

DS-2000 Series

Sound Level Measurement



ONO SOKKI CO., LTD.

Sound Level Measurement

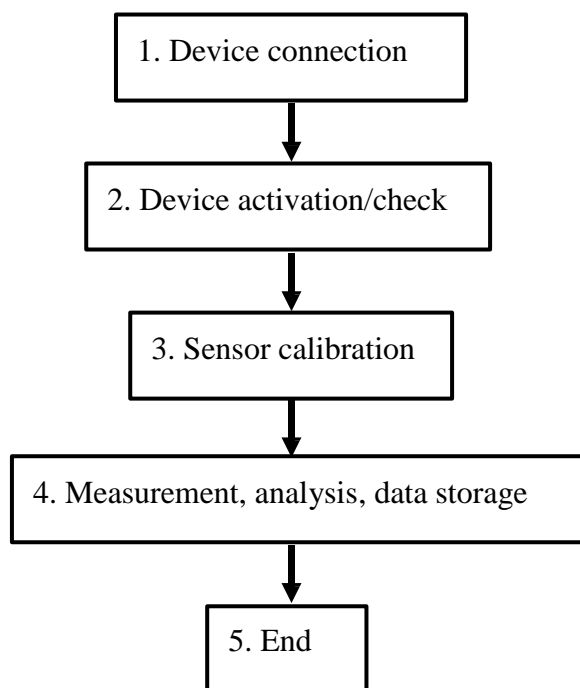
Target: Measurement of sound level generated from a drive unit having a gear under a steady operating condition and a condition where the number of rotations is dynamically changed.

Purpose: Measurement of sound level
How much is level variation?
What should be done as noise reduction measures?

Equipment:

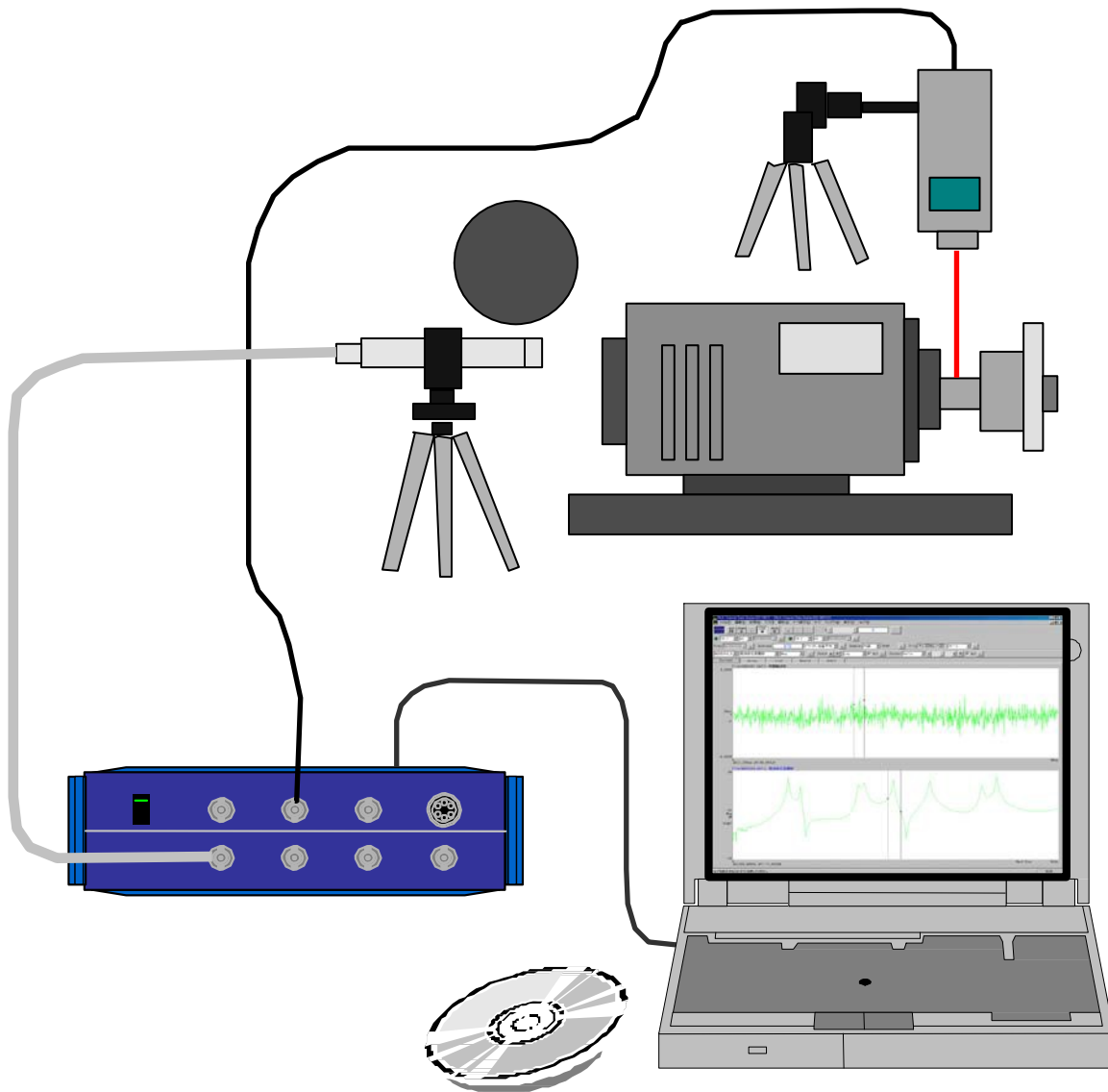
Equipment Name	Model Name	Qty.	Remarks
Main unit	DS-2104	1	
AC power adapter for main unit		1	With AC cable
Notebook PC		1	
AC power adapter for notebook PC		1	With AC cable
I/F card/cable	DS-0297	1	
Soft protection key		1	
Microphone	MI-1233	1	
Preamplifier for microphone	MI-3110	1	
Sound pressure calibrator	SC-3120	1	
Rotation sensor	HT-5200	1	
Tripod		2	For microphone/rotation sensor
Table tap		1	3 outlets or more
Both-ends BNC cable		1	Between DS-2104 and MI-3110
BNC mini-mini type jack cable		1	Between DS-2104 and HT-5200

Measurement procedure:



1. Connecting Devices

1-1. Connection Diagram



1-2. Connection Procedure

- (1) Connect the power adapter to the personal computer.
- (2) Connect the power adapter to the DS-2000.
- (3) Insert the protection key into the personal computer.
- (4) Connect the interface (ONOLINK II (Card)) between the personal computer and the DS-2000.
- (5) Connect the both-ends BNC cable between the measurement microphone and the DS-2000 Ch1 input.
- (6) Connect the signal cable between HT-5200 and EXT Sample of the DS-2000.

2. Activating and Checking Devices

2-1. Turning the Power On

- (1) Set the power switch on the front panel of the DS-2000 to the upper position.
The green lamp of the switch lights up.
- (2) Turn on the power of the personal computer.
The Windows OS starts.
- (3) Turn on the power of the HT-5200.
The LCD turns on.

