Semiconductor Parameter Measurement Application

CS-830
Instruction Manual

IWATSU

Preface

◇ Thank you so much for purchasing the Semiconductor Parameter Measurement Application CS-830. We hope it will bring you continued enjoyment and satisfaction.

◇ This instruction manual describes the CS-830 that controls the curve tracer CS-8000 series and PC using the LAN interface, and measures the characteristics of a device automatically.
For the function and the operation method of the curve tracer, refer to the instruction manual of each instrument.

◇ Before using the CS-830, read this manual and understand the content sufficiently. After you read it, keep this manual, instruction manual, and CD in a safe place.

Notices

◇ A part of this manual may be changed without notice for improving the performance and the function.

◇ Reprint or copy of the content of this manual without notice is prohibited.

◇ All instrument names and brand names included with this manual are described for the identification. Each instrument name and brand is the registered trade mark held by relevant individual or body corporate.

◇ Microsoft, Microsoft Windows, and Microsoft Excel are registered trademarks of Microsoft Corporation .
NI and National Instruments are registered trademarks of National Instruments Corporation.

◇ If you have any inquiry on this instrument, please contact Iwatsu at the address listed at the end of this manual or our sales distributors or contact Iwatsu office or our sales distributors for repair.

History

◇ March 2024: 1st edition issued

◇ December 2024: 2nd edition issued

Important Safety Precautions

To ensure safe operation of this instrument and to prevent damage to property, read and carefully observe "⚠ CAUTION" in the following section. Be sure to read them.

Description of "⚠ CAUTION" in this manual

⚠ CAUTION	If you handle the instrument wrongly ignoring the item described here, this software may be damaged.

Be sure to read the following for safety.

⚠ CAUTION

- **Caution for using this software**
  - When you install this software into the PC and use it, read and observe the content of "1.2 Prohibited matter" in this instruction manual.
    Otherwise, we may not repair the instrument.

Verify the package contents

It the CS-830 reaches you, please Verify the package contents. If some item is missing or the CD is damaged during the transportation, please contact Iwatsu at the address listed at the end of this manual or our sales distributors or contact Iwatsu office or our sales distributors for repair.

Packaged items

○ **CD**

The data stored in the CD of Semiconductor Parameter Measurement Application CS-830 is shown below.

Install CD	
readme_j.txt	
readme_e.txt	
IWATSUEula.rtf	**IWATSU Software License Agreement (English/Japanese)**
NILicenseAgreement_Jpn.rtf	**NI Software license agreement (Japanese)**
NILicenseAgreement_Eng.rtf	**NI Software license agreement (English)**
Install	**Data folder for installer**
Install.exe	**Installer file**
Manual	**Folder of instruction manual**
CS-830Manual_JP.pdf	**CS-830 Instruction Manual (Japanese)**
CS-830Manual_EN.pdf	**CS-830 Instruction Manual (English)**
CS-8000_WaveViewerHelp_JP.pdf	**WaveViewer Instruction Manual (Japanese)**
CS-8000_WaveViewerHelp_EN.pdf	**WaveViewer Instruction Manual (English)**
CS-8000 Remote Control Tool JP.pdf	**RemoteCtrlTool Instruction Manual (Japanese)**
CS-8000 Remote Control Tool EN.pdf	**RemoteCtrlTool Instruction Manual (English)**
CS_AddonCtrlHelp_jp.pdf	**AddonCtrlTool Instruction Manual (Japanese)**
CS_AddonCtrlHelp_en.pdf	**AddonCtrlTool Instruction Manual (English)**

Handling of the instrument

If a defect is generated at the install carried out by this instrument or a malfunction is generated after the install, please contact our company's service office (refer to the end of this manual and contact address").

Contents

1 Overview

Semiconductor Parameter Measurement Application CS-830 is the application software that connects the Curve Tracers CS-8000 Series to a PC with LAN interface and automatically measures characteristics of a device by remote control.

For evaluating the performance of a semiconductor device, it is necessary to measure some parameters (e.g. Ices, Vces, Vth, etc…) generally. However, measuring all parameters for more than one device is a hard work.

This software is convenient for reducing the labor hour of manual operation for such a work. If you use this software, for example, the measurement of each parameter is automatically performed following the prior setting. For this reason, the manual work is only the replacement of target devices and the change of wiring basically. The result of parameter measurement can be evaluated with the threshold value that has been set by automatically classifying the levels. Moreover, all parameter measurement results of all devices can be collectively saved, so you can browse them later.

In this manner, you can use this software as a convenient tool when you measure same types of devices repeatedly.

1.1 Main functions

- Automatic measurement
  A series of operations such as setting of Curve Tracer, acquisition of characteristic curve, reading of characteristic value from characteristic curve, and level evaluation are automatically executed. If more than one measurement item is set in advance, this series of operations is automatically executed for all measurement items.
- Setting and storage of automatic measurement items
  The settings of measurement items (item name, setting of Curve Tracer, method for acquiring a characteristic curve (Sweep, 1-Point) and application of constant current/voltage (Stress), method for reading a characteristic value, setting of Level evaluation etc.) that are carried out by the automatic measurement can be saved in a file. A file can include more than one measurement item. You can restart the same measurement by reading a saved file.
- Acquisition and setting of Curve Tracer TEMPLATE
  During the automatic measurement, the setting of Curve Tracer is carried out by recalling a TEMPLATE file, so it is necessary to create a TEMPLATE for each measurement item. In order to enabling this operation, you can acquire and store the setting of Curve Tracer as a TEMPLATE file in a PC or set a TEMPLATE file that is stored in a PC for Curve Tracer by contraries.
- Evaluation of level of measurement value
  The measurement value acquired by automatic measurement can be evaluated with an arbitrary level. The evaluation can be used for classifying conforming product and defective product. Action setting (stop of measurement, skip of measurement, warning display, and acquisition of Wave data/ScreenCopy) can be made for each level.
- Saving and reading of measurement result data
  The measurement result of automatic measurement is automatically saved in LogFile in XML format. The saved LogFile can be browsed and additional measurement can be carried out.
- Output of Excel or CSV file of measurement result data
  The measurement result of automatic measurement can be output by converting it to Excel file or CSV file.
- Control of the scanner system CS-700 and the temperature regulator (Option)
  Measurements can be made by incorporating into automatic measurement the controls such as the channel setting of the scanner system and the temperature setting of the temperature regulator.

- Application of constant voltage/current for a specified duration
  Constant voltage or constant current can be applied for a specified duration as an automatic measurement item. You can perform measurements at specified interval times and save the measurement results to a file.

1.2 Prohibited matter

When you use this software, observe the requirements shown below. Otherwise, the behavior cannot be ensured.

- This software can be installed into only one PC. The install into two or more PCs acts against the license agreement.
- Do not use a PC in power-saving mode.
- If the control from more than one connection is carried out at the same time during the measurement with this software by controlling Curve Tracer from other software, for example, the measurement may not be carried out properly.
- Do not use the measurement setting file (TestSuiteFile) and measurement result file (LogFile) for this application by editing them in the method other than the method of this software.
- Do not edit TEMPLATE file of Curve Tracer to recall it to Curve Tracer or do not use it for this software.

2 System Requirements

The Requirements for using this software are shown below.

Classifications	Items	Necessary requirements and specifications
Curve Tracer	Model	CS-8000 Series
	Software version	3.05 or later
Control PC	OS	Windows 10
	.Net Framework	4.0 or later
	VISA library	19.0.0 or later (only when using the ScannerSystem)
	Microsoft Excel	2007 or later 32bit (only when conversion to Excel is executed)

For stable operation of automatic measurement, please configure the system of the PC as follows prior to launching the application.

