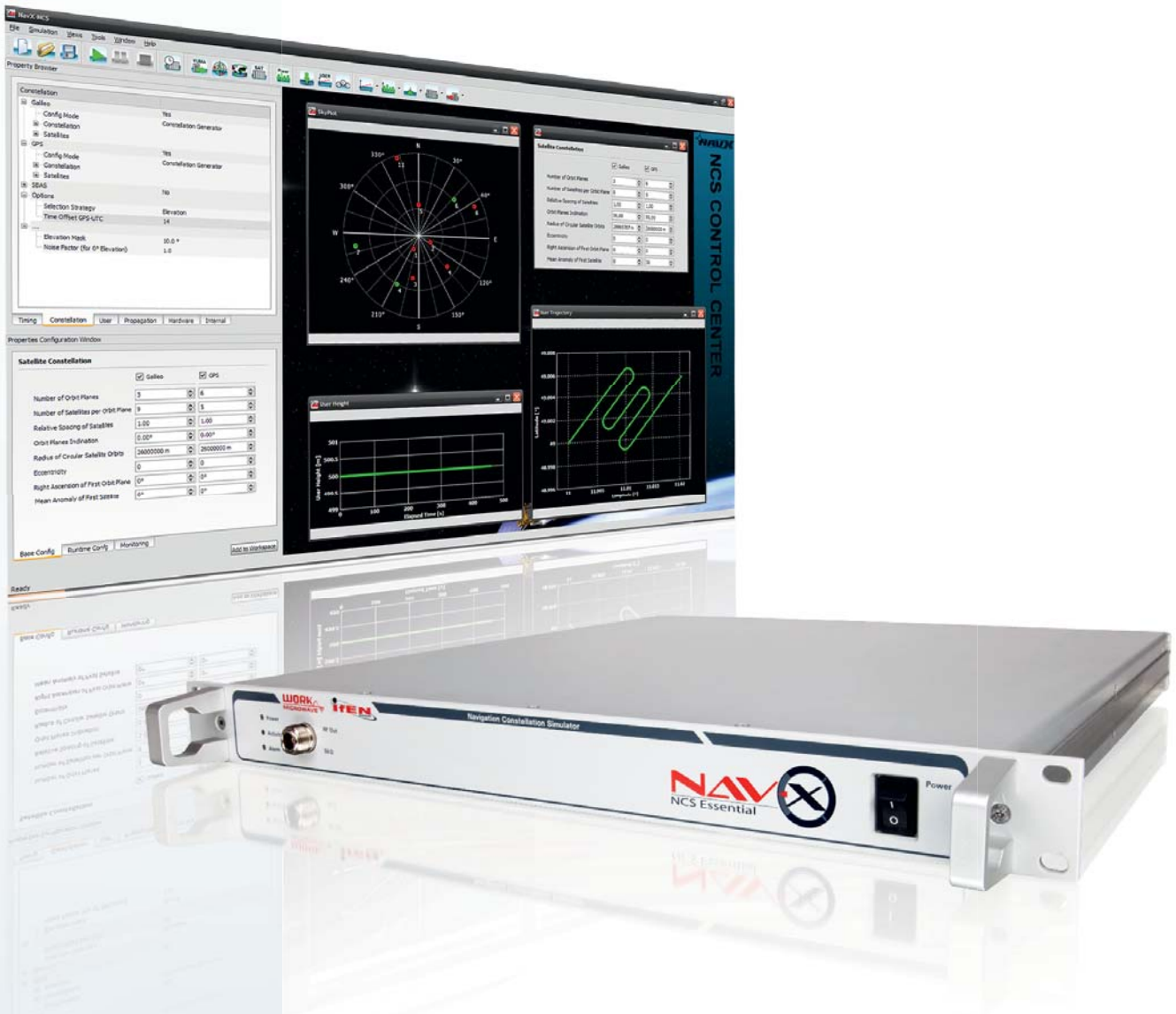
NavX®-NCS Essential

Data Sheet | August 2011



Multi-GNSS L1 RF Signal Generator

The new 'Standard' for research & development, system integration and production testing for consumer navigation equipment. Your future-proof investment in the leading edge test solution.

