RION CO., LTD.

Vibration Analysis Program

SX-A1VA

Instruction Manual

Manuals Provided with This Product

The following manuals are provided with this product.

SX-A1VA Instruction Manual (This Manual)
Describes how to operate and configure the Vibration Analysis Program "SX-A1VA"

Instruction Manual Application
The HTML help that describes settings for the SX-A1VA.

Overview of This Manual

This manual mainly describes the functions and operations of the SX-A1VA. When the measuring system is used with another device, be sure to read the manual of the device for the operation.

This manual consists of the following chapters:

SX-A1VA Overview
Describes the overview of this program.

Basic Operation
Describes the basic operation of this program.

Starting/Exiting the SX-A1VA
Describes how to start and exit this program.

- **Vibration Meter Mode**

Screen Layout (VM Mode)
Describes the layout of the screen displayed.

Measurement (VM Mode (Standard))
Describes the measurement-related operations in vibration meter mode such as how to start and stop measurement.

Evaluation
Describes the method of Evaluation.

Operating the Project (VM Mode)
Describes the project-related operations such as how to open and delete a project.

Operating Recall Screen (VM Mode)
Describes the operations on the Recall screen such as how to check settings.

Operating the Graph (VM Mode)
Describes the graph-related operations in vibration meter mode.

Settings (VM Mode)
Describes how to configure the setting items such as the Measurement settings screen and Input settings screen.

● **FFT Mode**

Screen Layout (FFT Mode)
Describes the layout of the screen displayed.

Measurement (FFT Mode)
Describes the measurement-related operations in FFT mode such as how to start and stop measurement.

Operating the Project (FFT Mode)
Describes the project-related operations such as how to open and delete a project.

Operating Recall Screen (FFT Mode)
Describes the operations on the Recall screen such as how to check settings.

Operating the Graph (FFT Mode)
Describes the graph-related operations in FFT mode.

Settings (FFT Mode)
Describes how to configure the setting items such as the Measurement settings screen and Input settings screen.

Items on Setting Screens
Describes the setting items on the Measurement settings or Recall settings screen.

WAVE File Format
Describes the format of the WAVE file.

Evaluation File Format
Describes the evaluation criteria result text file, evaluation criteria range format file output function format.

Technical Descriptions
Provides technical descriptions vibration measurement, terms related to analysis, etc..

Specifications
Provides the specifications of this program.

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WARNING

Be careful around rotating machinery	
⚠ WARNING	● When making measurements on exposed rotating parts or power train parts of machinery, proceed with utmost care to ensure that the accelerometer or accelerometer cable do not get caught in the machine. ● When making measurements on exposed rotating parts or power train parts of machinery, do not use the shoulder belt. If they are rolled in the machine, a dangerous accident is caused.

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SX-A1VA Overview

The SX-A1VA is a vibration analysis program that runs on the RIONOTE.
The SX-A1VA offers two types of analysis modes: “vibration meter mode” and “FFT mode.” You can anytime switch to another mode.
In vibration meter mode, the SX-A1VA displays measured vibration magnitude on the screen of this device and saves it into a file. It is also possible to save instantaneous values for measured vibration magnitude or arithmetic mean values for a specified measurement time.
In FFT mode, the SX-A1VA receives FFT data analyzed in real time, displays it on the screen of this device, and saves it into a file. It can also receive results of one frame, display them on the screen, and save them.
In vibration meter mode, the “Judgement Mode Setting” screen allows switching to “Evaluation criteria” to perform evaluation based on ISO 10186-1, with the evaluation criteria “acceptable”, “unsatisfactory”, and “unacceptable”. It is also possible to save instantaneous values or arithmetic mean values for a specified measurement time.

Vibration Meter Mode　　FFT Mode

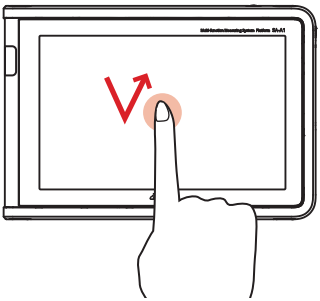
Switch the mode and operate

Basic Operation

Basic Operation

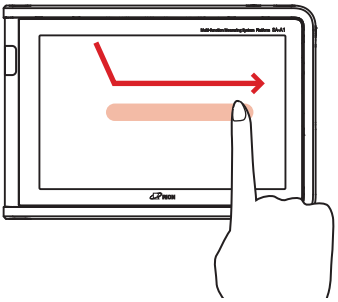
Important	- The touch panel is designed to be gently touched by fingers or stylus. Do not press the panel hard or touch it with a sharp object (such as ballpoint pen/pin). - Please note that the touch panel may not work correctly or cause malfunction on the following conditions. - Operation with a glove - Operation with a nail tip - Operation while putting foreign objects on the touch panel - Operation with a water droplet or condensation on the touch panel - Operation with wet or sweaty fingers

Tap/Double-Tap



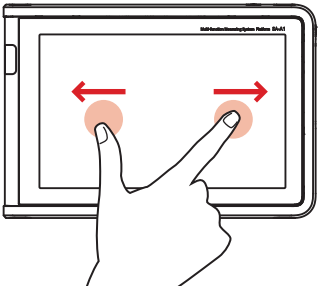
Tap is an operation in which you lightly touch the screen with a finger and immediately release the finger. It is used to select an item or icon displayed on the screen.
Double-tap is to tap twice quickly.

Slide



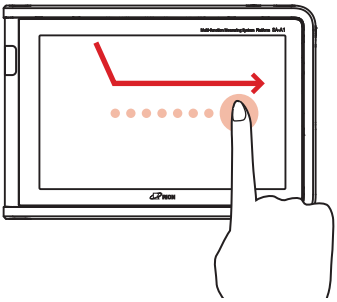
When all of data cannot be displayed on the screen, you can move the finger to the desired direction while lightly touching the screen. Slide is used to scroll the screen or switch pages. It is also used to move a gauge or bar to adjust the volume and brightness.

Pinch



You can open two fingers (pinch out) or close (pinch in) while touching the screen. It can be used to zoom in or out of a graph.

Drag

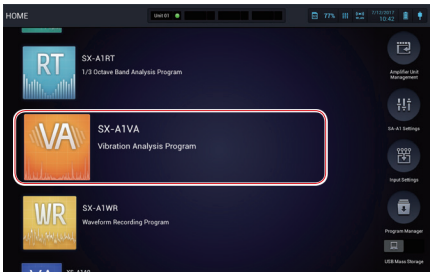


You can drag an item or icon to move to the desired location while lightly touching the screen.

Starting/Exiting the SX-A1VA

Starting the SX-A1VA

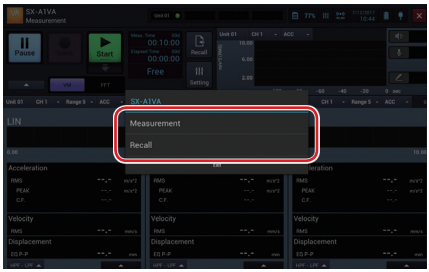
1. Tap [SX-A1VA] on the HOME screen.



The SX-A1VA starts.

MEMO	- You may not see [SX-A1VA] displayed on the screen if multiple programs are installed. In this case, slide the programs up or down on the HOME screen to display [SX-A1VA].

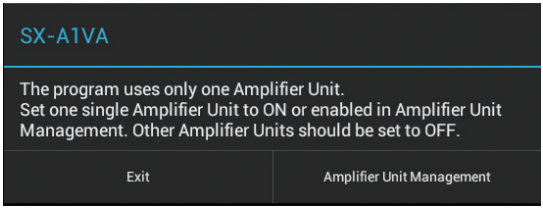
2. Tap the tab of a screen you want to display.



Tap [Measurement] to display the Measurement screen in vibration meter mode. Tap [Recall] to display the Select project screen.

Important

- When you tap [Measurement] while multiple or no amplifier units are registered, the following screen appears. In such a case, tap [Amplifier Unit Management] to configure to use one amplifier unit (refer to the manual of the SA-A1). Tap [Exit] to exit the SX-A1VA.



Switching the Mode Between Vibration Meter Mode and FFT Mode

The Measurement screen has two modes: “vibration meter mode” and “FFT mode”. You can switch the mode with the operation area.

1. **In the operation area, slide [Vibration Meter/FFT] toward the mode you want to use.**

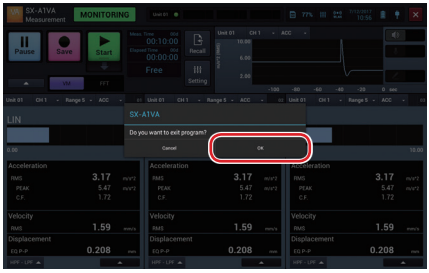
The mode switches to the mode you selected.

MEMO	- You cannot change the mode during measurement or trigger standby period, or pause.
	- Decide which mode to use depending on the purpose of measurement.
	  - Vibration meter mode: Select this mode when you use this device as a vibration meter.
	  - FFT mode: Select this mode when you conduct an FFT analysis.
	- The SX-A1VA starts in the mode in which it was exited the last time.

Exiting the SX-A1VA

1. **Tap [X] on the right side of the status bar.**

2. **Tap [OK].**



MEMO	- You cannot exit the SX-A1VA during measurement.

Vibration Meter Mode

Screen Layout (VM Mode)

Measurement Screen (Vibration Meter Mode (Standard)) Layout

Status Bar
Displays the registered amplifier status, date and time, and battery status.

Operation Area
Provides operational buttons and information for starting/stopping measurement and configuring the measurement time.

Time-Value Graph Display Area
Displays the channel you selected and “acceleration", “velocity” and “displacement” on the Time-Value graph. An overload marker is displayed when an overload occurs. A threshold marker is displayed when a specified threshold is crossed. You can also output a monitor audio, record a voice memo, and attach a marker.

Tacho Display Area
Displays the rotational speed of a selected unit. This area is not displayed when the tacho display is disabled.

Graph Display Area
Displays bar graphs and values of vibration magnitude, etc., that are currently input. By changing a setting, you can select the number of graphs to be displayed from 1 to 4. You can also check the abnormal state during measurement, such as OVERLOAD.

Measurement Screen (Vibration Meter Mode (Evaluation)) Layout

Status Bar
Displays the registered amplifier status, date and time, and battery status.

Operation Area
Provides operational buttons and information related to the measurement operation such as saving measurement values and displaying the setting screen.

Target Machine Area / Time-Value Graph Display Area
Displays the name of “Area”, “Machine”, “Point” for the measurement target. You can also switch to the Time-Value graph display. If overload has occurred, the overload marker is displayed. When exceeding the set threshold value, “Acceptable”, “Unsatisfactory” and “Unacceptable” markers are displayed. Monitor Output is also possible.

Tacho Display Area
Displays the rotational speed of a selected unit. This area is not displayed when the tacho display is disabled.

Graph Display Area
Displays bar graphs and values of vibration magnitude, etc., that are currently input. By changing a setting, you can select the number of graphs to be displayed from 1 to 4. You can also check the abnormal state during measurement, such as OVERLOAD.

Recall Screen (Vibration Meter Mode (Standard)) Layout

Status Bar
Displays the date and time, and battery status.

Operation Area
Provides operational buttons for moving to the Select project screen and Recall settings screen.

Threshold Area
Displays threshold judgement results. This area is not displayed when the threshold judgement function is disabled.

Time-Value Graph Display Area
Displays the selected channel and values of “acceleration”, “velocity”, and “displacement” on the Time-Value graph. If overload has occurred, the overload marker is displayed. The voice memo marker, user input marker are also displayed. When threshold evaluation has been enabled, the time-value graph shows the threshold 1 marker and/or threshold 2 marker for the respective interval if the measurement value has exceeded the specified threshold 1 and/or threshold 2.

MEMO	The time-value graph is not displayed when the following settings are active: - Store: Ave. (averaging result when measurement mode is “Ave.” or “Auto + Ave.”) - Store: Instantaneous Values (data saved with save button)

Tacho Display Area

Displays the rotational speed at the cursor position. When it is an instantaneous value, the rotational speed at the save time is displayed. This area is not displayed when the tacho display is disabled.

MEMO	The tacho display area is not displayed when the following settings are active: - Store: Ave. (averaging result when measurement mode is “Ave.” or “Auto + Ave.”)

Graph Display Area

Displays bar graphs and values of vibration magnitude at the cursor position. By changing a setting, you can select the number of graphs to be displayed from 1 to 4. You can also check the abnormal state during measurement, such as OVERLOAD.

Recall Screen (Vibration Meter Mode (Evaluation)) Layout

Status Bar
Displays the date and time and the battery status.

Operation Area
Provides operational buttons for moving to the Select project screen and Recall settings screen.

Evaluation Criteria Area
Depending on the evaluation result, the background color of channels exceeding the acceptable value is green, that of channels exceeding the unsatisfactory value is yellow, and that of channels exceeding the unacceptable value is magenta.

Target Machine Area
Displays the name of “Area”, “Machine”, “Point” for the measurement target.

Tacho Display Area
Displays the rotational speed when the measurement of a selected unit. This area is not displayed when the tacho display is disabled.

MEMO	When the measurement mode is set to “Average”, this area is not appear.

Graph Display Area
Displays bar graphs and values of vibration magnitude. By changing a setting, you can select the number of graphs to be displayed from 1 to 4.
You can also check the abnormal state during measurement, such as OVERLOAD.

Select Project Screen Layout

Status Bar
Displays the date and time and the battery status.

[Back]
Tap the button to return to the previous screen.

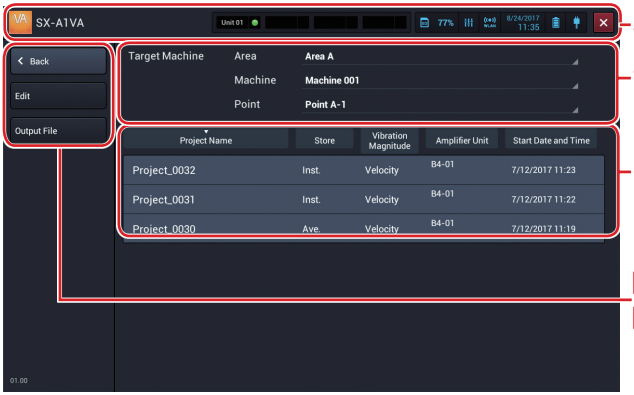
[Edit]
Tap the button to display the screen to change a project name or delete a project.

[Download]
Tap the button to download measurement data and waveform data saved in the amplifier unit of the RIONOTE.

[Screenshot]
Tap the button to list projects in which screenshots are saved.

Project List
Displays the list of saved projects.

Setting Screen Layout (Vibration Meter Mode (Evaluation))



Status Bar
Displays the date and time and the battery status.

[Back]
Tap the button to return to the previous screen.

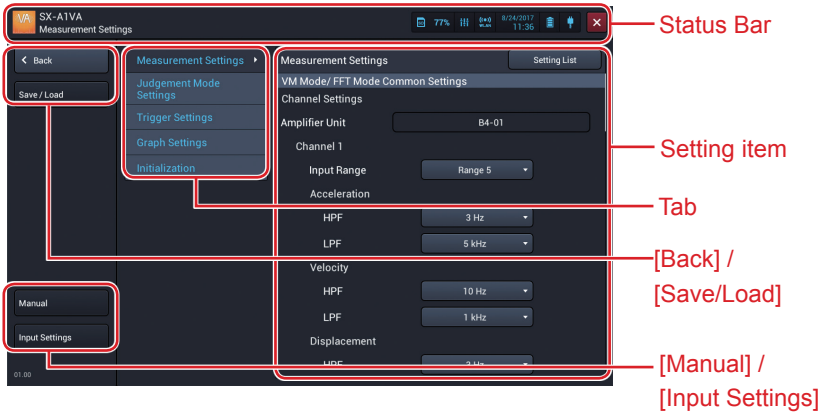
[Edit]
Tap the button to display the screen to change a project name or delete a project.

[Output File]
Tap the button to output the Evaluation results to a file. One file will be created for each measurement location selected on the Select Project screen.

Target Machine
The names “Area”, “Machine”, “Point” selected on the Measurement screen (in Evaluation mode) are displayed here.
Tap the display to enable changing.

Project List
Displays the list of saved projects measured by the target machine.

Setting Screen Layout



Status Bar
Displays the date and time and the battery status.

[Back]
Tap the button to return to the previous screen.

[Save/Load]
Tap the button to display the Save settings screen. This button appears when you move from the Measurement screen to the Setting screen.

MEMO	- If Judgement Mode is “Evaluation Criteria”, settings are saved in the database for each target machine, so they are excluded from loading.

[Manual]
Tap the button to display the HTML help.

[Input Settings]
Tap the button to display the Input settings screen. This button appears when you move from the Measurement screen to the Setting screen. (Refer to the manual of the RIONOTE)

Tab
The items settable on the Setting screen are displayed with tabs according to the purpose.

Setting item
Displays the setting items of the selected tab.

Measurement (VM Mode (Standard))

Setting the Measurement Mode

In vibration meter mode, the user has the choice of three measurement modes.

- Auto: Measurement of each vibration quantity is performed continuously at 100 ms intervals over the specified measurement time.
- Ave.: The average vibration quantity for the specified measurement time is calculated.
- Auto + Ave.: Both automatic and averaging measurement are performed simultaneously.

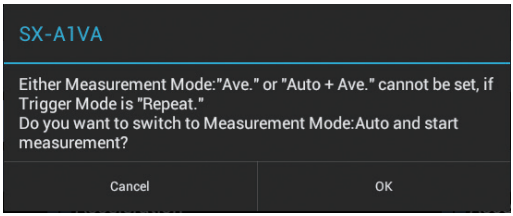
For details on measurement mode settings, please refer to “Configuring Various Items for Measurement (Vibration Meter Mode (Standard))” (P.124).

Important

- Do not power off or pull out the SD card during measurement.

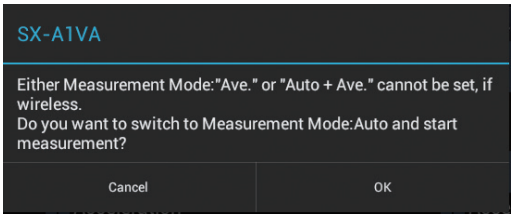
MEMO

- When sliding [Start] downward while the measurement mode is set to “Ave.” or “Auto + Ave.” and the trigger mode is set to “Repeat”, the following message appears.



Tap [OK] to switch the measurement mode to “Auto” and start measurement. Alternatively, tap [Cancel] to cancel the measurement.

- When sliding [Start] downward while the measurement mode is set to “Ave.” or “Auto + Ave.” and the trigger mode is set to “Repeat”, the following message appears.



Tap [OK] to switch the measurement mode to “Auto” and start measurement. Alternatively, tap [Cancel] to cancel the measurement.

Starting Measurement (Measurement Mode: Auto)

1. Slide [Start] down.

The SX-A1VA starts measuring and saving into the SD card.

Important - Do not power off or pull out the SD card during measurement.

MEMO

- Depending on the trigger mode, the operation after starting measurement varies.
  - Free : Starts measurement immediately. After measuring for the specified period of time, it finishes the measurement.
  - Single : It enters the trigger standby state and starts measuring when the trigger condition is met. After measuring for the specified period of time, it finishes the measurement.
  - Repeat : It enters the trigger standby state and starts measuring when the trigger condition is met. An operation goes back in a trigger standby state after measuring for the specified period of time. Measurement will end when data save is repeated for the set count.
- For details on how to configure the trigger mode, see “Configuring the Trigger Mode” (P.139).
- When trigger mode of the trigger settings is [Repeat], the Wave Recording cannot be set ON.
- When you start measurement, “Start” changes to “Stop”.
- The screen displays [MEASUREMENT] on the status bar during measurement. The screen displays [STANDBY] during a trigger standby period.
- Tap [Setting] during measurement or a trigger standby period to display the current settings.
- You cannot use the [Vibration Meter/FFT] button and [Recall] button during measurement, waiting for trigger and while paused.
- If overload occurs during measurement, the screen displays as follows:
  - A red marker is displayed on the Time-Value graph.
  - An “OVERLOAD” icon is displayed on the bar graph.
  - The background color of the overloaded vibration magnitude changes to red.

Stopping Measurement (Measurement Mode: Auto)

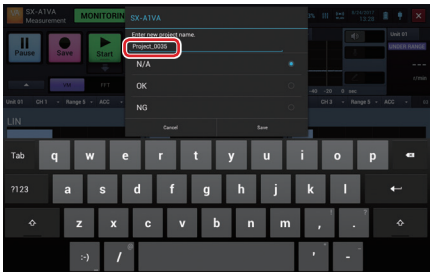
1. Slide [Stop] down.

MEMO	- Stop measurement when you want to do so before the specified measurement time elapsed. - When you stop measurement, [Stop] changes to [Start] and the screen displays [MONITORING] on the status bar.

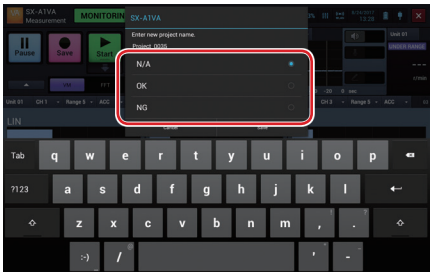
Saving Measurement Results (Measurement Mode: Auto)

A confirmation screen to save measurement results is displayed when the measurement is completed or stopped.

1. **Enter a project name.**

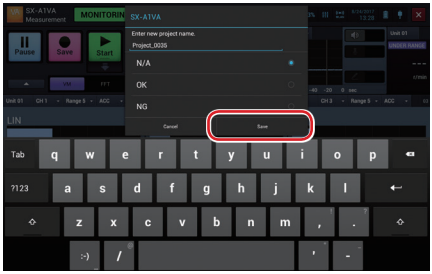


2. **Select a suffix to add to the end of the project name.**



MEMO	- The selectable suffixes are as follows: [N/A]: No suffix is added. [OK]: “_OK” is added to the end of the project name. (Example: “Project_0001” becomes “Project_0001_OK”.) [NG]: “_NG” is added to the end of the project name. (Example: “Project_0001” becomes “Project_0001_NG”.)

3. Tap [Save].



The measurement results are saved. Tap [Cancel] to return to the Measurement screen without saving measurement results.

MEMO	- To save the canceled measurement result, tap [▲] in the operation area, and then tap [Do you want to save the previous measurement result?].

Starting Measurement (Measurement Mode: Average)

1. Slide [Start] down.

The SX-A1VA starts measuring and saving into the SD card.

Important - Do not power off or pull out the SD card during measurement.

MEMO

- Depending on the trigger mode, the operation after starting measurement varies.
  - Free : Starts measurement immediately. After measuring for the specified period of time, it finishes the measurement.
  - Single : It enters the trigger standby state and starts measuring when the trigger condition is met. After measuring for the specified period of time, it finishes the measurement.
  - Repeat : Since “Average” measurement does not work with “Repeat”, the confirmation message for switching to the Auto Store will be displayed before measurement starts.
- For details on how to configure the trigger mode, see “Configuring the Trigger Mode” (P.139).
- Trigger mode: When the trigger mode is “Repeat”, “Wave Recording” becomes “OFF” and “Automatic show-up of save screen” does not appear.
- Regardless of trigger mode, if you connect the SA-A1WD wireless LAN, the confirmation message for switching to the Auto Store will be displayed before measurement starts.
- When you start measurement, “Start” changes to “Stop”.
- The screen displays [MEASUREMENT] on the status bar during measurement. The screen displays [STANDBY] during a trigger standby period.
- Tap [Setting] during measurement or a trigger standby period to display the current settings.
- You cannot use the [Vibration Meter/FFT] button and [Recall] button during measurement, trigger standby, or pause.

MEMO	- If overload occurs during measurement, the screen displays as follows:
	  - A red marker is displayed on the Time-Value graph.
	  - An “OVERLOAD” icon is displayed on the bar graph.
	  - The background color of the overloaded vibration magnitude changes to red
	- Depending on whether the “Automatic show-up of save screen” is ON / OFF, the ways of saving data are different after a measurement is completed or stopped. For details on saving, see P.43.
	  - OFF : The average result is displayed on the screen, but a confirmation screen for saving the measurement result is not displayed. To save the result, tap the [Save] button.
	  - ON : A confirmation screen to save the measurement data is brought up after a measurement. If you want to check the result after the measurement is completed or stop immediately, set it to [ON].

Stopping Measurement (Measurement Mode: Average)

1. Slide [Stop] down.

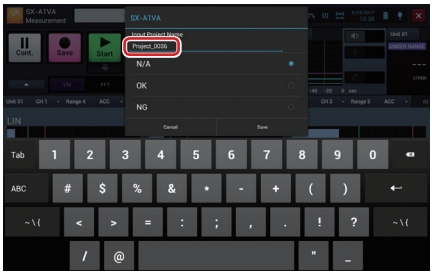
MEMO	- Stop measurement when you want to do so before the specified measurement time elapsed. - When you stop measurement, [Stop] changes to [Start] and the screen displays [PAUSE] on the status bar.

Saving Measurement Results (Measurement Mode: Average)

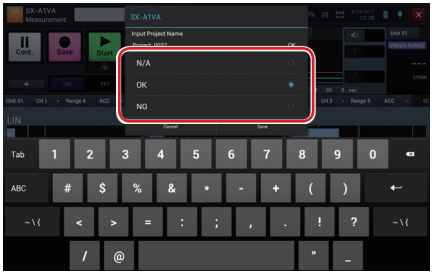
The method for saving differs, depending on whether “Automatic show-up of save screen” is set to ON or OFF. For information on how to make this setting, see “Setting Automatic show-up of save screen” (P.129).

- Automatic show-up of save screen to ON:
  A confirmation screen asking whether to save measurement result appears when measurement has completed or has been stopped by the user.

1. Enter a project name.

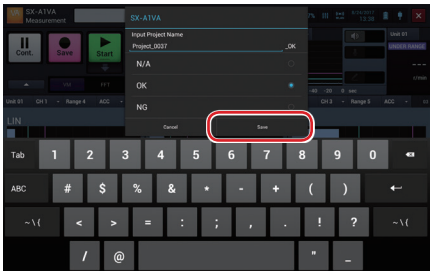


2. Select a suffix to add to the end of the project name.



MEMO	- The selectable suffixes are as follows: [N/A]: No suffix is added. [OK]: "_OK" is added to the end of the project name. (Example: "Project_0001" becomes "Project_0001_OK".) [NG]: "_NG" is added to the end of the project name. (Example: "Project_0001" becomes "Project_0001_NG".)

3. Tap [Save].



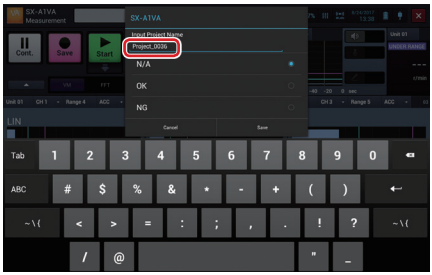
The measurement results are saved. Tap [Cancel] to return to the Measurement screen without saving measurement results. If measurement has completed or has been stopped while measurement mode is set to "Ave.", the system goes into the pause condition and the averaging result is shown on the Measurement screen.

MEMO	- To save the canceled measurement result, tap [▲] in the operation area, and then tap [Do you want to save the previous measurement result?].

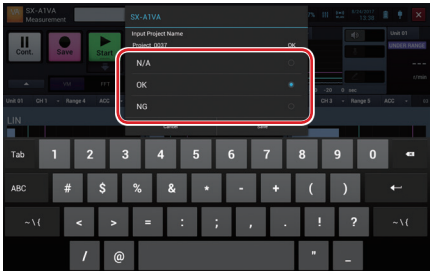
- Automatic show-up of save screen to OFF:
  When the measurement is completed or stopped, the measurement screen is in PAUSE, and data of Average results are displayed on the screen.

1. **Tap [Save].**

2. **Enter a project name.**

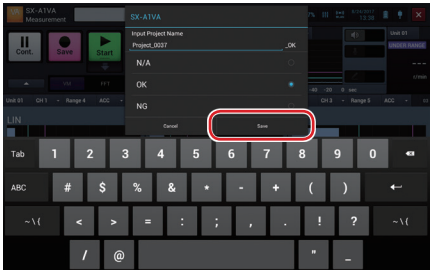


3. **Select a suffix to add to the end of the project name.**



MEMO	- The selectable suffixes are as follows: [N/A]: No suffix is added. [OK]: "_OK" is added to the end of the project name. (Example: "Project_0001" becomes "Project_0001_OK".) [NG]: "_NG" is added to the end of the project name. (Example: "Project_0001" becomes "Project_0001_NG".)

4. Tap [Save].



The measurement results are saved. Tap [Cancel] to return to the Measurement screen without saving measurement results. If measurement was completed or stopped while measurement mode is set to "Average", the system goes into the pause condition and the averaging result is shown on the Measurement screen.

MEMO	- To save the canceled measurement result, tap [▲] in the operation area, and then tap [Do you want to save the previous measurement result?].

Starting Measurement (Measurement Mode: Auto+Average)

1. Slide [Start] down.

The SX-A1VA starts measuring and saving into the SD card.

Important

- Do not power off or pull out the SD card during measurement.

MEMO

- Depending on the trigger mode, the operation after starting measurement varies.
  - Free : Starts measurement immediately. After measuring for the specified period of time, it finishes the measurement.
  - Single : It enters the trigger standby state and starts measuring when the trigger condition is met. After measuring for the specified period of time, it finishes the measurement.
  - Repeat : Since “Auto+Average” measurement does not work with “Repeat”, the confirmation message for switching to the Auto Store will be displayed before measurement starts.
- For details on how to configure the trigger mode, see “Configuring the Trigger Mode” (P.139).
- When the trigger mode is “Repeat”, “Wave Recording” becomes “OFF” and “Automatic show-up of save screen” does not appear.
- Regardless of trigger mode, if you connect the SA-A1WD wireless LAN, the confirmation message for switching to the Auto Store will be displayed before measurement starts.
- When you start measurement, “Start” changes to “Stop”.
- The screen displays [MEASUREMENT] on the status bar during measurement. The screen displays [STANDBY] during a trigger standby period.
- Tap [Setting] during measurement or a trigger standby period to display the current settings.
- You cannot use the [Vibration Meter/FFT] button and [Recall] button during measurement, trigger standby, or pause.
- If overload occurs during measurement, the screen displays as follows:
  - A red marker is displayed on the Time-Value graph.
  - An “OVERLOAD” icon is displayed on the bar graph.
  - The background color of the overloaded vibration magnitude changes to red.

Stopping Measurement (Measurement Mode: Auto+ Average)

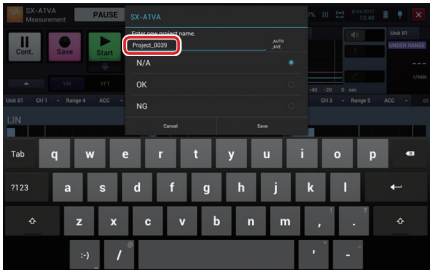
1. Slide [Stop] down.

MEMO	- Stop measurement when you want to do so before the specified measurement time elapsed. - When you stop measurement, [Stop] changes to [Start] and the screen displays [PAUSE] on the status bar.

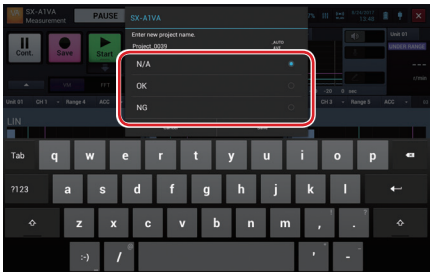
Saving Measurement Results (Measurement Mode: Auto+Average)

A confirmation screen to save measurement results is displayed when the measurement is completed or stopped.

1. **Enter a project name.**

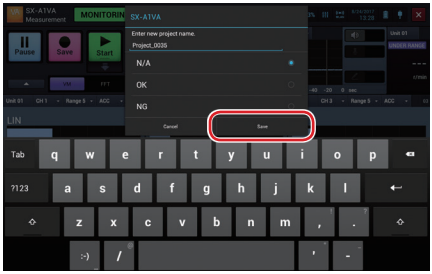


2. **Select a suffix to add to the end of the project name.**



MEMO	- The selectable suffixes are as follows: [N/A]: No suffix is added. (Example: “Project_0001” becomes the following) - Auto: “Project_0001_AUTO” - Average: “Project_0001_AVE” [OK]: “_OK” is added to the end of the project name. (Example: “Project_0001” becomes the following) - Auto: “Project_0001_AUTO_OK” - Average: “Project_0001_AVE_OK” [NG]: “_NG” is added to the end of the project name. (Example: “Project_0001” becomes the following) - Auto: “Project_0001_AUTO_NG” - Average: “Project_0001_AVE_NG”

3. Tap [Save].



The measurement results are saved. Tap [Cancel] to return to the Measurement screen without saving measurement results. If measurement has completed or has been stopped while measurement mode is set to “Auto+Ave.”, the system goes into the pause condition and the averaging result is shown on the Measurement screen.

MEMO	- To save the canceled measurement result, tap [▲] in the operation area, and then tap [Do you want to save the previous measurement result?].

Pausing Screen Update

You can pause the screen update during a monitoring state.

1. **Tap [Pause].**

The screen update pauses. While pausing, [Pause] changes to [Cont.] and [PAUSE] is displayed on the status bar.

MEMO	- You can save instantaneous values at the time of pausing by tapping [Save] while pausing.

2. **Tap [Cont.].**

The screen update restarts.

MEMO	- The response to the Pause/Cont. operations may be delayed by the influence of internal processes.

Saving Instantaneous Values

You can save instantaneous values regardless of whether during measurement or during a trigger standby period. Incidentally, only the instantaneous values of enabled channels are saved.

1. **Tap [Save].**

The instantaneous values are saved.

