



INSTRUCTION MANUAL

Sound Source Visualization System

MODEL EPS-02Sv2

NOISE LABORATORY CO., LTD.

Edition 2.00
AEA00085-00E-1

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The software provided by NoiseKen may require USB or other protection keys.
 - (1) If a protection key is included in the accessories, the protection key must be mounted in the computer where the software is used.
 - (2) As a general rule, the protection key is not reissued. In the event that the protection key is damaged or lost, please contact the NoiseKen Sales (or Repair) Division.

2. IMPORTANT SAFETY PRECAUTIONS

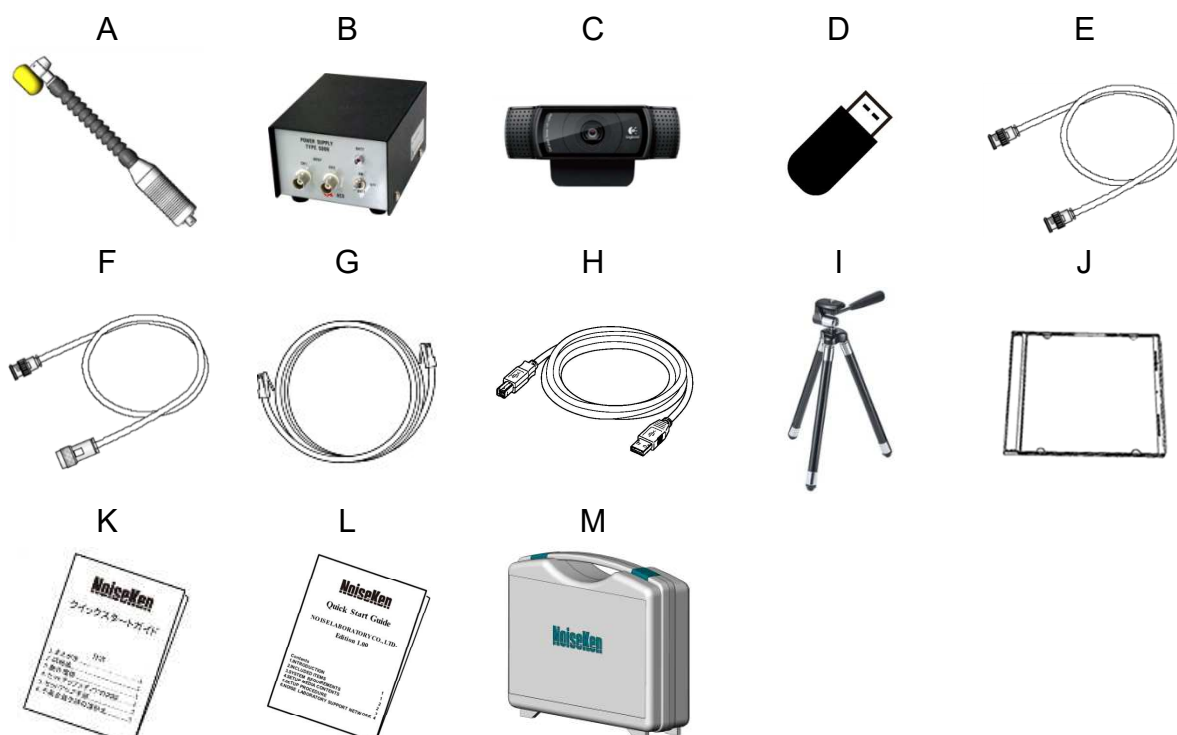
This software performs visualization of sound pressure in space. Important information for safe operation when performing visualization using this software is provided below, and so be sure to read it carefully before use.

Also, be sure to carefully read this manual and the instruction manual for each device to be used before using this software.

- 1. Incorrect or careless operation could result in a fatal injury.**
- 2. Avoid use in locations exposed to high humidity and large amounts of dust.**
- 3. When making connections, electric shock can occur due to contact with the supply voltage, and so before performing any connection work, be sure to turn off the power to the each device, and check that no power is flowing.**
- 4. Do not turn off the power to the each device or disconnect any cables while this software is running. This could cause PC operation to become unstable or the OS to malfunction. Be sure to always exit this software before turning off the power to the each device.**
- 5. If the coaxial cable is bent too hard, there is a possibility of breaking the wire. Handle the coaxial cable with care.**

3. Item Check List

Before starting use, check that the parts and accessories below are included with the product.



A: Sound pressure sensor (Microphone)	
• Main part.....	1
• Sensor cover (yellow/red/blue)	each 1
• Data sheet.....	1
B: Microphone power supply	
• Main part.....	1
• AC adapter	1
• Manual	1 set
• Battery.....	2
C: Web camera	
• Main part.....	1
• Warranty.....	1
D: USB protect key	
E: BNC coaxial cable (3 m)	
F: BNC-N coaxial cable (1.5 m).....	
G: LAN cable (2 m).....	
H: USB extension cable (2 m).....	
I: Camera tripod	
• Main part.....	1
• Storage bag.....	1
• Manual	1
J: Installation DVD (EPS-02Sv2)	
K: Japanese Quick Start Guide	
L: English Quick Start Guide.....	
M: Storage case.....	

* The key of C, J, K and L are included in the upgrade version.

* The key of D, J, K and L are included in the secondary license version.

* The warranty for A, D, E, F, J and M is in accordance with our warranty policy.

4. Introduction

Thank you for purchasing the EPS-02Sv2 Sound Source Visualization System. Before using the EPS-02Sv2, be sure to carefully read this manual to ensure that you maximize its performance when operating the EPS-02Sv2.

-
- **This User Guide is provided to ensure that people who follow the operating procedures and safety information can safely use the EPS-02Sv2 and maximize its performance.**
 - **Place this User Guide in a location where it is easily accessible whenever operating the EPS-02Sv2.**
-

4—1. Features

Enabling visualization of sound pressure in space

- A sound pressure sensor is used to perform frequency analysis with a spectrum analyzer and to map to the emission location of the actual image.
- The emission location is mapped relative to the sensor location recognized using the web camera.
- An area of up to 64 blocks × 48 blocks can be measured.
- A superimposed image of the measurement strength distribution diagram and web camera image are displayed for enabling easy identification of the emission source. The density of the strength distribution and frequency range can be specified.
- Measured results can be saved to a file, and the content of the measurement results and file can be compared for enabling visualization of the effects of corrective actions.
- Because the measurement sensor can be moved not by a device like a positioner but by hand, easy measurement is possible even in cramped spaces, outdoors, and other difficult-to-access locations.

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6. Overview

6—1. Notation Used in This Guide

The marks used in this guide and their meanings are provided below.

	Provides an additional explanation.
	Indicates a location for further reference.
	Indicates a setting restriction.
	Indicates that you must check before usage.

6—2. EPS-02Sv2 Features

* **Measurement sensor is detected from the image for recognizing the measurement location**

The measurement object and measurement sensor are captured by a camera, and the measurement sensor is found within the image for identifying the measurement location. The recognized measurement location is a relative location within the camera image.

Any user-selected color can be specified for the measurement sensor. However, selecting a color with the same tone as the background color will result in a reduced rate of recognition and even mistaken recognition in certain cases.

The measurable range is the area shown in the camera, but it is restricted to a range that can be recognized by the measurement sensor.

* **Automatic control by software**

Measurement sensor recognition from the camera image and control of the spectrum analyzer are performed automatically. The measurement results can be output as a CSV file, and the image can be output in BMP format.

Also, because the software is a Microsoft Windows application, it provides an easily-accessible interface that uses mouse operations while viewing the screen.

* **Visual display of measurement results**

The measurement strength distribution and camera image are displayed as a superimposed image on the computer screen. Also, the mouse pointer in the image can be used to confirm measurement results for any selected position.

In addition, an interpolation view of the surrounding strength can be used to provide easier assessment of the generation points.

* **Full emission analysis function for measurement points**

Data can be collected for the entire measurement frequency range generated from the measured object in a single measurement. The emission map for each frequency band is also redisplayed by simply specifying the frequency band.

6—3. Measurement Principle

The EPS-02Sv2 system performs two main operations for enabling visualization of the sound. First, it performs image recognition that identifies the measurement sensor location from the recording image. Second, it provides a color-coded distribution on the image indicating the strength of the signals detected by the measurement sensor.

In image recognition, 640 x 480 pixel video from the camera is monitored in real time, and a specific color only is extracted based on the specified parameters for "hue", "brightness", and "saturation". By finding the focal point of the area with the specific color, the location of the specific object (measurement sensor) can be found in the image.

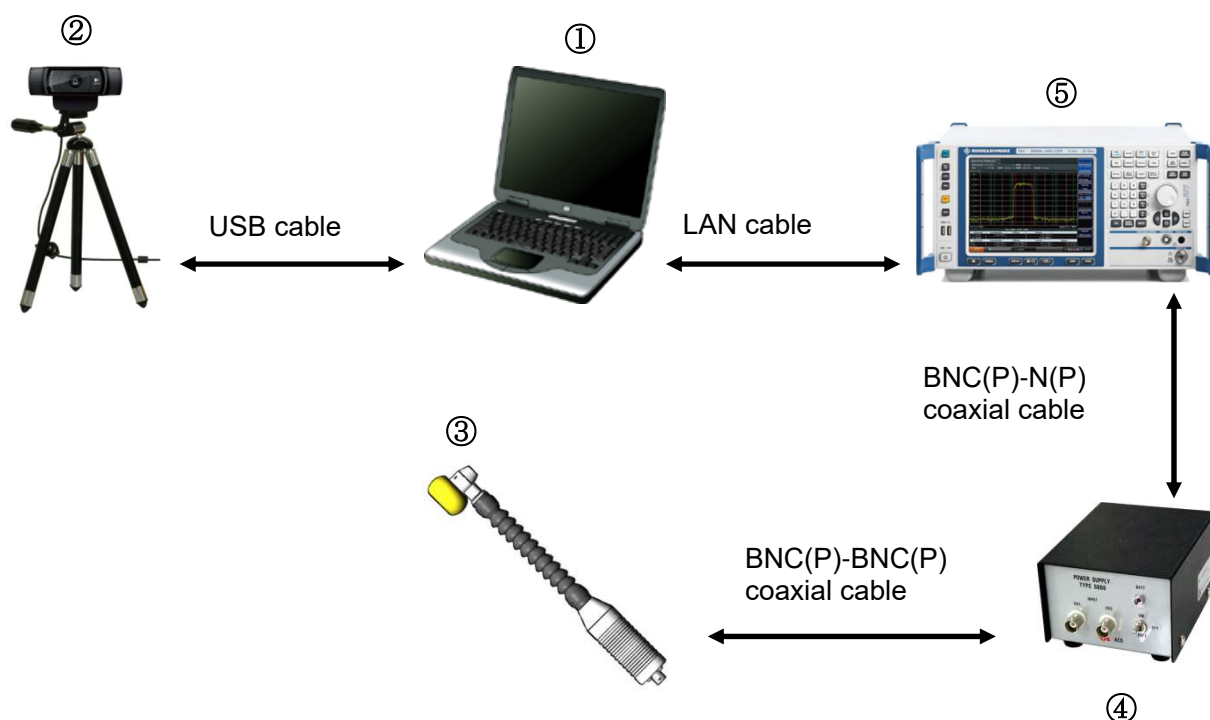
If an object with the same color as the specified color, but that is not the measurement sensor, appears in the image, the measurement sensor location cannot be recognized correctly because the focal point of all objects of this color is calculated. Therefore, the parameter settings for "hue", "brightness", and "saturation" that are used to detect the measurement sensor, the brightness and light exposure in the recording location, and selection of the lighting are important factors. Also, the cover of the measurement sensor must be adjusted based on the color of the measurement object.

