

USER MANUAL BWT61CL

Bluetooth 2.0 Inclinator Sensor



Tutorial Link

[Google Drive](#)

Link to instructions DEMO:

[WITMOTION Youtube Channel](#)

[BWT61CL Playlist](#)

If you have technical problems or cannot find the information that you need in the provided documents, please contact our support team. Our engineering team is committed to providing the required support necessary to ensure that you are successful with the operation of our AHRS sensors.

Contact

[Technical Support Contact Info](#)

Application

- AGV Truck
- Platform Stability
- Auto Safety System
- 3D Virtual Reality
- Industrial Control
- Robot
- Car Navigation
- UAV
- Truck-mounted Satellite Antenna Equipment

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1 Introduction

The BWT61CL is a multi-sensor device detecting acceleration, angular velocity and angle . The robust housing and the small outline makes it perfectly suitable for industrial retrofit applications such as condition monitoring and predictive maintenance. Configuring the device enables the customer to address a broad variety of use cases by interpreting the sensor data by smart algorithms.

BWT61CL's scientific name is AHRS IMU sensor. A sensor measures 3-axis angle, angular velocity, acceleration. Its strength lies in the algorithm which can calculate three-axis angle accurately.

BWT61CL is an CE standard accelerometer. It is employed where the highest measurement accuracy is required. BWT61CL offers several advantages over competing sensor:

- Heated for best data availability: new WITMOTION patented zero-bias automatic detection calibration algorithm outperforms traditional accelerometer sensor
- High precision Roll Pitch Yaw (X Y Z-axis) Acceleration + Angular Velocity + Angle
- Low cost of ownership: remote diagnostics and lifetime technical support by WITMOTION service team
- Developed tutorial: providing manual, datasheet, Demo video, free software for Windows computer, APP for Android smartphones
- WITMOTION sensors have been praised by thousands of engineers as a recommended attitude measurement solution

1.1 Warning Statement

- Putting more than 5 Volt across the sensor wiring of the main power supply can lead to permanent damage to the sensor.
- For proper instrument grounding: use WITMOTION with its original factory-made cable or accessories.
- Do not access the I2C interface.
- Do not change the baud rate because WITMOTION BLUETOOTH sensor's baud rate (Default 115200) is fixed.

1.2 LED Status

LED	Status	Remark
Red	Flashing	Charging
Blue	Flashing	Pairing process
	Keeping still	Successful pairing

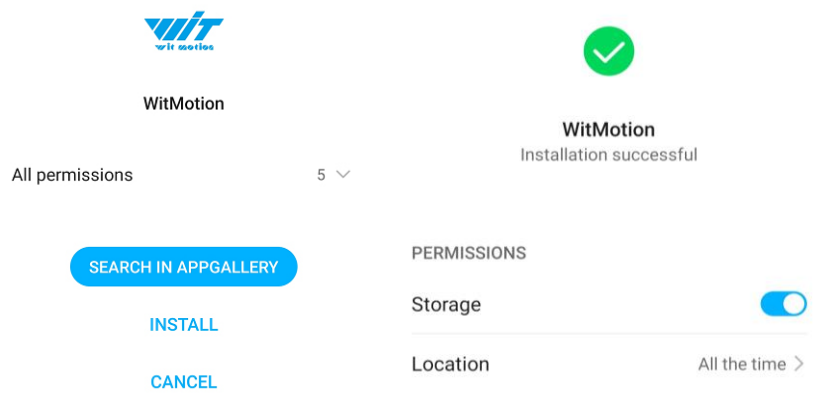
2 Use Instructions with Android Phone

For APP configuration introduction, please referring to the link.

https://drive.google.com/file/d/122Es4QPLi5R-O4TjN43FMFRcaNK9eSY8/view?usp=share_link

2.1 APP Installation

Install the APK file, give permission of Location and Storage



[WITMOTION 2023v New Android APP](#)

Link to check the tutorial video.

https://youtube.com/playlist?list=PL43tdDrVL_VC4njMairdwhH-O-AVWECvSs

My Drive > WITMOTION Document Center > Software, APP, Protocol,...				
Name	Owner	Last modified	File size	
WITMOTION PROTOCOL	me	Dec 22, 2022 me	—	
Software	me	Apr 19, 2023 me	—	
Sample Codes (SDK)	me	Apr 19, 2023 me	—	
Android APP(for WT901BLECL,WT901IDCL,BWT61CL,BWT901CL only)	me	Apr 20, 2023 me	—	

About Android APP:

1. It is required to allow for application positioning (Always allowed), and turn on the positioning function and Bluetooth.

Note: Paired devices can be searched without turning on positioning, but according to Google's requirements, if APP installed on a higher version of Android (6.0) mobile phone is paired with a Bluetooth device, positioning must be allowed when using Bluetooth at the same time.

2. After turning on Bluetooth, it takes about one minute to search for authorization to find Bluetooth.

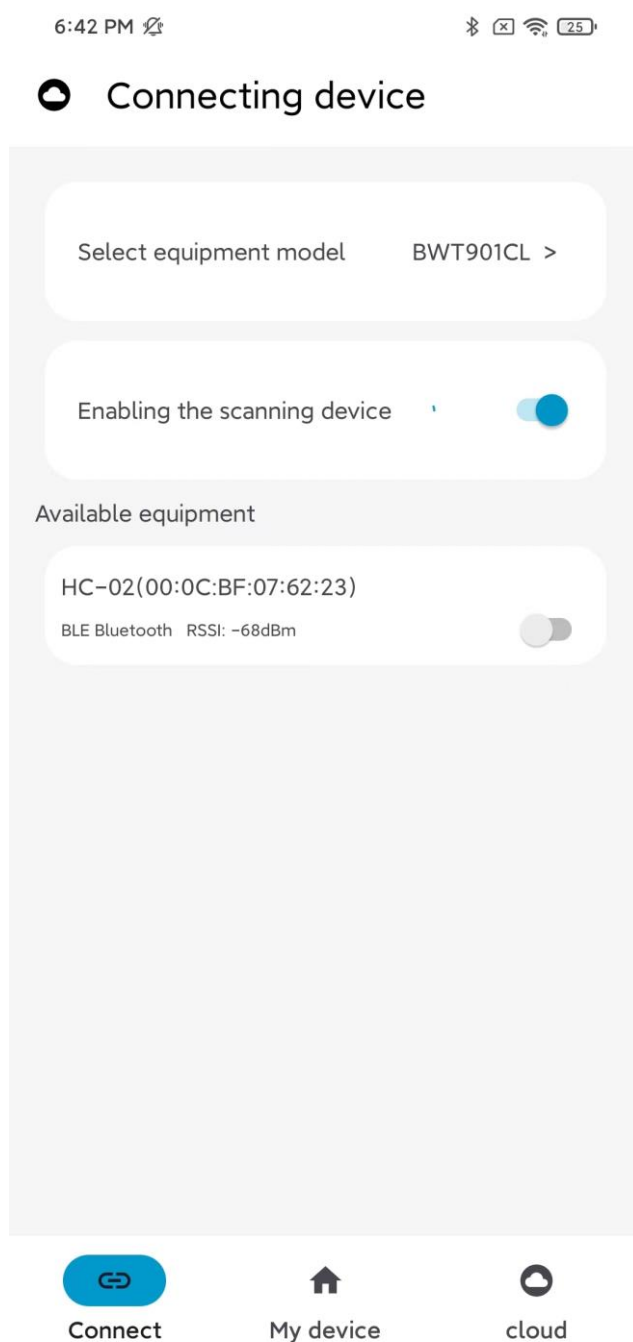
BWT61CL | manual V23-0603 | www.wit-motion.com

2.2 Connection

2.2.1 APP Pairing

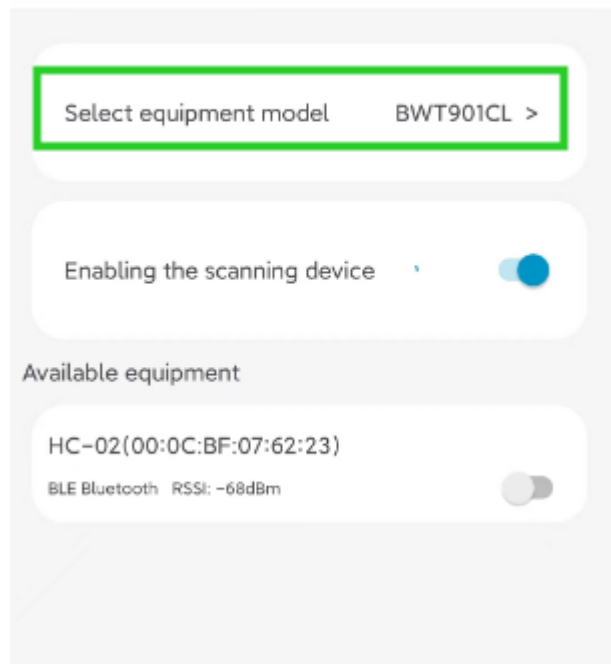
Step 1. Install the APK file, give permission of Location and Storage

Step 2. Open APP and click "Connect"

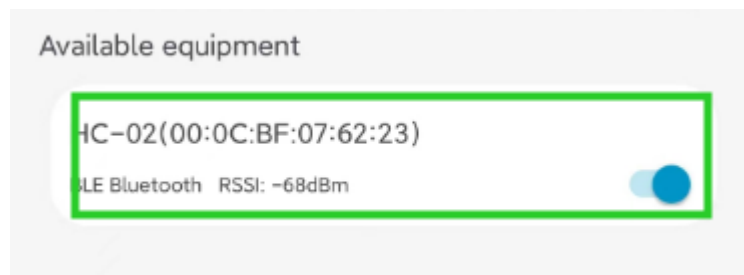


Step 3. Turn on the sensor, select “BWT901CL” and then scan the device.

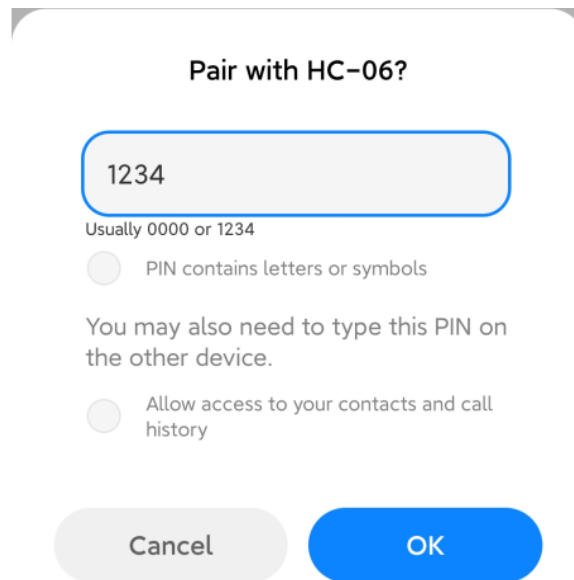
Connecting device



Note: The device will show as “HC-02”+“MAC address”



Step 4. Input password "1234" to pair with “HC-06”, then click "OK".

A screenshot of a mobile app's pairing screen. At the top, the text 'Pair with HC-06?' is centered. Below it is a rounded rectangular input field containing the number '1234'. Under the input field, the text 'Usually 0000 or 1234' is displayed. There are two radio buttons below this text. The first radio button is selected and is followed by the text 'PIN contains letters or symbols'. The second radio button is unselected and is followed by the text 'Allow access to your contacts and call history'. Below the radio buttons, there is a line of text: 'You may also need to type this PIN on the other device.' At the bottom of the screen, there are two buttons: a grey 'Cancel' button on the left and a blue 'OK' button on the right.

Pair with HC-06?

1234

Usually 0000 or 1234

☒ PIN contains letters or symbols

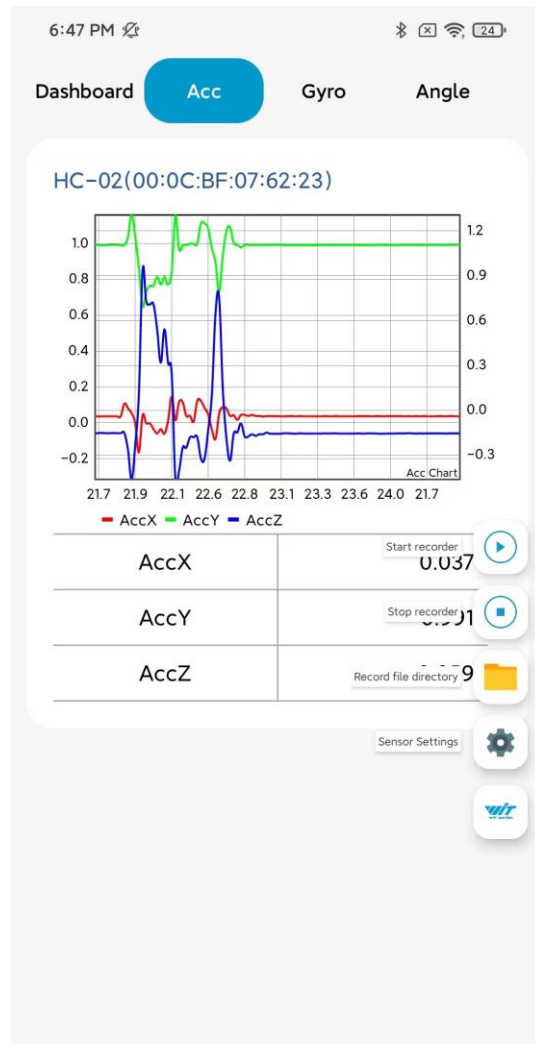
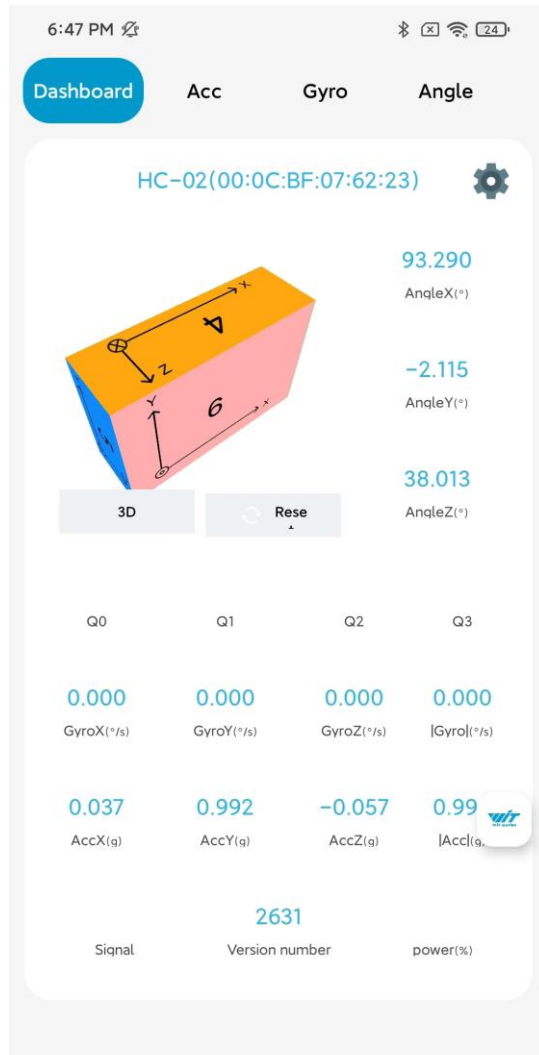
☐ Allow access to your contacts and call history

You may also need to type this PIN on the other device.

