



V1.9

HIGH ACCURACY 3D DIGITAL COMPASS
RION DCM250B/260B
Technical Manual

DCM250B/DCM260B HIGH ACCURACY 3D COMPASS

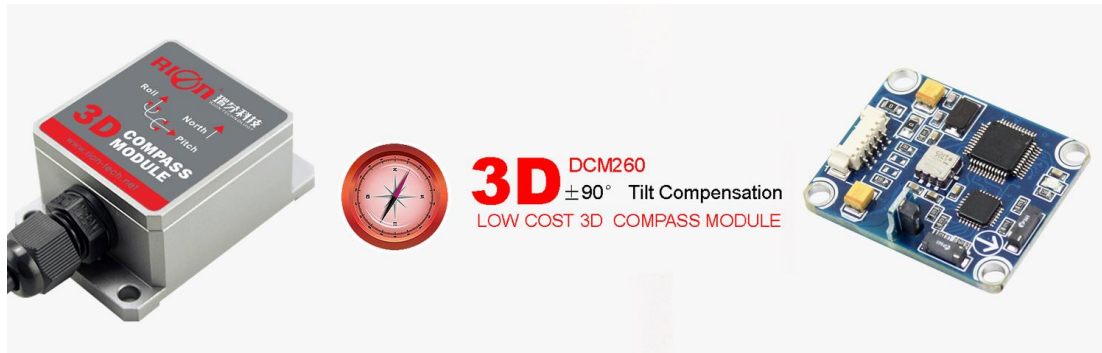


RION-TEHC QUALIFICATION CERTIFICATION

- Quality management system certification: GB/T19001-2016 idt ISO19001:2015 standard (certificate number: 128101)
- High-tech Enterprise (Certificate No.: GR201844204379)
- CE certification: AT011611745E FCC certification: AT011611744E
- China National Intellectual Property Appearance Patent Right (Patent No.: ZL 201830752874.1)
- Revision date: 2022-1-20

Note: Product functions, parameters, appearance, etc. will be adjusted with technical upgrades. Please contact our pre-sales business for confirmation when purchasing.

DCM250B/DCM260B HIGH ACCURACY 3D COMPASS



► INTRODUCTION

DCM250B/260B is a low-cost three-dimensional electronic compass, using hard and soft magnetic calibration algorithm, so that the compass can eliminate the influence of magnetic field through the calibration algorithm in the environment with magnetic field interference. The DCM250B&260B integrates a three-axis fluxgate sensor, calculates the heading in real time through the central processor, and uses a three-axis accelerometer to perform heading compensation for a wide range of tilt angles, ensuring that the compass can also provide high accuracy at tilt angles up to $\pm 85^\circ$ Heading data. The electronic compass integrates high-precision MCU control and diversified output methods. The standard interfaces include RS232/RS485/TTL and other interfaces, and other communication interfaces can be customized. The DCM250B/260B is small size, low in power consumption, and can be used in many fields such as stable antennas, vehicles, system integration, etc. The high shock resistance and high reliability also make the compass work normally in extremely harsh environments, and is more suitable for today's Precision measurement integrated control system.

► MAIN FEATURES

- ★ Azimuth accuracy: 0.8°
- ★ Inclination resolution: 0.1°
- ★ Temperature range: $-40^\circ\text{C} \sim +85^\circ\text{C}$
- ★ With hard magnetic, soft magnetic and tilt compensation
- ★ Standard RS232/RS485/TTL output interface
- ★ Inclination measurement range: $\pm 85^\circ$
- ★ Inclination accuracy: 0.2°
- ★ Size: $L68 \times W37 \times H24\text{mm}$
- ★ DC 5V power supply
- ★ IP67 waterproof

► APPLICATION

- ★ Satellite antenna searching
- ★ Antenna servo control
- ★ Laser rangefinder
- ★ Oceanographic survey instrument
- ★ Navigation surveying
- ★ Artillery launch system
- ★ Mapping
- ★ Special occasion robots
- ★ GPS combined navigation
- ★ Infrared imager
- ★ ROV underwater robot navigation
- ★ Unmanned aerial vehicles



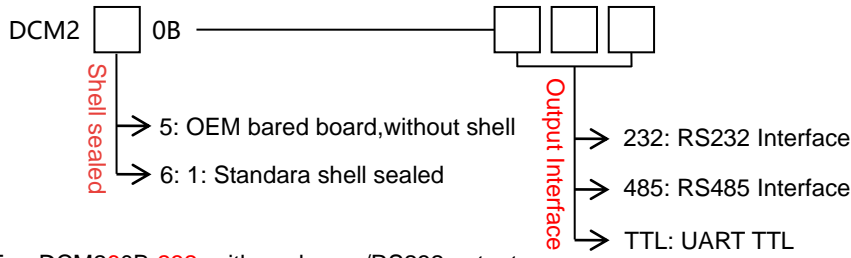
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► PERFORMANCE

