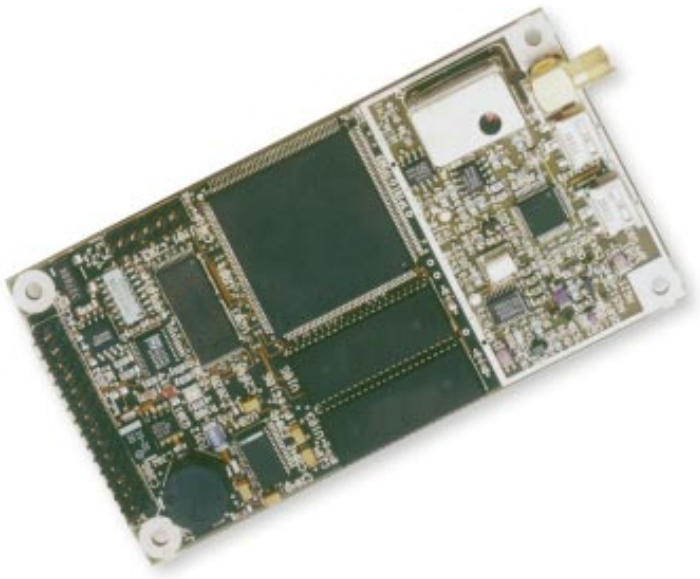
G12 GPS Board™

The new standard in advanced, high-precision OEM technology



Unmatched Performance

The Ashtech G12 GPS Board sets a new standard for unsurpassed performance in a wide assortment of high-accuracy marine, avionics and land navigation applications. This powerful 12-channel receiver is the first of its kind to offer a 20Hz update rate for real-time guidance, position and raw data output. The G12 offers differential accuracy less than 40cm, position latency better than 50ms, and exact position latency to millisecond accuracy. It delivers precise three-dimensional positions to meet the demanding requirements of high-end OEM system integration.

The G12 incorporates all-in-view tracking to track up to 12 satellites with a "loss of lock" re-acquisition time of less than 2 seconds, and delivers unsurpassed position accuracies of better than 40cm achieved immediately following satellite acquisition. Signal inaccuracies are removed with RAIM (Receiver Autonomous Integrity Monitoring), and Ashtech's revolutionary new strobe correlator technology provides unmatched multipath mitigation for code, providing the best possible position accuracy.

The G12 offers distinct timing options for precise timing and frequency, or time-tagging of positions, including 1PPS time pulse, variable frequency output, an event marker to tag time a position, and a programmable measurement strobe that generates a pulse at a programmable interval in advance of measurements.

Compatibility

The receiver is available in two sizes: (1) a compact 4.25" x 2.25", identical and pin-compatible to the Sensor II™ OEM board, affording easy upgradeability to the high-end OEM applications offered by the G12; and (2) a standard Eurocard with DIN 64 connector that is pin-compatible with other Eurocard DIN 64 GPS boards.

An all-in-view Differential Reference Station, providing RTCM SC104 message types 1,2,3,6,9,16, is available in both board dimensions. A standard G12 can be upgraded to include Differential Reference Station capability; alternatively, Ashtech offers a dedicated Reference Station at a substantial discount.

Windows Evaluation Software

Ashtech Evaluate™ software is available with the G12 and provides visual displays of satellite information (e.g., SNR), receiver position and velocity, as well as data logging and analysis. It also allows direct communication with the receiver. Compatible with both the G12 and the Sensor II boards, the software runs on Windows® version 3.x and Windows '95™ platforms.

Take It for a Test-drive

The G12 Evaluation Kit, which includes the G12 and all necessary components, enables you to perform a comprehensive G12 test-drive. The kit contains a G12 GPS board, Windows Evaluation software, power supply, ready-made interface cables, antenna, and manuals.

