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› WitMotion WT901SDCL 9-Axis Inclinometer Sensor User Manual

WITMOTION WT901SDCL

WitMotion WT901SDCL 9-Axis Inclinometer Sensor User Manual

Model: WT901SDCL | Brand: WITMOTION

1. INTRODUCTION

The WitMotion WT901SDCL is a high-performance 9-axis inclinometer sensor designed for precise attitude measurement. It integrates a 3-axis accelerometer, gyroscope, angle sensor, and magnetometer, utilizing a dynamic fusion algorithm with Kalman filtering for stable and accurate data output with low noise levels. This sensor supports both wired (TTL) and wireless (SD card storage) connections, making it versatile for various applications including PC and Android systems. It offers selectable measurement ranges and an output rate from 0.2Hz to 200Hz.

Free & Genuinely Useful Software



Figure 1: WitMotion WT901SDCL 9-Axis Inclinometer Sensor

2. PACKAGE CONTENTS

Please verify that all items are present in your package:

- 1 x WT901SDCL Sensor
- 1 x 16GB SD Card
- 1 x SD Card Reader
- 1 x Charging Cable
- 1 x Welcome Guide

Connection with Windows PC

Step 1. Download the related tutorial

Step 2. Install the CH340 driver and insert the cable to PC

Step 3. Open the MiniIMU.exe

Step 4. You will get the data after auto-searching finished



Figure 2: WT901SDCL sensor and included accessories.

3. SETUP

3.1. PC Connection and Software Setup

To connect the WT901SDCL sensor to a PC and utilize the WitMotion software, follow these steps:

1. Download the relevant tutorial and PC software from the official WitMotion website.
2. Install the CH340 driver (if required for your USB-TTL converter) and connect the sensor to your PC using the appropriate cable or adapter.
3. Open the MiniIMU.exe software.
4. The software should automatically detect the sensor and display real-time data.

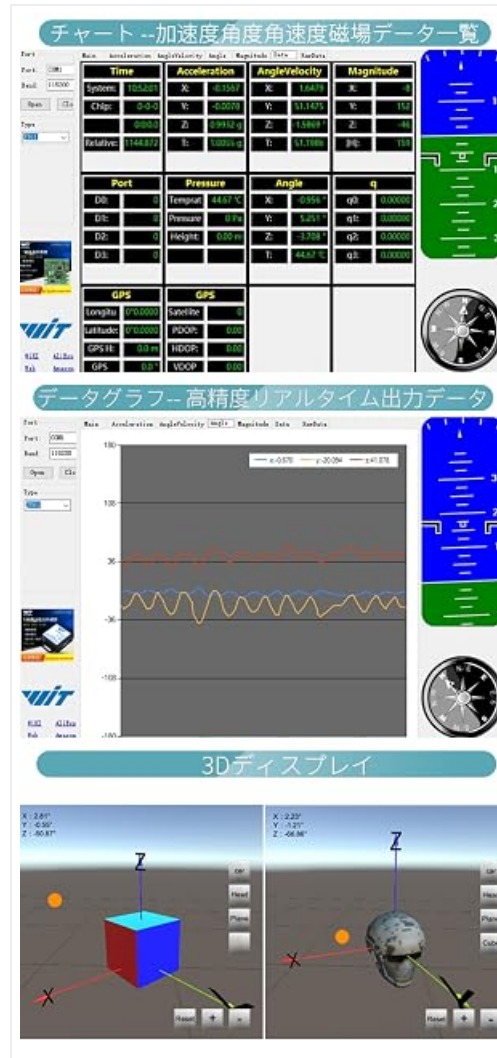


Figure 3: Connecting the WT901SDCL sensor to a Windows PC.

Video 1: Demonstration of the WT901 sensor's PC software interface, showing real-time data display, 3D visualization, and calibration procedures.

3.2. Android Connection and App Setup

For Android device connectivity, ensure you have a compatible USB-C adapter (if your phone uses USB-C) and follow these steps:

1. Search for "witmotion" on the Google Play Store and install the official WitMotion app.
2. Connect the sensor to your Android device using a USB-TTL converter and a suitable adapter.
3. Open the WitMotion app. Select the WT901 model and the appropriate baud rate (e.g., 9600).
4. The app will display real-time sensor data.

Video 2: Guide on using the WitMotion BWT901CL sensor with an Android smartphone, demonstrating connection, data display, and calibration.

4. OPERATING INSTRUCTIONS

4.1. Data Monitoring and Visualization

The WitMotion software (PC) and app (Android) provide various interfaces for monitoring and visualizing sensor data:

- **User Interface:** Displays real-time Pitch, Roll, and Yaw angles.
- **Data Chart:** Visualizes acceleration, angular velocity, angle, and magnetic field data over time.
- **3D Demo:** Provides an intuitive 3D representation of the sensor's motion state.



Figure 4: WitMotion PC software interface showing real-time angle data and 3D visualization.



Figure 5: 3D demonstration of sensor motion within the software.

4.2. Calibration

To ensure optimal accuracy, periodic calibration of the sensor is recommended:

1. **Acceleration Calibration:** Place the sensor on a stable, horizontal surface. Access the calibration menu in the software/app and initiate acceleration calibration.
2. **Magnetic Field Calibration:** This process helps reduce bias drift. Rotate the sensor slowly around all three axes (X, Y, and Z) while following the on-screen instructions in the software/app.

