



## Standpoint

Live sky synchronisation solution  
for Spirent GNSS Simulators



# Spirent Standpoint

---

## Purpose of this Document

This datasheet describes the functionality of Spirent Standpoint, a live sky synchronisation solution for Spirent GNSS simulators. This datasheet also provides technical data and configuration information.

**Please, speak to your Spirent sales representative before ordering to ensure your specific needs are met.**

### PROPRIETARY INFORMATION

THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE PROPERTY OF SPIRENT COMMUNICATIONS PLC. EXCEPT AS SPECIFICALLY AUTHORISED IN WRITING BY SPIRENT COMMUNICATIONS PLC, THE HOLDER OF THIS DOCUMENT SHALL KEEP ALL INFORMATION CONTAINED HEREIN CONFIDENTIAL AND SHALL PROTECT SAME IN WHOLE OR IN PART FROM DISCLOSURE AND DISSEMINATION TO ALL THIRD PARTIES TO THE SAME DEGREE IT PROTECTS ITS OWN CONFIDENTIAL INFORMATION.

© COPYRIGHT SPIRENT COMMUNICATIONS PLC 2023 - 2023

The ownership of all other registered trademarks used in this document is duly acknowledged.

## Table of Contents

|                                                        |   |
|--------------------------------------------------------|---|
| Purpose of this Document .....                         | 2 |
| Introduction .....                                     | 4 |
| Standpoint Solution Overview.....                      | 4 |
| Live sky synchronisation of PosApp.....                | 4 |
| Standpoint Software Utility.....                       | 5 |
| Detailed Performance Specification.....                | 6 |
| Related Brochures, Data Sheets and Specifications..... | 7 |
| Glossary of Terms.....                                 | 7 |
| For more information .....                             | 8 |

## List of Tables

|                                                           |   |
|-----------------------------------------------------------|---|
| Table 1: General Specifications.....                      | 6 |
| Table 2: Standpoint Reference Receiver Connectivity ..... | 6 |
| Table 3: Physical and Environmental Properties.....       | 6 |
| Table 4: Safety and EMC Compliance .....                  | 7 |
| Table 5: Related Product References .....                 | 7 |

## List of Figures

|                                                                    |   |
|--------------------------------------------------------------------|---|
| Figure 1: Standpoint illustrative setup with Spirent GSS7000 ..... | 4 |
| Figure 2: Standpoint software utility.....                         | 5 |

# Spirent Standpoint

## Introduction

GNSS simulators are used in many labs around the world to develop and test robust positioning, navigation, and timing systems. Unlike live testing, testing with simulators provides full control of the simulated satellite signals and the simulated environmental conditions, including scenarios for any location around the world or in space, with different times in the past, present, or future.

In some applications, there is a need to precisely synchronise the simulation time and/or the orbital parameters with the live sky GNSS time and ephemeris.

This is often the case when testing connected devices or automotive infotainment systems where the DUT is using a live timing input from other sources, such as cellular assistance data.

Other applications include cases where cold starting a receiver is not possible or desired. The first step when connecting any DUT to a GNSS simulator is usually to cold start the GNSS receiver. This clears position, time, almanac, and ephemeris from the module's memory, otherwise the DUT will fail or take significant time to track the signals from the simulators. Live sky synchronisation removes the need to cold start the receiver, allowing seamless transition of the DUT from a live sky environment to a lab environment.

Finally, live sky synchronisation can be used for realistic spoofing testing. This is accomplished by sending to the DUT authentic live sky signals combined with matching spoofing signals generated by the simulator. Spoofing tests carried out in this manner are more realistic compared to coupling two synthetic signals generated by a simulator, but they are also more complex to set up. Standpoint replies to that challenge by allowing precise synchronisation of the simulated spoofing signals with live sky.

## Standpoint Solution Overview

Spirent Standpoint solution comprises two key components: the Standpoint Reference Receiver and the Standpoint Software utility. The Standpoint Reference Receiver (hardware) is responsible for the acquisition of the live sky GNSS signals from an active antenna (provided), the synchronisation of the Spirent GNSS simulator via a 1PPS and a 10 MHz signals, and for passing the live sky ephemeris data to the Spirent GNSS simulator via a USB connection. Optionally, the live sky GNSS signal can be fed to the GNSS simulator for internal combination with the synchronised simulated signal (e.g., for spoofing testing). The Standpoint software utility is used to control the Standpoint Reference Receiver and communicate with PosApp.

