard for precision and reliability.
- The world's leading PNT systems are designed and verified using Spirent.
- Testing with PNT Xe guarantees alignment with the same test conditions, models, scenarios, and pass/fail criteria.
- The result is a seamless ecosystem for consistent test standards.

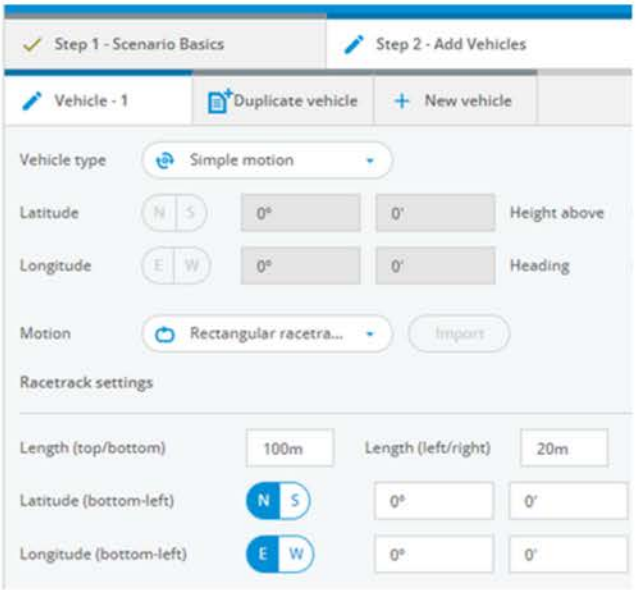

Figure 1. The Scenario Assistant creates scenarios from scratch or quickly and easily modifies existing scenarios

GPS M-Code for Authorized Users

CHALLENGE:

Modernizing military GPS systems to use encrypted signals such as M-Code may present logistical and operational challenges. Typically, integrating these signals required access to secure, classified lab environments. This restriction could slow development and increase costs.

SOLUTION:

PNT Xe makes M-Code testing accessible.

- By enabling in-house emulation of AES-encrypted M-Code and P-Code in unclassified environments, it eliminates the need for secure lab access.
- This shift reduces logistical complexity and empowers authorized teams to perform early-stage testing and validation more efficiently, accelerating development.

Accelerate Development Cycle

CHALLENGE:

Development teams require rapid, actionable feedback on incremental changes to keep pace with ambitious milestones and delivery goals.

SOLUTION:

PNT Xe is ideal for agile development environments.

- It streamlines the entire testing workflow—making it easy to generate, customize, automate, reuse, and share test scenarios for faster iteration and broader test coverage across multiple phases of testing.
- PNT Xe empowers teams to test even minor code changes with precision and speed. It supports agile continuous integration by delivering immediate feedback. Developers can identify and resolve issues earlier in the development cycle leading to less rework and a more resilient product.

Figure 2. PNT Xe simulator

Range-ready Hardware

PNT Xe is a compact, single-unit system with an embedded controller. Engineered for field and range deployment, it is MIL-STD-810H compliant for ground vehicle vibration and operates reliably from 0°C to +50°C. It supports one RF output and two software-defined radio (SDR) cards.

Each SDR card can be configured to generate up to 64 channels of any signal type within one of four frequency bands. Multiple constellations can be generated within a single SDR card, as long as they operate within the same frequency band.

Table 1. Signals grouped by frequency band

1561.098 - 1601.719 MHz	1202.025 - 1248.06 MHz	1176.45-1191.795 MHz	1268.52 - 1278.75 MHz
GPS L1 (C/A, C, P, AES-M) SBAS L1 Galileo E1 GLONASS FDMA L1 GLONASS CDMA L1OC BeiDou B1I BeiDou B1C QZSS L1 NavIC L1	GPS L2 (C, P, AES-M) GLONASS FDMA L2 GLONASS CDMA L2OC GLONASS CDMA L3OC BeiDou B2I BeiDou B2b QZSS L2	GPS L5 SBAS L5 Galileo E5 BeiDou B2a NavIC L5 QZSS L5	Galileo E6 BeiDou B3I QZSS L6

Single-box Solution Powered by SimGEN

PNT Xe is driven by SimGEN, the leading PNT simulation engine. The user interface has been simplified for targeted development and verification testing. Spirent's precise constellation and navigation modeling is built-in, including SimROUTE, a trajectory generation tool using Google Maps® or Open Street Maps.

Automation

- **Remote Control**. PNT Xe can be controlled via GUI or remote commands. Commands are formatted according to Spirent's SimREMOTE ICD and are sent via TCP/IP.
- **Spyder API using Python**. The open source Python development environment can more quickly and easily automate your test system, create software add-ons, and control the system remotely from another PC or simulator, saving time and resources.

Single Channel Utility (SCU)

PNT Xe supports the generation of a single channel satellite signal—ideal for testing where single satellite control is required.

Licensable Software Features

Feature	Description
SimMCODE	Unclassified GPS AES M-Code for authorized users only
Remote Vehicle	External injection of 6DoF motion data: commands streamed in as trajectory
NMEA Output	Output NMEA data for post-processing comparison with the receiver's NMEA
Data Streaming	Stream vehicle or satellite information to an IP address for real time analysis
RTCM Corrections	Improves the location accuracy for the simulated vehicle

Interoperability

PNT X users can generate compatible PNT Xe scenarios for backwards and forwards interoperability.