Cancel OK

Step 5. When pairing is done, the blue LED light of the sensor will flash and keep about one second

After a few seconds, the data will show automatically.



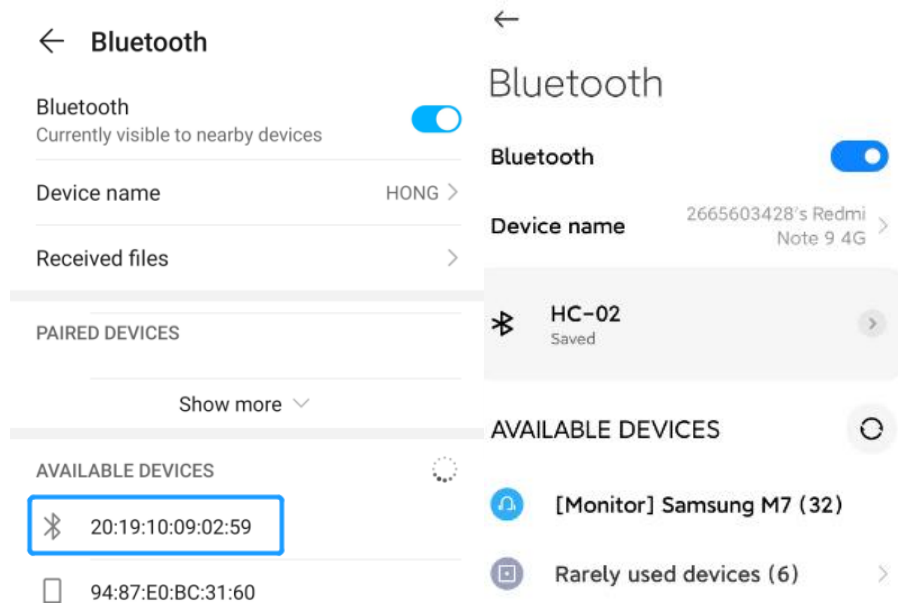
2.2.2 Phone's Bluetooth Pairing

Step 1. Install the APK file, give permission of Location and Storage

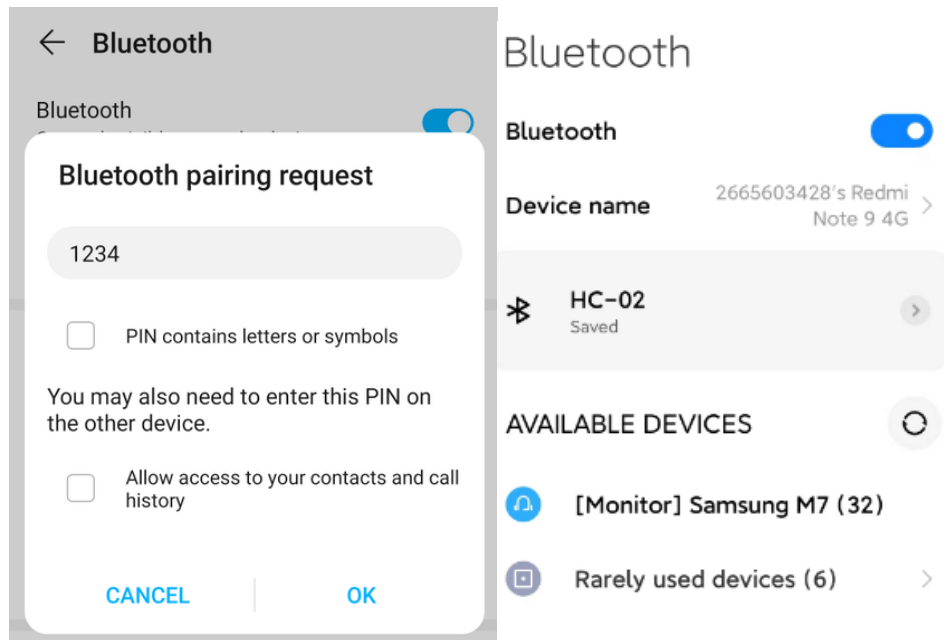
Step 2. Turn on the Bluetooth in the setting menu of smartphone

Step 3. Search the Bluetooth sensor

(First pairing the device will be recognize as mac address and will be shown as HC-02 after successful pairing.)



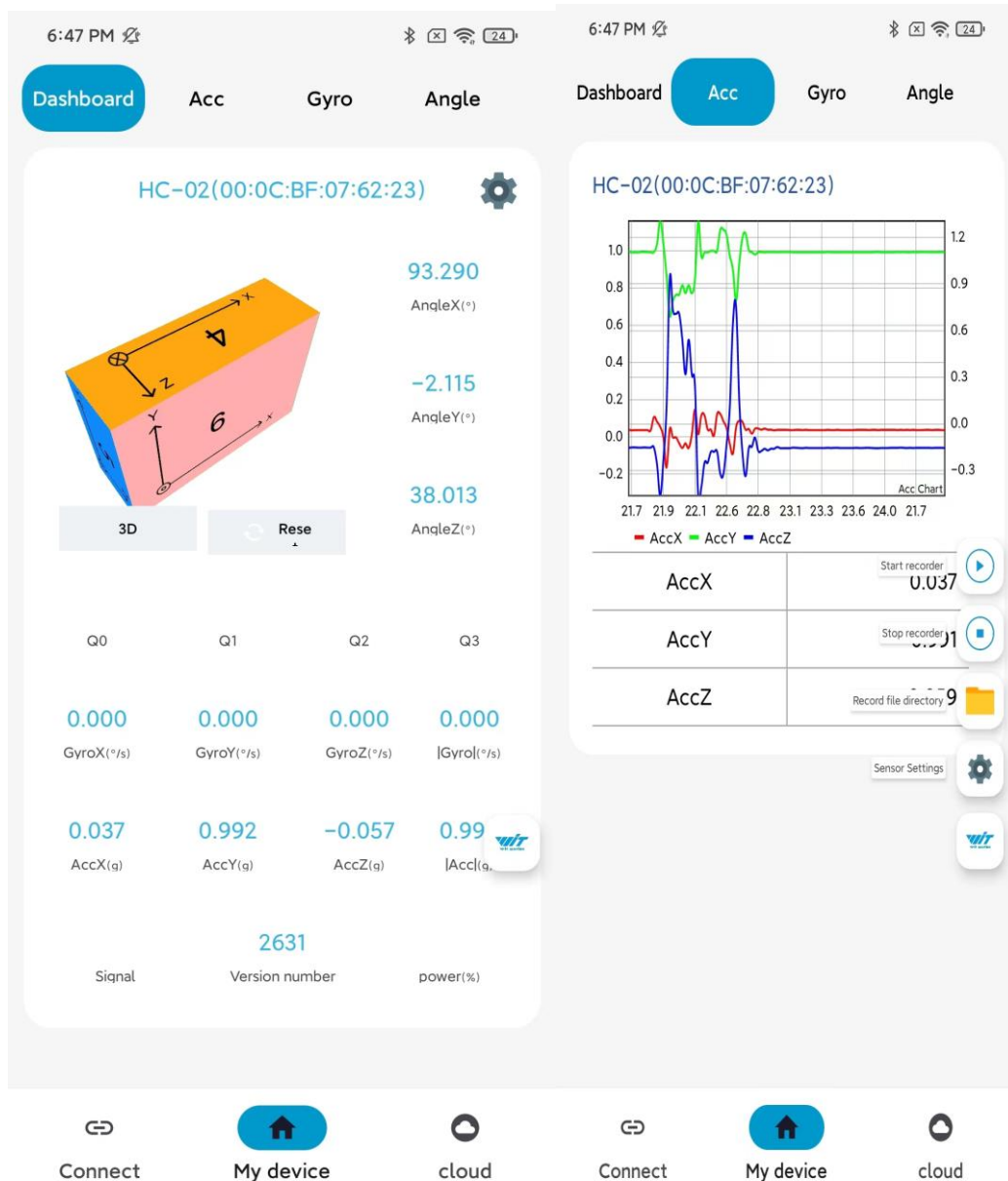
Step 4. Click the "MAC address" device and input the password "1234"



Step 5. Open the WITMOTION APP, and choose "BWT901CL"

Step 6. Click "Scan" and select the paired Bluetooth device "HC-02"
(No need to input password)

Step 7. The Blue LED light of sensor will keep on. Connection with APP is successful.



2.3 Calibration

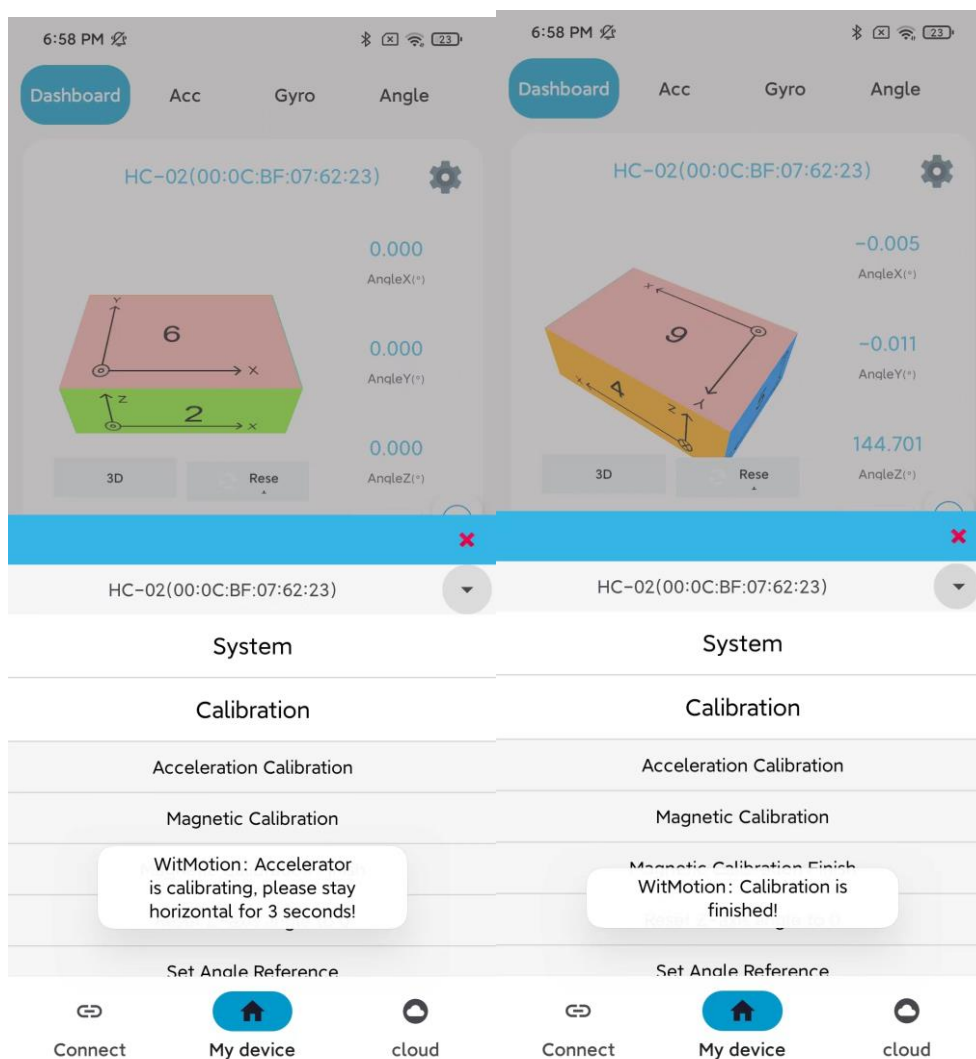
2.3.1 Acceleration Calibration

Step 1. Keep the module horizontally stationary

Step 2. Click the "Calibration" menu

Step 3. Click the "Acceleration Calibration" and wait for 3 seconds

Step 5. Check the result--confirm if there is 1g on Z-axis acceleration



2.4 Multi-connection

Link to the multi-connection video demo.

<https://youtu.be/f8jVw6EsgTM>

As with PC software, we recommend up to 4 devices multi-connection.

Below is the different phones' actual measure distance.

BD= Best distance; MD=Max distance

Phone	BWT61CL	Single device		Two devices	
		BD/m	MD/m	BD/m	MD/m
Samsung	Android 13		45m		
Honor	Android 12	29m	65m	23m	46m
Redmi	Android 10	11m	24m	12m	23m
vivo	Android 12	35m	67m	20m	30m
Oppo	Android 13	15m	37m	15m	36m
Xiaomi	Android 11	30m	50m		
iPhone	Ios16.4.1	14m	24m		
Lenovo	Android 11	105m	125m	82m	105m

3 Use Instructions with iPhone

The new version of iOS APP has been launched. There will be many function coming out soon in future.

