

RELEASE NOTES

Version 8.1.1 – June 15, 2020

Features include:

- Released new option BDS3 supporting the following signals
 - Beidou B1C (OPT-BDS3)
 - Beidou B2a (OPT-BDS3 + OPT-L5)
- Added support for new signal Beidou B3 (OPT-BDS + OPT-L6)
- Changed 1PPS output behavior – 1PPS signal is only output when a scenario or signal generator is running
- Changed default NTP server to pool.ntp.org
- Subframe 4 page 17 could have invalid data due to 0xAA pattern used to fill the subframe. Now subframe 3 page 14 is filled with valid text message “GNSS-SIGNAL-SIMULATOR”.
- New parameter available in options menu – TGD simulation. Used to enable or disable TGD for all satellites in the simulation.
- Implemented new variants of SOUR:SCEN:POW commands. Full set of supported variants is`1 now:
 - Queries:
 - § SOURce:SCENario:POWer?
 - § SOURce:SCENario:POWer? <satID>[,<freqband>|<signaltype>]
 - § SOURce:SCENario:POWer[n]? [<freqband>|<signaltype>]
 - § SOURce:SCENario:POWer? <SatSystem>[,<freqBand>]
 - § SOURce:SCENario:POWer? <SignalType>
 - Commands:
 - § SOURce:SCENario:POWer ON|OFF
 - § SOURce:SCENario:POWer <satID>,ON|OFF[,<freqband>|<signaltype>]
 - § SOURce:SCENario:POWer <satID>,<decimal>[,<freqband>|<signaltype>]
 - § SOURce:SCENario:POWer IMM,<satID>,ON|OFF[,<freqband>|<signaltype>]
 - § SOURce:SCENario:POWer IMM,<satID>,<decimal>[,<freqband>|<signaltype>]
 - § SOURce:SCENario:POWer <SatSystem>,ON|OFF[,<freqband>]
 - § SOURce:SCENario:POWer <SatSystem>,<decimal>[,<freqband>]
 - § SOURce:SCENario:POWer <SignalType>,ON|OFF
 - § SOURce:SCENario:POWer <SignalType>,<decimal>
 - § SOURce:SCENario:POWer[n] ON|OFF[,<freqband>|<signaltype>]
 - § SOURce:SCENario:POWer[n] <decimal>[,<freqband>|<signaltype>]

Fixes include:

- Fixed bug that could cause a crash when logging QZSS CNAV ephemeris (error occurred on ephemeris switch)
- Fixed a bug that caused satellites to be disabled on second day of NTP scenario
- Corrected an error that could cause L2P signals to be disabled when used in VTS

Version 7.5.1 – January 8, 2020

Features include:

- GLONASS ephemeris switches are logged in execution log
- Improved RINEX correctness checking
- Ignored RINEX records are logged in execution log
- CNAV data set switches are logged in execution log
- CNAV message 30 is now sent
- RINEX download source for Galileo added: CNES (serenad-public.cnes.fr).
 - Source not suitable for “Simulate Now.”
- Improved speed of observation file logging
- SBAS message types transmitted are logged in execution log
- Increased number of points allowed in NMEA trajectories (from 12000 to 50000)
- Satellites with invalid or unhealthy records in RINEX file will have a lower case letter on front panel display

Fixes include:

- RTCM Message Improvements
 - TGD correction is taken into account when calculating range differences
 - Fixed a multithread synchronization issue that could result in damaged RTCM
 - Messages 1004 and 1012 now transmit corrections for all satellites, even if they are transmitting L1-only
 - Order of messages are now fixed: 1002, 1004, 1006, 1010, 1012, 1033
 - Fixed a bug that caused damage messages in certain cases
- Fixed Beidou time calculation at leap second
- Improved synchronization on VTS system simulators
- Fixed NTP start time for looping scenarios
- Fixed antenna pattern application when RSG license is not present and 6DOF trajectory is used
- Improved MSAS correction simulation
- Fixed a bug that caused ephemeris validation to be skipped in signal generator mode
- Galileo E5a FNAV navigation logging
 - Changed page and subframe indexes changed to 1-based
- Fixed SCPI query sour:scen:tropo?