A spectrum analyzer is used as the measuring instrument for enabling measurement of the sound pressure level. The spectrum import count and frequency range vary depending on the measurement sensor and measuring instrument. The measurement data is mapped to a position specified by image recognition. The method of capturing data at the same position can be selected from MAX HOLD, PEAK HOLD, FREE RUN, and SINGLE.

After measurement is completed, the frequency range that you want to view can be selected for creating a strength distribution combined with the image.

7. System Configuration Diagram

7—1. System Configuration Diagram



① Control PC

This controls the various devices and conducts sound pressure measurement.

② Web camera

This captures the image of measurement object.

③ Sound pressure sensor

Measures sound pressure and outputs analog signals. This sensor is powered via the INPUT terminal of the microphone power supply. A certain color must be added to the sensor so that the PC can recognize the sensor position. Attach an included sensor cover to the sensor before use.

④ Microphone power supply

Connect the sound pressure sensor to “INPUT CH1” using the included BNC cable, and connect a spectrum analyzer to “OUTPUT CH1” using the included BNC-N cable.

Make sure that INPUT and OUTPUT connections are correct.

Be sure to take into account wrong connections may damage the equipment.

Set the GAIN changeover switch to 0 dB (default). If the switch is set to 20 dB, make sure that the setting does not exceed the maximum input of the spectrum analyzer

⑤ Spectrum analyzer

The spectrum analyzer is connected to the PC using the supplied LAN cable.

Support is provided for some spectrum analyzers described in [11—3.Supported Spectrum Analyzers] on page 36. Please consult with NoiseKen for use of spectrum analyzers that are not supported.

7—2. Functions of Each Device

① Control PC

This enables running of system control software. This software imports images from the web camera, identifies the measurement sensor within the image, and finds its location. After frequency analysis is performed by the spectrum analyzer, the control PC receives the measurement results and maps them to that location.

② Web camera

This is a general-purpose web camera. The image of measurement object is captured and transferred to the PC. The web camera is connected to the PC by a USB cable. If necessary, the connection can be extended by a USB extension cable.

③ Sound pressure sensor

This has a built-in microphone to measure sound pressure.

A special cover is attached to the sensor before use to improve the recognition rate.

The cover is made of windshield sponge, which reduces wind noise.

④ Microphone power supply

This supplies power to the sound pressure sensor connected to the INPUT terminal and outputs analog signal from the OUTPUT terminal.

By using the GAIN changeover switch above the OUTPUT terminal, signals are amplified to 20 dB. For the EPS-02Sv2, the switch must be set to 0 dB (default).

Since the spectrum analyzer is highly sensitive, amplified signals are usually not needed.

If the switch is set to 20 dB, before use, make sure that the setting does not exceed the maximum input of the spectrum analyzer.

It is powered by the AC adapter or batteries.

- Switch [ON]: Supplies power to the sound pressure sensor connected to the INPUT terminal and outputs signals from the OUTPUT terminal. The BATT LED is not lit, which is the normal status.

- Switch [OFF]: Stops supplying power to the sound pressure sensor and outputting signals from the OUTPUT terminal.

- Switch [BATT]: Checks whether the voltage of the AC adapter or the batteries are normal. If it is normal, the BATT LED is lit.

⑤ Spectrum analyzer

This performs frequency analysis of the signals from the measurement sensor and sends the spectrum data to the PC.

8. Preparation



CAUTION

In environments exposed to extremely large amounts of external noise, the equipment may be unable to realize its maximum performance.

Even when indoors, the equipment can be affected by an air conditioner and other electronic devices. During measurement, try to minimize external noise. Depending on the PC, its cooling fan may generate large noise not suitable for measurement.

8—1. System Backup

NoiseKen provides an optional service (additional charges apply) for installing the EPS-02Sv2 program in your PC before providing the program, but if the program is erased, install it from the supplied DVD. Copy the content of the DVD to a hard disk, removable disk, or other location and store it there in case of loss.

The CD included with the web camera mounted on the PC is provided to the customer, but it is also recommended that you create a backup of this CD in the same way and store it in a separate location from the original disk.

For details of setup, see "10. Setup" (P34).

8—2. System Connections

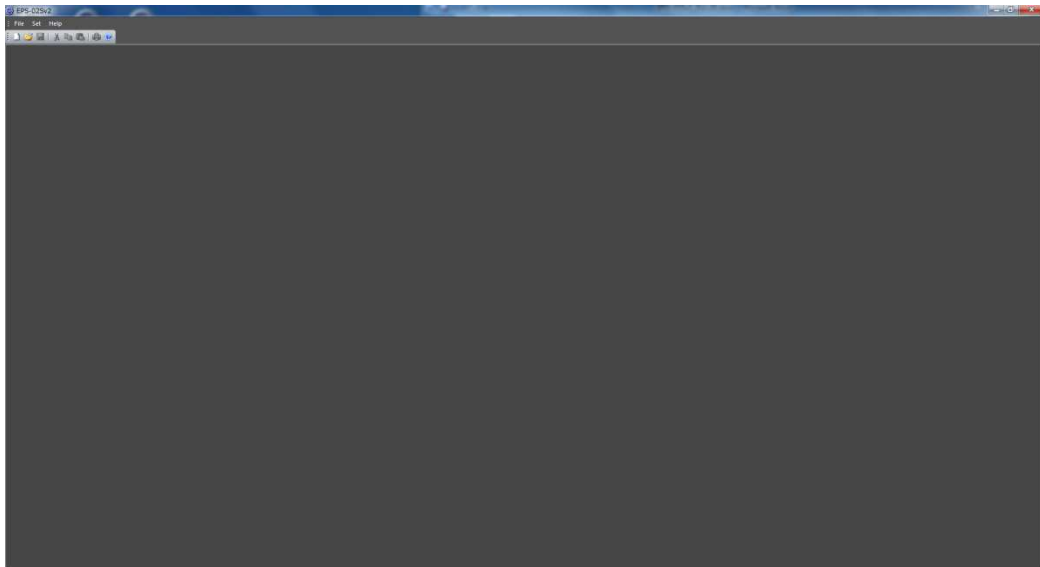
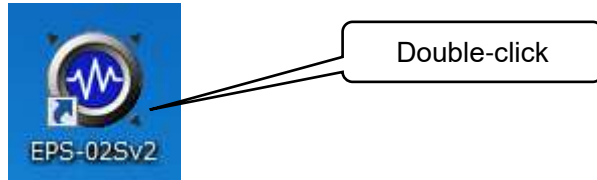
- ① Connect the web camera to the PC using the USB cable. Any commercially-available USB cable can be used, but it must be a cable that supports the USB 2.0 standards. Be aware that the USB 2.0 standards limit the cables to a maximum of 1 extension and maximum length of 5 m.
- ② The spectrum analyzer and PC are connected by a GPIB or LAN cable. A commercially-available cable can be used for the LAN cable. Use a one-to-one local connection without passing through the site LAN or hub.
- ③ Attach a sensor cover to the sound pressure sensor.
Connect the sound pressure sensor and the INPUT CH1 terminal of the microphone power supply using the included BNC cable.
A commercially-available 50 Ω coaxial cable can be used for the BNC cable.
- ④ Connect the spectrum analyzer and the OUTPUT CH1 terminal using the included BNC-N cable. Make sure that INPUT and OUTPUT connections are correct.
A commercially-available 50 Ω coaxial cable can be used for the BNC-N cable.

9. Operation Procedure

9—1. Starting and Exiting the Software

Starting the Software

To start the software, double-click the EPS-02Sv2 shortcut icon on the desktop.

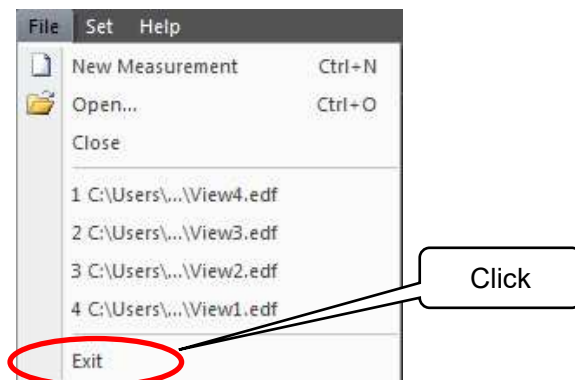


Screen displayed immediately after the software is started

Exiting the Software

To exit the software, click the close button on the right end of the title bar or click **Exit** from the **File** menu.

Because the software cannot be closed during measurement, finish measurement before exiting the software.



9—2. Image Recognition Settings

Image Recognition Setting Dialog Box

To open the **Image Recognition Setting** dialog box, click **Image Recognition Setting** from the **Set** menu.

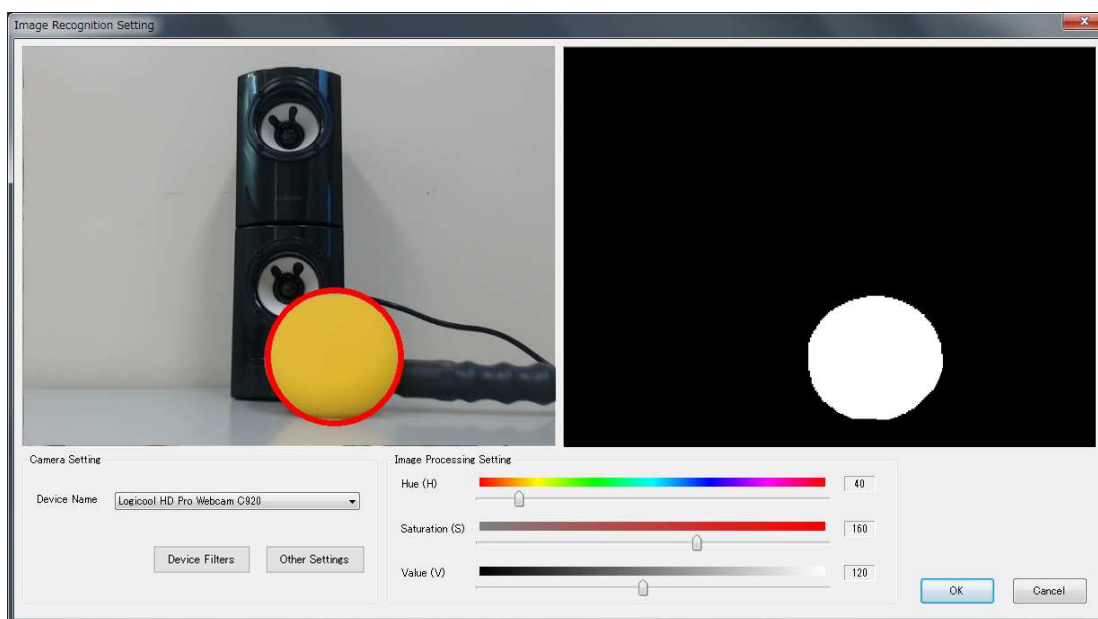
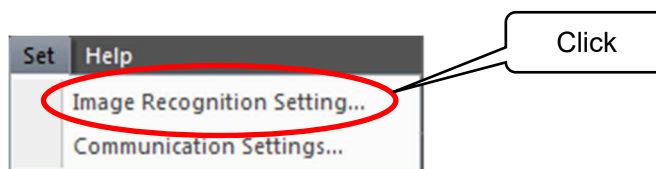