NOTICE:

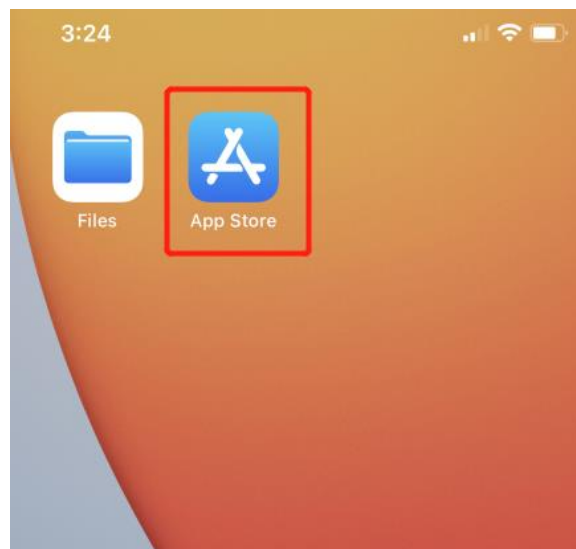
The existing function of history recording is in instructions at present.
Your understanding would be highly appreciated.

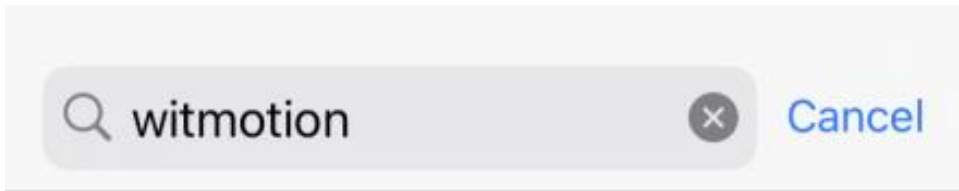
If you phone comes with txt reader, the recorded file can be easily opened.
A txt recorder like Micro Software.

https://www.youtube.com/playlist?list=PL43tdDrVL_VCgrQJTaODOhkkbmTkS1kMs

3.1 How to install

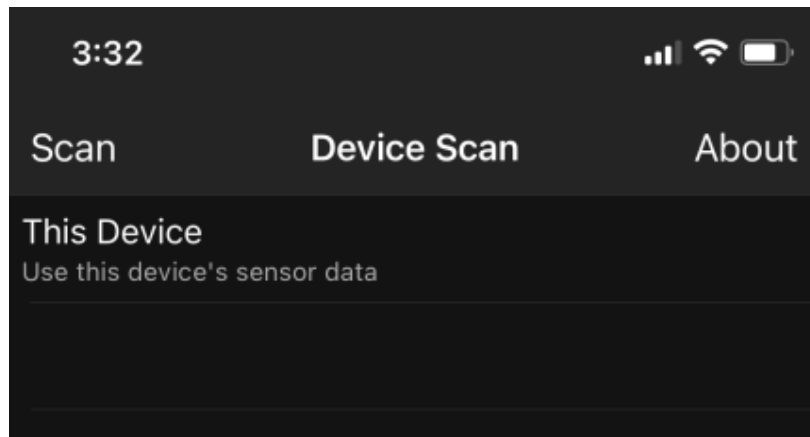
Step 1. Search "WITMOTION" on iOS App Store, and install the APP.



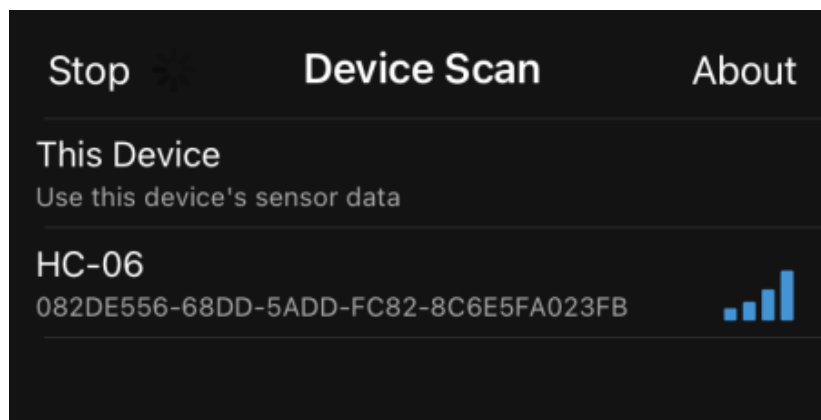


3.2 How to setup

Step 1. Turn on the sensor and then click "Scan"

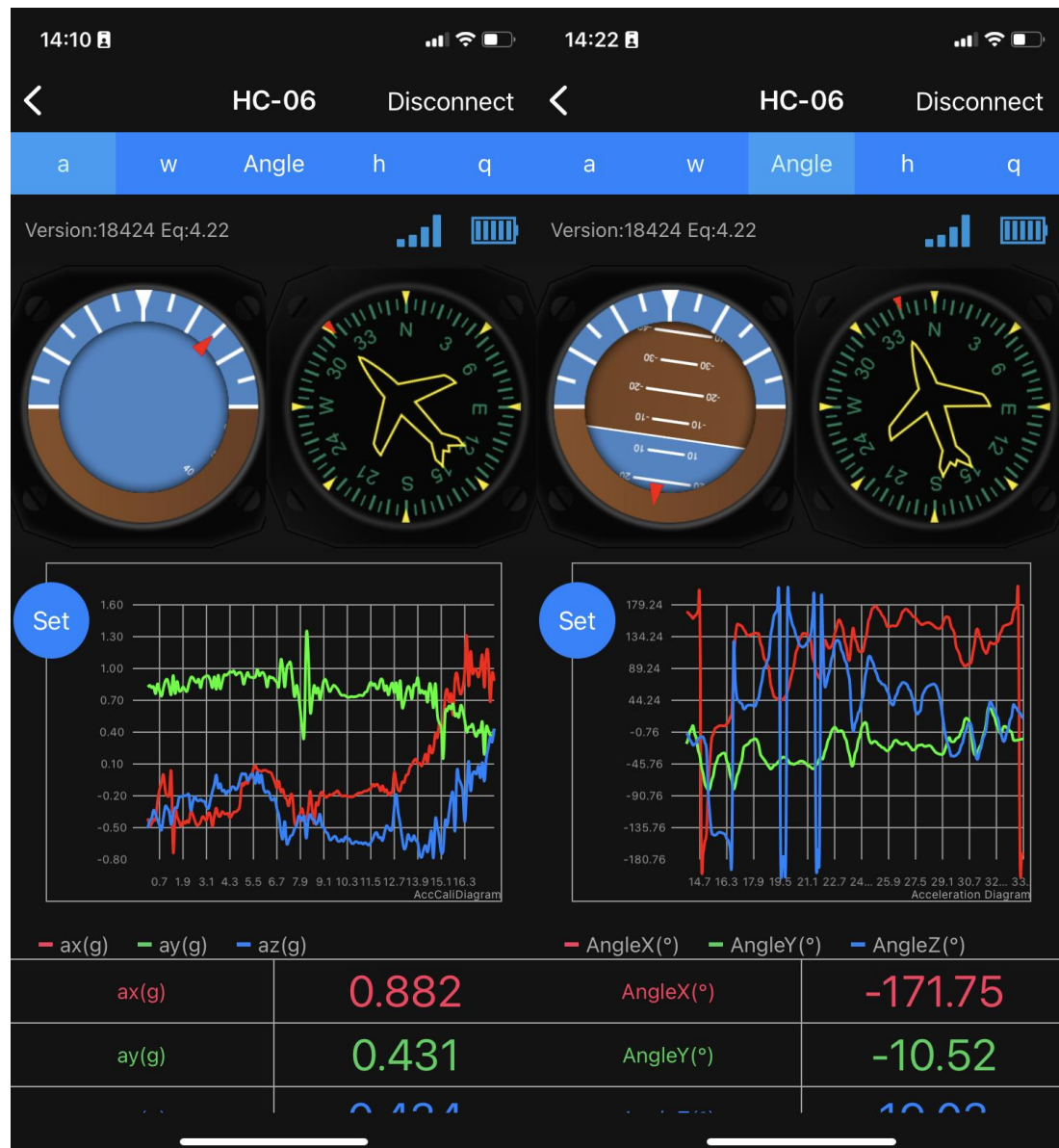


Sensor device ID will be recognized as HC-02
The second column is its SSID number.



Step 2. Select the device and the data will be online

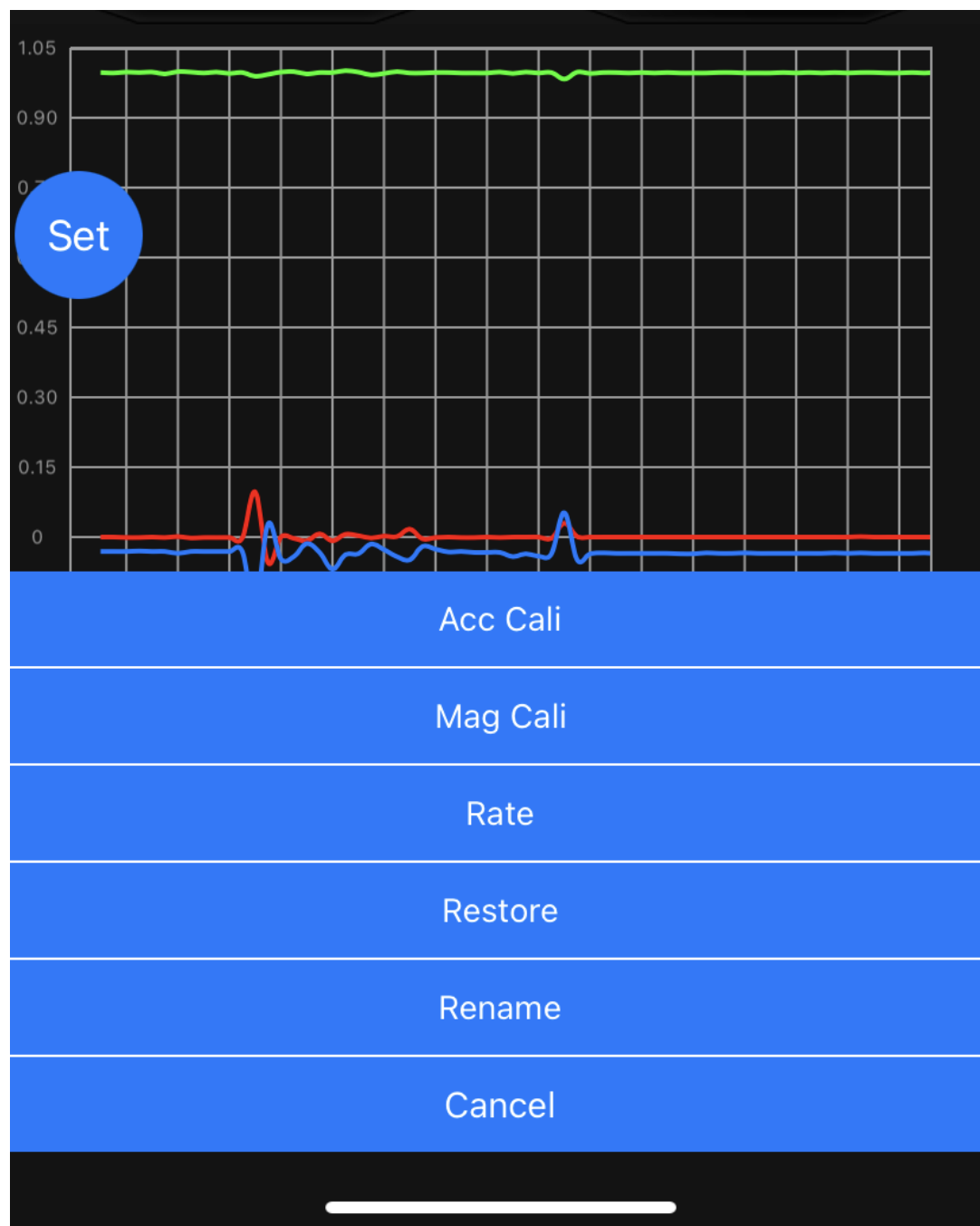
Demo: Angle data curve



3.3 How to configure

For menu setting and its introduction including button and functions setting, please referring to the Chapter 4.2.

Click the button of "SET", the menu will jump out automatically.



