Trimble BD982

DUAL-ANTENNA RECEIVER DELIVERS CENTIMETER ACCURATE POSITIONS AND PRECISE HEADING

GUIDANCE AND CONTROL POSITIONING

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, GLONASS L1/L2/L3 and BeiDou B1, B2 signals. In addition, Trimble is committed to the next generation of modernized GNSS configurations by providing Galileo and BeiDou compatible products available for customers well in advance of these systems becoming operational. In support of this plan, the Trimble BD982 is capable of tracking Galileo signals for evaluation and test purposes.2

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.

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



DATASHEET

Trimble BD982 Module

TECHNICAL SPECIFICATIONS[1]

- Position Antenna based on 220 Channel Maxwell 6 chip:
  - GPS: Simultaneous L1 C/A, L2E, L2C, L5
  - GLONASS: Simultaneous L1 C/A, L2 C/A , L2 P, L3 CDMA[13]
  - SBAS: Simultaneous L1 C/A, L5
  - BeiDou: B1, B2
  - Galileo: Simultaneous L1 BOC, E5A, E5B, E5AltBOC[2]
  - QZSS: L1 C/A, L1 SAIF, L2C, L5
- Vector Antenna based on second 220 Channel Maxwell 6 chip:
  - GPS: Simultaneous L1 C/A, L2E, L2C
  - GLONASS: Simultaneous L1 C/A, L2 C/A, L2 P
  - BeiDou: B1
- 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[3] ..... typically <10 seconds
  Initialization reliability[3] ..... 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/inputs:
  - CMR, CMR+,SCMRX, RTCM 2.1, 2.2, 2.3, 3.0, 3.1[12]
- Navigation outputs:
  - ASCII: NMEA-0183 GSV, AVR, RMC, HDT, VGK, VHD, ROT, GGK, GGA, GSA, ZDA, VTG, GST, PJT, PJK, BPQ, GLL, GRS, GBS and Binary: Trimble GSOF
- Control Software: HTML web browser. Internet Explorer, Firefox, Safari, Opera, Google Chrome
- 1 Pulse Per Second Output
- Event Marker Input Support
  LED drive support ..... .3 (indicating Power, Satellite Tracking, and Differential Data)

PERFORMANCE SPECIFICATIONS

Time to First Fix (TTFF)[7]
- Cold Start[8] ..... <45 seconds
- Warm Start[9] ..... <30 seconds
- Signal Re-acquisition ..... < 2 seconds

Velocity Accuracy[3,4]
- Horizontal ..... 0.007 m/sec
- Vertical ..... 0.020 m/sec

Acceleration ..... 11 g

Maximum Operating Limits[10]
- Velocity ..... .515 m/sec
- Altitude ..... 18,000 m

POSITIONING SPECIFICATIONS

Mode	Accuracy[4]	Latency[5]	Maximum Rate
Single Baseline RTK (<30 km)	0.008 m + 1 ppm Horizontal 0.015 m + 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	0.50 m Horizontal 0.85 m Vertical	<20ms	50 Hz

RTK initialization time[3] ..... typically <1 minute
RTK initialization reliability[3] ..... >99.9%

HEADING SPECIFICATIONS

Baseline	Accuracy4	Maximum Rate
2 m	<0.09º	50 Hz
10 m	<0.05º	50 Hz

PHYSICAL AND ELECTRICAL CHARACTERISTICS

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

ENVIRONMENTAL CHARACTERISTICS[11]

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
Mechanical shock MIL810D
±40 g operating
±75 g survival

ORDERING INFORMATION

Module Part Number 77911-XX
Module ..... Trimble BD982 GNSS available in a variety of configurations from L1 DGPS upwards
Evaluation Kit ..... Includes interface board and power supply

1 Trimble BD982 is available in a variety of software configurations. Specifications shown reflect full capability.
2 Developed under a license of the European Union and the European Space Agency.
3 May be affected by atmospheric conditions, signal multipath, satellite geometry and placement of antennas. Initialization reliability is continuously monitored to ensure highest quality.
4 1 sigma level, when using Trimble Zephyr™ 2 antennas.
5 At maximum output rate.
6 GPS only and depends on SBAS System performance. FAA WAAS accuracy specifications are <5 m 3DRMS.
7 Typical observed values.
8 No previous satellite (ephemerides / almanac) or position (approximate position or time) information.
9 Ephemerides and last used position known.
10 As required by the U.S. Department of Commerce to comply with export licensing restrictions.
11 Dependent on appropriate mounting/enclosure design.
12 Input only network correction.
13 There is no public GLONASS L3 CDMA ICD. The current capability in the receivers is based on publicly available information. As such, Trimble cannot guarantee that these receivers will be fully compatible.

Specifications subject to change without notice.

Contact your local dealer today

TRIMBLE
Integrated Technologies
510 DeGuigne Drive
Sunnyvale, CA 94085
Americas & Asia-Pacific
Europe/EMEA

Email: sales-intech@trimble.com

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