

Remote Control Software

SY-810 (Ver.3.1.0)

Instruction Manual

IWATSU ELECTRIC CO., LTD.

Introduction

- ◇ Thank you for purchasing this IWATSU and please regularly use IWATSU lastingly in future.
- ◇ This instruction manual describes how to install the remote control software SY-810 which is used for remote control between PC and B-H analyzer SY-8218 / SY-8219 through GP-IB and automatic measurement using SY-810.
For functions of the main unit SY-8218 / SY-8219 and operation method, see Instruction Manual of SY-8218 / SY-8219.
- ◇ Please read this manual before using this instrument. And then, carefully keep the CD including PDF file of this instruction manual, Setup file, and Readme text file.
- ◇ USB to GPIB Converter SY-509 is provided with this product. For SY-509, see the Instruction Manual attached.

Safety Precautions

To ensure safe operation of this product and to prevent damage to property, read and carefully observe " Cautions" in the following section.

Definition of " Caution" used in this manual

 CAUTION	Incorrect operation or failure to observe the caution may cause the software to be damaged.
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Notes

- ◇ Parts of the contents of this manual may be modified without notice for improvements in performance and functions.
- ◇ Reproduction or reprinting of the contents of this manual without prior permission from IWATSU is prohibited.
- ◇ All product names and brand names described in this manual are used for identification. Each of them is the registered trademark owned by the corresponding individual or company.
- ◇ Microsoft, Microsoft Windows, Microsoft Excel are the registered trademarks of Microsoft.
NI and National Instruments are the registered trademarks of National Instruments.
- ◇ If any question about this product arises, contact Iwatsu at the address listed at the end of this manual or our sales distributors.

Revision History

- ◇ May, 2011: 1st edition
- ◇ November, 2011: 2nd edition
- ◇ October, 2012: 3rd edition
- ◇ July, 2013: 4th edition
- ◇ January, 2014: 5th edition
- ◇ July, 2015: 6th edition
- ◇ May, 2016: 7th edition
- ◇ Aug, 2016: 10th edition

Read the following safety information.



Caution

- **Caution when using this software**

Before installing this software into PC and using it, read and carefully observe "1.3 Inhibited items" in this manual.

If not, repair may be refused.

Checking packed materials

When receiving this product, check the packed materials referring to components below. If there is a lacked item or an item damaged during transportation, immediately contact Iwatsu office or our sales distributors.

Components

- Remote Control Software SY-810 (CD)
Including:
 - Setupfile (setup.exe for Windows Vista / Windows 7 / Windows 8 / Windows 8.1 / Windows 10)
 - Instruction manual PDF file (Japanese version)
 - Instruction manual PDF file (English version)
 - Readme text file (Japanese version)
 - Readme text file (English version)
- USB to GPIB Converter SY-509
 - Converter
 - Instruction manual (Two sided print manuals of English version / Japanese version)
- Bulkhead adapter 182766-01 (from NATIONAL INSTRUMENTS)
- Software License Agreement (Two sided print paper of English version / Japanese version)
- Sales network and inquiry window (Only the Japanese version printed paper is appended.)

About handling the product

If a malfunction is found out in installation which is executed to add functions of this product or if a malfunction is found out in operation after installation, contact Iwatsu office or our sales distributor for repair.

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Chapter 1 Introduction

- In this manual, it explains the handling mainly when being combined with SY-8218. Especially as long as it doesn't refuse, please handle it based on this also when being combined with SY-8219.

■ 1.1 Outline

- This software allows automatic measurement by making a personal computer (hereinafter called "PC") control the B-H Analyzer remotely through GPIB.
Combination with a constant temperature chamber scanner system SY-320x/321x allows multiple samples in the constant temperature chamber to be measured automatically by making PC control the constant temperature chamber and the B-H Analyzer remotely.
Combination with Mini Single Sheet Tester SY-956 allows a single sheet sample to be measured automatically by making PC control the Mini Single Sheet Tester and the B-H Analyzer remotely.
Combination with DC BiasTester SY-960 allows automatic measurement by making PC control the DC BiasTester and the B-H Analyzer remotely.

■ 1.2 Characteristics

- This software has characteristics below:
 - ① Since multiple sample constants can be handled as one file, troublesome management for sample constants can be done very easily.
 - ② In addition, since conditions for automatic measurement can also be handled as one file, management is easy.
 - ③ The scheduling of automatic measurement can be configured by anybody easily using ①. and ②.
 - ④ The hardcopy of the measurement screen of the B-H Analyzer main unit can be saved automatically in PC for each automatic measurement.
 - ⑤ This software includes the manual measurement function which allows trial measurement before automatic measurement.

■ 1.3 Inhibited items

- When using this software, never do below. If not, a failure may occur. If a failure is caused by ① or ③, **repair should be refused**.
 - ① This software is installed in two PCs or more. It is the **violation of the license agreement** of this software.
 - ② Other than Stop button of this software is pressed during measurement. It may cause **malfunction**.
 - ③ The sample list file, condition file, or schedule file which is edited by other than method of this software is used by this software. It may cause not only **malfunction** but also **damage** to the software.
 - ④ Copy and paste function of Windows is used for edit work of the input etc. on this software. It may cause **malfunction**.
 - ⑤ The other GPIB control software is used when using this software. It may cause **malfunction**.
 - ⑥ The check is put in "The registered extension is not displayed" of Windows folder option. **It should cause malfunction**.

Chapter 2 Preparation before Measurement

■ 2.1 Operating environments

- Use of this software requires environments shown in Table 2-1.

Table 2-1 Operating environments

Device names	Necessary environments and specifications
B-H Analyzer	SY-8218, SY-8219 * System Software Version of the B-H analyzer should be the following. It can be confirmed that the CONFIG key of the B-H analyzer is pushed. SY-8218: 4.0.0.2 or later SY-8219: 4.0.1.2 or later * SY-8232, SY-8217, and SY-8258 not supported
Constant temperature chamber scanner system	SY-320x, SY-321x * It doesn't correspond to IE-1123 and IE-1129A.
Mini Single Sheet Tester	SY-956
DC Bias Tester	SY-960 (SY-961/962 are included.)
Control PC	PC-AT compatible machine (DOS/V machine) Desktop and note types
OS	Windows Vista SP2 (Japanese version, English version) Windows 7 32-bit / 64-bit version (Japanese version, English version) Windows 8 32-bit / 64-bit version (Japanese version, English version) Windows 8.1 32-bit / 64-bit version (Japanese version, English version) Windows 10 32-bit / 64-bit version (Japanese version, English version)
.NET Framework	3.5
CPU	Pentium 133MHz or more
Memory	64MByte or more
Devices that should be bought besides B-H analyzer, PC, and our optional option	USB support GPIB controller from NATIONAL INSTRUMENTS, GPIB-USB-HS+ (recommended) * Version 15.5.0 or later is necessary for the NI-488.2 driver.
Display	Resolution 1024×768 or more

- Microsoft Windows and .NET Framework are the registered trademarks of Microsoft Corporation in U.S.A. and other countries.
- Pentium is the registered trademark of Intel in U.S.A.

■ 2.2 Connection of equipment before they start

- The diagrams below show connection of devices necessary for measurement; i.e. Figure 2-1 for connection using the Chamber Scanner System SY-320x/321x, Figure 2-2 for connection using the Mini Single Sheet Tester SY-956, Figure 2-3 for connection using the DC Bias Tester SY-960 and Figure 2-4 for connection using only B-H Analyzer SY-821x.

* Broken lines show recommended devices which should be prepared separately by a user.

Recommended: From National Instruments
Hi-Speed USB support GPIB contro
NI GPIB-USB-HS+ / NI GPIB-USB-HS

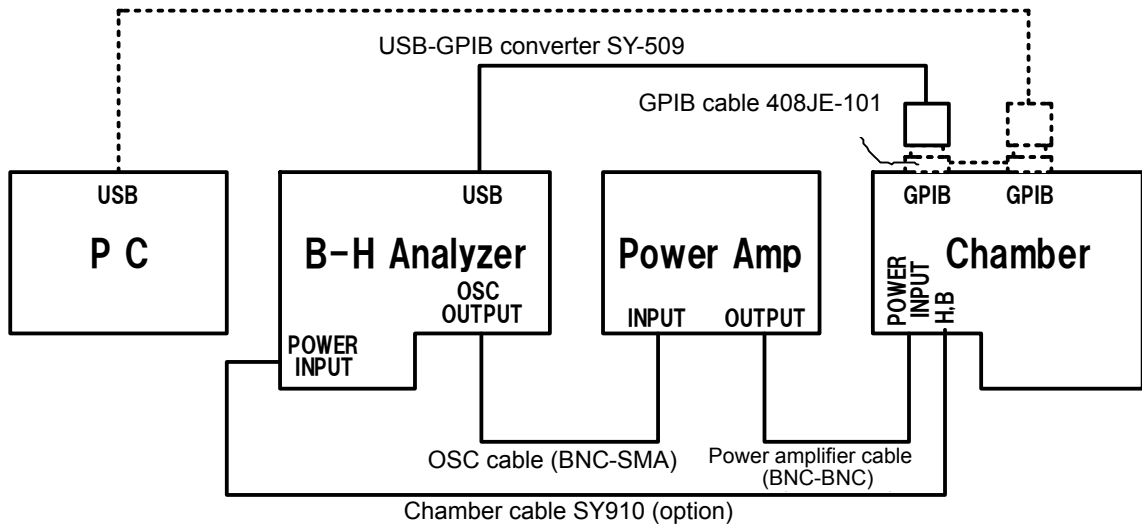


Figure 2-1 Connection using Chamber Scanner System SY320x/321x

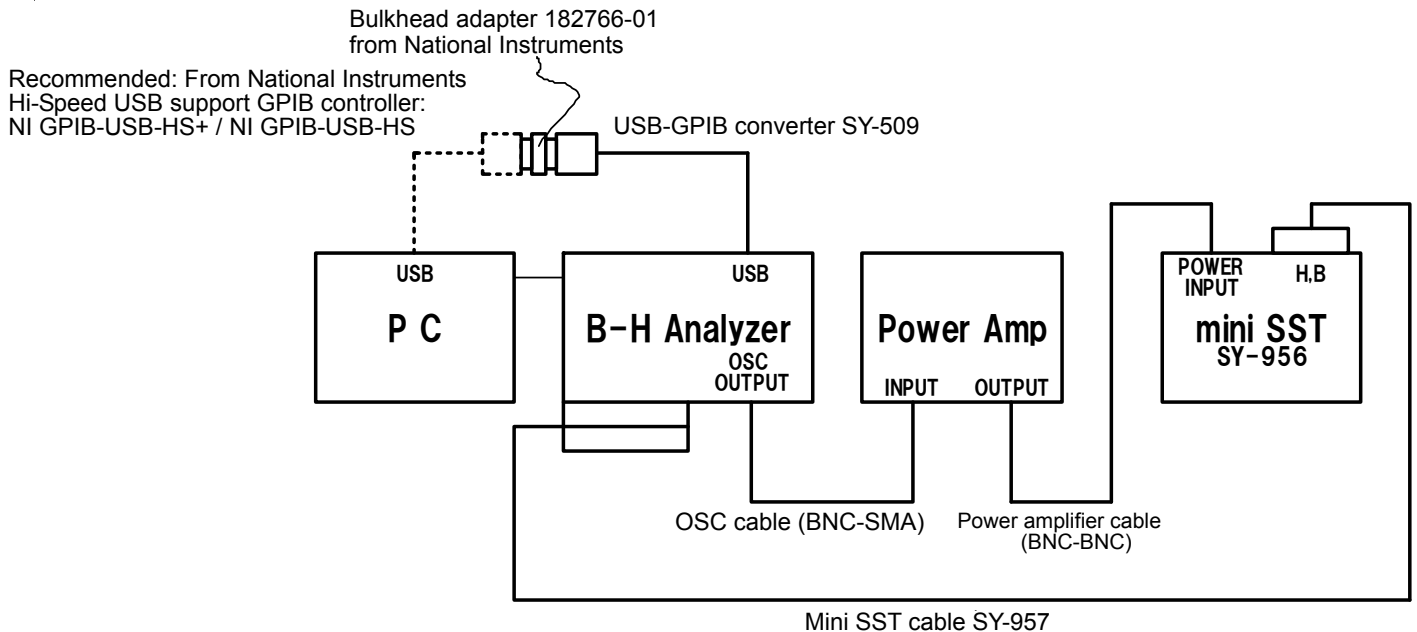


Figure 2-2 Connection using Mini Single Sheet Tester SY-956

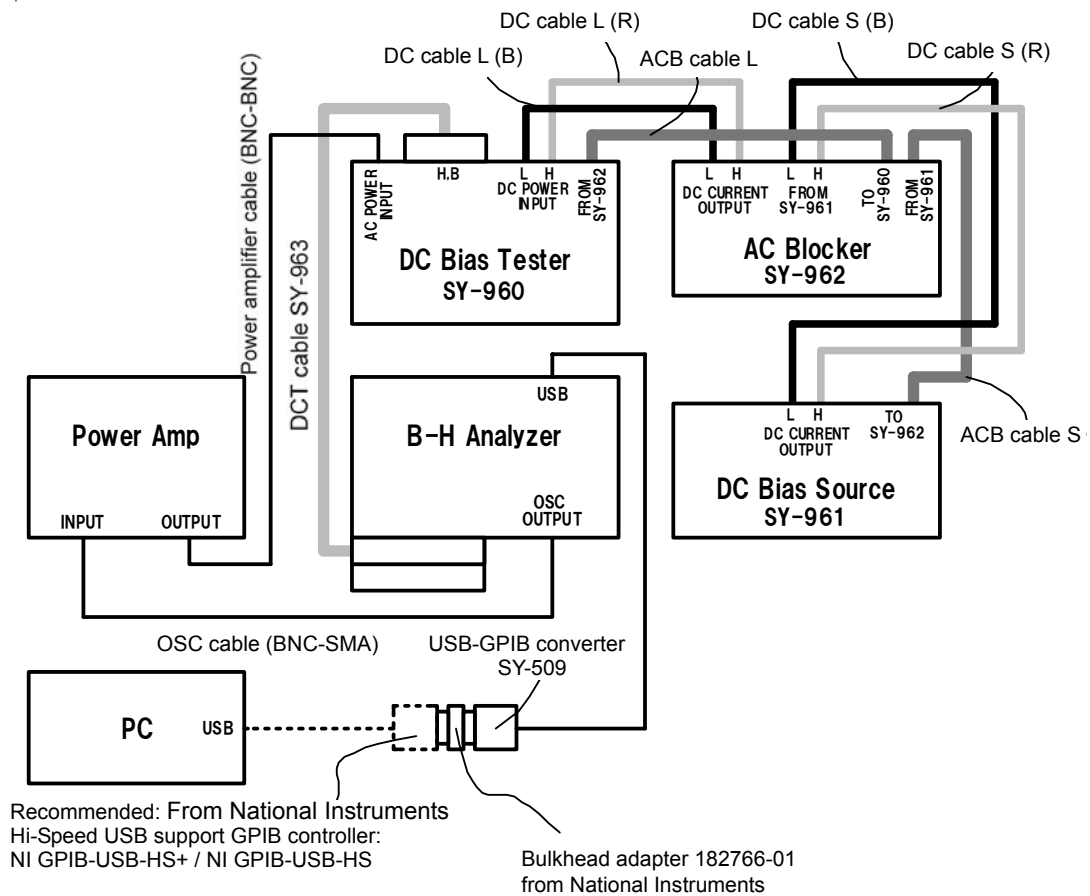


Figure 2-3 Connection using DC Bias Tester SY-960 etc.

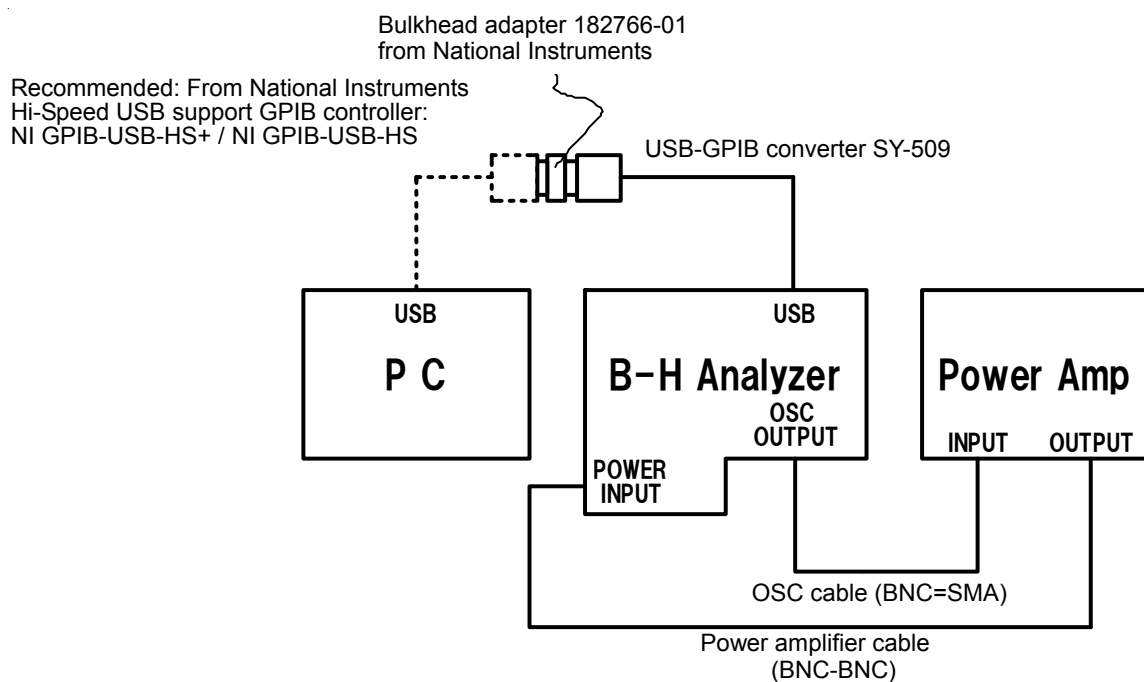


Figure 2-4 Connection using only B-H Analyzer SY-821x

■ 2.3 Setting of GPIB interface

- The GPIB interface of each device to be connected is set to use this software for measurement.

Be sure to make settings on Table 2-2. The scanner is the control unit for the Turntable in the constant temperature chamber.

Table 2-2 Setting of GPIB interfaces

Devices to be connected		GPIB interface settings
B-H Analyzer SY-8218/8219		Address: 1 Delimiter: CR+LF * For settings, see Figure 2-5.
Chamber Scanner System SY-320x/321x	Constant temperature chamber	GPIB: ON Address: 5 Delimiter: CR+LF * For setting, see the instruction manual of the constant temperature chamber.
	Scanner	Address: 3 ADDRESSABLE LISTNER NC OFF * For setting, see the instruction manual of the constant temperature chamber scanner system.
Mini Single Sheet Tester SY-956		No setting
DC Bias Tester SY-960		No setting

Utilities

Unit

Le : Freq : Pcm :

Ae : B : L :

Ve : Pc : I_{1m} :

We : Pcv : V_{2m} :

Information

Sound : Date :

Warning : Time :

Option

Chamber :

Continuous Measurement :

Single Sheet Tester :

DC Bias Tester :

Print

File Format :

GPIB

Address : (1~30)

Delimiter :

IWATSU SY-8219

Figure 2-5 Utilities screen of B-H Analyzer

■ 2.4 Setting of PC

- Before installation of this software, **be sure** to make settings below to you PC and to confirm ① and ②.

- ① Do set work of PC of the installation etc. by the account with the Administrator authority.
 - * Very note the Windows user account control, and set the account by the customer when using it by two or more accounts. Our company cannot set it.
- ② Do set work of PC of the installation etc. after invalidating it if necessary when you use the security software.
 - * This software cannot guarantee operation under the security software that the customer uses.
- ③ **Install NI-488.2 driver** provided with NI GPIB-USB-HS (from NATIONAL INSTRUMENTS) which is the recommended GPIB controller, **in the PC**.

Put the check in .NET Framework 3.5 language support and install it if the selection screen of the function to install as shown in Figure2-5 by the process of installing it is displayed.

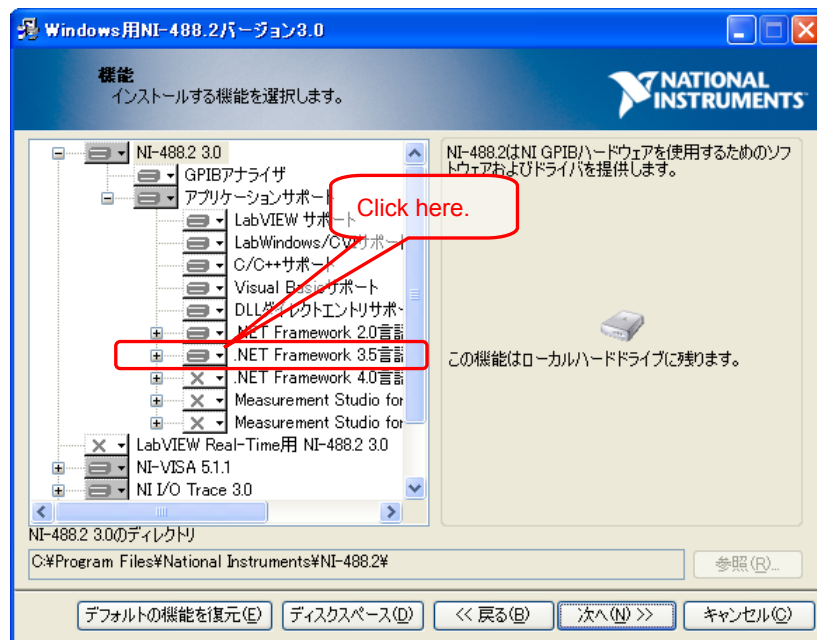


Figure2-6 NI-488.2 driver installation screen

- * Be sure to use the latest version of NI-488.2 driver, and version 15.5.0 or later is required.
- ④ **Be sure to remove** the check to "The registered extension is not displayed" of Windows folder option. The software should cause malfunction.

■ 2.5 Installation of software

- The procedure to install this software is as follows:

- ① Insert the attached CD into the CD drive of the PC.
- ② Open ¥SY-810_vxxx with Explorer, and as administrator execute Setup.bat. Then, three set of software that are shown in Table 2-3 is installed. The correspondence described in the remarks column of Table 2-3 might be necessary because of the environment of PC.

Table 2-3 Installed software

Installed software	Remarks
Microsoft .NET Framework 3.5	• The effect that is "Installed" on the console screen is displayed when having installed it, and do not install it. • Windows 8 OS installation DVD-ROM might be demanded for Windows 8, 8.1. • Windows 10 OS installation media might be demanded for Windows 10.
Microsoft Visual Basic Power Packs 3.0	• The effect that is "Installed" on the console screen is displayed when having installed it, and do not install it.
Remote Control Software SY-810	• The installation destination becomes C:¥IWATSU. * Do not change the installation destination. Then, it malfunctions.

- ② When  icon is displayed, the installation has been completed.

- * Either sample list file, condition file or schedule file that has been used might not be seen though it depends on the version before having used it when the version improves.

In that case, copy each file under C:¥Program Files¥IWATSU onto a pertinent folder under C:¥IWATSU newly. (Refer to ■ 3.11.3.)

■ 2.6 Uninstallation of software

- To uninstall this software, follow procedure of ① below:

- ① Use Control Panel of Windows to uninstall the software.

Chapter 3 Measurement

■ 3.1 Flow of measurement

- The following is the flow indicating the measurement procedure using this software.

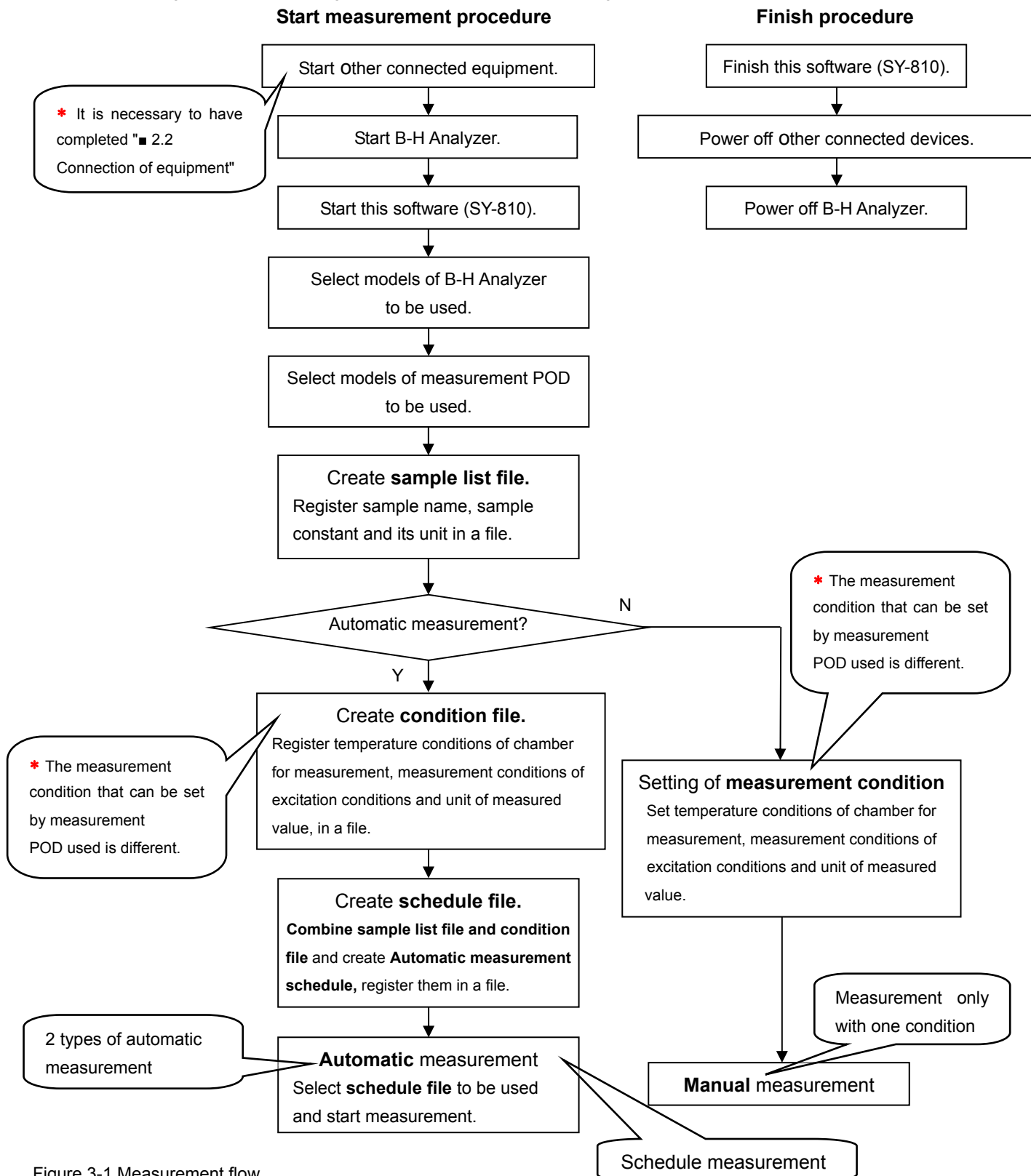


Figure 3-1 Measurement flow

■ 3.2 Starting software

- The following describes start procedure of this software.