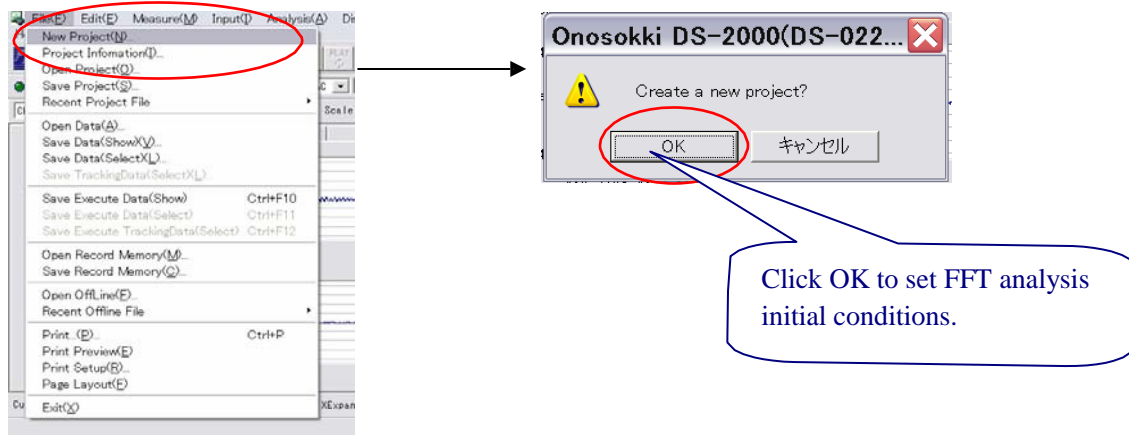
2-2. Activating DS-2000

- (1) Double-click the DS-0221FFT icon on the desktop.
- (2) Maximize the window size (both inner and outer windows).

2-3. Checking DS-2000 and Setting Conditions

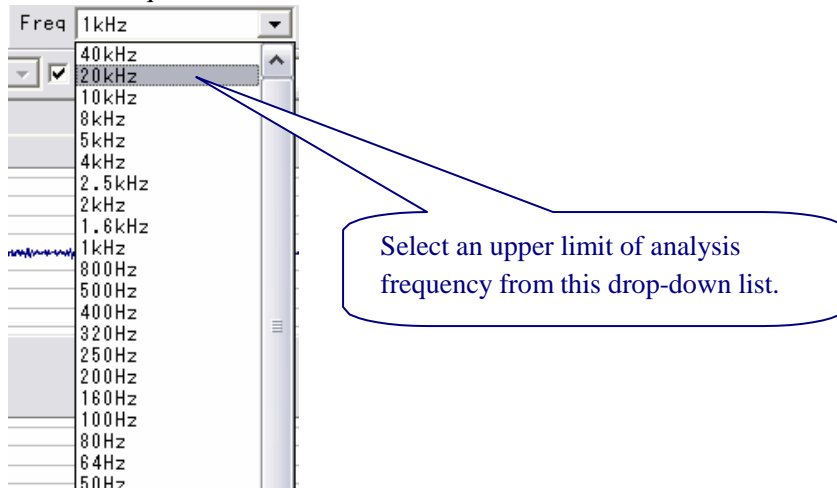
- (1) Setting to initial conditions

Select New Project from the File menu.



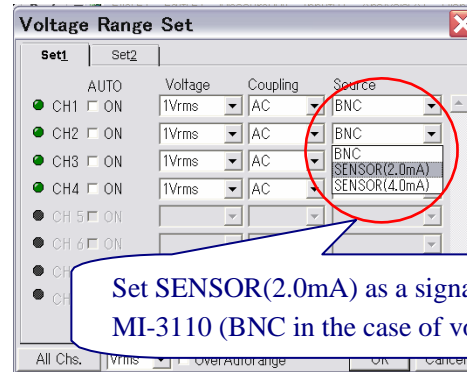
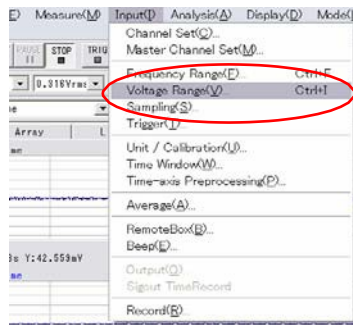
- (2) Setting a frequency range

Use the Freq tool bar.



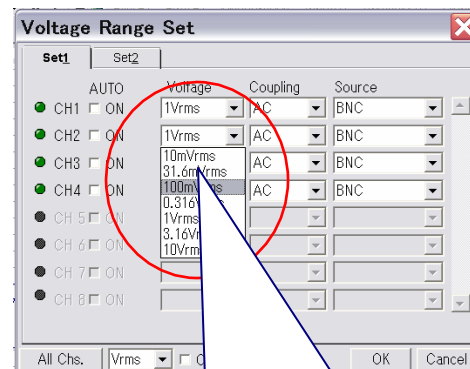
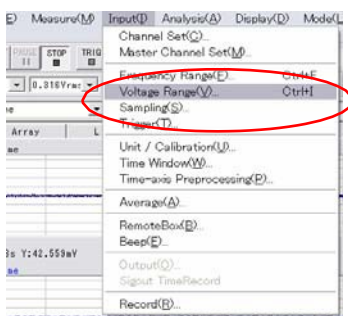
(3) Setting an input source

Select Voltage Range from the Input menu.



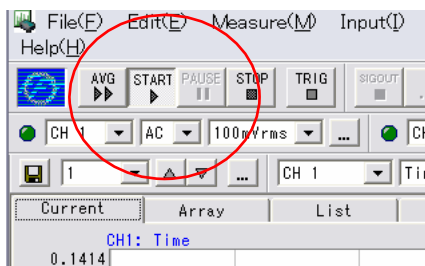
(4) Set an input voltage range.

Select Voltage Range from the Input menu.



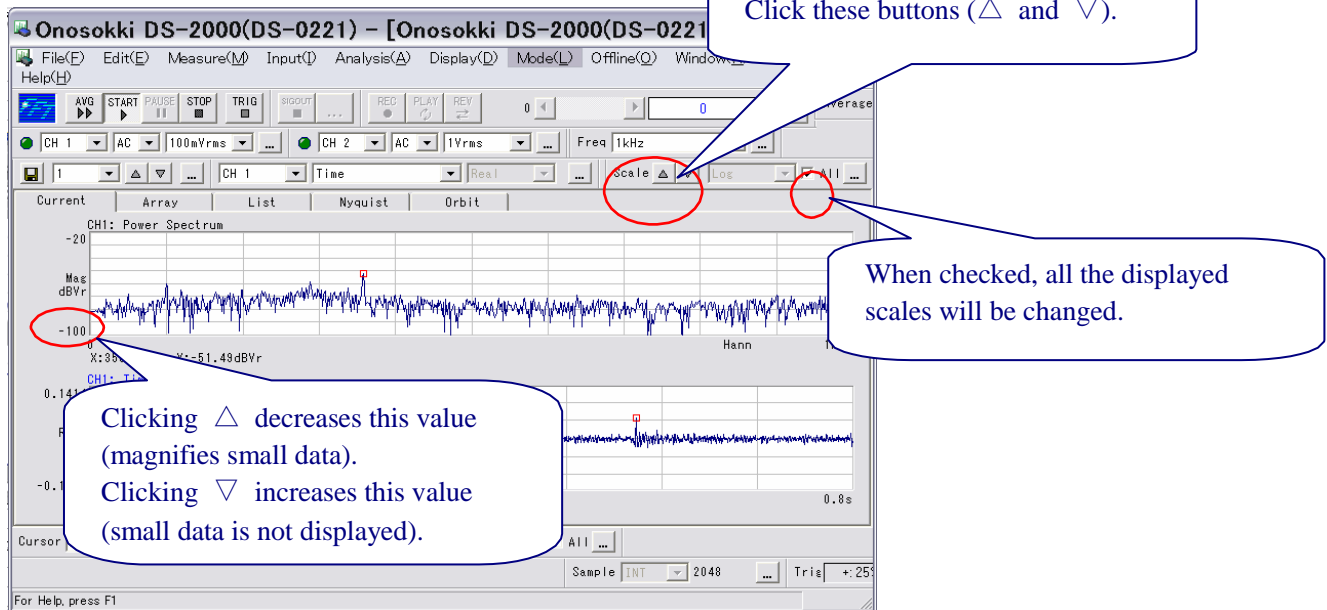
(5) Start data sampling.

