



DATA DISPLAY SOFTWARE for FRA51602/FRA51615

Instruction Manual

DA00066632-004

**DATA DISPLAY SOFTWARE for
FRA51602/FRA51615**

Instruction Manual

REGISTERED TRADEMARKS

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———— Preface ————

Thank you for purchasing the **FRA 51602 Gain-phase Analyzer** or the **FRA 51615 Frequency Response Analyzer**.

For safe and correct use of this product, please read the “Safety Precautions” section that follows before attempting to use the instrument.

■ Before reading

The description in this manual assumes that the reader is familiar with the basic operations involved in using Microsoft Windows 7/8.1, Microsoft Windows 10 or later. Concerning the basic Windows operations and terms such as ‘click’ and ‘drag’, etc., please refer to the Windows User Guide or other such documentation.

The figures and messages that appear in this manual are for Windows 7. The display content may differ for other Windows versions.

- The chapters of this manual are described below.

If you are using this product for the first time, begin reading by reading Chapter 1.

1. Introduction

A general description of the **FRA51602/FRA51615 Data Display Software**

2. Installation

The environment required for operation of the **FRA51602/FRA51615 Data Display Software** and how to install the software

3. Graph Display Functions

Explanation of functions related to graphs

4. Remote Control Functions

Explanation of functions related to remote control of the instrument

———— Safety Precautions ————

For safe use of this product, give full attention to the following warnings and cautions.

The NF Corporation shall not be held liable for damages that arise from failure to observe these warnings and cautions.

- Be sure to observe the instructions in the instruction manual.

This instruction manual contains information for the safe operation and use of this product.

Read the instructions and information before using the product.

All of the warning items contained in this instruction manual are intended to avoid risks that may lead to serious accidents. Follow the warnings and instructions carefully.

- If you think something is wrong, ...

If smoke or an unusual odor or sound comes from the instrument that is controlled by this software, immediately remove the power cord from the socket and cease use of the instrument.

If any such abnormality occurs, take measures to prevent the use of the instrument until repairs have been completed and promptly contact the NF Corporation or its authorized agent.

———— Disclaimer ————

The **FRA51602/FRA51615 Data Display Software** (referred to simply as “this software” in the following) is fully tested and inspected before shipping by the NF Corporation (referred to simply as “NF” in the following).

If you experience any problem, please contact NF or an authorized agent of NF.

NF accepts no responsibility for any damage that might arise from the use of this software. NF will not be obligated to revise or support this software, even if the software is found to be deficient. Use this software at your own risk and responsibility.

T a b l e o f C o n t e n t s

| | Page |
|--|------|
| 1. Introduction | 1-1 |
| 1.1. Overview..... | 1-2 |
| 2. Installation | 2-1 |
| 2.1. Required equipment | 2-2 |
| 2.1.1. Personal computer..... | 2-2 |
| 2.2. Installation procedures | 2-3 |
| 2.2.1. Installing the VISA driver..... | 2-3 |
| 2.2.2. Installing the FRA51602/FRA51615 Data Display Software | 2-3 |
| 2.2.3. Uninstalling the FRA51602/FRA51615 Data Display Software | 2-3 |
| 3. Graph Display Functions..... | 3-1 |
| 3.1. Menu structure..... | 3-2 |
| 3.2. Displaying graphs | 3-3 |
| 3.2.1. Loading measurement data from files | 3-3 |
| 3.2.2. Acquiring measurement data from FRA | 3-3 |
| 3.2.3. Graph display settings | 3-5 |
| 3.2.4. Cursor display | 3-7 |
| 3.2.5. Saving measurement data to a CSV file..... | 3-9 |
| 3.2.6. Printing graphs and copying graphs to the clipboard | 3-9 |
| 4. Remote Control Functions | 4-1 |
| 4.1. Remote control | 4-2 |

Figures and Tables

| | Page |
|--|------|
| Figure 3-1 Target select dialog box | 3-3 |
| Figure 3-2 Connection setting dialog box | 3-4 |
| Figure 3-3 Display setting dialog box | 3-7 |
| Figure 3-4 Hairline cursor | 3-8 |
| Figure 3-5 Data cursor | 3-8 |
| Figure 4-1 Remote control dialog box | 4-3 |

1. Introduction

| | | |
|------|---------------|-----|
| 1.1. | Overview..... | 1-2 |
|------|---------------|-----|

1.1. Overview

The **FRA51602/FRA51615 Data Display Software** supports the functions of the **FRA51602 Gain-phase Analyzer** and the **FRA51615 Frequency Response Analyzer** (both referred to simply as “FRA” in the following).

The **FRA51602/FRA51615 Data Display Software** runs on the Windows operating system of a personal computer and communicates with the FRA via a USB, GPIB, RS-232, or LAN interface to acquire measurement data or to read measurement data from a USB memory device and displays the data in graph form.