- ① Power supplies of the equipment other than the B-H analyzer are turned on, and those are started.
- ② The power supply of the B-H analyzer is turned on, and it is started.
- ③ Confirm that Start progress bar of B-H Analyzer disappears.
 - * If step ④ is executed when the progress bar appears, **PC cannot recognize B-H Analyzer.**
- ④ Double-click  icon on the PC desktop.

* Failure to execute this procedure **may cause this software not to operate correctly.**

■ 3.3 Finishing software

- The following describes finishing procedure of this software.

- ① Click "File" and "Quit" on Main window or click "Close" button on Windows to finish this software.

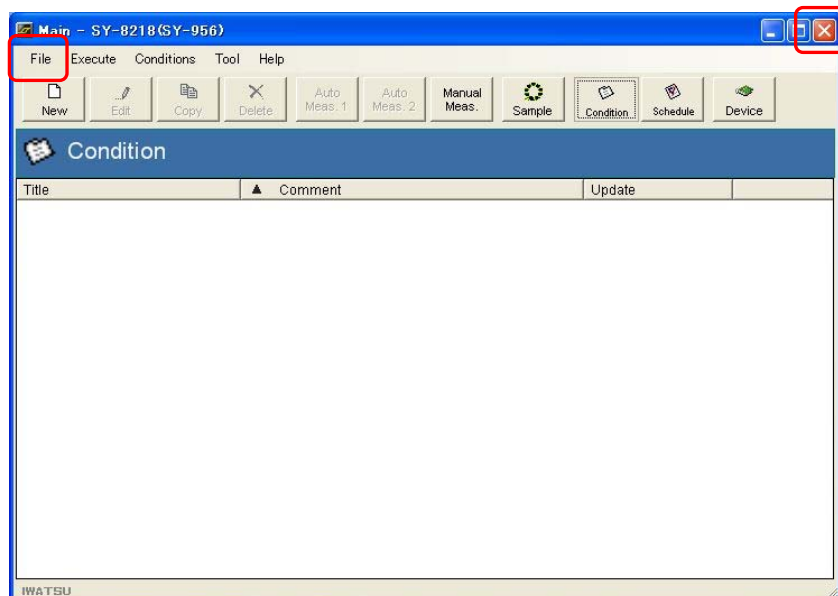


Figure 3-2 Finishing software

- ② If other devices are connected, power ON those devices.
- ③ Power OFF B-H Analyzer.
 - * Failure to execute this procedure **may cause this software not to finish normally.**

■ 3.4 Selection of Model of B-H analyzer and measurement Pod

- At the first start of this software, "Setup Window" opens. Select model of B-H Analyzer and measurement Pod.

- ① Select the model of B-H Analyzer to be used in "B-H Analyzer" list box.

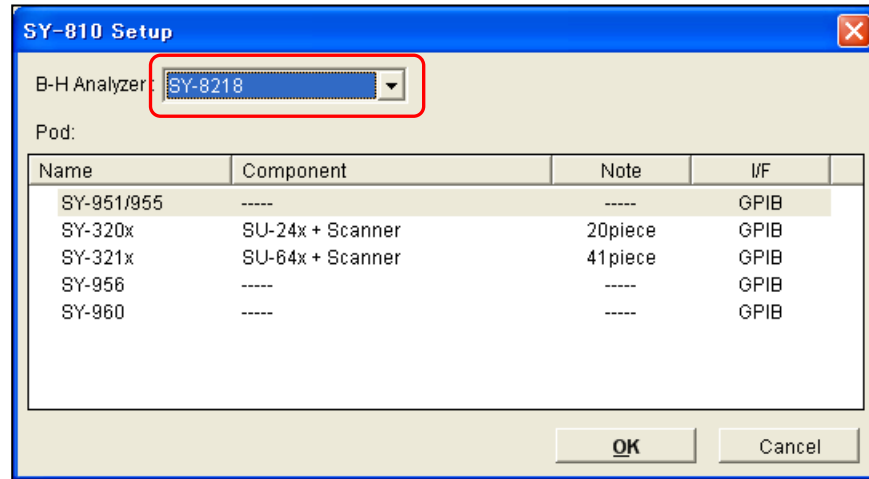


Figure 3-3 Setup window

- ② Select the model of measurement Pod to be used in "Pod" list view. That is; double-click the model name or click it to highlight it and click "OK" button. The selection is decided and "Setup" window closes. Refer to Table 3-1 for the model name of measurement Pod to be used.

- * As for the next starting, the selection when the "OK" button is clicked is reflected.
- * Click of "Cancel" button or "Close" button of Windows causes this software to finish without saving the setting.

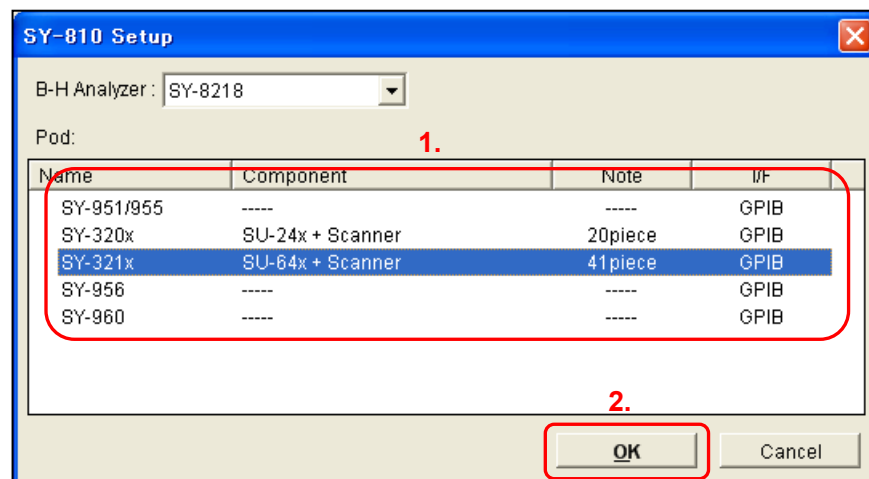


Figure 3-4 Setup window

Table 3-1 Selection of measurement Pod model

Pods	Descriptions
SY-951/955	Measure with standard measurement Pod of B-H analyzer.
SY-320x	Measure with Chamber Scanner System of 20 numbers of measurement samples.
SY-321x	Measure with Chamber Scanner System of 41 numbers of measurement samples.
SY-956	Measure with Mini Single Sheet Tester
SY-960	Measure with DC BiasTester

■ 3.5 Creating sample list file

- It sets the sample constant; i.e. **multiple sample constants are unified in a file which is registered and managed as a sample list file.**

① When "Setup" window closes, "Main" window opens first. Click "Sample" button.

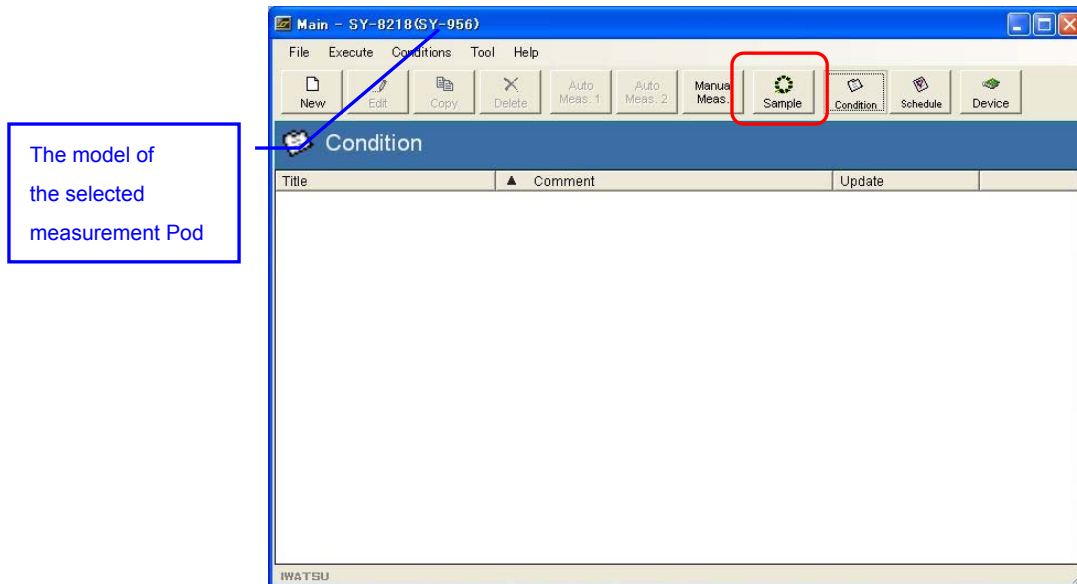


Figure 3-5 Main window

■ 3.5.1 New entry of sample constant and storage of it in sample list file

- The following describes how to enter a new sample constant and to save it in the sample list file.

① "Sample" window opens. Click "New" button on the upper side.

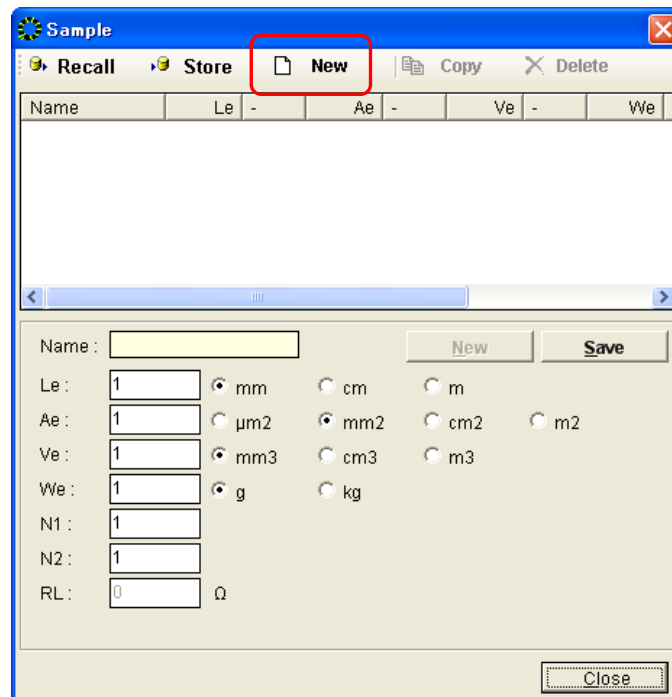


Figure 3-6 Sample window

- ② Enter the sample name and the sample constant, and select the unit of the sample constant. Table 3-2 shows meanings of symbols of the sample constants and entry rules.

- * Rw cannot be entered.
- * Enter the unit of Le, Ae, and Ve in the mm system when SY-956 is used for measurement Pod. When the sample list file is made by other units, the sample cannot be called by the automatic measurement in making the file of the schedule or the manual measurement. The value of N1 of SY-956 is applied.
- * When SY-956 is used for measurement POD, the value of N1 input here is not applied.
- * When SY-960 is used for measurement POD, the value of RL can be input.
The input resolution at this time becomes 0.001 if it is less than 1Ω, or 0.01 if it is 1Ω or more.

The 'Sample' window contains the following input fields and units:

- Name: [Text Field]
- Le: [1] mm (selected), cm, m
- Ae: [1] μm^2 , mm² (selected), cm², m²
- Ve: [1] mm³ (selected), cm³, m³
- We: [1] g (selected), kg
- N1: [1]
- N2: [1]
- RL: [0] Ω

Figure 3-7 Sample window

Table 3-2 Entry rules of sample constants

Symbols	Entry rules	Descriptions
name	Up to 20 alphanumeric characters	Sample name
Le	0.001 to 99999	Effective length of magnetic path
Ae	0.001 to 99999	Effective net core area
Ve	0.001 to 99999	Effective volume
We	0.001 to 99999	Mass
N1	0.1 to 9999.9	No. of primary turns
N2	0.1 to 9999.9	No. of secondary turns
RL	0.001 to 99.99	ESR of sample

- ③ After entry, click "Save" button. The saved item is displayed on the list view.
- * If "Save" button is not clicked, it is not displayed on the list view

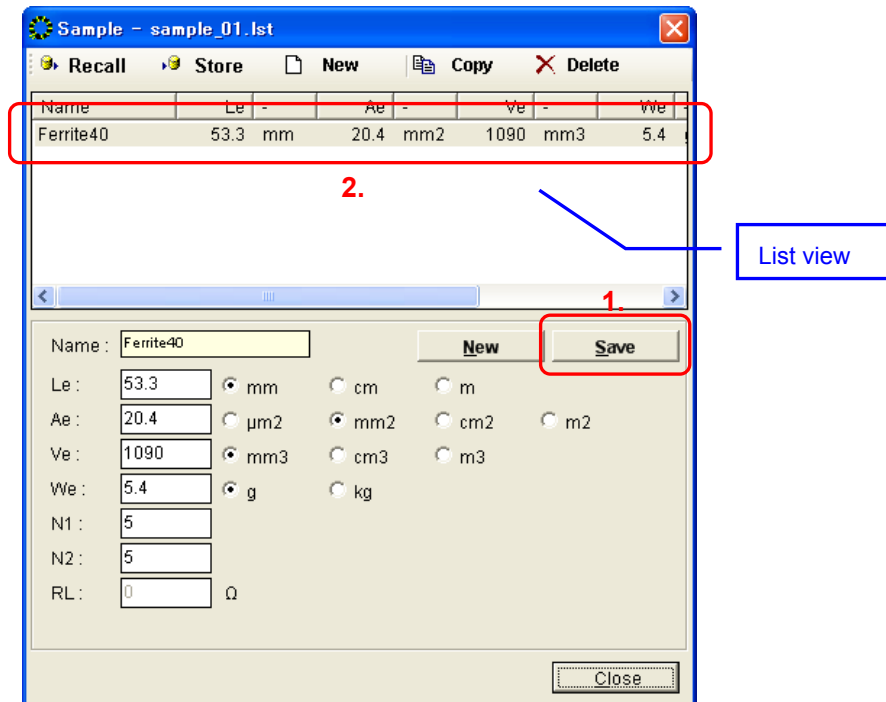


Figure 3-8 Sample window

- ④ If a new sample constant is added, click "New" button on the lower side and repeat steps ②. and ③.

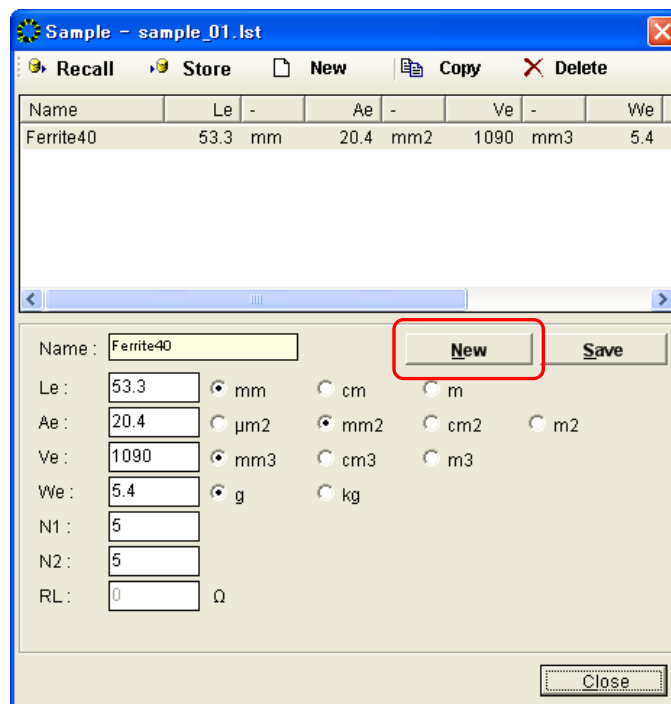


Figure 3-9 Sample window

- ⑤ To manage multiple sample constants already entered as a sample list file, click "Store" button.

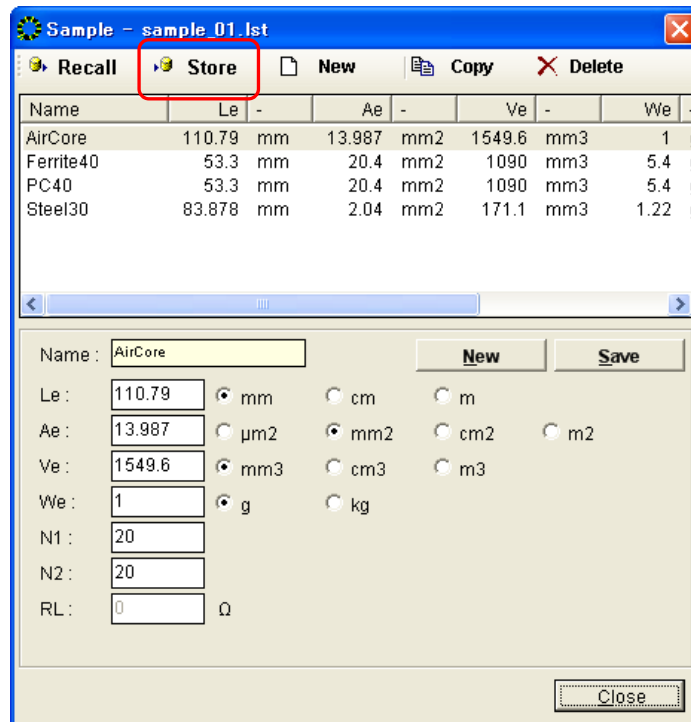


Figure 3-10 Sample window

- ⑥ "Save File As" dialog box opens. Enter the file name of the sample list file and click "Save" button.
- * For example, if a name of a measurer is used for the file name of a sample list file, each measurer can manage multiple sample constants.
 - * The file name of the sample list must not be used to the same one as name of the sample in the list. The sample list cannot be normally preserved.
 - * The extension of a sample list file to be saved is ".lst". **Never change it; otherwise, this software cannot be used.**
 - * **Never edit the sample list file by the other than the method of this software; otherwise, malfunction may occur.**

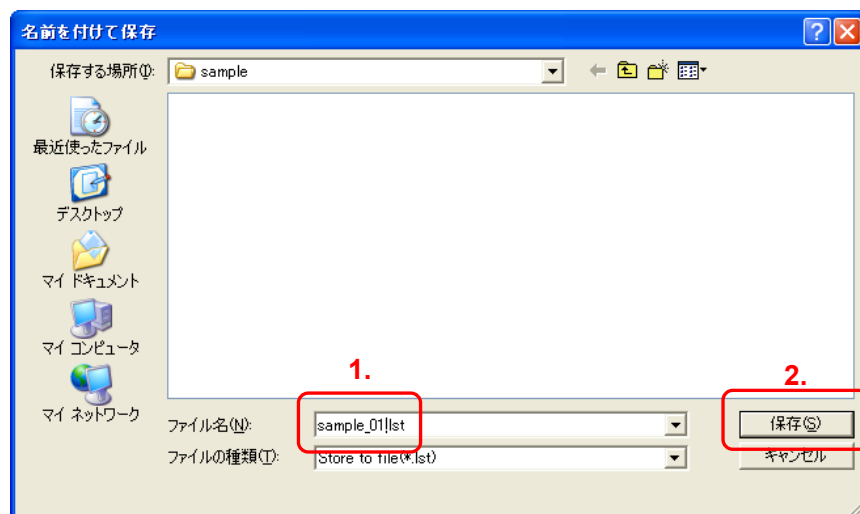


Figure 3-11 "Save" dialog box

- ⑦ Click "Close" button to close "Sample" window and to return to "Main" window.

The screenshot shows the 'Sample - sample_01.lst' window. At the top is a menu bar with 'Recall', 'Store', 'New', 'Copy', and 'Delete'. Below is a table with columns: Name, Le, Ae, Ve, We. The table contains four rows: AirCore, Ferrite40, PC40, and Steel30. Below the table is a form for editing a sample. The 'Name' field is set to 'AirCore'. The 'Le' field is 110.79 mm, 'Ae' is 13.987 mm², 'Ve' is 1549.6 mm³, and 'We' is 1 g. There are also fields for N1, N2, and RL. The 'Close' button is highlighted with a red box.

Name	Le	Ae	Ve	We
AirCore	110.79 mm	13.987 mm ²	1549.6 mm ³	1
Ferrite40	53.3 mm	20.4 mm ²	1090 mm ³	5.4
PC40	53.3 mm	20.4 mm ²	1090 mm ³	5.4
Steel30	83.878 mm	2.04 mm ²	171.1 mm ³	1.22

Figure 3-12 Sample window

■ 3.5.2 Modifying sample constant

- It modifies a part of the sample constant and saves it in the sample list file.
- ① Click the sample constant to be modified in the list view. After modification, click "Save" button. Click "Store" button to store the modified sample constant in the sample list file.

The screenshot shows the 'Sample - sample_01.lst' window. The 'Store' button in the menu bar is highlighted with a red box and labeled '4.'. The 'Ferrite40' row in the table is highlighted with a red box and labeled '1.'. The 'Save' button in the form is highlighted with a red box and labeled '3.'. The 'Le' field in the form is highlighted with a red box and labeled '2.'. The 'Name' field is set to 'Ferrite40'. The 'Le' field is 53.3 mm, 'Ae' is 20.4 mm², 'Ve' is 1090 mm³, and 'We' is 5.4 g. There are also fields for N1, N2, and RL.

Name	Le	Ae	Ve	We
AirCore	110.79 mm	13.987 mm ²	1549.6 mm ³	1
Ferrite40	53.3 mm	20.4 mm ²	1090 mm ³	5.4
PC40	53.3 mm	20.4 mm ²	1090 mm ³	5.4
Steel30	83.878 mm	2.04 mm ²	171.1 mm ³	1.22

Figure 3-13 Sample window

■ 3.5.3 Deleting sample constant

- It deletes the sample constant and save it in the sample list file.

① Click the sample constant to be deleted in the list view. Click "Delete" button to delete the selected sample constant from the list view. Click "Store" button to store the modified sample constant in the sample list file.

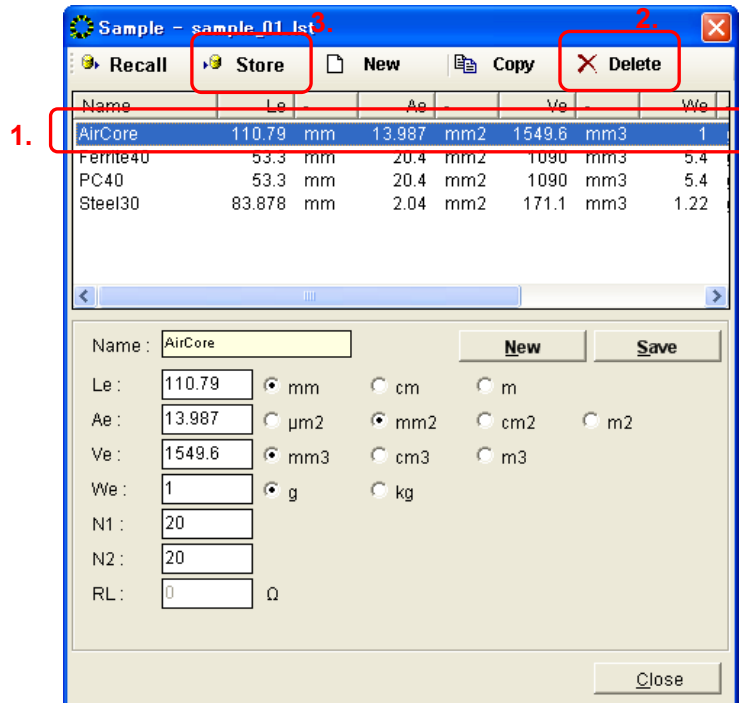


Figure 3-14 Sample window

■ 3.5.4 Creating copy of sample constant

- It creates a copy of the sample constant except "Name".

