



V1.1

HIGH ACCURACY 3D DIGITAL COMPASS
RION HCM370B/HCM375B-N

Technical Manual

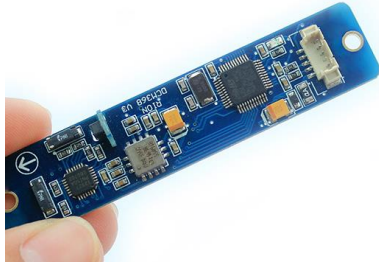
HCM370B&375B-N HIGH ACCURACY 3D DIGITAL COMPASS



PRODUCTION IMPLEMENTATION STANDARD REFERENCE

- Enterprise Quality System Standard: ISO9001: 2008 Standard (Certification No.: 128101)
- The Intellectual Property Management System Complies With The Standard: GB/T29490-2013 (Certificate No.: 18117IP1529R0S)
- High-Tech Enterprise (Certificate No.: GR201844204379)
- China National Intellectual Property Appearance Patent (Patent No.: ZL201730609573.9)
- Angle Sensor Production Standard: SJ20873-2003 General Specification For Sensor And Spirit Level
- Gyro Acceleration Test Standard: QJ 2318-92 Gyro Accelerometer Test Method
- Software Development Reference Standard: GJB 2786A-2009
- Product Environmental Test Detection Standard: GJB150
- Revision Time: 2020-5-16
- Product Functions, Parameters, Appearance, Etc. Will Be Adjusted With Technology Upgrades, Please Contact The Company's Pre-Sales Business To Confirm When Buying

HCM370B&375B-N HIGH ACCURACY 3D DIGITAL COMPASS



HCM SERIES HIGH ACCURACY
3D DIGITAL COMPASS



► INTRODUCTION

HCM370B-HCM375B is a high accuracy 3D digital compass of strip shape, its width is only 1.6cm, IP67 protection grade, suitable for many harsh environment such as drilling measurement. It adopts advanced hard iron and soft iron calibration algorithm, it can provide the high precision heading value output when both pitch and roll angle at any angle within 360°. It is small and low power consumption, suitable for current miniaturization sensitive measurement system. Sealed complete item and signal board are available.

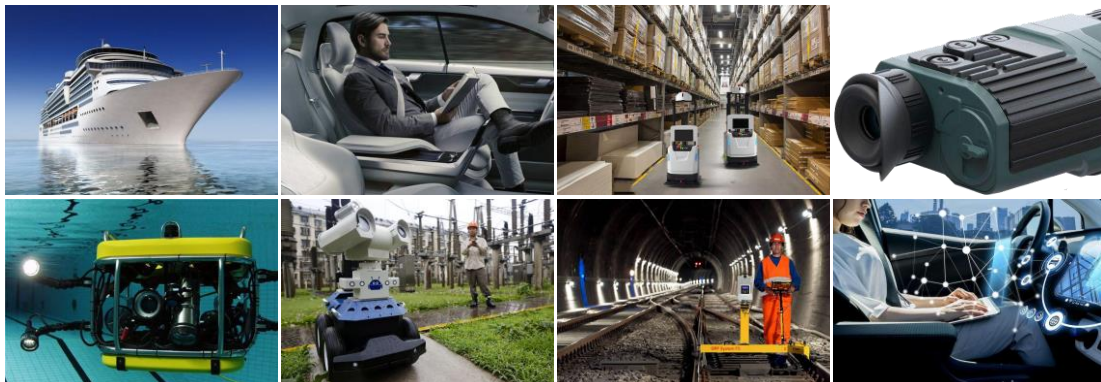
HCM370B-HCM375B integrated patented three-axis flux-gate technology. It calculates heading value in real-time by CUP, and perform heading value compensation in wide tilt range by using three axis accelerometer. It is high performance and excellent stability military level compass sensor. Its volume is small, power consumption is low. It could widely used in many application such as antenna installation, vehicle and integrated system, and so on.

