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aeron

aiding future


# NAVIGATION TECHNOLOGY
# INS I AHRS I IMU I GNSS

www.aeronsystems.com

# About Aeron

**Aeron is a pioneer in Inertial Navigation Technologies and MIL Grade Hardware Design with expertise in sensor-fusion algorithms and MIL Grade hardware design.**

Aeron Systems, established in 2008, is a leading designer and manufacturer of high-performance inertial navigation systems, sensors, and solutions for the aerospace and defense industries. Based in Pune, India, Aeron has over a decade of experience in the guidance, navigation, and control domains and has been supplying its indigenous solutions to various customers in the defense and aerospace segments.

**High-End Tactical Systems:**
Offers Fiber Optic Gyro-based GPS-aided INS for fighter aircraft, helicopters, UAVs, and land navigation.

**Diverse Military Platforms:**
Products deployed on UAVs, unmanned robots, armored vehicles, fighter jets, and land navigation systems.

**Innovative Navigation Systems:**
Renowned for MEMS and FOG-based Inertial Navigation Systems (INS-GPS, AHRS, Inertial Measurement Units).

**Airworthy AHRS Systems:**
Delivered type-approved systems for fighter aircraft.

**Turnkey Solutions:**
Provides comprehensive, ready-to-deploy solutions.

**Retrofitting Capabilities:**
Expertise in retrofitting systems for both land and aerial platforms.

**Tech-Driven Focus:**
Specializes in designing and producing military hardware and software.

**Advanced Testing Facilities:**
Equipped with state-of-the-art HILS and ESS for quality and reliability.

**In-Service Details:**
Products actively deployed and operational on various military platforms.

**Global Support Network:**
Extensive network of partners and distributors worldwide.

**Extensive Field Deployment:**
Over 15,000 sensors in use across 13+ countries.

## OUR PRODUCT RANGE

### MEMS

**Product Family Octantis2 MEMS INS-GNSS**

- OCT2 AN5300S Airworthy MEMS AHRS
- OCT2 NS7300D-01A Rugged INS-GNSS
- OCT3-NS7700T Dual Antenna MEMS INS-GNSS

