WT901WIFI Operation Manual

contents

1. Software Download

1.1. Witmotion Software Download

Witmotion software download link:

https://drive.google.com/file/d/10xysnkuyUwi3AK_t3965SLr5Yt6YKE-u/view?usp=drive_link

1.2. Driver Download

Driver download link:

https://drive.google.com/file/d/1JidopB42R9EsCzMAYC3Ya9eJ8JbHapRF/view?usp=drive_link

2. Sensor Connection

2.1. Sensor Wiring

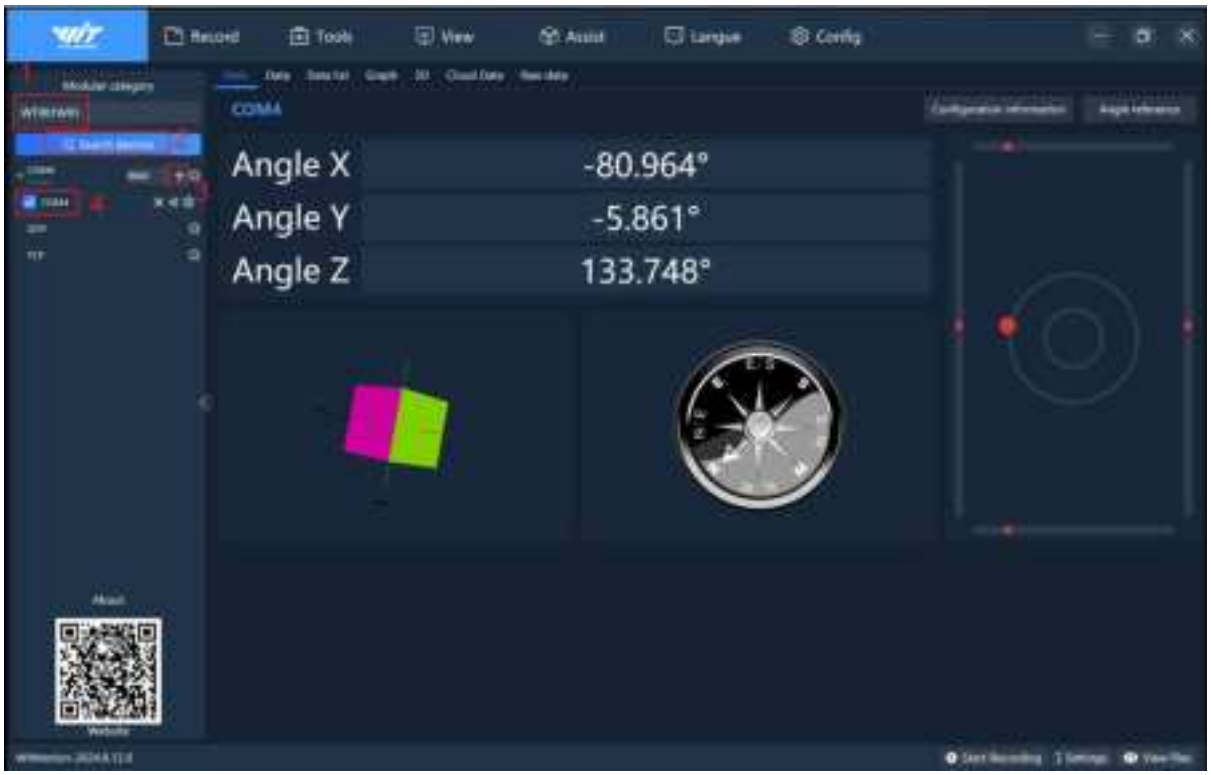
Type-C directly connects to the computer

2.2. Software Connection

After the driver is installed normally, you can see the COM port in the device manager

In the downloaded PC software package , open the WitMotion.exe software .

and all the sensor models supported by the Witmotion software will be displayed below . We need to select the corresponding sensor model and then connect the Witmotion software to the sensor. Select the model WT901WIFI here. Pay attention to the difference between the new and old versions of WIFI. The old version of WIFI model is WT901WIFI (old version) , and the device number on the sensor label starts with WT53. The new version starts with WT55 .

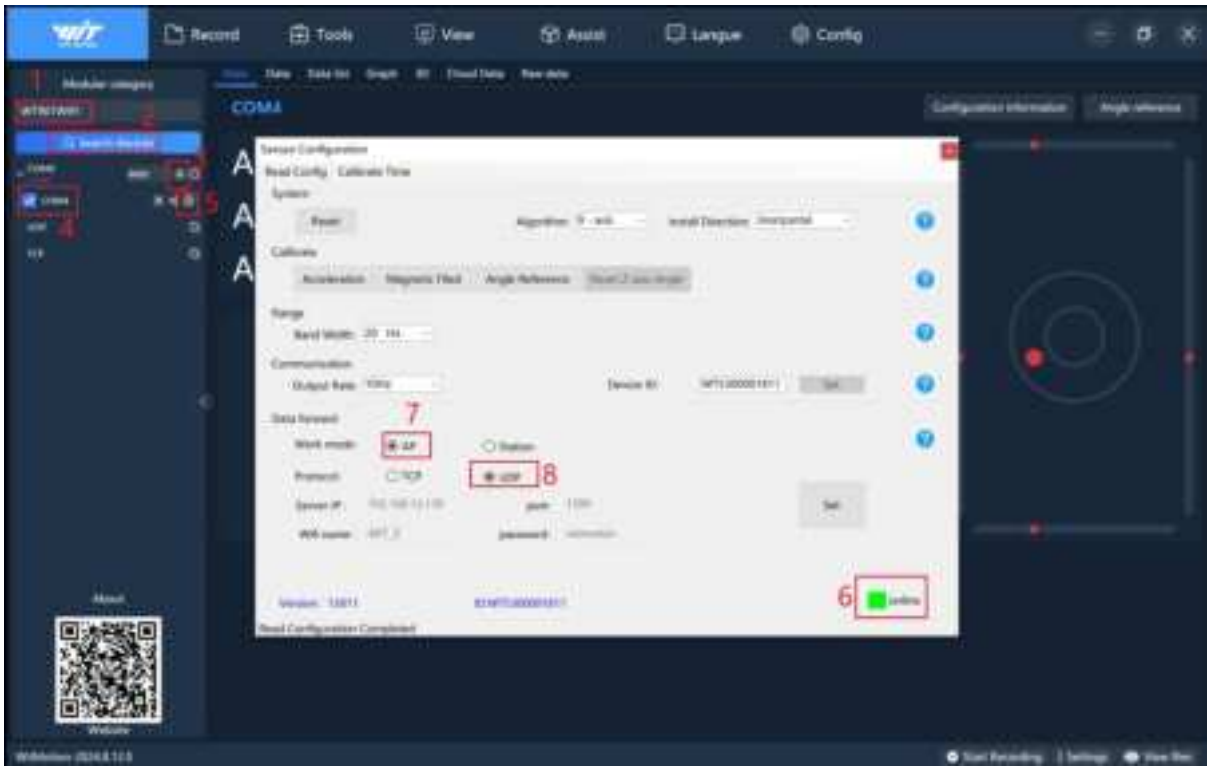


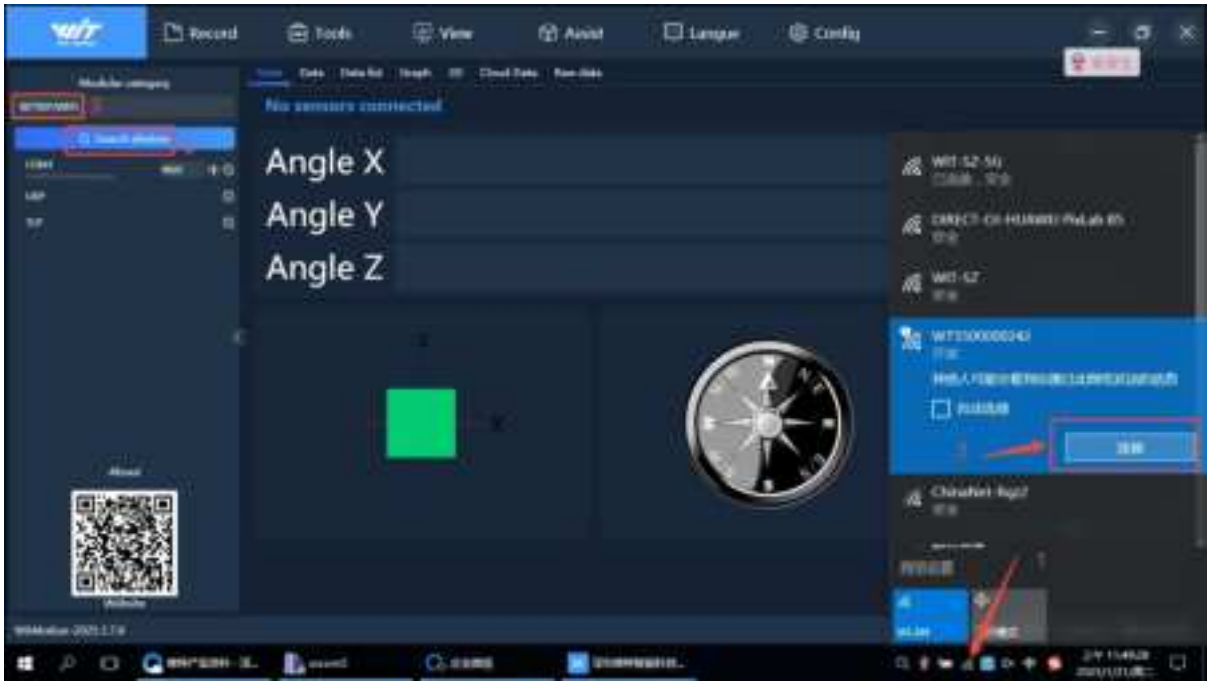
2.3. Sensor network

2.3.1. AP mode (router mode)

In AP mode, the sensor itself will create a hotspot named device number. (Note: The sensor can only select one protocol mode)

The WIFI hotspot created by the sensor in AP mode is shown in the figure below





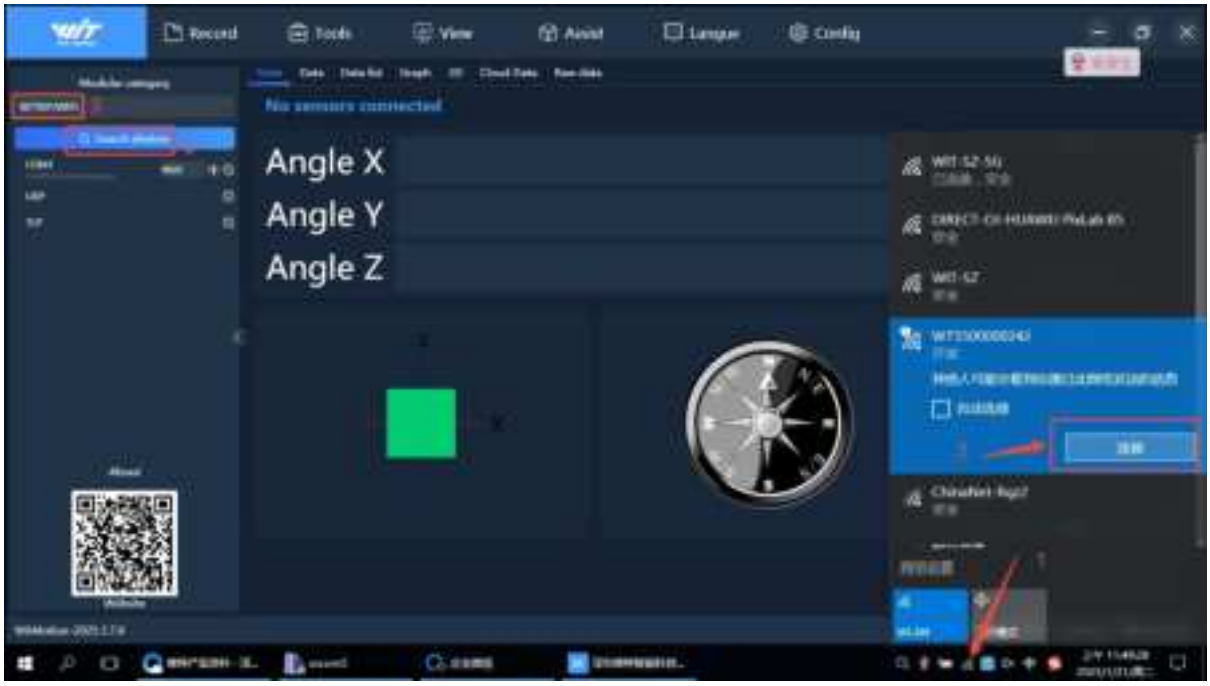
2.3.1.1. UDP protocol

The sensor creates a WIFI named device ID. The computer connects to the WIFI hotspot. After the connection is successful, the sensor will assign an IP to the computer. At this time, the sensor actively connects to the Server (Witmotion software) as a Client, establishes a UDP connection, and sends data to the Witmotion software (can only send to the Witmotion software in AP mode)

