



Positioning Leadership



WAAS Reference Receiver G-II

NovAtel's next generation of WAAS receiver, the WAAS Reference Receiver G-II, benefits from NovAtel's newest technology to provide exceptional tracking performance, advanced integrity monitoring, and improved multipath rejection for Satellite-Based Augmentation Systems (SBAS).

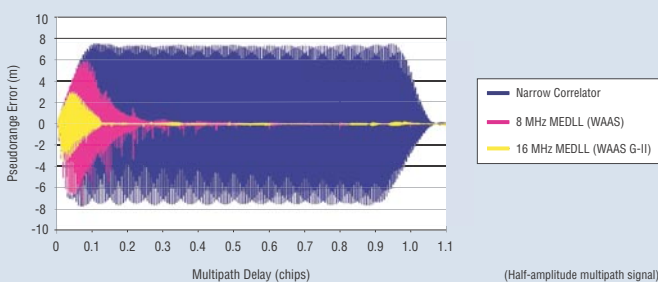
Superior tracking ability

Designed to meet demanding performance requirements, the WAAS G-II incorporates NovAtel's patented Narrow Correlator® tracking technology. With low angle satellite tracking and fast reacquisition, Narrow Correlator enhances the reception of satellite data for highly accurate range measurements. In addition, NovAtel's patent-pending SafeTrak™ algorithm increases reliability by detecting and eliminating cross-correlation.

Improved multipath elimination

NovAtel's WAAS reference receivers lead the world in multipath mitigation with our patented MEDLL® technology. Now, enhanced algorithms and increased RF bandwidth provide a 50 percent improvement in MEDLL performance, as shown in *Figure 1* below. As a result, the WAAS G-II provides the most accurate reference signal measurements available.

Figure 1 - Pseudorange Error Due to Multipath



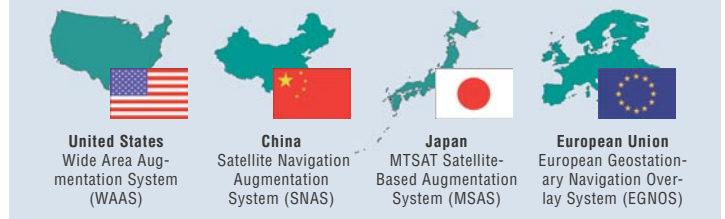
Signal quality monitoring

The WAAS G-II also 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 ICAO threat space.

Exceptional interference rejection

The WAAS G-II incorporates nearly ten years of technical innovation developed for SBAS networks around the world (see *Figure 2*). This research has resulted in superior protection against RF interference, which is often found in areas with high communication traffic such as air traffic control centers. This includes digital pulse blanking on the L2 signal to mitigate against in-band interference from radar and pulsed DMEs.

Figure 2 - NovAtel SBAS Reference Receivers Around the World



Future expandability

While providing today's leading edge technology, the WAAS G-II has the added advantage of expandability for the future. With the capability to hold up to 12 Euro form factor cards in three independent receiver sections, as shown in *Figure 3* (back), the WAAS G-II is ready to support additional receiver cards for tracking such signals as GPS L5 and L2C, Galileo, and GLONASS. As a result, the WAAS G-II is ready for the future in the world's wide area reference networks.

Performance¹

Frequency L1 (1575.42 MHz) & L2 (1227.6 MHz)

Codes Tracked

- GPS L1 C/A code, GPS L2 C/A code, and GPS L2 P(Y) code for GPS SVN (PRN 0-37)
- SBAS L1 C/A code for GEO SVN (PRN 120-138)

Satellite Tracking Channels

- Up to 18 L1 C/A (with up to four of those for SBAS L1 C/A)
- Up to 18 L2 P(Y) or L2 C/A (up to 14 when four SBAS GEOs are being tracked)

Pseudorange Measurement Accuracy

GPS L1, L2 C/A Code	10 cm RMS, C/N ₀ > 44 dB-Hz, DLL BW = 0.05 Hz
SBAS L1 C/A Code	1 m RMS, C/N ₀ > 44 dB-Hz, DLL BW = 0.05 Hz
GPS L2 P(Y) Code	50 cm RMS, C/N ₀ > 38 dB-Hz, DLL BW = 0.05 Hz