**Product Family Pollux2 Miniature MEMS INS-GNSS**

- PLX2-NS10 Miniature MEMS INS-GNSS

**Product Family CASTOR MEMS IMU**

- CSTR-GYR1200 MEMS GYRO
- CSTR-IMU1640 Tactical Grade MEMS IMU
- CSTR-IMU1100 MEMS IMU

**Product Family Galileo**

- Digital Magnetic Compass DMC 300

### FOG

**Product Family ALDEBARAN FOG-INS-GNSS**

- ALD-FOG210 Dual Axis FOG Gyro
- ALD-NS3500S Rugged FOG INS-GNSS

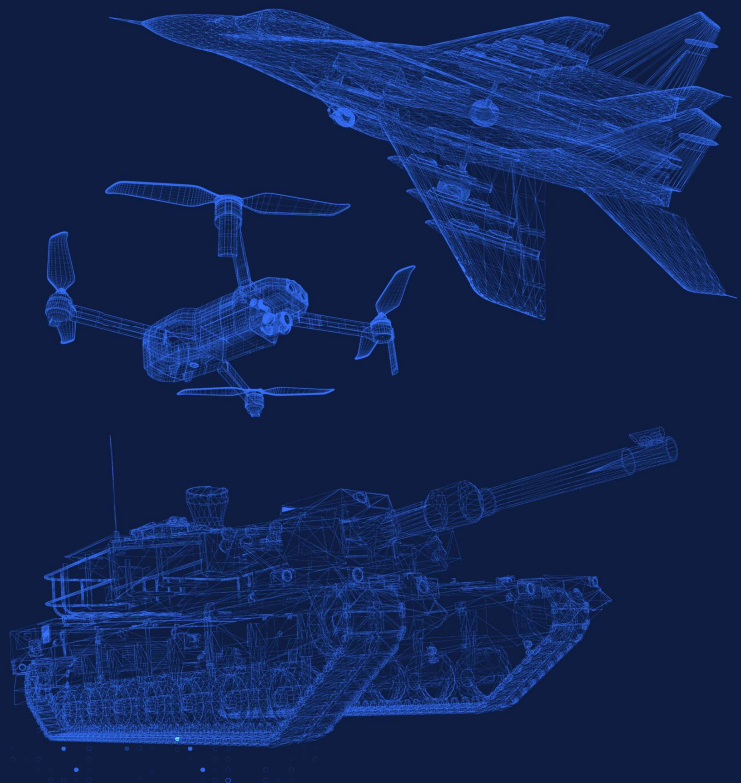
### Rugged GNSS Receiver

**Product Family DENEB**

- DNB-GN402 Rugged GNSS Receiver

### Solutions

**Land Navigation System**



MEMS: Micro-Electro-Mechanical System | IMU: Inertial Measurements Unit | FOG: Fiber Optic Gyroscope
INS: Inertial Navigation System | AHRS: Attitude and Heading Reference System | GNSS- Global Navigation Satellite System

# /MEMS

## Octantis Series: Rugged INS-GNSS/AHRS

The Octantis series INS/AHRS from Aeron Systems is a flagship MEMS INS GNSS product with a decade of proven success. It offers three variants mainly AHRS, Single Antenna and Dual Antenna System. Ideal for armored vehicles, tactical UAVs, ROVs, and as a secondary navigation system for aerial and land platforms.

### OCT2 AN5300S
**Airworthy AHRS**

Octantis AHRS is a tactical-class system for fighter aircraft, meeting DO-254, MIL-STD 461E, MIL-STD-810G, and DO-178B Level B standards. Type Approved by CEMILAC, it meets RTCA-DO -334 requirements. Suitable as a primary/secondary AHRS System and to be integrated with FDR.

**Performance**
- **Sensor Range** 450° / s | +/- 12 g
- **Roll / Pitch Accuracy** < +/- 1°
- **Heading Accuracy** <+/- 2.5°
- **Bias Instability** < 2.5°/Hr
- **Raw Data Update Rate** Up to 200 Hz
- **Shock Limit** Up to 20 g
- **Size / Weight** 148(L)x115(W)x63(H)mm/<1Kg

### OCT2 NS7300D-01A
**Rugged INS-GNSS**

GNSS-aided Inertial Navigation System, it features multi constellation, multi-frequency GNSS, and RF interference rejection. Suitable for armoured vehicles, land and marine platforms, and autonomous vehicles, it provides GNSS denied performance of < 1% DT.

**Performance**
- **Sensor Range** 450° / s | +/- 16 g
- **Roll / Pitch Accuracy** 0.06° RMS
- **Heading Accuracy** <0.3° RMS
- **Bias Instability** <1°/Hr
- **Raw Data Update Rate** Up to 200 Hz
- **Shock Limit** Up to 40 g
- **Size / Weight** 142(L)x115(W)x65(H)mm/<1 Kg

### OCT3-NS7700T
**Rugged Dual Antenna INS-GNSS**

A third-generation dual antenna GNSS-aided MEMS-based INS offering high-end tactical class performance. It features dual GNSS receivers for precise heading. Ideal for pointing and navigation applications.

**Performance**
- **Sensor Range** 450° / s | +/- 16 g
- **Roll / Pitch Accuracy** 0.06° RMS
- **Heading Accuracy** 0.1° RMS with dual-antenna @ 1.0 m Base Line
- **Bias Instability** <1°/Hr
- **Raw Data Update Rate** Up to 200 Hz
- **Shock Limit** Up to 40 g
- **Size / Weight** 142(L)x115(W)x65(H)mm/<1Kg

## // FEATURES

- Low cost of ownership
- Part of Multiple Military / Airforce Programs
- MIL-STD-810G, 461E tested
- Dual Antenna option
- High-performance attitude and position performance
- IRNSS Constellation Compatibility in INS Version



# /MEMS

## Pollux 2 Series: Miniature INS-GNSS

Aeron's Pollux 2 INS is a compact and advanced navigation solution featuring a proprietary Kalman filter engine, tri-axial MEMS accelerometers, gyroscopes, barometers, and magnetometers. Integrated multi-constellation GNSS ensures reliable navigation. With low Cost, Size, Weight, and Power (C-SWAP), it's ideal for micro UAVs, Drones, ROVs, VTOLs, UGVs, and UUVs, and can be integrated with autopilots for enhanced performance.


