

# USER MANUAL WT901BLECL BLE5.0

# Bluetooth 5.0 Inclinometer Sensor





# **Tutorial Link**

Google Drive

Link to instructions DEMO: WITMOTION Youtube Channel WT901BLECL 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 WT901BLECL BLE5.0 is a multi-sensor device detecting acceleration, angular velocity, angle as well as magnetic filed. 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.

WT901BLECL BLE5.0's scientific name is AHRS IMU sensor. A sensor measures 3-axis angle, angular velocity, acceleration, magnetic field. Its strength lies in the algorithm which can calculate the three-axis angle accurately.

It is employed where the highest measurement accuracy is required. WT901BLECL BLE5.0 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 + Magnetic Field output

• 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 (Defalut 115200) is fixed.

### **1.2 LED Status**

LED	Status	Remark
Red	Keeping on	Charging (powered by offered Type-C wire)
Blue	Flashing quickly	Standby
	Flashing slowly	Pairing succeeds



# **2** Use Instructions with Android Phone

For APP configuration introduction, please referring to the link. <u>https://drive.google.com/file/d/122Es4QPLi5R-O4TjN43FMFRcaNK9eSY8/view</u> <u>?usp=share\_link</u>

## 2.1 APP Installation

wit section		<b>v</b>	
WitMotion All permissions	5 🗸	WitMotion Installation successf	ul
SEARCH IN APPGALLERY		PERMISSIONS	
INSTALL		Storage	
CANCEL		Location	All the time $>$

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\_VBMU2CrEZfC0MxA0aRz-EY1\_

My	Drive $\rightarrow$ WITMOTION Document Center $\rightarrow$ Software, APP, Protocol,	2			⊞	(i)
Name	Ý	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,WT9011DCL,BWT61CL,BWT901CL only))	me	Apr 20, 2023 me	- 2*	± /_ ☆	:

#### **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.



## 2.2 Connection

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 "BWT901BLCL5.0" or "WT901BLECL" and then scan the device



Note: The device will show as "WT901BLE"+"MAC address"





Step 4. 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



## 2.3 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





## 2.3.2 Magnetic Field Calibration

- Step 1. Click the "Calibration" menu
- Step 2. Click the "Magnetic calibration" button
- Step 3. Slowly rotate the module 360° around X, Y, Z, 3-axis accordingly





Check the result: The Z-axis angle will have less drift than before. Notice: If there is drift of Z-axis, please stay away from the objective that can create magnetic field interference.



## 2.4 Multi-connection

Link to the multi-connection video demo. https://youtu.be/7M6R5Tjrz8U

As with PC software, we recommend up to 4 devices multi-connection. Below is the different phones' actual measure distance.

	WT901BLECL	Single dev	rice	Two dev	/ices	Three d	evices	Four de	vices
Phone		BD/m	MD/m	BD/m	MD/m	BD/m	MD/m	BD/m	MD/m
Samsung	Android 13	37m	69m						
Honor	Android 12	24m	59m	27m	53m	11m	33m	9m	20m
Redmi	Android 10	14m	22m	9m	17m	7m	13m	4m	9m
vivo	Android 12	61m	70m	26m	38m	14m	28m	7m	35m
Орро	Android 13		129m	25m	41m	18m	32m	11	21m
Xiaomi	Android 11	35m	75m	38m	66m	30m	35m		
iPhone	Ios16.4.1	34m	42m						
Lenovo	Android 11	36m	61m	29m	48m	22m	44m	30m	72

BD= Best distance; MD=Max distance



## **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\_VCgrQJTaODOhkkbmTkS 1kMs

## **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 WT901BLE+number The second column is its SSID number.



WT901BLECL BLE5.0 | manual v23-0420 | www.wit-motion.com



# 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.





## 3.3.1 Rename

Click rename and you can edit its name. The name will be fixed with WT + Name you input.





## 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.





5:52

al 🗢 🗩

#### 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 PC Connection

PC software is only compatible with Windows system. Link to download software Instructions Video link

#### 4.1.1 Serial Connection

**Step 1.** Connect the sensor with offered Type-C wire.

(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/1I3hl9Thsj9aXfG6U-cQLpV9hC3bVEH2V/view ?usp=sharing

\*How to Install and update the CH340 driver

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

👼 DriverSetup(X64)	– 🗆 X						
Device Driver I	nstall / UnInstall						
Select INF	CH341SER.INF ~						
INSTALL	WCH.CN  USB-SERIAL CH340  08/08/2014, 3.4.2014						
UNINSTALL							
HELP							

\*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  $\boxplus$  (Windows) button and type "*device manager* to quickly search for the application.



Device Manager	
View devices and prin Change device install Add a device	ters Device Manager atic View and update your hardware's setting
Find and fix problems	with devices
Add a wireless device	to the network
👯 View network compu	ters and devices
🔢 Change default settin	gs for media or devices
Start or stop using au	toplay for all media and devices
Hupdate device drivers	
🖌 Manage audio device	5
( Sync with other comp	outers, mobile devices, or network folders
Learn how to use you	r storage device to speed up your computer
AutoPlay	
Sound	

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.







COM3 open success, baud:115200



## 4.1.2 BLE 5.0 Adapter Connection

Adapter's CP2102 driver link

Note: If you use the Windows 10 OS computer, there is no need to install the driver.

Step 1. Insert adapter into the USB port in the beginning and confirm if there is a port generated in the device manager.





Step 2. Turn on the switch of the sensor after blue light of adapter flashes P.S The sensor's LED light will flash quickly. (once per second )

Step 3. Run the MiniIMU.exe application click search button and wait for 30 seconds.





Step 4. Data will appear once the auto-search finishedLED status: The LED light of sensor will flash slowly. (once two seconds.)The adapter's LED light will remain still.





# 4.2 Software Introduction

## 4.2.1 Main Menu



Main Menu of software				
Button		Function		
File		Launch recorded HEX file (Bin format)		
Tools		Hide or display tools box on left side		
Record		Record function		
3D		3D DEMO		
Config		Configuration setting		
	Language	English or Chinese		
Help	Bluetooth Set	Binding device or unbind		
	Firmware update	Option for firmware update		
	About Minimu	Info about Minimu.exe		
	Factory test	For manufacturer internal test only		
Auto-search		Auto searching the sensor		
Port		Com port selection		
Baud		Baud rate selection		
Туре		Fixed setting as Bluetooth 5.0 for		
		WT901BLECL BLE5.0		
Open		Open com port		
Close		Close com port		



.

# 4.2.2 Menu of Configuration

🐝 Bluetooth 5.0 - Config	×		
Read Config Calibration Time			
System Reset Sleep Algorithm:	9-axis ∨ Install Direction: Herizontal ∨ ⊠ Instruction Startup		
Calibrate			
Acceleration	Magnetic Filed Gyro Auto Calibrate		
Reset Height	Reset Z-axis Angle		
Range Acceleration: 16 g/s2 → Gy	yro: 2000 deg/s v Band Width: 20Hz v		
Communication Output Rate: 10Hz ~			
	Online		
Read timeout	.:		
Menu	of Configuration		
Button	Function		
Read Config	Reading the current configuration		
Calibrate Time	Calibration time of chip		

System							
Reset	Sleep	Algorithm:	9-axis	~	Install Direction:	Herizontal 🗸	☑ Instruction Startup

Menu of System				
Button	Function			
Reset	Reset to factory setting			
Sleep	Sleep function, not available for Bluetooth			
	sensor series			
Algorithm	6-axis algorithm or 9-axis			
Installation Direction	Vertical or horizontal installation			
Instruction Start-up	Instructions sending to start-up the sensor			



Calibrate

Acceleration	Magnetic Filed	🗹 Gyro Auto Calibrate
Reset Height	Reset Z-axis Angle	

Menu of Calibrate					
Button	Function				
Acceleration	Accelerometer calibration				
Magnetic Field	Magnetometer calibration				
Reset Height	Reset height data to 0				
	(only for sensor built-in barometer,				
	including WT901B, WTAHRS2, WTHARS1,				
	HWT901B)				
Reset Z-axis Angle	Reset Z-axis angle to 0 degree, not available				
	for WT901BLECL BLE5.0 in 9-axis algorithm				
Gyro Auto Calibrate	Auto-calibration of gyroscope				

Range							
Acceleration:	16 g/s2 ~	Gyro:	2000 deg/s	Ba	and Width:	20Hz ~	-

Menu of Range					
Button	Function				
Acceleration	Acceleration measurement range				
(2/4/8/16g/s2)					
Gyro	Gyroscope measurement range				
(250/500/1000/2000 deg/s)					
Band Width	Bandwidth range				
	(5/10/20/42/98/188/256Hz)				

Communication		
Output Rate:	10Hz	

Menu of Communication					
Button	Function				
Output Rate	Return rate selection				

 $\sim$ 



## 4.3 Calibration

Preparation: Ensuring the sensor is "Online".

Calibration on PC software:

It is required to calibrate for the first time usage.

### 4.3.1 Accelerometer Calibration

#### **Purpose:**

The accelerometer calibration is used to remove the zero bias of the accelerometer. Before calibration, there will be different degrees of bias error. After calibration, the measurement will be accurate.