- Setting of power plans
  Since operation time will not be as specified if PC enters the system stand-by (sleep) or hibernation mode during stress application or waiting time of TempRegulator, set time to enter into sleep and hibernation to appropriate values using Power Options of Windows.
- Setting of Windows Update
  Since the application may be prevented from continuing its operation due to automatic rebooting, etc., if any updates are automatically installed by Windows Update during stress application or waiting time of TempRegulator, configure Windows Update so that any updates will not be automatically installed during the automatic measurement of the application.

3 Connection

3.1 Network setting

This application uses TCP/IP protocol for the communications with Curve Tracer, so it is necessary to make network setting such as IP address. For REMOTE CONTROL setting of Curve Tracer, DHCP function is set to ON when the product is shipped from factory and the network setting is automatically carried out. For the environment without DHCP server, set DHCP function to OFF and make settings shown below manually.

- IP address
- Subnet mask
- Default gateway

For details on the setting, refer to [Detailed Settings in the SYSTEM Menu] in the instruction manual of Curve Tracer CS-8000.
Make the network setting between PC in which this application is installed and Curve Tracer properly for enabling communications.

3.2 Cable connection

If a proper network setting is made, turn OFF the power supply of Curve Tracer and connect PC in which this application is installed and Curve Tracer with a network cable.
For the connection via network, make a connection to the network terminal such as hub using a straight cable. When you connect Curve Tracer and PC directly, make a connection using a cross cable (for some PCs, the method of connection is distinguished by PC side by automatic detection, so both cables can be connected).

3.3 Check of connection

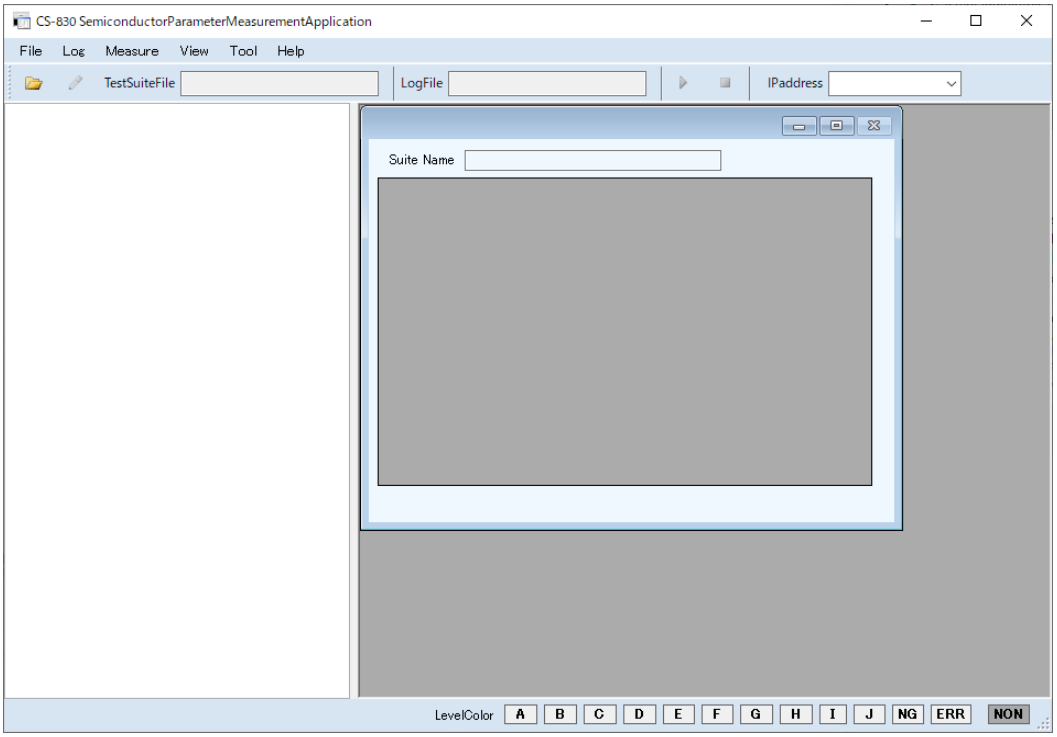
Turn ON the power supply of Curve Tracer. You can check the IP address that is set manually or automatically by clicking [SYSTEM Menu]-[SYSTEM STATUS]-[REMOTE STATUS].
Activate CS-830ParameterMeasurementApplication and input the IP address of Curve Tracer in [IPaddress] on the main screen. Click [Measure]-[ConnectCheck] on the main menu. If the connection is made properly, the message that the connection is made successfully is displayed at the lower left of the main screen. If the connection is failed, a warning screen is displayed. Check the network setting and connection.

4 Using the instrument with CS-830

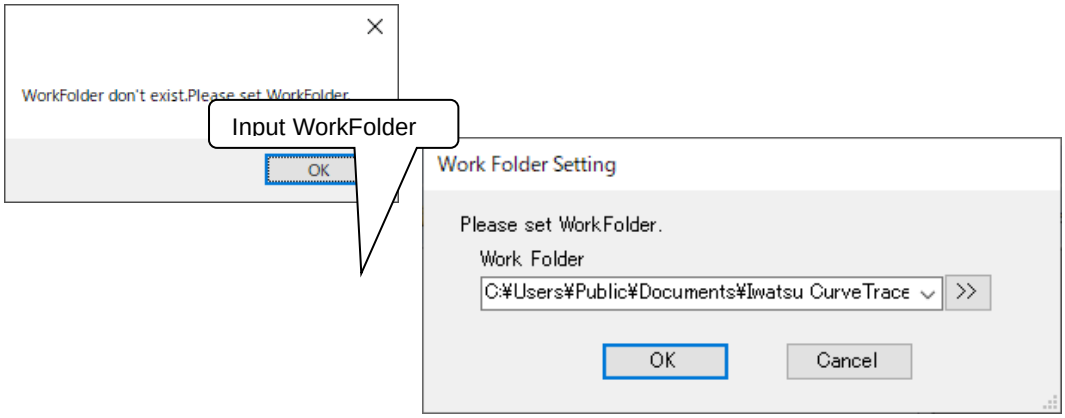
This chapter describes the flow from activation of application, setting of automatic measurement to measurement in series.
Here shows an example of measurement of 10Ω resistance.

4.1 Activation and initial setting of application

① Turn ON the power supply of Curve Tracer.
② Double-click the icon for CS-830ToolSet on the start menu of the PC and click the CS-830ParameterMeasurementApplication button on the screen that opens to activate the application.



The initial setting is not made when you use the application for the first time, so the setting of Work Folder is requested. Work Folder is the operation folder that is the storage destination of files created by this software.

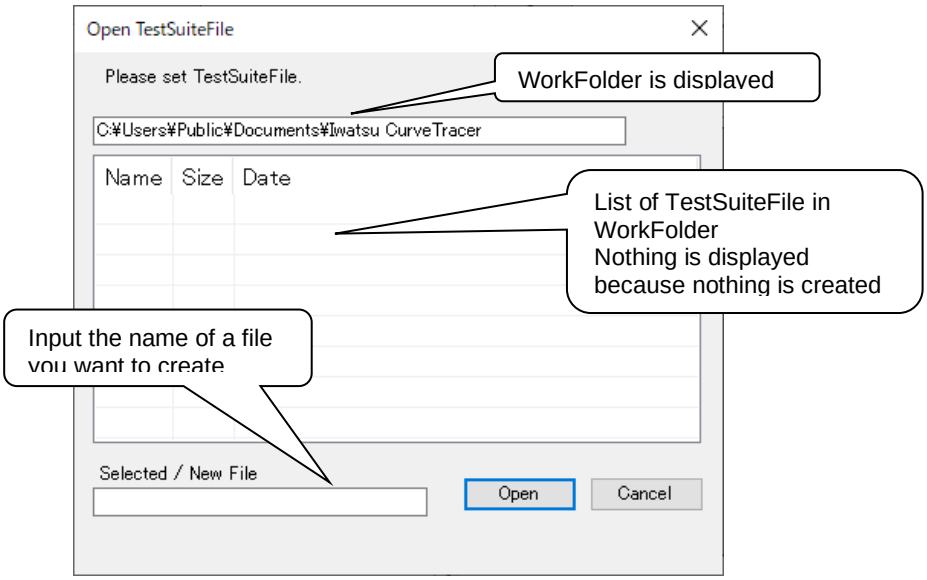


③ Connection setting
Input the IP address of Curve Tracer in [IPaddress] on the toolbar.
You can check the IP address of Curve Tracer with [SYSTEM menu] of Curve Tracer.

