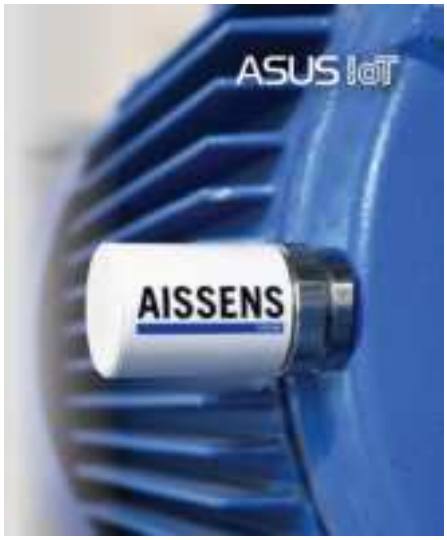
AISSENS 100AW



Advancing condition monitoring vibration sensor with Wi-Fi connectivity and full-scale data precision.

User Manual – EnglishV1.0

Google Play QR Code

iOS APP Store QR Code

Content

I. Safety instructions

To ensure the safe operation of this product, please read and follow the instructions carefully. These guidelines are designed to provide safe operating procedures and prevent any danger to the user and others.

1. **Product Placement**: Keep this product out of reach of children.
   - Swallowing sensor components, including accessories, or batteries may cause serious hazards. If accidental ingestion occurs, seek medical assistance immediately.
2. **NON-Rechargeable battery usage**:
   - During transportation, NON-Rechargeable batteries are classified as hazardous materials (also known as dangerous goods) and must be strictly controlled in accordance with relevant regulations and safety requirements.
   - Improper use may result in fire, explosion, or leakage, handle with caution.
   - Keep both new and used batteries out of reach of children.
   - When replacing the battery, use only the same type provided by the manufacturer.
3. **Health Caution**: If any skin irritation or inflammation occurs during or after using this product, stop using it immediately and seek medical assistance.
4. **Operational Restrictions**:
   - Do not modify this product or touch any exposed internal components to avoid injury.
   - If the product emits smoke or an unusual odor, stop using it immediately.
   - Ensure the product casing is properly installed to maintain its

waterproof function. Do not expose the product to foreign objects or liquids before it is securely assembled to prevent damage to the internal circuitry.

- The magnetic base has a strong attraction force; avoid placing it near iron objects to prevent pinching injuries.

5. **Environment Request**:

- Do not use this product in environments containing flammable or explosive gases.
- Do not operate this product at temperatures below -20°C or above 80°C, as it may cause damage.
- Do not place this product in environments with strong acids or strong alkalis.

6. **Prohibited Places**: If entering areas where usage restrictions apply, turn off this product as required by regulations.

II. Data visualization and condition monitoring

Thank you for choosing the ASUS Wi-Fi Vibration & Temperature Sensor AISSENS 100AW.

In factory operations, the stable performance of equipment is crucial for production efficiency and minimizing unplanned downtime. Even the slightest vibration changes in rotating machinery can be early indicators of potential failures. Through precise vibration monitoring, minor defects and anomalies can be detected in advance, allowing trend predictions before issues such as reduced energy efficiency, increased noise, or abnormal temperature rises occur.

As equipment operations become increasingly complex, accurate monitoring of rotational speed variations and load responses is essential. Traditional preventive maintenance is gradually evolving into data-driven intelligent monitoring, where stable remote monitoring and comprehensive data analysis are key to ensuring the reliability of industrial operations.

To address these industrial challenges, AISSENS 100AW (hereafter referred to as "the sensor") offers stable performance and efficient data collection capabilities. Below are its core features:

- **High bandwidth and high resolution**
  Support 6KHz bandwidth, 26.6K high sampling rate, and 0.1Hz resolution to accurately capture small vibration changes and reflect equipment conditions.
- **Wi-Fi vibration data reporting**
  Enables comprehensive vibration data tracking and provides a

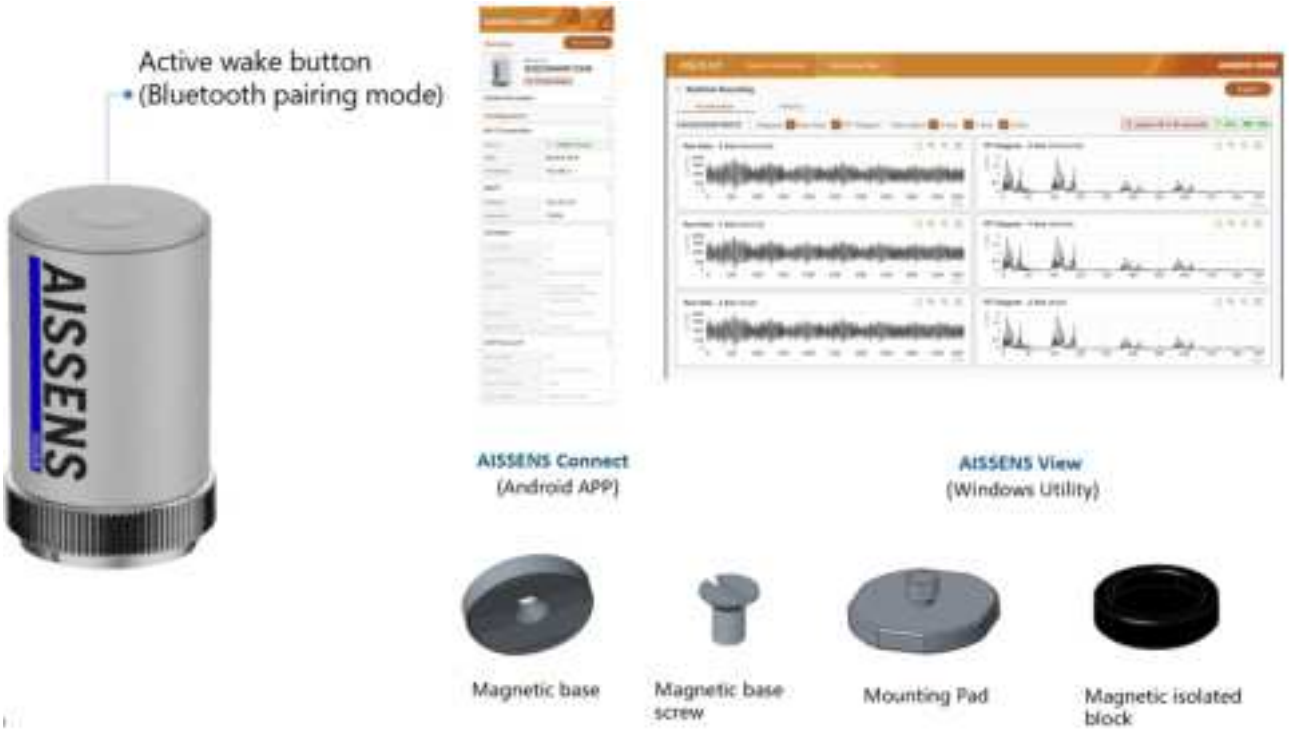
real-time monitoring map of everything from early signs to potential problems.

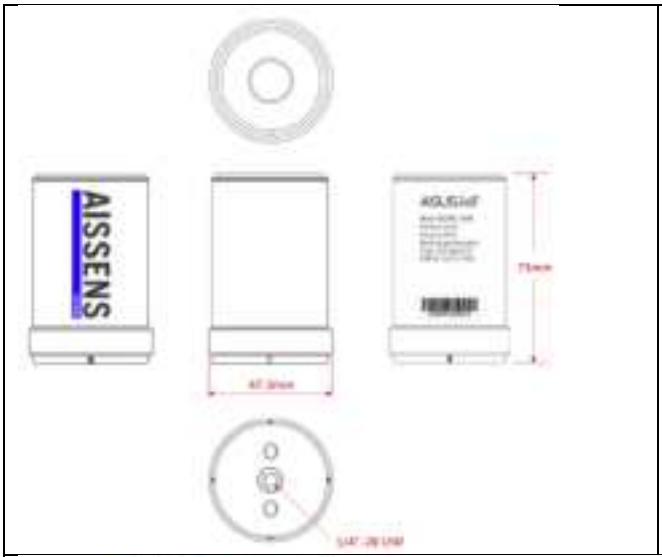
- **Industrial-grade durability**
  IP68 waterproof and dustproof standards, with 1-meter drop protection for harsh industrial environments.
- **Powerful software support**
  Supports raw data collection, OA, and FFT transformations, offering precise time-domain and frequency-domain analysis.
- **Battery Consumption**
  Features a flexible sampling mode to optimize power consumption, ensuring long-term, stable monitoring.
- **Standard MQTT protocol supports**
  Support MQTT communication protocol, facilitating secondary development and seamless system integration across various application scenarios.

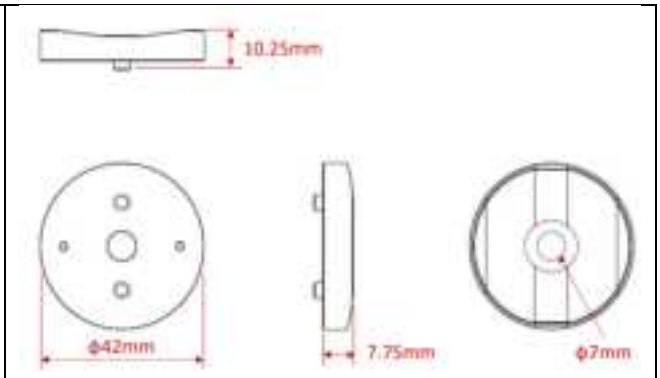
Sensors are integral to intelligent monitoring systems, enhancing the stability and efficiency of equipment operation. They provide comprehensive data support and a solid foundation for informed decision-making in operation and maintenance strategies.

III. Introduction of AISSENS sensors

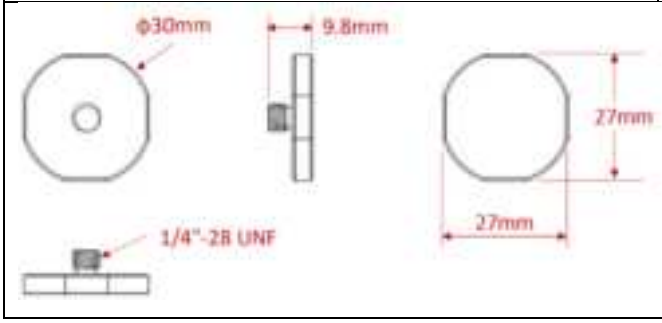
1. Accessories & Supporting Software







Magnetic Base



Mounting Pad

2. Setup preparation

A. Open the white casing and top cover of the sensor, then connect the battery.

B. Download **AISSENS View** software to a PC computer. For Android devices, download **AISSENS Connect** from **Google Play** or the **ASUS official website**, or manually install the APK.

