# FOG INERTIAL NAVIGATION SYSTEM

## FEATURES

- Multimode Kalman filter
- Accepts External Aiding Data
- Tactical class IMU, <0.1 °/ hr gyro
- Centimeter level position accuracy with RTK
- Multi-Constellation L1/L2/L5 GNSS with IRNSS
- Superior tracking robustness under heavy mechanical shocks or vibrations
- Isolated Interfaces and Power Supply
- MIL qualified to MIL-STD-810G, JSS55555, MIL-STD-461E and MIL-STD 704D

## APPLICATIONS

- Unmanned Aerial Vehicle
- Marine Navigation
- Armoured Vehicle Navigation
- Antenna Stabilization and Control
- Autonomous Vehicle Navigation
- Antenna Orientation and Stabilization
- Mapping and Surveying
- Land Navigation

## DESCRIPTION

Aldebaran ALD-NS3500S is a rugged GNSS aided high performance Fiber Optic Gyro (FOG) based Inertial Navigation System. The device incorporates high end tactical class three axis accelerometers, three axis fiber-optic gyroscopes and an integrated multi-constellation GNSS receiver. The sensors are characterized and calibrated in Aeron's state of art facility. Aeron's proprietary parameter estimation engine delivers fast alignment and tactical class navigation performance in a matter of minutes.

The ALD-NS3500S model has a multi-frequency (L1/L2/L5), multi-constellation GNSS receiver with multi tracked channels and best in class signal sensitivity. The ALD-NS3500S model has a multi-frequency (L1/L2/L5), multi constellation GNSS receiver including IRNSS and best in class signal sensitivity.

The Aldebaran series INS offers superior pure-inertial performance in short term GNSS outages. External air data/velocity and position aiding can also be provided to the system. ALD-NS3500S is suitable for positioning and pointing in airborne, land & naval applications.

# TECHNICAL SPECIFICATIONS

| Parameter Value | Parameter Value |
| --- | --- |
| | Aldebaran |
| | NS3500S |
| **Acceleration** | |
| Range (g) | ±10 |
| Bias Instability (μg) | 15 |
| Bias Repeatability (mg) | 1.2 |
| Raw Bandwidth (kHz) | >1 |
| **Angular Rate** | |
| Range (°/s) | ±450 |
| Bias Instability (°/hr) | 0.1 |
| Raw Bandwidth (kHz) | >1 |
| ARW (°/sqrt(hr)) | <0.012 |
| **Position/ Velocity Accuracy** | |
| Horizontal Position[1,2,3] | <0.8 cm with RTK[5] <br> 1.5 m with GNSS <br> 1 m with SBAS <br> 0.3% of DT with External Odometer [4] |
| Vertical Position[1,2,3] | <2 cm with RTK[5] <br> 2.5 m (1σ) with GNSS <br> 1.5 m (1σ) with SBAS <br> 2 m (1σ) relative with Barometer |
| Velocity (m/s) | 0.05 RMS with GNSS[8] |
| **Attitude** | |
| Roll Range (degree) | ±180 |
| Pitch Range (degree) | ±90 |
| Roll, Pitch Accuracy (degree) | ±0.05 (2σ) (Static/ low dynamics) <br> ±0.1 (1σ) Dynamic |
| Roll, Pitch Resolution (degree) | 0.01 |
| **Heading** | |
| Heading Range (degree) | ±180 |
| Heading Accuracy[1,2,6,7] | 0.5° RMS with magnetometer <br> 0.3° RMS with GNSS in dynamic conditions[8] |
| Resolution (degree) | 0.01 |
| **GPS / GNSS** | |
| Type | Multi channel, L1/ L2/ L5 Code / Carrier phase GPS, GLONASS, QZSS, BEIDOU and IRNSS/NavIC |
| Diff. Correction Type[4] | RTCMv2, RTCMv3, CMRv2 (for RTK mode) |
| TTFF[6] Cold Start (seconds) | 45 |
| Reacquisition Time (seconds) | 1 |
| Connector | TNC Socket |
| **Barometer** | |
| Range (hPa) | 300-1100 |
| Accuracy (hPa) | ±1 |

1 - Open sky conditions
2 - RMS levels
3 - Baseline <40 km
4 - RTK mode of operation requires differential corrections from RTK base station
5 - Time to First Fix
6 - Accuracy after magnetic calibration and setting correct declination / offset angle
7 - After magnetic calibration for Hard Iron and Soft Iron disturbances, and in static magnetic field
8 - 50% at 30 m/s for dynamic operation

