

PRODUCT DEBUGGING SOFTWARE

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					

Date format:hexadecimal

Identifier:Fixed68H

Data length:From data length to check sum(including check sum)length

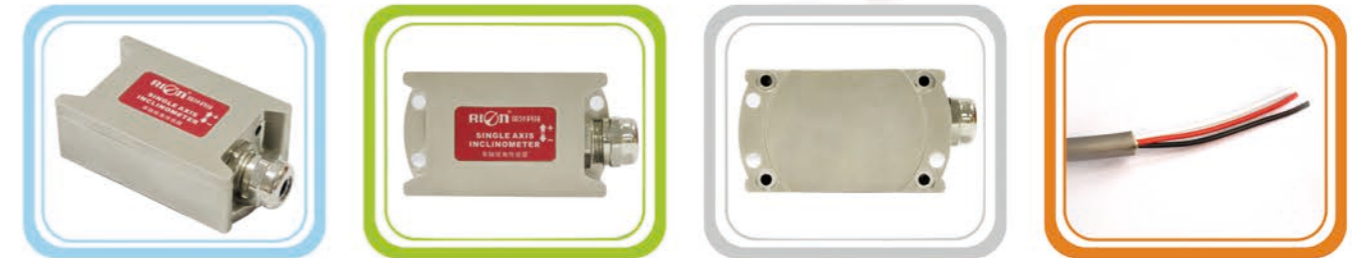
Address code:acquisition module addressDefault :00

Data field will vary with content and length of command word

Check sum:sum of Data length,Address code,Command word and data field, not include identifier.

2.COMMAND WORD ANALYSIS

Desc	Meaning/Example	Description
0X04	Read angle command at the same time E.g : 68 04 00 04 08	Data domain(0byte) No Data domain command
0X84	Sensor respond E.g: 68 0A 00 84 00 20 10 10 05 20 F3	Data domain (6byte) AAAB BB CC CD DD AAAB BB:3 character indicate X axis CC CD DD:3 character indicate Y axis Angle format analysis is as the same with X and Y axis The angle of the left example is X axis 020.1 deg, Y axis -05.2 degree
0X05	Setting relative/absolute ZERO : Can set the current angle to Zero degree, relative measurement, can also be set to absolute ex-factory zero, power off save E.g: 68 05 00 05 00 0A	Data domain(1byte) 00: absolute ZERO 01: relative ZERO
0X85	Sensor answer reply command E.g: 68 05 00 85 00 8A	Data domain(1byte) Data domain in the number means the sensor response results 00 Setting successfully FF Setting failure
0X0B	Setting communication rate E.g: 68 05 00 0B 03 13 The command setting is effective after power off then restart (power off with save function)	Data domain(1byte) Baud rate: 00 means 2400 01 means 4800 02 means 9600 03 means 19200,04 means 38400, default value is :9600.
0X8B	Sensor answer reply command E.G:68 05 00 8B 90	Data domain(1byte) Data domain in the number means the sensor response results 00 Success FF Failure
0X0C	Setting sensor output mode Response mode; Need upper computer send reading angle command , the sensor answer the corresponding angle Automatic output mode: The sensor with power on can Automatically output X angle , output frequency is 20HZ (Power off with save function) E.g: 68 05 00 0C 00 11	Data domain(1byte)factory default value:00 00 Answer reply mode 01 5Hz automatical output mode 02 15Hz automatical output mode 03 20Hz automatical output mode
0X8C	The sensor answer reply command E.g: 68 05 00 8C 00 91	Data domain(1byte) Data domain in the number means the sensor response results 00 Success FF Failure
0X0F	Setting module address command The sensor default address is 00, 1, such as a plurality of sensor to be connected with a bus cable, E.g RS485.requires each sensor is set to a different address, in order to achieve control and response angle . 2, If successfully changed the new address, follow all of the commands and responding Packet address code has to switch to the new address code which already changed then to be effective, otherwise the sensor will not respond to commands. (power off with save function) E.g: 68 05 00 0F 01 15 Setting the address to 01 68 05 FF 0F 00 13 Use the common addre	Data domain (1byte)XX Module address Address from 00 to EF range Note: All products have a common address :FF, If forget the address what has been set during operation , can use FF address to operate the product can still normally respond
0X8F	The sensor answer reply command E.g: 68 05 00 8F 94	Data domain(1byte), Data domain in the number means the sensor response results 00 Success FF Failure
0X0D	Query relative/absolute ZERO Used to query the sensor current ZERO mode is relative ZERO or absolute ZERO E.g : 68 04 00 0D 11	Data domain(0byte) No data domain commands
0X8D	The sensor answer reply command E.g:68 05 00 8D 00 92	Data domain (1byte), Data domain in the number means the sensor response results 00 Absolute ZERO 01 Relative ZERO



