

DS-0321 FFT Analysis Software

Operation manual


for Acoustic Analysis Using MI Series Measurement Microphone

This instruction manual describes basic operations of the MI series measurement microphone for acoustic analysis.

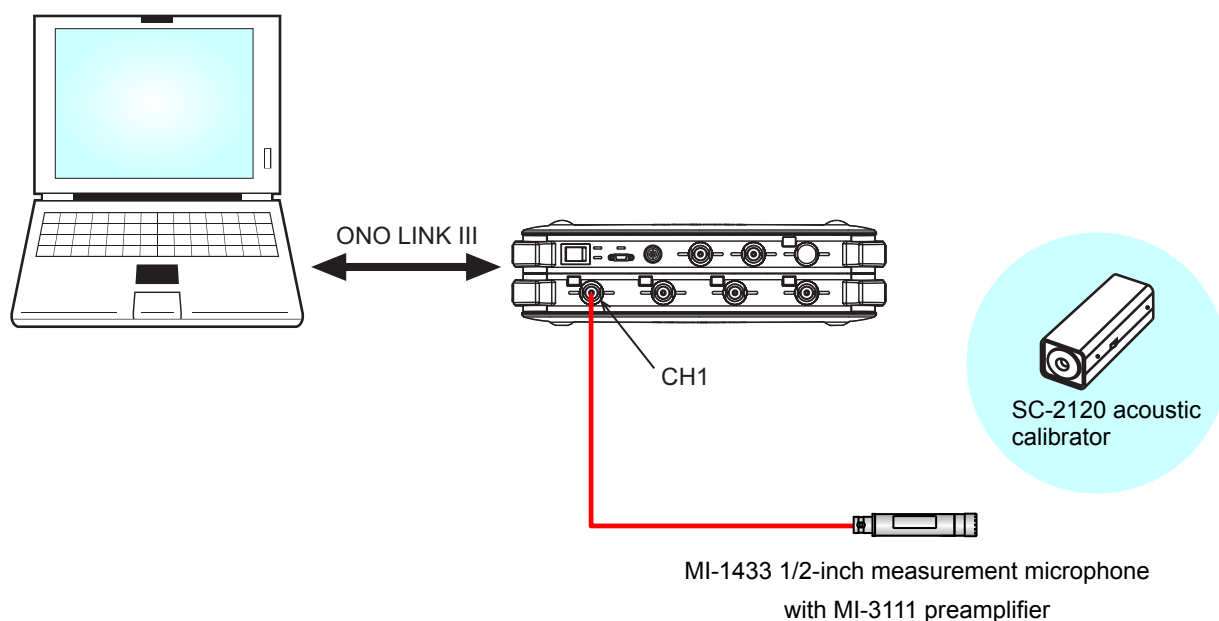
As in the system configuration shown in the figure below, the MI-1433 1/2 inch measurement microphone with MI-3111 preamplifier is connected to Ch1 of the DS-3000 (with Ch2 unused), FFT analysis is executed using DS-0321 FFT analysis software.

This manual describes functions with the focus on what behavior will result from a single operation, and you are recommended to try various actions on the instrument.

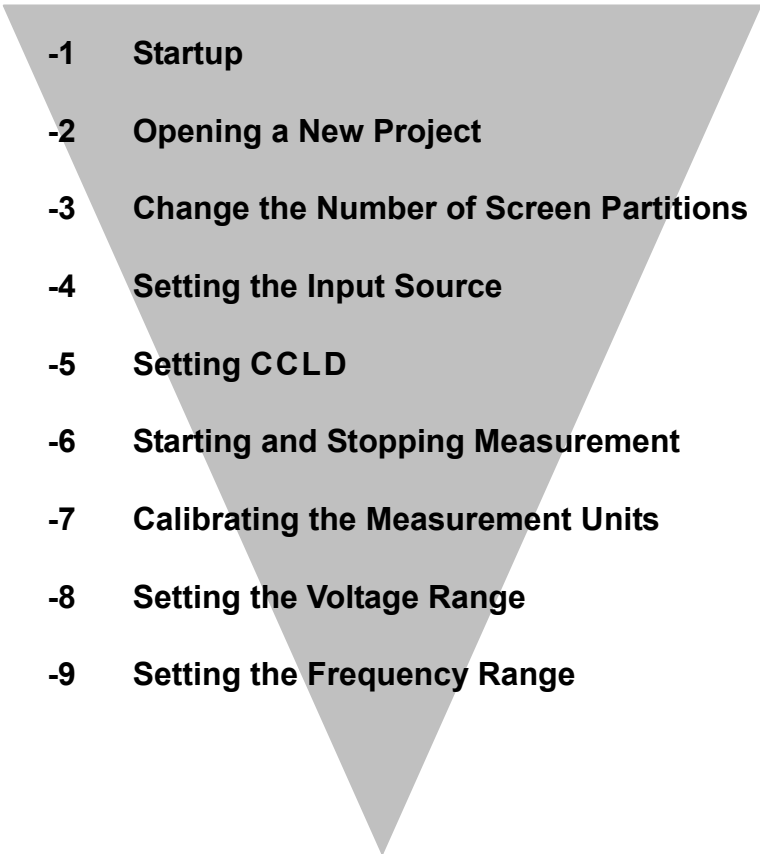
Basic operations of DS-3000 software are mostly executed in the Configuration window. As the operations in the Configuration window are correspondent with those of the Main menu, the Main menu operations are not included in this manual. For details on the Configuration window operations, refer to the respective procedure manuals ([Basic operation procedure for display of Configuration Window](#) and [Basic operation procedure for Configuration Setting](#)).

