MicroGRAM GPS Receiver

Enhancing your awareness in any environment.

Today's warfighters must be prepared to find their way in unfamiliar environments. Enhanced situational awareness in unpredictable territory makes for a military that is prepared to change ahead of the enemy. Rockwell Collins' proven heritage of the MPE™-S family of products facilitates surface mobility, augmenting alertness and preparedness.

Much smaller and much lighter than its predecessor version, MPE-S, yet retaining key functionality, the Rockwell Collins MicroGRAM delivers geolocation and precise positioning capabilities for military applications such as tactical communications, field computers and unmanned aircraft. MicroGRAM is size competitive with commercial GPS receiver chipsets. At its core, the MicroGRAM contains the Selective Availability Anti-Spoofing Module (SAASM). SAASM encapsulates all classified data and signal processing into one tamper-proof module, increasing the security of the MicroGRAM.

KEY FEATURES (SAASM)

- Capabilities of the Jaguar 12-channel GPS signal processor
- True All-In-View navigation of up to 12 GPS satellites
- Advanced correlator engine (ACE) turbocharges the engine for accelerated Direct-Y code acquisitions
- Next-generation security architecture provided by the key data processor (KDP 4)
- Unclassified-when-keyed operation
- Black key capable, for Over-The-Air-Rekeying (OTAR), when available from GPS satellites

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KEY FEATURES (MICROGRAM)

- Pick and Place compatible for ease of manufacturing
- Same serial interface protocol as MPE-S
- Selective Availability Anti-Spoofing Module (SAASM) security
- 12-channel continuous satellite tracking for true All-in-View operation
- L1 and L2 dual frequency GPS signal reception
- Aggressive satellite acquisition/reacquisition strategies to improve performance and reduce power consumption
- Cold Start without time, position or satellite almanac in less than 110 seconds
- Extended performance in a jamming environment
  - 41 dB while tracking
  - 24 dB during initial satellite acquisition
- User setup of units datums and coordinate formats
- RTCM 194-93/SC 104 Differential GPS Correction Input
- Mature, proven GPS technology

INTERFACE COMPATIBLE

The MicroGRAM is an optimized lightweight, low power design that uses CMOS logic for efficient message protocol compatible with the MPE-S. The two low power serial data ports are full duplex interfaces with the MPE-S heritage of ICD-GPS-153C. There are 1 pulse per second input and output timing pulses available for the host application to synchronize time. MicroGRAM provides DS-101 and DS-102 keying interfaces.

DUAL FREQUENCY RF

An advanced dual frequency RF front end allows track with both L1 and L2 GPS frequencies while minimizing the footprint on this miniaturized SAASM GPS receiver. Even when turned off, a precision time source runs continuously when auxiliary power is supplied to allow rapid acquisition of the GPS satellites when the MicroGRAM is turned on. Of course, all this capability requires only a single 3-volt power source.

SPECIFICATIONS

System characteristics

Dynamics	Velocity: 1,200 m/sec maximum* Acceleration: 9 g maximum
Time accuracy	100 nanoseconds
Position accuracy	DGPS: <2 meters CEP*
WAGE	<4 meters CEP*
PPS	<12 meters CEP*
Acquisition time	TTFF (95%): <10 sec hot start, 90 sec warm start TTSF (95%): <20 sec (Off or Stby <15 min) TTSF (95%): <55 sec (Off or Stby <60 min)
Velocity accuracy	0.04 m/sec steady rate (3D 95%)
Coordinate system	8 predefined
Datums	260 predefined, 6 user defined

INTERFACES

Interconnect

RF connector	Amphenol AMC RF Jack #A1JB
Power and data	Mini solder ball pins

Hardware interfaces

Two independent serial ports (full duplex CMOS)
1 pulse per second input (CMOS)
1 pulse per second output (CMOS)
L1/L2 active RF antenna port, 3.3 V dc
DS-101 and DS-102 key loading

PHYSICAL CHARACTERISTICS

Power	Operating: 3.3 V dc, <0.5 W typical Keep alive: 3.3 V dc, <0.3 mW typical
Weight	0.25 oz [7 gm] nominal
Size/volume	1.0" x 1.25" x 0.275" maximum [25.4 mm x 31.75 mm x 7 mm]
Temperature range	-40° C to +85° C operating -55° C to +85° C storage
Shock, all axes	>600g, ½ sine, 1 msec

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

* Export of precise positioning service (PPS) units is authorized for GPS Memorandum of Understanding countries only. PPS security modules must be obtained through foreign military sales (FMS) procurement.

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Rockwell Collins delivers smart communication and aviation electronic solutions to customers worldwide. Backed by a global network of service and support, we stand committed to putting technology and practical innovation to work for you whenever and wherever you need us. In this way, working together, we build trust. Every day.

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