4.2 Setting of automatic measurement

All measurement settings required for the automatic measurement are created and saved in a file called TestSuiteFile. The measurement is executed following the content of this file. For details on TestSuiteFile, refer to "8 TestSuiteFile."

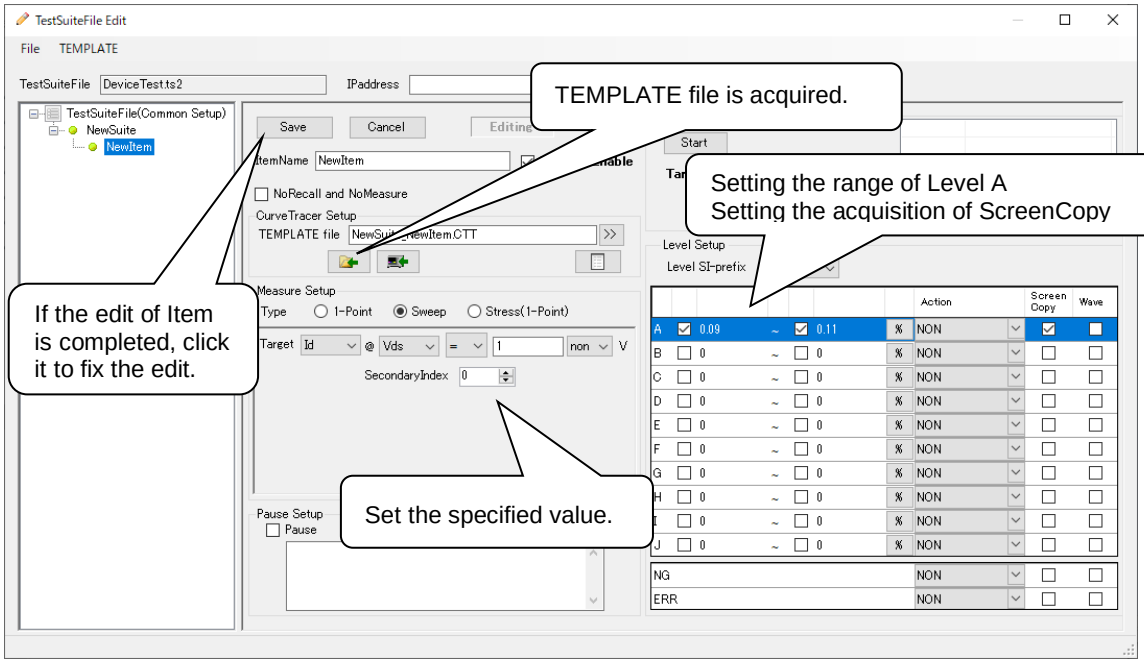
① Create TestSuiteFile.
Click [Open button] on the toolbar of the main screen.
Open TestSuiteFile screen is displayed.



Enter the file name of TestSuiteFile to be created into [Selected/New File]. The extension will be .ts2. Here, type "DeviceTest.ts2" as an example and click the [Open] button.

② Edit TestSuiteFile
When a file is created newly, TestSuiteFile Edit screen is automatically displayed after the selection of TestSuiteFile is completed. When a file is created newly, a Suite and an Item are automatically created.
<Setting of Item>
Item indicates a measurement item and one measurement result can be acquired for one Item. It is necessary to set following items for each Item. Refer to 8.2.2 Item Setup.

- Method for acquiring a characteristic curve
- Setting of Curve Tracer (TEMPLATE file)
- Method for reading a characteristic value from a characteristic curve
- Method for evaluating the level



Item settings screen

As a concrete example, set "Item for measuring the current value when 1V is applied to 10Ω resistance."

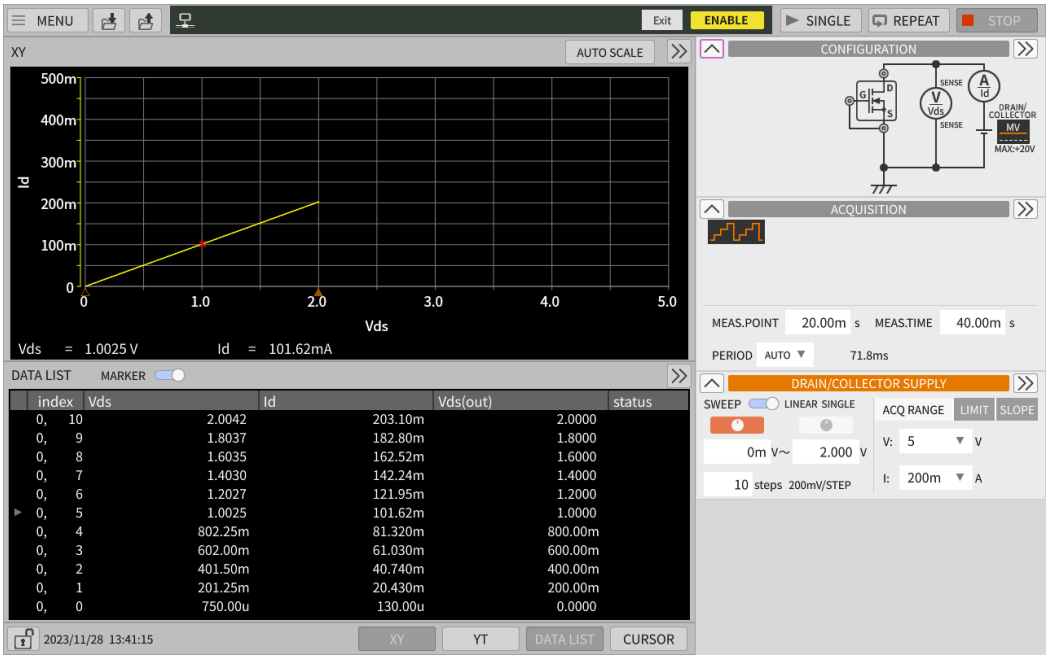
– Method for acquiring a characteristic curve
  In this example, acquire a characteristic curve with SWEEP measurement.
  Set [Type] of [MeasureSetup] to Sweep.

– Setting of Curve Tracer
  Connect a 10Ω resistance between the DRAIN/COLLECTOR and the SOURCE/EMITTER terminals.
  Operate Curve Tracer and make a setting so that a characteristic curve that steps over 1V can be acquired when SWEEP is executed. An example of setting is shown in the table below.

Example of settings for Curve Tracer

CONFIGURATION		DRAIN/COLLECTOR TEST- GATE/BASE COMMON
DRAIN/COLLECTOR SUPPLY	UNIT	MV
	SOURCE	VOLTAGE
	MODE	DC
	MAX	20V
	POLARITY	POSITIVE
	V レンジ	5V
	I レンジ	200mA
	SWEEP 範囲	0V ~ 2V 10Steps

After the setting of Curve Tracer is terminated, execute SWEEP with the main unit and check the characteristic curve that steps over 1V can be acquire as shown below.



Screen when SWEEP measurement is manually executed

After the characteristic curve is confirmed, press [TEMPLATE file acquisition button]  to acquire the current setting of Curve Tracer in a PC file.

– Method for reading a characteristic value from a characteristic curve
In this example, read the current value Id when 1V is applied to Vds from a characteristic curve.
[Target] is Id@Vds = 1.0000V, SecondaryIndex=0.

