GPS/GNSS Simulator

NavX®-NCS Professional Simulators
Flexibility | Scalability | Usability

Turning our test expertise into your success.

IFEN’s Multi-GNSS, Multi-Frequency and Multi-RF Output Simulators are pushing the boundary in flexibility, scalability and usability.
Features
Scalability & Flexibility
- 12 to 108 signal channels (up to 9 MERLIN simulation engines)
- Optional internal noise generator
- Free mapping of MERLIN modules to constellations / frequencies
- Extension of signal capability by software license

Connectivity
- Remote control capability via Ethernet control interface
- 1 PPS in and 10 MHz reference in / out
- External event trigger input

Usability and Control
- Advanced graphical user interface (GUI) for scenario definition, simulation configuration and control
- Intuitive operation allows easy modification of variables from preset defaults
- Full constellation, user and vehicle motion control
- Flexible user trajectory generation (pre-defined, from file, via editor or remote motion data)
- Data logging to a file during scenario run-time for analysis (RINEX navigation & observation, navigation run-time for analysis)
- Remote motion data / Hardware in the Loop

Comprehensive Simulation
- Space and user segment
- Extensive signal propagation modelling (multipath, ionosphere, troposphere, terrain)
- Antenna patterns
- Differential GNSS corrections

Benefits
- Ready for Today – Prepared for Tomorrow
With up to 108 signal channels, current multi-GNSS receivers can be tested with just one NavX®-NCS Professional. For more demanding applications with up to 216 signal channels two NavX®-NCS Professional devices can easily be synchronized.

- Future-Proof Investment
The NavX®-NCS Professional hardware can generate all existing GNSS signals including the already available Galileo, Beidou-2 and IRNSS signals and also cope with modulation and signal structures yet to be developed. Thus, the NavX®-NCS Professional is an assured investment for years to come.

- Custom Made ... for You
You can configure the NavX®-NCS Professional with just what you require today. No need to be tied to features you may never need. Add new capabilities as your testing requirements grow.

- No Testing Down-Time
Because we know that time is money the NavX®-NCS Professional can, unlike other existing simulators, be quickly and simply upgraded by a software license. No need to send your simulator back to us. Tell us what you need, and in a matter of minutes you’ll be up and running with a new GNSS system, frequency option, etc.

- Unique RF Output Structure
As an option up to 4 fully independent but also phaseable RF outputs can be installed. Today or subsequently, along with your requirements. The (possibly fifth) original output delivers a monitor RF signal that summarizes all others.

- Remote Motion Data / Hardware in the Loop
The high-performance signal generation empowers 6 degrees of freedom (6DOF) Remote Motion Data streaming in real-time. NavX-NCS’s interface is therefore fully capable of Hardware in the Loop (HIL) applications.

Applications
Discover the perfect test solution for all types of GNSS applications. The innovative multi-constellation / multi-frequency simulation capability in combination with the Multi-RF output option sets new standards in the field of GNSS simulation. Designed to deliver maximum flexibility, users are no longer faced with limitations.

- Dual-RF Output Applications
  - Antenna Diversity
  - Heading Determination
  - Differential GNSS
  - Dual Tracking

- Multi-RF Output Applications
  - Attitude Determination
  - Formation Flying
  - Radio Occultation (RO) and Precise Orbit Determination (POD)
  - CRPA Applications
    - Multiple antenna beam array measurements with 6 antennas for multipath mitigation, signal interference suppression, anti-spoofing and more.
    - You need more than 4 antennas for your sophisticated CRPA application? Ask us for a solution.
### Signal Specifications

#### Frequency Bands

<table>
<thead>
<tr>
<th>Band</th>
<th>Frequency (MHz)</th>
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<tbody>
<tr>
<td>GPS L1</td>
<td>1,575.42</td>
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<tr>
<td>GPS L2</td>
<td>1,227.60</td>
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<tr>
<td>GPS L5</td>
<td>1,176.45</td>
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<tr>
<td>Galileo E1</td>
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<tr>
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<td>Galileo E6</td>
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<tr>
<td>SBAS L5</td>
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</tbody>
</table>

#### Modulation Schemes

- BPSK, QPSK, BOC, CBOC, FDMA
- AltBOC, Tri-Phase Interplex (CASM)

#### Signal Propagation

- Definition of terrain obstructions
- Configuration of various multipath scenarios
- Definition of tropospheric and ionospheric influences

#### Signal Accuracy

- Pseudorange: < 1.0 mm RMS
- Pseudorange rate: < 1.0 mm/s RMS
- Interchannel bias: zero
- Intermodulation bias: ± 1.0 ns

#### Signal Quality

- Spurious (max.): < -70 dBc
- Harmonics (max.): < -40 dBc
- Phase noise (max.): 0.005 rad RMS
- Frequency stability (24h): ± 5 × 10^-10

#### Nominal RF Signal Levels

- RF signal output (max.): -90 dBm
- RF signal output (min.): -170 dBm
- RF monitoring port: -40 dBm

#### Signal Level Control

- Dynamic Range: 80.0 dB
- Resolution: 0.1 dB
- Accuracy: ± 0.1 dB RSS

#### Internal Noise Generator (Optional)

- Noise Level (max.): -110.0 dBm
- Noise Level (min.): -174.0 dBm
- Resolution: 0.1 dB
- Accuracy: ± 0.1 dB

### Hardware Features

#### Input Interfaces

- Power supply: 85 – 264 VAC, 40-70 Hz
- Ethernet control: RJ45
- 10 MHz reference (sine wave): BNC
- Hardware trigger input: BNC

#### Output Interfaces

- 1 - 5 RF signal outputs (front side): N
- RF monitoring port (rear panel): SMA
- 10 MHz reference (sine wave): BNC
- 1 Pulse Per Second (1 PPS): BNC

#### Plug-In Signal Generation Engines

- MERLIN up to 9 modules
- Channels per engine: 12

#### Physical Parameters Simulator Chassis

- Mounting: 19” rack mounting, 2 HU
- Size (H x W x D): 86 x 483 x 570 mm (3.4” x 19” x 22.6”)
- Weight: < 10 kg (< 31 lbs)
- Power consumption: < 120 W
- Operating Temperature: +10° to +55° C
- Storage Temperature: -40° to -70° C

#### Controller PC

- Controller PC HW: INTEL based
- Operating System: MS Windows® 7
- Control SW: NCS Control Center
For All Your GPS/GNSS Test Needs
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