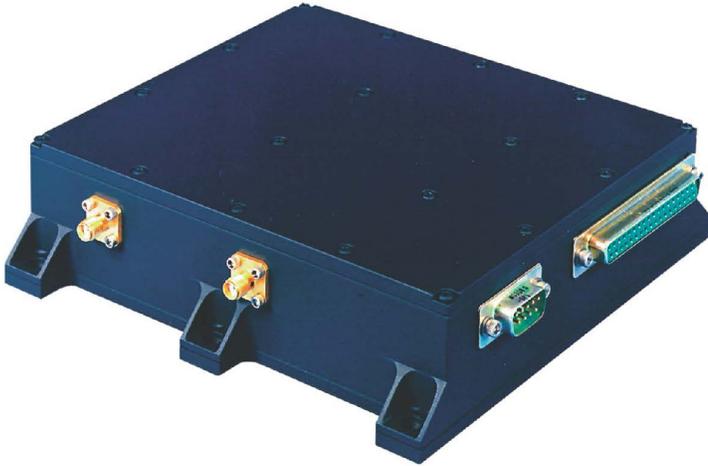


Viceroy[®]-4 GPS Spaceborne Receiver

Superior positioning with 200+ years of on-orbit performance



Design based on legacy space qualified digital design

20 years of trouble-free spaceflight heritage

Same reliable position, velocity, time, pseudorange
and carrier phase at 1Hz

Same form-factor and interface control as heritage Viceroy receiver

Overview

General Dynamics' Viceroy-4 Global Positioning System (GPS) Spaceborne Receiver provides position, velocity, and time information for Low Earth Orbit (LEO) and Geostationary Earth Orbit (GEO) applications. The use of dual antennas for LEO enhances the performance and satellite visibility. Each of the 12 GPS channels can be assigned to either antenna. The design supports an RS-422 interface.

Key Features

- Space Qualified Digital Design
- Full Spaceborne Capability
- Autonomous Operation
- Pseudorange and Integrated Carrier Phase at One Second Rate
- One PPS Clock Output Synchronized to GPS Time
- Radiation Hardened Static RAM
- Up to 12 Receive Tracking Channels
- 53 Cubic Inches
- 2.4 Pounds
- 20 to 35 VDC Operation
- Improved Radiation Hardened Digital Electronics
- 12 Channels Support All-in-View Tracking
- Dual Antenna – Any Channel Assigned to Either Antenna (LEO only)
- 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

Standard positioning service in space

Performance Characteristics

Receiver Architecture

- 12 channels with enhanced fast acquisition processor
- Dual antenna – any channel to either antenna (LEO only)
- L1: 1575.42 MHz, C/A code
- Carrier-aided code tracking
- Based on legacy Viceroy architecture (hardware and software)
- Kalman filter or least squares solution

Input/Output

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

Solution Accuracy

- Autonomous Position: < 15 meters, 1 sigma (LEO)
< 100 meters, 1sigma (GEO)
- Autonomous Velocity: < 0.1 meters/second, 1 sigma (LEO)
< 0.01 meters/second, 1 sigma (GEO)
- 1PPS time: < 100 ns, 1 sigma (typical)

Time to First Fix

- LEO: 4 minutes, cold start
- GEO: 10 minutes, cold start

Orbital Dynamics

- Altitude: approx 200km to 2000km (LEO)
approx 35,800km (GEO)
- Velocity: up to 16,000 meters/second
- Acceleration: 1G

Optional and Custom Features: Contact Factory

- Single string or redundant configurations
- Precision internal reference Ovenized Crystal Oscillator (OCXO)
- External 10 MHz reference oscillator
- Time Strobe Input: < 100 ns, 1 sigma
- MEO and HEO Altitudes

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: 8 W max; steady-state tracking (20-35 V)
- Vibration: 17 Grms
- Shock: 1750 G @ 500 Hz
- Temperature: -20°C to +60°C

GENERAL DYNAMICS

Mission Systems

Space Inquiries • 1-877-449-0600 • www.gdmissionsystems.com/space • www.gdmissionsystems.com/contact-us

©2019 General Dynamics. All rights reserved. General Dynamics reserves the right to make changes in its products and specifications at anytime and without notice. All trademarks indicated as such herein are trademarks of General Dynamics. All other product and service names are the property of their respective owners. © Reg. U.S. Pat. and Tm. Off.

D-VICEROY4-02-0919
PRI-1908-0054