

Psi Vision System Description

The Psi Vision 3000 system delivers persistent wide area surveillance in a lightweight and compact package suitable for aerial platforms, from MALE UAS to fixed and rotary wing aircraft. It is comprised of a 300+ megapixel color EO camera mounted in a 15" 3-axis stabilized 5 axis gimbal and provides real-time access to full motion (2 Hz) imagery over the persistent field of view and automated exploitation tools. Psi Vision 3000 provides high resolution at manageable bandwidth with minimal compression requirements.

The imagery data architecture has been designed to provide access to the imagery and meta-data over bandwidth-constrained datalinks and provides:

- Simultaneous access to multiple analytical queries of different zones of interest;
- Varying magnifications of different zones of interest coincident with persistent wide area awareness;
- Forensic querying of the data during real-time data acquisition.



Psi Vision 3000 in
PV 15 Turret



tCMS Processor and Storage
Unit (PSU) with up to 32 TB
removable data storage

Table 1.0 - Size, Weight, Power

LRU	Dimensions	Weight	Power	Reference
SGP-15 & Sensor (Turret)	15.5" Dia. x 18.52" H	< 100 lbs.	(Peak/Quiescent) 750W/450W	101557/101559
PSU (Processor)	15.4" x 13.45" x 21.5"	< 100 lbs.	1500W	101557/101559
S.I.G. Tracker	1U - 4U x 17"	40-100 lbs.	650W - 2200W	CONOPS dependent

Table 2.0 - Environmental Specifications

Environment	Turret	Processor
Operating Altitude	35,000 ft AMSL	35,000 ft AMSL
Airspeed: Operational (Non-operational)	<ul style="list-style-type: none"> • 350 knots IAS • 425 knots IAS 	N/A (Interior Installation)
Temperature: Operating (Non-Operating)	<ul style="list-style-type: none"> • -55°C to +55°C • -55°C to +71°C 	<ul style="list-style-type: none"> • 0°C to +55°C (-40° to +55°C available) • -40°C to +71°C
Shock: Functional (Crash Safety Shock)	<ul style="list-style-type: none"> • 6g, 20 msec • 10g, 11 msec 	<ul style="list-style-type: none"> • 10g, 11 msec • 20g, 11 msec
EMI/EMC	Designed for MIL-STD-461	