C. Identify a mounting location close to where the bearing is located on the equipment.

D. Use "AISSENS View" or the mobile app to connect and configure the sensor.

Comparison of AISSENS View and AISSENS Connect features (2024.11)

	AISSENS VIEW	AISSENS CONNECT
SUPPORT PLATFORMS	● Windows 10/11 ● Windows 2016 Server or later	● Android 10 or above ● Huawei HarmonyOS v4.2 based on Android or AOSP version ● iOS 15 or above
BLE BLUETOOTH DEVICE SCANNING	√	√
SET UP A WI-FI CONNECTION	√	√
SET A DATA CAPTURE SCHEDULE	√	√
CORRECTION TIME	√	√
READ THE VIRBRIATION SPECTRUM DATA	√	
OVER-THE-AIR FIRMWARE UPDATES	√	

MQTT BROKER ROLE	√	
MAIN USES	• MQTT server role • Vibration & Temperature transmission settings • Firmware updates	After completing the AISSENS View setup, proceed with on-site quick Bluetooth (BLE) configuration.

3. Factory reset AISSENS sensor

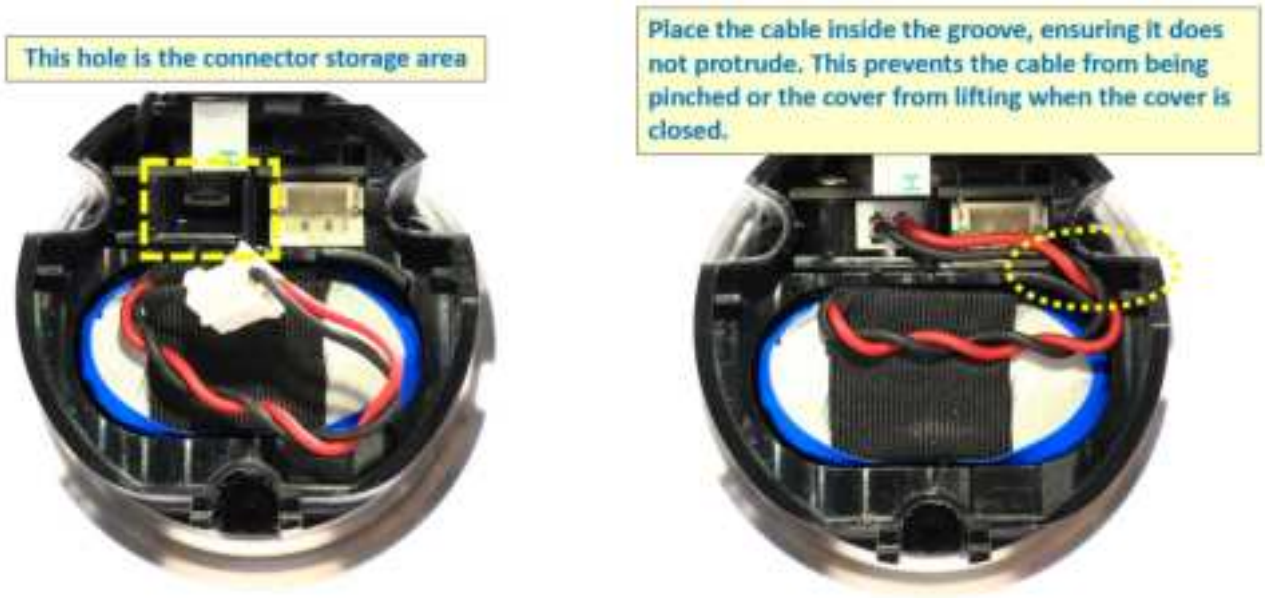
To restore the sensor to its factory default settings, ensure the sensor is powered on and operational. Then, press and hold the wake button for 10 seconds. The sensor will light up with a red indicator for 2 seconds, signaling that the settings have been successfully reset to factory defaults. This operation will only clear configuration information (such as Wi-Fi, MQTT broker, and recording schedule settings) without affecting the firmware version.

IV. NON-Rechargeable Battery

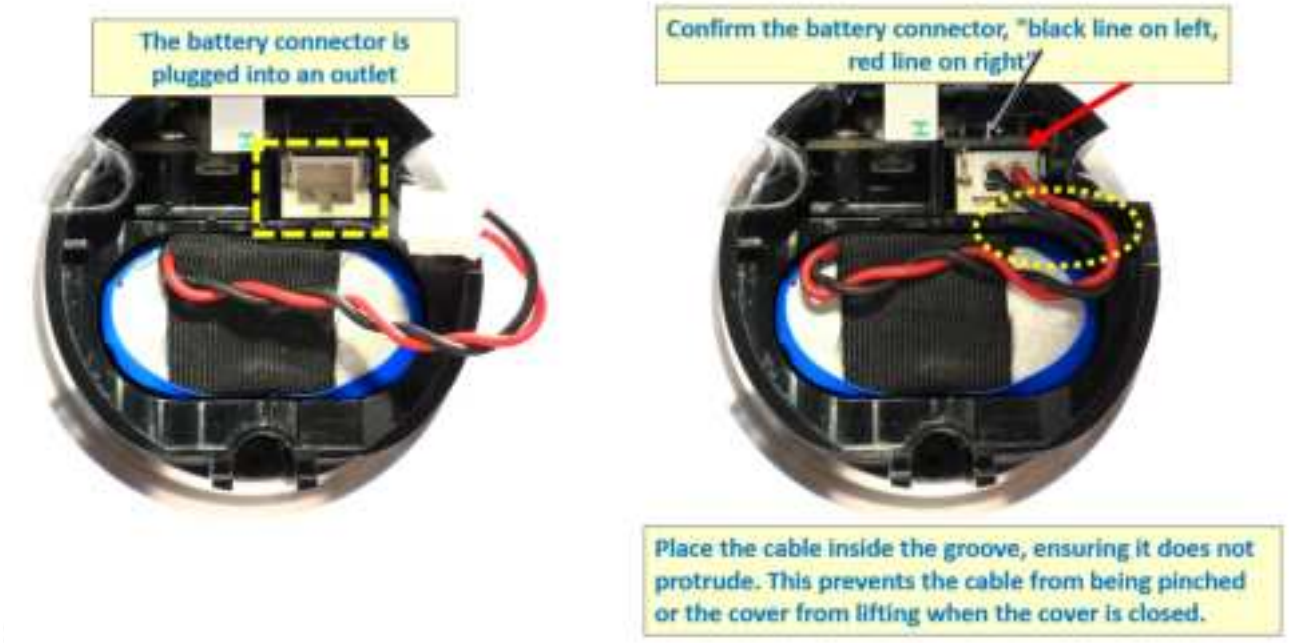
1. Power Connection – Confirm Battery Placement and Cable Management

To ensure stable monitoring performance, particularly for wide-temperature environments and high-energy-consuming Wi-Fi transmission, the sensor is equipped with a specially designed high-energy requirements in a wide range of temperatures battery pack, which is built into the device. For first-time use, simply plug the power cable into the power port to activate the device.

By default, the sensor will automatically enter sleep mode after three minutes of inactivity. Although the battery has an extremely low self-discharge rate, to extend battery life, it is recommended to unplug the power cable when the sensor is not in use for an extended period and store it in the designated compartment on the left side.



Power Disconnection and Cable Storage Method During Storage



Cable Storage Method When Powering On

Note:

- Please wear gloves and grip the bottom vertically threaded outer ring before twisting open the white outer casing.

---

2. Battery Consumption Estimates

The sensor's battery life depends on the environmental temperature, recording duration, frequency resolution (in seconds), and Wi-Fi signal strength. The recording time length is related to the frequency resolution, especially after performing the Fourier Transform (FFT) on the results.

- The longer the recording time, the higher the frequency resolution (the smaller the interval between frequency points).
- The shorter the recording time, the lower the frequency resolution (the larger the interval between frequency points).

Recording for a longer duration provides higher frequency resolution because the distinguishable frequency points become more detailed, making it suitable for capturing small frequency variations. On the other hand, recording data for a shorter time allows FFT to be completed faster, but the spectral resolution is lower, making it more suitable for situations where quicker results are needed, though it may not capture subtle frequency changes.

You can adjust the sensor's settings based on the required resolution and monitoring frequency. Below is the estimated power consumption for a room temperature of 30°C and good Wi-Fi signal strength (above -60dBm).

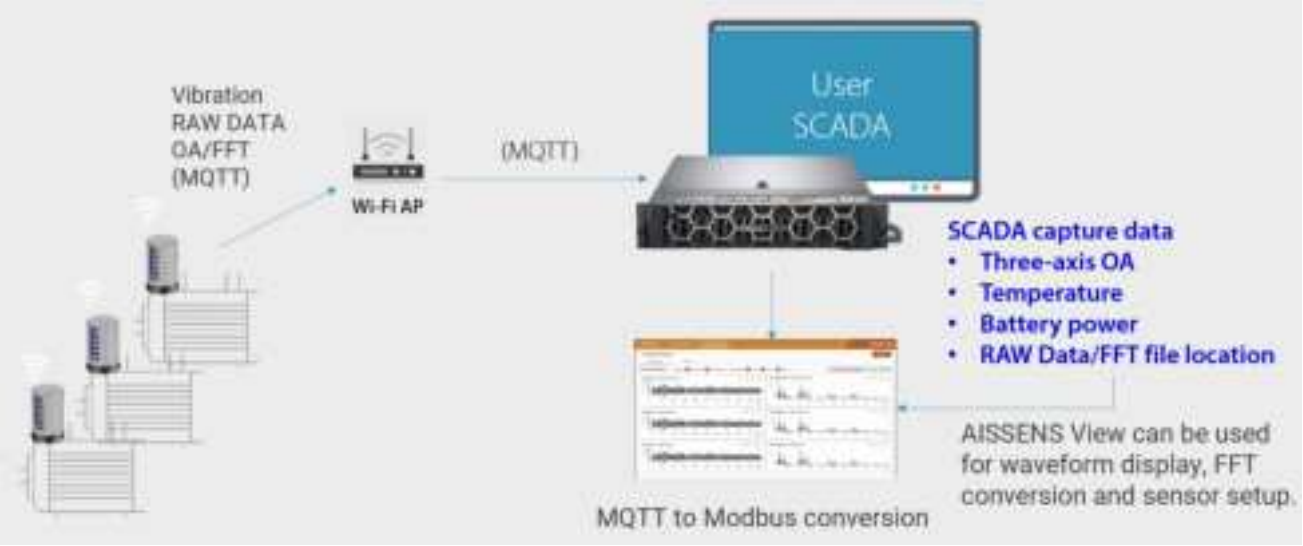
Time per recording	Frequency resolution	The total number of reports	Record every 3 hours	Record every 1 hour	File size (Raw data)	File size (OA+FFT)
2 seconds (RAW)	1Hz	15,199	5 years	1.7 years	1.9MB	0.7MB
3 seconds (RAW)	0.5Hz	14,855	5 years	1.7 years	2.8MB	1.5MB

5 seconds (RAW)		0.25Hz	10,728	3.6 years	1.2 years	4.7MB	3MB
6 seconds (RAW)		0.2Hz	10,291	3.4 years	1.1 years	5.6MB	4MB
11 seconds (RAW)		0.1Hz	6,659	2.2 years	9 months	10MB	8.1MB
AISSENS LOCAL COMPUTING	2 sec OA	N/A	10,139	3.4 years	1.1 years	N/A	82(bytes)
	3 seconds OA	N/A	5,885	2 years	8 months	N/A	82(bytes)
	3 seconds OA+FFT	0.5Hz	5,721	1.9 years	8 months	N/A	1.5MB

V. AISSENS View Introduction

AISSENS View is the core of the sensor data transmission system, responsible for sensor configuration, spectrum reading and conversion, firmware OTA, and other functions. If the computer's computing power and network bandwidth are sufficient, a single AISSENS View can support multiple sensors, performing sampling settings, data acquisition, and conversion. AISSENS View communicates with sensors based on the MQTT open transmission format, allowing third-party services to quickly interface with the core data of the sensors, thus accelerating the OT (Operational Technology) integration efficiency.

