

THE STANDARD IN ADVANCED HIGH-PRECISION OEM GPS TECHNOLOGY

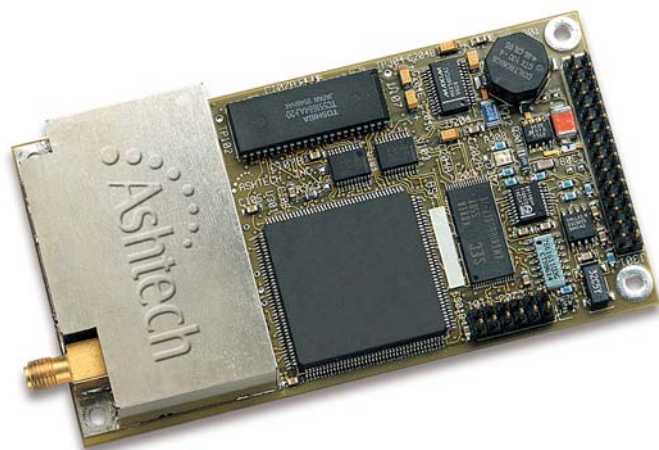
G12 GPS Board

UNMATCHED PERFORMANCE

The Ashtech® G12™ GPS board from Thales Navigation professional products sets the standard for superior performance in a wide assortment of high-accuracy marine, avionics and land navigation applications. Available in a board and sensor format, this powerful 12-channel receiver is the first of its kind to offer a 20 hz update rate for real-time guidance, position and raw data output. The G12 offers differential accuracy better than 40 cm and position latency less than 50 ms. It delivers precise three-dimensional positions to meet the demanding requirements of high-end OEM system integration. The G12 incorporates all-in-view tracking of 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 40 cm achieved immediately following satellite acquisition. Also, the Strobe Correlator™ technology provides unmatched code multipath mitigation, providing the best possible position accuracy. The G12 offers distinct timing options for precise timing and frequency, or time-tagging of positions, including 1 PPS time pulse, an event marker to time-tag a position, and a programmable measurement strobe that generates a pulse at a programmable interval in advance of measurements.

COMPATIBILITY

The G12 board from Thales Navigation is available in a compact 108 mm x 57 mm footprint, identical and pin-compatible to the Sensor II™ OEM board, affording easy upgradability to the high-



end OEM applications offered by the G12. An all-in-view Differential Base Station, providing RTCM SC-104 message types 1,2,3,6,16, is available in both board dimensions. A standard G12 can be upgraded to include differential base station capability; alternatively, Thales Navigation offers a dedicated Base Station. In fact, the G12 makes an extremely affordable base station, with which you don't have to pay for remote capabilities if you don't need them.

MULTIPATH MITIGATION

Multipath is the single largest cause of differential GPS position errors. The Strobe Correlator (patent pending) is a digital signal processing technique implemented in the hardware and software

G12 GPS BOARD

of the G12 receiver that removes multipath errors almost entirely for reflected signals with delays of 37 m or more. This represents the best DGPS multipath mitigation available today in GPS receivers—and it is available standard with the G12. This means improved accuracy and greater reliability.

WINDOWS EVALUATION SOFTWARE

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 all of our receivers, the software runs on Windows version 3.x Windows 95/98 and Windows NT 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 test-drive. It contains a G12 GPS board, the Evaluate software, power supply, ready-made interface cables, antenna, and manuals.

TECHNICAL SPECIFICATIONS

Real-Time Position Accuracy¹

Autonomous²
CEP: 3.0 m (9.843 ft)
Differential
CEP: 40.0 cm (1.312 ft)

Velocity Accuracy¹ (knots)

0.1 (95%)

Time To First Fix¹

	Min	Avg	Max
Re-acquisition	1 sec	2 sec	3 sec
Hot start	8 sec	11 sec	15 sec
Warm start	26 sec	35 sec	45 sec
Cold start	39 sec	45 sec	300 sec

Standard Features

- 12 Channels GPS code and carrier
- Strobe Correlator multipath mitigation
- Standard NMEA-0183 V2.2 output
- Position latency output
- Raw data output (code and carrier)
- 1 PPS (5V TTL)
- Precision: 340 ns (stand-alone)
45 ns (differential)
- Programmable Measurement Strobe

G12 Remote Standard Features

All G12 Standard Features and:

- Differential remote RTCM V2.2, message types 1,2,3,6,9,16
- 20 Gs tracking capability
- Position and raw data update rates selectable up to 10 Hz
- Event marker

Thales Navigation, Inc.