3.4 Data Recording

The data can be easily recorded by simply press the button of record.
 The recorded file can be txt format at present. You can send the record file to the computer and then paste the data to an excel file for intuitive reviewing.
 P.S If you meet any problem, please reach our team at support@wit-motion.com

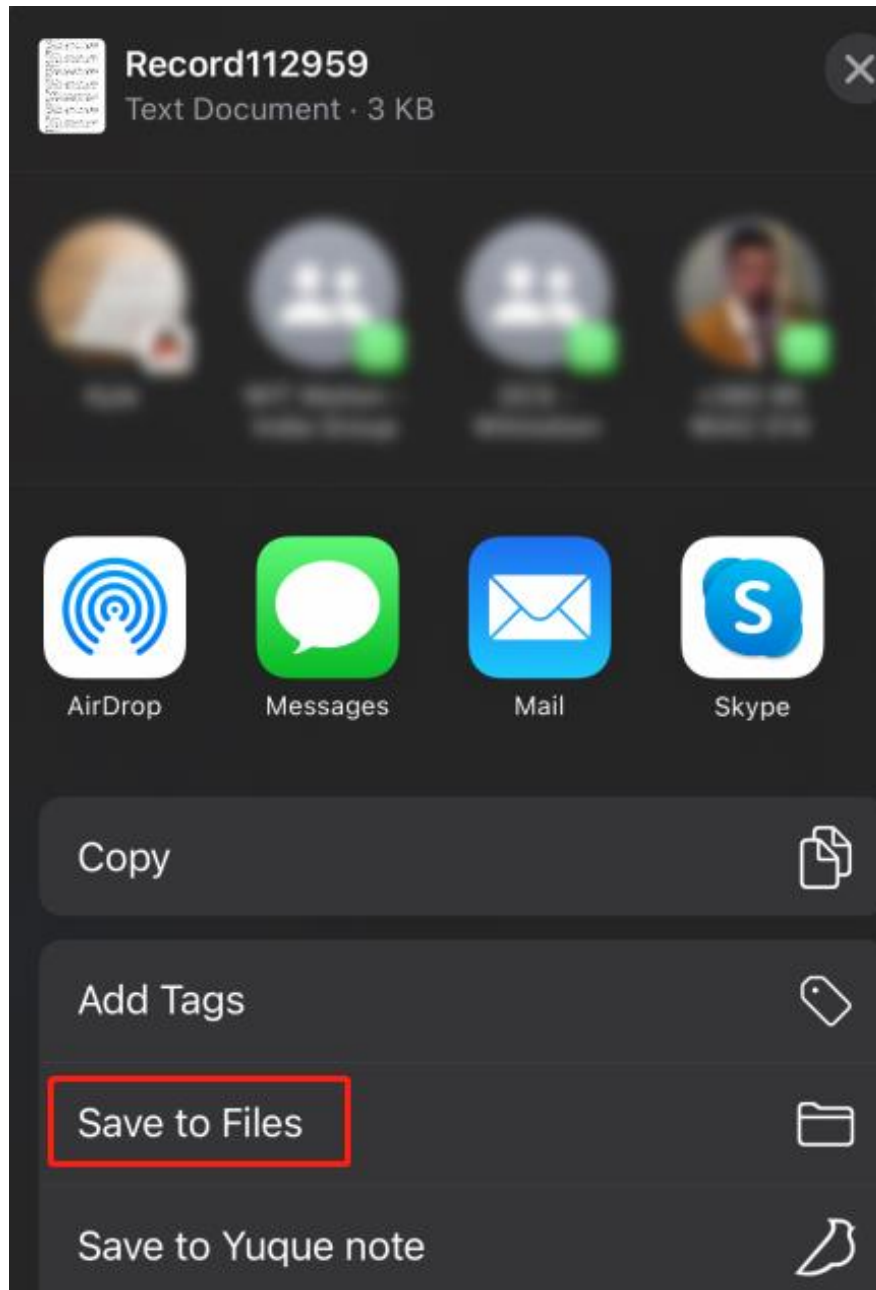
Step1. Click "Record"

Step2. When you finish the record, click "End".

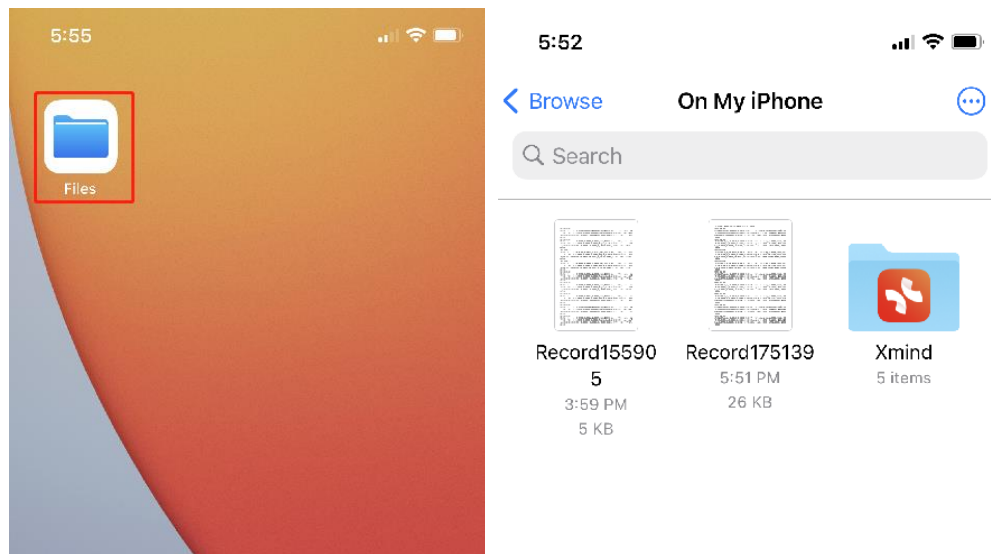


Step3. Once you finished the record, you need to save the file. We recommend you choose the button "Save to Files", the file will save the on your mobile desktop folder.

PS: We tried all saving methods and found this method to be convenient.



Step4. Come back to your mobile desktop, click the "Files", then you can check the records files.



Step 5. The file will show this format.

5:52

Done **Record175139 (2 of 2)**

```
,h,-4632.0000,-6725.0000,-1620.0000
2023-04-20
17:51:39.2,a,-0.0063,0.0015,1.0073,ver,18414,eq,4.0600,rs
si,-61,T,30.0700,w,0.0000,0.0000,0.0000,Angle,0.5768,-0.
1208,-145.4755,q,0.2967,0.0005,-0.0051,-0.9549,h,-4648
.0000,-6703.0000,-1601.0000
2023-04-20
17:51:39.2,a,-0.0068,0.0020,1.0088,ver,18414,eq,4.0600,r
ssi,-61,T,30.0700,w,0.0000,0.0000,0.0000,Angle,0.5823,-
0.1208,-145.4700,q,0.2968,0.0005,-0.0052,-0.9549,h,-46
44.0000,-6714.0000,-1587.0000
2023-04-20
17:51:39.3,a,-0.0054,0.0015,1.0088,ver,18414,eq,4.0600,rs
si,-61,T,30.0300,w,0.0000,0.0000,0.0000,Angle,0.5823,-0
.1208,-145.4590,q,0.2969,0.0005,-0.0052,-0.9549,h,-463
2.0000,-6706.0000,-1565.0000
2023-04-20
17:51:39.4,a,-0.0059,0.0024,1.0078,ver,18414,eq,4.0600,rs
si,-61,T,30.0700,w,0.0000,0.0000,0.0000,Angle,0.5823,-0.
1208,-145.4535,q,0.2969,0.0005,-0.0052,-0.9549,h,-463
7.0000,-6709.0000,-1566.0000
2023-04-20
```

4 Use Instructions with PC

4.1 Connection Method

PC software is only compatible with Windows system.

[BWT61CL Playlist](#)

4.1.1 TypeC-Cable Connection

Step 1. Connect the sensor with offered Type-Cable. Turn on the sensor and the blue light of the sensor flashes.

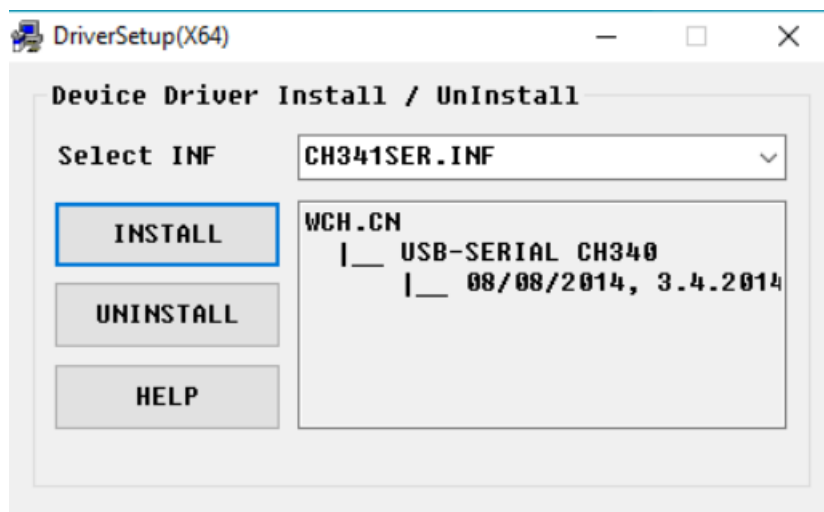
(Warm Reminder: If you wanna use a longer cable, it should be a standard Type-C data cable)

Step 2. Unzip the software and install the driver CH340


<https://drive.google.com/file/d/1I3hI9Thsj9aXfG6U-cQLpV9hC3bVEH2V/view?usp=sharing>

*How to Install and update the CH340 driver

Click the "Uninstall" button first. Then click on the "Install" button.



*How to verify your driver is working

1) To check that the CH340 enumerates to a COM port, you can open the device manager. You can click the **Start** or  (Windows) button and type "*device manager*" to quickly search for the application.



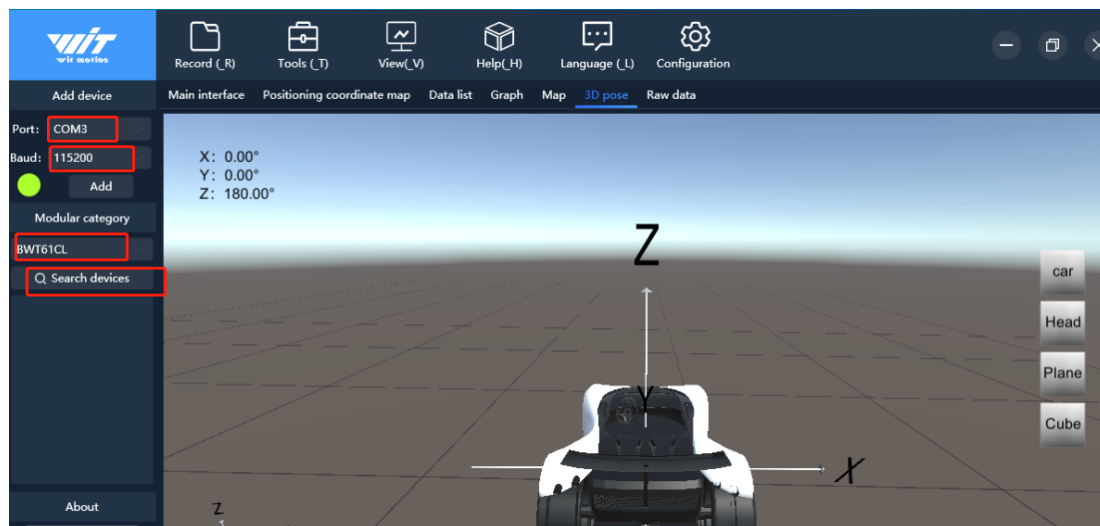
2) After opening the device manager, you will need to open the **Ports (COM & LPT)** tree. The CH340 should show up as **USB-SERIAL CH340 (COM##)**. Depending on your computer, the COM port may show up as a different number.



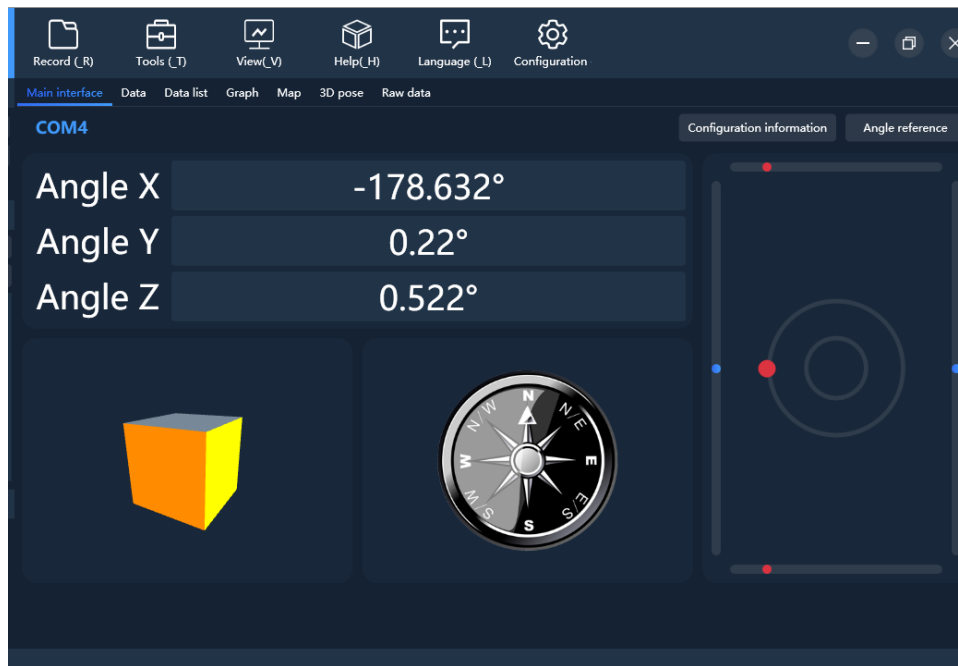
Step 3. Open the software(WitMotion.exe)

Name	Date modified	Type	Size
AutoUpdateApp	9/27/2022 9:39 AM	File folder	
Bin	1/2/2023 4:44 PM	File folder	
Config	11/5/2022 5:08 PM	File folder	
Plugins	1/6/2023 5:14 PM	File folder	
Record	11/15/2022 10:18 AM	File folder	
Temp	11/22/2022 4:40 PM	File folder	
Hit WitMotion.exe to open software.txt	7/25/2022 9:24 AM	文本文档	4 KB
WitMotion.exe	1/6/2023 5:12 PM	Application	773 KB
WitMotion.exe.config	8/17/2022 7:12 PM	CONFIG File	1 KB

Step 4. Choose the right "Port", Baud default 115200.enter the model name(BWT61CL), hit "Search devices".



Data will appear after auto-search finishes



Notice: If not successful, please operate manually
Choose the com port and baud rate 115200, data will be shown on the software.

