Trimble BD930-UHF

TRIPLE FREQUENCY RECEIVER WITH INTEGRATED COMMUNICATIONS

GNSS AND COMMUNICATION TIGHT INTEGRATION

Taking advantage of Trimble's expertize in both GNSS and UHF communications the Trimble® BD930-UHF module has been designed for applications requiring centimeter accuracy in a compact package. By integrating wireless communications on the same module the task of receiving RTK corrections is greatly simplified. A single intuitive web interface allows a variety of use cases to be supported.

Both GNSS and communication components are fully shielded. This design ensures the high quality 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 BD930-UHF supports both triple frequency from the GPS and GLONASS constellations plus dual frequency from BeiDou and Galileo. As the number of satellites in the constellations grows the BD930 is ready to take advantage of the additional signals. This delivers the quickest and most reliable RTK initializations for 1–2 centimeter positioning. For applications that do not require centimeter accuracy the BD930 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. These include everything from a DGPS L1 unit all the way to a four constellation triple frequency RTK unit. Choose the receiver that suits your application and price point. 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.

HIGH PERFORMANCE INTEGRATED UHF RECEIVER

The Trimble BD930-UHF integrates the latest generation of UHF receiver modems allowing the system to instantly receive corrections from a large installed base of GNSS reference stations. With the BD930-UHF you are buying a solution, not just a GNSS receiver. Key features include:

- 70 MHz Bandwidth (403-473 MHz)
- High Over-the-Air Link Rates
- Industry standard link protocols

FLEXIBLE INTERFACING

The Trimble BD930-UHF 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
- ▶ EMI shielded module
- ▶ Compact design for mobile applications
- ▶ Integrated 403-473 MHz UHF receiver
- ▶ Flexible RS232, USB and Ethernet interfacing
- ▶ Centimeter level position accuracy
- ▶ Proven Trimble Maxwell 6 technology

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TRIMBLE BD930-UHF module

TECHNICAL SPECIFICATIONS[1]

- 220 Channels:
  - GPS: L1 C/A, L2E, L2C, L5
  - BeiDou B1, B2
  - GLONASS: L1 C/A, L2 C/A, L3 CDMA
  - Galileo: E1, E5A, E5B, E5AltBOC[2]
  - QZSS: L1 C/A, L1 SAIF, L2C, L5
  - SBAS: L1 C/A, L5
- 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
- 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[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
- 1 Pulse Per Second Output
- Event Marker Input Support
- Supports Fault Detection & Exclusion (FDE), Receiver Autonomous Integrity Monitoring (RAIM)

WIRED 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
    - > 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
- Control Software: HTML web browser, Internet Explorer, Firefox, Safari, Opera, Google Chrome

INTEGRATED UHF RADIO

Frequency Band . . . . .403-473 MHz
Frequency Control . . . .   Synthesized 6.25 kHz tuning resolution
Frequency Stability . . . .+/- 1PPM
Channel Bandwidth   . . . . .12.5 kHz and 25 kHz, software derived
Sensitivity . . . .-110 dBm BER 10-5
Type Certification   . . . . Certified for operation in the U.S., Canada, Europe, Australia and New Zealand
Modulation/Link Rate . . . . 4-Level FSK: 9600 & 19,200 bps
GMSK: 4800, 8000, 9600, 16,000, 19,200 bps
Link Protocols . . . .   Transparent EOT/FST, TRIMMARK ™, TRIMTALK™, SATEL®[13]
Forward Error Correction (FEC) and Detection . . . . Switchable On or Off

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[3]

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	20 Hz
DGNSS	0.25 m + 1 ppm Horizontal 0.50 m + 1 ppm Vertical	<20 ms	20 Hz
SBAS[6]	0.50 m Horizontal 0.85 m Vertical	<20 ms	20 Hz

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

PHYSICAL AND ELECTRICAL CHARACTERISTICS

Size. . . . . 60 mm x 55 mm x 15 mm
Power. . . . . .3.3 V DC +5%/−3%
Typical 2.0 W (L1/L2 GPS + L1/L2 GLONASS)
Weight . . . . .60 grams
Connectors
I/O. . . . . 44 -pin header
GNSS Antenna. . . . . MMCX receptacle
UHF 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. . . . . .31.0 dB

ENVIRONMENTAL CHARACTERISTICS[11]

Temperature
Operating . . . . −40 °C to +80 °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. 91142-XX
Module . . . . .Trimble BD930-UHF GNSS available in a variety of configurations from L1 SBAS upwards
Evaluation Kit. . . . . Includes interface board, UHF antenna and power supply

1 Trimble BD930-UHF 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 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 SATEL is a trademark of SATEL Oy

Specifications subject to change without notice.