In this instruction manual, a series of clicking operations is described, for example, as follows: Click "File" > "Project File" > "New Project" > "".

■ System Configuration



■ Operation Flow

- 
- 1 Startup
 - 2 Opening a New Project
 - 3 Change the Number of Screen Partitions
 - 4 Setting the Input Source
 - 5 Setting CCLD
 - 6 Starting and Stopping Measurement
 - 7 Calibrating the Measurement Units
 - 8 Setting the Voltage Range
 - 9 Setting the Frequency Range

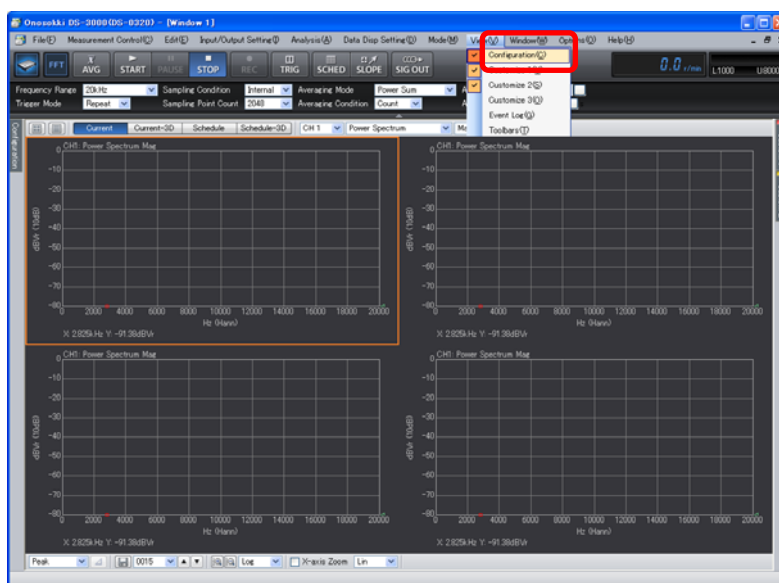
■ Operation Procedure

-1 Startup

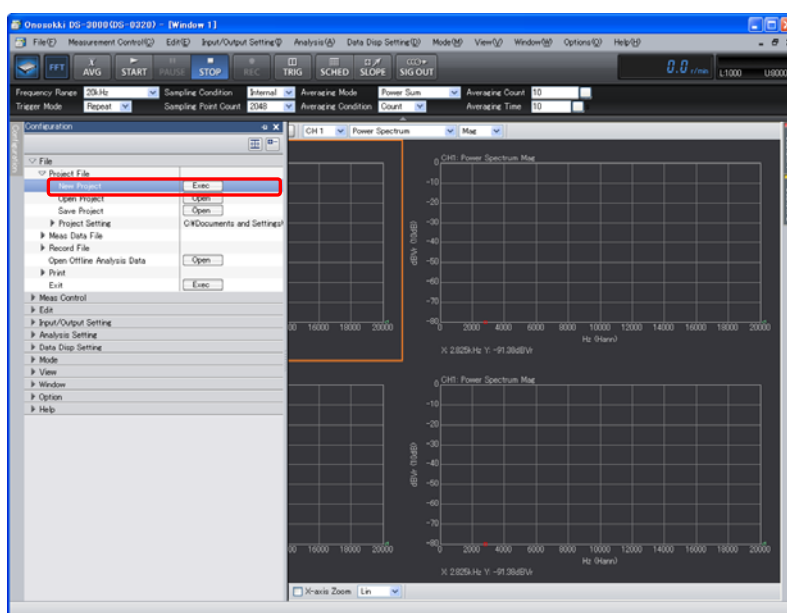
Connect each device as described in the System Configuration, turn power on, and start the DS-0321 FFT analysis software.

-2 Opening a New Project


- ① Click "View" > "Configuration" from the Main menu to open the "Configuration" window.