2.3.1.2. TCP

The sensor creates a WIFI named device ID. The computer connects to the WIFI hotspot. After the connection is successful, the sensor will assign an IP to the computer. At this time, the sensor actively connects to the Server (Witmotion software) as a Client, establishes a TCP connection, and sends data to the Witmotion software (can only send to the Witmotion software in AP mode)

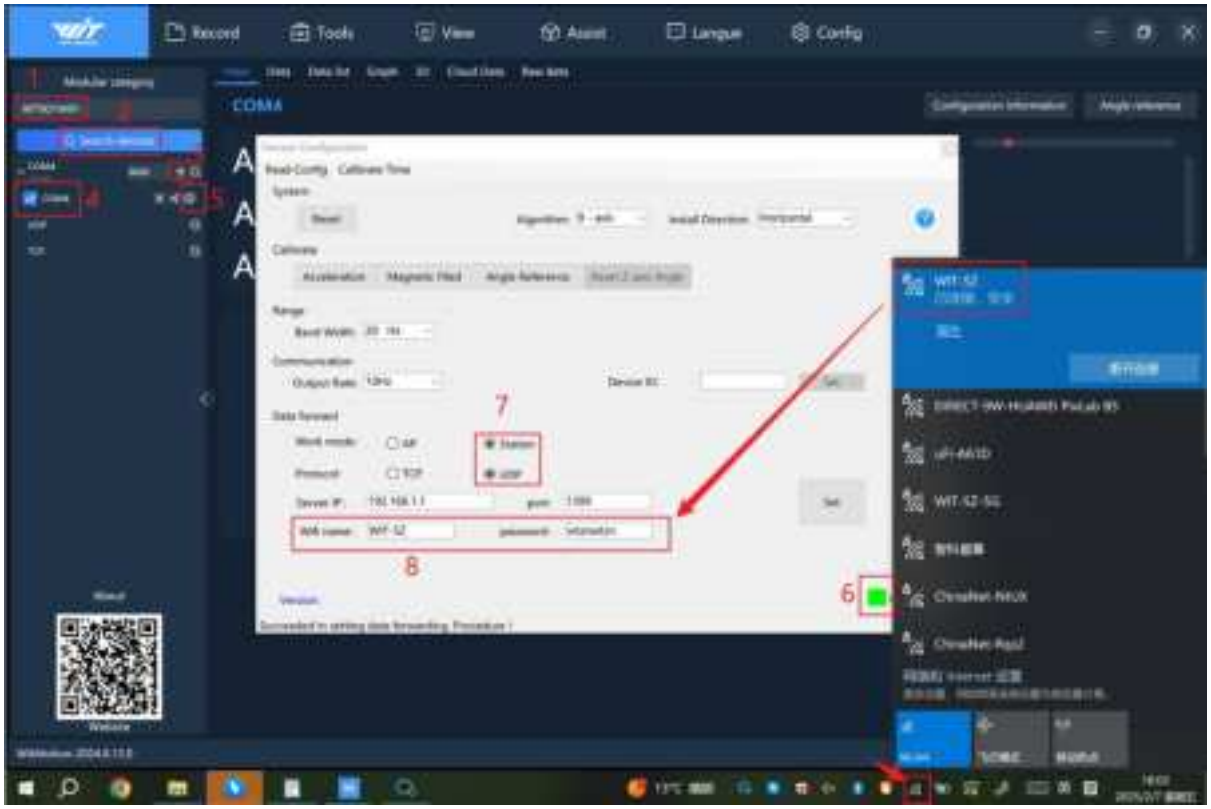
After completing any of the above settings, please click "Search Device" again and select the corresponding TCP/UDP device, as shown in the figure below:



2.3.2. Station Mode

In Station mode, the sensor needs to connect to an external WIFI network. The WiFi name and password of the computer must be the same as the WiFi name and password of the sensor, as shown below, otherwise the connection will fail.

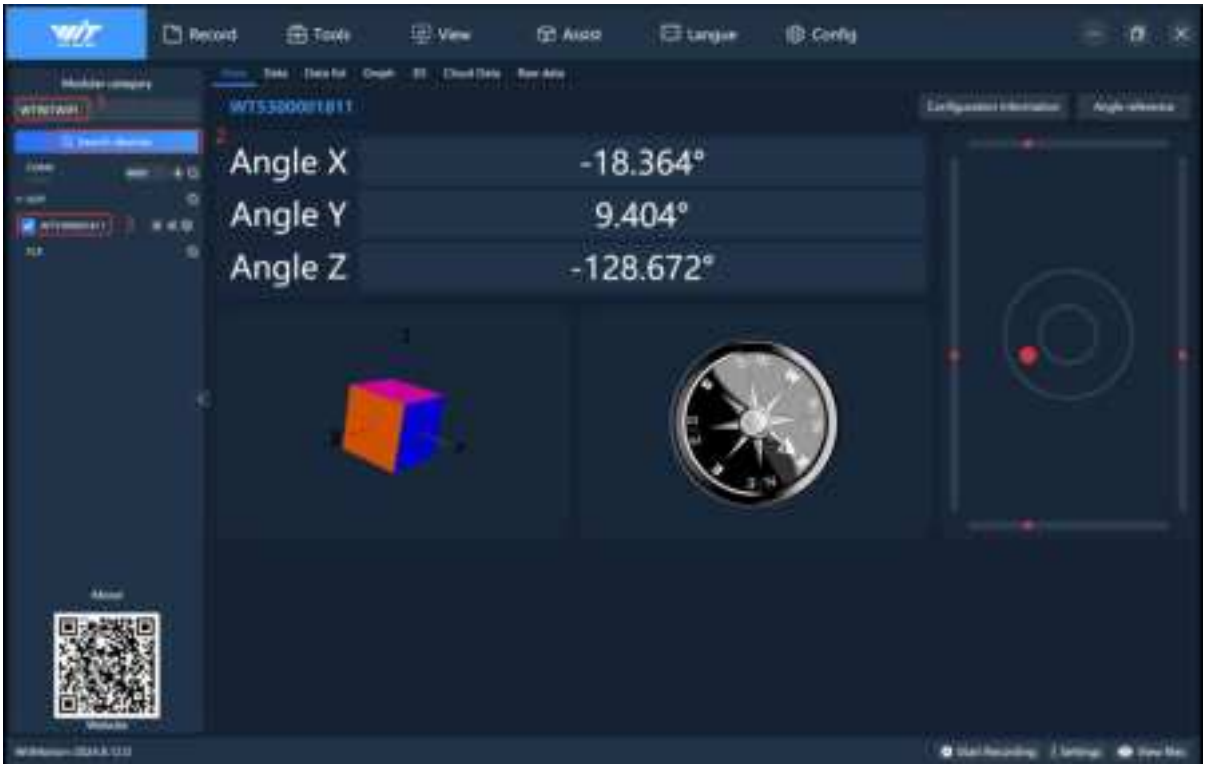
(Note: The sensor can only select one protocol mode)



2.3.2.1. UDP protocol

2.3.2.1.1. Specify Witmotion software

Enter the WIFI name and password (please check again after entering), IP (optional) and port (Witmotion software port is 1399). The computer and sensor need to be connected to the same LAN WIFI. After clicking Settings, click "Search Device" again. At this time, Witmotion software will broadcast its own IP. Sensors connected to the same LAN will receive the IP sent by Witmotion software . Then the sensor connects to the Server Witmotion software as the Client specified IP , establishes a UDP connection, and sends data to Witmotion software . The operation is shown in the figure below:



2.3.2.1.2. Specify the user server

Enter the WIFI name and password (please check again after entering) as well as the IP (user server IP) and port (user server port). After clicking Set, the sensor will connect to the user's server as the client's specified IP, establish a UDP connection, and send data.

Note: If the device cannot be searched or there is no connection in the above two connection operations, it may be that the WIFI parameters or IP parameters are incorrect. Please connect the serial port for wired configuration, or press and hold the button for 2 seconds to restore to AP mode and reset WIFI and IP.

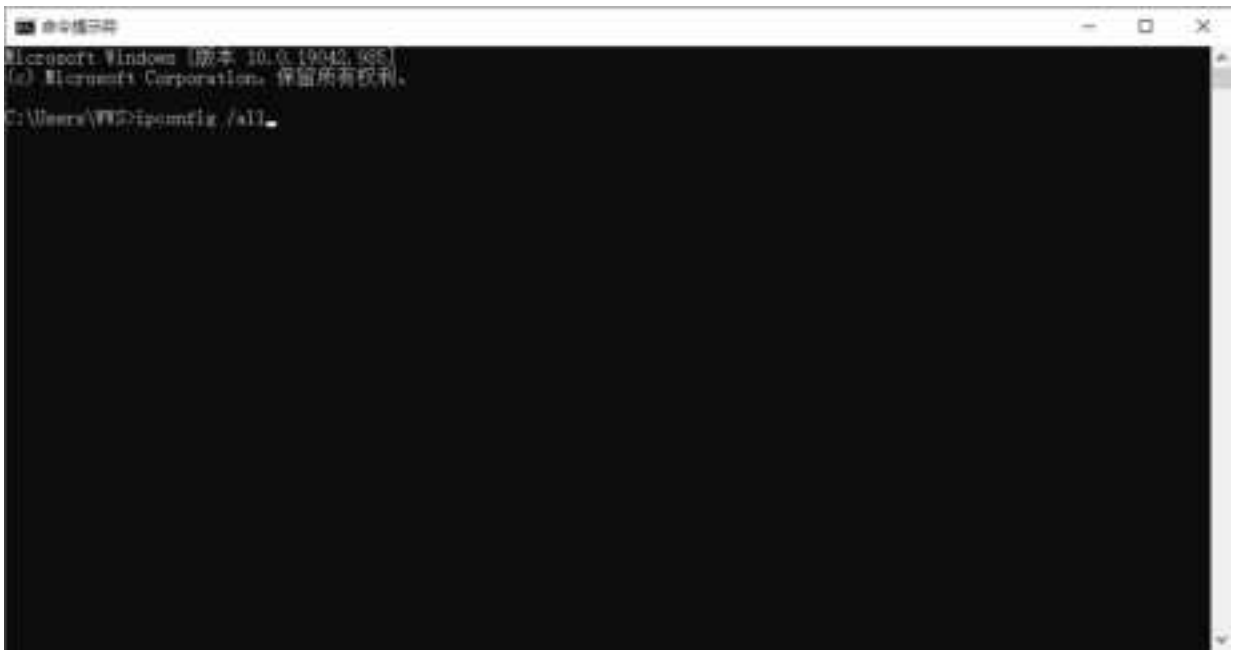
2.3.2.2. TCP

2.3.2.2.1. Specify Witmotion software

In AP mode, if you want to change to Station mode and display data in Witmotion software , it is not recommended to change to TCP directly. It is recommended to change to UDP in Station mode first;

because if you change to TCP at this time, the generated WIFI will be disconnected, and the computer's IP is unknown, so the TCP IP cannot be known. Once it is set arbitrarily, the sensor cannot be connected, and the Witmotion software will have no data and cannot be retrieved. You can only reconnect the serial port for configuration, or press and hold the button for 2 seconds to restore to AP mode and re-set WIFI and IP. The specific steps are as follows:

- In AP mode, set it to Station mode UDP connection (UDP can broadcast without establishing a connection, so the sensor can be notified by broadcast which IP to connect to; TCP cannot, so it is not recommended to directly change from AP to TCP in Station mode)
- Connect the computer to the same WIFI as the sensor
- Search for the device and select it
- Display data and configure
- To view the current computer IP, enter ipconfig /all in the command window and press Enter. The method is as follows:



- Set to Station mode TCP connection, fill in the local IP address you found, port 1399
- Search for devices, select them, and display data

2.3.2.2.2. Specify the user server

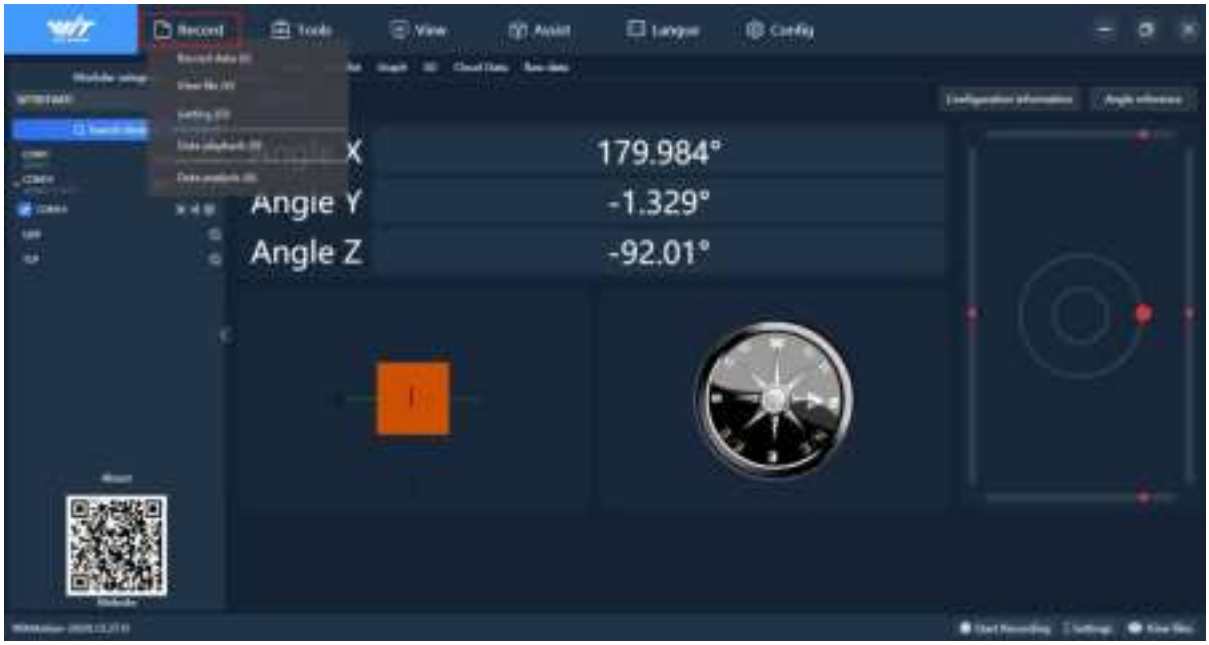
Enter the WIFI name and password (please check again after entering) as well as the IP (user server IP) and port (user server port). After clicking Set, the sensor will connect to the user's server as the client's designated IP (please ensure that the server TCP-Server is turned on, otherwise the sensor will not be able to connect), establish a TCP connection, and send data.

Note: If the device cannot be searched or there is no connection in the above two connection operations, it may be that the WIFI parameters or IP parameters are incorrect. Please connect the serial port for wired configuration, or press and hold the button for 2 seconds to restore to AP mode and reset WIFI and IP.

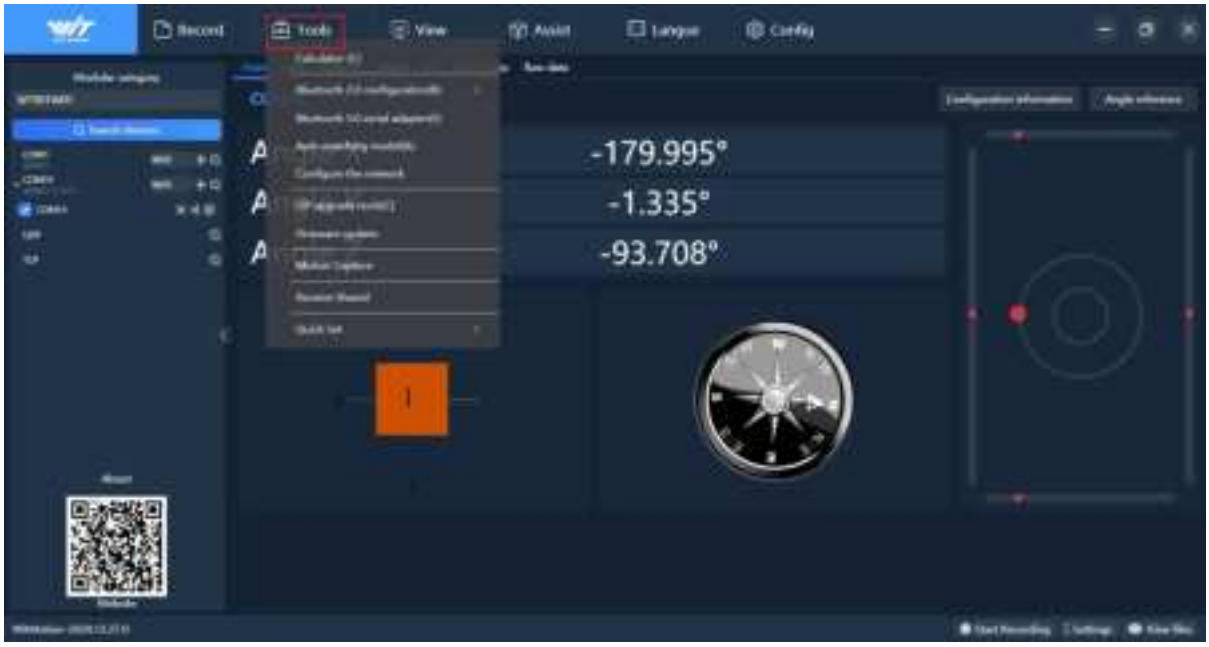
3. Witmotion Software Description

3.1. Menu Bar Description

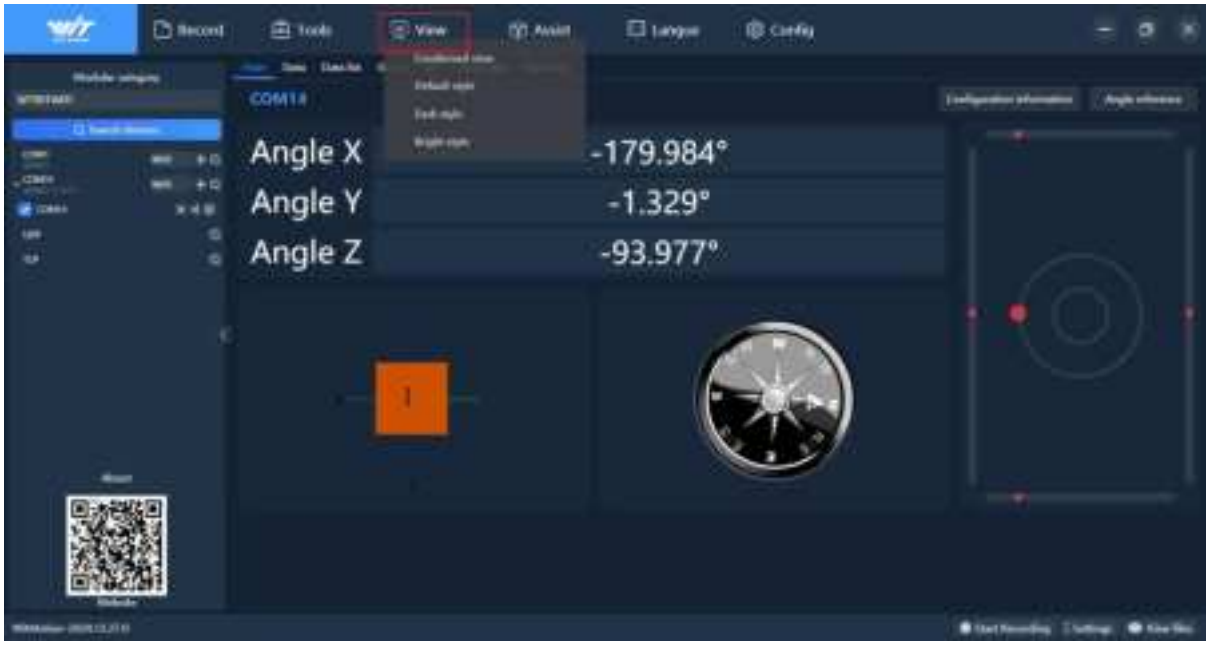
Record : The recording function option in the main menu includes functions such as recording data, viewing the record file save directory, play file playback, and Witt protocol playback.



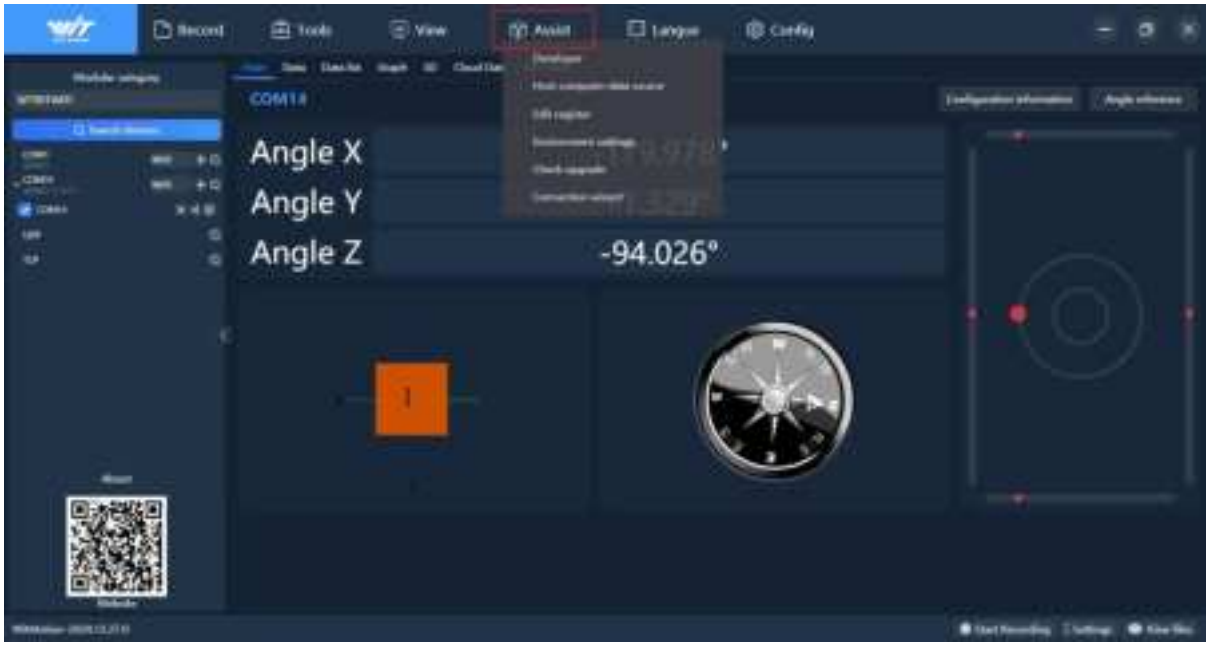
Tools : The main menu tool function options include calculator, ISP upgrade tool, firmware upgrade and other functions.



