Spirent Communications
GNSS Product Line Overview

Korea: Unitek Communication
Tel. 031-703-4765
Http://unitekcom.co.kr
Simulator and Application Overview

Production test  Maintenance  Qualification  Integration  R&D

Single channel  Portable  Commercial  Fully flexible

GSS6100  GSS4200  STR4500  GSS6560  GSS7700

GPS / SBAS

GBAS (LAAS)

DR & Inertial Sensors

GLONASS

GALILEO

Inspired Innovation
- 1-channel L1 C/A or SBAS
- Controlled by GPIB
- Inputs/outputs for synchronisation
- Can be fully ATE integrated

**Standard Production Tests**
- Power level variation
- Doppler shift can be changed
- Ranging code selection and data message generation
- Control of carrier and code phase generation

- Other model: Pseudolite (RTCM SC-104) signal generator (GSS4100-P)
GSS4200 : 6-channel simulator

- 6-channel L1 C/A chassis controlled by GPIB, USB or RS232
- Plenty of inputs/outputs for synchronisation
- Can be fully ATE integrated
- **ONLY 5-minute scenarios**
- Specialized for Telecom Production Tests
  - Generate an accurate position
  - Predefined scenarios (Request upon website)
  - 2 different power outputs (high and low level)
- Can emulate a GSS6100
**GSS4200 Connectivity**

**User ATE system**

- GPIB or RS232 or USB
- 6 channel RF o/p
- GPS Rx

**Easy ATE integration**
- list and select scenarios
- high and low power output modes
- start, stop, rewind
- loop mode
- single channel or multi channel mode
- power and other control via scenarios
The STR4500 GPS Simulator has been designed as precision test equipment for evaluating GPS/SBAS receiver equipment to include the following areas:

- Design verification
- Production test in manufacturing
- Comparative evaluation
- Statistical data-generation through extended and repeated tests
- Incoming product test
STR4500: 12-channel simulator

- 12-channel L1 C/A or SBAS chassis controlled by USB
- Plenty of inputs/outputs for synchronisation/integration
- Controlled by SimPLEX software
- Pre-defined scenarios
- User actions (Manually or remotely)
  - Power level
  - Ramp on Pseudo range
  - Antenna pattern
  - Changing scenario
STR4500 : 12-channel simulator

Remote Control Interface via Ethernet/RS232/USB

1PPS IN/OUT

TRIGGER IN

HIGH LEVEL RF CAL OUTPUT

10MHz EXT REF IN/OUT

STR4500 GPS SIGNAL GENERATOR

GPS RECEIVER UNDER TEST

PC WITH SimPLEX CONTROL S/W

USB

RF

RS232 RTCM-SC104 Differential Corrections

RS232 Data Capture NMEA-0183

Remote Control Interface via Ethernet/RS232/USB

1PPS IN/OUT

TRIGGER IN

HIGH LEVEL RF CAL OUTPUT

10MHz EXT REF IN/OUT

STR4500 GPS SIGNAL GENERATOR

GPS RECEIVER UNDER TEST
Maintained & Warranty customers have access to online Scenario Generator

This can be used to create an unlimited number of simple Scenario’s

Click for a Demo
STR4500 with SimPlex45

- SimPLEX45 *
  - As SimPLEX plus…
  - Define and edit scenarios
    - Start time and Date
    - Position
    - Vehicle motion
  - Import constellation data

Scenario Editor
Button new for SimPLEX45
GSS6560 : 12-channel simulator

- 12-channel L1 C/A or SBAS chassis controlled by USB
- Plenty of inputs/outputs for synchronisation
- Controlled by SimGEN software
- **Access to all test parameters**
- Synchronised multi-chassis to get up to 4 outputs
- Capable of generating STR4500’s scenarios
- Remote-control and external motion data (user trajectory)
GSS6560 with SimGen

- Full Control of
  - Constellation
  - Atmosphere
  - Motion (if required)
  - Multipath
  - Location/Time/Date
- All Aspects of Test Environment
• One or more chassis controlled by **SimGEN** software
• Each chassis can support up to 2 frequencies
• Up to 16 channels per frequency (4 channels per board)
GSS7700 Choices

Fully Flexible:

- L1 C/A, L1P, L1M-noise
- L2 C/A, L2P, L2C, L2M-noise
- L5 I5 and Q5
- SBAS: EGNOS, WAAS, MSAS
- GLONASS L1 (STR4780)

GPS L1/L2/L5 + GLONASS + Interference
GSS7700 Main Input and Outputs

- Synchronisation & timing in/out
- Trigger in/out
- External Reference Clock in/out
- Jammer in

GPS/SBAS RF monitor output (-70dBm +/-20dB)

Remote trajectory (File or Real-Time)
NMEA data from your receiver
Antenna patterns (file via GUI)
Iono / tropo delays
Remote commands to control the simulation or for HWIL applications
Almanac (Yuma, Rinex, SEM)

Logged simulation data (all parameters)
NMEA data
Differential corrections (RTCM104, LAAS) on RS232

GPS/SBAS RF output (-130dBm +/-20dB)
Define Constellation:
• Almanac
• Signal Outputs
• Data Messages

Define Atmosphere:
• Ionosphere
• Troposphere

Define Local Obscuration:
• If required
• Buildings etc

Define Multipath Effects:
• If required
• From buildings etc

Define DUT Type:
• Determine User Motion

Define Error Sources:
• Clock Errors
• Atmosphere
• Positional
STR4780 Glonass

- L1 GLONASS Simulation
  - Up to 12 satellites
    - Frequency channels -7 to +24
  - C/A Code and navigation data
    - “SP” service
  - Multi-chassis for dGLONASS
  - Integrates with GSS7700 for GPS+GLONASS simulation
  - Full SimGEN support
Properties of Glonass

- All satellites are distinguished by different carrier frequencies
- very low cross-correlation (< - 48 dB)
- complex frequency synthesisers in the receivers
- sensitivity to frequency dependent group delays in receivers

- Short “C/A”-code and low chipping rate
- easier acquisition
- susceptibility to interference and multipath
- noisier pseudo-range measurements

- Same codes on all satellites
- less complex code de-spreading in the receivers

- No ionospheric corrections in the navigation message
Glonass Modernisation

- **GLONASS-M (In service)**
  - narrower frequency band
  - additional navigation data (incl. GPS-GLONASS time difference)
  - reduced out-of-band emission
  - civil signal on “L2”
  - improved frequency stability (10-13)

- **GLONASS-K**
  (first launch possibly 2006)
  - third frequency
  - improved frequency stability (10-14)
  - integrity information
  - search-and-rescue payload
Other Options

- GSS4765 – Interference Simulation
- SimAUTO
  - Automotive Sensor outputs
  - SimGEN Only
- SimInertial
- Multi Output
Other Options

- LAAS Corrections (SimGEN Only)
- Bespoke Production test equipment
- Inertial Sensor testing

GSS4150 LAAS VDB Generator
Questions?