Resilient Navigation All In One

DATASHEET

The partnership between Honeywell and infiniDome introduces a cutting-edge UAV navigation system, merging Honeywell's HCINS and HRVS with infiniDome's Anti Jamming technology. This fusion delivers steady, accurate navigation in GNSS-challenged and even fully denied conditions, making it the most robust UAV navigation solution globally.

Honeywell

Alternative Navigation System for Autonomous and GNSS–Denied Operations

The Resilient Navigation All In One module seamlessly integrates Honeywell's advanced Compact Inertial Navigation System (HCINS), Radar Velocity System (HRVS), and infiniDome's GPSdome Anti-Jamming technology into a compact, rugged, ready-to-install navigation solution. The Resilient Navigation AIO module ensures robust, accurate navigation in GPS challenged and denied environments with simplifying integration on any customer platform.

Anti-Jamming (GPSdome SunStone)
A small-sized, add-on device that provides protection against GNSS interference, making the GNSS input ~100x more resilient to attacks, boosting GNSS data availability and strengthening the UAV's navigation source even in highly challenged environments through integration with HCINS's advanced logic.

Compact Inertial Navigation System (HCINS)
Leveraging Honeywell's inertial navigation sensors and algorithms, the HCINS fuses data from multiple sources with proprietary Kalman Filters to determine location, velocity, and heading in a compact, lightweight unit. With a MEMS-based IMU, it ensures accurate navigation even without external inputs.

Radar Velocity System (HRVS)
A compact radar-based system, uses mmWave technology to provide range, velocity, and angle data, compensating for drift in the inertial system. Paired with HCINS, it achieves less than 3% error of distance travelled, even in full GNSS denial.
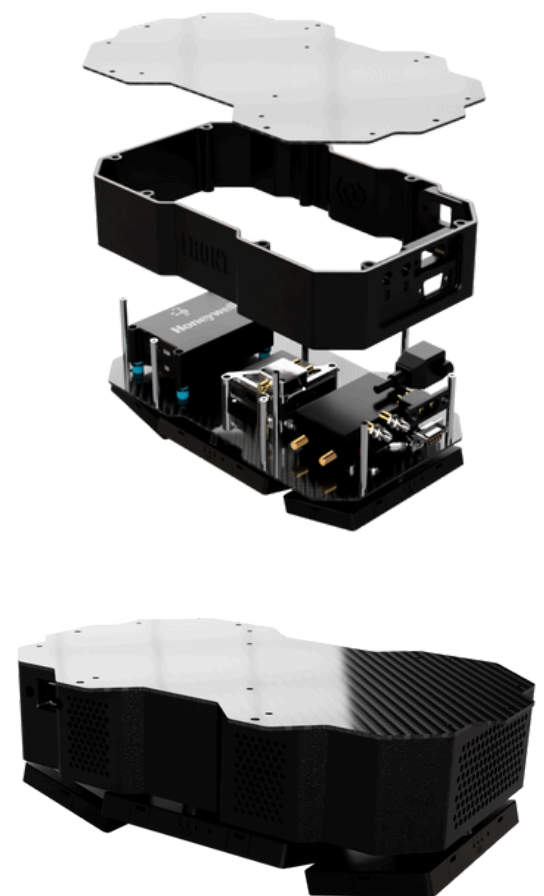
Resilient Navigation AIO module

	GPSdome-SunStone	HCINS	HRVS
Layers of Protection	GNSS frequency protection	MEMS based Inertial Measurement Unit	Radar Velocity System
Supported FW	Arducopter | PX4*		
Weight	1200g (fully integrated module)		
Dimensions	274 x 177 x 92 mm		
Input Voltage	8-26 VDC	Power Consumption	7.8W
Mounting interface	6 x M4 Bolts		
Connectors	GNSS	Main Power	Serial UART
	GNSS:2 X SMA female	XT-90 Male	D-sub 9 pin Fe

*PX4 FW with lose loop integration
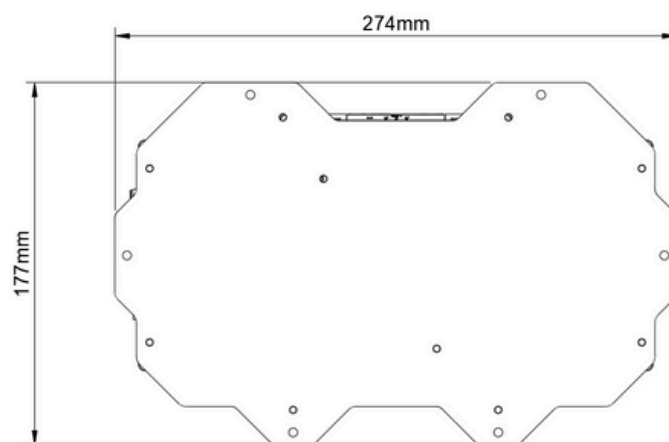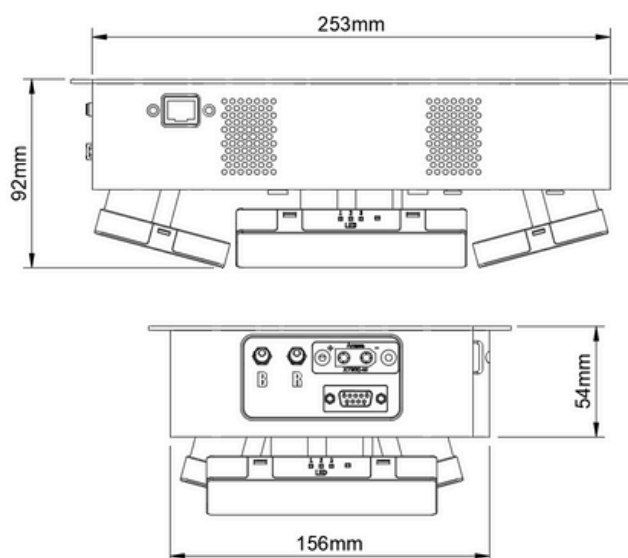
First Layer of Protection – Anti Jamming

