RUGGED INERTIAL NAVIGATION SYSTEM

FEATURES

- Multimode Kalman filter
- Estimating Accurate Heading Information
- Accepts External Aiding Data
- Centimeter level position accuracy with RTK
- Multi-Constellation L1/L2/L5 GNSS with IRNSS
- Advanced GNSS with anti-jamming and interference rejection
- Isolated Interfaces and Power Supply
- MIL-STD-704D, MIL-STD-810G and MIL-STD-461E/F Compliant

OCT3-NS7700T

Note: This is a representational image

APPLICATIONS

- Inertial Guidance and Dead Reckoning
- Armored Vehicle Navigation
- Platform Stabilization and Control
- Unmanned Vehicle Navigation
- Antenna Orientation and Stabilization
- Mapping and Surveying
- Land Navigation
- Tactical Grade Navigation

DESCRIPTION

The Octantis 3, OCT3-NS7700T is a third generation GNSS-aided MEMS based Inertial Navigation system which offers high-end tactical class performance. The OCT3-NS7700T is equipped with Aeron's proprietary Inertial Measurement Unit (IMU) which consists of 3-axis low-noise accelerometers and low-drift gyroscopes. The IMU sensing elements are characterized in-house and compensated for temperature drifts, mis-alignment, non-linearity and other errors over the entire dynamic operating ranges.

The OCT3-NS7700T has a proprietary parameter estimation engine based on a multi-modal Kalman filter. It works optimally by utilizing the high-speed processor architecture offering superior performance in demanding applications. The Kalman estimator delivers low drift position, velocity and attitude estimations in GPS denied conditions at high update rates. The system is ruggedized and complies to MIL-STD-704D, MIL-STD-810G and MIL-STD-461E/F standards.

The system has multiple interfaces for data capture, provision for interfacing external odometer/ air data input and feeding in aiding data from other external GNSS systems. The built-in low noise magnetometer is a redundant heading estimation source in GNSS denied/poor visibility conditions. The OCT3-NS7700T model has a multi-frequency (L1/L2/L5), multi-constellation GNSS receiver with Multi-channels and best in class signal sensitivity. The built-in GNSS receiver is resistant to radio frequency interference and protects the device performance from intentional jamming and spoofing. The OCT3-NS7700T performs well in dynamic conditions and gives the highly accurate attitude, heading, position, velocity and altitude data over high update rates for guidance, navigation and control applications.

TECHNICAL SPECIFICATIONS

Parameter Name	Parameter Value
	OCTANTIS 3
	NS7700T
Acceleration	
Range	±16 g
Angular Rate	
Range	±450°/s
Position & Velocity Accuracy	
Horizontal Position[1,2,3]	0.8 cm with RTK 1.5 m CEP (Under good GNSS availability) 1 m CEP (w/ SBAS) 2% of DT with odometer aiding
Vertical Position[1,2,3]	<2 cm with RTK 3m (1σ) with GNSS 2m (1σ) with SBAS
Velocity	0.03 m/s RMS (Under good GNSS availability)
Attitude	
Roll Range	±180°
Pitch Range	±90°
Roll, Pitch Accuracy[2]	0.06° RMS (static/low dynamics) 0.1° RMS (dynamic)
Heading Range	±180°
Heading Accuracy[1,2,5,6]	0.5° RMS with magnetometer 0.3° RMS with single antenna GNSS in dynamic conditions 0.1° RMS with dual-antenna @ 1.0 m antenna separation 0.02° RMS with dual-antenna @ 5.0 m antenna separation
Angle Resolution	<0.01°
Barometer	
Range	300-1100 hPa
Accuracy	±1 hPa
Magnetometer	
Range	±8 gauss
GPS / GNSS	
Type	GPS L1CA/L1P/L1C/L2P/L2C/L5 GLONASS G1/G2/G3, P1/P2 BeiDou B1i/B2i/B3i/B1C/B2a/B2b/AceBOC GALILEO E1BC/E5a/E5b/E6BC/AltBOC QZSS L1CA/L2C/L5/L1C/L6 NavIC (IRNSS) L5
TTFF[7] Cold Start	60 s
Reacquisition Time	1 s
Connectors	TNC x 2 (GNSS)
Electrical	
Input Voltage	12 V to 32 V DC
Power Consumption	<5W @ 16V
Connector	D38999
Interface Options	2xRS232 , 2xRS422 , Ethernet , CAN and 1PPS from GNSS

1 - Open sky conditions
2 - RMS levels
3 - Baseline <40 km
4 - 1-2 %, subject to Odometer accuracy
5 - Accuracy after magnetic calibration and setting correct declination / offset angle