Corporate Headquarters, Santa Clara, CA, USA
+1 408 615 5100 • Fax +1 408 615 5200
Toll Free (Sales in USA/Canada) 1 800 922 2401
Email professionalsales@thalesnavigation.com
In South America +56 2 234 56 43 • Fax +56 2 234 56 47
In China +86 10 6566 9866 • Fax +86 10 6566 0246

European Headquarters, Carquefou, France

+33 2 28 09 38 00 • Fax +33 2 28 09 39 39
Email professionalsalesemea@thalesnavigation.com
In Germany +49 81 6564 7930 • Fax +49 81 6564 7950
In Russia +7 095 956 5400 • Fax +7 095 956 5360
In UK +44 870 601 0000 • Fax +44 208 391 1672
In the Netherlands +31 78 61 57 988 • Fax +31 78 61 52 027
Web site www.thalesnavigation.com

G12 Base Station Standard Features

All G12 Standard Features and:

- Differential reference station RTCM Message Types 1,2,3,6,9,16
- Position and raw data update rates selectable up to 2 Hz

Optional Features

- Software toolkit
- 20 Hz position updates³
- 20 Hz raw data (code & carrier)

Communications

- 2 bi-directional RS-232 serial ports, up to 115,000 bps
- External LED drivers

Environmental & Physical

- Operating Temp: -30°C to +60°C
(-22°F to 140°F)
- Storage Temp: -40°C to +85°C
(-22°F to 185°F)
- Power Consumption: 1.8 W (Receiver)
0.3 W (antenna)
- Input Voltage: 5 VDC ±5%
100 mV p-p ripple
- Size: 108 mm x 57 mm
(4.25 in x 2.25 in)
- Connector: 30 pins (first 20 are
Sensor II compatible)
- Weight: 79.55 gr (2.8 ounces)
- Acceleration: 20 Gs
- Humidity: 95% non-condensing
- Speed (max)*: 514 m/sec (1,000 knots)
- Altitude (max)*: 18,287 m (60,000 ft)

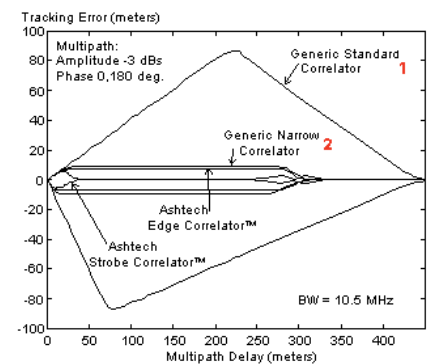
G12 Development Kit

The G12 Development Kit includes a G12 GPS receiver, antenna, power supply, cables, manuals and the Evaluate and Mission Planning™ Software. The kit is loaded with all the firmware options available.

Multipath Error Envelopes

1. Generic Standard Correlator Spacing, 1 chip
2. Generic Narrow Correlator Spacing, 0.1 chip

This figure shows the errors induced by a multipath signal half the strength of the direct signal.



The horizontal axis of the plot shows the multipath delay, this is the extra distance that the reflected signal travels compared to the direct signal. The vertical axis shows the induced range error caused by a multipath signal with the indicated delay.

From this plot you can see that typical narrow correlator performance and Edge Correlator™ performance is similar, while Strobe Correlator performance is much better, almost totally cancelling any multipath with a delay of more than 37 m.

¹ Accuracy and TTF specs. based on tests conducted in California. Differential tests performed using Ashtech Z-Sensor™ base station with Geodetic antenna and G12 GPS Board remote with Geodetic antenna (Marine IV antenna for TTF). Antenna benchmark locations determined using CORS sites Point Blunt (PBL1) and Pigeon Point (PPT1). Tests at different locations under different conditions may produce different results.

Position accuracy specifications are for horizontal positioning. Vertical error is typically <2 times horizontal error.

² Real-time position accuracies obtained with SA off. With SA on, accuracy of autonomous positioning may degrade up to 100 meters (95%) as specified by the U.S. Department of Defense.

³ When 20 Hz positions are generated the maximum number of satellites used is 10, the receiver still tracks up to 12 satellites and raw data is still available for up to 12 satellites. When positions are generated at 10 Hz, or lower, the receiver tracks and uses up to 12 satellites.

*Higher altitude and velocities are available under validated export license.