



# Trimble BD910

## SINGLE FREQUENCY RECEIVER DELIVERS HIGHEST ACCURACY FOR MOBILE POSITIONING APPLICATIONS

### COMPACT FULL METAL JACKET DESIGN

The Trimble® BD910 GNSS receiver module has been designed for applications requiring high accuracy from multiple GNSS constellations in a very small package. Mobile platforms can now embed proven Trimble RTK technology using a shielded module in a compact 41 mm x 41 mm x 7 mm form factor. The Trimble BD910 is a complete drop-in, solder-down module manufactured and tested to Trimble's highest quality standards. This design ensures the high quality GNSS signals are protected from the sources of EMI on the host platform. It also significantly reduces radiated emissions which speeds compliance certification and time to market.

### MULTI CONSTELLATION GNSS

The Trimble BD910 supports the L1 frequency from the GPS, GLONASS, Galileo, and BeiDou constellations. An L1 RTK engine delivers 1–2 centimeter positions. For applications that do not require centimeter accuracy the BD910 contains an advanced kalman filter PVT engine that delivers high accuracy GNSS, DGNSS positions in the most challenging environments such as urban canyons. Different configurations of the module are available from SBAS to multi-constellation L1 RTK. All features are password-upgradeable, allowing functionality to be upgraded as your requirements change.

The receiver also supports Fault Detection and Exclusion (FDE) and Receiver Autonomous Integrity Monitoring (RAIM) for safety-critical applications.

### DEMONSTRATED PERFORMANCE

Industry professionals trust Trimble embedded positioning technologies as the core of their precision applications. With the latest Trimble-precise Maxwell™ 6 technology, the BD910 provides assurance of long-term future-proofing and trouble-free operation. Moving the industry forward, the Trimble BD910 redefines high-performance positioning:

- On-board multipath mitigation
- Proven low-elevation tracking technology

### FLEXIBLE INTERFACING

The Trimble BD910 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. USB and RS-232 are also supported. Just like other Trimble embedded technologies, easy to use software commands simplify integration and reduce development times.

### Key Features

- ▶ 220 Channels for multi-constellation GNSS support
- ▶ Fully EMI shielded module
- ▶ Advanced kalman filter PVT engine
- ▶ Compact design for mobile applications
- ▶ Flexible RS232, USB and ethernet interfacing
- ▶ L1 RTK centimeter level position accuracy
- ▶ Proven Trimble Maxwell 6 technology
- ▶ Supports FDE and RAIM



# TRIMBLE BD910 module

## TECHNICAL SPECIFICATIONS<sup>1</sup>

- 220 Channels:
  - GPS: L1 C/A
  - GLONASS: L1 C/A
  - Galileo: E1<sup>2</sup>
  - BeiDou: B1
  - QZSS: L1 C/A, L1 SAIF
  - SBAS: L1 C/A
- Advanced Trimble Maxwell 6 Custom Survey 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
- Proven Trimble low elevation tracking technology
- 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
    - > NMEA, GSOFF, CMR 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 115,200
- Up to 20 Hz raw measurement & position outputs
- Reference outputs/inputs
  - CMR, CMR+, sCMRx, RTCM 2.1, 2.2, 2.3, 3.0, 3.1<sup>12</sup>
- 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 GSOFF
- Control Software: HTML web browser, Internet Explorer, Firefox, Safari, Opera, Google Chrome
- 1 Pulse Per Second Output
- Event Marker Input Support
- Supports Fault Detection & Exclusion (FDE), Receiver Autonomous Integrity Monitoring (RAIM)

## PERFORMANCE SPECIFICATIONS

Time to First Fix (TTFF) <sup>7</sup>	
Cold Start <sup>8</sup>	<45 seconds
Warm Start <sup>9</sup>	<30 seconds
Signal Re-acquisition	<2 seconds
Velocity Accuracy <sup>3,4</sup>	
Horizontal	0.007 m/sec
Vertical	0.020 m/sec
Acceleration	11 g
Maximum Operating Limits <sup>10</sup>	
Velocity	0.515 m/sec
Altitude	18,000 m

## POSITIONING SPECIFICATIONS<sup>3</sup>

Mode	Accuracy <sup>4</sup>	Latency <sup>5</sup>	Maximum Rate
Single Baseline RTK (<5 km)	0.008 m + 1 ppm Horizontal 0.015 m + 1 ppm Vertical	<30 ms	20 Hz
DGNSS	0.25 m + 1 ppm Horizontal 0.50 m + 1 ppm Vertical	<20 ms	20 Hz
SBAS <sup>7</sup>	0.50 m Horizontal 0.85 m Vertical	<20 ms	20 Hz

RTK initialization time<sup>3</sup> ..... typically <1 minute  
 RTK initialization reliability<sup>3</sup> ..... >99.9%

## PHYSICAL AND ELECTRICAL CHARACTERISTICS

Size	41 mm x 41 mm x 7 mm
Power	3.3 V DC +5%/–3% Typical 1.1 W (L1 GPS + L1 GLONASS)
Weight	19 grams
Connectors	
I/O	80 pin Narrow Pitch Panasonic Socket
Antenna	MMCX receptacle
Antenna LNA Power Input	
Input voltage	3.3 V DC to 5 V DC
Maximum current	400 mA
Minimum required LNA Gain	24.5 dB

## ENVIRONMENTAL CHARACTERISTICS<sup>11</sup>

Temperature	
Operating	–40 °C to +85 °C
Storage	–55 °C to +85 °C
Vibration	MIL810F, tailored Random 6.2 gRMS operating Random 8 gRMS survival MIL810D ±40 g operating ±75 g survival
Mechanical shock	
Operating Humidity	5% to 95% R.H. non-condensing, at +60 °C

## ORDERING INFORMATION

Module Part Number	60910-XX
Module	Trimble BD910 GNSS available in a variety of configurations from SBAS upwards
Evaluation Kit	Includes interface board and power supply

- 1 Trimble BD910 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, and satellite geometry. 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

Specifications subject to change without notice.

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