#### **Methods:**

Step 1. Keep the module horizontally stationary

Step 2. Click the acceleration in the "Config" and wait for 5 seconds

Step 3. Calibration done if OK shows



🛩 Bluetooth 5.0 - Config	$\times$
Read Config Calibration Time	
System       Reset     Sleep     Algorithm:     9-axis     Install       Direction:     Herizontal     ✓     Instruction	
Calibrate       Acceleration     Magnetic Filed       Reset Height     Reset 7 avic Angle	
Acceleration calibration      X	
Range     Calibration is in progress [0]       Acceleration:     16 g	
Communication	
Output Rate: 10Hz ~	
Online	
accessiony set up gyro:	

## Step 4. Check the result--confirm if there is 1g on Z-axis acceleration

🐲 WitMotion Shenzh	nen Co.,Ltd				- 🗆 X
<u>F</u> ile <u>T</u> ools <u>R</u> eco	ord <u>3</u> D <u>C</u> onfig <u>H</u> elp • Aut	to-search			
Port	Main Acceleration Angular	Velocity Angle Magnetic Field	Data Raw Data		CAN DO
Port: COM3 V	Time	Acceleration	Angular Velocity	Magnetic Filed	
Baud: 115200 ~	System: 14:38:34	X: -0.0029 g	X: -0.0610 °/s	X: 64	20
Open Close	Chip: 2000-0-0	Y: 0.0010 g	Y: -0.0610 °/s	Y: 38	—
Туре	4:18:10.960	Z: 1.0015 g	Z: 0.0000 °/s	Z: -222	10
Bluetooth 5.0	Relative: 15165.475	T: 1.0015 g	T: 0.0863 °/s	<b> H :</b> 234	
Transmit mode $~~$ $\sim$					
	Dent	Descente	Amela	Oustamian	—
	Port 1	Tomproture 0.00 °C	Angle	Quaternion	10
	D0. 1		X. 0.104	qu. 0.86576	—
	D1: 1	Pressure: 0 Pa	Y: 0.071	q1: 0.00052	20
	D2: 1	Height: 0.00 m	Z: 55.827 °	q2: 0.00104	
	D3: T		1: 0.00 °C	q3: 0.46786	30
÷ 💙					
WT901WIF1 Wireless Inclinometer Angle Acceleration Open Magnetic (C1 2	Location	PDOP			N/E
	Longitude: 0°0.00000'	Satellite 0			
	Latitude: 0°0.00000'	PDOP: 0.00			
	GPS H: 0.0 m	HDOP: 0.00			2 / 6
<u>WiKi</u> Web	GPS Yaw: 0.0 °	VDOP 0.00			M IS
Contact	GPS V: 0.000 km/h				
COM3 open success	haud:115200				



## 4.3.2 Magnetic Field Calibration

#### Purpose:

Magnetic calibration is used to remove the zero bias of the magnetic field sensor. Usually, the magnetic field sensor will have a large zero error when it is manufactured. If it is not calibrated, it will bring a large measurement error, which will affect the accuracy of the measurement of the z-axis angle of the heading angle.

#### **Preparation:**

Sensors should be 20cm away from magnetic and iron and other materials
 The value of H in magnetic field must be lower than 350.

👐 WitMotion Shenzhe	en Co.,Ltd				- 🗆 X				
Ele Iools <u>R</u> ecord <u>3</u> D <u>C</u> onfig <u>H</u> elp → Auto-search									
Port	Main Acceleration Angular	Velocity Angle Magnetic Field	Data Raw Data						
Port: COM3 ~	Time	Acceleration	Angular Velocity	Magnetic Filed					
Baud: 115200 ~	System: 14:52:32	X: 0.0000 g	X: 0.0000 °/s	X: 64	20				
Open Close	Chip: 2000-0-0	Y: -0.0073 g	Y: 0.0000 °/s	Y: -66	<u> </u>				
Туре	4:29:29.470	Z: 1.0015 g	Z: 0.0000 °/s	Z: -137	10				
Bluetooth 5.0	Relative: 16003.186	T: 1.0015 g	T: 0.0000 °/s	H : 165	_				
Transmit mode $~~$ $\sim$									
	Port	Pressure	Angle	Quaternion	10				
	D0: 1	Temprature 0.00 ℃	X: -0.434 °	q0: 0.35397					
	D1: 1	Pressure: 0 Pa	Y: -0.038 °	q1: -0.00098	20				
	D2: 1	Height: 0.00 m	Z: 138.516 °	q2: -0.00366	<u> </u>				
	D3: 1		T: 0.00 °C	q3: 0.93521					
WINING Wirden Inclinemater					E/S				
Angle Association Cyco Magnetic (C.T.Z.	Location	PDOP			4 0				
	Longitude: 0°0.00000'	Satellite 0							
	Latitude: 0°0.00000'	PDOP: 0.00			z = 0 - z				
and set	GPS H: 0.0 m	HDOP: 0.00							
Web	GPS Yaw: 0.0 °	VDOP 0.00			MN				
Contact	GPS V: 0.000 km/h								
				•					

COM3 open success, baud:115200

Methods:

Step 1. Open the Config menu.

Step 2. Click the "magnetic field" and slowly rotate the sensor 360° around X, Y, Z, 3-axis accordingly.



wr Bluetooth 5.0 - Config	$\times$
Read Config Calibration Time	
System           Reset         Sleep         Algorithm:         9-axis         Install         Herizontal         Instruction           Startup         Startup	
Calibrate       Acceleration     Magnetic Filed       Reset Height     Reset 7 avic Accele       Wr Magnetic field calibration     X	
Range     Please rotate X, Y, and Z axis by 360 degrees for calibration, and then click OK after the operation is completed.     th:     20Hz       Communication     OK(Q)	
Online	

Step 3. Click OK once the calibration done.

Step 4. Place the sensor horizontally stationary and make the Y axis point to the north.

Ster	5.	Check t	he dat	a of Z	' axis	angle.	it's ok	if the	value	is about	t 0°.
Step		CHECK C	ine aat		- 4/15	ungic,	10.2 010	in the	vuluc	15 0500	

🐲 WitMotion Shenzh	hen Co.,Ltd				– 🗆 ×
<u>F</u> ile <u>T</u> ools <u>R</u> eco	ord <u>3</u> D <u>C</u> onfig <u>H</u> elp •	Auto-search			
Port	Main Acceleration Angu	ar Velocity Angle Magnetic Field	d Data Raw Data		
Port: COM3 ~	Time	Acceleration	Angular Velocity	Magnetic Filed	
Baud: 115200 ~	System: 15:10:4	5 X: -0.0054 g	X: 1.1597 °/s	X: 4	20
Open Close	Chip: 2000-0	0 Y: 0.0127 g	Y: 0.3052 °/s	Y: 127	
Туре	4:47:3.14	0 Z: 1.0039 g	Z: 0.0000 °/s	Z: -159	10
Bluetooth 5.0	Relative: 17096.60	7 T: 1.0040 g	T: 1.1992 °/s	[H]: 204	—
Transmit mode $~~$					
	Dert	Drossure	Angle	Quatornion	
	D0:	1 Temprature 0.00 °C	X· 0.764 °	<b>Quaternion</b>	
	D1:	1 Pressure: 0 Pa	V: 0.385 °	q1: 0.00674	20
	D2 <sup>.</sup>	1 Height: 0.00 m	7: 0.253 °	q1: 0.00071	
	D3:	1	T: 0.00 °C	q2: 0.00256	20
				40.	
🦻 🗙					
WT901WIFI Wireless Inclinometer tagle toorlendion Gpts Magnetic (CT2	Location	PDOP			
	Longitude: 0°0.0000	0' Satellite 0			
	Latitude: 0°0.0000	0' PDOP: 0.00			3 - 0 - □
WiKi	GPS H: 0.0	m HDOP: 0.00			3
Web	GPS Yaw: 0.0	° VDOP 0.00			5 31
<u>Contact</u>	GPS V: 0.000 km,	h			
COM3 open success.	baud:115200				

WT901BLECL BLE5.0 | manual v23-0420 | www.wit-motion.com



## 4.3.3 Gyroscope Automatic Calibration

The gyroscope calibration is to calibrate the angular velocity, and the sensor will calibrate automatically.

It is recommended that the automatic calibration of gyroscopes can be inactivated only if the module rotates at a constant speed.

### 4.3.4 Reset Z-axis Angle

Note: If you want to avoid magnetic interference, you can change the algorithm

to 6-axis, function of resetting Z-axis angle can be used.

The z-axis angle is an absolute angle, and it takes the northeast sky as the coordinate system can not be relative to 0 degree.

Z axis to 0 is to make the initial angle of the z axis angle is relative 0 degree. When the module is used before and z - axis drift is large, the z - axis can be calibrated. When the module is powered on, the Z axis will automatically return to 0.

Calibration methods as follow: firstly keep the module static, click the "Reset Z-axis Angle" in the "Config", you will see the angle of the Z axis backs to 0 degree in the "Data".

### 4.3.5 Reset Height to 0

Only available for the module built-in barometer like WT901B, HWT901B, WTGAHRS1, WTGAHRS2.



## 4.4 Configuration

## 4.4.1 Data Recording

There is no memory chip in the sensor module, and the data can be recorded and saved on the computer.

w WitMotion Shenzhen Co.,Ltd	- 🗆 X
File Iools Record 3D Config Help - Auto-search	
Port Begin celeration Angular Velocity Angle Magnetic Field Data Raw Data	
Port: COM Stop	) (
Baude 115200 WitMotion Shenzhen Co.,Ltd	-
Open Close	- 50
Type Attitude Measurement System	-
Bluetooth 5.0	01
Transmit mode V Angle X: =16674	
	-
Angle Y: 8,84	01
Angle Z: -46.26	
WTW1001 Window Reference:	
Acc Calibrate	
WIKI	0 3
Web	S/3
Contact	
COM2 appa sussess build 115200	

Method is as follows: Click "Record" and "Start" will save the data as a TXT

file. The saved file is in the directory of the upper computer program Data.tsv: the beginning of the file has the value corresponding to the data.