The main functions of the **FRA51602/FRA51615 Data Display Software** are listed below.

- Obtain measurement data from the FRA via a GPIB, USB, RS-232 or LAN interface
- Display Graph of measurement data saved in USB memory by FRA
- Save measurement data to a CSV file
- Display measurement data in graph form
- Print a copy of the measurement data graph
- Perform remote control of the FRA

For more information on the operation of the remote control function, please refer to the instruction manual (remote control) for the FRA.

2. Installation

| | | |
|--------|--|-----|
| 2.1. | Required equipment | 2-2 |
| 2.1.1. | Personal computer..... | 2-2 |
| 2.2. | Installation procedures | 2-3 |
| 2.2.1. | Installing the VISA driver..... | 2-3 |
| 2.2.2. | Installing the FRA51602/FRA51615 Data Display Software..... | 2-3 |
| 2.2.3. | Uninstalling the FRA51602/FRA51615 Data Display Software | 2-3 |

2.1. Required equipment

Before installing the **FRA51602/FRA51615 Data Display Software**, confirm that your computer system satisfies the conditions listed below.

2.1.1. Personal computer

- Available hard disk space: At least 50 MB
- Display: At least 1600 × 900 pixels
- OS: Windows 7/8.1, Windows 10 or later Japanese/English version (Microsoft Corporation) with .NET Framework 4.0 installed
- Communication interface: USB, GPIB, RS-232, LAN

2.2. Installation procedures

2.2.1. Installing the VISA driver

FRA51602/FRA51615 Data Display Software is confirmed to work on NI-VISA Version 2023Q3 provided by National Instruments Corporation. Please be aware that we do not provide support for problems that occur in the VISA environment provided by other vendor products. If you want to use **FRA51602/FRA51615 Data Display Software** in the NI-VISA environment, you must obtain the license yourself from National Instruments Corporation. For details of NI-VISA, contact National Instruments Corporation or visit the National Instruments Website.

2.2.2. Installing the **FRA51602/FRA51615 Data Display Software**

.NET Framework 4.0 or a more recent version must be installed.

.NET Framework 4.0 can be downloaded from the Microsoft website (<http://www.microsoft.com>).

If .NET Framework 4.0 has not been installed before setup.exe is executed, a message prompting installation of the .NET Framework will be presented.

- a) Run setup.exe.
- b) Follow the instructions on the screen and press the [Next] button to install the software.
- c) When the installation is finished, the **FRA51602/FRA51615 Data Display Software** is ready to run.
The **FRA51602/FRA51615 Data Display Software** can be run by selecting "FRA516xxDataDspl" from the start menu

For more information, please refer to the Microsoft website.

2.2.3. Uninstalling the **FRA51602/FRA51615 Data Display Software**

If you are using Windows 7 or Windows 8.1, open the control panel and click on [Programs and Features]. Click on "FRA516xxDataDspl" and then click on the [Uninstall] button to remove the **FRA51602/FRA51615 Data Display Software**.

If you are using Windows 10, from the Start menu, click "Settings" and then click [System]. Next, click on [Apps & features], [FRA516xxDataDspl] and then click on the Uninstall button to remove the **FRA51602/FRA51615 Data Display Software**.

If you are using Windows 11, from the Start menu, click "Settings" and then click [System]. Next, click on [Installed apps], [FRA516xxDataDspl] and then click on the Uninstall button to remove the **FRA51602/FRA51615 Data Display Software**.

2.2 Installation procedures



3. Graph Display Functions

| | | |
|------|------------------------|-----|
| 3.1. | Menu structure..... | 3-2 |
| 3.2. | Displaying graphs..... | 3-3 |

3.1. Menu structure

The menu system of the **FRA51602/FRA51615 Data Display Software** is organized as shown below. The items that are marked with an asterisk (*) cannot be used when no graph is being displayed.

| Menu | Item | Description |
|-----------|-------------------------|---|
| File | Open from file | Load measurement data from the specified file and display it as a graph. |
| | Open from device | Data is acquired from the FRA and displayed as a graph. |
| | Save active plot to csv | The measurement data for the selected graph is saved to a file in CSV format. |
| | Page set up | Page format is set for printing. |
| | Preview(*) | A preview of the page to be printed is presented. |
| | Print(*) | The active graph is printed. |
| | Copy to clipboard(*) | A bitmap image of the active graph is copied to the clipboard. |
| | Exit | The FRA51602/FRA51615 Data Display Software program is terminated. |
| Device | Remote control | Perform remote control of the FRA. |
| | Connection setting | Change the settings for the connection to the FRA. |
| Graph | Display setting(*) | Set up the graph display. |
| Cursor | None | The graph cursor is not displayed. |
| | Hairline cursor | A hairline cursor is displayed on the graph. |
| | Data cursor | A data cursor is displayed on the graph. |
| Window(*) | (Graph name) | The graph window to be displayed is selected. |
| Help | Version | The software version and other information is displayed. |

3.2. Displaying graphs

The **FRA51602/FRA51615 Data Display Software** can read measurement data from a data file or acquire measurement data from the FRA and display that data as a graph. You can change the graph settings so that the data can be displayed as a bode plot, Nichols plot, or other graph forms. The displayed graph can be printed out by a printer, or copied to the clipboard as a bitmap image.

