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Global Positioning System (GPS)
Sensor Unit

IS&S GPS/WAAS Beta-3 Receiver

Technical Overview

The IS&S GPS/WAAS Beta-3 Receiver is a satellite receiver that utilizes the signals coming from Global Positioning System (GPS) satellite constellation and satellite-based augmentation systems (SBAS) such as the USA Wide Area Augmentation System (WAAS). It is a DO-229D compliant GPS-SBAS receiver certified by the FAA for TSO-C145c Class Beta 3 enabling LPV approaches and ADS-B mandate compliance.

The primary function of the receiver is to compute the position, velocity of an aircraft and the precise time (PVT). It also computes the integrity of the PVT from the SBAS signal, if available. The receiver detects and excludes failed satellites (FD/FDE) using receiver autonomous integrity monitoring (RAIM) algorithm, whenever there are enough number of tracked satellites. The sensor unit communicates with a host computer through a serial communication link.

IS&S is proud to serve a broad array of aerospace customers with increasingly sophisticated and technically advanced products. IS&S is at the forefront of developing a new generation of products which will meet the increasing demands of customers and regulators as requirements for air traffic management, fuel savings and environmentally friendly aircraft increase.



Features & Benefits

- Conformed to FAA TSOC-145c Class Beta 1,2, and 3
- Conformed to RTCA DO-229D, DO-178B Level B, DO 254 Level B, DO0160F
- 12GPS +3 SBAS Channels
- GPS WAAS Class Beta 3
- Interface: RS 422, Mil 38999 connector
- Antenna Connector: TNC RF Connector,Female
- Increased safety and reliability
- Logistics and maintenance benefits by integrating multiple functions into one LRU
- Primary means of navigation
- Cost effective solution
- Improved accuracy through SBAS correction
- PVT compliant for ADS-B operation
- GBAS capable



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Performance Characteristics

Conformity

RTCA	DO-229D, DO-301 DO-178B, DO-254, DO-160E
FAA	TSO-C145c, Class Beta-1, -2, -3

Performance

GPS L1 C/A Code Sensor	With SBAS Capability
12 GPS and 3 SBAS	Parallel Channels
Hor. Position Accuracy	3 m, RMS
Differential Position Accuracy	1 m, RMS
Vertical Position Accuracy	5 m, RMS
Velocity Accuracy	0.1 m/s., RMS
Pseudorange Accuracy	15 cm, RMS
Time Accuracy	20 ns, RMS
Update Rate	5 Hz

Sensitivity

GPS Acquisition	-136 dBm
GPS Tracking	-140 dBm

Environmental Characteristics

Temperature	-55° to 70°C
Altitude	60,000 ft (18,200 m)
Temp. Variation	DO-160E, Category B
Humidity	Do-160E, Category B

Dynamics

Speed, Acceleration and Jerk	Per DO-229D Requirements For En-Route, Terminal LNAV, LNAV/VNAV & LP/LPV Modes of Operation
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Integrity

RAIM	SBAS Integrity incorporated
FD/FDE	FD/FDE Incorporated
Alert	Navigation alerts per MOPS DO-229D through software
BITE	Comprehensive Power-on and Online Self Tests

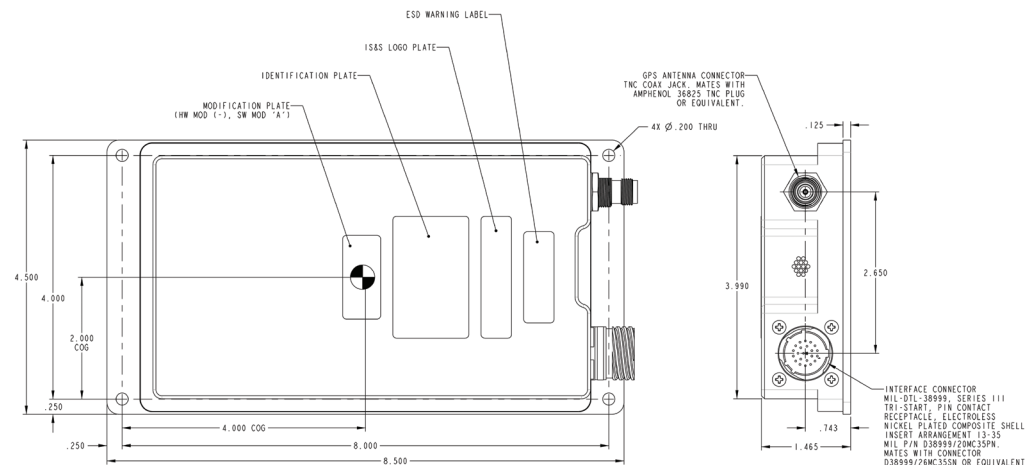
Design Assurance

Hardware	Per DO-524, Level B
Software	Per DO-178B, Level B

Interfaces

Input/Output (custom I/O available)	Separate RS-422 Host and Maintenance Ports 4 Input and 4 Output Discretes TTL and RS-422 Time Mark
Messages	Customized Protocol
Upgrades	Software upgrades through serial port

Outline Dimensions





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IS&S is the world's leading supplier of RVSM systems and integrator of Cockpit Information Systems (Cockpit/IP®) for the Commercial Air Transport, Military, and Business Aviation Markets. IS&S incorporates leading edge technologies into sophisticated, cost-effective solutions for the aerospace industry.



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