– Method for evaluating the level
In this example, the measurement result is evaluated as good (Level A) at 0.09 to 0.11A and the screen hardcopy at that time is recorded.
Check both of upper limit and lower limit of Level A of [Level Setup] and set the range 0.09 to 0.11, and then check the [ScreenCopy].

After the edit is completed, fix the edit by clicking [Save button]. Then, the edit of Item is terminated.

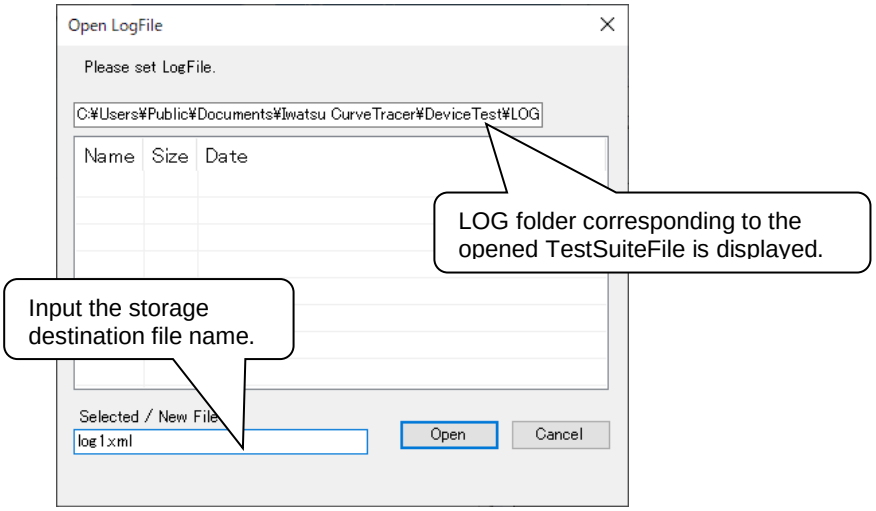
③ Terminating the edit of TestSuiteFile
Terminate the edit of TestSuiteFile by the menu on TestSuiteFile Edit screen, [File]-[Save+Exit].
If [Save+Exit] are not selected, the content of edit is not reflected to TestSuiteFile.

4.3 Measurement

Try to measure with made TestSuiteFile. For details on the measurement, refer to "10 Measurement."

① Start of measurement

Click the [measurement start button] on the main screen. The specification of LogFile for saving the measurement result is requested.

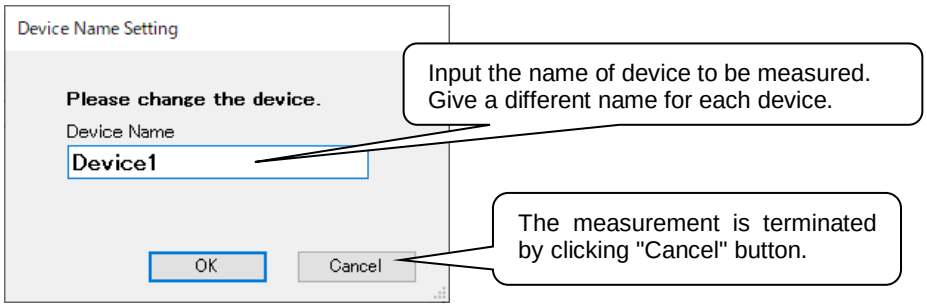


Enter the file name to save to LogFile into [SelectedFile]. The extension will be .xml.

Here, set "log1.xml" as an example and click the [Open] button.

② Setting of device name

If the setting of LogFile is completed, the setting of the device name is requested.



Set the device name to "Device1" and click [OK button].

③ Measurement

The measurement is started.

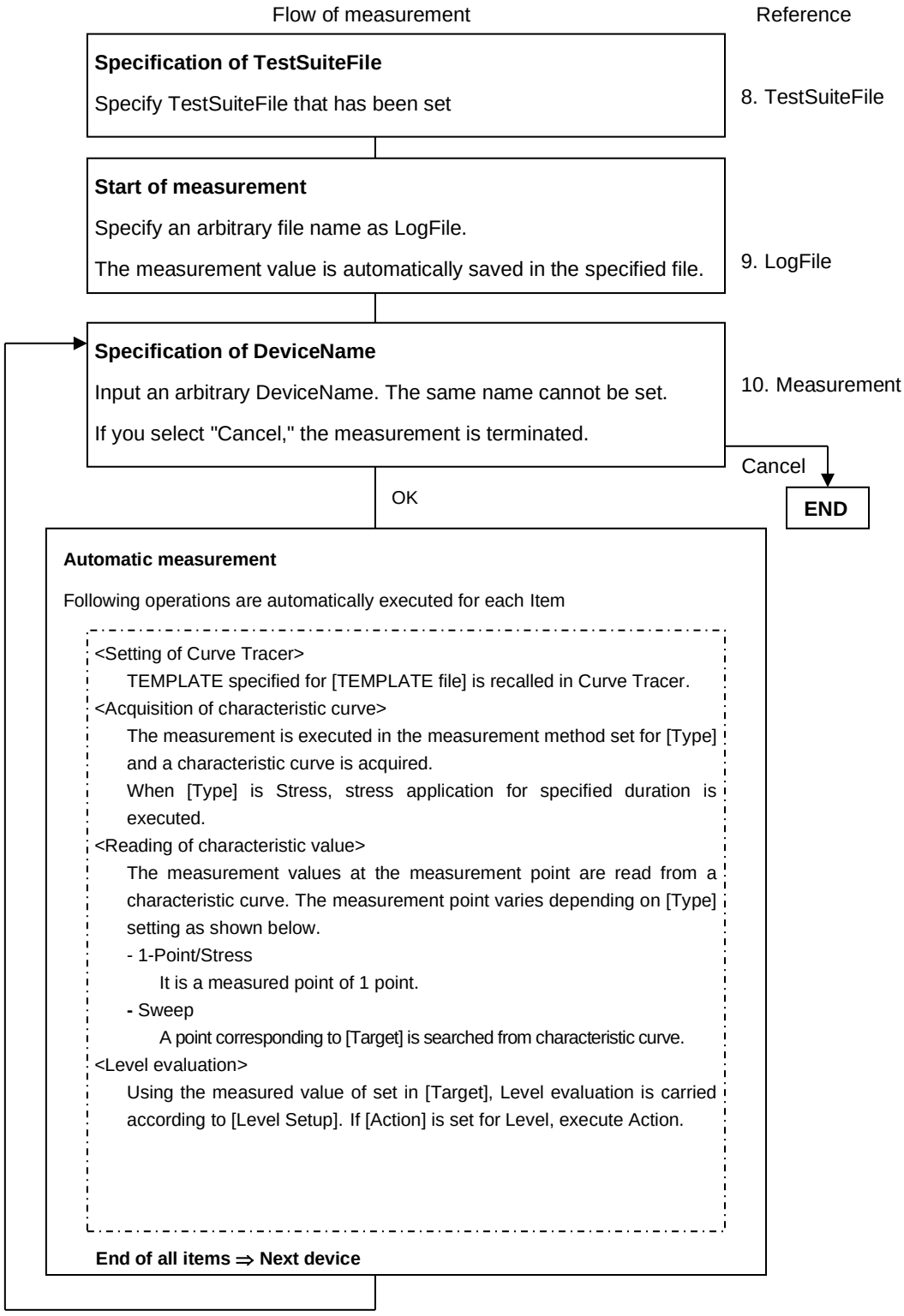
If the measurement of Item is completed, the measurement result and the level evaluation are displayed. When the measurement of all Items in Suite is completed, the level judgment of each Suite is displayed in a left Suite result display.
If the measurement of all Items is completed, the operation returns to "② Setting of device name" for measuring the next device. Click [Cancel button] on the device name setting screen to terminate the measurement.

The measurement result is automatically saved in LogFile "log1.xml" you set. You can browse LogFile later.