2	Eile Tools Record	10 Confin H	ele v Autors	anch									_	
ations:	Prile loois Record	so coning in	eip - Auto-s	earch			Rev Date				-			
	Port COM8	Main Accelerat	ion Angular	Velocity Ar	igle Magnet	sc Field Data	Raw Data	1				4	1	
		00 FB FF 00 00 75	F9 55 61 00	00 FE FF FB 0	17 00 00 00 00	00 00 FB FF	00 00 7A F9 5	5 61 00 00 FE	FF FC 07 0	0 00 00 00 00 00 0				
	Baud: 115200 ~	FA FF 00 00 7A F9	55 61 00 00	00 00 FA 07	00 00 00 00 0	0 00 FB FF 00	00 77 F9 55	51 01 00 FF FF	03 08 00	00 00 00 00 00			20	
k PC	Open Close	FF 00 00 84 F9 55	61 02 00 FF F	FF FD 07 00 0	0 00 00 00 00 00	FB FF 00 00	00 80 F9 55 61 0	1 00 00 FF FF	PE 07 00 0	0 00 00 00 00 00 FB 0 00 00 00 FA FF		_		
	Туре	00 00 83 F9 55 61	00 00 FD FF	FB 07 00 00	00 00 00 00 F	A FF 00 00 82	F9 55 61 FE	F FF FF 04 08	00 00 00 0	0 00 00 FA FF 00			10	
	Bluetooth 5.0	00 80 F9 55 61 FF	FF 01 00 06 0	00 00 00 00	00 00 00 FA FF	00 00 76 F9	55 61 04 00 F	F FF 02 08 00	00 00 00 0	0 00 FA FF 00 00				
>	Transmit moda	76 F9 55 61 FF FF	00 00 02 08 0	00 00 00 00 0	00 00 FA FF 00	00 72 F9 55	61 FF FF FF FF	FC 07 00 00	00 00 00 0	FA FF 00 00 72				
-	transmit houe	F9 55 61 00 00 FF	FF FD 07 00 0	00 00 00 00 0	00 FA FF 00 00	79 F9 55 61	FF FF FF FF OC	08 00 00 00	00 00 00 F	4 FF 00 00 7F F9		<u> </u>		
cand.		55 61 01 00 00 00	FE 07 00 00	00 00 00 00	FA FF 00 00 7	D F9 55 61 FF	FF 00 00 00 0	8 00 00 00 00	0 00 00 FA	FF 00 00 75 F9				
E Dat	200429110617 - Notepad							-		× 68 F9 55		_	10	
le Ed	it Format View Help									E F9 55	-	_		
tartT	me: 2020-04-29 1	1:01:37.522							1.2	^ 6 F9 55			20	
ddre	ss Time(s) ax(g	) ay(g)	az(g)	wx(deg/	s)wy(deg/	s)	wz(deg/	s)AngleX(d	deg)	F9 55 61		-		
250	11:06:18.494	0.0000	-0.0005	1,0000	0.0000	0.0000	0.0000	-0.0220	0.005	55 61 00		_		
50	11:06:18.682	-0.0005	-0.0015	0.9995	0.0000	0.0000	0.0000	-0.0275	0.0000	61 01 00		_	30	
x50	11:06:18.782	0.0000	0.0000	0.9995	0.0000	0.0000	0.0000	-0.0275	0.0000	12 00 01		_		
(50	11:06:18.903	0.0000	0.0000	1.0020	0.0000	0.0000	0.0000	-0.0275	0.0000	DO FC FF	6			_
x50	11:06:18.982	-0.0005	-0.0015	0.9985	0.0000	0.0000	0.0000	-0.0275	0.0000	00 00 FF	11			
)x50	11:06:19.083	0.0005	0.0000	1.0000	0.0000	0.0000	0.0000	-0.0275	0.0000	D FE 07	11			
x50	11:06:19.182	0.0005	-0.0010	0.9995	0.0000	0.0000	0.0000	-0.0275	0.0000	FF 07 00				
(50	11:06:19.282	0.0000	-0.0015	0.9990	0.0000	0.0000	0.0000	-0.0275	0.0000	17 00 00				
50	11:06:19.381	0.0005	0.0000	0.9980	0.0000	0.0000	0.0000	-0.0275	0.0000	00 00 00				
x50	11:06:19.490	0.0010	-0.0015	0.9985	0.0000	0.0000	0.0000	-0.0330	0.0000	00 00 00				
x50	11:06:19.582	0.0005	0.0000	1.0010	0.0000	0.0000	0.0000	-0.0330	0.0000	0 00 00				
50	11:06:19.682	-0.0010	0.0005	1.0010	0.0000	0.0000	0.0000	-0.0275	0.0000	00 00 00 ~	-			
x50	11:06:19.783	-0.0010	0.0000	0.9990	0.0000	0.0000	0.0000	-0.0275	0.0000					
(50	11:06:19.902	0.0000	0.0000	1.0010	0.0000	0.0000	0.0000	-0.0275	0.0000		-			
x50	11:06:19.982	-0.0005	-0.0010	1.0010	0.0000	0.0000	0.0000	-0.0275	0.0000	~			-	1
14.50	1116-20.082			10015	manna	mann	(ITANA)	-1114-411		>	-		1	
					A 6.44	40.00	a Vieweitig III.		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					

It is highly recommended that data can be pasted to a Excel file. In this way, all

#### data will be shown in order.

address	Time(s)	ChipTimea	ax(g)	ay(g)	az(g)	wx(deg/s)	wy(deg/s)	wz(deg/s)	AngleX(dec	AngleY(deg.	AngleZ(deg)	T(°) h	x hy	h	z
0x50	43:06.4	02:40.4	0.4443	0.1777	-0.8696	3.1738	-0.3662	-29.541	166.0364	-29.2072	120.6299	29.97	0	50	313
0x50	43:06.5	02:40.5	0.02	0.5796	-0.7739	-192.0166	283.9355	-700.2563	142.0532	-24.884	154.8907	30	-29	7	312
0x50	43:06.6	02:40.6	-0.2896	0.8599	-0.5571	-8.2397	-3.7842	-264.5264	124.0741	20.0171	-158.2196	30	-7	-85	291
0x50	43:06.7	02:40.7	-0.771	0.5322	-0.4761	36.0718	43.8232	-226.8677	132.984	41.4514	-138.0872	30	38	-93	289
0x50	43:06.8	02:40.8	-0.5601	0.4233	-0.5562	55.7861	101.9897	274.1699	144.5087	35.5792	-132.4292	30	22	-58	301
0x50	43:06.9	02:40.9	-0.0059	0.5503	-1.0103	139.0991	-32.7759	432.251	141.4929	1.8073	-174.1113	30	-22	-9	308
0x50	43:07.0	02:41.0	0.2656	0.3887	-0.8594	124.3896	7.8735	341.1865	154.6985	-15.5896	157.3077	30.01	-14	46	307
0x50	43:07.1	02:41.1	0.3911	0.1104	-0.8467	40.7715	11.9019	257.1411	177.3303	-25.7684	127.7325	30	0	104	294
0x50	43:07.2	02:41.2	0.3896	0.3022	-0.8994	-90.0879	135.3149	-268.9819	163.4601	-31.9867	128.6829	30.03	-2	67	308
0x50	43:07.3	02:41.3	0.2939	0.9531	-0.2837	-251.5259	48.645	-750.4272	119.0149	-0.3625	-174.1608	30.03	-30	-56	295
0x50	43:07.4	02:41.4	-0.4614	0.7075	-0.3384	-27.3438	-19.4702	-226.9287	112.8021	30.6519	-161.4001	30	33	-122	272
0x50	43:07.5	02:41.5	-0.7988	0.6279	-0.5044	28.0762	81.7261	122.1924	122.0087	39.8035	-151.1389	30	63	-110	275
0x50	43:07.6	02:41.6	-0.2495	0.8135	-0.5327	36.377	5.6763	93.0176	121.8494	15.7214	-161.109	30	12	-108	288
0x50	43:07.7	02:41.7	0.3057	0.7432	-0.5996	74.0356	-0.061	379.7607	126.7603	-11.4478	-176.6711	30.03	-51	-68	295
0x50	43:07.8	02:41.8	0.4922	0.4653	-0.7129	134.7656	24.231	268.9819	145.3656	-32.4756	163.3832	30.02	-83	10	295
0x50	43:07.9	02:41.9	0.4507	0.4272	-0.7871	-186.5234	-36.3159	420.6543	166.2616	-49.1583	130.2924	30.02	-86	71	292
0x50	43:08.0	02:42.0	0.6045	-0.062	-0.8027	37.9028	7.6294	-138.0005	173.4357	-45.8514	118.0206	30.03	-66	75	298
0x50	43:08.1	02:42.1	0.4712	0.6011	-0.5688	-172.6685	-7.1411	-537.6587	137.6312	-31.2396	163.8171	30.03	-78	20	300
0x50	43:08.2	02:42.2	-0.0649	0.873	-0.4028	-115.6616	2.3193	-276.2451	113.6481	4.6417	-169.8761	29.98	-37	-101	283
0x50	43:08.3	02:42.3	-0.4092	0.856	-0.1816	-134.8877	-38.208	-155.7007	99.8822	26.933	-165.943	30.03	32	-166	244
0x50	43:08.4	02:42.4	-0.5171	0.8809	-0.1152	84.1064	0.9155	86.2427	94.8285	33.2666	-167.5415	30.06	72	-186	218
0x50	43:08.5	02:42.5	-0.1782	0.9595	-0.2793	243.2861	29.3579	406.8604	110.7367	13.3429	-169.0686	30.03	29	-156	254