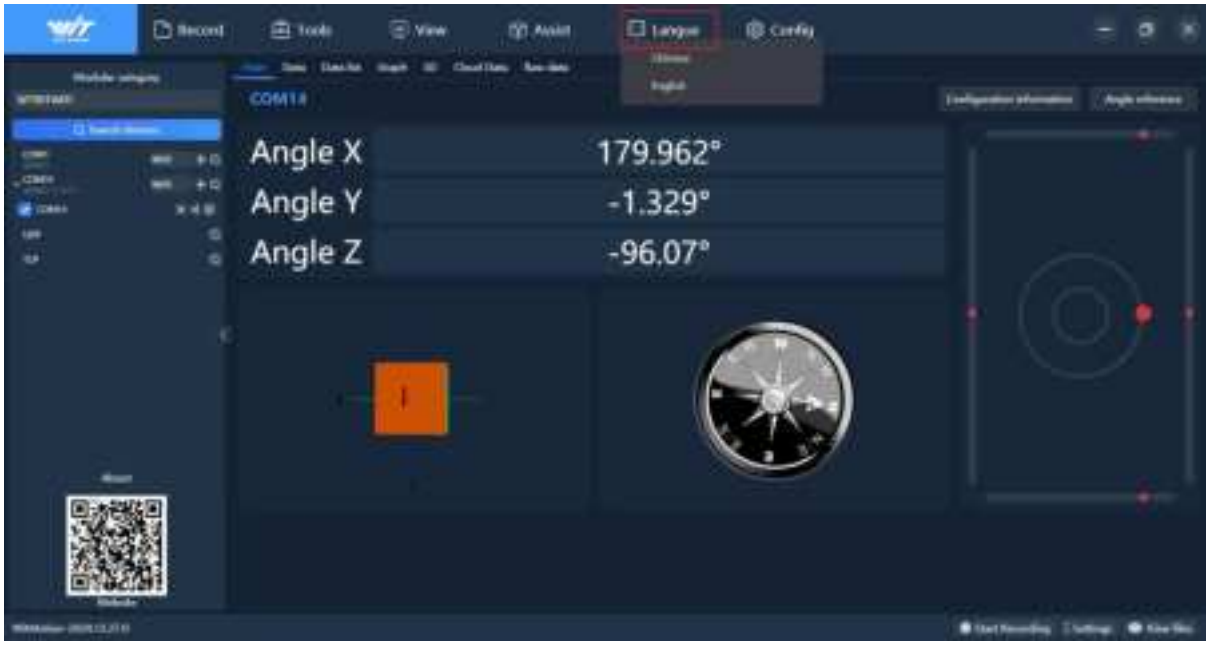
View : In the main menu view function options, there are three page display styles to choose from, namely, simplified style, default style, and dark style.



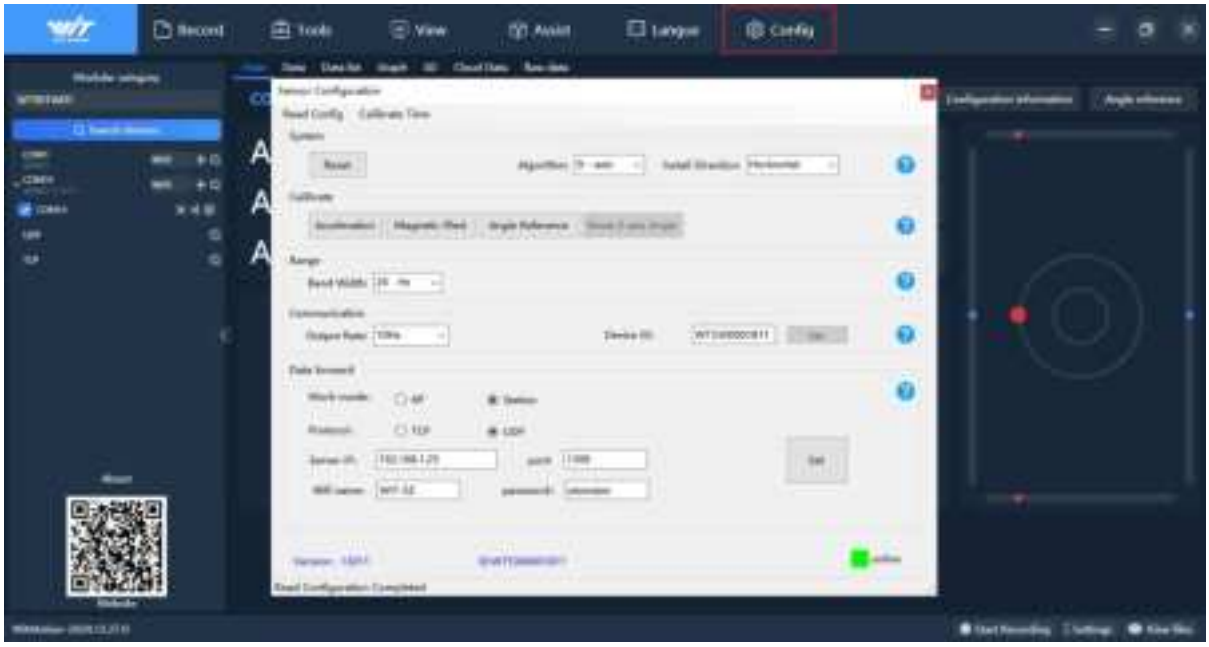
Assist : The main menu help function option includes functions such as developers, Witmotion software data source, environment settings, check upgrades, etc.



Langue : In the main menu language function options, there are two language presentation options: Chinese and English.

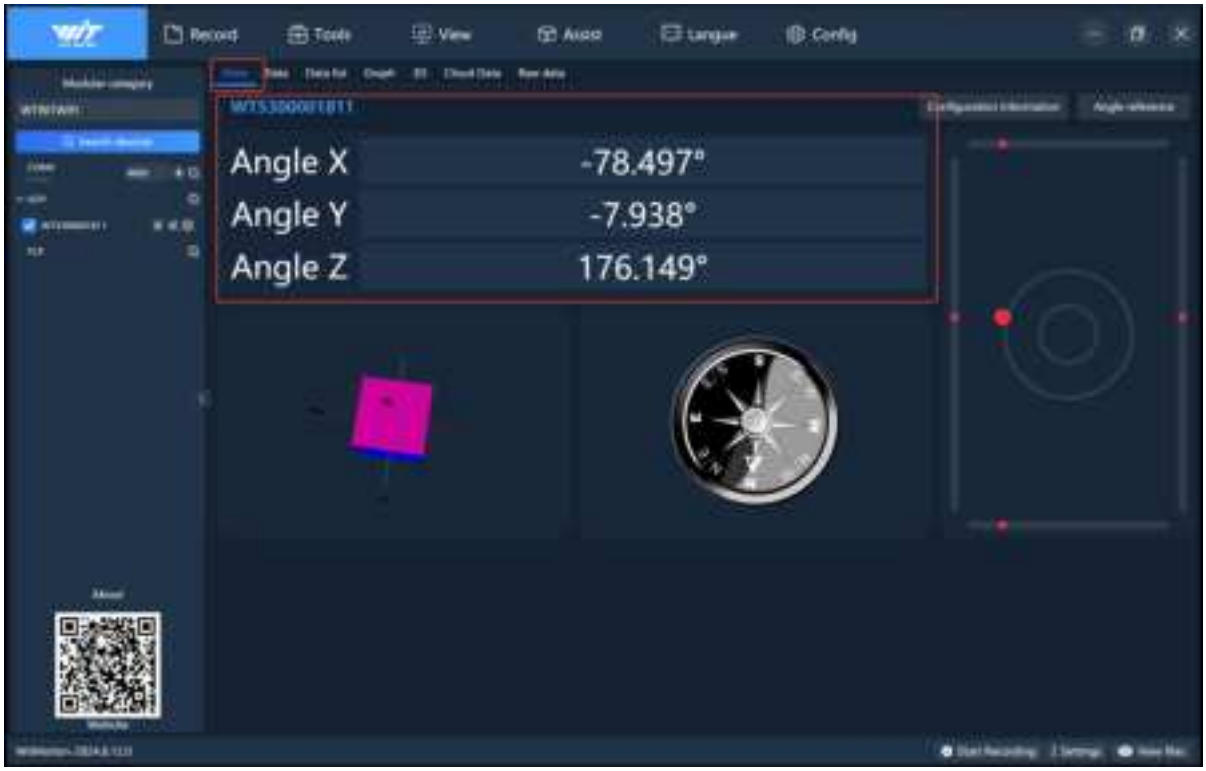


Configuration : In the main menu configuration function options, there are various sensor setting function options, which can adjust the sensor configuration to better meet the usage requirements.

