Jewell has a 40+ year history of providing precision force-balanced accelerometers and is pleased to provide electronic compass parts with the same attention to detail that our customers demand.

The **ECC-2D Series** is a low-cost 2D digital compass in a small package with low power consumption and high reliability designed for commercial and industrial users.

Features

- **Heading accuracy: ±1°**
- **Hard & soft iron magnetic compensation**
- **Wide operating temp range: -40° to +85°C**
- **Low-cost electronic compass**
- **RS232, RS485, and TTL outputs**
- **Small footprint (61L x 35W x 21H mm)**
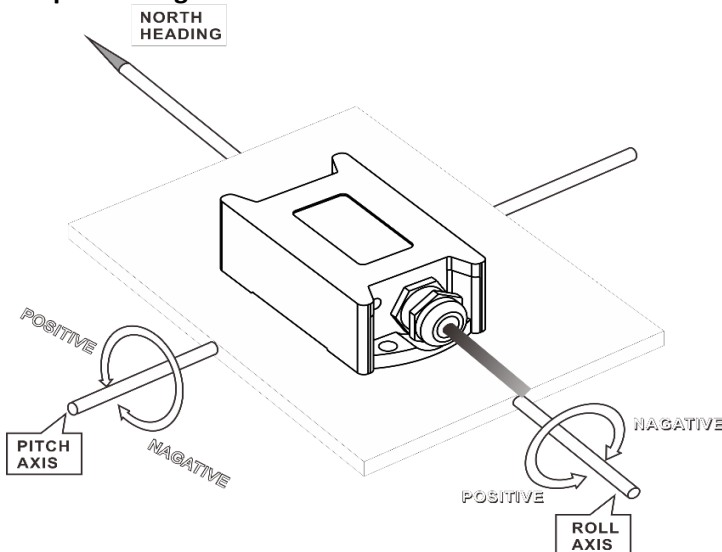- **5Vdc power supply**
- **IP67 seal**

Applications

- **Platform stabilization**
- **Satellite Antenna Control**
- **ROV/UUV Unmanned Underwater vehicles**
- **Marine navigation surveying & mapping**
- **Weather buoys**
- **Antenna positioning**

Outline Diagram
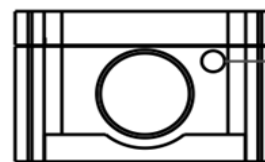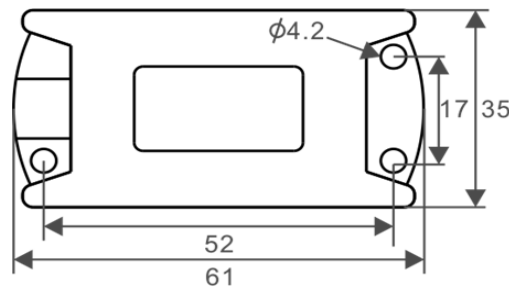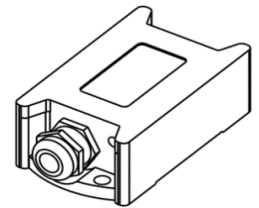
Dimension: 61 L x 35 W x 21 H mm

Pin Out

Wire color	Function
Red	5V
Black	GND
Yellow	RS232 (RXD)/RS485 (D+)
Green	RS232 (TXD)/RS485 (D-)

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*Performance Specifications:

Heading	
Resolution	0.1°
Accuracy	1°
Compass parameters	
Pitch Accuracy	1° (±15° range)
	1.5° (±30° range)
	2° (±60° range)
	3° (±90° range)
Pitch tilt angle	±80°
Roll Accuracy	1° (±15° range)
	1.5° (±30° range)
	2° (±60° range)
	3° (±90° range)
Roll tilt angle	±80°
Best compensation angular range	40°
Calibration	
Hard iron calibration	Yes
Soft iron calibration	Yes
Magnetic field interface calibration method	Plane rotation in a circle (2D calibration)
Interface	
Start-up delay	< 50 msec
Max output rate	20 Hz
Baud rate	2400 to 19200
Output format	Binary
Electrical	
Input voltage	5 Vdc (default)
	9-36 Vdc (custom)
Input current	45 mA max. operating
	35 mA Idle
	≤ 35 mA standby
Environmental	
Operating Temp	-40° to +85° C
Storage Temp	-40° to +100° C
Shock	2500g
Electromagnetic compatibility	according to EN61000 and GBT17626
Insulation resistance	≥ 100m
Shock resistance	100g@11ms, 3x/Axis (1/2 Sinusoidal)
Vibration	10grms, 10-1000 Hz
Mechanical	
Wires	4
Cable length	1 meter with leads (default)
Weight	160g without cable

*Note: **Specifications subject to change without notice**

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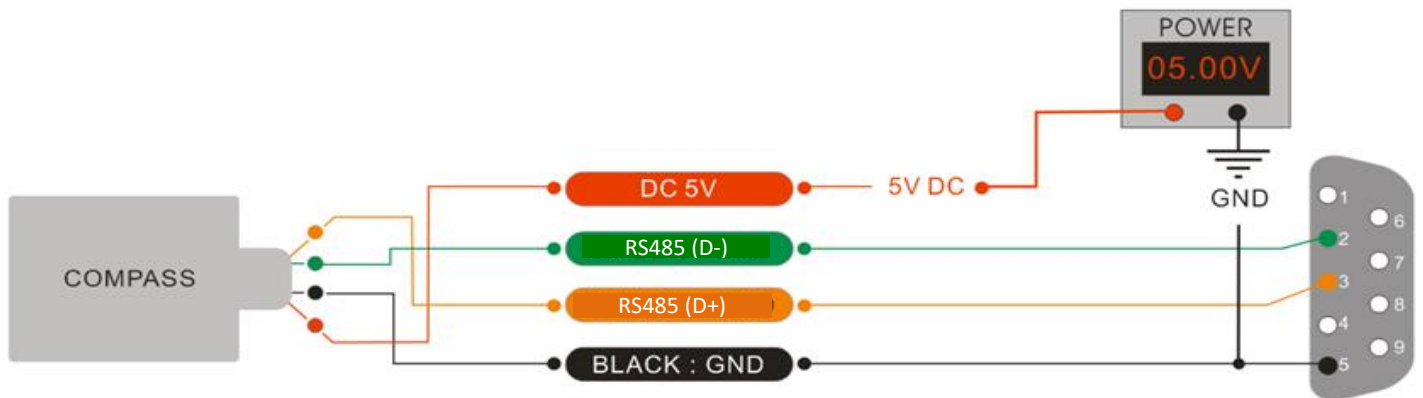
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Ordering information:

Model ECC-2D-RS485

Description: Low-cost ECC series
2D electronic compass
RS485 output
1m cable w/ leads
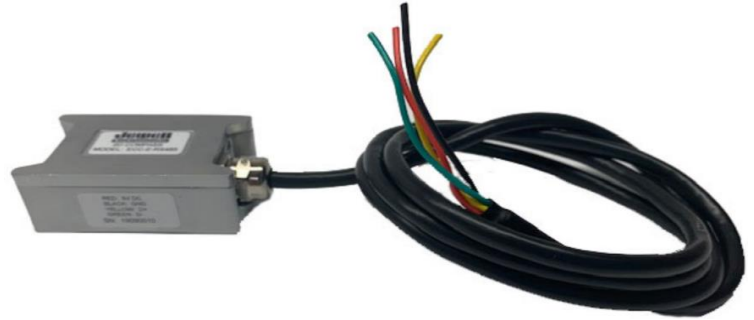
Electrical connections:

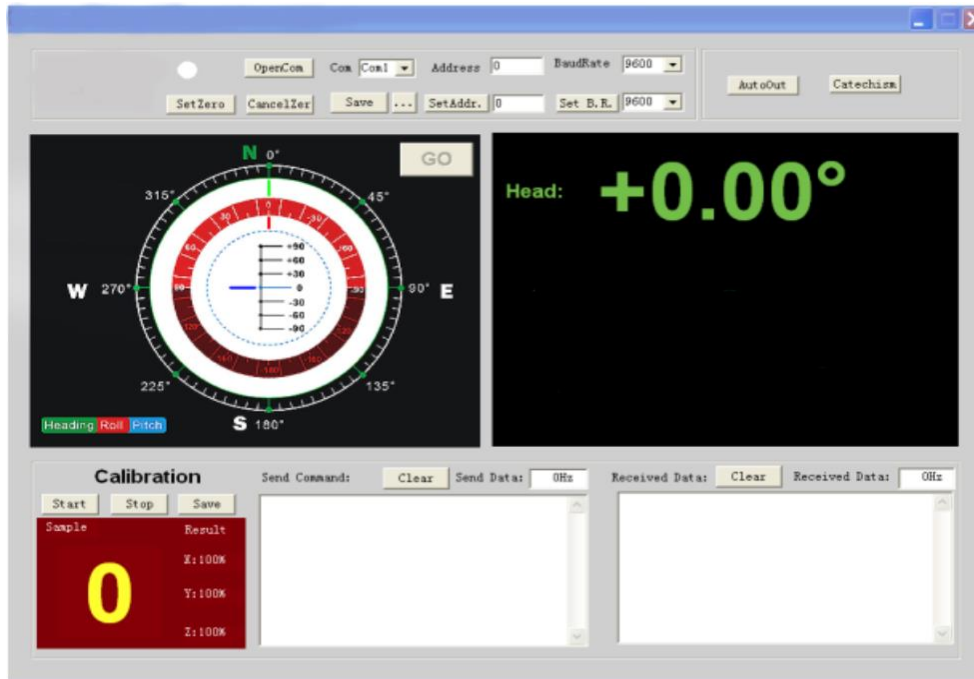
Installation & Calibration:

For best performance, please follow the recommendations below:

1) Place the compass as far as possible (at least 40 cm) from iron, magnets, engines and other magnetic objects that can interfere with the sensor measurements

2) During installation, use M3 stainless steel screws to mount each unit

3) Download the compass software

4) If the compass will be permanently mounted on a portable device, install the compass first to the surface before proceding with the calibration below

5) Place the unit horizontally on a flat surface away from magnetic interference and connect to a RS485-to-RS232 converter if using a computer to collect the data

6) Send the following command to begin calibration: **68 04 00 08 0C** in hexadecimal format (or click the "**CALI-START**" button on the compass program)

7) ECC compass will return the response command.

8) Horizontally rotate the compass 360 degrees on a non-magnetic surface proceeding the magnetic field data acquisition. The rotation should happen very slowly (about 40 seconds for a full rotation).

9) After a full 360° rotation, stop the calibration by sending the following command: **68 04 00 0A 0E** in hexadecimal format (or click "**CALI-SAVE**" button on the compass program)

Note: If the compass is installed in another enclosure assembly, the enclosure assembly will have magnetic interference, in order to calibrate compass installed, then calibrate by rotating the complete enclosure assembly together which insure accurate calibration.

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2D Compass Program:

Open/Close:	Open and close COM port;
Com:	Select the COM port connected to the ecompass
Address:	Default is 00
Set new address:	Click on 'Set Addr button'
Save data:	Click 'Save', the file is stored by default in C:\ COMDATA file
Set Zero:	Set the current angle to 00.00 degrees
Cancel Zero:	Undo the 'Set Zero' to factory default zero deg
Baud Rate:	Default is 9600
Set Baud rate:	Select a different value by clicking on 'Baud Rate', then 'Set B.R.'
Auto Output:	Switch to automatic output mode
Catechism:	Switch to a single measurement followed by a command entered in the 'Send Command' box
Mag. Dec.:	Magnetic declination setting. Enter the local magnetic declination, then click 'Mag.Dec' button to confirm
Calibration:	Compass calibration forum
Start button:	Begins calibration
Save data:	Stops calibration and save data