Multi-GNSS Platform	Coherent GPS L1, Galileo E1, GLONASS G1, QZSS L1 and SBAS signals
Flexible Capability Licensing	Extend your GNSS capabilities by simple SW licensing
Modular HW Plug-Ins	Scalable from 13 to 42 signal channels according to your needs
BLACK JACK Technology	Combine different GNSS signals within one BLACK JACK module

Made in Germany

In co-operation with WORK MICROWAVE and IFEN GmbH

NavX®-NCS Essential

RF Simulation Test Environment for all Consumer GNSS Signals

Features

Multi-GNSS Capabilities

- GPS L1
- Galileo E1
- GLONASS G1
- QZSS L1
- SBAS (WAAS, EGNOS, MSAS, GAGAN)

Scalability & Flexibility

- 13 - 42 signal channels (up to 2 BLACK JACK modules)
- Free mapping of channels to modulations and GNSSs by software configuration
- Extension of capability by SW license

Connectivity

- Remote control capability
- 1 PPS out
- 10 MHz reference in

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 and user control
- Flexible user trajectory generation (pre-defined, from file or via editor)
- Data logging to a file during scenario run-time for analysis
- Start on external trigger

Comprehensive Simulation

- Space and user segment
- Extensive signal propagation modelling (multipath, ionosphere, troposphere, terrain)
- 3GPP and 3GPP2 A-GNSS (A-GPS) performance test case support
- Automotive package available

The NavX®-NCS Essential has been designed to fully meet the requirements of single-frequency, multi-constellation GNSS (GPS, GLONASS, GALILEO, QZSS, SBAS and beyond) for system integration and production testing for high volume applications using the L1 / G1 / E1 frequencies.

The NavX®-NCS Essential, with its powerful executive software, is the leader in GPS, A-GPS, LBS and vehicle navigation testing, providing unique capabilities, like the emulation of various vehicle motion sensors for today's multi-sensor vehicle navigation systems.

Integration with Google Earth™ (for accurate trajectory visualisation), superior high dynamic range (for best-in-class indoor and urban canyon simulation) and A-GPS (A-GNSS) performance test case support come as standard.

Unlike other GNSS simulators, the NavX®-NCS gives you full control on scenario generation. Full GNSS simulation power just a few clicks away!

Benefits

▶ Ready for Today – Prepared for Tomorrow

With up to 42 simultaneous signal channels, the NavX®-NCS is prepared for today's GPS testing, but also for upcoming next generation GNSS systems including the simultaneous simulation of GPS, GLONASS, GALILEO, QZSS and SBAS. No one is left behind!

▶ Future-Proof Investment

The NavX®-NCS hardware is GNSS system agnostic. That means the NavX®-NCS can generate any known GNSS signal today, and also cope with modulations and signal structures yet to be developed. The NavX®-NCS is a safe investment for years to come.

▶ Custom Made ... for You

Because of its unique hardware and software architecture, you can configure the NavX®-NCS with just what you need today. No need to be tied to features you may never need. Add new capabilities as your testing needs grow.