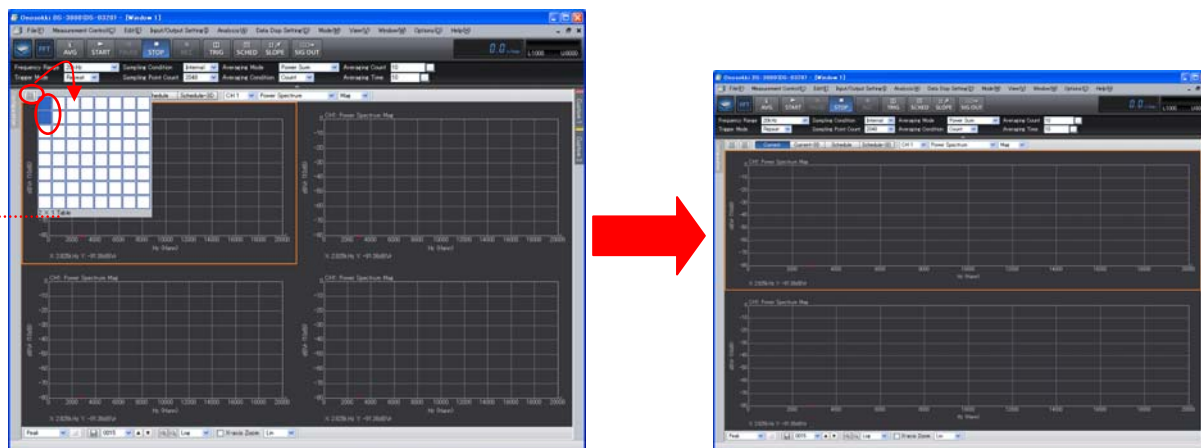


- ② In the "Configuration" window, click "File" > "Project File" > "New Project" > "Exec". This operation discards the current settings and opens a new project with the initial settings.

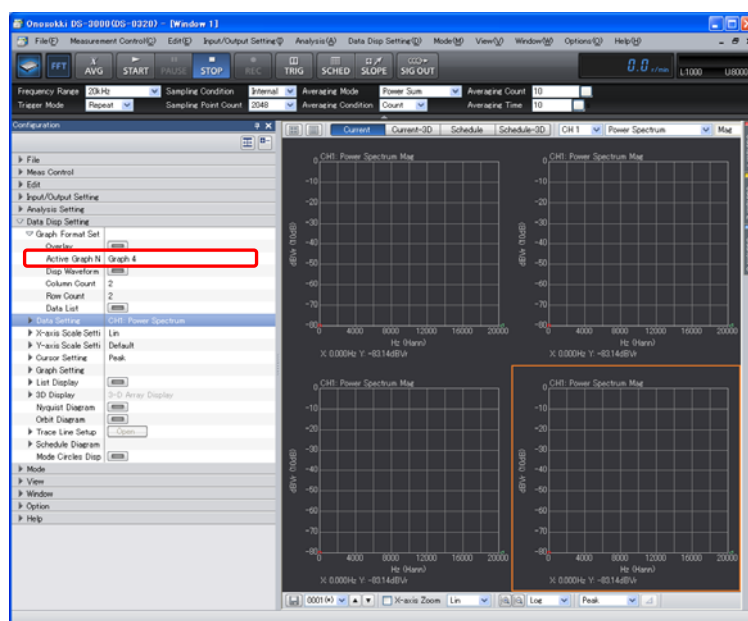


-3 Change the Number of Screen Partitions

- ① Click the Select Number of Partitions tool  above the graph window, and select the two partitions of the upper and lower ones as shown in the figure below. This results in two screen partitions.



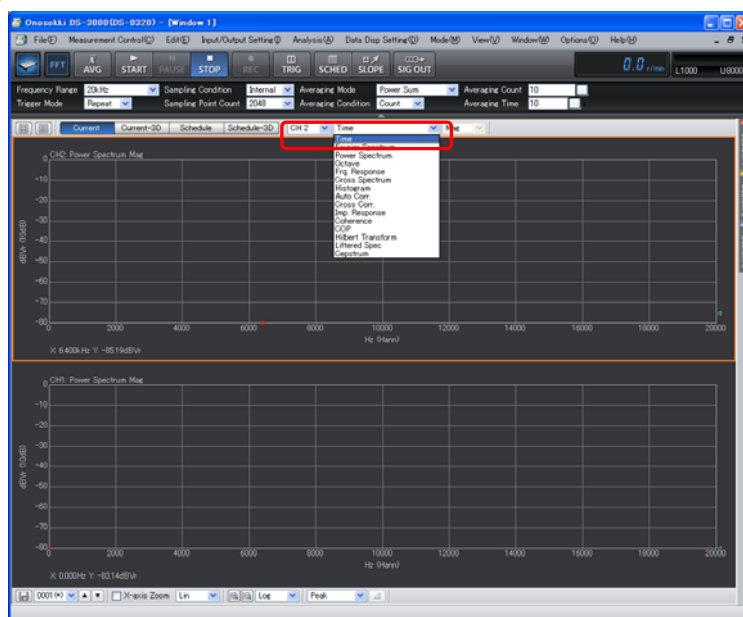
The graph numbers are automatically assigned to sequence numbers in the upper left to right order while changing the row ("Graph 1", "Graph 2", and so on). You can view the graph number by clicking "Set Data View" > "Set Graph Format" > "Active Graph Number" in the "Configuration" window.



