Galaxy Navigation Corp.

AHRS-100A®

AHRS-100A® is a high precision strip-down AHRS system which combines ultra-low noise MEMS 3-axis gyroscopes, 3-axis accelerometer, 3-axis magnetometer, barometer, high speed MCU and new generation multi-GPS module 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.

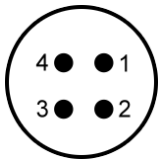
While moving and when encountering magnetic distortion, **AHRS-100A®** employs a patented Kalman filtering algorithm that intelligently fuses with gyros and accelerometers to overcome errors due to erratic motion and changes in the local magnetic field to generate optimal Attitude and Heading data outputs.

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 accelerometer
- 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
- Enable 0.5° GNSS heading accuracy
- Environmentally sealed (waterproof)
- Small size and light weight
- Low power consumption
- Compact design
- High CP value



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





Specification

Gyroscope		
Angular rate (3-axis)		±250°/s, ±500°/s
Noise density		0.01°/s/√Hz
Non linearity(Full Scale)		±0.2%
Accelerometer		
Acceleration (3-axis)		±2 g, ±4 g, ±8 g
Noise density		150 μg/√Hz
Sensitivity change vs. temperature		±0.01%/°C
Barometer		
Pressure range	300~1,200mbar(9,500m~ -500m)	
Resolution	Pressure	0.02 mbar
	Temperature	0.01°C
Relative accuracy(700~1000 mbar)		±0.1 mbar
Long term stability		± 1 mbar/year
Magnetometer		
Magnetic field range (3-axis)		± 8 Gauss
Linearity		± 0.1% of full scale
Field resolution		2 mGauss
Heading		
Range		0~360°
Static accuracy		1.0°
Dynamic accuracy		3.0°
Resolution		0.1°
GNSS aided		0.5°
Magnetic heading		1.0°~2.0°
Attitude		
Range (Pitch/Roll)		±90°/ ±180°
Static accuracy		1.0°
Dynamic accuracy		2.0°
Resolution		0.1°
Update rate		
AHRS		10 Hz (default)
Navigation		10 Hz (default)
Power		
Prime power		5±5% VDC
Antenna		3.3 VDC
Power consumption		< 0.5 W

Interface and Connector		
Interface		UART, RS-232
Data connector		O-type 4-pin
Antenna		SMA female
Baud rate 4,800~115,200 bps (default 115,200 bps)		
GNSS Module		
Channels		28
GPS, SBAS, QZSS,		L1, C/A
BeiDou		B1
GLONASS		L1, OF
Protocols	NMEA 0813,	Version 3.01
Sensitivity		
● Cold start		–148 dBm
● Reacquisition		–160 dBm
● Tracking		–165 dBm
Accuracy		
● Position		2.5 m (CEP)
● Velocity		0.1 m/s
● 1 PPS		20 ns (RMS)
Time-to-first-fix (TTFF)		
● Hot start		< 1 sec
● Cold		29 sec
● Reacquisition		< 1 sec
Dynamics		
Acceleration		≤4g
Velocity		500 m/s
Altitude limit		18,000 m
Environment		
Compensated temperature		– 40°C to +85°C
Operating temperature		– 40°C to +85°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