1. Basic Connection Architecture



A. Visit ASUS support site to download and install the latest AISSENS View program. https://www.asus.com/us/supportonly/aissens%20100aw/helpdesk_manual/

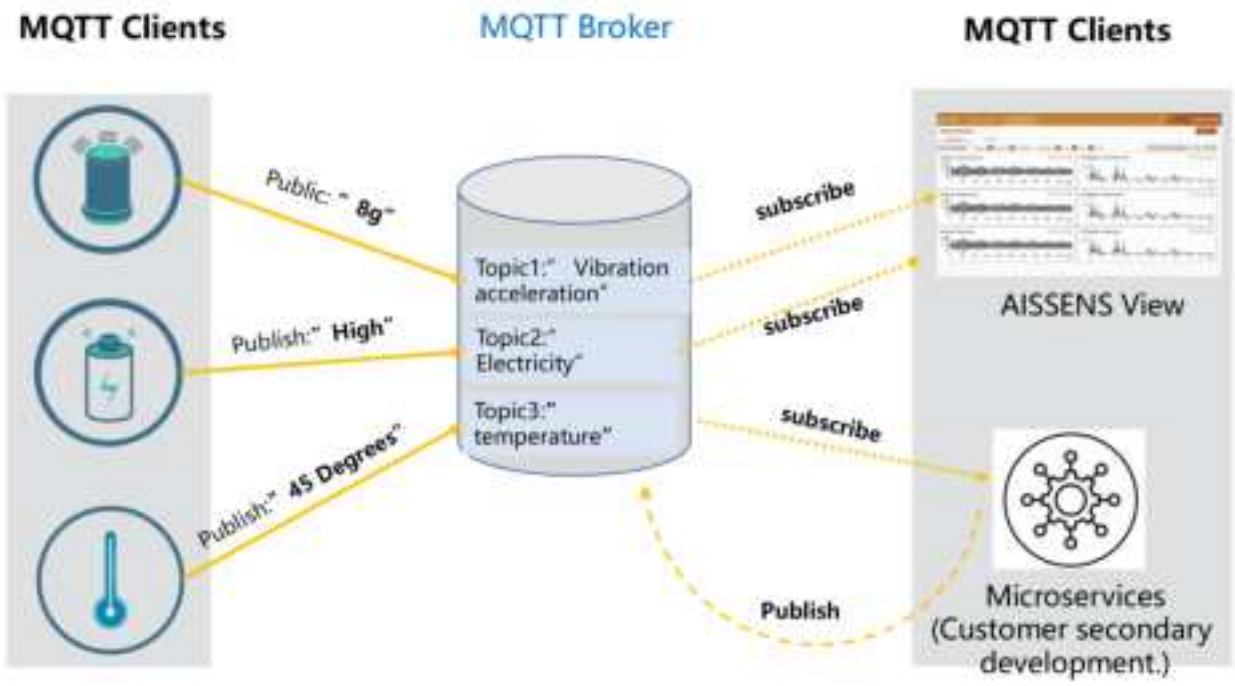
B. Make sure your PC is Wi-Fi and Bluetooth turned on.
C. Confirm the SSID and password of the 2.4GHz Wi-Fi AP.
D. Set the schedule (including recording time, recording interval and data type) in AISSENS View.

Note:

- The sensor only supports 2.4 GHz WPA2 connections.
- As an MQTT broker, it is recommended to use a fixed IP address for PC.

---

2. MQTT



MQTT (Message Queuing Telemetry Transport) is a lightweight communication protocol commonly used for data transmission between Internet of Things (IoT) devices. It is based on the publish/subscribe model and is suitable for scenarios with limited network bandwidth. The MQTT architecture consists of three parts: Publisher, Broker, and Subscriber.

MQTT Workflow:

A. **Publisher**: Devices or sensors send (publish) data and categorize it under specific topics. The diagram shows multiple sensor data points and topics, such as a vibration accelerometer (publishing data "8g" to the "vibration acceleration" topic), a temperature sensor (publishing "45 degrees" to the "temperature" topic), and a battery sensor (publishing "High" to the "battery" topic).
B. **Broker**: The MQTT broker is the core of the system, responsible for receiving data from various publishers and forwarding it to subscribers of the corresponding topics. Whether it' s **AISSENS View** (the data visualization platform) or other microservice systems, these subscribers can receive and process the data.
C. **Subscribers**: Subscribers register their interest in a particular topic, and when the MQTT broker receives data from that topic, it automatically pushes the data to the subscriber. The AISSENS View in the diagram is subscribed to the topics "Vibration Acceleration" and "Temperature" to monitor and analyze vibration data as well as temperature data. In addition, other microservices such as Modbus transformations can also be subscribed to a topic for further processing of topic information.

The sensor reports data through standard MQTT messages, allowing customers to easily use their existing MQTT brokers and communication infrastructure to obtain measurement data. This eliminates the need for additional gateway devices for protocol conversion — a common requirement with other wireless sensors — providing significant convenience.

.

VI. Ideal Sensor Placement

With a reliable sensor in place, the next step is identifying the optimal measurement locations. Since the installation method directly impacts measurement accuracy, below provides examples of common equipment types, highlighting suitable installation points with red dots for clarity.

Installation Tips:

A. Measurement locations selection: The sensor features a three-axis vibration sensing capability, but variations in physical movement vectors (left-right, up-down, front-back) at different measurement locations may still cause measurement errors. Generally, for horizontal equipment, horizontal movement is greater than vertical movement due to greater flexibility in the horizontal direction. Therefore, when possible, prioritize selecting the side of the equipment (horizontal direction) as the detection point rather than the top (vertical direction).

B. If no good test point is available in the horizontal direction, the sensor

can be mounted in a downward-facing horizontal test point.

C. For vertical installed equipment, the outlet pipe direction should align vertically.
D. Optimal Mounting Position: The test point should be as close as possible to the outer edge of the equipment 's bearing. Usually, data can be collected from one direction on the bearing, while the other two directions may not provide good test points. A three-axis vibration sensor can provide data collection in three directions from a single point, enhancing efficiency and accuracy.
E. Avoid Interference: Do not mount the sensor on structures subject to equipment vibrations, such as the equipment 's outer cover, motor cooling fan guard, fan housing, coupling guard, motor heat sink, or any structure prone to resonance interference. These locations can compromise data quality.
F. Repeatability: Ensure the test point aligns with the sensor's axial orientation. For long-term monitoring, mark the test point’ s location and orientation with a sticker. It can be quickly returned to its original test point after the sensor battery is replaced or the machine is repaired.
G. Mounting Options: The sensor can be quickly mounted using the magnetic base included. If magnetic attachment is not feasible, use a 2-part steel-reinforced epoxy to mount the target pad on the test point, then mount the sensor on the target pad.

Note:

- The magnetic base has a very strong magnetic force. Avoid placing it near iron objects to prevent pinch injuries. When carrying the sensor, use the packaging box or a magnetic isolation block to reduce interference.

VII. AISSENS indicator lights

1. Button description

- Press the button on the sensor: The sensor will flash green, indicating it is in pairing or connection mode. Once connected to the MQTT Broker, the green light will turn solid.
- Press and hold over 10 seconds, and it will start flashing red for 2 seconds. This indicates that the sensor has been reset, clearing Wi-Fi information and recording schedule settings, and restoring it to factory defaults.

2. LED Indicator Explanation

A. **No light:** The sensor is in **Sleep Mode**, and no operations can be performed. You can wake up the sensor by pressing the wake-up button.

B. **Red light flashing continuously:** The sensor is in a **Low Battery** state. It is recommended to replace the sensor's battery as soon as possible.

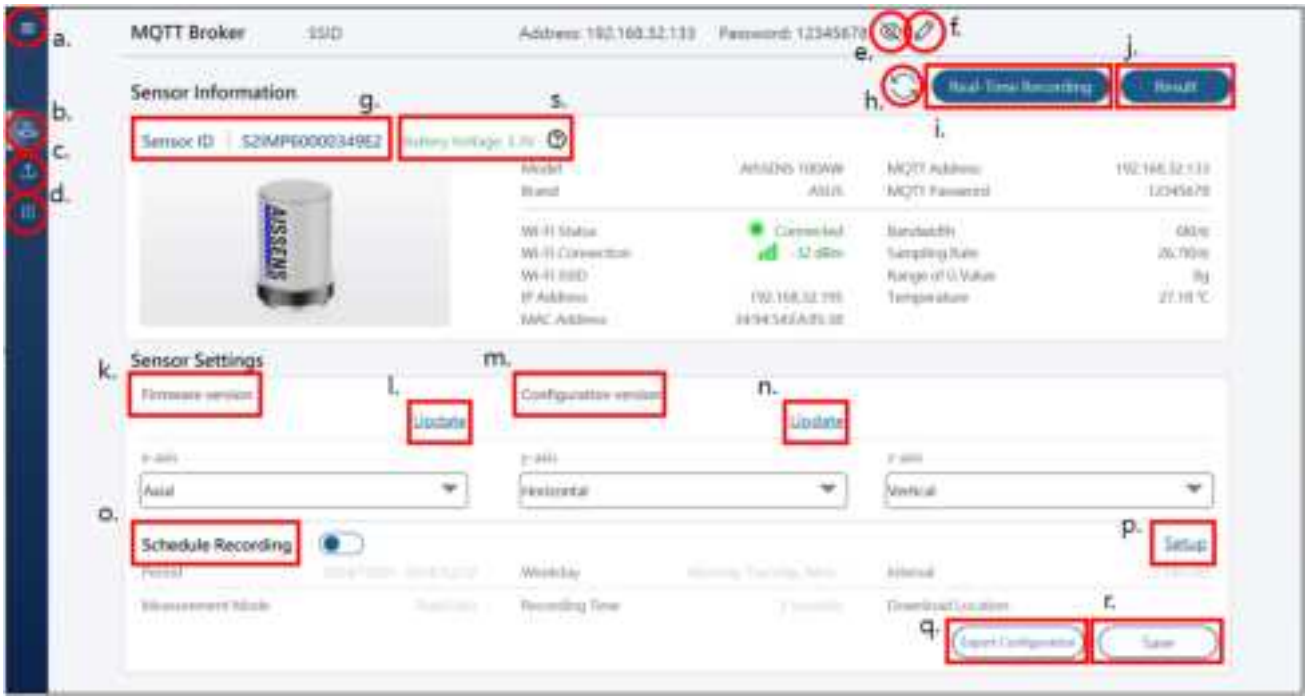
C. **Solid green light:** The sensor is in a **Connected** state, meaning it has successfully connected to Bluetooth and the MQTT Broker. You can now operate the sensor, such as modifying its settings.