5 Flow of measurement

For the measurement, the measurement items (Item) set for the setting file (TestSuiteFile) are automatically executed.

Item in [ ] indicates the item that is set as Item for TestSuiteFile.



6 Descriptions of screens

This chapter describes each screen and main terms.

6.1 Terminology

Terms	Descriptions	Referential chapters
Item	It is an item of characteristic measurement. One measurement result is acquired for one Item. When the measurement is executed, a series of behavior; setting of Curve Tracer – acquisition of characteristic curve – reading of characteristic value (from characteristic curve) – level evaluation is carried out for each Item when the measurement is executed.	8.2.2 Item Setup
Suite	It is a collection of more than one Item (measurement item). It is a category set by a user arbitrarily. The execution of measurement and the browse of measurement result can be collectively carried out by unit of Suite. It is used for classifying each device for the module in which more than one device is packaged.	8.2.3 Suite Setup
TestSuiteFile	It is a file for saving all measurement settings. The measurement is executed following this file.	8 TestSuiteFile
LogFile	It is a file for saving the measurement result. It is specified when the measurement is started and the measurement result is saved as automatically. It can be browsed.	9 LogFile
TEMPLATE File	It is a setting file of Curve Tracer. A TEMPLATE File is specified and Curve Tracer is set for each Item (measurement item).	8.3 Notes on TEMPLATE file
Work Folder	It is an operation folder in which files created by this software such as TestSuiteFile, LogFile, and SETUP File are stored.	7 Configuration of file

6.2 Main screen

It is the screen that is displayed immediately after this software is activated. The execution of measurement and the browse of log file are carried out on this screen. All operations such as various setup screens and call of a tool are started from this screen.

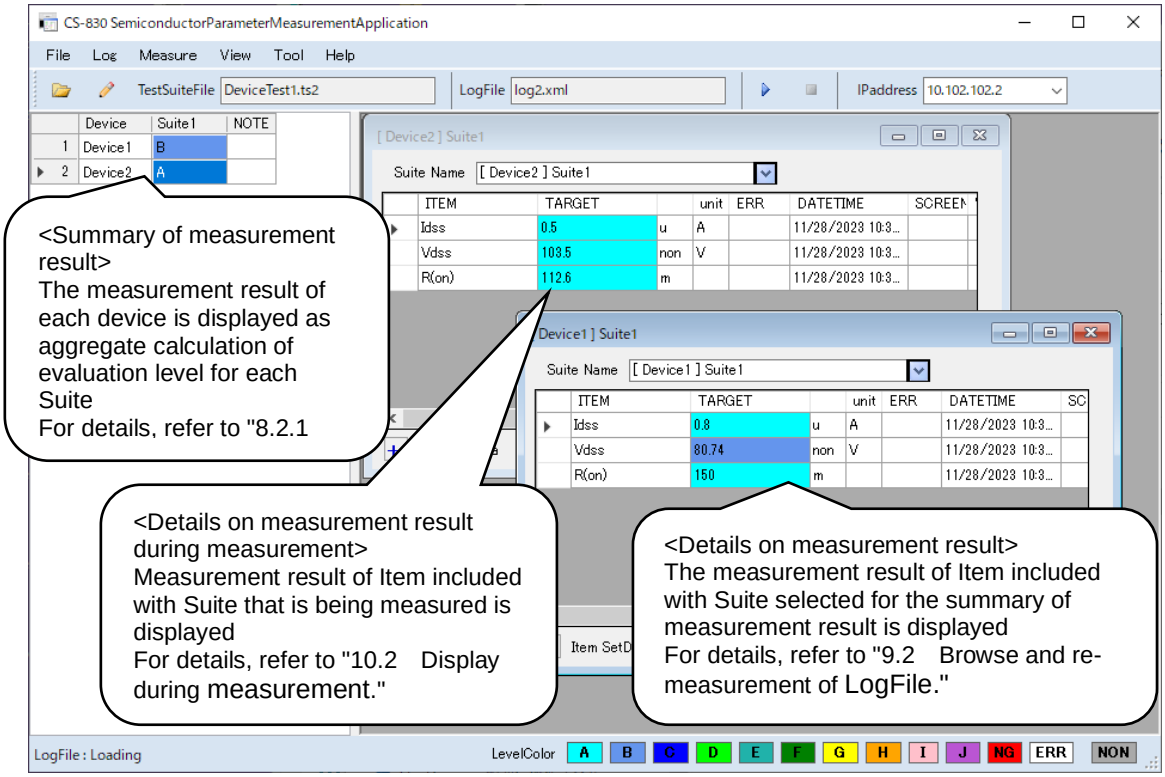


Figure 6-1 Main screen (example while the measurement is executed)

<Description of displayed item>

Item names	Descriptions
TestSuiteFile	Displays the opened TestSuiteFile name. Nothing can be input.
LogFile	Displays the opened LogFile name. Nothing can be input.
IPaddress	Input the IP address of Curve Tracer.
LevelColor	Displays the color of the evaluation level set by CommonSetup of TestSuiteFile. NON is the setting fixed to gray.

<Description of menu>

- File

Menus	Descriptions
Open	Carries out new creation / open of TestSuiteFile The screen for specifying a file is opened
Recent TestSuiteFile	Displays recently used TestSuiteFile. Up to six files are displayed. If you click it, the selected TestSuiteFile is opened.
Edit	Edits the opened TestSuiteFile TestSuiteFile Edit screen is opened
Work Folder Setting	Makes a setting of Work Folder Work Folder Setup screen is opened
Exit	Application is quit

- Log

Menus		Descriptions
Open/Delete		Carries out open / delete of LogFile The screen for specifying a file is opened
Recent LogFile		Displays recently used LogFile. Up to six files are displayed. If you click it, the selected LogFile is opened.
Save		Overwrites and saves the opened LogFile ∗ While the measurement is executed, the measurement result is always saved automatically, so it is not necessary to save it daringly. The manual saving is necessary only when a comment is written in NOTE field.
Export	to CSV	Converts the opened LogFile to CSV format and saves in a CSV file. The screen for specifying a file is opened
	to Excel	Converts the opened LogFile in Excel format with an arbitrary allocation and saves it in an Excel file. The screen for specifying the allocation is opened.

- Measure

Menus	Descriptions
Start	Starts the measurement. The behavior is same as that of [Start button] on the toolbar. Open LogFile screen of the storage destination of the measurement data is opened.
Stop	Stops the measurement. The behavior is same as that of [Stop button] on the toolbar.
ConnectCheck	Checks the connection with Curve Tracer. Checks the connection with the address that is specified as an [IPaddress]. The check result is displayed at the status display part at lower part of the screen.

- View

Menus	Descriptions
All Close	Closes all displayed Item measurement result screen Item result screen during the measurement is not closed
List of displayed screens	Lists the displayed Item measurement result screen and the Item result screen during the measurement. If you click a screen, the selected screen becomes active.