3.2.1. Loading measurement data from files

The **FRA51602/FRA51615 Data Display Software** can read data from FRA51602 or FRA51615 data files (.csv) or from FRA5090, FRA5095, FRA5087, or FRA5097 data files (.dat) and display the data as a graph.

By selecting the [File]-[Open from file] menu, measurement data can be read from the specified file and displayed as a graph.

When a file is selected, the Display Setting dialog box is presented so that you can change the graph display settings. (Refer to section 3.2.3, “Graph display settings”).

When two or more sets of measurement data are loaded, the “Target select” dialog box is presented with a choice between overlaying the data on an existing graph or opening a new graph window for display.

To overlay the data on an existing graph, select the existing graph window name and then click on the OK button or the Setting button. (The graph window name is the name of the data file that initially created the graph window.) If you click on the Setting button, you can change the graph display settings.

To create a new graph window, select “(New graph)” and then click on the OK button or the Setting button.

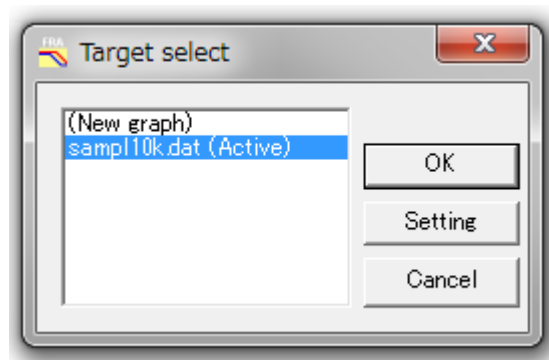


Figure 3-1 Target select dialog box

3.2.2. Acquiring measurement data from FRA

Use the [File]-[Open from device] menu to get measurement data from the FRA that is connected to the computer. The acquired data will become the data that is currently displayed on the FRA.

When more than one set of data is displayed, you can choose between overlaying the data or opening a new graph window in the same way as for loading measurement data from a file.

The settings for the connection between the computer and the FRA can be changed with the [Device]-[Connection setting] menu.

For connection to the FRA via USB, check the USB radio button and enter the seven-digit serial number. If the serial number begins with a zero, do not omit the zero when entering the number.

For connection to the FRA via GPIB, check the GPIB radio button and enter the address that is assigned to the FRA.

For connection to the FRA via RS-232, enter the number of the COM port that is connected to the FRA, the flow control method, and the delimiter character.

For connection to the FRA via a LAN, enter the IP address of the FRA.

For how to confirm the FRA serial number, GPIB address, RS-232 settings, or LAN IP address, please refer to the Instruction Manual (remote control) for the FRA.