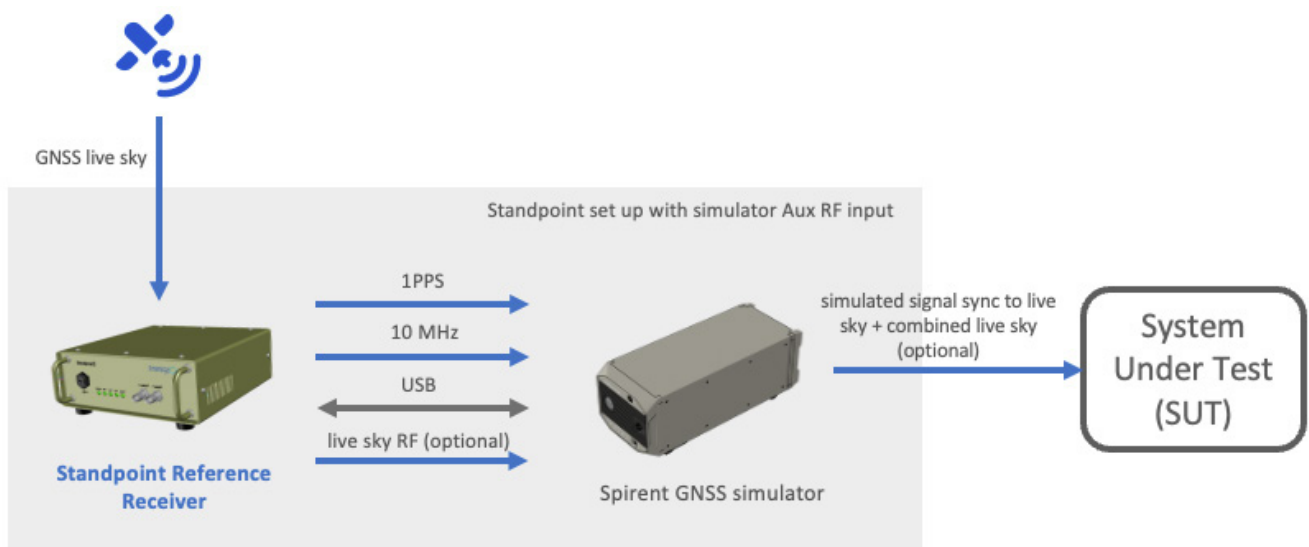


Figure 1: Standpoint illustrative setup with Spirent GSS7000

## Live sky synchronisation of PosApp

To sync PosApp with live sky, Standpoint passes RINEX data to PosApp then arms the scenario with a start time in advance (nominally 60s) of current live sky time. It will then send a run command at the correct time to ensure simulation and live sky time are aligned at the nano second level. With the correct configuration, the system is capable of synchronising to live sky with an accuracy of 50ns. The Standpoint solution can provide timing and orbital data for all four GNSS constellations (GPS, Galileo, BeiDou and GLONASS) seamlessly.

## Standpoint Software Utility

The Standpoint software utility is a web service application that allows users to interact with Standpoint via a standard web browser. It receives raw data (RINEX) from the GNSS receiver serial port and trigger the scenario start in PosApp via SimREMOTE, Spirent's remote-control interface.

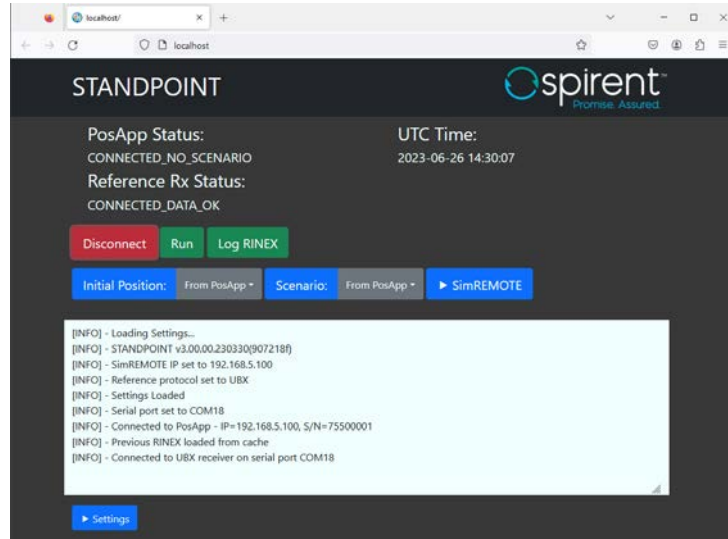


Figure 2: Standpoint software utility

Some of Standpoint software utility features include:

- Connection of the Standpoint reference receiver to the Spirent GNSS simulator, GSS7000 or GSS9000
- Synchronisation of PosApp scenario time and ephemeris with live sky
- Supported on SimGEN, SimREPLAY+ and SimTEST
- Load scenario in PosApp
- Change the initial position in the PosApp scenario
- Automatically populate satellite data in PosApp with logged RINEX data from the Standpoint reference receiver
- Web based and runs on the simulator's controller or a remote computer

## Detailed Performance Specification

Table 1: General Specifications

| Parameter                                 | Supported Values                                                                                                                                                   |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Synchronisation accuracy                  | < 50ns                                                                                                                                                             |
| Supported GNSS constellations and signals | GPS L1 C/A & L2C<br>GLONASS L1OF & L2OF<br>GALILEO E1BC & E5b<br>BEIDOU B1I or B1C & B2I<br>QZSS L1 C/A & L2C                                                      |
| Environment of operation                  | Reference Receiver must be static                                                                                                                                  |
| GNSS antenna                              | A default antenna is provided.<br>Recommended RF specifications are provided for the use of a different antenna and external RF combiner (both customer supplied). |