## 4.4.2 Data Playback

New function: When creating recorded file each time, there will a BIN file created in the folder of record file in path of installed software meanwhile. Recorded data playback method:

Step 1: Disconnect the sensor

Step 2: Click "File" Button and then click "Load"



Step 3: Choose the original path of software installation and load the Bin file





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Port Main Acceleration Angular Velocity Ang	le Magnetic Field Data	Raw Data		
Port:				` <mark>`</mark>
Baud: 115200 V	otion Shenz	zhen Co. I	td	20
Open Close			nu	
Type Attitu	de Measurei	ment Syst	zem 💦 👘	10
Bluetooth 5.0				<u> </u>
W Please choose file			×	
← → × ↑ 📙 « BLE Software for Windows PC → recordFile	✓ <sup>™</sup> Search	recordFile	۹	
Organize 🔻 New folder		8== 🕶 🔲	•	<u> </u>
This PC ^ Name	Date modified	Type Size	e	<u> </u>
Dijects Normal_200604093344.BIN	6/4/2020 9:33 AM	BIN File	C	20
Desktop	6/4/2020 9:44 AM	BIN File	1	
Documents				—
🕹 Downloads				
b Music				$\frown$
Pictures				
📑 Videos				
Local Disk (C:)				
DATA (D:)				
Play (E:)				3
PROGRAM & FIL V <				× s 3
File <u>n</u> ame:	~ Binary	/ file(*.bin)	~	
	2	2pen Cancel		
			.:	

Step 4: Click "Run" and the Binary file will be playback When playback, the rate can be editable.





### 4.4.3 Placement Direction

The default installation direction of the module is horizontal. When the module needs to be installed vertically, the vertical installation can be set.

Step 1: Rotate the module 90 degrees around the X-axis

Step 2: Place the sensor 90 degrees vertically

🛩 WitMotion Shenzhen Co.,Ltd	➡ Normal - Config >	< ×
<u>File Tools Record 3D Config E</u>	e Read Config Lock Unlock Calibrate Time	
Port Main Act Port: COM3 ~ Baud: 115200 ~	ce System Reset Sleep Alarm Algrithm: 9 - axis ∨ Install Calibrate	
Open Close	Acceleration Magnetic Filed Reset Z-axis Angle Gyro Auto Calibrate	20
Type		10 
	Accieration:     Io g     Gyro:     Zuou degyrs     band widu:     Zu     Gyro:     Inz     Gyro:     Gyro:     Inz     Gyro:     Gyro:	
	Content	20
	Pressure Location PDOP Quaternion Positioning Accuracy GPS Original Rott	30
	D0 model: AIN v pulse width: 0 🖨 cycle: 0 🖨	SIW
WY991WWFT Wirelben Itelfionneter Augle bestenist (geschapels: 3/17)	D1 model: AIN v pulse width: 0 + cycle: 0 + D2 model: AIN v pulse width: 0 + cycle: 0 +	6 4
	D3 model: AIN v pulse width: 0 🖨 cycle: 0 🚖	
WiKi Web	Save Config	ME
COM3 open success, baud:115200	Read Configuration Completed	

Step 3: Click "Vertical" as install directions on the "Config" menu



## 4.4.4 Bandwidth

## Default bandwidth is 20Hz.

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<u>F</u> ile <u>T</u> ools <u>R</u> ecord <u>3</u> D <u>C</u> onfig <u>H</u> elp ▼ Auto-search	
Port Main Acceleration Angular Valocity Angle Magnetic Field Data Raw Data Port: COM3 v Bluetooth 5.0 - Config X	
Baud: 115200 V Read Config Calibration Time	
Type Reset Sleep Algorithm: 9-axis V Install Direction: Herizontal V Startup	
Calibrate	
Transmit mode  Acceleration Magnetic Filed Gyro Auto Calibrate	
Reset Height Reset Z-axis Angle	10
Range	<u> </u>
Acceleration: 16 g/s2 V Gyro: 2000 deg/s V Band Width: 5Hz V	20
Communication 188Hz	
Output Rate:         50Hz         98Hz         42Hz         42Hz	
	NE
5Hz	
WiKi	
Web Online	S
Contact Successfully set bandwidth!	
OM3 open success, baud:115200	

#### Explanation:

1. The higher rate of bandwidth setting will lead to higher fluctuation in data waveform. Conversely, the lower rate of bandwidth, data will become more fluent.

#### For example:

Bandwidth as 50Hz, Output rate as 5Hz. The waveform is very steady.



👐 WitMotion Shenzhen Co.,Ltd	- O X
Eile         Iools         Record         3D         Config         Help         + Auto-search           Port         Main         Acceleration         Angular Velocity         A	ngle Magnetic Field Data Raw Data
Port: COM3 ~ Baud: 115200 ~ 1.2	☞ Bluetooth 5.0 - Config Read Config Calibration Time
Type 1-	System Reset Sleep Algorithm: 9-axis V Install Direction: Herizontal V Startup
Transmit mode ~ 0.8	Calibrate           Acceleration         Magnetic Filed         Image: Gyro Auto Calibrate
0.6	Reset Height Reset Z-axis Angle
0.4	Range       Acceleration:     16 g/s2       Gyro:     2000 deg/s       Band Width:     5Hz
0.2	Communication Output Rate: 50Hz
·///	
Wiki         -0.2           Web         -0.2           Contact         17:40:20.516	Online

Bandwidth as 256Hz, Output rate as 50Hz. The waveform will show more fluctuation.



2. The higher rate of bandwidth will solve the data-repeating problem.

For example, if the bandwidth setting is 20Hz, retrieval rate as 50Hz, there will be 5 repeating data.

If you prefer there is no repeating data, it is required to increase the bandwidth more than 50Hz.

```
WT901BLECL BLE5.0 | manual v23-0420 | www.wit-motion.com
```



## 4.4.5 6-axis/ 9-axis Algorithm

6-axis algorithm: Z-axis angle is mainly calculated based on angular velocity integral. There will be calculated error on Z-axis angle.

9-axis algorithm: Z-axis angle is mainly calculated and analyzed based on the magnetic field. Z-axis angle will have few drift.

The default algorithm of WT901BLECL is 9-axis. If there is magnetic field interference around installed environment, it is recommended to switch to 6-axis algorithm to detect the angle.

Method:

Step 1: Switch to the "6-axis" algorithm on the "Config" menu.

Step 2: Proceed with the "Accelerometer calibration" and "Reset Z-axis angle" calibration.

After the calibration is completed, it can be used normally.

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<u>F</u> ile <u>I</u> ools <u>R</u> ecord <u>3</u> D <u>C</u> onfig <u>H</u> elp + Auto-search	
Port Main Acceleration Angular Velocity Angle Magnetic Field Data Raw Data	
Port: COM3 V Bluetooth 5.0 - Config X	) <sup>0</sup> 2
Baud: 115200 V Bead Config Calibration Time	
Open Close	
System	
Bluetooth 5.0 Reset Sleep Algorithm: O-axis V Install Direction: V Install Direction:	
Transmit mode V Calibrate	<u>م</u> ل کر کھ
Acceleration Magnetic Filed	
Reset Height Reset Z-axis Angle	
Kange	
Acceleration: 16 g/s2 V Gyro: 2000 deg/s V Band Width: 20Hz V	
Communication	
WWITHIN Windows buckmonter By Kindows and Applications a	G W W
	e 71 - 2
<u>Wiki</u> Wab	A E E
Contact	
Online	
COM3 open success, bau Successfully set algorithm!	



# **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.

<u>Video demo</u>

Below is the new software and universal instruction download link.

https://drive.google.com/drive/folders/1dnwmnH7mi4zBpNqDywLz rzsV7BfeKaD9?usp=share\_link

	Software Instructions PG software Download PC software Developed PC software Software Connect the sonsor Install University Connect the sonsor Install University Connect to software Connect to software Conn	an algung a sa ta an	ļ		
	PDF Software	Instructions	₩itMoti	on New Softwar	
				3	
wite section	Record (R) Tools (T)	View(_V) Help(_H)	دریا Language (L) Config	אר uration	- • ×
Add device	Main interface Data Data list	Graph Map 3D pose Raw	data		
Port: COM4	COM6,9600,50			Con	iguration information Angle reference
ID: 0x50	Angle X	-0	.505°		
Add Modular category	Angle Y	1.	203°		
WT901C-485 Q. Search devices	Angle Z	-42	2.155°		
🛃 соме.9600.50	J				$\left( \right)$
			A S	N m	
About			\$ s/3	2	[
WeChat					

WITMOTION New Software(Universal)

Note:

The 2022 old version software will be reserved for use. You can check "Chapter 3 Use Instructions with PC" for more details.



# **6** Multiple-Connection Instructions

The WT901BLECL 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 BLE 5.0 adapter (refer to the chapter4.1.2 BLE 5.0 Adapter Connection)



## **6.1 Connection Instructions**

- 1. Install WitMotion New Software (<u>Download link</u>).
- 2. Open the WitMotion New Software and the laptop's Bluetooth.