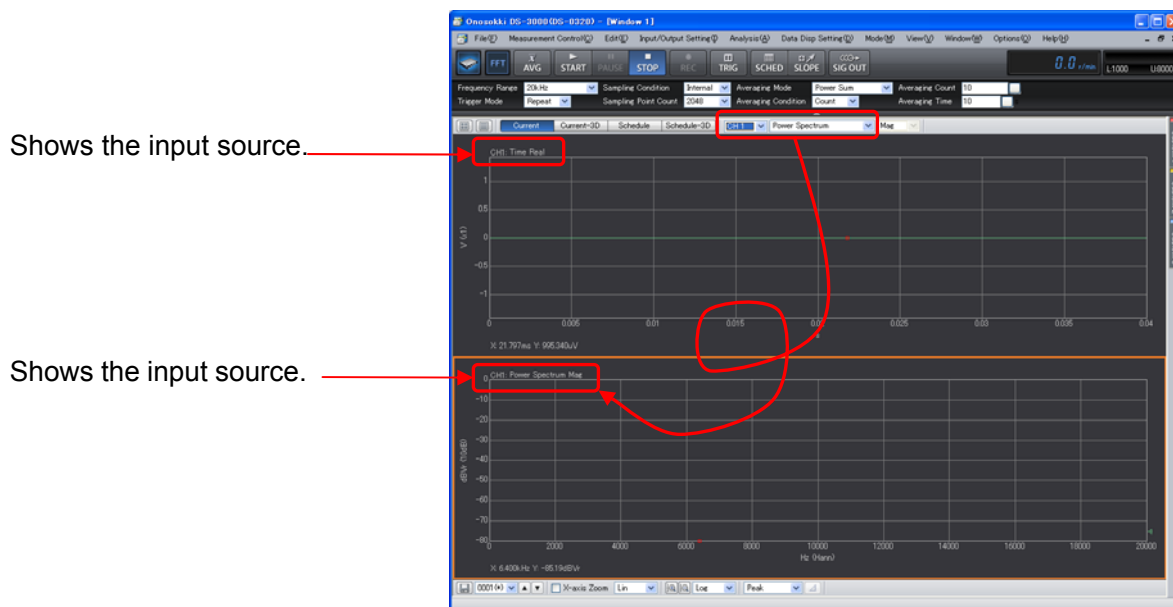
-4 Setting the Input Source

Set the graph in the upper screen partition to the "Ch1 Time Waveform" view. Set that in the lower partition to the "Ch1 Power Spectrum" view.

- ① Click in the upper graph to activate it. The graph is enclosed with orange box lines.
- ② Select "CH1" using the Select Input Source tool above the graph window. From the pull-down menu on the right to it, select "Time Waveform".



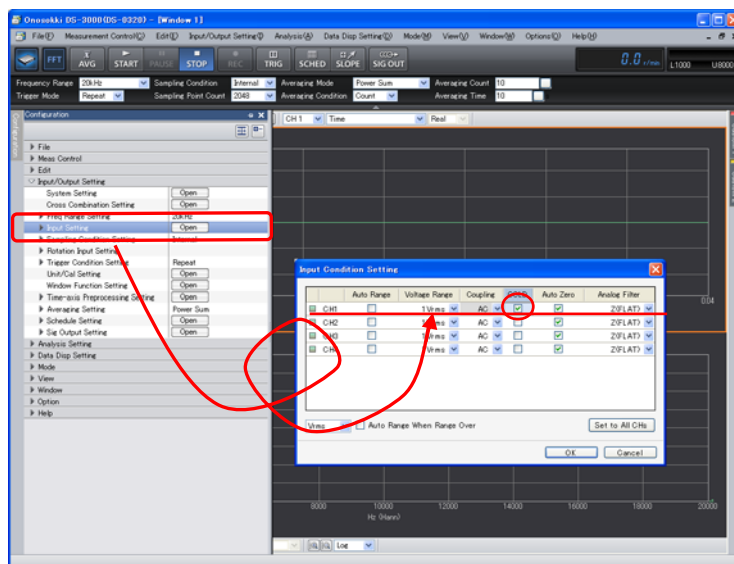
- ③ In a similar manner, click in the lower graph, select "CH1" for the input source, and select "Power Spectrum" for the display waveform.