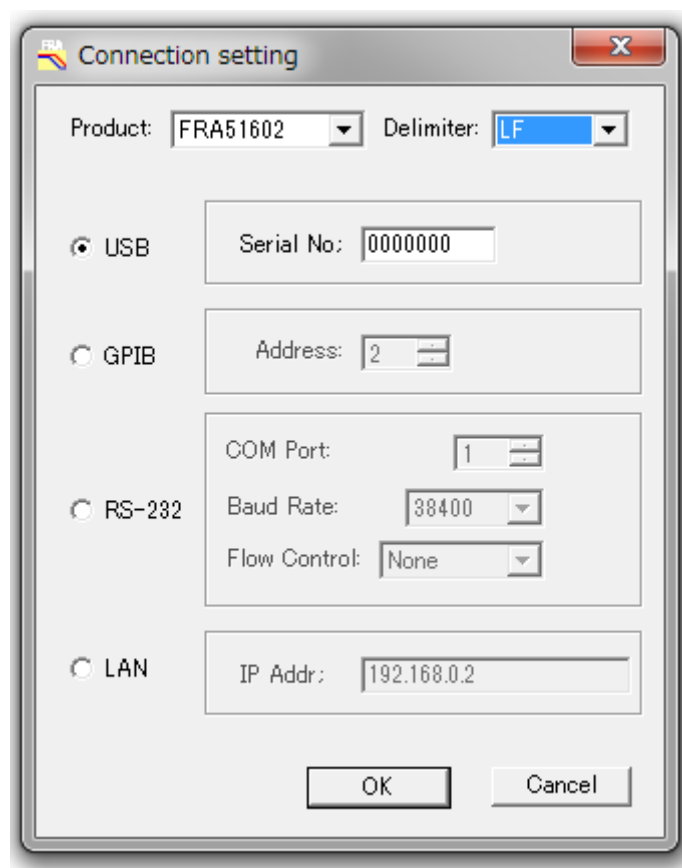


Figure 3-2 Connection setting dialog box

3.2.3. Graph display settings

The graph display settings can be changed when loading measurement data from a data file, when acquiring measurement data from an FRA, or by using the [Graph]-[Display setting] menu.

| Tab | Item | Description |
|------------|------------------|---|
| General | Title | Enter the title of the graph. |
| | Background color | Set the background color of the graph. |
| | Units | Set the graph display unit. Select either gain or impedance. |
| | Template | A typical setting template for the x-axis and y-axis |
| | Graph size[mm] | Specify the horizontal and vertical size of the graph. Pressing the “Restore to defaults” button enters the default values (225 mm × 120 mm). |
| | Font | Set the font for the file name and the graph title. |
| Data | Delete | Delete the data of the selected file name from the graph. |
| | Analysis mode | Set the data analysis mode. |
| Horizontal | Data | Select the data type for display on the X axis. The choices are “Frequency”, “Re” (real part), and “Phase”. |
| | Caption | Set the caption for the X axis. |
| | Use default | If this is checked, the default setting for the X axis caption is used. If unchecked, the caption for the X axis can be set freely. |
| | Scale | Set the scale for the X axis. The choices are “Linear”, “Linear (dB)” (decibels), and “Log”. |
| | Format | Specify the number of scale gradations on the X axis. |
| | Grid | Specify the color and width of the X axis grid lines and whether or not to display the grid lines. |
| | Margin [mm] | Specify the left and right margins for the plot. |
| | Scale option | Specify the maximum and minimum values and the step width for the scale on the X axis. When “Log” has been set for the scale, only “Auto” can be specified for the step. |
| | Font | Specify the font for the X axis caption and scale. |

3.2 Displaying graphs

| | | |
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| Vertical1 | Data | Select the data type for display on the Y1 axis (the vertical axis on the left side). The choices are “R”, “Re” (real part), “-Re” (negative real part), “Im” (imaginary part), “-Im” (negative imaginary part), and “Phase”. |
| | Caption | Set the caption for the Y1 axis. |
| | Use default | If this is checked, the default setting for the Y1 axis caption is used. If unchecked, the caption for the Y1 axis can be set freely. |
| | Scale | Set the scale for the Y1 axis The choices are “Linear”, “Linear (dB)” (decibels), and “Log”. |
| | Format | Specify the number of scale gradations on the Y1 and axis. |
| | Grid | Specify the color, width and whether or not to display the Y1 axis gridlines. |
| | Margin [mm] | Specify the upper and lower margins for the plot |
| | Scale option | Specify the maximum and minimum values and the step width for the scale on the Y1 axis. When “Log” has been set for the scale, only “Auto” can be specified for the step. |
| | Font | Specify the font for the Y1 axis caption and scale. |
| Vertical2 | Data | Select the data type for display on the Y2 axis (the vertical axis on the right side). The choices are “None”, “R”, “Re” (real part), the “Im” (imaginary part), “-Im” (negative imaginary part), and “Phase”. |
| | Caption | Set the caption for the Y2 axis. |
| | Use default | If this is checked, the default setting for the Y2 axis caption is used. If unchecked, the caption for the Y2 axis can be set freely. |
| | Scale | Set the scale for the Y2 axis The choices are “Linear”, “Linear (dB)” (decibels), and “Log”. |
| | Format | Specify the number of scale gradations on the Y2 axis. |
| | Grid | Specify the color, width and whether or not to display the Y2 axis gridlines of the grid lines. |
| | Margin[mm] | Specify the upper and lower margins for the plot |
| | Scale option | Specify the maximum and minimum values and the step width for the scale on the Y2 axis. When “Log” has been set for the scale, only “Auto” can be specified for the step. |
| | Font | Specify the font for the Y2 axis caption and scale. |
| Item | | Select the FRA settings information to be displayed in the graph. |

