TECOM

Pro-3200

Smart Portable Vibration

Diagnosis Instrument
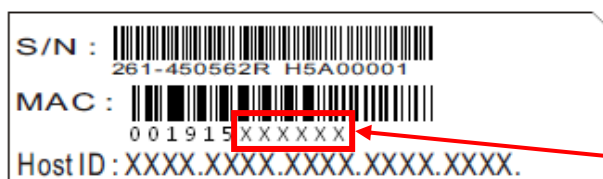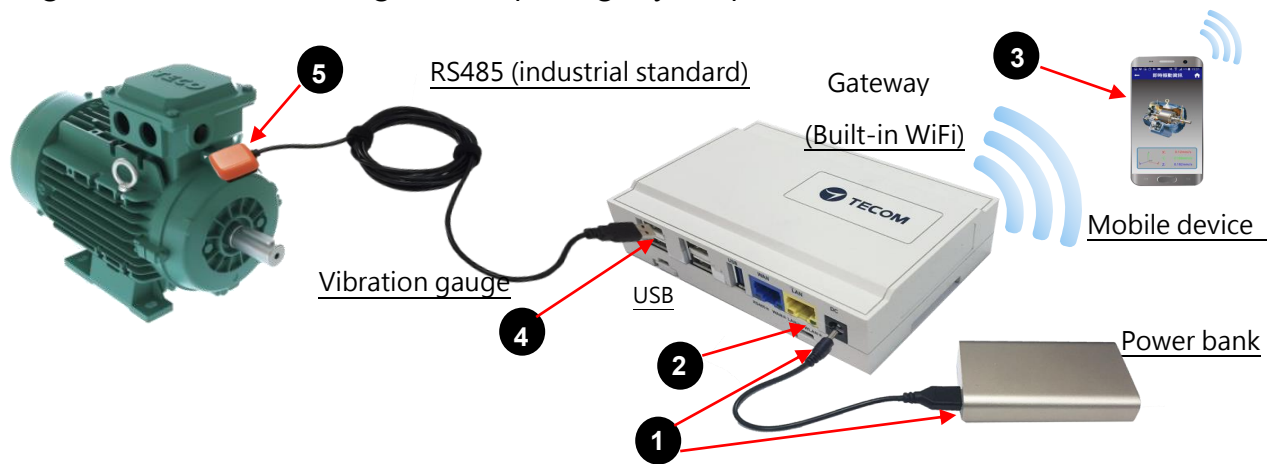
Operation Manual

Table of contents

Pro-3200 Installation and Measurement Quick Guide 1-2-3

1 APP download and installation

Search and download [Pro-3200] from Apple Store or Google Play to install it on your smartphone. Make sure the latter is connected to the Internet in advance.

2 Set up and connect your product in 5 steps

Open the instrument box, remove e-Gateway AG-300 Plus2, power bank, and vibration gauge, follow the following 1~5 steps to get your product installed.

1. Connect output of power bank to DC input of e-Gateway AG-300 Plus2, switch on the power bank.
2. Wait until the green WLAN LED indicator lights up to proceed with WiFi connection setup for your smartphone.
3. In [Setup], [WiFi] menu of your smartphone, look for WiFi access point name →"TECOM_XXXXXX", the 6-digit number "XXXXXX" contained in the name should be the same of the last 6-digit of MAC address shown in SN label on the side of the e-Gateway AG-300 Plus2; if so, the WiFi network found by your smartphone is the same one of your different; press "TECOM_XXXXXX" to start connecting; the smartphone and your device connected successfully once the message "Connected" prompted.

S/N : 261-450562R H5A00001

MAC : 001915 XXXXXX

Host ID : XXXX.XXXX.XXXX.XXXX.XXXX.

Connection between the two can be established only if this 6-digit number matches the one shown in "TECOM_XXXXXX" shown in your WiFi

❹ Connect vibration gauge USB port to the 1st and 2nd RS485 port of e-Gateway AG-300 Plus2.

❺ Mount magnetic vibration gauge to right position of equipment for measurement.

Once step 1~5 executed successfully the connection is set and the smartphone is ready for diagnosis operation.

3   Measurement and diagnosis

This device provides [**Plug-and-play**] fast connection diagnosis. Please power on the power bank and e-Gateway AG-300 Plus2 once step ⃞2 [Setup and connection] is done.

1. Enable the [Vibration diagnosis] APP on your smartphone

2. Auto log in the WiFi connected e-Gateway AG-300 Plus2 without any parameter setup as shown in figure below:
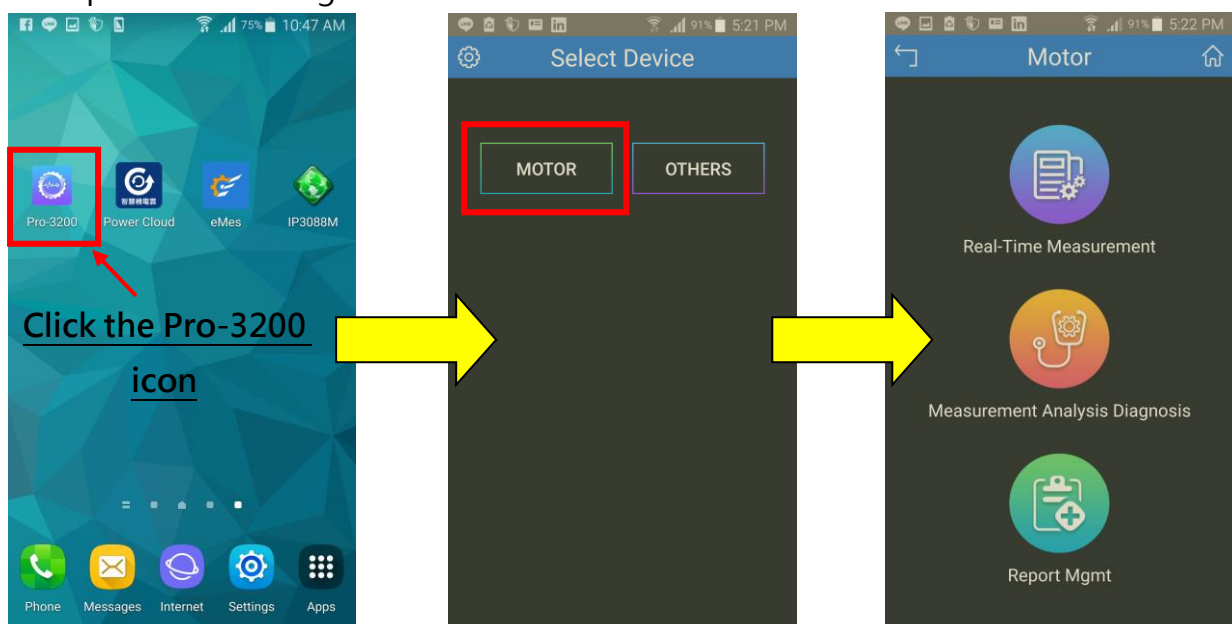
3. Execute vibration diagnosis operation with the help of APP wizard

Note: 1. Network security verification is required by remote login, which may include account setup and registration; please consult technical service experience and refer to advanced operation manual for this.

2. APP can choose 「MOTOR」, 「OTHERS」 two categories of equipment,

「Motor」 equipment can provide Real-Time Measurement, Measurement Analysis Diagnosis and Report Management functions;

「OTHERS」 provides functions such as Real-Time Measurement, Measurement and Measurement report management, but does not provide Analysis and Diagnosis functions.

Overview

Tecom smart portable vibration diagnosis instrument is one of the most innovative mobile maintenance products in the world. By making the most of IoT, sensor, and management software technology it is designed to measure vibration of running E&M equipment without extra power cord or network cable. With fully PnP based convenience, it is ideal for small and medium size manufacturers and enterprises in pursuing productivity 4.0.

Featuring IoT WiFi gateway (AG-300 Plus2), integrated vibration gauge VB-200STU, power bank, and iOS and Android platform available diversified smartphone APP (which can be downloaded, installed, and used immediately), Tecom smart portable vibration diagnosis instrument system is ideal for equipment installation or maintenance engineers for measuring temperature and vibration at equipment power contact, E&M, rotary machinery, and motor on the spot. In addition, it combines measurements made on site with interactive analysis and diagnosis of the system to provide instant, helpful, and effective target E&M equipment health analysis which, in turn, not only enable easy manufacturing E&M equipment management and upkeep in healthy status but also prevent hazardous system shutdown from happening.

Tecom smart portable vibration diagnosis instrument may connect up to 2 vibration gauges for multiple diagnosis at the same time. With a breakthrough in vibration measurement concept, it integrates vibration <u>measurement</u>, <u>analysis</u>, and <u>diagnosis</u> operation in one portable device to save working hours and reduce onsite maintenance and repair time significantly.

Tecom smart portable vibration diagnosis instrument system may help acquiring full first commissioning operation data that is critical for later maintenance and big data analysis for manufacturer in future product release.
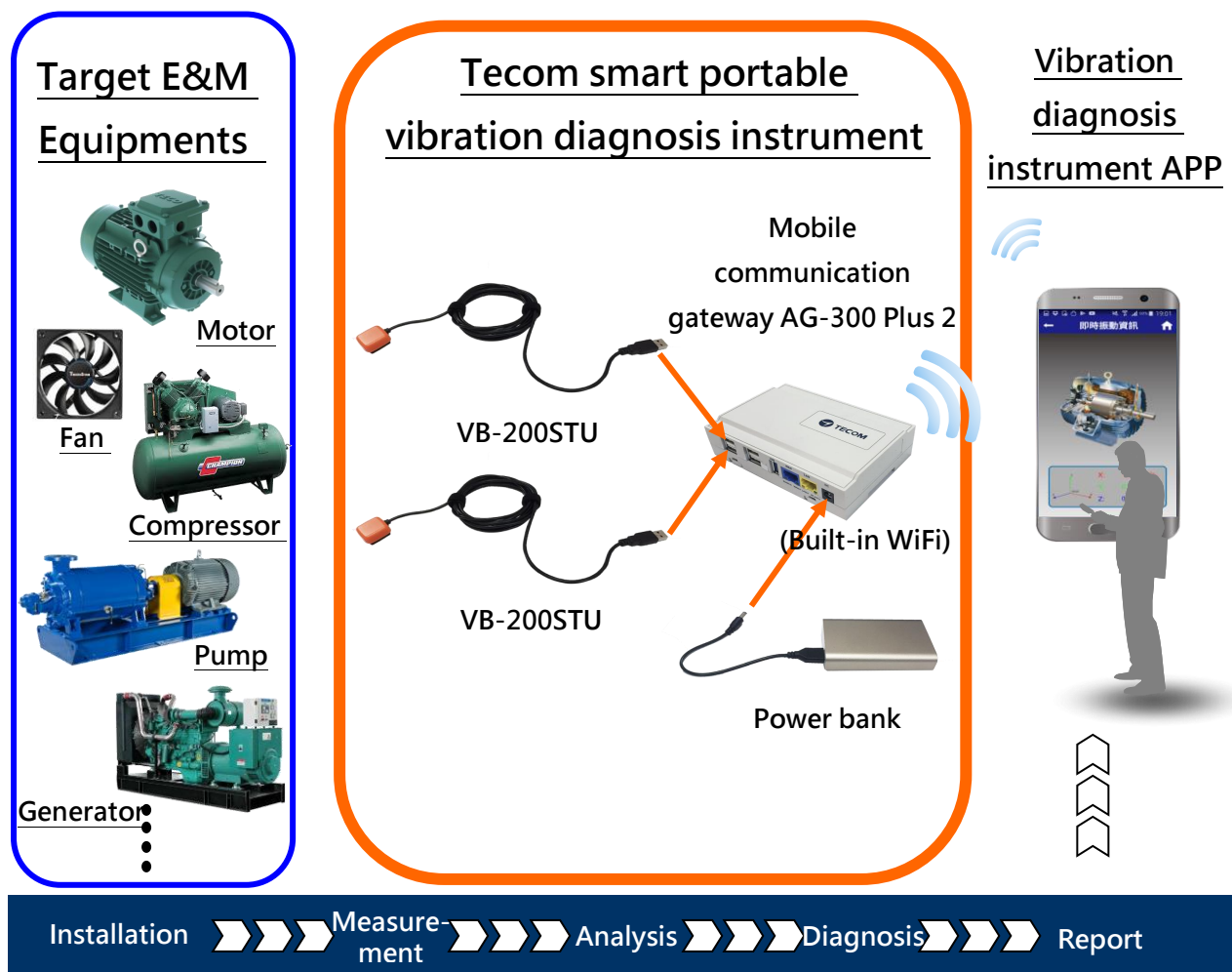
In situ and instant vibration diagnosis information

Productivity 4.0

Pro-3200 portable vibration diagnosis instrument

1. System structure

2. System composition

(1) AG-300 Plus2: IoT Gateway　　　x1

(2) VB-200STU: magnetic external vibration sensor (with USB cable)　　　x2

(3) Power bank　　　　　　　　　x1

(4) Power supply　　　　　　　　x1

(5) Smartphone APP (iOS, Android) (need to download and install on your own)

(6) Quick installation guide (electronic file)

(7) Portable vibration diagnostic carrying case and belt

(8) Other connection related accessories

Vibration diagnostic equipment picture

3. System capacity

1. The e-Gateway AG-300 Plus2 of this portable vibration diagnosis instrument may connect and sync up to:

   → 2 vibration gauge (USB interfaced)

   → sensor type: VB-200 STU

2. The smartphone may monitor up to 10 AG-300 Plus2 device at the same time

3. This portable vibration diagnosis instrument supports up to 20 users for concurrent diagnosis

4. Capacity of power bank: 10050mAh

5. Fully charged power bank may support portable vibration diagnosis instrument for 12 hours without stop

4. Equipment wiring

Open **portable vibration diagnosis instrument** carrying case and belt, and connect them according to wiring diagram shown below.