Click the ">" tool button.



(6) Change the display gain.

Use the tool bar.

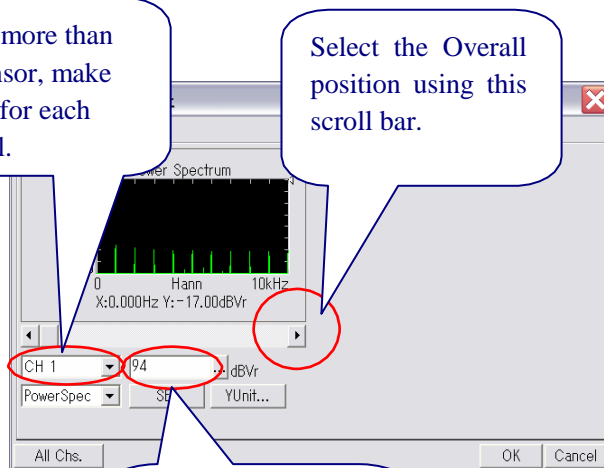
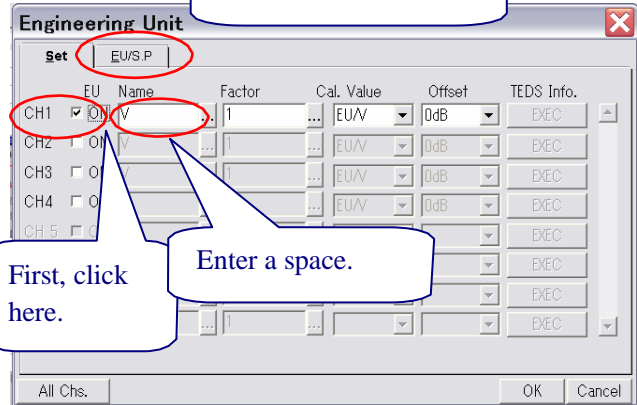
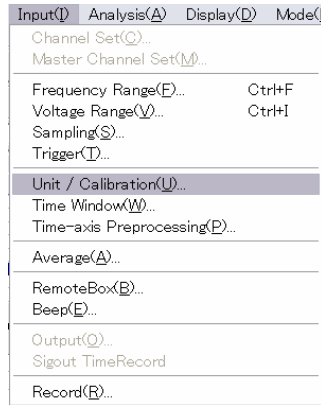


Make sure that the signal from the sensor (microphone) can be correctly analyzed.

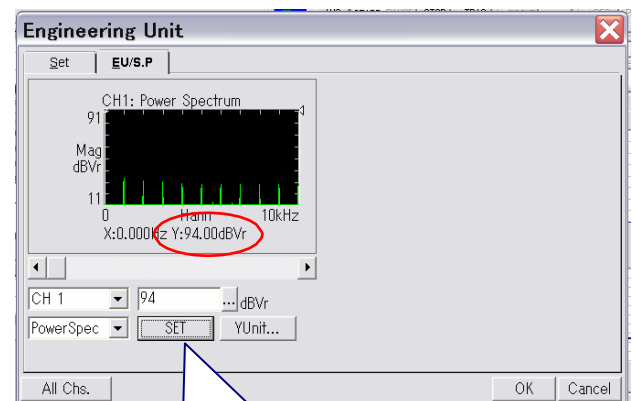
3. Calibrating the Sensor (Microphone)

1. Insert the tip of the microphone into the calibrator.
2. Turn on the calibrator.
3. If the input over LED is list, increase the voltage range.
4. Perform calibration.

(1) Select Unit / Calibration from the Input menu.



Set a calibrator value (sound pressure level) here.



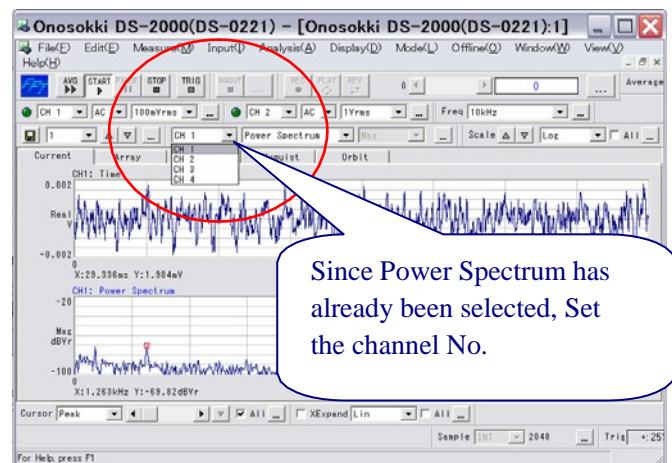
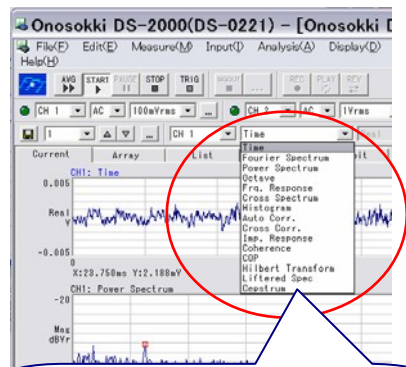
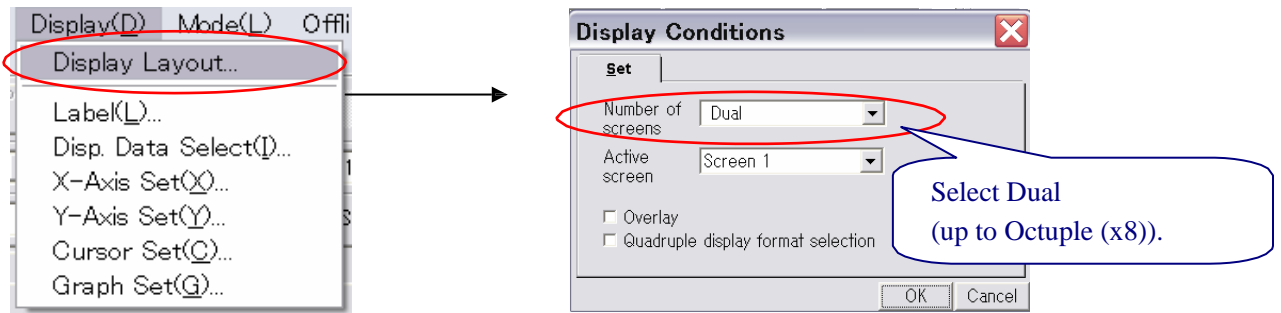
Make sure that the setting is displayed when the SET button is pressed.