Jamming and Spoofing Extensions

The following hardware can be used with PNT Xe.

In-field Spoofing Resilience Testing

- **Live-sky Signals + Injected Spoofing with Standpoint**
- Synchronize real satellite signals and simulated for in-field spoofing.
- Traditional spoofing techniques rely on radiated signals that require special licenses and approvals.
- Injected spoofing is more controlled. PNT Xe feeds spoofed signals directly to the DUT via the RF output, while the DUT continues to track live GNSS signals.
- By synchronizing live and simulated signals, PNT Xe with Standpoint enables highly-realistic spoofing scenarios in operational conditions.
- It also enables receivers to integrate from live sky into an anechoic chamber without disruption.

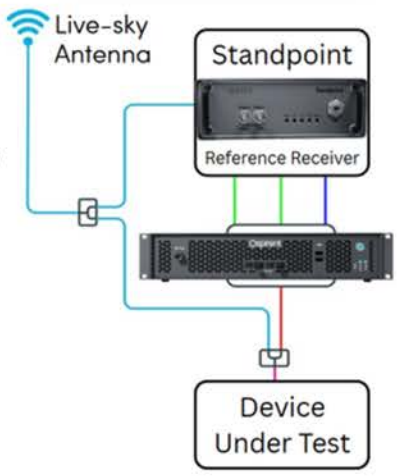

Figure 3. Standpoint with PNT Xe

Jamming Signals

Spirent GSS7765 Interference Generator provides a comprehensive solution for testing in the presence of intentional or unintentional RF interference. Seamless integration with PNT Xe ensures full control over jamming signal dynamics.

GSS7765 supports a broad range of interfering signal types, including Continuous Wave (CW), AM, and FM (pulsed signals also available). It also supports noise generation with variable bandwidth.

Field Upgradable

PNT Xe supports in-field upgrades for future scalability, including:

- In-field hardware upgrades for additional RF SDR card (maximum of 2)
- Software feature keys to enable additional GNSS

PNT Xe and PNT X Comparison Table

System Capabilities	PNT Xe	PNT X
Max Purpose-built SDR Cards	2	10
Max Channels (Each channel can generate multiple signals for one satellite at one frequency, e.g., a L1 channel could create L1C/A, L1C, L1P(Y), and L1M signals.)	128	640
Supported Constellations and Frequencies	All	All
Max Number of Frequencies at One Time	2	4 + S-band
Number of RF Outputs / Antennas	1	10

Encrypted Military Signals	PNT Xe	PNT X
Max Secure Channels	32	320
GPS AES M-Code and P-Code	✓	✓
Full Suite of Secure Military Signals for GPS and Galileo	No	✓

NAVWAR	PNT Xe	PNT X
Embedded Jamming and Spoofing	No	✓
Compatible with External Interference Generator, GSS7765	✓	✓
Live-sky + Injected Spoofing Signals with Standpoint	✓	✓
CRPA, Wavefront and Anechoic Chamber	No	✓

Complementary Signals and Sensors	PNT Xe	PNT X
Inertial Navigation Systems	No	✓
LEO Constellations and ALTNAV	No	✓
Custom Signal Generation	No	✓

Size, Weight, and Power	PNT Xe	PNT X
Dimensions (Height x Width x Depth)	2U Chassis Only: 88.1 x 448.7 x 495.5 mm (3.47 x 17.66 x 19.51 in) With Rackmount Ears + Ports: 88.1 x 482.6 x 513 mm (3.47 x 19.00 x 20.20 in)	4U for Signal Generator + 4U for C50 X Controller Combined units: ~ 354 x 486.8 x 665.8 mm (~ 14 x 19.17 x 26.22 in)
Weight (Configuration Dependent)	<15 kg (33 lbs)	Combined units: <50.7 kg (111.7 lbs)
Power	100-240V 5A Max 50 to 60 Hz	100-240 V 9A Max 50 to 60 Hz
Ruggedized	Yes – Compliant with MIL-STD-810H Vibration in Ground Vehicle & Operating Range from 0°C to +50°C (32°F to 122°F)	No

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**.

Ordering Information

Available to Order from Spirent Federal Systems

- info@spirentfederal.com
- 801-785-1448

PNT Xe Part Numbers

- PNT Xe and associated products are commercial-off-the-shelf (COTS) products.
- **Due to PNT Xe's flexibility and wide range of use cases, there are several COTS options to fit your test needs.**
- Please contact us to determine which options will work best for you.

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.

About Spirent Federal Systems

Spirent Federal Systems provides the world's leading PNT test solutions to the US Government and contractors to enable resilient PNT under any conditions and outpace evolving navigation warfare threats. As a US proxy company, Spirent Federal enhances Spirent's commercial offerings with classified and other sensitive military signal emulation capabilities. For more information, visit **spirentfederal.com**.

ISO 9001 ISO 14001 ISO 27001 ISO 45001 INVESTORS IN PEOPLE We invest in people Platinum ilac-MRA A2LA ACCREDITED CERT #3144.02 JOSCAR REGISTERED

Issue 1-01 08/25

spirent Federal Systems