① Click the sample constant to be copied in the list view. Click "Copy" button to copy the selected sample constant except "Name". A new sample constant is created.

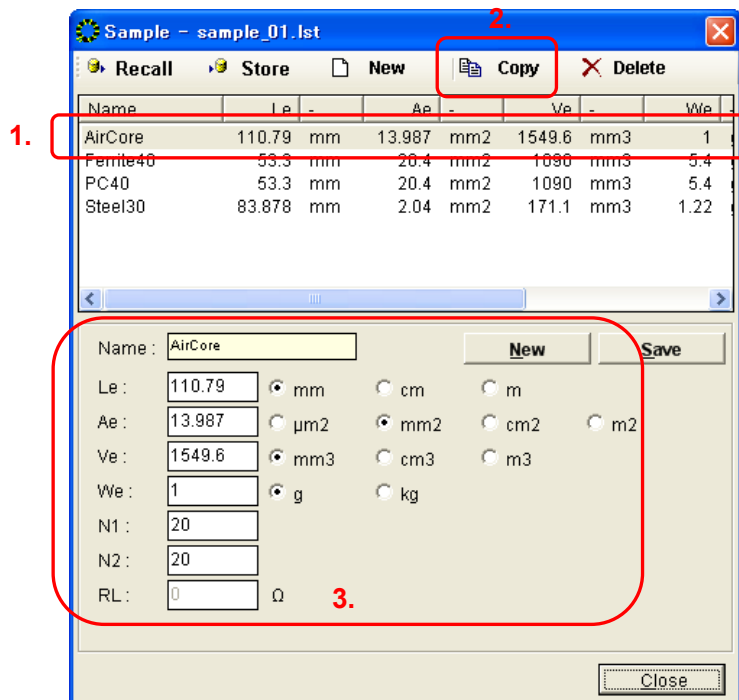


Figure 3-15 Sample window

■ 3.5.5 Recalling sample list file

- It recalls the sample list file to edit the sample constant in the sample list created before.

① Click "Recall" button in "Sample" window.

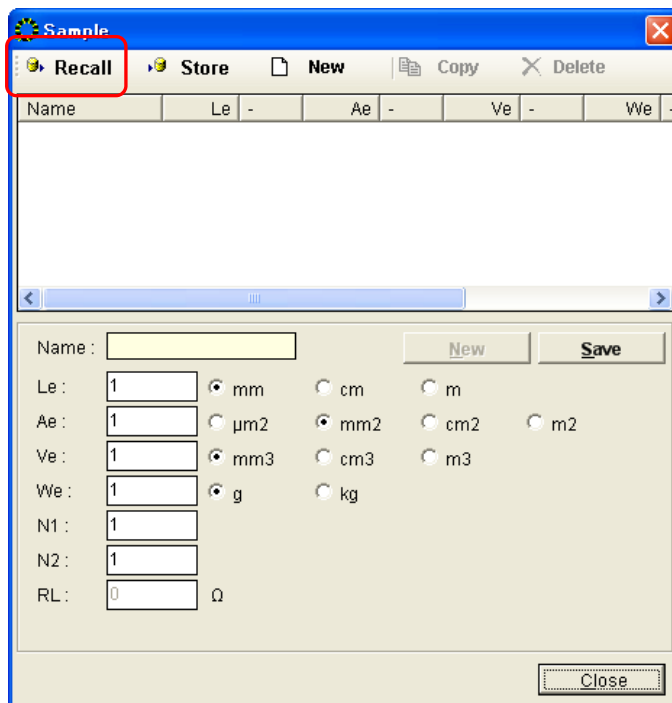


Figure 3-16 Sample window

② "Open File" dialog box opens. Select the sample list file to be edited and click "Open."

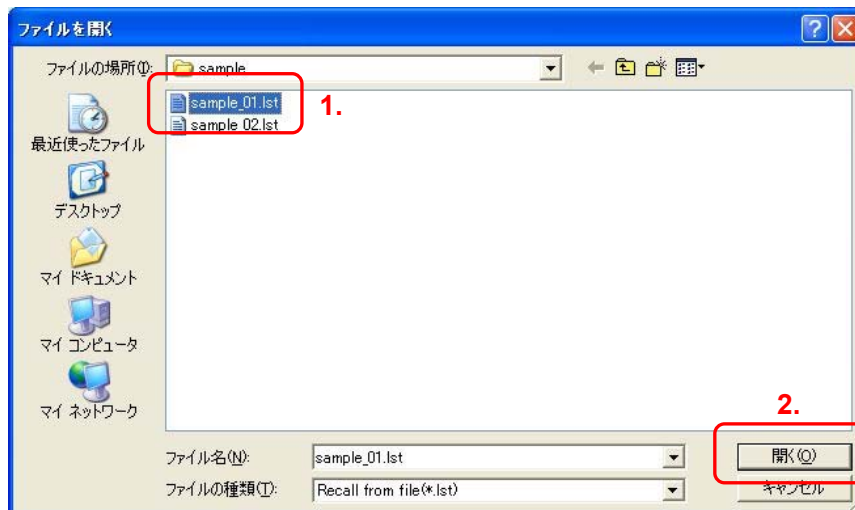


Figure 3-17 Sample window

③ The screen returns to "Sample" window and the list view shows the sample constants saved in the selected sample list file.

★ To change the sample constant, see ■3.5.2 to ■3.5.4.

■ 3.6 Creating condition file

- At the time of measurement, it sets the temperature condition of the constant temperature chamber and the measurement condition of the excitation and the unit of the value to be measured. They are unified in a file which is registered and managed as a condition file. **The measurement condition that can be set is different according to measurement Pod used.**

① On "Main" window, Click "Condition" button and then "New" button.

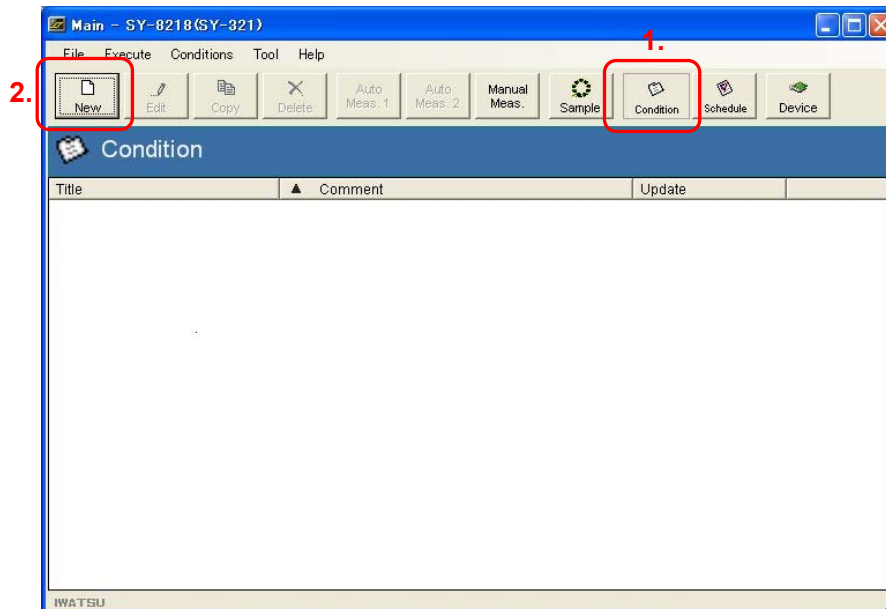


Figure 3-18 Main window

■ 3.6.1 New setting of measurement condition and storage of it in condition file

- The following describes how to set a new measurement condition and to save it in the condition file.

① "Condition" window opens.

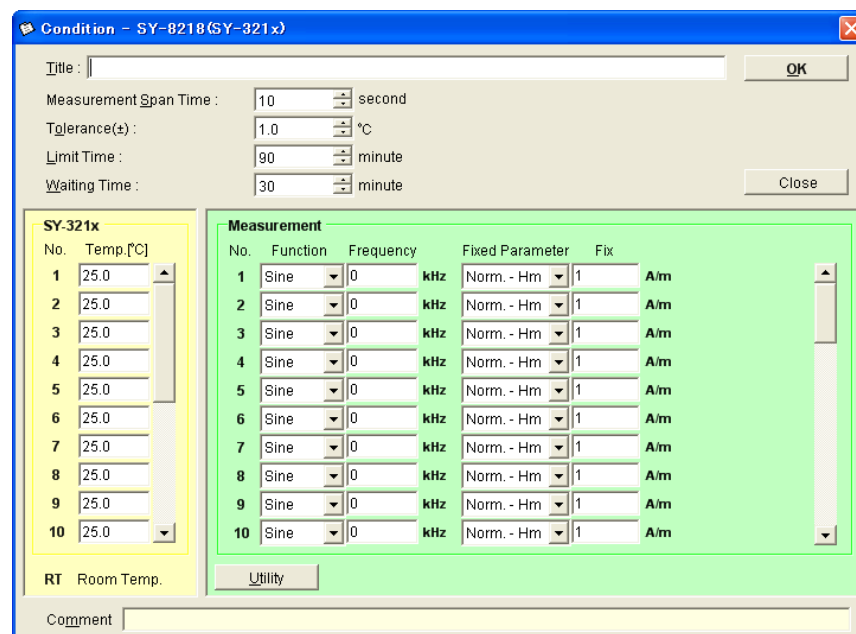


Figure 3-19 Condition window

- ② Enter the file name of the condition file in "Title" field. Up to 20 alphanumeric characters can be entered.

Condition - SY-8218(SY-321x)

Title: Condition_01

Measurement Span Time: 10 second

Tolerance(±): 1.0 °C

Limit Time: 90 minute

Waiting Time: 30 minute

SY-321x

No.	Temp.[°C]
1	RT
2	25.0
3	27.0
4	25.0
5	25.0
6	25.0
7	25.0
8	25.0
9	25.0
10	25.0

RT Room Temp.

Measurement

No.	Function	Frequency	Fixed Parameter	Fix
1	Sine	10 kHz	Norm. - Hm	3 A/m
2	Sine	0.05 kHz	Norm. - Hm	130 A/m
3	Sine	500 kHz	Norm. - Hm	35 A/m
4	Sine	0 kHz	Norm. - Hm	1 A/m
5	Sine	0 kHz	Norm. - Hm	1 A/m
6	Sine	0 kHz	Norm. - Hm	1 A/m
7	Sine	0 kHz	Norm. - Hm	1 A/m
8	Sine	0 kHz	Norm. - Hm	1 A/m
9	Sine	0 kHz	Norm. - Hm	1 A/m
10	Sine	0 kHz	Norm. - Hm	1 A/m

Utility

Comment

Figure 3-20 Condition window

- ③ When the measurement Pod is SY-320x/321x, set the control condition of the constant temperature chamber. Table 3-3 shows meanings of setting items and their settable range.

* It is possible to set only [Measurement Span Time] by other measurements Pod.

Condition - SY-8218(SY-321x)

Title: Condition_01

Measurement Span Time: 10 second

Tolerance(±): 1.0 °C

Limit Time: 90 minute

Waiting Time: 30 minute

SY-321x

No.	Temp.[°C]
1	RT
2	25.0
3	27.0
4	25.0
5	25.0
6	25.0
7	25.0
8	25.0
9	25.0
10	25.0

RT Room Temp.

Measurement

No.	Function	Frequency	Fixed Parameter	Fix
1	Sine	10 kHz	Norm. - Hm	3 A/m
2	Sine	0.05 kHz	Norm. - Hm	130 A/m
3	Sine	500 kHz	Norm. - Hm	35 A/m
4	Sine	0 kHz	Norm. - Hm	1 A/m
5	Sine	0 kHz	Norm. - Hm	1 A/m
6	Sine	0 kHz	Norm. - Hm	1 A/m
7	Sine	0 kHz	Norm. - Hm	1 A/m
8	Sine	0 kHz	Norm. - Hm	1 A/m
9	Sine	0 kHz	Norm. - Hm	1 A/m
10	Sine	0 kHz	Norm. - Hm	1 A/m

Utility

Comment

Figure 3-21 Condition window

Table 3-3 Control items of constant temperature chamber

Items	Settable range	Units	Descriptions
Measurement Span Time	0 to 9999	sec	It sets the time interval after measurement under a certain condition finishes until measurement under the next condition starts. The first setting of this should be the time after Waiting Time (described below) finishes until measurement under the first condition starts. * The time set here is an interval time added in addition at measurement intervals of the default that exists in each measurement mode.
Tolerance	0.1 to 100.0	°C	It sets the tolerance ($\pm$ °C) of the setting temperature of the constant temperature chamber. Reaching a value within this range should be regarded as reaching the setting temperature.
Limit Time	Waiting Time to 9999	min	It sets the time to start measurement unconditionally if the temperature of the constant temperature chamber is not within Tolerance of the setting temperature for some reason. The start point of the time is the time when the constant temperature chamber starts control at the corresponding setting temperature.
Waiting Time	0 to 90	min	It sets the time after the constant temperature chamber reaches the setting temperature ($\pm$ Tolerance) until measurement starts. If the temperature of the constant temperature chamber becomes out of the Tolerance during Waiting Time, the time should be calculated again after the constant temperature chamber reaches the setting temperature ($\pm$ Tolerance).

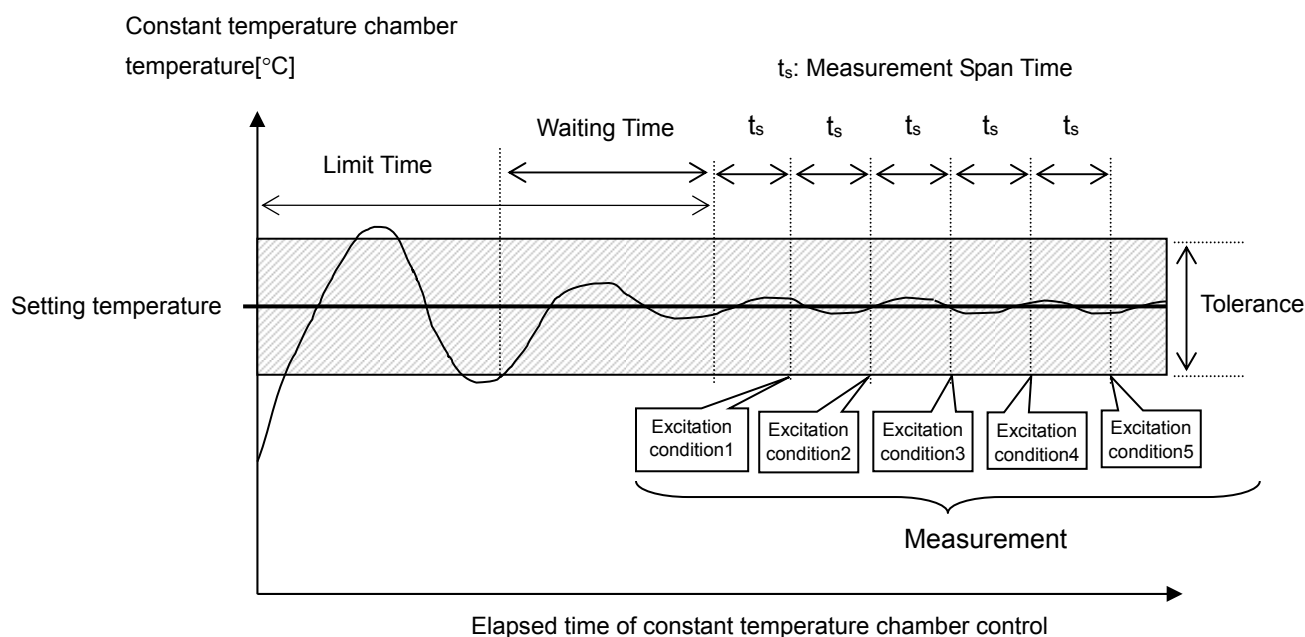


Figure 3-22 Control items of constant temperature chamber

- ④ When the measurement Pod is SY-320x/321x, set the temperature condition of the constant temperature chamber. **Up to 20 temperature conditions** (No.1 to 20) can be set. Table 3-4 shows settable range. Up to 10 temperature conditions can be displayed on the screen.

* It is not possible to set it by other measurements Pod.

Figure 3-23 Condition window

Table 3-4 Settable temperature ranges of constant temperature chamber

Types of used constant temperature chamber	Settable range
SY-320x/321x	−30.0°C to 150.0°C and RT*

- * RT (Room Temperature) is used as described below. It may be required that measurement under the initial condition; i.e. before changing the temperature of the constant temperature chamber, is made in advance. If RT is selected as the initial measurement temperature condition by the schedule setting (described later), **the first measurement can be made under the initial condition of the constant temperature chamber** by disregarding the setting of the constant temperature chamber described to Table3-3.

- ⑤ Next, click "Utility" button.

No.	Function	Frequency	Fixed Parameter	Fix
1	Sine	10 kHz	Norm. - Hm	3 A/m
2	Sine	0.05 kHz	Norm. - Hm	130 A/m
3	Sine	500 kHz	Norm. - Hm	35 A/m
4	Sine	0 kHz	Norm. - Hm	1 A/m
5	Sine	0 kHz	Norm. - Hm	1 A/m
6	Sine	0 kHz	Norm. - Hm	1 A/m
7	Sine	0 kHz	Norm. - Hm	1 A/m
8	Sine	0 kHz	Norm. - Hm	1 A/m
9	Sine	0 kHz	Norm. - Hm	1 A/m
10	Sine	0 kHz	Norm. - Hm	1 A/m

Figure 3-24 Condition window

- ⑥ "Measurement" frame changes to "Unit" frame. Click a button corresponding to the unit of each measurement value in the frame.

* For meaning of each symbol, see Instruction Manual of B-H Analyzer.

Figure 3-25 Condition window

- ⑦ Make settings for measurement in "Configuration" frame. Table 3-5 shows meanings and settable ranges of setting items.

Figure 3-26 Condition window

Table 3-5 Setting items of Configuration

Items	Selection/setting range	Descriptions	
Pod Type	Not possible to select	The model name of Pod that has been selected now is displayed.	
Average	Power of 2; i.e. 2^0 to 2^6	Selects No. of averaging times of measurement signal waveform.	
Retry	Power of 2; i.e. 2^3 to 2^5	Selects the upper No. of times of excitation until values of specified target parameter converge within Tolerance.	
Mov-Avg	Odd in 1 to 111	Selects the moving average number applied to sample data of a measurement signal waveform	
Coil	1	1-coil method	Selects whether the sample is measured by 1-coil method or by 2-coil method. * When measurement POD is SY-956, it is fixation in 2-coil method and it is not possible to select it.
	2	2-coil method	

- ⑧ In "Tolerance" frame, set Tolerance (i.e. Permissible value ($\pm\%$)) of the target parameter in each measurement mode. If the value is within this range, the target parameter is regarded as reaching the setting value. Table 3-6 shows the settable ranges.

Figure 3-27 Condition window

Table 3-6 Setting range of Tolerance

Item	Settable range	Description
Tolerance	0.1 to 100	Sets common Tolerance to all calculation mode.

- ⑨ Click "Condition" button.

Figure 3-28 Condition window

- ⑩ The screen returns to "Measurement" frame. Set the excitation condition for measurement. **40 excitation conditions (No.1 to 40) can be set. The excitation condition and range that can be set are different according to measurement POD used. Refer to Table 3-7 for SY-320x/321x, refer to Table 3-8 for SY-956, refer to Table 3-9 for SY-960 and refer to Table 3-10 for SY-951/955.**

Figure 3-29 Condition window

Table 3-7 Excitation conditions for SY-320x/321x

Items		Selection / setting range		Descriptions	
Function		Sine		Sine wave	Selects type of the exciting signal.
		Pulse		Square wave	* When the calculation mode is a μ mode, Pulse cannot be selected.
Frequency	Sine	SY-8218	10Hz to 5MHz	Sets the frequency of the exciting signal. * If "0" is set, measurement is not done.	
		SY-8219	10Hz to 1MHz		
	Pulse	10Hz to 1MHz			
Fixed Parameter		Norm. - Hm		Normal mode, target parameter Hm	Selects the calculation mode and target parameter. * For meanings of the calculation mode and target parameter, see Instruction Manual of B-H Analyzer.
		Norm. - I1m		Normal mode, target parameter I1m	
		Norm. - Bm		Normal mode, target parameter Bm	
		Norm. - V2m		Normal mode, target parameter V2m	
		μ - Hm		μ mode, target parameter Hm	
		μ - I1m		μ mode, target parameter I1m	
		μ - Bm		μ mode, target parameter Bm	
		μ - V2m		μ mode, target parameter V2m	
Fix		0.001 to 99999		Sets the target parameter value.	

Table 3-8 Excitation conditions for SY-956

Items	Selection / setting range	Descriptions	
Function	Sine	Only sine wave for SY-956	
Frequency	10Hz to 20kHz	Sets the frequency of the exciting signal. * If "0" is set, measurement is not done.	
Fixed Parameter	Norm. - Hm	Normal mode, target parameter Hm	Selects the calculation mode and target parameter. * For meanings of the calculation mode and target parameter, see Instruction Manual of B-H Analyzer.
	Norm. - I1m	Normal mode, target parameter I1m	
	Norm. - Bm	Normal mode, target parameter Bm	
	Norm. - V2m	Normal mode, target parameter V2m	
	μ - Hm	μ mode, target parameter Hm	
	μ - I1m	μ mode, target parameter I1m	
	μ - Bm	μ mode, target parameter Bm	
	μ - V2m	μ mode, target parameter V2m	
Fix	0.001 to 99999	Sets the target parameter value.	
Yoke Comp.	Disabled	Invalidate the yoke compensation.	
	Enabled	Validate the yoke compensation.	
Le	System	Use a size the inside between a peculiar measurement yoke magnetic poles to SY-956 used for effect magnetic path length Le.	
	User	Use Le of the sample list file made by ■ 3.5.1 for effect magnetic path length Le.	

Table 3-9 Excitation conditions for SY-960

Items		Selection / setting range		Descriptions	
Function		Sine		Sine wave	Selects type of the exciting signal.
		Pulse		Square wave	* When the calculation mode is a μ mode, Pulse cannot be selected.
Frequency	Sine	SY-8218	10Hz to 3MHz	Sets the frequency of the exciting signal. * If "0" is set, measurement is not done.	
		SY-8219	10Hz to 1MHz		
	Pulse	10Hz to 1MHz			
Fixed Parameter		Norm. - ΔH		Normal mode, target parameter ΔH	Selects the calculation mode and target parameter. * For meanings of the calculation mode and target parameter, see Instruction Manual of DC Bias Tester.
		Norm. - ΔIL		Normal mode, target parameter ΔIL	
		Norm. - ΔB		Normal mode, target parameter ΔB	
		Norm. - ΔVL		Normal mode, target parameter ΔVL	
		μ - ΔH		μ mode, target parameter ΔH	
		μ - ΔIL		μ mode, target parameter ΔIL	
		μ - ΔB		μ mode, target parameter ΔB	
		μ - ΔVL		μ mode, target parameter ΔVL	
Fix		0.001 to 99999		Sets the target parameter value.	
Duty		10 to 90		Sets the pulse Duty value. * When the Function is Sine, it is not possible to set Duty.	
Idc		0.00 to 30.00		Sets DC bias current value.	

Table 3-10 Excitation conditions for SY-951/955

Items		Selection / setting range		Descriptions	
Function		Sine		Sine wave	Selects type of the exciting signal.
		Pulse		Square wave	* When the calculation mode is a μ mode, Pulse cannot be selected.
Frequency	Sine	SY-8218	10Hz to 10MHz	Sets the frequency of the exciting signal. * If "0" is set, measurement is not done.	
		SY-8219	10Hz to 1MHz		
	Pulse	10Hz to 1MHz			
Fixed Parameter		Norm. - Hm		Normal mode, target parameter Hm	Selects the calculation mode and target parameter. * For meanings of the calculation mode and target parameter, see Instruction Manual of B-H Analyzer.
		Norm. - I1m		Normal mode, target parameter I1m	
		Norm. - Bm		Normal mode, target parameter Bm	
		Norm. - V2m		Normal mode, target parameter V2m	
		μ - Hm		μ mode, target parameter Hm	
		μ - I1m		μ mode, target parameter I1m	
		μ - Bm		μ mode, target parameter Bm	
		μ - V2m		μ mode, target parameter V2m	
Fix		0.001 to 99999		Sets the target parameter value.	

- ⑪ Enter a **memo** in "Comment" field. **Only alphanumeric characters** can be entered. The number of characters to be entered is not restricted.

Condition - SY-8218(SY-321x)

Title: Condition_01

Measurement Span Time: 10 second

Tolerance(±): 1.0 °C

Limit Time: 90 minute

Waiting Time: 30 minute

SY-321x

No.	Temp.(°C)
1	RT
2	25.0
3	27.0
4	25.0
5	25.0
6	25.0
7	25.0
8	25.0
9	25.0
10	25.0

RT Room Temp.

Measurement

No.	Function	Frequency	Fixed Parameter	Fix	Unit
1	Sine	10	Norm. - Hm	3	A/m
2	Sine	0.05	Norm. - Hm	130	A/m
3	Sine	500	Norm. - Hm	35	A/m
4	Sine	0	Norm. - Hm	1	A/m
5	Sine	0	Norm. - Hm	1	A/m
6	Sine	0	Norm. - Hm	1	A/m
7	Sine	0	Norm. - Hm	1	A/m
8	Sine	0	Norm. - Hm	1	A/m
9	Sine	0	Norm. - Hm	1	A/m
10	Sine	0	Norm. - Hm	1	A/m

Utility

Comment

Figure 3-30 Condition window

- ⑫ Click "OK" button to manage measurement conditions being set up to now as a condition file. The condition file with the file name in "Title" name and the extension of ".cnd" is created and the screen changes to "Main" window.