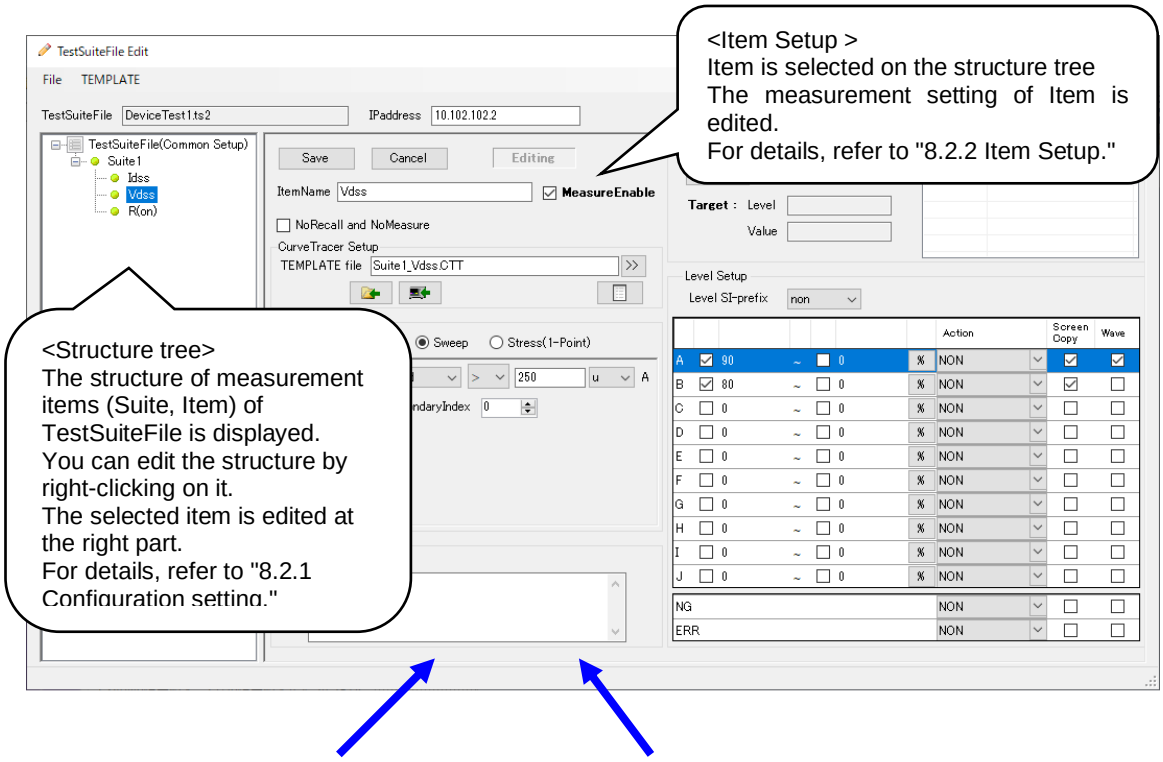
- Tool

Menus	Descriptions
Beep	Sets the ON/OFF of the beep.
AddonConfiguration	Sets the configuration of the Addon function. Displays the Addon List.
AddonControl	Sets the Addon function and carries out the measurement using the Addon function. Opens the control screen.

- Help

Menus	Descriptions
About	Displays the information of this application
Help	Displays the help information of this application

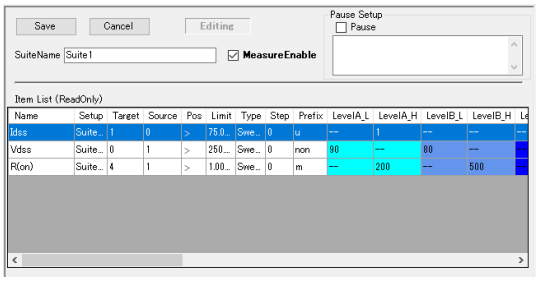
6.3 TestSuiteFile Edit screen



<Suite Setup >

Suite is selected on structure tree.

Refer to "8.2.3 Suite Setup."



<Common Setup >

Common Setup is selected on structure tree.

Refer to "8.2.4 Common Setup."

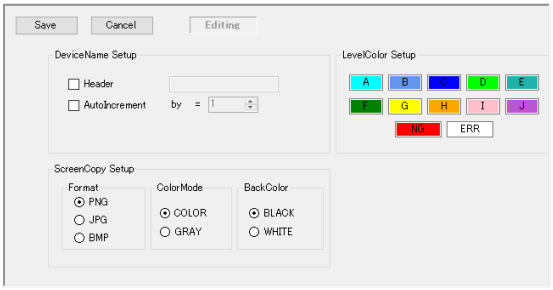


Figure 6-2 TestSuiteFile Edit screen

<Description of displayed item>

Item names	Descriptions
TestSuiteFile	Displays the name of TestSuiteFile to be edited. Nothing can be input.
IPaddress	Input the IP address of Curve Tracer. This function is used for acquiring and setting a TEMPLATE file. The address is the same for the setting of main screen.

<Description of menus>

- File

Menus	Descriptions
Copy to NewFile	Copies a TestSuiteFile that is being edited and saved in other file. Also, the TEMPLATE file specified in the Item is copied. The screen for specifying a file is opened.
Discard + Exit	Closes the edit screen without saving the content of edit by resetting the TestSuiteFile to the original status before the edit screen is opened.
Save + Exit	Closes the edit screen by saving the content of edit in the TestSuiteFile.

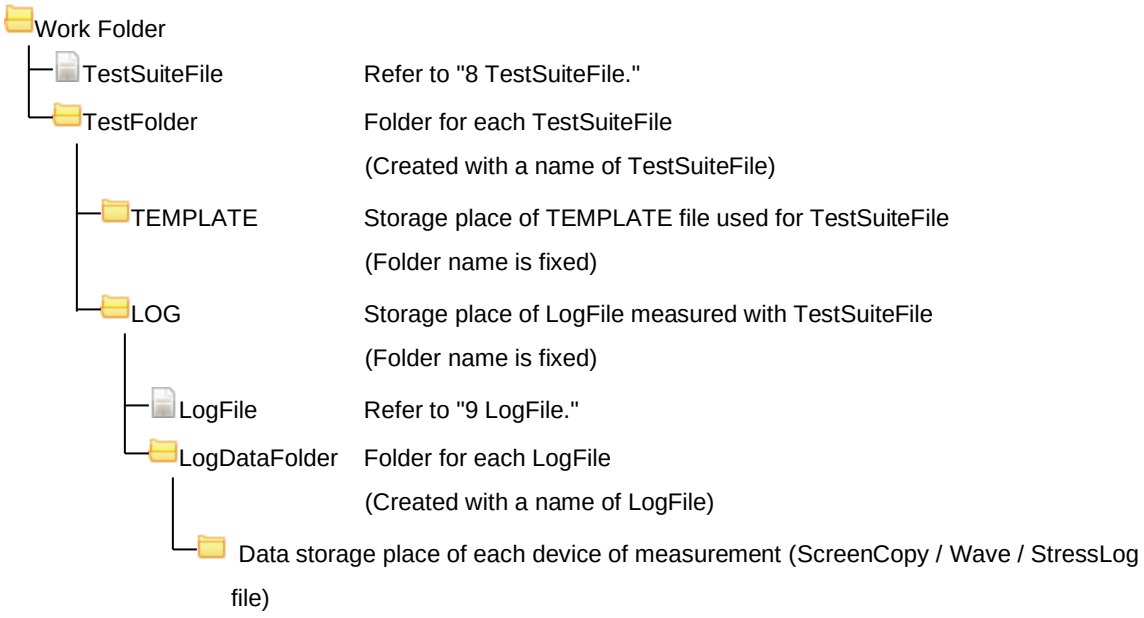
- TEMPLATE

Menus	Descriptions
Import	Copies the specified SETUP file in the TEMPLATE folder corresponding to the TestSuiteFile that is being edited (at Work Folder or lower). This function is executed when you use a TEMPLATE used for other TestSuiteFile or TEMPLATE file saving in a USB memory by Curve Tracer CS-8000. "Export TEMPLATE files" screen is opened.
Export	Copies a file stored in the TEMPLATE folder to the arbitrary folder corresponding to the TestSuiteFile that is being edited (at Work Folder or lower). "Export TEMPLATE files" screen (Export folder specification) is opened.

7 Configuration of file

With this application, a Work Folder is set and all of measurement setting files (TestSuiteFile) and measurement result files (LogFile) are created in the Work Folder.
Make a setting of Work Folder with the menu on the main screen, [File]-[WorkFolder Setting].
If Work Folder is not properly set at the startup, the resetting is requested.