Description

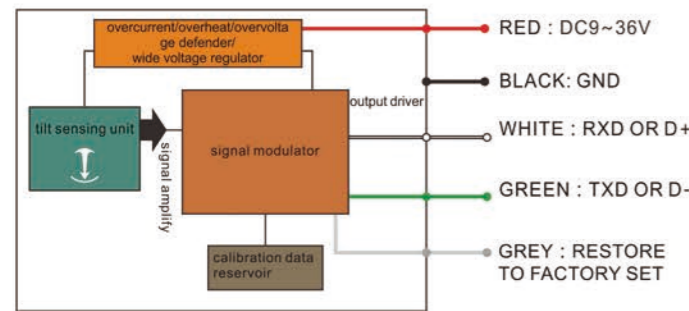
MCA416Inclinometersensor,developedbyRIONtechnology, is a new low cost full posture tilt measurement product. the newest anti-interference design was adopted. new MEMS sensor was integrated. wide working temperature, good performance in anti-shock. long-term reliable work life as long as 10 years.

This product adopts the non-contact measuring principle, can output real-time current attitude angle, simple to use, no need to find the relative variation of the two surface for mounting. It is a ideal choice for Industrial automation control and platform measuring attitude !

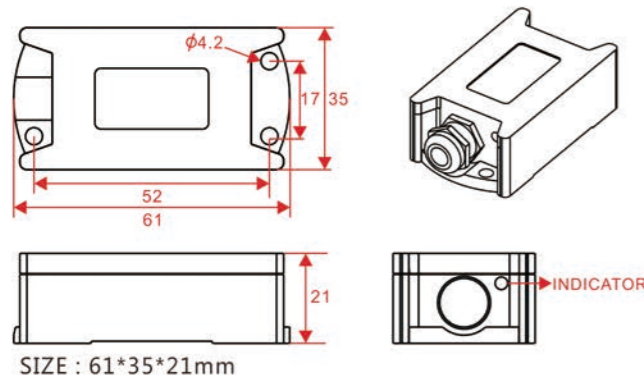
Features

- resolution:0.1°
- output: 4~20mA
- six installation methods
- power supply: 9~36V
- zero set function
- work temperature:40~+85°C
- IP67
- high anti-0shock>3500g

System diagram



Dimension



Usage

- 1, the working principle is sensing gravity of earth, when installation, the sensing axis of the sensor should be parallel with the tilt axis of measured object to achieve the best accuracy. the install surface of the measured object must be flat, stable, contact close, error may be caused if the installation surface is not even.
- 2, any side of the six sides of the sensor could be as the installation side. After installation, set current position as zero position by the zero set function, (at the same time, the installation way is set as well, the set value is stored in reservoir of the sensor. After zero set, the sensor will work and regard the current position as zero position). set steps as below:
short circuit set line(grey) and GND(black) for 3 second above, the power indicator will shut off at the same time, unbind set line after power indicator flicker again, zero set finished, indicator will back to normally on status.
- 3, the protection class is Ip66, rain or water spray would not affect its proper work, please do not soak it under water for long time in case inner circuit would be damaged, damage caused by which is beyond warranty service
- 4, after installation, please do not short-circuit signal wire and power+ in case of damaging output circuit. the signal- and power- is shared by the same wire, so please connect acquisition signal- end to the power-.

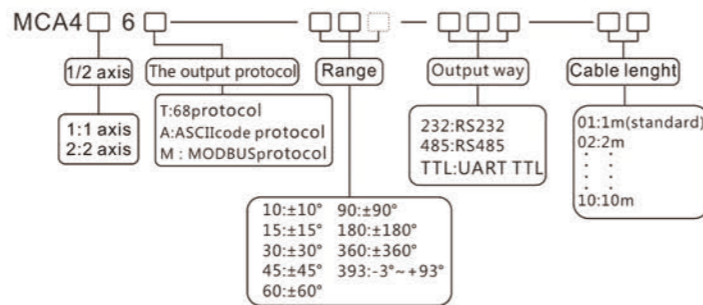
Application

- agricultural machinery
- lifting machinery
- crane
- aerial platform
- solar tracking system
- medical equipment
- electric vehicle control

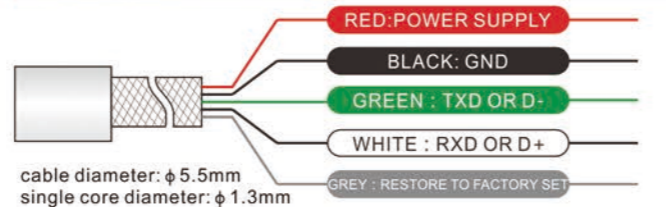
Parameters

Item	Conditions	≤±30°	≤±60°	≤±90°	≤±360°	Unit
Resolution		0.1	0.1	0.1	0.1	°
Accuracy	25°C	±0.2	±0.3	±0.5	±0.6	°
Response time		0.05	0.05	0.05	0.05	S
Temperature drift	-5 ~ 55°C	±0.5	±0.5	±0.5	±0.5	°
	-25 ~ 70°C	±0.7	±0.7	±0.7	±0.7	°
	-40 ~ 85°C	±0.8	±0.8	±0.8	±0.8	°
Output load		>500 ohm				
Working time		50000 hours/time(no fault)				
Insulation resistance		>100 ohm				
Anti-shock		10grms, 10~1000Hz				
Impact resistance		100g@11ms,times/axis(half sinusoid)				
Weight		60g				
Certificate		CE;FCC;CCC;				
Production standard		GB/T 191 SJ 20873-2003 tilt sensor,level sensor general specification				
Quality system		ISO9001:2008 standard(certificate No.:128101)				

