

## GSS4150

The integrated solution to  
GNSS + GBAS functional testing

As air transport continues to grow, the use of Global Satellite Navigation Systems (GNSS) for Flight Navigation is increasing. So too is the move towards using systems that support Required Navigation Performance (RNP). Augmentation Systems to GNSS, both Satellite-Based Augmentation Systems (SBAS), such as Wide Area Augmentation System (WAAS) and European Geostationary Navigation Overlay System (EGNOS) are already in use but the adoption of the Local Area systems such as the Ground-Based Augmentation Landing System (GBAS Landing System) for airport precision approach and category I, II, and III landing operations is on the rise. A critical system such as this must meet stringent performance indicators for RNP and be sure to maintain accuracy and stability under the full range of real-world conditions.

In order to help developers and integrators to test the airborne GNSS receiver in their GBAS Landing System, Spirent has developed the GSS4150 solution. The GSS4150 GBAS Landing System VDB Simulator has been designed to add a single, integrated source of the VHF Data Broadcast (VDB) augmentation signal to Spirent's range of GNSS RF constellation simulators - in a rack-mountable chassis.

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## GSS4150B

Data messages are constructed in real time from two sources associated with the host GNSS Simulator:

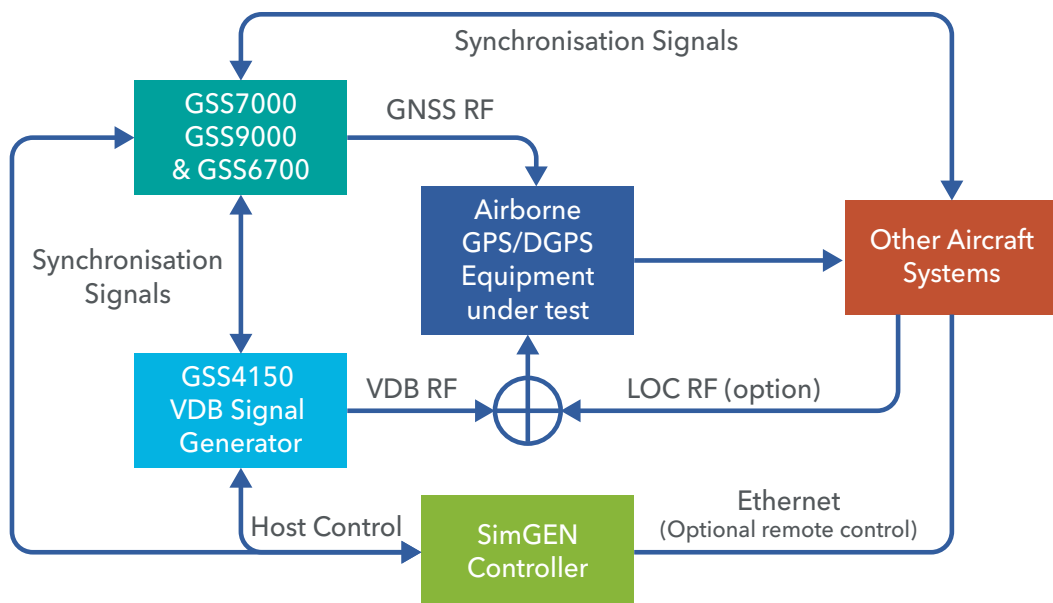
### No. 1

The first source is the error modelling applied to a simulated GNSS reference receiver, the location for which is user-specified. The various simulated system effects are calculated and the resulting errors are compiled into the differential corrections for message type 1 of GBAS.

### No. 2

The second source is the fixed data entered by the user via detailed on-screen forms that is required by message types 2 and 4, and for some fields associated with message type 1. The GSS4150 varies the signal level in response to the distance of separation from the defined simulated transmitter location and the simulated aircraft position, and in response to the simulated VHF antenna reception pattern.

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## Specifications

The GSS4150 comprises a VHF signal source generator and software extensions contained within Spirent's SimGEN software. It supports message types:

<b>Message Types 1 2 3</b>	Differential Corrections 100 second smoothed pseudoranges
<b>Message Type 2</b>	GBAS related data
<b>Message Type 4</b>	FAS and TAP construction data
<b>Message Types 5 2 3</b>	Ranging Source Availability
<b>Message Types 11 2 3</b>	Differential Corrections 30 second smoothed pseudoranges

### Signal Capability

Parameter	Comment	Value
Number of VHF Signal Sources		1 channel
Carrier Frequency	Minimum Maximum Resolution	108.000MHz 117.975MHz 0.025MHz
Symbol Rate	Fixed	10.500 symbols/s
Modulation		D8PSK
TDMA Timing	Reference RTCA DO-246	As ICD
Maximum Signal Level	At RF port (represents modelled received power at VHF antenna)	-50dBm
Signal Level Control	Range	40dB 0.5dB
Signal Level Accuracy	1-sigma calibration uncertainty	1dB (RSS)
Adjacent channel suppression	First Channel Second Channel	-40dBc -65dBc

### Specified Accuracy

Parameter	Comment	Value
	Uncertainty in calibrated simulated power at maximum power level	±0.7dB (RSS) ±1.0dB (Max)
Signal Level	Run-to-Run variance under same environmental conditions	<0.2dB
	Linearity	<±0.5dB
Carrier Frequency	<b>The unit will normally be frequency locked to an external reference from the simulator, and is dependent on its calibrated accuracy.</b> Master clock may be manually adjusted to < 0.02Hz error at calibration interval (1 year).	<±5Hz at 108MHz after one year (absolute)

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## Signal Capability

Port	In/Out	Type	Characteristics
RF	OUT	COAXIAL Type 'N' Female Front Panel	Provides the primary RF GPS signal output at specified levels.  50 ohm VSWR <1.2:1 (band) DC isolated
EXT REF External reference	IN	COAXIAL BNC socket Rear Panel	Allows locking to external simulator references
10MHz Internal Reference Oscillator	OUT	COAXIAL BNC socket Rear Panel	10MHz Sine 0 dBm normal 50 ohm
1PPS OUT (1 pulse per second)	OUT	25-Way D-Type Rear Panel	TTL level compatible Normal width 100ms 50 ohm
HOST PC	IN/OUT	USB downstream connector	Control interface
110/240V ac	IN	International Standard Rear Panel	



### Contact Us

For more information, call your Spirent sales representative or visit us on the web at [www.spirent.com/ContactSpirent](http://www.spirent.com/ContactSpirent).

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

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