Trimble BD970

COMPACT, LOW-POWER GNSS RECEIVER

COMPACT FULL METAL JACKET DESIGN

The Trimble® BD970 GNSS system is a compact multi-constellation receiver designed to deliver centimeter accuracy to a variety of applications. With the Trimble BD970, OEM's and integrators can be assured their investment is sound today and into the future. The Trimble BD970 GNSS supports a wide range of satellite signals, including GPS L2C and L5, GLONASS L1/L2 and BeiDou, B1 and B2 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 Trimble BD970 is capable of tracking both Galileo signals for evaluation and test purposes.[1]

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 BD970 provides assurance of long-term future-proofing and trouble-free operation. Moving the industry forward, the Trimble BD970 redefines high-performance positioning:

- On-board multipath mitigation
- Proven low-elevation tracking technology
- Dramatically improved RTK initialization

FLEXIBLE INTERFACING

The Trimble BD970 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, RS232 and CAN are also supported. 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 BD970 is rigorously tested to perform in the harsh environments your products are built for, with the reliability you expect from Trimble.

Key Features

- 220 Channels for Multi-Constellation GNSS Support
- Flexible RS232, USB, Ethernet or CAN Interfacing
- Centimeter-level position accuracy
- Proven Trimble Maxwell 6 technology
- Compact Form Factor

DATASHEET

Trimble BD970 Module

TECHNICAL SPECIFICATIONS

- 220 Channels:
  - GPS: Simultaneous L1 C/A, L2E, L2C, L5
  - GLONASS: Simultaneous L1 C/A, L1 P, L2 C/A (GLONASS M Only), L2 P
  - SBAS: Simultaneous L1 C/A, L5
  - Galileo: Simultaneous L1 BOC, E5A, E5B, E5AltBOC[1]
  - BeiDou: B1, B2
  - QZSS: L1 C/A, L1 SAIF, L2C, L5
- 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:

Initialization time[2] ..... typically <10 seconds
Initialization reliability[2] ..... >99.9%

- 1 USB port
- 1 CAN 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, GSOF, 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
- 3 x RS232 ports:
  - Baud rates up to 115,200
- 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[8]
- 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)[8]
- Cold Start[9] ..... <45 seconds
- Warm Start[10] ..... <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[11]
- 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
DGNSS	0.25 m + 1 ppm Horizontal 0.50 m + 1 ppm Vertical	<20 ms	50 Hz
SBAS[5]	0.50 m Horizontal 0.85 m Vertical	<20 ms	50 Hz

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

PHYSICAL AND ELECTRICAL CHARACTERISTICS

Size ..... 100 mm x 60 mm x 11.6 mm
Power ..... 3.3 V DC +5%/–3%
Typical 1.4 W (L1/L2 GPS)
Typical 1.5 W (L1/L2 GPS and G1/G2 GLONASS)
Weight ..... 62 grams
Connectors
- I/O ..... 24-pin header + 6-pin header
- Antenna ..... MMCX receptacle

ENVIRONMENTAL CHARACTERISTICS[6]

Temperature
- Operating ..... –40 °C to +75 °C
- Storage ..... –55 °C to +85 °C

Vibration ..... MIL810 F, tailored
Random 6.2 gRMS operating
Random 8 gRMS survival
Mechanical shock MIL810D
±40 g operating
±75 g survival

ORDERING INFORMATION

Module Part Number 71970-XX
Module ..... Trimble BD970 GNSS available in a variety of configurations from L1 DGPS upwards
Evaluation Kit ..... Includes interface board and power supply

1 Developed under a License of the European Union and the European Space Agency.
2 May be affected by atmospheric conditions, signal multipath, and satellite geometry. Initialization reliability is continuously monitored to ensure highest quality.
3 1 sigma level, when using Trimble Zephyr 2 antennas.
4 At maximum output rate.
5 GPS only and depends on SBAS System performance. FAA WAAS accuracy specifications are <5 m 3DRMS.
6 Dependent on appropriate mounting/enclosure design.
7 Input only network correction.
8 Typical observed values
9 No previous satellite (ephemerides / almanac) or position (approximate position or time) information.
10 Ephemerides and last used position known
11 As required by the U.S. Department of Commerce to comply with export licensing restrictions.

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

© 2021, Trimble Navigation Limited. All rights reserved. Trimble logo are trademarks of Trimble, registered in the United States and in other countries. All other trademarks are the property of their respective owners. (01/21)