4. Measurement and Analysis

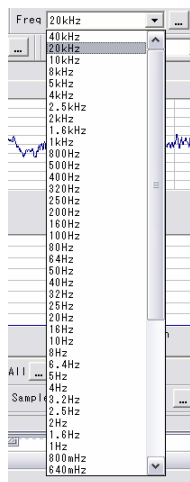
4-1. Frequency Analysis of Sound Level

- (1) Select the dual-screen mode and display the time-axis waveform at the top and the power spectrum at the bottom.

Select Display Layout from the right-click menu and then select Dual in the Display Conditions dialog.



- (2) Select a frequency range from 10 kHz to 20 kHz.

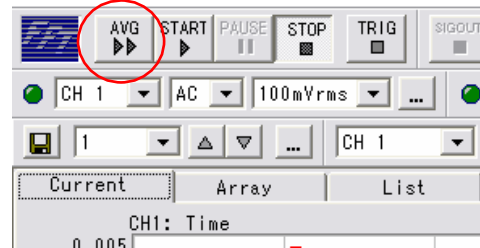
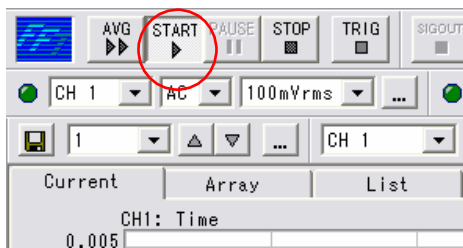


(3) Select a voltage range that does not cause input-over.

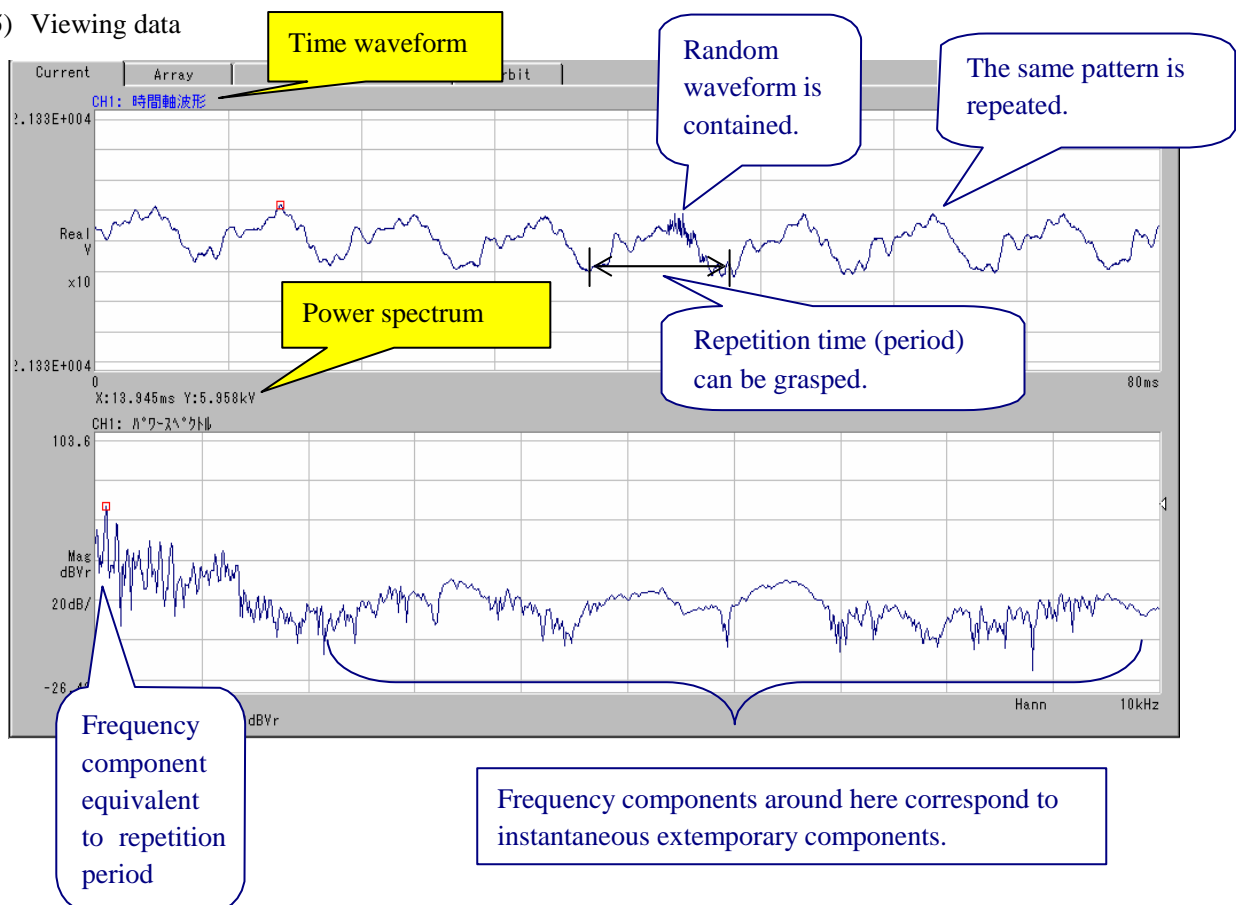
(4) Perform data sampling.

Monitor in the instantaneous mode.

Create analysis data in the averaging mode.