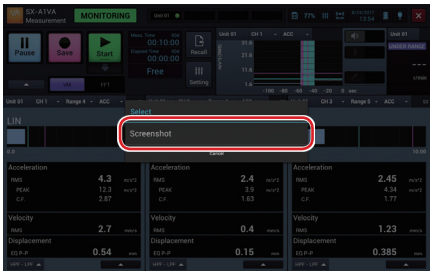
MEMO	- The instantaneous values are saved in the project folder. - You can save instantaneous values at the time of pausing by tapping [Save] while pausing.

Capturing Screens during Monitoring and Measurement

You can save the entire screen during monitoring and measurement in a PNG format image file.

1. **Tap [▲] in the operation area during monitoring and measurement.**

2. **Tap [Screenshot].**



The screen is saved.

MEMO	- The screen image file is saved as a black and white reversal image to be suited to printing with a computer. - A file of image saved during measurement is saved in the project folder. - A file of graph image saved during monitoring is saved in the [SD card\SX-A1VA\Others] folder created in the SD card. - You can also save a screenshot with multi-function key. - For how to save a screenshot of an individual graph, see “Capturing the Screenshot of the Graph” (P.121). - The image files saved during measurement can be displayed on this device. (“Displaying a Screenshot” P.101)

Checking Vibration Sound

You can monitor and check the vibration sound during measurement.

1. **During measurement, slide the monitoring button in the Time-Value graph display area toward the right.**

The vibration sound is output.

MEMO	- When the voice memo is enabled, it is automatically disabled when monitoring starts. - When using a wireless connection, the monitor sound may be interrupted.

2. **To stop monitoring, slide the monitoring button toward the left.**

Inserting the Voice Memo

You can record a voice memo during measurement using the microphone connected to the RIONOTE.

1. **During measurement, slide the voice memo button in the Time-Value graph display area toward the right.**

Recording of a voice memo starts. The recorded voice memo is indicated by a green marker on the Time-Value graph.

MEMO	- When the monitoring is enabled, it is automatically disabled when recording of a voice memo starts. - You can record a voice memo during measurement only. - When the measurement mode is “Ave.”, the voice memo is disabled.

2. **To stop recording, slide the voice memo button toward the left.**

Inserting a Marker

You can insert a marker on a graph during measurement.

1. **During measurement, slide the marker button in the Time-Value graph display area toward the right.**

Recording of a marker starts. The recorded marker is indicated by a yellow bar on the Time-Value graph.

MEMO	- You can insert a marker during measurement only. - When the measurement mode is “Ave.”, the Maker is disabled.

2. **To stop inserting a marker, slide the marker button toward the left.**

MEMO	- When markers overlap one another, they are displayed in the following order of precedence: Overload > Voice memo > Threshold 2 > Threshold 1 > Marker inserted by the user

Evaluation (Advance Preparation)

Importing the Machine List Master DB File

Evaluation requires a device list master database file (file name: SX-A1VA.db) that manages and saves measurement settings and results for each measurement location and machine measurement position.
This database file enables switching to Evaluation.

1. **Save the machine list master DB file into an SD card.**

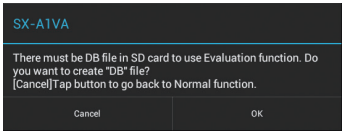
Important	- Save the file into the “SX-A1VA” folder of the SD card. If it is saved in another location, it will not be imported.

2. **Set the SD card into this device.**

3. **Start the SX-A1VA.**

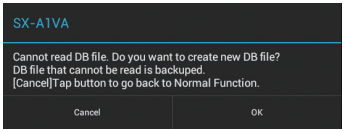
The machine list master DB file is imported at the time of start of the SX-A1VA.

MEMO	- If attempting to switch the Judgement Mode to Evaluation while no SX-A1VA.db file is present in the SX-A1VA folder on the SD card, or if the Evaluation screen is shown when SX-A1VA is started, the error message shown below appears. Tap [OK] to create the SX-A1VA.db file. If Evaluation settings and measurement results are to be saved on an ongoing basis, you should leave an SD card with a machine list master database file always inserted in the unit.



MEMO

- If Evaluation settings and measurement results are to be saved on an ongoing basis, you should leave an SD card with a machine list master database file always inserted in the unit. To continue saving Evaluation settings and measurement results on another SD card, copy the SX-A1VA folder from the current card onto the new card and then use the new card for saving.
- If no SD card is inserted, it is not possible to switch the Judgement mode settings to Evaluation. Also when starting the SX-A1VA application, the Judgement mode settings will be “Standard”.
- If the message shown below appears, the database file may be corrupt. Use the backup version of the SX-A1VA.db file as described under “Important”.



Important

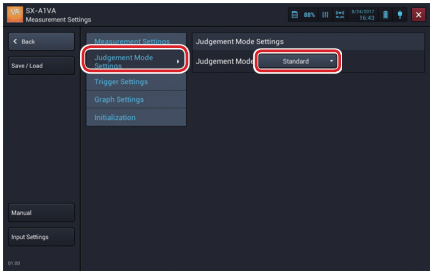
- The SX-A1VA.db file contains Evaluation settings and measurement results for 3600 target machine points. You should back up the file regularly in intervals of one to three months. For information on how to access an SD card inserted in the RIONOTE as a removable disk via USB, please refer to the RIONOTE Instruction Manual (P.48).
- If [Format] is executed for an SD card inserted in the RIONOTE, the SX-A1VA.db file will also be deleted.

Changing the Judgement Mode

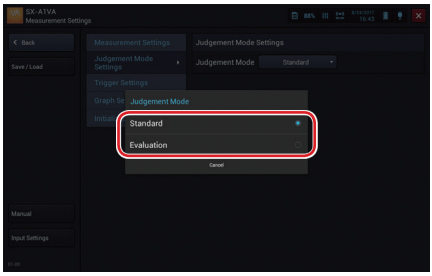
To use Evaluation, change the Judgement mode settings from the Measurement Settings screen.

1. **Tap [Setting] on the Measurement screen (vibration meter mode).**

2. **Tap [Judgement Mode Settings] and tap [▼] on [Judgement Mode].**

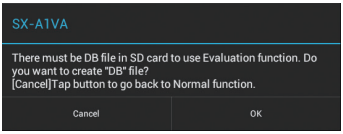


3. Select the judgement mode to use.

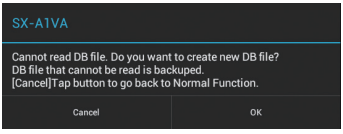


MEMO

- If attempting to switch the Judgement mode to Evaluation while no SX-A1VA.db file is present in the SX-A1VA folder on the SD card, or if the Evaluation screen is shown when SX-A1VA is started, the error message shown below appears. Tap [OK] to create the SX-A1VA.db file. If Evaluation settings and measurement results are to be saved on an ongoing basis, you should leave an SD card with a machine list master database file always inserted in the unit.



- If the message shown below appears, the database file may be corrupt. Use the backup version of the SX-A1VA. Also, if there is no problem with the new DB file, tap [OK].

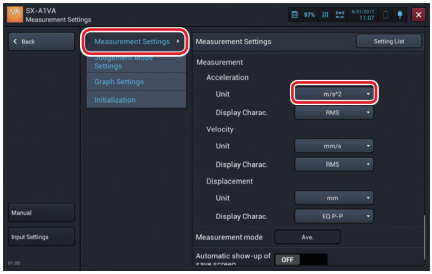


Configuring Units and Display Characteristics of Velocity

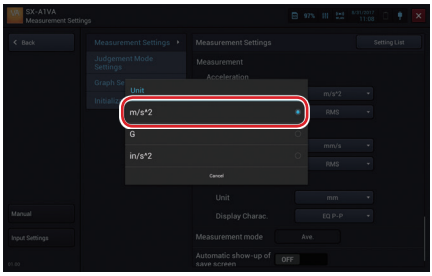
To conduct Evaluation, change units to SI units (acceleration: “m/s^2”, velocity: “mm/s” and displacement: “mm” or “μm”) and change the display characteristics of velocity to “RMS.”

1. **Tap [Setting] on the Measurement screen (vibration meter mode).**

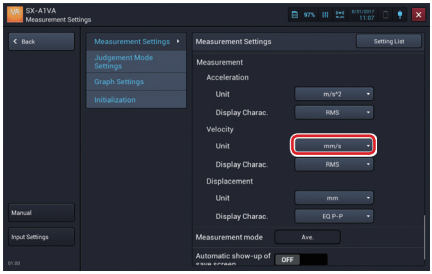
2. **Tap [Measurement Settings] and tap [▼] on [Unit] of [Acceleration].**



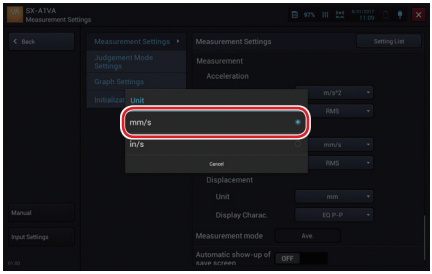
3. **Tap [m/s^2].**



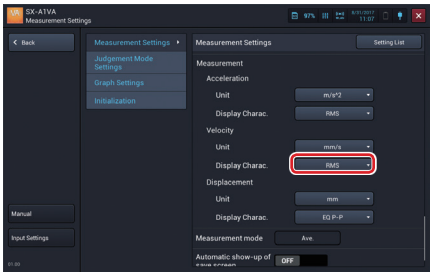
4. **Tap [▼] on [Unit] of [Velocity].**



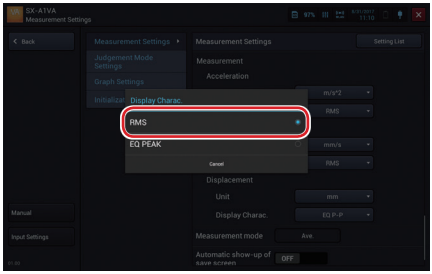
5. **Tap [mm/s].**



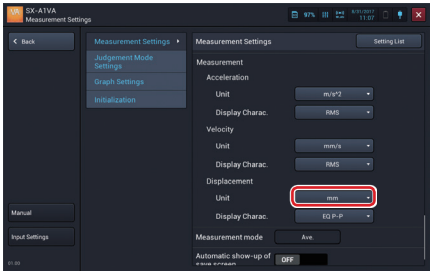
6. **Tap [▼] on [Display Charac.] of [Velocity].**



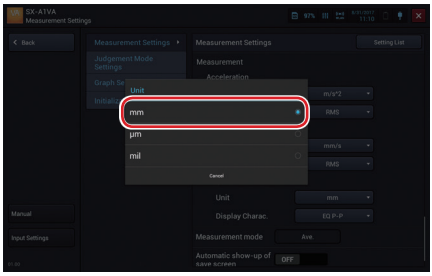
7. **Tap [RMS].**



8. **Tap [▼] on [Unit] of [Displacement].**



9. **Tap [mm].**


SX-A1VA
Measurement Settings
Back
Measurement Settings
Setting List
Judgement Mode Settings
Measurement
Acceleration
Unit
m/s^2
RMS
mm
μm
mil
Cancel
mm/s
RMS
Unit
mm
Display Charac.
EQ P-P
Manual
Input Settings
Measurement mode
Ave.
Automatic show-up of wave screen
OFF

Configuring Evaluation Criteria Values for Each Channel

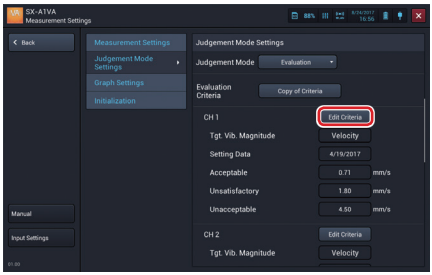
For each channel in which to perform Evaluation, the evaluation criteria “Acceptable”, “Unsatisfactory”, and “Unacceptable” can be set. (In the following, these are referred to as “Acceptable value”, “Unsatisfactory value”, and “Unacceptable value”.) Evaluation criteria values are saved for each selected measurement target machine.

1. **Select a measurement target machine in the Measurement screen (vibration meter mode (evaluation)).**

   Tap [Area], [Machine] and [Point] of Target Machine to select the respective target.

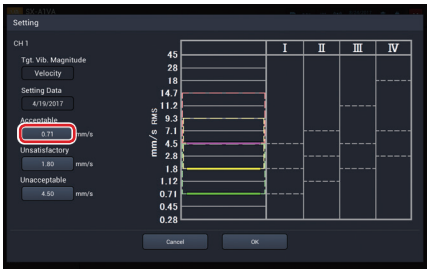
2. **Tap [Setting].**

3. **Tap [Judgement Mode Settings] and tap [Edit Criteria] on [CH1].**



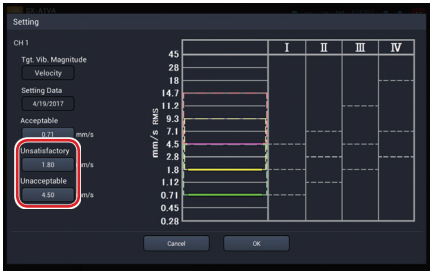
The Setting screen is displayed.

4. **Tap [Acceptable].**



5. **Input the number and tap [OK].**

6. Doing the same procedure, tap [Unsatisfactory] to set “Unsatisfactory value” and [Unacceptable] to set “Unacceptable value”.

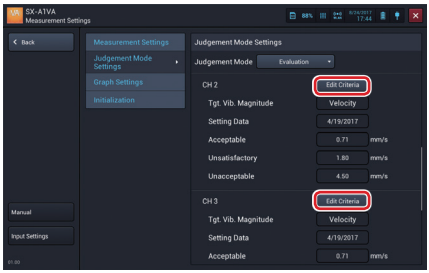


MEMO	- The “Acceptable value”, “Unsatisfactory value”, and “Unacceptable value” graph on the setting screen for Evaluation Criteria is based on the ISO 10816-1 reference values for Class I to IV. It cannot be modified by dragging or similar.

7. Tap [OK] after all settings are completed.

MEMO	- Observe the following condition when making settings for “acceptable value”, “unsatisfactory value”, and “unacceptable value”. If this condition is not met, an error message appears. Acceptable value > Unsatisfactory value > Unacceptable value - Tap [Cancel] to abort the setting process and return to the [Judgement Mode Settings] tab.

8. Configure other channels in the same procedure.

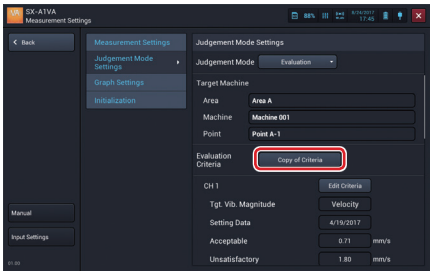


Copying Evaluation Criteria Values

You can copy Evaluation Criteria values configured for a channel to all of the other channels. It is convenient when you use the same Evaluation Criteria values for other channels.

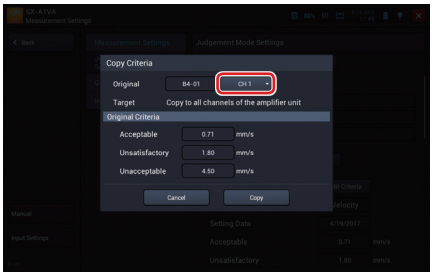
1. **Tap [Setting] on the Measurement screen (vibration meter mode (evaluation)).**

2. **Tap [Judgement Mode Settings] and tap [Copy of Criteria].**



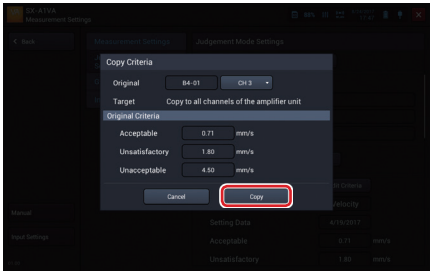
The Copy Criteria screen is displayed.

3. **Tap [▼] on the copy source channel.**



4. **Select a channel to copy from.**

5. **Tap [Copy].**



The evaluation criteria values of the selected channel are copied to all channels.

MEMO	- You can view the evaluation criteria values to be copied under [Original Criteria].

Evaluation

Overview of Evaluation

When performing Evaluation in vibration meter mode, instantaneous values or averaged results can be saved. The measurement mode is fixed to “Ave."(Average).

MEMO	- If you connect the SA-A1WD wireless LAN, the measurement does not start when the Measurement Mode is “Ave.". Save the instantaneous values from the [Save] button on the measurement screen.

Switching between [Select Target Machine] and [T-V Graph]

During Evaluation, the display can be switched to either “Select Target Machine” or “T-V Graph".

1. **When the display shows the target machine, tapping [Select Target Machine] switches the display select window to Time-Value graph display.**

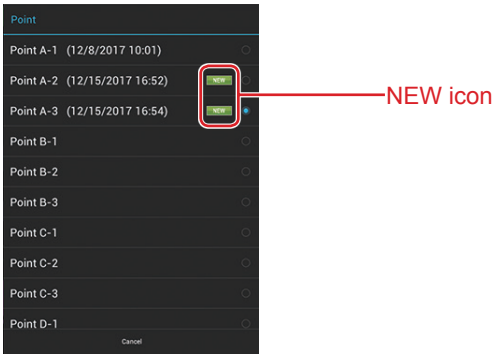
2. **When the display shows the Time-value graph, tapping [T-V Graph] switches the display select window to the target machine.**

Selecting the measurement target machine

Select the “Area", “Machine", and “Point” items for the machine on which Evaluation is to be performed. The selection procedure is the same for all three items. The example below shows how to select “Point".

1. **Tap [Point] for the target machine.**

2. **Select the point to be measured.**



MEMO	- If a point is selected after measurement data have been saved, the indication “NEW” appears on the right (only for the measurement point). This applies to measurement points for which measurement has been performed within 24 hours since the last measurement date/time.

Conducting Evaluation (Instantaneous values)

Evaluation results are instantaneous value and saved as follows.

1. **Select a measurement target machine in the Measurement screen (Evaluation mode).**

   Tap [Area], [Machine], and [Point] to select the respective target.

MEMO	- You can tap [Select a measurement target machine] to change to display the Time-Value graph.

2. **View the bar graph.**

   Measured vibration magnitude of the current evaluation target is refreshed and displayed. On the bar graph, lines representing the specified acceptable value, unsatisfactory value, and unacceptable value are displayed.

MEMO	- The acceptable value, unsatisfactory value, and unacceptable value are displayed in green, yellow, and magenta respectively. - When the target vibration magnitude is other than “velocity,” the line of the Evaluation Criteria value is not displayed.

3. View values of the vibration magnitude.

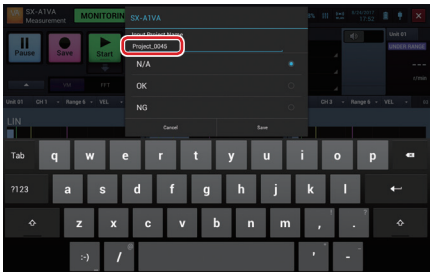
Measured vibration magnitude of the current judgement target is refreshed and displayed. You can view more accurate measurement data by tapping [Pause] to pause the measurement at the instant when the measured vibration magnitude is stabilized.

After pausing, tap [Cont.] to resume measurement.

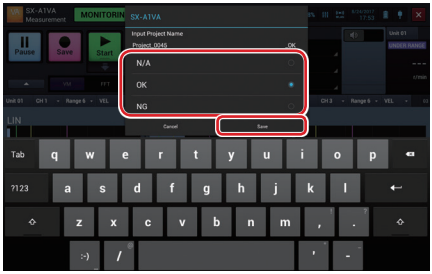
MEMO	- When the measured magnitude exceeds the acceptable value, unsatisfactory value, or unacceptable value, the value is displayed with the green, yellow, or magenta background respectively. - When the measured vibration magnitude is not stabilized, display the Time-Value graph and pause measurement near a middle value.

4. **Tap [Save].**

5. **Enter a project name.**



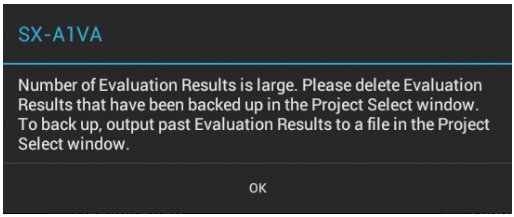
6. **Select a suffix to add to the end of the project name and tap [Save].**



The measurement results are saved. Tap [Cancel] to return to the Measurement screen without saving measurement results.

MEMO

- The selectable suffixes are as follows:
  [N/A]: No suffix is added.
  [OK]: “_OK” is added to the end of the project name.
  (Example: “Project_0001” becomes “Project_0001_OK".)
  [NG]: “_NG” is added to the end of the project name.
  (Example: “Project_0001” becomes “Project_0001_NG".)
- When there is a large number of saved evaluation results, the following message appears.



Create a backup by saving the measurement results as a CSV file using the file output function (Please refer to the P.89). You can delete old data or data that are no longer needed from the Select Project screen.

Conducting Evaluation (Measurement Mode: Average)

Evaluation results are averaged and saved as follows.

1. **Select a measurement target machine in the Measurement screen (Evaluation mode).**

   Tap [Area], [Machine], and [Point] to select the respective target for the evaluation.

MEMO	- You can tap [Select Target Machine] to change to display the Time-Value graph.

2. **View the bar graph.**

   Measured vibration magnitude of the current judgement target is refreshed and displayed. On the bar graph, lines representing the specified acceptable value, unsatisfactory value, and unacceptable value are displayed.

MEMO	- The acceptable value, unsatisfactory value, and unacceptable value are displayed in green, yellow, and magenta respectively. - When the target vibration magnitude is other than “velocity,” the line of the Evaluation Criteria value is not displayed.

3. Slide [Start] down.

MEMO	For enhanced measurement accuracy, wait until the measured vibration magnitude has stabilized before tapping [Start].

The SX-A1VA starts measuring and saving into the SD card.

Important	- Do not power off or pull out the SD card during measurement.

MEMO	- The trigger mode is “free", you cannot change. Free : Starts measurement immediately. After the specified time of measuring, it finishes the measurement. - Waveform recording is OFF, when Measurement mode: average. - If the SA-A1WD is connected to a wireless LAN, a confirmation message for switching the connection type appears. Instantaneous values can be saved by using the [Save] button on the Measurement screen. - When you start measurement, “Start” changes to “Stop." - The screen displays [MEASUREMENT] on the status bar during measurement. - Tap [Setting] during measurement or a trigger standby period to display the current settings.

MEMO	- You cannot use the [Vibration Meter/FFT] button or the [Recall] button during measurement, trigger standby, or pause. - If overload occurs during measurement, the screen displays as follows: - A red marker is displayed on the Time-Value graph. - An “OVERLOAD” icon is displayed on the bar graph. - The background color of the overloaded vibration magnitude changes to red. - Depending on whether the “Automatic show-up of save screen” is ON / OFF, the ways of saving data are different after a measurement is completed or stopped. For details on saving, see P.83. - OFF : The average result is displayed on the screen, but a confirmation screen for saving the measurement result is not displayed. To save the result, tap the [Save] button. - ON : A confirmation screen to save the measurement data is brought up after a measurement. If you want to check the result after the measurement is completed or stop immediately, set it to [ON].

Stopping Evaluation · Measurement (Measurement Mode: Average)

1. Slide [Stop] down.

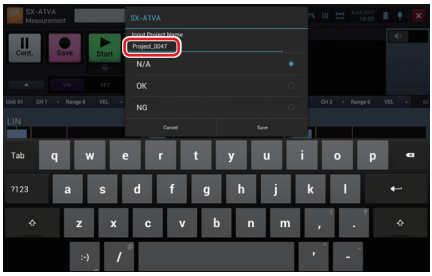
MEMO	- Stop measurement when you want to do so before the specified measurement time elapsed. - When you stop measurement, [Stop] changes to [Start] and the screen displays [PAUSE] on the status bar.

Saving Evaluation • Measurement Results (Measurement Mode: Average)

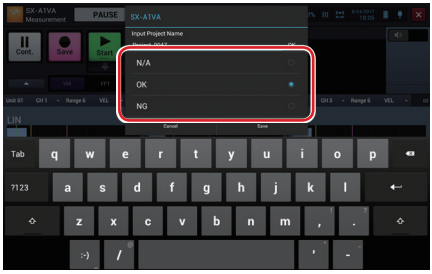
The method for saving differs, depending on whether “Automatic show-up of save screen” is set to ON or OFF. For information on how to make this setting, see “Setting Automatic show-up of save screen” (P.129).

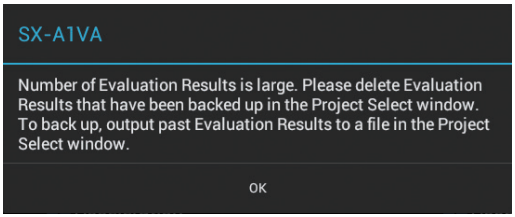
- Automatic show-up of save screen to ON:
  A confirmation screen asking whether to save measurement result appears when measurement has completed or has been stopped by the user.

1. **Enter a project name.**

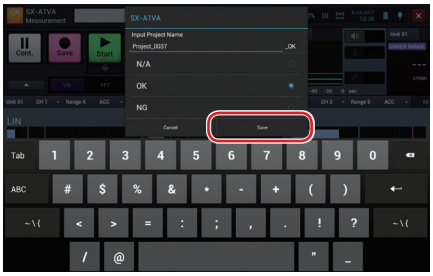


2. **Select a suffix to add to the end of the project name.**



MEMO	- The selectable suffixes are as follows: [N/A]: No suffix is added. [OK]: “_OK” is added to the end of the project name. (Example: “Project_0001” becomes “Project_0001_OK".) [NG]: “_NG” is added to the end of the project name. (Example: “Project_0001” becomes “Project_0001_NG".) - The following message will be displayed, when there are many stored Evaluation data.  Save the measurement result as a CSV file by Output File and back up. Also delete old data or unnecessary data from the select project screen.

3. Tap [Save].



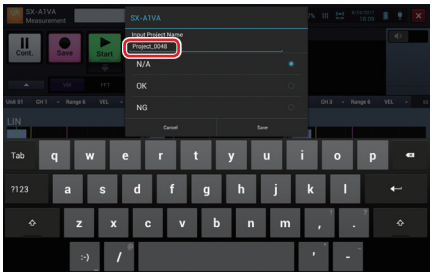
The measurement results are saved. Tap [Cancel] to return to the Measurement screen without saving measurement results. If measurement has completed or has been stopped while measurement mode is set to “Ave.”, the system goes into the pause condition and the averaging result is shown on the Measurement screen.

MEMO	- To save the canceled measurement result, tap [▲] in the operation area, and then tap [Do you want to save the previous measurement result?].

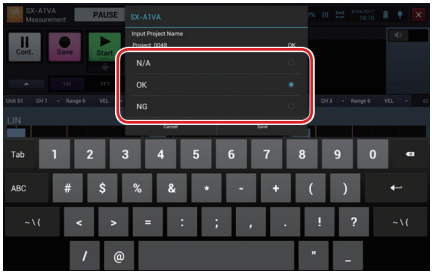
- Automatic show-up of save screen to OFF:
  When the measurement is completed or stopped, the measurement screen is in PAUSE, and data of Average results are displayed on the screen.

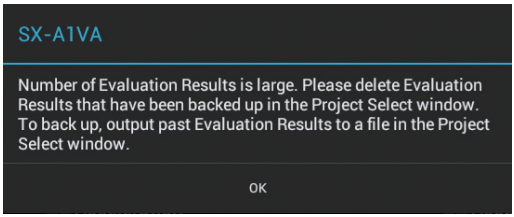
1. **Tap [Save].**

2. **Enter a project name.**

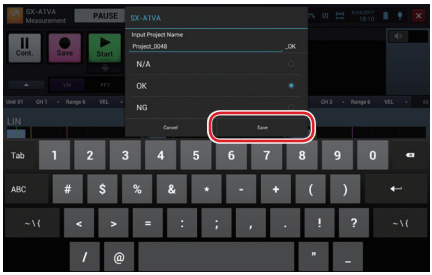


3. **Select a suffix to add to the end of the project name.**



MEMO	- The selectable suffixes are as follows: [N/A]: No suffix is added. [OK]: "_OK" is added to the end of the project name. (Example: "Project_0001" becomes "Project_0001_OK".) [NG]: "_NG" is added to the end of the project name. (Example: "Project_0001" becomes "Project_0001_NG".) - The following message will be displayed, when there are many stored Evaluation Results.  Save the measurement result as a CSV file by Output File and back up. Also delete old data or unnecessary data from the select project screen.

4. Tap [Save].



The measurement results are saved. Tap [Cancel] to return to the Measurement screen without saving measurement results. If measurement has completed or has been stopped while measurement mode is set to "Ave.", the system goes into the pause condition and the averaging result is shown on the Measurement screen.

MEMO	- To save the canceled measurement result, tap [▲] in the operation area, and then tap [Do you want to save the previous measurement result?].

Checking Measurement Results

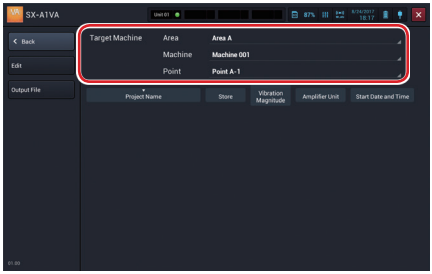
Data measured in Evaluation mode can be checked on the Recall screen.

1. **On the Measurement screen (in evaluation mode), tap [Recall].**

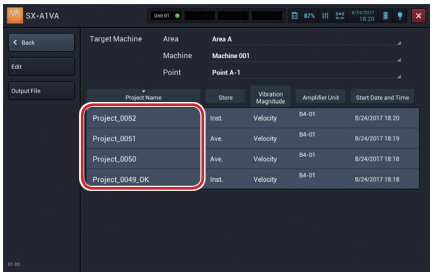
Select Project Screen is displayed

2. **Select the measurement target machine.**

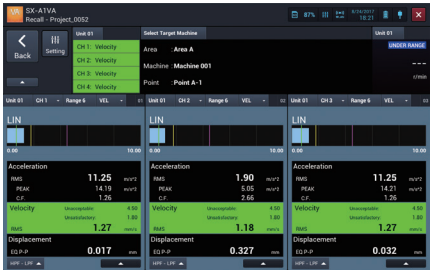
Tap [Area], [Machine], and [Point] to select the project for which to display data.



3. Tap the project name of measurement data to be displayed.



Recall screen is displayed

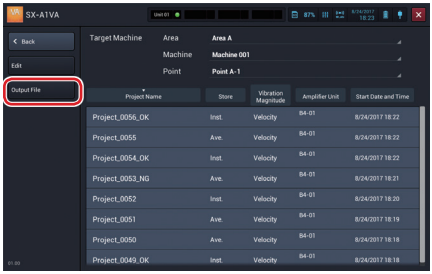


MEMO	- The steps for controlling the graph are the same as “Operating Recall Screen (VM Mode)”. Refer to the P.104

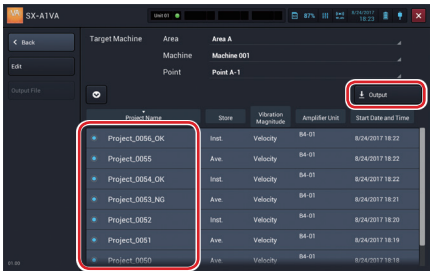
Output File of Evaluation Results

Tap the button to output the Evaluation results to a file. One file will be created for each measurement location selected on the Select Project screen.

1. **Tap [Output File].**

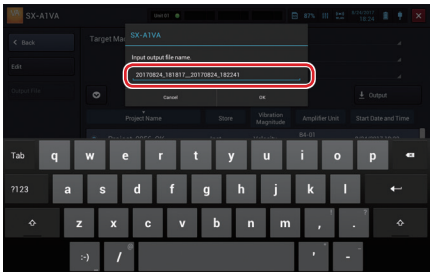


2. **Tap the project for which to output a file, and tap [Output File].**



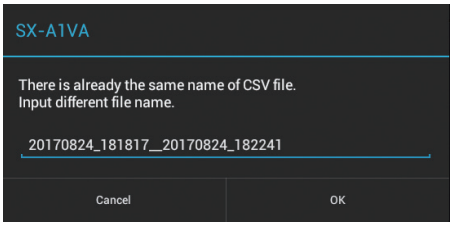
MEMO	- Selected projects are indicated by a [●] at left. - To deselect a project, tap it once more.

3. Enter the name and tap [OK].

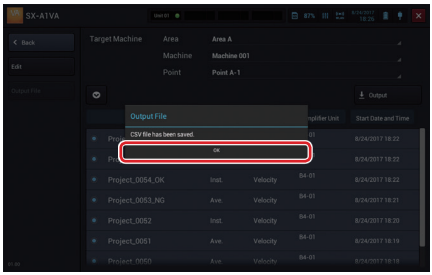


MEMO

- The file is output to the target machine folder that is currently selected in the SX-A1VA folder.
- The file name is automatically generated from the selected project.The name is created using the oldest and the newest measurement date in the selected project.
- If a file of the same name exists already, tapping [OK] once more will bring up the input screen again.

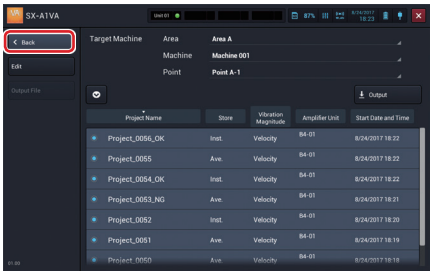


4. **When file output is completed, a message appears. Tap [OK].**



MEMO	- Depending on the number of selected projects, the time to complete the save will be longer.

5. **Tap [Back]**.