A. Connect AG-300 Plus2 to VB-200STU with RS485(1/2)
B. Connect AG-300 Plus2 DC Jack to power bank to the power cord
C. WiFi connect smartphone to built-in WiFi router of AG-300 Plus2
D. Mount (magnetic) vibration gauge to target equipment according to its installation guidelines
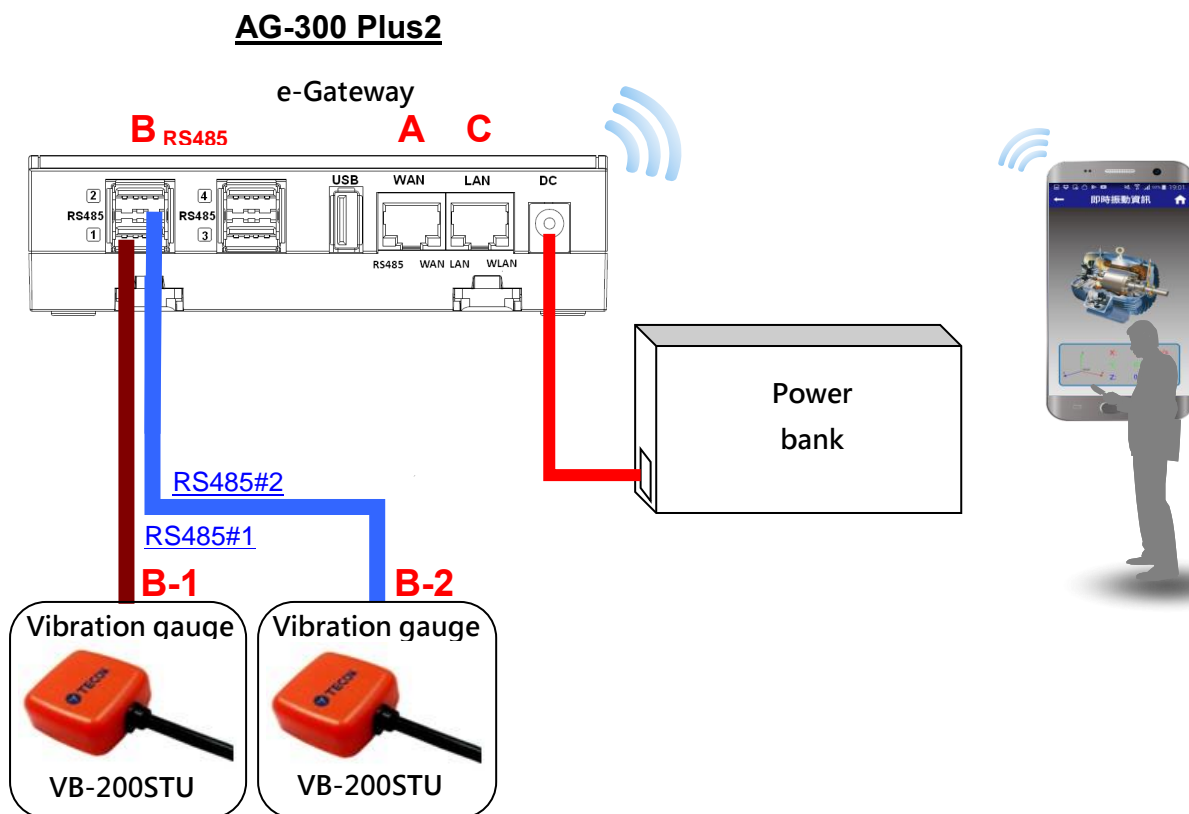
Once wired according to aforementioned diagram, your smartphone is now ready to execute test, analysis, and diagnosis over target equipment with the "vibration diagnosis" APP; follow the following diagram and steps E~F for computer and the Internet connection as required.

E. Connect AG-300 Plus2 WAN port (blue) and LAN port of ADSL modem with network cable
F. Connect AG-300 Plus2 LAN port (yellow) and PC with network cable (for system

setup only)
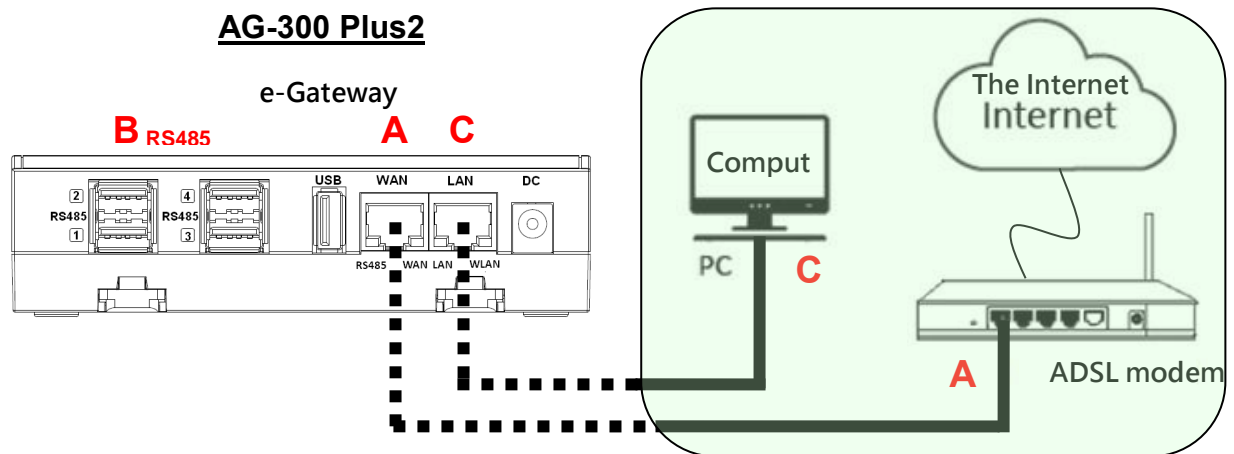
5. RS485 wiring

(1) AG-300 Plus2

E-gateway AG-300 Plus2 supports up to 4 vibration gauge with RS485 (USB) connection as shown in figure below:

RS485 (USB) set 1   RS485 (USB) set 2   RS485 (USB) set 3   RS485 (USB) set 4

VB-200STU   VB-200STU   Reserved   Reserved
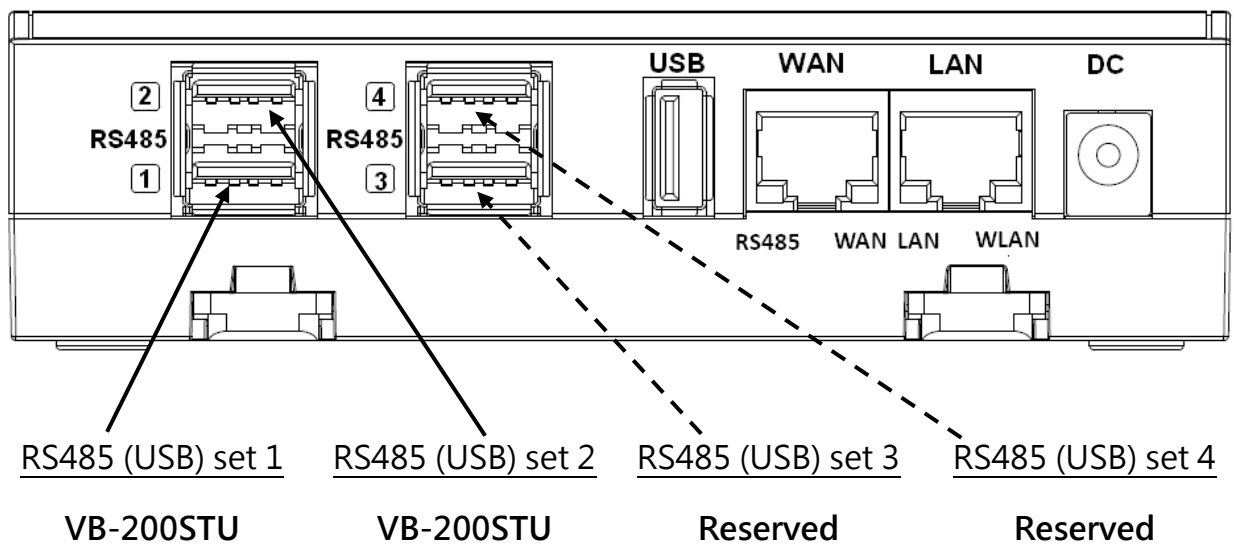
(2) VB-200STU

This portable vibration diagnosis instrument comes with 2 built-in vibration gauges VB-200STU; featuring integrated RS485 cable and USB connector the latter may direct connect to e-gateway AG-300 Plus2 as shown inthe figure below:

Magnetic vibration gauge   RS485(USB)

VB-200STU

Target E&M equipment (motor)

VB-200STU vibration gauge
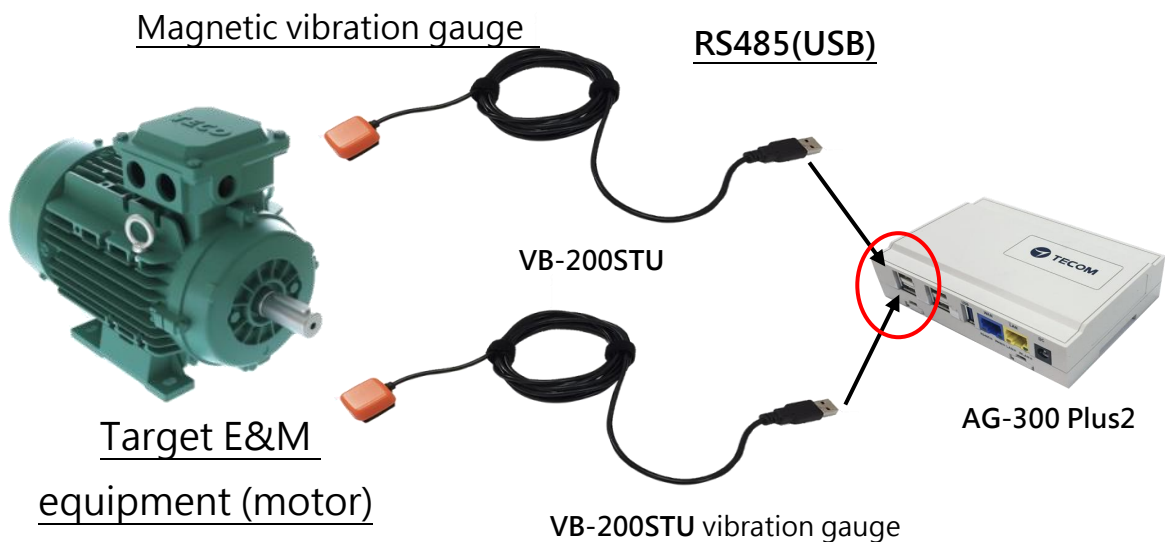
AG-300 Plus2

6. Power bank wiring

This portable vibration diagnosis instrument comes with power bank power cord, please connect DC Plug to DC jack of AG-300 Plus2 and USB connector to USB port in power bank as shown in figure below:

e-gateway AG-300 Plus2

DC power plug

Power bank

Power bank power cord   USB
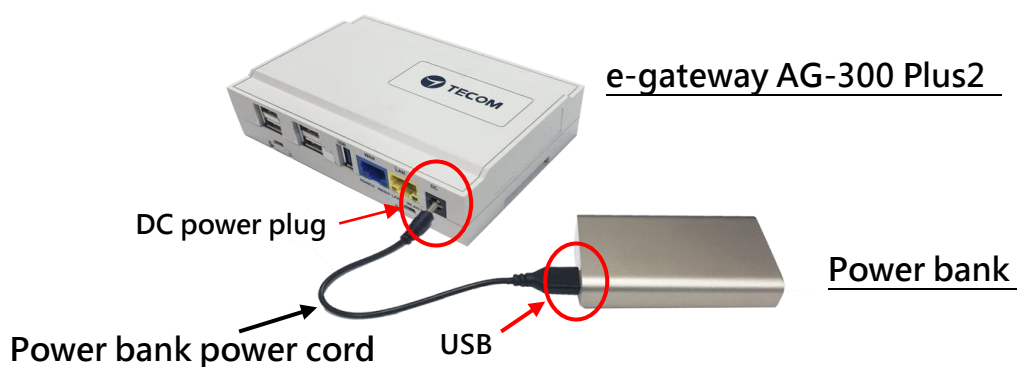
7. Equipment dimension

(1) AG-300 Plus2 dimension: 130mm (length) x 90mm (width) x 36 mm (height)

(2) VB-200STU dimension: 30.5mm (length) x 30.5mm (width) x 11.5mm (height), 3M cable

(3) Power bank dimension: 90.5mm (length) x 59mm (width) x 22mm (height)

(4) Power supply dimension: 70mm (length) x 29mm (width) x 40mm (height)

(5) Vibration diagnosis instrument dimension: 320mm (length) x 236mm (width) x 76mm (height)