Single Channel Phase Accuracy

GPS L1, L2 C/A Code	3 mm RMS, C/N ₀ > 44 dB-Hz, PLL BW = 3 Hz
GPS L2 P(Y) Code	5 mm RMS, C/N ₀ > 38 dB-Hz, PLL BW = 0.2 Hz

Data Rate

Raw Measurements	1 Hz
SQM Measurements	1 Hz
MEDLL Measurements	1 Hz
Status Data	1 Hz

Time to First Fix² 100 s (95%)

Signal Reacquisition

GPS L1	3 s (typical)
GPS L2	20 s (typical)
SBAS L1	5 s (typical)

MTBF³ 64,586 hr

Altitude⁴ 3,000 m

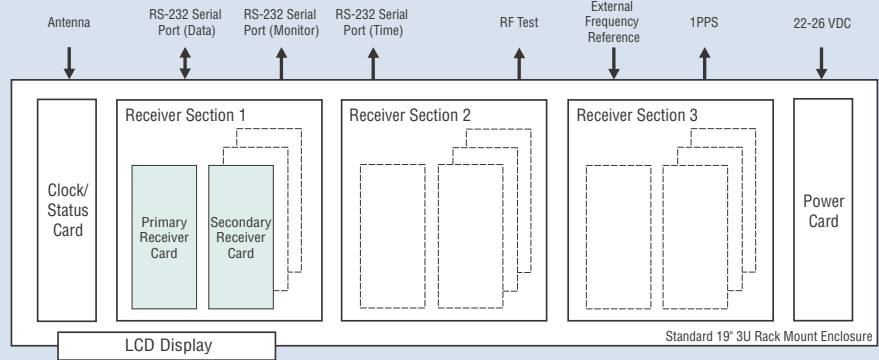
¹ Typical values. Performance specifications subject to GPS system characteristics, US DOD operational degradation, ionospheric conditions, satellite geometry, baseline length, and multipath effects.

² With stabilized internal and external oscillators and initial time, almanac, and position.

³ Per MIL-HDBK-217F Notice 2 at +35°C external ambient temperature.

⁴ May operate above 3,000 m in a controlled environment, however is not qualified as such. Export licensing restricts operation to a maximum of 18,288 meters.

Figure 3 - WAAS G-II Block Diagram



Physical & Electrical

Size (H x W x D) 17.7 x 44.9 x 41.3 cm
(without mounting brackets)

Weight 9.4 kg

Power

Input Voltage	+22 to +26 VDC
Power Consumption	20 W (typical)

External Oscillator Input

Input Frequency	10 MHz ± 5 ppm
Signal Level	0 to +17 dBm

Communication Ports

- 1 RS-232 bi-directional serial port capable of up to 230,400 bps (Data port)
- 1 RS-232 output port for 1PPS timing data, capable of up to 230,400 bps (Time port)
- 1 RS-232 output port for data monitoring, capable of up to 230,400 bps (Monitor port)

Input/Output Connectors

Power Input	3-position chassis jack
Antenna Input	TNC female
RF Test Output	TNC female
External Oscillator Input	BNC female
1PPS Output	BNC female
COM1 (Data port)	DB-9 male
COM2 (Time port)	DB-9 male
COM3 (Monitor port)	DB-9 male

Environmental

Temperature	
Operating	-25°C to +55°C
Storage	-40°C to +85°C
Humidity	10% to 80%

Features

- 50% improvement in MEDLL performance
- Patented Narrow Correlator® tracking technology for superior tracking
- Signal Quality Monitoring (SQM) measurements using multiple correlators
- Includes RFI improvements developed for the US WAAS network
- Tracks and decodes SBAS signals
- Patent-pending SafeTrak cross-correlation verification algorithm
- Digital pulse blanking on the L2 signal for mitigation against interference from radar and pulsed DMEs
- Wide range of flexible controls and configurable outputs for maximum access to satellite data
- Built-in forced-air cooling
- Expandability for future signals, such as L5, L2C, Galileo, and GLONASS

For more information, visit our website.

U.S. & Canada	1-800-NovAtel
Europe	+44 (0) 1524 848 374
Other	+1-403-295-4900
Fax	+1-403-295-4901
Email	sales@novatel.ca
Web	www.novatel.com