GPSdome-SunStone

- Null Steering Technology
- Protected Frequency: L1 and E1/L2/L5/G1
- Optional Secondary: L1 and E1/L2/L5/G1
- Passthrough: Choose two of L1 and E1/L2/L5/G1
- Latency: 100ns ±15ns (fixed)
- Waterproof Rating: IP65
- Operating Temperature Range: –40°C to +71°C
- Size: 80mmx78.5mmx28mm (Single)
  80mmx78.5mmx33.5mm (Dual)
- Weight: 180g (Single) | 200g (Dual)
- Average Power Consumption: <2.7W

Scan for full datasheet of GPSdome-SunStone

Second Layer of Protection

Honeywell Compact Inertial Navigation System

- Small INS with dual GNSS receivers
- Horizontal drift after 30s GNSS outage with no aiding ~ 5m
- Navigation health monitor
- Latency: 100ns ±15ns (fixed)
- Size: 104mmx60mmx28mm
- Weight: 140g
- Max power consumption: <3W

- Not export controlled (ECCN: 7A994)

Scan for full datasheet of HCINS

Honeywell Radar Velocity System

- 3D velocity aiding system
- CEP error of 1–3% distance traveled when integrated with HCINS
- Navigation health monitor
- 60GHZ / 80GHZ
- Size: 113mmx65mmx31mm
- Weight: 63g
- Max power consumption: <2W

• Not export controlled (ECCN: 6A998.a)

Scan for full datasheet of HRVS
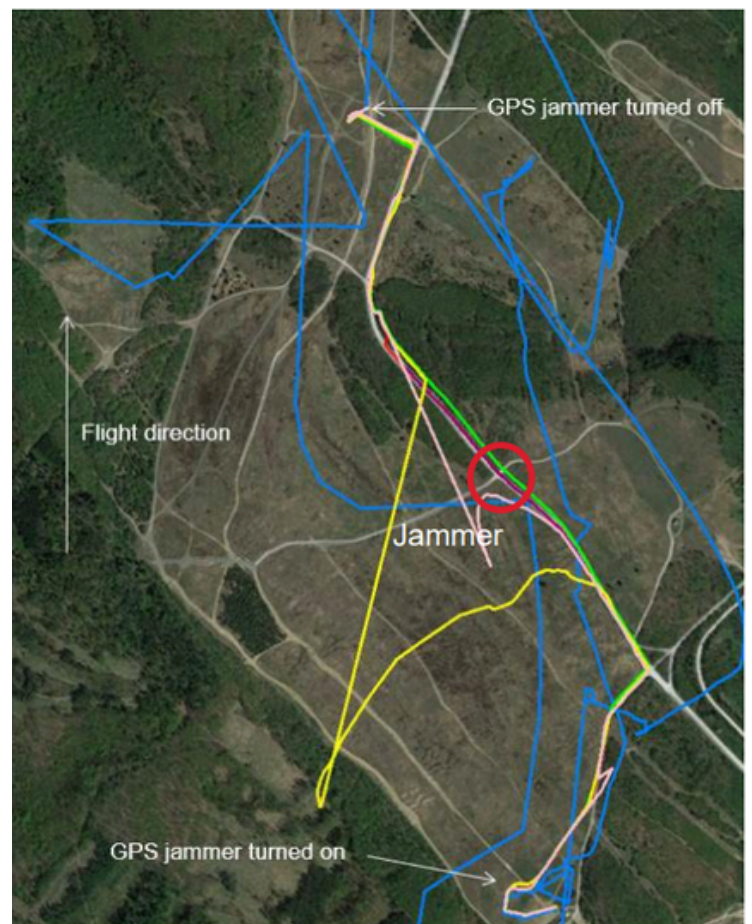
Proven Performance in Combat

Setup:

• 20W GPS jammer with omnidirectional antenna placed in the middle of the track (**Red Circle**).

• Jamming Level: Medium power GPS jamming.

• Flight speed 5 m/s.

Results:

• HCINS + GPSdome were able to provide reasonable position for half of the flight time, except for a 250m radius around the GPS jammer (**Pink** line).

• HCINS correctly rejected poor GPS measurements (**Pink** & **Purple** lines) and started to use the GPS position once it was available.

• HRVS is an important part of the system, able to maintain high navigation accuracy in case of higher GPS jamming conditions (**Purple** line).

Legend:

• **Green** – True Position.

• **Blue** – Unprotected Pixhawk GPS.

• **Yellow** – Protected by GPSdome (With GPS Aiding).

• **Pink** – GPSdome + HCINS (With GPS Aiding).

• **Purple** – GPSdome + HCINS + HRVS.

(No GPS aiding, Only HRVS aiding).