

KEY FEATURES

Precise Heading + Pitch/Roll

Improved Dual Frequency Performance

Precise Platform Positioning

Web User-Interface

Precise Point Positioning using Trimble® RTX Correction Services

- Trimble® CenterPoint® RTX for sub 4 cm accuracy
- Trimble® RangePoint™ RTX for sub 50 cm accuracy

Superior Connectivity

- Ethernet, USB, Serial Ports

Small Form Factor

Z-Blade Technology

Low Power Consumption

Centimeter Level Positioning



MB-TWO RECEIVER MODULE

HIGH PERFORMANCE RTK, HEADING AND RTX IN A COMPACT OEM MODULE

The Trimble MB-Two is the successor to the Trimble MB-One OEM receiver module. The MB-Two maintains the identical form-factor as its predecessor and offers customers a drop-in replacement to utilize the latest GNSS design innovations. Versatile, powerful, compact and smart; the Trimble MB-Two provides faster Dual Frequency based Heading acquisition and an improved positioning engine with additional GNSS signals. In addition two MB-Two modules may be used for Precise Platform Positioning using data from three antennas for precise position and attitude.

ADVANCED FEATURES WITH Z-BLADE TECHNOLOGY

The MB-Two allows a wide range of option-upgradable GNSS configurations from single frequency (GPS, SBAS) to dual frequency GNSS (GPS, QZSS, GLONASS, BeiDou, Galileo). Trimble's patented Z-Blade technology drives a powerful GNSS agnostic engine allowing the MB-Two to use any GNSS system for positioning, without any dependency on GPS. The GNSS engine utilizes over-the-air satellite corrections via embedded L-Band hardware to achieve centimeter/decimeter level accuracy with Trimble RTX corrections. With worldwide availability of RTX corrections, the MB-Two delivers centimeter level positioning without a dedicated base station.

DUAL ANTENNA INPUT FOR HEADING + PITCH OR ROLL

- GNSS Heading + Pitch or Roll
- Fast Time to First Heading (TTFH)
- Two antenna inputs (solo/dual mode)
- Single board for RTK/RTX and Heading

POWERFUL RTK ENGINE

The MB-Two has a powerful RTK engine that delivers centimeter-level accuracy for systems using corrections from a local base or RTK network. It also features RTK against a moving base for relative positioning. The network RTK capabilities include third-party network corrections such as VRS, FKP, and MAC. The advanced RTK algorithms use all available satellites to compute Heading with baseline length auto calibration together with Pitch or Roll.

NEXT GENERATION HARDWARE DESIGN

- Low-power consumption in a compact size
- Dual Core CPU for optimal performance
- Web User Interface for ease of use
- Effective GNSS RF design



TRIMBLE MB-TWO RECEIVER MODULE

GNSS CHARACTERISTICS

240 Tracking Channels (dual antennas)

- GPS L1+L2
- QZSS L1+L2
- GLONASS G1 + G2 FDMA (HW ready for G1 and G2 CDMA¹)
- BeiDou B1+B2
- GALILEO E1+E5b
- SBAS L1

- 2 L-Band Tracking Channels

FEATURES

- Ashtech patented Strobe Correlator Z-Blade Technology for reduced GNSS multi-path
- Up to 250 MB of internal memory for data logging (including Ashtech Trouble LOG ATL files)
- GPS-only, GLONASS-only, or BeiDou-only solution (Autonomous to full RTK)
- Fast Search Engine to improve TTFF
- Multi-dynamic mode (static/moving Base and Rover functions simultaneously)
- Adaptive velocity filter to meet specific dynamic applications
- Onboard memory for various applications
- Position in local datums and projections with RTCM-3 transformation data
- Programmable startup protection

I/O DATA AND FORMATS

- Up to 50 Hz position/velocity/heading/observables output
- One push Ashtech Trouble Log (ATL)
- Ashtech Hot Standby RTK Algorithms
- RTK with Static & Moving Base corrections supported
- Reference Inputs/Outputs²: RTCM 3.2, RTCM 2.3, CMR/CMR+, ATOM
- RTK Networks Supported: VRS, FKP, MAC
- Navigation Outputs: NMEA-0183, ATOM format

PHYSICAL CHARACTERISTICS

Size 71 mm x 46 mm x 11 mm
Power 3.2 to 4.5 V DC
Power Consumption³ <1.2 Watt
Weight 24 grams

Connectors
I/O 28 pin dual-row male header
Antenna 2 x MMCX female connectors

Antenna LNA Power Input
Input Voltage Range 4.0 to 12.0 V DC on I/O connector pin 5⁴

Maximum current 150 mA
Minimum current 5 mA
LNA Gain Range (minus signal loss) 17 to 37 dB

ENVIRONMENTAL CHARACTERISTICS⁵

Operating Temperature -40 °C to +85 °C
Storage -40 °C to +85 °C
Vibration MIL-STD 810F, Fig. 514.5C-17
Random 6.2 gRMS operating
Random 8 gRMS survival

Mechanical Shock MIL-STD 810F, Fig. 516.5-10
(40g, 11ms, saw-tooth)