Condition - SY-8218(SY-321)

Title: condition_01

Measurement Span Time: 10 second

Tolerance(±): 1.0 °C

Limit Time: 90 minute

Waiting Time: 30 minute

SY-321

No.	Temp.(°C)
1	RT
2	25.0
3	27.0
4	25.0
5	25.0
6	25.0
7	25.0
8	25.0
9	25.0
10	25.0

RT Room Temp.

Measurement

No.	Function	Frequency	Parameter	Fix	Unit
1	Sine	10	B-H - Hm	3	A/m
2	Sine	0.05	B-H - Hm	130	A/m
3	Sine	500	B-H - Hm	35	A/m
4	Sine	0	B-H - Hm	1	A/m
5	Sine	0	B-H - Hm	1	A/m
6	Sine	0	B-H - Hm	1	A/m
7	Sine	0	B-H - Hm	1	A/m
8	Sine	0	B-H - Hm	1	A/m
9	Sine	0	B-H - Hm	1	A/m
10	Sine	0	B-H - Hm	1	A/m

Utility

Comment test

OK

Close

Figure 3-31 Condition window

- * The extension of the created condition file is ".cnd". **Never change it; otherwise, it cannot be used by this software.**
- * **Never edit the condition file by the other than the method of this software; otherwise, malfunction may occur.**

■ 3.6.2 Modifying measurement condition

- It modifies a part of the measurement condition and saves it in the condition file.

① Double-click the condition file to be modified in the list view of "Main" window. "Condition" window of the selected condition file opens. After modification, click "OK" in "Condition" window.

The modified measurement condition is overwritten (saved) on the condition file.

* When measurement POD is SY-960, the condition file made when other measurements POD are selected **cannot be edited**. The "Condition" window is not displayed when selecting it and the dialog box of Figure 3 33 is displayed.

* Except when measurement POD is SY-960, the condition file made when measurement POD of SY-960 is selected **cannot be edited**. The "Condition" window is not displayed when selecting it and the dialog box of Figure 3 33 is displayed.

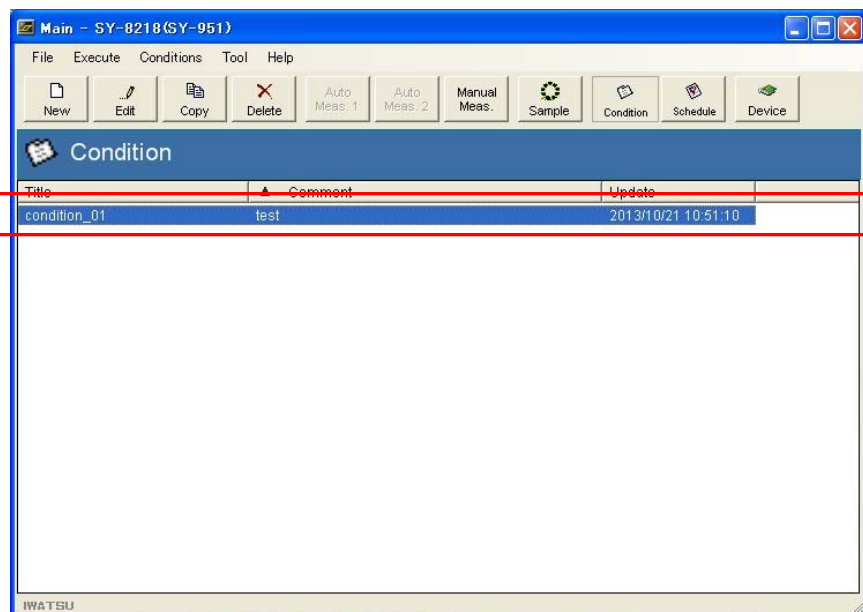


Figure 3-32 Main window

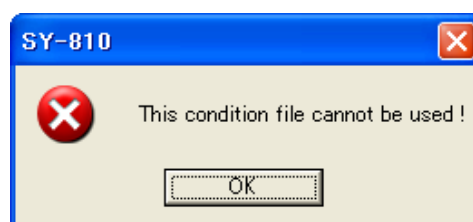


Figure 3-33 Error message of useless Condition file

■ 3.6.3 Copying condition file

- It creates a copy of the condition file.

- ① Click the condition file to be copied in the list view of "Main" window. Click "Copy" button to create the copy. The default file name is created by adding "Copy of" at the beginning of the original file name.

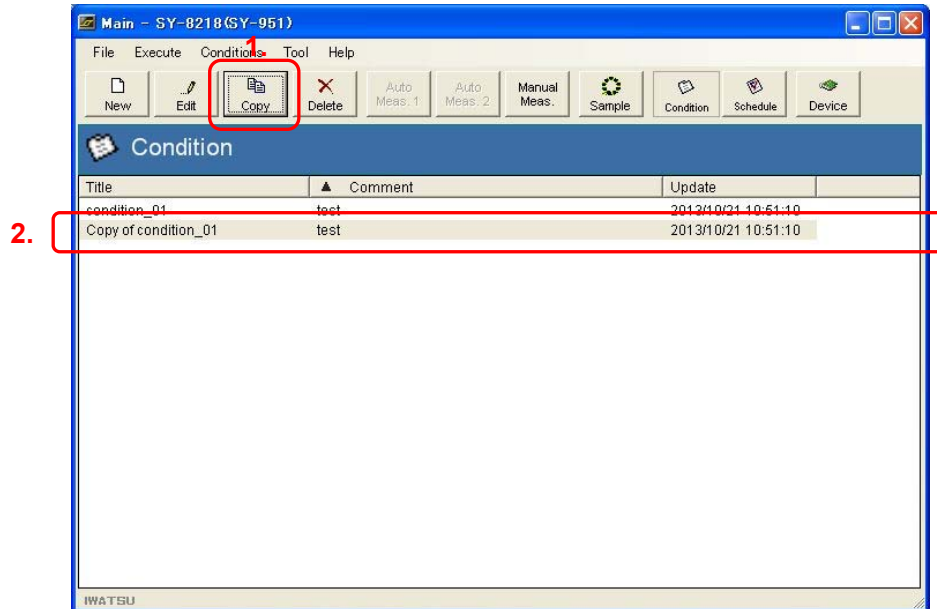


Figure 3-34 Main window

■ 3.6.4 Renaming condition file

- It changes the name of the condition file.

- ① Click the condition file whose name is to be changed in the list view of "Main" window. Next, click "File" → "Rename" to go to the status where the file name can be changed.

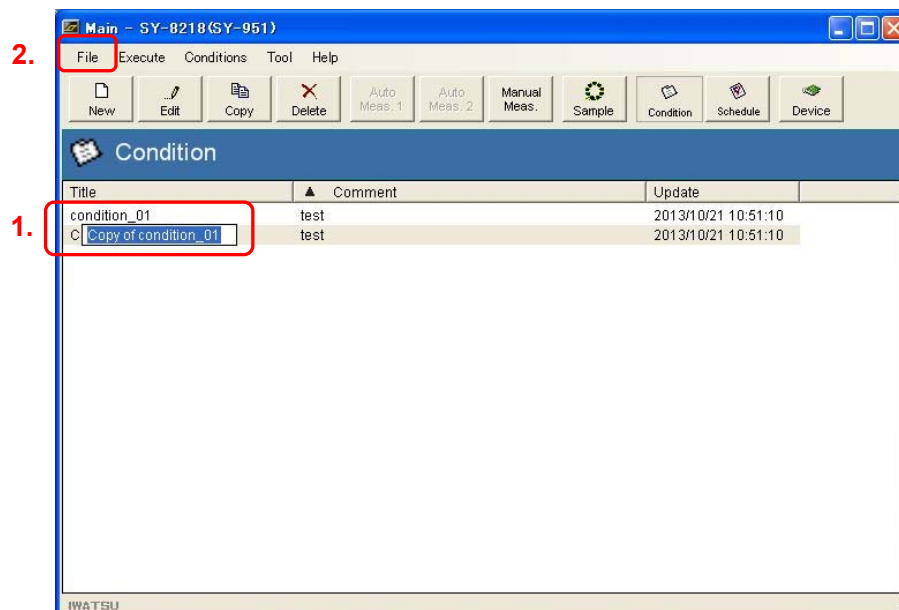


Figure 3-35 Main window

■ 3.6.5 Deleting condition file

- It deletes an unnecessary condition file.

① Click the condition file to be deleted in the list view of "Main" window.
Next, click "Delete" button to delete the selected file.

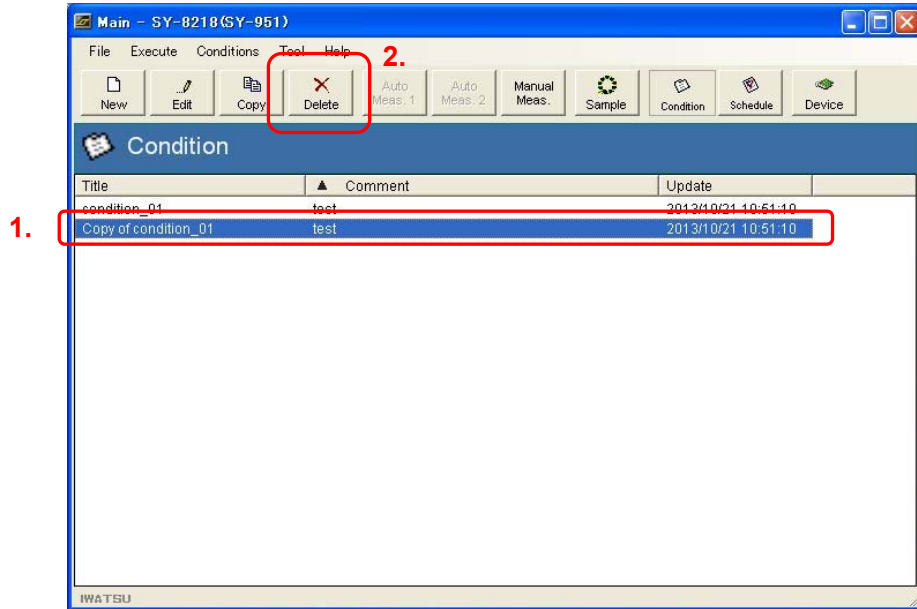


Figure 3-36 Main window

■ 3.7 Creating schedule file

- It creates the schedule file for automatic measurement using the sample list file and the condition file created up to now and registers/ manages it. **The schedule that can be set is different according to measurement Pod used.**

① Click "Schedule" and then "New" button in "Main" window.

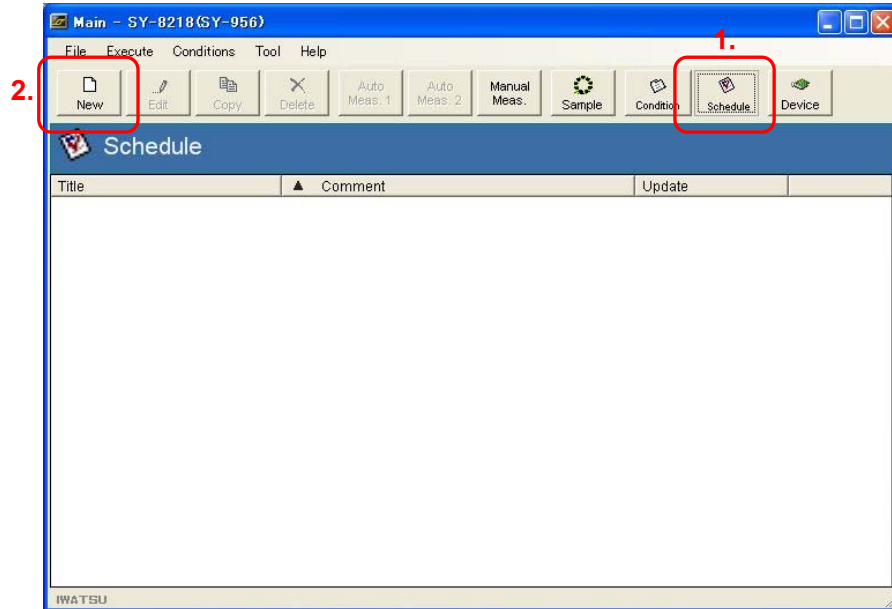


Figure 3-37 Main window

■ 3.7.1 Description of "Schedule" window

- Before creating the schedule of automatic measurement, it is necessary to be familiar with expressions on "Schedule" window.

① Figure 3-38 is the example of the schedule of automatic measurement when the measurement Pod is SY-321x. Some of the meanings of this schedule are explained below.

a: The condition file to which the temperature condition, the excitation condition and the unit of measured value etc. used by this schedule are described is "condition_01".

b: The sample registered in the sample list file by the sample name of "Ferrite40" is set in position No.1 of the Turntable in the constant temperature chamber.

c: The temperature when "Ferrite40" is measured is the temperature condition No.1 of condition file "condition_01"

d: The excitation condition when "Ferrite40" is measured is three excitation condition No.1, 2, and 3 of the condition files "condition_01".

* The check on the temperature condition is not displayed, except when measurement POD is SY-320x/321x. Moreover, it is not significant to position No. of the Turntable.

The screenshot shows the 'Schedule - SY-8218(SY-321x)' window. It has a title bar, a 'Title' field set to 'measure_01', and a 'Condition' dropdown set to 'condition_01'. Below these are two main tables: 'Temperature' and 'Measurement'. The 'Temperature' table has columns 1-10, and the 'Measurement' table has columns 1-3. The 'Sample Name' column is also present. The 'Lot Name' column is also present. The 'Sample Name' column is highlighted in blue. The 'Temperature' table has 'X' marks in the first column for rows 1, 3, 7, and 9. The 'Measurement' table has 'X' marks in the first three columns for rows 1, 3, 7, and 9. Callouts explain the following:

- a: The condition file name used is "condition_01".
- b: The position of the Turntable in the constant temperature chamber where "Ferrite40" is set is No.1.
- c: The temperature when "Ferrite40" is measured is the temperature condition No.1 of condition file "condition_01"
- d: The excitation condition when "Ferrite40" is measured is three excitation condition No.1, 2, and 3 of the condition files "condition_01".
- b: The measured sample name is "Ferrite40" selected from the sample list file.

No.	Lot Name	Sample Name	Temperature	Measurement
1	Oct10	Ferrite40	X	X X X
2				
3	Oct20	Steel30	X X	X
4				
5				
6				
7	Oct24	AirCore	X X	X X
8				
9				
10				

Figure 3-38 Schedule window

- ② What is the sample of "**Ferrite40**"? Click "Sample Name" button to open "Sample" window and select "Feririte40" to find out the sample constant of it; i.e. it has been created in ■3.5.

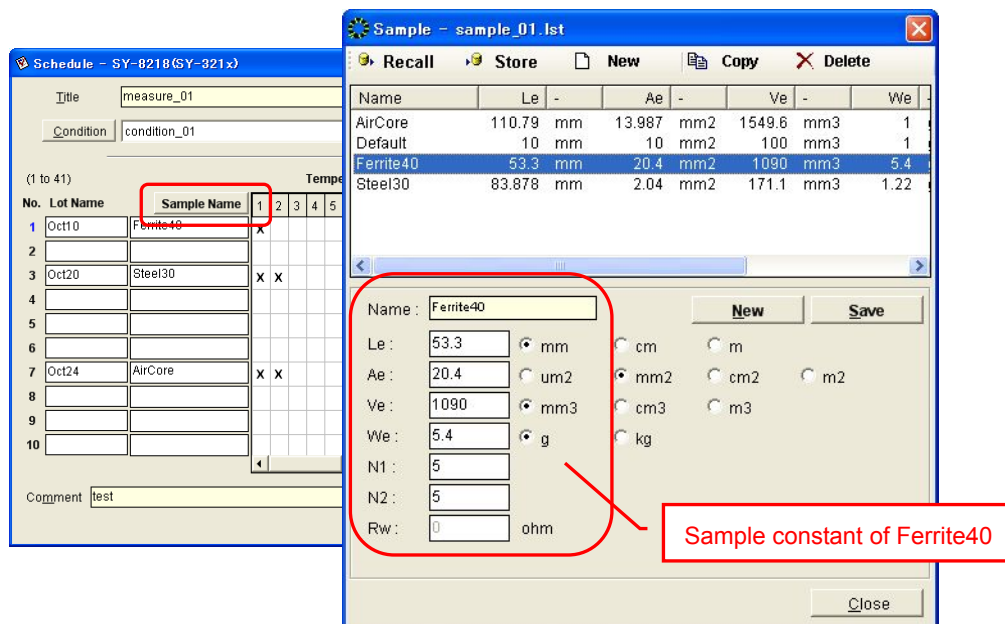


Figure 3-39 Sample window

- ③ What is the **temperature condition No.1**? Click "Condition" button to display the content of the condition file with the file name "condition_01". It shows that the **temperature condition No.1** is RT which has been created in ■3.6.

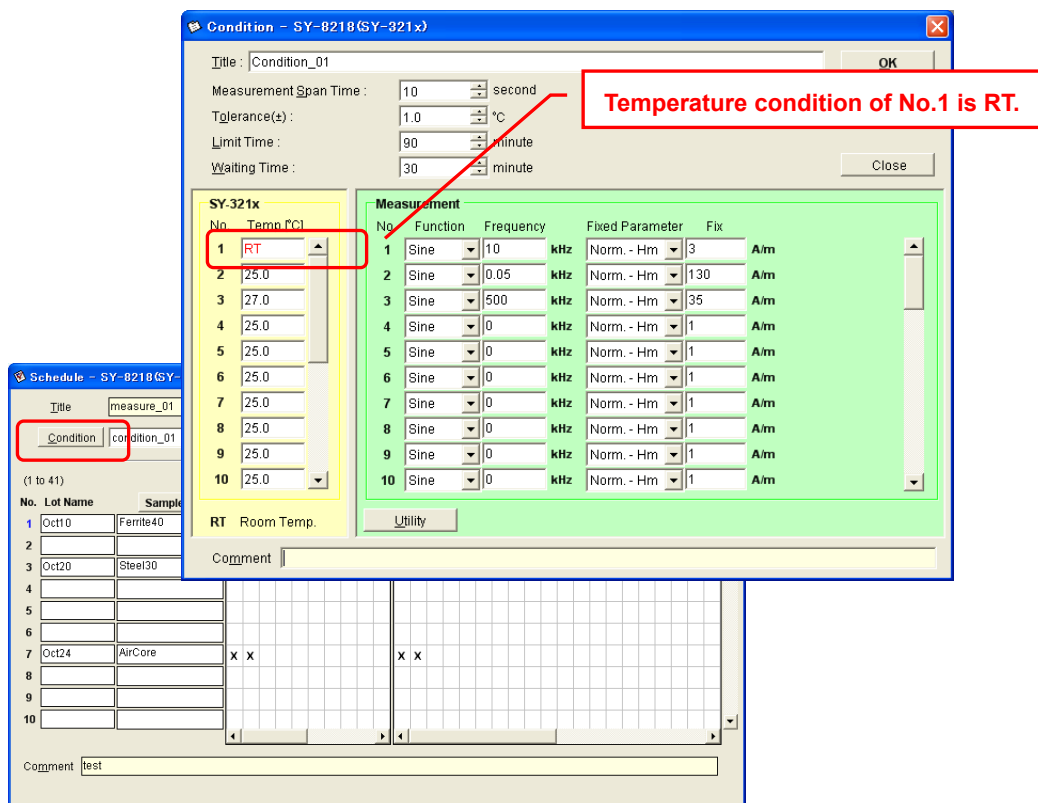


Figure 3-40 Condition window

- ④ What are **excitation conditions No.1, 2, and 3?** They are shown in the red frame in Figure 3-41.

Condition - SY-8218(SY-321x)

Title: Condition_01 [OK]

Measurement Span Time: 10 second

Tolerance(±): 1.0 °C

Limit Time: 90 minute

Waiting Time: 30 minute [Close]

SY-321x

No.	Temp.[°C]
1	RT
2	25.0
3	27.0
4	25.0
5	25.0
6	25.0
7	25.0
8	25.0
9	25.0
10	25.0

RT Room Temp.

Measurement

No.	Function	Frequency	Fixed Parameter	Fix
1	Sine	10 kHz	Norm. - Hm	3 A/m
2	Sine	0.05 kHz	Norm. - Hm	130 A/m
3	Sine	500 kHz	Norm. - Hm	35 A/m
4	Sine	0 kHz	Norm. - Hm	1 A/m
5	Sine	0 kHz	Norm. - Hm	1 A/m
6	Sine	0 kHz	Norm. - Hm	1 A/m
7	Sine	0 kHz	Norm. - Hm	1 A/m
8	Sine	0 kHz	Norm. - Hm	1 A/m
9	Sine	0 kHz	Norm. - Hm	1 A/m
10	Sine	0 kHz	Norm. - Hm	1 A/m

Utility

Comment

Figure 3-41 Condition window

- ⑤ If arranged, meanings of contents in red frame on "Schedule" window in Figure3-42 are as Table 3-11:

Table 3-11 Setting contents of Schedule window

Position on Turn table	Sample names	Temp. condition for measurement	Excitation conditions for measurement			Control condition of constant temperature chamber Other measurement conditions
		No.1	No.1	No.2	No.3	
No.1	Ferrite40 *Reference sample list file : "sample.01"	RT	Sine, 10kHz Normal mode Hm specification Hm=3[A/m]	Sine, 0.05kHz Normal mode Hm specification Hm=130[A/m]	Sine, 500kHz Normal mode Hm specification Hm=35[A/m]	Conditions written in condition file name "condition_01"
* Reference condition file: "condition_01"						

Schedule - SY-8218(SY-321x)

Title: measure_01 [OK]

Condition: condition_01 [Close]

(1 to 41)

No.	Lot Name	Sample Name	1	2	3	4	5	6	7	8	9	10	1	2	3
1	Oct10	Ferrite40	X										X	X	X
2															
3	Oct20	Steel30	X	X									X		
4															
5															
6															
7	Oct24	AirCore	X	X									X	X	
8															
9															
10															

Comment: test

Figure 3-42 Schedule window

- ⑥ Therefore, "Schedule" window allows you to understand **which sample is set on what position** on the Turntable and that **measurement should be made at what temperature and under what excitation conditions.**

■ 3.7.2 Creation of new schedule and storage of it in schedule file

- ① Let's create the schedule shown in Figure 3-38 when the measurement Pod is SY-321x. First enter the file name of the schedule file in "Title" field. **Up to 20 alphanumeric characters can be entered.**

- * How to make the schedule file is the same, except when measurement POD is SY-320x/321x excluding the description related to SY-320x/321x.

[illegible]

Figure 3-43 Schedule window

- ② Click "Condition" list box to select **the condition file used for automatic measurement**. The list box displays all condition files created and saved in ■ 3.6.

- * Click of "Condition" button allows "Condition" window of the selected condition file to open; therefore contents of the measurement condition can be checked and modified.

Schedule - SY-8218(SY-321x)

Title: measure_01

Condition: condition_01 (new data) condition_01 condition_02_sst condition_03_dct

(1 to 41)

No.	Lot Name	Sample Name	1	2	3	4	5	6	7	8	9	10	1	2	3
1	Oct10	Ferrite40	X										X	X	X
2															
3	Oct20	Steel30	X	X									X		
4															
5															
6															
7	Oct24	AirCore													
8															
9															
10															

Comment: test

Click "Condition" to open Window.

Figure 3-44 Schedule window

③ When measurement POD is SY-320x/321x, click "Sample Name" field corresponding to the position No. of the Turntable to be used. All sample list file names saved are displayed.

* The upper limit of the position No. of the Turntable to be used is decided by the model of the constant temperature chamber to be used. See Table3-11.

* It is not significant to Turntable position No., except when measurement POD is SY-320x/321x Use No.1.

Table 3-12 Upper limit of Turntable No.

Models of constant temperature chamber	Upper limit of Turntable position No.
SY-320x	20
SY-321x	41

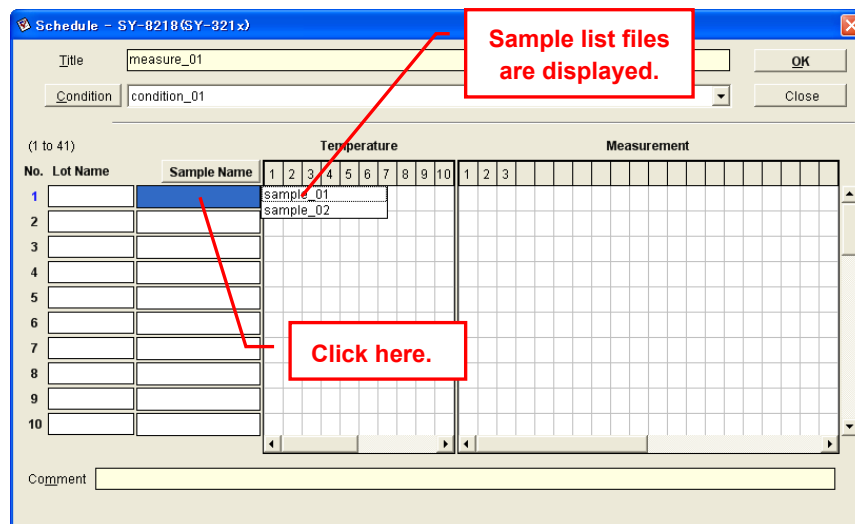


Figure 3-45 Schedule window

④ Click the displayed sample list file name to display the sample names included in the file.

