Super C/A Sensor™

Real-time Differential Navigator

Better than 1 Meter Accuracy

The Ashtech® SCA Sensor GPS Receiver is a powerful navigation system that offers Real-Time Differential capability and Super C/A(tm) tracking. It is ideal for high precision land, sea and air navigation or real-time mapping applications. Extensive interface capabilities, integrated with leading edge technology, makes the Super C/A Sensor an ideal differential base station and differential remote unit.

The receiver uses "All-in-View" dedicated 12 channel Super C/A code tracking where the carrier phase is used for smoothing the low noise code ranges. This enables greater accuracies than other GPS receivers that have no carrier smoothing or low noise code measuring techniques. 1 Hz computation rates are standard.

The SCA Sensor continuously tracks up to 12 satellites simultan-eously on 12 separate and parallel channels using Ashtech's Super C/A code. Loss of lock on one channel has no impact on other channels. Since satellite range information can be viewed simultaneously, any oscillator offset is accurately and efficiently removed.

Design/Performance Features

The SCA Sensor provides an accuracy stand-alone of 25M SEP subject to the government policy of Selective Availability (100M with SA engaged).

Two SCA receivers, one base and one remote, provide <1 meter accuracy using Real-Time Differential (similar accuracy is achievable using a DNS-12 or a Z-12 as a base station). Sub-meter accuracy is also achievable using the U.S. Coast Guard Differential Service.

The base receiver is capable of outputting RTCM SC 104 Version 2.1 via any one of its serial ports. A telemetry link such as a data radio or a maritime beacon system can be used to receive the differential data. Three RS-232 serial I/O ports provide interfacing with external devices using the NMEA 0183 format.

One independent measurement is determined per second with no interpolation or extrapolation from previous solutions. The position and velocity computations are performed using all the satellites in view simultaneously.

Other performance features include:

- 1 PPS timing pulse accurate to 100 ns (SA off). This pulse can be advanced or delayed for different triggering applications.
- Real-time data outputs to accommodate a variety of raw pseudorange, emphemeris and position data in either binary or ASCII format which is selectively provided via any of the serial ports.

The receiver uses a number of different antenna configurations for unique applications. Antennas are available for pole-mounted applications, vehicles or aircraft.

Options include:

- Photogrammetry/event input marker which accurately time tags external events to an accuracy of 100 ns (SA off). This information is either sent back out a serial port or recorded in the internal memory.
- A 4 mb memory board for additional data storage when post-processing of data is desired.
- L1 carrier phase which supports the ability to attain centimeter level accuracy when accompanied with the PNAV post-processing software.

PNAV Post-Processing Software

Ashtech's newest application software package was designed to produce high-accuracy positions resulting from the post-processing of carrier-phase, dual-frequency, full wavelength L1 and L2 data. This software, combined with the Super C/A Sensor data provides a powerful new capability in GPS, providing sub-meter accuracy. This capability is especially valuable for post-processed differential when a data link is not available.

Sub-meter accuracy is achievable with the standard configuration, while sub-decimeter accuracy is achievable with the carrier phase option.

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Ashtech

Super C/A Sensor Specifications

Resolution and Accuracy

Measured and Computed Data

Autonomous Positing	25m rms
Real-time differential position	<1m rms (PDOP≤4)
Post-processed position	1cm ± 1ppm

With L1 Carrier Phase (Optional)

Velocity	1cm/second (PDOP≤4, 0.02 knots)
Update rate	Once per second
Time to first fix	Typically < 1 minute

Environmental & Physical

Operating temp	-20°C to +55°C
Storage temp	-30°C to +75°C
Speed (Max)	Does not exceed 1,000 knots
Altitude (Max)	60,000 ft

Higher altitude and velocities up to 25,000 knots are available under validated export license.

Dimensions	3.65”W x 1.9”H x 6.2”D

Standard Features

- 12 channel all-in-view operation
- Carrier-smoothed pseudo ranges
- 4 Watt Power Consumption
- 3 RS-232 I/O Ports (38,400 Baud)
- NMEA 0183 outputs
- 1 second update rate
- 0.5 Mb memory (20,000 epochs)
- QA/QC range residuals and expected 1 sigma position error output via serial port
- Real-Time Differential (As user equipment in RTCM 104 format - RTCM receives Type 1,2,3,6,9,16)
- 1 PPS accurate time pulse
- Real-Time data outputs
- Power input 6-15 VDC
- 1 Year Warranty

Optional Features

- Base mode RTCM Type 1, 3, 9, 16
- 4.5 Mb memory (180,000 epochs)
- Memory board—4 mb
- Photogrammetry/Event Input

Standard Accessories

- Receiver operating manual
- Mounting plate

Optional Accessories

- Data radios (UHF/VHF)
- PNAV post-processing software
- 10, 30, 60 meter antenna cable
- Antenna line amplifier
- Aircraft antenna system

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