WITMOTION 2023 New Software >
Bin
Config
📕 Plugins
📕 Record
📕 Temp
Hit WitMotion.exe to open software.txt
Software Instructions Manual.pdf
WitMotion.exe
WitMotion.exe.config

3. Choose module "BWT901BLECL5.0".

wir assilies	Record (_R) Tools (_T)	View(_V)	Help(_H)	Language (_L)	Configuration (_		) X
Add device	Main interface Data Data list	Graph 3D pose	Raw data				
Port :	No sensors connecte	d					
Baud : 9600							
Add 💛	Angle X						
Modular category							
BWT901BLECL5.0	Angle Y						
BWT901BLECL5.0	Angle 7						
WT901BLE5.0	Angle Z						
WT9344M							
W1645-485							
WT635-7DT-485					N		
WT61C_TTL				~	T m		
JY60				3-			
JY61				3	2		
BWT61CL					S		
JY62							
HWT905-422							
JY61P							
JY901							

- 4. Open all sensors.
- Click "Search devices", the software will auto-search. Once it searches "WT901BLE68", close the pop-up, and then wait for a minute, you can see the data.



wir scotios	Record (_R) Tools	, (_T) View(	ј _v, на	elp(_H) La	anguage (_L)	Configuration					
Add device	Main interface Data	Data list Graph	3D pose R	Raw data							
Port:	No sensors con	nected									
Add	Angle X										
BWT901BLECL5.0	Angle Y										
Q Search devices	Angle Z	搜索									
			DABA2BEED744,WT901BLE68,2,1 3 devices found								
					3						

PS: If the interface hasn't show the data, select the device "WT901BLE68".

	wit matter	Record (_R)	Tools (_T)	View(_V)	Help(_H)	) Language	e (L) Configura	<b>}</b>		- 6	×
	Add device	Main interface	Data Data list	Graph 3D p	ose Raw da	ta					
Port:										Data column	filtering
Baud:	115200	Conn	ection name	Accel	eration X 🛛 🖡	Acceleration Y	Acceleration Z	Angular velocity X	Angular velocity Y	Angular velocity Z	Angle X
 ∧	Add Addular category	WT90	01BLE68(FF7AF50F9	486) -0.17	з -	0.06	0.008	990.234	371.277	-167.053	139.515
BWT	901BLECL5.0	WT90	D1BLE68(FEBF1EDD	BF51) -0.75	5 C	0.515	-0.108	-475.525	-189.819	97.595	89.16
C W	2 Search devices	WT90	01BLE68(DABA2BEE	D744) -0.78	1 C	).183	0.068	-432.617	-173.462	71.838	68.461
✓ W	T901BLE68(FEBF1EDD8F51)	WT90	D1BLE68(FBABB9F96	F95A) -0.87	5 -	0.42	-0.283	-182.8	-67.993	47.607	159.395
w	T112233(F96235D93C8A)										
🗹 w	T901BLE68(DABA2BEED744)										
w 🔽	T901BLE68(FBABB9F9F95A)										

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/vi ew?usp=share\_link

## 6.1.1 Data Configuration

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

Y	111 SECULION	Record (_R)		View(_V)	Help(_H	) Language (_L)	Configuration						- 0	×
Main int	erface Data	Data list Graph	3D pose Raw	data		WT901BLE68(FF7AF50F WT901BLE68(FEBF1EDD WT901BLE68(DABA2BE	9486) DBF51) ED744)						Data column f	iltering
	Connection n	ame	Acceleration X	Acceleration Y	Accele	wT901BLE68(FBABB9F9F95A)			Angular velocity Z	Angle X	Angle Y	Angle Z	Magnetic field	K Mag
	WT901BLE68	(FF7AF50F9486)	0.001	-0.983	0.183	0	0		0	-79.365	-0.121	44.198	36.554	9.40
	WT901BLE68	(FEBF1EDDBF51)	0.003	-0.985	0.152					-81.683	-0.154	145.673	20.972	27.5
	WT901BLE68	(DABA2BEED744)	0.019	-0.979	0.195					-78.937		-134.78	-27.538	29.4
	WT901BLE68	(FBABB9F9F95A)	-0.009	-0.968	0.26					-74.702	0.434	152.468	-41.356	49.3
With Anio	2100													



Step 1. Click the config as you request. Step 2. The software will auto-save the config.

vit souther	Record (_R)	Tools (_T)	View(_V)	Help(_H)	Language (_L)Co	nfiguration					- 0	
Main interface	Data Data list Graph	3D pose Raw	data								Data column fi	terina
												tering
Conn	nection name	Acceleration X	Acceleration Y	Acceleration Z	Angular velocity X	Angular velocity Y	Angular velocity Z	Angle X	Angle Y	Angle Z	Magnetic field X	Mag
WT90	01BLE68(FF7AF50F9486)	1.36	0.15	-0.058	-148.926	-221.313	-88.562	138.384	-64.951	-138.527	-2.058	-49.
WT90	01BLE68(FEBF1EDDBF51)	1.354	-0.185	-0.188	-183.105	-173.462	-83.252	168.981	-66.379	-53.52	-21.952	
WT90	01BLE68(DABA2BEED744)	1.067	0.173	-0.162	186.279	156.677	45.532	144.827	-62.99	-43.616	-61.936	
WT90	01BLE68(FBABB9F9F95A)	0.499	-0.073	0.283	-248.413	-448.059	-169.373	35.64	-76.63	-45.423	-73.990	
		Sensor Configuration System Calibrate Calibrate Acceleratio Comunicate Baud Ri Read Configuration	eration N an: 16 g/s2 ate: 10Hz	Algrithm: Axis 9 lagnetic Filed	✓ Installation Reset Z-axis Angle deg/s ✓ Band Wi Device Name:	Dire(Horizonti v ) () dth: 20 Hz v WT 18LE68	Gyro Auto C	alibrate 0 0 hange 0 online				
WitMotion-2.2.19	9.0											



## 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".

witr motion	Becord ( B)	Tools ( T)	View(V)		Language ( 1)	Configuration			- 0	) ×
Add device	Main interface	Data Data list	Graph 3D pose	e Raw data						
Port:								-	Data colum	n filtering
Baud: 115200	Sensor Co	nfiguration							Angular velocity Z	Angle X
Add	Syst	em								
Modular category		Default	Accelerometer	Calibration			× ction	0	0 ×	-0.082
BWT901BLECL5.0	Cali	brate								0.016
Q. Search devices		Acceleration					Gyro Auto Calibrate	0	0	0.78
VT901BLE68(FBABB9F9F95A)	Ban	0e								
WT901BLE68(FEBF1EDDBF51)	Δ	ccleration: 16 g/s						0		-0.027
VT901BLE68(DABA2BEED744)	Con	nunicate								
😴 WT901BLE68(FF7AF50F9486)		Baud Rate: 10Hz					Change	0		
WT901BLE58(C6E5845726A8)					100 %			-		
About							<b>—</b> o	Inline		
WeChat	Read Confi	guration Completed								



## 6.1.3 Device name Edition

Step 1. Modify your device name.

Due to the integrated WitMotion algorithm and settings, the device name will always start with "WT".

Step 2. Input the name you prefer. Then click the "Save Config".

V.	Record (_R)	Tools (_T)	View(_V)	Help(_H)	Language (_L) Co	nfiguration					- 0	×
Main inter	face Data Data list Graph	3D pose Raw data										
											Data column fil	ering
	Connection name	Acceleration X	Acceleration Y	Acceleration Z	Angular velocity X	Angular velocity Y	Angular velocity Z	Angle X	Angle X Angle Y		Magnetic field X	Mag
	WT901BLE68(FF7AF50F9486)	1.36	0.15	-0.058	-148.926	-221.313	-88.562	138.384	-64.951	-138.527	-2.058	-49.
	WT901BLE68(FEBF1EDDBF51)	1.354	-0.185 -0.188		-183.105	-173.462	-83.252	168.981	-66.379	-53.52	-21.952	-23.
	WT901BLE68(DABA2BEED744)	1.067	0.173	-0.162	186.279	156.677	45.532	144.827	-62.99	-43.616 -61.936		-22.1
	WT901BLE68(FBABB9F9F95A)	0.499	-0.073	0.283	-248.413	-448.059	-169.373	35.64	-76.63	-45.423	-73.990	-112
		System Def Calibrate Calibrate Accleratic Calibrate Accleratic Comunicate Baud Ra	ault // rration // // m: 16.g/s2 tte: 10Hz	Axis 9 agnetic Filed	✓ Installation Reset Z-axis Angle deg/s      ✓ Band Wi Device Name:	Dire(Horizont: ) dth: 20 Hz WT IBLE68	Carl Instruction	alibrate ?				
WitMotion	-2.2.19.0											



## 6.1.4 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:

wir seaties	Record (_R)	Tools (_T)	View(_V)	Help(_H	l) Language	e (L) Configura	<b>}</b>		- 0	
Add device	Main interface	Data Data list	Graph 3D p	oose Raw d	ata					
Port: 💛									Data column f	filtering
Baud: 115200 🗸	Cor	nection name	Acce	leration X	Acceleration Y	Acceleration Z	Angular velocity X	Angular velocity Y	Angular velocity Z	Angle X
Add	wr	901BI F68(DABA2BFF	D744) 0.99	9	0.167	-0.083	-22 827	-24 292	25.269	73,779
Modular category										
BWT901BLECL5.0 🗸	WT	901BLE68(FF7AF50F9	486) -0.22		0.984	-0.092		-15.442	35.461	90.505
Q Search devices	WT	901BLE68(FBABB9F9I	95A) 0.62	8	0.772	0.105	-27.222	-8.728	-24.841	91.236
VT901BLE68(DABA2BEED744)										
VT901BLE68(FF7AF50F9486)	WT	901BLE68(FEBF1EDD	3F51) 0.23	5	-1.03	0.073	12.573	55.115	-31.738	-92.362
VT901BLE68(FBABB9F9F95A)										
VT901BLE68(FEBF1EDD8F51)										
WTKKKKK(DC9ACF5E3261)										
About										
WeChat Without 2, 190										



