



## KEY FEATURES

Dual-antenna inputs for precise heading calculation

Multi-Constellation GNSS Support

OmniSTAR VBS/XP/G2/HP support

Flexible RS232, USB, Ethernet or CAN Interfacing

Centimeter level position accuracy



## COMPACT, DUAL-ANTENNA GNSS RECEIVER DESIGNED TO DELIVER CENTIMETER ACCURATE POSITIONS AND PRECISE HEADING TO CHALLENGING GUIDANCE AND CONTROL APPLICATIONS.

**THE LATEST IN GNSS TECHNOLOGY FROM TRIMBLE IS NOW AVAILABLE TO ORIGINAL EQUIPMENT MANUFACTURERS (OEM) AND SYSTEM INTEGRATORS.**

The Trimble® BD982 GNSS system is a single board solution for precise position and heading. The product delivers the latest in GNSS signal support delivering multi-constellation RTK baselines between the two connected antennas and to a remote base station. With the Trimble BD982, OEM's and integrators can be assured their investment is sound today and into the future. The Trimble BD982 GNSS supports GPS L1/L2/L5 and GLONASS L1/L2 signals. In addition, Trimble is committed to the next generation of modernized GNSS configurations by providing Galileo-compatible products available for customers well in advance of Galileo system availability. In support of this plan, the new Trimble BD982 is capable of tracking the experimental GIOVE-A and GIOVE-B test satellites for signal evaluation and test purposes.<sup>1,2</sup>

With the option of utilizing OmniSTAR VBS, XP, G2 and HP services, the BD982 delivers varying levels of GNSS performance right down to the sub-decimeter level, even without the use of a base station.

### DUAL-ANTENNA INPUT

Single antenna GNSS systems have difficulty determining where the antenna is positioned relative to the vehicle and object of interest, especially when dynamics are low. External sensors can be used to augment this however these tend to drift when static. Heading derived from dual-antenna GNSS measurements overcomes these issues and is

now economically the right choice. The BD982 harnesses the power of the 220 channel Trimble Maxwell 6 Technology with dual chips supporting two antennas connected to the board. Independent observations from both antennas are passed to the processor where multi-constellation RTK baselines are computed. A single connection to the board via RS232, USB, Ethernet or CAN delivers both centimeter accurate positions and less than a tenth of a degree (2 meter baseline) heading accuracy.

### FLEXIBLE INTERFACING

The Trimble BD982 was designed for easy integration and rugged dependability. Customers benefit from the Ethernet connectivity available on the board, allowing high speed data transfer and configuration via standard web browsers. Just like other Trimble embedded technologies; easy to use software commands simplify integration and reduce development times. All software features are password-upgradeable, allowing functionality to be upgraded as your requirements change.

### COMPACT DESIGN

The compact form factor is suitable for applications where lightweight is a necessity. The BD982 is rigorously tested to perform in the harsh environments your products are built for, with the reliability you expect from Trimble.

# TRIMBLE BD982 GNSS RECEIVER MODULE

## TECHNICAL SPECIFICATIONS

- Position Antenna based on 220 Channel Maxwell 6 chip:
  - GPS: Simultaneous L1 C/A, L2E, L2C, L5
  - GLONASS: Simultaneous L1 C/A, L1 P, L2 C/A, L2 P
  - SBAS: Simultaneous L1 C/A, L5
  - GIOVE-A: Simultaneous L1 BOC, E5A, E5B, E5AltBOC<sup>1</sup>
  - GIOVE-B: Simultaneous :L1 CBOC, E5A, E5B, E5AltBOC<sup>1</sup>
  - GALILEO: Disabled<sup>2</sup>
- Vector Antenna based on second 220 Channel Maxwell 6 chip:
  - GPS: Simultaneous L1 C/A, L2E, L2C
  - GLONASS: Simultaneous L1 C/A, L1 P, L2 C/A, L2 P
- Advanced Trimble Maxwell Custom GNSS Technology
- High precision multiple correlator for GNSS pseudorange measurements
- Unfiltered, unsmoothed pseudorange measurements data for low noise, low multipath error, low time domain correlation and high dynamic response
- Very low noise GNSS carrier phase measurements with <1 mm precision in a 1 Hz bandwidth
- Signal-to-Noise ratios reported in dB-Hz
- Proven Trimble low elevation tracking technology
- Initialization time<sup>3</sup> typically <10 seconds
- Initialization reliability<sup>3</sup> typically >99.9%
- 1 USB port
- 1 CAN port
- 1 LAN Ethernet port:
  - Supports links to 10BaseT/100BaseT networks
  - All functions are performed through a single IP address simultaneously—including web GUI access and raw data streaming
  - Network Protocols supported
    - HTTP (web GUI)
    - NTP Server
    - NMEA, GSOF, CMR etc over TCP/IP or UDP
    - NTripCaster, NTripServer, NTripClient
    - mDNS/uPnP Service discovery
    - Dynamic DNS
    - eMail alerts
    - Network link to Google Earth
    - Support for external modems via PPP
- 4 x RS232 ports
  - Baud rates up to 460,800
- 1 Hz, 2 Hz, 5 Hz, 10 Hz, 20 & 50 Hz positioning outputs (depends on installed option)
- Up to 50 Hz raw measurement & position outputs

