

# HALO



5-element GPS L1 & ALTNAV AJ & single element GPS L2  
with adaptive frequency notching

Navigator for GPS-denied scenarios with built-in ALTNAV  
receiver, IMU, and other sensors to provide a blended  
solution or individual sensor outputs for client systems

Eliminates cold starts with ALTNAV-based downstream  
MGUE initialization for direct M-code acquisition in  
spoofed environments

TRL 7 solution with 3 years of evidence from multiple  
assessment exercises

Compatible with most major ground-based PNT hubs  
available in the market

## Overview

HALO is a “Smart Antenna” that provides a 5-element antenna array with integrated anti-jam (AJ) electronics, ALTNAV receiver, and Kalman filter-based Navigator using an on-board, low-cost, micro-electromechanical Inertial Management Unit (IMU). Designed to applicable MIL standards, the HALO form factor incorporates a programmable Software Defined Radio (SDR) platform that provides an assured navigation solution in challenging GPS denied environments. The mounting footprint of the HALO unit is mechanically compatible with an industry standard NATO mount along with features that allow easy and fast platform integrations.

## Key Features

- Highly integrated **direct-RF Sampling Architecture** using a state-of-the-art Gen 3 RFSoc that contains an UltraScale+ FPGA, multiple ADCs & DACs and multi-core ARM processor in a custom heat sunk thermally managed package.
- Flexible **re-programmable SDR platform** capable of rapid firmware and software updates including third party IP to mitigate evolving threats.
- **Optimized SFAP-based AJ** nulling algorithm designed to protect M-code receivers while supporting continuous operations in friendly BFEA jamming environments.
- Robust NAVWAR capability with built in **ALTNAV receiver & embedded IMU** along with wheel-speed sensor input, PNT fusion engine, integrity monitor and Direct-M initialization when paired with a compatible PNT hub.
- Designed to ease ground vehicle **Platform Integration** with operability possible on a single coaxial cable\*
- Digital interface provides 6-axis IMU, 3-axis magnetometer, barometer, temperature, ALTNAV (position, pseudo range, doppler, ephemeris, 1PPS) along with blended navigation solution.
- **Ruggedized & Power optimized** to function in adverse conditions while running on unregulated vehicle power consuming less than 12.5W.

Design/Performance Parameter	Physical/Performance Characteristics
Size and Weight	Diameter: 7.5 inches (19.1 cm) Height (w/o connector): 4.1 inches (10.4 cm) Height (w/ connector): 5.0 inches (12.7 cm) Weight: 8.5 lbs. (3.9 kg)
Color & Finish	Color (default): Camo Green #34094* Radome finish: Polyurethane enamel base Iridite per MIL-STD-5541
Connector Interface	PWR/CRTL/DATA port: 22 pin circular MIL-DTL-3899 receptacle RF port: TNC Female
Communication Protocol	Serial: RS-422 Ethernet: 1Gb/s* USB: 2.0* Timing: 1PPS IN/OUT Debug: JTAG, RS-232
Supported Constellations	GPS, Iridium, mGNSS & other constellations*
Supported Signals	L1 C/A, L2C, L1 & L2 P(Y), L1 & L2 M-code, Galileo E1
Compatible PNT Hubs	DAGR, Enhanced D3M, DAPS, CMOSS APNT card, NavGuide*
GPS signal gain	30dB
GPS signal group delay	< 4 microseconds
L1 & E1 Jamming Susceptibility	>100dB J/S w/ military receiver for 1-4 ground-based jammers >80dB J/S w/ military receiver for more than 4 ground-based jammers
GPS denied position accuracy	Stationary: 20m CEP Ground Dynamics: 50m CEP
Attitude accuracy	GPS tracking: <0.5deg GPS denied: <1.0deg
RF Pass-thru mode	GPS L1, GPS L2, ALTNV, Galileo E1
Predicted Reliability	<ul style="list-style-type: none"> <li>■ Probability of Success: 3 years: &gt;.9994</li> <li>■ Probability of Success: 10 years: &gt;.9983</li> <li>■ Service Life: 20 years</li> </ul>
Power Requirements	<ul style="list-style-type: none"> <li>■ Steady state power consumption: 12.46 watts</li> <li>■ In-Rush: &lt; 2 amps</li> <li>■ Input Voltage: Supports 12 – 32 VDC</li> <li>■ Unregulated Power: Designed to MIL-STD-1275E</li> </ul>
Mounting Provisions	4-hole pattern in 4.25 inches square spacing w/ 8-32 screws NATO mount compatible
Performance in Adverse Weather Conditions	The antenna will have negligible degradation in severe rain, snow, or cloudy weather conditions (Assuming antenna is not covered in ice)
Environmental Specifications	Designed to MIL-STD-810H Operating Temperature: -40 degC to +52 degC
Electromagnetic Interference (EMI)	Designed to MIL-STD-461G

\*Please contact GDMS Sales & Business team to discuss the opportunity

## GENERAL DYNAMICS

### Mission Systems

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