G-III Reference Receiver

The G-III Reference Receiver Delivers Accurate GNSS Signal Measurements

Superior Tracking Ability

The G-III Reference Receiver incorporates patented Narrow Correlator® tracking technology by Hexagon | NovAtel which enhances the reception of satellite data for highly accurate range measurements. In addition, the patent-pending SafeTrak™ algorithm by NovAtel increases reliability by detecting and eliminating cross-correlation.

Signal Quality Monitoring

The G-III Reference Receiver offers Signal Quality Monitoring (SQM) measurements to monitor the quality of the incoming signal and detect satellite failures. Multiple correlators provide real-time data to conduct satellite signal quality monitoring over the full International Civil Aviation Organization (ICAO) threat space.

Exceptional Interference Rejection

NovAtel has over 20 years of experience developing innovative solutions for Satellite Based Augmentation Systems (SBAS) around the world. The G-III Reference Receiver incorporates the latest of these technical innovations to provide superior protection against Radio Frequency (RF) interference, including pulse blanking to minimize in-band interference from radar and pulsed Distance Measuring Equipment (DME).

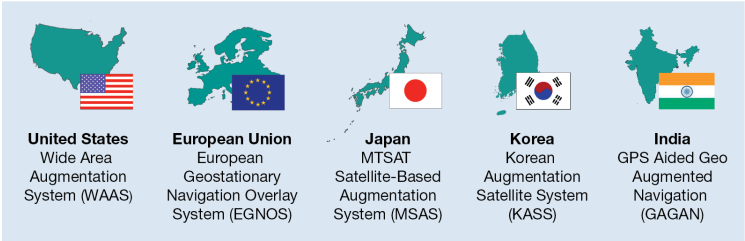

Figure 1: NovAtel SBAS Reference Receivers Around the World

Customizable SBAS Receiver Platform

The flexible design of the G-III Reference Receiver allows to it to be easily customized to be used within any current or future Space Based Augmentation System.

Future Expandability

While providing today's leading edge technology, the G-III Reference Receiver has the added advantage of expandability. With the ability to add more processing components, the G-III Reference Receiver can be expanded to support new signals and additional global constellations as they become available.

Proven Operational Stability

The G-III Reference Receiver has been successfully deployed across several SBAS around the world, accumulating millions of operational hours.

Benefits

- Software developed and qualified to RTCA DO-178B DAL D standards for safety of life applications
- Meets demanding performance requirements for low elevation satellite tracking
- Provides highly accurate GNSS signal measurements
- Superior protection against RF interference

Features

- Patented Narrow Correlator tracking technology for optimal tracking
- Dynamic PLL feature to enhance tracking availability
- Signal Quality Monitoring (SQM) measurements using multiple correlators
- Tracks and decodes SBAS signals
- Patent-pending SafeTrak cross-correlation verification algorithm
- Digital pulse blanking for mitigation against interference from radar and pulsed DMEs
- Wide range of flexible controls and configurable outputs for maximum access to satellite data
- Expandability for future signals and additional constellations, such as GLONASS, Galileo, BeiDou, QZSS and NavIC
- Standard 19-inch EIA form factor allows easy integration into existing infrastructure

Performance[1,2]

Nominal Bandwidth

L1	1575.42 MHz ±12 MHz
L2	1227.60 MHz ±12 MHz
L5	1176.45 MHz ±12 MHz

Signal Support

GPS L1 C/A, L1C, L2 P(Y), L2C and L5	PRN 1-63
SBAS L1 C/A and L5	PRN 120-158

Satellite Tracking Channels

Simultaneous tracking of up to 18 GPS satellites and up to 8 SBAS satellites

Pseudorange Measurement Accuracy[3] (RMS)

GPS L1 C/A Code	10 cm
GPS L1C Code	7 cm
GPS L2 P(Y) Code	50 cm
GPS L2C Code	10 cm
GPS L5 Code	5 cm
SBAS L1 C/A Code	10 cm
SBAS L5 Code	4 cm

Carrier Phase Accuracy[3] (RMS)

L1	3 mm
L2 P(Y) Code	5 mm
L2	3 mm
L5	3 mm

Measurement Update Rate

Pseudorange measurements	1 Hz
Carrier phase measurements	1 Hz
SQM measurements	1 Hz
Time	1 Hz

Signal Acquisition[4]

GPS (without almanac)	180 seconds
GPS (with almanac and time)	45 seconds
SBAS	45 seconds

Physical and Electrical

Dimensions	482 x 266 x 487 mm
Weight	12.6 kg

Power

Input voltage	120/240 VAC
Frequency	50/60 Hz
Power consumption	<150 W

External Frequency Reference

Input frequency	10 MHz ±1 Hz
Signal level	0 to +17 dBm
Short-term stability	≤ 2x10E-11/1 s

Communication Ports

1 Ethernet port for configuration and data, 100BaseTX (Data port)

1 output only Ethernet port for data monitoring, 100BaseTX (Monitor port)

1 bi-directional RS-232 serial port for initial configuration, capable of up to 115,200 bps (Maintenance port)

Connectivity

Power input	IEC C14
Antenna input	TNC female
RF test output	TNC female
External oscillator input	TNC female
External oscillator output	TNC female
1PPS output	TNC female
1PPS input	TNC female
Data port	RJ-45
Monitor port	RJ-45
Maintenance port	DB9 male

Environmental

Temperature

Operating	+12.7°C to +29.5°C
Operating, degraded	-25°C to +12.7°C +29.5°C to +55°C
Storage	-40°C to +85°C

Humidity (non-condensing)	10% to 80%
Altitude[5]	3,000 m

1. The performance values are for the WAAS version of the G-III Reference Receiver.
2. Typical values. Performance specifications subject to GPS system characteristics, US DOD operational degradation, ionospheric and tropospheric conditions, satellite geometry, baseline length, multipath effects and the presence of intentional or unintentional interference sources.
3. C/No =45 dB-Hz, DLL BW = 0.05 and PLL= 3 Hz for all signals except L2P(Y). C/No = 38 dB-Hz, DLL BW = 0.05 Hz, and PLL BW = 0.2 Hz for L2P(Y). Utilizing an external frequency standard with performance specified as above.
4. For all GPS signals except L1C.
5. May operate above 3,000 m in a controlled environment, however is not qualified as such.

Contact Hexagon | NovAtel

sales@novatel.com 1-800-NOVATEL (U.S. and Canada) or 403-295-4900 | China: 0086-21-68882300 | Europe: 44-1993-848-736 | SE Asia and Australia: 61-400-883-601.
For the most recent details of this product: novatel.com

D17243 Version 3 | 12/06/2020 | Printed in Canada