### 6.1.5 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.

A + 御片存档       Name       Date modified       Type       Size         I 2022说明书终稿       ●       BWT901BLECL5.0_1682518006073.piny       4/26/2023 2.06 PM       BIN File       44 KB         I Tutorial       ●       BWT901BLECL5.0_1682518006073.piny       4/26/2023 2.06 PM       PLAY File       1,008 KB         I BAt为(HFBA15D992CL7)       ●       BWT901BLECL5.0_1682518006073.1.cv       4/26/2023 2.06 PM       XLS 工作表       340 KB         I Desktop       ●       BWT901BLECL5.0_1682518006073.1.cv       4/26/2023 2.06 PM       Text Document       302 KB         I Desktop       ●       BWT901BLECL5.0_1682518006073.1.cv       4/26/2023 2.06 PM       Text Document       302 KB         I Motor         I Desktop       ●       I Motor         I Motor       I	← → · · ↑ 🖡 « WitMotion New Software 2023 > WITMOTION Software (V2.2.20.5) > Record · · ひ $>$ Search Reco														rch Record					
	📕 A+	图片存档	ä	7	^	Name		~	Date modified						Туре	9		Size		
1       Tutorial       Desktop       Desktop       Desktop       Desktop         ● Desktop	202	■ 2022说明书终稿 ★ □ PW/T001PLECL5.0.1602510006072 bin												PM	RIN	File		44 KB		
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AMAZON COURSE - 22 - 3     S     BWT901BLECL5.0_1682518006073_1.txt     4/26/2023 2:06 PM     XLS 工作表     302 KB     Data 数件FBA15D93CZL *     BWT901BLECL5.0_1682518006073_1.txt     4/26/2023 2:06 PM     Text Document     302 KB     Spcs + custom fee     2022 统算文件存档     Desktop     申请 - Robotshop入驻     Desktop													4/20/2023 2:00 PIVI			rFile		1,008 KB		
■ 日本投件FBA15D93CZL #       ■       ■       BWT901BLECL5.0_1682518006073_1.bxt       4/26/2023 2:06 PM       Text Document       302 KB         ■ Spcs + custom fee       ■       2022 56852/H74Pd       ■       ■       Spcs + custom fee       Notestation fee       Spcs + custom fee	AM	IAZON C	OURSE	- 22- 🛪	•	BWT901BLECL5.0_1682518006073_1.csv							4/26/2023 2:06 PM			XLS 工作表			340 KB	
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$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		Deive De	record																	
14:06:46       TYD_DELEG       0.04       -0.82       0.478       2.014       -0.61       -0.916       -02.95       -17.677       -17.677       -15.467       -78.855       -210.442       0.0342       0.0342       0.0342       0.0342       0.0342       0.0342       0.0342       0.0342       0.0342       0.0342       0.0353       0.0729       0.4402       0.8601       0.18756         14:06:44       T112233(1       0.05       0.396       -0.923       0       0       156.945       -2.791       124.014       71.375       65.017       -35.075       0.07269       0.4402       0.8601       0.18756         14:06:44       T112233(1       0.65       0.396       -0.929       0       0       156.945       -2.791       124.014       71.375       65.017       -35.075       0.07269       0.4402       0.8601       0.18756         14:06:46       T112233(1       0.49       0.396       -0.929       0       0       156.945       -2.791       124.014       71.375       65.017       -35.075       0.07269       0.4402       0.8601       0.18756         14:06:46       T112233(1       0.494       0.398       -0.929       0       0       156.945       -2.791	Time Devi	ce naz Accel	leratiAcc	eleratiAc	celerati	Angular veAs	ngular veA	ngular veA	ingle X(° .	Angle Y(*	Angle Z(*	Magnetic fl	Magnetic f	Magnetic i	Temperatus Q	uaternior	Quaternior	Quaternior	Quaternions 3()	
14:06:40       T1122331       0.449       0.396       -0.925       0       0       126.945       -2.791       124.014       71.375       65.017       -35.075       0.07299       0.4602       0.86261       0.18756         14:06:46.T1122331       0.05       0.98       -0.929       0       0       126.945       -2.791       124.014       71.375       65.017       -35.075       0.07299       0.4602       0.86261       0.18756         14:06:46.T1122331       0.05       0.398       -0.929       0       0       126.945       -2.791       124.014       71.375       65.017       -35.075       0.07289       0.4602       0.86261       0.18756         14:06:46.T1122331       0.049       0.398       -0.929       0       0       156.945       -2.791       124.014       71.375       65.017       -35.075       0.07289       0.4602       0.86261       0.18756         14:06:46.T1122331       0.049       0.398       -0.929       0       0       156.945       -2.791       124.014       71.375       65.017       -35.075       0.07289       0.4402       0.86261       0.18756         14:06:46.T1122331       0.049       0.398       -0.929       0       0	14:06:46.WT90	1BLE6	0.204	-0.882	0.478	2.014	-0.61	-0.916	-62,056	-11, 673	-177.627	-15.467	-78.825	-210. 442		0.03482	0.09781	-0.51102	0.85321	
14:06:40       11:12:233 (I       0.049       0.396       -0.923       0       0       126.945       -2.791       124.014       71.375       65.017       -35.075       0.07299       0.46402       0.86201       0.18756         14:06:46.TT112233 (I       0.05       0.396       -0.929       0       0       156.945       -2.791       124.014       71.375       65.017       -35.075       0.07289       0.46402       0.86201       0.18756         14:06:46.TT112233 (I       0.05       0.396       -0.929       0       0       156.945       -2.791       124.014       71.375       65.017       -35.075       0.07289       0.46402       0.86201       0.18756         14:06:46.TT112233 (I       0.049       0.396       -0.929       0       0       156.945       -2.791       124.014       71.375       65.017       -35.075       0.07289       0.46402       0.86201       0.18756         14:06:46.TT112233 (I       0.049       0.396       -0.923       0       0       156.945       -2.791       124.014       71.375       65.017       -35.075       0.07289       0.46402       0.86201       0.18756         14:06:46.TT112233 (I       0.049       0.398       -0.923       0	14:06:46. WT11	12233 (F	0.049	0.396	-0.928	0	0	0	156.945	-2.791	124.014	71. 375	65.017	-35.075		0.07269	0.46402	0.86261	0. 18756	
$ \begin{array}{c} 14 0 = (4, 0) \\ 14 10 = (4, 0) \\$	14:06:46. WI11	2233 (F	0.049	0.396	-0.928	0	0	0	156.945	-2.791	124.014	71.375	65.017	-35.075		0.07269	0.46402	0.86261	0. 18756	
$ \begin{array}{c} 1.00 & 0.01 & 1.12331 \\ 1.40 & 0.6 & 0.1122331 \\ 1.40 & 0.6 & 0.10 \\ 1.40 & 0.6 & 0.1122331 \\ 1.40 & 0.6 & 0.123 \\ 1.40 & 0.6 & 0.133 \\ 1.40 & 0.6 & 0.133 \\ 1.40 & 0.6 & 0.133 \\ 1.40 & 0.6 & 0.133 \\ 1.40 & 0.6 & 0.133 \\ 1.40 & 0.6 & 0.133 \\ 1.40 & 0.6 & 0.133 \\ 1.40 & 0.6 & 0.133 \\ 1.40 & 0.6 & 0.133 \\ 1.40 & 0.6 & 0.133 \\ 1.40 & 0.6 & 0.133 \\ 1.40 & 0.6 & 0.133 \\ 1.40 & 0.6 & 0.133 \\ 1.40 & 0.6 & 0.133 \\ 1.40 & 0.6 & 0.133 $	14:00:40. #111	2233 (1	0.05	0.390	-0.928	0	0	0	156,045	-2.791	124.014	71. 373	65.017	-35.075		0.07269	0.46402	0.80201	0.18756	
$ \begin{array}{c} 14.06 + 0.071122331 \\ 14.06 + 0.0712231 \\ 14.06 + 0.0712231 \\ 14.06 + 0.0712231 \\ 14.06 + 0.0712231 \\ 14.06 + 0.0712231 \\ 14.06 + 0.0712231 \\ 0.049 \\ 0.098 \\ 0.098 \\ 0.099 \\ $	14:00:40. #111	2233 (F	0.05	0.390	-0.929	0	0	0	100.940	-2.791	124.014	71. 375	65 017	-35,075		0.07269	0.40402	0.80201	0. 18756	