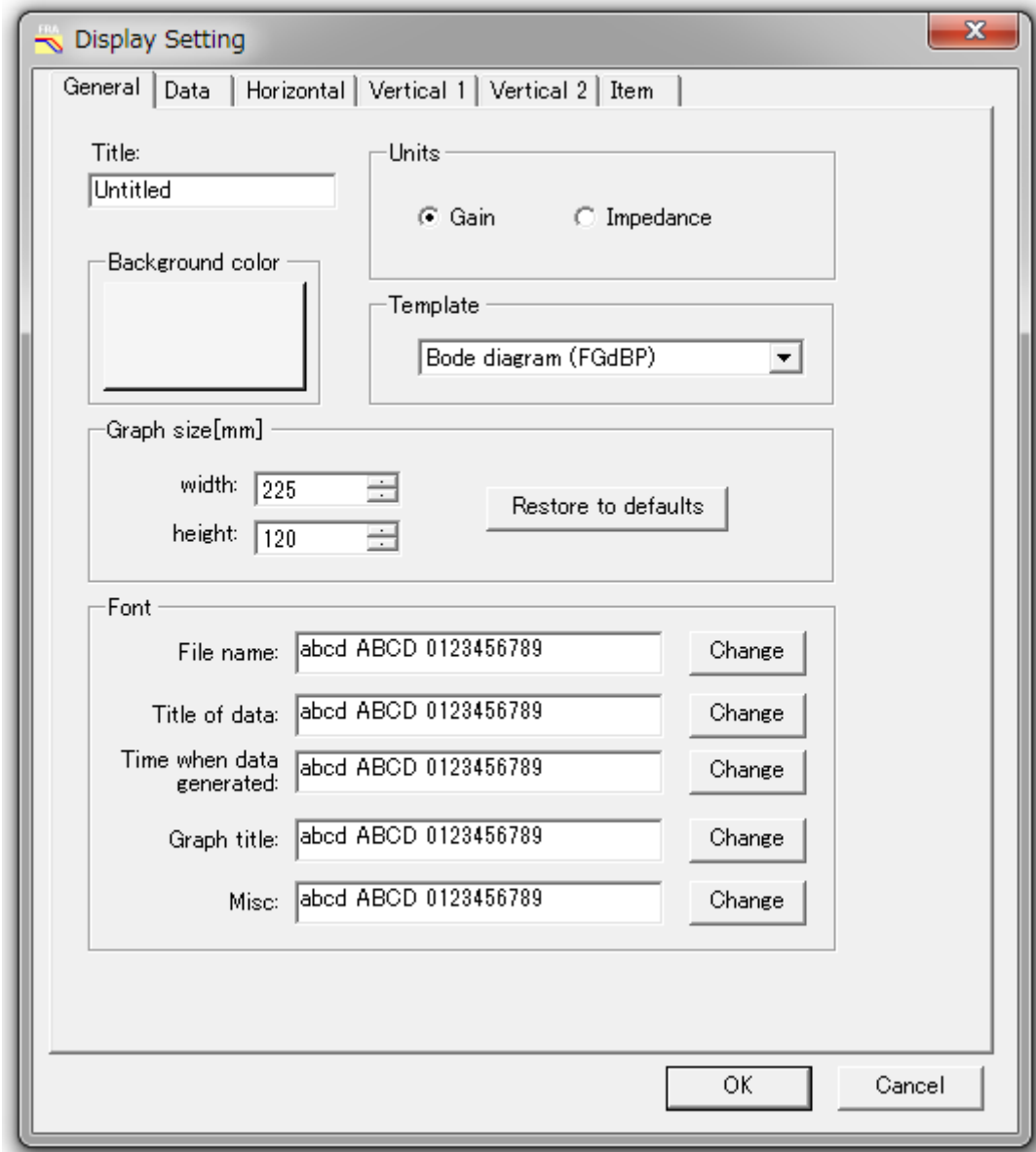


Figure 3-3 Display setting dialog box

3.2.4. Cursor display

The type of cursor that is presented on a graph for reading values can be selected with the [Cursor] menu. Selecting [Cursor]-[Hairline cursor] displays a hairline cursor that can be used to read values at any point in the graph window. Selecting [Cursor]-[Data cursor] displays a data cursor for reading measurement data at any point in the graph window. The values that correspond to the cursor position are displayed in the lower left corner of the graph window. The data cursor can be moved left and right by dragging with the mouse or by pressing the left or right arrow keys while a graph window is selected.