Version 7.3.1 – April 2, 2019

Features include:

- Added SBAS L5 signal simulation
- New syntax for power events added
 - `<time> system <system-name> abspower [on|off|<power>]`
 - `<time> system <system-name> abspower [on|off|<power>]`
 - `<time> system <system-name> relpower [<power>]`
- Keyboard can now be used for control and data entry in web interface
- Improved Galileo simulation
 - More frequent change of almanacs
 - IODa and almanac reference time derived from reference time of ephemeris
 - Reject user provided Galileo ephemeris records where TOE is not a multiple of 60 seconds
 - E5b health status could be wrong if it was overwritten by data from another satellite
- All default scenarios have date moved to 2022
- Generated new Beidou ephemeris to avoid gaps in validity intervals

Fixes include:

- IRNSS/NavIC simulation improvements
 - Corrected almanac data
 - Added support for PRN 8 and PRN 9
 - Updated default data based on live sky signal transmission
- Fixed a bug that could cause a time jump or unsynchronized TOW information in certain Galileo scenario configurations
- Improved simulation of GLONASS leap second
- Fixed GGA sentence to correctly reflect total number of satellites in use
- Corrected issue that could cause multipath signals from previous scenario to appear in the next run scenario in certain cases
- Corrected power change for frequency band – now all signals in band will be adjusted instead of only one signal type

Version 7.2.7 – February 19, 2019

Added support for new hardware board revision

Version 7.2.6 – November 30, 2018

Features include:

- Interface type settings preserved when performing factory reset via SPCI command
- Fixed FEC encoding for CNAV and SBAS messages
- Corrected error in QZSS Subframe 5, SV_ID field

Version 7.2.5 – November 2, 2018

Features include:

- Introduced UNECE R-144 option (OPT-UNR)
- Added NAVBITS support for IRNSS
- Added subframe logging
 - IRNSS L5
 - Galileo E1, E5a, E5b
 - GLONASS L1, L2
 - GPS L2C, L5
 - QZSS L2C, L5
 - SBAS
- Updated list of available WAAS satellites
- Added event to change absolute power of an individual satellite system
- Added new variants of “SOUR:SCEN:POW?” query
 - “SOUR:SCEN:POW?” - returns “ON” if at least one signal in scenario has power turned on
 - “SOUR:SCEN:POW? <Satellite system>”
 - “SOUR:SCEN:POW? <Satellite system>,<Frequency band>”
- New support for comments in event and scenario files using # symbol
- Execution Log now contains the scenario stop time

Fixes include:

- Multiple fixes for IRNSS simulation
 - Corrected CRC Computation
 - Implemented proper ephemeris switching
 - Fixed wrong PRN ID AL field for message 7
 - Corrected delta Isf field in message 9
- Corrected simulation of P1 field in GLONASS string 1
- Events at elapsed time zero will be applied
- Fixed 1 second NTP time sync error (was introduced in 7.2.1)

Version 7.2.1 – October 1, 2018

Features include:

- Branding changed from Spectracom to Orolia
 - StudioView version 5.2.1.4 or later is required to communicate with GSG after upgrade
 - Web interface branding changed
 - Response to IDN query will return OROLIA rather than SPECTRACOM
 - Startup splash screen shows new graphic
- New leap second settings
 - Auto - The number of leap seconds is set by the date of the scenario
 - RINEX - The number of leap seconds is set by the RINEX header in the specified file
 - Fixed - User can set a custom value
- Elevation mask allowed value is lowered to -89. A simple obscuration check is done to ensure satellites are not visible if blocked by the Earth.
- GSG will not include ionosphere or troposphere effects when simulated vehicle is above ionosphere or troposphere.
- Added support for Beidou D1 and D2 subframe logging.
- Optimized use of download data in Simulate Now mode, especially on day boundaries.
- Added igs.bkg.bund.de ftp site as a source for download ephemeris.

Fixes include:

- Fixed a bug in GLONASS N4 and NA fields calculation
- Doppler calculations optimized for orbital trajectories. 10Hz update rate may still be a limiting factor in orbital trajectories.

- Fixed an issue that could cause disabled satellite when trajectory is close to navigation satellite.
- Fixed an issue that could cause receiver to drop satellite on spontaneous switch of ephemeris.
- Fixed an issue that could cause CNAV fields greater than 32 bits long to have wrong MSBs
- Corrected BDS subframe transmission timing that caused issues with some Qualcomm chipsets.
- Fixed a bug that caused multiple noise jammers to not be created when specified in scenario.
- Prevented a crash condition that could occur with a fixed number of satellites was selected and no valid navigation data was available.
- Fixed a bug in SBAS handling when UDREI field in fast corrections record is UDREI_NOT_MONITORED.
- Corrected a bug for GPS satellites that caused the wrong subframe to be transmitted after a week boundary was crossed (including GPS 2019 rollover week tests).