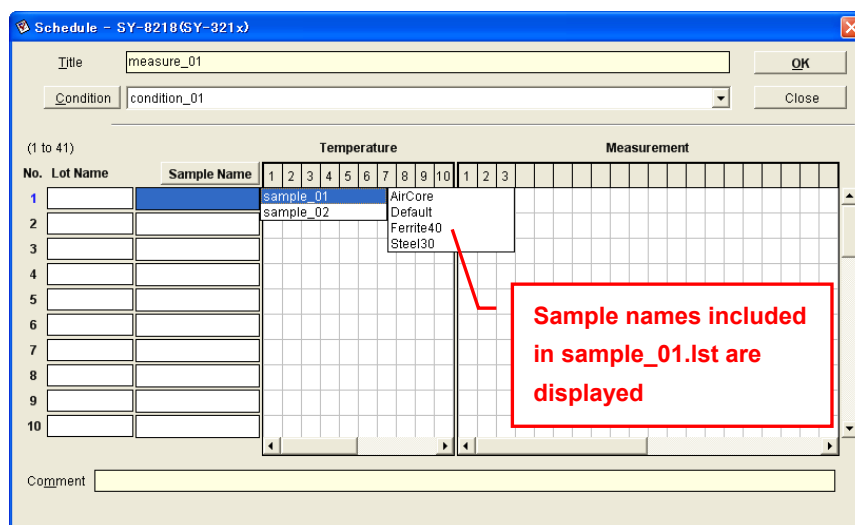


Figure 3-46 Schedule window

* For cancellation, click other positions than "Sample Name" field; e.g. "Lot Name" field.

⑤ Click the sample name to be measured to decide the selection.

- * Click of "Sample Name" button allows "Sample" window to open; therefore, contents of the sample constant can be checked and modified.
- * Right-click the sample name to check the contents of the sample constant.

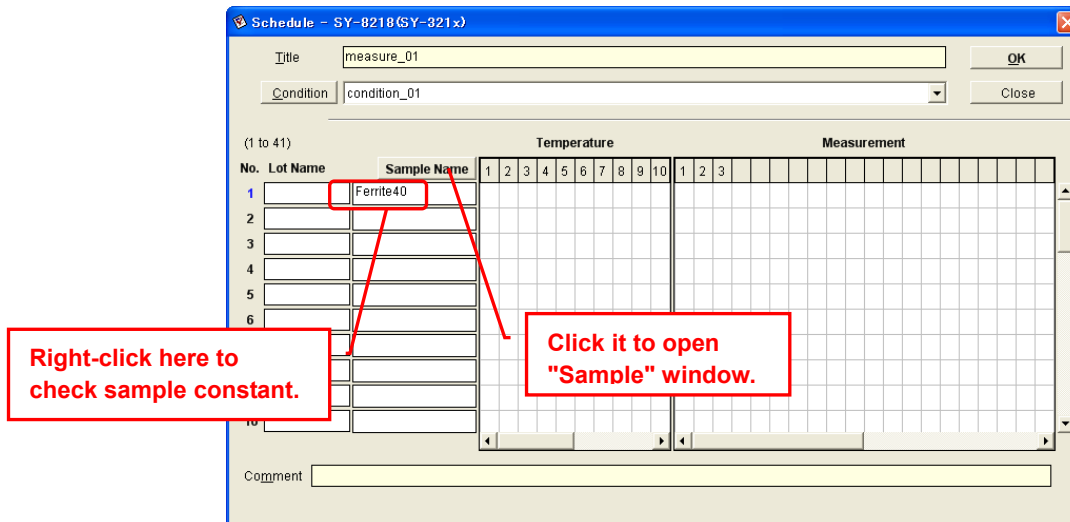


Figure 3-47 Schedule window

⑥ Click "Lot Name" field to enter Lot name as required. Only alphanumeric characters can be entered.

- * Entry is necessarily not required.

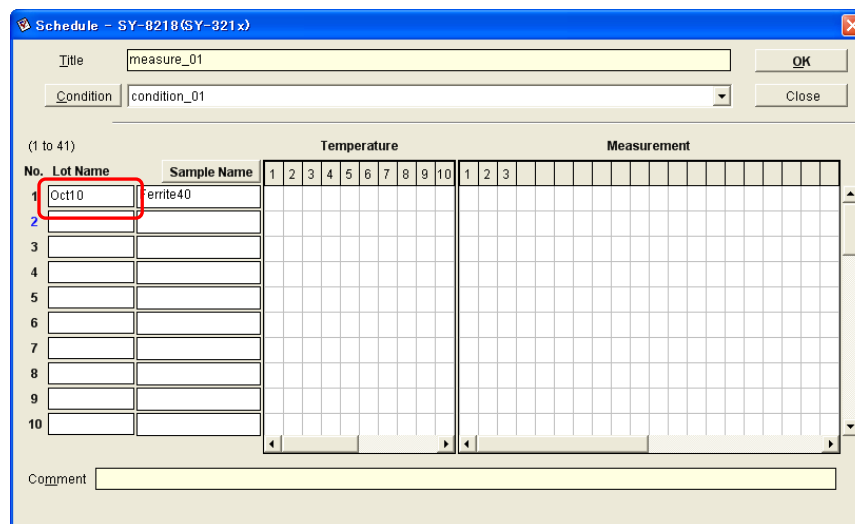


Figure 3-48 Schedule window

- ⑦ When measurement POD is SY-320x/321x, double-click "No" field of the temperature condition for measurement. If selected, "X" mark is added. No. corresponds to the No. of the temperature condition of the selected condition file. Double-click it again to delete "X" mark; i.e. not selected.

- * Right-click "No." field allows Check/Uncheck popup menu to appear, which can be used to set "Selected/Not".
- * It is not possible to select it, except when measurement POD is SY-320x/321x.

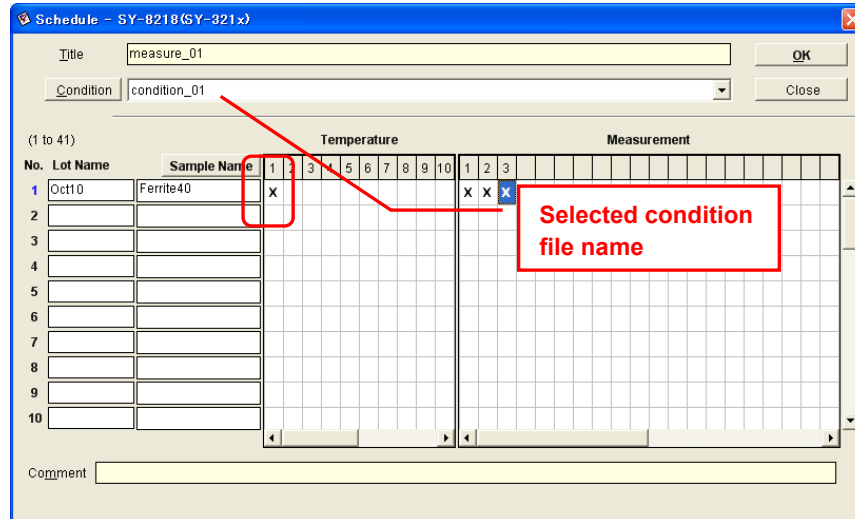


Figure 3-49 Schedule window

- ⑧ Double-click "No" field of the excitation condition for measurement. If selected, "X" mark is added. No. corresponds to the No. of the excitation condition of the selected condition file. Double-click it again to delete "X" mark; i.e. not selected.

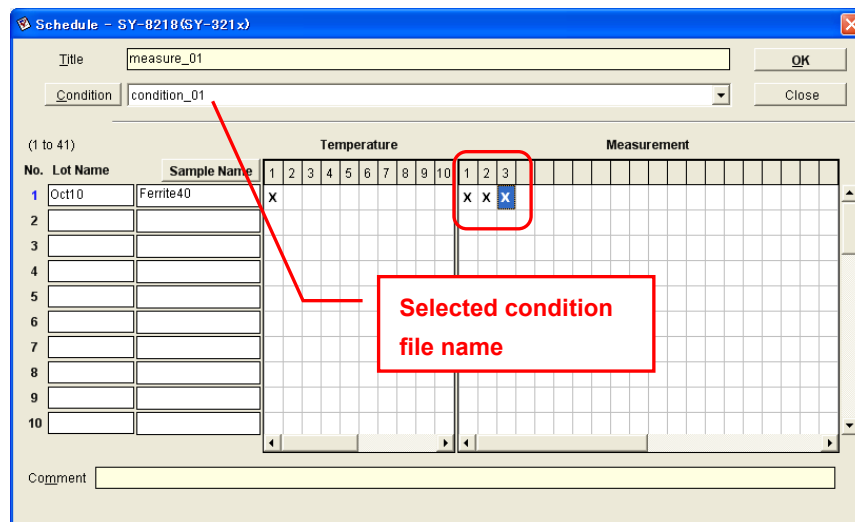


Figure 3-50 Schedule window

- * The number of measurement conditions cannot exceed 8000.

- ⑨ Similarly edit other Turntable positions used, and complete the schedule of Figure3-38 when measurement POD is SY-320x/321x.

Schedule - SY-8218(SY-321x)

Title: OK

Condition: Close

(1 to 41)

No.	Lot Name	Sample Name	Temperature										Measurement																						
			1	2	3	4	5	6	7	8	9	10	1	2	3																				
1	Oct10	Ferrite40	X										X	X	X																				
2																																			
3	Oct20	Steel30	X	X									X																						
4																																			
5																																			
6																																			
7	Oct24	AirCore	X	X									X	X																					
8																																			
9																																			
10																																			

Comment: test

Figure 3-51 Schedule window

- ⑩ Enter a memo in "Comment" field. **Only alphanumeric characters can be entered.** The number of characters to be entered is not restricted.

[illegible]

Figure 3-52 Schedule window

- ⑪ Click "OK" button to save the schedules being set up to now as a file.

The schedule file with the file name in "Title" name and the extension of ".sch" is created and the screen changes to "Main" window.

- * The extension of the created schedule files ".sch". **Never change it; otherwise, it cannot be used by this software.**
- * **Never edit the schedule file by the other than the method of this software; otherwise, malfunction may occur.**

Figure 3-53 Schedule window

■ 3.7.3 Other edit functions when creating schedule

- ① Right-click the position No. of the Turntable to open the popup menu including functions shown in Table 3-13. **The selected No. changes to blue.** The function applies to the entire line corresponding to the selected position No.

Figure 3-54 Schedule window

Table 3-13 Popup menu of Turntable position No.

Items	Functions
Cut	Deletes all contents in the selected line.
Copy	Copies contents of the selected line except Lot Name to the clipboard.
Paste	Pastes the contents copied in Copy above on the selected line.
Line Insert	Inserts an empty line above the selected line.
Line Delete	Deletes the selected line itself.
Check	Makes all temperature/ excitation conditions in the selected line selected.
Uncheck	Makes all temperature/ excitation conditions in the selected line not selected.

■ 3.8 Remote and local

- Now, measurement can be made. Before actual measurement, it is necessary to be familiar with the remote and local states.
- ① When this software starts measurement, B-H Analyzer is controlled by the PC; i.e. B-H Analyzer main unit cannot be operated on the unit itself. This is called the **remote state** and at that time, Mode of B-H Analyzer is indicated in red.

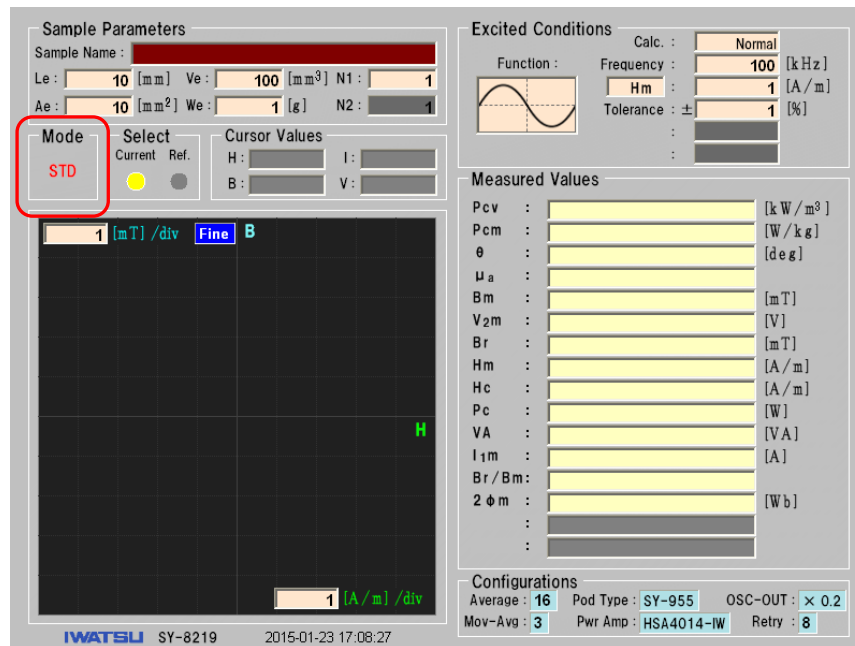


Figure 3-55 Measurement screen on B-H Analyzer

- ② The state where B-H Analyzer main unit can be operated on the unit itself is called the **local state** and at that time, Mode of B-H Analyzer is indicated in blue. To forcibly change the remote state to the local state, press "STOP" key on B-H Analyzer

■ 3.9 Automatic measurement

- As for the automatic measurement, the function is different according to measurement Pod used. Refer to Table 3-14.

Table 3-14 Functions of automatic measurement

Measurement Pods	Functions of automatic measurement
SY-320x/321x	Make the automatic measurement for two or more samples set in the Turntable of Chamber Scanner System SY-320x/321x while changing the temperature and the excitation condition respectively. There are two methods of automatic measurements.
SY-956	Make the automatic measurement for the sample set in the Mini Single Sheet Tester SY-956 while changing the excitation condition.
SY-960	Make the automatic measurement for the sample set in the DC Bias Tester SY-960 while changing the excitation condition.
SY-951/955	Make the automatic measurement for the sample set in the standard measurement Pod SY-951/955 while changing the excitation condition.

■ 3.9.1 Differences between automatic measurement 1 and 2

- There are two types of automatic measurement; i.e. automatic measurement 1 and automatic measurement 2. **When measurement Pod is SY-320x/321x, the automatic measurement 1 gives priorities to the fixed Turntable position while the automeasurement 2 to the fixed excitation condition.**
 - * Except when measurement POD is SY-320x/321x, two or more samples cannot be treated, and use automatic measurement 1.
- ① Automatic measurement 1 gives priority and measures the position fixation of Turntable in the order of Figure 3-56.
 - First, when the constant temperature chamber reaches the temperature condition 1, measurement is made in the order of the excitation conditions indicated by **red** arrow.
 - Next, when the constant temperature chamber reaches the temperature condition 2, measurement is made in the order of the excitation conditions indicated by **blue** arrow and the automatic measurement finishes.

(Measurement of the Turntable 2; i.e. Ferrite40 is not made under the temperature condition 2 because it is not selected.)

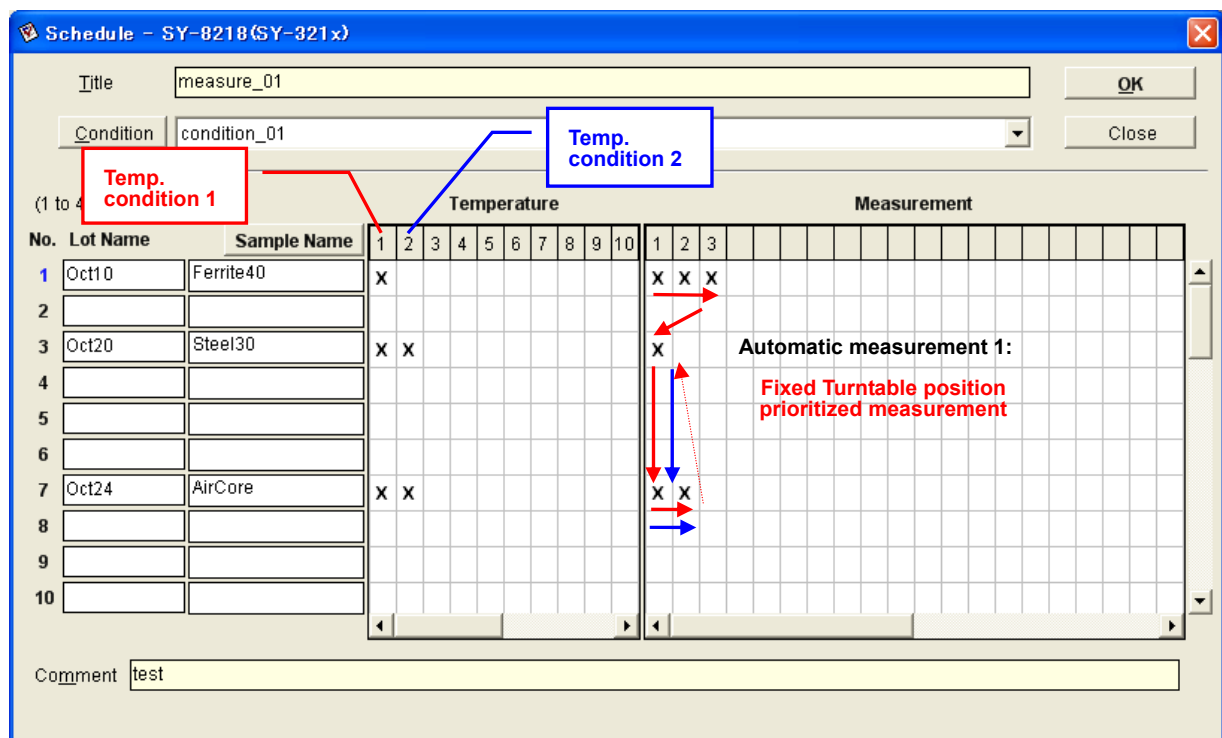


Figure 3-56 Measurement order of automatic measurement 1

- ② Automatic measurement 2 gives priority and measures the excitation condition fixation in the order of Figure 3-57.
- First, when the constant temperature chamber reaches the temperature condition 1, measurement is made in the order of the excitation conditions indicated by **red** arrow.
 - Next, when the constant temperature chamber reaches the temperature condition 2, measurement is made in the order of the excitation conditions indicated by **blue** arrow and the automatic measurement finishes.
- (Measurement of the Turntable 2; i.e. Ferrite40 is not made under the temperature condition 2 because it is not selected.)

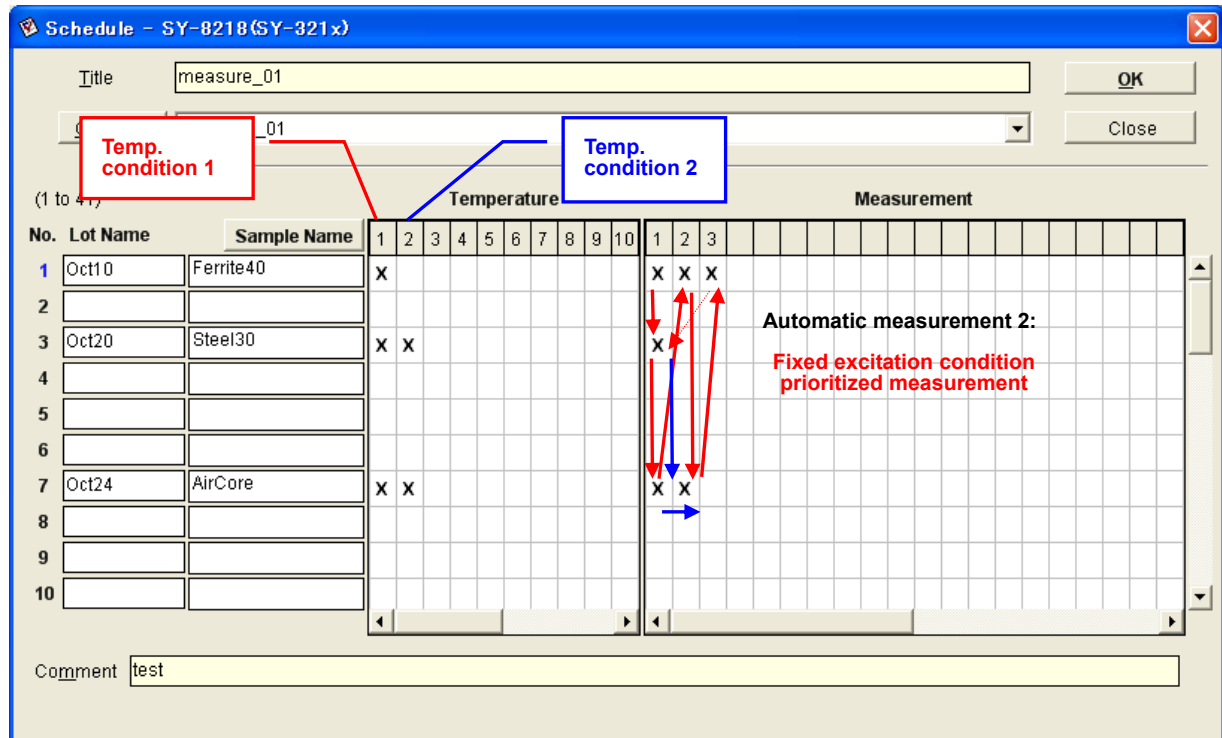


Figure 3-57 Measurement order of automatic measurement 2

■ 3.9.2 Automatic measurement

- The procedure to execute the automatic measurement 1 is described.

① Click "Schedule" button on "Main" window to display the schedule file created in the list view.

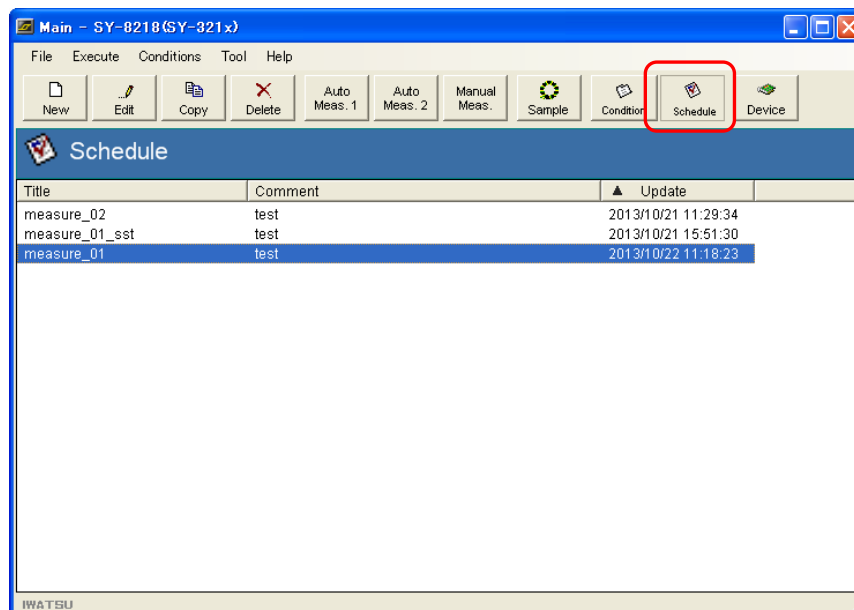


Figure 3-58 Main window

② Click the schedule file for which the automatic measurement is to be made and click "Auto Meas.1".

- * If clicking "Auto Meas.2", the automatic measurement 2 can be made. Because of the same operation between the automatic measurement 1 and 2, the operation of automatic measurement 2 is not described in this manual.
- * When measurement Pod is SY-320x/321x, If the constant temperature chamber is not connected or not recognized by the PC, the dialog box shown in Figure 3-60 is displayed . In addition, if the scanner is not connected or not recognized by the PC, the dialog box shown in Figure 3-61 is displayed.

