

# ANS-510D

ASELSAN NAVAL INERTIAL  
NAVIGATION SYSTEM

1 NM/ 4 HR  
PERFORMANCE WITHOUT GPS

IN MOTION ALIGNMENT  
WITH GPS OR LOGSPEED

EMBEDDED GPS  
SAASM OR SPS





# ANS-510D

## ASELSAN NAVAL INERTIAL NAVIGATION SYSTEM

ANS-510D is a navigation grade naval inertial navigation system with embedded GPS receiver and Log speed interface. It is a small, low-cost, mass-producible system that will support a broad spectrum of marine platforms. ANS-510D is designed for stabilization of shipboard sensors, such as radars, EO/IR trackers and to serve as a main/back up ship's gyrocompass.

ANS-510D supplies linear acceleration, linear and angular velocity, position, attitude and heading to the host vehicle systems continuously. ANS-510D provides a hybrid (inertial + GPS) navigation solution, inertial only navigation solution and a GPS only navigation solution simultaneously.

ANS-510D is an open architecture and hardware/software flexible unit which can be adapted to various naval platforms.

ANS-510D consists of strapdown inertial measurement unit, system processor unit, power supply unit, Embedded GPS Receiver (EGR) and chassis. EGR is capable of tracking space vehicles simultaneously and transmitting the line-of-sight (LOS), position and velocity information to the system processor. The system processor combines the GPS data with the inertial data from IMU in a tightly coupled mechanization using Kalman filter.

ANS-510D is capable of using either SAASM compliant GPS receiver or commercial SPS GPS receiver as embedded GPS receiver.

ANS-510D is also capable of using external Log Speed data to complement hybrid and inertial only navigation solutions. The tightly coupled, embedded INS/GPS and integrated Log Speed mechanization of ANS-510D provides improved performance for surface naval platforms.

ANS-510D also has capability to operate with an external GPS receiver. In case of external GPS, system processor combines the GPS data with the inertial data in a loosely coupled mechanization.

### System Operational Modes

- Initialization
- Alignment
  - Dock Gyro Compass (GC) Alignment
  - In Motion Alignment with GPS
  - In Motion Alignment with Log Speed
- Navigation
  - Hybrid Navigation (HNAV)
  - Inertial Navigation (INAV)
- Initiated Built In Test (IBIT)

### System Functions

- Hybrid, Free Inertial, GPS Only Navigation Solution
- Position Update
- Alignment Progress Status
- GPS Lever Arm Correction
- Start-Up BIT, Periodic BIT
- Field Programmable Software

### System Interfaces

- 28 VDC Power Input
- RS422 Asynchronous Serial Interfaces
- Test Port Serial Interface, User Port Serial Interface
- Spare serial Ports
- External GPS Interface
- Have Quick and 1PPS Interface
- KYK-13 Interface
- Active and Passive RF Antenna Interface
- Discrete Interfaces

### Navigation Performance

Positioning and Pointing Accuracy	Inertial	Inertial + Log Speed	Inertial + GPS + Log Speed
Position (CEP)	≤1 nm/hr	≤ 1 nm/4 hr	≤10 m
Heading (azimuth) (RMS)	≤1 mils	≤1 mils	≤1 mils
Roll and Pitch (RMS)	≤0.5 mils	≤0.5 mils	≤0.5 mils

### Alignment Modes and Durations

Dock Gyrocompass Alignment Mode	GPS In-Motion Alignment Mode	Log Speed In-Motion Alignment Mode
15 min	15 min	30 min

### Environmental Conditions

- MIL-STD-810 Compliant

### Electromagnetic Conditions

- MIL-STD-461 / DO-160E Compliant

### Dimensions and Weight

- ~ 26cm x 19cm x 15cm (including connectors)
- < 6.2 kg with GPS receiver installed