MADE IN INDIA

## TECHNICAL SPECIFICATIONS

| Parameter Value | Parameter Value<br>Aldebaran<br>NS3500S |
|---|---|
| **Electrical** | |
| Input Voltage (V DC) | 12 to 32 |
| Power Consumption (W) | <10 |
| Update Rate (Hz) | 100 (Navigation)<br>200 (Raw measurement) |
| Interface | RS232(CH1), RS232(CH2)[5], RS422 x 2, 1PPS |
| Data Format | NMEA / Binary |
| External Inputs | External GNSS feed<br>External Magnetometer feed<br>External Airspeed feed<br>External Position and Speed input |
| **Physical** | |
| Dimensions (mm) | 172.4 (L) x 155 (W) x 114 (H) |
| Weight (kg) | 2.5 ±0.05 |
| **Environment** | |
| Operating Temperature (°C ) | -40 to +71 |
| Storage Temperature (°C ) | -55 to +85 |
| IP Protection | IP65 |
| **Hardware Design Compliant** | |
| Power Supply | MIL-STD-704D* |
| EMI/EMC | MIL-STD-461E* |
| Environmental Tests | MIL-STD-810G* |

*-MIL-STD qualified

## MECHANIAL DIMENSIONS

All the Dimensions are in mm
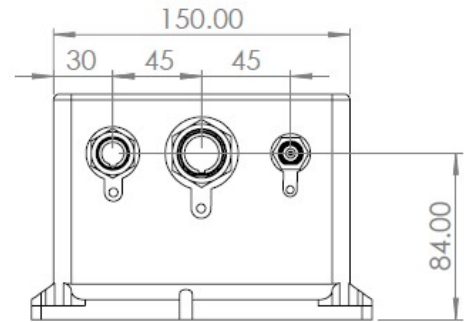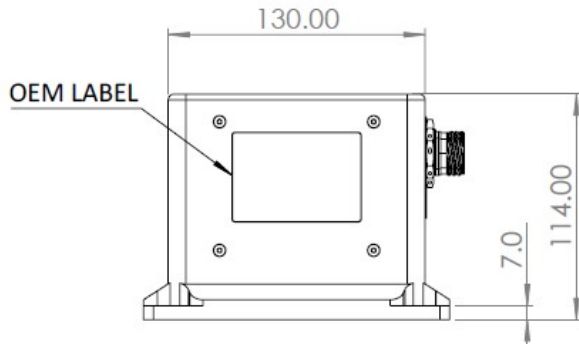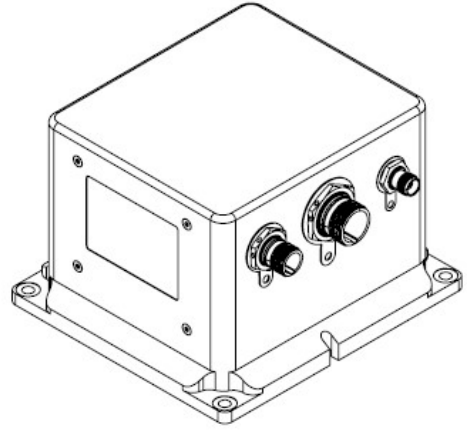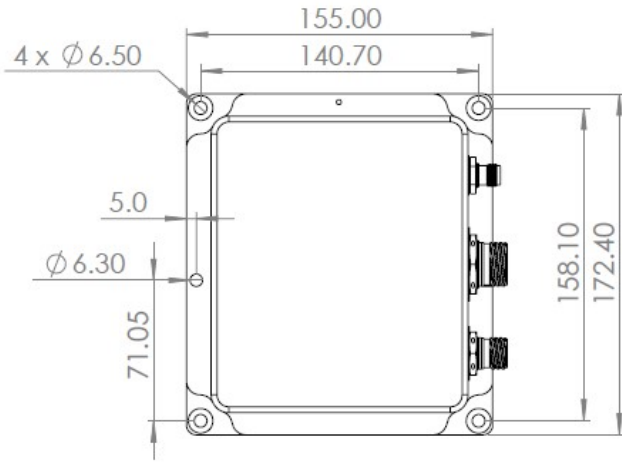


## ORDERING INFORMATION

**ALD-NS3500S (Product Code: 25022)**