- When you click in the graph, it is enclosed with orange box lines to show that it is active.
- The settings in the "Configuration" window are reflected in the active screen partition, except for the measurement items related to all the channels, including the frequency and voltage ranges.
- No operations are permitted on some items unless the system is in the "STOP" state. For example, the character string indicating the average number of process times grays out during averaging measurement, meaning that the setting is unchangeable.

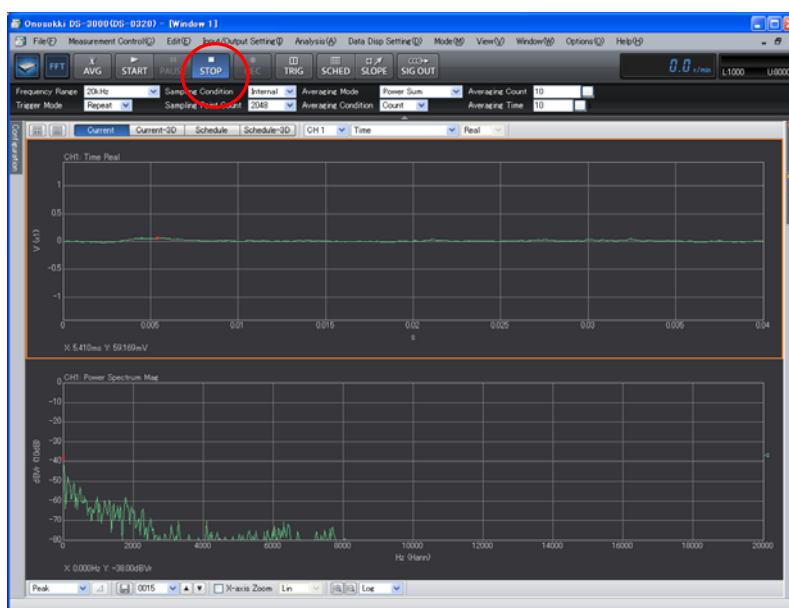
-5 Setting CCLD

- ① In the "Configuration" window, click "Set I/O" > "Set Input" > "Open". The "Set Input Conditions" dialog box opens.
- ② In the "Set Input Conditions" dialog box, put a check mark in the "CCLD" box of "CH1". This allows power of "+24V/4mA" to be supplied from CH1 to the MI-1433 1/2 inch measurement microphone with MI-3111 preamplifier; the signal will be input properly.



-6 Starting and Stopping Measurement

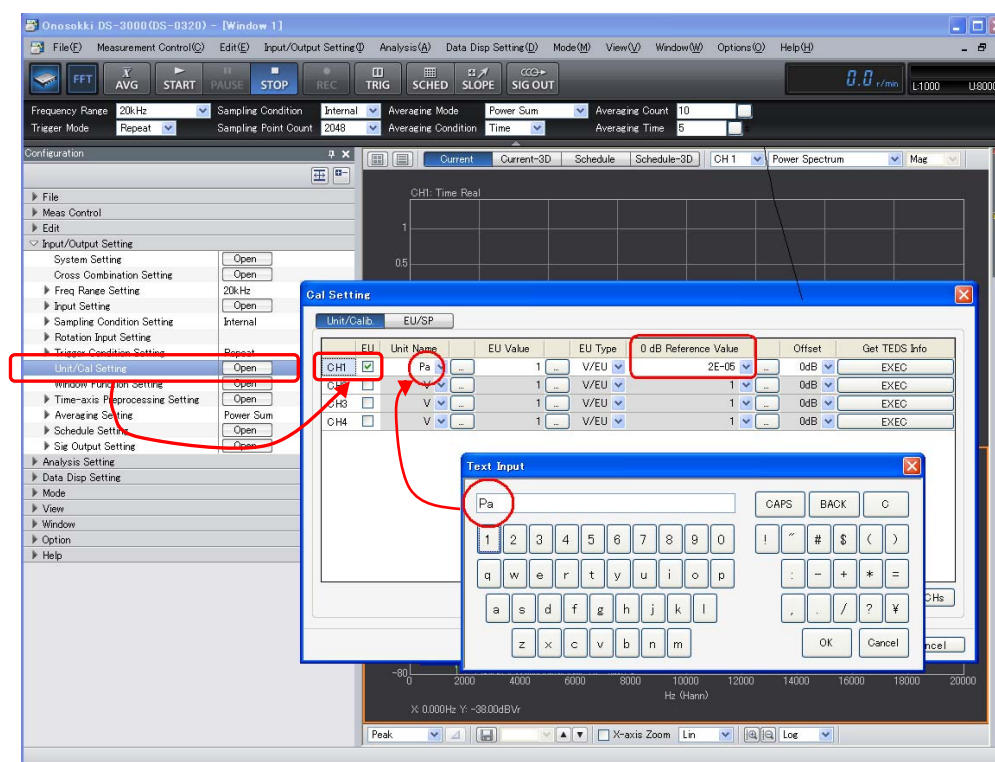
- ① Start or stop the measurement using the "START" or "STOP" button on the main tool bar. If the waveform displayed is small, you need to adjust the voltage range according to Step 8. The following figure shows the noise waveforms measured. The time waveform is in the upper partition ("Graph 1") and its power spectrum is in the lower partition ("Graph 2").



