



AC12 Receiver

GPS, SBAS AND PRECISION CARRIER PHASE CAPABILITY

Thales, a world leader in GPS+SBAS technology, now offers the AC12™ OEM board with raw GPS carrier phase observables as a standard feature. Leveraging more than 15 years of OEM expertise in carrier phase technology, the AC12 is capable of precise carrier phase output while remaining cost effective. For high-precision applications constrained by cost and size, the AC12 board is the ultimate solution.

HIGH-ACCURACY CARRIER PHASE

The AC12 is a low-cost board with carrier phase measurements that deliver high-accuracy and flexibility found only in expensive GPS boards. The AC12's extremely accurate carrier phase data can be used for navigation and provides an advantage in a variety of applications, enabling users to apply their choice of carrier smoothing algorithms to improve the pseudorange positioning accuracy and even perform carrier-phase differential positioning. The AC12 receiver is compatible with GrafNav™ software.

INNOVATIVE SATELLITE TRACKING TECHNOLOGY

The AC12 supports differential remote operation and is capable of tracking Satellite Based Augmentation System (SBAS – WAAS/EGNOS/MSAS) satellites to enable enhanced and free-of-charge DGPS positioning. Next-generation board design minimizes the impact of common mobile application challenges such as skyward obstructions and GPS signal multipath, while superior signal reacquisition techniques ensure position availability and reliability.

LOW-COST SOLUTION

For many applications, such as agriculture, GIS and mapping, the AC12 provides high-performance GPS at a fraction of the cost of “high-end” alternatives. A field-proven design built on Thales' world-class GPS engineering capabilities, the AC12 OEM board is also ideal for land and marine navigation, low-cost heading and attitude systems, deformation monitoring, asset and people tracking, relative navigation, automotive, military, and even golf course management – delivering reliable, consistent position and raw data including carrier phase measurements under the toughest conditions.



AC12 offers a range of additional features:

- Low power consumption – only 0.23 watts
- User-defined and pre-defined datums
- Two-way serial port communications
- Raw data output (code and carrier)
- Precise carrier-phase tracking
- 1PPS output accurate to better than 250 nanoseconds
- Same form factor and interface as A12™ OEM board
- Also available in a rugged sensor or as a Development Kit

AC12 RECEIVER

TECHNICAL SPECIFICATIONS

Standard Features

- 12-channels GPS receiver with up to 2 channels for SBAS
- L1 frequency, C/A code and carrier
- DGPS Remote
- 1-Hz update rate
- 1 PPS (TTL)
- Precision: 250 ns (Stand-alone)
- Single Port Operation
- 99 Predefined Datums
- User-defined datum Support
- WAAS/EGNOS Support
- Speed (max) 514 m/s (1,000 knots)
- Altitude (max) 18,288 m (60,000 ft)

Accuracy

Real Time Position¹

Autonomous

Horizontal CEP	3.0 m (9.843 ft)
Horizontal 95%	5.0 m (16.48 ft)

SBAS (WAAS/EGNOS/MSAS)

Horizontal CEP	1.0 m (3.28 ft)
Horizontal 95%	3.0 m (9.843 ft)

DGPS

Horizontal CEP	0.8 m (2.62 ft)
Horizontal 95%	1.5 m (4.92 ft)

Carrier Phase Measurement Accuracy

3 mm (RMS)

Acquisition Time²

Typical Acquisition Time

Hot start	<10 sec
Warm start	<45 sec
Cold start	<150 sec

Typical Reacquisition Time

Total satellite blockage
for < 20 seconds 1–2 sec

Total satellite blockage
for < 180 seconds 3–5 sec

Communication

- Standard NMEA–0183 V3.0 interface utilizing common Thales OEM receiver command set
- Differential remote operation using RTCM V2.2 Message Types 1, 3 and 9.
- Software-selectable baud rate ranging from 1200 bps to 115K bps

AC12 OEM Board

Operating Temp

–30°C to +80°C
(–22°F to 176°F)

Storage Temp

–40°C to +85°C
(–40°F to 185°F)

Humidity

95% RH, non-condensing

Vibration

5-20 Hz	0.008 g ² /Hz
20-100 Hz	0.05 g ² /Hz
100-900 Hz	3 dB/octave

Size (including shield case)

40 x 61.2 x 13.3 mm
1.58 x 2.41 x 0.52 in

Weight (including shield case)

1.6 oz. (45.4 gr)

I/O Connector: 8-Pin Molex Connector

P/N 53254-0810

RF Connector: Right Angle SMB

Primary Voltage 3.3 to 5.0 VDC

Current Consumption 55-70 mA

- Power (typical) 230 to 250 mW @3.3 to 5.0 VDC

- Back-up Voltage 2.7-3.6 VDC = 6 μ A

I/O Ports

- 1 full-duplex serial port (TTL compatible) for primary I/O

- 1 half-duplex serial port (TTL compatible) for RTCM input

AC12 Sensor

Operating Temp

–30°C to +70°C
(–22°F to 158°F)

Storage Temp

–40°C to +85°C
(–40°F to 185°F)

Size

111.2 x 104.6 x 29.5 mm
4.38 x 4.12 x 1.16 in

Weight

8.5 oz. (240.0 gr)

I/O Ports 2 RS-232 Ports

Input Voltage 10-18 VDC

Current Consumption 70-90 mA

Power Consumption (typical) 1 watt



A12/AC12 Sensor

Development Kit

Kit includes

- PC compatible Evaluate and Mission Planning™ Software
- AC12 sensor: AC12 receiver in a rugged enclosure with 12 VDC power supply and RS-232 interface.
- Magnetic-mount antenna with cable
- Null modem cable and RS-232 interface cable with integral power connector
- Power source adapters (auto lighter adapter, AC adapter)

Mini Magnetic Mount Antenna

5V active micro patch antenna

Dimensions: 46 x 39 x 12.5 mm

Cable Length: 6 m

Connector: SMB (board) or SMA (sensor)

Gain: 24.5 dBi



Mini Magnetic Mount Antenna

1 Position accuracies are based on tests calculated in low multipath environment under clear sky conditions. Accuracy may degrade in high multipath environments.

2 Assumes that at least 4 GPS satellites are clearly visible.

Thales

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