8. Pro3200 portable vibration diagnosis instrument view

PRO-3200
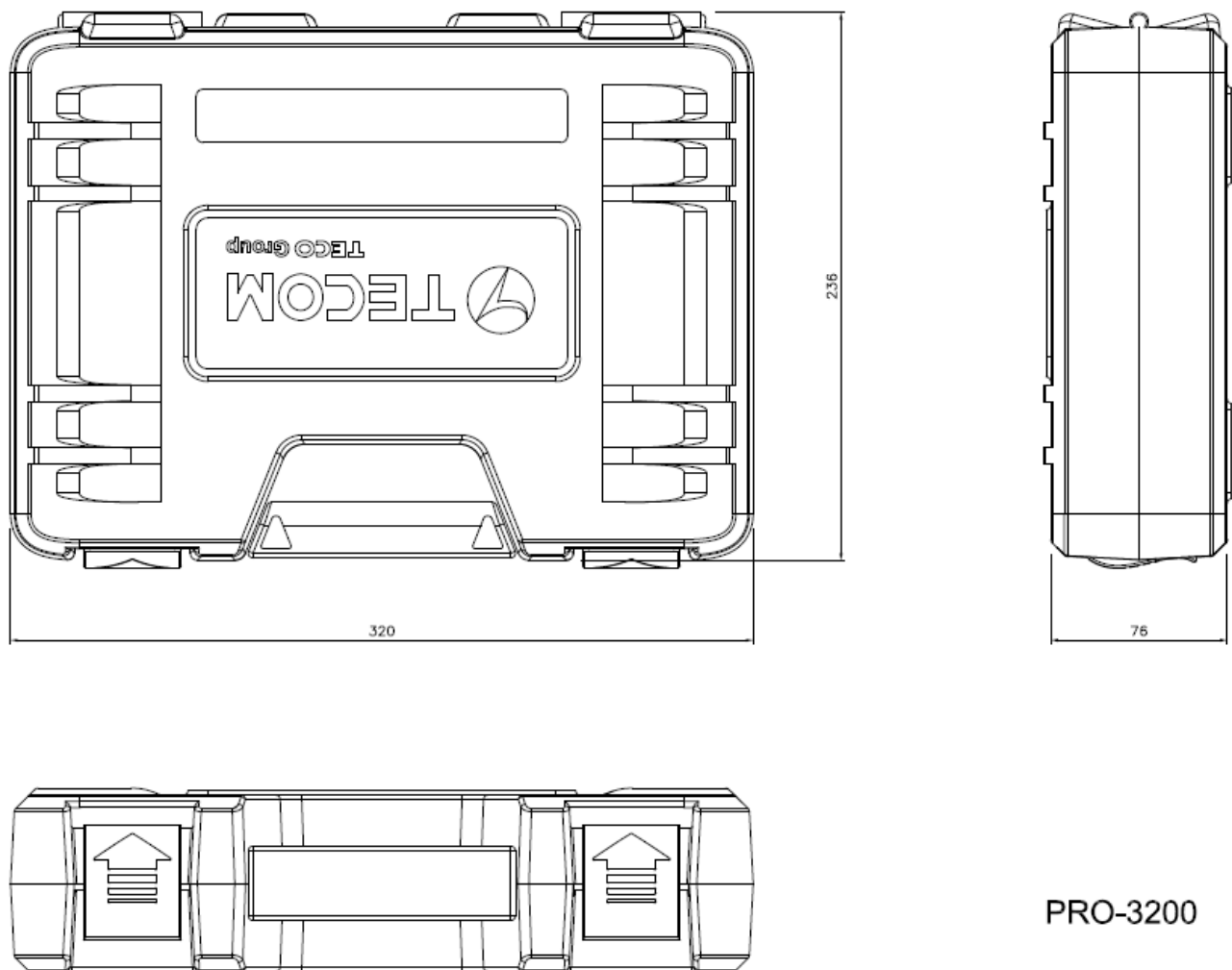
9. AG-300 Plus2 view
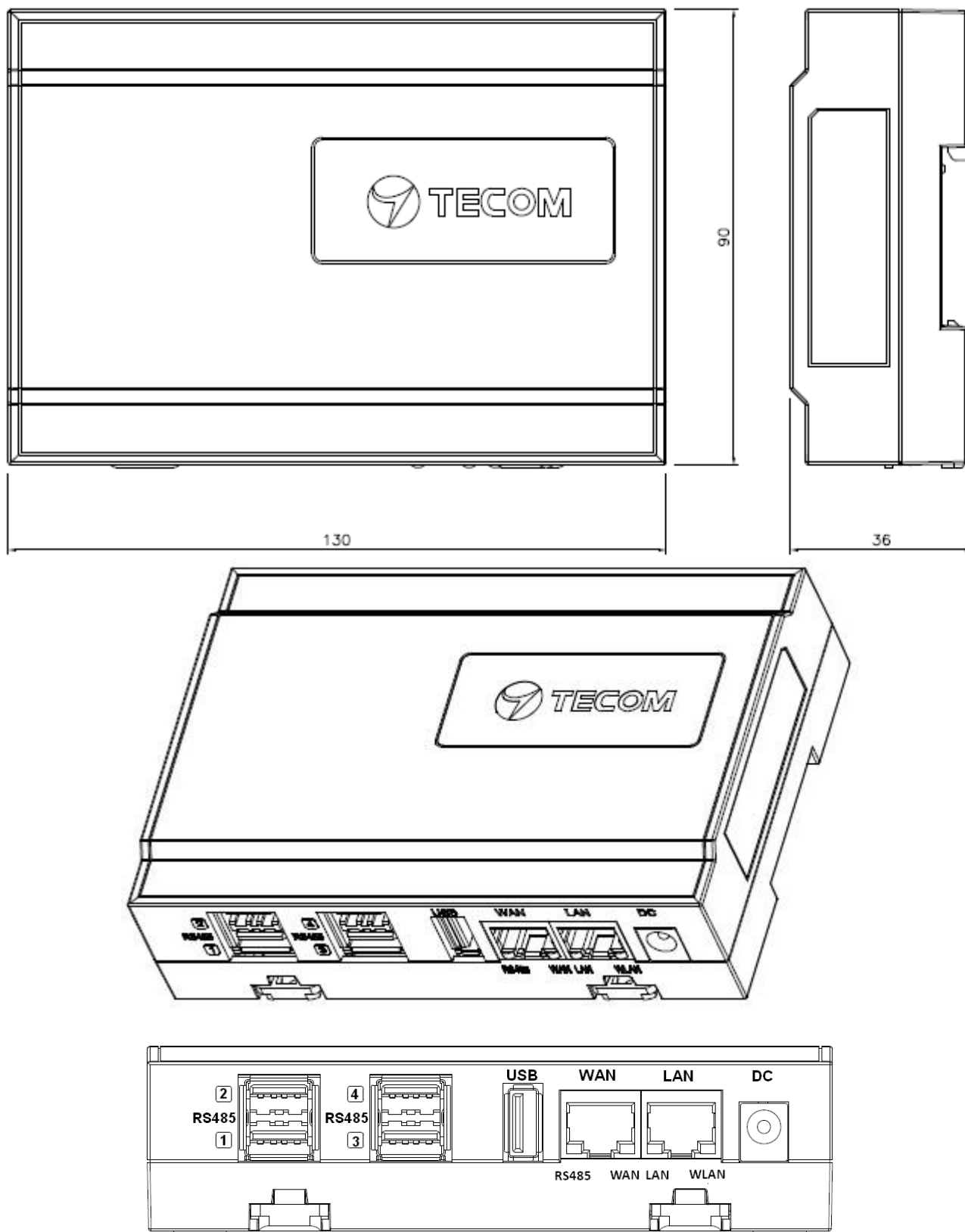
10. Power supply and cord of power bank view
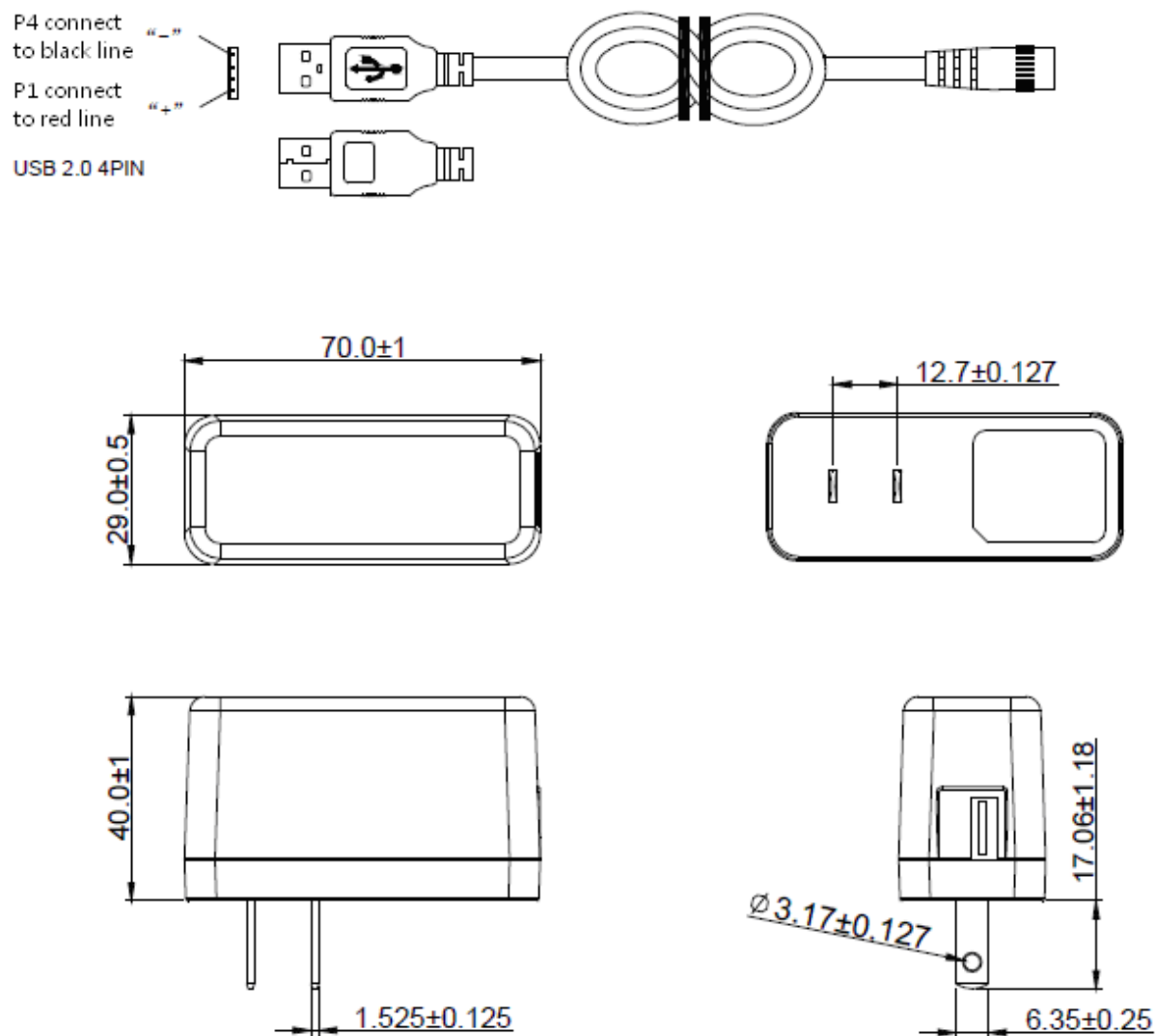
11. VB-200STU view
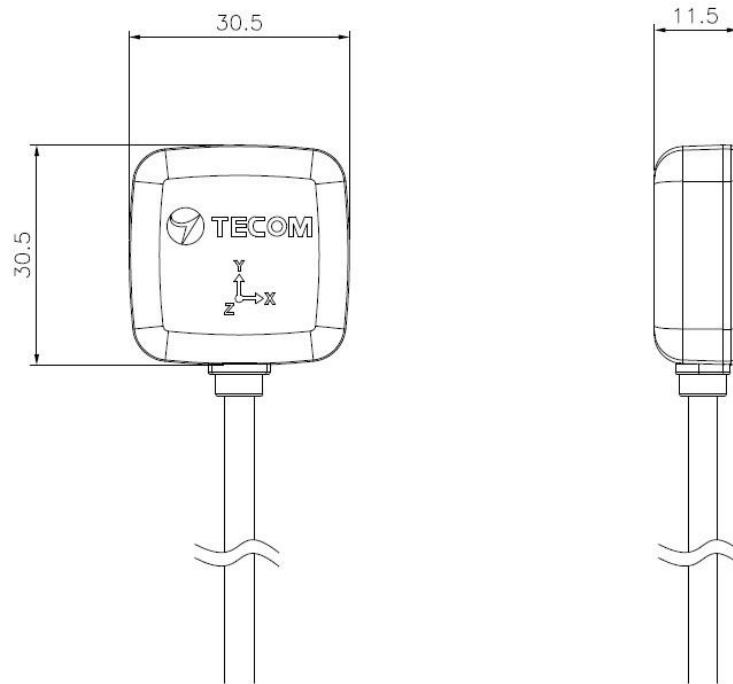
VB-200STU body with USB cable view:

12. Vibration gauge installation position (recommended)

Vibration measurement must observe the following rules according to ISO-10816 standard.