D. **Slow flashing green flashing (1 Hz):** The sensor is either in **Recording Mode** or **Pairing Mode**. This means the sensor is processing a recording action (e.g., scheduled recording) or attempting to establish a connection (e.g., searching for Bluetooth or an MQTT Broker when activated).

E. **Rapid flashing green light (3 Hz):** The sensor is in **Data Transmission Mode**, indicating it is currently transmitting data (e.g., uploading recorded data after completing a scheduled recording). If the

transmission fails for any reason (e.g., weak Wi-Fi signal), the sensor will display a **solid red light for 2 seconds** before entering sleep mode.

VIII. AISSENS View Software Interface Function Introduction



a. Menu: Collapsible menu that allows users to adjust the layout based on their needs.
b. Sensor Settings Page: Displays sensor information and setting schedules.
c. Data Reading Page: Reads the recorded data file and displays them in graphical format.
d. Bluetooth pairing page: Pairing sensor and setting connection information.
e. Show/Hide: Toggles the visibility of the MQTT Broker password.
f. Edit: Change the password of MQTT broker.
g. Sensor ID: Displays a list of sensors for selection. Only sensors connected to the MQTT Broker will appear in the list.
h. Reload Page Button: Refresh the sensor information page.
i. Real-Time Recording button: Select real-time data recording types and display graphs.

j. Result: Displays real-time recording results.
k. Firmware Version: Displays the current firmware version of the sensor.
l. Firmware update: Go to the sensor firmware update page.
m. Recording Scheduling Configuration File: displays the configuration file information of the sensor's current recording schedule.
n. Modify Recording Scheduling Configuration File: Modify the information of the recording scheduling configuration File.
o. Recording Schedule Toggle: Enables or disables the sensor recording function.
p. Recording Schedule Settings Menu: Setting the recording schedule details for the sensor.
q. Export Configuration Settings: Export the recording settings as a file.
r. Save: Save the recording settings.
s. Battery voltage display: Displays the battery voltage of the sensor, categorized into three levels:
   (1) Battery high (indicated in green): ≥ 3.3V
   (2) Battery Medium (indicated in yellow): 3.15V~3.3V
   (3) Battery Low (indicated in red): < 3.15V (Battery is nearly depleted; replace it soon)

IX. Software installation

1. Install AISSENS View & Connect

A. Install AISSENS View on your PC

To use ASUS IoT AISSENS View, follow the installation steps below. Once installed, you can open and use it from your desktop.

a. Execute the program and click Next to install it.
b. Select the installation directory and click Next.
c. Click Next to confirm the installation.
d. During the installation process, Windows may prompt you whether to allow the APP to change your sensor, at this time, please click Yes.
e. Click Close to complete the installation.

B. Install AISSENS Connect on a Mobile Device

Please search for "AISSENS Connect" in Google Play or Apple APP Store, download it, and complete the installation on your mobile device.

Note:

- To install AISSENS View on your PC for the first time, you need to install VC_redist.x64.exe first.
- Windows Server 2016 environments require additional .NET Framework v4.7.2 to be installed.
- Go to Network and Internet>Wi-Fi> Network Configuration File Types and choose Private Network.
- After the installation is complete, you can find the ASUS IoT AISSENS View icon on the desktop of PC to open it directly.

---

2. Wake up the sensor

a. Press the button above the sensor.

b. When successfully turned on, the sensor will start flashing green.

3. Pair the sensor via Bluetooth

A. PC (AISSENS View):

a. Open ASUS IoT AISSENS View and go to the Sensor Pairing page, where the system will automatically start Bluetooth pairing.

b. If No ASUS Sensor Paired is displayed, please make sure that the Bluetooth function and sensor are turned on. Once confirmed, click "**Add New**" again to manually enter pairing mode.

c. Once the system detects the sensor, it will take you to the **Sensor List** page. Select the desired sensor to complete the pairing process. If the specified sensor is not found, click the **Refresh** button in the top right corner to restart the Bluetooth search.

B. Mobile (AISSENS Connect):

Open AISSENS Connect and the system will automatically start Bluetooth pairing. On the Select Sensor page, select the specified sensor to complete the pairing process. If the sensor is not found, click the Refresh button in the top right corner to search for Bluetooth again.

If the page shows **No sensor detected,** please make sure that the Bluetooth function and sensor are turned on, and after confirming that it is normal, please click Search again to let the system manually enter the pairing mode.

Note:

- Before pairing, ensure that Bluetooth is enabled on both devices.
- **PC**: In the settings > select Bluetooth & other devices > Bluetooth, and then turn on the Bluetooth function.
- **Mobile**: In Settings, tap Connect, then enable Bluetooth.

- When AISSENS Connect is opened for the first time, it will ask for location and Bluetooth permissions, please make sure both are authorized.

---

4. Set the Wi-Fi information for AISSENS

A. PC (AISSENS View):

In the Setup Information page, select Wi-Fi Settings and select the same domain as AISSENS View in the Wi-Fi List.

B. Mobile (AISSENS Connect):

In the Configuration section, click on Wi-Fi Connections and select the same domain as AISSENS View in the Wi-Fi List.

Note:

- The sensor needs to be in the same network domain as AISSENS View.
- If the Wi-Fi AP is hidden, click the Add New button in the upper right corner and enter the SSID and Password.
- Make sure that your PC's firewall does not block AISSENS View MQTT Broker.
- The sensor can only be connected to 2.4GHz Wi-Fi AP.
- When using an iPhone Wi-Fi hotspot, open Settings > Personal Hotspot > Maximize Compatibility to ensure you get a 2.4GHz hotspot.

5. Set the MQTT information for AISSENS

A. AISSENS View (Windows):

On the Setup Information page, check whether the MQTT Address and Password are the same as the MQTT Broker information.

B. AISSENS Connect(Mobile):

In the Configuration section, verify that the MQTT Address and Password match the MQTT Broker information.

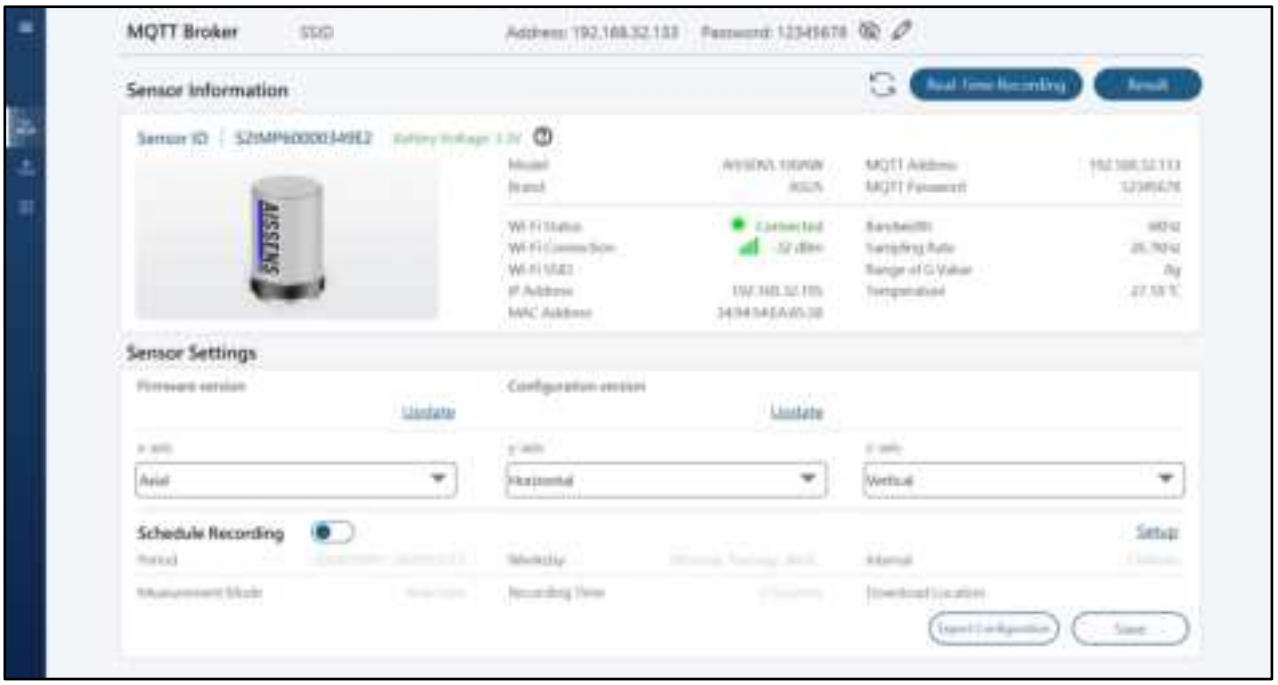
Note:

MQTT Broker information is displayed at the top of the AISSENS View Sensor Information page.

---

6. Complete sensor configuration

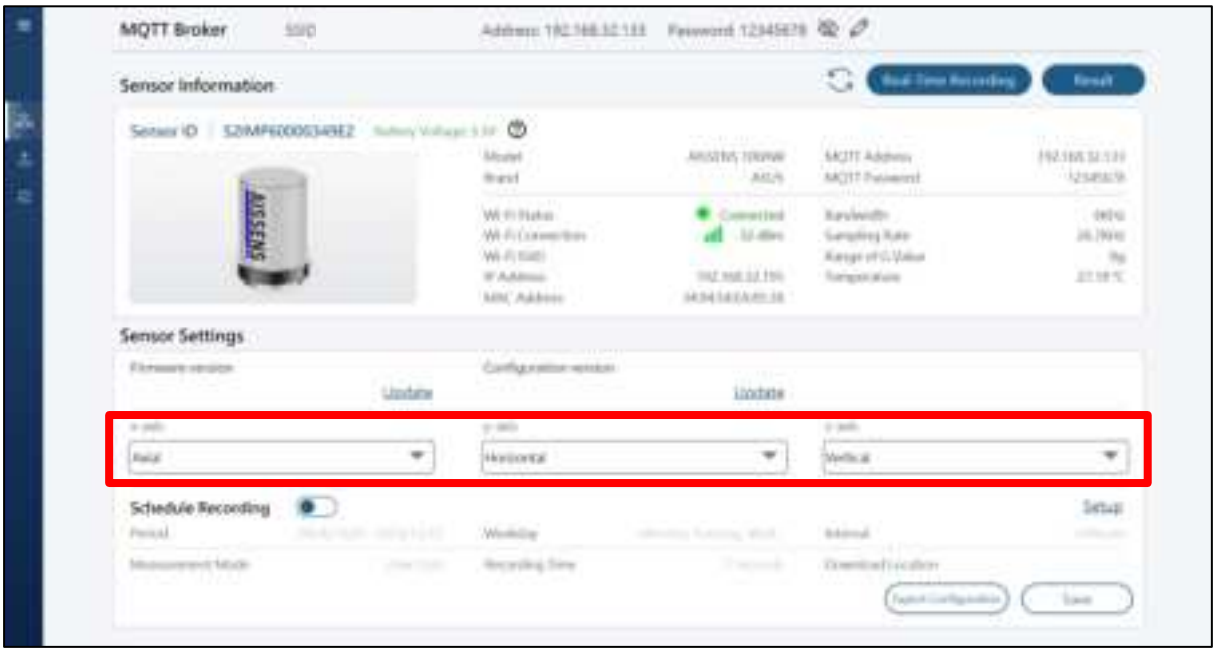
Once both Wi-Fi and MQTT settings are successfully configured and connected, go to the Sensor Information page in AISSENS View. Click the refresh button, and the sensor information should display correctly.