1170 Kifer Road • Sunnyvale, CA 94086
Tel: 408-524-1400 • Fax: 408-524-1500
http://www.ashtech.com

Blenheim Office Park • Lower Road
Long Hanborough • Oxfordshire OX8 8LN • England
Tel: 44 993 883 533 • Fax: 44 993 883 977

Ashtech

G-12 GPS Board Specifications

Real-Time Position Accuracy[1]

Dynamic or Static

Horizontal CEP	40cm
Horizontal 95%	90cm
Vertical 95%	1.6m

G12 Standard Features

- 12 Channels GPS code and carrier
- Edge Correlator™
- Differential Remote RTCM V2.1 Message Types 1,2,3,6,9,16.
- Standard NMEA-0183 V2.0 output
- 20g's tracking capability
- 2 second re-acquisition time
- Position latency output
- Geoid and Magnetic Variation models
- Selectable update rate up to 10Hz
- 2Hz raw data output (code and carrier)
- 1PPS (5V TTL)
  - **Precision** 200ns (stand-alone, SA on)
  - **Precision** 30ns (differential)
- Programmable Meas. Strobe
- Variable Frequency Output from <1Hz to 8.25 MHz

Optional Features

- Software toolkit
- 20Hz position updates[2]
- 20Hz raw data (code & carrier)
- Event Marker
- Receiver Autonomous Integrity Monitoring (RAIM)
- Strobe Correlator™ multipath mitigation

1 Accuracy specs based on test data using G12 reference station with Ashtech Geodetic antenna, G12 rover with Ashtech Marine IV™ antenna, short baseline, standard Edge Correlator.

2 When 20Hz positions are generated the maximum number of satellites used is 8, the receiver still tracks up to 12 satellites and raw data is still available for up to 12 satellites.

When positions are generated at 10Hz, or lower, the receiver tracks and uses up to 12 satellites.

G12 Reference Station Standard Features

- 12 Channels GPS code & carrier
- Edge Correlator
- Differential reference station RTCM Message Types 1,2,3,6,9,16
- Geoid and Magnetic Variation models
- 2Hz raw data output (code and carrier)
- 1 PPS (5V TTL)

Communications

- 2 RS-232 serial ports, up to 115,000 bps
- 1 synchronous communications port
- External LED drivers

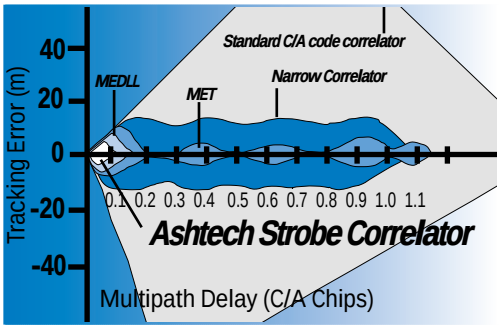
Environmental

Operating Temp	-30°C to +70°C
Storage Temp	-40°C to +85°C
Sustained acceleration	20g
Power Consumption	1.4W (Board) 0.25W (Antenna)
Input Voltage	5VDC ±5% 10mV p-p ripple
Weight	2.8 ounces
Speed (Max)	1,000 nautical miles/h
Altitude (Max)	60,000 ft

Higher altitude and velocities up to 9km/s are available under validated export license.

Ordering Information

Format	Part Number
4.25" x 2.25", 30 pin (first 20 pins are Sensor II compatible)	**990190**
Eurocard 16.7 x 10.0 cm, DIN64	**990191**
4.25" x 2.25" Reference Station	**990192**
Eurocard Reference Station	**990193**
4.25" x 2.25" Evaluation Kit	**990194**
Eurocard Evaluation Kit	**990195**
4.25" x 2.25" Evaluation Kit Reference Station	**990209**
Eurocard Evaluation Kit Reference Station	**990210**



Measurement and position errors occur in part when GPS receivers cannot distinguish direct signals from indirect signals, reflected off of objects. These indirect signals are known as multipath, and the ability to reject them is known as multipath mitigation.

The figure above compares multipath mitigation techniques among five types of GPS receivers, illustrating the varying results of each in controlling multipath. The range error caused by a strong multipath, or indirect signal, is plotted against the delay of that multipath signal compared to the direct signal path. The delay is measured in C/A code chips (1 millisecond = 1 chip).

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