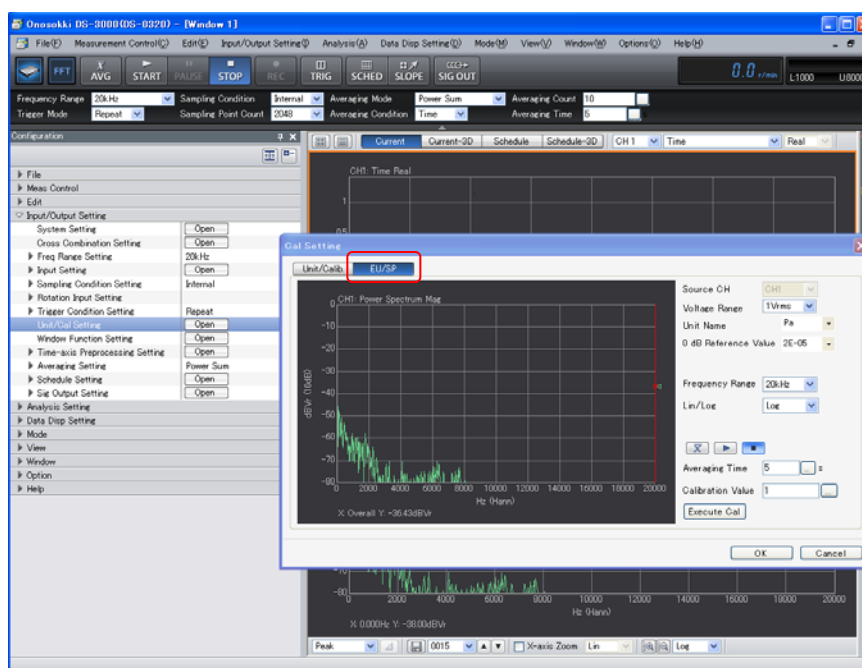
-7 Calibrating the Measurement Units

Calibrate the measurement units so that the reading along the Y axis can be directly read in the sound pressure level (dB) in the "START" status.

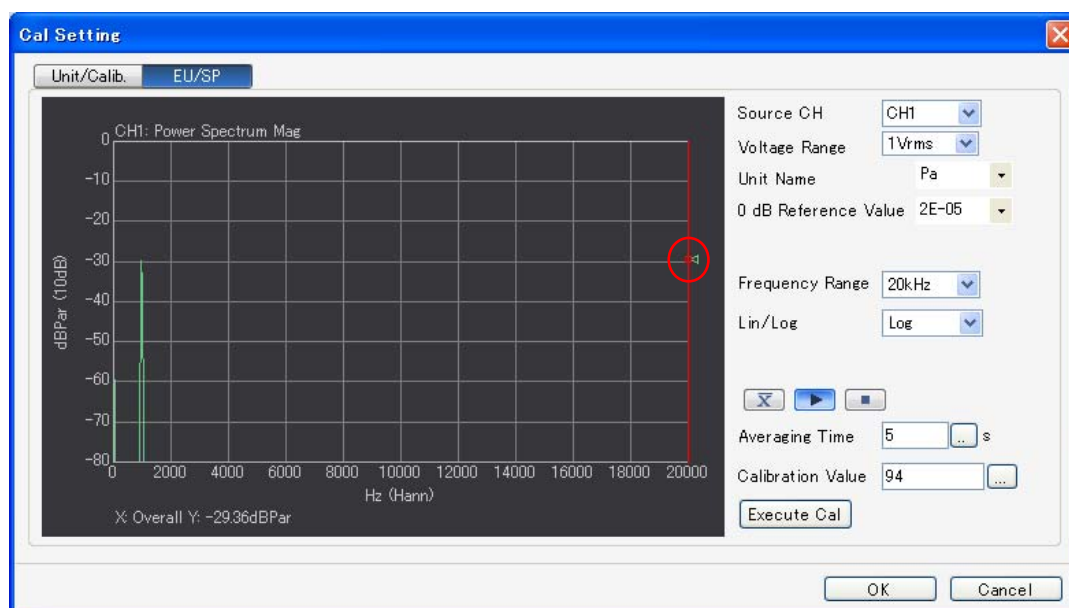
- ① Input the reference signal from the acoustic calibrator SC-2120. Turn on the power to the acoustic calibrator SC-2120 and slowly insert the microphone MI-1433 all the way to the bottom. Wait about 30 seconds for the sound pressure of the acoustic calibrator to stabilize.
- ② In the "Configuration" window, click "'Set I/O" > "Calibrate Measurement Units" > "Open". The "Set Calibration" dialog box opens.
- ③ Put a check mark in the "EU" box of "CH1" in the "Set Calibration" dialog box. Then, click the "Unit Name" key-in button to open the "Enter Character String" window, key in the unit name, and click the OK button. In the following figure, the pressure unit "Pa" is entered. Unit in a time waveform display is "Pa", "dBPar" in a power spectrum display. If you want to omit the pressure unit (Par) from the indication, leave the unit name field blank.