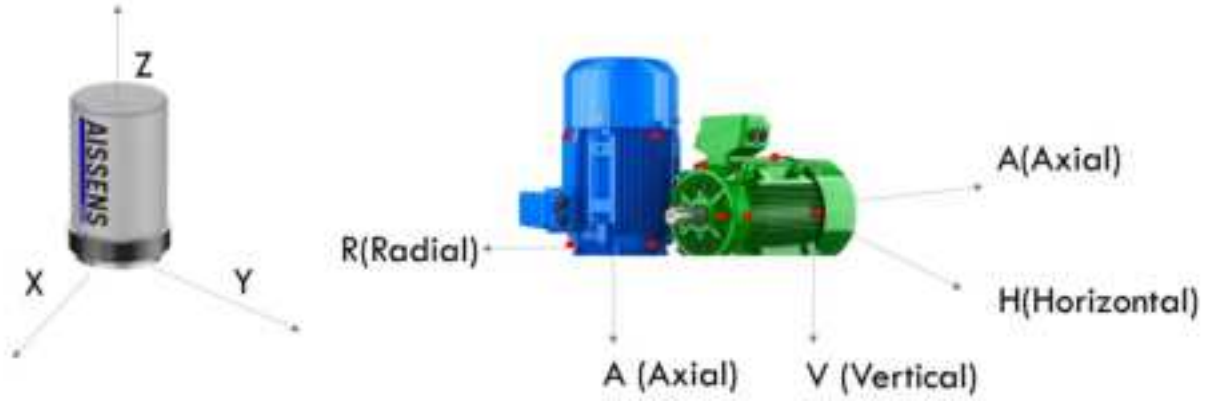
X. AISSENS View feature description

1. Set the sensor three-axis orientation information

The sensor can measure three directions, depending on the user's installation method, the direction of X, Y, and Z will change, and it is not a fixed value, for example, the X axis may correspond to the vertical, horizontal, or axial direction. Therefore, the 3-axis orientation function can be set through AISSENS View, which allows the user to accurately mark the direction of the sensor to ensure the correctness of subsequent data collection and application. When the setting is complete, press Save.



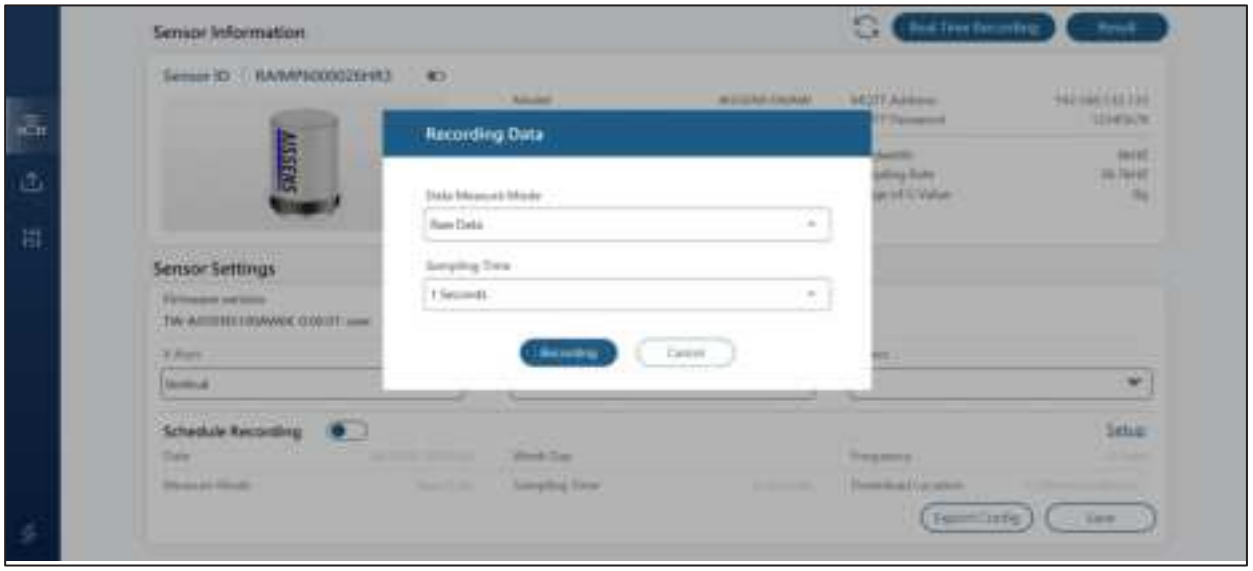
Note: The X, Y, and Z axis directions must not be duplicated.



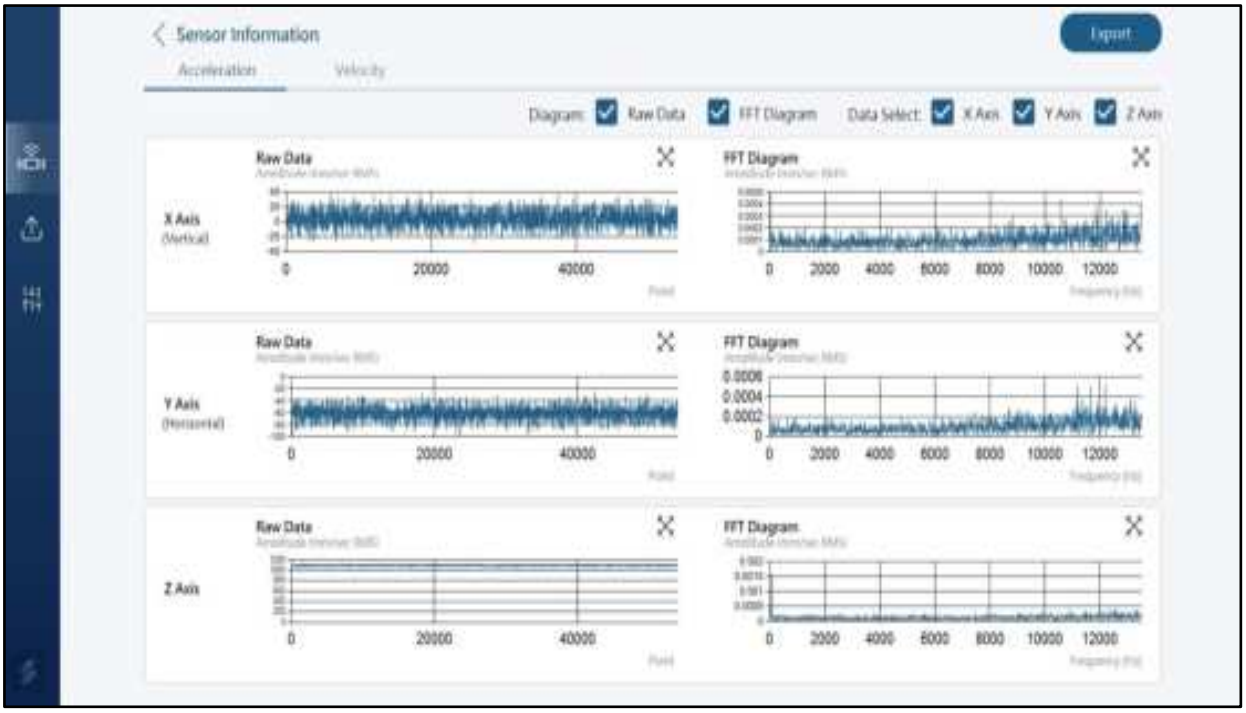
2. Real-Time Recording

Follow the steps below to make a Real Time Recording:

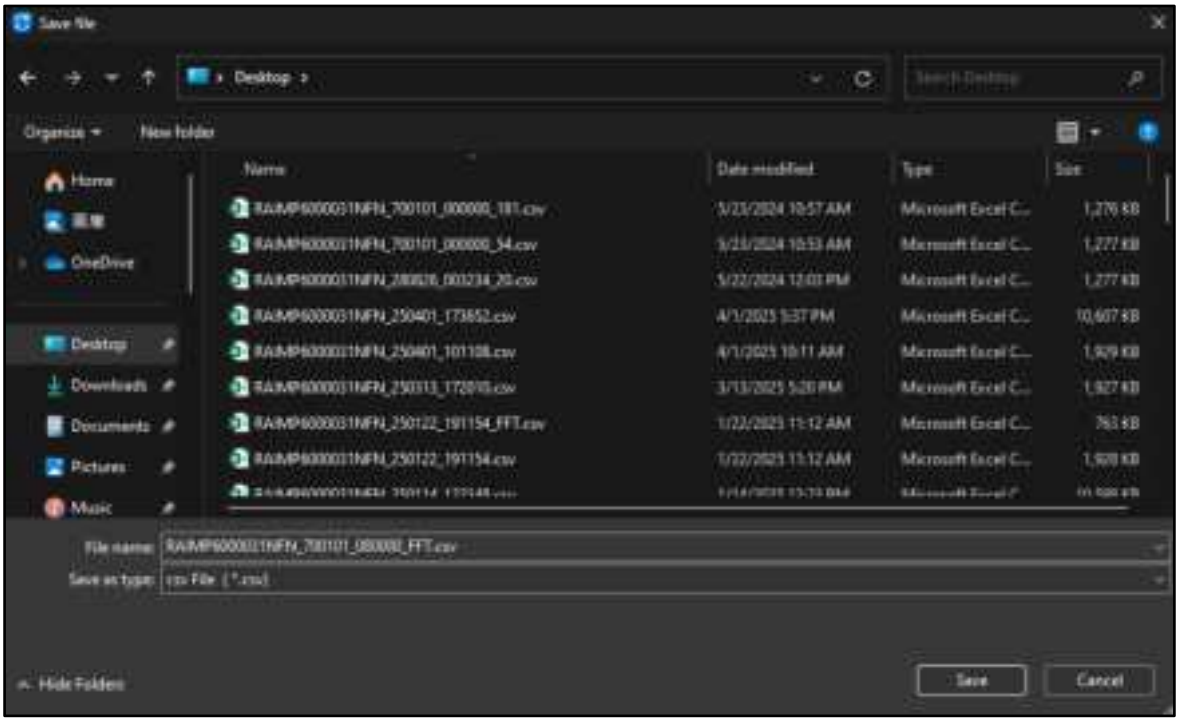
a. Click the Real Time Recording button, then select the data measure mode and sampling time.



b. After the recording is completed, you can view the result (Raw Data / OA / FFT) on the page.



c. Click the Export button in the top right corner, select the storage location, and export the CSV file.