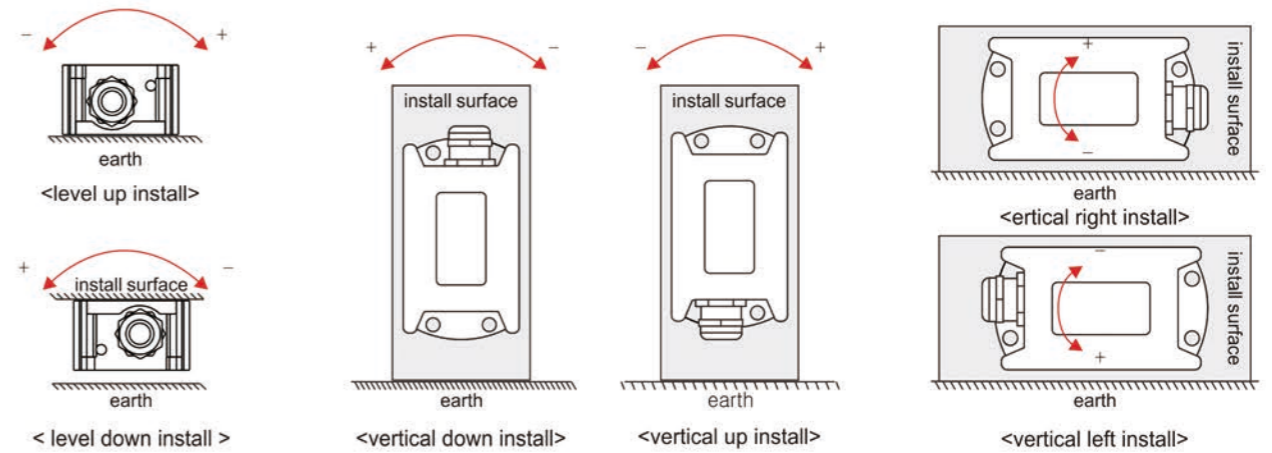
Order guide



Connection



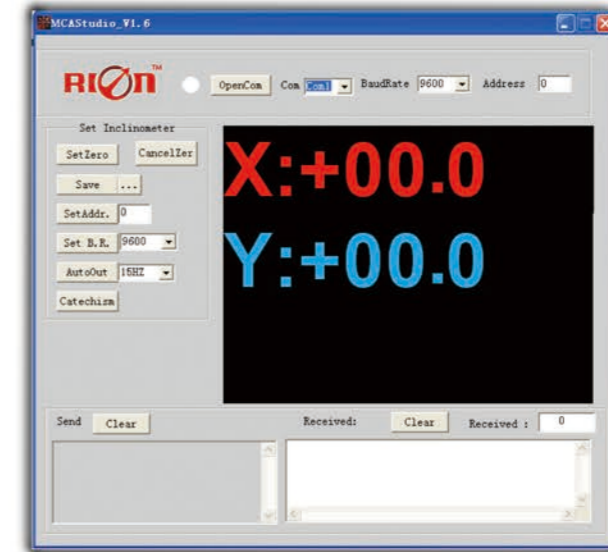
Installation way



Note:factory default intallation is level up,if other installation needed,please refer to clause 2 to set.

Product output characteristics

Can be downloaded from the website of the rifen official website to download the Angle debugging software for the preliminary Angle debugging, also can download the public version of the public version of the serial assistant debugging software!



- Open/Close** : Open/close com port
- Com** : Choose com port to equipment
- Address** : Input current address code of sensor, default as 00
- Set Address** : Set sensor's address code, input desired address code in input box on the right, click SetAddr.
- Save Data** : Store data, click it to sore angle value synchronously, document is stored in the file C:....COMDATA
- Set Zero** : Set relative zero, could set current position as 00.00 degree;
- Cancel Zero** : Cancle relative zero, and restore absolute angle measure;
- Baud Rate** : Choose baud rate, default value is 9600;
- Set Baud Rate**: Set baud rate, choose right baud rate, and click Set B.R;
- Auto Output** : Switch to automatic output mode, under which mode, different output rate can be input;
- Catechism** : Switch to question answer mode;

Note: after the software installed, if can not open it, please follow the instruction below(by administrator's ID)

- 1, Copy the three file in the pacake:copy to
- 2, click start-run...it will indicate success if installation complete