DATASHEET

Trimble BD992

DUAL-ANTENNA RECEIVER DELIVERS CENTIMETER ACCURATE POSITIONS AND PRECISE HEADING

DUAL-ANTENNA INPUT

The Trimble® BD992 GNSS system is a single board solution for precise position and heading. 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.

TRIMBLE MAXWELL 7 TECHNOLOGY

The Trimble BD992 supports triple frequency for the GPS, GLONASS, BeiDou and Galileo constellations. As the number of satellites in the constellations grows the BD992 is ready to take advantage of the additional signals. This delivers the quickest and most reliable RTK initializations for centimeter positioning. With the latest Trimble Maxwell™ 7 Technology, the BD992 provides :

- 2 x 336 Tracking Channels
- Trimble Everest Plus multipath mitigation
- Advanced RF Spectrum Monitoring and Analysis
- Proven low-elevation tracking technology

With the option of utilizing OmniSTAR or RTX services, the BD992 delivers varying levels of performance down to centimeter level without the use of a base station.

ROBUST CENTIMETER ACCURATE SOLUTIONS

The Trimble BD992 integrates the latest in precision inertial sensors in a compact package. With the BD992 you are buying a robust navigation solution, not just a GNSS receiver. Key features include:

- High update rate position and heading solutions
- Robust Moving Baseline RTK for precision landing on moving platforms

FLEXIBLE INTERFACING

The Trimble BD992 was designed for easy integration and rugged dependability. Customers benefi t from the Ethernet connectivity available on the board, allowing high speed data transfer and configuration via standard web browsers. USB, CAN and RS-232 are also supported. Just like other Trimble embedded technologies, easy to use software commands simplify integration and reduce development times.

Different configurations of the module are available. These include everything from a DGPS L1 unit all the way to a four constellation triple frequency RTK unit. All features are password-upgradeable, allowing functionality to be upgraded as your requirements change.

Key Features

- Trimble Maxwell 7 Technology
- Dual-antenna inputs for precise heading calculation
- 336 Channels per antenna for multi-constellation GNSS support
- OmniSTAR/RTX Support
- Compact design for mobile applications
- Flexible RS232, USB and Ethernet interfacing
- Centimeter level position accuracy
- Advanced RF Spectrum Monitoring



Preliminary

DATASHEET

Trimble BD992 MODULE

TECHNICAL SPECIFICATIONS[1]

- Trimble Maxwell 7 Technology
- Position Antenna based on 336 Channel Maxwell 7 chip:
  - GPS: L1 C/A, L2E, L2C, L5
  - BeiDou B1, B2, B3[13]
  - GLONASS: L1 C/A, L2 C/A, L3 CDMA[14]
  - Galileo[2]: E1, E5A, E5B, E5AltBOC, E6[14]
  - IRNSS L5
  - QZSS: L1 C/A, L1 SAIF,L1C, L2C, L5, LEX
  - SBAS: L1 C/A, L5
  - MSS L-Band: OmniSTAR, Trimble RTX
- Vector Antenna based on second 336 Channel Maxwell 7 chip:
  - GPS: L1 C/A, L2E, L2C, L5
  - BeiDou B1, B2, B3
  - GLONASS: L1 C/A, L2 C/A, L3 CDMA[14]
  - Galileo[2]: E1, E5A, E5B, E5AltBOC, E6[14]
  - IRNSS L5
  - QZSS: L1 C/A, L1 SAIF, L1C, L2C, L5, LEX
- High precision multiple correlator for GNSS pseudorange measurements
- Trimble Everest Plus multipath mitigation
- Advanced RF Spectrum Monitoring and Analysis
- 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
- Proven Trimble low elevation tracking technology
- Reference outputs/inputs
  - CMR, CMR+, sCMRx, RTCM 2.1, 2.2, 2.3, 3.0, 3.1[12], 3.2
- 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, NMEA2000
- 1 Pulse Per Second Output
- Event Marker Input Support
- Supports Fault Detection & Exclusion (FDE), Receiver Autonomous Integrity Monitoring (RAIM)

COMMUNICATION

- 1 USB 2.0 Device port
- 1 LAN Ethernet port:
  - Supports links to 10BaseT/100BaseT auto-negotiate 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
    - > Dynamic DNS
    - > eMail alerts
    - > RDNIS Support
    - > NMEA, GSOF, CMR over TCP/IP or UDP
    - > NTripCaster, NTripServer, NTripClient
    - > mDNS/uPnP Service discovery
    - > Network link to Google Earth
    - > Support for external modems via PPP
- 2 x RS232 ports
  - Baud rates up to 460800
- 1 CAN Port
- Control Software: HTML web browser, Internet Explorer, Firefox, Safari, Opera, Google Chrome

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

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

RTK initialization time[3] ..... typically <1 minute
RTK initialization reliability[3] ..... >99.9%
Position latency[5] ..... <20ms
Maximum Position/Atitude Update Rate ..... 50 Hz

PHYSICAL AND ELECTRICAL CHARACTERISTICS

Size ..... 100 mm x 60 mm x 11.6 mm
Power ..... 3.3 V DC +5%/–3%
Typical 1.5 W (L1/L2 GPS + L1/L2 GLONASS)
Weight ..... 60 grams

Connectors
- I/O ..... 44 -pin header
- GNSS Antenna ..... 2 x MMCX receptacle

Antenna LNA Power Input
- Input voltage ..... 3.3V DC to 5V DC
- Maximum current ..... 400 mA

Minimum required LNA Gain ..... 31.0 dB (> 35 dB Recommended)

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

Operating Humidity ..... 5% to 95% R.H. non-condensing, at +60 °C

ORDERING INFORMATION

Module Part Number 100992-XX
Module ..... Trimble BD992 GNSS available in a variety of configurations from L1 SBAS upwards
Evaluation Kit ..... Includes interface board, power supply

1 Trimble BD992 is available in a variety of software configurations. Specifications shown reflect full capibility.
2 Developed under a License of the European Union and the European Space Agency.
3 May be affected by atmospheric conditions, signal multipath, and satellite geometry. Initialization reliability is continuously monitored to ensure highest quality.
4 1 sigma level, when using Trimble Zephyr 2/3 antennas. Add 1 ppm for RTK position accuracies.
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 The hardware of this product is designed for Beidou B3 compatibility (trial version) and its firmware will be enhanced to fully support such new signals as soon as the officially published signal interface control documentation (ICD) becomes available.
14 There is no public GLONASS L3 CDMA or Galileo E6 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.
15 RTX and OmniSTAR accuracies depend on correction service chosen. Trimble CenterPoint RTX provides <4cm horizontal accuracy 95% of the time with initializations of less than 30 minutes.

Specifications subject to change without notice.

POSITIONING SPECIFICATIONS[3,4,15]

	Autonomous	SBAS	DGNSS	RTK
No GNSS Outages				
Position (m)	1.00 (H) 1.50 (V)	0.50 (H) 0.85 (V)	0.25 (H) 0.50 (V)	0.008 (H) 0.015 (V)
Roll/Pitch (deg)	N/A	N/A	N/A	N/A
Heading (deg) on 2m Baseline	<0.09°	<0.09°	<0.09°	<0.09°

Preliminary