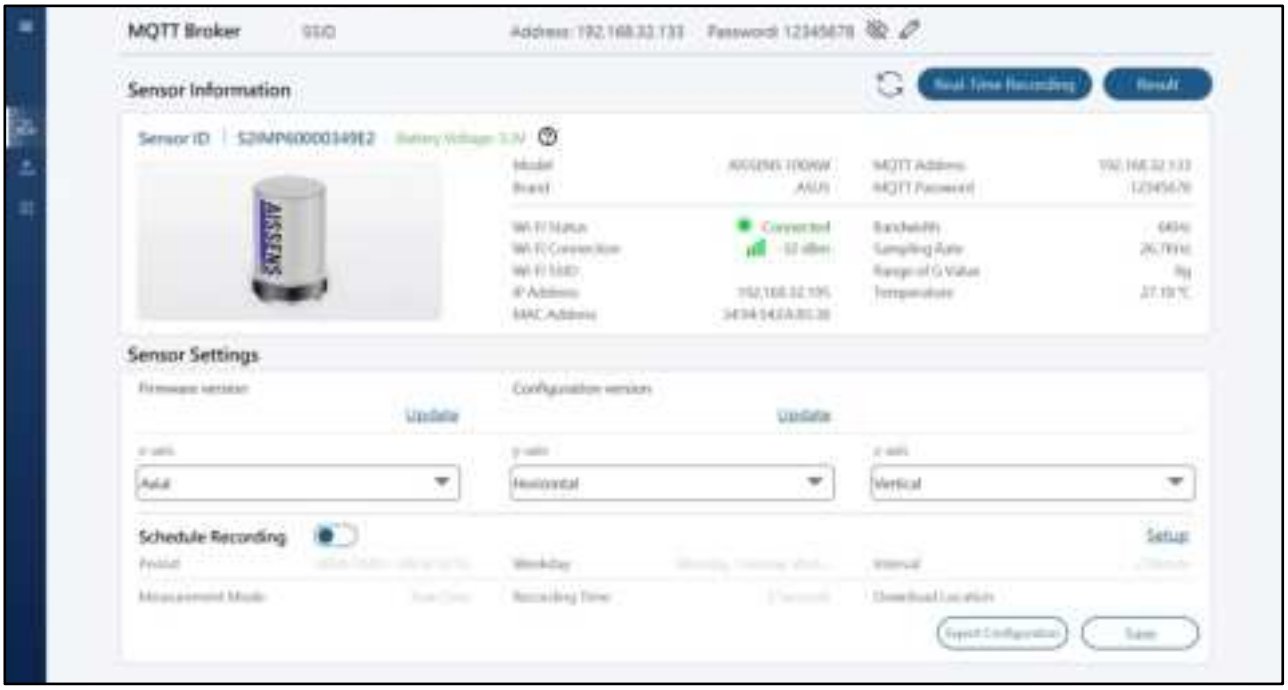

Sensor Information
Export
Diagram:
Raw Data
FFT Diagram
Data Select:
X Axis
Y Axis
Z Axis
Raw Data
FFT Diagram
X Axis
Raw Data
FFT Diagram
Y Axis
Raw Data
FFT Diagram
Z Axis

d. Click Browse Files on the Load Files page to reload the exported files.

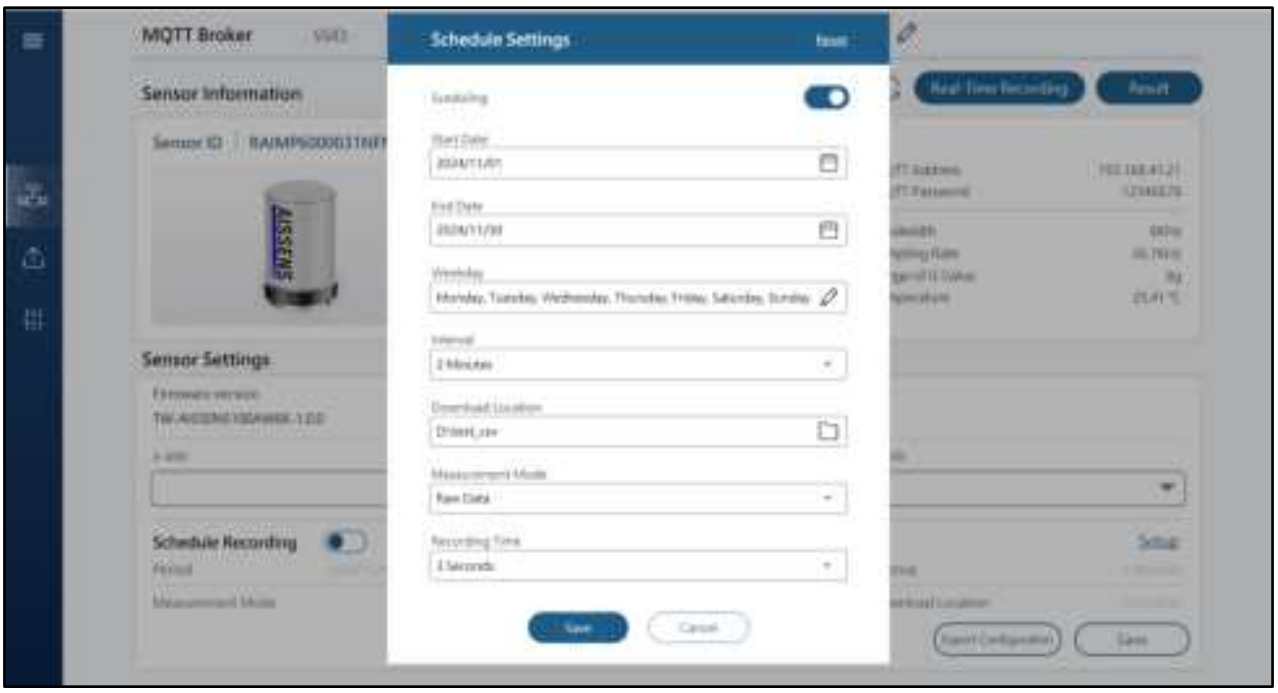
3. Perform Schedule Recording

Follow the steps below to perform the Schedule Recording function:

a. Click the Setup button to set the Schedule Recording.



b. Set the Schedule Settings, and press Save when the setting is complete.



- Scheduling: Toggle to enable or disable scheduled recording.
- Start Date: Sets the start time for scheduled recording. For example, if set to 2025/01/01, recording will begin at 00:00 on 2025/01/01.
- End Date: Sets the end time for scheduled recording. For example, if set to 2025/12/31, recording will stop at 23:59 on 2025/12/31.
- Weekday: Specifies the days for recording. For example, if Monday and Tuesday are selected, recordings will occur only on these days within the specified start and end dates.
- Interval: Defines the time interval between recordings. For example:
  - If set to 15 minutes, recordings occur every 15 minutes.
  - If set to 1 hour or more, recordings align with the hour. For example, a 1-hour interval ->recording occurs at every full hour (e.g., 00:00, 01:00, 02:00, etc.); an 8-hour interval -> recording

occurs three times a day (e.g., 00:00, 08:00, 16:00).

- Download Location: Specifies the storage path for recording data. You can set a custom path as needed.
- Measurement Mode: A Select the type of data to record:
  - Raw Data
  - OA+FFT
  - OA Only
  - Raw Data+OA+FFT

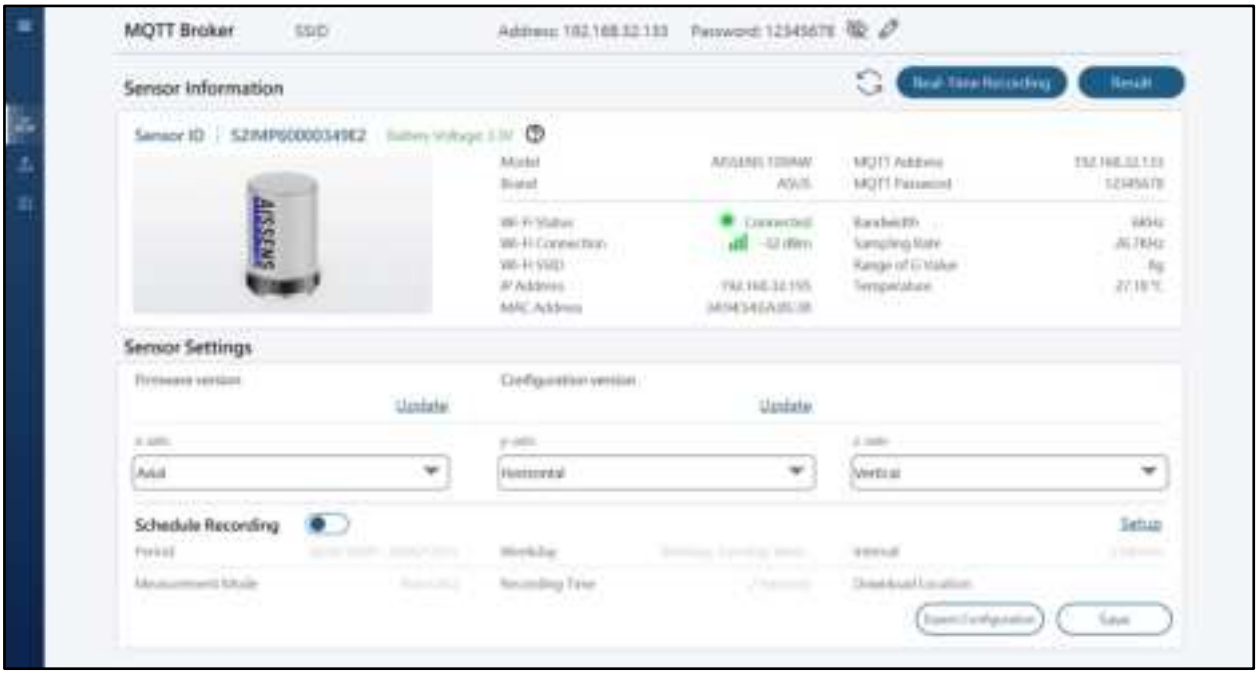
  Choose the mode that suits your requirements.
- Recording Time: Specifies the duration of each recording.

c. After completing the settings, press Save, and a prompt will appear asking whether to begin recording immediately. If Yes is selected, the sensor will record a data entry immediately and follow the scheduling plan. If No is selected, you can make additional changes. The sensor will enter a scheduled mode after being idle for three minutes and start recording the next time it wakes up.

