

MS860

Rugged Dual-Antenna GPS Receiver for Precise Heading and Position

Key Features and Benefits

- 10-Hz precise heading without drift or calibration
- 20-Hz position update rate
- Built for rugged environments
- All-solid-state—no moving parts
- Industry-standard interfacing
- User-defined local coordinates direct from receiver
- Supports industry-standard CAN bus architecture

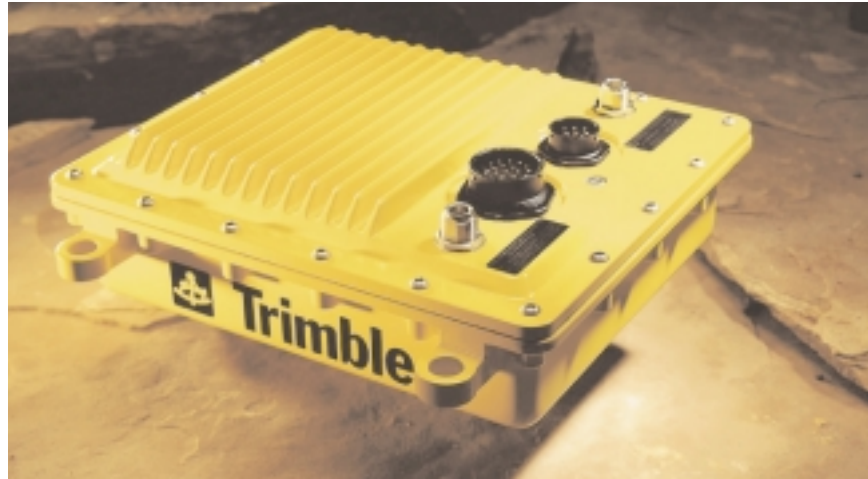
The Trimble MS860™ receiver delivers a new dimension in GPS receiver technology—Trimble's patented RTK (real-time kinematic) heading technology—to provide precise position, heading and speed of a dynamic platform. This rugged, dual-antenna receiver addresses a vast range of precise navigation applications in the fields of construction, dredging, marine survey, commercial marine, agriculture, and general machine guidance.

Rugged design

The MS860 receiver is designed for use in the most demanding application environments, such as on construction equipment, farm machinery, and sea-going vessels. The bolt-in unit has been proven in use on construction equipment around the world. The all-solid-state electronics unit contains no moving parts, thus avoiding the need for scheduled maintenance and calibration.

Accuracy and response times

Today's navigation and guidance applications require virtually instantaneous position and heading reports multiple times per second. The MS860 receiver delivers positions to guidance or control-loop software up to 20 times per second with a latency of less than 20 milliseconds. This responsiveness is matched with horizontal accuracies of two centimeters and vertical accuracies of three centimeters. Heading accuracies of 0.03° RMS



MS860 Dual-Antenna GPS Receiver—High performance in tough environments

are achieved at 10 times per second. The RTK heading technique allows the quoted heading accuracies to be obtained without the need for external differential GPS (DGPS) corrections. Designed for use in a high-speed, dynamic environment, the MS860 receiver offers accurate heading at rates of turn in excess of 90°/sec. For less demanding applications, a DGPS submeter version is available.

Interfacing and configuration ease

Industry-standard NMEA messages or compact binary data can be output through any of the three bidirectional serial ports. Local datum and transformation parameters can be loaded directly into the receiver. The receiver also includes support for the industry-standard CAN (Controller Area Network) architecture. Both the RTCM format for DGPS corrections and Trimble's published Compact Measurement Report

(CMR) differential data can be received simultaneously. The receiver can choose the optimum source at any given time and provide seamless navigation.

Advanced technology

The accuracies, update rates and latencies available in the MS860 receiver are made possible through a GPS architecture specifically designed for demanding dynamic positioning applications. Custom-designed hardware with Super-trak™ multibit GPS signal technology and EVEREST™ advanced multipath suppression provide superior tracking, especially for weaker, low-elevation satellites. These robust, dual-frequency measurements allow reliable, rapid, and fully automatic On-the-Fly (OTF) initializations.