4.1.2 USB-HID Connection

Step 1. Open the software(WitMotion.exe)

Name	Date modified	Type	Size
AutoUpdateApp	9/27/2022 9:39 AM	File folder	
Bin	1/2/2023 4:44 PM	File folder	
Config	11/5/2022 5:08 PM	File folder	
Plugins	1/6/2023 5:14 PM	File folder	
Record	11/15/2022 10:18 AM	File folder	
Temp	11/22/2022 4:40 PM	File folder	
Hit WitMotion.exe to open software.txt	7/25/2022 9:24 AM	文本文档	4 KB
WitMotion.exe	1/6/2023 5:12 PM	Application	773 KB
WitMotion.exe.config	8/17/2022 7:12 PM	CONFIG File	1 KB

Step 2. Insert the USB-HID adapter into the USB slot of the computer (the blue light of HID adapter flashes)



Step 3. Install the driver CH340 and confirm the “com port” in device manager

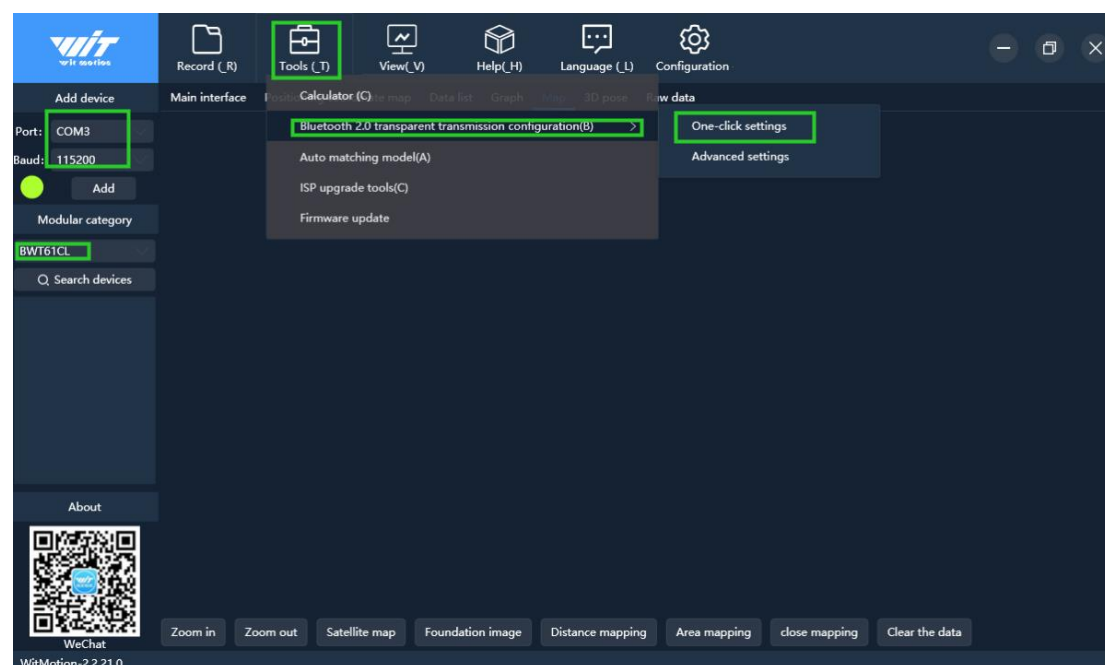
<https://drive.google.com/file/d/1I3hl9Thsj9aXfG6U-cQLpV9hC3bVEH2V/view?usp=sharing>

*How to Install and update the CH340 driver

Please kindly refer to Chapter 5.1.1 TypeC-Cable Connection, content of installing or updating CH340 driver

Step 4. Turn on the sensor and the blue light of the sensor flashes

Step 5. Open the software. The default baud rate is 115200. Choose the right Port, enter the purchased product model, then hit Tools<Transmission Configuration<One-click settings.

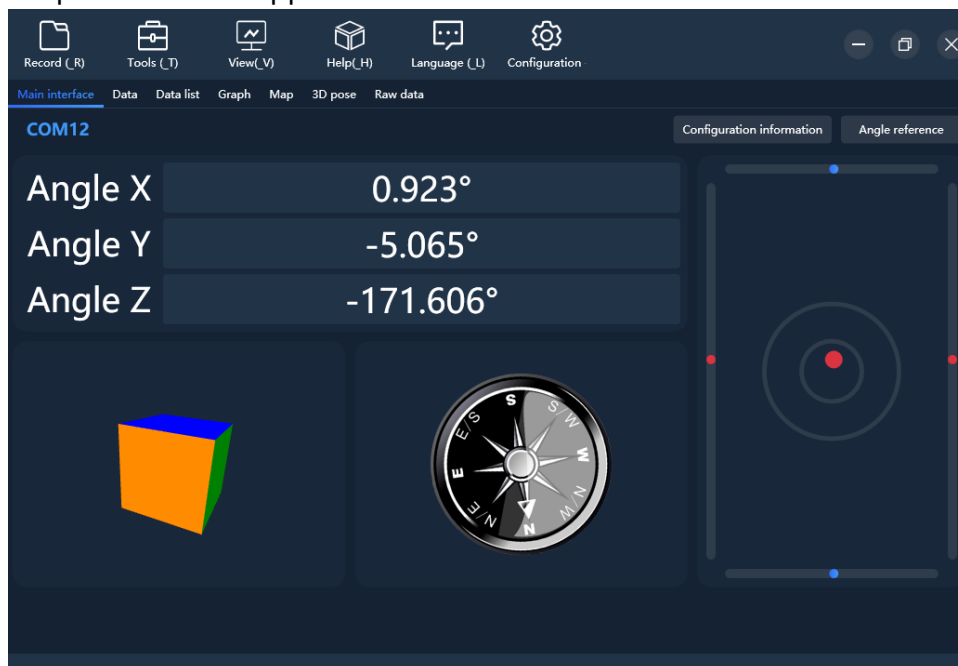


Step 6. the software will be set up unbinding automatically and search devices successfully (Bluetooth Pairing process)

Step 7. Wait till the sensor's blue LED light remains on--means pairing succeeded

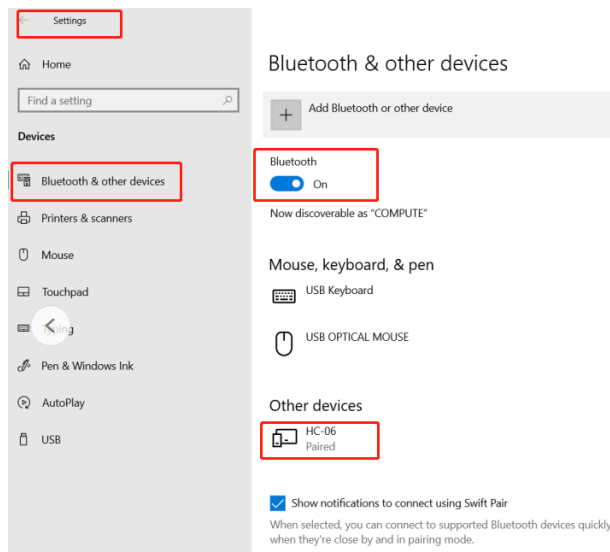


Step 8. Data will appear once the auto-search finishes



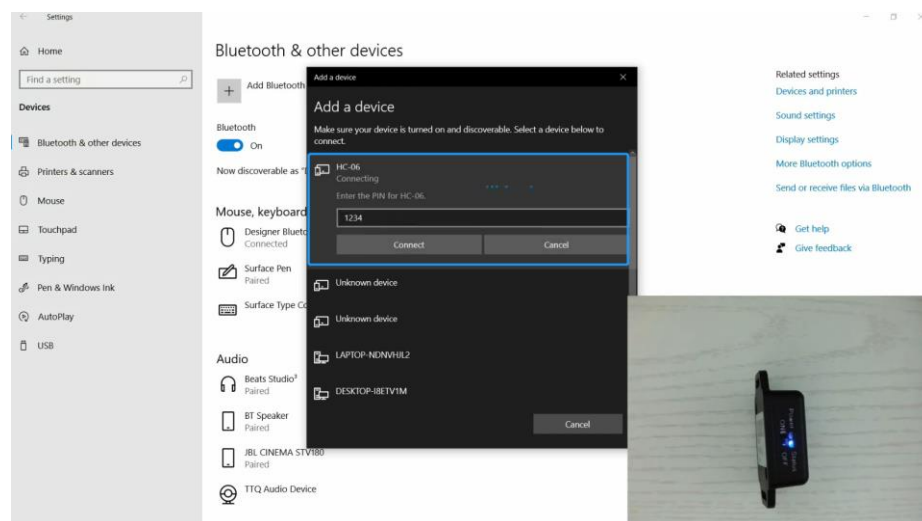
4.1.3 PC's Bluetooth Connection

Step 1. Turn on the computer's Bluetooth

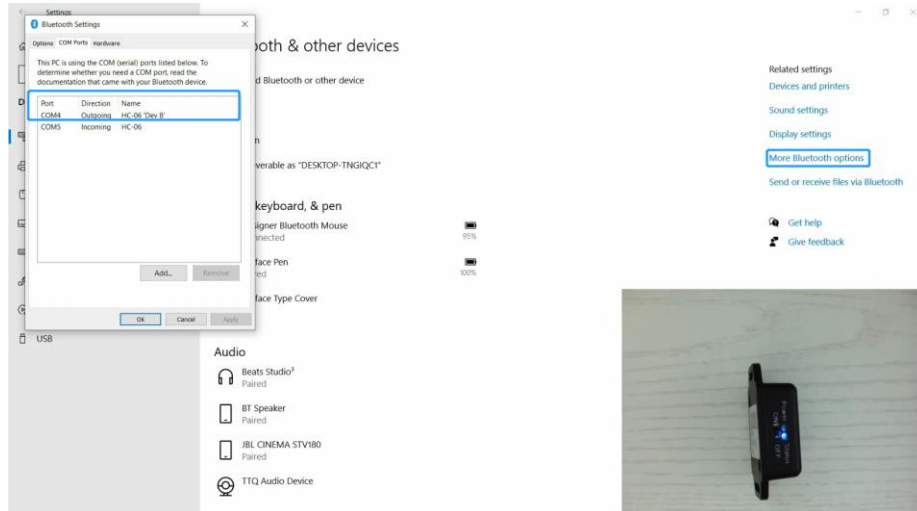


Step 2. Turn on the sensor

Step 3. Search HC-06/HC-02 device and input pairing password, 1234

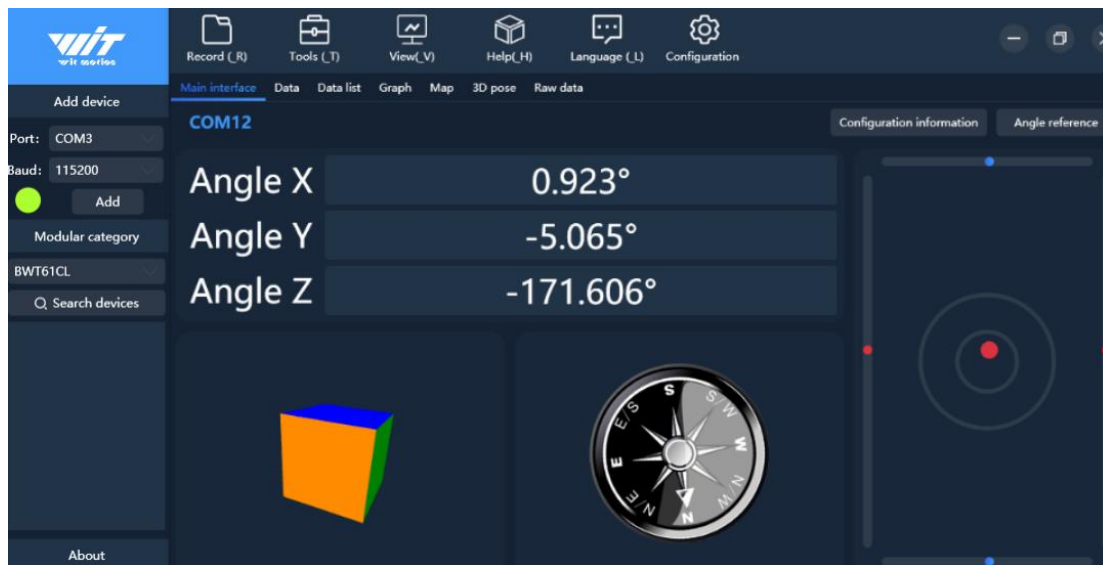


Step 4. Confirm the "outgoing com port" on "More Bluetooth Options" page



Step 5. Open software (WitMotion.exe) and choose the correct com port and keep the baud 115200.

Step 6. Data will appear once the automatic search finishes.



5 Instructions of 2023 New Software

In order to improve the user experience and our customer service, we develop a new version PC software.

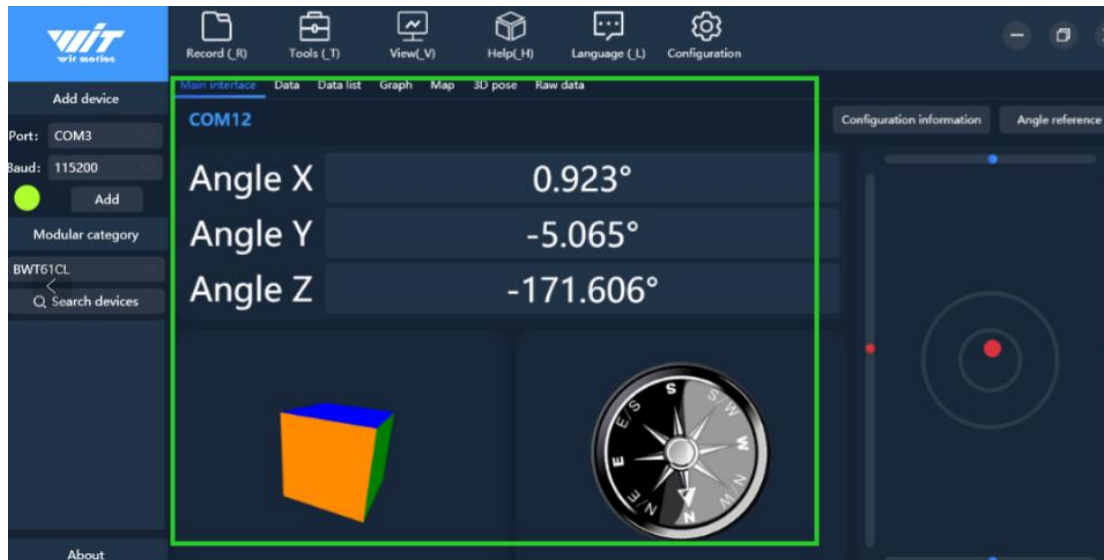
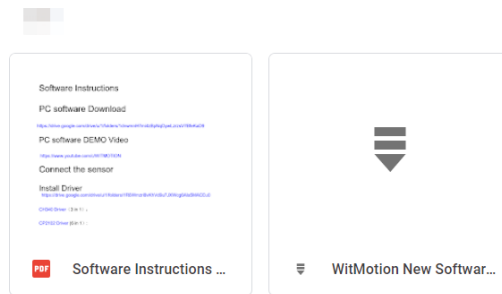
Link to check the PC Software connection video demo.