3.2 Displaying graphs

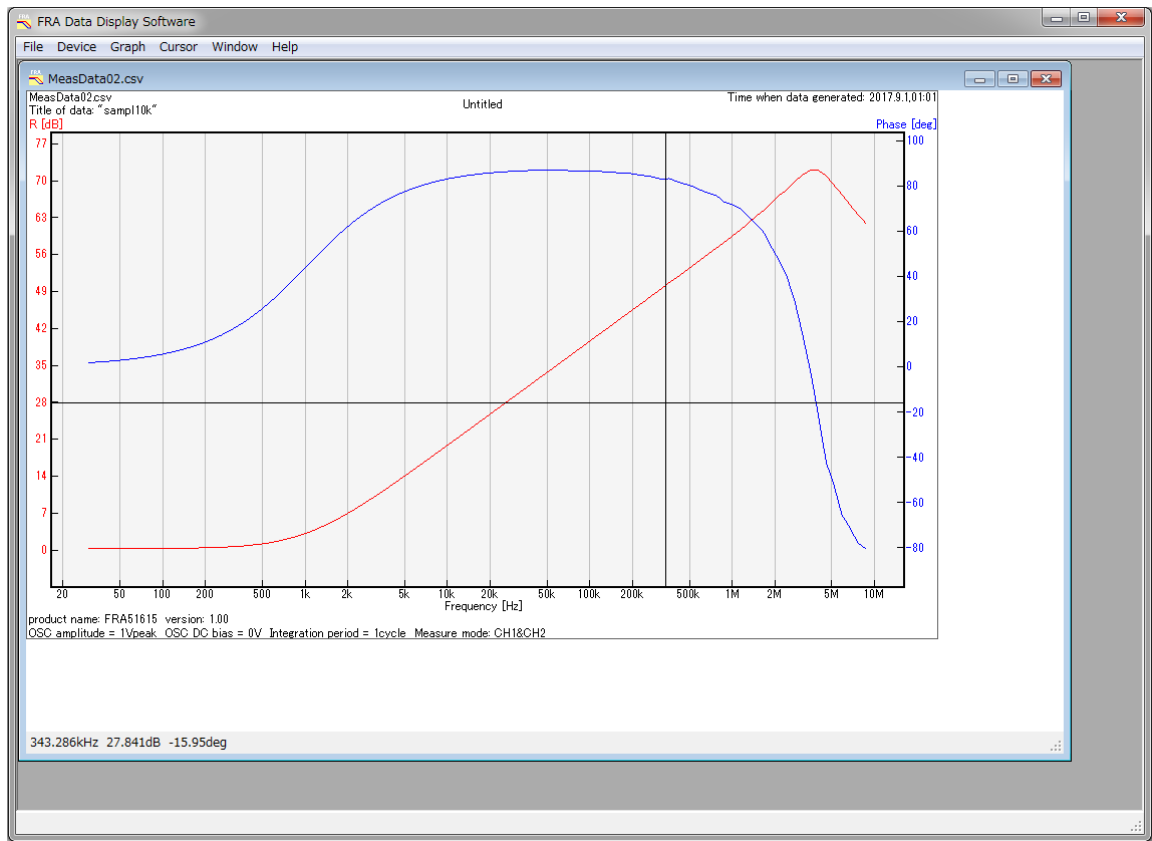


Figure 3-4 Hairline cursor

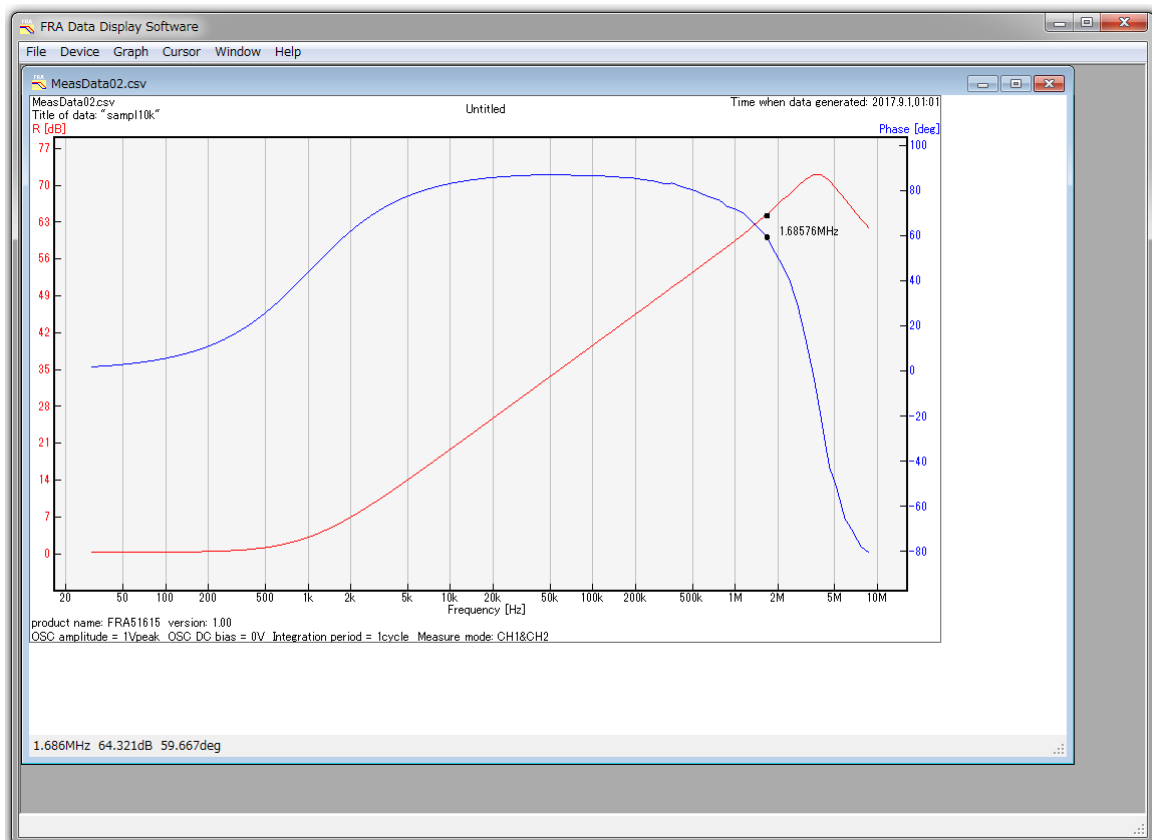


Figure 3-5 Data cursor

3.2.5. Saving measurement data to a CSV file

By selecting the [File]-[Save active plot to csv] menu, the measurement data of the active graph can be saved to a file in CSV format.

The file format is listed below.

- Line 1: Fixed header “F, G, P”
- Line 2 and subsequent lines: Measurement data

Each line contains three items in the order of frequency (Hz), gain (no unit), and phase (degrees).

The values are represented in exponent format.

When the display unit is set to impedance (the [Unit] setting of the [Display setting] dialog box [General] is “Impedance”), the output is in 1.0000000000e00 multiples of 1.0 (Ω).

3.2.6. Printing graphs and copying graphs to the clipboard

The graph that is displayed in the active graph window can be printed by selecting the [File]-[Print] menu. The printing settings such as paper size and printing direction can be changed with the [File]-[Page setup] menu. You can see a preview of the image that would be printed by selecting the [File]-[Preview] menu.

Selecting the [File]-[Copy to clipboard] menu will copy the graph image that is displayed in the active graph window to the clipboard as bitmap data. From the clipboard, you can paste the image data into a suitable application program.



4. Remote Control Functions

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| 4.1. | Remote control | 4-2 |