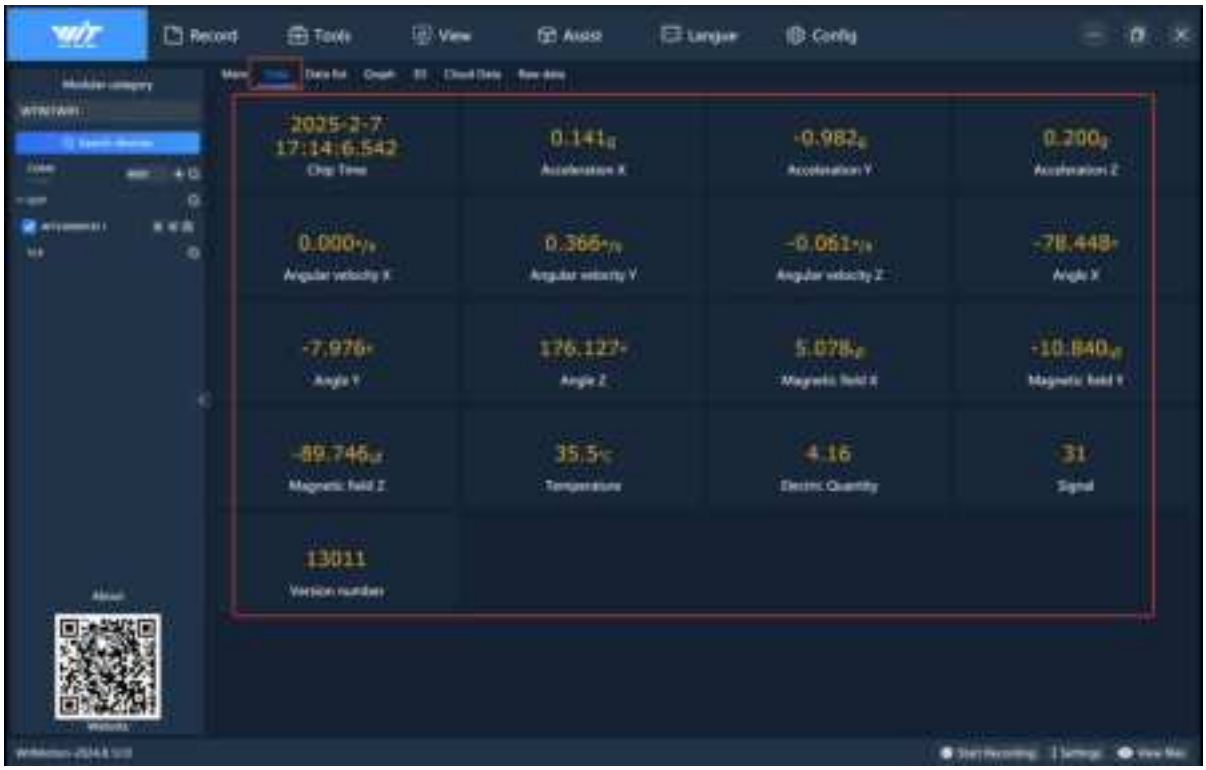


3.2. Interface Description

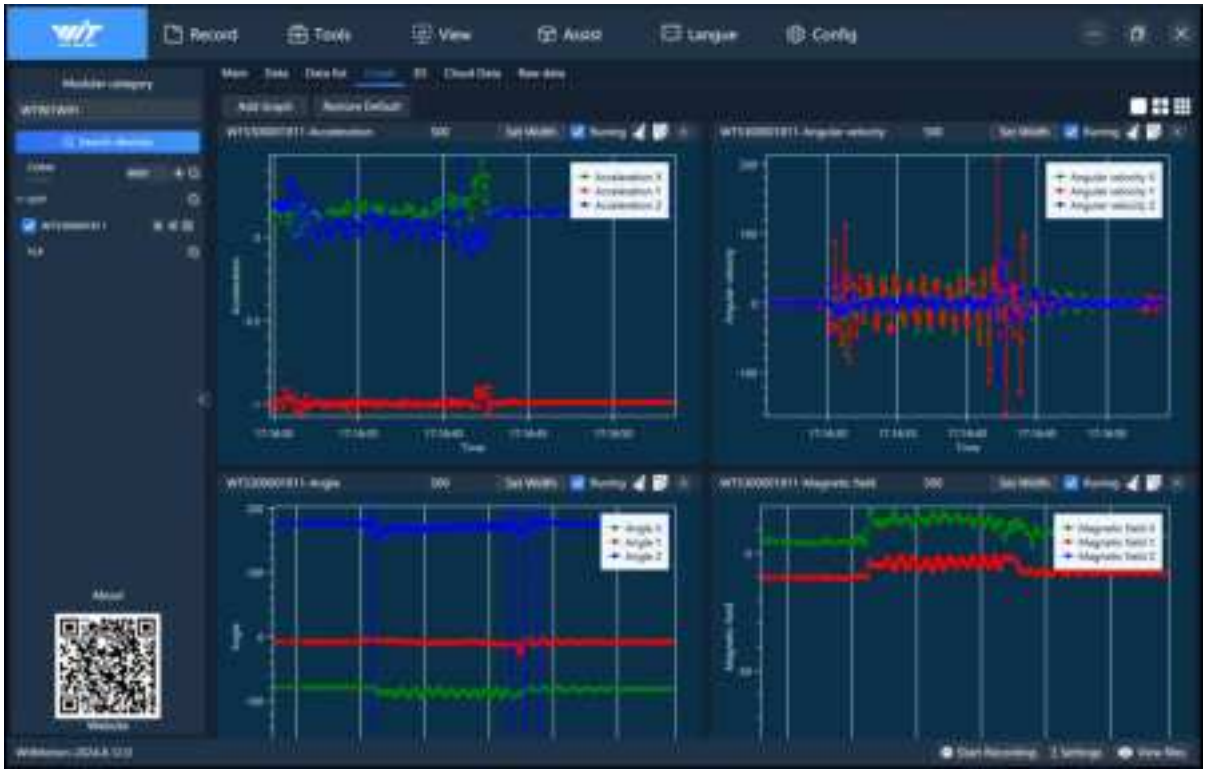
Main interface, data grid, data list, curve chart, 3D posture, original data



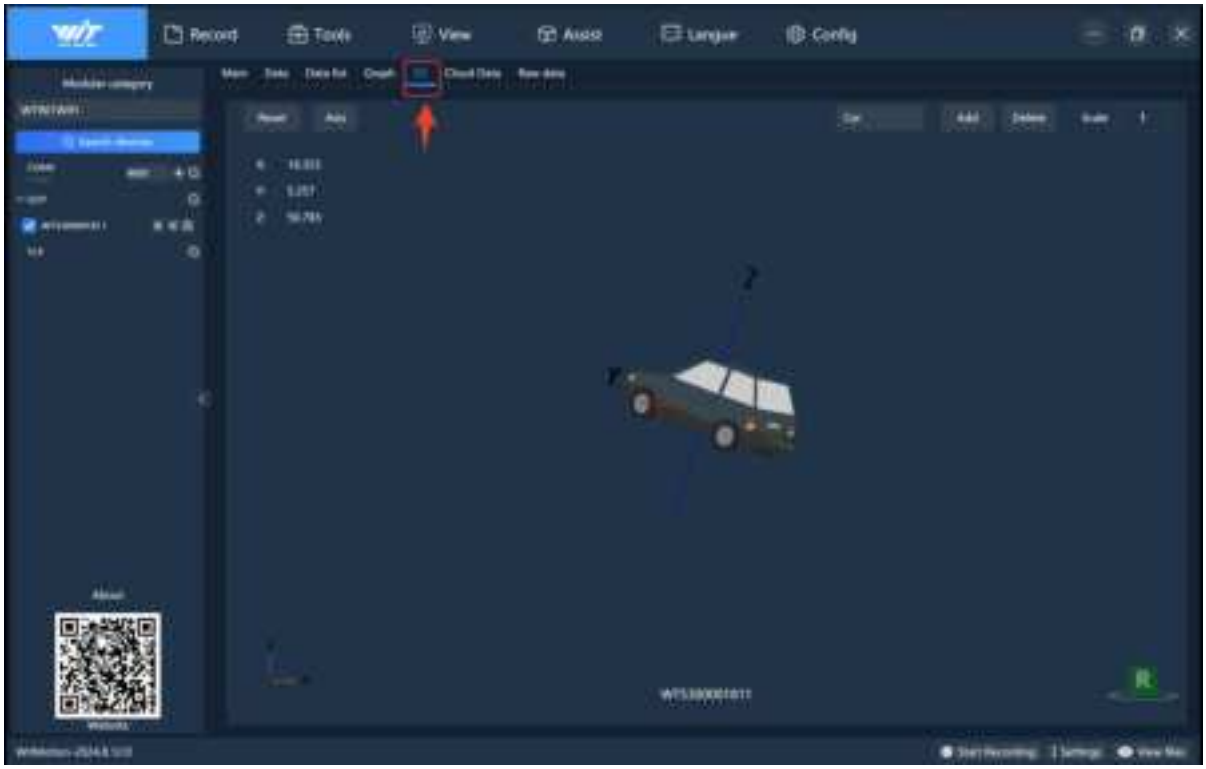
The data grid is the data presentation effect of the main interface. It integrates all the data of the sensors and can present the sensor data more comprehensively and intuitively.



There are three presentation effects for the curve graph, namely acceleration curve, angular velocity curve, angle curve and magnetic field curve.

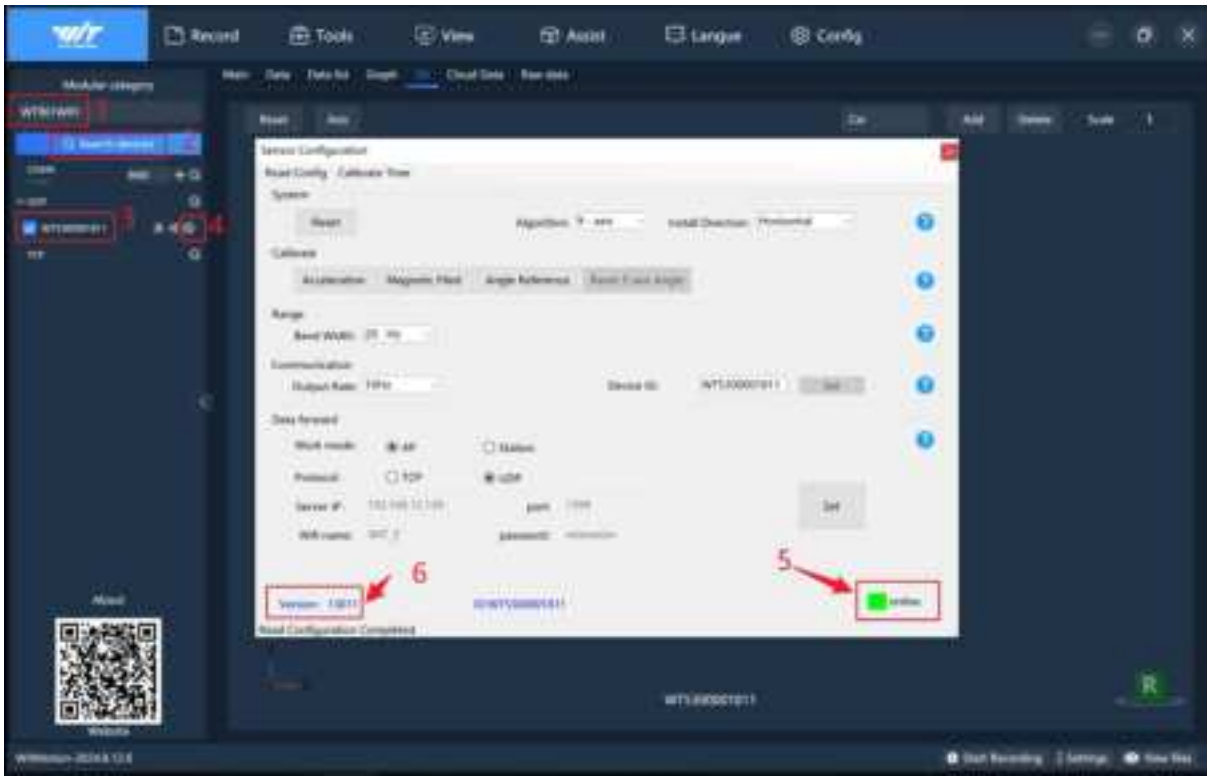


In the 3D posture presentation effect, the 3D model will change the display direction as the three-axis angle changes; there are four 3D models that can be changed on the right side of the 3D posture display area, and you can click the +- buttons to enlarge and reduce the 3D model **. Note: The data output of the angles X, Y, and Z must be available for display.**



To view the version number of the sensor, you need to click the configuration button first. The sensor version number will be displayed in the lower left corner of the sensor configuration window.

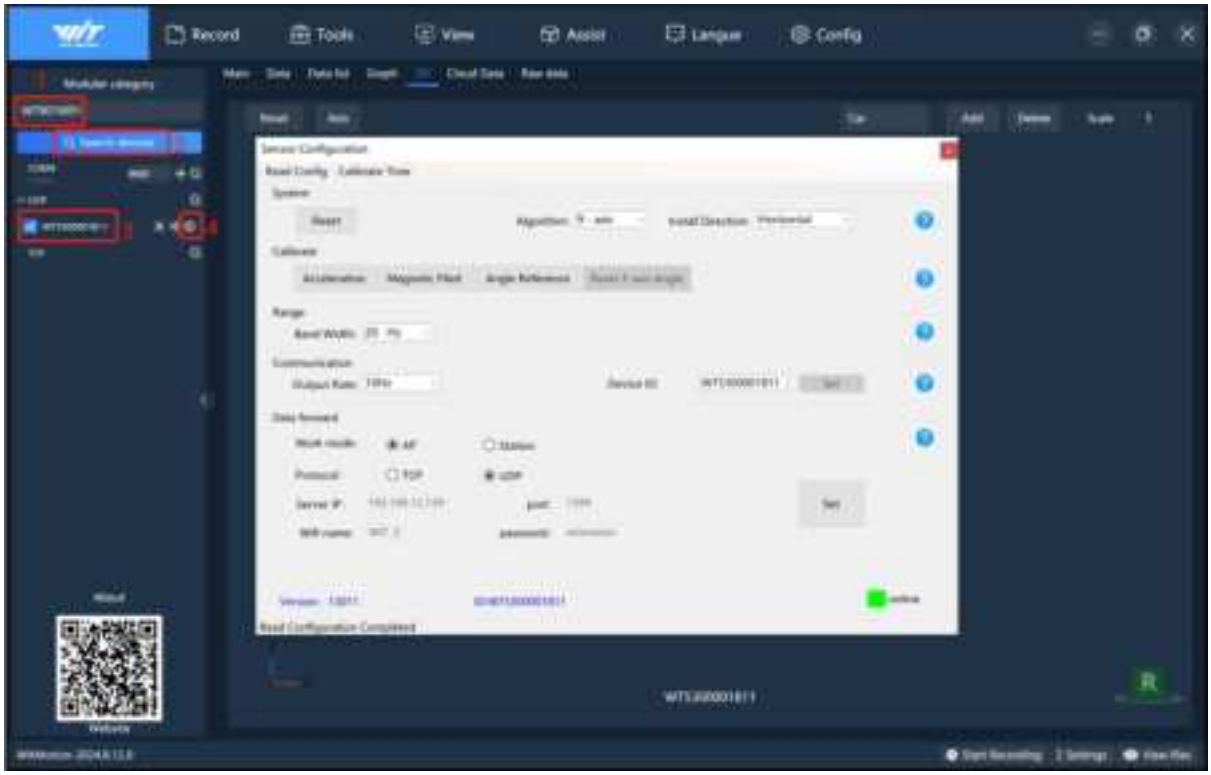
Note: You need to be online to read the version number.