[Video demo](#)

Below is the new software and universal instruction download link.

https://drive.google.com/drive/folders/1dnwmnH7mi4zBpNqDyWLzrzsV7BfeKaD9?usp=share_link

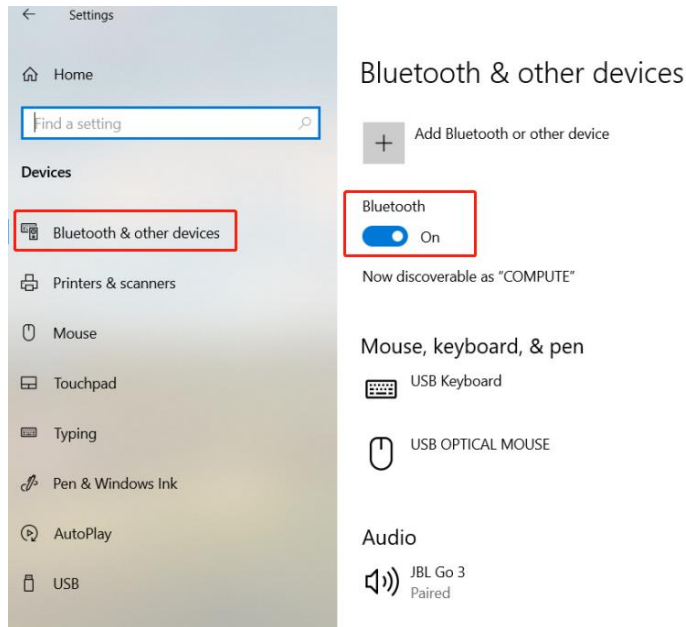
WITMOTION New Software(Universal)



6 Multiple-Connection Instructions

The BWT61CL can be connected via laptop's Bluetooth. It is required to use the WitMotion New Software. The maximum is up to 4 units in the same time via connection.

PS. It is required to turn on the laptop's Bluetooth.



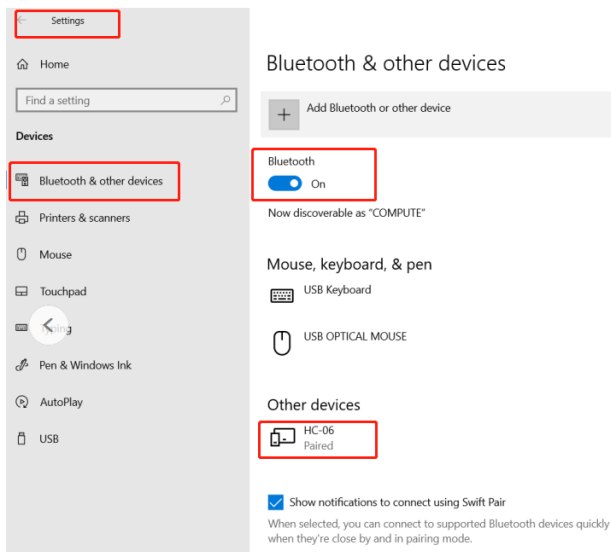
Because Bluetooth is limited, sometimes the data lag when you're using Bluetooth to multi-connect, and the Bluetooth range will be less. Of course, the different phone has a different range.

If you need longer Bluetooth range when multi-connection (up to 30m), please use our USB-HID adapter (refer to the chapter 4.1.2 USB-HID Connection)

6.1 Connection Instructions

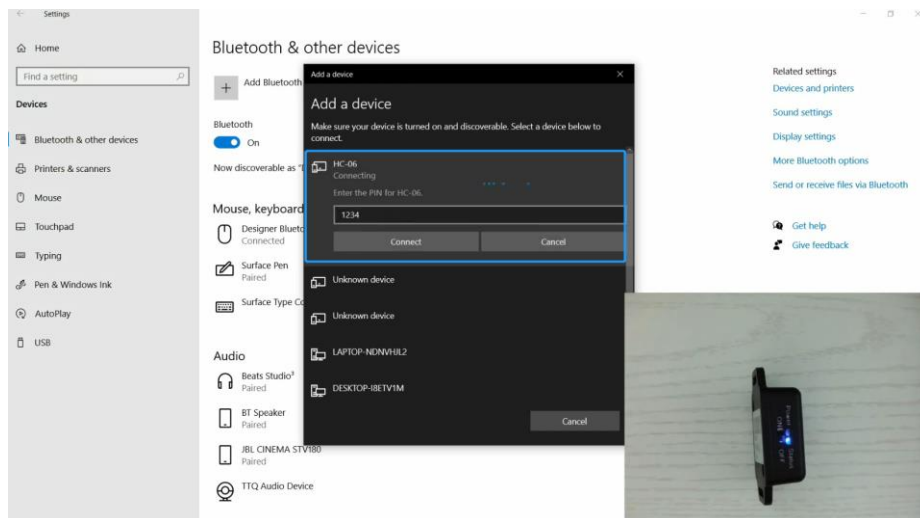
Step 1. Install WitMotion New Software ([Download link](#)).

Step 2. Turn on the computer's Bluetooth

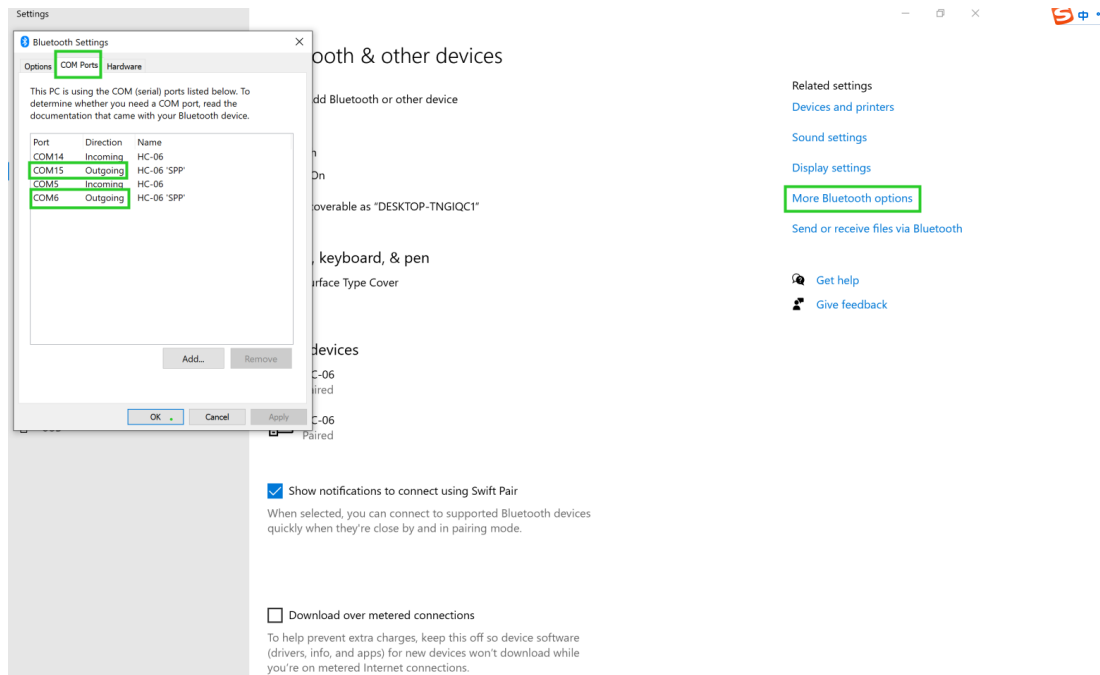


Step 3. Turn on the sensor

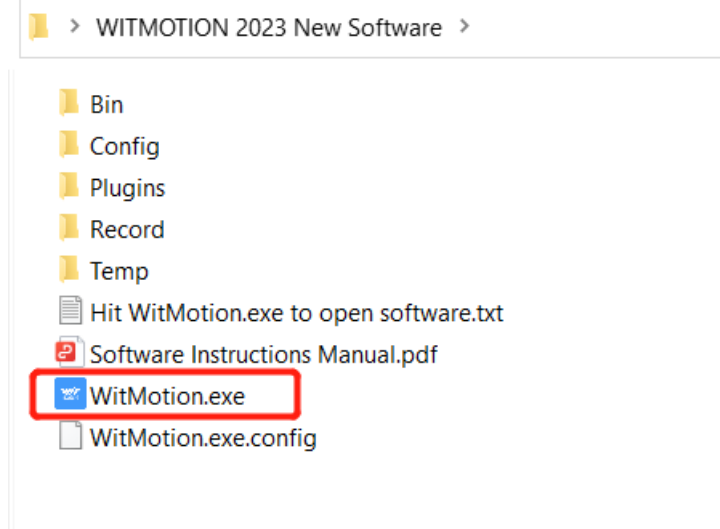
Step 4. Search HC-06 device and input pairing password, 1234



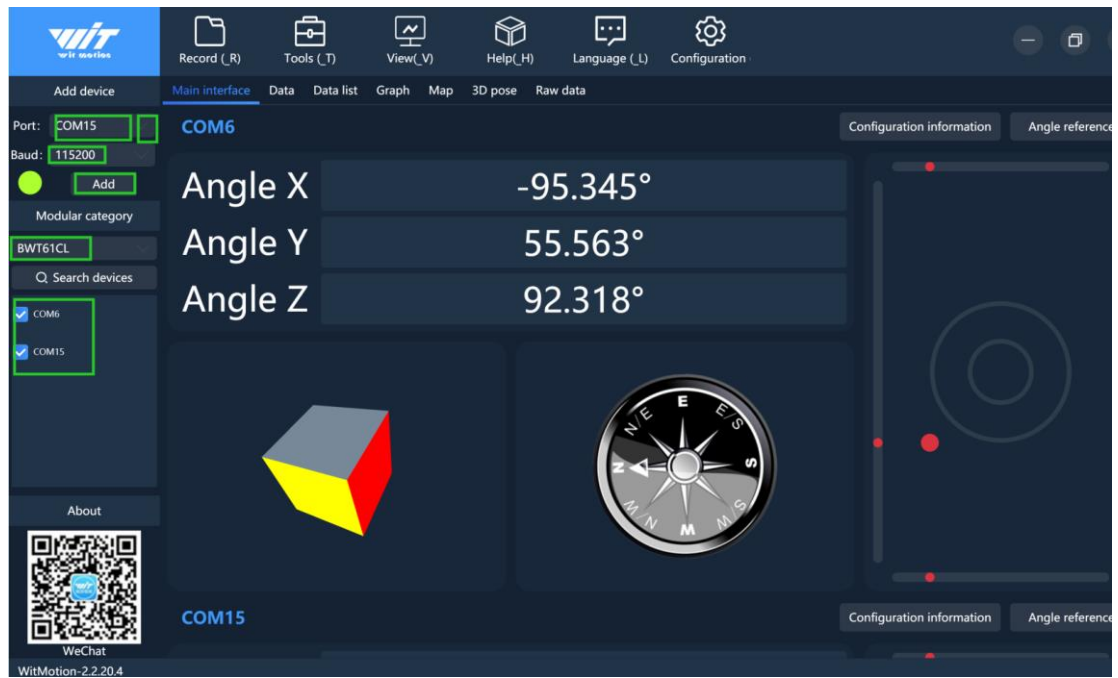
Step 4. Confirm the “outgoing com port” on “More Bluetooth Options” page, and check the Port corresponding to Direction is “Outgoing”.



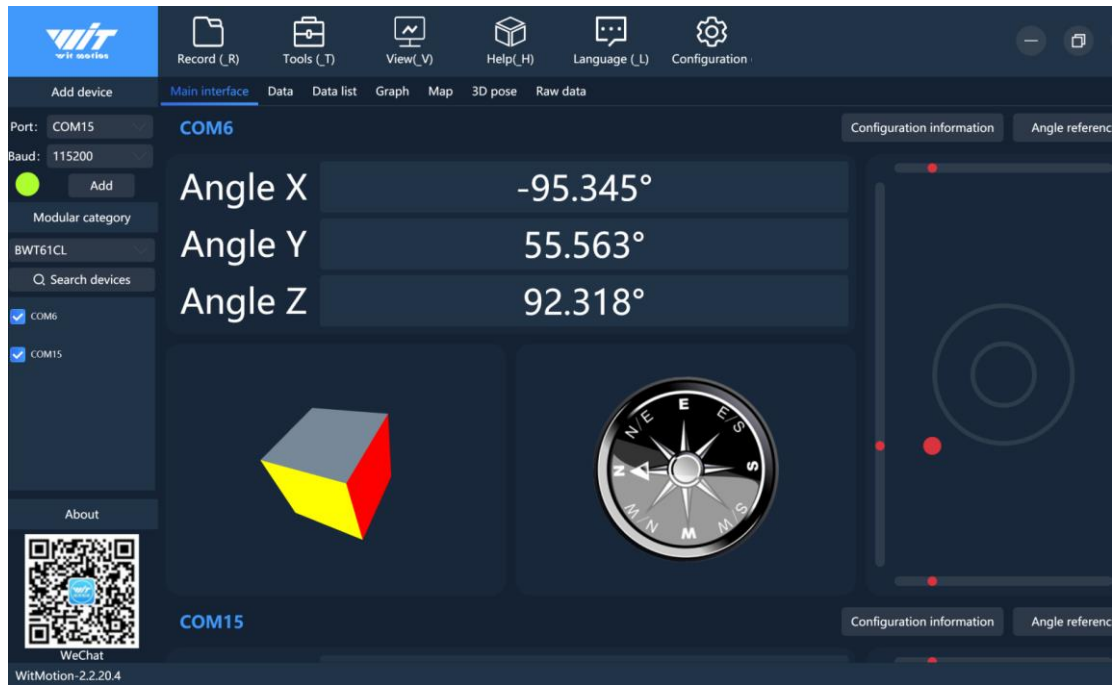
Step 5. Open the WitMotion New Software and the laptop’s Bluetooth.