<u>**Note:**</u>

After installing the sofware and program won't open, please utilize following these steps:

1) Copy these three files: mscomm.srg, mscomm32.ocx, and mscomm32.dep from the folder to C:/Windows/system32 path below

2) Click "Start", then "run" : regsvr32 mscomm32.ocx

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Protocol:

1. DATA FRAME FORMAT: (8 bits date, 1 bit stop, No check, Default baud rate 9600)

Identifier (1byte)	Date Length (1byte)	Address code (1byte)	Command word (1byte)	Date domain	Check sum (1byte)
68					

Identifier: Fixed68H

Data length: From data length to check sum (including check sum) length
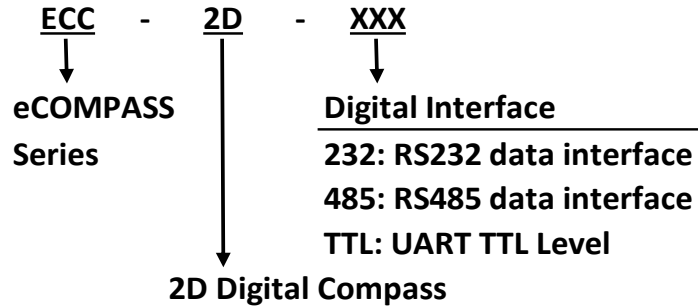
Address code: Accumulating module address, Default :00

Date domain will be changed according to the content and length of command word

Check sum: Data length、Address code、Command word and data domain sum, No carry.

2. COMMAND word analysis

Desc.	Meaning/Example	Description
0X08	**Start calibration command** *68 04 00 08 0C*	Data domain (0byte) No Data domain command
0X88	Sensor answer reply E.g: **68 05 00 88 00 8D**	Data domain (1byte) Data domain in the number means the sensor response result 00 Start success FF Start failure
0X0A	**Save calibration command** *68 05 00 8A 00 8F*	Data domain (0byte) No Data domain command
0X8A	Sensor answer reply command E.g.: **68 05 00 8A 00 8F**	Data domain (1byte) Data domain in the number means the sensor response result 00 Success FF Failure
0X0B	**Setting communication baud rate command** *68 05 00 0B 02 12*	Data domain (1byte) Baud rate: default :9600 00 means 2400 01 means 4800 02 means 9600 03 means 19200 04 means 38400 05 means 115200
0X8B	Sensor answer reply command E.g.: **68 05 00 8B 00 90**	Data domain (1byte) Data domain in the number means the sensor response result 00 Success FF Failure
0X0F	**Setting module address command** *68 05 00 0F 01 15*	Data domain (1byte) XX module address, address from 00 to EF range Note: Our products have a unified address: **FF, if forgot the set address when operating, can use the FF address to operate the product, still normal response.**
0X8F	Sensor answer reply command E.g.: **68 05 00 8F 94**	Data domain (1byte) Data domain in the number means the sensor response result 00 Success FF Failure
0X0C	**Setting angle output mode** *68 05 00 0C 00 11*	Data domain (1byte) 00：answer reply mode 01：Auto output mode Default: answer reply mode
0X8C	Sensor answer reply command E.g:**68 05 00 8C 00 91**	Data domain (1byte), Data domain in the number means the sensor response result 00 Success FF Failure

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HOW TO ORDER

```
ECC    -    2D    -    XXX
 |           |          |
 ↓           |          ↓
eCOMPASS     |      Digital Interface
Series       |      232: RS232 data interface
             |      485: RS485 data interface
             |      TTL: UART TTL Level
             ↓
       2D Digital Compass
```

Model: ECC-2D-RS485
Description: ECC Series, eCOMPASS Electronic Compass, RS485
Digital Interface.