1. Close to the bearing

2. In direction either vertical or horizontal rather than 45-degrees or tilted direction

3. See diagram below for recommended installation position where the arrow symbol indicates direction and letter "x" the installation position.
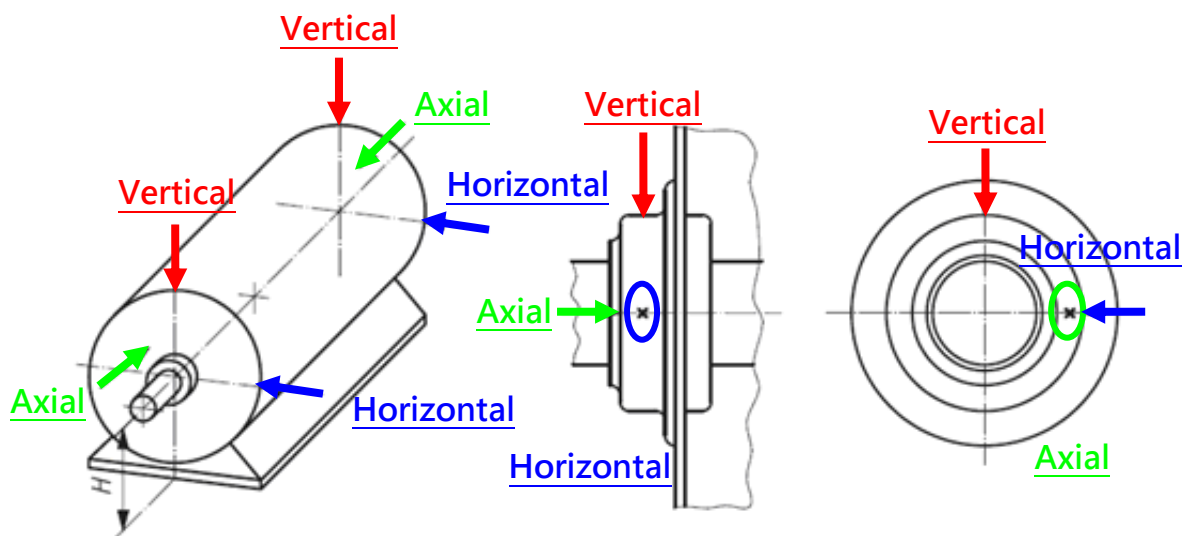
3 Axials X/Y/Z Position   3 Axials X/Y/Z Installation Location

Vibration gauge 3-axis direction

VB-200STU
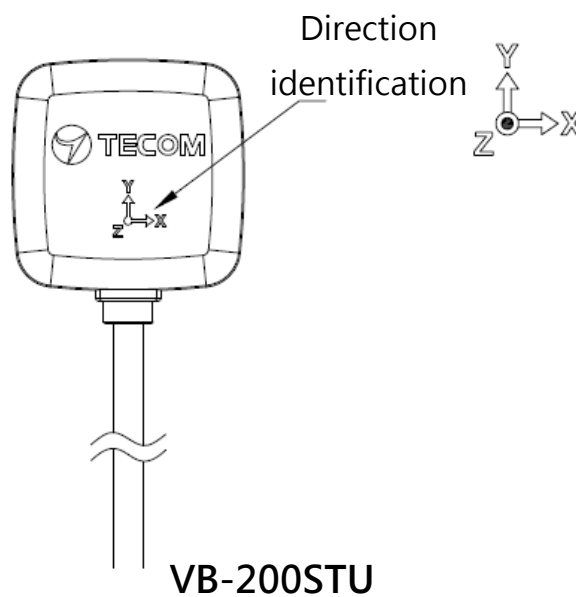
13. Installation Precautions

(1) The vibration gauge wire must be loosened. The wire close to the vibration gauge body can not be tightened. Therefore, pay attention when handling the wire, and leave some flexibility to allow the wire to move freely without affecting the vibration.

(2) After vibration gauge installation is completed, you can shake the vibration gauge by hand, the vibration gauge must be very solid, no shaking phenomenon, otherwise the vibration value will increase, but also increases the frequency of unpredictable. In practice, the vibrating gauge mounted with a magnet will be secured with quick-drying glue.

(3) The point of installation must be thick steel, such as a motor body. Do not install on fan covers or heat sink fins or thin iron plates because they are too thin and easy to resonate, vibration values increase, and produce unexpected frequencies.

(4) Generally, the vibration value will be less than 10 mm / s. If the vibration of the motor itself is not large and the vibration value is large, please re-check if the installation point and the vibration gauge are installed securely.

(5) This vibration frequency response frequency range is 1-1130Hz.

14. Installation Reference

14-1 Vertical

When the vibration gauge is installed in the vertical direction, it should be placed just above the rotating shaft. At this time, the Z-axis of the vibration gauge is the vertical direction. Please note that the two legs of the magnet are parallel to the rotating shaft so that they can be fixed on the arc surface of the motor on.
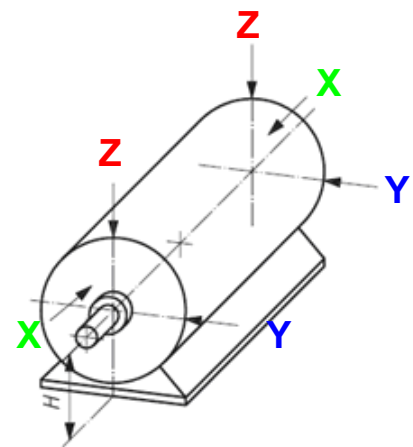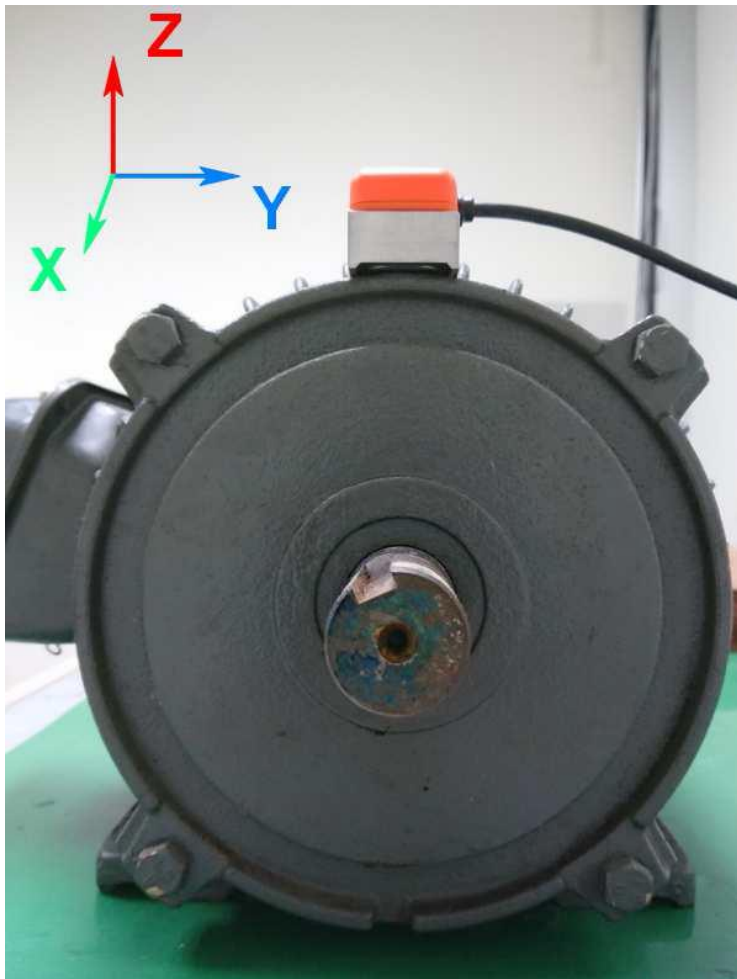

When using the vertical installation position, the figure represents the measured correct X, Y, Z vibration axis.
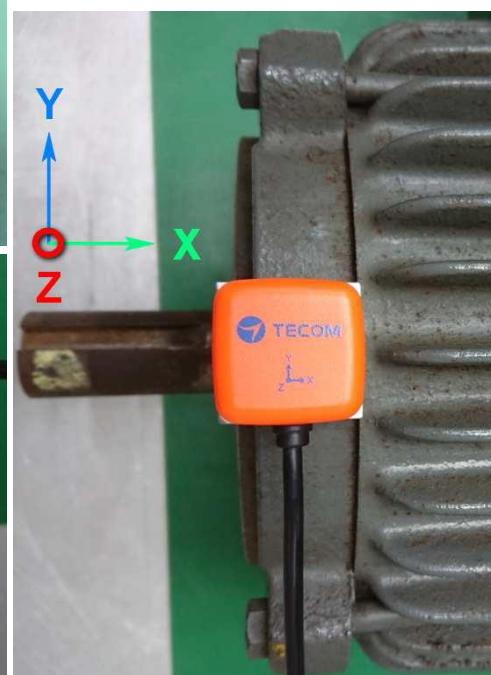
14-2 Horizontal

When the vibration gauge is installed in the horizontal direction, it should be placed on the level of the rotation axis, does not put too high, so as not to increase the vibration value. Put the higher position, the greater the value of the horizontal vibration. At this time, the Z axis of the vibration gauge is the horizontal direction. If you measure only one point, it is recommended to use this point. Vibration measurement of the vertical direction, to be placed on top of the rotating shaft, then the vibration of the Z-axis is the vertical direction, please note that the two legs of the magnet parallel to the axis of rotation, it can be fixed in the motor arc on.
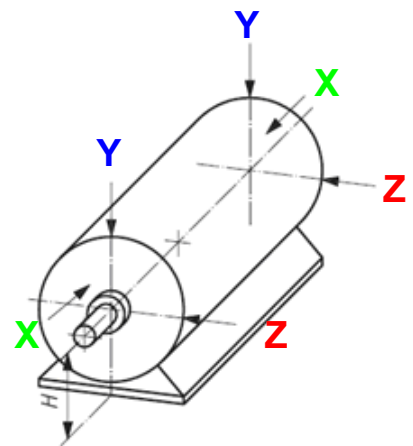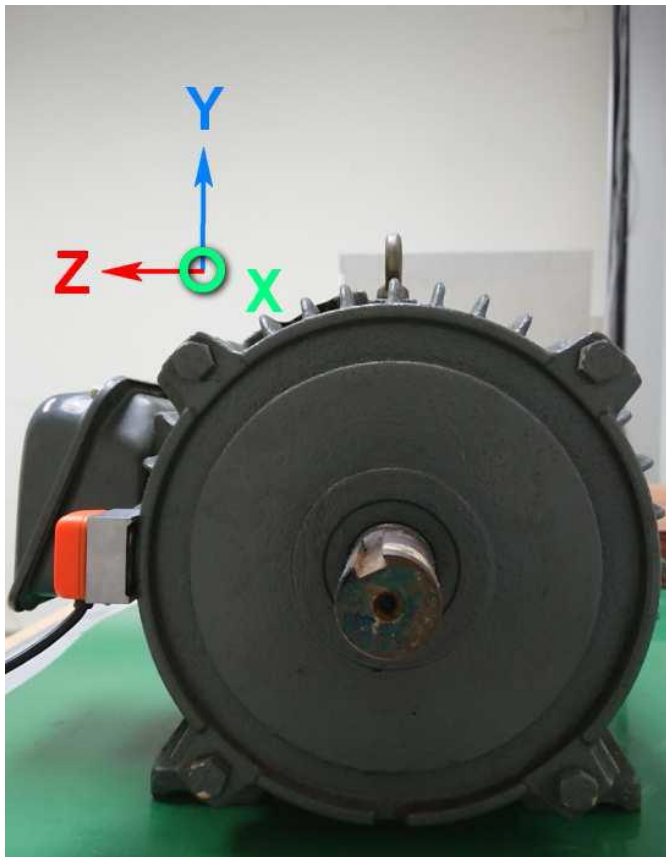
When using a horizontal mounting position, the figure represents the correct measured axial direction of vibration.
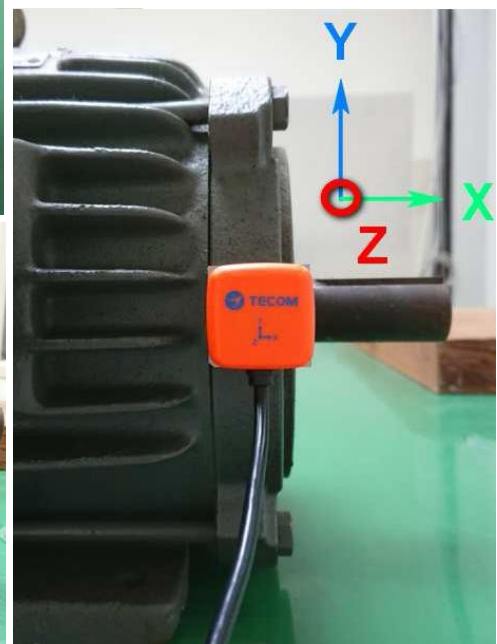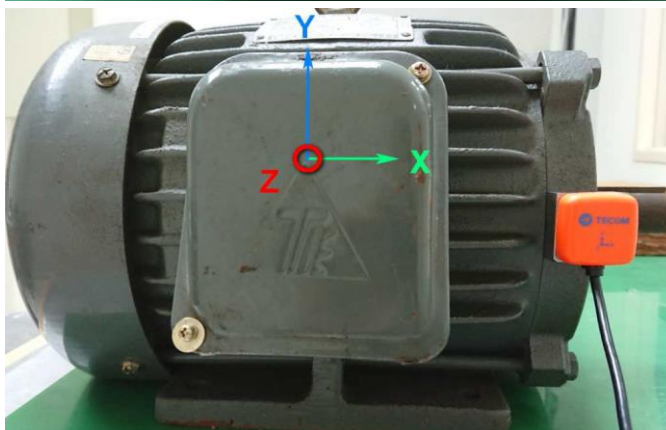
14-3 Axial