|------|----------------------|-----|

4.1. Remote control

The FRA can be set for remote control by using the [Device]-[Remote control] menu.

The function of each setting is described below.

- Basic Parameters

Enter values for the basic parameters and press the Enter key to make the setting effective.

The setting items are as follows.

Sweep Max Frequency: Set the maximum frequency for a sweep measurement.

Sweep Min Frequency: Set the minimum frequency for a sweep measurement.

Sweep Spacing: Set the sweep measurement mode (linear or log).

Sweep Resolution: Set the sweep resolution (points/sweep).

OSC Amplitude: Set the AC amplitude.

OSC Bias: Set the DC bias.

- Measure

Execute / Stop measurement by FRA. The contents that can be executed are as follows.

Sweep: Pressing the Down or Up button executes a sweep measurement.

Stop: Pressing the Stop button during a sweep measurement terminates the measurement.

- Osc

Controls the oscillator output of the FRA. The contents that can be executed are as follows.

OFF: Pressing the AC/DC button turns off the oscillator output for both AC and DC. Pressing the AC button turns off the oscillator output for AC.

ON: Pressing the AC/DC button turns on the oscillator output for both AC and DC.

- Command

Enter any command and press the Enter key to execute the command. For information on the commands, refer to the Instruction Manual (remote control) for the FRA.

- Log

Display the log for the executed command.