DCM250B/260B		Parameters
Compass heading parameters	Heading accuracy	0.8° tilt <10°
		1.5° tilt <30°
		2.0° tilt <40°
		3.0° tilt <60°
	Resolution	0.1°
Compass inclination parameter	Pitch accuracy	0.1° <15° (measure range)
		0.2° <30° (measure range)
		0.3° <60° (measure range)
	Pitch range	±85°
	Rolling accuracy	0.1° <15° (measure range)
		0.2° <30° (measure range)
		0.3° <60° (measure range)
Roll range	±85°	
Resolution	0.1°	
Tilt compensation angle range	<40°	
calibration	Hard iron calibration	Yes
	Soft iron calibration	Yes
	Magnetic field interference calibration method	Rotate horizontally one round (2D calibration)
Physical characteristics	Size	L68xW37xH24mm
	RS232/RS485/TTL	4 cores 1-meter direct lead
Interface	Start delay	<50mS
	Output rate	20Hz/s
	Baud rate	2400 to 19200baud
	Output format	Binary high-performance protocol
Power supply	Supply voltage	(default) DC+5V
		(optional) DC 9 ~ 36V
	Current (MAX)	45mA
	Ideal mode	35mA
	Sleep mode	TBD
Environment	Operating range	-40°C ~ +85°C
	Storage temperature	-40°C ~ +100°C
	Anti-vibration performance	2500g
EMC	According to EN61000 and GBT17626	
MTBF	≥40000 hours/time	
Insulation resistance	≥100MΩ	
Impact resistance	100g@11ms, three direction (half sinusoid)	
Anti-vibration	10grms, 10 ~ 1000Hz	
Weight	Single board: ≤25g ≤135g (including 1 meter cable)	

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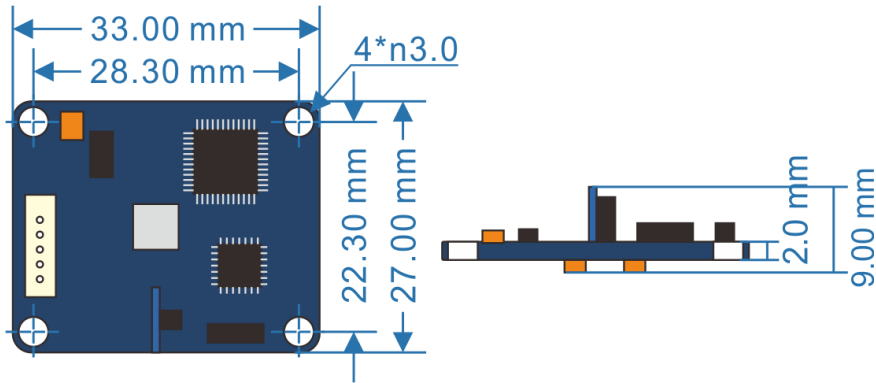
► ORDER INFORMATION



E.g: DCM260B-232: with enclosure/RS232 output.