► MAIN FEATURE

- Heading Accuracy: 0.5°
- Tilt Resolution: 0.1°
- Working Temp.: -40°C~+85°C
- With Hard And Soft Magnetic Calibration
- Roll Measure Range: ±180°
- Tilt Accuracy: <0.2°(Full Range)
- Dimension: L110×W19.5×H19.5mm
- Rs232/Rs485/Ttl Output

► APPLICATION

- Satellite antenna search satellite
- GPS integrated navigation
- Gun emission system
- Laser range finder
- ROV underwater robot navigation
- Special occasion robot
- Marine navigation surveying and mapping
- Antenna servo control
- Infrared imager
- Map for plotter
- Oceanography measurement instruments
- Unmanned aircraft



○ Inclinometer ○ 3D compass ○ Digital inclinometer ○ Accelerometer ○ Gyro ○ North finder ○ INS&IMU

SINCE2008 · Inertial Attitude Measurement Manufacturer

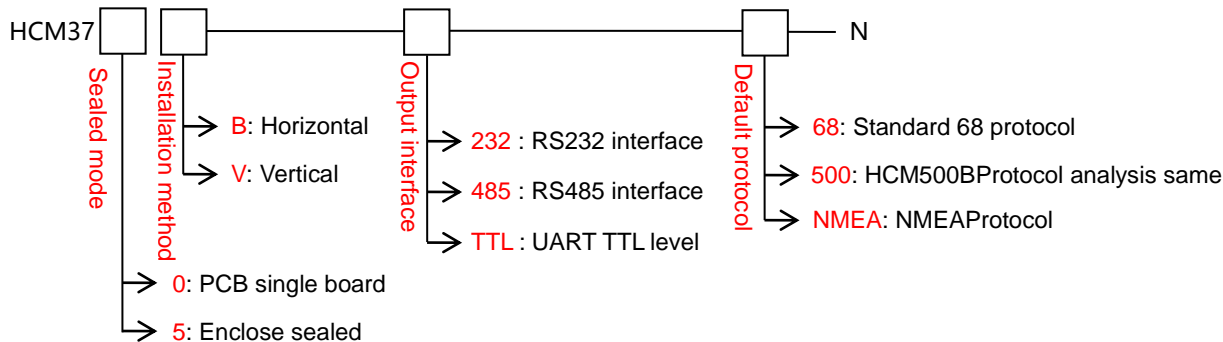
HCM370B&375B-N HIGH ACCURACY 3D DIGITAL COMPASS

▶ PRODUCT PARAMETERS

HCM370B / HCM375B		Index
Heading	Heading Accuracy	0.5° Tilt < 10°
		2.0° Tilt < 60°
		3.0° Tilt < 80°
	Resolution	0.1°
Tilt	Pitch Accuracy	0.1°<15° (Measure Range)
		0.1°<30° (Measure Range)
		0.1°<60° (Measure Range)
		0.2°<85° (Measure Range)
	Pitch Range	±85°
	Roll Accuracy	0.1°<15° (Measure Range)
		0.1°<30° (Measure Range)
		0.1°<60° (Measure Range)
0.2°<180° (Measure Range)		
Roll Range	±180°	
Resolution	0.1°	
Calibration	Hard Magnetic Calibration	Available
	Soft Magnetic Calibration	Available
	Magnetic Filed Interference Calibration Method	Rotate 360° Horizontally; Vertical Rotation(Optional)
	RS-232/RS485/TTL	5Pin Quick Plug Connector
Interface	Start Delay	<50ms
	Max Output Rate	20Hz/s
	Communication Rate	2400 TO 19200baud
	Output Format	Binary High Performance Protocol
Power Supply	Power Voltage	(Default) DC+5V
	Current(Max)	30ma
	Ideal Current	26ma
	Sleep Mode	TBD
Environment	Working Temp.	-40°C~+85°C
	Storage Temp.	-40°C~+100°C
	Anti-Shock Performance	100g
	Protection Level	IP67
Electromagnetic Compatibility	According TO EN61000 and BT17626	
Mtbf	≥40000 Hour/Time	
Insulation Resistance	≥100M.O.	
Anit-Impact	100g@11ms、3Times/Axis(Half Sinusoid)	
Anti--Shock	10grms、10~1000Hz	
Dimension	L110×W19.5×H19.5mm	
Weight	70g(Not Include Cable)	

HCM370B&375B-N HIGH ACCURACY 3D DIGITAL COMPASS

▶ PRODUCT ORDERING INFORMATION



E.g : HCM375B-232-68-N: Enclosure packaging / horizontal installation / RS232 Interface / Standard 68 protocol.