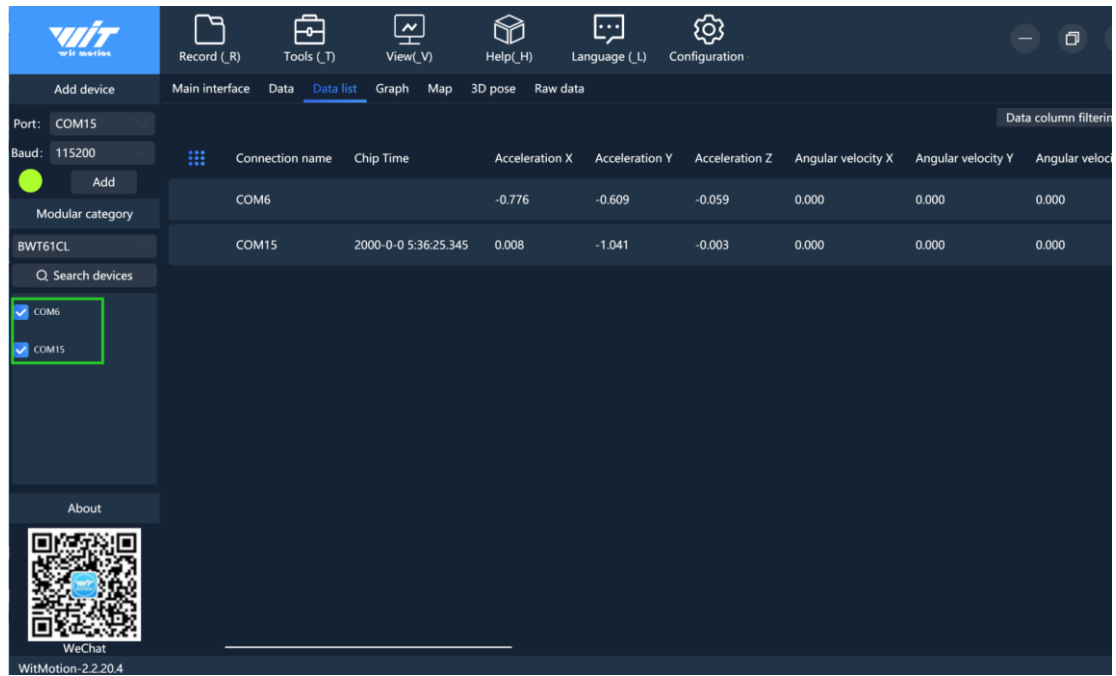
Step 6. Choose module "BWT61CL", and choose the right Port, then click 'Add'.



Step 7. Wait for a minute, you can see the data.



PS: If the interface hasn't show the data, select the device "COM+Number".



Noted: In standby mode, the sensor flashes quickly. Once the sensor was connected successfully, the blue light will start flashing slowly.

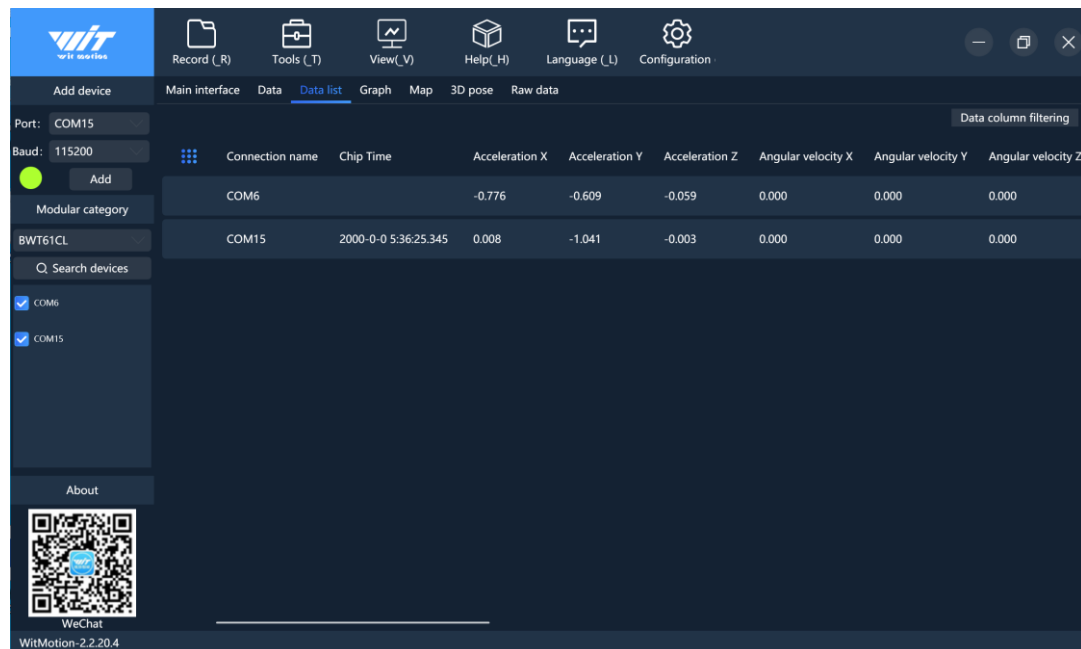
6.1 Software Setting

For software introduction including button and functions setting, please referring to the below link.

https://drive.google.com/file/d/18OntSUDU1m4vNhcRXvmTeFN1rAK3jcmZ/view?usp=share_link

6.1.1 Data Configuration

Click the corresponding sensor, you can configure the individual sensor separately, record and so on.



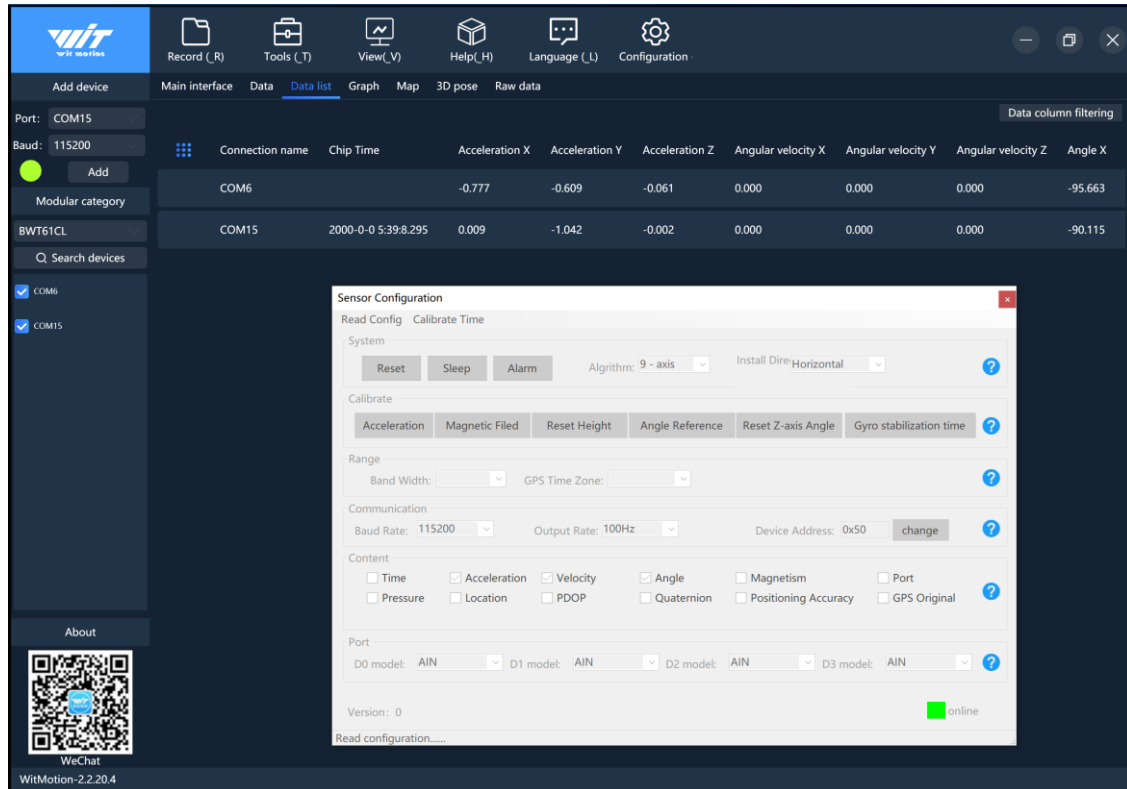
The screenshot displays the WitMotion software interface. The top navigation bar includes icons for Record (R), Tools (T), View (V), Help (H), Language (L), and Configuration. The left sidebar contains options for Add device, Port (COM15), Baud (115200), Add, Modular category, BWT61CL, Search devices, and About. The main area shows a table with sensor data.

Connection name	Chip Time	Acceleration X	Acceleration Y	Acceleration Z	Angular velocity X	Angular velocity Y	Angular velocity Z
COM6		-0.776	-0.609	-0.059	0.000	0.000	0.000
COM15	2000-0-0 5:36:25.345	0.008	-1.041	-0.003	0.000	0.000	0.000

At the bottom left, there is a QR code labeled 'WeChat' and the version number 'WitMotion-2.2.20.4'.

Step 1. Click the config as you request.

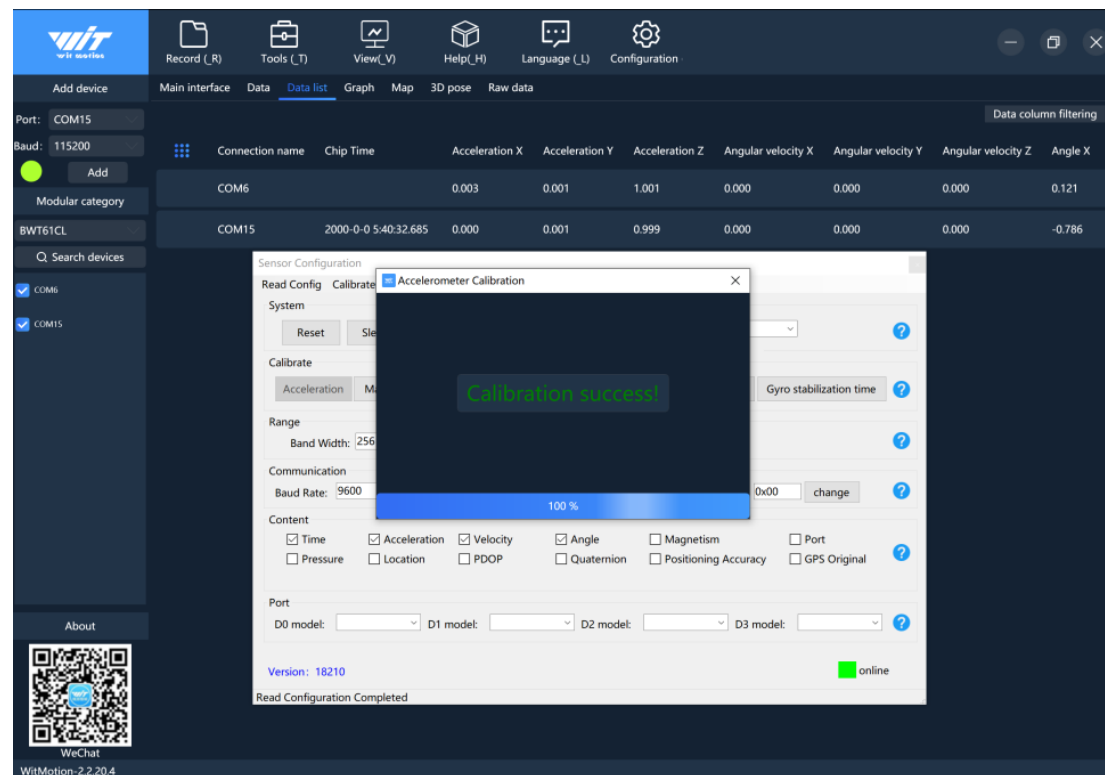
Step 2. The software will auto-save the config.



The screenshot shows the WIT Motion software interface. On the left, there is a sidebar with options like 'Add device', 'Port: COM15', 'Baud: 115200', 'Modular category', 'BWT61CL', 'Q Search devices', and 'About'. The main area displays a 'Data list' table with columns for Connection name, Chip Time, and various sensor readings (Acceleration X, Y, Z, Angular velocity X, Y, Z, Angle X). A 'Sensor Configuration' dialog box is open, showing tabs for 'Read Config' and 'Calibrate Time'. The 'Read Config' tab is active, displaying settings for System (Reset, Sleep, Alarm), Calibration (Acceleration, Magnetic Field, Reset Height, Angle Reference, Reset Z-axis Angle, Gyro stabilization time), Range (Band Width, GPS Time Zone), Communication (Baud Rate: 115200, Output Rate: 100Hz, Device Address: 0x50), Content (Time, Acceleration, Velocity, Angle, Magnetism, Port, Pressure, Location, PDOP, Quaternion, Positioning Accuracy, GPS Original), and Port (D0 model: AIN, D1 model: AIN, D2 model: AIN, D3 model: AIN). The 'online' status is indicated by a green light.

6.1.2 Calibrate

It is the similar with the method of the calibration of the standard PC software. If you don't how to config the parameter, please click "question mark".