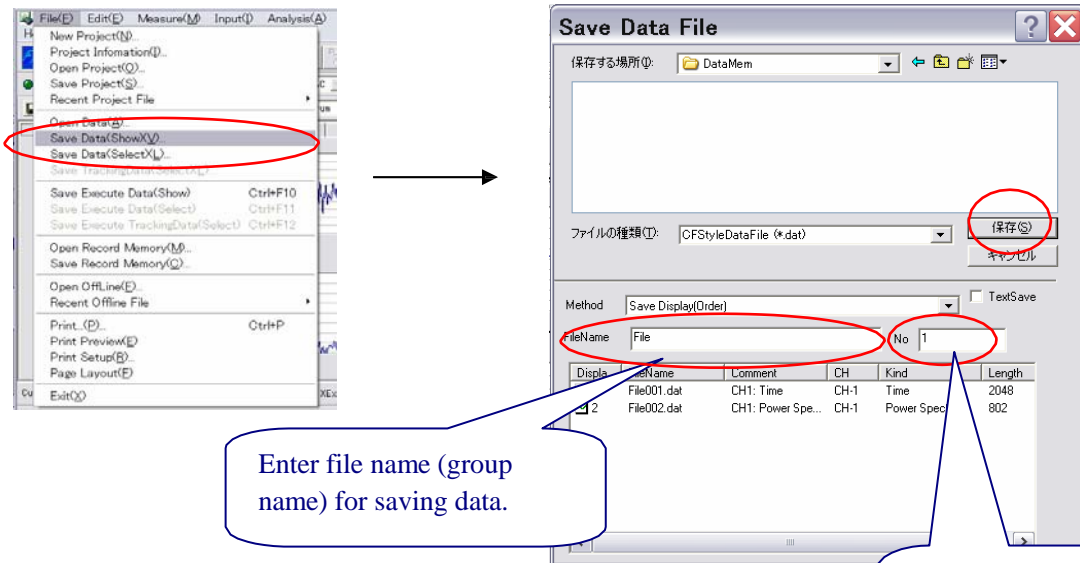
(5) Viewing data



4-2. Saving Data

(1) Saving the displayed screen data in a file

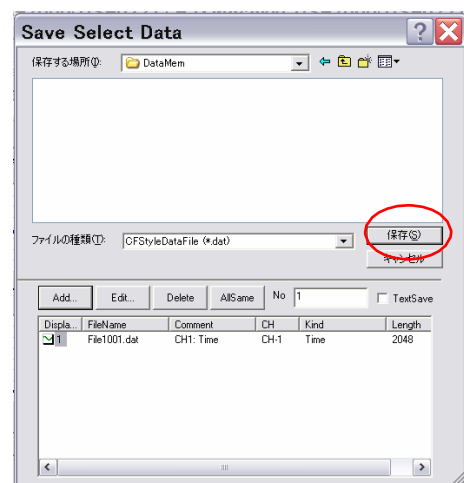
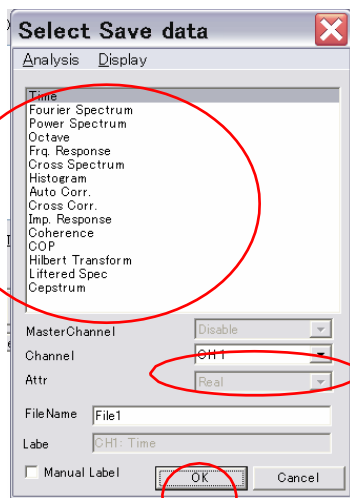
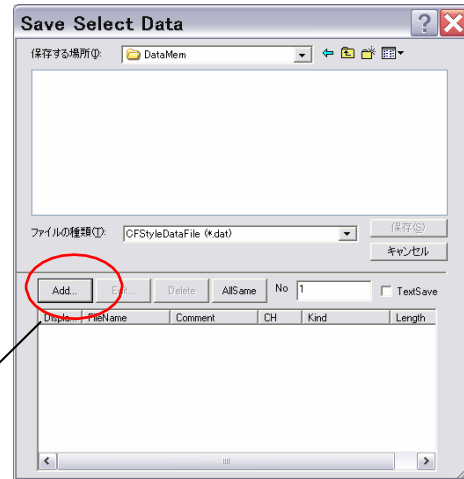
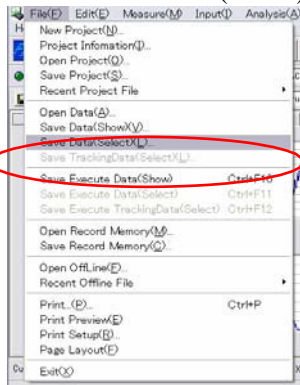
Select Save Data (Show) from the File menu.



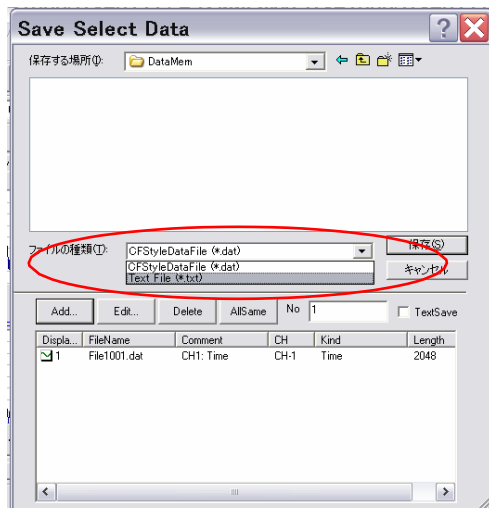
For the dual screen mode, two files will be created.

(2) Saving data of specified type in a file

Select Save Data (Select) from the File menu.