Video 3: Detailed demonstration of acceleration and magnetic field calibration procedures using the WitMotion PC software.

4.3. Data Logging and Storage

The WT901SDCL features SD card storage for data logging. Data can be recorded and reviewed directly from the SD card or through the connected PC/Android device.

- **SD Card Storage:** The sensor can record data directly to the included 16GB SD card for offline analysis.
- **Real-time Data Review:** Connect the sensor to a PC or Android device to view and record data in real-time.

Specifications

No.	Parameter
Name	9-axis Acceleration Data Logger
Model Number	WT901SDCL
Supply Voltage	3.7V (battery) / 5V (USB power)
Current	<40mA (recording), <50uA (Standby)
Volume	51.3mmX36mmX15mm
Interface	TTL wired communication/SD card wireless storage
Dimension	3-axis (acceleration, gyroscope, angle, mag field) quaternion
Range	Acceleration: $\pm 2/4/8/16g$ (optional), Angular speed: $\pm 2000^{\circ}/s$, Angle X, Z $\pm 180^{\circ}$ Y $\pm 90^{\circ}$
Stability	Acceleration: 0.01g, Angular velocity $0.05^{\circ}/s$.
Angle Accuracy	X Y axis dynamic 0.1° , static 0.05° Z axis 1°
Mag Field Accuracy	1mg
Attitude Stability	0.01°
Output Content	Time, acceleration, angular velocity, angle, magnetic field
Output frequency	0.1~200Hz (default 200Hz)
Baud rate	2400bps-921600bps
Battery Lifetime	5 hours

Figure 6: WT901SDCL sensor with SD card inserted for data logging.

5. MAINTENANCE

To ensure the longevity and optimal performance of your WT901SDCL sensor, observe the following maintenance guidelines:

- Keep the sensor clean and free from dust and debris. Use a soft, dry cloth for cleaning.
- Avoid exposing the sensor to extreme temperatures, humidity, or direct sunlight for prolonged periods.
- Handle the sensor with care to prevent physical damage.
- Ensure proper storage in a cool, dry place when not in use.

- Regularly check for firmware updates on the WitMotion official website to benefit from performance improvements and new features.

6. TROUBLESHOOTING

If you encounter issues with your WT901SDCL sensor, refer to the following common problems and solutions:

Problem	Possible Cause	Solution
No data output on PC/Android.	Incorrect driver installation, loose connection, incorrect baud rate, sensor not powered on.	Verify driver installation, check cable connections, ensure sensor is powered, select correct baud rate in software/app.
Inaccurate angle readings.	Sensor not calibrated, magnetic interference.	Perform acceleration and magnetic field calibration. Move sensor away from strong magnetic fields.
SD card not recognized.	SD card improperly inserted, corrupted SD card, incompatible format.	Reinsert SD card correctly. Try formatting the SD card (backup data first). Use a different SD card if necessary.
Software/App crashes or freezes.	Outdated software/app version, system incompatibility.	Update software/app to the latest version. Ensure your operating system meets the minimum requirements.

7. SPECIFICATIONS

Parameter	Value
Model Number	WT901SDCL
Name	9-axis Acceleration Data Logger
Supply Voltage	3.7V (battery) / 5V (USB power)
Current Consumption	<40mA (recording), <50uA (Standby)
Dimensions	51.3mm x 36mm x 15mm
Interface	TTL wired communication / SD card wireless storage
Measurement Axes	3-axis (acceleration, gyroscope, angle, magnetic field) quaternion
Acceleration Range	±2/4/8/16g (optional)
Angular Speed Range	±2000°/s
Angle Range	Angle X, Z ±180° Y ±90°
Stability	Acceleration: 0.01g, Angular velocity: 0.05°/s
Angle Accuracy	X Y axis dynamic 0.1°, static 0.05° Z axis 1°
Magnetic Field Accuracy	1mg
Attitude Stability	0.01°
Output Content	Time, acceleration, angular velocity, angle, magnetic field
Output Frequency	0.1–200Hz (default 200Hz)

Parameter	Value
Baud Rate	2400bps–921600bps
Battery Lifetime	4 hours (wireless connection)

Free & Genuinely Useful Software

Compared with traditional sensor's simplified serial software, WITMOTION software offers several advantages over competing sensor:



Data Record



3D Display



Data Graphs



Data
Dashboard



Configurations
Setting



Compatible with
Windows OS

Figure 7: Physical dimensions of the WT901SDCL sensor.

8. WARRANTY AND SUPPORT

WitMotion provides comprehensive support for its products:

- **Warranty:** A 12-month quality guarantee is provided for the WT901SDCL sensor.
- **Tutorials and Resources:** Tutorial links are printed on the guide card included in the package. Additional resources, including software downloads and detailed documentation, are available on the official WitMotion website.

- **Customer Service:** For any questions or issues, please contact WitMotion customer support. We are committed to providing satisfactory service and solutions.

ASK A QUESTION ABOUT THIS MANUAL

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

Name

Anonymous

Email

you@example.com

After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question