Image Recognition Setting dialog box

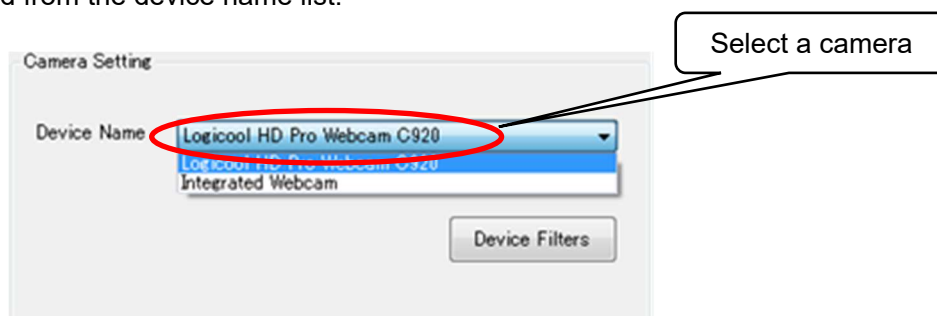


Adjust the camera position so that the measurement object can be captured by the camera. Take the following conditions into account during adjustment. Changing camera properties or adjusting the lighting may be required depending on the circumstances.

- Sufficient brightness is provided so that the measurement object and the measurement sensor can be fully recognized.
- There is no object whose color is similar to that of the measurement sensor.

Device Name

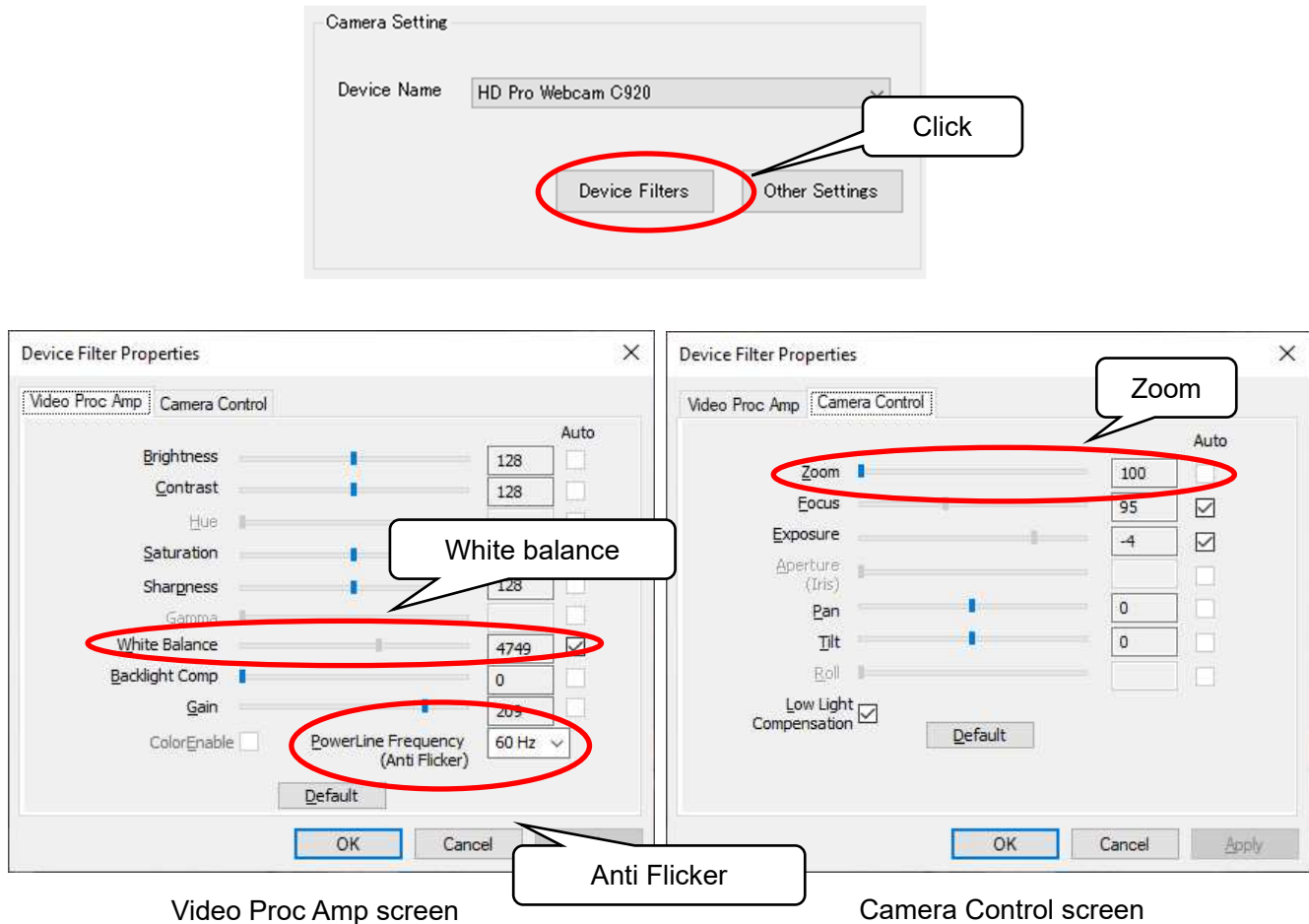
Camera names are displayed in the **Device Name** list. If multiple cameras are connected, select the camera to be used from the device name list.



Device Filters

To open the **Webcam Properties** dialog box, click the **Device Filters** button.

In the dialog box, the camera properties, such as zoom, white balance, and anti-flicker, can be set.



- **White balance**
White balance is a function to perform color correction so that a white object appears white. If the light source, such as sunlight, light bulb, or fluorescent, makes the white object look bluish or reddish, adjust white balance.
- **Anti Flicker**
Anti Flicker is a function to reduce flicker in images.
- **Zoom**
Zooming may not be possible depending on the model, driver, or color space / compression settings. Refer to “Other Settings” on page 15 for the color space / compression.

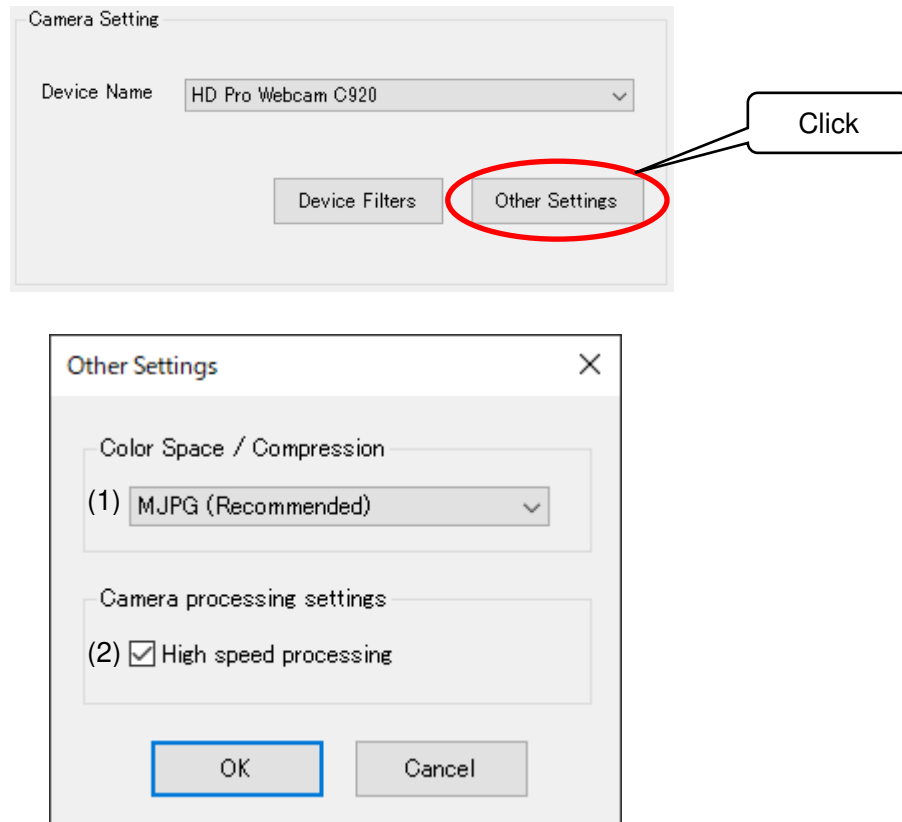


The Properties screen may vary depending on the model or driver version of the connected camera.

Other Settings

To open the **Other Settings** dialog box, click the **Other Settings** button.

In the dialog box, the color space / compression and camera processing can be set.



Other Settings dialog box

(1) Color Space / Compression

The color space / compression of the camera can be changed. If the camera is not working properly, changing it may improve the situation. The first item in the list is the recommended method.

(2) High speed processing

Speed up camera processing. If the camera is not working properly, unchecking the checkbox may improve the situation.

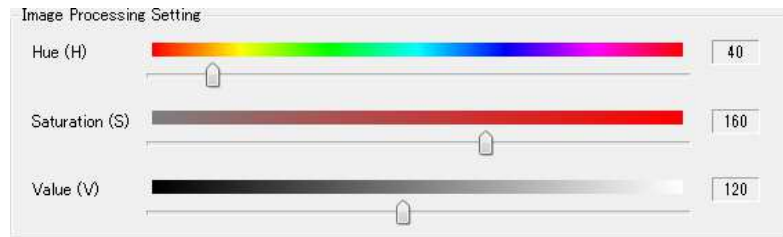
Image Recognition Setting

Adjust the three parameters, **Hue**, **Saturation**, and **Value**, in the **Image Processing Setting** so that the color of the sound pressure sensor can be recognized. The binarized image on the right side can be changed by moving the slider of each parameter.

Hue: Sets the hue, such as red, blue, or yellow

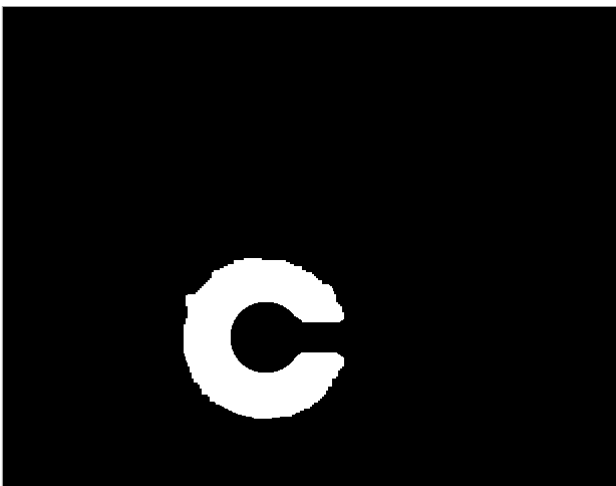
Saturation: Sets the intensity and purity of a hue

Value: Sets the lightness of a color.