4. Sensor related configuration

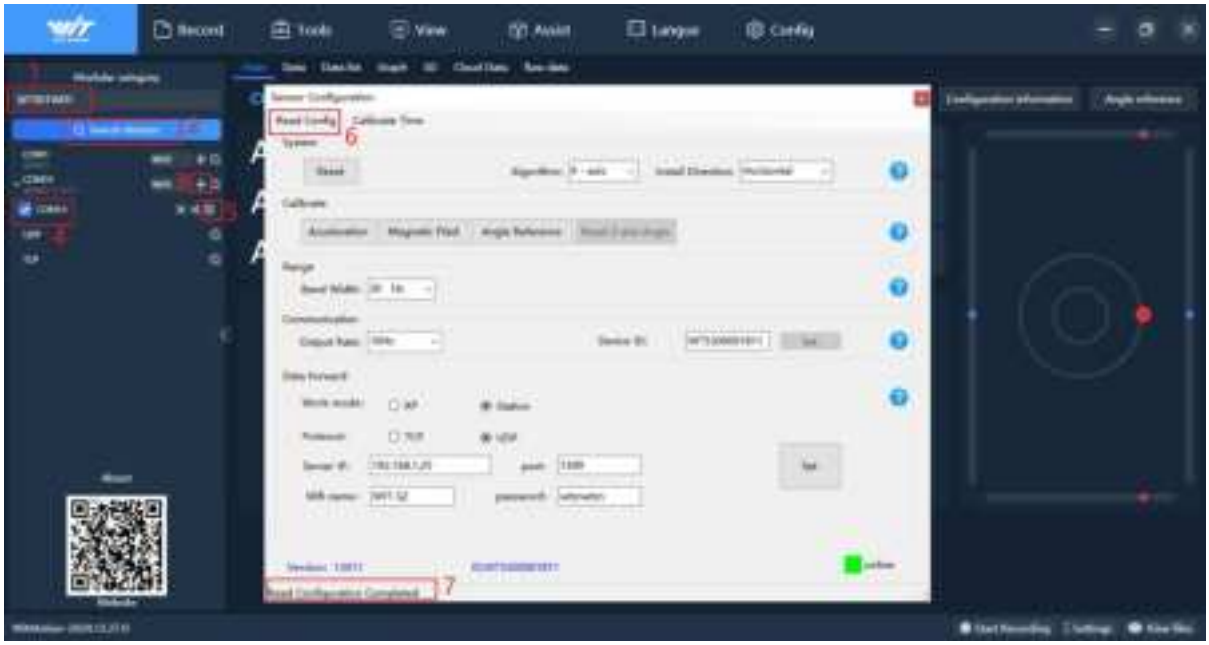
4.1. Sensor Configuration Instructions

Click this tab to read the sensor configuration. When you open the configuration tab, the module configuration is read by default. When you need to change the configuration, you can click this tab after the change is completed to check whether the configuration is successful. **Note: You need to be online to read the configuration.**



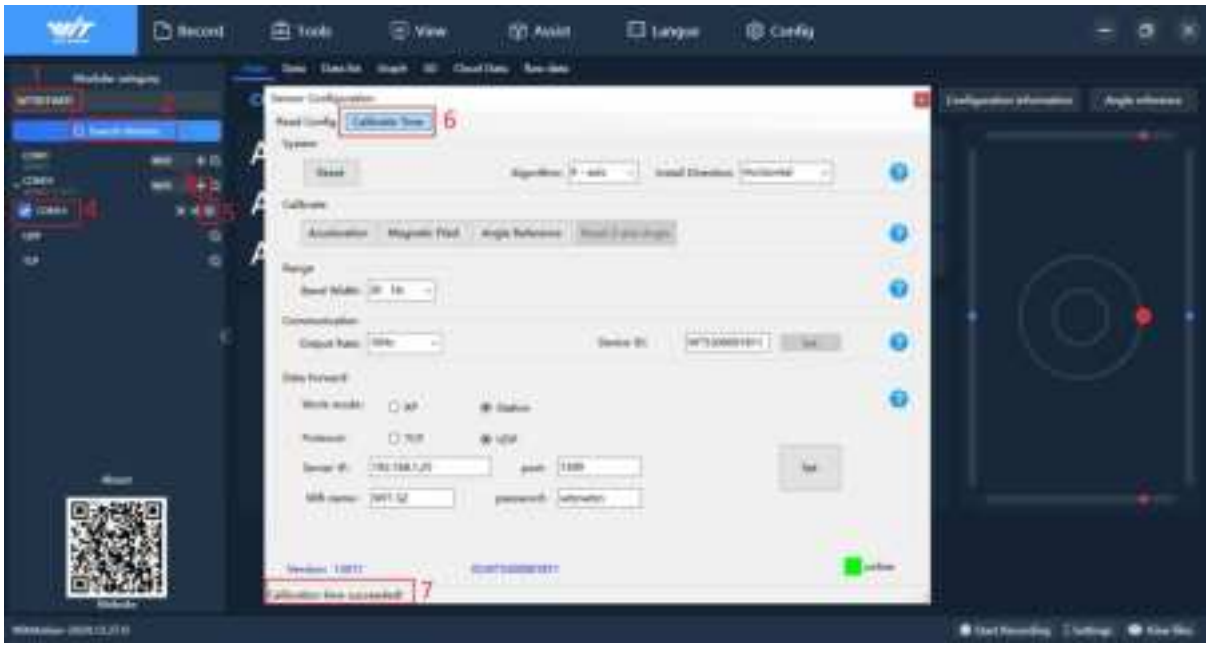
4.1.1. Read Configuration

Click Read Configuration to re-read the configuration page data and update it .



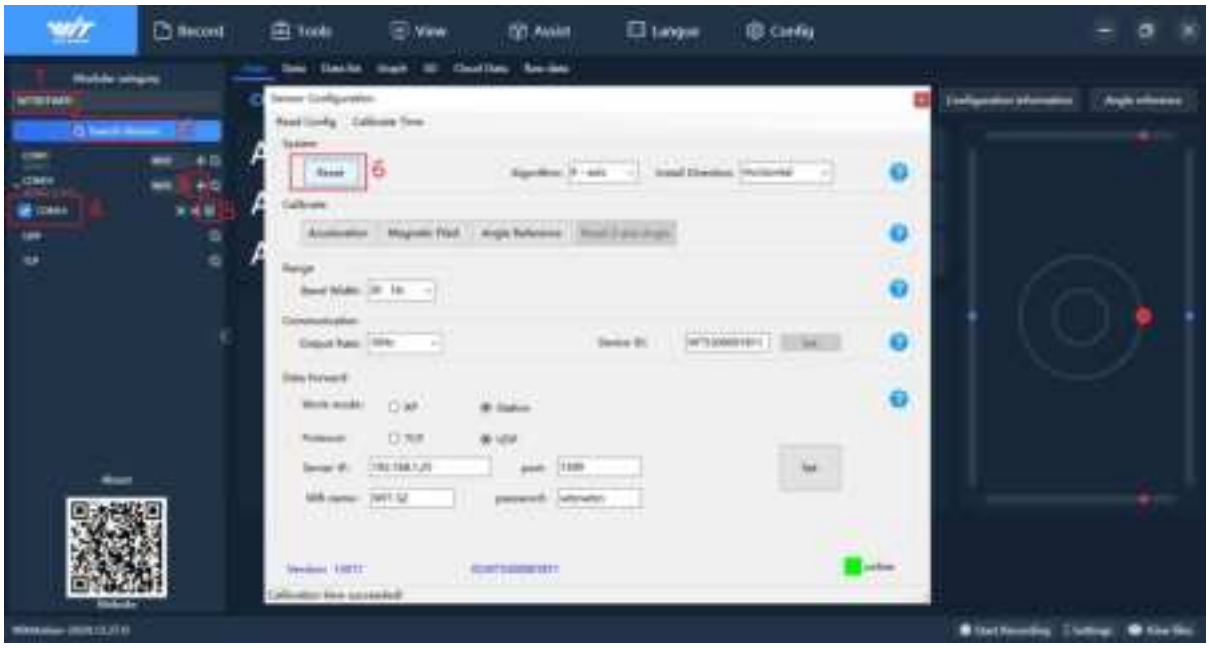
4.1.2. Calibration time

Click Calibrate Time to send a time calibration command to the sensor (it will be sent automatically when the device is connected, no additional manual calibration is required)



4.1.3. Restore settings

Click Restore Settings to restore the sensor to factory settings, which may cause the current connection to be disconnected. After reconfiguring, search for the device .



4.1.4. algorithm

The six-axis sensor uses a six-axis algorithm, and the Z-axis angle is mainly calculated based on the integral of the angular velocity.

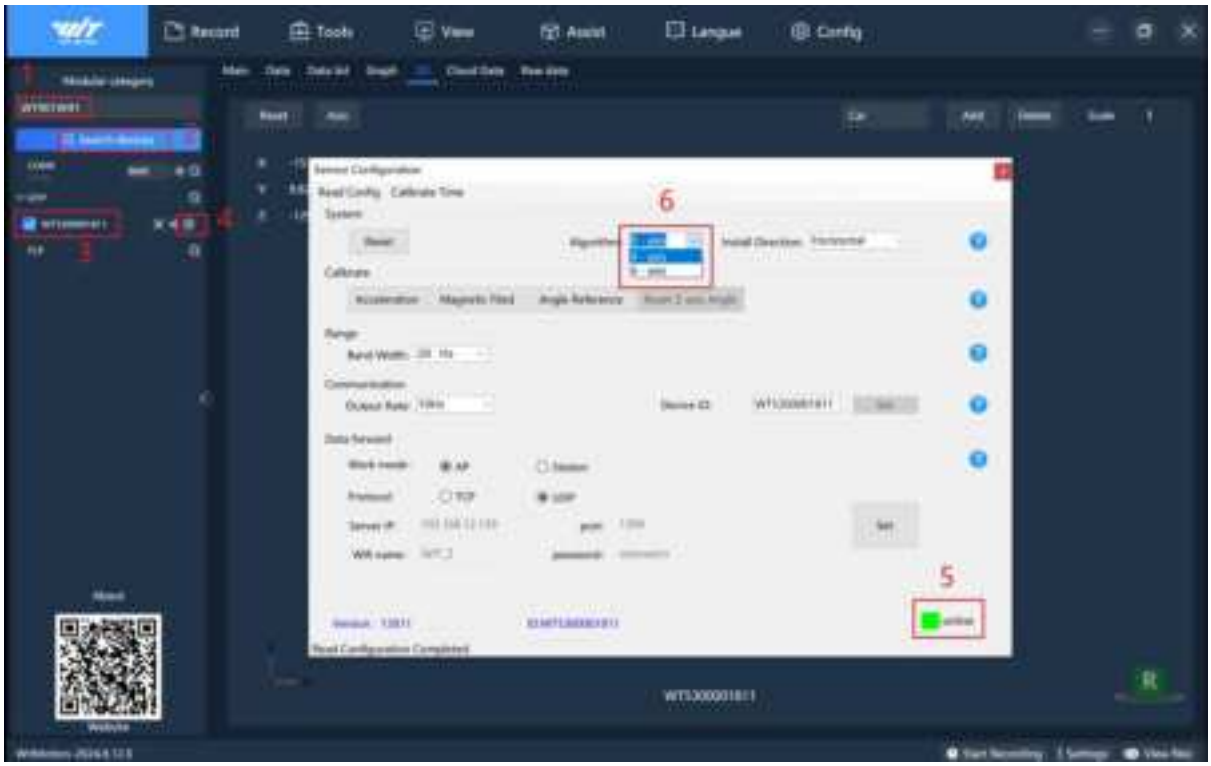
The nine-axis sensor uses a nine-axis algorithm. The Z-axis angle is mainly calculated based on the magnetic field, and there will be no drift. When there is magnetic field interference in the use environment, you can try to use the 6-axis algorithm to detect the angle.

How to use the nine-axis algorithm to six-axis algorithm: Change the algorithm to "six-axis" in the Witmotion software configuration bar, and then perform the addition calibration and Z-axis zero calibration. After the calibration is completed, it can be used normally.

Note: Only the 9-axis sensor can switch algorithms, and the system defaults to the 9-axis algorithm. The 6-axis sensor cannot switch algorithms.

Note: Z-axis zero return is only valid for the 6-axis algorithm. Switching the 9-axis sensor to the 6-axis algorithm can achieve Z-axis zero return.

The Z-axis angle of the nine-axis sensor under the nine-axis algorithm is an absolute angle, with the northeast sky as the coordinate system , and cannot be relatively returned to 0.