Version 7.1.5 – March 19, 2018

Features include:

- Updated supported SBAS satellites
- SBAS satellites can be selected by PRN number from a list of known satellites
- Updated default Galileo navigation data
- Added additional eCall scenario to allow first fix from GPS before Galileo-only test (OPT-ECL)
- Extended duration of eCall sensitivity test (OPT-ECL)
- Updated eCall dynamic trajectory (OPT-ECL)
- Simulation accuracy improvement for Beidou and Galileo – gravitational constants and angular velocity of Earth refined
- Improved position accuracy by selecting ephemerides using time of transmission
- Simulate MSAS corrections
- Made it easy to switch between SBAS/Others signals in Signal Generator configuration
- New SCPI command to change/enable/disable power of satellites of specific system
- Added SCPI command to turn off RF Signal of individual satellites
- Updated the QZSS file server URL

Fixes include:

- RINEX records with TOC not a multiple of 16 are rejected
- Timeout happens on PC side while waiting response to some RSG commands over USB
- Crash if SBAS Modulated signal selected in Signal Generator
- “Klobuchar” and “off” values were doubled in ionospheric mode menu
- Interference channel for modulated and unmodulated interference power was not set correctly
- Fixed crash if a satellite type (block) doesn't support certain signal and all other signals are off
- Sensor name parameter in SCPI commands is now case insensitive

Version 7.1.1 – December 19, 2017

Features include:

- Power offsets between different signal types can now be user defined
- Updated web interface links for Spectracom website
- Updated eCall scenarios (OPT-ECL)
- Implemented Galileo signal changes to work with certain Qualcomm chipsets
- New SCPI Commands for configuring power offsets:
 - SOURce:ABSPOWER
 - SOURce:RELPOWER
 - SOURce:REFPOWER
- SOURce:SCENario:POWER command now accepts ON and OFF as arguments
- Front panel power levels are shown with .1dB resolution Fixes include:
- Prevented a lockup condition when scenario is started with circle diameter of zero
- Fixed an issue that could cause more satellites to be generated than the requested number
- Corrected specific case that would cause looping of NMEA trajectories to fail
- Proper use of QZSS almanac data
- Corrected doppler initialization for circle trajectory
- Moved eCall scenarios start positions to land
- HV option is again displayed in the Options menu
- Fixed SCPI and event file power level control of interference signals
- Correct SBAS file loading

Version 7.0.5 – July 19, 2017

Features include:

- SBAS satellites have a fixed power offset of -2.5dBm to the GPS satellites
- Smoother ephemeris data set transitions
- New eCall scenarios added (OPT-ECL) Fixes include:
 - Circle trajectory can be used in anticlockwise direction again
 - Fixed bug that prevented setting the number of SBAS satellites
 - Corrected wrong observation ID for Galileo
 - Fixed Gravimeter sensor calculation error
 - Improved EGNOS correction performance
 - Fixed looping of RSG trajectories
 - Fixed a bug with GPS almanac for PRN > 25

Version 7.0.2– April 25, 2017

Features include:

- Introduced eCall option (OPT-ECL)
- PDOP is now displayed on the front panel (previously HDOP was displayed)
- Allowed changing of signal mode (modulation) while signal generator is running (modulated/PRN/unmodulated)
- Added support for velocity profile in signal generator Fixes include:
 - Corrected bug that prevented selecting multiple constellations in signal generator mode
 - Fixed setting of GLONASS frequency slot in signal generator when both unmodulated GPS and GLONASS signals are selected

Version 6.7.7– March 1, 2017

Features include:

- Current number of leap seconds when using default data set to 18
- Added support for Galileo E6B/C signals Fixes include:
 - Improved lever arm calculations

Version 6.7.5 – February 14, 2017

Features include:

- Execution log now contains the board and channel mapping of each signal generated during a scenario
- Introduced new log for subframe information
- Updated default NTP to UTC offset value to 18
- Galileo generation improvements
 - Added possibility to specify Galileo almanacs
 - Fixed IODa in subframe data
 - Improved generation of almanacs from ephemerides - The almanac is generated from the ephemeris having time of clock closest to the time of almanac
 - SVID is set to zero in subframe data, if the corresponding SV is not included in the constellation
 - Fixed iono parameters in subframes
 - Fixed satellite health parameters in subframes Fixes include:
- Corrected the times in the data logs so they are all aligned
- Fixed a lockup condition that could occur when NTP time is selected and scenario start is cancelled
- Fixed infrequent packet loss problem causing TCP retransmissions
- Improved USB operation that caused errors when files were transferred

Version 6.7.3 – November 15, 2016

Fixes include:

- Corrections to GSG-5 licensing

Version 6.7.2 – November 11, 2016

Fixes include:

- Corrections to GSG-61 signal generator operation

Version 6.7.1 – November 2, 2016

Features include:

- New Troposphere model – DO-229
- Support for TLE file format
- Added new parameter to prn and channel power events to keep noise setting the same when power is adjusted
- Implemented advanced log feature with support for RSG and satellite data
- All RSG queries are available without RSG license
- GSG-61 model introduced
- Added display of imperial values and UTC time to the front panel display while scenario is running
- Spaces are allowed around commas used as delimiters in SCPI arguments
- Multiline responses for raw SCPI mode now always contain newline symbol after the last line
- New scenario parameter allows the user to set all power offsets between constellations to zero Fixes include:
- Corrected application of SBAS NAVBITS events
- Improved performance of SBAS corrections
- Fixed a bug that caused a unit crash when downloading observation files
- Signal generator corrected to generate multiple constellations simultaneously
- SOURce:SCENario:DATEtime SCPI command can be used to set the time to NTP
- Fixed the ability to set the date/time and position while scenario is not running
- Corrected RINEX observation file generation for QZSS
- Updated list of supported SBAS satellites
- Implemented a workaround for the GSG dropping from the network
- Improved web interface to prevent it from becoming inaccessible
- Fixed a bug that caused SCPI requests to time out
- Removed unnecessary newline symbols in NMEA log

Version 6.6.5 – June 7, 2016

Fixes include:

- Corrected event file usage in looping scenarios

Version 6.6.3 – May 8, 2016

Fixes include:

- Fixed a bug that prevented calibration verification in manufacturing

Version 6.6.1 – April 22, 2016

Features include:

- NMEA handling is redesigned. Interpolation is done internally; external interpolation of the trajectory is no longer a requirement.
- Increased precision of lever arm and ECEF coordinate entries
- Subframes are now synchronized across all GPS satellites. All GPS satellites transmit the same subframe/page at the same time.
- Introduced OPT-TLM allowing the TLM word to be set to all 1's in the unit, applied to all simulations
- Introduced OPT-HPWR to allow the maximum power available from the GSG to increase to -50dBm
- Environment propagation models can be selected from the front panel
- Return Link Service testing for Galileo is supported
- RSG file trajectories can be looped within a scenario
- New SCPI command for rebooting the unit remotely
 - SYSTem:REBOOT

Fixes include:

- Corrected a bug that caused that GLONASS 4 year interval number to be incorrect after rollover
- Update of start time from NTP is now correct when stopping a scenario and immediately restarting it

Version 6.5.3 – December 21, 2015

Features include:

- QZSS and GPS ephemeris and almanac files can now be downloaded from the JAXA server Fixes include:
- Fixed a problem that caused GLONASS only scenarios to have the wrong date
- Corrected a bug that could cause ephemeris download to fail

Version 6.5.1 – September 14, 2015

Features include:

- New environmental propagation models: Urban, Suburban, Rural
- SCPI command added for changing signal generator mode
- Added support for RINEX v2.12 file types

- ANTEX files are accepted to support PPP testing Fixes include:
- Noise BW properly set in GSG-55 licensed units
- NMEA correctly outputs speed over ground
- Fixed a bug that caused signal generator to lock up when SBAS signal type was selected
- Adding SBAS in a scenario will correctly generate only 1 of each satellite

Version 6.4.3 – July 13, 2015

Features include:

- Separate fields for NTP server address and data download server address
- New signal generator mode – PRN code modulation ON, data modulation OFF
- Default data and NTP offset are updated to reflect the current GPS-UTC offset – now 17
- The GN talker ID for RMC and GGA NMEA sentences is now accepted for trajectory files Fixes include:
- Correct power level set when commanded via SCPI
- Corrected GLONASS almanac time when user navigation files are used

Version 6.4.1 – May 27, 2015

Features include:

- Support for IRNSS L5 constellation generation (OPT-IRN)
- Support for QZSS L2C and L5 (OPT-QZ, OPT-L2C, OPT-L5)
- Trajectories can now be defined using 6 Keplerian elements
- Added YUMA Almanac support for QZSS
- Default constellation updated to support newly launched block IIF satellite
- Improved calculations when only position information is given as trajectory
- Added SCPI commands to support closed circle trajectories
 - TURNRATE – similar to RATEHEADING command, but the given rate will be used as an average heading around full circle, and heading will be changed each step in order to maintain a closed circle
 - TURNRADIUS – specifies value of circle radius in meters
- Added SCPI command to query SV position
 - SVPos? – query a satellite’s ECEF position
- Added SCPI commands to query pseudo-range and Doppler of each satellite
 - DOPpler? – query a satellite’s Doppler
 - PRANge? – query a satellite’s pseudo-range for a frequency band
- Added confirmation when stopping a running scenario
- Default RINEX data is now available to user from StudioView File Manager or web interface files
- User can now specify the sequence of CNAV messages Fixes include:
- Fixed a bug that could cause a crash if the user trajectories directory is empty
- Improved Simulate Now satellite generation through UTC day rollover
- Improved L2C and L5 CNAV message update
- Heading on front panel shows correct value even when speed is very small
- Fixed BeiDou GEO satellites’ residuals jump
- Changed web server to eliminate issues with the web UI locking up
- Fixed a bug that caused the simulator to disable satellites when it should not

Version 6.3.5 – April 13, 2015

Features include:

- Support for new GSG hardware revisions Fixes include:
- Corrected BeiDou day numbering for BeiDou-only leap second testing
- Corrected how GLONASS ephemeris is transmitted during GLONASS-only leap second
- Fixed an issue that caused a unit lockup when a BeiDou scenario is running for more than 20 hours.