6 - After magnetic calibration for Hard Iron and Soft Iron disturbances, and in static magnetic field
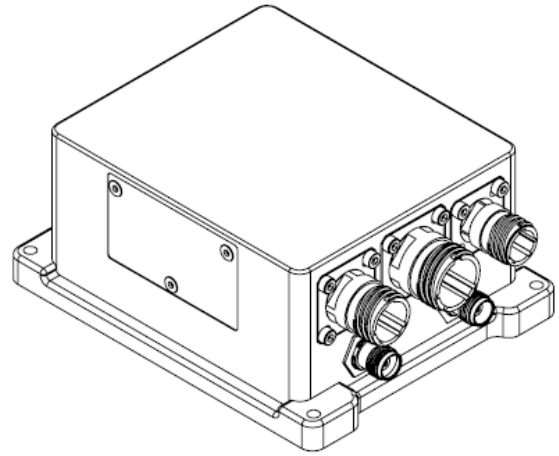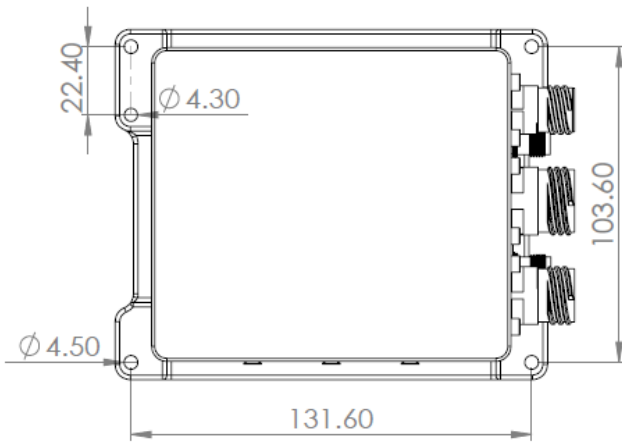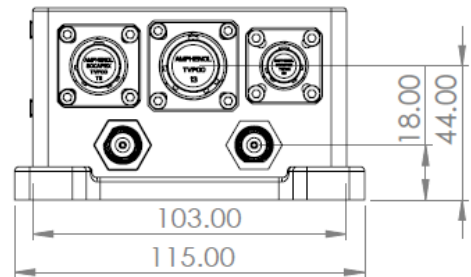7 - Time to First Fix

TECHNICAL SPECIFICATIONS

Parameter Name	Parameter Value
	OCTANTIS 3
	NS7700T
Physical	
Weight	<1kg
Dimensions	142 mm (W) x 115 mm (B) x 65 mm (H)
Update Rate	100 Hz (Navigation data) 200 Hz (IMU data)
Data Format	NMEA ASCII, Binary, J1939
External I/Ps	Odometer/Air Data
Output Parameters	Euler Angles (Yaw, Pitch, Roll); Quaternion; Position; Velocity; Acceleration, Angular Rate
Environmental Compliant	
Operating Temperature	-40°C to +71°C
Storage Temperature	-55°C to +85°C
Humidity	10% to 90% RH (non - condensing)
Survival Shock	Up to 40 g
Ingress Protection	IP65
Vibration	0.04 $g^2/\sqrt{Hz}$
Power Supply Protection	As per MIL-STD-704D
EMI/EMC	As per MIL-STD-461E/F
Environmental Tests	As per MIL-STD-810G

SOFTWARE SUITE

The Octantis 3 INS is accompanied by a feature rich software suite, for easy configuration, magnetic calibration, data display and data logging.

Note: *These images of the software suite are for reference.*

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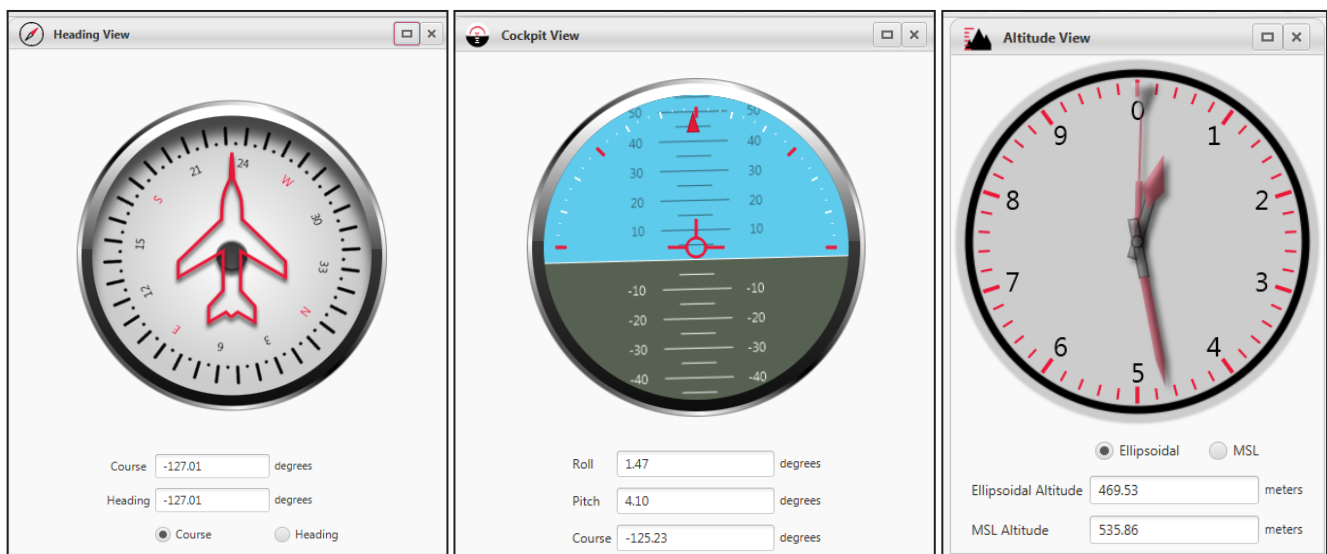
MECHANICAL DIMENSIONS

ISOMETRIC VIEW FOR REFERENCE
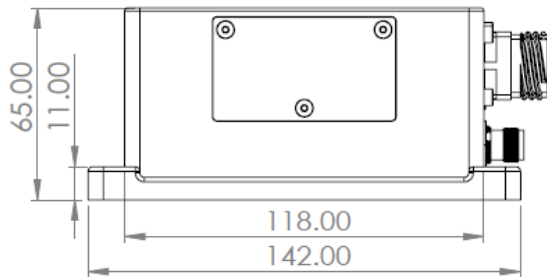
ORDERING INFORMATION

OCT3 - NS7700T (Product Code: 19029)

Preliminary Datasheet   MADE IN INDIA   Datasheet Ver. 1.0, April 2023

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