The screenshot shows the WIT Motion software interface. On the left, there is a sidebar with options like 'Add device', 'Port: COM15', 'Baud: 115200', 'Modular category', 'BWT61CL', 'Search devices', and 'About'. The main interface has a top menu bar with 'Record (R)', 'Tools (T)', 'View (V)', 'Help (H)', 'Language (L)', and 'Configuration'. Below the menu bar, there are tabs for 'Main interface', 'Data', 'Data list', 'Graph', 'Map', '3D pose', and 'Raw data'. The 'Data list' tab is active, showing a table of sensor data. The table has columns for 'Connection name', 'Chip Time', 'Acceleration X', 'Acceleration Y', 'Acceleration Z', 'Angular velocity X', 'Angular velocity Y', 'Angular velocity Z', and 'Angle X'. The data is organized into two rows: COM6 and COM15. The COM15 row shows a chip time of 2000-0-0 5:40:32.685 and various acceleration and angular velocity values. A 'Data column filtering' button is located in the top right corner of the table. In the center of the screen, a 'Sensor Configuration' dialog box is open, showing the 'Accelerometer Calibration' tab. The dialog box has a 'Calibration success!' message and a progress bar at 100%. The dialog box also has sections for 'System', 'Calibrate', 'Range', 'Communication', 'Content', and 'Port'. The 'Content' section has checkboxes for 'Time', 'Acceleration', 'Velocity', 'Angle', 'Magnetism', 'Port', 'Pressure', 'Location', 'PDOP', 'Quaternion', 'Positioning Accuracy', and 'GPS Original'. The 'Port' section has dropdown menus for 'D0 model', 'D1 model', 'D2 model', and 'D3 model'. The 'Version: 18210' and 'online' status are shown at the bottom of the dialog box. The background interface shows a QR code and the text 'WeChat' and 'WitMotion-2.2.20.4'.

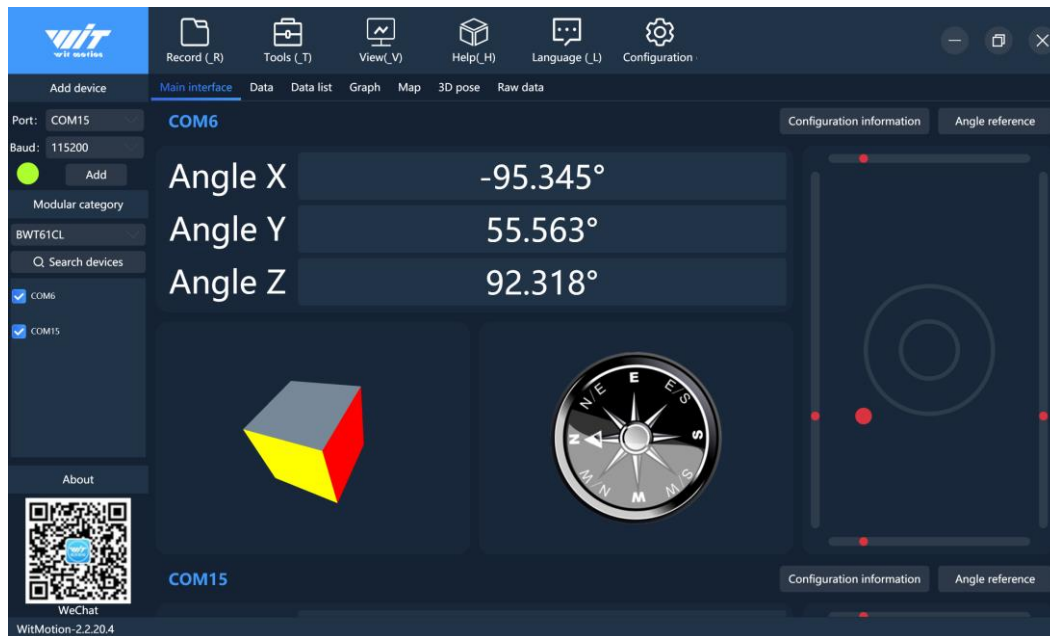
Connection name	Chip Time	Acceleration X	Acceleration Y	Acceleration Z	Angular velocity X	Angular velocity Y	Angular velocity Z	Angle X
COM6		0.003	0.001	1.001	0.000	0.000	0.000	0.121
COM15	2000-0-0 5:40:32.685	0.000	0.001	0.999	0.000	0.000	0.000	-0.786

6.1.3 Curve Display

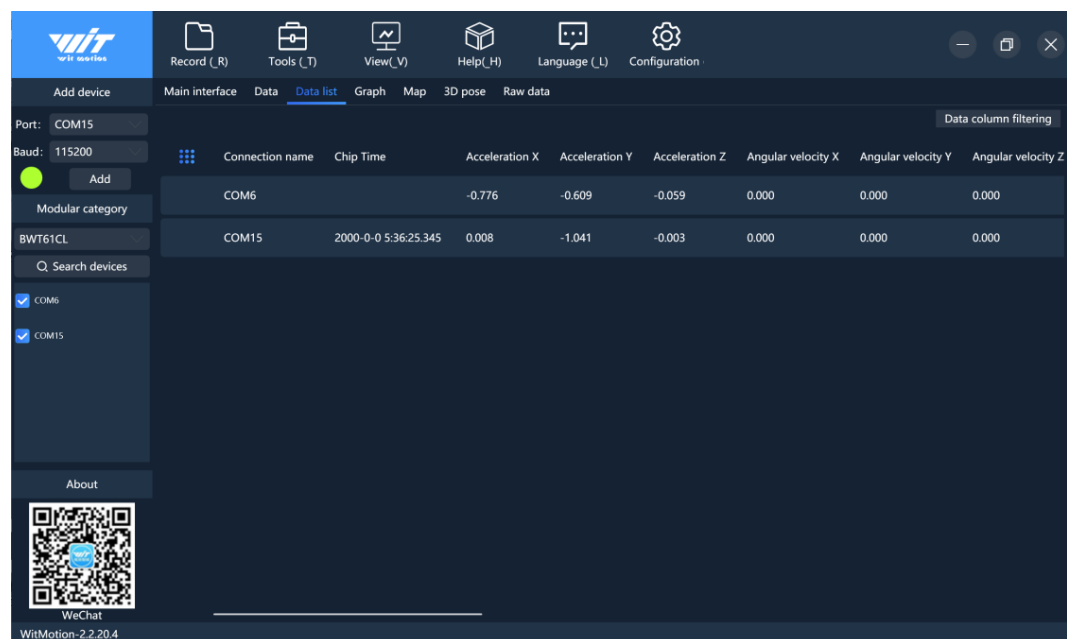
There are various choices on the data details, such as acceleration, angle data and so on.

Demo 1:

You can switch views as you like.



Demo 2:



6.1.4 Data Recording

Step 1. Click "Record".

Step 2. Click "Stop".

Step 3. Extract the recorded file.

Step 4. Paste all the recorded data packet to a Excel file for intuitive reviewing.

1685819431238	6/3/2023 7:10 PM	BIN 文件	22 KB
1685819431238.play	6/3/2023 7:10 PM	PLAY 文件	331 KB
1685819431238_1	6/3/2023 7:10 PM	XLS 工作表	70 KB
1685819431238_1	6/3/2023 7:10 PM	文本文档	63 KB

时间	设备名称	Chip Time	Accelerat	Accelerat	Accelerat	Angular	Angular	Angular	Angle X	Angle Y	Angle Z	Magnetic	Magnetic	Magnetic	Temperatu
19:10:31	SI00M8_1152	2023-5-2	-0.679	0.239	0.585	-119.812	-36.377	-14.465	-3.455	61.699	-147.618	7.042	-71.583	-32.667	40.33
19:10:31	SI00M8_1152	2023-5-2	-0.688	0.054	0.542	-115.601	-47.729	-6.104	-4.449	61.216	-147.513	6.65	-70.592	-32.067	40.33
19:10:31	SI00M8_1152	2023-5-2	-0.847	-0.055	0.544	-101.807	-26.978	-9.216	-5.592	60.941	-147.744	6.392	-69.808	-31.642	40.39
19:10:31	SI00M8_1152	2023-5-2	-0.829	-0.056	0.512	-107.056	-15.93	1.831	-6.509	60.804	-147.706	6.208	-69.233	-31.133	40.45
19:10:31	SI00M8_1152	2023-5-2	-0.888	-0.049	0.508	-99.67	-1.892	-2.747	-7.493	60.749	-147.805	6.058	-68.867	-30.458	40.33
19:10:31	SI00M8_1152	2023-5-2	-0.832	0.379	0.533	-140.686	18.311	19.287	-8.416	60.941	-147.607	5.942	-68.633	-29.8	40.33
19:10:31	SI00M8_1152	2023-5-2	-0.736	-0.065	0.581	-84.839	26.184	13.611	-9.108	61.188	-147.431	5.808	-68.458	-29.125	40.33
19:10:31	SI00M8_1152	2023-5-2	-0.799	-0.048	0.523	-75.195	47.363	22.705	-9.58	61.655	-147.228	5.667	-68.342	-28.317	40.45
19:10:31	SI00M8_1152	2023-5-2	-0.878	-0.04	0.5	-66.04	75.378	27.466	-9.915	62.364	-146.992	5.492	-68.242	-27.475	40.33
19:10:31	SI00M8_1152	2023-5-2	-0.914	-0.117	0.509	-58.228	116.272	35.4	-10.19	63.43	-146.75	5.258	-67.383	-26.825	40.33
19:10:31	SI00M8_1152	2023-5-2	-0.462	0.16	0.876	-5.249	-31.921	28.259	14.31	-23.516	39.216	6.333	-67.008	-24.017	40.2
19:10:31	SI00M8_1152	2023-5-2	-0.852	-0.03	0.401	-35.339	152.344	38.025	-10.305	64.929	-146.585	6.908	-66.942	-21.883	40.33
19:10:31	SI00M8_1152	2023-5-2	-0.872	-0.04	0.341	-10.62	170.349	45.105	-10.118	66.61	-146.371	6.725	-66.842	-20.817	40.26
19:10:31	SI00M8_1152	2023-5-2	-0.904	-0.032	0.28	6.348	199.89	56.274	-9.558	68.566	-145.953	6.15	-67.092	-19.775	40.45
19:10:31	SI00M8_1152	2023-5-2	-0.91	-0.011	0.247	26.855	222.656	59.998	-8.646	70.774	-145.371	5.811	-67.558	-18.717	40.39
19:10:31	SI00M8_1152	2023-5-2	-0.92	-0.044	0.211	49.683	240.845	62.866	-7.289	73.152	-144.575	5.693	-67.507	-17.575	40.39
19:10:31	SI00M8_1152	2023-5-2	-0.916	0.073	0.167	72.937	259.827	72.144	-5.026	75.729	-143.047	5.496	-67.942	-16.433	40.39
19:10:31	SI00M8_1152	2023-5-2	-0.944	0.339	0.222	93.506	281.982	66.772	-1.851	78.47	-140.856	5.252	-68.392	-15.242	40.33
19:10:31	SI00M8_1152	2023-5-2	-1.039	0.075	0.041	136.78	295.959	68.115	3.098	81.304	-137.263	5.079	-68.992	-13.967	40.39
19:10:31	SI00M8_1152	2023-5-2	-1.144	0.105	0.011	152.344	352.783	83.13	15.04	84.452	-126.898	4.821	-69.642	-11.008	40.33
19:10:31	SI00M8_1152	2023-5-2	-1.116	0.078	-0.068	167.847	417.053	87.219	60.529	87.27	-83.106	4.627	-70.142	-9.575	40.45
19:10:31	SI00M8_1152	2023-5-2	-1.11	0.052	-0.064	175.964	435.669	91.003	132.632	85.594	-12.777	4.427	-71.708	-3.733	40.33
19:10:31	SI00M12	2023-6-2	-0.147	0.871	0.716	618.347	226.518	-266.907	45.967	-15.496	33.569	4.227	-72.683	-0.925	40.45
19:10:31	SI00M8_1152	2023-5-2	-1.121	0.059	-0.086	183.044	443.298	95.398	151.694	81.584	4.427	4.045	-73.367	0.45	40.45
19:10:31	SI00M8_1152	2023-5-2	-0.927	0.033	-0.107	189.819	450.745	99.182	158.857	77.217	9.657	4.227	-73.95	1.817	40.45
19:10:31	SI00M8_1152	2023-5-2	-0.917	-0.042	-0.168	177.551	431.885	120.911	162.048	72.823	10.953	4.117	-74.158	4.583	40.26
19:10:31	SI00M8_1152	2023-5-2	-0.968	0.024	-0.424	165.71	361.389	119.934	163.658	68.983	10.761	4.045	-74.308	3.15	40.33
19:10:31	SI00M8_1152	2023-5-2	-1.018	0.054	-0.514	162.17	322.571	114.99	164.822	65.693	10.124	3.842	-74.475	1.817	40.45
19:10:31	SI00M8_1152	2023-5-2	-1.118	0.18	-0.511	169.739	330.75	96.558	166.146	62.397	9.63	3.533	-74.633	1.817	40.45
19:10:31	SI00M8_1152	2023-5-2	-0.833	0.1	-0.476	162.109	333.801	92.651	167.503	59.079	9.223	3.308	-74.795	1.817	40.45
19:10:31	SI00M8_1152	2023-5-2	-0.861	0.071	-0.585	159.058	321.594	84.595	168.849	55.893	8.811	3.842	-74.958	1.817	40.45
19:10:31	SI00M8_1152	2023-5-2	-0.699	0.105	-0.613	158.508	320.74	76.965	170.195	52.762	8.421	3.975	-75.117	1.817	40.45
19:10:31	SI00M8_1152	2023-5-2	-0.792	0.073	-0.654	162.476	328.003	79.59	171.502	49.565	7.954	4.117	-75.282	1.817	40.45
19:10:31	SI00M12	2023-6-2	-0.648	0.689	-0.378	1189.514	-43.396	-458.191	120.026	16.271	35.662	23.52	-75.458	1.817	40.45
19:10:31	SI00M8_1152	2023-5-2	-0.768	0.095	-0.701	167.725	336.467	79.285	172.809	46.329	7.405	4.227	-75.633	1.817	40.45
19:10:31	SI00M8_1152	2023-5-2	-0.68	0.063	-0.695	158.675	363.831	76.965	174.106	42.874	6.861	4.558	-75.807	1.817	40.45
19:10:31	SI00M8_1152	2023-5-2	-0.726	0.102	-0.707	150.513	385.742	75.989	175.281	39.172	6.279	4.475	-76.007	1.817	40.45
19:10:31	SI00M8_1152	2023-5-2	-0.611	-0.048	-0.726	126.221	381.47	98.816	176.155	35.458	5.477	4.117	-76.183	1.817	40.45
19:10:31	SI00M8_1152	2023-5-2	-0.569	0	-0.811	148.254	353.577	71.35	177.308	32.031	4.796	4.045	-76.363	1.817	40.45