Version 6.3.1 – February 28, 2015

Features include:

- GSG Front Panel Menu has been redesigned. All items are still available/settable from the front panel, but the menu arrangement has changed. The basic scenario parameters are more accessible and the advanced features are now submenus.
- SP3 format now supported for defining constellation
- IRNSS L5 signal available in the signal generator (OPT-IRN)
- Future Leap Second value, week number, and day of week are read from RINEX 3 header file if given

- New SCPI command to check synchronization of time between GSG and NTP server
 - Simulate Now can use files generated by SecureSync (instead of internet source)
 - Added Navbits support for Galileo
 - Updated RSG Engine to include more realistic movement model
 - Improved NTP time synchronization
 - New SCPI commands have been introduced to allow entry of PRY rates and attitude in degrees
 - TLM value updated to reflect current value in the GPS signal
 - Improved SCPI-raw performance
 - Scenarios are now available for RTCM 11000.3 Marine testing
 - TDG (timing group delay) set to a non-zero value Fixes include:
 - Corrected carrier phase observations for GPS L5
 - Corrected RTCM messages to include initialization of carrier phase advance (due to ionosphere)
 - Fixed an error that could cause Simulate Now to lose synchronization in scenario runs of greater than 1 day
 - Corrected a bug that caused *OPC? to fail to block commands when issued in the first seconds of a scenario start
 - Fixed an issue that caused HDOP value in NMEA sentences to be updated only when view 2 or higher was shown on front panel during running scenario.
 - Fixed a bug that set max power level at -67.3dBm instead of -65dBm
- NOTE: Requires min v2.04 to be installed first

Version 6.2.7 – January 22, 2015 Limited Release

Features include:

- Removed auto start confirmation pop-up from GSG-51

Version 6.2.5 – December 1, 2014 Limited Release

Features include:

- Added Navbits support for BDS and SBAS signals
- QZSS L1-SAIF signal introduced (OPT-QZ)

Version 6.2.1 – October 31, 2014

Features include:

- Support for QZSS L1C/A (OPT-QZ)
 - Support for GEO and IGSO BeiDou satellites (OPT-BDS)
 - Support for Beidou B2 (OPT-BDS, OPT-L5)
 - Support for Vehicle Silhouetting to block signals based on vehicle body (OPT-VIS)
 - Support for Lever Arm (OPT-VIS)
 - Multipath parameters can now be modified during runtime using SCPI commands or event files
 - Pressing the 'Menu' button when the scenario is running displays the running scenario configuration
 - STANAG tropospheric model is available
 - IONEX files are accepted for custom Ionosphere models
 - Navigation message modification can be done using event files
 - Altitude is also displayed as Mean Sea Level on front panel and in NMEA log
 - L5 band is supported by the ionosphere model
 - RINEX Observations include phase data Fixes include:
 - Corrected multipath doppler offset implementation
 - Corrected normalized sensor range
 - Fixed a bug that caused linearaccelerometer to give the wrong direction
 - Improved scenario startup time
 - Starting altitude is handled correctly when using NMEA files
 - Corrected PRYrate command so the orientation does not suddenly change when crossing 180degrees
- NOTE: Requires min v2.04 to be installed first

Version 6.1.1 – July 18, 2014

Features include:

- Support for Jamming simulation (OPT-JAM)
 - Added noise and sweep types of interference
 - Added location based jammer
- Support for sensor simulation (OPT-SEN)
 - Accelerometer
 - Linear Accelerometer

- Gravimeter
- Gyroscope
- Odometer
- Odometer3D
- Support for environmental models to block signals (OPT-VIS)
- Timing calibration file is accessible to the user if OPT-TIM is installed
- Run-time control of noise and unit power level from front panel
- Added capability to change navigation message bits to simulate errors
- YUMA almanac is accepted
- SCPI improvements
 - SatID can be given as an input for SOURce:SCENario:POWer
 - Added command for retrieving MAC address via SCPI
- Added possibility to add a random offset to multipath carrier phase at startup
- Option E6 has been renamed to L6 to support BeiDou B3 when available
- MAC address is now shown in the network settings menu
- Part number is displayed on the show system information screen
- Added ability to upload files to unit via web interface
- Signal Generator settings persist through a power cycle Fixes include:
- When Observation logging is turned on, it is only for one scenario
- Fixed web interface presentation and operation in Internet Explorer
- RTCM messages are no longer available when a base station location is not set
- Fixed a bug that caused unit transmit power to change when a high power level interference signal was set
- Event files are limited to 4000 lines
- Improved SCPI-RAW over Telnet
- Fixed a bug that caused unsaved parameter changes to show in the scenario overview