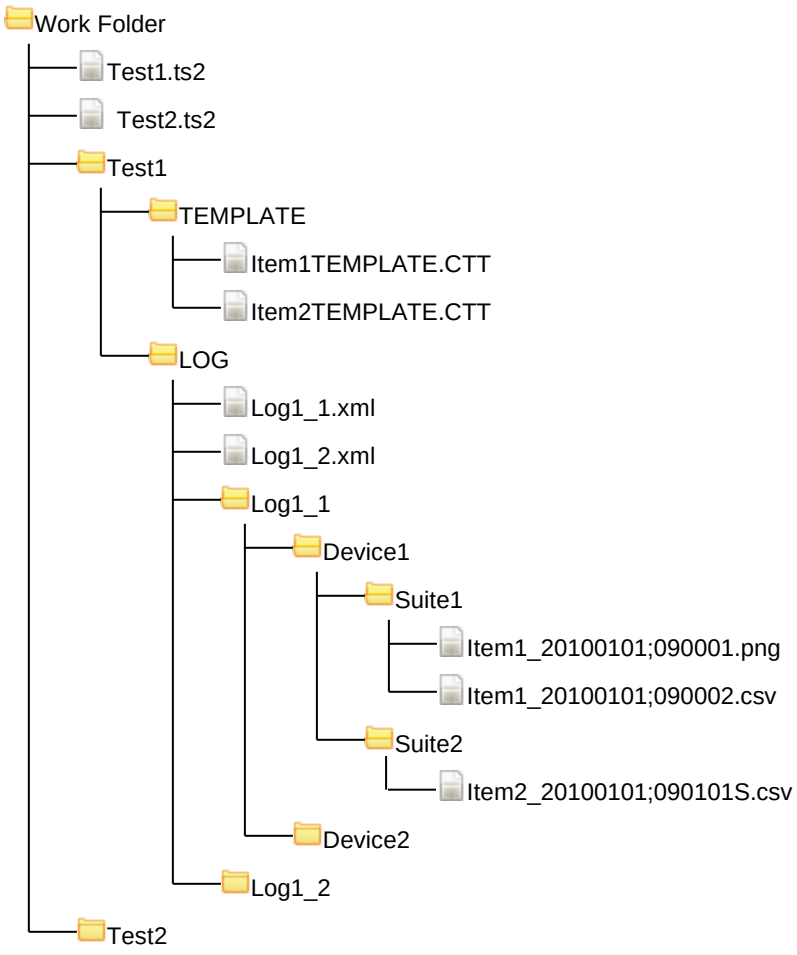
7.1 Details on configuration



<Example of configuration>
Here describes the configuration of folders when settings and measurements shown below are carried out as an example.

TestSuiteFile : Test1.ts2, Test2.ts2
(Suite1-Item1 and Suite2-Item2 are created in Test1.ts2 and the acquisition of ScreenCopy is set by Item1. It is acquired at 09:00:01 on 2010/01/01. And, the acquisition of Wave is set by Item1. It is acquired at 09:00:02 on 2010/01/01.
Acquisition of StressLog is set by Item2. It is acquired at 09:01:01 on 2010/01/01.)

LogFile : Log1_1.xml and Log1_2.xml measured by Test1.ts2
(Log1_1.xml measured Device1 and Device2)

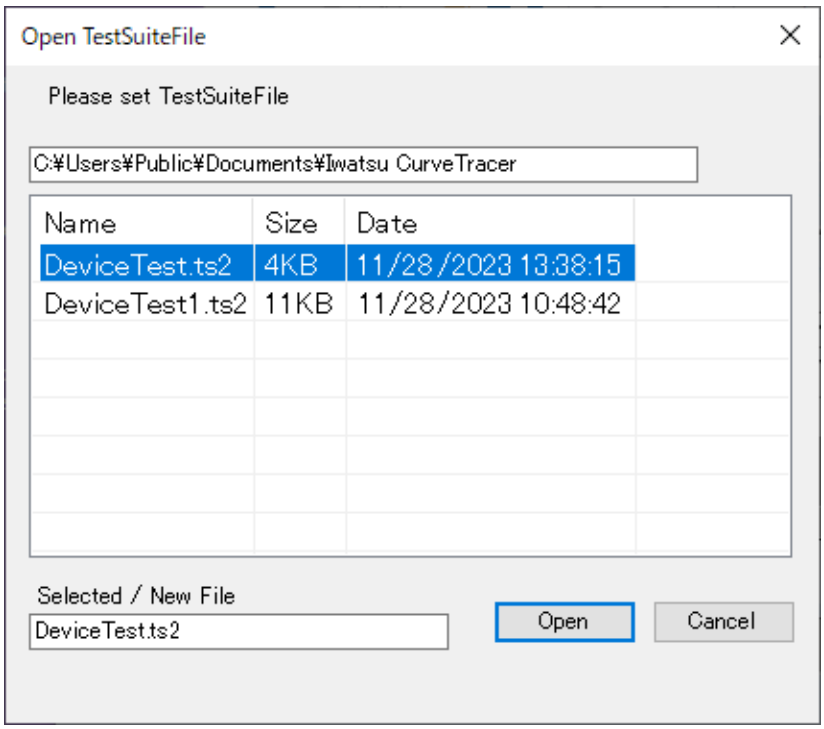


8 TestSuiteFile

The TestSuiteFile is a file stored as .ts2 file in XML format in which the configuration and the setting of automatic measurement are described. This application performs the automatic measurement according to the content described in TestSuiteFile. Consequently, it is always necessary to create a TestSuiteFile before the measurement. If it is created once, the same measurement can be performed by opening the created TestSuiteFile from the next measurement.

8.1 Creation / selection of TestSuiteFile

If you click the menu on the main screen, [File]-[Open] or clicking [Open button]  on the toolbar, the screen for opening a TestSuiteFile is displayed.



When you create a TestSuiteFile newly, specify the file name created here. If you open an existing file, select it from the list.

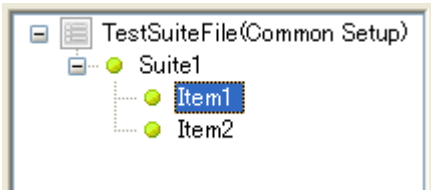
8.2 Edit of TestSuiteFile

For a new creation, TestSuiteFile Edit screen automatically appears if TestSuiteFile is opened. When you edit an existing file, click the menu on the main screen, [File]-[Edit] or click [Edit button]  on the toolbar while TestSuiteFile is opened. Then, TestSuiteFile Edit screen appears.

For TestSuiteFile, set a characteristic you want to measure as a measurement item (Item). For each measurement item (Item), the configuration is set in the category defined by a user called test suite (Suite). The following page describes the edit of TestSuiteFile in categories of configuration setting, Common Setup, Suite Setup, and Item Setup.

8.2.1 Configuration setting

Set the configurations of Suite and Item on the Tree at the left part of TestSuiteFile Edit screen.
The menu is displayed by right-clicking each item.



- TestSuiteFile (Common Setup) menu

Menu item	Behavior
Add Suite	Adds a new Suite to the bottom. The temporary name is set as NewSuite. The name can be changed on Suite Setup screen. ∗1

- Suite menu

Menu items	Behaviors
Copy+Paste	Copies the selected Suite and adds it to the bottom. The temporary name is set as [SuiteName] _copy. The name can be changed on Suite Setup screen. ∗1
Up	Moves the selected Suite upward by one stage.
Down	Moves the selected Suite downward by one stage.
Delete	Deletes the selected Suite.
Add Item	Adds a new Item to the bottom of the selected Suite. The temporary name is set as NewItem. The name can be changed on TestSuiteFile Edit screen. ∗2

- Item menu

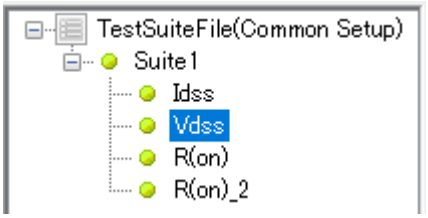
Menu items	Behaviors
Copy+Paste	Copies the selected Item and adds it to the bottom. The temporary name is set as [ItemName] _copy. The name can be changed on TestSuiteFile Edit screen. ∗2
Up	Moves the selected Item upward by one stage.
Down	Moves the selected Item downward by one stage.
Delete	Deletes the selected Item.

