

Multiple air platforms supported.

Our software enhances performance of any
Inertial Navigation System or Inertial
Measurement Unit

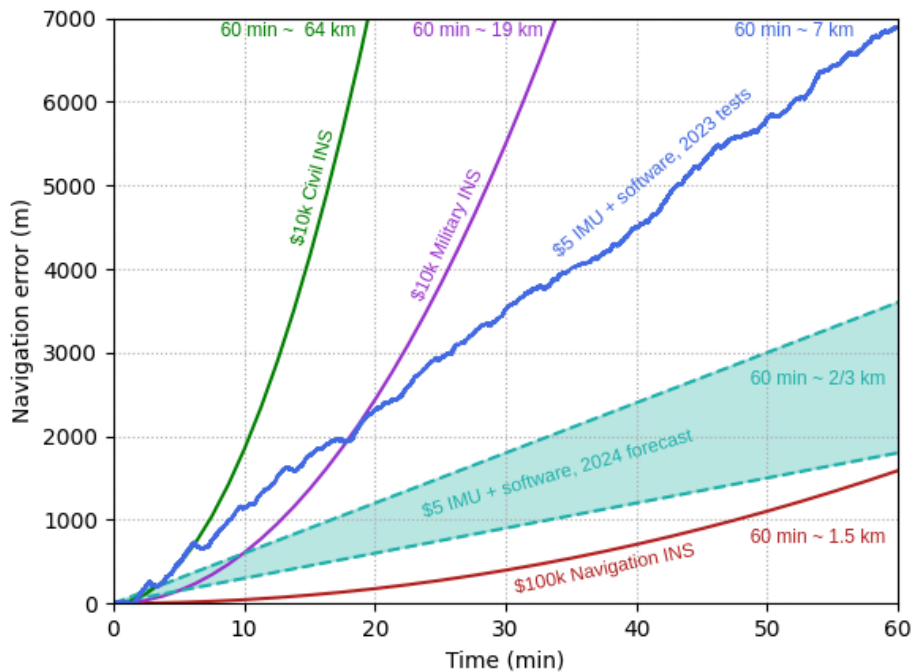
No cameras

Uses typically-discarded data and signals to
improve navigation performance

No communications

Low-computing requirements, typically a
Raspberry Pi Zero or similar

Any weather and terrain



Performance of even a \$5 smartphone IMU boosted to be equivalent to high-end INS.



SENS-INS
Software Enhanced
Navigation System Datasheet
(UAS)

GPS/GNSS-free Navigation
for Disposable/Attributable Air
Platforms

Drift (\$5 IMU test)	2024 forecast around Lat/Lon ~0.5m/second to 1.0 m/second linear growth (1.8km to 3.6km / hr).
Attitude	Absolute attitude estimation typically +- 5 degrees.
Inertial Measurement Unit	Typically a \$5 IMU as used on Pixhawk, Ardupilot and similar. Sensor agnostic to a large extent. Better performance with better IMU such as HG1930, MTI-03 etc.
Computing Required	Raspberry Pi-Zero-2 (around \$10) or better on a linux-based operating system. Can be integrated into other operating systems and code bases.
Supplied as	Either a small computing card with SENS installed, or can be sold as a licence and included as a library into the UAS flight control system.
Navigation Output	Typical INS output (dead-reckoned position from a lat-lon starting point, plus velocities and 3D attitude). SENS is essentially an enhanced INS and can be treated as such. Provides a full 6DoF navigation solution.
Output frequency	20Hz to 400Hz (150Hz typical), depends on computing and sensor frequency.
Interfaces	Runs on the UAS onboard comms bus, supports typical protocols such as UART, ethernet etc.
Error estimation	Resets to an appropriate value when an absolute fix is obtained, whether from GPS/GNSS or a LIDAR or machine vision navigation system. Provided as an output.
GPS/GNSS Inputs	GPS/GNSS position taken if available. When available SENS interpolates between fixes. When not available SENS continues to estimate position until a new fix is obtained.
Absolute inputs	Machine Vision/LIDAR/TERCOM/TERPROM/SLAM inputs as available (all optional).
Sensor Inputs	IMU is required, additional navigation-related sensors provide improved performance: barometer, altimeter, magnetometers, airspeed/pitot.
Signal inputs	All signals on the platform that relate to things that affect the way it flies. Typically: control surface angle, engine/motor RPM, fuel level and more.
Data inputs	Many aspects of design data that characterise flight performance can be used e.g. airframe layout, mass distribution, servo frequency response, flight data and more. Environmental inputs improve performance e.g. air temperature. Mission context can further improve performance.
Certifications	On a path to compliance with DO-178C and others. ISO9001-2015 company.
Onboarding	Typically 1-4 months will be needed to calibrate and interface to your platform to provide Initial Operational Capability, with another 2-3 months for Full Operational Capability.
Platforms suitable	Fixed-wing and rotary UAS particularly guided munitions whether rocket launched, air dropped, powered, gliding or freefall.
Costs	Focused on high-volume disposable/attribution systems, contact us for volume pricing.
ITAR	100% ITAR-free, 100% UK technology.
Readiness	Being fitted to high volume disposable/attribution UAS through 2024.