4.1.5. Installation direction

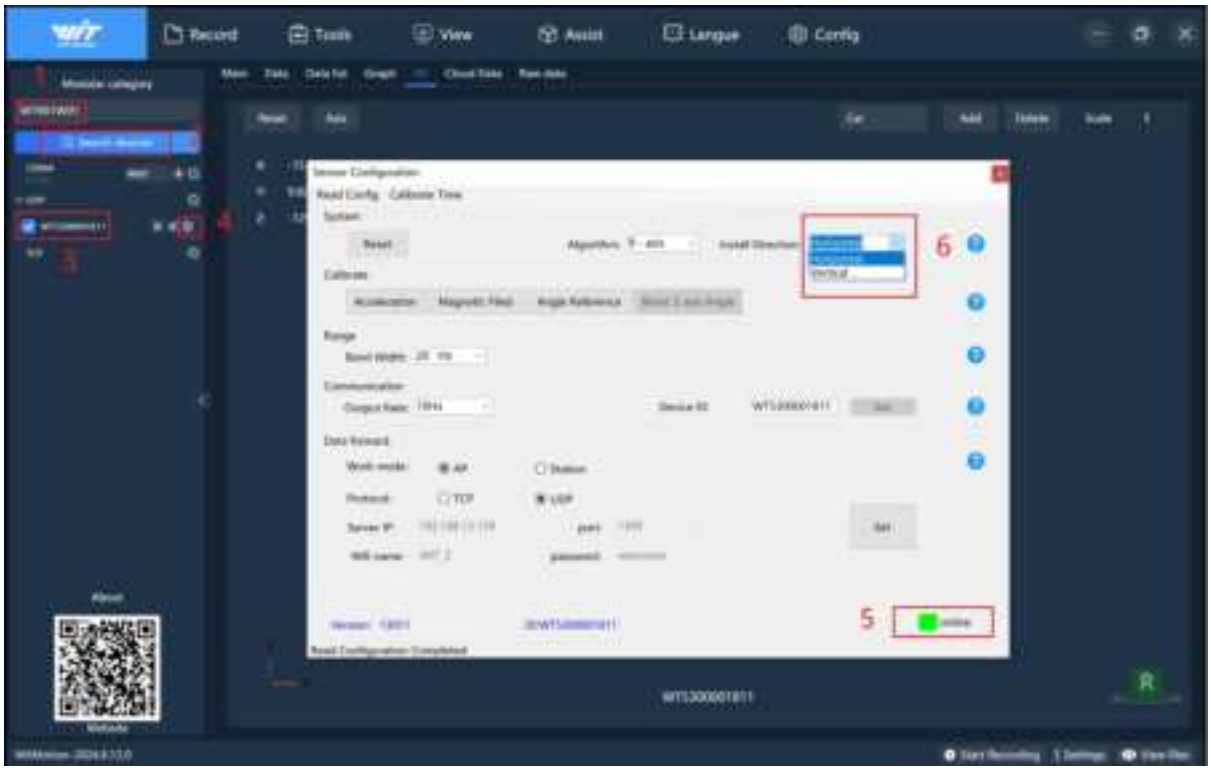
The default installation direction of the module is horizontal installation. When the module needs to be placed vertically, the vertical installation setting can be used.

Vertical installation method: When installing vertically, rotate the module 90° around the X axis and place it vertically upward. Select "Vertical" in the "Installation Direction" option in the Witmotion software configuration bar. After the setting is completed, calibration is required before use.

The module is installed horizontally by default. When the module needs to be installed vertically, the vertical installation setting can be used.

Vertical installation:

垂直安装



4.2. Sensor Calibration

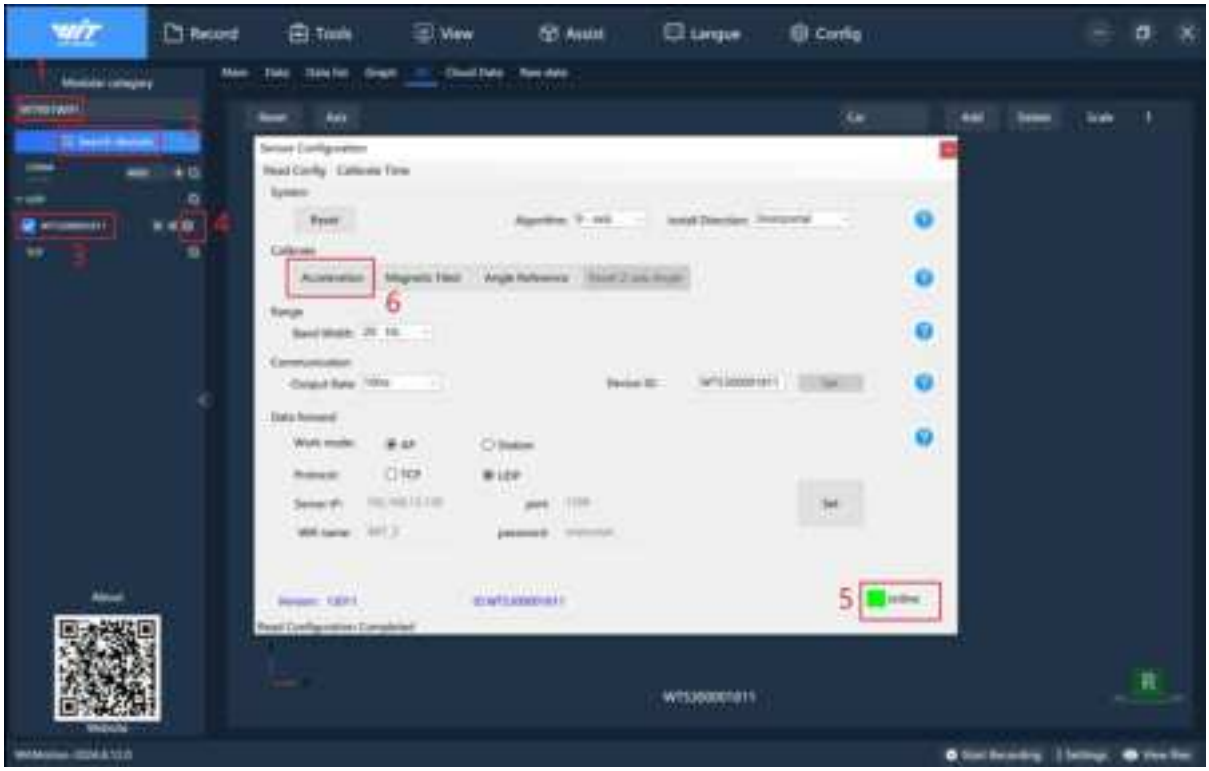
4.2.1. Acceleration Calibration

Accelerometer calibration: used to remove the zero bias of the accelerometer. The sensor will have different degrees of zero bias error when it leaves the factory, and it needs to be manually calibrated for accurate measurement.

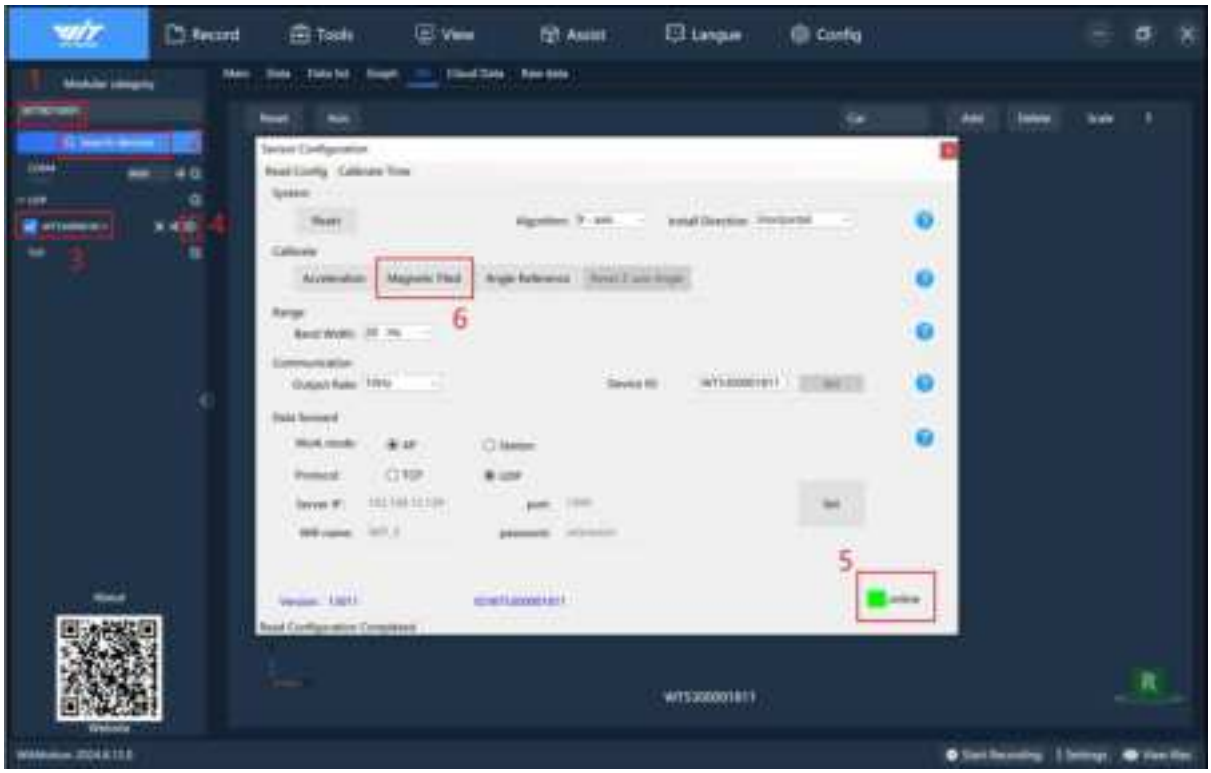
Add-on calibration method :

First, keep the module horizontal and still, click the acceleration in the calibration column under the sensor configuration window, and after 1 to 2 seconds, the values of the module's acceleration in the three axes will be around 0 0 1, and the X and Y axis angles will be around 0°. After calibration, the XY axis angles will be more accurate.

Note: When the Z axis is horizontal and stationary, there is a gravitational acceleration of 1G.