14 06:46 TT112233 (0       0.49       0.39       0.49       0.99       0.492       0       0       16.949       -2.19       124.014       T1.375       65.017       -35.075       0.07299       0.4462       0.8621       0.13756         144.06:46 TT112233 (1       0.49       0.396       -0.929       0       0       156.943       -2.791       124.014       T1.375       65.017       -35.075       0.07299       0.4462       0.8621       0.13756         144.06:46 TT112233 (1       0.49       0.396       -0.928       0       0       156.945       -2.791       124.014       T1.375       65.017       -35.075       0.07299       0.4462       0.8621       0.13756         144.06:46 TT112233 (1       0.494       0.396       -0.928       0       0       156.945       -2.791       124.014       T1.375       65.017       -35.075       0.07299       0.4402       0.86261       0.18756         144.06:46 TT112233 (1       0.448       0.395       -0.929       0       0       156.945       -2.791       124.014       T1.375       65.017       -35.075       0.07299       0.4402       0.86561       0.18756         144.06:44 TT12233 (1       0.448       0.395       -0.299 </td <td>14:06:46 WT11</td> <td>2233 (1</td> <td>0.05</td> <td>0.396</td> <td>-0.929</td> <td>0</td> <td>0</td> <td>0</td> <td>156 045</td> <td>-2.791</td> <td>124.014</td> <td>71.375</td> <td>65 017</td> <td>-35.075</td> <td></td> <td>0.07269</td> <td>0.46402</td> <td>0.86261</td> <td>0.18756</td>	14:06:46 WT11	2233 (1	0.05	0.396	-0.929	0	0	0	156 045	-2.791	124.014	71.375	65 017	-35.075		0.07269	0.46402	0.86261	0.18756	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	14:06:46 WT11	2233 (5 )	0.00	0.306	-0.020	0	0	0	156 945	-2 701	124.014	71 375	65 017	-35 075		0.07260	0.46402	0.86261	0.18756	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	14:06:46 WT11	2233 (F	0.049	0.396	-0.928	0	0	0	156 945	-2 791	124.014	71 375	65 017	-35 075		0.07269	0 46402	0.86261	0 18756	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	14:05:46 WT11	5(C68E -	0.026	0.029	1.018	0	0	0	1.67	1,439	83 979	33 124	2 744	-29.89		0.74319	0.00241	0.0191	0.66873	
	14:06:46. WT11	2233 (F	0.049	0.396	-0.928	0	0	0	156, 945	-2.791	124,014	71. 375	65,017	-35,075		0.07269	0,46402	0, 86261	0, 18756	
$ \begin{array}{c} 14.06.46, $$T112233$$($ 0.448 0.396 -0.929 0 0 0 156.945 -2.791 124.014 71.375 65.017 -35.075 0.07269 0.4602 0.86051 0.18756 14.0646, \mbox{$$T112233$$($ 0.448 0.396 -0.929 0 0 0 156.945 -2.791 124.014 71.375 65.017 -35.075 0.07269 0.4602 0.86051 0.18756 14.0646, \mbox{$$T112233$$($ 0.448 0.396 -0.929 0 0 0 0 156.945 -2.791 124.014 71.375 65.017 -35.075 0.07269 0.4602 0.86051 0.18756 14.0646, \mbox{$$T112233$$($ 0.448 0.396 -0.929 0 0 0 0 156.945 -2.791 124.014 71.375 65.017 -35.075 0.07269 0.4602 0.86051 0.18756 14.0646, \mbox{$$T112233$$($ 0.449 0.395 -0.929 0 0 0 0 156.945 -2.791 124.014 71.375 65.017 -35.075 0.07269 0.4602 0.86051 0.18756 14.0646, \mbox{$$T112233$$($ 0.449 0.395 -0.929 0 0 0 0 156.945 -2.791 124.014 71.375 65.017 -35.075 0.07269 0.4602 0.86051 0.18756 14.0646, \mbox{$$T112233$$($ 0.499 0.395 -0.929 0 0 0 0 156.945 -2.791 124.014 71.375 65.017 -35.075 0.07269 0.4602 0.86051 0.18756 14.0646, \mbox{$$T112233$$($ 0.499 0.395 -0.929 0 0 0 0 156.945 -2.791 124.014 71.375 65.017 -35.075 0.07269 0.4602 0.86051 0.18756 14.0646, \mbox{$$T112233$$($ 0.490 0.395 -0.929 0 0 0 0 156.945 -2.791 124.014 71.375 65.017 -35.075 0.07269 0.4602 0.86051 0.18756 14.0646, \mbox{$$T112233$$($ 0.490 0.395 -0.929 0 0 0 0 156.945 -2.791 124.014 71.375 65.017 -35.075 0.07269 0.4602 0.86051 0.18756 14.0646, \mbox{$$T112233$$($ 0.490 0.395 -0.929 0 0 0 0 156.945 -2.791 124.014 71.375 65.017 -35.075 0.07269 0.4602 0.86051 0.18756 14.0646, \mbox{$$T112233$$($ 0.494 0.395 -0.929 0 0 0 0 156.945 -2.791 124.014 71.375 65.017 -35.075 0.07269 0.4602 0.86051 0.18756 14.0646, \mbox{$$T112233$$($ 0.494 0.395 -0.929 0 0 0 0 156.945 -2.791 124.014 71.375 65.017 -35.075 0.07269 0.4602 0.86051 0.18756 14.0646, \mbox{$$T112233$$($ 0.494 0.395 -0.929 0 0 0 0 156.945 -2.791 124.014 71.375 65.017 -35.075 0.07269 0.4602 0.86051 0.18756 14.0646, \mbox{$$T112233$$($ 0.494 0.395 -0.929 0 0 0 156.945 -2.791 124.014 71.375 65.017 -35.075 0.07269 0.4602 0.86051 0.18756 14.0646, \mbox{$$T112233$$($ 0.494 0.395 -0.929 0 0 0 156.945 -$	14:06:46. WT11	2233 (F	0.049	0.396	-0.928	0	0	0	156.945	-2.791	124.014	71.375	65.017	-35.075		0.07269	0.46402	0.86261	0.18756	
	14:06:46. WT11	2233 (F	0.048	0.396	-0.928	0	0	0	156.945	-2,791	124.014	71.375	65.017	-35.075		0.07269	0.46402	0.86261	0.18756	
	14:06:46. WT11	2233 (F	0.048	0.395	-0.929	0	0	0	156.945	-2.791	124.014	71.375	65.017	-35.075		0.07269	0.46402	0.86261	0.18756	
$ \begin{array}{c} 14:06:44, \end{tr} 11:2233 (f 0.48 0.38 - 0.29 0 0 0 156.945 -2.79 124.014 71.375 65.017 -35.075 0.07269 0.4602 0.6801 0.18756 14:06:46, \end{tr} 11:2233 (f 0.49 0.385 -0.29 0 0 0 0 156.945 -2.79 1124.014 71.375 65.017 -35.075 0.07269 0.4602 0.6801 0.18756 14:06:46, \end{tr} 11:2233 (f 0.49 0.385 -0.29 0 0 0 0 156.945 -2.79 1124.014 71.375 65.017 -35.075 0.07269 0.4602 0.6801 0.18756 14:06:46, \end{tr} 11:2233 (f 0.49 0.385 -0.29 0 0 0 0 156.945 -2.79 1124.014 71.375 65.017 -35.075 0.07269 0.4602 0.6801 0.18756 14:06:46, \end{tr} 11:2233 (f 0.49 0.385 -0.29 0 0 0 0 156.945 -2.79 1124.014 71.375 65.017 -35.075 0.07269 0.4602 0.6801 0.18756 14:06:46, \end{tr} 11:2233 (f 0.49 0.385 -0.29 0 0 0 0 156.945 -2.79 1124.014 71.375 65.017 -35.075 0.07269 0.4602 0.6801 0.18756 14:06:46, \end{tr} 11:2233 (f 0.49 0.385 -0.29 0 0 0 0 156.945 -2.79 1124.014 71.375 65.017 -35.075 0.07269 0.4602 0.6801 0.18756 14:06:46, \end{tr} 11:2233 (f 0.49 0.385 -0.29 0 0 0 0 156.945 -2.79 1124.014 71.375 65.017 -35.075 0.07269 0.4602 0.6801 0.18756 14:06:46, \end{tr} 11:223 (f 0.49 0.385 -0.29 0 0 0 0 156.945 -2.79 1124.014 71.375 65.017 -35.075 0.07269 0.4602 0.6801 0.18756 14:06:46, \end{tr} 11:223 (f 0.49 0.385 -0.29 0 0 0 0 156.945 -2.79 1124.014 71.375 65.017 -35.075 0.07269 0.4602 0.6801 0.18756 14:06:46, \end{tr} 11:223 (f 0.49 0.385 -0.29 0 0 0 0 156.945 -2.79 1124.014 71.375 65.017 -35.075 0.07269 0.4602 0.6801 0.18756 14:06:46, \end{tr} 11:223 (f 0.49 0.385 -0.29 0 0 0 0 156.945 -2.79 1124.014 71.375 65.017 -35.075 0.07269 0.4602 0.6801 0.18756 14:06:46, \end{tr} 11:223 (f 0.49 0.385 -0.29 0 0 0 0 156.945 -2.79 1124.014 71.375 65.017 -35.075 0.07269 0.4602 0.6801 0.18756 14:06:46, \end{tr} 11:223 (f 0.49 0.385 -0.29 0 0 0 0 156.945 -2.79 1124.014 71.375 65.017 -35.075 0.07269 0.4602 0.6801 0.18756 14:06:46, \end{tr} 11:223 (f 0.49 0.385 -0.929 0 0 0 0 156.945 -2.79 1124.014 71.375 65.017 -35.075 0.07269 0.4602 0.6801 0.18756 14:06:46, \end{tr} 11:223 (f 0.49 0.385 -0.929 0 0 0 0 156.945 -2.79 1124.014 71.375 65.017 -35.0$	14:06:46. WT11	2233 (F	0.048	0.395	-0.929	0	0	0	156.945	-2.791	124.014	71.375	65.017	-35.075		0.07269	0.46402	0.86261	0.18756	
	14:06:46. WT11	.2233 (F	0.048	0.395	-0.929	0	0	0	156.945	-2.791	124.014	71.375	65.017	-35.075		0.07269	0.46402	0.86261	0.18756	