When the vibration gauge measurement value is the axial direction, it must be placed on the level of the rotation axis, do not put too high, so as not to increase the vibration value. Put the higher position, the greater the value of the horizontal vibration. At this time, the Z axis of the vibration gauge is the horizontal direction. If you measure only one point, it is recommended to use this point. Vibration measurement of the vertical direction, to be placed on top of the rotating shaft, then the vibration of the Z-axis is the vertical direction, please note that the two legs of the magnet parallel to the axis of rotation, it can be fixed in the motor arc on.
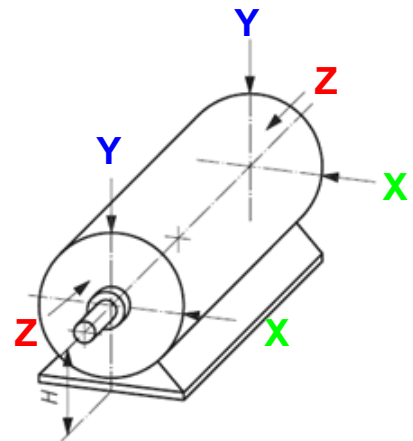
When using the axial installation position, the figure represents the measured correct vibration axis.
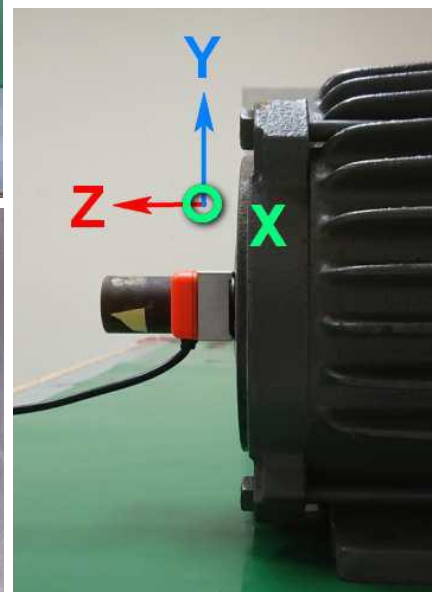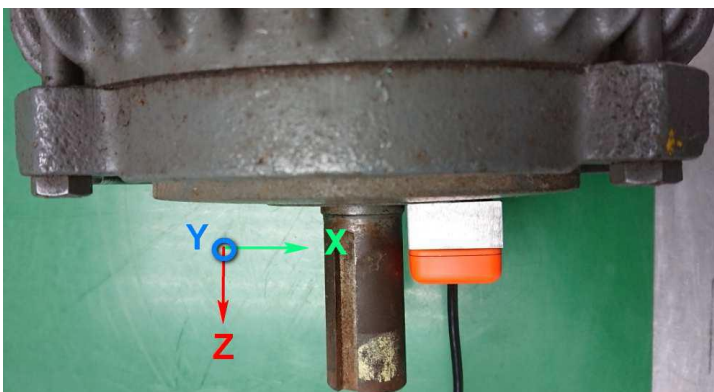
Equipment setup

1. Network setup

Step 1

- Keep your PC / NB and e-gateway AG-300 Plus2 in the same LAN segment
  (better have DHCP enabled on your PC / NB)
- Connect PC/NB and AG-300 Plus2 (LAN port) with Ethernet cable
- Connect power adaptor to AG-300 Plus2
- Open a browser on the connection, input AG-300 Plus2 setup page address
  http://192.168.168.10
- Input user name: **admin**
- Input password: **IP585xAdmin**
- Click **OK**

Step 2

(Skip this step for DHCP PnP network)

- In main menu on the left, click [**Settings**] →[**WAN**].

- **In WAN connection type dropdown menu, select** [**STATIC (Fixed IP)**]
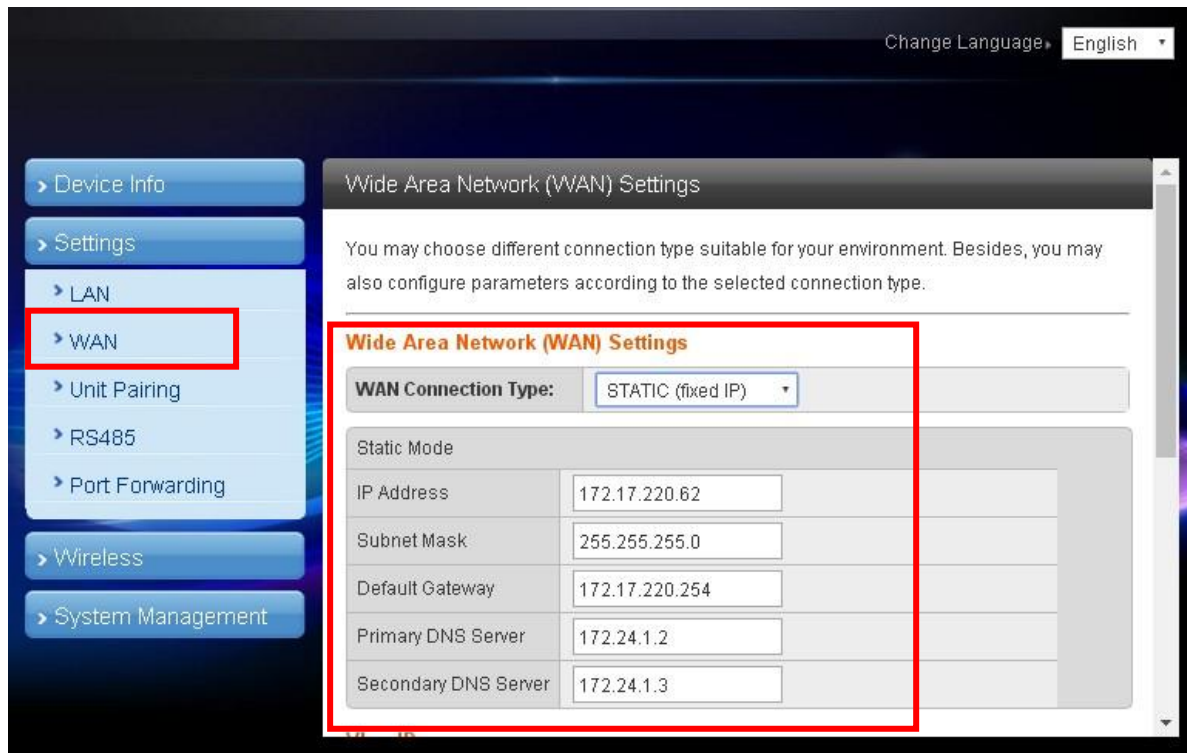
- **IP address:** input IP data.

- **Subnet mask:** input subnet mask data.

- **Default gateway:** input default gateway data.

- **Primary DNS server:** input main DNS server data.

- **Secondary DNS server**input secondary DNS server.

- Click the [**Apply**] button at bottom of page once all settings were made successfully.

Try connecting to popular web sites (e.g., edition.cnn.com and www.yahoo.com.tw **to validate external networking function**

Set smartphone APP communication port to TCP 53100 ~53199 in case firewall management service is in existence.

2. Account setup

Step 1

In the Main Manu section on the left, click ［**Settings**］→［**Unit pairing**］ then select the ［**Add**］ button.

Step 2

Check the ［**Select**］ column before selecting the ［**Edit**］ button
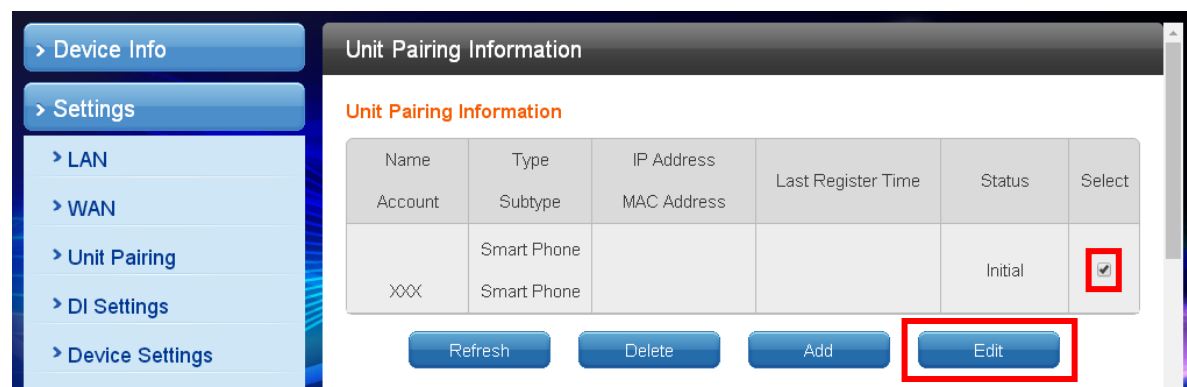
- **Name** : input user name.

- **Account** : e.g. 103 (you can have 20 account with number in range of 100-119).

- **Password**: input password (better the same as account ID).

- Click〔**Save**〕 button at bottom of page to keep settings you have made.

- Click〔**Start pairing**〕 button.

- To edit user account: check the [Select] column; click the [Edit] button, and the existing settings of the account displays for you to change.

- To delete user account: when the user was disconnected check the [Select] column, click the [Delete] button to remove the account.

3. VB200 setup

This portable vibration diagnosis instrument supports up to 2 magnetic VB-200STU for concurrent measurement, analysis, and diagnosis; see section "RS485 wiring" for its installation.

The VB-200 series vibration gauge comes with default value of RS485 ID at 15; one RS485 cable may connect one VB-200 series vibration gauge only; factory default of this portable vibration diagnosis instrument may connect two VB-200 series vibration gauge; please connect the latter to the 1st and 2nd RS485 port of AG-300 Plus2; the 3rd and 4th RS485 ports are reserved for expansion in the future; to connect 3 or more VB-200 series vibration gauge you need to add RS485 device in the management page first.

Connect only one VB-200 series vibration gauge in a RS485 port, otherwise the system may fail to identify individual gauge as each of them bears the same RS485 ID value of 15; please make sure only one VB-200 series vibration gauge is connected to one RS485 port to prevent setup confusion.

Please follow steps below to add the 3rd VB-200 series vibration gauge:
- In main menu on the left, click **[Settings]** →**[RS485]**.
- The VB200 page displays and clicks **[Add] option in it.**
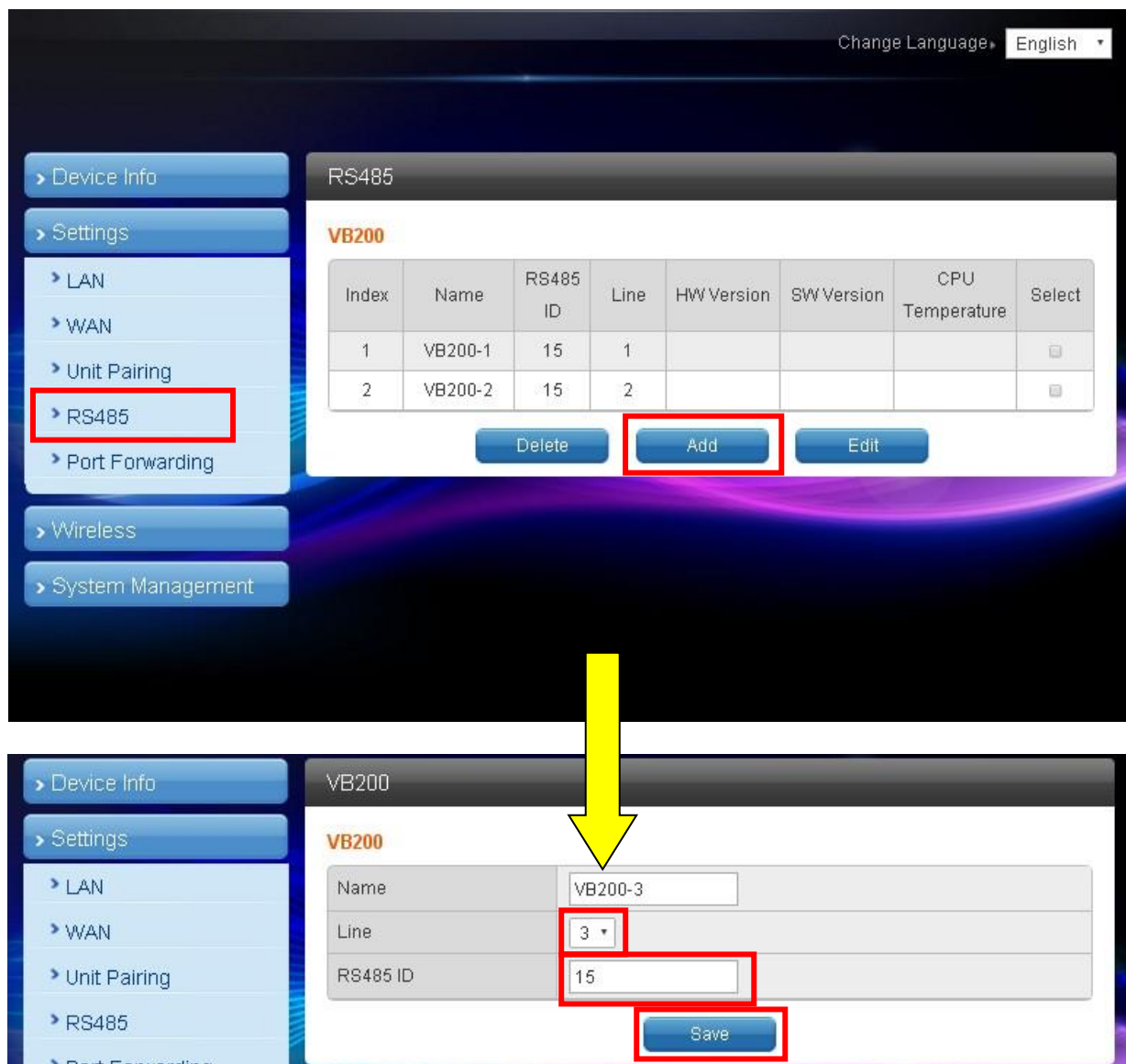
- **Name**: "VB-200" or any name you like.

- Line: select line 3 ~ 4 (line 1~2 added by factory default).

- RS485 ID: please fill in a value compliant with your RS485 configuration (this system support RS485 ID in range of 0-15).

