

AHRS-100[®]

AHRS-100[®] is a strip-down AHRS system which combines ultra-low noise MEMS 3-axis gyroscopes, 3-axis accelerometer, 3-axis magnetometer, barometer and high speed MCU in a single, compact board. All sensors are calibrated over their temperature · bias · scale factor · axis alignment and g-sensitivity in order to make them ideal for demanding applications.

While moving and when encountering magnetic distortion, **AHRS-100[®]** employs a patented Kalman filtering algorithm that intelligently fuses with gyros and accelerometers to overcome errors due to erratic motion and changes in the local magnetic field to generate optimal Attitude and Heading data outputs.

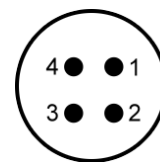
Application :

- Stabilization platform control
- Aviation control system (UAV, Fixed wing, Rotor, etc)
- Ground vehicle control
- Underwater vehicle control
- Autonomous vehicle
- Robots



Feature :

- Suitable for primary attitude reference
- All solid state components (no moving parts)
- Auto self-calibrate attitude when system fixed and power on
- Integrated 16-bit ADCs enable simultaneous sampling of gyros and accelerometers
- 24-bit ADC digital pressure sensor
- Overcome errors due to erratic motion and changes in the local magnetic field
- Enable 1° to 2° compass heading accuracy
- Environmentally sealed (waterproof)
- Small size, light weight and compact design
- Low power consumption
- High CP value



1. Power
2. Rx
3. Tx
4. Ground



Specification

Gyroscope	
Angular rate (3-axis)	$\pm 250^\circ/\text{s}$, $\pm 500^\circ/\text{s}$
Noise density	$0.01^\circ/\text{s}/\sqrt{\text{Hz}}$
Non linearity(Full Scale)	$\pm 0.2\%$
Accelerometer	
Acceleration (3-axis)	$\pm 2 \text{ g}$, $\pm 4 \text{ g}$, $\pm 8 \text{ g}$
Noise density	$150 \mu\text{g}/\sqrt{\text{Hz}}$
Sensitivity change vs. temperature	$0.01\%/^\circ\text{C}$
Barometer	
Pressure range	300~1,200mbar(9,500m~ -500m)
Resolution	Pressure 0.02 mbar Temperature 0.01 $^\circ\text{C}$
Relative accuracy (700~1000 mbar)	$\pm 0.1 \text{ mbar}$
Long term stability	$\pm 1 \text{ mbar/year}$
Magnetometer	
Magnetic field range (3-axis)	$\pm 8 \text{ Gauss}$
Linearity (full scale)	$\pm 0.1\%$
Field resolution	2 mGauss
Heading	
Range	0~360 $^\circ$
Static accuracy	1.0 $^\circ$
Dynamic accuracy	3.0 $^\circ$
Resolution	0.1 $^\circ$
Magnetic heading	1.0 $^\circ$ ~2.0 $^\circ$

Attitude	
Range (Pitch/Roll)	$\pm 90^\circ/ \pm 180^\circ$
Static accuracy	1.0 $^\circ$
Dynamic accuracy	2.0 $^\circ$
Resolution	0.1 $^\circ$
Update rate	
AHRS	10 Hz (default)
Power	
Prime power	5 \pm 5% VDC
Power consumption	< 0.5 W
Interface and Connector	
Interface	UART, RS-232
Data connector	O-type 4-pin
Baud rate	4,800~115,200 bps (default 115,200 bps)
Environment	
Compensated temperature	- 40 $^\circ\text{C}$ to +85 $^\circ\text{C}$
Operating temperature	- 40 $^\circ\text{C}$ to +85 $^\circ\text{C}$
Vibration	4 g, RMS (20~2000 Hz)
Shock	40 g, 11 ms 1/2 sine wave
Environmentally sealed	IP67
Physical	
Dimensions	50 x 50 x 22 mm
Weight	< 40 grams
Enclosure	Aluminum alloy