



GPS+GLONASS OEM RECEIVER DESIGNED EXPLICITLY FOR AVIATION

GG12-Pro Receiver

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

While many previous designs were successful with aircraft manufacturers and aircraft systems manufacturers for test-flight applications, the Ashtech® GG12-Pro™ from Thales Navigation Professional Products 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 GG12-Pro design team adhered to FAA/RTCA design criteria.

The GG12-Pro receiver is a new addition to the GG12™ family and includes RAIM, Predictive RAIM and ARINC 429/743 Interface onboard.

CERTIFICATION

The GG12-Pro from Thales Navigation 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 has been developed to



conform to the RTCA DO-208 (MOPS for Airborne Supplemental Navigation Equipment Using GPS) requirements.

The hardware and navigational accuracy have been developed in accordance with the RTCA DO-217 (MASPS DGNSS Instrument Approach System: SCAT-I) requirements.

The receiver capably operates in autonomous or 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.

GG12-PRO RECEIVER

ANTI-JAMMING

The GG12-Pro receiver features extensive anti-jam capabilities in the RF hardware.

GPS Only Configuration:

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

GPS+GLONASS Configuration:

The GPS and GLONASS RF sections are independent, so that in-band CWI jamming on GLONASS frequencies will not affect GPS, and vice-versa. The GPS component of the receiver meets the CWI specification from RTCA DO-208 and DO-229. The GLONASS portion of the receiver satisfies a similar CWI specification. Both the GPS and GLONASS receiver portions meet DO-235 (RF interference to the GNSS environment).

12 PARALLEL CHANNEL RECEIVER

GPS Only Configuration:

The GG12-Pro GPS board incorporates all-in-view tracking of up to 12 satellites with a "loss of lock" re-acquisition time of less than 3 seconds.

GPS+GLONASS Configuration:

The channels may be dynamically assigned to GPS or GLONASS. The user may specify which channels track which system, or the receiver can perform this task automatically. In automatic mode, the user may define a primary system; the receiver tracks as many satellites of the primary system as possible, and uses the remaining channels to track satellites from the secondary system. The GPS+GLONASS receiver may be commanded to become a GPS-only receiver, or a GLONASS-only receiver.

EVALUATION SOFTWARE

Evaluate™ software is available with the GG12-Pro 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 all of our receivers, the software runs on Windows version 3.x Windows 95/98 and Windows NT platforms.

TECHNICAL SPECIFICATIONS

Standard Features

- 12 channels L1 C/A code & carrier
- Available in GPS-only and GPS+GLONASS configurations
- 2 Hz and 5 Hz position update rates
- Position Latency¹: < 70 ms
- Raw data output (code and carrier)
- Standard NMEA-0183 V2.3 output
- Differential remote RTCA DO-217
- Position latency output
- 1 PPS timing signal
- Differential diagnostics output
- Turn-on & operational built-in tests
- RAIM
- Geoid and Magnetic Variation models
- RS232 and ARINC 743 Interface

Real-Time Position Accuracy²

Autonomous^{3,4}
95%: 10 m (32.81 ft)

Differential
CEP: 40.0 cm (15.75 in)

Velocity Accuracy (knots)²
0.1 (95%)

Time To First Fix² Re-acquisition

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

	95%
Hot Start	90 sec
Warm Start	120 sec
Cold Start	180 sec

Dynamics

- Acceleration: 10 g
- Speed⁵: 514 m/sec (1,000 knots)
- Altitude⁵: 18287 m (60,000 ft)
- Vibration: RTCA DO-160D
Section 8.0
Category S (Curve B)

Physical & Environmental

- Size: 117 mm x 197 mm x 21.6 mm
(4.6 in x 7.75 in x 0.85 in)
- Weight: 170.45 gr (6.0 ounces)
- Input voltage:
5VDC ± 5%, 50mV p-p ripple
±15VDC ±10% (for ARINC 429)
- Power Consumption: < 5.5 W (Receiver)
< 0.3 W (Antenna)
- 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 with five extra holes. One hole in the middle of each side and one hole located in the center of the board to reduce resonance effects. The center of each hole is 0.175" from each edge.

RS-232 I/O Connector

The GG12-Pro RS-232 I/O connector is a right-angled Samtec TSW-116-08-G-D-RA-15. The mating Samtec cable with 2 connectors would be IDSD-16-D-xx, where xx is the length in inches. The mating board-to-board connector would be SSW-116-01-G-D. Most socket strips made for .025" square pins on 0.100" centers with 2 rows of 16 pins will fit.

ARINC I/O Connector

The GG12-Pro ARINC Connector is a 36 pin right-angled header Samtec TSW-117-08-G-D-RA-012. The mating connector is SSW-117-01-G-D and mating cable assembly would be 1DSD-17-D-XX. Most socket strips made for .025" square pins on 0.100" centers with 2 rows of 17 pins will fit.

Communications

- 2 bi-directional RS232 serial ports up to 115,200 baud.
- 1 Input and 2 output high/low speed ARINC 429 ports

Antenna

The GPS+GLONASS configuration uses one antenna to receive both GPS and GLONASS signals. The antenna connects through a single antenna port on the GG12-Pro receiver.

Development Kit

The GG12-Pro Development Kit, which includes the GG12-Pro and all necessary components, enables you to perform a comprehensive test-drive. The kit contains a GG12-Pro GPS receiver, the Evaluate software, power supply, ready-made interface cables, antenna, and manuals.

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 specifications based on tests conducted in Moscow. 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.

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 available under validated export license.

Thales Navigation

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 Washington, DC +1 703 476 2212 • Fax +1 703 476 2214

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 1993 8867 66 • Fax +44 1993 8867 67

In the Netherlands +31 78 61 57 988 • Fax +31 78 61 52 027

Web site www.thalesnavigation.com

Thales Navigation follows a policy of continuous product improvement; specifications and descriptions are thus subject to change without notice.

Please contact Thales Navigation for the latest product information.