### PLX2-NS10
**Miniature INS-GNSS**

Miniature INS-GNSS The Pollux2 NS10 is a compact and low SWAP device with superior performance for use in various unmanned platforms, including UAVs and UGVs, for control and navigation purposes. It offers 2 m CEP position accuracy and 0.2 m/s velocity accuracy and can be easily integrated with professional autopilots like Pixhawk and Veronte. The NS10 is widely used by global UAV customers.

**Performance**
- **Sensor Range** 450° / s | +/- 16 g
- **Roll / Pitch Accuracy** 0.1° RMS
- **Heading Accuracy** <0.3° RMS
- **Bias Instability** 2.5°/Hr
- **Raw Data Update Rate** Up to 200 Hz
- **Shock Limit** 40 g
- **Size / Weight** 45(L)x45(W)x20(H)mm/80Gms

### Autopilot Integration with PLX2 NS10

**Seamless Integration:**
Compatible with PX4, Cube Orange Autopilot, and Ardupilot firmware.
Bypasses onboard IMUs for superior performance.
Utilizes a proprietary EKF-based sensor fusion engine.

**Enhanced Navigation:**
Improved stability and accuracy during rapid movements.
Ideal for UAVs (Unmanned Aerial Vehicles) and UGVs (Unmanned Ground Vehicles).

**Performance in GNSS-denied Environments:**
Leverages additional sensors like airspeed data and odometers.
Ensures precise navigation without relying on GNSS.

**Applications:**
Suitable for defense, industrial, and automotive sectors.
Provides reliable navigation in diverse and demanding conditions.

## // FEATURES

- MIL-qualified as per MIL-STD-810G
- High-performance IMU
- Miniature, low SWAP design
- Autopilot Integration - Pixhawk and Cube Pilot
- GNSS Denied Capabilities

## CASTOR Series: High Performance MEMS IMU

The Castor series is a high-performance triaxial MEMS IMU with low-noise gyroscopes, 1 deg./hr. gyro bias instability, and a wide dynamic range. It features SPI digital interface and RS 422, configurable FIR filters, and is factory-calibrated for temperature compensation. Suitable for high shock (1000g) and vibration environments, it offers a 500Hz sensor bandwidth and complies with MIL standards.


### CSTR-IMU1640

The CSTR-IMU1640 is a High-performance Tactical Grade triaxial MEMS IMU for guidance, navigation, and control. It features low noise gyroscopes, 1 deg./hr. gyro bias instability, a wide dynamic range, and a SPI digital interface. Factory-calibrated for temperature effects, it excels in high shock (1000g) and vibration environments.

**Performance**

- **Sensor Range**
  +/- 480°/ s | +/- 16 g
- **Bias Instability**
  < 1°/Hr
- **Raw Data Update Rate**
  Up to 4000 Hz
- **Shock Limit**
  Up to 1000 g
- **Size / Weight**
  47(L)x44(W)x14(H)mm/<80Gms


### CSTR-IMU1100

The CSTR-IMU1100 is a high-performance triaxial MEMS IMU for guidance, navigation, and control, with 1000g shock survival and an RS422 interface. It allows user configuration of rate range, filter coefficients, and sampling rate. Factory-calibrated for temperature effects, it suits dynamic operations and meets MIL standards.

