Hamburg Engineering

RION™

SPECIFICATIONS

Item No.：DCM400

Desc.：High Accuracy 3D Digital Compass

Production implementation standard reference

● Enterprise quality system standards: ISO9001: 2008 standard (certification number: 128101)

● Tilt sensor production standards: GB / T 191 SJ 20873-2003 inclinometer general specification of Level

● Gyro accelerometer test standard: QJ 2318-92 Gyro accelerometer test methods

● Software development reference standard: GJB 2786A-2009 military software development General requirements

● Product environmental testing standards: GJB150

● Electromagnetic anti-interference test standards: GB / T 17626

● Version|:ver.01

●Revision Date:2016.5.3

General Description

DCM400B is a low-cost 3D electronic compass , using USA patented technology of hard magnetic and soft magnetic calibration algorithm, make the compass eliminate the magnetic influence through calibration algorithm in the magnetic interference environment . DCM400B integrated three-axis fluxgate sensor, in real time solver heading through the central processor, and using 3-axis accelerometer to proceed heading compensation for the wide range tilt angle.

DCM400B with small size, low power consumption, can be used for the antenna stability, vehicles, systems integration and other more fields , high shock resistance, high reliability makes the compass work properly in extremely harsh environments, and is more suitable for nowadays miniaturization military high-precision measurement integrated control system.

Features:

- ●Heading accuracy: 0.8°
- ●Wide temperature :   -40℃～+85℃
- ●With hard magnetic ,soft magnetic and angle compensation
- ●Standard RS232 output interface

- ●Tilt angle measuring range :±30°
- ●Size: L82×W60×H27mm
- ●DC 12V power supply
- ● IP67 protection class

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

Electrical Characteristics

DCM260B Technical Data		
Compass heading parameter	The best heading accuracy	0.8° tilt <10°
		2.0° tilt <30°
	Resolution	0.1°
	Pitch tilt range	±30°
	Roll tilt range	±30°
Calibration	Hard iron calibration	Yes
	Soft iron calibration	No
	Magnetic field interference calibration method	Plane rotation in a circle (2D calibration)
Physical features	Dimension	L82×W60×H27mm
	Weight	200g
	RS-232 interface	DB9 interface connector
Interface features	Start delay	<50MS
	Maximum output rate	25Hz
	Communication rate	9600 baud
	Output format	Hexadecimal high performance protocol
Power	Power supply	（Default）DC+12V
	Current(Maximum)	45mA
Enviroment	Operating range	-40℃～+85℃
	Storage temperature	-40℃～+85℃
Electromagnetic compatibility	According to EN61000 and GBT17626	
MTBF	≥40000 hours/times	
Insulation resistance	≥100M	
Shock resistance	100g@11ms、3Times/Axis(half sinusoid)	
Anti-vibration	10grms、10～1000Hz	

Dimension

DB9接口   标定开关

82 ±0.20
74 ±0.10
Ø3.30
27 ±0.20
5
15
51 ±0.10
60 ±0.20
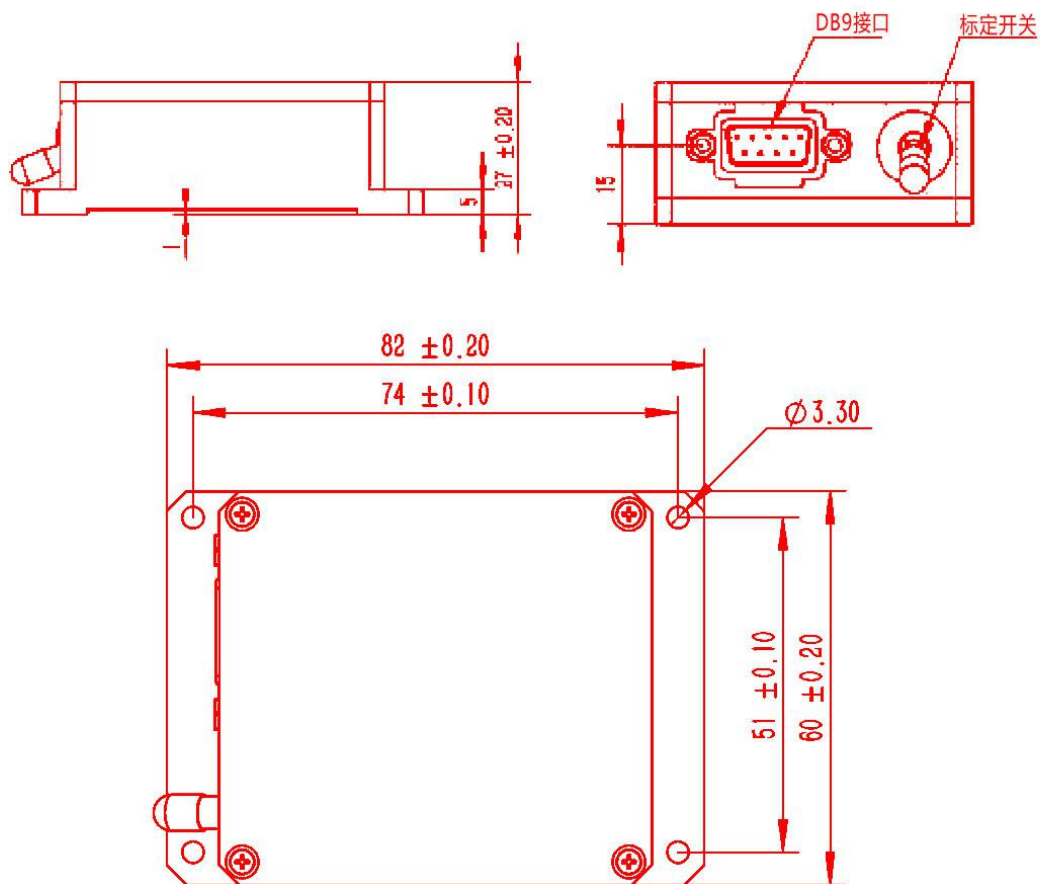
Electrical Connection

