

Viceroy-4™ GPS Spaceborne Receiver

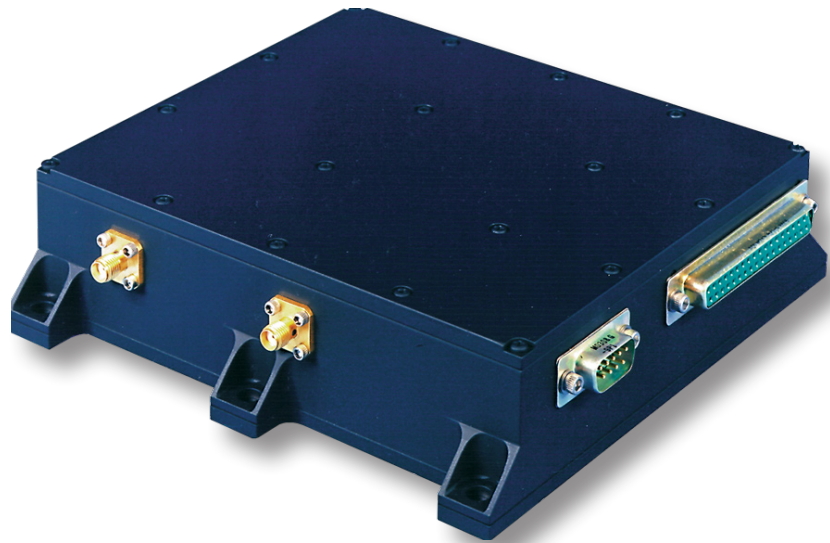
standard positioning service in space

Legacy Features

- Space Qualified Digital Design
- Full Spaceborne Capability
- Autonomous Operation
- Pseudorange and Integrated Carrier Phase at 1 Second Rate
- 1 PPS Clock Output Synchronized to GPSTime
- Radiation Hardened Static RAM
- Up to 12 Receive Tracking Channels
- Only 53 Cubic Inches
- Only 2.4 Pounds
- 20 to 34 VDC Operation

New Features (Avail 2Q 2010)

- Improved Radiation Hardened Digital Electronics
- 18 Channels Support All-in-View Tracking
- Dual Antenna – Any Channel Assigned to Either Antenna
- Fast Cold Start Mode Simplifies Integration and Autonomous Operation
- Low Signal Acquisition and Tracking Supports GEO Sidelobe Tracking
- Enhanced Resolution 1 Pulse per Second Output
- Time-Strobe Input



General Dynamics' Viceroy-4 GPS Spaceborne Receiver provides position, velocity, and time information for Low Earth Orbit (LEO) and Geostationary Earth Orbit (GEO) applications. Performance and satellite visibility are enhanced through the use of dual antennas; each of the 18 GPS channels can be assigned to either antenna. The design supports RS-422 or MIL-STD-1553 bus interfaces.

Legacy Benefits

- Design Based on Legacy Space Qualified Digital Design
- 20 Years of Trouble-Free Spaceflight Heritage
- Same Reliable Position, Velocity, Time, Pseudorange & Carrier Phase @ 1 Hz
- Same Form-Factor and Interface Control as Heritage Viceroy Receiver

Viceroy-4 GPS Spaceborne Receiver

standard positioning service in space

Performance Characteristics

Receiver Architecture

- 18 Channels with Enhanced Fast Acquisition
- Dual Antenna – any channel to either antenna
- L1: 1575.42 MHz, C/A code
- Carrier-Aided Code Tracking
- Based on legacy Viceroy architecture (hardware and software)

Input/Output

- RS-422 serial I/O (standard)
- MIL-STD-1553B (optional)
- X.25 protocol with ECEF position, velocity, time, longitude, latitude, pseudorange, carrier phase
- One pulse per second (GPS, UTC, or Measurement Epoch Time)
- Time strobe input signal
- 9-Pin male Sub-D for prime power
- 37-pin female Sub-D for command and telemetry

Solution Accuracy

- Autonomous Position: < 15 meters, 1 sigma
- Autonomous Velocity: < 0.05 meters/second, 1 sigma
- 1PPS time: < 100 ns, 1 sigma
- Time Strobe Input: < 100 ns, 1 sigma

Time to First Fix

- 60 seconds, cold start

Orbital Dynamics

- Altitude: LEO to GEO (200 km – 45,000 km)
- Velocity: up to 16,000 meters/second
- Acceleration: 1G

Optional and Custom Features

- Serial Port – 1553 or standard RS422
- Code Types: L1 C/A
- Kalman Filter or Least Squares Solution
- Single string or redundant configurations
- Low signal acquisition and tracking to 20 dB-Hz (GEO side lobes)
- Precision internal reference Ovenized Crystal Oscillator (OCXO)
- External 10 MHz reference oscillator

Antenna

- Active microstrip patch antenna (LEO), 0.4 lbs
- High gain multi-element antenna (GEO), 1.0 lb
- Power supplied by Viceroy-4
- SMA female connection on receiver and antenna

Physical/Environmental

- Size: 6.0" x 5.2" x 1.7" (152 x 132 x 43 mm)
- Weight: 2.4 lbs (1.1 kg) max
- DC Power: 7 W max; steady-state tracking (20-34 V)
- Vibration: 17 Grms
- Shock: 1750 G @ 500 Hz
- Temperature: -20°C to +60°C

For More Information, Contact:

Lisa Barker
Manager, Business Development
303-649-7532
lisa.barker@gd-ais.com

Warren Skarda
Director, Space Electronics
480-441-8420
warren.skarda@gd-ais.com

www.gd-ais.com
www.gd-space.com

GENERAL DYNAMICS
Advanced Information Systems