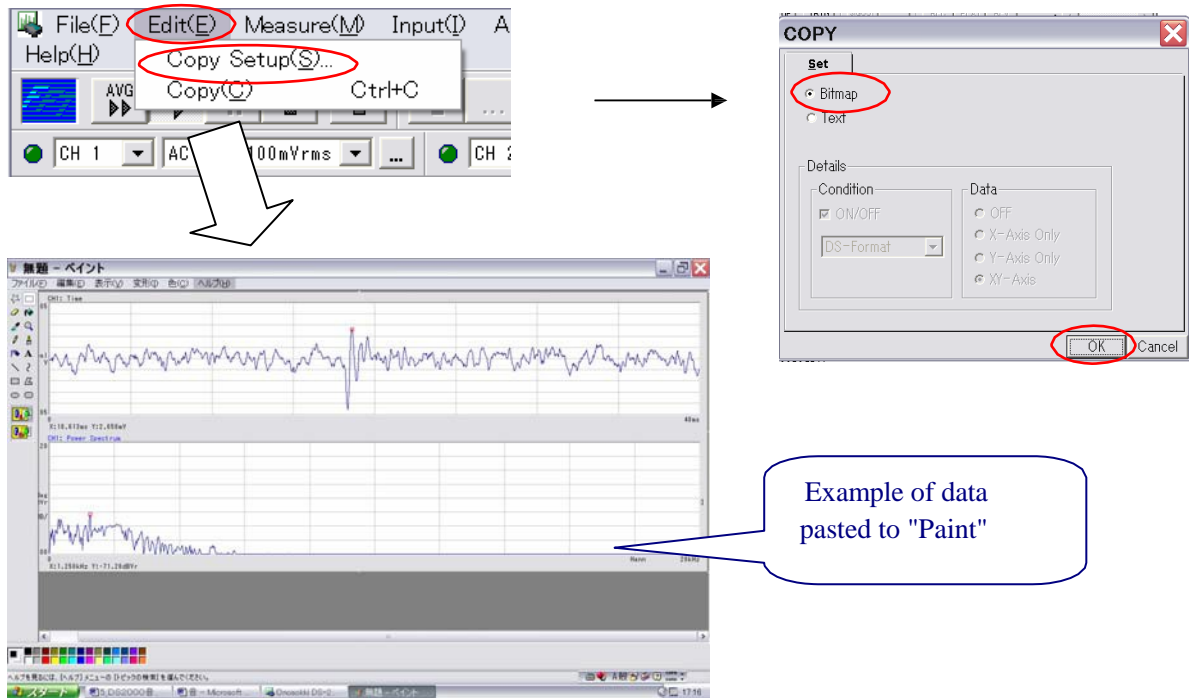


(3) Saving text in a text file



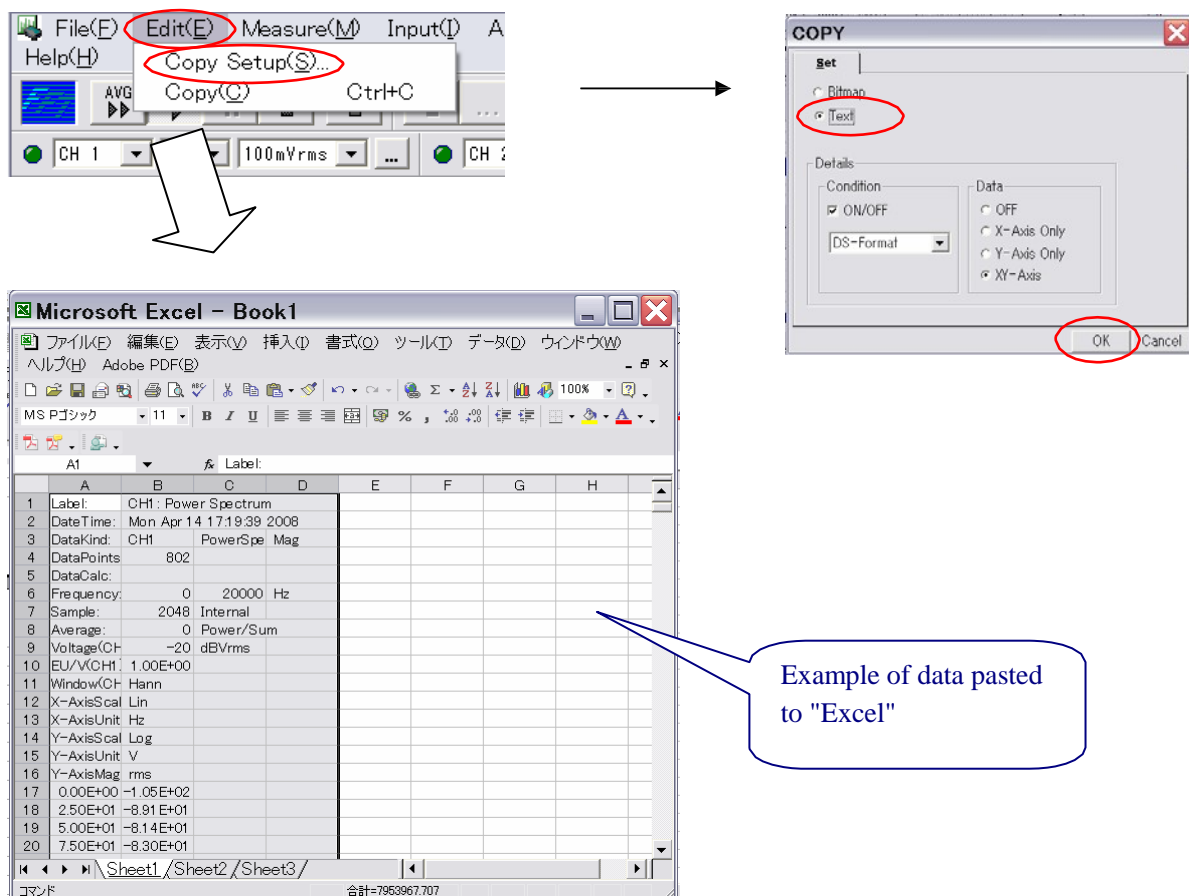
(4) Saving as an image file

Select Copy Setup from the Edit menu, select Bitmap, and execute Copy.



(5) Pasting data to Office application software.

Select Copy Setup from the Edit menu, select Text, and execute Copy.



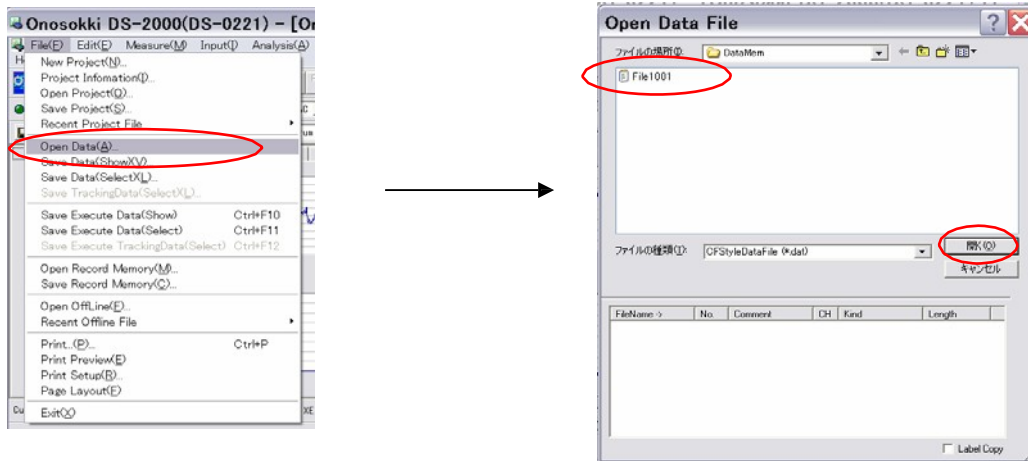
4-3. Comparing Sound Level

- (1) Select the dual-screen mode.

Select Display Layout from the right-click menu and then select Dual in the Display Conditions dialog.

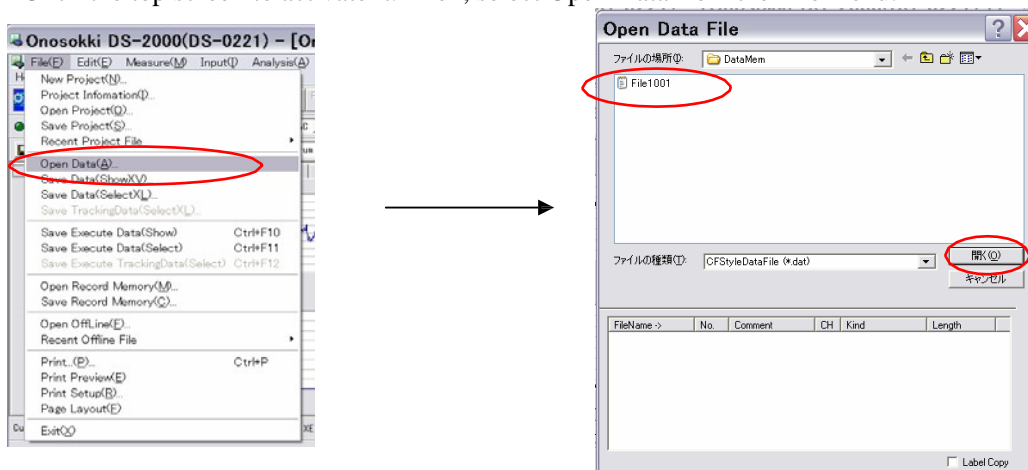
- (2) Load file data to be used as reference data in the top screen.

Click the top screen to activate it. Then, select Open Data from the File menu.