- NOTE: Requires min v2.04 to be installed first

Version 6.0.4 – May 5, 2014

Fixes include:

- Fixed a bug that could cause unit to lock up when loading/starting/stopping scenarios
- Corrected Interference channel issue that could lead to all interference channels defaulting to GPS L1 C/A
- Corrected phi orientation in user antenna files
 - Phi is now anti-clockwise with phi 0 degrees pointing to the north

- NOTE: Requires min v2.04 to be installed first

Version 6.0.3 – April 17, 2014

Features include:

- SCPI-RAW allows sending of SCPI commands via Ethernet without using VISA or VXI-11
- New SCPI command allows user to disable altitude compensation
- RTCM 3.x message support for GLONASS
- Position can be set using the RSG SCPI commands when a scenario is loaded but not yet running Fixes include:
- 2 SCPI commands updated for better performance
 - SOURce:POWer
 - SOURce:SCENario:DATEtime?
- Corrected minor coordinate format issue
- Corrected power levels with antenna pattern files
- Heading and RateHeading commands do not reset acceleration to zero

- NOTE: Requires min v2.04 to be installed first

Version 6.0.1 – March 13, 2014

Features include:

- BeiDou B1 (opt-BDS) capable
- RTCM 3.x message output capable (opt-RTK)
- Memory optimized to allow 4 constellations to be generated simultaneously
- Unit files can now be accessed via http (Web interface)
- RINEX Navigation files can be logged on the unit during a scenario run
- YUMA almanac is now generated automatically when a scenario is run
- Added the ability to independently control power levels for L1, L2, and L5

- Protocol enhancements
 - Added command to enable Galileo E5 in signal generator mode
 - Added commands to control power levels by frequency from protocol Fixes include:
 - GPS signals used as interference or in Signal Generator are no longer lost at the week rollover
 - Corrected gains in antenna model GPS-703-GGG
 - Corrected vertical acceleration RSG commands
 - Corrected a geometry issue that affected position when traveling a large distance from scenario start position
 - Abspower off event corrected
 - GLONASS leap second is properly handled
 - Protocol fixes
 - SOURCE:PPSOUTPUT no longer requires full command text, shortened SCPI command is accepted
 - Datetime second format corrected
- NOTE: Requires min v2.04 to be installed first

Version 5.5.7 – December 20, 2013

Features include:

- Improved Simulate Now reliability
 - Improved external triggering Fixes include:
 - Correct power level offsets that were not applied to different frequencies, codes, and constellations.
 - Corrected L2C and L2P signal levels
 - Corrected L2P(Y) signals
 - Corrected 180 degree longitude entry
 - Corrected GLONASS signal disappearing in signal generator mode after 2-5 hours.
 - Corrected the PPS offset value in units with an older hardware configuration
- NOTE: Requires min v2.04 to be installed first

Version 5.5.5 – November 11, 2013

Features include:

- Improved observation files
 - Different files names for each observation file
 - More than one hour of observations data can be collected
 - Support for record and playback to replay data recorded data the same day
 - Galileo E5 capable Fixes include:
 - Galileo E1/E5 ranges corrected
 - Corrected an issue that could cause the unit to lock up at a certain day and time of week Known Issue:
 - Power level offsets are not applied to different frequencies, codes, and constellations.
- NOTE: Requires min v2.04 to be installed first

Version 5.5.4 – October 25, 2013

Features include:

- Improved PPS timing calibration, allows special calibration option
 - Aligned the NMEA log data to the whole second
 - Improved response when querying unused channels Fixes include:
 - SBAS corrections applied to the satellite ranges
 - Corrected SCPI commands for power adjustment when used with RSG option and without
 - Corrected a bug that prevented a custom antenna gain pattern from taking effect unless 'enter' was pressed
 - Corrected the number of digits in NMEA data timestamps
 - Corrected transfer of binary files using SCPI
 - SBAS satellite position correction
- NOTE: Requires min v2.04 to be installed first

Version 5.5.1 – July 8, 2013

Features include:

- Simulate 'Now' capable
- Galileo E1 capable
- Improved trajectory altitude handling
- Observations now support multiple frequency bands
- SV clock models implemented
- Added ability to load user selected SBAS files

- NOTE: Requires min v2.04 to be installed first

Version 5.1.13 – May 23, 2013

Fixes include:

- Corrected L2 power level issue.