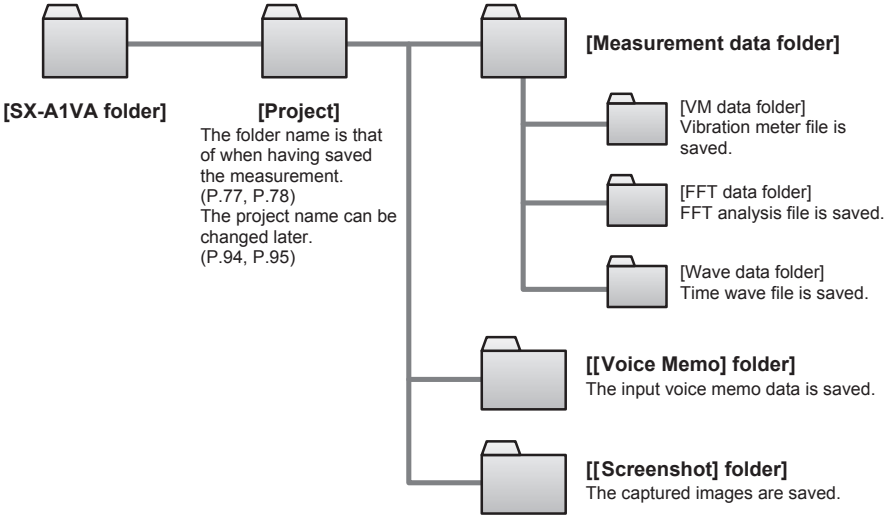


Back to the Select Project Screen

Operating the Project (VM Mode)

Project

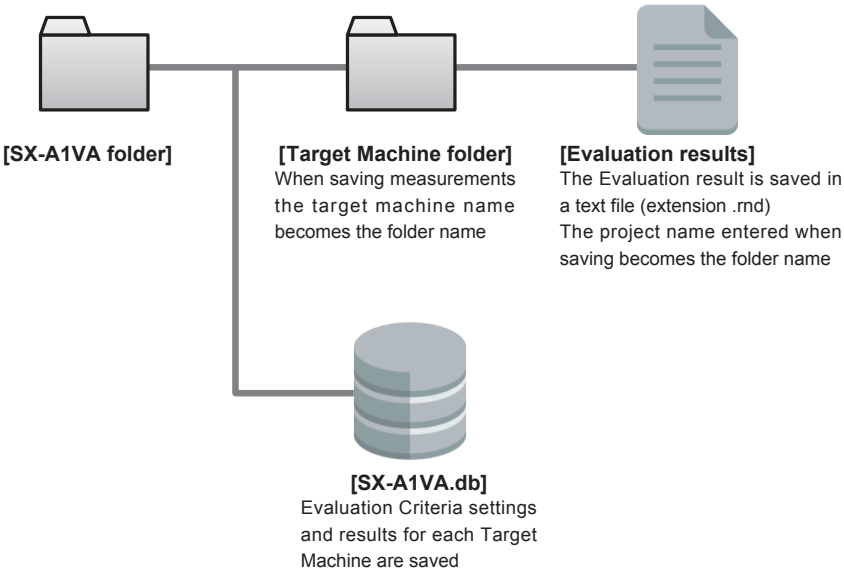
Project is a folder to save data such as a measured record. All data regarding measured records are saved in the same project.
The project name can be changed to any name later.



MEMO	- When a project has been transferred via an SD memory card to a computer, it can be transferred back and used again on the unit. Do this by saving the project directly into the “SD card\SX-A1VA” folder.

Unlike projects in vibration meter mode and FFT mode, a project for Evaluation is stored as a text file (extension .rnd) and database file (SX-A1VA.db). The text file is stored in the selected target machine folder.

The Select Project screen of Evaluation allows the following operations: [Opening the Project], [Changing the Project Name], [Deleting the Project], and [Displaying a Screenshot]. First select the measurement target machine to which the project belongs, and then perform the respective steps.



Target machine folder name is named based on the following rule.
[Area name]_[Machine name]_[Point name]
Example: Area: “Area A”, Machine: “Machine001”, Point: “Point A-1” becomes “Area A_ Machine001_Point A-1” folder

MEMO	- When a project has been transferred via an SD memory card to a computer, it can be transferred back and used again on the unit. Do this by saving the project directly into the “SD card\SX-A1VA” folder. The measurement target machine folder and text file are not required. Storing only the measurement target machine folder and text file does not enable reuse on the RIONOTE. - Because the measurement target machine folder is created based on the language setting of the RIONOTE, the text file save location will differ according to the language environment.

Opening the Project

1. Tap [Recall] on the Measurement screen.

The Select project screen is displayed.

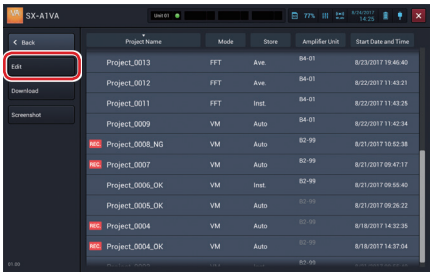
2. Tap the name of the project you want to open.

The Recall screen appears and displays measurement data of the selected project .

Changing the Project Name

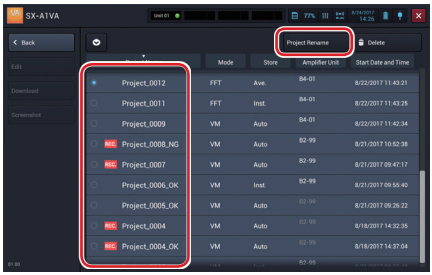
1. **Tap [Recall] on the Measurement screen.**

2. **Tap [Edit].**



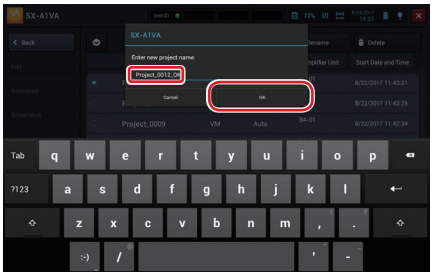
The Select edit project screen is displayed.

3. **Tap the project of which you want to edit the name and tap [Project Rename].**



MEMO	- You can select only one project. - When the project is selected, [●] appears to the left of the project. - Tap the selected project again to cancel the selection.

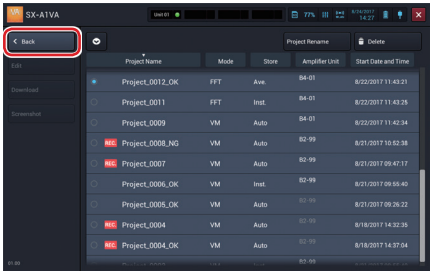
4. Enter the name and tap [OK].



The project is renamed and you return to the Edit Project screen.

MEMO	- You cannot rename a project to an existing project name. If you try to rename to an existing project name, an error message is displayed.

5. Tap [Back].



Back to the Select Project Screen

Downloading Waveform Data

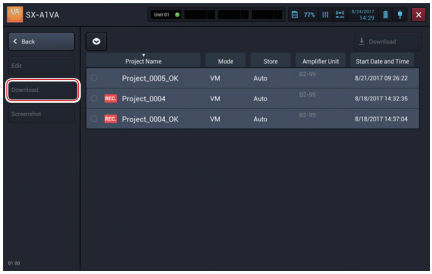
The measurement mode, amplifier unit connection method, and waveform recording settings determine how the measurement data and time waveform data are saved on the SD card in the amplifier unit.

- Vibration meter mode: If the SA-A1WD is connected via wireless LAN, the measurement data and time waveform data are saved. (Time waveform data are saved only if waveform recording is ON.)
- FFT mode: Time waveform data are saved if waveform recording is ON, regardless of the amplifier unit connection method.

To save measurement data and time waveform data on the SD card in the RIONOTE, the data must be downloaded.

1. **Tap [Recall] on the Measurement screen.**

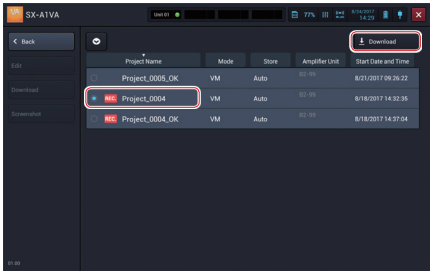
2. **Tap [Download].**



The Download project screen is displayed.

MEMO	- For projects whose measurement data and time waveform data are both saved on the SD card in the amplifier unit, the amplifier unit name is shown in gray. - An amplifier unit name of a project is displayed in yellow when measurement data of that project is saved in the SD card of the amplifier unit.

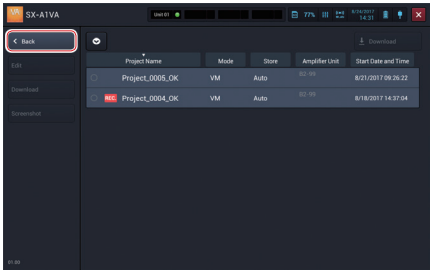
3. Tap the project you want to download, and then tap [Download].



The selected measurement data is downloaded to the SD card of this device.

MEMO	- You can select multiple projects. - When the project is selected, [●] appears to the left of the project. - Tap the selected project again to cancel the selection. - Tap to select all projects.

4. Tap [Back].

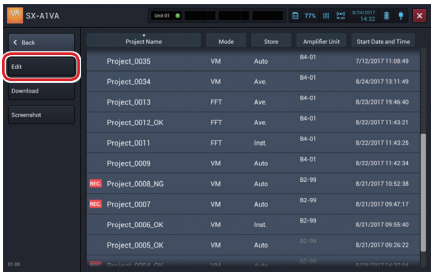


Back to the Select Project Screen

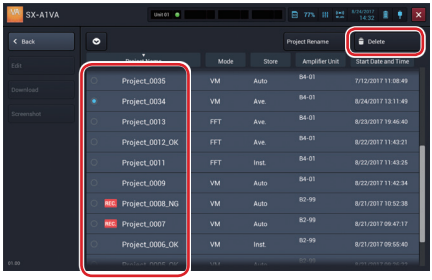
Deleting the Project

1. **Tap [Recall] on the Measurement screen.**

2. **Tap [Edit].**



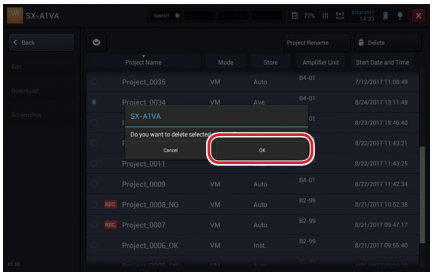
3. **Tap the project to delete and tap [Delete].**



A delete confirmation message is displayed.

MEMO	- You can select multiple projects. - When the project is selected, [●] appears to the left of the project. - Tap the selected project again to cancel the selection. - Tap ⌄ to select all projects.

4. Tap [OK].

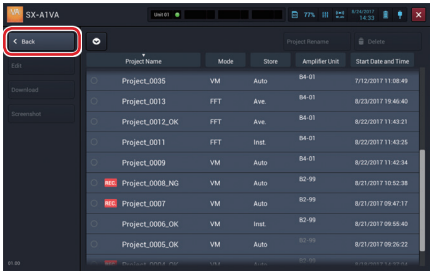


The project is deleted and you return to the previous screen.

Important

- If you delete the project, you cannot restore data. Check if data is unnecessary before deleting.

5. Tap [Back].



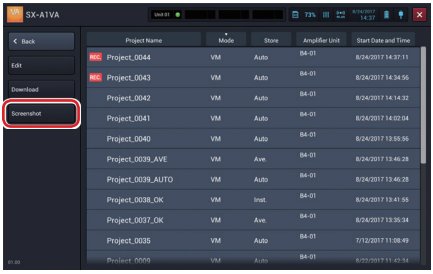
Displaying a Screenshot

You can display screenshots captured in the Measurement screen and Recall screen by retrieving them from a project.

1. **Tap [Recall] on the Measurement screen.**

   The Select Project screen is displayed.

2. **Tap [Screenshot].**



   Projects that include screenshots are displayed.

3. Tap a project that includes a screenshot you want to display.

The screenshot is displayed.
When there are multiple screenshots, you can switch them by tapping the arrows beside the number of pages in the lower part of the screen.

4. Tap [Delete] to delete a screenshot currently displayed.

5. Tap [Close] to return to the Select Project screen.

MEMO	- “File Name,” “Delete,” “Close,” and “Number of Pages” are hidden after a while. When you tap the screen, they are displayed again. - This function is for browsing image data in a project. Screenshots saved in the “Others” or “SX-A1VA\Others” folder cannot be viewed on the RIONOTE.

Operating Recall Screen (VM Mode)

Capturing Recall Screen

You can save the Recall screen in a PNG format image file.

1. **Open a project and display the Recall screen.(P.94)**

2. **Tap [▲] in the operation area of the displayed Recall screen.**

3. **Tap [Screenshot].**

The screen is saved.

MEMO	- The screen image file is saved as a black and white reversal image to be suited to printing with a computer. - A captured image file is saved in the project folder when Vibration Meter Mode (Standard). - You can also save a screenshot with multi-function key. - When Vibration Meter Mode (Standard), the image files can be displayed on this device. (“Displaying a Screenshot” P.101)

Save Measurement Values at the Cursor Position as Instantaneous Values (Vibration Meter Mode (Standard))

Save the measurement values at the cursor position of the Time-Value graph as instantaneous values.

1. **Move the cursor to the desired position in the Time-Value graph.**

2. **Tap [Output] in the operation area.**

The instantaneous values are saved.

MEMO	- The instantaneous values are saved in the project folder.

Playing a Voice Memo (Vibration Meter Mode (Standard))

You can play a voice memo recorded during measurement.

1. **In the Time-Value graph, tap a voice memo marker you want to play.**

The voice memo is played.

2. **To stop playback, tap [Stop] in the operation area**

The voice memo playback is stopped.

Inserting a Marker into Measured Data (Vibration Meter Mode (Standard))

You can insert a marker to measured data.

1. **Tap [Marker].**

2. **To change the ending point of the marker, slide the ending line to the desired point.**

MEMO	- You cannot move the ending line to a point earlier than the starting line. If you move it before the starting line, the starting line moves too.

3. **To change the starting point of the marker, slide the starting line to the desired point.**

MEMO	- You cannot move the starting line to a point later than the ending line. If you move it after the ending line, the ending line moves too.

4. **To move the marker range, slide the gray portion.**

The marker moves keeping its range.

5. **When you decide the marker position, tap [ENTER] below the marker.**

The marker is inserted in the selected area.

6. **To stop inserting markers, tap [Marker].**

MEMO	- When markers overlap one another, they are displayed in the following order of precedence: Overload > Voice memo > Threshold 2 > Threshold 1 > Marker inserted by the user

Deleting a Marker (Vibration Meter Mode(Standard))

1. **Tap [Marker].**

2. **Tap [Delete] below the marker to delete.**

The marker is deleted.

MEMO	- [Delete] may be hidden if a marker you are inserting is overlapping. In such a case, move the marker you are inserting.

Operating the Graph (VM Mode)

Zooming In/Out on the Time-Value Graph (Vibration Meter Mode (Standard))

In vibration meter mode, you can zoom in/out on the Time-Value graph

1. **To zoom in, pinch out (open two fingers) on the Time-Value graph.**

2. **To zoom out, pinch in (close two fingers) on the Time-Value graph.**

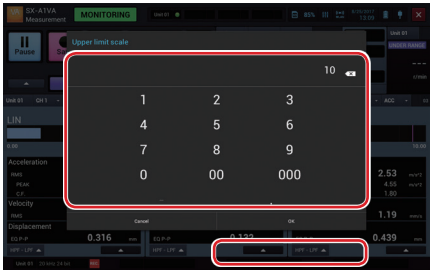
MEMO	- The maximum time that can be displayed in the Time-Value graph is as follows. - Measurement screen: 2 minutes - Recall screen: 1 hour

Changing the Y Axis Scale of Time-Value Graph (Vibration Meter Mode (Standard))

Tap the upper part of the Y axis label to change the upper limit scale or tap the lower part of it to change the under limit scale.

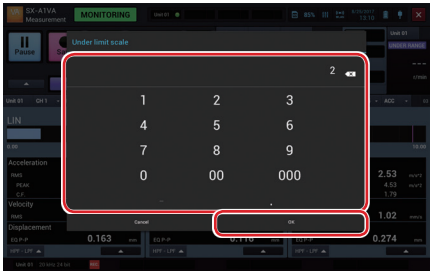
1. **Tap the upper part of the Y axis label.**

2. **Enter the upper limit value of the scale and tap [OK].**



3. **Tap the lower part of the Y axis label.**

4. **Enter the under limit value of the scale and tap [OK].**



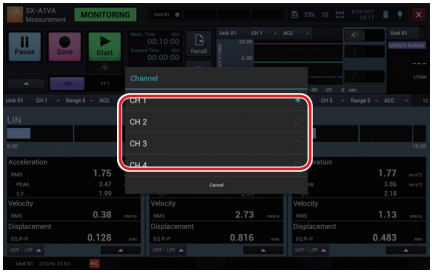
MEMO	- Double-tap the Y axis label to return to the initial state.

Switching the Display Contents on Graphs

The graph of the vibration magnitude of the selected channel is displayed. Changing each item enables you to change the graph view.

1. **Tap the channel number to change the channel.**

2. **Tap the channel number to display.**



3. Tap the input range to change the input range of the channel.

MEMO	- You cannot change the input range on the Recall screen.

4. Tap the desired input range.

5. **Tap the vibration magnitude to change the target vibration magnitude.**

6. **Tap the target vibration magnitude to display.**

MEMO	- You can select from “Acceleration,” “Velocity,” or “Displacement” for the target vibration magnitude.

Checking the HPF and LPF settings

To check the HPF and LPF settings for each vibration quantity in selected channels, bring up the checking screen.

MEMO	- The HPF and LPF settings cannot be modified from this screen.

1. **Tap [HPF-LPF ▲] in the graph for the settings that you want to check.**

2. **The HPF and LPF settings for each vibration quantity in the channel of the selected graph are shown.**

Tap [Close] to return to the original screen

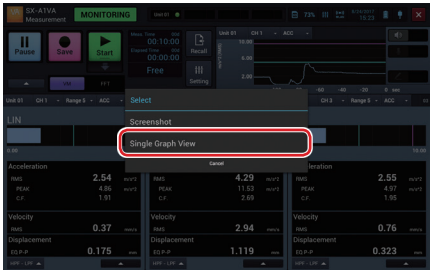
Using the Single Graph View

When using the multiple graph display (two to four graphs), zoom in on the selected graph for the single graph view.

MEMO	- You can select the single graph view setting when you using the multiple graph display. - The number of graphs to display can be selected from [Graph Settings] in [Setting]. (P.141)

1. **Tap [▲] on the graph on which you want to see as the single graph.**

2. **Tap [Single Graph View].**



The selected graph is displayed in the entire graph display area.

MEMO	- You can also double-tap the graph to switch the display.

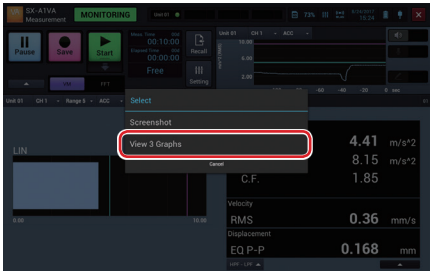
Using the Multiple Graph View

Change the graph view displayed in the entire graph display area (single graph view) to the multiple view.

MEMO	- You can zoom out of a graph when using the multiple graph view. You cannot zoom out when using the single graph view setting. - The number of graphs to display can be selected from [Graph Settings] in [Setting].(P.141)

1. **Tap [▲] on the graph when the single graph.**

2. **Tap [View 2 Graphs], [View 3 Graphs], or [View 4 Graphs].**



The graph is changed to the multiple view.

MEMO	- You can also double-tap the graph to switch the display.

Capturing the Screenshot of the Graph

You can save a screenshot of a specified graph in a PNG format image file.

1. **Tap [▲] on the graph you want to capture a screenshot.**

2. **Tap [Screenshot].**

The graph is saved in a PNG format image file.

MEMO	- The captured graph image file is saved as a black and white reversal image suitable for printing with a computer. - A file of graph image captured during measurement is saved in the project folder. - Graphs captured at times other than during measurement or on the Recall screen are saved in the “SX-A1VA\Others” folder on the SD card. - On Evaluation, graphs captured during measurement or on the Recall screen are saved in the “SX-A1VA\Others” folder on the SD card. - You can use the multi-function key to capture all the graphs currently displayed on the screen into an image file. - Image files captured during measurement and captured on the Recall screen can be displayed on this device.(P.101)

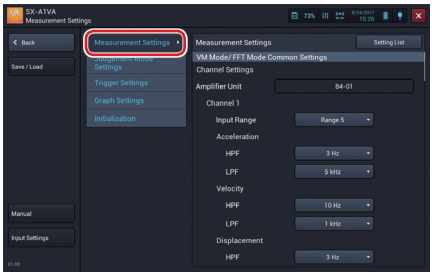
Settings (VM Mode)

Configuring the Amplifier Unit

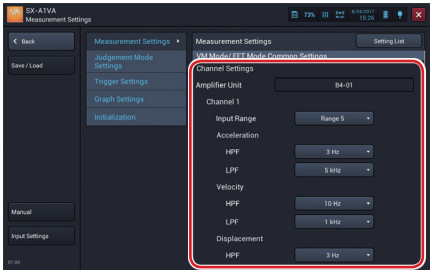
Change the settings of the amplifier unit.

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Measurement Settings].**



3. **Configure each item for [Amplifier Unit].**



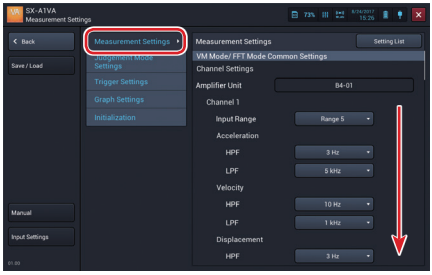
MEMO	- The available setting items are different for vibration meter mode - standard evaluation mode, vibration meter mode - evaluation criteria, and FFT mode. - For details on settings for each item, see “HTML for Instruction Manual Application” provided with this device.

Configuring Various Items for Measurement (Vibration Meter Mode (Standard))

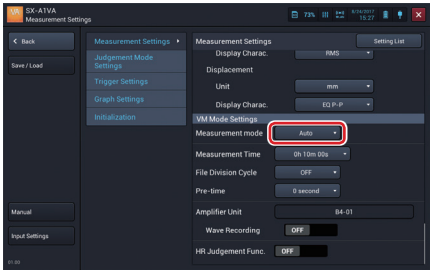
Configure the measurement time, division cycle, and pre-time for measurement in vibration meter mode.

1. **Tap [Setting] on the Measurement screen in vibration meter mode.**

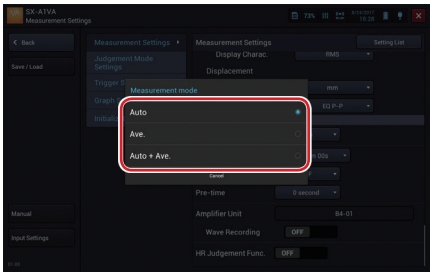
2. **Tap [Measurement Settings] and scroll the screen down.**



3. **Tap [▼] on [Measurement mode] in [VM Mode Settings].**

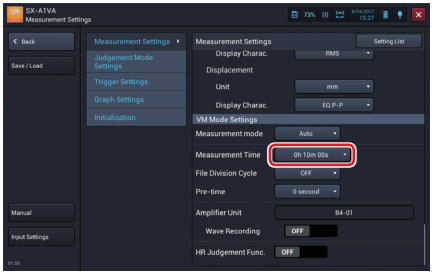


4. Tap the measurement mode to set

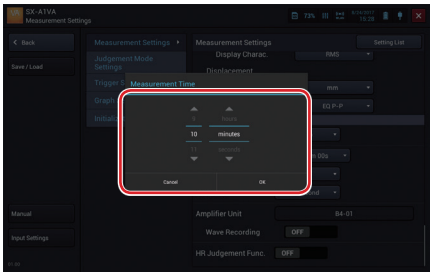


MEMO	- The measurement mode can be selected from [Auto], [Average], [Auto+Average].

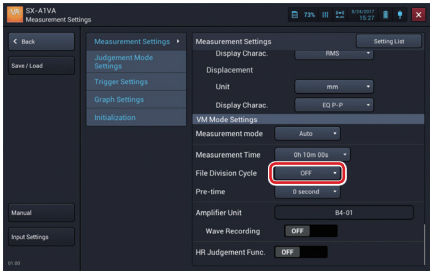
5. Tap [▼] in [Measurement Time] of [VM Mode Settings].



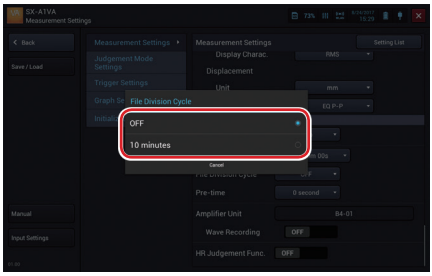
6. **Slide the measurement time to configure and tap [OK].**



7. **Tap [▼] on [File Division Cycle].**

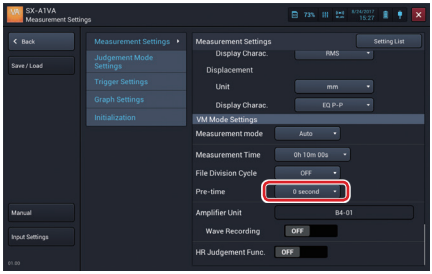


8. Tap the file division cycle to set.

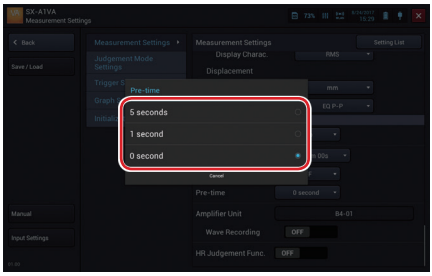


MEMO	- You can select [OFF] or [10 minutes] for the file division cycle. - When the measurement mode is “average”, the file division cycle cannot be set.

9. Tap [▼] on [Pre-time].



10. Tap the pre-time to configure.



MEMO	- You can select from [5 seconds], [1 second], and [0 second] for the pre-time. - The pre-time is not displayed when the following settings: - Measurement mode is [Average]. - Measurement modes other than the above are set, and “Time” or “Tacho Pulse” is selected on the trigger source of the trigger settings.

Setting Automatic show-up of save screen

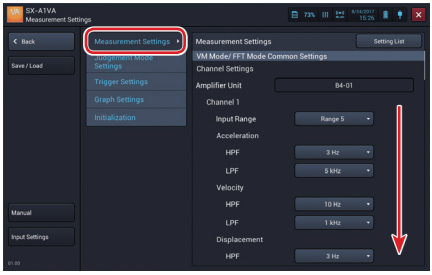
This setting affects the timing of the prompt for saving data that appears when measurement is completed or has been stopped, while measurement mode is set to “Average”.
Select the most suitable setting from the choices below.

- [OFF]: Averaging results are to be checked on screen before saving. (Saving can be performed by tapping [Save].)
- [ON]: Averaging results are to be saved without checking on screen. (Save prompt appears when measurement is completed or has been stopped.)

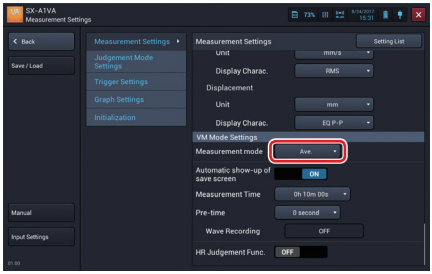
MEMO	Vibration meter mode - The Save Screen Auto Display applies only when the measurement mode is “Average” and the trigger is set to “Free” or “Single”. Evaluation mode - The Save Screen Auto Display applies only when the measurement mode is “Average” and the trigger is set to “Free”.

1. **Tap [Setting] on the Measurement screen in vibration meter mode.**

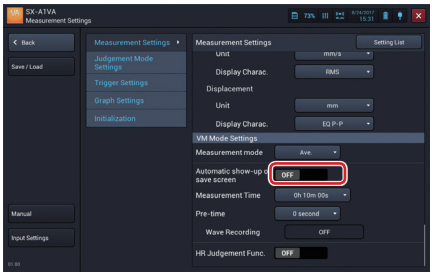
2. **Tap [Measurement Settings] and scroll the screen down.**



3. **Confirm that [Measurement mode] in [VM Mode settings] is [Average].**



4. **Tap to switch [ON] or [OFF] on [Automatic show-up of save screen] .**



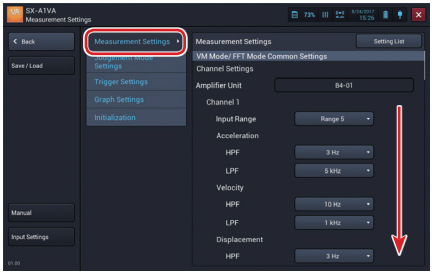
MEMO	- This screen example is the vibration meter mode, but the operation is the same in the evaluation mode.

Configuring Wave Recording (Vibration Meter Mode (Standard))

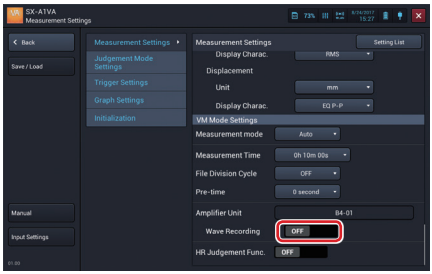
Configure whether or not to record waveform during measurement.

1. **Tap [Setting] on the Measurement screen in vibration meter mode.**

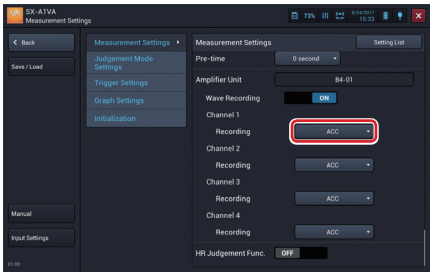
2. **Tap [Measurement Settings] and scroll the screen down.**



3. **To record waveform, switch to [ON] of [Wave Recording].**

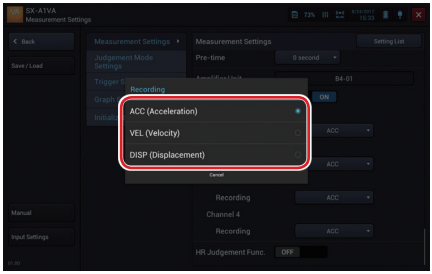


4. Tap [▼] on [Recording].



MEMO	- It is not displayed when [Wave Recording] is [OFF].

5. Tap the target of recording to set.



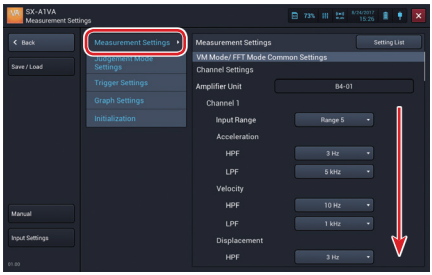
MEMO	- When the wave recording is set to ON, measurement data is saved into the SD card of the amplifier unit.

Configuring Threshold (Vibration Meter Mode(Standard))

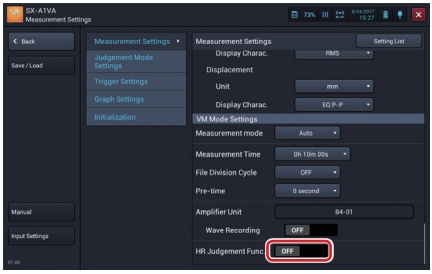
When the threshold judgement function is set to ON in vibration meter mode, the threshold of measured vibration magnitude can be judged by the specified value. The threshold is displayed in the “Time-Value graph area”, “graph display area”, and “threshold area.”

1. **Tap [Setting] on the Measurement screen in vibration meter mode.**

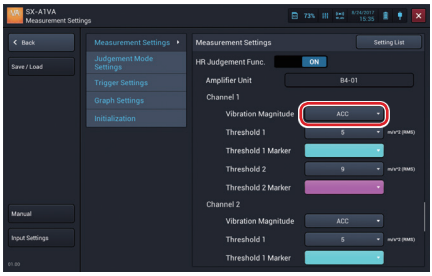
2. **Tap [Measurement Settings] and scroll the screen down.**



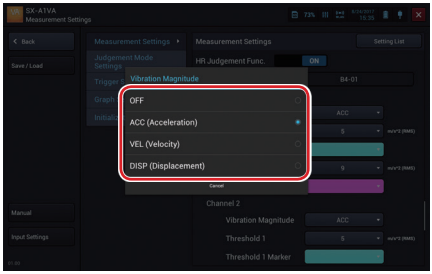
3. **Tap [TH Judgement Func.] to switch it to [ON].**



4. Tap [▼] on [Vibration Magnitude].

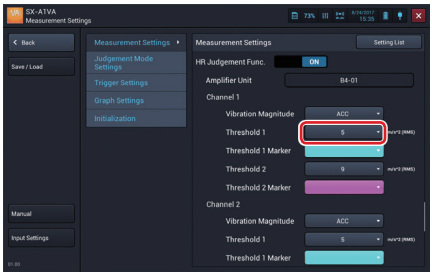


5. Tap the vibration magnitude to set.

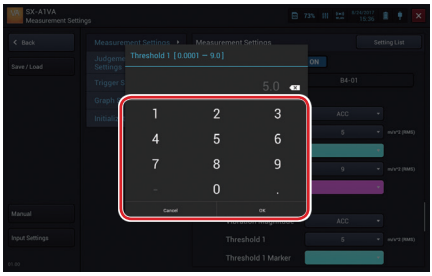


MEMO	- You can select from “Acceleration,” “Velocity,” or “Displacement” for the vibration magnitude. The threshold judgement is not done for the channel for which [OFF] is selected.

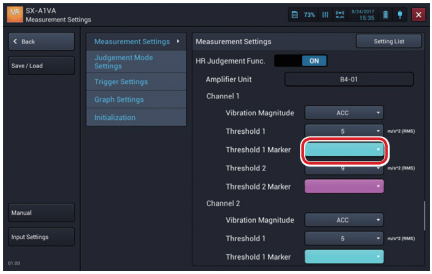
6. Tap [▼] on [Threshold 1].



