

MPE™ – M Receiver

Enhanced awareness in highly contested environments

Increased mission effectiveness and safety

BAE Systems advances its proven heritage of Selective Availability Anti-Spoofing Module (SAASM)-based products to M-Code, allowing soldiers to be more mobile, alert, and prepared during any mission.

Capable of receiving both existing operational GPS signals, and the new M-Code signal, the MPE-M is the most power-efficient M-Code Type II solution on the market. This receiver delivers geolocation and precise positioning for space-constrained applications and provides increased security assurance through anti-jamming capabilities. The MPE-M is size-compatible with the MPE-S receiver and offers a new security architecture for enhanced integrity, exclusivity, and resiliency.

At its core, the M-Code signal increases MPE-M's mission-effectiveness, while maintaining standard SAASM functionality.



MPE-M is in operational use and currently deployed worldwide.

Key features and benefits

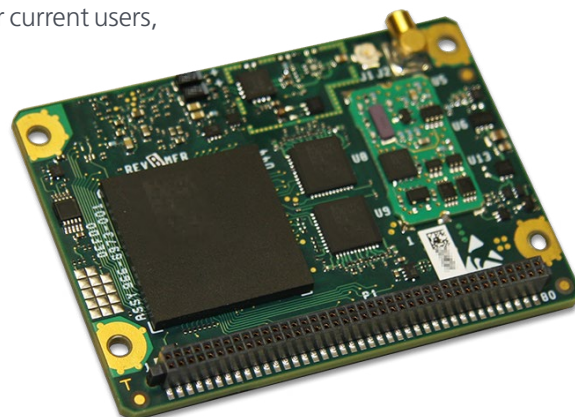
- Advanced correlator engine for accelerated Direct-Y and Direct-M code acquisitions
- Aggressive acquisition/reacquisition strategies to improve performance and reduce power consumption
- Black key capabilities include Over-The-Air-Rekeying (OTAR) when available from GPS satellites for increased security
- Cryptographic key retention without battery backup allows for increased protection and storage
- Compatible with both Fixed Reception Pattern Antenna (FRPA) and nulling capable Controlled Reception Pattern Antenna (CRPA) for increased anti-jamming and anti-spoofing ability
- Next-generation modernized security architecture with Signed Group M-Code Package (SGMP) compatibility for ease of integration with future applications
- Components enable improved performance over Y-Code in a jamming environment:
 - Better than 41 dB J/S while tracking (state 5)
 - Better than 54 dB J/S (state 3)
 - Blue Force Electronic Attack (BFEA) mitigation
- 24-channel continuous satellite tracking allows the receiver to monitor up to 24 satellites and choose the best position
- Field reprogrammable to support future feature updates

Backward compatibility

The MPE-M is backward-compatible for current MPE-S embedded GPS receiver users. The familiar 80-pin I/O connector and robust MMCX RF connector is easily recognizable for current users, allowing for an economical upgrade to an embedded M-Code receiver.

Dual-frequency RF

An advanced, dual-frequency RF front end enables continuous track of both L1 and L2 GPS satellite frequencies. Even when off, a precise, low-power time source runs continuously to allow rapid acquisition of GPS satellites when the receiver is turned on again. All of this capability requires only a single, three-volt power source.



Mature, proven GPS technology

System characteristics

Dynamics (velocity)	Man-portable: 10 m/s maximum Surface vehicle: 25 m/s maximum Low dynamic aircraft: 250 m/s maximum
Dynamics (acceleration)	Man-portable: 1 m/s ² maximum Surface vehicle: 3 m/s ² maximum Low dynamic aircraft: 20 m/s ² maximum
Time accuracy	100 nsec
Position accuracy	PPS: <5 meters CEP*
Acquisition time	TTFB (95%): <15 sec hot start, <70 sec warm start (Direct Y/M) TTTF (95%): <20 sec, (Off or Stby <15 min) TTTF (95%): <38 sec, (Off or Stby <60 min)
Velocity accuracy	Man-portable: 0.3 m/sec steady rate (3D 95%) Surface vehicle: 4.0 m/sec steady rate (3D 95%) Low dynamic aircraft: 10.0 m/s steady rate (3D 95%)
Storage capacity	999 waypoints, 15 reversible routes

Interfaces

Connectors

- Power and data (SAMTEC P/N SFM-140-L2-S-D-LC)
- RF input (Huber Suhner P/N 85MMCX-50-0-1/III)

Hardware interfaces

- Four low-power CMOS serial data ports
- 4th serial port is either low-power CMOS or RS-232 serial data port
- One PPS input
- Four independent 1 PPS/10 PPS configurable outputs
- L1/L2 active RF antenna port, 3.0 VDC
- DS-101 key loading, zeroize discrete
- HAVE QUICK (SS-110990 and ICD-GPS-060A compliant)

Physical characteristics

Power	Operating: +3.3 VDC, <1.0 W typical Keep alive: +3.0 VDC to +6.0 VDC, <4 mW typical
Weight	1.4 oz (40 gm) nominal
Size/volume	2.45 x 1.76 x 0.285 in. maximum (6.2 x 4.5 x 0.724 cm)
Temperature range	-40° C to 85° C operating -55° C to 85° C storage

* The MPE-M is security-approved for operational use by authorized U.S. GPS Precise Positioning Service (PPS) users and for export to authorized foreign countries via the Foreign Military Sales (FMS) process.

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