Adjust the parameters until the sound pressure sensor is recognized as a circle and no other object is recognized. If there is any object whose color is similar to that of the sensor in the background, hide the object or change the color of the sensor.

Once the sensor is recognized as a circle, click **OK** to complete adjustment.



Desirable recognition state
The shape of the sensor is almost circular.
There are no recognized areas in the background.



Not desirable recognition state
The shape of the sensor is not circular.
There are recognized areas in the background.



Procedure for successful sensor recognition setting

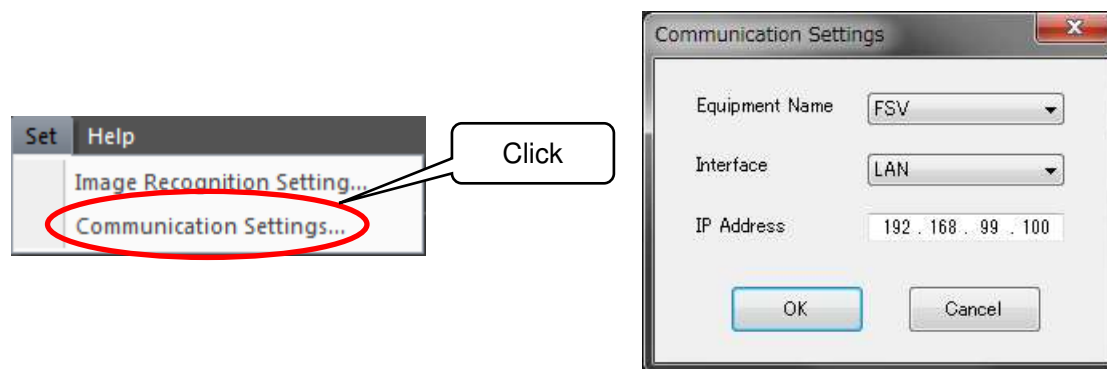
1. Set the **Saturation** and **Value** to 0.
2. Adjust the **Hue** so that the sensor is most clearly recognized.
3. Increase the **Saturation** gradually to remove other recognized areas around the sensor.
Do not increase the **Saturation** excessively to prevent the recognized sensor area from being impaired.
4. Increase the **Value** in the same manner.
5. Finally, move the sensor outside of the camera view, and make sure that there is no object to be recognized.
If any other object is recognized, repeat steps 3 and 4.
When the mal-recognition is not solved even if steps 3 and 4 are repeated, start over from step 1.

9—3. Communication Settings

Communication Settings Dialog Box

To open the **Communication Settings** dialog box, click **Communication Settings** from the **Set** menu.

In this dialog box, a remote-controlled spectrum analyzer can be set up.

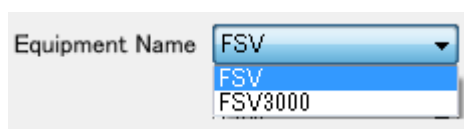


Communication Settings dialog

Equipment Name

Select the equipment name of the connected spectrum analyzer.

The following driver is available as standard options: FSV and FSV3000. Customized spectrum analyzer drivers are also included in this list.



If the **Equipment Name** list is blank, no spectrum analyzer driver may exist. Check to see that spectrum analyzer drivers (*.sads) are stored in the folder where the EPS-02Sv2 executable file is stored (C:\Program Files (x86)\NoiseKen\EPS-02Sv2, under normal conditions).

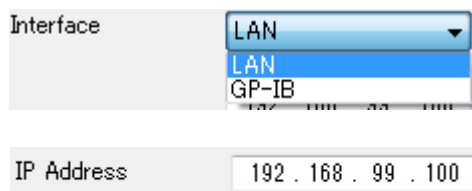
	EPS-02R.ico	9/9/2015 10:06 PM	Icon	212 KB
	EPS-02Sv2.exe	3/8/2017 5:20 PM	Application	4,129 KB
	FSV.sads	3/2/2017 4:41 PM	SADS File	1,806 KB
	FSV3000.sads	11/11/2019 10:05 AM	SADS File	1,805 KB



When NI-VISA (National Instruments) has not been installed, the **Equipment Name** list is blank even if spectrum analyzer drivers exist. In such cases, install NI-VISA according to “10—3.Installing the Software” in page 35.

Interface

Select LAN as the interface and set the IP address. For how to set the IP address, see “10—2.Network Address Settings” in page 34.



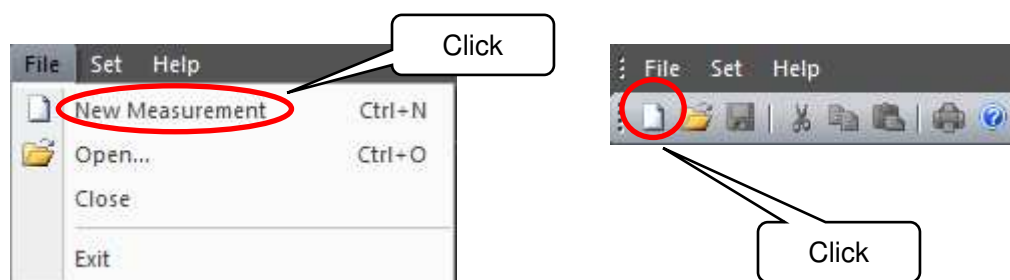
9—4. New Measurement (Setting Measurement Conditions)

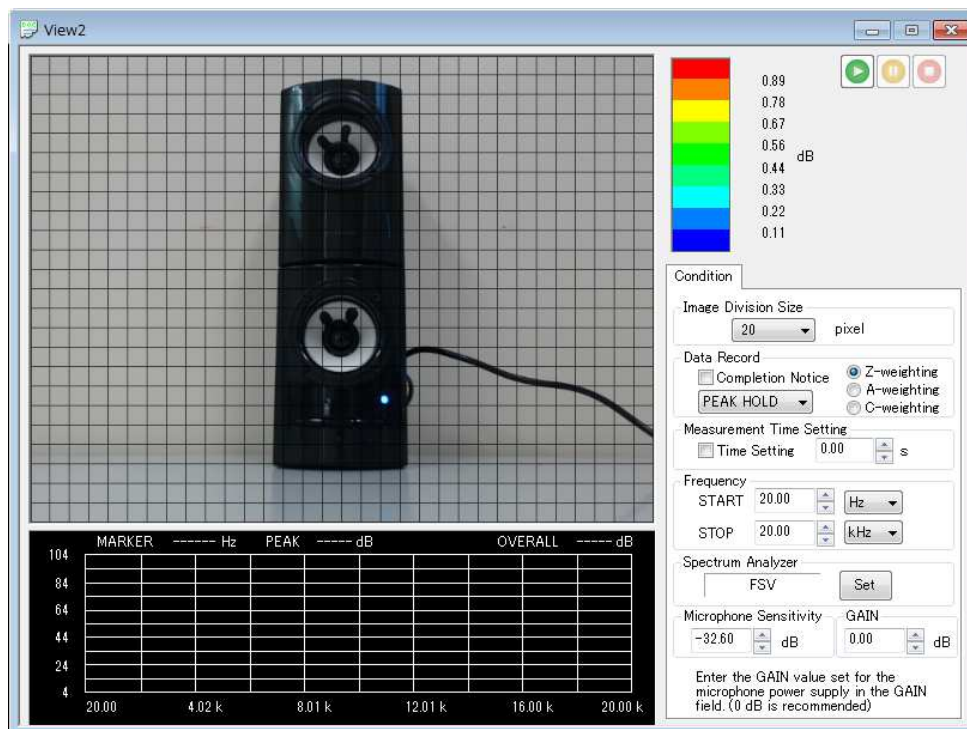
View Window

To open a **View** window, click **New Measurement** from the **File** menu or click the **New Measurement** button on the toolbar.

Whenever a **View** window is newly opened, it is numbered as follows: View1, View2, View3 ... These names can be changed freely when the file is saved after measurement.

Before starting measurement, set an image division size, properties for the spectrum analyzer, and other conditions in the **View** window.





View window (before measurement)

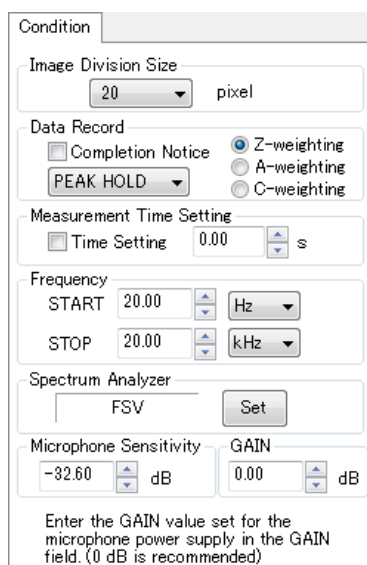


If a web camera or USB protect key is not connected, new measurement is not possible.

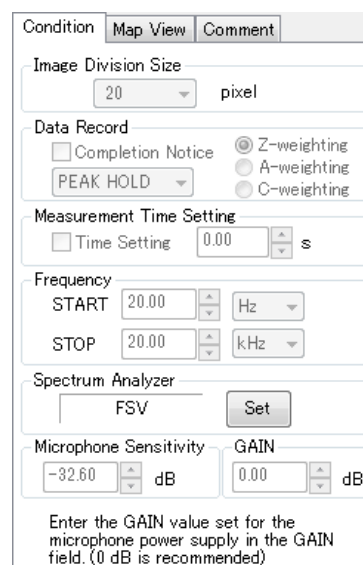
Condition Tab

In the **Condition** tab, set the image division size, properties for the spectrum analyzer, and other conditions.

Condition items can be set only before measurement. After completion of measurement, all items are displayed but cannot be changed.



Conditions (before measurement)



Conditions (after measurement)

Image Division Size

Set the division size by which a camera image of 640×480 pixels is divided.

The image division size can be selected from 10 pixels (H: $64 \times$ V: 48 squares), 16 pixels (H: $40 \times$ V: 30 squares), 20 pixels (H: $32 \times$ V: 24 squares), 32 pixels (H: $20 \times$ V: 15 squares), 40 pixels (H: $16 \times$ V: 12 squares), 80 pixels (H: $8 \times$ V: 6 squares), or 160 pixels (H: $4 \times$ V: 3 squares).

Select 20 or 32 pixels normally.

