

## KEY FEATURES

Heading + Pitch/Roll

Dual-frequency - GPS+SBAS

Single-frequency - GPS+GLONASS+SBAS

L1 RTK and L1/L2 RTK

Compact design and  
low-power consumption

Designed for demanding  
environments

Ashtech Z-Blade Technology

- GNSS-centric engine
- GLONASS-only capable



MB100 GNSS RECEIVER

## COMPACT, LOW-POWER, GPS/GLONASS, RTK OEM RECEIVER MODULE

When power consumption, size and dependable performances such as raw data quality, real-time positioning (SBAS up to RTK) or GNSS Heading + Pitch/Roll determination are critical, the Ashtech MB100 GNSS module simply delivers!

The MB100 is the only receiver designed to address L1 GPS+SBAS applications - including Heading + Pitch/Roll determination, L1/L2 GPS+SBAS or L1 GPS/GLONASS+SBAS applications in the smallest form factor and lowest power consumption available today on the market. Z-Blade Technology and dual-frequency GPS configuration offer amazing, long-range RTK performance, while single-frequency GPS + GLONASS configuration provides more satellites in view for demanding environments.

### 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 in dual-frequency GPS mode
- Full benefit of any available GLONASS satellites to strengthen the GPS solution in single-frequency GPS + GLONASS mode
- The most compact differential/raw data protocol: Ashtech Optimized Messaging (ATOM)

### SEAMLESS INTEGRATION AND FLEXIBILITY

The MB100 features low-power consumption in an extremely compact board design and a variety of output messages and data formats for extensive OEM solution interoperability. The MB100 works as a base, a rover and even a GNSS compass, and is available in various GNSS modes to adapt to customer needs. All GNSS modes are available in the same hardware and are simply activated by firmware option activation.

MB100 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 or roll determination with baseline length auto-calibration
- Up to 20 Hz fast RTK and raw data output

The MB100 features two antenna input connectors, with automatic switching between the two antennas for specific applications such as handheld and tablet PC integration or Heading + Pitch/Roll determination - the ideal, low-cost GNSS compass solution!

# ASHTECH MB100 GNSS RECEIVER MODULE\*

## GNSS CHARACTERISTICS

- 45 channels:
  - GPS and GLONASS L1 C/A,
  - GPS L1/L2 P(Y)-code, L2C, L1/L2 full wavelength carrier,
  - SBAS (WAAS / EGNOS / MSAS)
- Fully independent code and phase measurements
- Advanced multi-path mitigation
- Z-Blade technology for optimal GNSS performance:
  - Ashtech GNSS centric algorithm: fully independent GNSS signal tracking and processing
  - Quick signal detection engine for fast acquisition and re-acquisition of GNSS signals
  - Fast and stable RTK solution

## FEATURES

- Up to 20 Hz Real-time GPS, GLONASS, SBAS raw data (code and carrier) and position output
- Real-time GPS, GLONASS and SBAS sub-frames output
- Ephemeris and almanac for GPS, GLONASS and SBAS output
- 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

## 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

## ACCURACY SPECIFICATIONS (RMS)<sup>1</sup>

### SBAS

- < 50 cm typical Horizontal

### DGPS

- < 30 cm + 1 ppm typical Horizontal<sup>2,3</sup>

### FLYING RTK

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

## RTK

- Horizontal: 1 cm + 1 ppm<sup>2,3</sup>
- Vertical: 2 cm + 1 ppm<sup>2,3</sup>

## HEADING, PITCH/ROLL

- Heading: 0.2 deg/baseline (m)<sup>2,4</sup>
- Pitch/roll: 0.4 deg/baseline (m)<sup>2,4</sup>

## RTK INITIALIZATION RANGE

- 40 km and more in dual frequency mode
- Up to 10 km typical in single frequency mode

## TIME TO FIRST FIX<sup>1,6</sup>

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

## RELIABILITY

- Up to 99.9% typical (user configurable)

## I/O INTERFACE

- SAMTEC 26 pins I/O connector (SAMTEC FTS-113-01-F-DV-A (pin out allocation compatible with DG14))
- 1 RS232 up to 921.6 kbits/sec (Rx/D, Tx/D, CTS and RTS signals)
- 1 RS232 up to 115.2 kbits/sec (Rx/D and Tx/D signals)
- 1 USB 2.0 Device "Serial Port" up to 12Mbits/sec
- 1 PPS output
- 1 Event marker input
- Radar-simulated pulse output on the I/O connector for accurate ground speed
- Onboard LED + output to drive external LED
- Antennas: 2 female MMCX straight connector<sup>5</sup>

## PHYSICAL CHARACTERISTICS

- Size (WxHxD): 58x56x11 mm (2.3x2.2x0.4 in)
- Weight: 22g / 0.78oz

## POWER CHARACTERISTICS

- Power input: +3.3V DC±10% power input
- Power consumption:
  - < 0.8W in GPS L1
  - < 0.95W in GPS L1/L2 or GPS+GLONASS L1
- Back-up power: 2.6 to 3.3V DC<sup>6</sup>
- Antenna(s) LNA power output: +5 VDC (±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 ANTENNAS

- Compact GNSS Machine/Marine/Aviation Antennas: Trimble AV33 & AV34
- GNSS Machine/Marine/Aviation Antennas: Trimble AV59 & LV59

## 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

## ORDERING INFORMATION

- MB100 is available in a variety of configurations
- Evaluation Kit
  - Includes interface board and power supply

(\*) Including all available options

- (1) Accuracy and TFF 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 time's 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 TFF performances. ons availability and quality.



Specifications and descriptions are subject to change without notice.

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