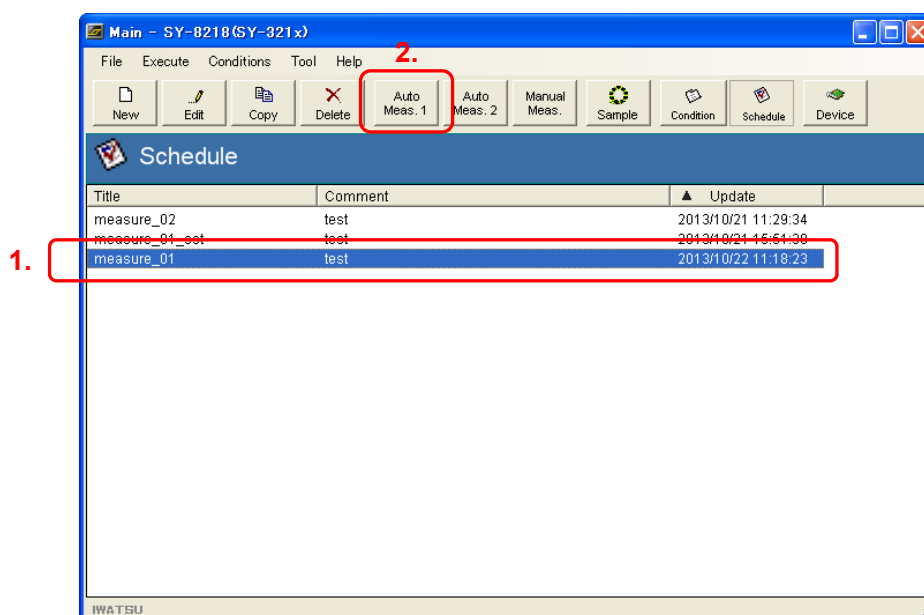


Figure 3-59 Main window



Figure 3-60



Figure 3-61

- ③ "Auto Meas.1" window opens. Before measurement, make settings as shown in Table 3-15 as required.
 * **Never execute this operation during the automatic measurement; otherwise, malfunction may occur.**

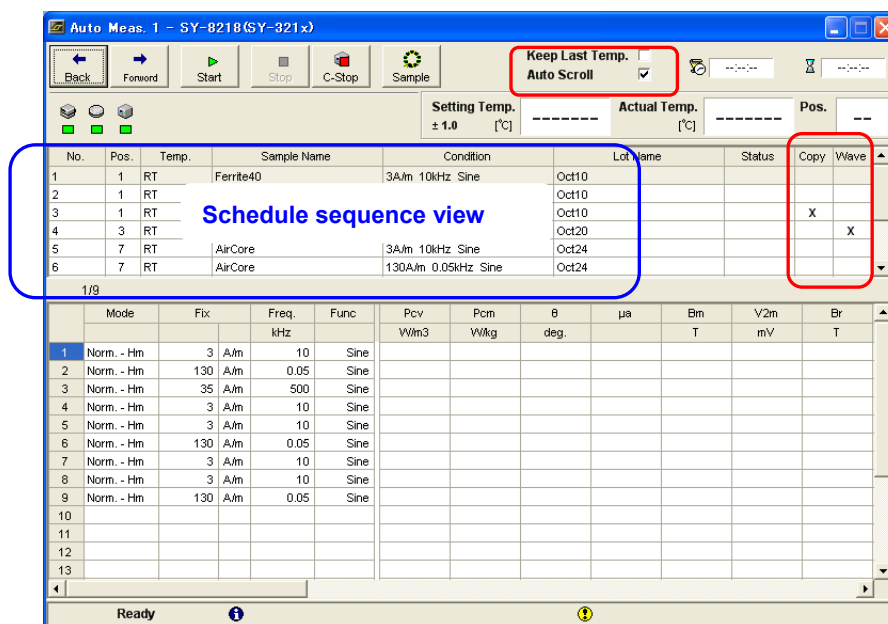


Figure 3-62 Auto Meas.1 window

Table 3-15 Other settings

Items	Functions
"Keep Last Temp" check box	- Clicking allows the check mark to be entered. It is effective only for SY-320x/321x measurement Pod. ☒ : After completion of the automatic measurement, temperature of the constant temperature chamber is kept at the last measured temperature of the automatic measurement. ☐ : After completion of the automatic measurement, temperature of the constant temperature chamber is kept at 25°C.
"Auto Scroll" check box	- Clicking allows the check mark to be entered. ☒ : Allows automatic scroll on the sequence view to display the sequence currently measured. ☐ : Stops automatic scroll on the sequence view.
"Copy" column	- Double-clicking allows "X" mark to be inserted. Double-clicking again allows it to be deleted. X: Automatically saves the measurement screen hardcopy of B-H Analyzer main unit when measuring a corresponding line. - Storage drive: USB memory connected with B-H Analyzer - Destination: ¥image¥<file name of measurement data decided in step ⑤>--○○ * ○○: 2-digit measurement serial number with a hyphen added automatically * File format is decided by operation of B-H Analyzer main unit. See Instruction Manual of B-H Analyzer.
"Wave" column	- Double-clicking allows "X" mark to be inserted. Double-clicking again allows it to be deleted. X : Automatically saves the waveform data in csv format when measuring a corresponding line - Destination: ¥<file name of measurement data decided in step ⑤>--○○_calculation mode * ○○: 2-digit measurement serial number with a hyphen added automatically * File format is CSV with comma as a delimiter.

④ Click "Start" button of the automatic measurement.

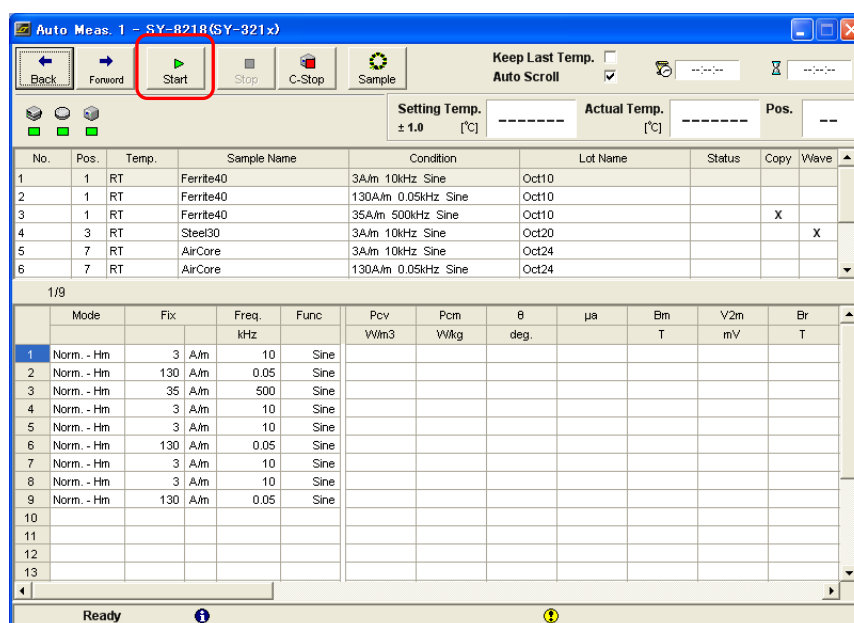


Figure 3-63 Auto Meas.1 window

- ⑤ "Save File As" dialog box to decide the storage destination of measurement data opens. Enter the file name and click "Save". **Up to 20 alphanumeric characters can be entered.**

* When the head of the file name is 0 or a numerical value alone for 16 characters or more might not open it with Excel.

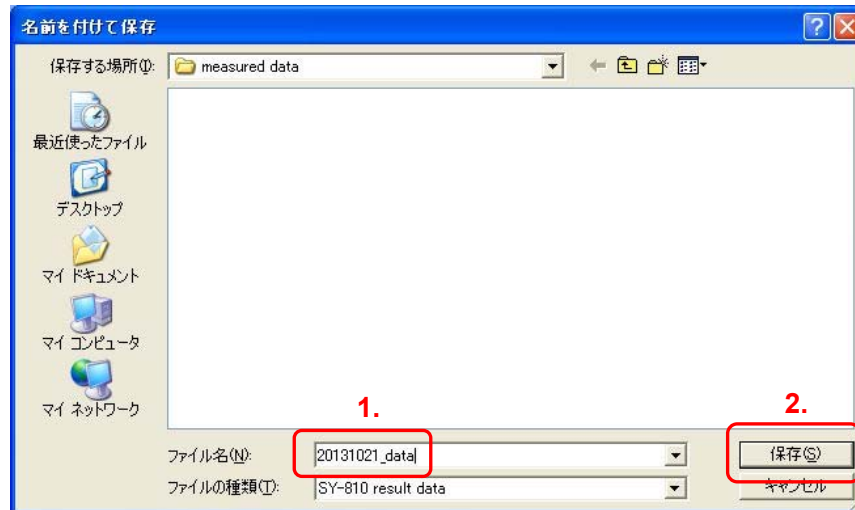


Figure 3-64 Save dialog box

- ⑥ The screen returns to "Auto Meas.1" window and the automatic measurement starts. The following describes functions on "Auto Meas.1" window.

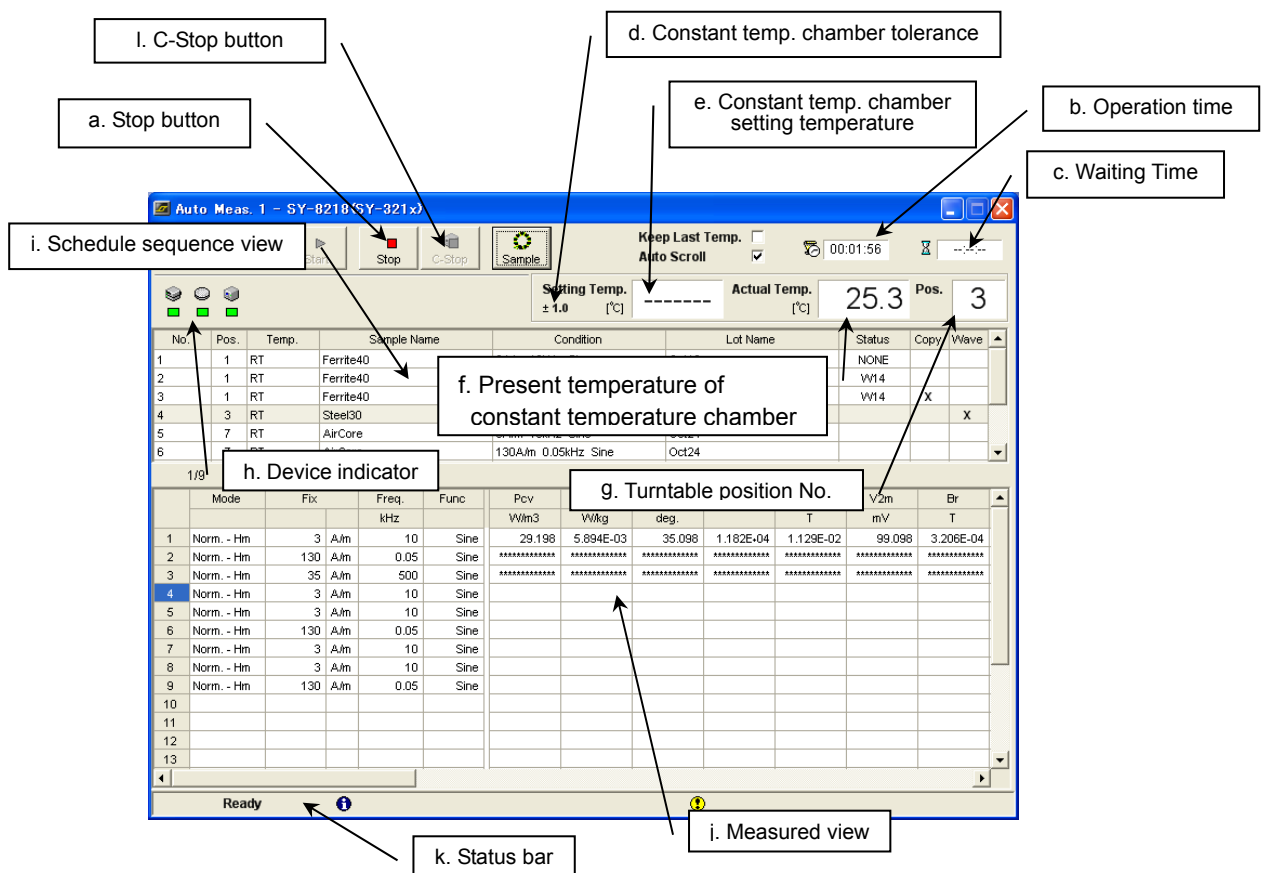


Figure 3-65 Auto Meas.1 window

- a. **"Stop" button:** If clicked, the automatic measurement is finished forcibly.
 * Even if STOP key on B-H Analyzer is pressed during the automatic measurement, the measurement cannot be stopped forcibly.
- b. **Operation time:** Displays the elapsed time after "Start" button is pressed.
- c. **Waiting Time:** When measurement Pod is SY-320x/321x, displays the remaining time of Waiting time of the constant temperature chamber which is set in the used condition file (See Table 3-3).
- d. **Constant temperature chamber Tolerance:**
 When measurement Pod is SY-320x/321x, displays the Tolerance of the constant temperature chamber which is set in the used condition file.
- e. **Constant temperature chamber setting temperature:**
 When measurement Pod is SY-320x/321x, displays the temperature of the constant temperature chamber which is currently set in accordance with the used schedule file
 * If the setting temperature is "RT", ----- is displayed.
- f. **Constant temperature chamber current temperature:**
 When measurement Pod is SY-320x/321x, displays the current temperature of the constant temperature chamber.
- g. **Position No. of Turntable:**
 When measurement Pod is SY-320x/321x, displays the current position No. of the Turntable.
- h. **Device indicator:** Displays the status of the device connected through the GPIB interface. For statuses, see Figure 3-66 and Table 3-16. Moreover, the connection of SY-956 and SY-960 is not displayed.

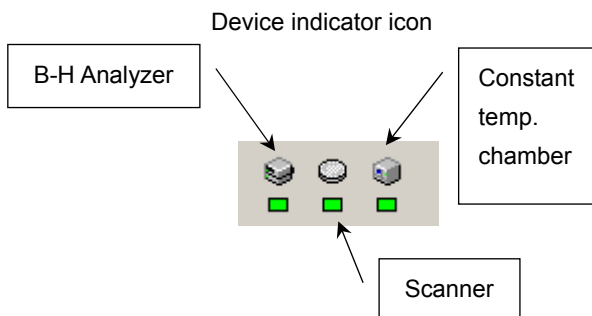


Figure 3-66 Device indicator

Table 3-16 Device indicator

Indicator colors	Status
	GPIB not connected (not recognized)
	GPIB connected
	GPIB under communication

- i. **Schedule sequence view:**
 Displays the sequence of the measurement schedule described in Figures 3-56 and 3-57 depending on the used schedule file and the selected automatic measurement type.
 The sequence currently executed is displayed with hatching.
 The displayed content is different in POD used. Refer to Table 3-17 to 3-20.

Table 3-17 Items of schedule sequence view for SY-320x/321x

Items	Descriptions	Remarks
No.	Schedule sequence No. Measurement is made in this sequence.	-
Pos.	Position No. being set of Turntable	Contents of the used schedule file are reflected.
Temp.	Temperature condition being set for measurement of the constant temperature chamber	
Sample Name	Sample name being set	
Condition	Main excitation condition being set for measurement	
Lot Name	Lot. Name of sample being set	
Status	Displays an error or warning No. if a trouble occurs after completion of measurement. ★ For the error or warning No., see Table 4-1. ★ "NONE" is displayed if no error or warning occurs.	
Copy	Automatic storage setting of hardcopy of B-H Analyzer measurement screen	See Table 3-15.
Wave	Automatic storage setting of measurement waveform data	

Table 3-18 Items of schedule sequence view for SY-956

Items	Descriptions	Remarks
No.	Schedule sequence No. Measurement is made in this sequence.	-
Pos.	Position No. being set of Turntable	Contents of the used schedule file are reflected.
Sample Name	Sample name being set	
Condition	Main excitation condition being set for measurement	
Y Comp.	Set yoke compensation	
Le	Set type of Le in effect magnetic path length	
Lot Name	Lot. Name of sample being set	-
B Coil	The type of B coil used for SY-956 is displayed.	
Status	Displays an error or warning No. if a trouble occurs after completion of measurement. ★ For the error or warning No., see Table 4-1. ★ "NONE" is displayed if no error or warning occurs.	
Copy	Automatic storage setting of hardcopy of B-H Analyzer measurement screen	See Table 3-15.
Wave	Automatic storage setting of measurement waveform data	

Table 3-19 Items of schedule sequence view for SY-960

Items	Descriptions	Remarks
No.	Schedule sequence No. Measurement is made in this sequence.	-
Pos.	Position No. being set of Turntable	Contents of the used schedule file are reflected.
Sample Name	Sample name being set	
Condition	Main excitation condition being set for measurement	
Idc	Set direct current superimposed	
Duty	Value of set pulse Duty	
Lot Name	Lot. Name of sample being set	
Status	Displays an error or warning No. if a trouble occurs after completion of measurement. ★ For the error or warning No., see Table 4-1. ★ "NONE" is displayed if no error or warning occurs.	
Copy	Automatic storage setting of hardcopy of B-H Analyzer measurement screen	See Table 3-15.
Wave	Automatic storage setting of measurement waveform data	

Table 3-20 Items of schedule sequence view for SY-951/955

Items	Descriptions	Remarks
No.	Schedule sequence No. Measurement is made in this sequence.	—
Pos.	Turntable position No. in schedule file	Contents of the used schedule file are reflected.
Temp.	"---" is displayed.	
Sample Name	Sample name being set	
Condition	Main excitation condition being set for measurement	
Lot Name	Lot. Name of sample being set	
Status	Displays an error or warning No. if a trouble occurs after completion of measurement. * For the error or warning No., see Table 4-1. * "NONE" is displayed if no error or warning occurs.	
Copy	Automatic storage setting of hardcopy of B-H Analyzer measurement screen	See Table 3-15.
Wave	Automatic storage setting of measurement waveform data	

- j. **Measured view:** Displays the measurement result for each schedule sequence.
 * If measurement is not made for some reason, "*****" is displayed. In this case, even if "Copy" or "Wave" column is checked, the corresponding data is not saved.
- k. **Status bar:** Displays the progress of measurement.
- l. **"C-Stop" button:** When measurement Pod is SY-320x/321x, if clicked, control of the constant temperature chamber is forcibly stopped.
 * If the constant temperature chamber is not connected, this button is invalid.
- ⑦ If all schedule sequences finish and the automatic measurement is completed, "Status bar" displays "Ready" and "Measurement completed".
- * When measurement Pod is SY-320x/321x, if the door of the constant temperature chamber is opened during measurement, the measurement is forcibly finished.

■ 3.10 Manual measurement

- It sets newly temperature condition of constant temperature chamber, excitation conditions and measurement condition of unit of measured value etc. for measurement and executes one measurement. **The measurement condition that can be set is different according to measurement Pod used.**

① Click "Manual Meas." on "Main" window.

- ★ When measurement Pod is SY-320x/321x, if the constant temperature chamber is not connected or not recognized by the PC, the same dialog box as the automatic measurement shown in Figure 3-60 is displayed. In addition, if the scanner is not connected or not recognized by the PC, the dialog box shown in Figure 3-61 is displayed.

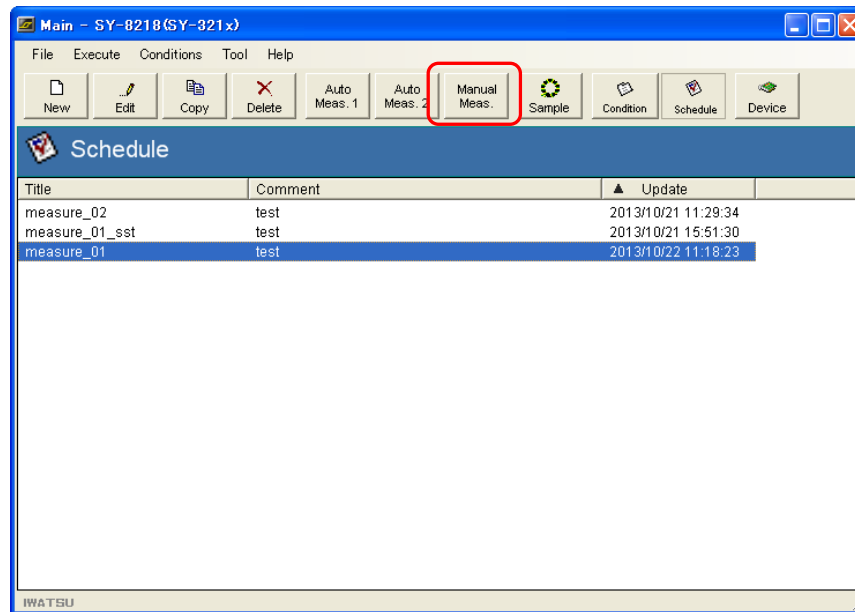


Figure 3-67 Main window

② "Manual Meas." window opens.

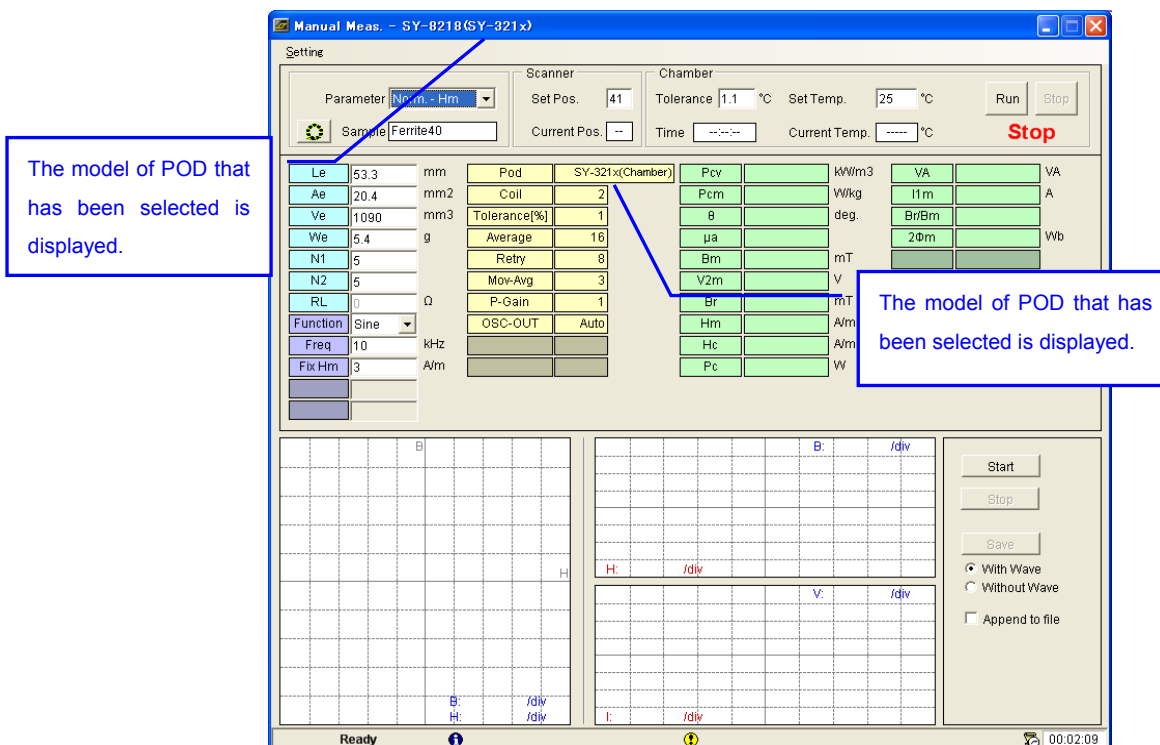


Figure 3-68 Manual Meas. window

- ③ Click "Parameter" list box and select the calculation mode and the target parameter. Selectable items are the same as the automatic measurement.

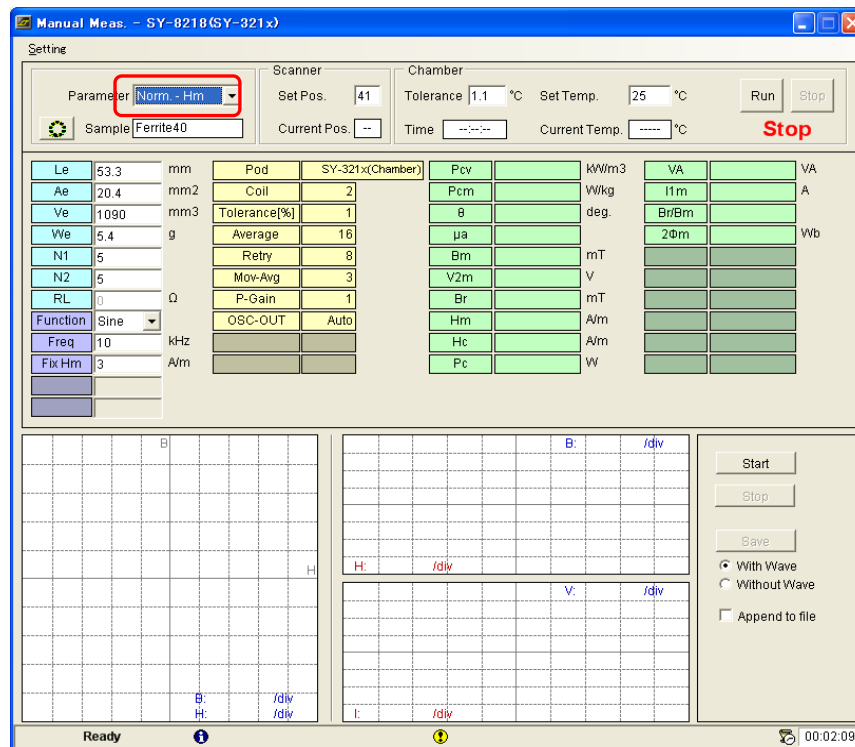


Figure 3-69 Manual Meas. window

- ④ Click "Sample" field and select the sample name. The sample list file and sample names included in the file are displayed. Select the sample name of the sample constant to be used. The same operation as that from Figure 3-45 to 3-46 will be done.

* If cancellation is to be made during selection, click the sample constant field.

