

Trimble MB-TWO

HIGH PERFORMANCE COMPACT OEM MODULE

HIGH PERFORMANCE RTK, HEADING AND RTX

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.

THREE ANTENNA INPUTS FOR FULL ATTITUDE

- GNSS Heading + Pitch + 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.

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



03-9243385 | 03-9243352 | טל: 7042 פ"ת | רח' אודם 14, ת.ד. 7042 פ"ת | sales@hypertech.co.il | www.hypertech.co.il

TRIMBLE MB-TWO module

TECHNICAL SPECIFICATIONS¹

- 240 Tracking Channels (dual antennas)
 - GPS L1+L2
 - QZSS L1+L2
 - GLONASS G1 + G2 FDMA HW ready for G1 and G2 CDMA²
 - BeiDou B1+B2
 - GALILEO E1+E5b
 - SBAS L1
- 2 L-Band Tracking Channels
- 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/Outputs³: RTCM 3.2, RTCM 2.3, CMR/CMR+, ATOM
- RTK Networks Supported: VRS, FKP, MAC
- Navigation Outputs: NMEA-0183, ATOM format

PERFORMANCE SPECIFICATIONS^{7,8}

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), Autonomous	1.70 m
Velocity Accuracy ⁷	0.005 m/sec HRMS
Maximum Operating Limits ⁹	
Velocity	515 m/sec
Altitude	18,000 m

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

1 Trimble MB-Two is available in a variety of software configurations which are field upgradable. Specifications shown reflect full capability.
 2 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.
 3 RTCM-3.2 Multiple Signal Messaging (MSM) guarantees compatibility with 3rd party for each GNSS data.
 4 Typical power consumption for a 12 V input source.
 5 This will be used if greater than main power input voltage.
 6 Dependent on appropriate mounting / enclosure design.
 7 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.
 8 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.
 9 As required by the U.S. Department of Commerce to comply with export licensing restrictions.
 10 Latency figures for position correspond to Master/primary sensor only. Heading latency is dependent on primary sensor latency.
 11 GPS only and depends on SBAS System performance. FAA WAAS accuracy specifications are <5 m 3DRMS.
 12 Trimble RTX correction services are only available on land.
 13 Attitude specifications were obtained using L1 / L2 data.

POSITIONING SPECIFICATIONS^{7,8}

Mode	Accuracy	Latency ¹⁰	Update Rate
SBAS	0.5 m Horizontal ¹¹ 0.85 Vertical	< 10 ms	up to 50 Hz

RTK SPECIFICATIONS^{7,8}

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^{7,8,12}

Mode	Accuracy ¹²	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^{7,8,13}

Mode	Accuracy	Initialization Time	Operational Range
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		

PHYSICAL AND ELECTRICAL CHARACTERISTICS

Size (W x H x D)	71 mm x 46 mm x 11 mm
Power	3.2 to 4.5 V DC
Power Consumption ⁴	<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 5 ⁵
Maximum current	150 mA
Minimum current	5 mA
LNA Gain Range (minus signal loss)	17 to 37 dB

ENVIRONMENTAL CHARACTERISTICS⁶

Operating Temperature	-40 °C to 85 °C
Storage	-40 °C to +70 °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

RECOMMENDED ANTENNAS

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

ORDERING INFORMATION

Module Part Number	106960-XX
Module	Trimble MB-Two available in a variety of configurations from SBAS upwards
Evaluation Kit	Includes interface board and power supply

Specifications subject to change without notice.



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