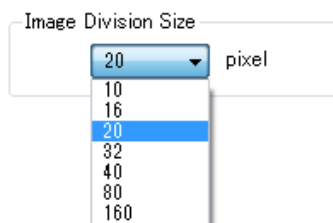


Image division size: 10 pixels



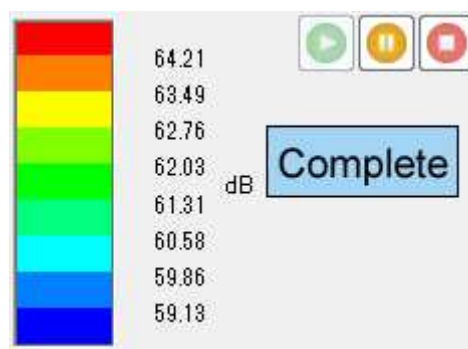
Image division size: 160 pixels

Capturing

If the checkbox for **Completion Notice** is checked, **Complete** is displayed when all image divisions are completely color-coded during measurement.

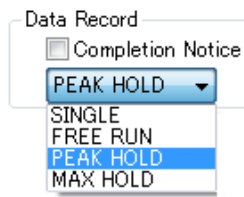


Before completion of measuring all divisions



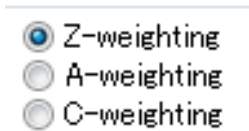
After completion of measuring all image divisions

How to store spectrum data at the same measurement point (the same square of the grid) can be selected from **SINGLE**, **FREE RUN**, **PEAK HOLD**, or **MAX HOLD**.



SINGLE	Performs measurement only one time.
FREE RUN	Always overwrites the data.
PEAK HOLD	Compares the maximum values of the spectrum waveforms, and overwrites the retained value if it is not the largest.
MAX HOLD	Compares the maximum values of the spectrum waveforms on a point basis, and overwrites the retained values if it is not the largest.

One of Z-weighting, A-weighting, and C-weighting can be selected.

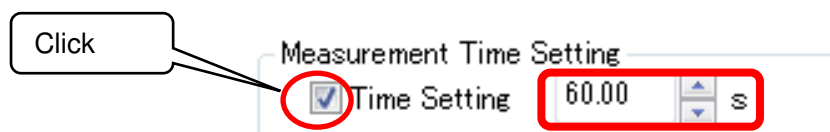


Z-weighting	Can measure sound pressure levels without frequency weighting.
A-weighting	Frequency weighting in accordance with the characteristics of human auditory sense
C-weighting	Frequency weighting that is closer to a flat frequency response than A-weighting

Measurement Time Setting

If the checkbox for **Measurement Time Setting** is checked, when the time in seconds specified for the image division has elapsed during measurement, **Time Exceeded** is displayed. In addition, the circle that indicates the sensor position blinks until the time specified has elapsed.

If moving from the image division before the specified time in seconds has elapsed, the elapsed time is reset to 0.



Before the time specified has elapsed



After the time specified has elapsed

If the method of capturing data is PEAK HOLD or MAX HOLD, the measurement results are not applied until the specified time in seconds has elapsed. After the specified time in seconds has elapsed, the operation becomes the same as when the checkbox is unchecked.

Frequency

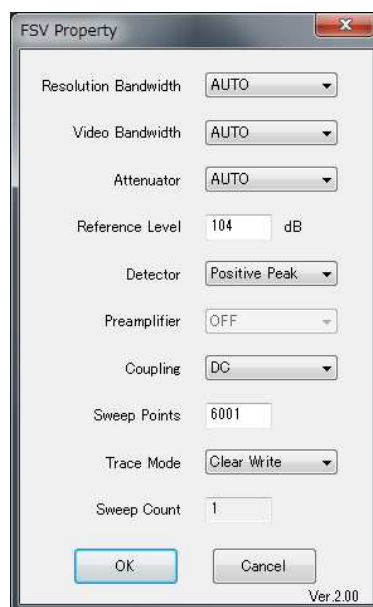
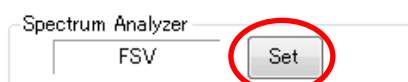
The measurable frequency range depends on the spectrum analyzer and sound pressure sensor. The frequency unit can be selected from Hz, kHz, MHz, and GHz.



Spectrum Analyzer

To configure advanced settings for the spectrum analyzer, click the **Set** button next to the equipment name of the analyzer to open the **Property** dialog box.

For details of each item, refer to the instruction manual for the spectrum analyzer.



Items shown in the **Property** dialog box may vary depending on the selected spectrum analyzer driver.

Microphone Sensitivity

Enter the microphone's own sensitivity value into the Microphone Sensitivity field.

Enter the exact value of [Sensitivity: $-xx.x$ dB] shown in the data sheet (graph sheet) included with the sound pressure sensor.

Microphone Sensitivity

-32.60 dB

GAIN

Enter the GAIN value set for the microphone power supply into the GAIN field.

Since the spectrum analyzer is highly sensitive, generally there is no problem when 0 dB is set.

GAIN

0.00 dB

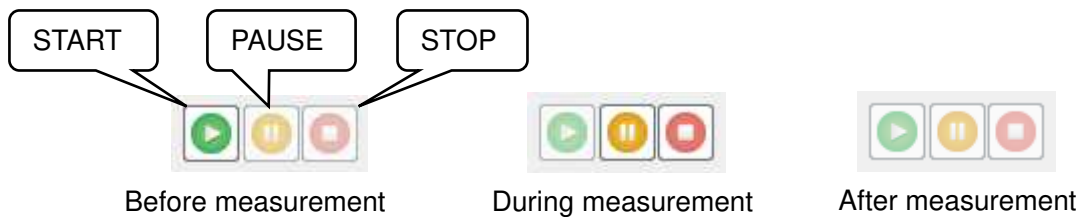
9—5. New Measurement (Performing Measurement)

Performing Measurement

To start measurement, click the **START** button in the upper right of the **View** window. During measurement, the **PAUSE** and **STOP** buttons are enabled.

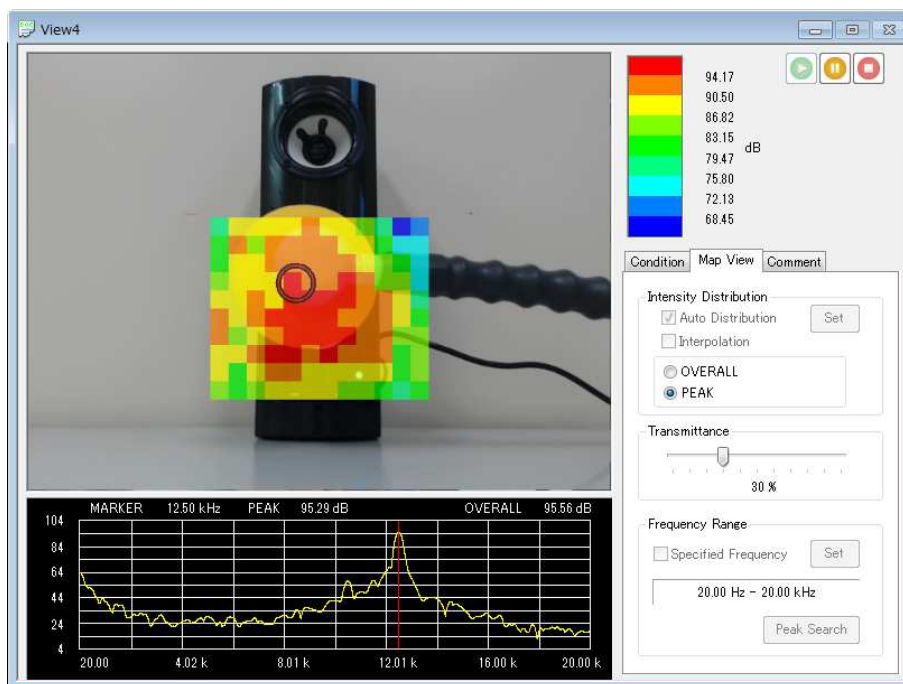
To suspend measurement, click the **PAUSE** button to suspend measurement, and to finish measurement, the **STOP** button.

After completion of measurement, all buttons are disabled. When performing measurement again, click **New Measurement** from the **File** menu or click the **New Measurement** button on the toolbar.



Once measurement is started, the **Map View** and **Comment** tabs appear next to the **Condition** tab. In the Map View tab, during measurement, **Intensity Distribution** mode can be switched between **OVERALL** and **PEAK**, and **Transmittance** can be changed, and after completion of measurement, all items can be set. Items in the **Comment** tab can be set even during measurement.

During measurement, points (squares in the grid) measured are color-coded according to the setting of the overall or peak value in the **Map View** tab and are overlaid on the camera image. In addition, the spectrum data measured by the spectrum analyzer is displayed in the spectrum graph area located in the lower part of the **View** window, on a point-by-point basis.



Move the sound pressure sensor while keeping the same direction and maintaining a constant distance from the object to be measured.

The EPS-02Sv2 software sends a sweep start command to the spectrum analyzer immediately after the sensor is recognized. After completion of sweeping, the software recognizes the sensor position again, and only when the sensor is found at the same point (position) where it was placed at the start of the analyzer sweeping, the spectrum data is stored.

If the sensor is moved quickly, the point at the start of sweeping differs from that at the completion of sweeping, and as a result, measurement data is not stored. For spectrum analyzers with slow response speed, move the sensor more slowly.

If the sensor is not recognized or other object is falsely recognized, reconfigure the image recognition setting. Click **Image Recognition Setting** from the **Set** menu to change the setting. Please note that it is possible during measurement.

The [OVERALL] field at the top right of the spectrum graph displays the overall value measured by the spectrum analyzer. The overall value is exactly the value that was measured by the spectrum analyzer without any modification made on the PC.



If **MAX HOLD** is selected for **Data Record**:

MAX HOLD processing is carried out on the PC against the trace data acquired from the spectrum analyzer to the PC, to create a spectrum graph.

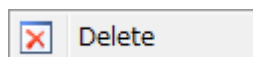
OVERALL displayed at the top right of the spectrum graph switches to **OVERALL (for reference)**

The **OVERALL (for reference)** field displays the largest of all overall values that were measured by the spectrum analyzer at the point.

Deleting Measurement Data

Stored measurement data can be deleted on a point-by-point basis.

When data to be deleted is right-clicked during measurement, the **Delete** menu will appear. Click this menu to delete the measurement data for the corresponding point.



Before deleting data



After deleting data

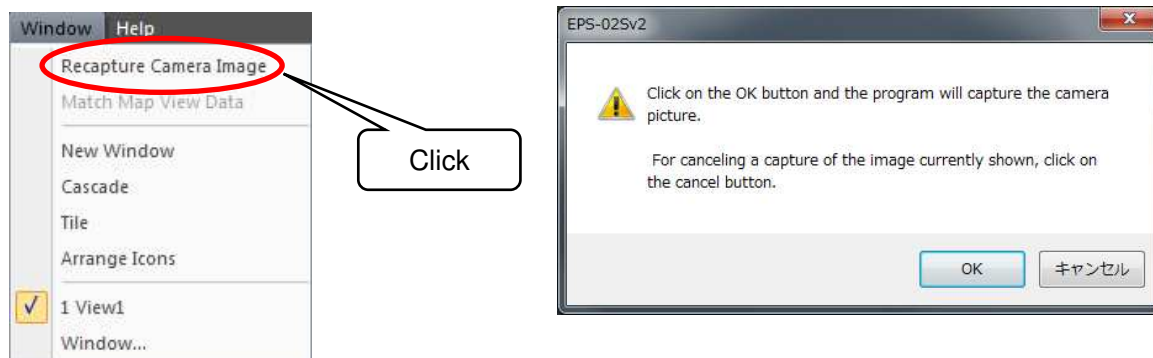


Data can be deleted only during measurement and cannot be deleted after completion of measurement.