- ④ Click the "EU/SP" tab in the "Set Calibration" dialog box. The calibration setting dialog box of "EU/SP" opens.

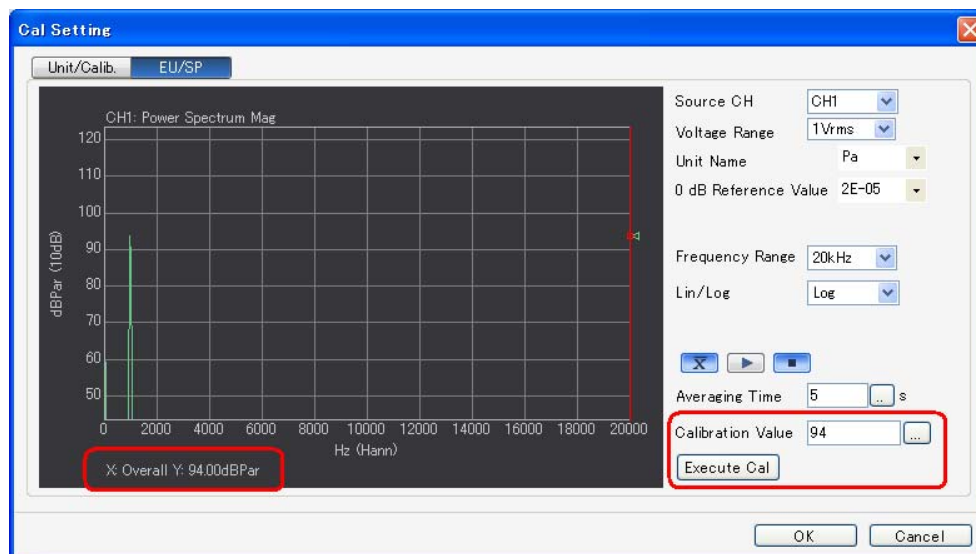


- ⑤ Press the "START" button in the main toolbar to start measurement.
- ⑥ Move the cursor to the "overall" position in the calibration setting dialog box of "EU/SP". Click in the window near the overall position and red line appears. Using the left and right arrow keys on the keyboard, move the cursor to align with the red line. At this time, "X: Overall" is displayed at the bottom of the window.

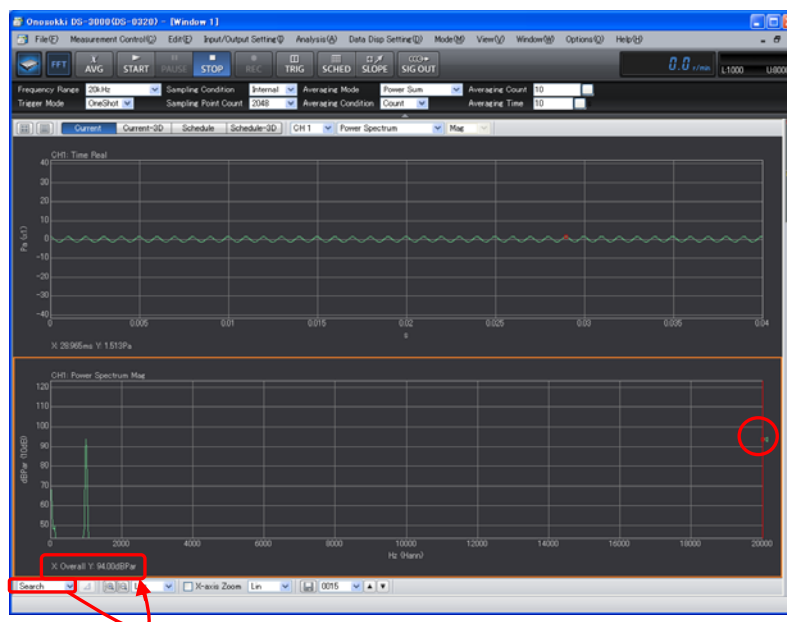


- ⑦ Set the calibration sound pressure of the acoustic calibrator SC-2120 (provided in the test chart of the acoustic calibrator). Specify the sound pressure in "Calibration Value" (94 dB/Pa in the following

example) at the right side of the calibration setting dialog box of "EU/SP" and click the "Execute calibration" button. At this time, "X: Overall Y: 94.000 dB Par" is displayed at the bottom of the dialog box. This confirms that the calibration has been executed. If you want to omit the pressure unit ("Pa") from the indication, leave the unit name field blank.



