

MB800



Multi-Constellation, Multi-Frequencies GNSS Centric Board

With the MB800, its new multi-constellation multi-frequencies board, Ashtech brings to the OEM market a unique blend of technologies which increases RTK availability and data integrity. Embedded Z-Blade technology ensures powerful performance and a patented way to use multiple GNSS constellations for high-accuracy positioning and surveying solutions. When dependable performances such as raw data quality or real-time positioning are critical, the new Ashtech MB800 GNSS board simply delivers!

Ashtech High-End Performance

Embedded Z-Blade GNSS centric technology uses all available GNSS signals equally, without any constellation preference, to deliver fast and stable solutions. This leads to incredibly robust and dependable measurement processing, resulting in optimized field productivity:

- Advanced multi-path mitigation and signal tracking for maximum data reliability
- Fast initialization and centimeter accuracy at long-range
- Full benefit of any available GLONASS satellites to strengthen the GPS solution
- The most compact differential/raw data protocol: Ashtech Optimized Messaging (ATOM)

Seamless Integration and Flexibility

Designed as a drop-in replacement of the MB500 to support existing OEM customers, the MB800 features a variety of output messages, data formats and advanced features for extensive OEM solution interoperability. The MB800 works as a base and as a rover and is available in various GNSS modes to adapt customer needs. All these GNSS modes are available in the same hardware and are simply activated by firmware option activation.

MB800 supports standard and advanced RTK operations such as:

- RTK against a static base, with or without SBAS and GLONASS satellites
- Advanced RTK against an external moving base for relative positioning
- Network RTK using third-party network corrections: VRS, FKP, MAC
- Heading and pitch/roll determination with baseline length auto-calibration against another receiver
- Dual RTK engine which automatically selects the best position available (Hot Standby RTK) or for RTK + Heading or Relative Positioning against another receiver
- Up to 20 Hz fast RTK and raw data output

Key Features

- 120 Channels
- Multi-constellation
- Multi-frequencies
- RTK, Advanced RTK, Dual RTK
- New Ashtech Z-Blade Technology

MB800 GNSS Centric Board

GNSS Characteristics

- 120 channels:
 - GPS L1 C/A L1/L2 P-code, L2C, L5
 - GLONASS L1 C/A, L2 C/A code
 - GALILEO E1 and E5 (including GIOVE-A and GIOVE-B test satellites)
 - SBAS L1 code and carrier (WAAS/EGNOS/MSAS)
 - Fully independent code and phase measurement
- Z-Blade technology for optimal GNSS performance:
 - Ashtech GNSS centric algorithm
 - Quick signal detection engine for fast acquisition and re-acquisition of GNSS signals
 - Fast and stable RTK solution
 - Up to 20 Hz real-time raw data, position and heading (against another receiver) output
 - Advanced multi-path mitigation technique
 - RTK base and rovers modes, post-processing

Features

- Up to 20 Hz Real-time GNSS raw data (code and carrier) and position output
- Real-time GNSS sub-frames output
- Ephemeris and almanac for GNSS
- Ionosphere data output
- NMEA0183 messages output
- RTK base and rover modes
- Easy-to-use trouble ticket (ATL)

RTK Base

- RTCM-2.3 & RTCM-3.1
- CMR & CMR+
- DBEN & ATOM (Ashtech format)
- Moving base operation
- Automatic Base Station Position Averaging

RTK Rover

- Up to 20 Hz Fast RTK
- RTCM-2.3 & RTCM-3.1
- CMR & CMR+
- DBEN, LRK & ATOM (Ashtech formats)
- Networks: VRS, FKP, MAC
- NMEA0183 messages output
- RTK with moving base operation
- Heading and pitch or roll determination with auto-calibration (against another receiver)

Accuracy Specifications (RMS)¹

SBAS

- < 50 cm typical Horizontal

DGPS

- < 30 cm + 1 ppm typical Horizontal^{2,3}

Flying RTK

- 5cm + 1 ppm horizontal (steady state) for baselines up to 1000 km

RTK

- Horizontal: 1 cm + 1 ppm^{2,3}
- Vertical: 2 cm + 1 ppm^{2,3}

Heading, Pitch/Roll

- Heading: 0.2 deg/baseline (m)^{2,4}
- Pitch/roll: 0.4 deg/baseline (m)^{2,4}

RTK Initialization

- Instant-RTK Initialization
 - Typically 2-second initialization for baselines < 20 km
 - Up to 99.9% reliability (user configurable)
- RTK Initialization range
 - >40 km

Time to First Fix^{1,6}

- Re-acquisition: 3 sec
- Hot start: 11 sec
- Warm start: 35 sec
- Cold start: 45 sec

I/O Interface

- 100% compatible with MB500
- 30 pins SAMTEC TMM-115-03-G-D connector
- 1 Fast UART port (LV-TTL) up to 5 Mbits/sec
- 1 Fast UART port (LV-TTL) up to 921.6 kbits/sec
- 1 RS232 port up to 921.6 kbits/sec
- 1 USB 2.0 port up to 12 Mbits/sec
- 1 PPS output
- 1 Event marker input
- Onboard LED + output to drive external LED
- Antenna: female MMCX straight connector
- Reference Clock Input signal: female MMCX straight connector

Physical Characteristics

- Size: 100x80x13 mm (3.9 x 3.1 x 0.5 in)
- Weight: 61 g/2.18 ozoz
- 100% compatible with MB500

Power Characteristics

- Input voltage: 3.3 to 9V DC
- Power consumption:
 - <1.9 W (GPS L1/L2)
 - <2.4W (GPS+GLONASS)
- Back-up power for RTC: 2.6 to 3.3V DC⁵
- Antenna(s) LNA power output: +5 VDC ($\pm 10\%$), Max current 100mA, Min current 5mA

Environmental Characteristics

- Operating temperature: -40° to +85°C (-40° to +185°F)
- Storage temperature: -40° to +85°C (-40° to +185°F)
- Humidity: 95% non-condensing
- Shock: MIL-STD 810F, Fig. 516.5-10 (40g, 11ms, saw-tooth)
- Vibration: MIL-STD 810F, Fig. 514.5C-17

Recommended Ashtech Antennas

- GNSS Survey Antenna (38dB gain)
- GNSS Machine/Marine Antenna (38dB gain)

Configuration Tool

Ashtech Communicator is a GNSS utility for boards and sensors evaluation and configuration.

- Preset of commands
- Real-time data logging
- Real-time data visualization

Other Configurations

MB800 receivers are also available in:

- ABX800 & ABX802 compact rugged sensor housing
- HDS800 advanced Heading System

⁽¹⁾ Accuracy and TTFB specifications may be affected by atmospheric conditions, signal multipath, satellite geometry and corrections availability and quality. Position accuracy specifications are for horizontal positioning. Vertical error is typically < 2 times horizontal error.

⁽²⁾ 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.

⁽³⁾ Steady state value for baselines < 50 km after sufficient convergence time.

⁽⁴⁾ Typical values for properly installed antenna on vehicle body.

⁽⁵⁾ For internal and external active antennas with automatic switch to external antenna when connected or for Heading determination between both antennas.

⁽⁶⁾ Back-up battery may be used for RTC (Real Time Clock) to improve hot start TTFB performances.

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