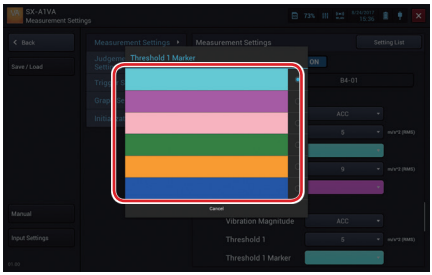
7. **Enter the value to set to threshold 1 and tap [OK].**



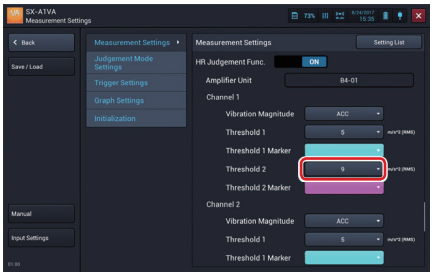
8. **Tap [▼] on [Threshold 1 Marker].**



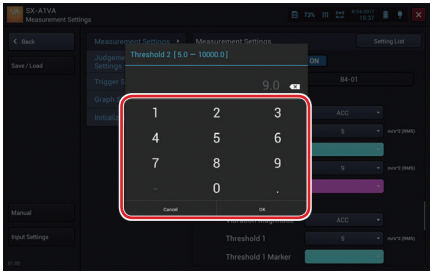
9. **Tap the color to set to Threshold 1**



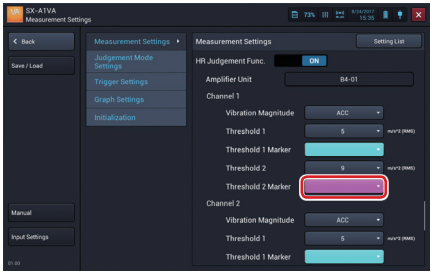
10. **Tap [▼] on [Threshold 2].**



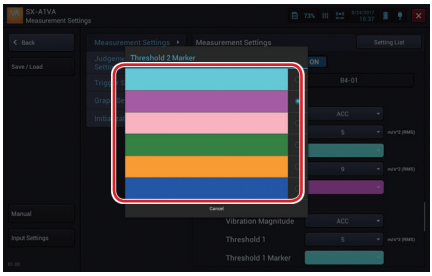
11. **Enter the value to set to threshold 2 and tap [OK].**



12. **Tap [▼] on [Threshold 2 Marker].**



13. Tap the color to set to threshold 2



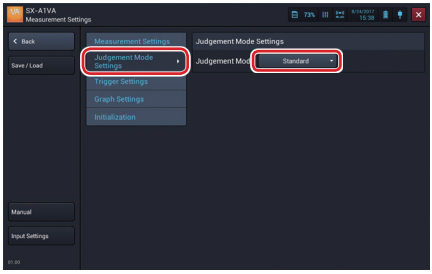
MEMO	- The judgement conditions of the threshold are as follows: Threshold 1: When the value does not exceed threshold 2 but exceeds the setting value of threshold 1 Threshold 2: When the value exceeds the setting value of threshold 2 - The dividing line of the specified threshold is displayed on the Time-Value graph and bar graph in the specified color. - When the vibration magnitude exceeds the threshold, the threshold 1 marker and threshold 2 marker are displayed on the Time-Value graph in the specified color.

Configuring the Judgement Mode

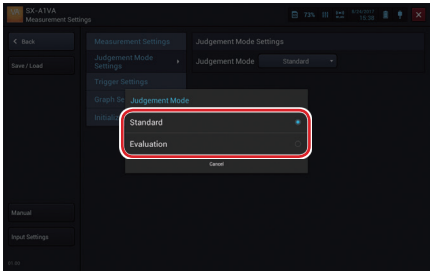
When the unit is operating in vibration meter mode and Judgement Mode has been switched to Evaluation, three Evaluation Criteria (“Acceptable”, “Unsatisfactory”, “Unacceptable”) have to be set, in accordance with ISO 10186-1.

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Judgment Mode Settings] and tap [▼] on [Judgment Mode].**



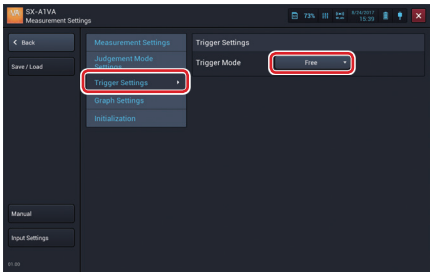
3. **Tap the mode to configure.**



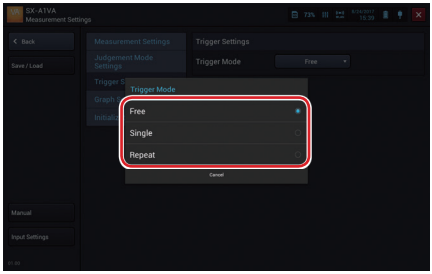
Configuring the Trigger Mode

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Trigger Settings] and tap [▼] on [Trigger Mode].**

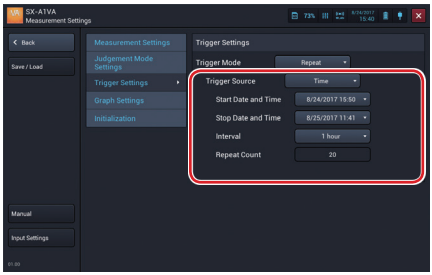


3. **Tap the trigger mode to configure.**



MEMO	- For details on the trigger mode, see “Trigger Settings”(P.276)

4. If you select [Single] or [Repeat], configure the trigger conditions.

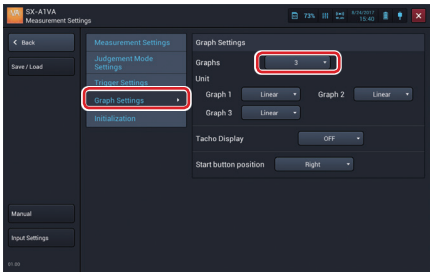


MEMO	- For details on settings for each item, see “HTML for Instruction Manual Application” provided with this device.

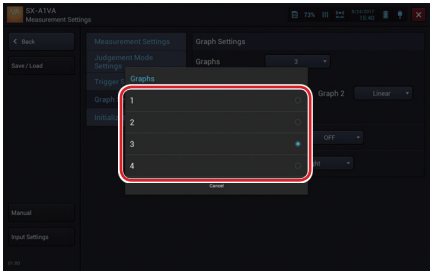
Configuring the Number of Graphs to Display

1. **Tap [Setting] on the Measurement or Recall screen.**

2. **Tap [Graph Settings] and tap [▼] on [Graphs].**



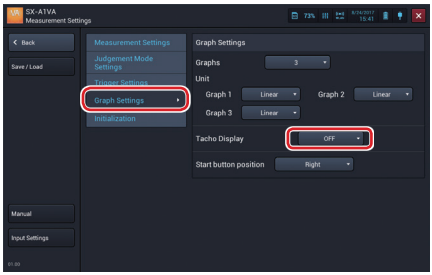
3. **Tap the number of graphs to display.**



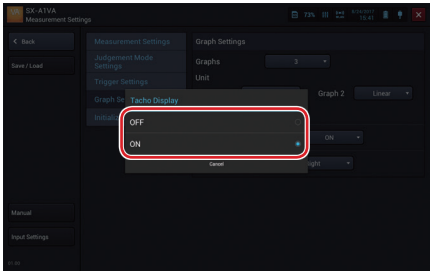
Configuring Tacho Display

1. **Tap [Setting] on the Measurement or Recall screen.**

2. **Tap [Graph Settings] and tap [▼] on [Tacho Display].**



3. **Select Tacho display [ON]. If you do not want to display it, tap [OFF].**

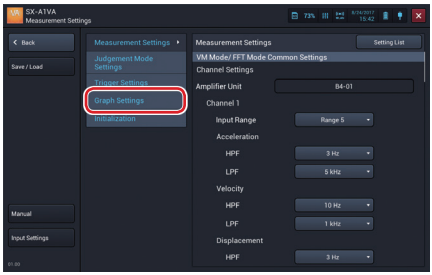


Setting the Position of the Start Button

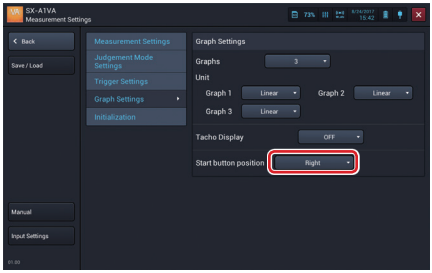
Change the position of the [Start] button in the operation area.

1. **Tap [Setting] on the Measurement screen.**

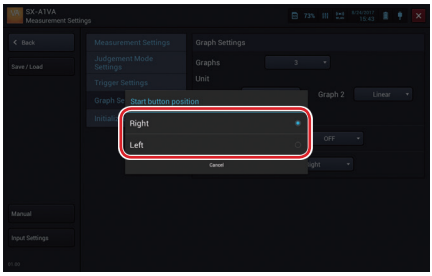
2. **Tap [Graph Settings].**



3. **Tap [▼] on [Start button position].**



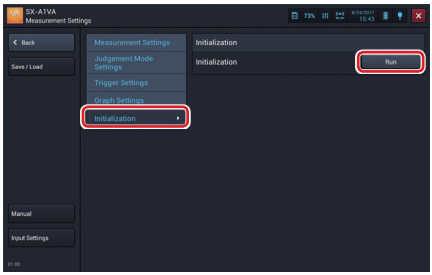
4. **Tap the position to place the button.**



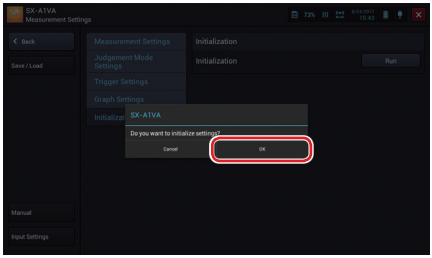
Initializing the Settings

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Initialization] and then [Run].**



3. **Tap [OK].**



Initialization is performed and all settings are reset to factory default settings.

Initial setting values are as follows:

Vibration Meter Mode

Item		Default
Measurement Settings Vibration Meter Mode • FFT Mode common Settings	Input Voltage Range	Range 5
	Acceleration HPF	3 Hz
	Acceleration LPF	5 kHz
	Velocity HPF	10 Hz
	Velocity LPF	1 kHz
	Displacement HPF	3 Hz
	Displacement LPF	500 Hz
	Acceleration Unit	m/s^2
	Acceleration Display Charac.	RMS
	Velocity Unit	mm/s
	Velocity Display Charac.	RMS
	Displacement Unit	mm
	Displacement Display Charac.	EQ P-P
Measurement Settings Vibration Meter Mode	Measurement Mode	Auto
	Save Screen Auto Display	OFF
	Measurement Time	0h 10m 00s
	File Division Cycle	OFF
	Pre-time	0 seconds
	Waveform Recording	OFF
	Target recording	Acceleration
	Threshold judgement function	OFF
	Vibration Magnitude	Acceleration
	Threshold 1	5
	Threshold 1 Marker	Cyan
	Threshold 2	9
	Threshold 2 Marker	Magenta
Judgement Mode Settings	Judgement Mode	Standard
Trigger Settings	Trigger Mode	Free
	Trigger Source	Vibration Magnitude
	Repeat Count	2
	Trigger Source	Channel1
	Trigger Slope	+
	Trigger Vibration Type	Acceleration
	Trigger Vibration Magnitude	10

Graph Settings	Graphs	3
	Unit	Linear
	Tacho Display	OFF
	Start button position	Right

Vibration Meter Mode • Evaluation

Item		Default
Measurement Settings Vibration Meter Mode • FFT Mode common Settings	Input Voltage Range	Range 5
	Acceleration HPF	3 Hz
	Acceleration LPF	5 kHz
	Velocity HPF	10 Hz
	Velocity LPF	1 kHz
	Displacement HPF	3 Hz
	Displacement LPF	500 Hz
	Acceleration Unit	m/s^2
	Acceleration Display Charac.	RMS
	Velocity Unit	mm/s
	Velocity Display Charac.	RMS
	Displacement Unit	mm
	Displacement Display Charac.	EQ P-P
	Save Screen Auto Display	OFF
	Measurement Time	0h 10m 00s
Measurement Settings Evaluation Mode Settings	Setting date	Date and time when initialized
	Acceptable	0.71
	Unsatisfactory	1.80
	Unacceptable	4.50

MEMO

- The setting of all measurement positions is the initial value in the above table.
- Initializing the graph setting is the same as in the vibration meter mode.
- For details on each item, refer to “Items on Setting Screens” (P.270).

Calibrating

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Input Settings].**

The Input settings screen is displayed allowing you to configure the amplifier unit.

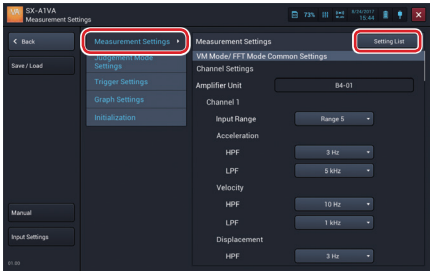
MEMO	- For details on input settings, see “Configuring the Calibration” in the RION-OTE Instruction Manual. - On the SX-A1VA, the application will not start if [High Pass Filter] on the input setting screen is set to anything other than OFF. But, change the setting of [High Pass Filter] as necessary when you calibrate using VE-10 on the Input Settings Screen.

Setting List of Measurement Settings

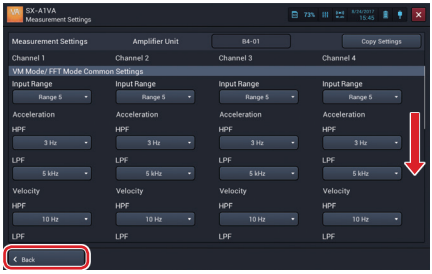
Measurement settings of each channel can be displayed on one screen for check and change.

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Measurement Settings] and then [Setting List].**



3. **Scroll the screen, check and change the settings, and tap [Back].**

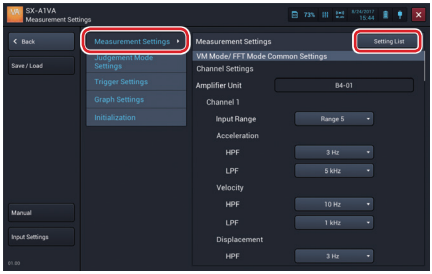


Copying the Measurement Settings

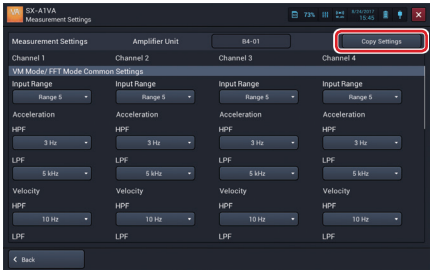
On the Setting List, you can copy the measurement settings of the selected channel to other channels at once.

1. **Tap [Setting] on the Measurement screen.**

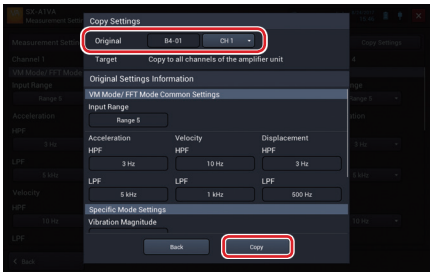
2. **Tap [Measurement Setting] and tap [Setting List] .**



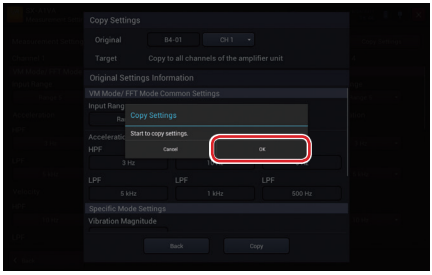
3. **Tap [Copy Settings].**



4. **Set the channel to be copied and tap [Copy].**

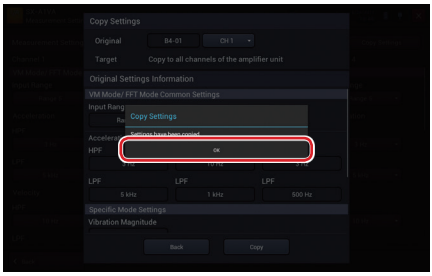


5. **Tap [OK] on the confirmation screen.**

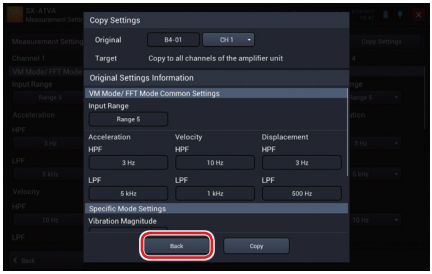


The measurement setting of the channel selected at the copy source is copied to all channels.

6. Tap [OK].



7. Tap [Back].



The screen returns to the setting list screen.

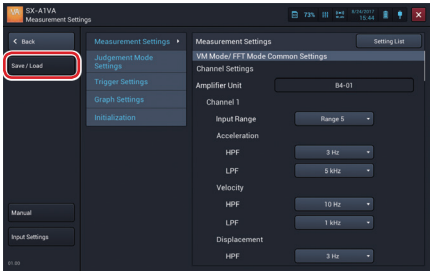
Saving the Current Settings

You can save settings configured in the Measurement settings screen. This allows you to load and restore the settings whenever you want. It is useful to save frequently-used settings. You can save up to five configurations in the internal memory and one configuration in the SD card as settings for startup (P.165)

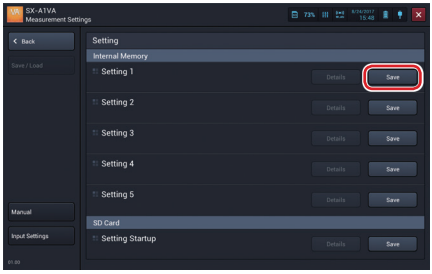
MEMO	Each setting for target machine of Evaluation is not saved

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Save/Load].**

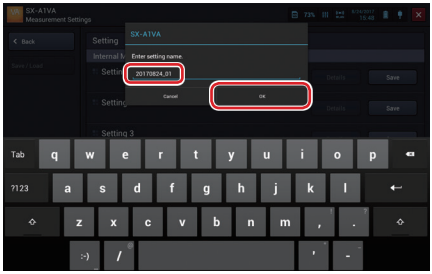


3. **Tap [Save] of the desired save location.**



MEMO	- If you tap [Save] of a line where settings are already saved, new settings overwrite the old ones.

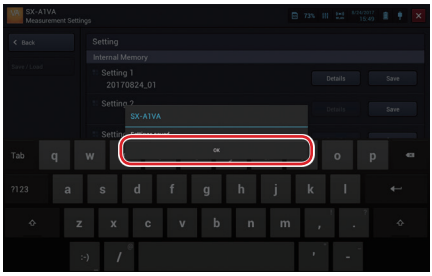
4. Enter the setting name to save and tap [OK].



When the settings are saved, a save completion message is displayed.

MEMO	- You can use alphabetical and numeric characters and underscore for a setting name.

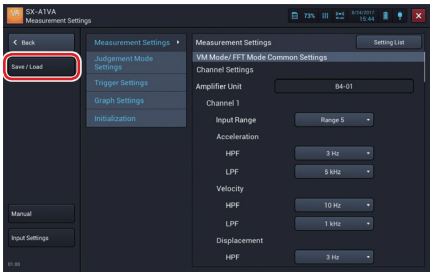
5. Tap [OK].



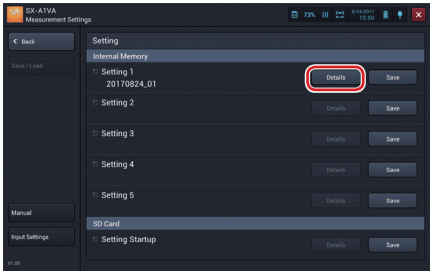
Confirming the Saved Settings

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Save/Load].**

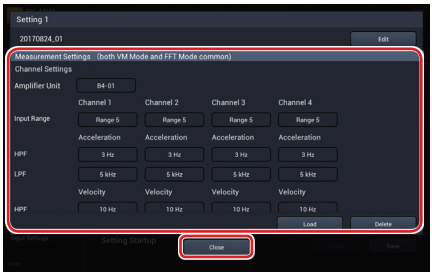


3. **Tap [Details] in the settings to check.**



The settings are displayed.

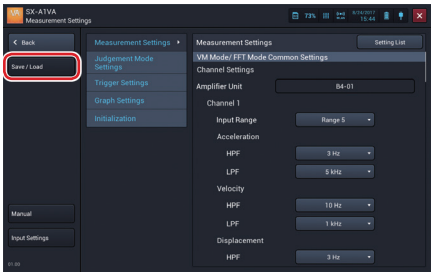
4. Check the settings and then tap [Close].



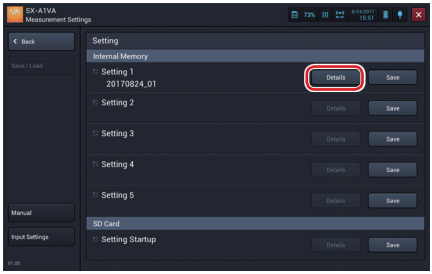
Loading the Settings

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Save/Load].**

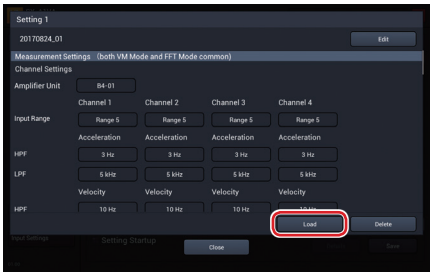


3. **Tap [Details] in the settings to load.**



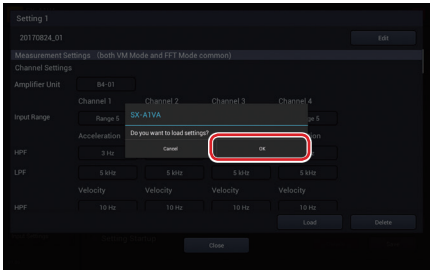
The settings are displayed.

4. Tap [Load].



A loading confirmation message is displayed.

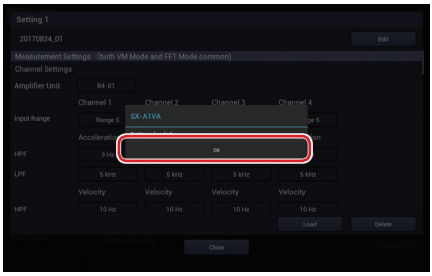
5. Tap [OK].



The settings are loaded.

MEMO	- Setting loading is not performed to Evaluation. - Evaluation settings are saved in the database.

6. Tap [OK].

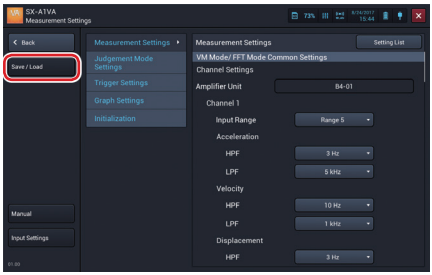


MEMO	- If you load the settings, the current settings will be deleted.

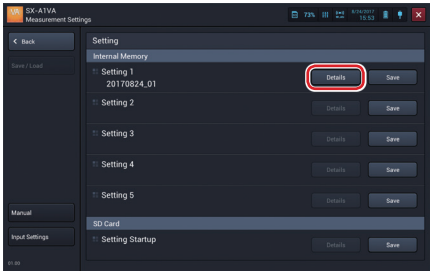
Changing the Name of Saved Settings

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Save/Load].**



3. **Tap [Details] in the settings to rename.**

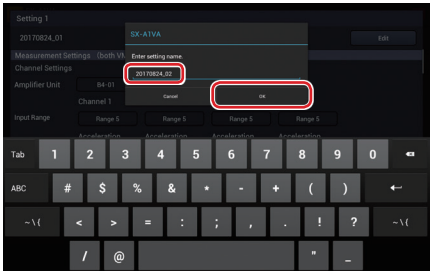


The settings are displayed.

4. Tap [Edit].

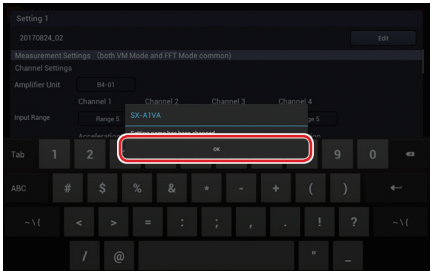
The setting name entry screen is displayed.

5. Enter a new setting name and tap [OK].



MEMO	- You can use alphabetical and numeric characters and underscore for a setting name.

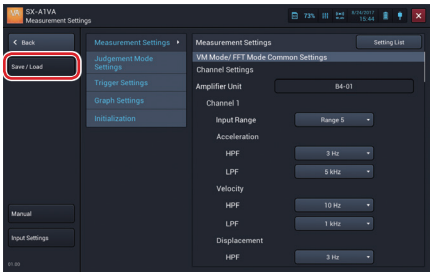
6. Tap [OK].



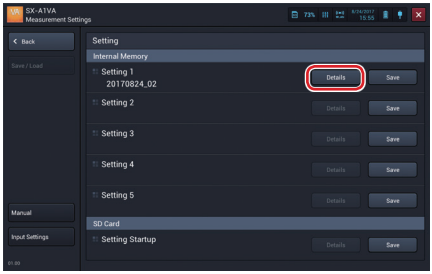
Deleting Settings

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Save/Load].**



3. **Tap [Details] in the settings to delete.**

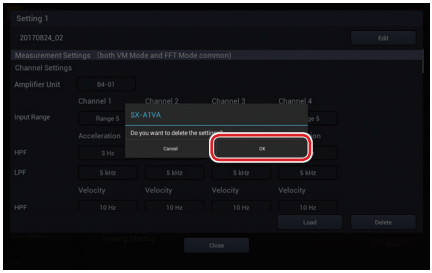


The settings are displayed.

4. Tap [Delete].

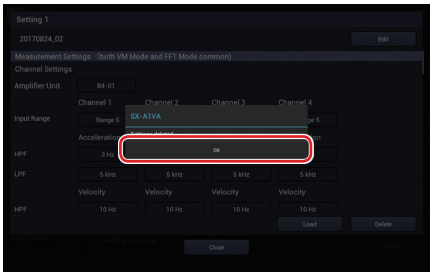
A delete confirmation message is displayed.

5. Tap [OK].



The settings are deleted.

6. Tap [OK].

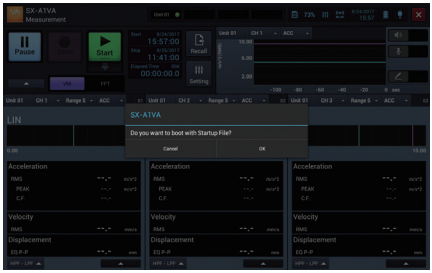


Important

- You cannot restore the settings you deleted. Make sure that the settings can actually be deleted before deleting.

About Settings for Startup

If a Startup File (setting startup file) is included in the SD card inserted into the RIONOTE, the following selection screen is displayed after “Measurement” is selected when the SX-A1VA is started.



Tap [OK] on this screen to load the settings in the Startup File. Tap [Cancel] to start with the settings when the SX-A1VA was shut down previously.

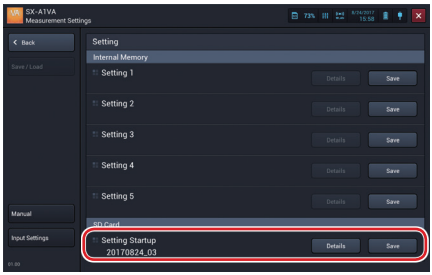
Handling the Startup File

The procedures for handling the Startup File such as saving and deleting are the same as those of the setting file in the internal memory.

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Save/Load].**

3. **Perform the operation on the Startup File such as saving and deleting.**



MEMO	- The Startup File is saved in [SX-A1VA] - [SETTING] - [STARTUP] folder in the SD card. - The settings can be taken over by loading the saved Startup File to other RIONOTE.

Important	- You cannot load the Startup File saved in the SD card if you change its name or edit it improperly.

FFT Mode

Screen Layout (FFT Mode)

Measurement Screen Layout

Status Bar

Displays the registered amplifier status, date and time, and battery status.

Operation Area

Displays the buttons for starting, stopping, and pausing measurement, and some measurement conditions.

Analysis Setting Area

Displays a part of setting items for measurement. You can change those settings.

Tacho Display Area

Displays the rotational speed of a selected unit. This area is not displayed when the tacho display is disabled.

FFT Graph Display Area

Displays graphs of data such as FFT analysis results of waveform data that is currently input. You can also change the analysis type to display an automatic domain waveform. By changing a setting, you can select the number of graphs to be displayed from 1 to 4. You can also check the abnormal state during analysis, such as OVERLOAD.

Recall Screen Layout

Status Bar
Displays the date and time and the battery status.

Operation Area
Provides operational buttons for moving to the Select project screen and Recall settings screen and shows the settings for analysis.

Analysis Setting Area
Shows the analysis setting items for measurement.

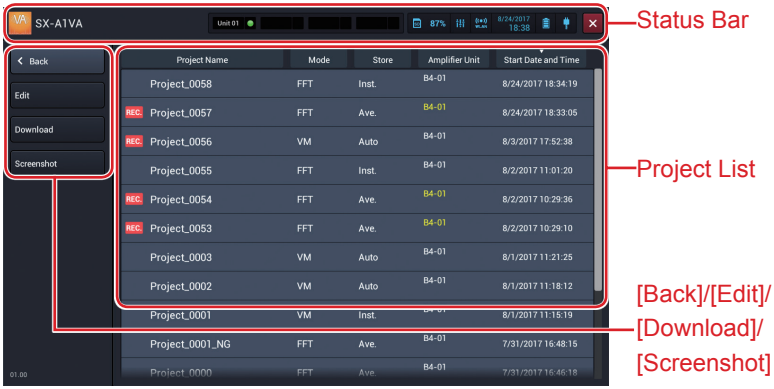
Measurement Date and Time Area
Shows the measurement date and time. For data recorded with the trigger mode set to Repeat, you can change the measurement result view.

Tacho Display Area
Shows the rotational speed of the measurement date and time. This area is not displayed when the tacho display is disabled.

MEMO	The tacho display area is not displayed when the following setting is active: - Store: Ave.

FFT Graph Display Area
Shows graphs of calculation results of the measurement date and time. By changing the analysis type, you can also display a time-domain waveform. By changing a setting, you can select the number of graphs to be displayed from 1 to 4. You can also check the abnormal state during recording, such as OVERLOAD.

Select Project Screen Layout



Status Bar
Displays the date and time and the battery status.

[Back]
Tap the button to return to the previous screen.

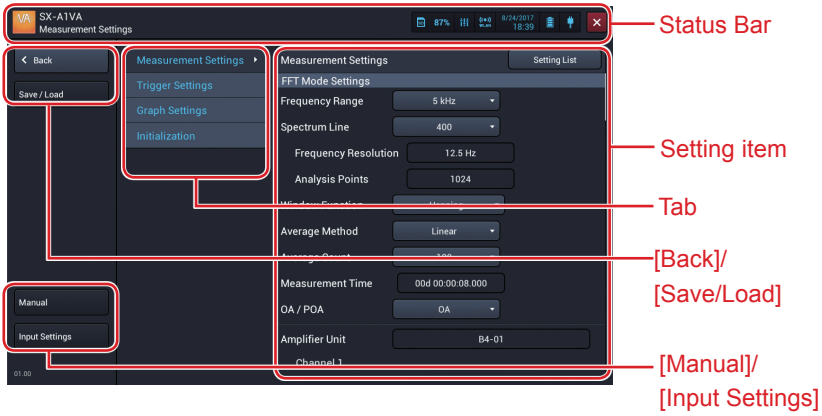
[Edit]
Tap the button to display the screen to change a project name or delete a project.

[Download]
Tap the button to download waveform data saved in the amplifier unit of the RIONOTE.

[Screenshot]
Tap the button to list projects in which screenshots are saved.

Project List
Displays the list of saved projects.

Setting Screen Layout



Status Bar
Displays the date and time and the battery status.

[Back]
Tap the button to return to the previous screen.

[Save/Load]
Tap the button to display the Save settings screen. This button appears when you move from the Measurement screen to the Setting screen.

MEMO	- If Judgement Mode is “Evaluation”, settings are saved in the database for each target machine, so they are excluded from loading.

[Manual]
Tap the button to display the HTML help.

[Input Settings]
Tap the button to display the Input settings screen. This button appears when you move from the Measurement screen to the Setting screen. (Refer to the manual of the RIONOTE)

Tab
The items settable on the Setting screen are displayed with tabs according to the purpose.

Setting item
Displays the setting items of the selected tab.

Measurement (FFT Mode)

Starting Measurement

1. **Slide [Start] down.**

The SX-A1VA starts measuring and saving into the SD card.

Important - Do not power off or pull out the SD card during measurement.

MEMO

- Depending on the trigger mode, the operation after starting measurement varies.
  - Free : Starts measurement immediately. After the specified average count of measuring, it finishes the measurement.
  - Single : Enters the trigger standby state and starts measuring when the trigger condition is met. After the specified average count of measuring, it finishes the measurement.
  - Repeat : Enters the trigger standby state and starts measuring when the trigger condition is met. An operation goes back in a trigger standby state after the specified average count of measuring. Measurement will end when data save is repeated for the set count.
- For details on how to configure the trigger mode, see “Configuring the Trigger Mode” (P.236).
- When the trigger mode is “Repeat”, “Wave Recording”becomes “OFF”
- When you start measurement, “Start” changes to “Stop".
- The screen displays [MEASUREMENT] on the status bar during measurement. The screen displays [STANDBY] during a trigger standby period.
- Tap [Setting] during measurement or a trigger standby period to display the current settings.
- You cannot use the [Vibration Meter/FFT] button and [Recall] button during measurement, trigger standby, or pause.
- In the following settings, a warning message appears and measurement does not start. Change any settings.
  Channel Number: 4
  Frequency Range: 20 kHz
  Analysis Points: 8192
  Wave Recording: ON

Stopping Measurement

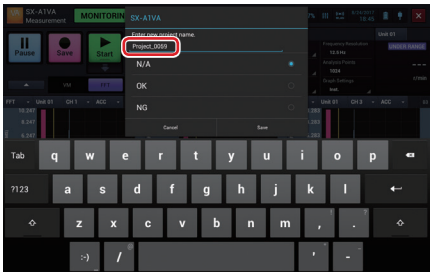
1. Slide [Stop] down.

