Puma™ VNS

VISUAL NAVIGATION SYSTEM

AV's Puma™ VNS is a visual-based navigation system for Puma 2AE, Puma 3AE, and Puma LE small unmanned aircraft systems (SUAS). Puma VNS enables GNSS-denied navigation across GNSS-contested environments. The system performs Visual Inertial Odometry (VIO) through a suite of integrated sensors and an onboard compute module to determine the precise location of the aircraft during flight.

Designed to adapt to a continuously changing battlefield, Puma VNS will enable increasingly advanced navigation capabilities, features, and functionality through future software and hardware updates. Available as an add-on option for new Puma 3AE and Puma LE system orders and as a retrofit kit allowing existing Puma 2AE, Puma 3AE, and Puma LE customers to upgrade fielded systems.

Visual-Based Navigation System for Puma™ Systems   PUMA™ VNS

_Compatibility

Puma 2AE, Puma 3AE & Puma LE

_Specifications

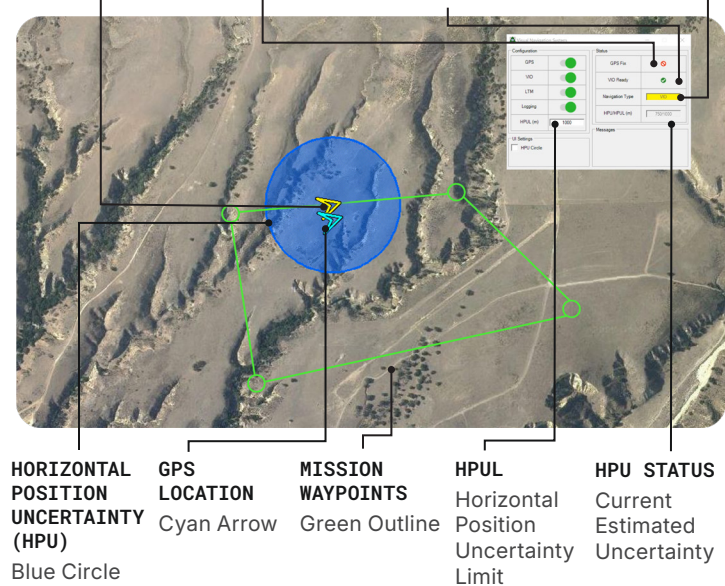|	PUMA 2AE/PUMA 3AE	PUMA LE
ENDURANCE WITH PS2500 BATTERY	2.4 hr	5.1 hr
INSTALLATION	Initial factory or depot-level retrofit installation of external mounting pad then plug & play field installation & removal	
ENVIRONMENTAL RATING	All-weather (excluding water landing)	
OPTIMUM OPERATING ALTITUDE	800 ft (244 m) AGL typical[1]	
OPERATIONAL WEIGHT	1.2 lb (0.54 kg)	2.2 lb (0.98 kg)

1. Position accuracy reduced at higher altitude

VNS ESTIMATED LOCATION
Yellow Arrow

GPS STATUS
Red: No Valid Fix
Green: Valid Fix

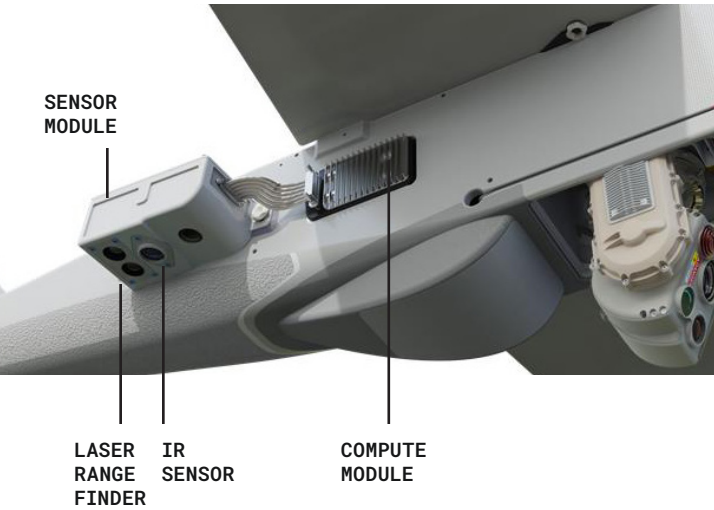**VIO STATUS**
Red: VIO Not Available
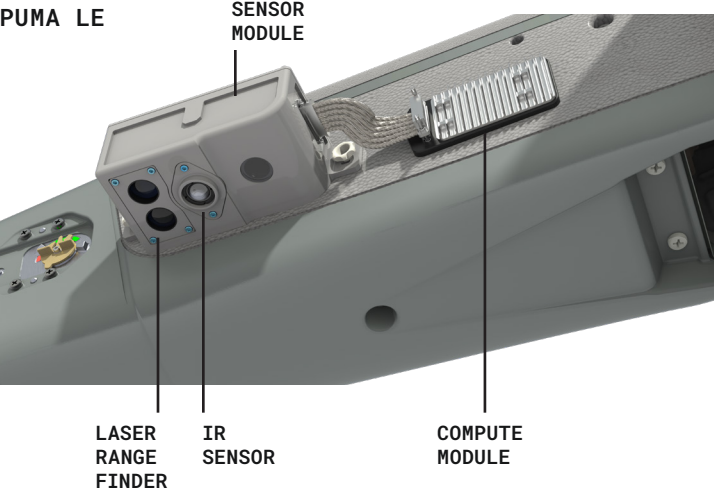Green: VIO Available

NAV TYPE
GPS │ VIO │ AIR

HORIZONTAL POSITION UNCERTAINTY (HPU)
Blue Circle

GPS LOCATION
Cyan Arrow

MISSION WAYPOINTS
Green Outline

HPUL
Horizontal Position Uncertainty Limit

HPU STATUS
Current Estimated Uncertainty

[INCLUDED IN KIT]
COMPUTE MODULE, SENSOR MODULE AND MOUNTING HARDWARE

PUMA AE

SENSOR MODULE

LASER RANGE FINDER IR SENSOR COMPUTE MODULE

PUMA LE

SENSOR MODULE

LASER RANGE FINDER IR SENSOR COMPUTE MODULE

_Key Features

› **GNSS-DENIED OPERATION:** Operate efficiently in GNSS-contested environments, day or night
› **SEAMLESS MISSION CONTINUITY:** Achieve mission continuity with zero pilot input through GNSS-contested environments
› **FIELD UPGRADABLE:** Easily retrofit existing Puma 2AE, 3AE, and Puma LE systems quickly in the field
› **ACCURATE LOCATION ESTIMATION:** The VNS's Visual Inertial Odometry (VIO) estimates true location without GNSS
› **GLOBAL NAVIGATION OUT-OF-THE-BOX:** Deploy and navigate the Puma aircraft anywhere in the world without pre-loading map imagery