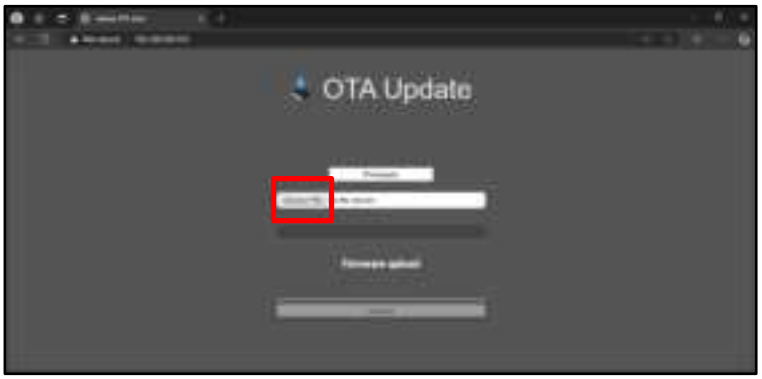
4. Performing Firmware Update (FW Update via OTA)

Follow these steps to update firmware:

a. After clicking **Update**, the browser for the update process will pop up.



b. Click the **"Choose File"** button, choose the firmware version you want to update, and then click **"Upload"** to start the update.



Wait for the update progress to reach 100% and a message **"Upload Success"** will appear when the update is complete. The sensor will automatically restart. The user can close the window and return to AISSENS View to continue operations.

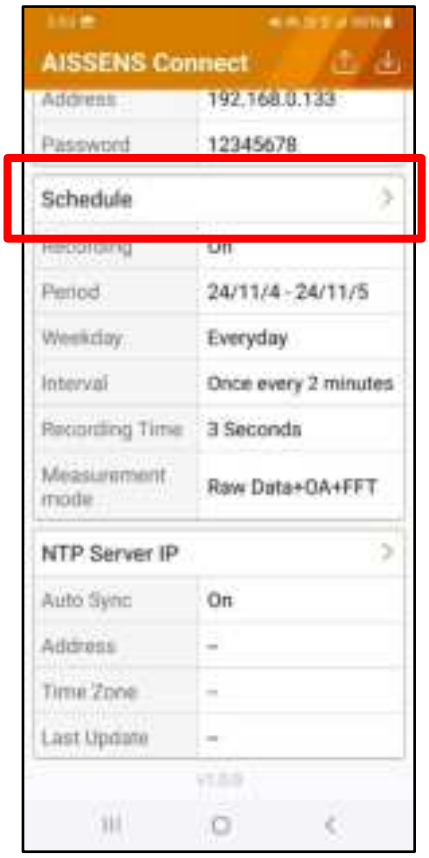
Note: Do not perform any other operations during the firmware update to avoid update failure.

XI. AISSENS Connect – Mobile APP

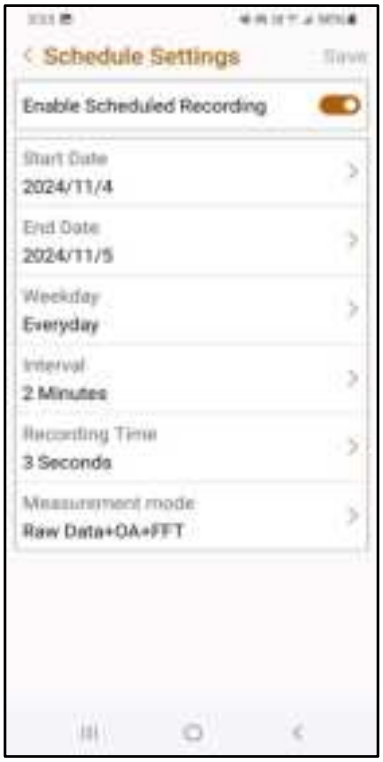
1. Setup Schedule Recording

Follow the steps below to perform the Schedule Recording function:

a. Click on the Schedule section to set the Schedule Recording.



b. Set the Schedule Settings.



- Scheduling: Toggle to enable or disable scheduled recording.
- Start Date: Sets the start time for scheduled recording. For example, if set to 2025/01/01, recording will begin at 00:00 on 2025/01/01.
- End Date: Sets the end time for scheduled recording. For example, if set to 2025/12/31, recording will stop at 23:59 on 2025/12/31.
- Weekday: Specifies the days for recording. For example, if Monday and Tuesday are selected, recordings will occur only on these days within the specified start and end dates.
- Interval: Defines the time interval between recordings. For example:
  - If set to 15 minutes, recordings occur every 15 minutes.
  - If set to 1 hour or more, recordings align with the hour. For example, a 1-hour interval ->recording occurs at every full hour (e.g., 00:00, 01:00, 02:00, etc.); an 8-hour interval -> recording

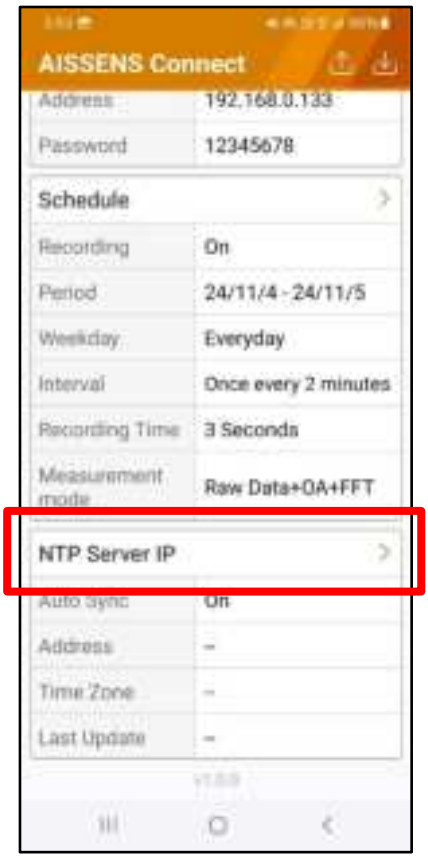
occurs three times a day (e.g., 00:00, 08:00, 16:00).

- Download Location: Specifies the storage path for recording data. You can set a custom path as needed.
- Measurement Mode: A Select the type of data to record:
  - Raw Data
  - OA+FFT
  - OA Only
  - Raw Data+OA+FFT

  Choose the mode that suits your requirements.
- Recording Time: Specifies the duration of each recording.

2. NTP server configuration

a. Click on the NTP Server IP section to set the NTP server settings.



b. Set the NTP Server IP.

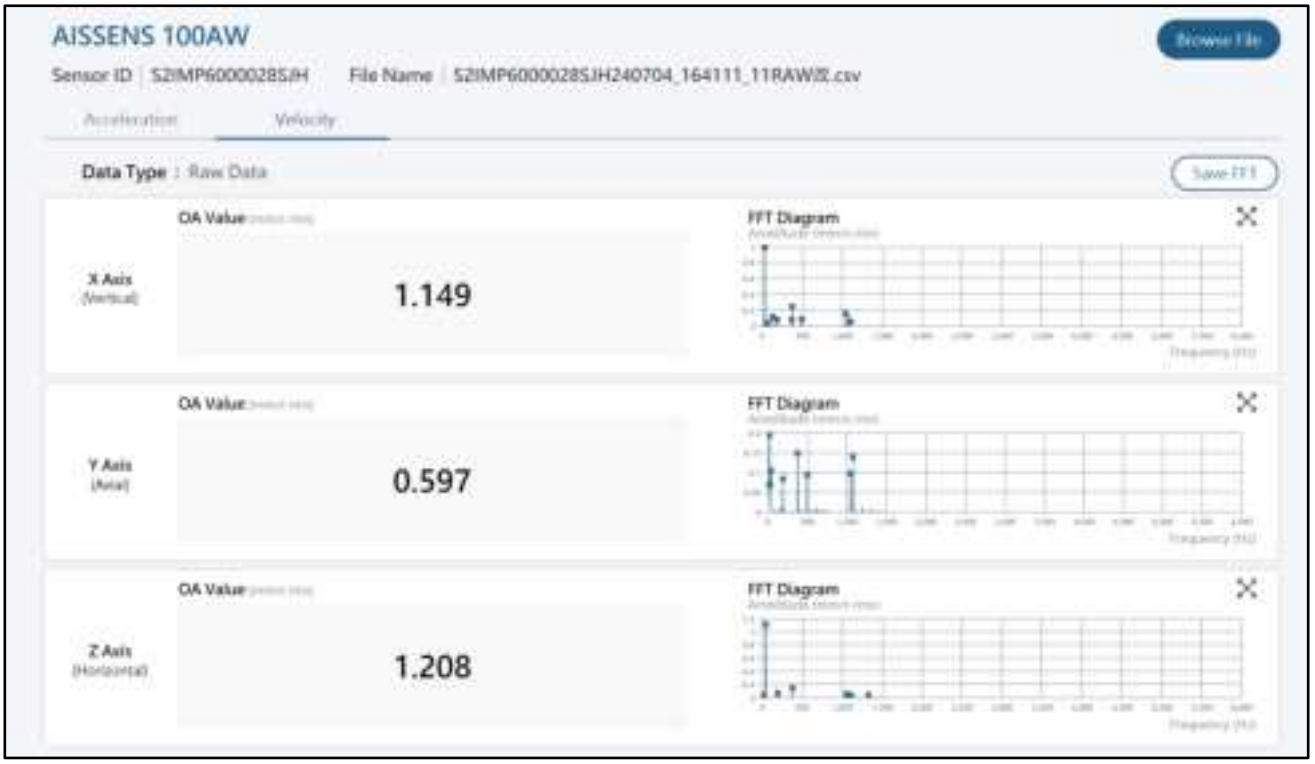
- Enable NTP Auto Sync: When enabled, the sensor will automatically sync time during its first wake-up each day.
- Address: the address of the NTP server.
- Last Sync Time: Displays the most recent time synchronization. Tap Sync Now to manually sync.
- Time Zone: Set the time zone.

XII. Spectrum interpretation

1. Raw data Spectrum

Raw Data _Acceleration

Raw Data _ Velocity



A. Information obtainable from raw data

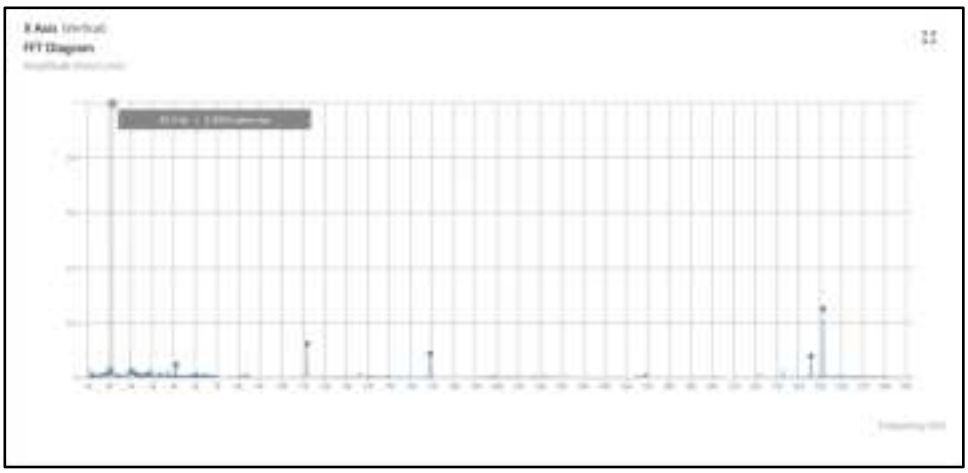
- **Complete Data Recording:** Provides unfiltered and uncompressed raw data, supporting further customized processing and analysis, enhancing data flexibility.
- **Waveform Feature Identification:** Captures transient vibration peaks and impact events, aiding in the identification of short-term or intermittent faults.
- **High-frequency vibration monitoring:** Acceleration data is sensitive to high-frequency vibrations, making it suitable for fault analysis of components such as bearings and gears.
- **Impact and Transient Event Detection:** Acceleration data captures instantaneous impact events, helping to detect potential issues such as bearing degradation, misalignment, or looseness.