► PRODUCT SIZE

COMPASS MODULE SIZE

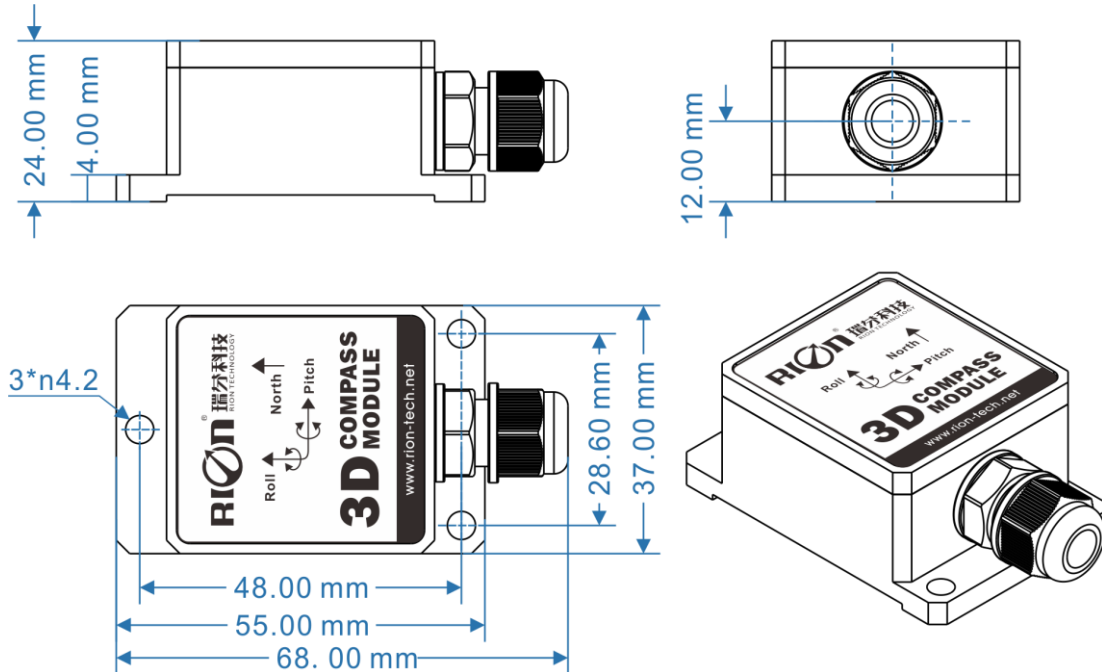


Shell size: L33xW27xH9mm

Installation size: L28.3xW22.3xH2mm

outing screws: 4 M3 screws

SIZE OF COMPASS WITH HOUSING



Shell size: L68xW37xH24mm

Installation size: L48xW28.6xH4mm

outing screws: 3 M4 screws

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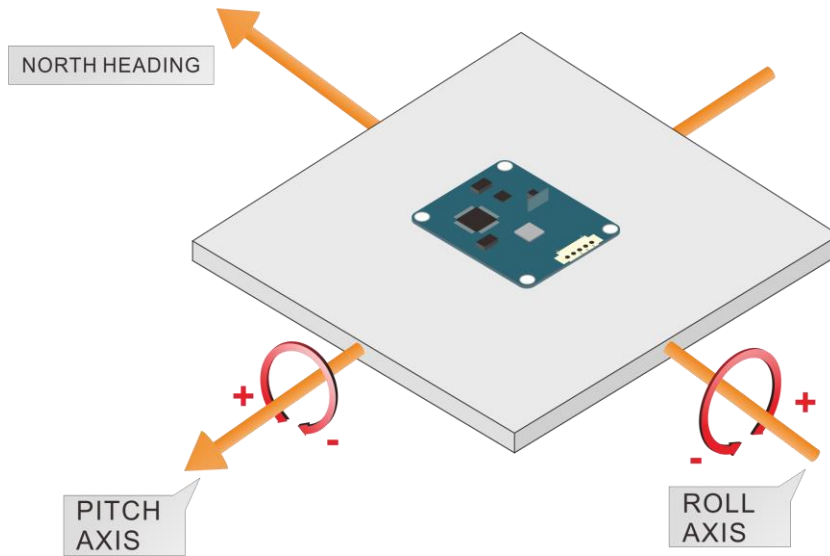
► MEASUREMENT AND INSTALLATION

Because the azimuth of the DCM250B&260B three-dimensional electronic compass uses the principle of geomagnetism, it is necessary to choose the environment installation location with the smallest magnetic interference. Please install the product away from iron, magnets, motors and other magnetic objects. Even if there are these magnetic sources around, it needs to be kept away at least 40CM (different magnetic fields have different interference distance). In order to ensure product measurement accuracy, M3 stainless steel screws must be used for installation.

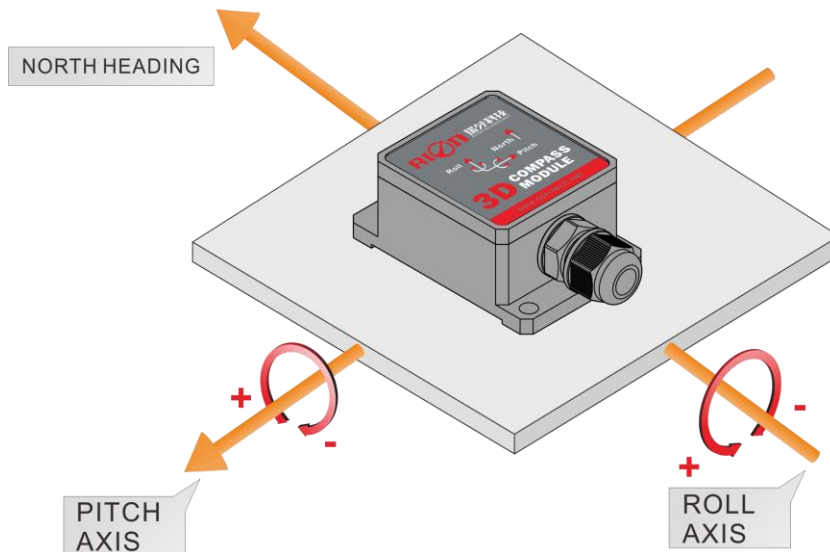
This product can compensate for moderate deviations in a stable magnetic environment, but cannot compensate for changing magnetic interference. Please pay attention to the magnetic field generated by the DC wire, because the magnitude of the magnetic field will change with the DC current. The battery is also a source of interference. Each installation is different and the user must evaluate the installation feasibility under all possible operating environments.

In a non-interference environment, the measured heading accuracy of this product is $\leq 1^\circ$, but scientific test methods are also crucial. Our recommended test method is: install this electronic compass on a vertical aluminum (non-magnetic other material) rod to make heading accuracy measurements (of course the rotating rod is perpendicular to the rotating platform, try to avoid large external magnetic fields interference). Doing so can reduce the radius of compass rotation, scientifically improve the measurement accuracy. This is only to provide laboratory installations, which must be handled flexibly for specific situations. For example: when installed on a car, this product is installed perpendicular to the direction of movement.

DCM250B installation and measurement direction



DCM260B installation and measurement direction



○Tilt sensor ○Electric Compass ○Digital Inclinometer ○Accelerometer ○Gyro ○North Finder ○INS&IMU

SINCE2008 · Expert Of Inertial Attitude Measurement



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