MEMO	- Stop measurement when you want to do so before the specified measurement time elapsed. - When you stop measurement, [Stop] changes to [Start] and the screen displays [MONITORING] on the status bar.

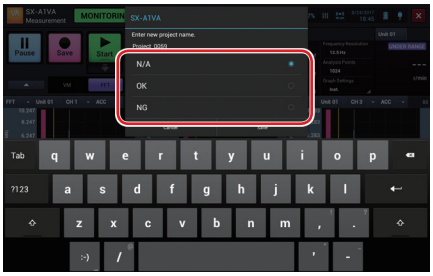
Saving Measurement Results

A confirmation screen to save measurement results is displayed when the measurement is completed or stopped.

1. **Enter a project name.**

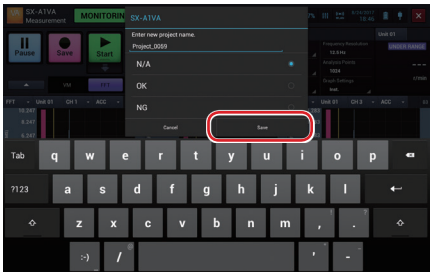


2. **Select a suffix to add to the end of the project name.**



MEMO	- The selectable suffixes are as follows: [N/A]: No suffix is added. [OK]: “_OK” is added to the end of the project name. (Example: “Project_0001” becomes “Project_0001_OK”.) [NG]: “_NG” is added to the end of the project name. (Example: “Project_0001” becomes “Project_0001_NG”.)

3. Tap [Save].



The measurement results are saved. Tap [Cancel] to return to the Measurement screen without saving measurement results.

MEMO	- To save the canceled measurement result, tap [▲] in the operation area, and then tap [Do you want to save the previous measurement result?]. - When measured with the wave recording set to ON, the waveform level data is saved into the SD card of the amplifier unit. To recall this data, you need to download it to the SD card of this device.(P.192)

Pausing Screen Update

In the monitoring condition or when waveform recording is OFF, screen updating can be paused as follows.

1. **Tap [Pause].**

The screen update pauses. While pausing, [Pause] changes to [Cont.] and [PAUSE] is displayed on the status bar.

MEMO	- You can save instantaneous values at the time of pausing by tapping [Save] while pausing.

2. **Tap [Cont.].**

The screen update restarts.

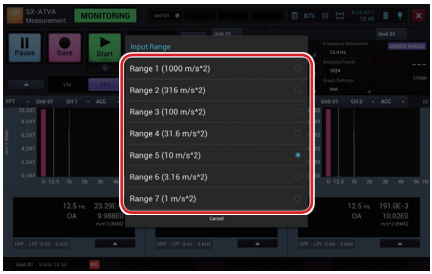
MEMO	- The response to the Pause/Cont. operations may be delayed by the influence of internal processes.

Changing the Analysis Setting While Monitoring

While monitoring, you can change the settings of the input range, frequency range,Spectrum Line (FFT analysis points), and window function.

1. **To change the input range, tap the input range of the channel of which you want to change the setting.**

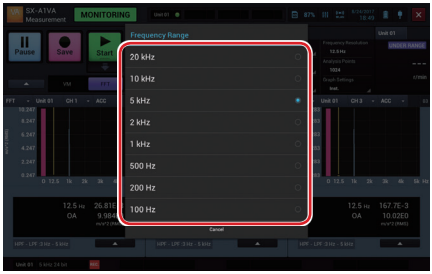
2. **Tap the desired input range.**



MEMO	- You cannot change the setting during average calculation.

3. **To change the frequency range, tap [Frequency Range] in the analysis setting panel.**

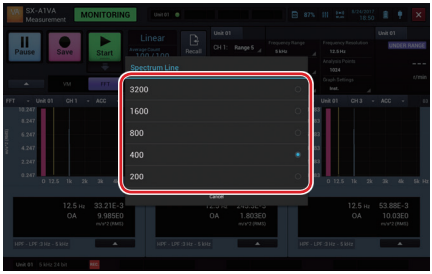
4. **Tap the desired frequency range.**



MEMO	- You cannot change the setting during average calculation.

5. **To change the spectrum line (FFT analysis points), tap [Spectrum Line] in the analysis setting panel.**

6. **Tap the desired spectrum line.**



MEMO	- You cannot change the setting during average calculation.

7. **To change the window function, tap [Window Function] in the analysis setting panel.**

8. **Tap the desired window function.**

MEMO	- You cannot change the setting during average calculation.

Saving Instantaneous Values

During any state of measurement (except during trigger standby), instantaneous values can be saved. Incidentally, only the instantaneous values of enabled channels are saved.

1. **Tap [Save].**

The instantaneous values are saved.

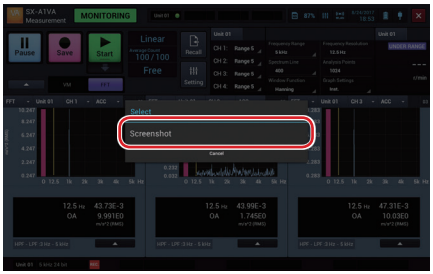
MEMO	- The instantaneous values are saved in the project folder.

Capturing Screens During Monitoring and Measurement

You can save the entire screen during monitoring and measurement in a PNG format image file.

1. **Tap [▲] in the operation area during monitoring and measurement.**

2. **Tap [Screenshot].**



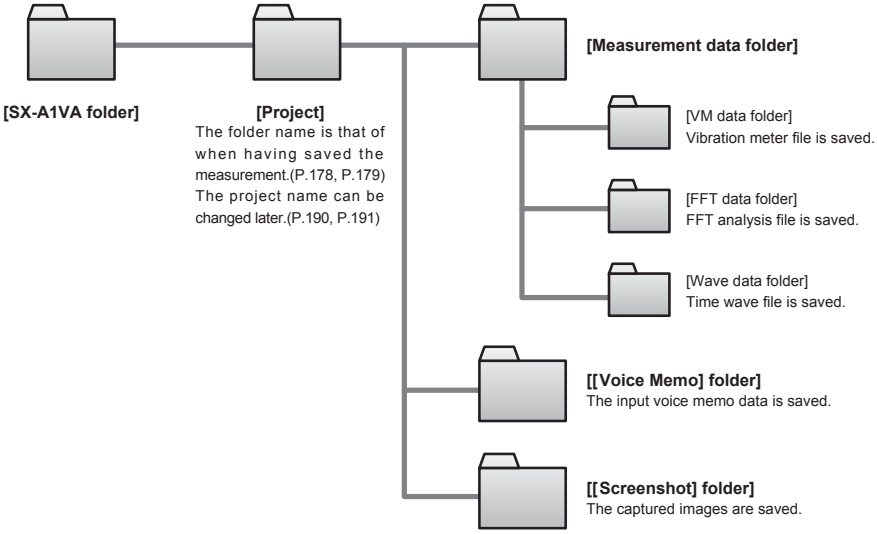
The screen is saved.

MEMO	- The screen image file is saved as a black and white reversal image to be suited to printing with a computer. - A file of image saved during measurement is saved in the project folder. - A file of graph image saved during monitoring is saved in the [SX-A1VA\Others] folder created in the SD card. - You can also save a screenshot with multi-function key. - For how to save a screenshot of an individual graph, see “Capturing a Screenshot of the Graph” (P.206) - The image files saved during measurement can be displayed on this device. (Please refer to the “Displaying a Screenshot". P.196)

Operating the Project (FFT Mode)

Project

Project is a folder to save data such as a measured record. All data regarding measured records are saved in the same project.
The project name can be changed to any name later.



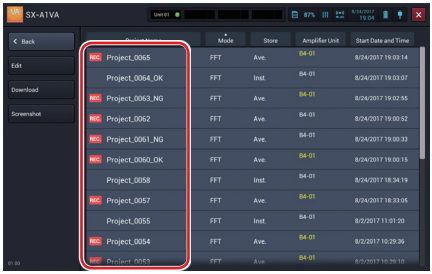
MEMO	- When a project has been transferred via an SD memory card to a computer, it can be transferred back and used again on the unit. Do this by saving the project directly into the “SD card\SX-A1VA” folder.

Opening the Project

1. Tap [Recall] on the Measurement screen.

The Select project screen is displayed.

2. Tap the name of the project you want to open.

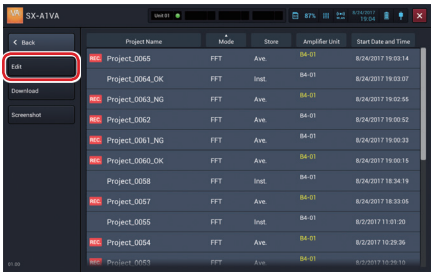


The Recall screen appears and displays measurement data of the selected project .

Changing the Project Name

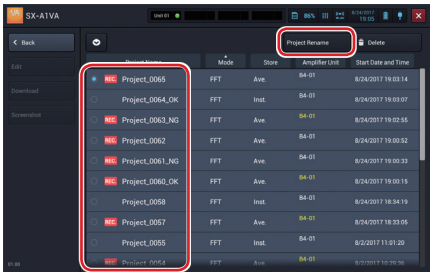
1. **Tap [Recall] on the Measurement screen.**

2. **Tap [Edit].**



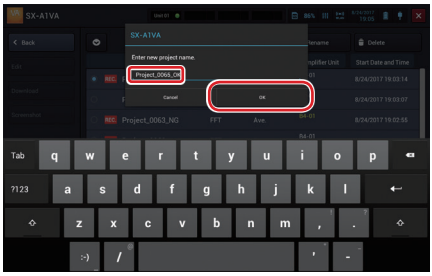
The Select edit project screen is displayed.

3. **Tap the project of which you want to edit the name and tap [Project Rename].**



MEMO	- You can select only one project. - When the project is selected, [●] appears to the left of the project. - Tap the selected project again to cancel the selection.

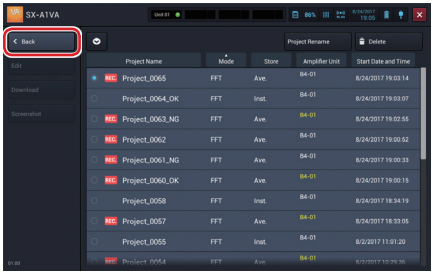
4. Enter the name and tap [OK].



The project is renamed and you return to the Select edit project screen.

MEMO	- You cannot rename a project to an existing project name. If you try to rename to an existing project name, an error message is displayed.

5. Tap [Back].



You return to the Select project screen.

Downloading Waveform Data

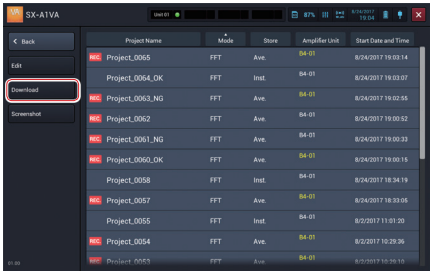
The measurement mode, amplifier unit connection method, and waveform recording settings determine how the measurement data and time waveform data are saved on the SD card in the amplifier unit.

- Vibration meter mode: If the RIONOTE is connected via wireless LAN, the measurement data and time waveform data are saved. (Time waveform data are saved only if waveform recording is ON.)
- FFT mode: Time waveform data are saved if waveform recording is ON, regardless of the amplifier unit connection method.

To save measurement data and time waveform data on the SD card in the RIONOTE, the data must be downloaded.

1. **Tap [Recall] on the Measurement screen.**

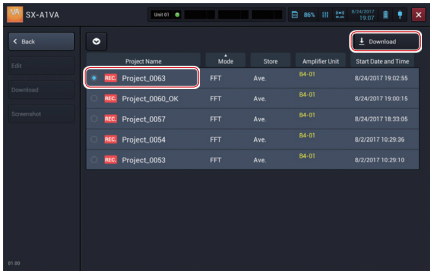
2. **Tap [Download].**



The Download project screen is displayed.

MEMO	- For projects whose measurement data and time waveform data are both saved on the SD card in the amplifier unit, the amplifier unit name is shown in gray. - An amplifier unit name of a project is displayed in yellow when measurement data of that project is saved in the SD card of the amplifier unit.

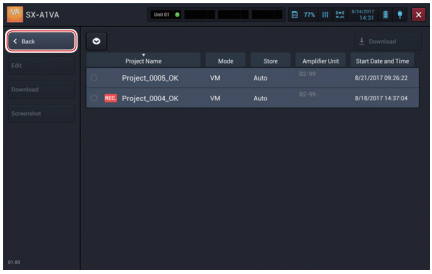
3. Tap the project you want to download, and then tap [Download].



The selected measurement data is downloaded to the SD card of this device.

MEMO	- You can select multiple projects. - When the project is selected, [●] appears to the left of the project. - Tap the selected project again to cancel the selection. - Tap to select all projects.

4. Tap [Back].

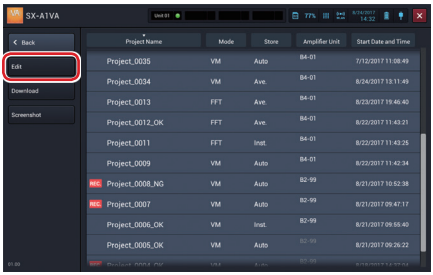


You return to the Select project screen.

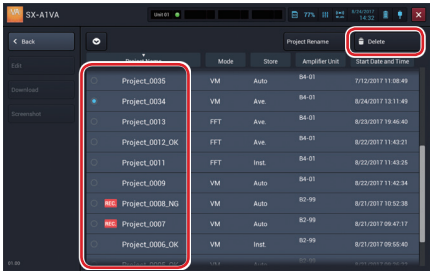
Deleting the Project

1. **Tap [Recall] on the Measurement screen.**

2. **Tap [Edit].**



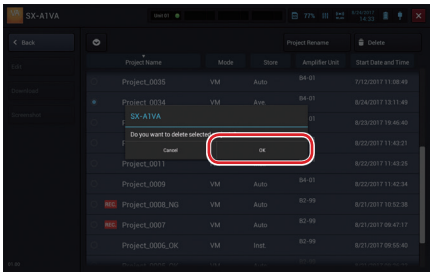
3. **Tap the project to delete and tap [Delete].**



A delete confirmation message is displayed.

MEMO	- You can select multiple projects. - When the project is selected, [●] appears to the left of the project. - Tap the selected project again to cancel the selection. - Tap ▼ to select all projects.

4. Tap [OK].

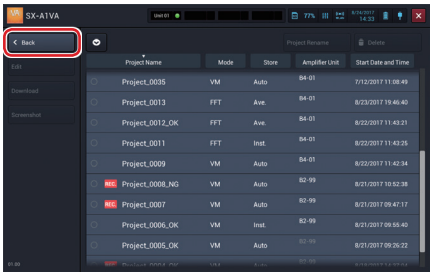


The project is deleted and you return to the previous screen.

Important

- If you delete the project, you cannot restore data. Check if data is unnecessary before deleting.

5. Tap [Back].



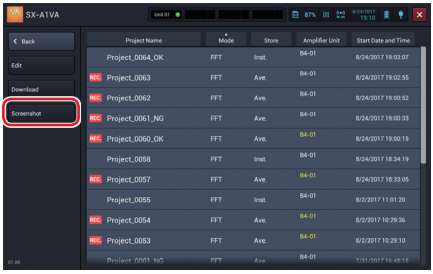
Displaying a Screenshot

You can display screenshots captured in the Measurement screen and Recall screen by retrieving them from a project.

1. **Tap [Recall] on the Measurement screen.**

   The Select project screen is displayed.

2. **Tap [Screenshot].**



   Projects that include screenshots are displayed.

3. Tap a project that includes a screenshot you want to display.

The screenshot is displayed.
When there are multiple screenshots, you can switch them by tapping the arrows beside the number of pages in the lower part of the screen.

4. Tap [Delete] to delete a screenshot currently displayed.

5. Tap [Close] to return to the Select project screen.

MEMO	- “File Name,” “Delete,” “Close,” and “Number of Pages” are hidden after a while. When you tap the screen, they are displayed again. - This function serves for viewing image data that are part of a project. Screenshots saved in the “Others” or “SX-A1VA\Others” folder cannot be viewed on the RIONOTE.

Operating Recall Screen (FFT Mode)

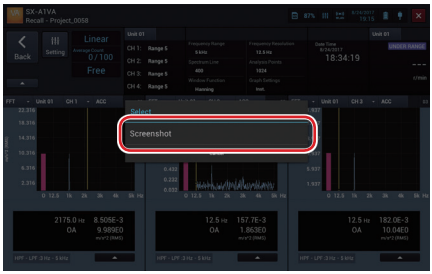
Capturing Recall Screen

You can save the Recall screen in a PNG format image file.

1. **Open a project and display the Recall screen. (P.189)**

2. **Tap [▲] in the operation area of the displayed Recall screen.**

3. **Tap [Screenshot].**



The screen is saved.

MEMO	- The captured screen image file is saved as a black and white reversal image to be suited to printing with a computer. - A captured image file is saved in the project folder. - You can also save a screenshot with multi-function key. - Captured image files can also be displayed on this device. (P.196)

Operating the Graph (FFT Mode)

Switching the Display Contents on Graphs

The graph of the FFT result of the selected channel is displayed. Changing each item enables you to change the graph view.

1. **Tap the displayed data to change the target to display in the graph.**

2. **Tap the target you want to display.**

MEMO	- You can select “FFT” (power spectrum) or “TIME” (time-domain waveform of one frame) for the target to display in the graph.

3. **Tap the channel number to change the channel.**

4. **Tap the channel number to display.**

5. **Tap the vibration magnitude to change the target vibration magnitude.**

6. Tap the target vibration magnitude to display.

MEMO	- You can select from [Acceleration (ACC)], [Velocity (VEL)], [Displacement (DISP)], and [ACCe (Acceleration Envelope)] for the target vibration magnitude.

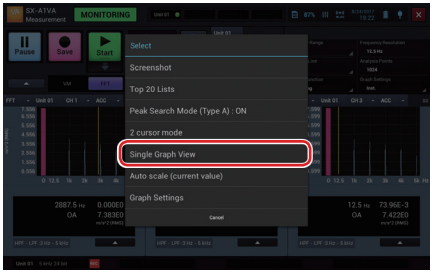
Using the Single Graph View

When using the multiple graph display (two to four graphs), you can zoom in on the selected graph for the single graph view.

MEMO	- You can select the single graph view setting when you are using the multiple graph display. - You cannot select Single Graph View when using the single graph view. - The number of graphs to display can be selected from [Graph Settings] in [Setting]. (P.238)

1. **Tap [▲] on the graph you want to see as the single graph.**

2. **Tap [Single Graph View].**



The selected graph is displayed in the entire graph display area.

MEMO	- You can also double-tap the graph to switch the display.

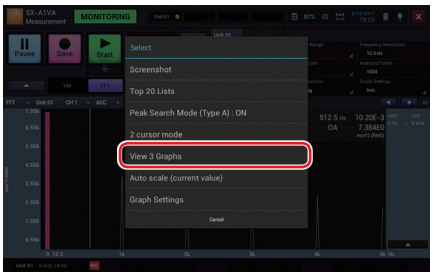
Using the Multiple Graph View

Change the graph view displayed in the entire graph display area (single graph view) to the multiple graph view.

MEMO	- You can select the single graph view setting when you are using the multiple graph display. - You cannot select Single Graph View when using the single graph view. - The number of graphs to display can be selected from [Graph Settings] in [Setting]. (P.238)

1. Tap [▲] on the graph you want to zoom out.

2. Tap [View 2 Graphs], [View 3 Graphs], or [View 4 Graphs].



The graph is changed to the multiple view.

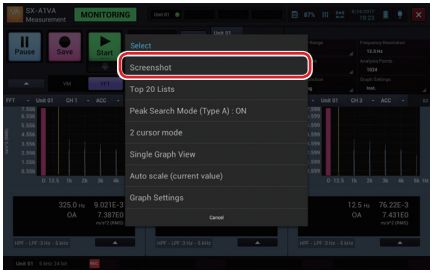
MEMO	- You can also double-tap the graph to switch the display.

Capturing a Screenshot of the Graph

You can save a screenshot of a specified graph as a PNG format image file.

1. **Tap [▲] on the graph you want to capture.**

2. **Tap [Screenshot].**



The graph is saved as a PNG format image file.

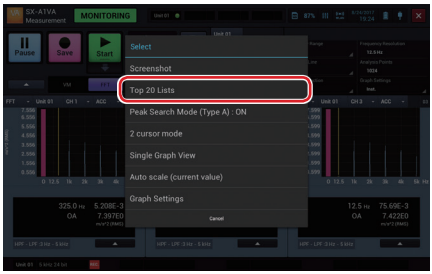
MEMO	- The captured graph image file is saved as a black and white reversal image suitable for printing with a computer. - A file of graph images captured during measurement is saved in the project folder. - A file of graph images captured other than during measurement is saved in the [SX-A1VA\Others] folder created on the SD card. - You can use the multi-function key to capture all the graphs currently displayed on the screen into an image file. - Image files captured during measurement and captured on the Recall screen can be displayed on this device. (P.196)

Switching the Graph View to the Top 20 List

The graph view can be switched to the “top 20 list view” which shows the frequencies and levels of top the 20 in descending order of level.

1. **Tap [▲] on the graph you want to switch to the top 20 list view.**

2. **Tap [Top 20 Lists].**



The view switches to the top 20 list view.

MEMO	- You can switch to the top 20 list view when the target to display in the graph is “FFT." - To return to the graph view, tap [▲] again and select [Graph View].

Switching the Cursor Mode

You can switch the cursor mode. Cursor modes come in the following two types:

- 1 cursor mode: Only the main cursor (solid line) is displayed.
- 2 cursor mode: The main cursor (solid line) and sub cursor (broken line) are displayed.

1. **Tap [▲] on the graph for which you want to switch the cursor mode.**

2. **Tap [1 cursor mode] or [2 cursor mode].**

Only the main cursor is displayed in 1 cursor mode.

The main cursor and sub cursor are displayed in 2 cursor mode.

MEMO	- To return to the previous cursor mode, tap [▲] again, and then select [1 cursor mode] or [2 cursor mode]. - When the target to display in the graph is “TIME,” the time interval between two cursors is displayed under the cursor value indication. - When the graph view is “FFT", the frequency difference between 2 cursors is displayed below the cursor value display.

Moving the Cursor

You can move the cursor by sliding it to the left or right while tapping.
The cursor can also be moved by tapping a desired point on the graph.

When the graph is displayed in one screen, you can also operate the cursor with the button displayed in the upper right of the graph. Select a cursor you want to move. Then, tap [◄] to move it to the left by one scale along the X axis. Tap [►] to move it to the right by one scale along the X axis.

MEMO	- [◄] and [►] can only be used to display graphs one screen at a time. - When the graph display target is “FFT” and peak search mode is ON, the main cursor is shown in pink. It can moved by sliding it, and the [◄] and [►] buttons move it to the peak positions. In 2-cursor mode, the sub cursor can be moved to the peak positions by tapping the [◄] and [►] buttons. To move the sub cursor to any position, slide it or use direct input. (However, when direct input is used, the peak search mode becomes OFF.)

Directly Enter the Cursor Position

When the target to display in the graph is “FFT,” you can directly enter a frequency to specify the cursor position.

1. **Tap the value of the frequency displayed at the top right of the graph.**

2. **Enter the frequency to which you want to move the cursor, and then tap [OK].**

The cursor moves to the frequency line position nearest to the frequency you entered.

MEMO	- You can specify the frequency when the target to display in the graph is “FFT." - When using 2-cursor mode, first tap the cursor to move, and then tap the numeric input field to perform direct input. - If the entered frequency does not match a frequency line position, the screen for selecting a target frequency appears.

Switching peak search mode (Type A or B) between ON and OFF

There are two types of peak search modes, as follows.

- Type A: Positive peaks are treated as peaks and the cursor can be moved to the top 50 peaks within the frequency range.
- Type B: Both positive and negative peaks are taken as peaks and the cursor can be moved to the top 50 peaks within the frequency range.

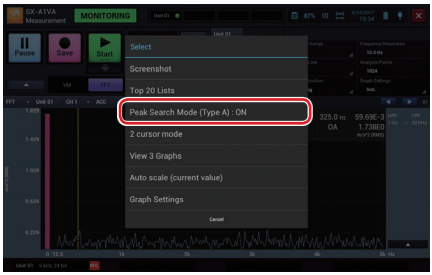
MEMO	- For information on how to select Type A or Type B, please refer to “Setting the peak search mode (FFT mode)” (P. 241).

Switch Peak Search Mode (Type A or B) ON or OFF.

- Peak search mode (Type A or B) ON: The cursor automatically moves to the frequency of a nearby peak value within the top 50.
- Peak search mode (Type A or B) OFF: The cursor can be moved to any position and it will stay at that position.

1. **Tap [▲] on the graph for which you want to switch the peak search mode.**

2. Tap [Peak Search Mode (Type A or B): ON] (or [Peak Search Mode (Type A or B): OFF).



The peak search mode is switched ON or OFF

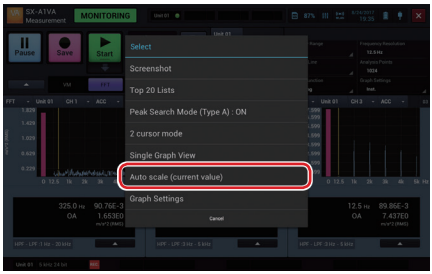
MEMO	- You can switch to the top 20 list view when the target to display in the graph is “FFT." - When peak search mode (Type A or B) is ON, the cursor is displayed in pink color. - When peak search mode (Type A or B) is OFF, the cursor is shown in yellow. - The sub cursor is not shown in pink also when peak search mode (Type A or B) is ON. It also does not move automatically to a peak position.

Automatically Adjusting the Y Axis Scale of Graph

The scale range of the Y axis is automatically adjusted so that the maximum value and minimum value of the measurement data are included.

1. **Tap [▲] on the graph for which you want to adjust the Y axis scale.**

2. **Tap [Auto scale (current value)].**



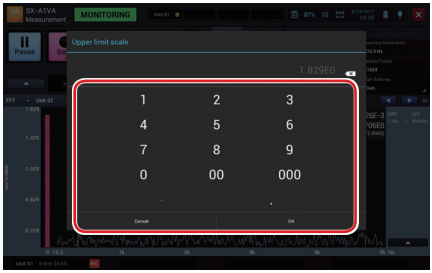
The Y axis of the graph is automatically adjusted so that the maximum value and minimum value of the measurement data are included.

Changing the Y Axis Scale of Graph

Tap the upper part of the Y axis label to change the upper limit scale or tap the lower part of it to change the under limit scale.

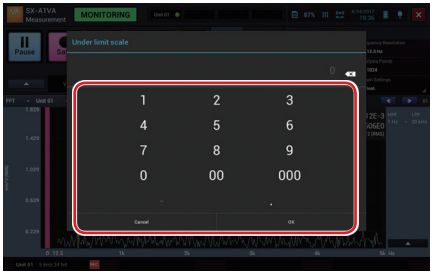
1. **Tap the upper part of the Y axis label.**

2. **Enter the upper limit value of the scale and tap [OK].**



3. Tap the lower part of the Y axis label.

4. Enter the under limit value of the scale and tap [OK].



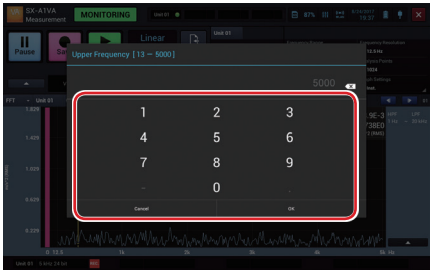
MEMO	- Double-tap the Y axis label to return to the initial state.

Changing the X Axis Scale (Frequency Range) of Graph

Tap the right part of the X axis label to change the upper frequency, or tap the left part of it to change the lower frequency.

1. **Tap the right part of the X axis label.**

2. **Enter the upper frequency to be displayed and tap [OK].**



3. Tap the left part of the X axis label.

4. Enter the lower frequency to be displayed and tap [OK].

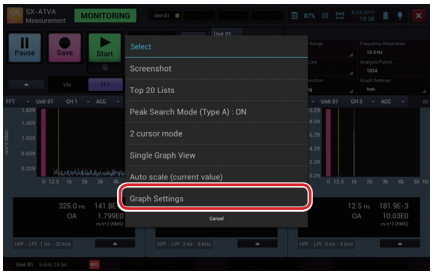
MEMO	- Double-tap the X axis label to return to the initial state. - The valid frequency boundaries you can enter are as follows: Upper : From (Lower Frequency + Frequency Resolution width) to (Frequency Range) Lower : From (Frequency Resolution width) to (Upper Frequency–Frequency Resolution width)

Changing Settings of Graphs

The graph settings available for each channel on the Settings screen (“X Axis” on P.282 and “Y Axis” on P. 283) can also be changed here.

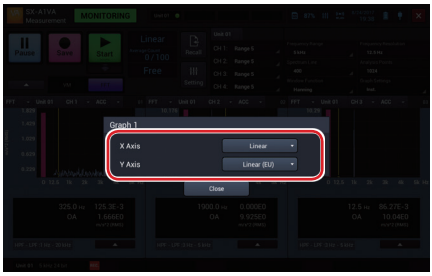
1. **Tap [▲] on the graph of which you want to change the settings.**

2. **Tap [Graph Settings].**



The Graph settings screen is displayed.

3. Change the settings and tap [Close].

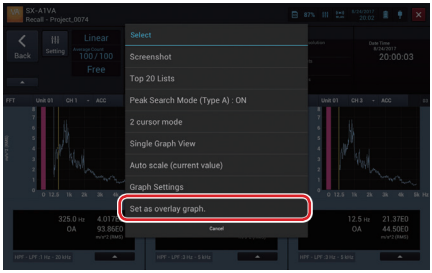


Specifying the Graph Data for Overlay

On the Recall screen, specify the graph data for overlay on the Measurement and Recall screens.
For graph overlay display, set [Overlay] to [ON] in graph settings on the Measurement settings screen (P.240)

1. **Tap [▲] of the graph to be specified as overlay data on the Recall screen.**

2. **Tap [Set as overlay graph].**



When [Overlay] is [ON] in the graph settings of the Measurement settings screen, the specified graph of the recall data is overlaid on the Measurement and Recall screens.

MEMO	- When the following settings during measurement are different from current settings, overlay is not performed: - Spectrum Line (Analysis Points) - Frequency Range - Vibration Magnitude

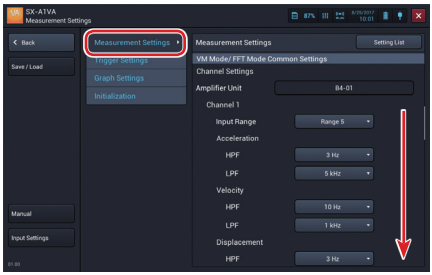
Settings (FFT Mode)

Configuring the Amplifier Unit

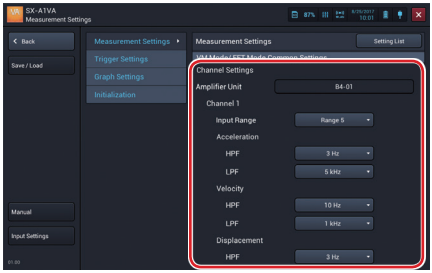
Change the settings of the amplifier unit.

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Measurement Settings] and scroll the screen down.**



3. **Configure each item for [Amplifier Unit].**



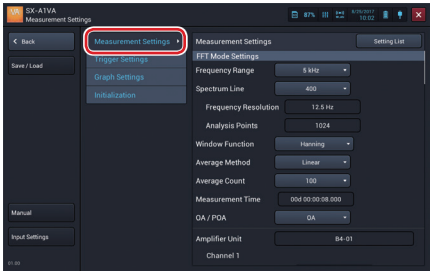
MEMO	- The available setting items are different for vibration meter mode - standard, vibration meter mode - evaluation, and FFT mode. - For details on settings for each item, see “HTML for Instruction Manual Application” provided with this device.