4.1 Remote control

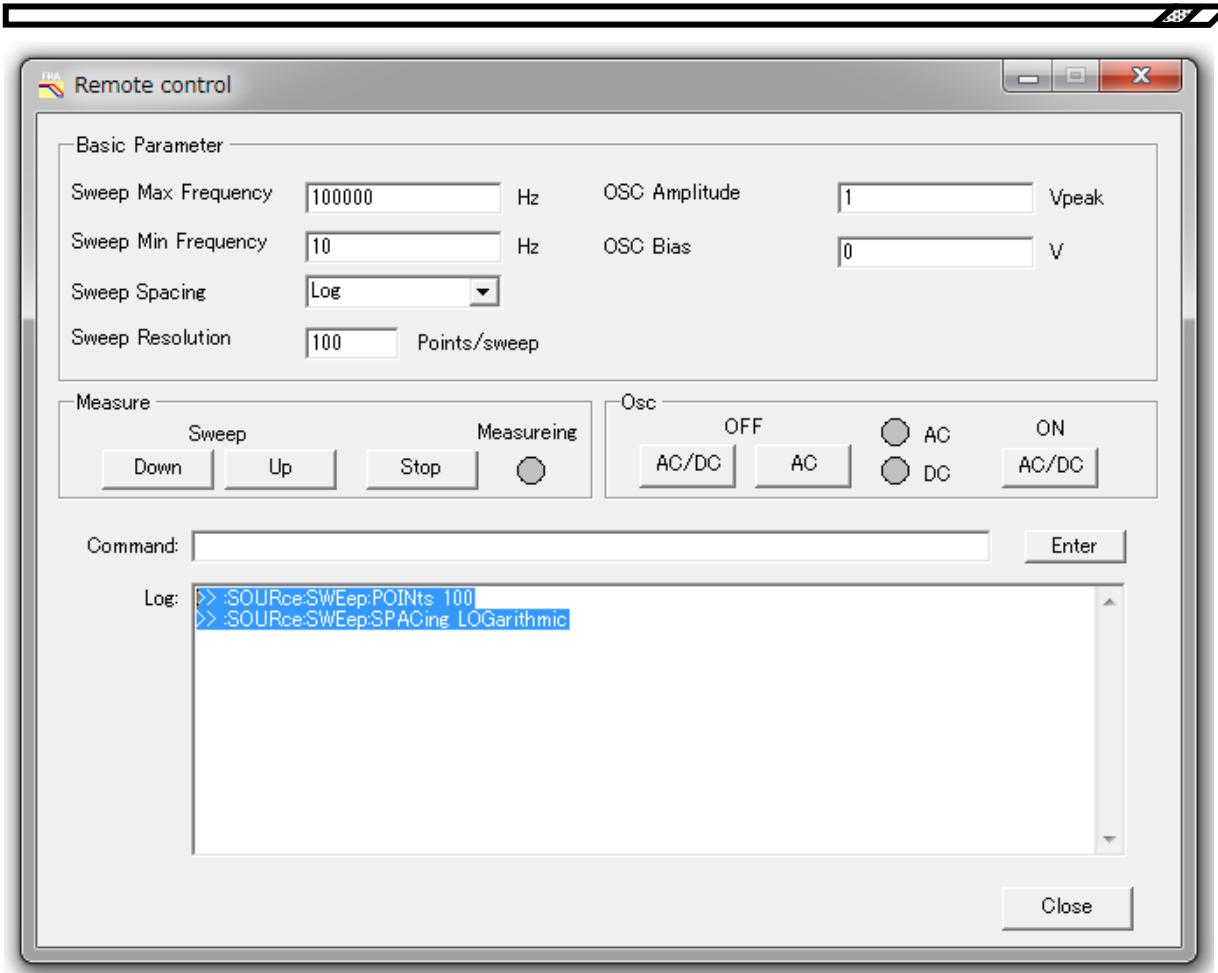


Figure 4-1 Remote control dialog box

———— Warranty ————

The **FRA51602/FRA51615 Data Display Software** (“this software”) was fully tested and inspected by NF before shipment.

If you experience any malfunction due to manufacture or accident during transport, please contact the NF or an authorized agent.

NF does not warrant the quality or function of this software to be compliant with your purpose of use. There is no warrant that this software will be entirely free of defect or interruption of operation.

The NF Corporation will not be held liable for any damage (including but not limited to loss of business gain, disruption of business activities, loss of business information, or other financial loss that might arise from the use or nonuse of this software.

This warranty is valid only in Japan.

In any of the situations described below, the customer will be charged for repair, even within the warranty period.

- Failure is caused by product handling or storage in any manner contrary to the methods of use described in the Instruction Manual.
- Failure or damage is caused by dropping, shock, or other such effects of movement or transport by the customer.
- The product has been modified by the customer.
- Failure or damage is caused by a force majeure accident such as fire, earthquake, flooding, lightning strike, riot, acts of war, or other natural disaster.

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———— Contacting Us ————

If you encounter any problems or uncertainties, please contact NF or an authorized agent, providing the model or product name and version, and a description of the situation in as much detail as possible.

Notes

1. Reproduction of this program or this instruction manual, in part or in whole, is prohibited.
 2. The contents of this manual may be revised without notice.
 3. Information provided in this manual is intended to be accurate and reliable. However, if you notice any errors or omissions, please contact NF or an authorized agent.
 4. We assume no responsibility for any effect of the operations described in this manual, regardless of item 3 above.
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FRA51602/FRA51615 Data Display Software Instruction Manual

NF Corporation

3-20 Tsunashima Higashi 6-chome, Kohoku-ku.

Yokohama-shi 223-8508, Japan

TEL: +81-45-545-8111 FAX: +81-45-545-8191

<http://www.nfcorp.co.jp/english/index.html>

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