$ \begin{array}{c} 14:06:46, \mbox{T112233}(6 & 0.049 & 0.385 & -0.929 & 0 & 0 & 0 & 166, 945 & -2.791 & 124, 014 & 71.375 & 65.017 & -35.075 & 0.07269 & 0.46402 & 0.8661 & 0.18756 \\ 14:06:46, \mbox{T112233}(6 & 0.049 & 0.385 & -0.929 & 0 & 0 & 156, 945 & -2.791 & 124, 014 & 71.375 & 65.017 & -35.075 & 0.07269 & 0.46402 & 0.8661 & 0.18756 \\ 14:06:46, \mbox{T112233}(6 & 0.049 & 0.395 & -0.929 & 0 & 0 & 0 & 156, 945 & -2.791 & 124, 014 & 71.375 & 65.017 & -35.075 & 0.07269 & 0.46402 & 0.8661 & 0.18756 \\ 14:06:46, \mbox{T112233}(6 & 0.049 & 0.395 & -0.929 & 0 & 0 & 0 & 156, 945 & -2.791 & 124, 014 & 71.375 & 65.017 & -35.075 & 0.07269 & 0.46402 & 0.8661 & 0.18756 \\ 14:06:46, \mbox{T112233}(6 & 0.049 & 0.395 & -0.929 & 0 & 0 & 0 & 156, 945 & -2.791 & 124, 014 & 71.375 & 65.017 & -35.075 & 0.07269 & 0.46402 & 0.8661 & 0.18756 \\ 14:06:46, \mbox{T112233}(6 & 0.049 & 0.395 & -0.929 & 0 & 0 & 0 & 156, 945 & -2.791 & 124, 014 & 71.375 & 65.017 & -35.075 & 0.07269 & 0.46402 & 0.8661 & 0.18756 \\ 14:06:46, \mbox{T112233}(6 & 0.049 & 0.395 & -0.929 & 0 & 0 & 0 & 156, 945 & -2.791 & 124, 014 & 71.375 & 65.017 & -35.075 & 0.07269 & 0.46402 & 0.8661 & 0.18756 \\ 14:06:46, \mbox{T112233}(6 & 0.049 & 0.395 & -0.929 & 0 & 0 & 0 & 156, 945 & -2.791 & 124, 014 & 71.375 & 65.017 & -35.075 & 0.07269 & 0.46402 & 0.8661 & 0.18756 \\ 14:06:46, \mbox{T112233}(6 & 0.049 & 0.395 & -0.929 & 0 & 0 & 0 & 156, 945 & -2.791 & 124, 014 & 71.375 & 65.017 & -35.075 & 0.07269 & 0.46402 & 0.8661 & 0.18756 \\ 14:06:46, \mbox{T112233}(6 & 0.049 & 0.395 & -0.929 & 0 & 0 & 0 & 156, 945 & -2.791 & 124, 014 & 71.375 & 65.017 & -35.075 & 0.07269 & 0.46402 & 0.8661 & 0.18756 \\ 14:06:46, \mbox{T112233}(6 & 0.049 & 0.395 & -0.929 & 0 & 0 & 0 & 156, 945 & -2.791 & 124, 014 & 71.375 & 65.017 & -35.075 & 0.07269 & 0.46402 & 0.8661 & 0.18756 \\ 14:06:46, \mbox{T112233}(6 & 0.049 & 0.395 & -0.929 & 0 & 0 & 0 & 156, 945 & -2.791 & 124, 014 & 71.375 & 65.017 & -35.075 & 0.07269 & 0.46402 & 0.8661 & 0.18756 \\ 14:06:46, \mbox{T112233}(6 & 0.049 & 0.395 & -0.929 & 0 & 0 & 0 & 156, 945$	14:06:46. WT11	2233 (F	0.049	0.395	-0.929	0	0	0	156.945	-2.791	124.014	71.375	65.017	-35.075		0.07269	0.46402	0.86261	0.18756	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	14:06:46. WT11	.2233 (F (	0.049	0.395	-0.929	0	0	0	156.945	-2, 791	124.014	71.375	65.017	-35.075		0.07269	0.46402	0.86261	0.18756	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	14:06:46.WT90	1BLE67	0.2	-0.885	0.471	4.639	-0.793	-1.282	-62.084	-11.667	-177.627	-15.467	-78.825	-210. 442		0.03482	0.09781	-0.51102	0.85321	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	14:06:46. WT11	2233 (F	0.049	0.395	-0.929	0	0	0	156.945	-2.791	124.014	71.375	65.017	-35.075		0.07269	0.46402	0.86261	0. 18756	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	14:06:46. WT11	2233 (F	0.049	0.395	-0.929	0	0	0	156.945	-2.791	124.014	71.375	65.017	-35.075		0.07269	0.46402	0.86261	0. 18756	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	14:06:46. #T11	2233 (F	0.049	0.395	-0.929	0	0	0	156.945	-2.791	124.014	71.375	65.017	-35.075		0.07269	0.46402	0.86261	0. 18756	
14:00:40:#1112233(I       0.049       0.395       -0.259       0       0       150.945       -2.791       124.014       71.375       65.017       -35.075       0.07299       0.46402       0.86021       0.18756         14:06:40:#1112233(I       0.049       0.395       -0.929       0       0       156.945       -2.791       124.014       71.375       65.017       -35.075       0.07289       0.46402       0.86261       0.18756         14:06:40:#1112233(I       0.049       0.395       -0.929       0       0       156.945       -2.791       124.014       71.375       65.017       -55.075       0.07289       0.46402       0.86261       0.18756         14:06:40:#1112233(I       0.049       0.395       -0.929       0       0       156.945       -2.791       124.014       71.375       65.017       -55.075       0.07289       0.4602       0.86261       0.18756         14:06:44.#TI13(685       -0.029       0.03       1.018       0       0       1.67       1.439       33.379       33.124       2.744       -29.89       0.74319       0.0482       0.8673         14:06:44.#TI13(685       -0.03       -0.86       -0.56       -0.165       -11.655       +17.655	14:06:46. #T11	2233 (1	0.049	0.395	-0.929	0	0	0	156. 945	-2.791	124.014	71.375	65.017	-35.075		0.07269	0.46402	0. 86261	0.18756	
14:06:46. WT112233(F         0.049         0.395         -0.929         0         0         16:06:46         11:373         65:017         -35:075         0.07269         0.4602         0.8601         0.18756           14:06:46. WT112233(F         0.049         0.395         -0.929         0         0         156:945         -2.791         124.014         71.375         65.017         -35:075         0.07269         0.4602         0.8661         0.18756           14:06:46. WT112233(F         0.049         0.395         -0.929         0         0         156.945         -2.791         124.014         71.375         65.017         -35.075         0.07269         0.4602         0.8661         0.18756           14:06:46. WT115(668         -0.026         0.03         1.018         0         0         1.67         -17.91         124.014         71.375         65.017         -35.075         0.07269         0.4602         0.8661         0.18756           14:06:46. WT115(668E         -0.026         0.03         1.018         0         0         1.67         -11.635         -17.742         -744         -29.89         0.74319         0.00342         0.0919         0.68673           14:06:46. WT115(668E         -0.026	14:00:40. #111	2233 (1	0.049	0.395	-0.929	0	0	0	100.945	-2, 791	124.014	71. 375	65.017	-35.075		0.07269	0.40402	0.80201	0.18756	
14:06:46.WT1122331 0.049 0.395 -0.229 0 0 0 156.95 -2.791 124.014 11.373 06.011 -35.013 0.07269 0.4642 0.68051 0.13756 14:06:46.WT1122331 0.049 0.395 -0.229 0 0 0 156.95 -2.791 124.014 11.375 05.017 -35.017 0.70769 0.4642 0.68051 0.13756 14:06:46.WT115(768 -0.026 0.03 1.018 0 0 0 1.67 1.499 83.979 33.124 2.744 -29.99 0.74319 0.00241 0.0191 0.66873	14:06:46 WT11	2233 (F	0.049	0.395	-0.929	0	0	0	156 045	-2.791	124.014	71.375	65 017	-35.075		0.07269	0.46402	0.86261	0.18756	
14:06:46.WT115(C68E -0.026 0.03 1.018 0 0 0 1.67 1.439 83.97 33.124 2.744 -29.89 0.74319 0.00341 0.0191 0.66873 14:06:46.WT9018LE67 0.203 -0.892 0.46 2.502 -0.061 -0.366 -62.155 -11.635 -177.627 -15.467 -78.825 -21.442 0.03482 0.09781 -0.51102 0.83321	14:06:46 WT11	2233 (F	0 049	0.305	-0.929	0	0	0	156 945	-2 701	124 014	71.375	65.017	-35.075		0.07269	0 46402	0.86261	0 18756	
14:06:46.WT901BLE67 0.203 -0.892 0.46 2.502 -0.061 -0.366 -62.155 -11.635 -177.627 -15.467 -78.825 -210.442 0.03482 0.09781 -0.51102 0.85321	14:06:46. WT11	5 (C68E -	0.026	0, 03	1.018	0	0	0	1, 67	1, 439	83, 979	33, 124	2.744	-29, 89		0,74319	0.00241	0,0191	0.66873	
	14:06:46. WT90	IBLE67	0. 203	-0.892	0.46	2.502	-0.061	-0.366	-62.155	-11.635	-177.627	-15.467	-78.825	-210. 442		0.03482	0.09781	-0.51102	0.85321	