Configuring Various Items for Measurement

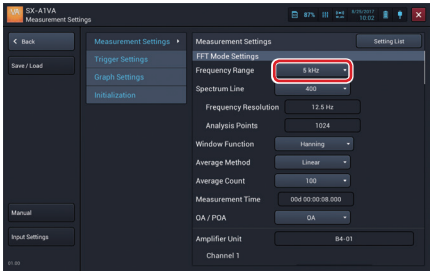
Set Frequency Range, Spectrum Lines, Window Function, Average Method, Average Count, Measurement Time, OA / POA in FFT mode

1. **Tap [Setting] on the Measurement screen in FFT mode.**

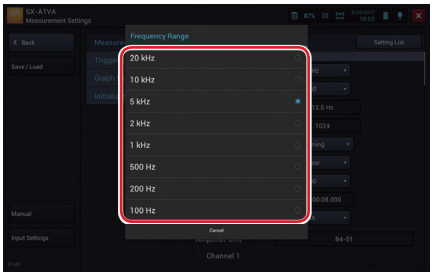
2. **Tap [Measurement Settings]**



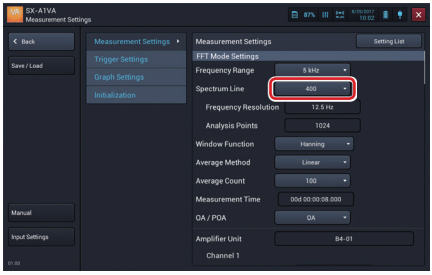
3. **Tap [▼] in [Frequency Range] of [FFT Mode Settings].**



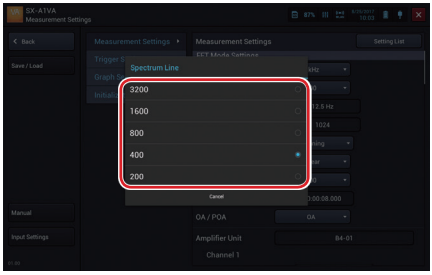
4. **Tap the Frequency Range to configure.**



5. **Tap [▼] in [Spectrum Line] of [FFT Mode Settings].**

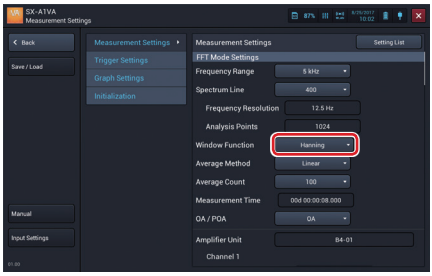


6. **Tap the Spectrum Line to configure.**

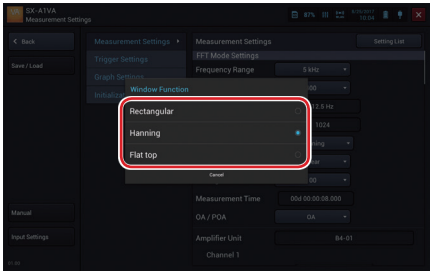


MEMO	- The spectrum lines can be selected from 200, 400, 800, 1600, 3200. The frequency resolution and analysis points are determined from the frequency range and the spectrum lines. For details, refer to the setting items on the setting screen (P.270).

7. **Tap [▼] in [Window Function] of [FFT Mode Settings].**

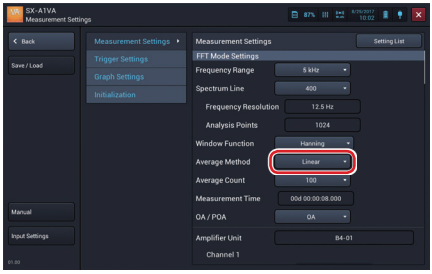


8. **Tap the window function you want to configure.**

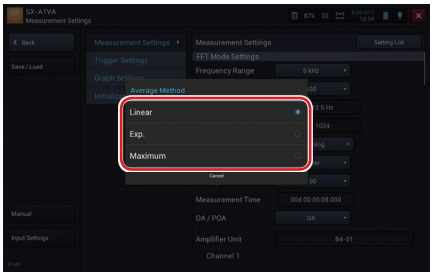


Set the average method and average count of measurements.

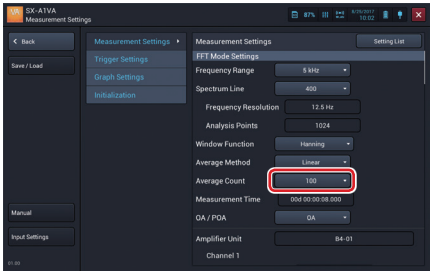
9. Tap [▼] in [Average Method]



10. Tap the average method you want to configure.



11. Tap [▼] in [Average Count]

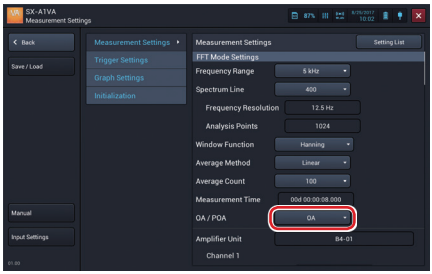


12. Enter the number to set to average count and tap [OK].

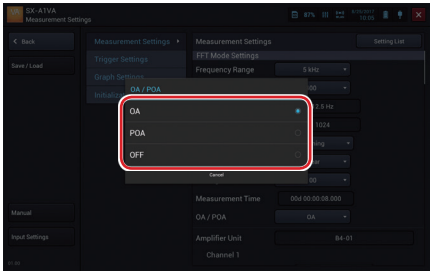
MEMO	- The average method can be changed by tapping the average method display on the measurement screen. - The average count can be changed by tapping the average count display on the measurement screen.

Select ON/OFF of OA (Over All) or POA (Partial Over All).

13. Tap [▼] in [OA/POA]



14. Tap the one you want to configure.

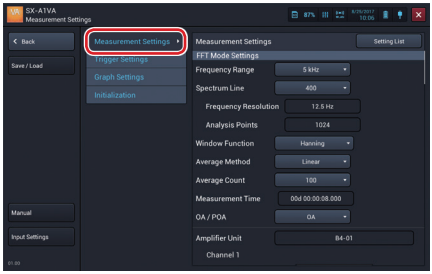


Setting the vibration magnitude to be FFT analyzed

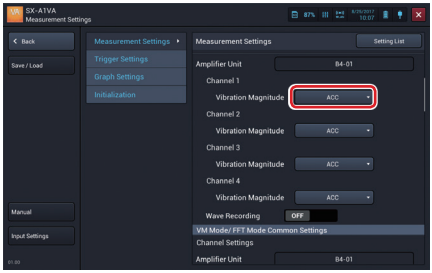
Set the target vibration magnitude to be FFT analyzed for each channel.

1. **Tap [Setting] on the Measurement screen in FFT mode.**

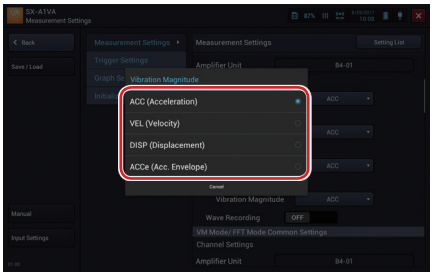
2. **Tap [Measurement Settings]**



3. **Tap [▼] on [Vibration Magnitude].**

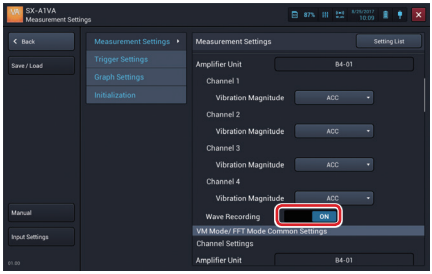


4. Tap the target vibration amount you want to FFT analysis



MEMO	- You can select from [ACC (Acceleration)], [VEL (Velocity)], [DISP (Displacement)], or [ACCe (Acceleration Envelope)] for the target vibration magnitude.

5. To record waveform, switch [Wave Recording] to [ON].

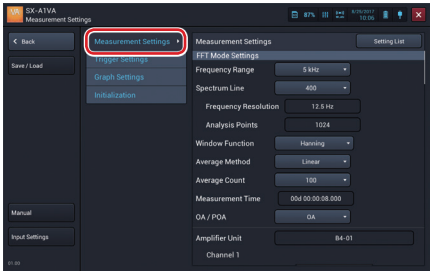


Changing the logical CH setting

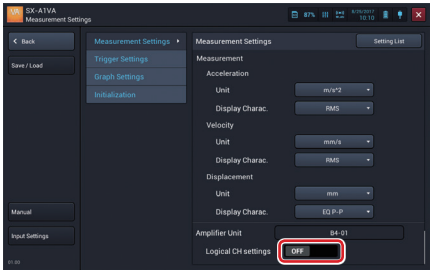
By changing this setting, it is possible to use one input channel for display and averaging of multiple vibration quantities.

1. **Tap [Setting] on the Measurement screen in FFT mode.**

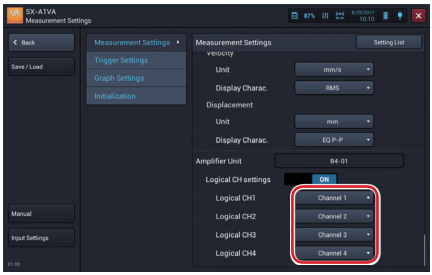
2. **Tap [Measurement Settings].**



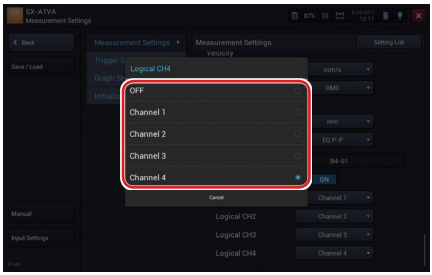
3. **Slide OFF to ON to activate [Logical CH Settings].**



4. **Tap channel 1 to 4 to change the input channel for Logical CH1 to 4**



5. **Tap the input channel that displays multiple vibration amounts and performs average calculation.**

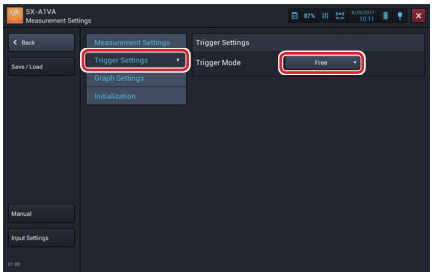


MEMO	- With SA-A1B4, make the following settings to use input channel 1 and input channel 2 for display and averaging of two vibration quantities each. Logical CH1 : Channel 1 Logical CH2 : Channel 1 Logical CH3 : Channel 2 Logical CH4 : Channel 2 * The above is just an example for illustrating possible settings. Other combinations are also possible. - With SA-A1B2, when the logical channel setting is ON, up to 4 channels can be set in the same way as with SA-A1B4. - When the logical channel setting is OFF, display and calculation is separated by the respective input channel.

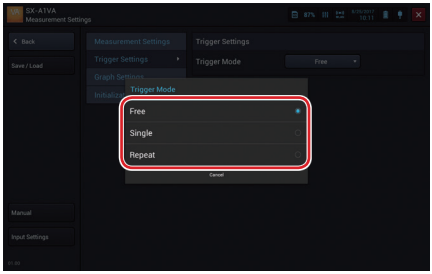
Configuring the Trigger Mode

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Trigger Settings] and tap [▼] on [Trigger Mode].**

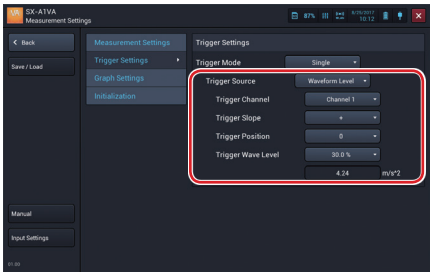


3. **Tap the trigger mode to configure.**



MEMO	- For details on the trigger mode, see “Trigger Settings” (P.276)

4. If you select [Single] or [Repeat], configure the trigger conditions.

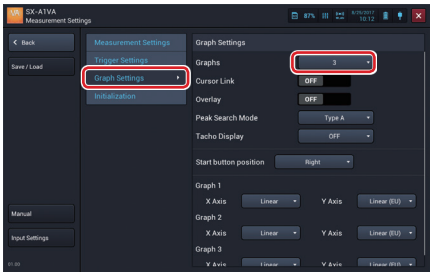


MEMO	- For details on settings for each item, see “Instruction Manual Application” provided with this device.

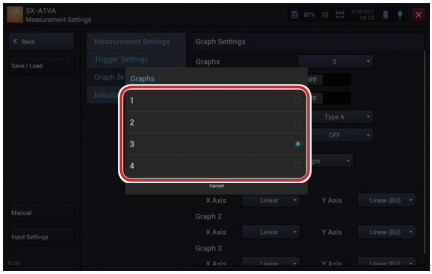
Configuring the Number of Graphs to Display

1. **Tap [Setting] on the Measurement or Recall screen.**

2. **Tap [Graph Settings] and tap [▼] on [Graphs].**



3. **Tap the number of graphs to display.**

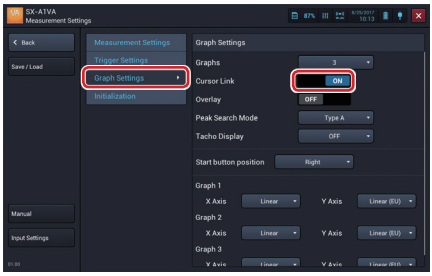


Configuring the Cursor Link

The cursor link is a function to move all the cursors of displayed multiple graphs to the same location. This item is used to enable/disable cursor link.

1. **Tap [Setting] on the Measurement or Recall screen in FFT mode.**

2. **Tap [Graph Settings] and tap [ON] or [OFF] in [Cursor Link].**



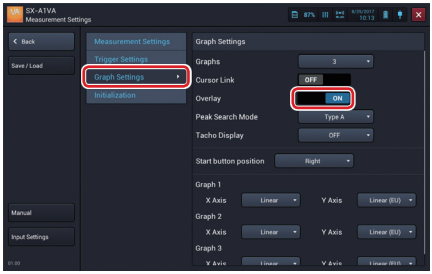
MEMO	- If you set it to [ON], the cursor link is enabled. If you set it to [OFF], the cursor link is disabled. - The settings can be switched by each tapping. - The conditions of graphs for which the cursors are linked are as follows. - Graphs with the same frequency range and analysis points - Graphs in the time domain - Graphs in the frequency domain - Even if cursor link is set to ON, if you set “Peak Search Mode (Type A or B)” is ON in 2 graphs or more, cursor link operation will not be performed.

Setting Overlay

Set the function for overlay of graphs.

1. **Tap [Setting] on the Measurement or Recall screen in FFT mode.**

2. **Tap [Graph Settings] and tap [ON] or [OFF] in [Overlay].**



MEMO	- If you set it to [ON], the overlay is enabled. If you set it to [OFF], the overlay is disabled. - The settings can be switched by each tapping. - For how to specify the graph data for overlay, see “Specifying the Graph Data for Overlay” (P.223)

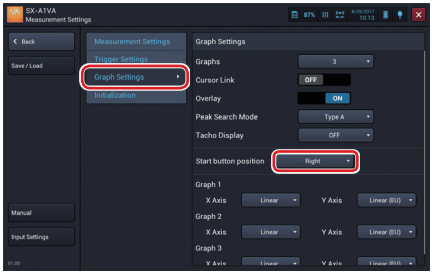
Setting the Peak Search Mode

There are two types of peak search modes, as follows.

- Type A: Positive peaks are treated as peaks and the cursor can be moved to the top 50 peaks within the frequency range.
- Type B: Both positive and negative peaks are taken as peaks and the cursor can be moved to the top 50 peaks within the frequency range.

1. **Tap [Setting] on the Measurement or Recall screen in FFT mode.**

2. **Tap [Graph Settings] and tap [Type A] or [Type B] in [Peak Search Mode]**

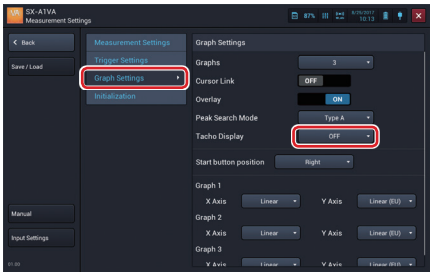


MEMO	- For information on how to select Type A or Type B, please refer to “Setting the peak search mode (FFT mode)” (P.214)

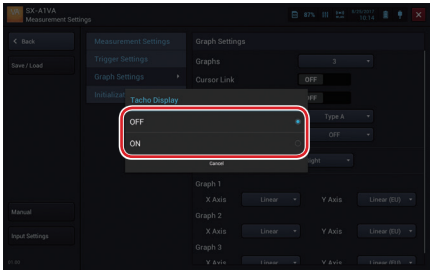
Configuring Tacho Display

1. **Tap [Setting] on the Measurement or Recall screen.**

2. **Tap [Graph Settings] and tap [▼] on [Thaco Display]. (Both the vibration meter mode and FFT mode are available)**



3. **Select Tacho display [ON]. If you do not want to display it, tap [OFF].**

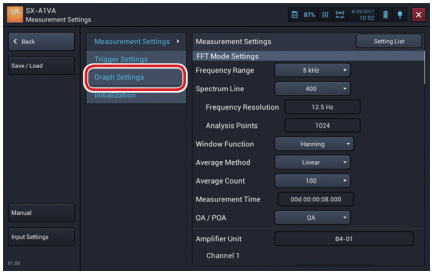


Setting the Position of the Start Button

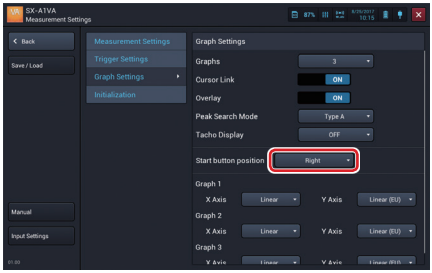
Change the position of the [Start] button in the operation area.

1. **Tap [Setting] on the Measurement screen.**

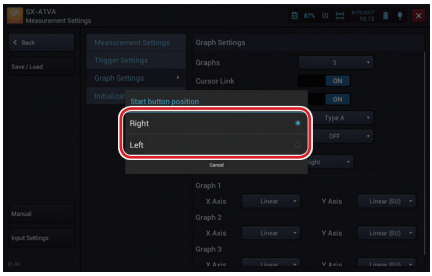
2. **Tap [Graph Settings].**



3. **Tap [▼] on [Start button position].**



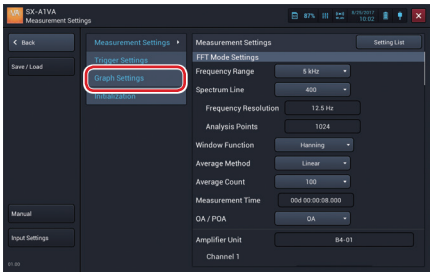
4. **Tap the position to place the button.**



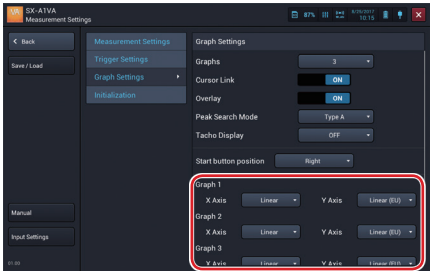
Configuring Axes Display on the Graph

1. **Tap [Setting] on the Measurement screen.**

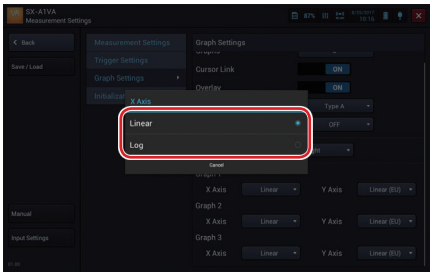
2. **Tap [Graph Settings].**



3. **Tap [▼] of each graph axis you want to configure.**



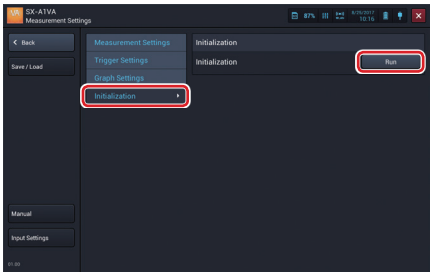
4. Tap Linear or Log



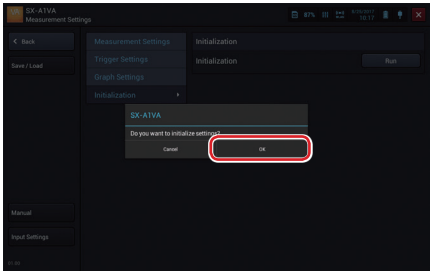
Initializing the Settings

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Initialization] and then [Run].**



3. **Tap [OK].**



Initialization is performed and all settings are reset to factory default settings.

MEMO	- The setting of the vibration meter mode and the evaluation criteria of the vibration meter mode are also initialized.

Initial setting values are as follows:

FFT Mode

Item		Default	
Measurement Settings (FFT Mode Settings)	Frequency Range	5 kHz	
	Spectrum Line	400	
	Window Function	Hanning	
	Average Method	Linear	
	Average Count	100	
	OA/POA	OA	
	Lower Frequency	12.5	
	Upper Frequency	5000.0	
	Vibration quantities	Acceleration	
	Wave Recording	OFF	
Measurement Settings Vibration Meter Mode/FFT Mode common settings	Input Voltage Range	Range 5	
	Acceleration HPF	3 Hz	
	Acceleration LPF	5 kHz	
	Velocity HPF	10 Hz	
	Velocity LPF	1 kHz	
	Displacement HPF	3 Hz	
	Displacement LPF	500 Hz	
	Acceleration Unit	m/s^2	
	Acceleration Display Charac.	RMS	
	Velocity Unit	mm/s	
	Velocity Display Charac.	RMS	
	Displacement Unit	mm	
	Displacement Display Charac.	EQ P-P	
	Logical CH Setting	OFF	
	Logical CH1	Channel1	*
	Logical CH2	Channel2	
	Logical CH3	Channel3	
	Logical CH4	Channel4	

Trigger Settings	Trigger Mode	Free
	Trigger Source	Waveform Level
	Repeat Count	2
	Trigger Channel	Channel1
	Trigger Slope	+
	Trigger Position	0
	Trigger Wave Level	30.0 %
Graph Settings	Graphs	3
	Cursor Link	OFF
	Peak Search Mode	Type A
	Overlay	OFF
	Tacho Display	OFF
	Start button position	Right
	X Axis	Linear
	Y Axis	Linear (EU)

* Logical CH initial settings

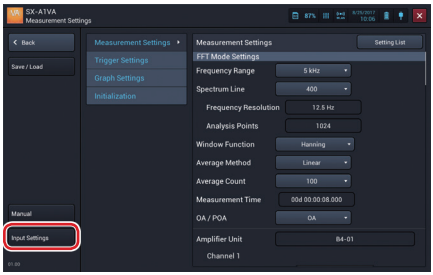
By default, the logical channels 1 to 4 are assigned to the same number channel, but only for channels that have been enabled when making input settings.
Channels that are disabled are assigned to the lowest channel number among enabled channels.
As a result, multiple logical channels may be assigned to the same channel number.
Example: When channels 1, 2, and 4 are enabled, the following applies.
(Channel 3 is disabled)
Logical CH1: Channel 1
Logical CH2: Channel 2
Logical CH3: Channel 1
Logical CH4: Channel 4

MEMO	- For details on each item, see “Items on Setting Screens” (P.270).

Calibrating

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Input Settings].**



The Input settings screen is displayed allowing you to configure the amplifier unit.

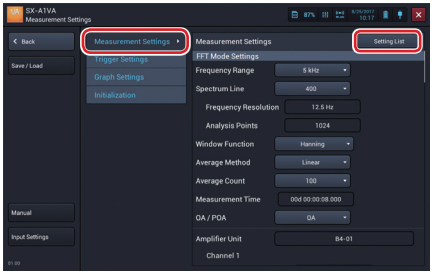
MEMO	- For details on input settings, see “Configuring the Calibration” in the SA-A1 Instruction Manual. - With SX-A1VA, applications will not start if [High-pass Filter] on the Input Settings screen is set to position other than OFF. However, to perform calibration at the Input Settings screen using the VE-10, the [High-pass Filter] setting may have to be changed.

Setting List of Measurement Settings

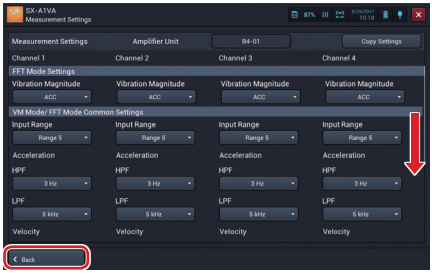
Measurement settings of each channel can be displayed on one screen for check and change.

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Measurement Settings] and then [Setting List].**



3. **Scroll the screen, check and change the settings, and tap [Back].**

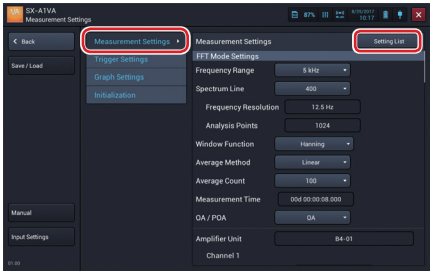


Copying the Measurement Settings

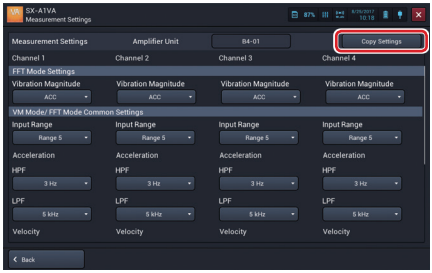
You can copy all measurement settings for a channel selected in the list display to another channel in a single operation.

1. **Tap [Setting] on the Measurement screen.**

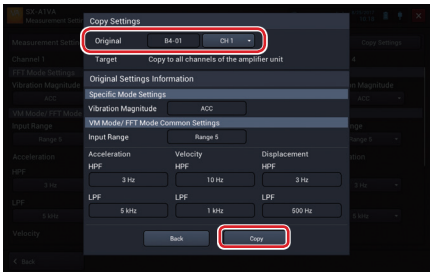
2. **Tap [Measurement Settings] and then [Setting List].**



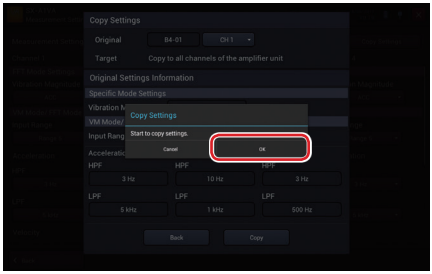
3. **Tap [Copy Settings].**



4. **Set the channel to be copied and tap [Copy].**

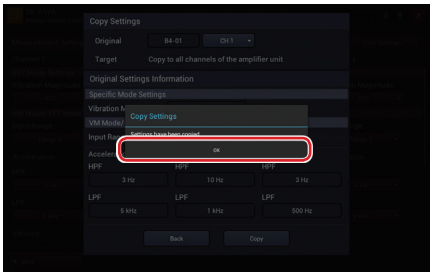


5. **Tap [OK] on the confirmation screen.**

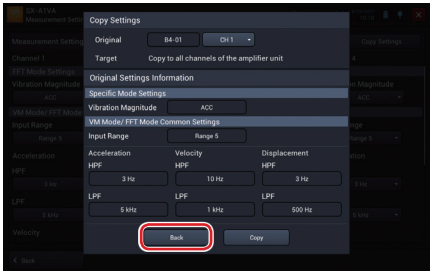


The measurement setting of the channel selected at the copy source is copied to all channels.

6. Tap [OK].



7. Tap [Back].



The screen returns to the setting list screen.

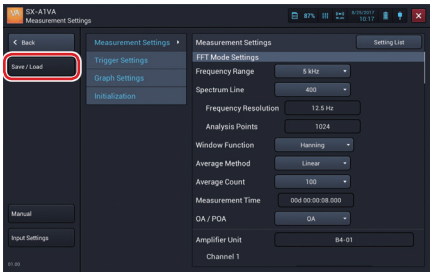
Saving the Current Settings

You can save settings configured in the Measurement settings screen. This allows you to load and restore the settings whenever you want. It is useful to save frequently-used settings. You can save up to five configurations in the internal memory and one configuration in the SD card as settings for startup (P.267).

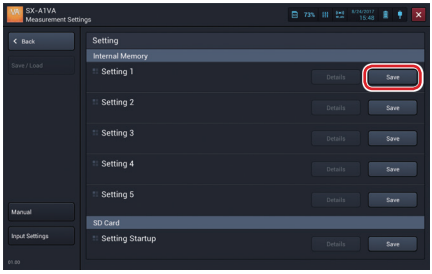
MEMO	Each setting for target machine of Evaluation is not saved.

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Save/Load].**

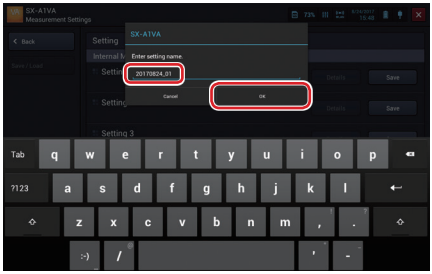


3. **Tap [Save] of the desired save location.**



MEMO	- If you tap [Save] of a line where settings are already saved, new settings overwrite the old ones.

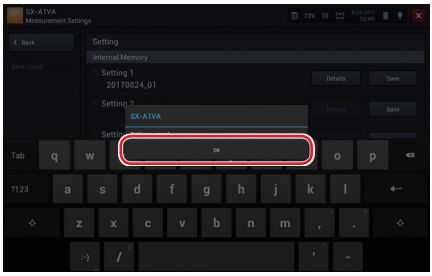
4. Enter the setting name to save and tap [OK].



When the settings are saved, a save completion message is displayed.

MEMO	- You can use alphabetical and numeric characters and underscore for a setting name.

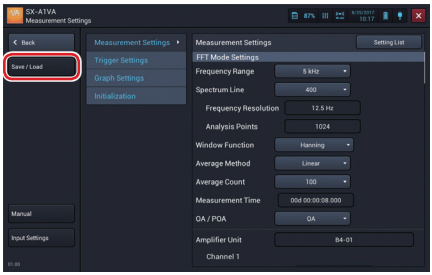
5. Tap [OK].



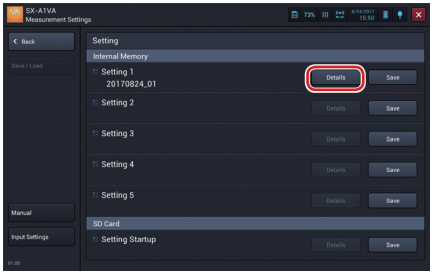
Confirming the Saved Settings

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Save/Load].**

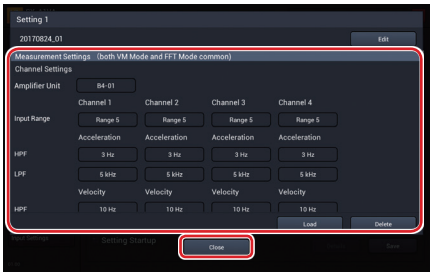


3. **Tap [Details] in the settings to check.**



The settings are displayed.

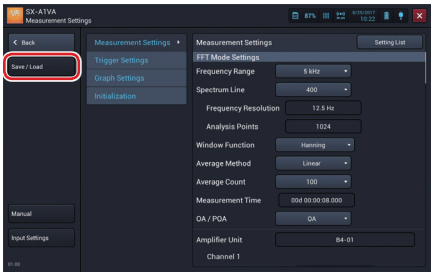
4. Check the settings and then tap [Close].



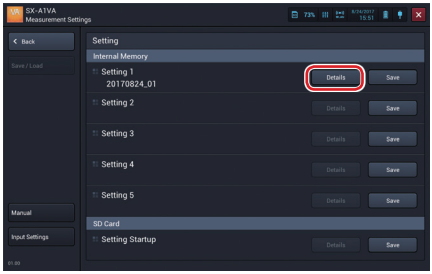
Loading the Settings

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Save/Load].**

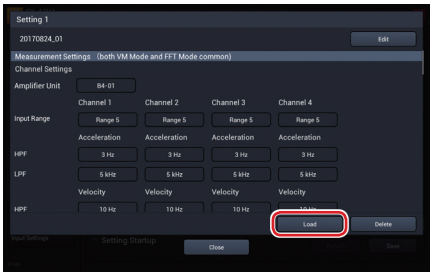


3. **Tap [Details] in the settings to load.**



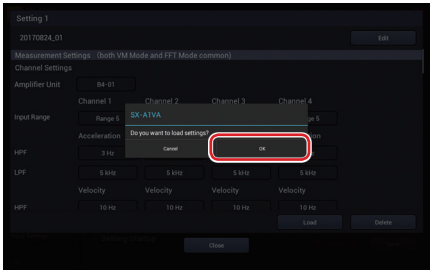
The settings are displayed.

4. Tap [Load].



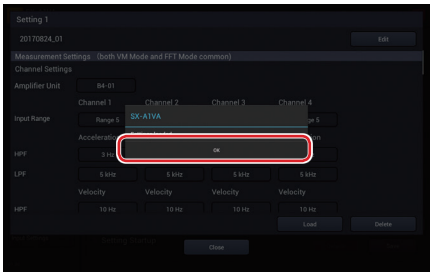
A loading confirmation message is displayed.

5. Tap [OK].



The settings are loaded.

6. Tap [OK].

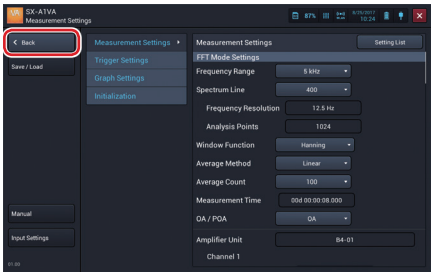


MEMO	- If you load the settings, the current settings will be deleted.

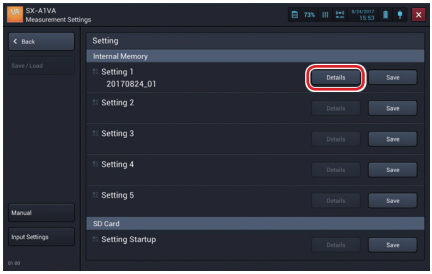
Changing the Name of Saved Settings

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Save/Load].**



3. **Tap [Details] in the settings to rename.**

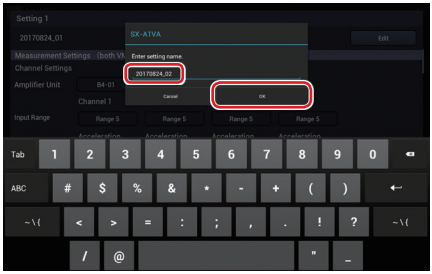


The settings are displayed.

4. Tap [Edit].

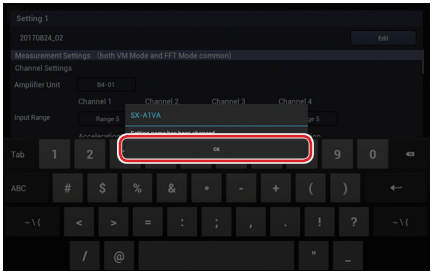
The setting name entry screen is displayed.