- NOTE: Requires min v2.04 to be installed first

Version 5.1.11 – May 6, 2013

Fixes include:

- Patch to Linux kernel to address new USB part now being used.

- NOTE: Requires min v2.04 to be installed first

Version 5.1.9 – May 6, 2013

Fixes include:

- Corrected network bug that could cause unit to randomly drop from network
- Improved RSG synchronization with OPC
- Fixed an error that could cause satellites to be disabled due to a phase shift between P-code and C/A code

- NOTE: Requires min v2.04 to be installed first

Version 5.1.7 – April 30, 2013

Features include:

- Improved external trigger feature - only first trigger received is used
- Introduces single channel GSG-5 unit Fixes include:
- 'Speed or altitude above regulation limits' error that can occur during a static scenario
- Improved synchronization for GSG-63/64 models
- Corrected GLONASS ranges

- NOTE: Requires min v2.04 to be installed first

Version 5.1.5 – April 10, 2013

Fixes include:

- Fixes GPIB bug that affects log? command

- NOTE: Requires min v2.04 to be installed first

Version 5.1.3 – April 02, 2013

Fixes include:

- Removes an error message that may show in GSG-5 licensed units

- NOTE: Requires min v2.04 to be installed first

Version 5.1.1 – March 18, 2013

Features include:

- Controlled TOA for Age of Almanac reporting by some receivers
- Default data leap second updated to 16

- NOTE: Requires min v2.04 to be installed first

Version 5.0.1 – February 22, 2013

Features include:

- Capability for new GPS signals L2c and L5
- Adds the ability to choose the satellite model for each GPS and GLONASS satellite
- Calibration date is stored in unit
- Improved options display – see which options are enabled and which are not in each unit
- Signal generator can output 1 each of GPS and GLONASS

- Adds the capability to add trial licenses for software options Fixes include:
 - Corrected error when antenna model is used with attitude changes
 - Corrected the ephemeris data file calculation in signal generator mode
 - Added fix for Garmin that would not use the signal if there was 0 clock error
 - Improved the fan speed settings
 - Improved NMEA file size and handling (improvement from 4.5/4.51)
- NOTE: Requires min v2.04 to be installed first

Version 4.51 – December 20, 2012

Fixes include:

- SBAS bug fix in v4.5 that would cause SBAS satellites to be disabled when the scenario is started.
- NOTE: Requires min v2.04 to be installed first

Version 4.5 - December 19, 2012

Features include:

- Capability for Real-time scenario generation feature
 - Introduces new trajectory format, .traj files
 - Repeatable trajectory capability
 - Programmable PPS (configurable to 1, 10, 100, 1000 PPS)
 - Reset (&Clean) factory defaults using SCPI protocol Fixes include:
 - Faster response to SOUR:SCEN:LOG? command
- NOTE: Requires min v2.04 to be installed first

Version 4.11 - October 23, 2012

Fixes include:

- Improved USB functionality Version 4.09 - October 18, 2012 Features include:
 - Change in signal generator mode to use af0 and af1 value from the RINEX ephemeris file.
 - Execution log introduced on unit.
- NOTE: Requires min v2.04 to be installed first

Version 4.07 - September 28, 2012

Corrections include:

- L1L2-Iono model correction
 - Signal duplication using events now works properly
 - Multi-band antenna gain fixes
 - Unit detects loss of external reference and reports error
- NOTE: Requires min v2.04 to be installed first

Version 4.05 – August 18, 2012

- Includes workaround for Topcon GRS-1 issue Corrections Include:

- Corrected a bug that can cause a 'Speed or altitude above regulation limits' error to occur in a static scenario
 - Corrected a bug that caused interference signals to have -65dbm power level regardless of requested value
 - Ensured all interference signals are shown in the scenario details when running
 - Fixed an issue with GLONASS only scenarios where the next day's data did not load on long scenarios
- NOTE: Requires min v2.04 to be installed first

Version 4.01 – August 6, 2012

- Introduces GSG-62.

- Introduces GPS P/Pseudo-Y.