Operating Humidity 95% non-condensing
Maximum Acceleration 11 g

PERFORMANCE SPECIFICATIONS^{6,7}

Time to First Fix (TTFF)

Cold Start <60 seconds
Warm Start <45 seconds
Hot Start <11 seconds
Signal Re-acquisition <2 seconds

Position Accuracy (HRMS), Autonomomous 1.70 m
Velocity Accuracy⁶ 0.005 m/sec HRMS

Maximum Operating Limits⁸

Velocity 515 m/sec
Altitude 18,000 m

POSITIONING SPECIFICATIONS^{6,7}

Mode	Accuracy	Latency ⁹	Update Rate
SBAS	0.5 m Horizontal ¹⁰ 0.85 Vertical	< 10 ms	up to 50 Hz

RTK SPECIFICATIONS^{6,7}

Mode	Accuracy	Initialization Time	Operational Range
L1 / L2 Single Baseline RTK	8mm + 1 ppm Horizontal	< 1 min (typical)	< 40 km
L1 Flying RTK	5 cm + 1 ppm Horizontal (steady state)	< 10 min (typical)	< 10 km

TRIMBLE RTX SPECIFICATIONS^{6,7,11}

Mode	Accuracy ¹¹	Initialization Time	Operational Range
CenterPoint® RTX	4 cm Horizontal (95%)	< 30 min	Unlimited on land
RangePoint™ RTX	50 cm Horizontal (95%)	< 5 min	Unlimited on land

HEADING, ROLL / PITCH SPECIFICATIONS^{6,7,12}

Axis	Accuracy	Initialization Time	Update Rate
Heading (1 m baseline)	0.2° RMS	< 10 sec (typical)	up to 50 Hz
Heading (3 m baseline)	0.06° RMS	< 10 sec (typical)	up to 50 Hz
Heading (10 m baseline)	0.02° RMS	< 10 sec (typical)	up to 50 Hz
Roll / Pitch	2 * Heading accuracy		

I/O INTERFACE

- SAMTEC 28 Pin I/O Connector (TMM-114-03-G-D) with backward compatibility for current industry standards
- 3 x LVTTTL (UART types) serial ports allowing up to 921,600 bps
- USB 2.0 OTG port allowing up to 12Mbps (USB/ Serial Link, USB Memory Stick, Onboard Memory Access)
- CAN bus interface (hardware ready)
- 1 PPS out / Event In

- 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)
 - ▶ NtripCaster, NtripServer, NtripClient
 - ▶ Dynamic DNS
 - ▶ NTP Server

RECOMMENDED ANTENNAS

- Compact GNSS Machine/Marine/Aviation Antennas: Trimble AV33 & AV 34
- GNSS Machine/Marine/Aviation Antennas: Trimble AV59 & LV 59

OPERATING INFORMATION

Module

- Trimble MB-Two available in a variety of configurations from SBAS upwards in a single hardware flavor which is field upgradable.
- Evaluation Kit
- Includes interface board and power supply

* Trimble MB-Two is available in a variety of software configurations. Specifications shown reflect full capability.

- 1 This is based on the assumption that these new signals will be transmitted within natural GLONASS L1, L2 or within GPS L1/L2 frequency bands.
- 2 RTCM-3.2 Multiple Signal Messaging (MSM) guarantees compatibility with 3rd party for each GNSS data.
- 3 Typical power consumption for single antenna L1 GPS/ GLONASS.
- 4 This will be used if greater than main power input voltage.
- 5 Dependent on appropriate mounting / enclosure design.
- 6 Accuracy and TTFF specifications may be affected by atmospheric conditions, signal multipath, satellite geometry and corrections availability and quality. Typical range for vertical error is about twice as much as the horizontal error specification.
- 7 Performance values assume minimum of five satellites, following the procedures recommended in the product manual. High multi-path areas, high PDOP values and periods of severe atmospheric conditions may degrade performance.
- 8 As required by the U.S. Department of Commerce to comply with export licensing restrictions.
- 9 Latency figures for position correspond to Master/ primary sensor only. Heading latency is dependent on primary sensor latency.
- 10 GPS only and depends on SBAS System performance. FAA WAAS accuracy specifications are <5 m 3DRMS.
- 11 Trimble RTX correction services are only available on land.
- 12 Attitude specifications were obtained using L1 / L2 data.



Specifications and descriptions are subject to change without notice.

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AMERICAS
TRIMBLE NAVIGATION LIMITED
Integrated Technologies
510 DeGuigne Drive
Sunnyvale, CA 94085 USA
+1-408-481-8000
Email: americasales-intech@trimble.com

EUROPE & MIDDLE EAST
TRIMBLE NAVIGATION LIMITED
Integrated Technologies
Germany
+49 (6142) 2100-348
France
+33 2 28 09 3800
Email: emeasales-intech@trimble.com

CHINA
TRIMBLE NAVIGATION LIMITED
Integrated Technologies
Email: chinasales-intech@trimble.com

ASIA - PACIFIC
TRIMBLE NAVIGATION LIMITED
Integrated Technologies
Email: asiasales-intech@trimble.com

RUSSIA
TRIMBLE NAVIGATION LIMITED
Integrated Technologies
+49 (6142) 2100-348
Email: rusales-intech@trimble.com