







# ORIENTUS

## MEMS AHRS

Orientus is a ruggedised miniature sensor and AHRS that provides accurate orientation under the most demanding conditions.

It combines temperature calibrated accelerometers, gyroscopes and magnetometers in a sophisticated fusion algorithm to deliver accurate and reliable orientation.

## PERFORMANCE

-  0.2 ° Roll and Pitch
-  0.5 ° GNSS Heading
-  3 °/hr Gyroscope Bias
-  1000 Hz Update Rate

## KEY FEATURES

- Linear Acceleration Compensation
- Magnetic Interference Mitigation
- Low Weight : 25 grams
- Small Size : 30 x 30 x 24 mm
- Low Power : 0.325 W

## APPLICATIONS



AIR

- UAV Orientation
- Stabilisation & Pointing



LAND

- Robotic Control & Orientation
- Stabilisation & Pointing
- Human Movement

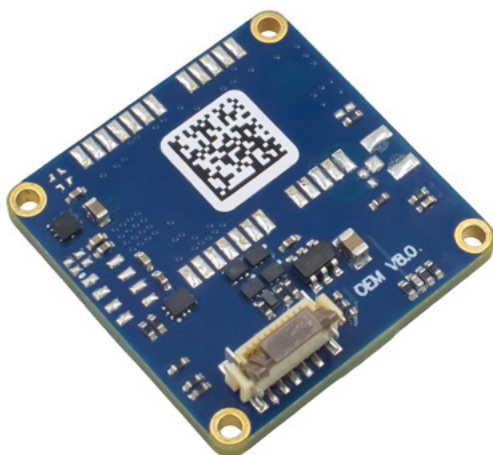


SEA

- AUV Orientation
- ROV Orientation

## FEATURES

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### HIGH PERFORMANCE MEMS

Orientus contains high performance MEMS sensors that are put through Advanced Navigation's intensive 8 hour temperature calibration process.

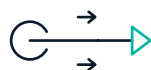
This provides the highest accuracy possible from this sensor class and outputs consistent accuracy over the full temperature range from  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ .



### AUTOMATIC MAGNETIC CALIBRATION

Orientus features fully automatic magnetic calibration that updates every time the unit moves and removes all requirements on a manual calibration process.

This provides reliable accurate heading through changing environments.



### LINEAR ACCELERATION COMPENSATION

Orientus uses an innovative algorithm to compensate for linear accelerations.

This allows Orientus to maintain accurate roll and pitch through short term linear accelerations that typically cause significant errors in competitors systems.

For long term linear accelerations Orientus supports the addition of an external GNSS receiver for full acceleration compensation.



### HIGH UPDATE RATE

Orientus's internal filter runs at 1000 Hz and data can also be output at this rate over high speed RS232.

This allows for control of dynamically unstable platforms.



### RELIABILITY

Orientus has been designed from the ground up for mission critical control applications where reliability is very important. It is built on top of a safety oriented real time operating system and all software is designed and tested to safety standards with fault tolerance in mind.

The hardware is designed and manufactured to mil standards.



# SPECIFICATIONS

## ORIENTATION

Roll & Pitch Accuracy (Static)	0.2 °
Heading Accuracy (Static)	0.5 °
Roll & Pitch Accuracy (Dynamic)	0.6 °
Heading Accuracy (Dynamic)	1.0 °
Orientation Range	Unlimited
Internal Filter Rate	1000 Hz
Output Data Rate	Up to 1000 Hz
Latency	0.3 ms

## HARDWARE

Operating Voltage	4 to 36 V
Input Protection	± 60 V
Power Consumption	0.325 W
Operating Temperature	-40 °C to 85 °C
Environmental Protection	IP68 MIL-STD-810G
MTBF	380,000 hrs
Shock Limit	2000 g
Dimensions (excluding tabs)	30 x 30 x 24 mm
Dimensions (including tabs)	30 x 40.6 x 24 mm
Weight	25 grams

## COMMUNICATION

Interface	RS232
Speed	4800 to 1M baud
Protocol	AN Packet Protocol, NMEA or TSS
Peripheral Interfaces	2x GPIO and Auxiliary RS232
GPIO Level	5 V
GPIO Functions	NMEA input / output Novatel input AN Packet Protocol input / output Magnetometers disable Set zero orientation Packet trigger u-blox input TSS output Custom (contact us)

## SENSORS

SENSOR	ACCELEROMETERS	GYROSCOPES	MAGNETOMETERS
Range (dynamic)	± 2 g ± 4 g ± 16 g	± 250 °/s ± 500 °/s ± 2000 °/s	± 2 G ± 4 G ± 8 G
Bias Instability	20 ug	3 °/hr	-
Initial Bias	< 5 mg	< 0.2 °/s	-
Initial Scaling Error	< 0.06 %	< 0.04 %	< 0.07 %
Scale Factor Stability	< 0.06 %	< 0.05 %	< 0.09 %
Non-linearity	< 0.05 %	< 0.05 %	< 0.08 %
Cross-axis Alignment Error	< 0.05 °	< 0.05 °	< 0.05 °
Noise Density	100 ug/√Hz	0.004 °/s/√Hz	210 uG/√Hz
Bandwidth	400 Hz	400 Hz	110 Hz