5. Enter a new setting name and tap [OK].



MEMO	- You can use alphabetical and numeric characters and underscore for a setting name.

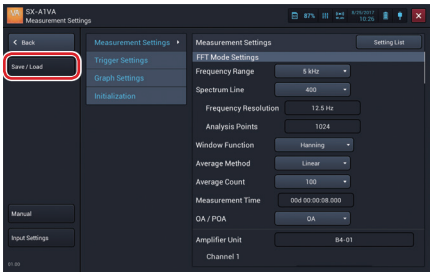
6. Tap [OK].



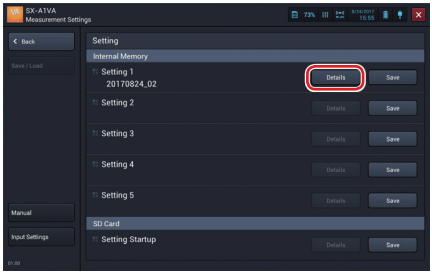
Deleting Settings

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Save/Load].**



3. **Tap [Details] in the settings to delete.**

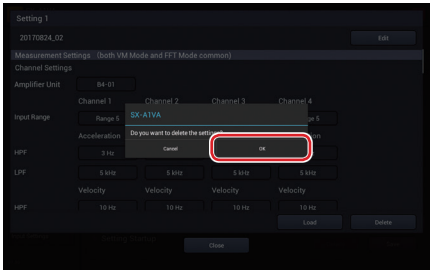


The settings are displayed.

4. Tap [Delete].

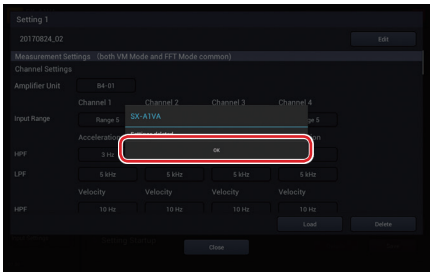
A delete confirmation message is displayed.

5. Tap [OK].



The settings are deleted.

6. Tap [OK].



Important

- You cannot restore the settings you deleted. Make sure that the settings should actually be deleted before deleting.

About Settings for Startup

If a Startup File (setting startup file) is included in the SD card inserted into the RIONOTE, the following selection screen is displayed after “Measurement” is selected when the SX-A1VA is started.

Tap [OK] on this screen to load the settings in the Startup File. Tap [Cancel] to start with the settings when the SX-A1VA was shut down previously.

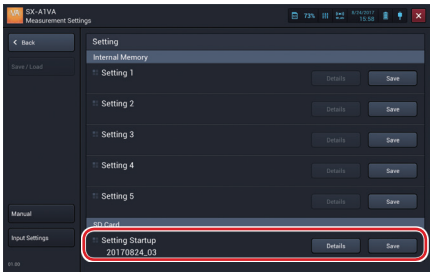
Handling the Startup File

The procedures for handling the Startup File such as saving and deleting are the same as those of the setting file in the internal memory.

1. **Tap [Setting] on the Measurement screen.**

2. **Tap [Save/Load].**

3. **Perform the operation on the Startup File such as saving and deleting.**



MEMO	- The Startup File is saved in [SX-A1VA] - [SETTING] - [STARTUP] folder in the SD card. - The settings can be taken over by loading the saved Startup File to other RIONOTE.

Important	- You cannot load the Startup File saved in the SD card if you change its name or edit it improperly.

Items on Setting Screens

Items on Setting Screens

This section describes the setting items on the Measurement settings screen (vibration meter mode/FFT mode) and Recall settings screen.

Measurement Settings (VM Mode)

VM Mode/ FFT Mode Common Settings

Configure the common settings for vibration meter mode and FFT mode. Items you can configure are the input range of the amplifier unit, HPF, LPF, unit and display characteristics of acceleration, unit and display characteristics of velocity, and unit and display characteristics of displacement.

VM Mode Settings

Configure the measurement time, etc., for measurement.

- Measurement Mode
  Configure the measurement mode.
  You can select Auto, Average, or Auto + Average.
- Save Screen Auto Display
  You can select whether to automatically display the project save screen when a measurement is completed or has been manually stopped.
  This setting is shown when the measurement mode is “Average”.
- Measurement Time
  Configure the measurement time. The setting range is 1 second to 1 hour.
- File Division Cycle
  Configure the file division cycle.
  You can select OFF or 10 minutes.
- Pre-time
  Configure the pre-time.
  You can select 5 seconds, 1 second, or 0 second.
  Cannot be set when the measurement mode is “Average”.

Amplifier Unit

Shows the amplifier unit ID to be used for measurement.

Waveform Recording

Set ON/OFF of waveform recording for analysis. When the measurement mode is “Average”, it is fixed to [OFF].

- Recording
  Configure the target of recording for each channel. You cannot configure this item when [Wave Recording] is [OFF].
  You can select Acceleration, Velocity, or Displacement.

Threshold Judgement Function

Set ON/OFF of the threshold judgement function.

- Vibration Magnitude
  Configure the vibration magnitude for each channel. You cannot configure this item when [Threshold Judgement Function] is [OFF].
  You can select OFF, Acceleration, Velocity, or Displacement.
- Threshold 1
  Configure threshold 1 for each channel. You cannot configure this item when [Threshold Judgement Function] is [OFF].
  Configurable range varies depending on settings such as the sensitivity and vibration magnitude.
- Threshold 1 Marker
  Configure the marker color of threshold 1 for each channel. You cannot configure this item when [Threshold Judgement Function] is [OFF].
- Threshold 2
  Configure threshold 2 for each channel. You cannot configure this item when [Threshold Judgement Function] is [OFF].
  Configurable range varies depending on settings such as the sensitivity and vibration magnitude.
- Threshold 2 Marker
  Configure the marker color of threshold 2 for each channel. You cannot configure this item when [Threshold Judgement Function] is [OFF].

Measurement Settings (FFT Mode)

Frequency Range

Configure the frequency range that determines the upper frequency of FFT.
You can select 20 kHz, 10 kHz, 5 kHz, 2 kHz, 1 kHz, 500 Hz, 200 Hz, or 100 Hz.

Spectrum Lines

Configure the spectrum lines.
You can select 200, 400, 800, 1600, or 3200.

Frequency Resolution

The frequency resolution is determined by the following calculation expression from the specified frequency range and analysis points:
Frequency Resolution = Frequency Range / Spectrum Lines

Analysis Points

The analysis point is determined by the following calculation expression from the specified analysis points:
Analysis Point = Spectrum Lines * 2.56

Window Function

Configure the window function for processing the sampled waveform level data for each channel.
You can select Rectangular, Hanning, or Flat top.

Average Method

Select the average method for calculations in FFT analysis.
You can select Linear, Exp., and Maximum.
When trigger mode of the trigger settings is [Repeat], [Exp.] cannot be selected.

Average Count

Specifies the number of averaging runs. The setting range is 1 to 1024.
The meaning of the average count setting differs, depending on the selected averaging method, as shown in the table below.

Average Method	Average Count
Linear	Number of frames used for arithmetic mean calculation $\overline{X_n}=\sum_{i=1}^{n} X_i / n$ (n: 1, 2, 3,⋯, N) $\overline{X_n}$: Averaged data X_i: Instantaneous data
Exponential (Exp.)	Weighting used for exponential averaging $\overline{X_n} = \alpha\, \overline{X_{n-1}} + (1 - \alpha)\, X_n$ $\alpha = \exp^{-\frac{1}{k}}$ $\overline{X_n}$: Averaging data, X_n: Instantaneous data K : Exponential Average Count
Maximum	Maximum value within calculation interval

Exponential Average Count

Specify the exponential average count. You can set between 1 and 9999. You cannot set this item when Exp. is not selected for the average method.

Measurement Time

Shows the time automatically calculated.

MEMO	- The measurement time calculation is an approximation and may differ slightly from the actual measurement time. - “Measurement Time (Reference)” is shown when performing measurement with the following settings: 20 kHz frequency range, 3200 lines, 4 channels.

OA/POA

Select ON/OFF of OA (Over All) or POA (Partial Over All).

- Lower Frequency
  Configure the lower frequency of POA. This item is displayed only when [POA] is selected.
- Upper Frequency
  Configure the upper frequency of POA. This item is displayed only when [POA] is selected.

Amplifier Unit

Shows the amplifier unit ID to be used for measurement.

Vibration Magnitude

Select the vibration magnitude to display.
You can select ACC, VEL, DISP, or ACCe (Acceleration Envelope).

Waveform Recording

Set ON/OFF of waveform recording for analysis.
When you set the wave recording to [ON], the measurement function is restricted as follows:
- [Exp.] of the average method cannot be selected.

VM Mode/ FFT Mode Common Settings

Configure the common settings for Vibration Meter mode and FFT mode. Items you can configure are the input range of the amplifier unit, HPF, LPF, unit and display characteristics of acceleration, unit and display characteristics of velocity, and unit and display characteristics of displacement.

Logical CH settings

Select ON/OFF of the logical channel.
When ON is selected, you can select a logical channel of each channel.

Judgement Mode Settings (VM Mode)

Judgement Mode

Select the judgement mode.
You can select Standard, or Evaluation.
When Evaluation is selected, you can change the Evaluation Criteria of each channel.

Trigger Settings

Trigger Mode

Select the basic action when a trigger occurs. When no trigger action is needed, select Free.

Trigger Mode	Action
Free	No trigger action is performed. When you slide [Start] downward, the analysis starts immediately. In vibration meter mode, analysis is complete after measurement has been performed for the selected time. In FFT mode, analysis is performed for the selected number of averaging runs. Sliding [Stop] downward also terminates the analysis.
Single	Sliding [Start] downward activates the trigger standby condition. Subsequently, measurement will start when a trigger condition is met, and the measurement value will be continuously updated. Sliding [Stop] downward terminates the measurement.
Repeat	Sliding [Start] downward activates the trigger standby condition. Subsequently, measurement will start when a trigger condition is met. After calculation for the selected averaging count has been performed, the system reverts to the trigger standby condition. With this setting, measurement terminates when data for the selected repeat count have been saved. Sliding [Stop] downward also terminates the measurement.

Trigger Source

Configure the type of the trigger signal. This is not displayed when Free is selected for the trigger mode.

Vibration Meter Mode

Trigger Source	Action
Vibration Magnitude	When vibration magnitude that exceeds the specified trigger vibration magnitude is input, the trigger standby state is exited and the measurement starts.
External	When the terminal of the EXT trigger input is shorted out, the trigger standby state is exited and the measurement starts.
Time	When the specified start date and time has passed, the trigger standby state is exited and the measurement starts.
Tacho Pulse	This item is displayed when the trigger mode is Single/ Repeat and [Tacho Pulse Input] of [Tacho Pulse / Extra DC Input] on the Input settings screen is enabled. When the setting value is crossed by the rotational speed of the signal that is input to the tacho pulse/extra DC input terminal, the trigger standby state is exited and the measurement starts.

FFT Mode

Trigger Source	Action
Waveform Level	When the input signal magnitude of the specified channel (Trigger Channel) crosses the setting value (Trigger Wave Level), the trigger standby state is exited and the analysis starts.
External	When the terminal of the EXT trigger input is shorted out, the trigger standby state is exited and the analysis starts.
Time	When the specified start date and time has passed, the trigger standby state is exited and the analysis starts.
Tacho Pulse	This item is displayed when the trigger mode is Single/ Repeat and [Tacho Pulse Input] of [Tacho Pulse / Extra DC Input] on the Input settings screen is enabled. When the setting value is crossed by the rotational speed of the signal that is input to the tacho pulse/extra DC input terminal, the trigger standby state is exited and the analysis starts.

Start date and time

When the trigger source is set to Time, configure the date and time to start measurement.

Stop date and time

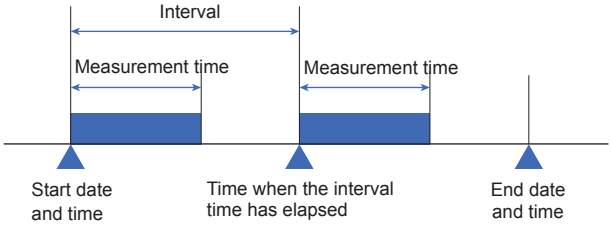
When the trigger source is set to Time, configure the date and time to finish measurement. This is not displayed when Single is selected for the trigger mode.

Interval

When the trigger source is set to Time, configure the interval time. This is not displayed when Single is selected for the trigger mode.

MEMO

- When the trigger mode is Repeat and trigger source is Time, measurement is conducted from the start date and time at intervals of the interval time. Therefore, when the interval time is shorter than the measurement time, the trigger standby state is not entered.



Repeat Count

When the trigger mode is set to Repeat, configure the repeat count. You can set between 2 and 1000.

Trigger Channel

When the trigger source is set to one of Vibration Magnitude, Waveform Level, and Tacho Pulse, select a channel among the channel 1 to 4 (or channel 1 to 2). This channel is called a trigger channel.

Trigger Slope

When the trigger source is set to one of Vibration Magnitude, Waveform Level, and Tacho Pulse, select a direction in which the signal crosses the trigger level.
You can select + or –.

Trigger Vibration Magnitude Type

When the trigger source is set to Vibration Magnitude, select the type of the vibration magnitude.
You can select Acceleration, Velocity or Displacement.

Trigger Vibration Magnitude

When the trigger source is set to Vibration Magnitude, select the vibration magnitude.
Configurable range varies depending on settings such as the sensitivity and vibration magnitude.

Trigger Position

When the trigger source is set to Waveform Level, specify the temporal relationship between the trigger detection point and frame start point with analysis points. When the setting value is 0, the trigger detection point is the same as the screen frame start point. The negative setting value is the pre-trigger whereas the positive setting value is the post-trigger.
You can set a value within the range of –(Analysis Points/2) to (Analysis Points/2).

Trigger Wave Level

When the trigger source is set to Waveform Level, a trigger occurs when the input signal waveform exceeds the trigger level value. Configure the trigger level as the relative magnitude of the measurement input range against the full scale value [%]. You can set between –99.9 and 99.9.
Note that when the input range is changed, the magnitude of input signal waveform necessary for trigger occurrence is also changed.
The magnitude of trigger level is shown on the time-domain waveform graph of the trigger channel.

Trigger Rotational Speed

When the trigger source is Tacho Pulse, if the setting value is crossed by the rotational speed of the signal that is input to the tacho pulse/extra DC input terminal, a trigger occurs. You can set between 201 and 599999.

Graph Settings (VM Mode)

Graphs

Select the number of graphs displayed in the graph display area.
You can set between 1 and 4.

Unit

Select the unit to display on the graph.
You can select Linear or Log.

Tacho

Configure how to display the tacho display panel.
You can select OFF or ON.
This item cannot be configured when no connected amplifier unit is configured to enable the tacho pulse input.

Start button position

Select the position of the Start button in the operation area.
You can select Right or Left.

Graph Settings (FFT Mode)

Graphs

Select the number of graphs displayed in the graph display area.
You can set between 1 and 4.

Cursor Link

Set ON/OFF for the cursor link.

Overlay

Set ON/OFF of the overlay.

Peak Search Mode

Select the operation type for peak search.
You can select Type A or Type B.

Tacho Display

Configure how to display the tacho display panel.
You can select OFF or ON.
This item cannot be configured when no connected amplifier unit is configured to enable the tacho pulse input.

Start button position

Select the position of the Start button in the operation area.
You can select Right or Left.

X Axis

Configure contents to display on the X axis of the graph.
You can select Linear or Log.

Y Axis

Configure contents to display on the Y axis of the graph.
You can select Linear or Log.

Using “dB reference value” set in “Calibration” of “Input setting”, the dB value when Log (dB) is selected is calculated as follows.

$Log(dB) = 20Log_{10}$ (Linear value / dB reference value)

In this application, select “Piezoelectric acceleration pickup” for “Sensor category” in “Input setting”. At this time, the dB reference value can be set as follows.
10^{-5}, 10^{-6} or free input

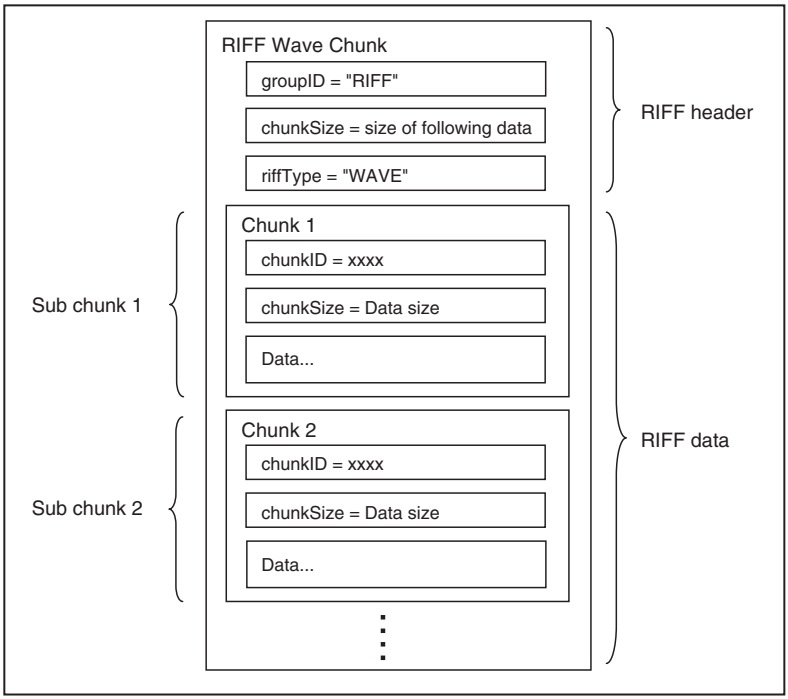
WAVE File Format

WAVE File Format

This section provides details about the WAVE file format used by the SX-A1VA.

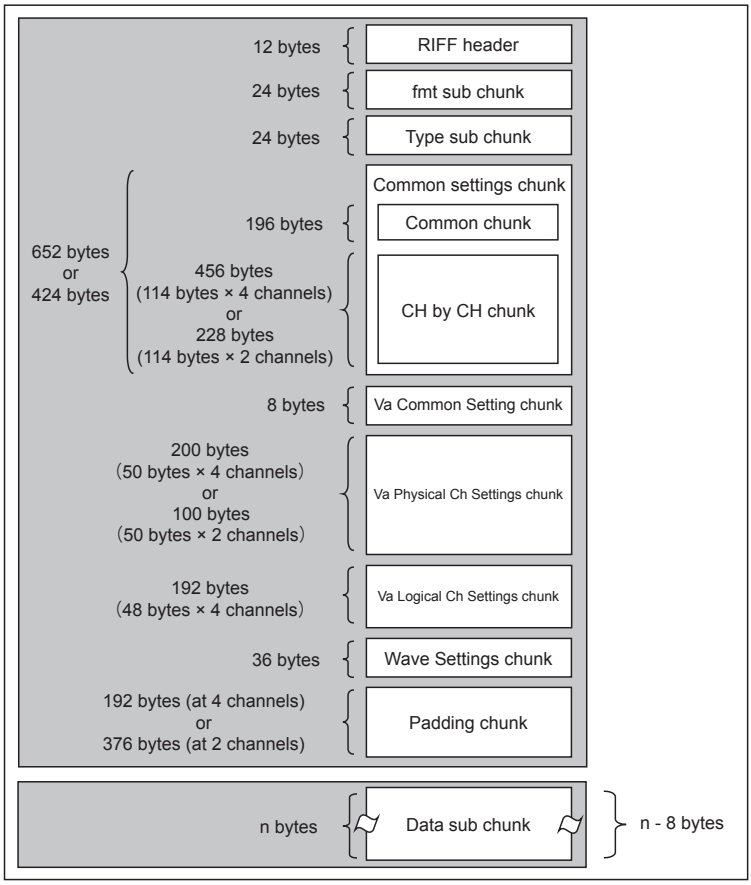
Basic Structure

The WAVE file is made up of variable-length blocks called “chunks”. The basic structure is as follows.



Basic WAVE file structure

The chunks and file structure used by the SX-A1VA are shown below.



File structure and size

Invalid Values

For unused items, a value defined as an invalid value is inserted.
The invalid values for the respective data types are shown in the table below.

Type	Invalid values
char	Blank
int16	Minimum value
uint16	Maximum value
int32	Minimum value
uint32	Maximum value
int64	Minimum value
uint64	Maximum value
float	Minimum value
double	Minimum value

Data Types

The SX-A1VA uses the following specially defined data types.

```
typedef struct {
  uint32      dwDataAddress; /* < Address as counted from start of data chunk */
  uint32      dwDataSize;
  uint32      dwFatDateTime;
  } MARKERFORMAT;

typedef struct {
                year   :6;          /* < Year (offset from 2000)          */
                mon    :4;          /* < Month (1 to 12)                  */
                day    :5;          /* < Day (1 to 31)                    */
                hour   :5;          /* < Hours (0 to 23)                  */
                min    :6;          /* < Minutes (0 to 59)                */
                sec    :6;          /* < Seconds (0 to 59)                */
  } FATDATETIME;

  dwFatDateTime
      The date is a packed value with the following format.
      Bits        Values     Meaning
      0 to 5      0 to 59    Second
      6 to 11     0 to 59    Minutes (0 to 59)
      12 to 16    0 to 23    Hours (0 to 23, 24-hour format)
      17 to 21    0 to 31    Day of the month (1 to 31)
      22 to 25    1 to 12    Month (1 = January, 2 = February, and so on)
      26 to 31    0 to 63    Year offset from 2000 (add 2000 to get actual year)
```

Chunks

The following tables provide details about the structure of the RIFF header (RIFF chunk) and the various sub chunks listed in the section “File structure and size”. (“_” means a space.)

RIFF chunk

Table 1 RIFF chunk

Type	Variable name	Size (Byte)	Description	Value
char[4]	Chunk ID	4	Indicates RIFF	"RIFF"
uint32	Chunk Size	4	Total size of following data (not including this item)	Depends on recording parameters
char[4]	riffType	4	Indicates RIFF type	"WAVE"

fmt sub chunk

Table 2 fmt sub chunk

Type	Variable name	Size (Byte)	Description	Value
char[4]	Chunk ID	4	Indicates chunk type	"fmt_"
uint32	Chunk Size	4	Total size of following data (not including this item)	16
uint16	wFormatTag	2	Format type	0x0001
uint16	nChannels	2	Number of channels	1 to 4
uint32	nSamplesPerSec	4	Number of samples per second	See Table 3
uint32	nAvgBytesPerSec	4	Number of bytes per second	See Fig. 1
uint16	nBlockAlign	2	Block size	See Fig. 2
uint16	wBitsPerSample	2	Number of bits per sample	16 / 24

Table 3 nSamplesPerSec

	100 Hz	500 Hz	1 kHz	5 kHz	10 kHz	20 kHz
x 2.56	256	1280	2560	12800	25600	51200

$$\text{nAvgBytesPerSec} = \text{nSamplesPerSec} \times \text{nChannels} \times \frac{\text{wBitsPerSample}}{8}$$

Fig. 1 nAvgBytesPerSec

$$\text{nBlockAlign} = \text{nChannels} \times \frac{\text{wBitsPerSample}}{8}$$

Fig. 2 nBlockAlign

Type sub chunk

Table 4 Type sub chunk

Type	Variable name	Size (Byte)	Description	Value
char[4]	Chunk ID	4	Indicates chunk type	"TYPE"
uint32	Chunk Size	4	Total size of following data (not including this item)	616
char[8]	File Type	8	File type	“WR_____”
uint16	File Revision	2	Chunk format version number	1 or more
Reserved		6		

"_” means a space.

CommonShareSetting (common) chunk

Stores setting information of the unit, including trigger settings etc.

Table 5 CommonShareSetting (common) chunk

Type	Variable name	Size (Byte)	Description	Value
char[4]	ChunkID	4	Indicates chunk type	“CSET”
uint32	ChunkSize	4	Total size of following data (not including this item)	416 : SA-A1B2 644 : SA-A1B4
char[12]	Product Type	12	Product designation	“SX-A1VA_____”
uint16	Repeat Serial Number	2	Repeat trigger sequential number	Top number is 1, Nth number is N
uint16	File Serial Number	2	Split file sequential number	Top number is 1, Nth number is N
int64	StartTime	8	File start time	UNIX time (msec)
int64	Actual Record Time	8	Actual record time from Start Time	Time accuracy is 10 ms. Refer to the Wave Data chunk for the exact number of samples.
int16	Unit Equipped Channels	2	Number of total channels	2/4
int16	Total Enabled Channels	2	Number of enabled channels	1 to 4
uint16	Edit Flag	2	Whether to cut out (edit)	0: No editing (no clipping) 1: With edit (with cutout)
int16	Unit ID	2	Unit ID number	1 to 99
char[40]	Unit Name	40	Unit name	
char[8]	Unit Type	8	Unit type	B2_____/B4_____
char[16]	Unit Serial Number	16	Serial number	
int32	Unit CPU Version	4	CPU version	AA.BB.XXYY (8 digits in hex number)

Type	Variable name	Size (Byte)	Description	Value
int32	Unit DSP Version	4	DSP version	AA.BB.XXYY (8 digits in hexnumber)
int32	Unit CPLD Version	4	CPLD version	AA.BB.XXYY (8 digits in hex number)
int32	Unit SubMicon Version	4	Sub-microcomputer version	AA.BB.XXYY (8 digits in hex number)
int16	TriggerMode	2	Trigger mode	0 : Free 1 : Single 2 : Repeat
int16	Trigger Source	2	Trigger source	4 : External 16 : Level 64 : Rotation pulse 512 : Time 2048 : Vibration quantities
int16	Trigger Channel	2	Trigger monitored channel	1 to 4
int32	Trigger Level Wave	4	Trigger level	Digit value in signed 16bit or 24bit is inputted by Int32 of MSB stuffing
int16	Trigger Level Lp	2	Trigger level (Lp)	1dB scale
int32	Trigger Level Tacho	4	Trigger level (rotation)	rpm scale (Digit value with signed 24 bits)
int16	Trigger Slope	2	Trigger slope	0 : + 1 : -
int64	Trigger Start Date Time	8	Trigger start time	UNIX time
int64	Trigger Stop Date Time	8	Trigger stop time	UNIX time
int32	Trigger Interval	4	Trigger interval	Second time scale
int16	Measure Frequency Range	2	Frequency range	3 : 100Hz 4 : 200Hz 5 : 500Hz 6 : 1kHz 7 : 2kHz 8 : 5kHz 9 : 10kHz 10 : 20kHz

Type	Variable name	Size (Byte)	Description	Value
int16	Measure Frequency Ratio	2	Frequency ratio (Sampling frequency / Frequency range)	1 : 2.56
int16	Tacho Codec Mode	2	Tacho meter codec mode	0 : OFF 2 : ON
int16	Trigger Vibration Type	2	Trigger Vibration Magnitude Type	0 : Acceleration effective value 1 : Speed effective value 2 : Displacement effective value 3 : Acceleration Peak 4 : Acceleration crest factor
double	Trigger Vibration Value	8	Trigger vibration value	If either of the following conditions is satisfied, invalid value Trigger Mode : Free Trigger Source : other than VM
int16	Data Type	2	Data Type	0 : Auto 1 : Manual 2 : Inst 3 : Ave
Reserved		10		

CommonChSetting (each CH) chunk

Stores setting information of the unit, including each channel (for four channels or 2 channels) settings etc.

Table 6 CommonChSetting (each CH) chunk

Type	Variable name	Size (Byte)	Description	Value
char[40]	Chx Name	40	Channel name	
int16	Chx Number	2	Channel number	1 to 4
int16	Chx Enabled	2	Channel input enable	0 : false 1 : true
int16	Chx Measure Enabled	2	Channel measurement enable	0 : false 1 : true
int16	Chx Sensor Type	2	Sensor type	2 : Microphone 3 : Piezoelectric Accelerometer 4 : Sound Level Meter 6 : Vibration Level Meter 20 : Miscellaneous AC 21 : Miscellaneous DC

Type	Variable name	Size (Byte)	Description	Value
int16	Chx Input Range	2	Input voltage range	2 : 0.01V (-40dB) #Vrms 3 : 0.031623V (-30dB) #Vrms 4 : 0.1V (-20dB) #Vrms 5 : 0.316228V (-10dB) #Vrms 6 : 1V(0dB) #Vrms 7 : 3.162278V (10dB) #Vrms 8 : 10V(20dB) #Vrms 102 : 0.01V (-40dB) #Vpeak 103 : 0.031623V (-30dB) #Vpeak 104 : 0.1V (-20dB) #Vpeak 105 : 0.316228V (-10dB) #Vpeak 106 : 1V (0dB) #Vpeak 107 : 3.162278V (10dB) #Vpeak 108 : 10V (20dB) #Vpeak (Vpeak is for DA - 21)
int16	Chx Coupling	2	Input coupling	0 : AC 1 : DC
int16	Chx CCLD	2	CCLD setting	0 : false 1 : true
int16	Chx Inversion	2	Input inversion	0 : false 1 : true

Type	Variable name	Size (Byte)	Description	Value
int16	Chx HPF Cutoff Frequency	2	High-pass digital filter cutoff frequency	0 : OFF 1 : 0.07 Hz 4 : 1 Hz 6 : 3 Hz 8 : 5 Hz 12 : 10 Hz 22 : 1 kHz 100 : User Filter
int16	Chx LPF Cutoff Frequency	2	Low-pass digital filter cut off frequency	0 : OFF 4 : 200 Hz 6 : 500 Hz 8 : 1 kHz 12 : 2 kHz 14 : 5 kHz 18 : 10 kHz 28 : 20 kHz 100 : User Filter
char[8]	Chx Measurement Unit	8	Unit	V inputted EU unit dB Pa m/s2 V
double	Chx ValuePerBit	8	Calibration value (physical quantity per 1 bit)	Setting value on calibration
double	Chx ValuePerVolt	8	Calibration value (sensitivity)	Setting value on calibration
double	Chx Offset Value	8	Calibration value (offset value of physical quantity)	Setting value on calibration
double	Chx Zero dB Reference (EU)	8	Calibration value (notation of 0 dB reference index)	Setting value on calibration
uint16	ChxOverload	2	Overload information in the file	0 : No overload has occurred 1 : Overload has occurred at least once
uint16	Chx Discontinuous	2	Discontinuity information in the file	0 : There is no discontinuity during measurement 1 : Discontinuity exists more than once during measurement
Reserved		10		

Wave Settings chunk

Table 7 Wave Settings chunk

Type	Variable name	Size (Byte)	Description	Value
char[4]	Chunk ID	4	Indicates chunk type	"WSET"
uint32	Chunk Size	4	Total size of following data (not including this item)	28
uint16	Frequency Weighting	2	Frequency Weighting	0 : A 1 : C 2 : Z 3 : G 4 : Lv_Vertical # Vertical characteristics 5 : Lv_Horizontal # Horizontal characteristics
int16	Pre-time	2	Pre-recording time	0 -1 -5
Reserved		24		

Padding chunk

Table 8 Padding chunk

Type	Variable name	Size (Byte)	Description	Value
char[4]	Chunk ID	4	Indicates chunk type	"padi"
uint32	Chunk Size	4	Total size of following data (not including this item)	Wave file: 372 (4 ch), 472 (2 ch)
Reserved			Padding bytes to place the header on a 512 byte boundary	

Wave Data chunk

Recorded raw waveform data are stored here.

Table 9 Wave Data chunk

Type	Variable name	Size (Byte)	Description	Value
char[4]	Chunk ID	4	Indicates chunk type	"data"
uint32	Chunk Size	4	Total size of following data (not including this item)	Depends on recording time
WAVEData	Data	Depends on recording time	Store the recorded raw waveform data	

WAVEData follows the data conventions for regular WAVE files (16 bit/24 bit, little endian, 16 bit range full-scale value 15910, 24 bit range full-scale value 4072960).

Evaluation File Format

Evaluation File Format

This section provides details about the Evaluation results text file, Evaluation file output function format of the SX-A1VA.

File format for the Evaluation results

The Evaluation results text file (rnd file) is saved in a folder created separately for each target machine directly under the SX-A1VA folder. The file format is as shown in Table 1.

The file name uses the specified project name (for example “Project_0001.rnd"). Individual data are separated by commas (,). The file contains the result of the Evaluation.