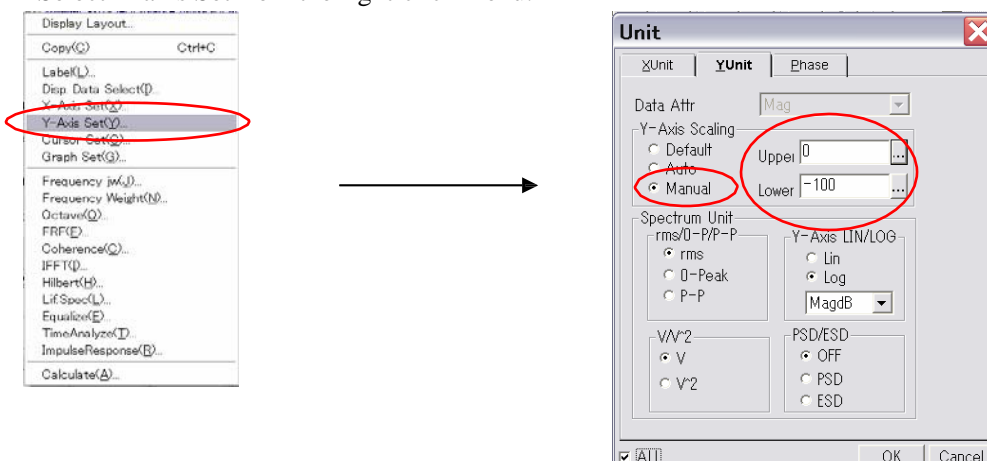
- (3) Load file data to be compared with the reference data in the top screen.

Click the top screen to activate it. Then, select Open Data from the File menu.



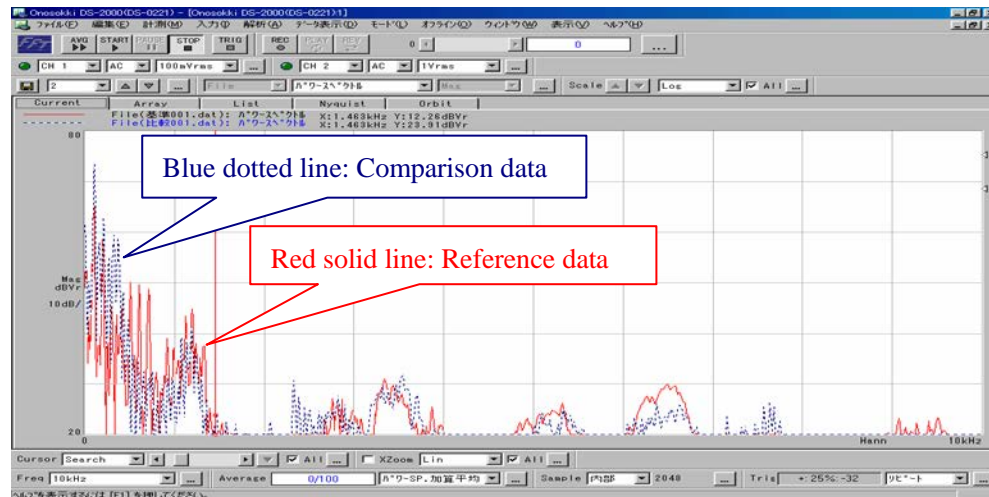
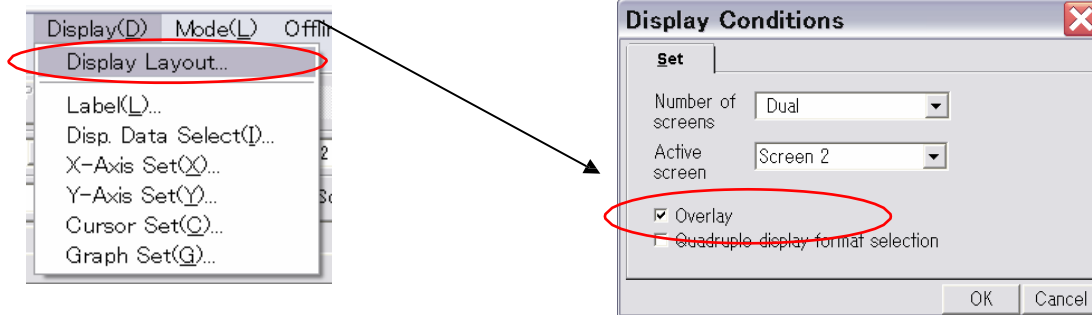
- (4) Select Manual as the Y-axis scale.

Select Y-axis Set from the right-click menu.



- (5) Select the Dual and Overlay display modes.

Select Display Layout from the right-click menu and then check Overlay in the Display Conditions dialog.

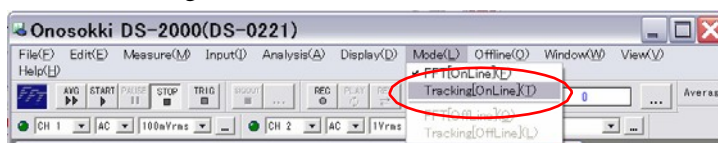


- (6) Use the cursor function.

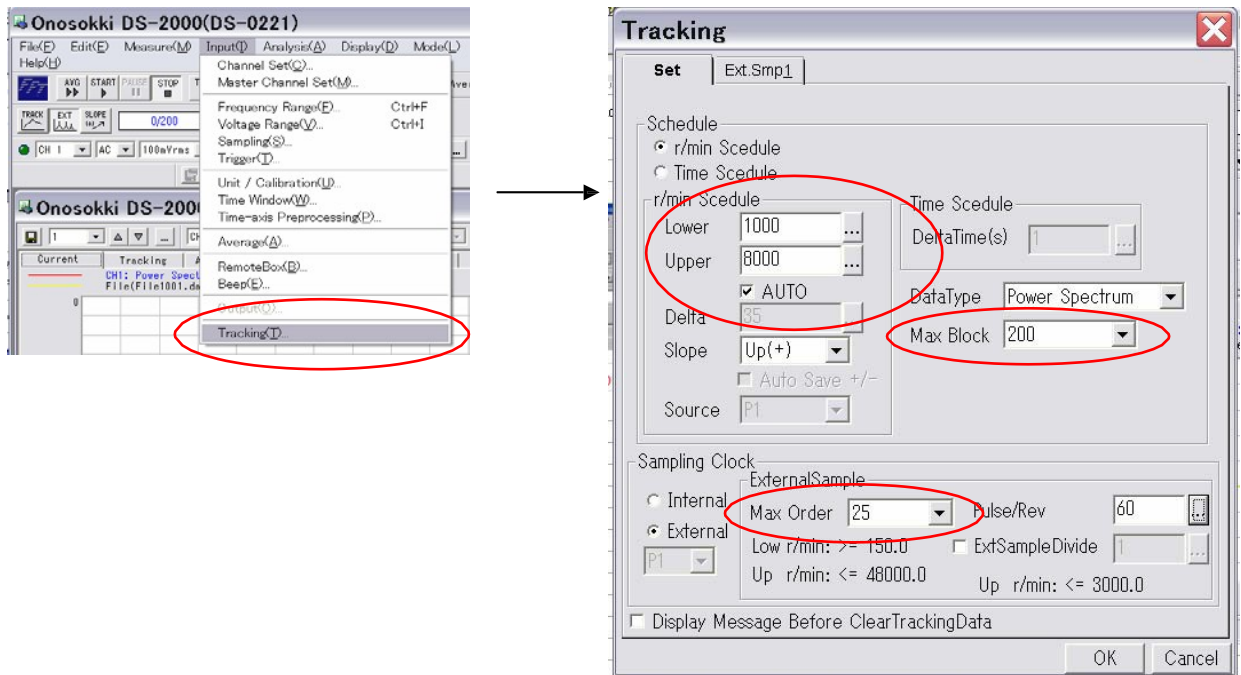
When you click in the screen, the frequency and sound level value can be read directly.