**Performance**

- **Sensor Range**
  +/- 480°/ s | +/- 16 g
- **Bias Instability**
  < 1°/Hr
- **Raw Data Update Rate**
  Up to 2000 Hz
- **Shock Limit**
  Up to 1000 g
- **Size / Weight**
  39(L)x45 (W)x22(H)mm/< 80Gms


### CSTR-GYR1200

The CSTR-GYR1200 is a high-performance triaxial MEMS gyroscope for guidance, navigation, and control, with 1000g shock survival and an RS422 interface.
User-configurable for rate range, filter coefficients, and sampling rate, it is factory-calibrated for temperature effects, suitable for dynamic operations, and meets MIL environmental and EMC standards.

**Performance**

- **Sensor Range**
  +/- 480°/ s
- **Bias Instability**
  <1°/Hr
- **Raw Data Update Rate**
  Up to 2000 Hz
- **Shock Limit**
  Up to 1000 g
- **Size / Weight**
  47(L)x44(W)x14(H)mm/<80Gms

## // FEATURES

- Miniature in size
- High Dynamic Range
- Low Angle Random Walk
- Continuous Self-Diagnosis
- High mechanical Shock Survivability
- Digital SPI Interface





## Galileo Series: Digital Magnetic Compass


### GLO-DMC300

The GLO-DMC300 by GALILEO is a compact, low-power digital magnetic compass perfect for land and marine tasks. Featuring MEMS accelerometer and magnetometer, it delivers precise heading, roll, and pitch with tilt compensation. Its plug-and-play design, configurable update rates, and noise reduction filter ensure reliability even in dynamic conditions.

**Performance**

- **Heading Accuracy**
  +/- 1°
- **Range**
  +/- 180° (Roll) & +/- 60° (Pitch)
- **Range Accuracy**
  +/- 0.5 (1σ)
- **Ingress Protection**
  IP 50
- **Size / Weight**
  107(L)x48(W)x27.5(H)mm/180gm

## // FEATURES

- Heading Accuracy: ±1°
- Low Power Consumption
- Roll and Pitch Accuracy: ±0.5°
- Compact and Easy to Use
- RS232 or RS485 Interfaces
- Hard Iron and Soft Iron Calibration

# /FOG

## ALDEBARAN Series: High-end Tactical Class FOG INS-GNSS/IMU

The Aldebaran is a fibre-optic gyro (FOG) based inertial sensor system family with two variants IMU Version with dual-axis fibre-optic gyro for tactical systems, meeting MIL standards for reliability in harsh conditions and INS Version combines GNSS with fibre-optic gyroscopes for precise navigation in challenging environments. With 0.1 deg/h gyro bias instability, it excels in GNSS-deprived conditions and is ideal for airborne, land, and naval applications.

### ALD-FOG210
**Dual Axis FOG Gyro**

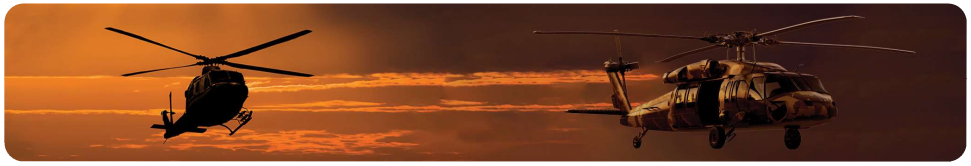
ALD-FOG210 is a Two-Axis Fiber-Optic Gyro system for military applications, qualified for air, land, and marine use. Deployable in pedestals, fire control, remote weapon, RADAR, and laser-optic systems, it has a rate sensing range up to 400 deg/s, 1 deg./hr bias instability, high bandwidth (>=500Hz), and 1 KHz update rate.

**Performance**
- **Sensor Range**
  400°/s
- **Bias Instability**
  <1°/Hr
- **Raw Data Update Rate**
  Up to 1000 Hz
- **Shock Limit**
  Up to 20 g
- **Size / Weight**
  163 (L) x 144 (W) x 84 (H) mm / < 2.0 Kg

### ALD-NS3500S
**Rugged FOG INS-GNSS**

A high-performance Fiber-Optic Gyro-based Inertial Navigation System with GNSS receiver, accelerometers, gyroscopes, and a fast alignment engine. Superior navigation for land and aerial environments, ensuring 0.3% Distance Travelled in GNSS Denied land operations, meeting all application requirements.