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STANDARD FEATURES

The MS860 receiver is a 36-channel L1/L2 RTK GPS receiver with dual-antenna input.

- 10-Hz precise heading
- 20-Hz position updates
- <20-ms position latency
- User-defined local coordinates direct from receiver
- 3 serial I/O ports
- 1-PPS output
- RTCM input/output
- One-year hardware warranty

OPTIONS AND ACCESSORIES

- Rugged L1/L2 machine-mount antenna
- Micro-centered™ antenna
- Extended hardware warranty
- Firmware and software update service
- Receiver mounting kit

PHYSICAL CHARACTERISTICS

| | |
|-----------|---|
| Size | 29cm x 28cm x 9cm (11.42 in. x 11.02 in. x 3.54 in.) |
| Weight | 4.8 kg (10.56 lbs.) |
| SizePower | 9 VDC to 32 VDC, 15 Watts |

ENVIRONMENTAL CHARACTERISTICS

| | |
|------------------|---|
| Temperature | Operating: -40°C to +70°C (-40°F to +158°F) Storage: -55°C to +85°C (-67°F to +185°F) |
| Humidity | MIL 810 E, Meth. 507.3 Proc III, Aggravated, 100% Condensing |
| Sealing | Sealed to ±5 PSI |
| Vibration | MIL 810 D, Tailored Random 8g RMS Operating |
| Mechanical Shock | MIL 810 D Operating: ±40g Survival: ±75g |
| EMC | Radiated Emissions: CE Class B Conducted Emissions: SAE J1113/41 Radiated Immunity: CE Class B 60V/m ESD: ±15 KV Input Voltage Transients: ISO 7637-2, Pulses 1 - 5 |

TECHNICAL SPECIFICATIONS

| | | | |
|-------------------|---|-----------------------------|-----------------|
| Tracking | 18 channels L1 C/A code, L1/L2 full cycle carrier. Fully operational during P-code encryption. | | |
| Signal processing | Super-trak multibit technology EVEREST multipath suppression | | |
| Positioning | | | |
| <u>Mode</u> | <u>Accuracy</u> ^A | <u>Latency</u> ^B | <u>Max Rate</u> |
| Synchronized RTK | 1cm + 2ppm Horizontal 2cm + 2ppm Vertical | 300 ms ^C | 10 Hz |
| Low Latency RTK | 2cm + 2ppm Horizontal ^D 3cm + 2ppm Vertical | <20ms | 20 Hz |
| DGPS | <1m | <20ms | 20 Hz |
| Heading | | | |
| <u>Baseline</u> | <u>Accuracy</u> ^A | <u>Max Rate</u> | |
| 10m | <0.03° | 10Hz | |
| 5m | <0.08° | 10Hz | |

^A 1 sigma level

^B At maximum output rate

^C Dependent on data link throughput

^D Assumes 1 second data link delay

| | |
|-----------------|---|
| Initialization | Automatic OTF (on-the-fly) while moving |
| Time required | Typically <1 minute |
| Start-up | <90 seconds from power-on to positioning <30 seconds with recent ephemeris |
| Communications | 3 RS-232 ports. Baud rates up to 115,200 2 CAN/J1939 ports. |
| Configuration | Configuration Toolbox, Remote Controller Software, HYDROpro™ software, or user-defin- able application files. |
| Output Formats | |
| NMEA-0183 words | GGK, GGA, HDT, ROT, ZDA, VTG, GST, AVR, PJT and PJK |
| Other | Trimble Binary Streamed Output |

ORDERING INFORMATION

For further information contact your nearest Trimble Authorized Distributor or Trimble Office.

You may also visit our website at: <http://www.trimble.com>

Specifications and descriptions are subject to change without notice.



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