▶ No Testing Down-Time

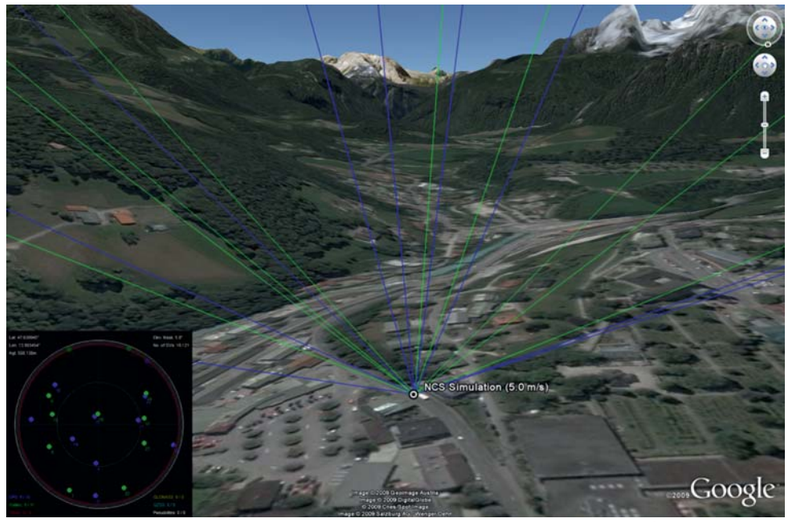
Because we know that time is money, unlike other existing simulators, the NavX®-NCS can be upgraded by a software license. No need to send your NavX®-NCS back to us. Tell us what you need, and in a matter of minutes (not weeks!) you'll be up and running with a complete new GNSS system, frequency options, etc.

▶ Fully Compatible with A-GPS Testing Standards

The NavX®-NCS is fully configured to be integrated with your A-GPS and LBS wireless system and it is compatible with current 2G and 3G A-GPS testing standards.

The NavX®-NCS Essential consists of the signal generation hardware and a control computer including the pre-installed Windows®-based 'NCS Test Center', for production and system integration applications, or 'NCS Control Center', a flexible and powerful software for Research & Development simulation configuration and interactive control.

The NavX®-NCS Essential can also be connected to other hardware or be integrated into existing test environments. Various input and output interfaces like 1PPS, a hardware trigger, input for external oscillators offer full flexibility for a variety of applications.



Visualization of NavX®-NCS simulation data

NavX®-NCS control center window

Innovation

BLACK JACK Technology

With the introduction of the BLACK JACK simulation engine at the heart of the NavX®-NCS Essential, it is for the first time possible to assign to one signal generation HW module not only one type of GNSS constellation, but the full range of all available GNSS systems, independent of the modulation type.

This enables a new level of GNSS constellation configuration, which was not existing before, providing the user with full flexibility and outstanding benefit.

BLACK JACK signal generation engine

Two BLACK JACK engine fit into one NCS Essential

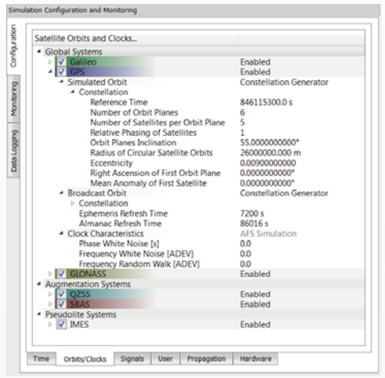
Made in Germany

In co-operation with WORK MICROWAVE

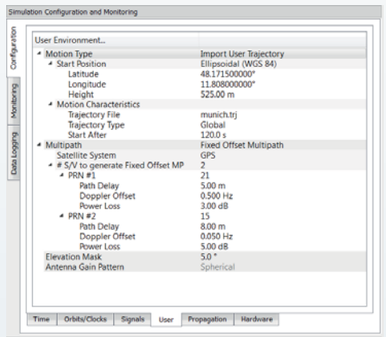
NavX®-NCS Essential

System Capabilities and Specifications

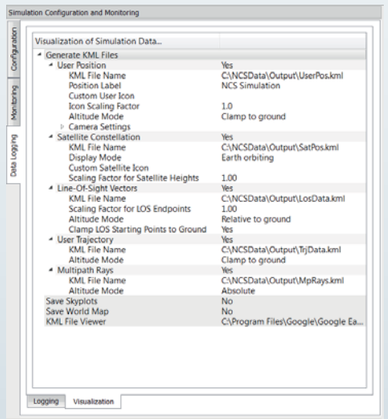
Control Center SW



Fully flexible constellation editor



Comprehensive user trajectory generation



Outstanding data visualization

Made in Germany

Simulation Capabilities

Supported GNSS and Augmentation System Capability

- Galileo (E1)
- GPS (L1)
- GLONASS (G1)
- QZSS (L1)
- SBAS (EGNOS, WAAS, MSAS, GAGAN)
- Assisted GNSS support