Recapturing Camera Image

If the **STOP** button is clicked after completion of measurement, the camera image switches from video to still image. If the still camera image includes an unnecessary object, such as the sensor, the camera image can be recaptured.

Click **Recapture Camera Image** from the **Window** menu. The still image will switch to video and the following message will be displayed.



Clicking the **OK** button switches the camera image from video to still image to capture a new camera image. To return the original camera image, click the **Cancel** button.



Before recapturing




After recapturing

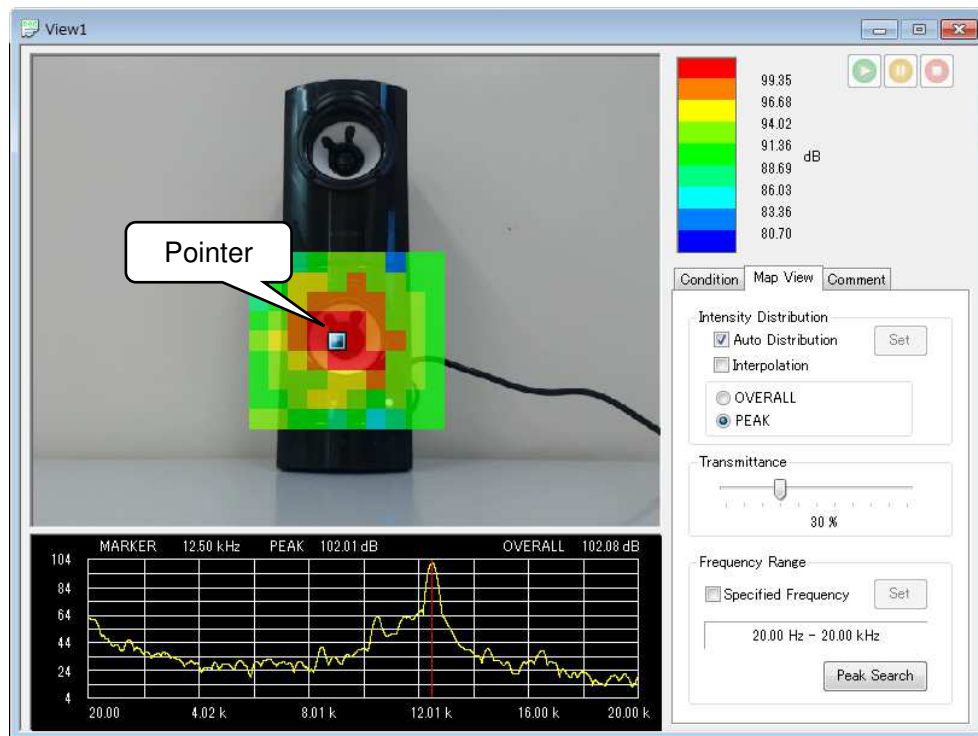


Recapturing is possible as many times as needed before the file is saved.
Note that recapturing is not possible once the file is saved.

9—6. Measurement Data Analysis

Measurement Data

After completion of measurement, a square pointer  will be displayed on the camera image. Dragging this pointer to the desired point can display the spectrum data at the relevant point. The pointer automatically moves to the highest level point immediately after measurement is complete or the file is opened.



In the **Condition** tab, the conditions configured before measurement can be checked. The representation of measurement data can be changed in the **Map View** tab. In the **Comment** tab, measurement information and other comments can be entered.

Condition

Map View

Comment

Image Division Size
20 pixel

Data Record
☐ Completion Notice
☒ Z-weighting
☐ A-weighting
☐ C-weighting
PEAK HOLD

Measurement Time Setting
☐ Time Setting 0.00 s

Frequency
START 20.00 Hz
STOP 20.00 kHz

Spectrum Analyzer
FSV Set

Microphone Sensitivity
-32.60 dB GAIN 0.00 dB

Enter the GAIN value set for the microphone power supply in the GAIN field. (0 dB is recommended)

Condition

Map View

Comment

Intensity Distribution
☒ Auto Distribution Set
☐ Interpolation
OVERALL
PEAK

Transmittance
30 %

Frequency Range
☐ Specified Frequency Set
20.00 Hz - 20.00 kHz
Peak Search

Condition

Map View

Comment

Measurement Information
Model
Serial No.
Day
Temperature deg
Humidity %

Memo

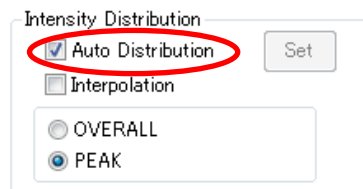
Condition tab

Map View tab

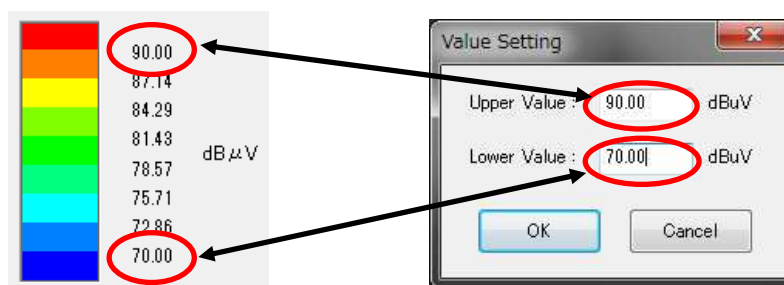
Comment tab

Auto Distribution

When the **Auto Distribution** checkbox is checked, the color map is made according to automatic distribution between the highest and lowest intensity. When **OVERALL** is chosen, the maximum and minimum overall values are displayed as color-coded images. When **PEAK** is selected, the maximum and minimum peak values are displayed as color-coded images.

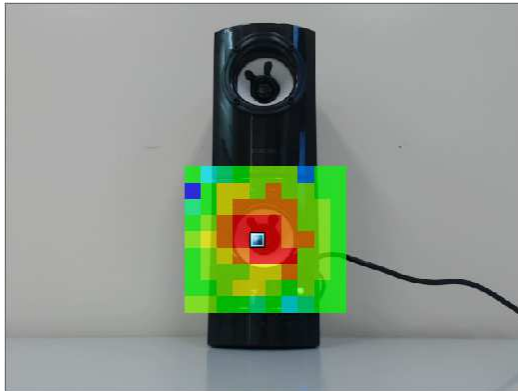
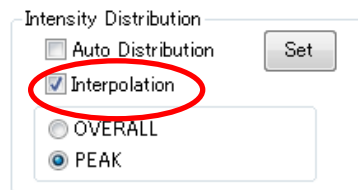


To change the **Upper/Lower Value** to desired values, uncheck the **Auto Distribution** checkbox and click the **Set** button. The upper/lower value settings will be reflected to the map data color bar.

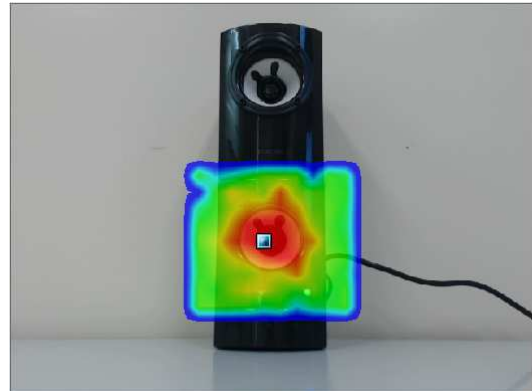


Interpolation

When the **Interpolation** checkbox is checked, the map data image is smoothly displayed by interpolation of the boundaries between divisions.



Without interpolation

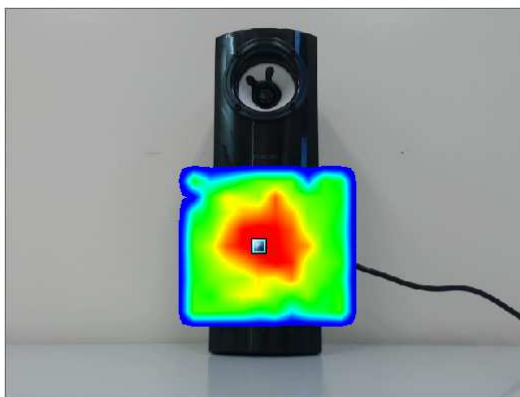
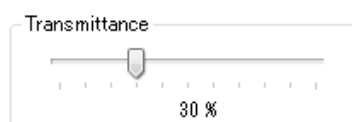


With interpolation

Transmittance

The transparency of the color map can be changed.

When **Transmittance** is set to 100%, the map is invisible and only the camera image will be displayed. When **Transmittance** is set to 0%, the camera image is invisible at the points where data exist.



Transmittance: 0%

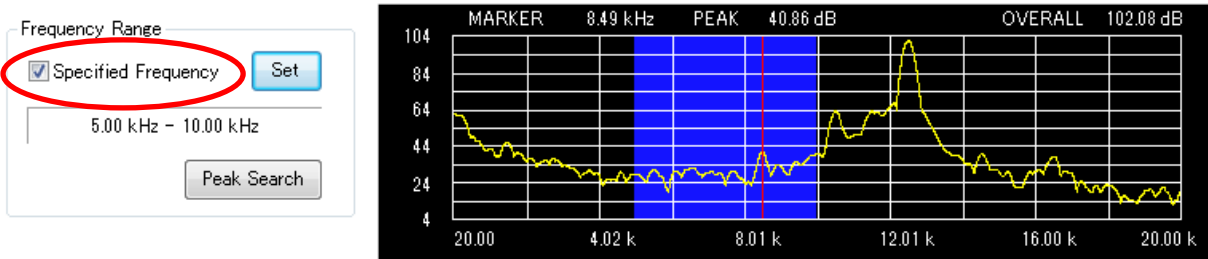


Transmittance: 100%

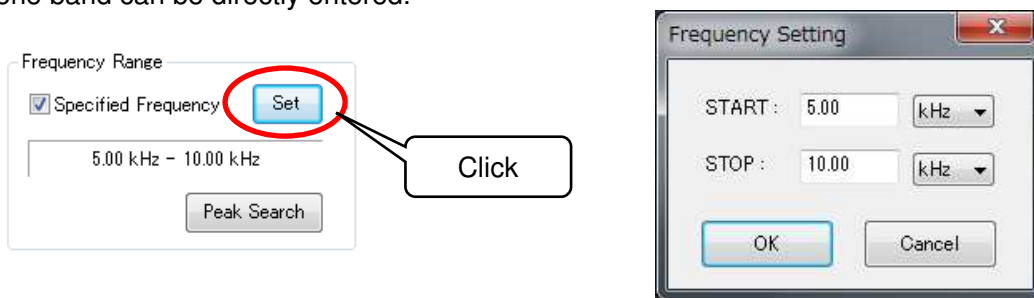
Frequency Range

When **PEAK** is chosen for **Intensity Distribution**, if the **Specified Frequency** checkbox is checked under **Frequency Range**, the map is color-coded not using the peak values of the whole frequency range but using those of the specified frequency range, and the relevant blue zone band is displayed in the spectrum graph.