**Performance**
- **Sensor Range**
  450° / s | +/- 10 g
- **Roll / Pitch Accuracy**
  0.05° RMS
- **Heading Accuracy**
  <0.3° RMS
- **Bias Instability**
  <0.1° /Hr
- **Raw Data Update Rate**
  Up to 200 Hz
- **Shock Limit**
  Up to 20 g
- **Size / Weight**
  173(L)x155(W)x114(H)mm/2.5Kg



### // FEATURES
- Qualified as per MIL-STD-810 / 461 / 704-D
- High-performance FOG IMUs
- Low cost of ownership
- Part of Multiple Military Programs
- IRNSS Constellation Compatibility in INS Version
- Superior tracking robustness under heavy mechanical shocks or vibrations



# /DENEB Series: Rugged GNSS Receiver

## DENEB Series: Rugged GNSS Receiver

### DNB-GN402
**Rugged GNSS Receiver**

The DNB-GN402 receiver offers highly accurate real-time positioning, ideal for autonomous vehicles, robotics, and surveying. Its multi-frequency, multi-constellation capability ensures signal reception from various satellite systems like GPS, GLONASS, Galileo, Beidou, IRNSS/NavIC, and SBAS, improving accuracy in challenging environments. Equipped with a high-gain GNSS antenna and 1PPS CMOS output for UTC synchronized time information, it's a robust solution for precise positioning and surveying.

**Performance**
- **Position Accuracy**
  **Horizontal -**
  1cm CEP with RTK / 1.5m CEP in Standalone mode
  **Vertical -**
  1cm CEP with RTK / 2m CEP in Standalone mode
- **Heading Accuracy**
  <0.3° RMS
- **Shock Limit**
  Up to 20 g
- **Size / Weight**
  179(L)x104(W)x61(H)mm/<1.5Kg

### // FEATURES
- Multi-Frequency L1/L2/L5 RTK GNSS receiver
- Multi-constellation GNSS support
- Centimeter level position accuracy
- High Accuracy 1 PPS output
- Multiple interfaces: RS232, Ethernet
- Power, Communication & Health LED Indicators

# /Solutions

## Land Navigation System

Aeron offers a complete land navigation suite that includes a Rugged Inertial Navigation System, a vehicle-mounted display with navigation software, and accessories. The navigation system has a multi-constellation GNSS and can be interfaced with the vehicle odometer over CAN or pulse inputs. The suite includes a feature-rich user interface with military mapping capability.

The navigation software supports DSM as well as Open Maps. It supports WGS84 as well as the Military Grid Reference System format. The system provides position accuracy of 1.5 m in standalone mode and 2 cm in RTK mode, making it an ideal choice for demanding applications. It also supports the Indian Satellite Constellation IRNSS (NAVIC).

## // FEATURES

- Hybrid Navigation with INS
- High-end tactical class navigation system
- Supports GNSS-denied condition for intermittent loss of signal
- Multi-frequency GNSS receiver with L1, L2, and L5 bands
- Supports GPS, GLONASS, GALILEO, IRNSS(NAVIC) and SBAS constellations
- Rugged display with Navigation software that supports Open Maps and DSM Maps



# /SUPPORT SERVICES

### Extended Warranty Support

Aeron is committed to long-term support of its aerospace and defense solutions, and it provides extended warranty terms of up to 5 years as a paid service that customers can use depending on project requirements.

### Partner Network

Aeron has a partner network in over 10 countries including the US, France, Spain, Australia, Singapore, Turkey, and South Korea.

### Long term product support

Aeron is dedicated to supporting its aerospace and defense clients throughout the entire platform lifespan, even amidst the unstable global supply chain environment.

### Upgrades

Software updates and upgrades are provided to customers for as long as the hardware is supported.

### Online Support

Online and real-time remote support is available to customers using Aeron's inertial products.

# /Roadmap