- Introduces GPS L2 and GLONASS L2. Features include:

- Added ability to set scenario start time from an NTP server
- NMEA log data from unit contains more accurate SNR values
- Introduced user defined antenna patterns
- Arming and Triggering can now be done from the front panel
- The front panel keys can be locked out
- Introduced Scenario Relative power event

Corrections include:

- GLONASS RINEX file fixes
- Corrected a bug that would cause a crash if a scenario was started with zero satellites selected
- Corrected a bug that could occur in the transmit power menu after a factory reset

- Improved error message received when unit exceeds regulation limits
- Updated satellite identifiers returned by SOURCE:SCENARIO:SATID[n]?
- GPIB setting now persists through a power cycle
- Updated 3GPP trajectory to correct for a jump sometimes seen when the trajectory repeats
- Calibration mode now outputs full power with zero attenuation
- Corrected an almanac issue that caused certain receivers to hang when reading almanac data for unhealthy sats

- NOTE: Requires min v2.04 to be installed first

Version 3.03 – April 30, 2012

-Allows for creation of GSG-53 GPS/GLONASS 4-channel simulator Corrections include:

- GLONASS almanac fixes
- New coordinate formats on front panel display. Pressing the format button now changes between:
 - 1) Geodetics in DD MM.mmmm (current format)
 - 2) Geodetics in DD MM SS.ss
 - 3) Geodetics in DD dddd
 - 4) EFEC in IIIIII.ii (signed Integers)
- Antenna model fixes:
 - Fixed issue with signal levels growing over time when using patch antenna model
 - Corrected a minor issue in the cardioid antenna model algorithm
- Fixes to interference channels:
 - Changed the display of the interference channel to indicate whether it is a GPS or GLONASS CW signal
 - Correct an error that could cause the wrong frequency to be transmitted when selecting GLONASS slot 0
- Improvements to firmware update:
 - Update can be canceled while the file is being transferred but not once update has started
 - Firmware will check for free space and firmware file in the user partition temporarily as necessary
- SCPI protocol fixes:
 - Added proper wait time for SOURCE:ONECHN:CONTROL stop command
 - Corrected GGA format from NMEA log query- removed extra field
 - Changed Elevation and Azimuth fields in GSV sentences to integers
- Other fixes:
 - Disabled the ability to create a multipath SBAS signal via an event file
 - Added an acknowledgement screen after reset to factory defaults is complete

- NOTE: Requires min v2.04 to be installed first

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Version 3.02 – March 13, 2012

- Correction: Unit locks up on next reboot after manual calibration using calibration menu.

- NOTE: Requires min v2.04 to be installed first

Version 3.01 - February 29, 2012

- Corrections to the v3.00 release

- NOTE: Requires min v2.04 to be installed first

Version 3.00 - February 22, 2012

- GSG-56 introduced GLONASS support New features include:

- RINEX Observation file logging,
- 10Hz NMEA trajectory support
- ECEF coordinate support
- Interference signals (GSG-55/56) Bug fixes include:
- Time jump at day26
- USB improvements

- NOTE: Requires min v2.04 to be installed first

Version 2.09 – October 12, 2011

- Configurable gateway
- Configurable DNS
- HTTP proxy support to be used with download feature
- Because of above changes the “Interface and reference” menu has been reorganized
- Fix for “Garbage on the screen when scen/siggen is run/stopped many times from protocol”

- NOTE: Requires min v2.04 to be installed first

Version 2.08 - September 29, 2011

- Limits for Export restricted version changed to be greater than before
 - Fix for "Every Thursday in 2011 (except a few in Jan2009) cause error"
- NOTE: Requires min v2.04 to be installed first

Version 2.07 - August 26, 2011

- External trigger can be used to synchronize several units
 - Improved almanac handling
 - Faster scenario start-up
 - Web interface improvements
 - Ublox and Trimble Force 22E receiver performance verified
 - GSG-55E model name introduced
 - A number of scenario replay and usability enhancements
- NOTE: Requires min v2.04 to be installed first

Version 2.06 - May 31, 2011

- Correcting for FPGA M9K Memory Block Read Issue, which caused severe problems for affected HWunits
 - Introducing Reset&Clean functionality
 - Introducing Configurable gateway
 - Introducing Export restricted version
 - Introducing Dynamic navigation message updating and better leap second handling
 - Usability improvements, e.g. Yes/No/Cancel dialogs and better error handling when parsing user uploaded scenario files
 - Avoiding 'no ext ref' warning message, by giving the PLL extra time to lock. Esp needed by the 622 VCXO version.
- NOTE: Requires min v2.04 to be installed first

Version 2.05 - April 25, 2011

- Web interface reboot disabled during firmware update
 - Front panel changes according the license
- NOTE: Requires v2.04 to be installed first

Version 2.04 - April 11, 2011

- Support for Web interface, unit front panel as a Web page.
- NOTE: Requires v2.03 to be installed first

Version 2.03 - April 6, 2011

- Support for configurable VCXO frequency
- First part for enabling web server interface

Version 2.02 - March 10, 2011

- Leap second feature added
- NMEA trajectory corrections with improved support data with only one of the GGA, RMC types present
- Changes in navigation message to correct for an issue seen with Rockwell receivers
- Protocol improvements, IEEE488.2 commands
- Corrected issue with verifying calibration data
- Corrected missing SBAS data behavior