- ⑧ Click the OK button at the lower right of the calibration dialog box of "EU/SP" to return to the measurement window.
- ⑨ Confirm the acoustic calibration signal. Set the cursor setting tool to "Search" at the lower left of the graph window and align the cursor with the overall position in the same way as step ⑥ above. The successful calibration can be reconfirmed by confirming that "X: Overall Y: 94.000 dB Par" is displayed at the bottom of the window.

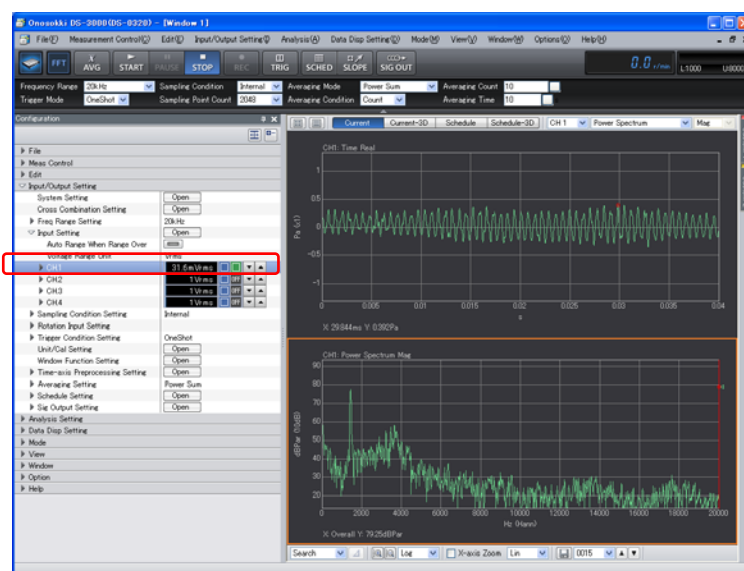


- ⑩ Turn off the power to the acoustic calibrator SC-2120 and remove the microphone MI-1433 from the acoustic calibrator.
- ⑪ Attach the microphone MI-1433 to the measurement point.
- ⑫ If you want to omit the pressure unit (Par) from the indication, leave the unit name field blank.

Setting the Voltage Range

Adjust the voltage range to be suitable for the input signal. When the input signal exceeds the range, the "CH1" signal lamp changes to red. You must change it so that it will not be exceeded.

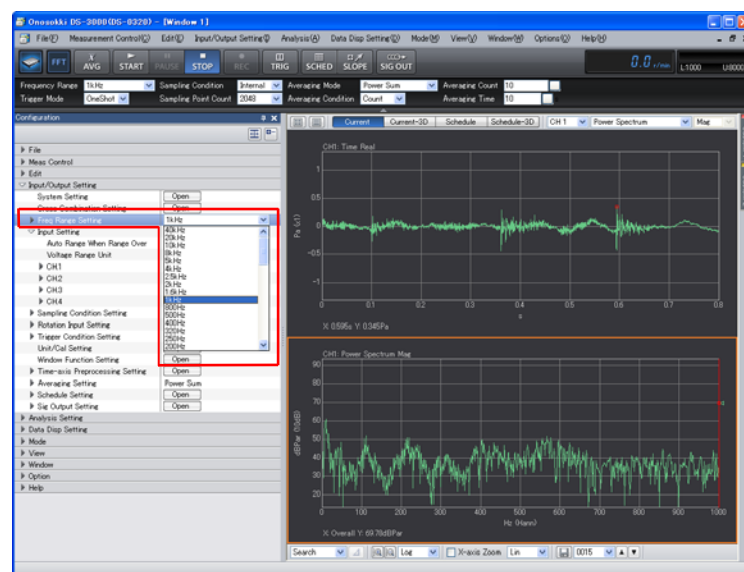
- ① Click the START button in the main toolbar.
- ② In the "Configuration" window, click " Input/Output Setting " > " Input Setting " > "Voltage Range Setting". Then, by using the ▲ or ▼ button of "CH1", adjust the voltage range to be suitable for the input signal.



-8 Setting the Frequency Range

While observing the displayed power spectrum, set the frequency range you want to analyze.

- ① In the "Configuration" window, click "Input/Output Setting " > "Freq Range Setting", and select the frequency range for analysis from the pull-down list displayed. In the following figure, "1 kHz" is set for the frequency range.



- For the analysis method and display, see operational procedure step 9 and after in the "Noise Analysis

Notes:

1. The copyright of this procedure manual is owned by ONO SOKKI CO., LTD.
2. Reproduction without permission is prohibited.
3. This operation manual describes the procedure for general measurement and the publisher has no responsibility for data obtained by the customer during operation.