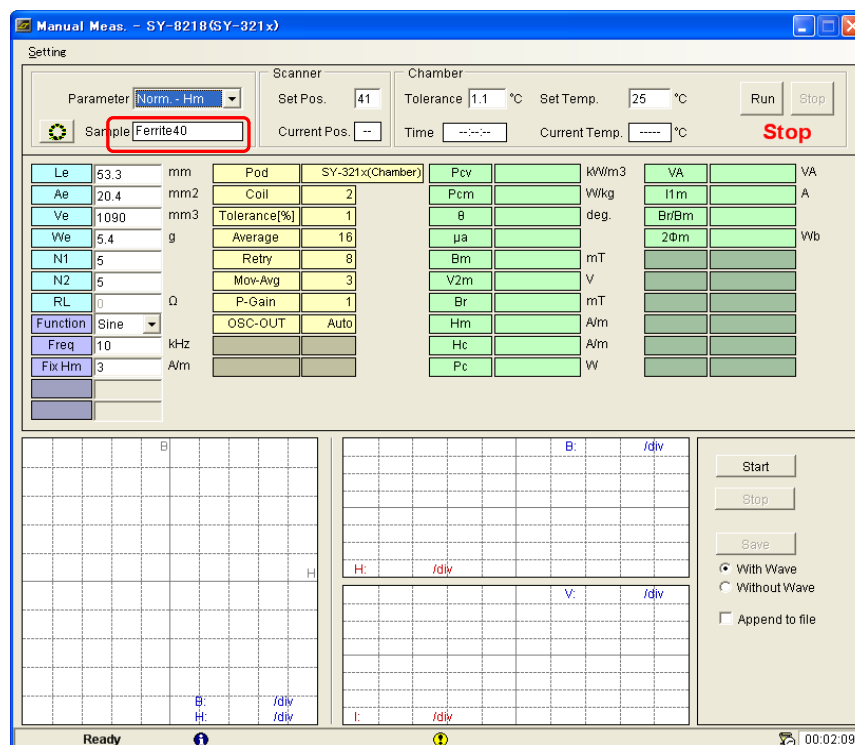


Figure 3-70 Manual Meas. window

- ⑦ Select or enter the excitation condition for measurement. The same input rules as the automatic measurement should be used. **The range and the excitation condition that can be set are different according to measurement POD used.** Refer to Table 3-7 to 3-10.

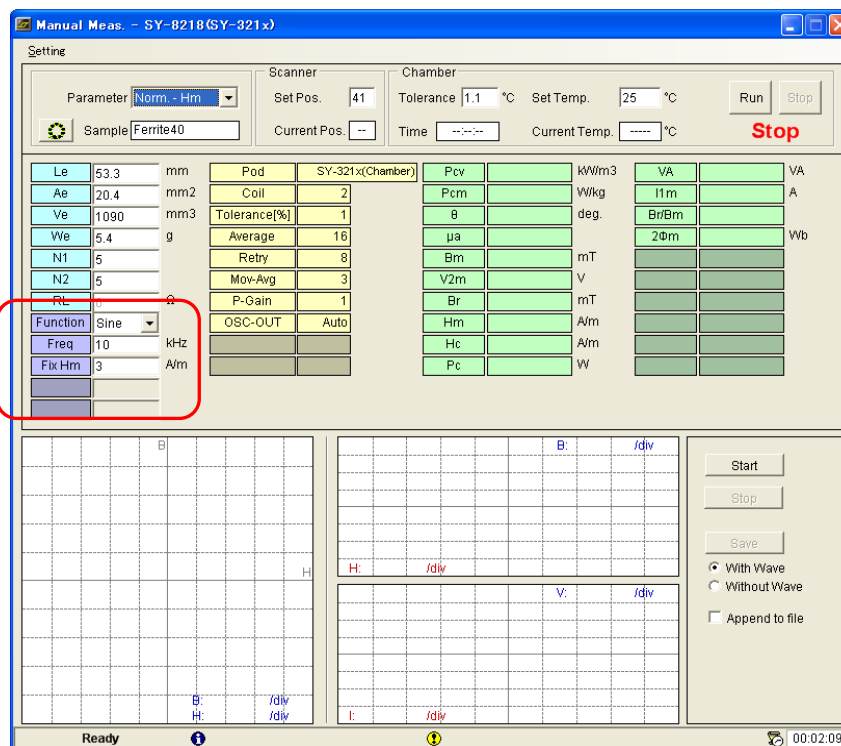


Figure3-73 Manual Meas.ウィンドウ

- ⑧ When measurement POD is SY-320x/321x, enter the position No. of the Turntable connected to the sample to be measured. The upper limit of No. to be entered is the same as the automatic measurement which is decided by the model of constant temperature chamber. See Table 3-12.

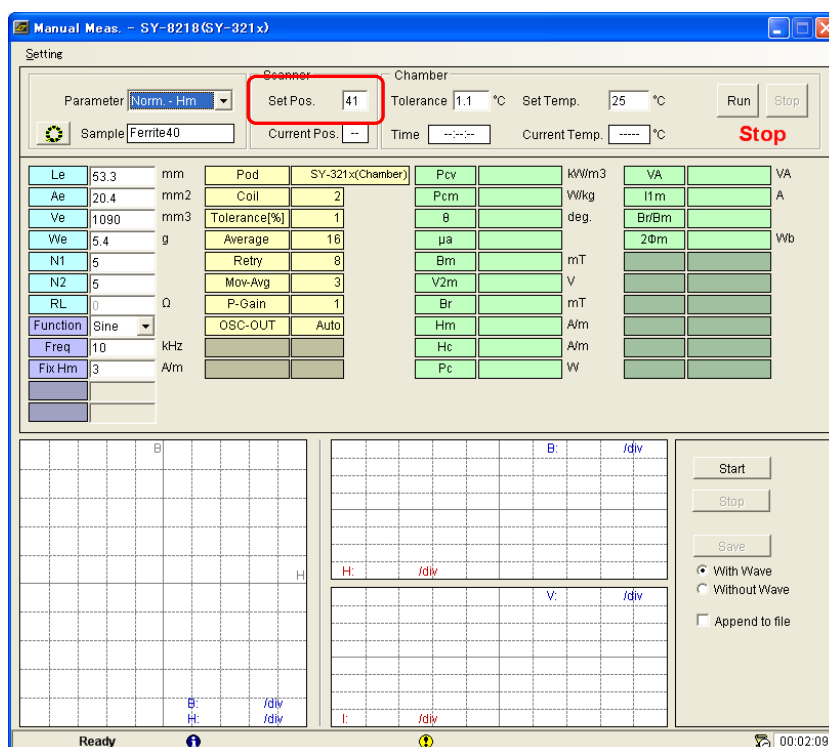


Figure 3-74 Manual Meas. window

- ⑨ When measurement POD is SY-320x/321x, enter the temperature of the constant temperature chamber and Tolerance for measurement. The same input rules as the automatic measurement should be used. See Table 3-4 and Table 3-6.

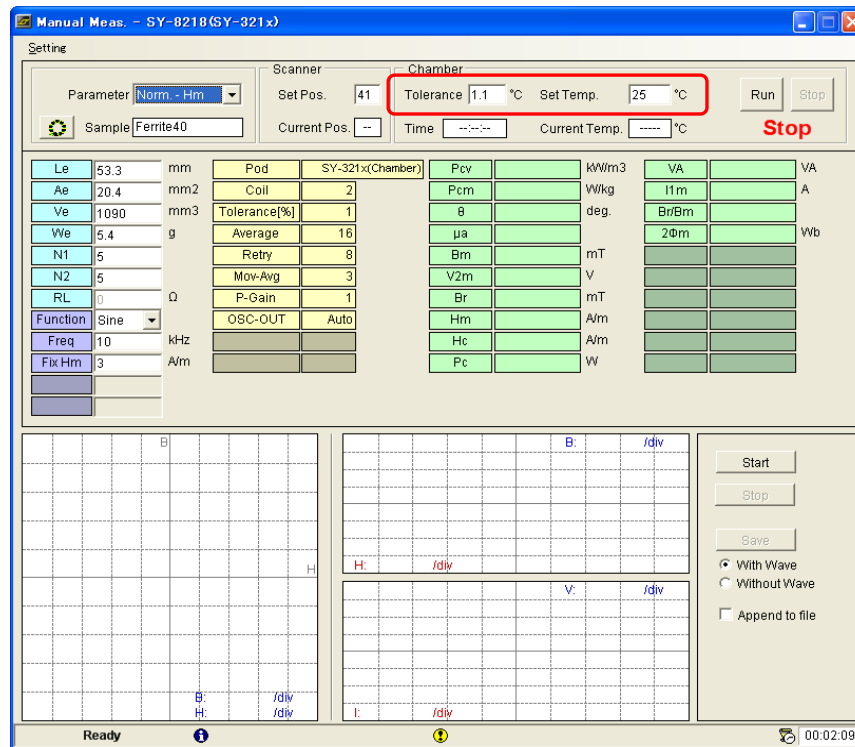


Figure 3-75 Manual Meas. Window

- ⑩ Click "Setting" and then "Configuration" to open "Configuration" window for manual measurement. Make entry or selection in accordance with Table 3-19. Click "OK" button to decide the change.

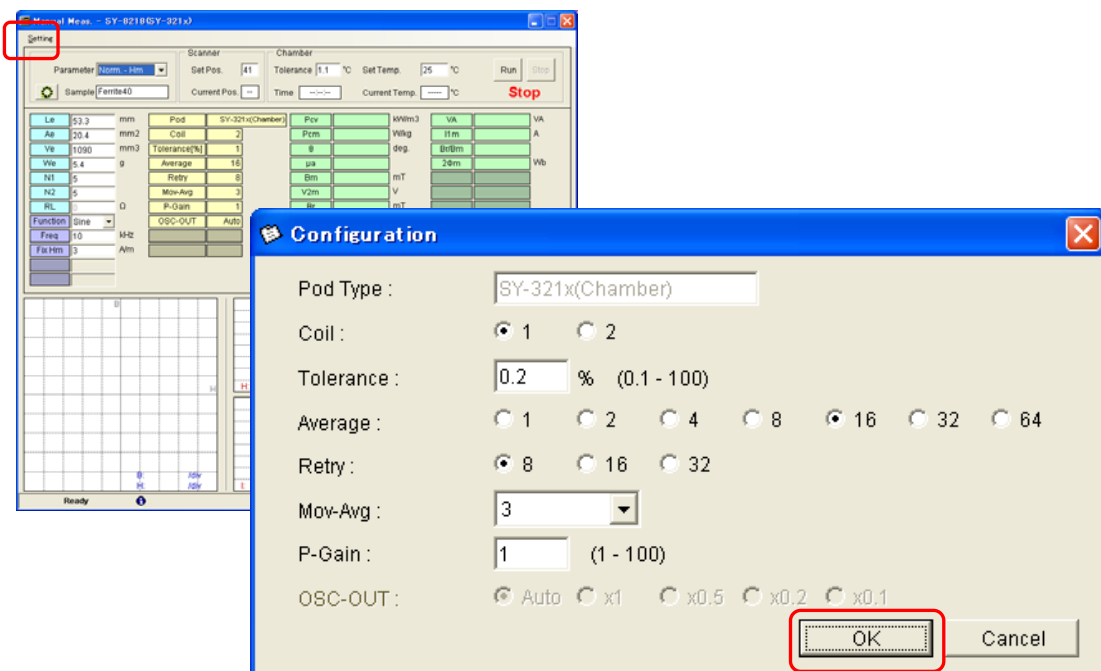


Figure 3-76 Configuration window

Table 3-21 Configuration setting items

Items	Selections/setting ranges	Descriptions	
Pod Type	Not selected	Model name of POD that has been selected now	
Coil	1	1-coil method	Selects whether 1-coil / 2-coil method is used to measure the sample.
	2	2-coil method	* When measurement POD is SY-956, it is fixation in 2-coil method and can not be selected.
Tolerance	0.1 to 100	Sets the tolerance X. The tolerance X is used for the criteria to finish measurement; i.e. X [%] is the ratio of an actual value to a target parameter setting value and if X is reached, measurement finishes.	
Average	Power of 2; i.e. 2^0 to 2^6	Selects No. of averaging times of measurement signal waveform.	
Retry	Power of 2; i.e. 2^3 to 2^5	Selects the upper No. of times of excitation until values of specified target parameter converge within Tolerance.	
Mov-Avg	Odd in 1 to 111	Selects the moving average number applied to sample data of a measurement signal waveform	
P-gain	Integer in 1 - 100	Selects a gain of a power amplifier to connect. A gain is displayed on the measurement screen and saved when data is saved.	
OSC-OUT	Not selected	Attenuation ratio of the built-in signal generator	

- ⑪ Click "Setting" and then "Unit" to open "Unit" window for manual measurement. Select the unit of each measurement value. Click "OK" button to decide the change.

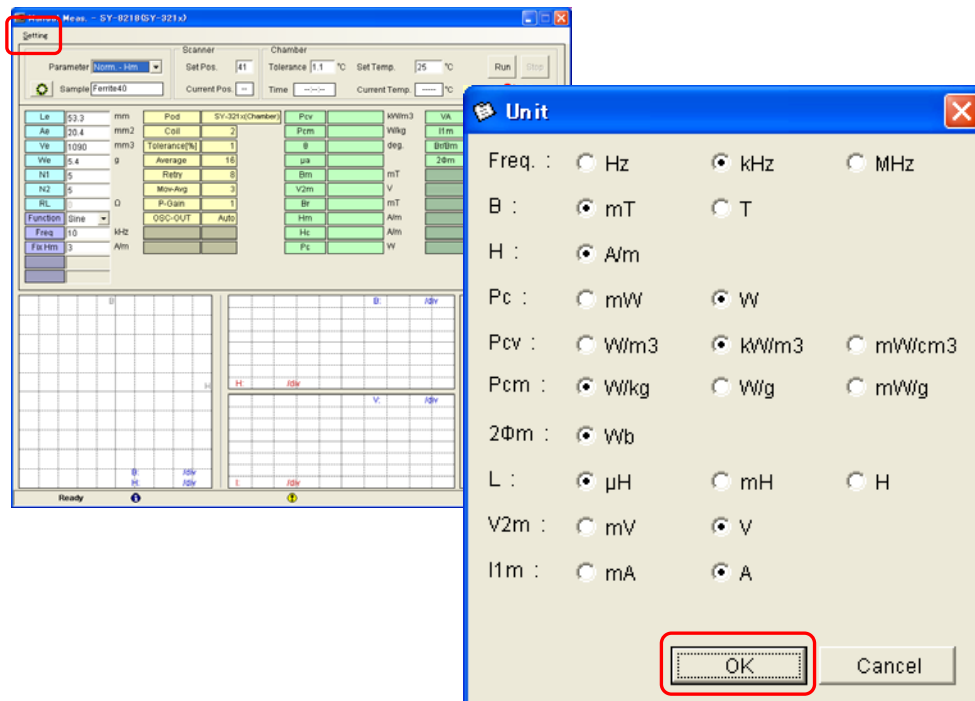


Figure 3-77 Unit window

- ⑫ When measurement POD is SY-320x/321x, click "Run" button to start the control of the constant temperature chamber.

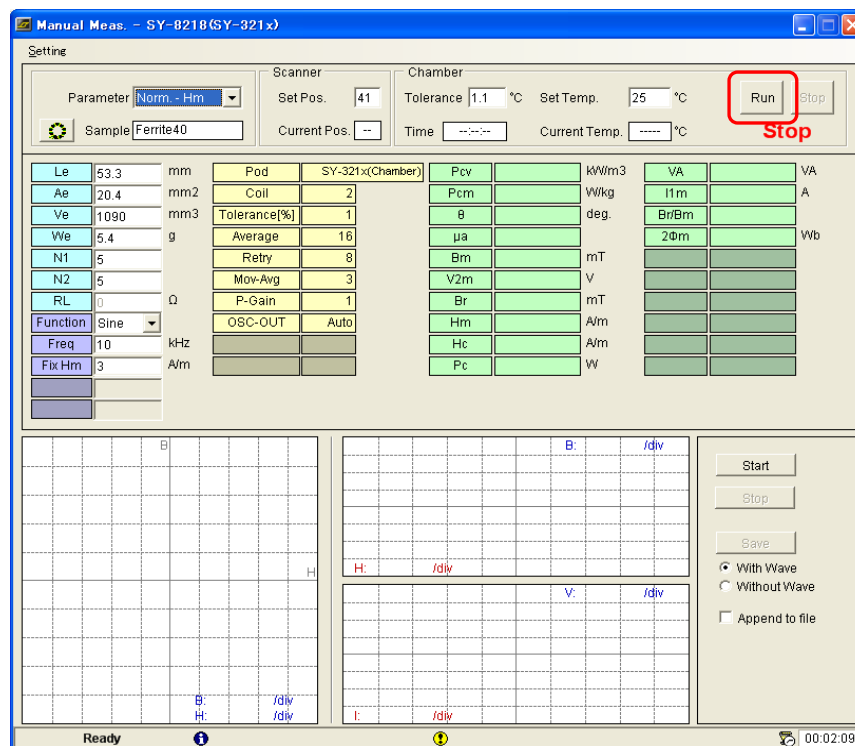


Figure 3-78 Manual Meas. window

- ⑬ Figure 3-79 shows "Manual Meas." window when measurement Pod is SY-321x and after clicking "Run" button. The following describes additional display and functions related to the constant temperature chamber.

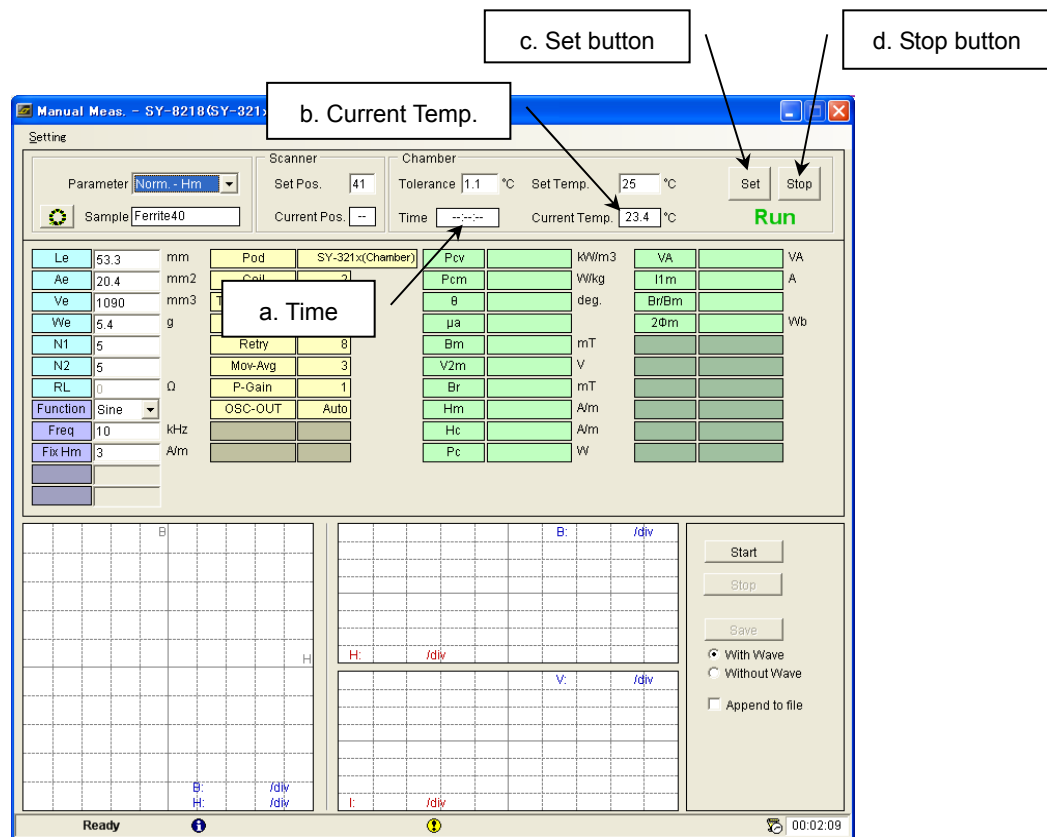
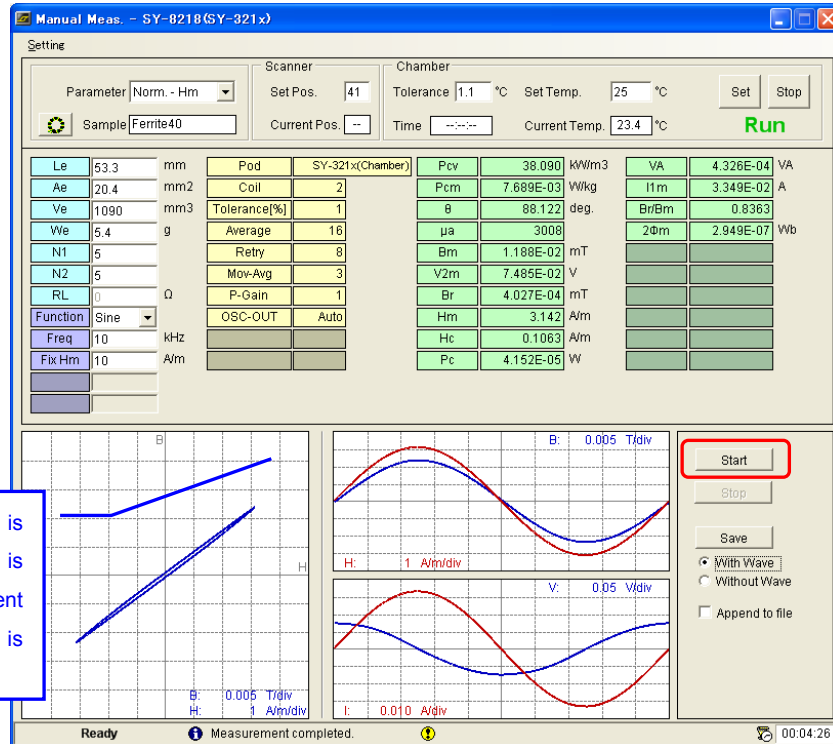


Figure 3-79 Manual Meas. window

- a. **Time** : Displays the elapsed time after the temperature of the constant temperature chamber enters Tolerance of the setting temperature.
- b. **Current Temp.** : Displays the current temperature of the constant temperature chamber.
- c. **"Set" button** : If the setting temperature of the constant temperature chamber is to be changed during control of the constant temperature chamber, change the temperature in "Set Temp." and then click "Set" button.
- d. **"Stop" button** : If clicked, control of the constant temperature chamber is forcibly stopped.

- ⑭ Click the button "Start". Measure only once then under the excitation condition to be set. When the measurement ends, waveform data is displayed. When measurement POD is SY-320x/321x, click the "Start" button at the time that the temperature of the constant temperature chamber reaches at the preset temperature. Then, measure only once under the excitation condition of setting after even No. that the Turntable position set rotates.

* When measurement POD is SY-320x/321x, if the door of the constant temperature chamber is opened during measurement, the measurement is forcibly finished.



When measurement Pod is SY-956 and YokeComp is effective, the measurement frequency of 1st/3rd is displayed here.

Figure 3-80 Manual Meas. window

- ⑮ The following describes other display and functions related to measurement.

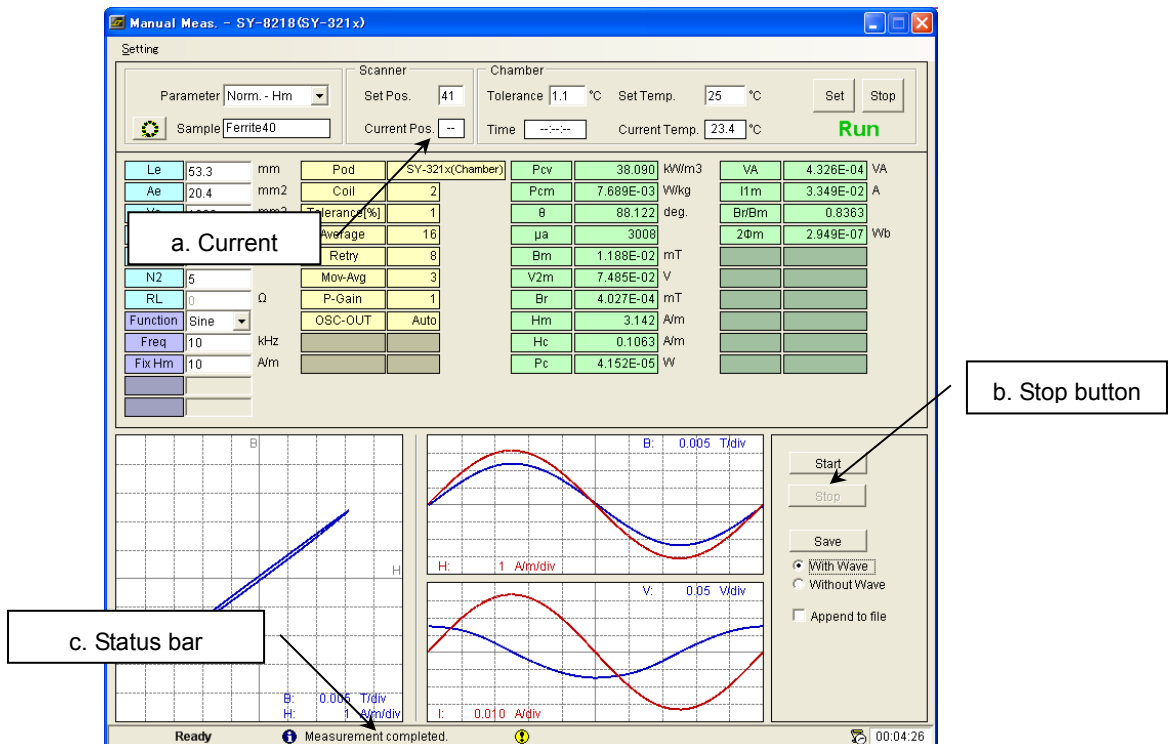


Figure 3-81 Manual Meas. window

- a. **Current Pos.:** When measurement Pod is SY-320x/321x, displays the current Turntable No.
- b. **"Stop" button:** If clicked during measurement, the measurement is forcibly finished.
- c. **Status bar:** Displays the progress and messages for measurement. For messages, see Table 4-1.
 * If multiple errors occur, only error numbers are displayed (not error messages).