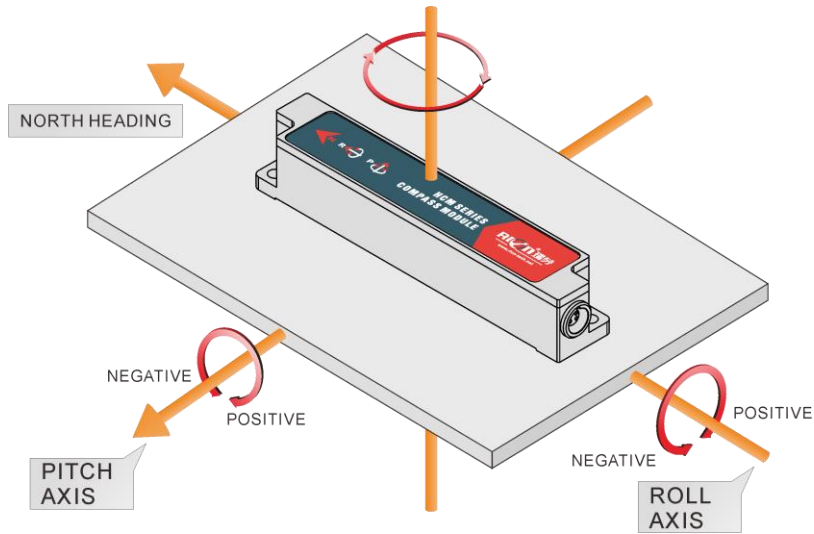
▶ MEASURING DIRECTIONS&FIX

HCM370B-HCM375B 3D electronic compass azimuth is using geomagnetic principle, so it is very important to select a minimum magnetic interference environment for installation position. Please place and install it away from the iron, magnets, engines and other magnetic objects as much as possible as you can. Need control over 30CM distance (different magnetic interfere with the compass in different distance) at least even there are these magnetic medium around . In order to ensure optimal measurement environment please must use the M3 anti-interference screws for installation .

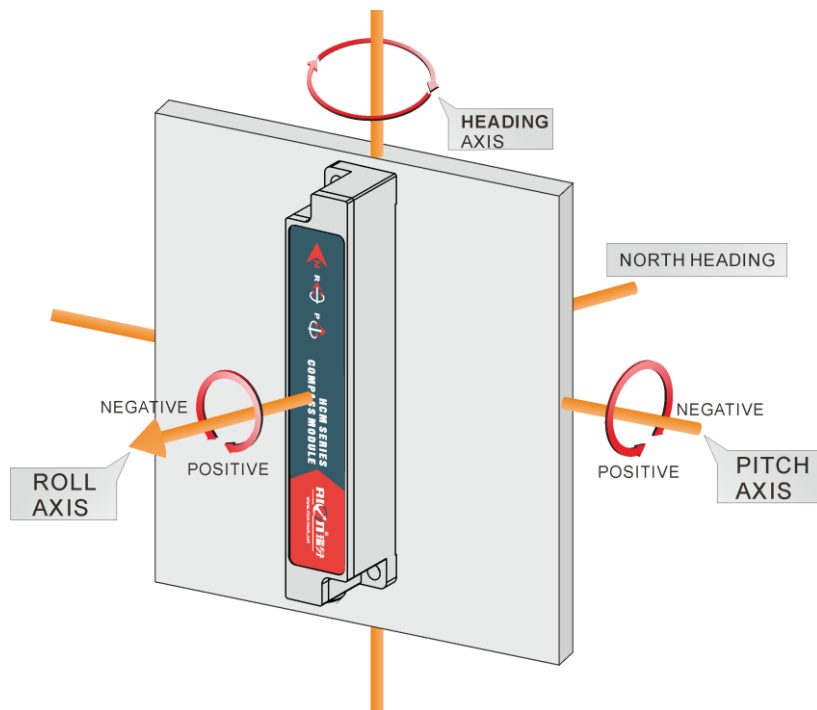
Although it can compensate the moderate deviation in the stable magnetic environment, but it can not compensate the changed magnetic interference. Please pay much attention to the wire with DC will generates a magnetic field , because if the DC change then the magnetic field will also change in size . The battery also is another interference source of changing . Each installation is different, and the user must evaluate the feasibility of installation under all possible operating environment.