4-4. Measuring Sound Level Variation

- (1) Select Tracking(OnLine) from the Mode menu.

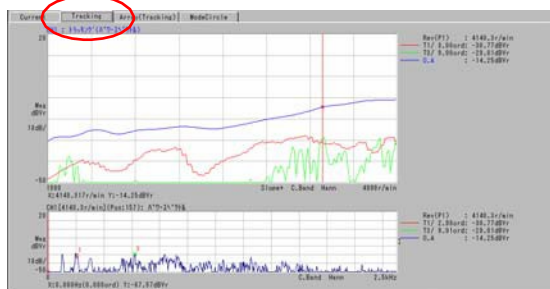


- (2) Set the following tracking conditions.
 Range of number of rotations subjected to tracking
 Rotational pulse condition
 Number of blocks to be sampled
 Maximum analysis order

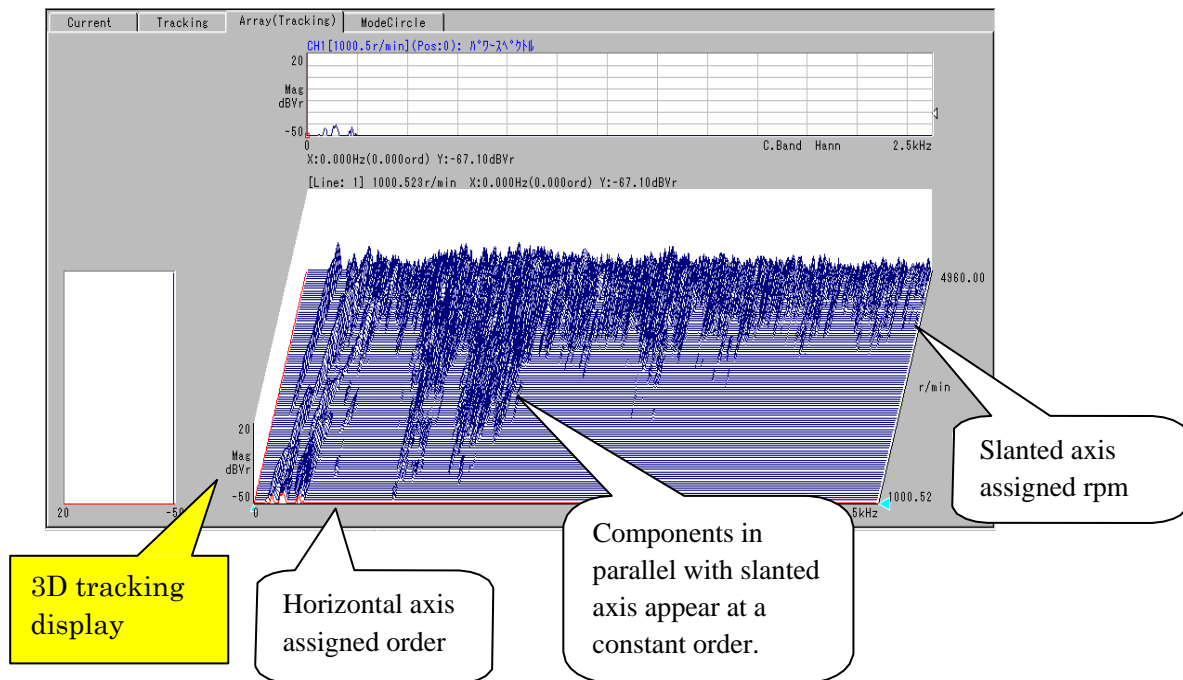
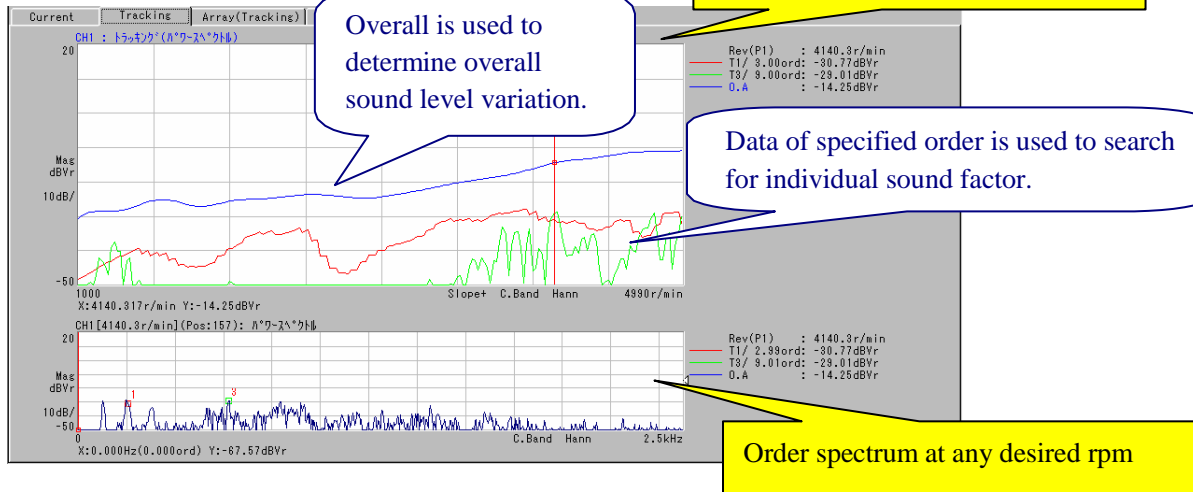


- (3) Starting tracking analysis
 With the TRACK tool button pressed, click START.

- (4) Tracking display



(5) Viewing data of tracking results



5. Ending process

5-1. Turning the Power Off

When analysis software is activated, do not turn off the power of DS-2000.

- (1) Normally terminate Windows OS of the personal computer.
- (2) Turn off the power of DS-2000 (DS-2104).

5-2. Disconnection

- (1) Disconnect the signal cable between the HT-5200 and EXT Sample of DS-2000.
- (2) Disconnect the both-ends BNC cable between the measurement microphone and Ch1 input of DS-2000.
- (3) Disconnect the interface (ONOLINK II (Card)) between the personal computer and DS-2000.
- (4) Remove the protection key from the personal computer.
- (5) Disconnect the power adapter of DS-2000.
- (6) Disconnect the power adapter of the personal computer.

CAUTION:

1. The copyright of this procedure manual is reserved by Ono Sokki Co., Ltd.
2. Duplication without prior permission is prohibited.
3. This procedure manual explains general measurement procedures. Ono Sokki assumes no responsibility for data obtained through a specific operation performed by the customer.