Example file

```
Saved Time,2017/08/08 16:01:54.3
Store Type,Ave.
Measurement Time,00d 00:00:14

Area, Area A
Machine, Machine 001
Point, Point A-1

Unit ID,1,1,1,1,
Channel,1,2,3,4,

Time Constant,1 s,1 s,1 s,1 s,

ACC Unit,m/s^2,m/s^2,m/s^2,m/s^2,
ACC RMS/EQ,RMS,RMS,RMS,RMS,
VEL Unit,mm/s,mm/s,mm/s,mm/s,
VEL RMS/EQ,RMS,RMS,RMS,RMS,
DISP Unit,mm,mm,mm,mm,

Input Range,Range 5,Range 5,Range 5,Range 5,
```

```
ACC HPF,3 Hz,3 Hz,3 Hz,3 Hz,
ACC LPF,5 kHz,5 kHz,5 kHz,5 kHz,
VEL HPF,10 Hz,10 Hz,10 Hz,10 Hz,
VEL LPF,1 kHz,1 kHz,1 kHz,1 kHz,
DISP HPF,3 Hz,3 Hz,3 Hz,3 Hz,
DISP LPF,500 Hz,500 Hz,500 Hz,500 Hz,

Evaluation (ACC/VEL/DISP),Velocity,Velocity,Velocity,Velocity,
Acceptable threshold,0.71,0.71,0.71,0.71,
Unsatisfactory threshold,1.8,1.8,1.8,1.8,
Unacceptable threshold,4.5,4.5,4.5,4.5,

ACC,0.04864285543486624,0.09509733978588604,0.08022981409741602,0.0
8168267184329112,
ACC PEAK,0.20926165225934046,0.42080869303952395,0.353058336668544
1,0.34924246938179215,
ACC C.F.,4.30199368891723,4.425517127182111,4.401078209989448,4.27586
7038899052,
VEL,0.07832156562579544,0.20551366598766937,0.1282482173148074,0.132
1500099098579,
DISP,0.03515094864301144,0.08673506102795593,0.054548993149601335,0.
05133490301495026,
Evaluation,Favorable,Favorable,Favorable,Favorable,
ACC Overload,,,,,
VEL Overload,,,,,
DISP Overload,,,,,

Tacho[r/min],---
```

Table 5 File Format item

Item name	Repetitive	Description
Saved Time	1	The measurement start date and time is output.
Store Type	1	The store type is output. Inst.: Instantaneous value, Ave.: Average
Measurement Time	1	Measurement time is output. When Instantaneous values, “- d - - -. -” is output.
[New line]	1	
Area	1	The area name selected when saving this result is output.
Machine	1	The machine name selected when saving this result is output.
Point	1	The point name selected when saving this result is output.
[New line]	1	
Unit ID	1~4	The amp unit ID used when saving this result is output. The number of valid channels is output.
Channel	1~4	Output the channel number that was in effect when saving this result. After that, the data output on the same line will be the output channel setting or measurement result.
[New line]	1	
Time Constant	1~4	The time constant is output. “1 s” is fixed.
[New line]	1	
ACC Unit	1~4	The unit of the acceleration selected when saving this result is output.
ACC RMS/EQ	1~4	As a result, the indication characteristic of the acceleration selected at the time of saving is output.
VEL Unit	1~4	The unit of the velocity that was selected when saving this result is output.
VEL RMS/EQ	1~4	As a result, the indication characteristics of the velocity selected at the time of saving are output.
DISP Unit	1~4	The unit of the displacement selected when saving this result is output.
DISP RMS/EQ	1~4	The indication characteristics of the displacement selected when saving this result are output.
[New line]	1	
Input Range	1~4	The resultant input range that was selected when saving this result is output.
ACC HPF	1~4	The resultant acceleration HPF that was selected when saving this result is output.

ACC LPF	1~4	The acceleration LPF that was selected when saving this result is output.
VEL HPF	1~4	The resulted velocity HPF is output when saving this result.
VEL LPF	1~4	The velocity LPF selected when saving this result is output.
DISP HPF	1~4	The displacement HPF that was selected when saving this result is output.
DISP LPF	1~4	The displacement LPF that was selected when saving this result is output.
[New line]	1	
Evaluation (ACC/VEL/DISP)	1~4	Outputs the type of vibration magnitude for the Evaluation. “Velocity” is fixed.
Acceptable threshold	1~4	"Acceptable” value set at the time of saving this result will be output.
Unsatisfactory threshold	1~4	The value of “Unsatisfactory” set when saving this result is output.
Unacceptable threshold	1~4	The value of “Unacceptable” set when saving this result is output.
[New line]	1	
ACC	1~4	Vibration magnitude of acceleration is output.
ACC PEAK	1~4	The peak value of the acceleration is output.
ACC C.F.	1~4	Crest factor of acceleration is output.
VEL	1~4	Vibration magnitude of velocity is output.
DISP	1~4	The vibration magnitude of displacement is output.
Evaluation	1~4	Evaluation results for the set “Acceptable", “Unsatisfactory” and “Unacceptable” values are output. - “Favorable” : VEL ≦ Acceptable threshold - “Acceptable": Acceptable threshold < VEL ≦ Unsatisfactory threshold - “Unsatisfactory": Unsatisfactory threshold < VEL ≦ Unacceptable threshold - “Unacceptable": Unacceptable < VEL
ACC Overload	1~4	As a result, information on whether or not OVERLOAD was generated by acceleration at the time of saving is output. "Over” is output when OVERLOAD occurs.

VEL Overload	1~4	As a result, information on whether or not OVERLOAD occurred at the time of saving is output. "Over” is output when OVERLOAD occurs.
DISP Overload	1~4	As a result, information on whether or not OVERLOAD occurred at the time of saving is output. "Over” is output when OVERLOAD occurs.
[New line]	0, 1	It is output only when tacho pulse input is ON.
Tacho [r/min]	0, 1	The rotation speed at the time of measurement is output. It is output only when the input is ON. > “Numerical": rotational speed > “---": In case of average or rotational speed is invalid value

Repeat : 1 to 4 are delimited by “,” (comma) as many as the number of effective channels.

When opening this file in Microsoft Excel, the year, month, day, hour, minute and second of Saved Time may not be displayed correctly depending on the setting of cell's permanent format.
Operation to correct display, please refer to “Information about Text Files created by the Conversion (SX-A1RT)” in the RIONOTE manual

CSV file format of Evaluation file output function

The measurement result data for the project selected for file output on the Evaluation project selection screen can be output as a CSV file. The file is saved in a folder created separately for each target machine directly under the SX-A1VA folder. The file format is as shown in Table 2.

The file name is as specified on the screen. Individual data are separated by commas (,).

Example file

```
Saved Time,2017/08/10 16:32:29.7

Area, Area A
Machine, Machine 001
Point, Point A-1


ACC Unit,m/s^2
ACC RMS/EQ,RMS
VEL Unit,mm/s
VEL RMS/EQ,RMS
DISP Unit,mm
DISP RMS/EQ,EQ P-P
```

```
DateTime,Project Name,Store Type,Measurement Time,AmpUnit,CH1 Input Range,···abridgement···
2017/08/08 15:53:58.7,Project_0012,Inst.,--d --:--:--,B4-01,Range 5,···abridgement···
2017/08/08 15:54:09.1,Project_0013_NG,Inst.,--d --:--:--,B4-01,Range 5, ···abridgement···
2017/08/08 15:57:02.9,Project_0014_NG,Ave.,00d 00:01:09,B4-01,Range 5, ···abridgement···
```

Header part : Outputs start date and time of file output, machine to be measured, unit, instruction characteristics.

Data part : Outputs the Evaluation result of the selected project. The item name of the data is displayed at the top, and the results for each project are output line by line after that.

Table 2 File Format item

Header section

Item name	Description
Saved Time	The file save date and time is output.
[New line]	
Area	Outputs the area name that instructed file output.
Machine	Outputs the machine name that instructed file output.
Point	Outputs the measurement point that instructed file output.
[New line]	
[New line]	
ACC Unit	Unit of acceleration selected at file output is output.
ACC RMS/EQ	The indication characteristic of the acceleration selected at file output is output.
VEL Unit	Unit of velocity selected at file output is output.
VEL RMS/EQ	Indication characteristics of the velocity selected at file output will be output.
DISP Unit	The unit of the displacement selected when outputting the file is output.
DISP RMS/EQ	Indication characteristics of displacement selected at file output is output.
[New line]	

Data section

Item name	Description
DateTime	The measurement start date and time is output.
Project Name	The project name is output.
Store Type	The store type is output. Inst.: Instantaneous value, Ave.: Average
Measurement Time	Measurement time is output. When instantaneous values, “- d - - -. -” is output.
AmpUnit	It outputs by amplifier unit name.
CHX Input Range	The software range set for the target channel is output.

CHX ACC HPF	The acceleration HPF set for the target channel is output.
CHX ACC LPF	The acceleration LPF set for the target channel is output.
CHX VEL HPF	The velocity HPF set for the target channel is output.
CHX VEL LPF	The velocity LPF set for the target channel is output.
CHX DISP HPF	The displacement HPF set for the target channel is output.
CHX DISP LPF	The displacement LPF set for the target channel is output.
CHX Evaluation (ACC/VEL/DISP)	The type of the vibration magnitude of the Evaluation set for the target channel is output.
CHX Acceptable threshold	"Acceptable" value of the Evaluation set for the target channel is output.
CHX Unsatisfactory threshold	The "Unsatisfactory" value of the Evaluation set for the target channel is output.
CHX Unacceptable threshold	"Unacceptable" value of the Evaluation set for the target channel is output.
CHX ACC	The measurement result of the acceleration of the target channel is output.
CHX ACC PEAK	The measurement result of the acceleration peak value of the target channel is output.
CHX ACC C.F.	The measurement result of the acceleration crest factor of the target channel is output.
CHX VEL	The measurement result of the speed of the target channel is output.
CHX DISP	The measurement result of the displacement of the target channel is output.
CHX Evaluation	Evaluation results for the set "good", "caution" and "danger" values are output. - "Favorable" : VEL ≦ Acceptable threshold - "Acceptable" : Acceptable threshold < VEL ≦ Unsatisfactory threshold - "Unsatisfactory" : Unsatisfactory threshold < VEL ≦ Unacceptable threshold - "Unacceptable" : Unacceptable < VEL
CHX ACC Overload	Information on whether or not OVERLOAD occurred on the target channel by acceleration is output. "Over" is output when OVERLOAD occurs.
CHX VEL Overload	Information on whether or not OVERLOAD has occurred in the target channel at the speed is output. "Over" is output when OVERLOAD occurs.
CHX DISP Overload	Information on whether or not OVERLOAD has occurred due to displacement to the target channel is output. "Over" is output when OVERLOAD occurs.

Tacho[r/min]	The rotation speed at the time of measurement is output. - “number": rotation speed - “---": When average or rotation speed is invalid value

"X” of the item starting from “CHX ~” will contain numbers from 1 to 4, and 4 channels will be output regardless of SA-A1B2 and SA-A1B4. In addition, “- - - - - - - - - - - - - -” is output to all channels which are invalid in the input setting, and if the CH 2 is invalid, all the data of the item starting from CH 2 will be “- -".

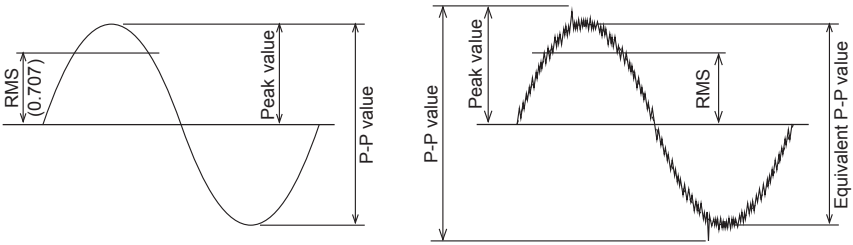
When opening this file in Microsoft Excel, the year, month, day, hour, minute and second of Saved Time may not be displayed correctly depending on the setting of cell's permanent format.
Operation to correct display, please refer to “Information about Text Files created by the Conversion (SX-A1RT)” in the RIONOTE manual.

Technical Reference

Technical Reference

Expression of vibration magnitude

The meanings of the various vibration measurement values are explained below.



- Peak value [screen indication: PEAK]: Maximum value of one side of the amplitude
- Effective value [screen indication RMS]: Square root of the mean square of the instantaneous value
- Peak to peak value (P-P value): Maximum difference between maximum value and minimum value
- Equivalent peak value [screen indication: EQ PEAK]: $\sqrt{2}$ times the effective value
- Equivalent peak to peak value [screen indication: EQ P-P]: $2\sqrt{2}$ times the effective value
- Crest factor [screen indication: C.F.]: Peak value / Effective value. For a sine wave, this is $\sqrt{2}$

MEMO	- For a pure sine wave, Peak value = Effective value x $\sqrt{2}$, but in real world situations this usually does not apply.

Filter characteristics

- High-pass filter, low-pass filter

The typical characteristics of the high-pass and low-pass filters of this product are shown in the diagrams below. For each filter, the point where gain is at -10% is taken as the cutoff frequency. However, the 10 Hz rating of the high-pass filter and the 1 kHz rating of the low-pass filter used for vibration severity evaluation follow the ISO 2954:2012 specifications, with the -3 dB point being used to represent the cutoff frequency. All filters are third-order filters. The transition region slope of the high-pass filter is 18 dB/oct and that of the low-pass filter is -18 dB/oct.

The “18 dB/oct” rating means that the gain increases by 18 dB when the frequency is doubled.

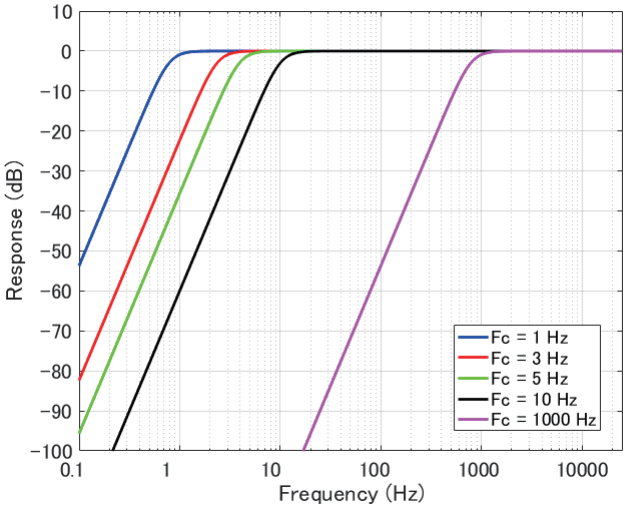


Fig.: Representative characteristics of high pass filter

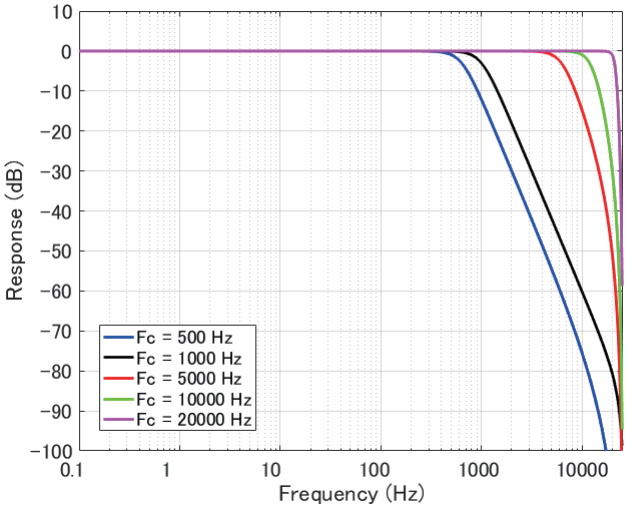


Fig.: Representative characteristics of low pass filter

- Velocity and displacement filters

The typical characteristics of the velocity and displacement filters of this product are shown in the diagrams below. The integral filter used for determining velocity is a first-order filter (-6 dB/oct), and the two-stage integral filter for determining displacement is a second-order filter (-12 dB/oct). The diagram below shows the typical characteristics when the high-pass filter is set to 1 kHz. Both for velocity and displacement, this amounts to a gain change of approximately -10% (approx. -0.9 dB) from the ideal integral characteristics at 3 Hz (-6 dB/oct line).

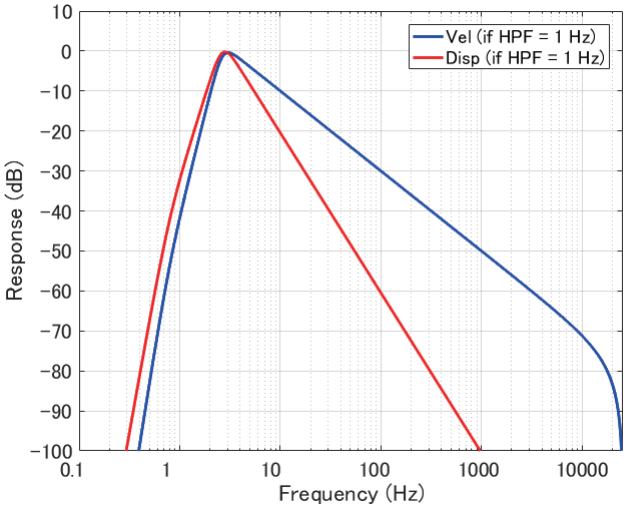
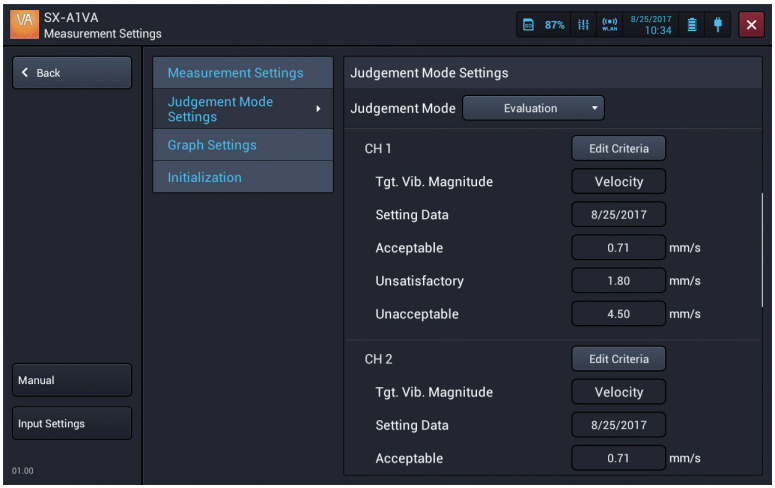


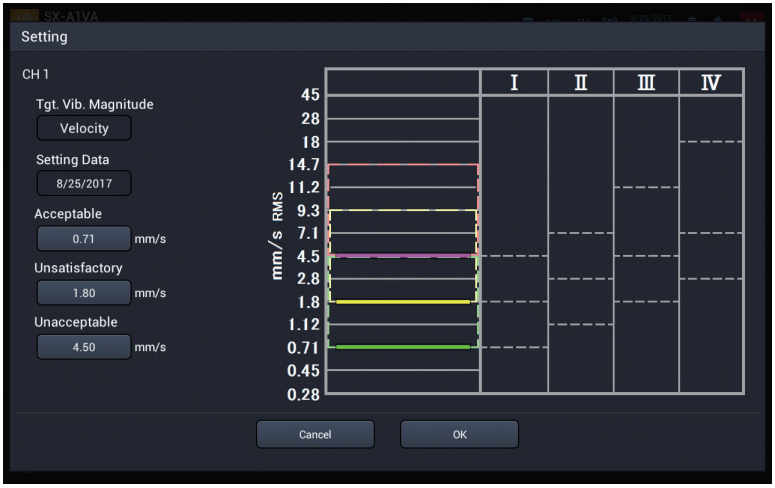
Fig.: Representative characteristics of velocity / displacement filter
(when 1 Hz HPF is applied)

Evaluation criteria

Vibration severity is defined as a quantity that comprehensively expresses the intensity of a vibration. It is arrived at by taking various factors that describe the vibration into account, such as maximum, average, and effective values etc.
The vibration severity of machinery is defined by ISO 10816 (Evaluation of machine vibration by measurements on non-rotating parts). For details, please refer to “5. Evaluation of Machine Vibrations” in the “Measurement of Machine Vibrations” Technical Reference issued by Rion.
According to ISO 10816-1:1995 / Amd. 1:2009, evaluation criteria for mechanical vibration over a specified range are to be decided by agreement between the supplier and the user of the machine, and boundary values for evaluation are to be determined in consideration of the measurement position and the support rigidity of the machine etc.
The SX-A1VA program offers a Judgement Mode setting screen for specifying the evaluation criteria in accordance with this standard. It is also possible to specify evaluation criteria for specific machinery according to ISO 10816-2 and later.



Tap the Edit Evaluation Criteria button to check the criteria range values according to ISO 10816-1:1995 / Amd.1:2009. Changing boundary values within this range is also possible. By using different boundary values, you can adapt the evaluation procedure to different target machines.
The default settings for evaluation criteria boundary values are the lowest values for each indicated range.
For reference, the boundary values for the respective classes according to ISO 10816-1:1995 are also shown.



About the “Maximum” Averaging Method

When [Average Method] in measurement settings is set to [Maximum], the maximum value for each line is held during operation.

About the “Exponential” Averaging Method

Exponential averaging in FFT analysis gives more weight to immediately preceding values and less weight to earlier values. Unlike linear averaging, FFT analysis will not stop when a specified averaging count is reached. It therefore is suitable for assessing the temporal shift of an averaged spectrum. The larger the exponential average coefficient k, the longer the averaging time. Specifying a large coefficient k has a similar effect to specifying a long time constant. When the exponential average coefficient k is large, the rise time for values will be longer. If values need to be read quickly, setting a lower coefficient to reduce the averaging effect is recommended.

Window Functions and Correction when Window Functions are Applied

In FFT analysis, the window function is applied before splitting time waveform data into units of a constant size (frame length). The window function serves to reduce the so-called spectral leakage effect that tends to occur in FFT analysis.
FFT calculation is performed under the assumption that the source waveform data (subsequently called frame data) are one unit cut out from a waveform of infinite duration, where the same unit is endlessly repeated before and after. If the value at the left edge of the frame data differs from the value at the right edge, a discontinuity will therefore occur at the joining section. This discontinuity which did not exist in the original time waveform data comprises a wide range of frequency components. In addition to the original frequency components, the FFT analysis result therefore contains superfluous frequency components in the vicinity of this area. This phenomenon is referred to as spectral leakage.
A window function normally will be symmetrical and have the same attenuation at both ends. When this is applied to the frame data, the amplitude (energy) of the discontinuity section will become smaller, which means that spectral leakage is decreased. However, because the amplitude (energy) of the waveform decreases, the original frequency components in the FFT analysis result will also be attenuated.
Therefore correction for the amplitude attenuation caused by the window function is applied, so that the spectral value for each line is the same as before introducing the window function.
Because the POA value calculated from each corrected line spectrum does not match the value before window function application, correction is again applied so that the POA value calculated from each line spectrum is equal to the power of the original frame data for the same frequency band.

Discontinuity of FFT Window

When performing real time analysis with SX-A1VA in FFT mode, the time window may become discontinuous, depending on the settings for frequency range and number of lines (number of analysis points). With real time analysis, the overlap ratio of line numbers is as shown below.

Frequency Range (Sampling frequency)	Overlap ratio
100 (256)	0.875
200 (512)	0.875
500 (1280)	0.75
1000 (2560)	0.5
Others	0

With a setting of 4 channels, 3200 lines, and 20 kHz frequency range, invalid values will be obtained.

Subsampling of Averaging Count

With SX-A1VT, the display during averaging may discard certain time frames, such as the 1st, 4th, 7th etc., depending on the setting. This applies only to the display. Calculation of the averaging result is based on all frames without subsampling.

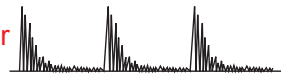
Acceleration envelope

Apply a 1 kHz high-pass filter to the input acceleration signal with a sampling frequency of 51.2 kHz and find the absolute value. Then apply the anti-aliasing filter and perform downsampling to determine the acceleration envelope for each frequency range.

(1) Acceleration signal sampled at a frequency of 51.2 kHz

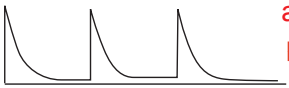
(2) Determine absolute waveform value

Apply 1 kHz high-pass filter



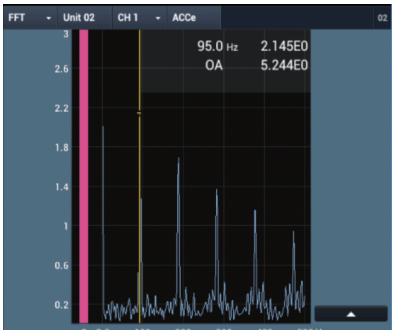
Apply anti-aliasing filter and perform downsampling

(3) Determine acceleration envelope for each frequency range



FFT analysis

(4) FFT spectrum



Logical Channel

In FFT analysis mode, frequency analysis is performed for each channel with the previously specified vibration magnitude settings.
By using the logical channel setting function, it is possible to perform frequency analysis on the input signal for a given channel with different vibration quantity settings. After a logical channel setting has been made, the “Channel” indication for setting items on the setting screen will indicate the logical channel.

Example 1
Perform FFT analysis on a single channel with four different vibration magnitude types. Assign all four logical channels to the same channel, and select different vibration magnitude settings for each channel.

		Vibration magnitude settings	
Logical Channel 1	----	Channel 1	Acceleration
Logical Channel 2	----	Channel 1	Velocity
Logical Channel 3	----	Channel 1	Displacement.
Logical Channel 4	----	Channel 1	Acceleration Envelope

Example 2
Perform FFT analysis on two channels with two different vibration magnitude types. Assign logical channels 1 and 2 to channel 1, and logical channels 3 and 4 to channel 2. Select two different vibration magnitude settings for the two channel pairs.

		Vibration magnitude settings	
Logical Channel 1	----	Channel 1	Acceleration
Logical Channel 2	----	Channel 1	Velocity
Logical Channel 3	----	Channel 2	Acceleration
Logical Channel 4	----	Channel 2	Velocity

Specifications

Specifications

Number of channels

Physical channel

Number of channels that can input signals via the amplifier unit

Up to 2 channels (SA-A1B2 case)

Up to 4 channels (SA-A1B4 case)

Logical channel

Channels that can be assigned to the physical channels of the amplifier unit, and do signal processing

Up to 4 channels (regardless of SA-A1B2/B4)

Input range upper limit (input voltage range to be used)

Acceleration:

1000	* 10^N m/s^2	(10 V range)
316	* 10^N m/s^2	(10 V range)
100	* 10^N m/s^2	(10 V range)
31.6	* 10^N m/s^2	(10 V range)
10	* 10^N m/s^2	(10 V range)
3.16	* 10^N m/s^2	(1 V range)
1	* 10^N m/s^2	(1 V range)

Velocity:

3160	* 10^N mm/s	(10 V range)
1000	* 10^N mm/s	(10 V range)
316	* 10^N mm/s	(10 V range)
100	* 10^N mm/s	(10 V range)
31.6	* 10^N mm/s	(10 V range)
10	* 10^N mm/s	(1 V range)
3.16	* 10^N mm/s	(1 V range)

Displacement:

89.4	* 10^N mm	(10 V range)
28.3	* 10^N mm	(10 V range)
8.94	* 10^N mm	(10 V range)
2.83	* 10^N mm	(10 V range)
0.894	* 10^N mm	(10 V range)
0.283	* 10^N mm	(1 V range)
0.089	* 10^N mm	(1 V range)

N is changed by sensitivity

- N = 1: The sensitivity is 0.0001 to 0.999 mV/ (m/s^2)
- N = 0: The sensitivity is 1.00 to 9.99 mV/ (m/s^2)
- N = −1: The sensitivity is 10.0 to 15000.0 mV/ (m/s^2)

Vibration measurement range (when PV-57I is connected)

Acceleration: 0.02 to 141.4 m/s^2 (rms)

Velocity: 0.2 to 141.4 mm/s (rms, at 159.15 Hz)

Displacement: 0.02 to 40.0 mm (eq peak-peak, 15.915 Hz)

Measurement frequency range (electrical characteristics)

Acceleration: 1 Hz to 20 kHz

Velocity: 3 Hz to 3 kHz

Displacement: 3 Hz to 500 Hz

Acceleration envelope: 1 kHz to 20 kHz

Filter

Butterworth filter 3rd order (Cutoff characteristic 18 dB/oct).

At the cutoff frequency, the filter for vibration severity is -3 dB, and the other filter -10% (about -0.9 dB) attenuation

High pass filter

1 Hz, 3 Hz, 5 Hz, 10 Hz, 1 kHz

Low pass filter

500 Hz, 1 kHz, 5 kHz, 10 kHz, 20 kHz

Operation mode

SX-A1VA offers two types of analysis modes:

- Vibration meter mode
- FFT analysis mode

Vibration meter mode

Vibration magnitude

Simultaneously calculate the following items by digital filter calculation. Assume acceleration input.

Acceleration:

Signals input via accelerometer.

Select the display characteristics from effective value (rms), equivalent peak value (eq 0-peak).

In addition, true peak value for 2 seconds and crest factor are also calculated.

Velocity:

1st-order integrated signal of the input acceleration signal

Select the display characteristics from effective value (rms), equivalent peak value (eq 0-peak)

Displacement:

2nd-order integrated signal of the input acceleration signal

Select the display characteristics from effective value (rms), equivalent peak value (eq 0-peak), equivalent peak value (eq peak-peak)

Sampling frequency

51.2 kHz

Time constant

1 second

Measurement time

1 second to 1 hour, 100 ms

Store function

a) Saving the instantaneous values of the vibration magnitude (instantaneous value store)

b) Save time history fluctuation of vibration magnitude every 100 ms (Auto store)

c) Calculate and store the average value of the time history fluctuation of the vibration magnitude within the specified time (average value store)

Display method

Numeric display

Displays values simultaneously for acceleration, velocity and displacement.

Bar graph display

Displays bar graph for vibration magnitude.

Linear or Log can be selected

Time-value display

Displays the time history fluctuation for vibration magnitude

Tacho display

Rotation speed is displayed together with vibration magnitude

Display interval is every 500 ms

Threshold judgment function

Sets the threshold value of the vibration magnitude and notifies the measurement screen when the vibration amount exceeds the threshold value during measurement

ISO Evaluation Criteria

Evaluation judges on the basis of ISO 10816-1: 1995 / Amd 1: 2009, to the measurement of instantaneous value or average value

FFT analysis mode

Vibration magnitude

a) Power spectrum display

Different settings can be made between channels. Select one vibration magnitude from the following.

1. Acceleration:

Signals input via accelerometer.

Select the display characteristics from effective value (rms), equivalent peak value (eq 0-peak)

2. Velocity:

1st-order integrated signal of the input acceleration signal

Select the display characteristics from effective value (rms), equivalent peak value (eq 0-peak)

3. Displacement:

2nd-order integrated signal of the input acceleration signal

Select the display characteristics from effective value (rms), equivalent peak value (eq 0-peak), equivalent peak value (eq peak-peak)

4. Acceleration envelope

b) Time waveform display of one frame

Display one time waveform of acceleration, speed, displacement, acceleration envelope for each channel

Frequency range

100 Hz, 200 Hz, 500 Hz, 1 kHz, 2 kHz, 5 kHz, 10 kHz, 20 kHz

Analysis spectrum lines (analysis points)

Number of selectable analysis spectrum lines (analysis points)
200, 400, 800, 1600, 3200 (512, 1024, 2048, 4096, 8192)

Window function

Rectangular, Hanning, Flat Top

Average calculation

Linear average, Exponential average, Maximum hold (MAX)

Average count

1 to 1024, ∞ (∞ is available only when the average operation is exponential average)

Store function

a) Save the value of 1 frame displayed on the screen (instantaneous value store)

b) Save the result of averaging multiple frame values (culated value store)

Rotation speed indication

Display rotation speed together with FFT analysis result

The display interval is “FFT analysis frame interval” or “screen update interval of 500 ms”, whichever is the longer is applied

Top 20 list display

Rank frequencies and vibration values in descending order of level

Specifying Overlay Graph Data function

Overlay the selected FFT analysis result on the measurement screen and the recall screen

Maximum/Minimum scale change for Y/X axis

The maximum and minimum scale values of Y/X axis can be changed by tapping within the Y/X axis display area of a graph

Display function

This function is common to vibration meter mode and FFT analysis mode

Display unit

	Effective value (rms)
Acceleration	m/s^2 , G , in/s^2
Velocity	mm/s , in/s
Displacement	mm , μm , mil

Overload, Underrange

Display and record overload and overload history for vibration input

Display overload and underrange for the tacho input

Waveform recording

Waveform recording range

Waveform recording is enabled in the following range

1. Auto store range of the vibration mater mode
2. Instantaneous value store range of the FFT analysis mode (1 frame)
3. Calculated value store range of the FFT analysis mode

Sampling frequency

Vibration mater mode: 51.2 kHz (Fixed)

FFT analysis mode: Frequency range X 2.56

Quantization bit rate

24 bit (fixed)

Trigger measurement

Both vibration meter mode and FFT analysis mode have a trigger function.

Trigger mode

Free, Single, Repeat

Trigger source

Measurement mode	Selectable trigger source
Vibration meter mode	Vibration magnitude, Time, External, Tacho pulse
FFT analysis mode	Waveform (Wave value), Time, External, Tacho pulse

Trigger level

Trigger source: Set vibration level, threshold value for waveform case

Trigger slope

Trigger source: Set + / - for vibration magnitude, waveform, tacho pulse

Pre-time

Trigger source of vibration meter mode: Set for vibration amount, external

0 s, 1 s, 5 s

Trigger position

Trigger source of FFT analysis mode: Set for waveform, external

Less than half of analysis points for ± 1 frame

Save file

The files saved by this application are as follows

1) Binary file

1. Measurement results of vibration meter mode
2. Measurement results of FFT analysis mode

2) Text file

1. Measurement result of vibration meter mode
2. ISO Evaluation criteria
3. Measurement conditions

3) WAVE file
   1. Wave file
   2. Voice memo (can be recorded only during measurement)

4) PNG file
   Screenshot image file

5) Database file
   1. Marker (Can be added only during measurement)
   2. ISO Evaluation criteria result

Recall function

Read the measurement data from the SD card and display it on the recall screen

1) Vibration meter data
   Vibration magnitude and ISO Evaluation criteria result

2) FFT analysis data
   Vibration spectrum and time-domain waveform

Loading the Startup File

Start with the RIONOTE specified condition using the configured settings file which is saved as “Startup file”

Battery life

Over 2.5 hours during continuous measurement (typical value)
(SA-A1B4 connection, CCLD ON, FFT analysis mode, LCD lighting state (maximum brightness))

Function Button

Screen Capture (screenshot)
   Capture the entire screen and save as an image file

Pause/Unpause
   Stop screen update temporarily

Measure Start/Stop

Start analysis by pressing the function button during monitoring

Stop analysis by pressing the function button again during measurement

Initialization function

Initialize the settings.

Display language switching

Depending on the settings of RIONOTE, you can switch between Japanese, English, and Korean display.

Media

SD memory card (512 MB)

Dimensions and Weight

32 mm (L) x 24 mm (W) x 2.1 mm (T)

Approx. 5 g

Supplied accessories

Inspection certificate 1

http://www.rion.co.jp/

No. 62441