B. Information obtainable from raw data– Velocity

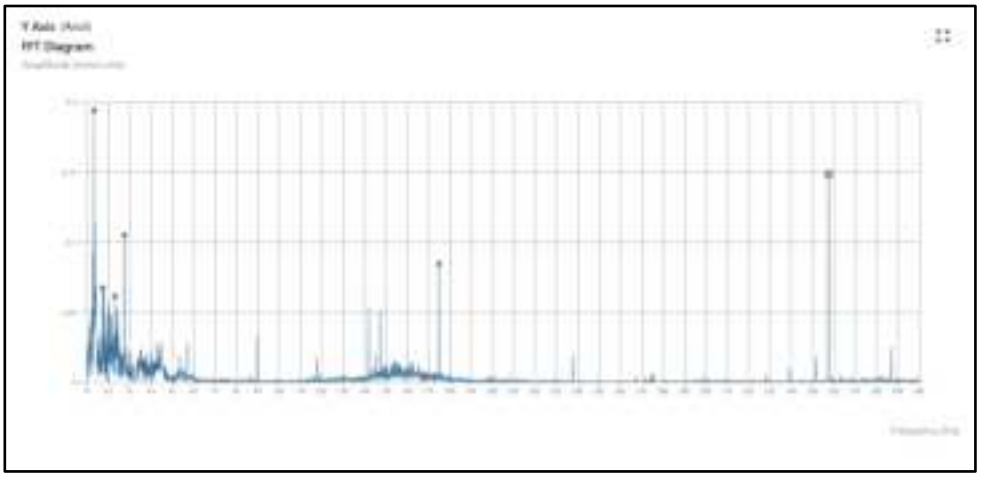
- **Vibration severity assessment:** The RMS (Root Mean Square) value of velocity can be used to measure overall vibration intensity, reflecting equipment health status and allowing comparison with standards such as ISO 10816.
- **Operational Stability Evaluation:** Variations in velocity reflect the operational stability of the equipment and can be used for trend analysis.

2. Velocity FFT spectrum

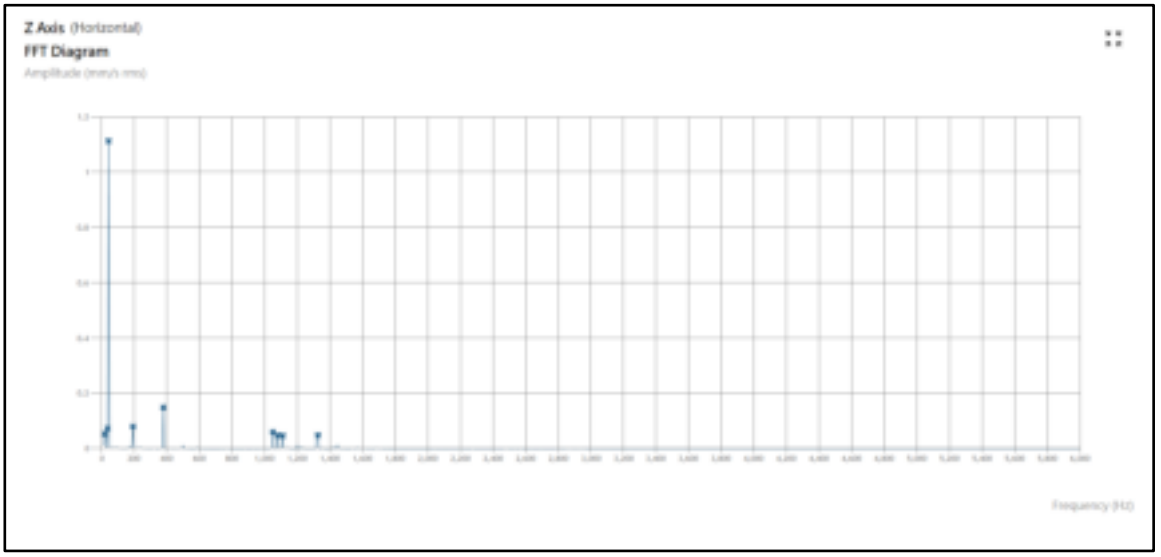
Raw Data_Velocity _X axis FFT



Raw Data_Velocity_Y-axis FFT



Raw Data_Velocity_Z-axis FFT



A. Information obtainable from the velocity FFT

- **Vibration spectrum across axes:** The vibration spectra of the X, Y, and Z axes can be analyzed to identify different frequency components on each axis and understand the vibration behavior of the equipment in all directions.
- **Fault diagnosis:** The characteristic frequencies of each axis reveal potential mechanical faults. Different types of faults, such as imbalance, misalignment, or bearing wear, generate significant vibration signals within specific frequency ranges.
- **Amplitude analysis:** The amplitude in the spectrogram helps assess the distribution of vibration energy on each axis. Higher amplitudes indicate strong vibrations at specific frequencies, aiding in prioritizing potential fault sources.
- **Resonance Identification:** FFT can detect resonance at specific frequencies (or their harmonics), which often amplifies vibration amplitudes and may lead to equipment damage.
- **Overall health assessment:** By comparing spectral characteristics across different axes, the overall health of the machine can be evaluated, helping determine whether the machine's operation is balanced and assessing its operational stability.
- **Fault progress monitoring:** Regular velocity FFT analysis can track changes in equipment condition. An increase in amplitude at certain frequencies over time may indicate the progression of a potential failure.

3. ISO 10816-3 standard

Vibration speed: 10-1000 Hz r > 600 rpm, 2-1000 Hz r > 120 rpm					
Machine type		Medium-sized equipment 15 kW < P ≤ 300 kW		Large equipment 300 kW < P < 50 MW	
		motor 160 mm ≤ H < 315 mm		motor 315 mm ≤ H	
basis		rigid	Flexible	rigid	Flexible
Inch/s rms	mm/s rms				
0.03	0.71	A			
0.06	1.4				
0.09	2.3	B			
0.11	2.8				
0.14	3.5	C			
0.18	4.5				
0.28	7.1	D			
0.43	11				

A: New machine status

B: Allows long-term unlimited operation

C: Allows short-term operation

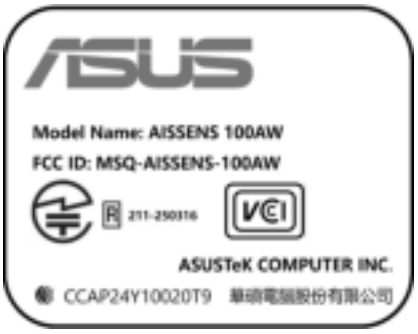
D: Damage caused by vibrations

XIII. Appendix

1. Product Precautions

A. Environmental Protection Service Life

B. Certification Label



- **NCC:**

Model : AISSENS 100AW

Contains CCAP24Y10020T9

Low-Power Radio Frequency Equipment Warning:

For low-power RF equipment that has obtained the certification of approval, the company, the firm or the user shall not change the frequency, increase the power or change the characteristics and functions of the original design without approval.

The use of low-power radio frequency equipment shall not affect flight safety and

interfere with legitimate communications; if interference is detected, usage must be stopped immediately until the issue is resolved. Legal communications refer to radio communications operated in accordance with telecommunications regulations. Low-power RF equipment must tolerate interference from legal communications or industrial, scientific, and medical (ISM) radio emissions.

- **VCCI:**

この装置は、現在設置されている場所で妨害波の測定がされた情報技術装置です。この場所以外で使用する場合は、その場所で、再び妨害波の測定が必要となります。

Translation:
This is a product for which interference was measured and confirmed to comply at the present installation site. When this equipment is used at any other location, interference must be measured at the new location for compliance.

- **FCC:**

FCC ID: MSQ-AISSENS-100AW

Federal Communications Commission Statement
Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the Federal Communications Commission (FCC) rules. These limits are designed to provide reasonable protection against

harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment causes harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by doing one or more of the following 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.

FCC RF Exposure

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.

- **MIC:**

- **EU:**

EU RF Output Power Table

Function	Frequency	Maximum Output Power EIRP(mW)
Wi-Fi	2.4 – 2.4835 GHz	< 100
Bluetooth	2.4 – 2.4835 GHz	< 100

Simplified EU Declaration of Conformity

ASUSTek COMPUTER INC. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU. Full text of EU declaration of conformity is available at https://www.asus.com/support/.

Electronic Label Viewing Instructions:

AISSENS VIEW:

Step1: Click Sensor Information

Step2: Click ⓘ icon

Step3: You can find the electronic label in the pop-up window

AISSENS Connect:

Step1: Search the Sensor

Step2: Navigate to the “Detail Information” section

Step3: You can find the electronic label at the bottom of the list

AISSENS CONNECT

AISSENS VIEW

2. Copyright Notice

No part of this user guide, including the products and software described in it, may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form or by any means, except documentation kept by the purchaser for backup purposes, without the express written permission of ASUSTek COMPUTER INC. (“ASUS”).

Product warranty or service will not be extended if: (1) the product is repaired, modified or altered, unless such repair, modification of alteration is authorized in writing by ASUS; or (2) the serial number of the is defaced or missing.

ASUS PROVIDES THIS User guide “AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL ASUS, ITS DIRECTORS, OFFICERS, EMPLOYEES OR AGENTS BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES (INCLUDING DAMAGES FOR LOSS OF PROFITS, LOSS OF BUSINESS, LOSS OF USE OR DATA, INTERRUPTION OF BUSINESS AND THE LIKE), EVEN IF ASUS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES ARISING FROM ANY DEFECT OR ERROR IN THIS User guide OR PRODUCT.

Products and corporate names appearing in this user guide may or may not be registered trademarks or copyrights of their respective

companies, and are used only for identification or explanation and to the owners' benefit, without intent to infringe.

SPECIFICATIONS AND INFORMATION CONTAINED IN THIS User guide ARE FURNISHED FOR INFORMATIONAL USE ONLY, AND ARE SUBJECT TO CHANGE AT ANY TIME WITHOUT NOTICE, AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY ASUS. ASUS ASSUMES NO RESPONSIBILITY OR LIABILITY FOR ANY ERRORS OR INACCURACIES THAT MAY APPEAR IN THIS User guide, INCLUDING THE PRODUCTS AND SOFTWARE DESCRIBED IN IT.

3. ASUS Contact information

Manufacturer: ASUSTek COMPUTER INC.

Tel: +886-2-2894-3447

Address: 4F, No. 150, LI-TE RD., PEITOU, TAIPEI 112, TAIWAN

Authorized representative in Europe:

ASUS Computer GmbH

Address: HARKORT STR. 21-23, 40880 RATINGEN, GERMANY