Reference outputs . . . . . CMR, CMR+, RTCM 2.1, 2.2, 2.3, 3.0, 3.1  
 Navigation outputs . . . . . ASCII: NMEA-0183 GSV, AVR, RMC, HDT, VGK, VHD, ROT, GSK, GGA, GSA, ZDA, VTG, GST, PJT, PJK, BPQ, GLL, GRS, GBS and Binary: Trimble GSOF

- Control Software
  - HTML web browser. Internet Explorer 7.0 or later
  - Firefox 3.5 or later
  - Safari 4.0
  - Opera 9
  - Google Chrome
- 1 Pulse Per Second Output
- Event Marker Input Support

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LED drive support . . . . . 3 (indicating Power, Satellite Tracking, and Differential Data)

## POSITIONING SPECIFICATIONS

Mode	Accuracy <sup>4</sup>	Latency <sup>5</sup>	Maximum Rate
Single Baseline RTK (<30km)	8 mm + 1 ppm Horizontal 15 mm + 1 ppm Vertical	<20 ms	50 Hz
DGPS	0.25 m + 1 ppm Horizontal 0.50 m + 1 ppm Vertical	<20 ms	50 Hz
SBAS <sup>6</sup>	<5 m 3DRMS	<20 ms	50 Hz

## HEADING SPECIFICATIONS

Baseline	Accuracy <sup>4</sup>	Maximum Rate
2 m	<0.09°	50 Hz
10 m	<0.05°	50 Hz

## PHYSICAL CHARACTERISTICS

Size . . . . . 100 mm X 84.9 mm X 11.6 mm  
 Power . . . . . 3.3V DC +5%/-3%  
 Typical 2.1W (L1/L2 GPS)  
 Typical 2.3W (L1/L2 GPS and G1/G2 GLONASS)  
 Weight . . . . . 92 grams  
 Connectors  
 I/O . . . . . 40-pin header  
 Antenna . . . . . 2 x MMCX receptacle

## ENVIRONMENTAL CHARACTERISTICS<sup>7</sup>

Temperature  
 Operating -40 °C to +75 °C  
 Storage -55 °C to +85 °C  
 Vibration MIL810F, tailored  
 Random 6.2 gRMS operating  
 Random 8 gRMS survival  
 MIL810D  
 Mechanical shock ±40 g operating  
 ±75 g survival

## ORDERING INFORMATION

Module Trimble BD982 GNSS available in a variety of configurations from L1 DGPS upwards  
 Evaluation Kit Includes interface board and power supply

<sup>1</sup> Galileo GIOVE-A and GIOVE-B test satellite support uses information that is unrestricted in the public domain and is intended for signal evaluation and test purposes.  
<sup>2</sup> The hardware is compliant to Galileo OS SIS ICD, Issue 1, Rev. 1, Sep 2010. Commercial sale of Galileo technology requires Trimble to acquire a Commercial license from the EU. At the time of writing there is no process for obtaining a license. Therefore to comply with the ICD Copyright/IPR terms all Galileo firmware/hardware functionality have been disabled. Depending upon the terms of the license an upgrade to full Galileo (L1 CBOC, E5A, E5B, E5AltBOC) may be offered. This will require an additional fee.  
<sup>3</sup> May be affected by atmospheric conditions, signal multipath, and satellite geometry. Initialization reliability is continuously monitored to ensure highest quality.  
<sup>4</sup> 1 sigma level, when using Trimble Zephyr 2 antennas.  
<sup>5</sup> At maximum output rate.  
<sup>6</sup> Depends on SBAS system performance.  
<sup>7</sup> Dependent on appropriate mounting/enclosure design.

Specifications subject to change without notice.



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