- Click [**Save**] button at bottom of page.
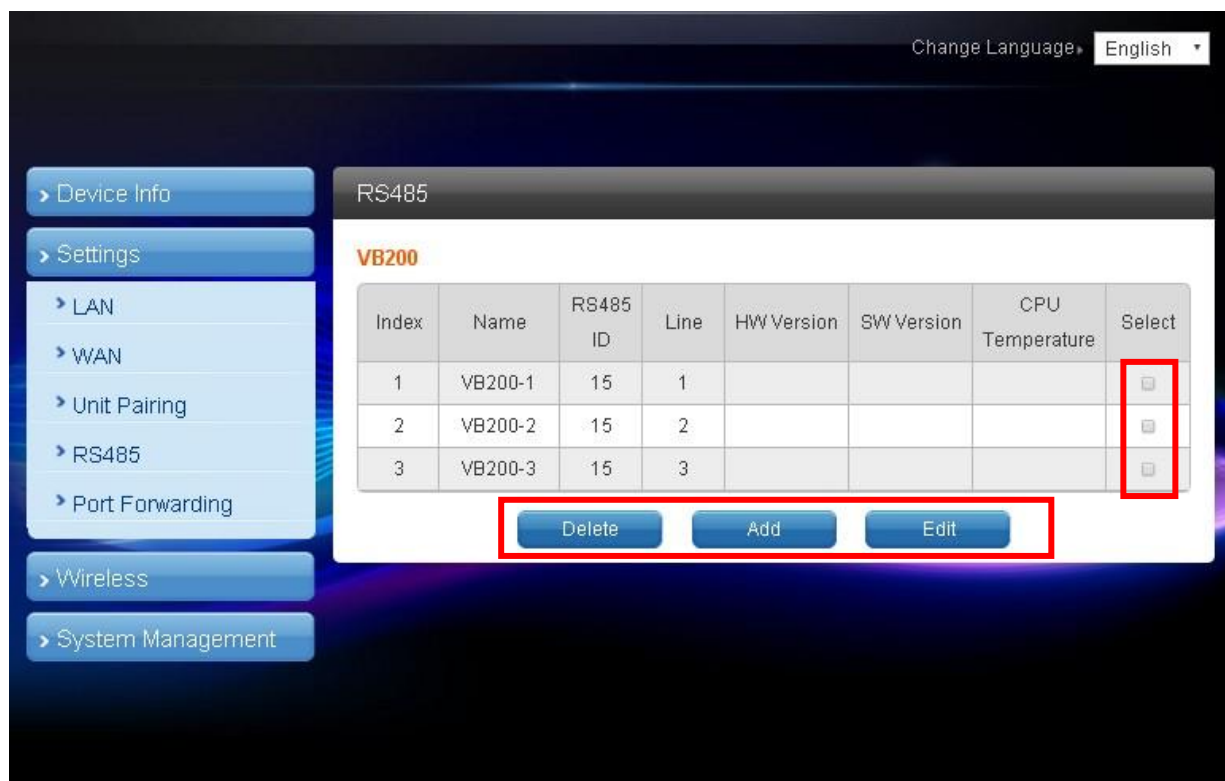
- To edit the settings of VB-200: check the [Select] column, click the [Edit] button, and the existing settings display for you to change.

- To delete settings of VB-200: check the [Select] column; click the [Delete] button to remove the VB-200 vibration gauge.

- To add VB-200 vibration gauge: click the [Add] button to add new VB-200 setup.

4. Wireless setup

Designed for e-gateway AG-300 Plus2 hardware, the "wireless setup" page contains options of WiFi mode, "Basic", "Advanced", "Security", and "Station list".

You may set WiFi mode into "Wireless AP mode" and "Wireless client mode".
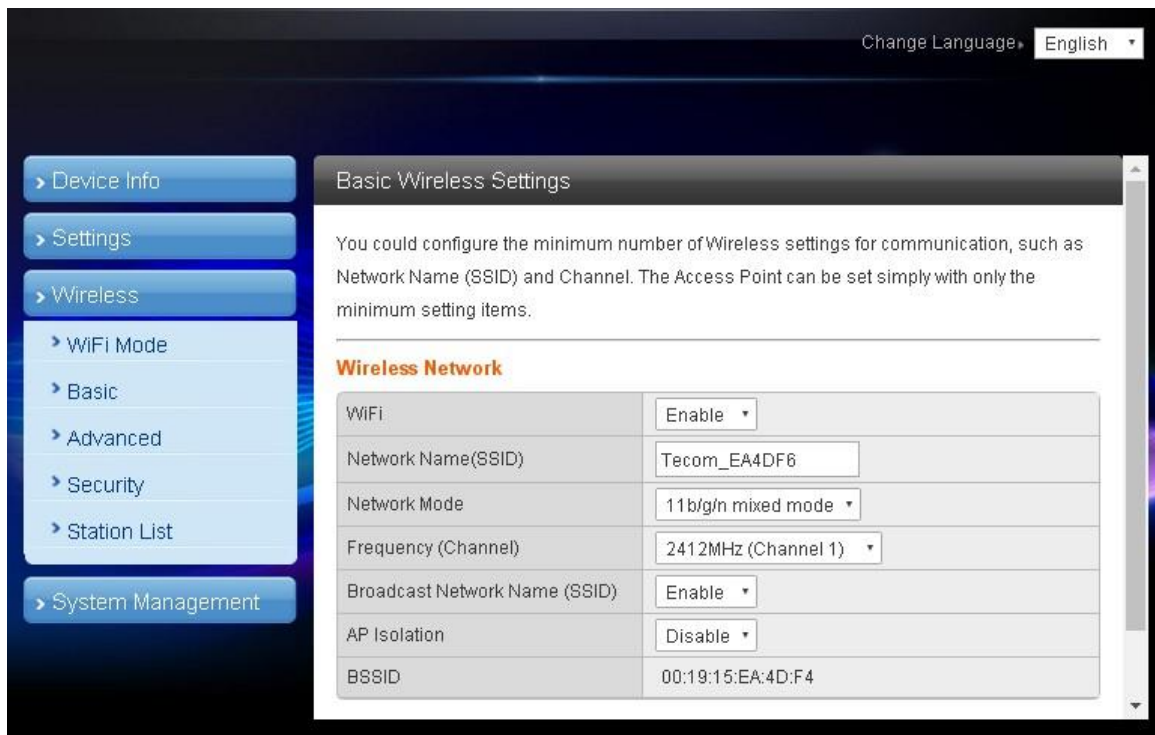
The wireless AP mode is an AP with gateway serving as WiFi access point.

The wireless client mode set the gateway as a client to connect to other WiFi AP.

4.1 The wireless AP mode configuration (WiFi mode setup)

4.1.1 Basic wireless settings
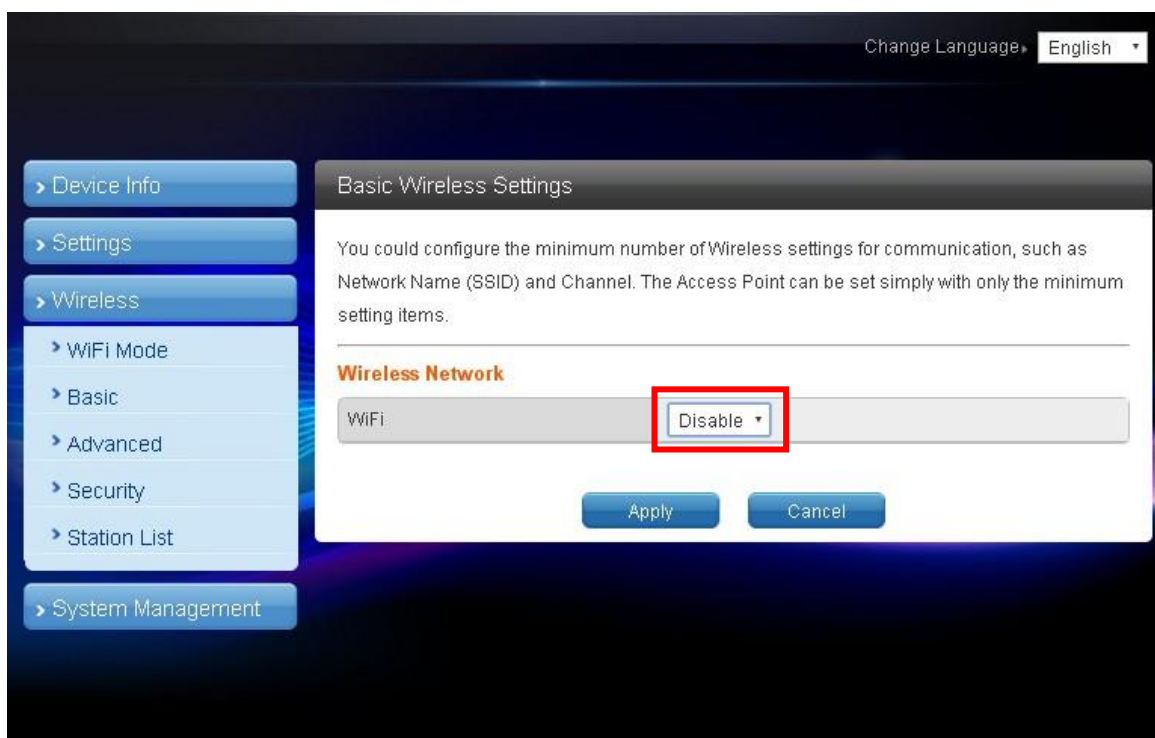
This option enables user to set up basic wireless communication parameters including network name and mode with WiFi function default to Enable. WiFi [Enable] page: see figure below:

WiFi [Disable] page: see figure below:

4.1.2 Advanced wireless settings

This option is aimed at setting up country/region and support channel with page as shown in figure below:
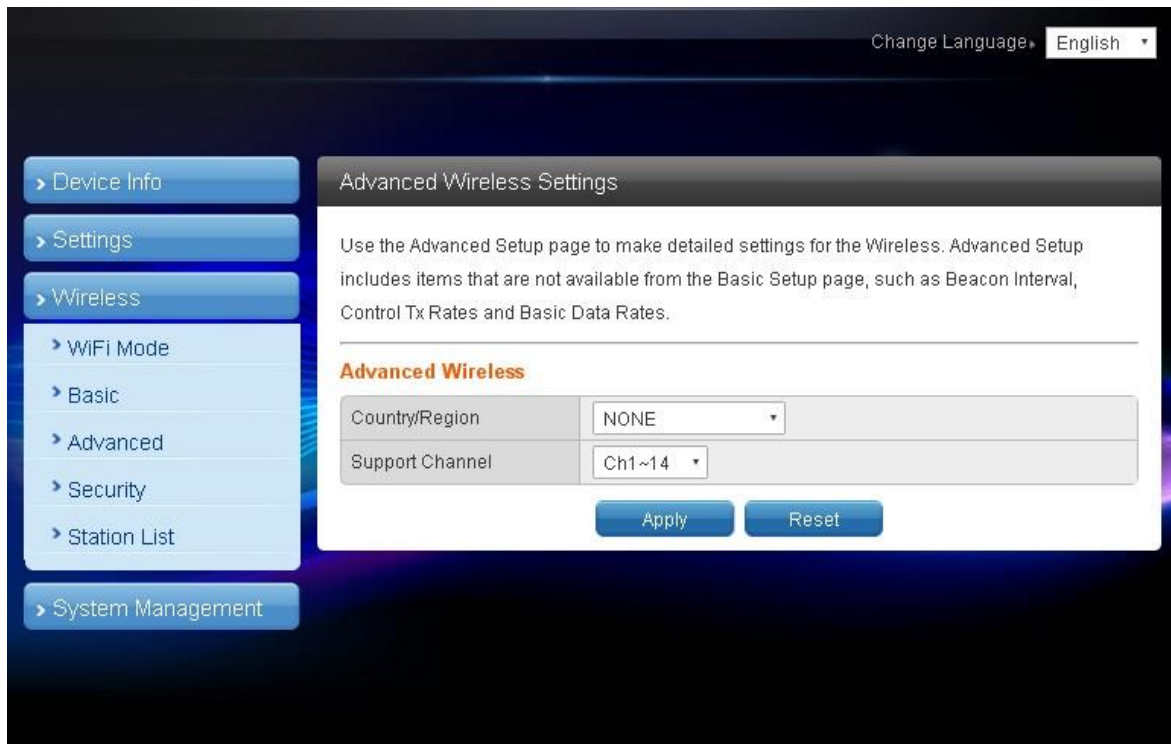
4.1.3 Wireless security/encryption settings