The optimal heading accuracy of it can reach 0.3°~0.5°, this undergo a rigorous validation indisputable, the most scientific test method is equally crucial. The test method we recommend is: Please install the electronic compass to a vertical and erect aluminum pole (non-magnetic material), then proceed with heading accuracy measurement (of course the rotating rod perpendicular to the rotating platform, as much as possible to avoid large external magnetic field interference). Doing so can reduce the compass turning radius, to scientifically improve the measurement accuracy. This is just to provide the installation of the laboratory, must be flexible to deal with the specific situation. E.g: is mounted in the car, HCM505B should do its installation in the perpendicular to the movement direction.

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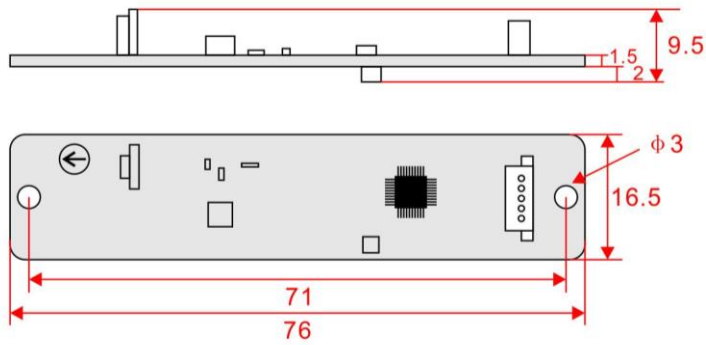
HORIZONTAL INSTALLATION DIAGRAM



VERTICAL INSTALLATION DIAGRAM

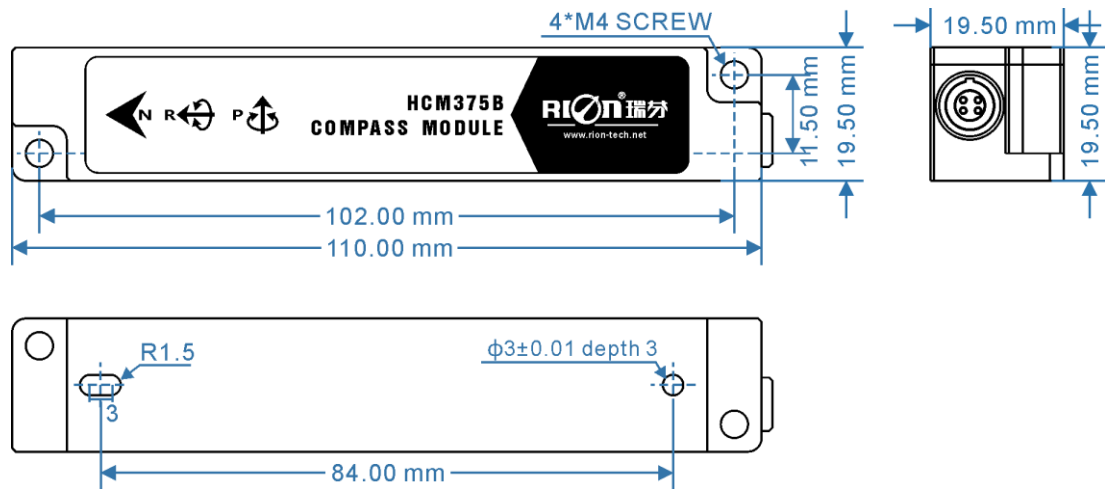
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► SINGLE BOARD SIZE CHART



Dismenion : L76xW16.5xH9.5mm

► SHELL SIZE CHART



SIZW : L110xW19.5xH19.5mm