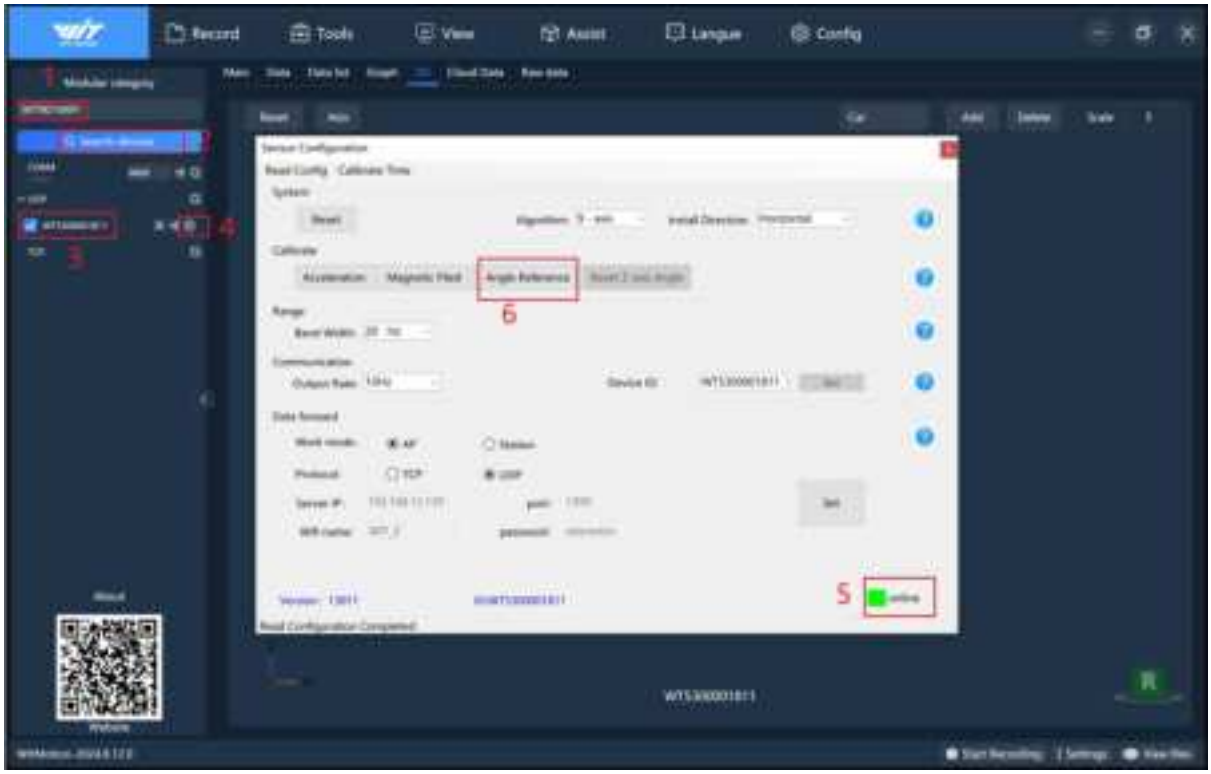


4.2.2. Magnetic field calibration



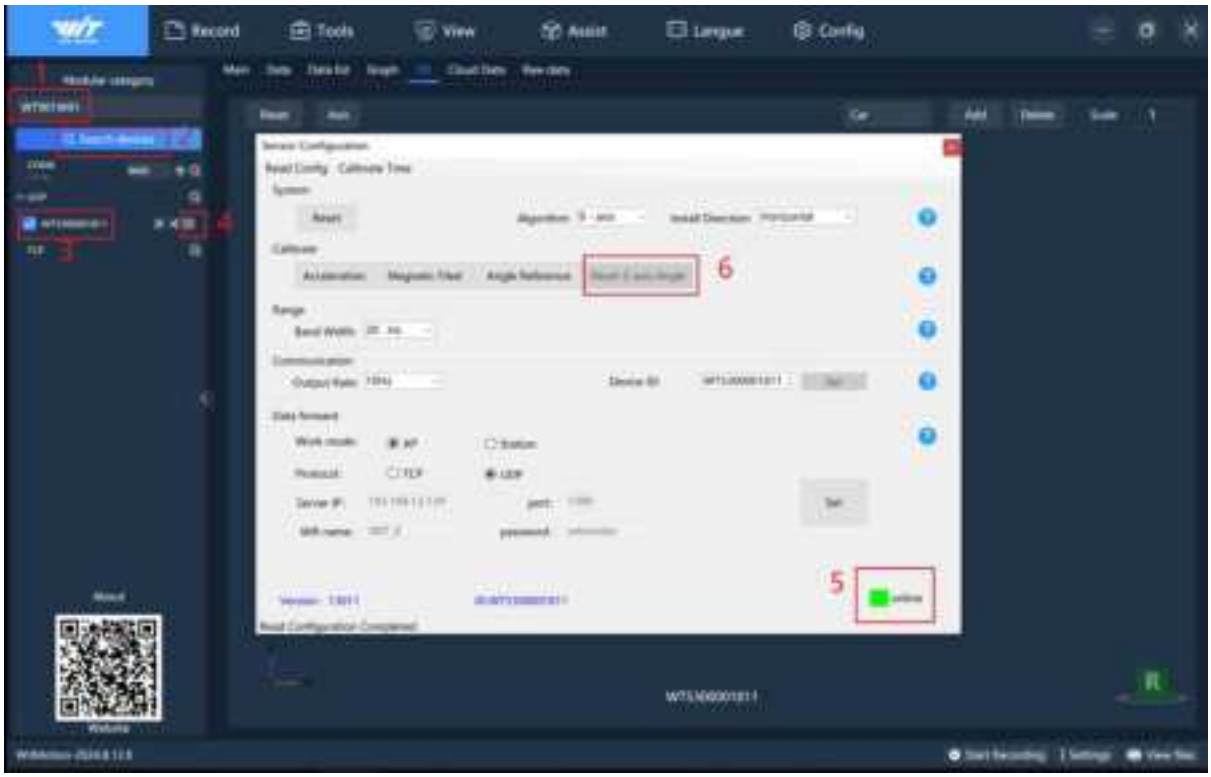
4.2.3. Z axis zeroing

Clicking Z-axis zero will set the current calibration of the Z-axis to 0 degrees (only effective when configured under the 6-axis algorithm)



4.2.4. Angle reference

Clicking on the angle reference will set the current sensor X and Y angles to 0 degrees.



4.3. Scope and Communications

4.3.1. bandwidth

Bandwidth means:

Bandwidth refers to the maximum speed of change of the measured object, and the unit is Hz, that is, the number of changes in 1 second. If the movement of the measured object changes very quickly, a high bandwidth is required, otherwise the bandwidth can be reduced. High bandwidth can make data respond faster and more timely, but it will bring greater measurement noise. Low bandwidth can make the measurement data smoother and filter out most of the high-frequency noise, but the problem is that the response will be delayed. It is suitable for situations where the measured object moves slowly and does not need to respond quickly to changes.

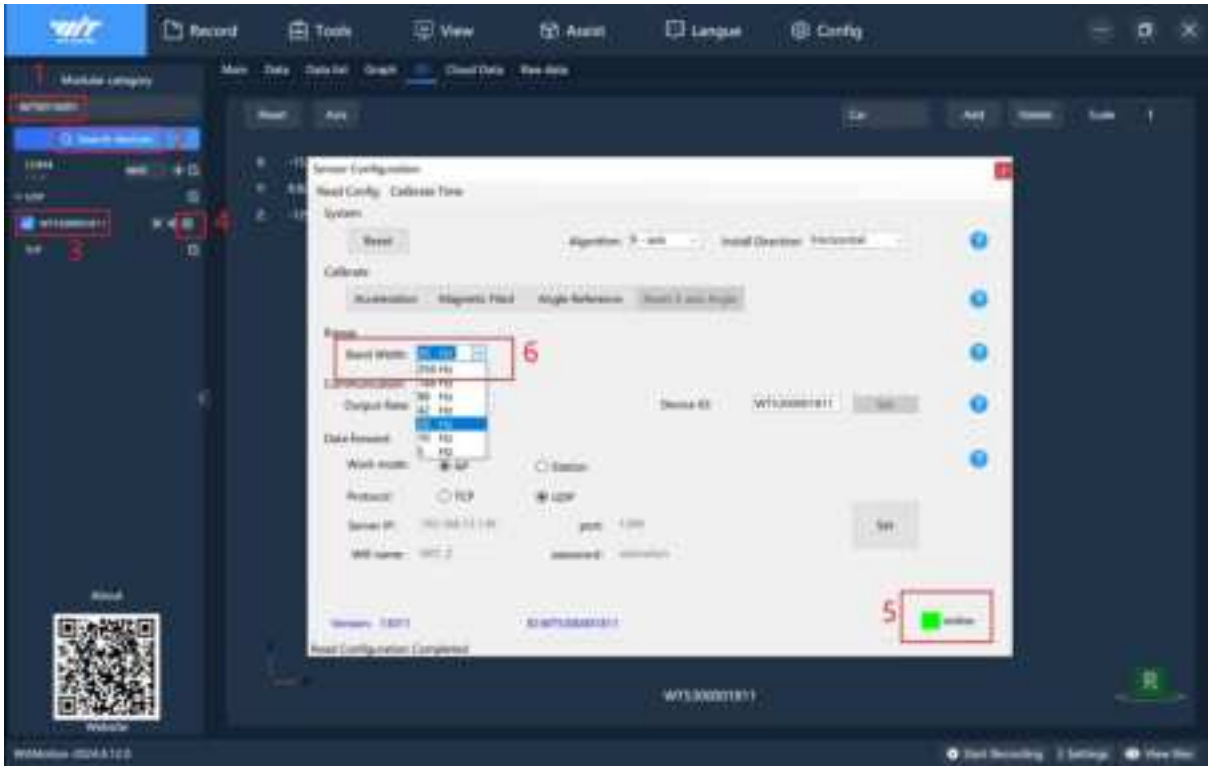
If the data output rate is higher than the bandwidth, resampling may occur, that is, two or more adjacent data are exactly the same.

To summarize:

	High bandwidth	Low bandwidth
Data smoothness	Not smooth	smooth
noise	big	Small
Response speed	quick	slow

Directions:

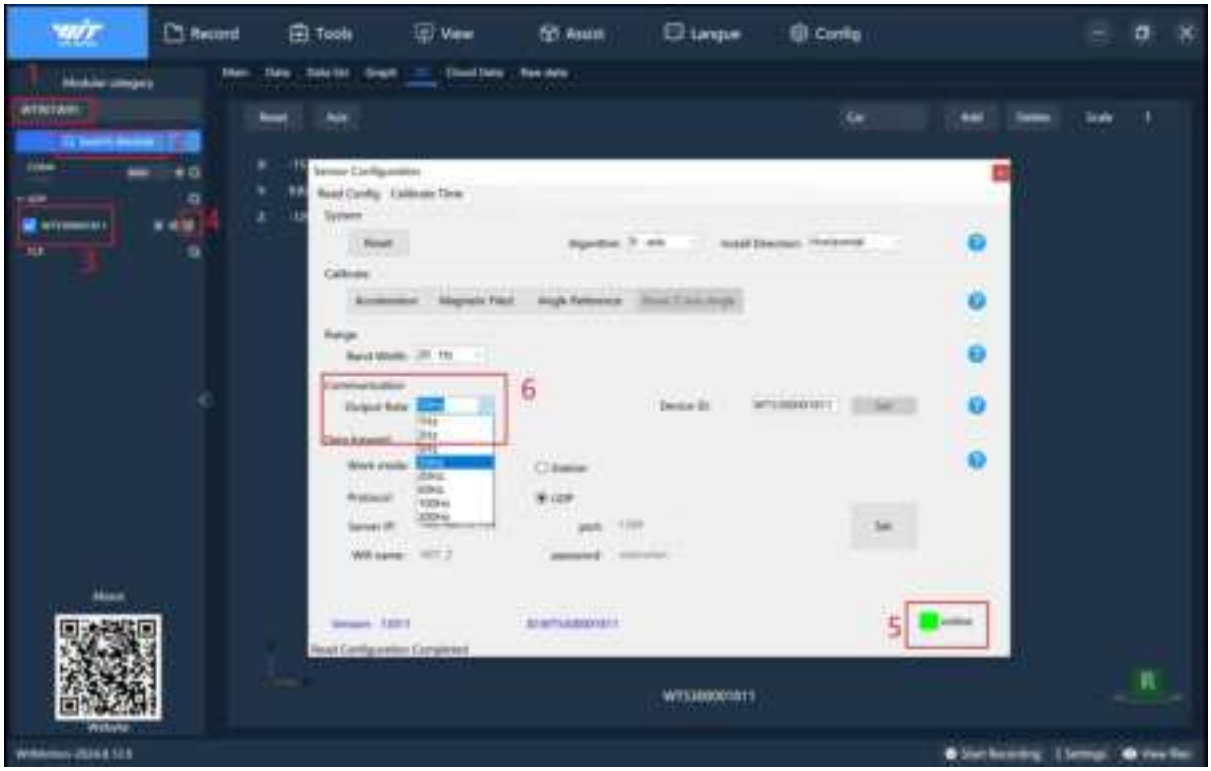
in the Witmotion software configuration bar to set it. The default is 20HZ, which can adapt to most measurement situations.



4.3.2. Return rate

Setting method: Click Witmotion software configuration option, and select the return rate 1~200HZ in the configuration bar.

The module's default return rate is 10Hz, and the maximum return rate supported is 200Hz.


Record
Tools
View
Assist
Langue
Config
6
5

FCC Warnning:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection againstharmful interference in a residential installation. This equipment generates, uses and can radiateradio frequency energy and, if not installed and used in accordance with the instructions, maycause harmful interference to radio communications. However, there is no guarantee thatinterference will not occur in a particular installation. If this equipment does cause harmfulinterference to radio or television reception, which can be determined by turning the equipmentoff and on, the user is encouraged to try to correct the interference by one or more of thefollowing measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1)This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 0cm between the radiator and your body.