⑩ If the measurement data is to be saved, click "Save" button. "Save File As" dialog box appears. Enter the file name and click "Save". **Up to 20 alphanumeric characters can be entered.**

In addition, if With Wave is checked, the measurement waveform data is also saved simultaneously.

File name: <Above file name> -1_<calculation mode>Data file format: CSV with commas as delimiter.

Moreover, when the check is put in Append to file, the measurement data is added to the same file.

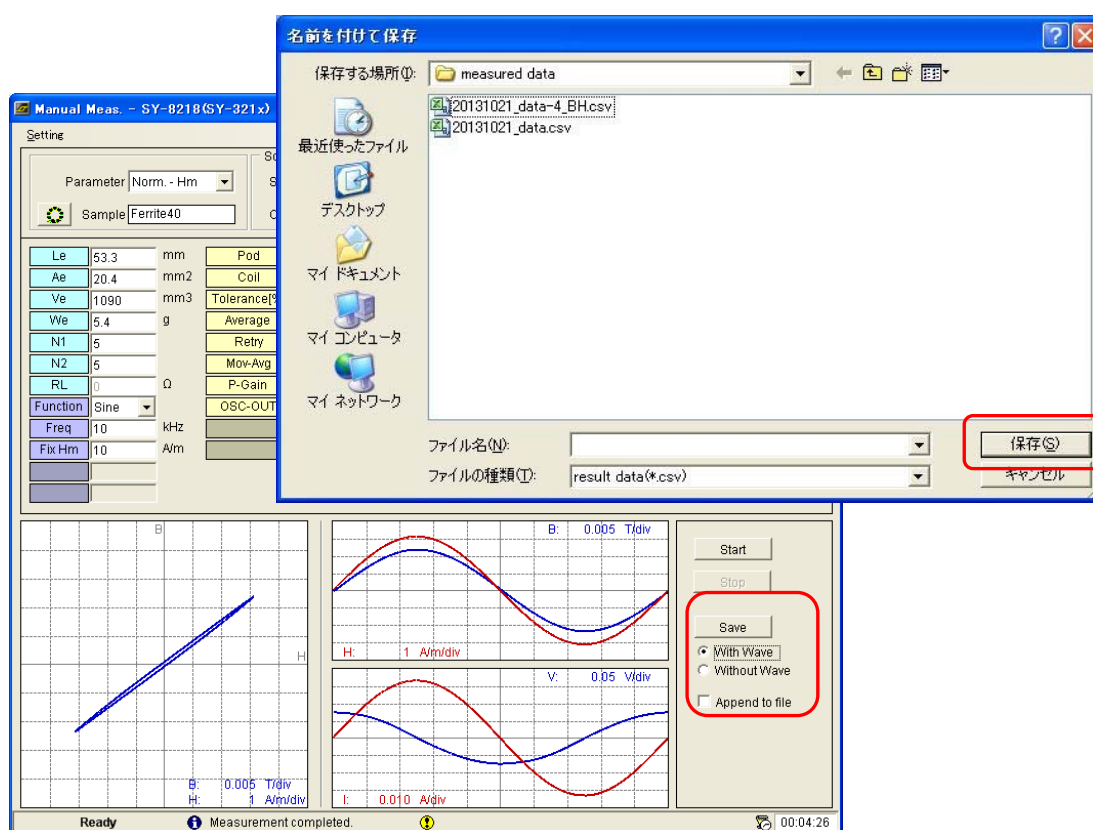


Figure 3-82 Storage dialog box

■ 3.11 Others

■ 3.11.1 "Device" window

- The following describes "Device" window

- ① Click "Device" button on "Main" window to open "Device" window.

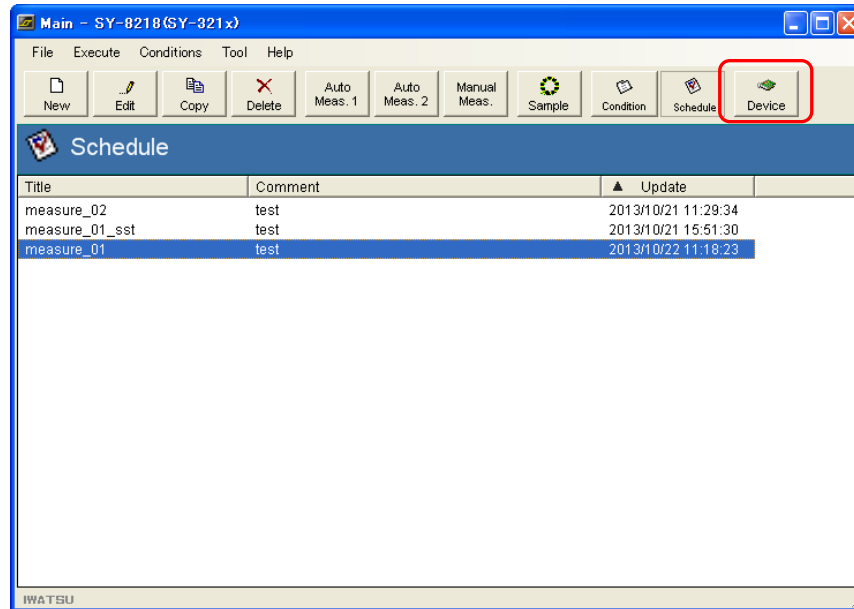


Figure 3-83 Main window

- ② "Device" window displays connection statuses of devices. Figure 3-84 shows connection status of B-H Analyzer: SY-8218, the constant temperature chamber, and the scanner and their GPIB addresses (see Table 2-2). And Figure 3-85 shows connection status of only B-H Analyzer: SY-8218. "Search" button is pressed, connection status of devices are searched again. Moreover, the connection of SY-956 and SY-960 is not displayed.

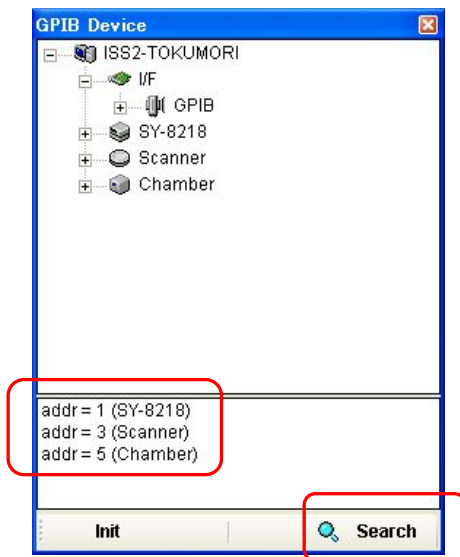


Figure 3-84 Device window

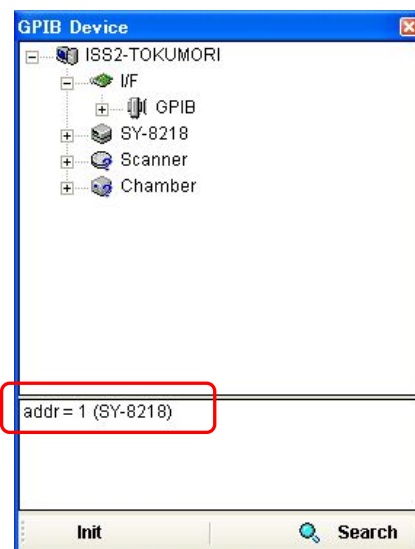


Figure 3-85 Device window

■ 3.11.2 "Main" window menu bar

- Table 3-22 shows description of "Main" window menu bar including what has not been explained up to now.



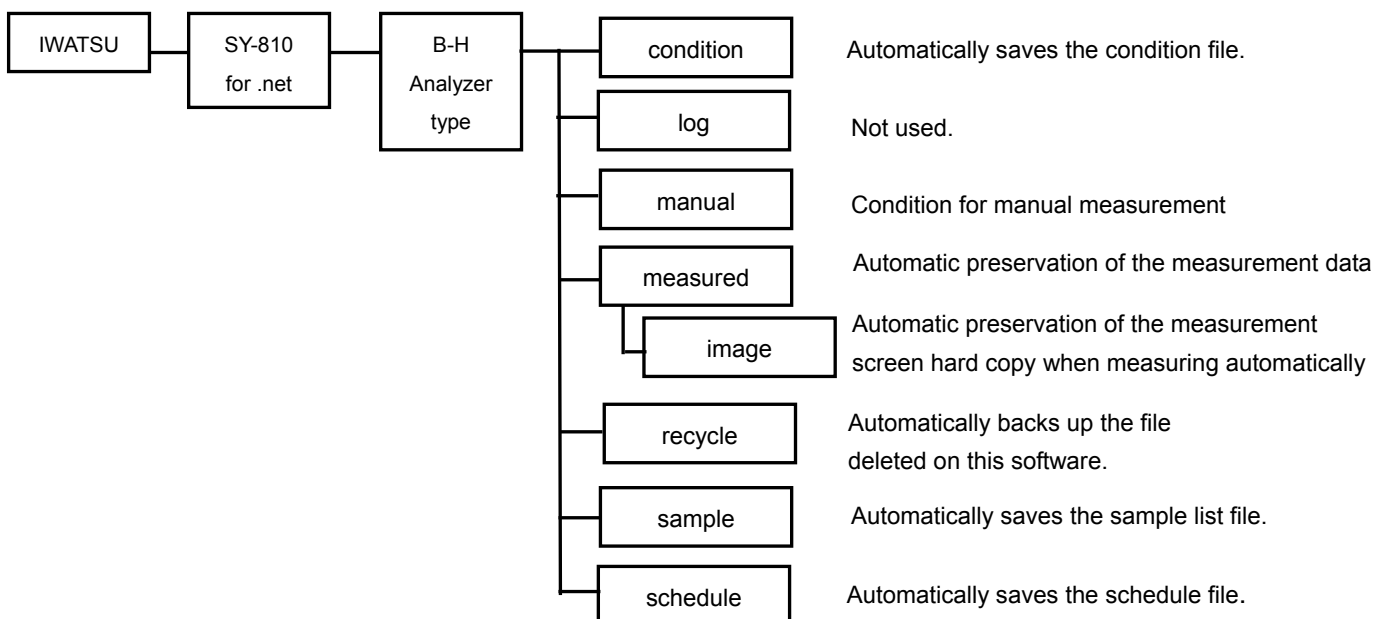
Figure.3-86 Main window menu bar

Table 3-22 Main window menu bar

Menu items	Commands	Descriptions
File	New	Newly opens a selected file.
	Edit	Edits the selected file.
	Copy	Copies the selected file.
	Delete	Deletes the selected file.
	Rename	Renames the selected file.
	Quit	Finishes SY-810.
Execute	Auto Meas.1	Executes automatic measurement 1 with the selected schedule file.
	Auto Meas.2	Executes automatic measurement 2 with the selected schedule file.
	Manual Meas.	Makes manual measurement.
Conditions	Edit Sample	Opens "Sample" window.
	Condition	Opens "Condition" window.
	Schedule	Opens "Schedule" window.
Tool	Device View	Opens "Device" window.
Help	About SY-810	Displays the version information on SY-810.

■ 3.11.3 Folder structure

- Figure 3-87 shows the folder structure which is automatically generated by this software.



- * A file in "recycle" folder should be deleted by Explorer and others as required.
- * A file in each folder **must not be edited** by other than the method of this software.

Figure 3-87 Software folder structure

■ 3.11.4 Measurement data

- The following is the supplement related to measurement data and waveform data for automatic/manual measurement which are saved by this software.

- ① File format for both: CSV format with commas as a delimiter
- ② If measurement cannot be made because of e.g. Errors, "*" (asterisk) is saved.
- ③ The POD type is stored by the figure. Please refer to Table3-23 for correspondence.

Table 3-23 No. of POD type

POD Type		Storage POD No.
SY-8218	SY-951 (Standard)	0
	SY-320x (Chamber)	1
	SY-321x (Chamber)	
	SY-956 (Single Sheet)	2
	SY-960 (DC Bias)	3
	-	4
	-	5
SY-8219	SY-955 (Standard)	0
	SY-320x (Chamber)	1
	SY-321x (Chamber)	
	SY-956 (Single Sheet)	2
	SY-960 (DC Bias)	3
	-	4
	-	5

Chapter 4 Troubleshooting and Maintenance

■ 4.1 Error message and warning message

- If the message No. or message shown in Table.4-1 is displayed in "Status" field of the schedule sequence view for automatic measurement or in the status bar for manual measurement, remedy shown in Table should be executed.

Table.4-1 Errors /Warning messages

Message No.	Causes	Remedies
E08: Call service!	• Interference of firmware when starting	• Reactivate according to ■ 4.7 of Instruction Manual for SY-8218/8219. When the symptom is the same even if it reactivates, contact our service center, and notify the error message No.
E01, E02, E03, E05, E07, E11: Call service!	• Malfunction occurs in hardware.	• Reactivate this instrument. When the symptom is the same even if it reactivates, contact our service center, and notify the error message No.
In case of SY-8218, E12: POD unconnected! Shutdown the SY-8218!	• Measurement POD is not connected to B-H Analyzer.	• Power off this instrument and connect the measurement POD to B-H Analyzer.
In case of SY-8219, E12: POD unconnected! Shutdown the SY-8219!	• The model No. of a measurement POD connected to this instrument is different from that selected in the measurement mode.	• Power off this instrument and connect a proper measurement POD. * In Utilities > Option, if the corresponding Option is not set to Enabled, the measurement cannot be done.
E13: Memory bank X data has NaN!	• Non-numerical value is written in memory bank X, or memory bank X is abnormal.	• Reactivate this instrument. When the symptom is the same even if it reactivates, contact Iwatsu service center to tell the error message No.
E14: Memory bank X shunt resistance errors!	• The shunt resistance of memory bank X is ≤ 0.	
E16: SY-821x software version is outdated!	• As the version of the software for the B-H Analyzer is old, it doesn't correspond to SY-810 used.	• The main unit software should improve in the version. Contact Iwatsu service center.
E17: Temp. of FET heat sink on DCS exceeds setting!	• The temperature of the heat sink of SY-961(DCS) (thermistor) exceeded 90°C.	• Reactivate SY-961. When the symptom is the same even if it reactivates, contact our service center, and notify the error message No.
E18: DCS over current!	• The output current of SY-961(DCS) exceeded setting value $\times 1.1$.	• Power off SY-961. Contact Iwatsu service center to tell the error message No.
W09: Measurement was finished forcibly	• STOP button is pressed to stop measurement forcibly.	—
W12: Temp. of the shunt resistance exceeds setting!	• The temperature of the shunt resistance measuring the exciting current exceeds 80°C.	• Reduce Hm, Bm, Im, and V2m of Fixed Parameter to decrease the exciting current before measurement. • Reduce the number of Averages. Or increase Tolerance to make the excitation time short.
W13: Pod cover opens!	• POD cover opens.	• Close POD cover securely.
	• POD has come off the main unit.	• Power off this instrument and neatly connect measurement POD to main unit.

Table.4-1 Errors / warning messages

Message No.	Causes	Remedies
W14: Shortage of the exciting current!	The exciting current is insufficient because of approximate value excitation.	- Confirm whether the sample is connected. - Confirm whether the output goes out of the power amplifier - Raise the gain of the power amplifier. - Increase N_1 of the sample.
	The DC cable (black) has been disconnected by the DC bias measurement.	Confirm the disconnection of the DC cable (black).
W15: SST fixture cover opens!	The cover of SY-956 (SST) is open.	Shut the cover of SY-956 neatly.
W16: DCT cover opens!	The cover of SY-960 (DCT) is open.	Shut the cover of SY-960 neatly.
W19: H range over at 1st excitation!	Overflow occurs in the exciting current measurement range during approximate value excitation.	If H_m is specified in Fixed Parameter, confirm whether numeric values and units of L_e and N_1 are correct.
W20: B range over at 1st excitation!	Overflow occurs in the induced voltage measurement range during approximate value excitation.	If B_m is specified in Fixed Parameter, confirm whether numeric values and units of A_e and N_2 are correct.
W23: SST serial communication is abnormal!	Serial communication with SY-956 (SST) is abnormal.	Reactivate this instrument and SY-956. When this phenomenon happens frequently, contact lwatsu service center to tell the error message No.
W24: DCT serial communication is abnormal!	Serial communication with SY-960 (DCT) is abnormal.	Reactivate this instrument, SY-960 and SY-961. When this phenomenon happens frequently, contact lwatsu service center to tell the error message No.
W25: DCS serial communication is abnormal!	Serial communication with SY-961 (DCS) is abnormal.	Reactivate this instrument, SY-960 and SY-961. When this phenomenon happens frequently, contact lwatsu service center to tell the error message No.
W30: Setting condition error! $V_2 > 200V$	In measurement condition, induced voltage exceeds 200[V].	Confirm wheter values and units of N_2, A_e, and freq. are proper.
		- Confirm wheter values and units of B_m specified in Fixed Parameter is proper. - Reduce N_2 of the sample.
W32: Setting condition error! $I_1 > 6A$	In measurement condition, exciting current exceeds 6[A].	Confirm whether values and units of N_1 and L_e are proper.
		- Confirm whether value and unit of H_m specified in Fixed Parameter are proper. - Increase N_1 of the sample.
W34: Setting condition error! Yoke V_3 or $V_4 > 200V$	It is forecast that the output voltage of the third or fourth turns of the measurement yoke exceeds 200V when 2nd is measured by the Single Seat Measurement.	Confirm whether the value specified with Fixed Parameter is too large.
		Confirm whether the value of A_e is too large.

Table.4-1 Errors / warning messages

Message No.	Causes	Remedies
W35: Setting condition error! $\Delta V_L > 400V$	It is a measurement condition for the increment voltage to exceed $400[V_{p-p}]$ by the DC bias measurement.	- Confirm whether values and units of N_2, A_e, and freq. are proper. - Confirm whether values and units of B_m specified in Fixed Parameter is proper. - Reduce N_2 of the sample.
W36: Setting condition error! $\Delta I_L > 12A$	It is a measurement condition for the increment current to exceed $12[A_{p-p}]$ by the DC bias measurement.	- Confirm whether values and units of N_1 and L_e are proper. - Confirm whether value of H_m specified in Fixed Parameter is proper. - Increase N_1 of the sample.
W41: OSC output under! $\leq 0V$	OSC output is tried to be set under $0[V]$ during approximate value excitation.	- Confirm whether the value specified with Fixed Parameter is too small. - Reduce the gain of the power amplifier.
W42: Shortage of the exciting current!	The exciting current is insufficient by asymptote excitation.	Confirm whether the sample is connected or disconnected.
W43: OSC output under! $\leq 0V$	OSC output is tried to be set under $0[V]$ during asymptote excitation.	- Confirm whether the output of the power amplifier is proper. - Reduce the gain of the power amplifier.
W50: Measured V_{2m} over! $> 200V$	Induced voltage measured exceeds $200[V]$.	- Confirm whether values and units of N_2, A_e, and freq. are proper. - Confirm whether value and unit of B_m specified in Fixed Parameter are proper. - Reduce N_2 of the sample.
W51: Measured V_{2m} under! $\leq 0V$	Induced voltage measured becomes $0[V]$ or less.	- Confirm whether the output of the power amplifier exceeds ratings. (Confirm that the OVER LOAD lamp of the power amplifier turns on.) - Confirm whether secondary turns has been disconnected.
W52: Measured I_{1m} over! $> 6A$	Exciting current measured exceeds $6[A]$.	- Confirm whether values and units of N_1 and L_e are proper. - Confirm whether unit of H_m specified in Fixed Parameter is proper. - Increase N_1 of the sample.
W53: Measured I_{1m} under! $\leq 0A$	Exciting current measured is $0[A]$ or less.	- Confirm whether value and unit of specified in Fixed Parameter are proper. - Confirm whether primary turns is not disconnected. - It is an extremely small current that cannot be measured with this instrument.
W54: Measured V_L over! $> 200V$	In DC bias measurement, the voltage to be measured exceeds $200[V]$.	Confirm the measurement condition. (Refer to ■ 2.3 of the instruction manual for SY-960.)
W55: DCS overvoltage!	The compliance voltage of SY-961 (DCS) is overvoltage.	After confirm whether big I_{dc} is thrown into the sample that ESR is big, restart SY-961.
W56: DCS no current!	The current is not output from SY-961(DCS).	After confirm whether the DC cable disconnects or unconnects, reactivate SY-961

Table.4-1 Errors / warning messages

Message No.	Causes	Remedies
W57: Temp. of FET heat sink on DCS exceeds setting!	The temperature (IC sensor) of the heat sink of SY-961(DCS) exceeded 90[°C].	Reactivate SY-961. When this phenomenon happens frequently, contact Iwatsu service center to tell the error message No.
W58: Temp. of sample on DCT exceeds setting!	The temperature of the sample exceeded the preset temperature of overheating protection switch by the DC bias measurement while measuring.	Review the measurement condition.
W59: Measured $\angle$ IL over! > 12A	It is a measurement condition for the increment current to exceed 12[A_{p-p}] by the DC bias measurement.	Confirm the measurement condition. (Refer to ■ 2.3 of the Instruction Manual for SY-960.)
W60: Retry over!	In the number of excitation times set in Configuration > Retry, a measured value of the parameter specified in Fixed Parameter cannot be obtained within Tolerance.	- Try to increase Tolerance. - Enlarge the value specified with Fixed Parameter. - Increase the number of Retry times. - If B-H curve becomes nearly saturated, change Fixed Parameter from Bm to Hm.
W61: Accuracy limit of measurement!	The minimum limit of core loss measured by this instrument is exceeded.	- Confirm broken winding and winding applied to the measurement POD. - Extremely small core loss that cannot be measured with this instrument.
W62: Not measure in this condition!	Although a measurement condition is changed, no measurement is made and data tries to be saved.	After measurement, save the data.
W63: C drive cannot save!	Data or setup tries to be saved in C drive of B-H Analyzer.	Connect USB storage device (e.g. USB memory) to this instrument and save data in it. * This instrument does not disclose C drive to a user.
W65: Target device is not found!	- No storage equipment to save / recall is found out (removed on the way). - Recalled the data of a different model.	- Press the EXT key and then insert USB memory. - The data of a different model can not be recalled.
W66: Read only file cannot be saved!	Data cannot be saved in the read-only file.	Specify other than read-only file for a storage file.
W68: Already exists. Do you want to overwrite it?	Data tries to be overwritten on an existing file.	Select Yes or No.
W69: Failed in a saved!	Data fails to be saved. (Memory is full or memory is removed during save operation.)	Remove the cause.
W70: Failed in a recalled!	It failed in the recall of data. (SST that doesn't correspond to the main unit is connected and so on.)	Remove the cause.
W71: DCS output time out!	The electric current output time of SY-961(DCS) exceeded the time limit.	- Try to increase Tolerance. - Decrease the number of Retry times.

■ 4.2 Other troubles

Table.4-2 Other troubles

Phenomena	Causes	Remedies
Click cannot be done because the measurement button of e.g. "Auto Meas 1" on "Main" window is disabled.	• B-H Analyzer is powered off.	• Finish this software and power on B-H Analyzer.
	• B-H Analyzer is not connected.	• Finish this software and make connection as shown in Figure 2-1 to 2-3.
	• GPIB address of B-H Analyzer is incorrect.	• Finish this software and make address setting as shown in Table.2-2.
The constant temperature chamber is connected but "Chamber off!" is displayed.	• The constant temperature chamber is powered off.	• Finish this software and power on the constant temperature chamber.
	• GPIB address of the constant temperature chamber is incorrect.	• Finish this software and make address setting as shown in Table.2-2.
The constant temperature chamber is connected but "Scanner off!" is displayed.	• The scanner is powered off.	• Finish this software and power on the scanner.
	• GPIB address of the scanner is incorrect.	• Finish this software and make address setting as shown in Table.2-2.
Hang up.	• PC is used in the power saving mode.	• Forcibly finish this software and release the power saving mode of the PC.
Although clicking "Quit", the software cannot be finished.	• B-H Analyzer, the constant temperature chamber, or the scanner is powered off first.	• Forcibly finish this software and observe the finish sequence in future. See ■ 3.3 of Instruction Manual for SY-8218/8219.
	• The sample list file, condition file, or schedule file which was edited by other than the method of this software is used.	• Forcibly finish this software and if it occurs after restarting this software, the software may be damaged. Not guaranteed.
Click cannot be done because "Start" button on "Main" window is disabled.	No "X" mark exists on the selected schedule file.	Use the proper schedule file.
"Chamber: Door is opening " is displayed though the door in the constant temperature chamber is closed.	• The BNC cable from the constant temperature chamber is not connected with the door switch in the back of the constant temperature chamber scanner unit.	• This software is ended, and the BNC cable from the constant temperature chamber is connected with the door switch in the back of the constant temperature chamber scanner unit. (Refer to the instruction manual for the constant temperature chamber scanner unit SY-320x/321x.)
When the measurement begins, "Freq" is out of range. Please change the value. (Range 10 ~ *1000000 Hz) is displayed. * The display changes into the unit and the figure of the frequency by measurement POD.	• Though the measurement POD is SY-955, it tries to measure by the frequency that exceeds sine wave 1MHz.	• Changes to the measurement frequency of 1MHz or less.
	• Though the measurement POD is SY-956, it tries to measure by the frequency that exceeds sine wave 20kHz.	• Changes to the measurement frequency of 20kHz or less.
	• It tries to measure by the frequency of less than 10kHz though measurement POD is SY-960.	• Changes to the measuring frequency of 10kHz or more.

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