This zone band can be moved to the right or left by dragging it, and thereby the color-map on the camera image changes. In addition, the width of the zone band can be changed by dragging an end of the band to the right or left.

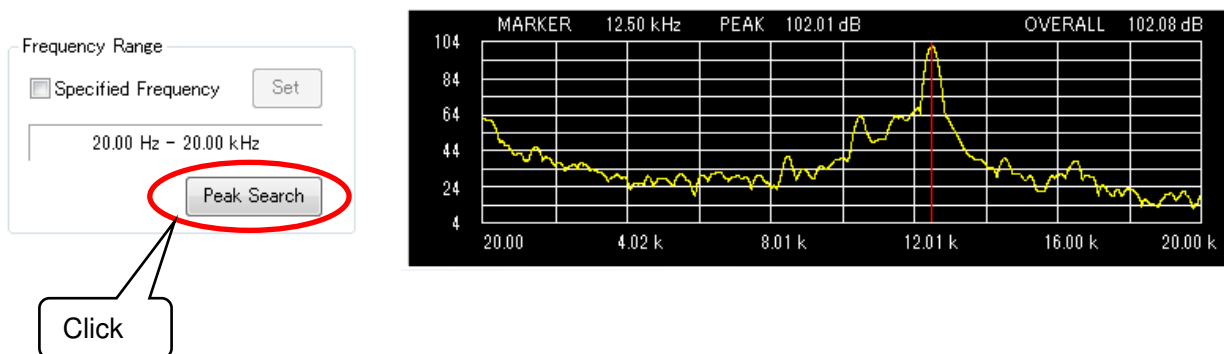


Clicking the **Set** button opens the **Frequency Setting** dialog box, where the frequency range for the zone band can be directly entered.



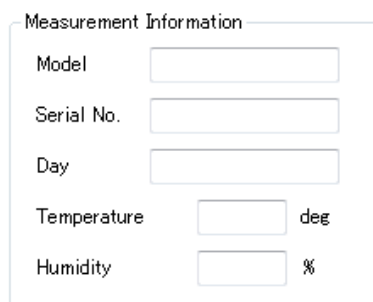
If **OVERALL** is chosen, the checkbox for Specified Frequency cannot be checked. Please note if the checkbox for Specified Frequency is checked, **PEAK** cannot be switched to **OVERALL**.

Clicking the **Peak Search** button moves the pointer to the point with the maximum peak value in the map. And then, the red line moves to the maximum peak value of the spectrum graph. If the zone band is displayed, the pointer moves to the point with the maximum peak value in the zone band. If **OVERALL** is chosen for **Intensity Distribution**, the pointer moves to the point with the maximum overall value in the map.



Measurement Information

The measurement date is automatically input in the **Day** field. For other items, enter information freely. If no information is required, leave the field blank.

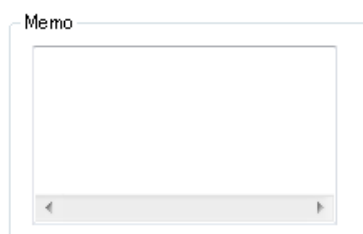


Measurement Information

Model	<input type="text"/>
Serial No.	<input type="text"/>
Day	<input type="text"/>
Temperature	<input type="text"/> deg
Humidity	<input type="text"/> %

Memo

Any information about measurement can be entered freely. In the **Memo** field, there is no limit of the number of characters.

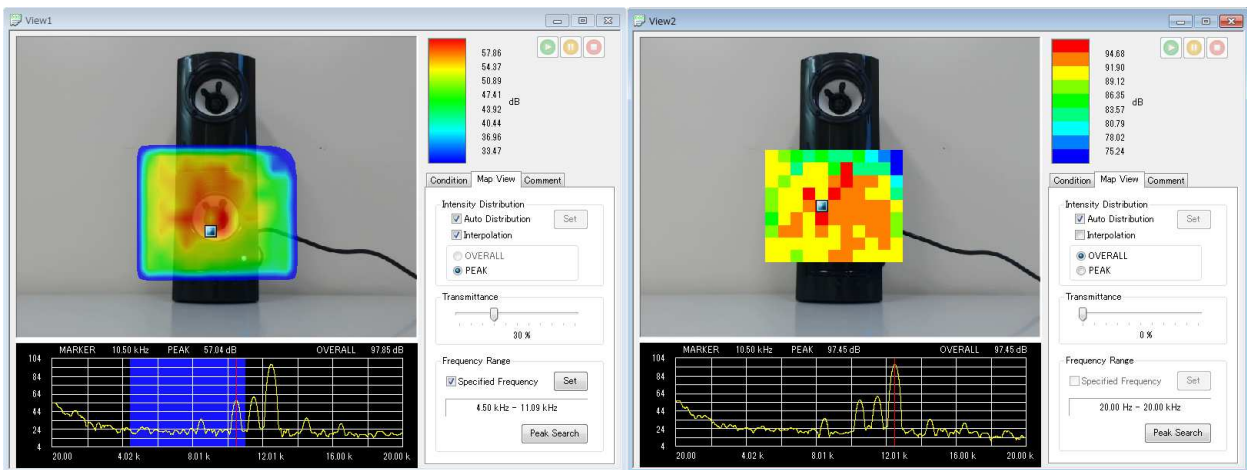
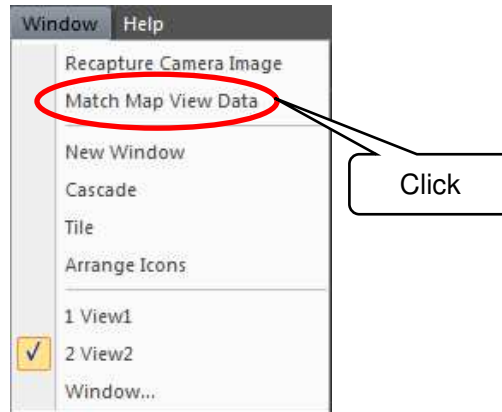


Memo

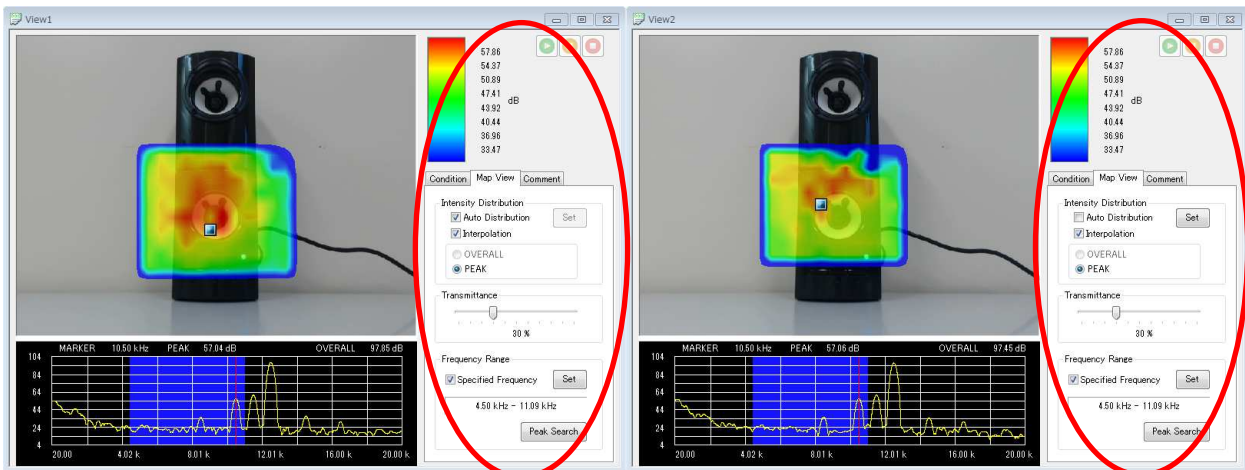
Matching Map View Data

The same setting can be applied to all maps on the **View** windows that are currently open.

When **Match Map View Data** in the **Window** menu is clicked, the map view settings of the last active **View** window will be applied to all of open **View** windows. The settings to be applied include **Upper/Lower Value**, **Interpolation**, **OVERALL/PEAK**, and **Transmittance**. **Specified Frequency** is also applied if the **START** and **STOP** frequencies are the same among Windows. Use this function to compare measurement data before and after corrective actions.



Before matching map view data

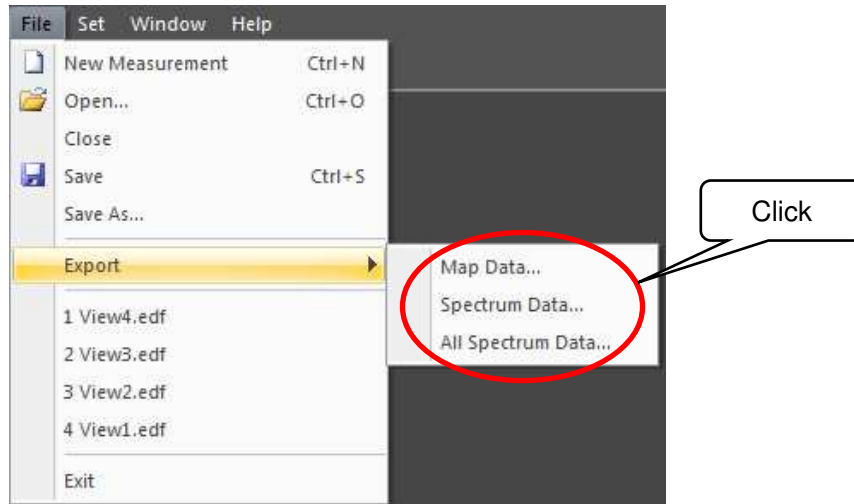


After matching map view data

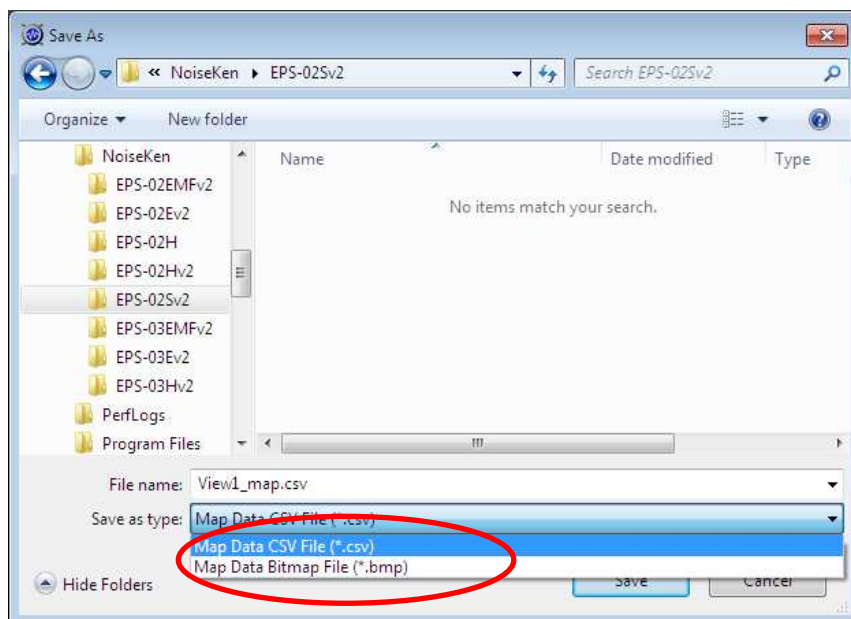
Exporting Measurement Data

Measurement data can be exported to an external file.

