ZCC220L-232 Digital Compass

General Description

ZCC220L-232 is a high accuracy plane digital compass module.Its working principle: Two axis perpendiculars with each other induce the earth's magnetic field at the same time then calculate the azimuth. It communicates with PC via 232 interface (TTL or 485 interface can be customized). It features stable performance and high accuracy. Also it has calibration function and you can get accurate azimuth wherever. There are both continuous and inquiry output mode. At the same time it has declination angle and installation angle compensatory function. It can suit different working conditions.

Features

• High accuracy
• Light weight.
• Cost effective.
• Ease of integration.
• Fine aluminium case(please mention if need waterproof)

Applications

• Handheld instruments and meters
• Navigation system.
• Auto helm ruder.
• Aerial position.
• Automobile GPS navigation
• Aero model position.
• Robots navigation and position.

Ordering Information   ZCC220L-232

Specifications

Parameter	Value	Unit	Remark
Measuring Range	0° ～ 360°	°	Compass placed horizontally
Resolution	0.1	°	
Accuracy	1	°	RMS
Response Frequency	4	Hz	
Repeatability	<0.3	°	
Voltage	5v	VDC	
Operating Current	<30	mA	5V continuous output
Operating Temperature	-40 ～ 85	℃	
Storage Temperature	-45 ～ 125	℃	

Communication Protocol：（output via ASC11；Baud rate is 9600bp/s）：

1 ASC11 format

One set of data has 13bytes.

Byte1：$(0x24)

Byte2：H(0x48)

Byte3：,(0x2C)

Byte4：hundreds digit of angle

Byte5：tens digit of angle

Byte6：units digit of angle

Byte7： . (0x2e)

Byte8：decimal place of angle value.

Byte9： *(0x2A)

Byte10：First bit calibration

Byte11：Second bit calibration

Byte12：0x0D（Enter）

Byte13：0x0A（New line）

2 User instructions

- Output version of software first after powered on： ZCcC 1.6c

- Enter into angle output mode automatically.

3 Order word related：(Please distinguish lower case and capitalization)

"**R**" －－System reset

"***Bau=4800**" －－Setting baud rate 4800.

"***Bau=9600**" －－Setting baud rate 9600.

"***Bau=19200**" －－Setting baud rate 19200.

"***P**" －－ Single output. When it sends once system will output a set of data.

"*n" －－Continuous output.

"*z" －－ Setting zero. Sets zero degree as datum mark and angle output based on the

datum mark.

"p" －－Calibration. After calibrated the compass will circularly output "studing…'

"r" －－ Finish calibration. Return to continuous output mode.

"b" －－ Setting declination angle. It will wait after system has accepted it and PC will

output declination angle among 000-360 degrees.

"c" －－ Reading declination angle.

"d" —— Setting deviation angle. It will wait after system has accepted it and PC will

output deviation angle among 000-360 degrees.

"e" —— Reading deviation angle.

4 Parity bit arithmetic

Byte4^ Byte5^ Byte6^ Byte8^0x32

The value of the frontal 4 digits is the first parity bit and the latter is the second parity bit.

For example: $ZC, 281. 4*3D

2^8=A, A^1=B, B^4=F, F^0x32=0x3D; The first parity bit: 0x33. The second: 0x3D.

Installing Size and Definition of Connection：（Unit :mm）
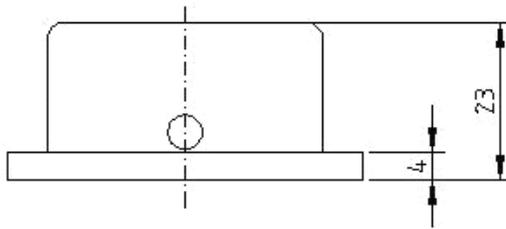
Connection Definition：

Red：+5VDC

Black：GND

Blue：RXD

Green （yellow）：TXD

Shanghai Zhichuan Electronic Tech Co., Ltd.   - 3 -

Address: 3F Compositive Building, No.112 8Denghui Road, Minhang, Shanghai, China.
Tel：86 21 6490 8093 Ext.214;   Fax: 86 21 6490 8096 ;   Email:shining@zc-sensor.com
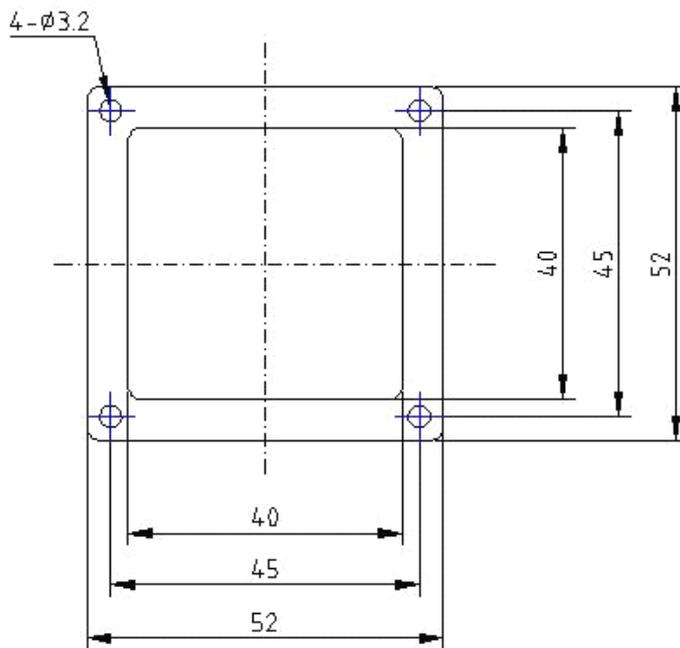
Technical terms

1 Declination Angle

It is the angle between magnetic north and true north. Declination angle of different place are different, even at the same place declination angle varies with the time. When we use compass to navigating, we get directions relative to magnetic north. So we can get directions relative to true north through declination angle compensation. For example, the current direction counted by compass is north by east 30 degrees and the declination angle is 5 degrees. So the direction relative to true north is 35 degrees (30+5°=35°)

2 Installation Angle

There is an arrowhead on the compass module and it's used to denote directions. When installed, it requests that forward direction of the object surveyed is consistent with the arrowhead. So the direction counted by the compass is the right direction. If installing direction is not consistent with the arrowhead, there is a included angle and it is the deviation angle. Only after we compensate it the compass outputs the true direction.

3 Calibration

It's also called hard iron compensation. All digital compasses must be calibrated before used. Once hard iron conditions change, the magnetic field conditions will be changed too. At this time angle information counted by the compass will be inaccurate. In order to remove the influence, it's necessary to calibrate the compass.

4 Calibrating methods and functions

When magnetic field changes angle information counted by compass will be in accurate. This time it is necessary to calibrate the compass to remove the influence.

Methods:

Send "P" command, and then rotate the compass two circles slowly, equably and flatly, fast not allowed. One cycle needs more than one minute. Then send "r" command to finish calibration.

Specification subject to change without notice.