Table 3.0 - System Block Diagram

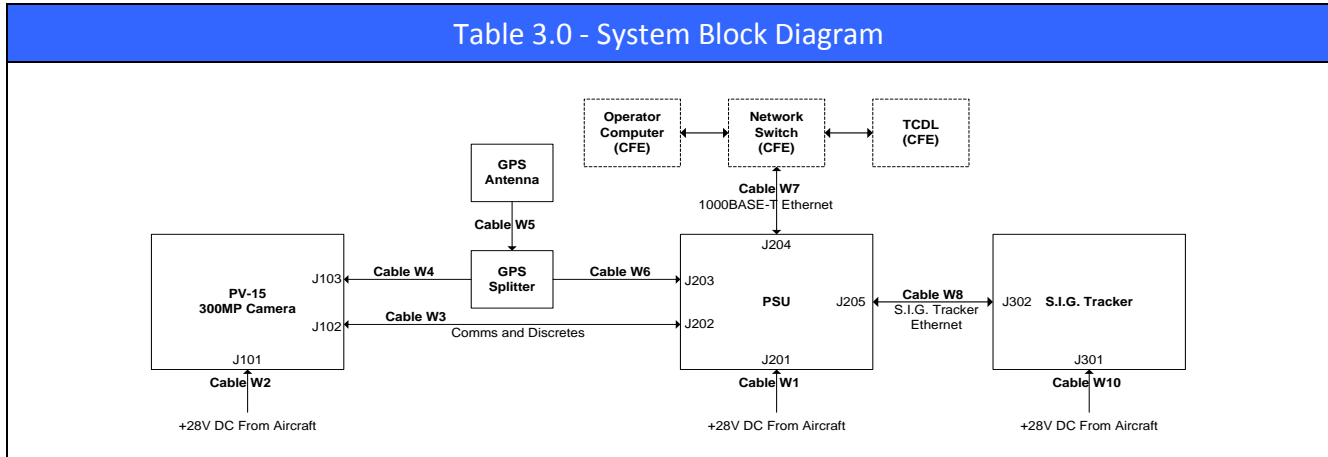


Table 4.0 System Performance – Key Parameters

Component	Notes
Sensor	
Camera Type	Color 332 Mega-Pixel CCD, Compound Focal Plane
Focal Plane Dimensions	107mm x 94mm
Pixel Pitch	5.5µ x 5.5µ
Integration Time	1 to 140 ms
Data Output	Single Fiber Optic, Ethernet Interface, Continuous Virtual Focal Plane
Lens Focal Length	90mm/f4.0 (Optional 58, 120, 150mm)
FOV (H x V)	61.5° x 55.1°
Resolution	@10,000 ft AGL 0.2m GSD at image center, footprint 4.5km x 3.8km @15,000 ft AGL 0.3m GSD at image center, footprint 6.5km x 5.3km @18,000 ft AGL 0.35m GSD at image center, footprint 7.5km x 6.0km
Processing / Storage	
Processor	CPU/GPU Processing in ANSI/VITA 46.0-2007 compliant hardware
Storage	Compact, Modular – 2 x 16TB High Performance Hard Drives (approximately 7 hours endurance) Hot Swappable
PED	<ul style="list-style-type: none"> Real-Time Reach-Back anywhere in data set Min 4 real-time or forensic keyholes (streams) of 1024 x 1024 image Able to simultaneously monitor >15 100m x 100m areas of interest Open architecture data decoder Compatible with MIT-LL APIX Automated, structured track metadata for HVT tracking, ROI monitoring, and pattern of life analysis (SIG – TASS solution) Cross-cueing and fusion with SIGINT
Turret	
L.O.S. Stabilization	< 5µ Radian
# of Active Axes	5 Axes (3 Axis stabilization + 2 Axis steering)
Steering Modes	Geo-Steering, Geo-Pointing, Motion Compensation (linear, rotational)

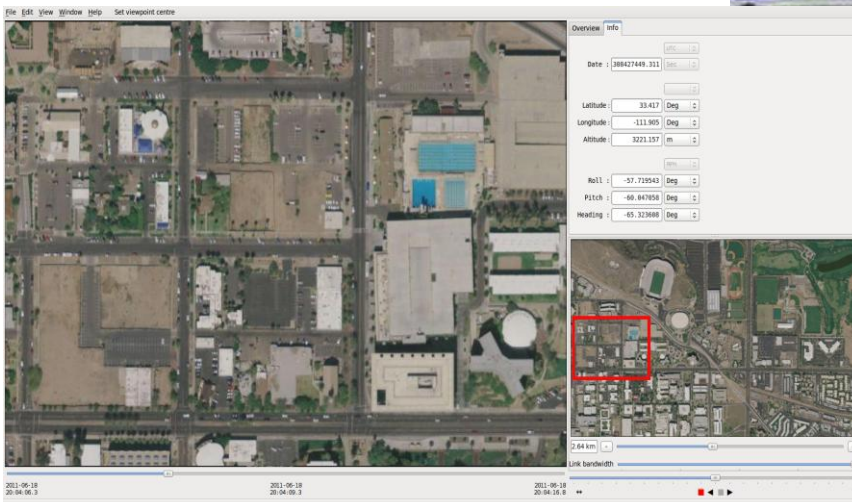
Imagery Exploitation Tools

Signal Innovations Group’s Tracking Analytics Software Suite (TASS) architecture naturally accommodates the fusion of SIGINT intercepts with video track data to provide both high-quality geospatial target location (from video tracks) and a unique target ID (from SIGINT reports), thus providing a non-traditional means for tagging, tracking, and locating HVTs. TASS offers greatly extended long-term tracking of HVTs and improved high-accuracy targeting. TASS offers:

- Use of adaptive Bayesian-based algorithms that are robust to:
 - changing lighting conditions & low contrast targets,
 - occlusions and noisy background images from compression.
- Greater track coverage, longer track lengths, fewer track swaps, and a low false track rate relative to other tracking methods.
- Simultaneous auto-tracking of thousands of vehicles and dismounts in full-motion video (FMV) streams and large-scale Wide Area Motion Imagery (WAMI), including pattern-of-life analysis for mission planning.

SIG Tracking Information

(Movers, automatically tracked and tagged, can be superimposed on a Google Map Image)



Psi Vision Viewer