This option is aimed at setting up wireless security and encryption to prevent equipment access and monitoring without certification; available security modes are WPASKWPA2PSK and Disable with factory default set to the latter. See figure below for page of this option:
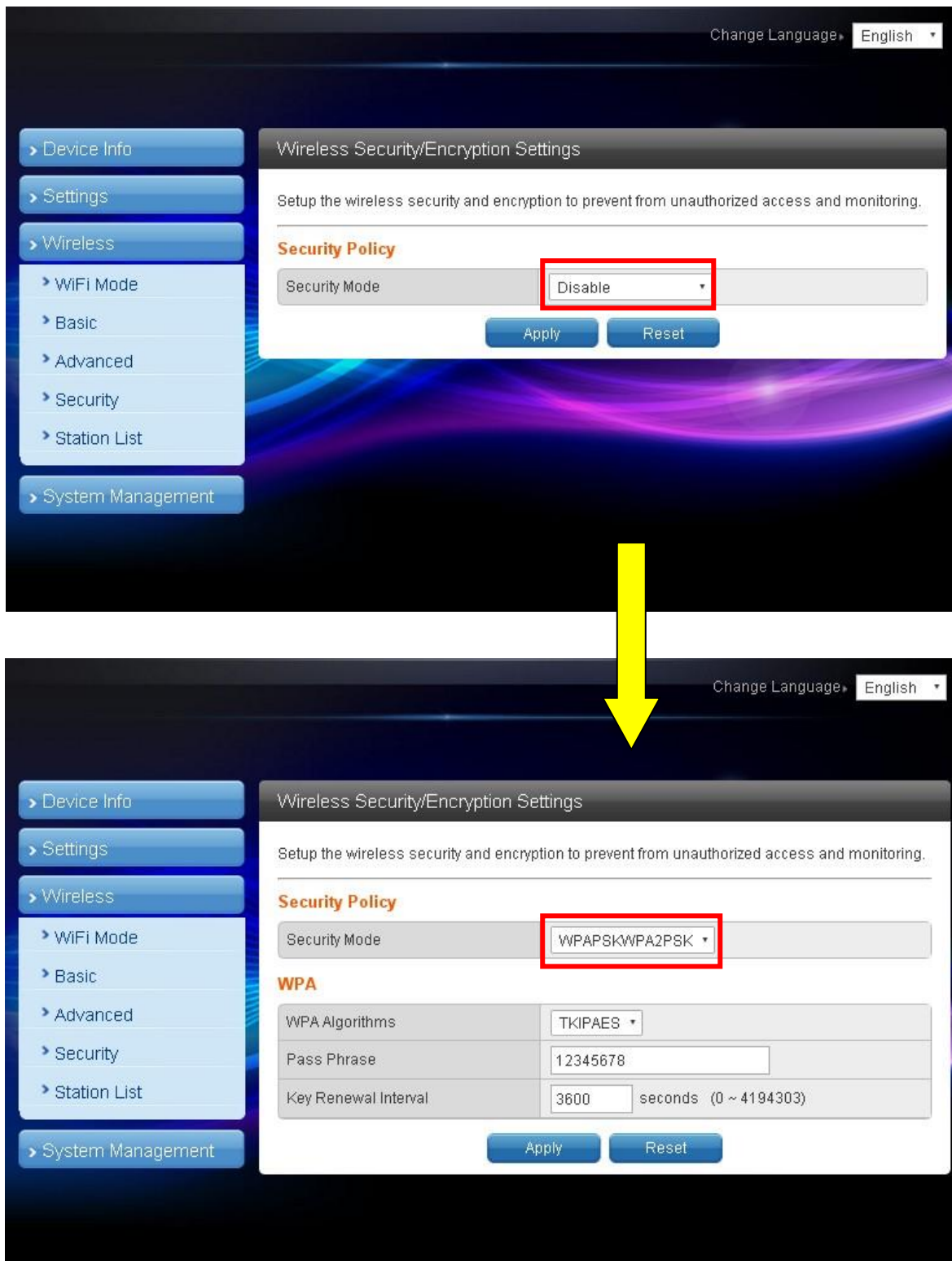
Set up WPA algorithm, pass phrase, and key renewal interval; once set up and saved successfully users are required to input pass phrase set up here to connect to WiFi.
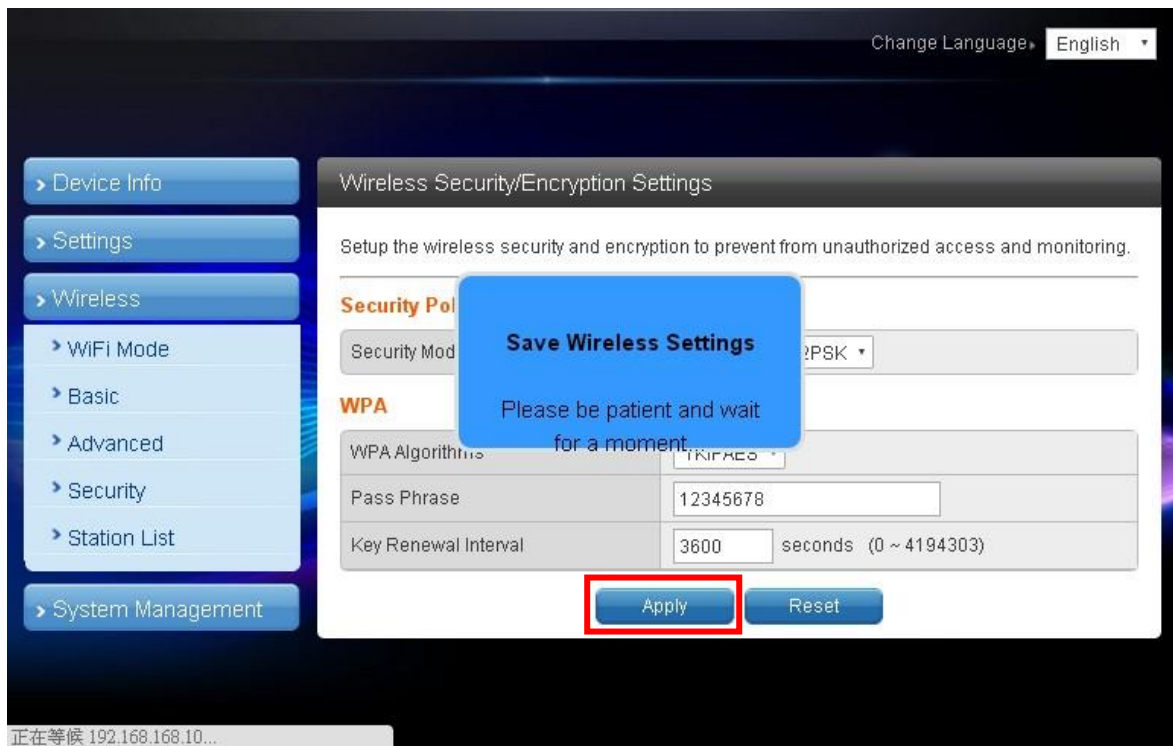
The client end is required to log in WiFi router of e-gateway AG-300 Plus2 with his/her smartphone:
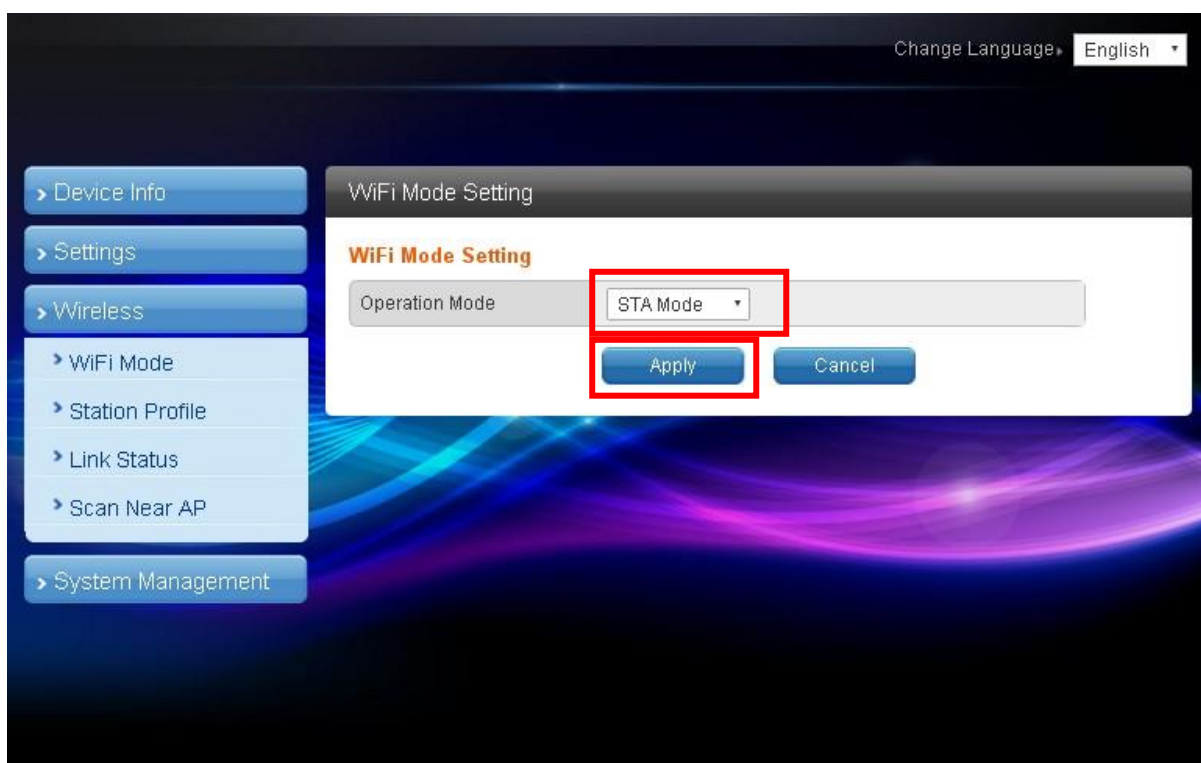
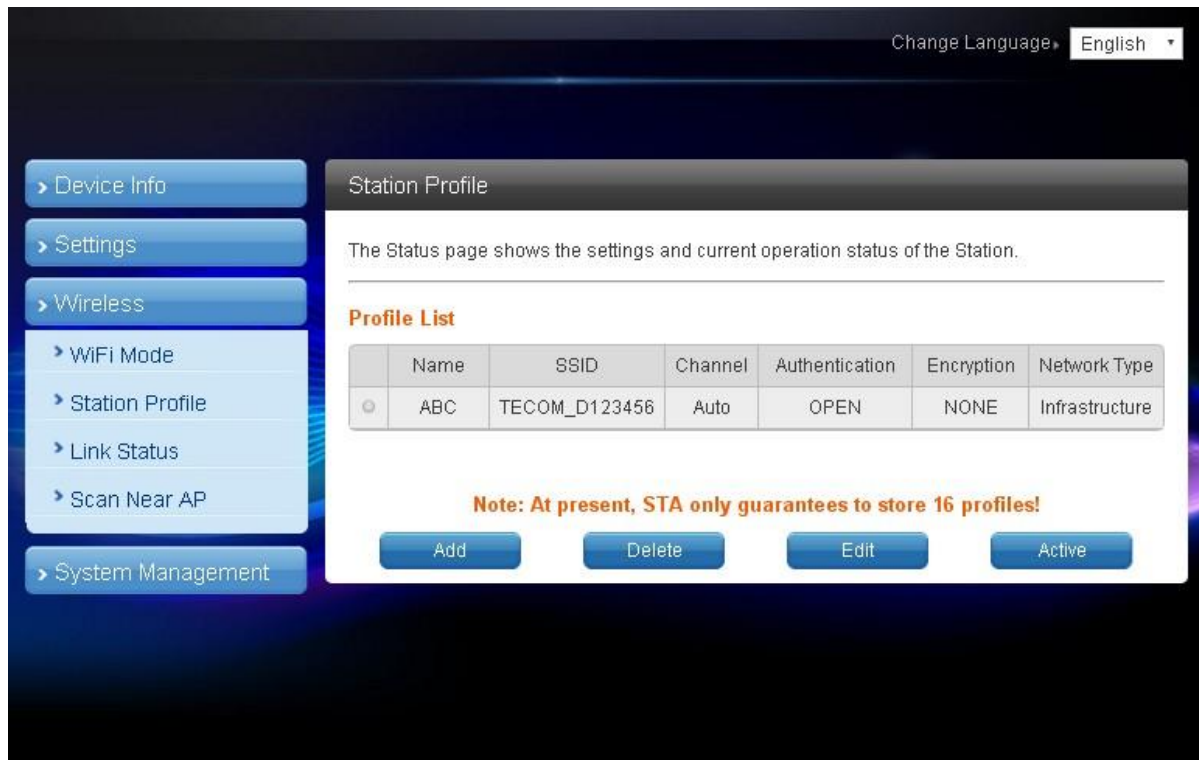### 4.1.4 Station list

Users of this solution may monitor clients connected to AP.
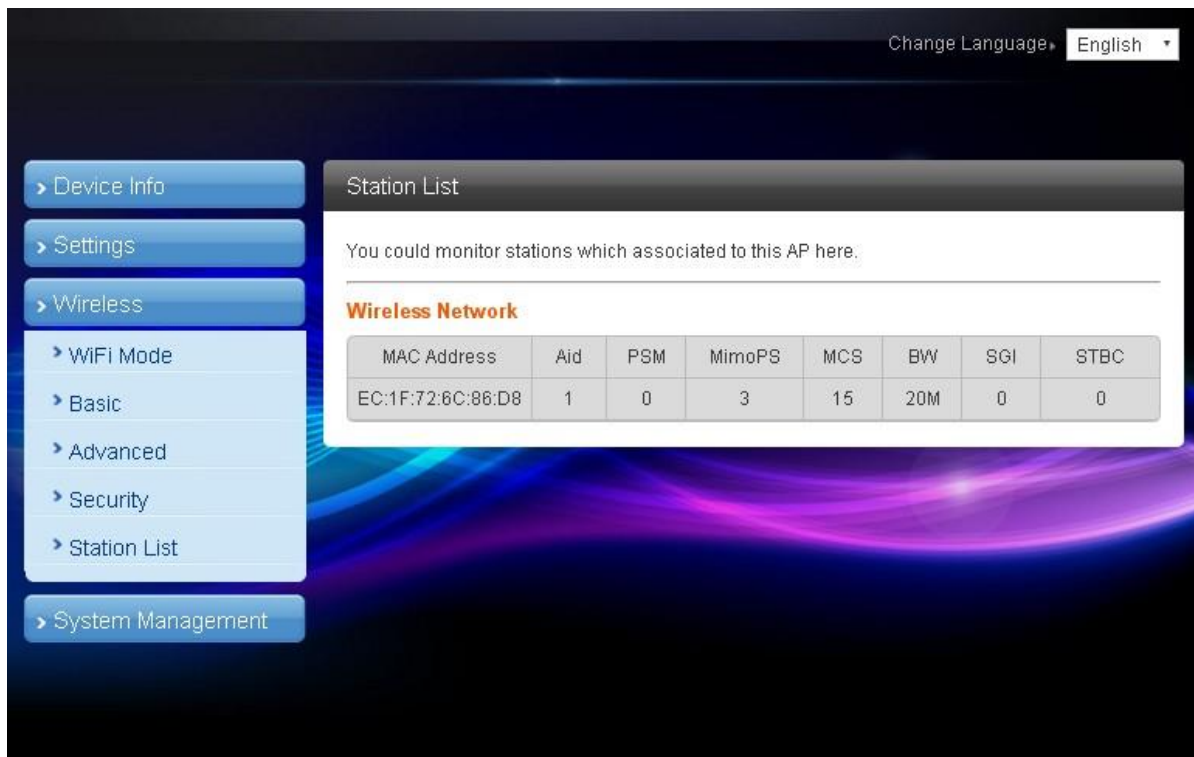
4.2 WiFi mode setting

Select STA mode and click [Apply] in the WiFi mode setting.