DB9 Male Connector	Cable definition
1	No connection
2	RS232 TXD
3	RS232 RXD
4	No connection
5	Power -（Signal/Power GND）
6	No connection
7	No connection
8	No connection
9	Power +（12V）
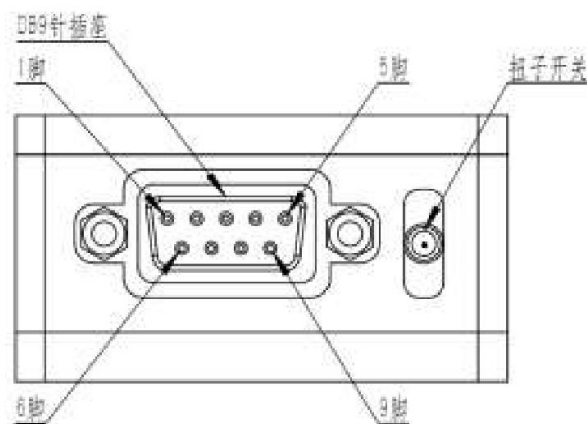
Input /output data frame format

Data frame format ：（8 bits date，1 bit stop，No check，Default baud rate 9600）

Compass output mode is " answer " mode,   when the upper computer is less than or equal to 25Hz, to input the fixed format attitude angle , the compass will output the azimuth / heading information at the same frequency.

1、Input command format

Byte	Desc.
Byte1	Frame head（fixed EB）
Byte2—3	Roll angle，range -60°～+60°，scale factor 0.002°/Bit
Byte4—5	Pitch angle，range-60°～+60°，scale factor0.002°/Bit
Byte6—7	Identifter word（fixed AA 55）
Byte8	Tail frame（Byte2—Byte7 of Checksum）

E.g：Input data frame EB 01 DF F9 31 01 53 AA 55 5D

    EB　　　　　　　——Frame head

    01 DF　　　　　——Roll angle value：+0.958°

    F9 31　　　　　——Pitch angle value：-3.486°

    AA 55　　　　　——Identifter word

    5D　　　　　　——Tail frame（Checksum）

2、Output data frame format

Byte	Desc.
Byte1	Frame head（fixed CC）
Byte2	Identifter word（fixed 55）
Byte3—4	Azimuth, range 0～360°, scale factor（360/4096）°/Bit
Byte5	AA Output flag bit
Byte6	Tail frame（Byte3—Byte5 Checksum）

E.g：Output data frame CC 55 01 AC AD

    CC 55　　　　　——Frame head

01 AC ——compass azimuth value 37.6°
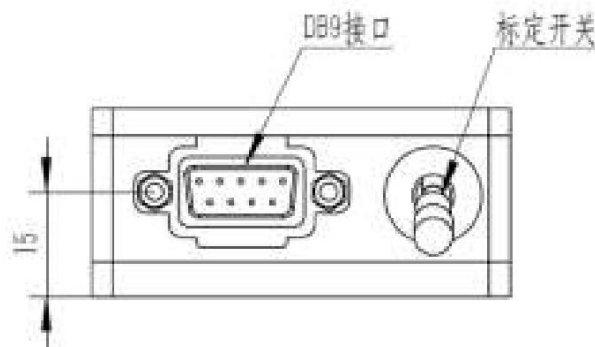
AA

57 ——Tail frame（Checksum）

Calculation method:

The azimuth angle value is represented by two bytes, high in the former low after, two bytes into a combination with the sign bit word, the word is represented by the complement   form, conv

ert to decimal form then multiplied by the scale factor of the calculated results is azimuth.

Compass calibration method

The compass is connected with the attitude system, attitude system fixed frequency to send level posture angle information of the compass system; power on compass calibration switch (push up), alternating output 0x8000 and 0x0000, enter the compass calibration state; rotate compass one circle and a half in horizontal(level) position and uniform speed , make the switch is in the state under below showing, compass will output azimuth angle normally,the calibration is complete.

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