Table 2: Standpoint Reference Receiver Connectivity

| Port (Position)        | Type   | Parameter                                                                                                           |
|------------------------|--------|---------------------------------------------------------------------------------------------------------------------|
| GNSS Antenna in (REAR) | Input  | N-type coax female, 50 Ohm, VSWR <1.5:1<br>DC bias +3.3V DC (open circuit), 110mA current limit, Maximum RF +13 dBm |
| RF Out (REAR)          | Output | N-type coax female, 50 Ohm, VSWR <1.2:1<br>AC coupled $\pm 50$ V DC, maximum reverse RF +30 dBm                     |
| Mains Input (REAR)     | Input  |                                                                                                                     |
| Pulse 1 (REAR)         | Output | 1PPS BNC coax socket, 50 Ohm, 3.3V TTL level compatible, 30% duty cycle.                                            |
| Pulse 2 (REAR)         | Output | 10MHz BNC coax socket, 50 Ohm, 3.3V TTL level compatible, 50% duty cycle.                                           |
| Pulse 1 (FRONT)        | Output | 1PPS BNC coax socket, 50 Ohm, 3.3V TTL level compatible, 30% duty cycle                                             |
| Pulse 2 (FRONT)        | Output | 10MHz BNC coax socket, 50 Ohm, 3.3V TTL level compatible, 50% duty cycle                                            |
| USB (FRONT)            | I/O    |                                                                                                                     |
| USB (REAR)             | I/O    |                                                                                                                     |

Table 3: Physical and Environmental Properties

| Parameter             | Value                                       |
|-----------------------|---------------------------------------------|
| Height                | 78 mm                                       |
| Width                 | 220 mm                                      |
| Depth                 | 227 mm (Not including front & rear handles) |
| Typical Weight        | 1.66 kg                                     |
| Operating Environment | +10 to +40°C (50 to 104°F)                  |
| Storage Environment   | -40 to +60°C (-90 to 140°F)                 |
| Electrical Power      | 100-240V<br>0.45 A MAX<br>50 to 60Hz        |

## Note(s):

Physical and Environmental Properties such as the Operating and Storage Environments apply to the Standpoint Reference Receiver only. Associated equipment or other Spirent supplied equipment may not extend to these environmental limits.

Table 4: Safety and EMC Compliance

The product complies with the requirements of the Low Voltage Directive (LVD) 2014/35/EU as amended, and the EMC Directive 2014/30/EU as amended.

| Compliance | Applicable Standard                                                                                                       |
|------------|---------------------------------------------------------------------------------------------------------------------------|
| Safety     | IEC 62368-1:2014 (Second Edition) Audio/video, information, and communication technology equipment                        |
| EMC        | EN 61326-1:2013 Electrical equipment for measurement, control, and laboratory use. EMC requirements. General requirements |

## Related Brochures, Data Sheets and Specifications

Table 5: Related Product References

| Related Product | Description                                 | Data Sheet / Specification |
|-----------------|---------------------------------------------|----------------------------|
| SimGEN          | GNSS Software Suite                         | MS3008                     |
| SimREMOTE       | Simulator Remote Control Additional Options | MS3015                     |
| GSS9000         | GSS9000 Constellation Simulator             | MS9000                     |
| GSS7000         | GSS7000 Constellation Simulator             | MS7000                     |

## Glossary of Terms

|       |                                          |
|-------|------------------------------------------|
| 1PPS  | One Pulse-Per-Second                     |
| EMC   | Electromagnetic Compatibility            |
| GPS   | Global Positioning System US GNSS system |
| GNSS  | Global Navigation Satellite System       |
| GUI   | Graphical User Interface                 |
| ICD   | Interface Control Document               |
| RF    | Radio Frequency                          |
| RINEX | Receiver Independent Exchange format     |
| SUT   | System Under Test                        |

## Spirent Standpoint

---

### For more information

For more information on any aspect of Standpoint, please contact your Spirent representative or Spirent directly:

#### **Spirent Communications plc**

Address: Aspen Way, Paignton, Devon TQ4 7QR, UK

Telephone: +44 1803 546325

E-mail: [globalsales@spirent.com](mailto:globalsales@spirent.com)

Website: [www.spirent.com](http://www.spirent.com)

#### **US Government & Defence, Spirent Federal Systems Inc,**

Address: 1402 W. State Road, Pleasant Grove, UT 84062

Telephone: +1 801 785 1448

E-mail: [info@spirentfederal.com](mailto:info@spirentfederal.com)

Website: [www.spirentfederal.com](http://www.spirentfederal.com)



Americas

Europe

Asia

## 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 solutions, Spirent assures that our clients fulfill that promise.

## Why Spirent?

Over 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 systems 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



INVESTORS IN PEOPLE  
We invest in people Platinum



## 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](http://www.spirent.com)

Americas 1-800-SPIRENT  
+1-800-774-7368  
[sales@spirent.com](mailto:sales@spirent.com)

US Government & Defense  
[info@spirentfederal.com](mailto:info@spirentfederal.com)  
[spirentfederal.com](http://spirentfederal.com)

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

Asia and the Pacific  
+86-10-8518-2539  
[salesasia@spirent.com](mailto:salesasia@spirent.com)