4.2.1 Station profile

Having a gateway as an ordinary client, this page displays information of APs saved in the gateway; you may add, delete, and edit information of desired AP; select an AP and click "Open", the gateway will then auto connect to the AP; even after gateway restart connection to pre-set AP will be established automatically.

Click the "Add" or "Edit" button and the AP data edit page displays.

4.2.2 Edit station profile

In most cases, users may change parameters of "Name", "SSID", "BSSID" and "Security policy" and leave default value of the others intact in the station profile edit page.

"Name": name of the profile

"SSID": name of AP

"BSSID": MAC address of AP

"Security policy": encryption mechanism of given AP
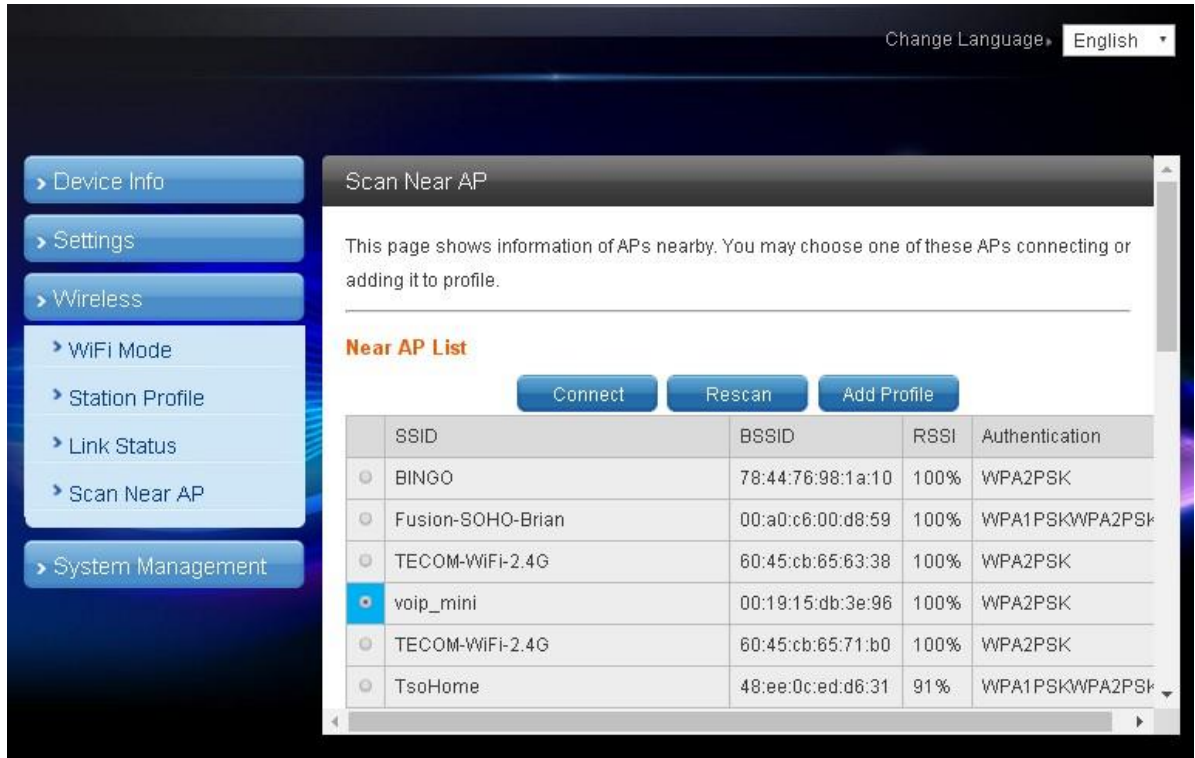
4.2.3 Station link status

Link information after gateway connected to AP is shown here.

4.2.4 Scan near AP

Scan gateway neighboring APs for information

Click "Connect" to connect the AP; data of the latter are not saved (data lost after gateway restarted).

Click "Rescan to scan" neighboring APs once again. Scanning may fail to identify all APs when there are many available nearby; rescan couple of times may be needed in case like this.

Click the "Add profile" button to save AP data in station profile file.

5. Hardware setup

AG-300 Plus2 pins definition diagram
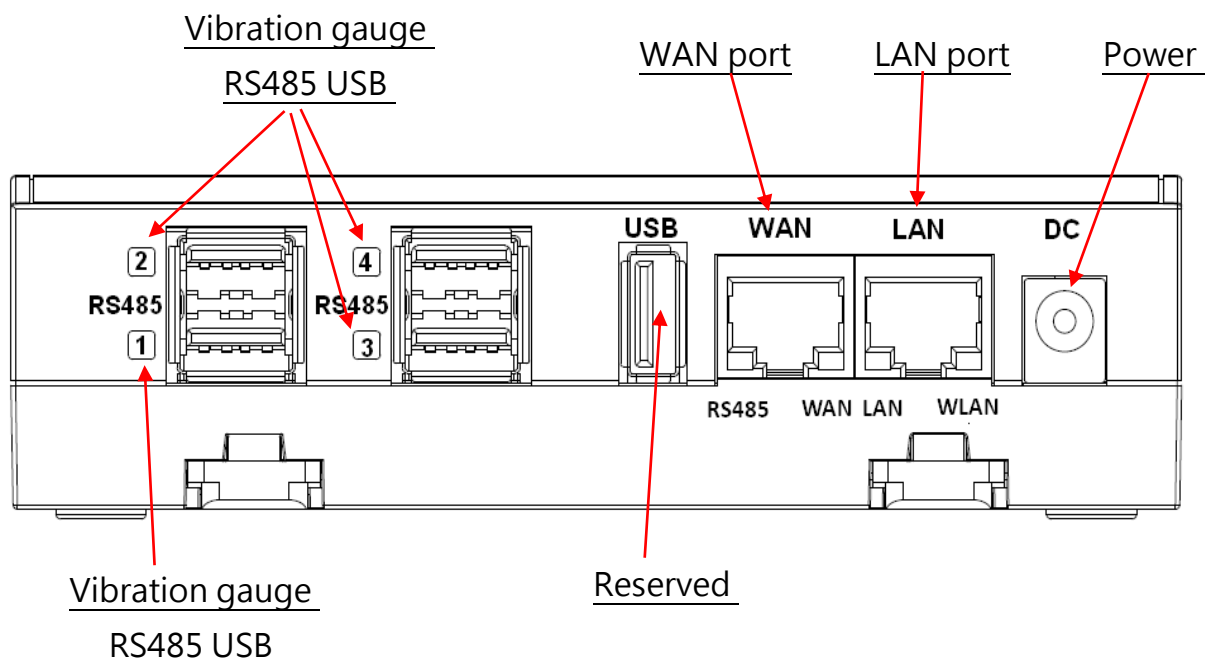
APP software operation

By following steps set in homepage of **[Pro-3200 installation and measurement quick guide 1-2-3]** users of this vibration diagnosis instrument may auto connect to it for instant operation data query and vibration diagnosis analysis and report without account setup and login. Follow steps below to set up your vibration diagnosis instrument for user account and server IP address.

1. Open the [Vibration Diagnosis] APP on your smartphone

2. This vibration diagnosis instrument provides PnP quick online diagnosis; log in account 100~119 without other parameter settings as shown in figure below:
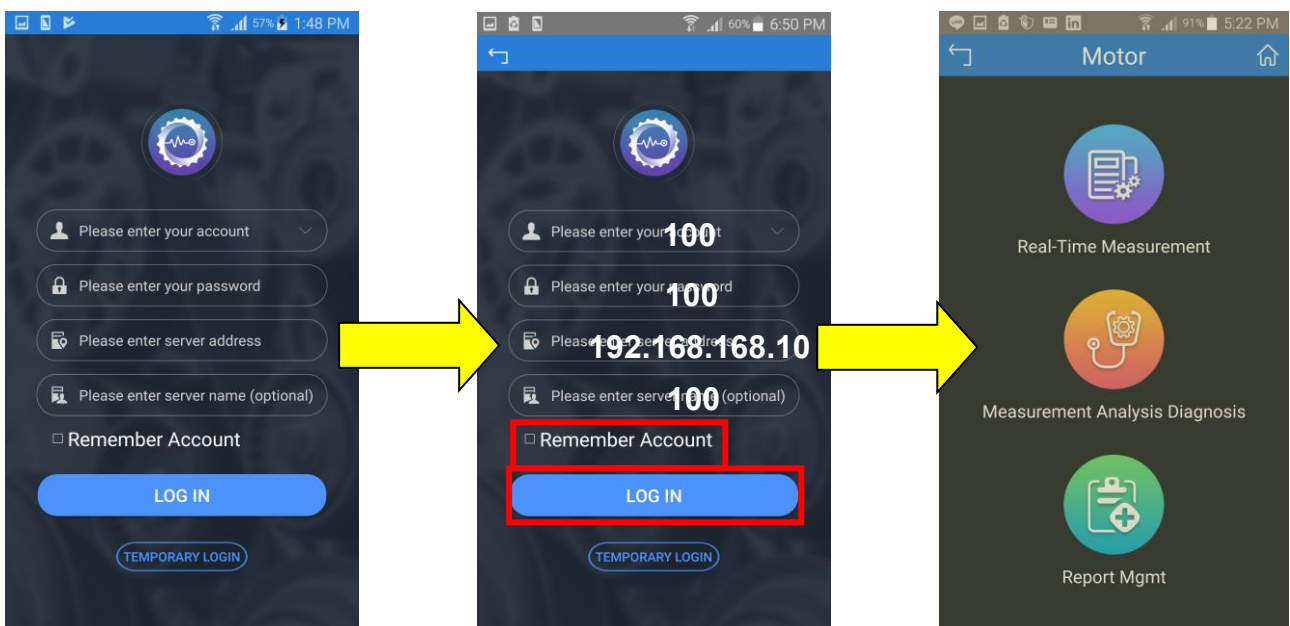
3. Input <u>Account: 100</u>, <u>Password: 100</u>, <u>Address: 192.168.168.10</u>, <u>Name: 100</u> or custom values defined earlier; initial values of account, password, and name are set to be the same; the system comes with 20 accounts (100~119) for equipment pairing use.

   - **Account:** 100 (there are 20 accounts available with ID in range of 100-119).

   - **Password:** your personal password (better the same as account ID).

   - **Server IP:** the IP address or server ID set by AG-300 Plus2.

   - **Server name:** name of AG-300 Plus2 server.

4. Check [**Remember account**], press [**Log in**], and the vibration diagnosis instrument page displays.

5. Depending on the type of equipment under test, select「MOTOR」or「OTHERS」.

6. Please follow APP wizard to execute the following vibration diagnosis operation:

    (1) **Vibration measures:** select this option to monitor vibration readings of target E&M equipment; note that this is a pure monitoring function and without data saving.

    (2) **Diagnosis:** Select this option for vibration measurement, analysis, and diagnosis with steps: [Input equipment data] →[Vibration measurement] →[Analysis diagnosis]; please follow APP wizard to get complete vibration analysis and diagnosis report.

    (3) **Report management:** Access and manage reports provided by the system; distribute them to relevant personnel by email or communication software anywhere anytime.

7. If you have checked the [**Remember Account**] option, you may click the "**V**" icon on the right of account direct and fast login as shown in figure below:

Quick login step 1-2-3
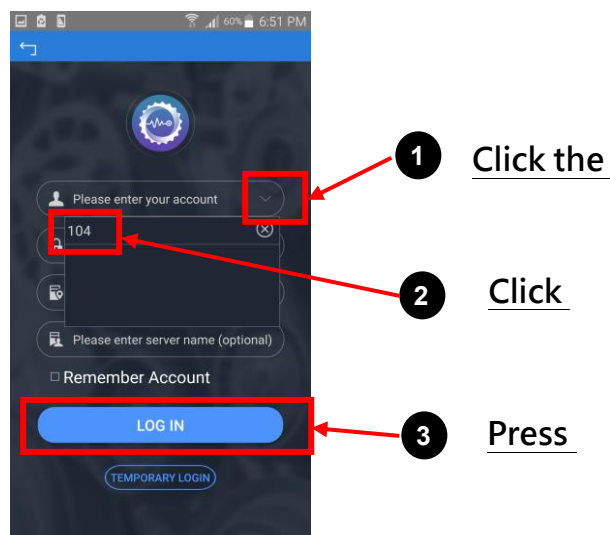
8. Please check steps below if you failed to login:

    (1) Is networking function of your smartphone enabled?
    (2) Is network signal of smartphone in good conditions?
    (3) Is AG-300 Plus2 powered on?
    (4) AG-300 Plus2 **equipment pairing** set up?

(5) Is AG-300 Plus2 networking function in normal conditions?

(6) Is smartphone and AG-300 Plus2 WiFi [connected]?

Note: you may get Host ID on the AG-300 setup page once it is connected to external network.

In the main menu on the left, click [**Device Info**] → [**Status Overview**] option, to get **Host ID** in the System Info window.

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This manual may be modified when necessary because of improvement of the product, modification, or change in specifications. This manual is subject to change without notice.