SkyNav® GG12W™ GPS Board
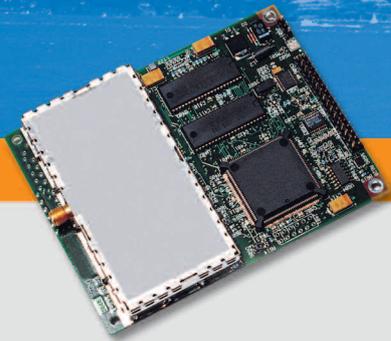
GPS+SBAS All-in-view Positioning Single Receiver Solution

With over 10 years of experience in high-precision receiver design, we have developed an OEM GPS and GPS+SBAS™ receiver explicitly for the aviation industry.

The SkyNav GG12W from Magellan is ideally suited to integration within Technical Standard Order (TSO) Flight Management Systems (FMS), ground-based reference stations for GPS aircraft landing systems (SCAT I and LAAS) and other avionics. In addition to traditional GPS receiver design and ISO 9001 engineering practices, the GG12W design team adhered to FAA/RTCA design criteria.

Certification
The SkyNav GG12W software has been developed in accordance with the requirements for RTCA DO-178B Level 'B' (Software Considerations in Airborne Systems and Equipment Certification). The hardware and software have been developed to conform to the RTCA DO-208 (MOPS for Airborne Supplemental Navigation Equipment Using GPS) and RTCA DO-229D (MOPS for GPS/WAAS Airborne Equipment) requirements.

The receiver capably operates in autonomous or SBAS differential mode, making it ideal for all phases of flight, including precision approach. It also provides code and carrier data for ground reference station operation.

Anti-jamming
The SkyNav GG12W receiver features extensive anti-jam capabilities in the RF hardware.

The receiver meets the CWI (Continuous Wave Interference) specification from RTCA DO-208 and DO-229D (WAAS MOPS).

12 Parallel Channel Receiver
The SkyNav GG12W GPS board incorporates tracking of up to 12 satellites with a "loss of lock" re-acquisition time of less than 3 seconds. Ten channels are assigned to GPS and 2 channels are assigned to SBAS. The criteria of satellite selection implements the requirements of RTCA/DO-229D.

Windows Evaluation Software
Evaluate™ software is available with the SkyNav GG12W and provides visual displays of satellite information (e.g., azimuth, elevation, SNR), receiver position and velocity, as well as data logging and analysis. It also allows direct communication with the receiver. Compatible with most Magellan receivers, the software runs on Windows® version 3.x, Windows 95/98, NT, 2000, and XP platforms.

Features

- **FAA-certifiable for avionics integration**

- **GPS+SBAS to meet D0-229D**

- **High performance and reliability**

Standard Features

- 12 channels L1 C/A code & carrier
- 1 Hz, 2 Hz and 5 Hz position update rates
- Position Latency[1]: < 90 ms
- Raw data output (code and carrier)
- Standard NMEA-0183 V2.3 output
- SBAS Differential
- Position latency output
- Raw SBAS data output
- Geoid and Magnetic Variation models

Real-Time Position Accuracy[2]

- Autonomous[3,4]
  3 meters (CEP 50%)
  5 meters (95%)
- SBAS Differential
  1 meter (CEP 50%)
  3 meters (95%)
- Velocity Accuracy (knots)[2]
  0.1 (95%)

Time to First Fix[2]

TTFF requirements of RTCA/DO-229D at the minimum signal level and in the presence of interference are met.

Re-acquisition

- < 3 sec if blockage is less than 10 sec
- < 5 sec if blockage is 10–60 sec

Dynamics

- Acceleration: Meets RTCA/DO-229D requirements for normal and abnormal maneuvers
- Speed[5]: 514 m/sec (1,000 knots)
- Altitude[5]: 18287 m (60,000 ft)
- Vibration[6]: RTCA DO-160D (curves B, M, L)

Physical & Environmental

- Size: 108 mm x 82.5 mm x 15.44 mm
  (4.275 in x 3.25 in x 0.608 in)
- Weight: 108 gr (3.8 ounces)
- Input voltage: 5VDC ± 5%
  50mV p-p ripple
- Power Consumption: < 1.5 W (Receiver)
- Operation Temp: –30°C to +70°C
  (–22°F to 158°F)
- Storage Temp: –40°C to +85°C
  (–40°F to 185°F)

Mounting

One mounting hole is located in each corner; the center of each hole is 0.15" from each edge.

Connectors

32 pin (pins 1–30 compatible with G12™; pins 1–20 compatible with G12 and Sensor II™).

The SkyNav GG12W connector is a SAMTEC SDL-116-G-D connector (socket)

Most socket strips made for .025" square pins on 0.100" centers with 2 rows of 16 pins will fit.

Communications

2 bi-directional RS232 serial ports up to 115,200 baud.

[1] The time delay from the instant a message is time tagged to when the receiver finishes its transmission @ 115,200 baud. Latency specification is for certain messages. Latency of other messages under different conditions may yield different results.

[2] Accuracy and TTFF specs. based on tests conducted in California. Differential tests performed using Z-Sensor™ base station with Geodetic antenna and SkyNav GG12W GPS Board remote with Geodetic antenna (Marine IV antenna for TTFF). 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 positioing. Vertical error is typically <2 times horizontal error.

[3] 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.

[4] Conforms to RTCA DO-217 (MInimum Aviation System Performance Standards—Instrument Approach System SCAT-I).

[5] Higher altitudes and speeds are available under validated export license.

[6] Tested to RTCA DO-160C specification, categories B, M, and N within a Flight Management System..

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