Select **Export** from the **File** menu, and choose one from **Map Data**, **Spectrum Data**, and **All Spectrum Data**. The **Save As** dialog box will appear.



In **Save as type** on the **Save As** dialog box, either **CSV File** or **Bitmap File** can be specified.





➤ Map Data

CSV file: The peak values for each measurement point are exported.

BMP file: The map data image pasted on the camera image is exported.

➤ Spectrum Data

CSV file: The spectrum waveform data for the point indicated by the pointer  is exported.

BMP file: The spectrum graph image for the point indicated by the pointer  is exported.

➤ All Spectrum Data

CSV file: The spectrum data for all measurement points are exported.

10.Setup

10—1.Important Notes on Setup

This section describes setup for the software and peripheral devices. To perform setup, you must be logged in with administrator privileges.

Also, it is recommended that setup be performed by some engineer with a certain degree of proficiency in computers, including having an understanding of Ethernet addresses and other terminology.

Be aware that some details may vary for different OS versions, PC display settings, and other environments.

10—2.Network Address Settings

1) Setting the IP Address of the PC

From the **Control Panel**, select **Network and Sharing Center**, and click **Change adapter settings** from the list on the left side.



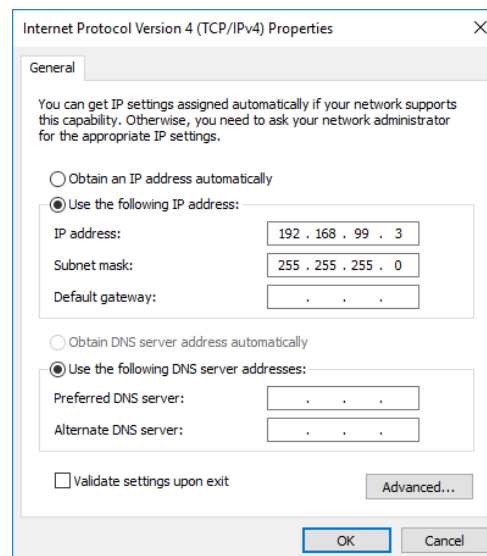
<How to open Control Panel>

In the search box on the taskbar, type **Control Panel**, and then select **Control Panel**.

The adapters that can connect to the network are displayed. Double-click the adapter (local area connection) that is connected to the spectrum analyzer to display its properties. Select "Internet Protocol Version 4", and click to display the properties.

Enter "192.168.99.3" for the IP address and "255.255.255.0" for the subnet mask, and click **OK**.

This completes the IP address settings for the PC.



2) Set the IP address of the spectrum analyzer

For details on the spectrum analyzer settings, see the instruction manual for the spectrum analyzer.

Set the IP address to "192.168.99.100" and the subnet mask to "255.255.255.0".

10—3.Installing the Software

1) Installing NI-VISA

Load the supplied DVD, and open the "NI-VISA" folder. Run Install.exe to start the installation process. Then, perform installation by following the instructions from the installer. When installing, make sure that the installation items include NI-VISA.

2) Installing the EPS-02Sv2 Software

Load the supplied DVD, and open the "EPS-02Sv2" folder.

Run EPS-02Sv2_En.msi to start the installation process. Then, perform installation by following the instructions from the installer.

* If a previous version of EPS-02Sv2 software is already installed, uninstall it before performing the installation.

3) Use of the supplied USB protect key

The supplied protect key is not required for checking the measurement data. For carrying out a measurement by controlling the peripherals, the supplied protect key is required.

It is required to install the driver of the USB protect key before use. The driver file is in "JSP USB" folder in the supplied setup media. After you insert the USB protect key into a USB port of the PC where EPS-02Sv2 software is installed, open Device Manager and select "unknown devices" or "HardKey" of "other devices" and install the driver.

The program can run a measurement only when the USB protect key is inserted into the PC. The USB protect key can be plugged into any USB port.

11. Specifications

11—1. Specifications

Control software, PC, and camera

Item	Specifications
Image size	640 × 480 pixels
Image division size	10, 16, 20, 32, 40, 80, or 160 pixels
Capturing type	Single / Free Run / Peak Hold / Max Hold
Camera image display	Still image / Video
Secondary functions	Save / Import / Export / Comment
Supported OS	Windows 10 / 11

11—2. System Requirements

OS	:	Microsoft Windows 10 (Japanese / English version) Microsoft Windows 11 (Japanese / English version)
CPU	:	Dual Core 2.4 GHz or faster recommended
Memory	:	8 GB or more recommended
Storage	:	5 GB or more
Display	:	1366 × 768 dots or more 1920 × 1080 dots recommended

Other requirements:

- Operation cannot be guaranteed when using online storage or software that uses cloud services.
- 2 empty USB ports

* A DVD drive is required for installation.

* If software with high CPU utilization is running, the operation may become unstable.

* Refer to the manufacturer's website for the latest operation warranty of each device such as camera.

11—3. Supported Spectrum Analyzers

Rohde & Schwarz	FSV
Rohde & Schwarz	FSV3000

12. Warranty

Repair Service Warranty

This repair service warranty applies to the repair services provided for maintaining the designated functions and performance of NoiseKen products.

1. **Warranty Coverage**
This warranty covers NoiseKen products and their accessories.
2. **Technology and Work Fees**
If a breakdown occurs in a NoiseKen product, NoiseKen will provide repair services free of charge based on the warranty terms and conditions as long as the warranty period is still valid. If the warrant period has expired, the customer will bear the actual costs associated with technology and work for the repair.
3. **Ownership of Replacement Parts**
The ownership of all defective parts replaced in the course of performing the repair belong to NoiseKen. If the repair service fees are borne by the customer, NoiseKen will receive the replaced defective parts unless the customer specifically requests otherwise.
4. **Limitation of Liability**
If the customer incurs any damages due to the repair service or breakdown of the NoiseKen product purchased by the customer, the liability of compensation for damages by NoiseKen to the customer is limited to the amount paid by the customer for the applicable NoiseKen product or the applicable non-NoiseKen product (product by other manufacturer) only if these damages are due to the willful intent or negligence by NoiseKen. However, for damages incurred by the customer due to the above-described repair service provided by NoiseKen or breakdown of the applicable NoiseKen product, under no circumstances will NoiseKen be liable for any loss of potential income occurring directly or indirectly or any direct or indirect damages due to compensation by the customer to a third party.
5. **Wrong Parts, Missing Parts, or Breakage**
If the product cannot be used when a wrong part, missing part, or breakage occurs in a NoiseKen product purchased by the customer, NoiseKen will not be liable for any damages whatsoever for losses incurred by the customer due to loss of sales or other derived losses, special losses, or indirect or punitive damages, or any damages due to compensation by the customer to a third party.
6. **Decline to Repair**
The company may not accept a repair order in the following cases.
 - More than 5 years have passed since manufacture of a product discontinued.
 - More than 8 years have passed after delivery.
 - Required component for servicing already discontinued and no alternative is available.
 - Product changed, repaired or remodeled without obtaining a prior permission from the Company.
 - Product severely damaged to the extent it has lost its original form.

Product Warranty

For breakdowns that occur within the product warranty period, NoiseKen will repair or replace the product free of charge. The extent and content of the repair work for the equipment will be determined by NoiseKen. This product warranty is valid in Japan only.

1. Device Coverage

This warranty covers NoiseKen products and their accessories.

2. Product Warranty Period

- This warranty is for one year starting from the delivery date of the product.
If the same breakdown at the same location is repaired, the warranty period is six months from the date that the repair was completed.
- For non-NoiseKen products, the product warranty of the supplier (manufacturer) applies.

3. Exceptions

Regardless of the above stipulations, the warranty does not cover breakdowns due to one of the following.

- ✧ Replacement of consumable parts, including the replacement (for used products) of mercury relays, high-voltage relays, coaxial cords, coaxial connectors, automatic switchers, contactors, and other consumables
- ✧ Damage or breakdowns that occurred due to failure to follow proper operating procedures.
- ✧ Product failures resulting from damage or breakdowns due to modifications not involving NoiseKen
- ✧ Product failures resulting from damage or breakdowns that occurred when someone unauthorized by NoiseKen attempted to perform repairs
- ✧ Product failures resulting from damage or breakdowns caused directly or indirectly by natural disasters, war, riots, civil strife, or other force majeure
- ✧ Product failures resulting from damage or breakdowns caused by transportation, vibrations, dropping, impact, or other misuse after delivery
- ✧ Product failures resulting from damage or breakdowns caused by the usage environment
- ✧ When the customer takes the product outside Japan

Software Warranty

A warranty is provided for the software produced by NoiseKen and its update files under the following terms and conditions. This warranty is valid in Japan only.

1. **Scope of Warranty**
This warranty applies to the software produced by NoiseKen and its update files.
2. **Free Support**
If a fault occurs in the system as a result of this software by NoiseKen, NoiseKen will provide support free of charge through software fixes and updates or other means only within the warranty period. However, please be aware that we may discuss when to implement corrective measures for minor issues.
3. **Total Maximum Liability**
If the customer incurs losses or damages due to a fault of this NoiseKen software purchased by the customer, unless the losses or damages are the result of willful or negligent actions, the maximum amount of NoiseKen's liability for compensation for these losses or damages to the customer is equal to the amount that the customer paid for this NoiseKen software. But, NoiseKen assumes no liability for any losses or damages incurred by the customer due to faults arising from this software by NoiseKen, including but not limited to, direct or indirect potential lost earnings and direct or indirect damages due to third party claims for compensation against the customer.
4. **Warranty Period**
The warranty period is the support period of the OS by the provider (including extended support periods) for the OS where operation is guaranteed by NoiseKen. When the support period of this OS ends, support for this software in this OS will also come to an end.
The after service of the software ends support when the production and sales of the specific control equipment are discontinued.
5. **Exclusions**
These terms and conditions do not constitute a full and complete guarantee of operation or compatibility with the customer's system. Also, the following situations are outside the scope of support.
[Combining with products]
Although every effort will be made to provide comprehensive software support, in combination with products other than those recommended by NoiseKen, some faults may be unable to be resolved due to lack of compatibility or conflicts with PCs, peripherals, and other hardware, and OS and other software. In addition, even in combination with products recommended by NoiseKen, faults may be unable to be resolved due to serious defects occurring in the recommended products.
[Added functions and OS upgrades]
Please note that support for added functions and OS upgrades are outside the scope of free support.

13.NOISE LABORATORY SUPPORT NETWORK

- If a symptom which seems a trouble is found, check the symptom, software version, model name of connected device, and serial number, and inform this information to Noise Laboratory or your nearest sales agent of Noise Laboratory.

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