Configuration and Control

- Time, date and user position
- Support of user trajectories
- Pre-configured simulations available

Space and User Segment

- Import YUMA almanac files
- Definition of orbit parameters per satellite
- Single-step constellation generator
- Definition of satellite clock characteristics
- Definition of user and satellite antenna patterns
- Definition of arbitrary elevation masks

Signal Propagation

- Assisted GNSS (Assisted GPS) compliant multipath scenarios
- Definition of tropospheric and ionospheric influences

User Trajectories

- Predefined user trajectories available
- Import of NMEA files
- Integrated trajectory editor
- Preview of trajectory characteristics

Analysis and Interactive Control

- Display and monitoring of simulation data during run time
- Export of simulation data to file
- Interactive control of signal parameters during run time

Signal Specifications

Frequency Bands

• GPS L1	1,575.42 MHz
• Galileo E1	1,575.42 MHz
• GLONASS G1	1,602.00 MHz

Modulation Schemes

• BPSK & CDMA	GPS L1
• BPSK & FDMA	GLONASS G1
• BOC, CBOC	Galileo E1

Signal Dynamics

• Max. velocity (LOS):	± 22,800 m/s
• Max. acceleration:	± 390 m/s^2
• Max. jerk:	± 15,600 m/s^3

Signal Accuracy

• Pseudorange:	< 2 mm RMS
• Pseudorange rate:	< 2 mm/s RMS
• Interchannel bias:	zero
• Intermodule bias:	< ± 1.1 ns

Signal Quality

• Spurious (max.):	< -50 dBc
• Harmonics (max.):	< -40 dBc
• Phase noise (max.):	0.015 rad RMS
• Frequency stability (24h):	< ± 5 × 10^{-10}

Nominal RF Signal Levels

• RF monitoring port:	- 60 dBm
• RF signal output(max.):	- 90 dBm
• RF signal output(min.):	- 170 dBm

Signal Level Control

• RF attenuation:	0.0 - 40.0 dB	at 0.1 dB steps (per module)
• Digital attenuation:	0.0 - 40.0 dB	at 0.1 dB steps (per channel)

Hardware

Input Interfaces

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

Output Interfaces

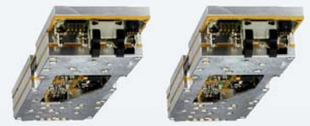
• RF signal output (front side):	N
• RF monitoring port (rear panel):	SMA
• 10 MHz reference (sine wave):	BNC
• 1 pulse per second (1 PPS):	BNC

NCS Essential front side

NCS Essential rear side

Plug-In Modules

• BLACK JACK:	up to 2 modules
• Channels per module:	13 - 21
• GNSS per module:	all GNSS



BLACK JACK signal generation modules

Physical Parameters

• Mounting:	19″ rack mounting, 1 HU
• Size (H x W x D):	43 x 483 x 570 mm
• Weight:	< 7 kg
• Power consumption:	< 70 W
• Operating Temperature:	+10° to +55° C
• Storage Temperature:	-40° to +70°

Control Computer

• Laptop	INTEL i7 based
• Operating systems:	MS Windows® 7
• Control SW:	NCS Test Center or NCS Control Center

NCS Control Computer

In co-operation with IfEN GmbH and WORK MICROWAVE

Disclaimer
Specification subject to change without prior notice

NavX®-NCS Essential

Headquarter

IFEN GmbH
Alte Gruber Straße 6
85586 Poing
Germany

Global Sales

For additional product information or sales orders outside of the EMEA area, please contact our distributors and sales agents directly.

The current list of distributors is available on www.ifen.com/distributors

For further information please contact:

phone: +49.8121.2238.20
email: sales@ifen.com
web: www.ifen.com

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