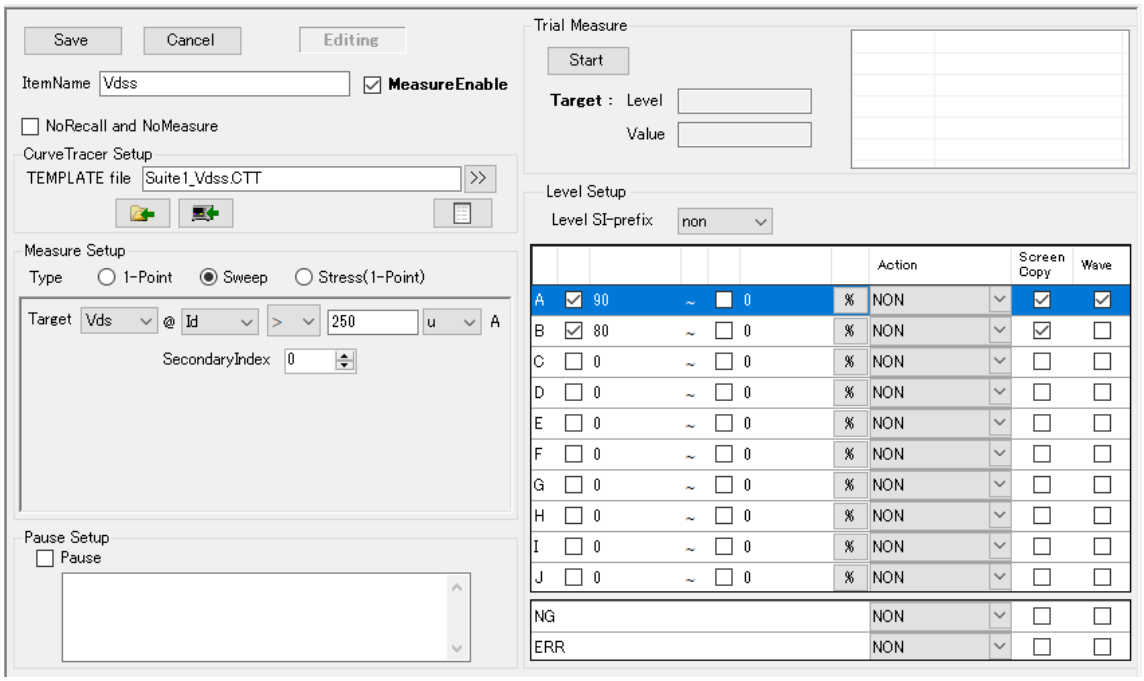
∗1: Up to 40 Suites can be created.
∗2: Up to 40 Items can be created in one Suite.

8.2.2 Item Setup

It is set to measure one characteristic. Specify the Curve Tracer setting (a TEMPLATE file) and set the point for measurement and the Level range for evaluation so on.

If you select the hierarchy of Item from the Tree at the left of TestSuiteFile Edit screen (right figure), the right part of TestSuiteFile Edit screen changes to the Item Setup screen shown in below.





- ItemName
  Sets the name of measurement item (Item)
  Same ItemName cannot be set in Suite
  Both of two-bytes and one-byte characters can be set. However, characters shown below cannot be used.
  (One-byte \: / ? [ ] * < > ‘ “　two-byte ￥ ： / ？ ［ ］ ＊‘)
  Up to 30 characters can be set regardless of two-byte and one-byte characters.

- MeasureEnable
  Sets validity / invalidity of measurement. If it is deselected, the measurement becomes invalid and not executed.

- NoRecall and NoMeasure
  Neither the setting change of Curve Tracer (Recall of the TEMPLATE file) nor the measurement are executed when checking it, the value of the point specified with [MeasureSetup] is searched and acquired from the measured waveform data (the data measured with previous one Item), and it is assumed the measurement result of Item.

- CurveTracerSetup

Specifies the setting of Curve Tracer with a TEMPLATE file.
It is specified from a TEMPLATE file stored in the TEMPLATE folder corresponding to TestSuiteFile (refer to 7 Configuration of file). For the addition of a file to the TEMPLATE folder, refer to 8.3 Notes on setup file.


Acquires the current setting of Curve Tracer in a file specified for [TEMPLATE file] by remote control.


Recall of a TEMPLATE file specified in [TEMPLATE file] for Curve Tracer by remote control


Displays the list of setting items of TEMPLATE file that is specified as [TEMPLATE file].
A set item cannot be edited. A TEMPLATE file can be saved with other name from the list display screen.

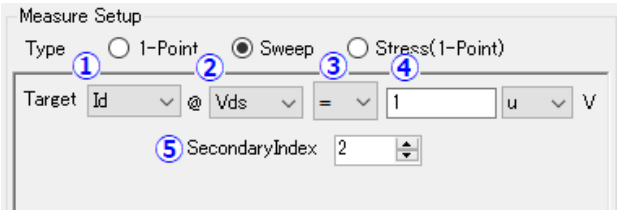
- MeasureSetup

Selection of measuring method in [Type].The content of setting for [Measure Setup] changes by [Type].

1-Point

The SweepMode of Curve Tracer is set to NONE and only one point is measured.
The value of [Target] of 1 point data is the measurement result.

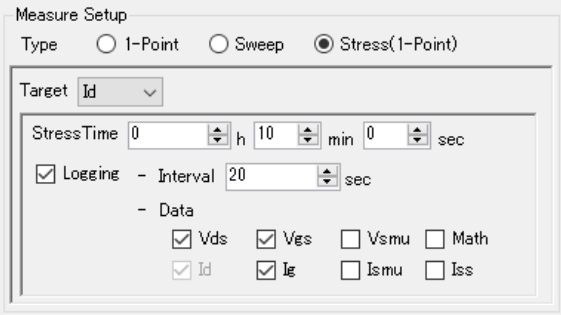
Sweep



Performs sweep measurement. The data specified in ④ is searched from the data of the type specified in ② of the Sweep waveform using the method selected in ③, and the value of the corresponding data specified in ① becomes the measurement result. The Sweep waveform targets the SecondaryIndex specified in ⑤.
SI-Prefix can be set within the range of p (10^{-12}) ～G (10^{9}). The value can be set by the resolution of 1E-10 within the range of -1E+10-1E+10. The value is rounded by seven effective digit numbers.
Measured values at two points that straddle the set value in ④ are candidates. Set the method for deciding the measurement point according to the characteristic measurement of the target.

Symbols	Methods for deciding the measurement point
>	Measurement point larger than setting value
<	Measurement point smaller than setting value
≅	Measurement point more close to setting value
=	Calculation value when it interpolates between two points, and it becomes set value

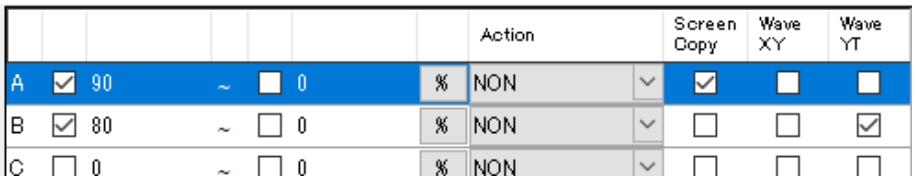
Stress(1-Point)



[Target] setting is the same as 1-Point.
Set the application time at [Stress Time]. (Allowable range : 10 sec - 1000h59min50sec)
In [Logging], set the file saving of measured values during stress application and interval.
Saves the values specified in [Data] to a file.

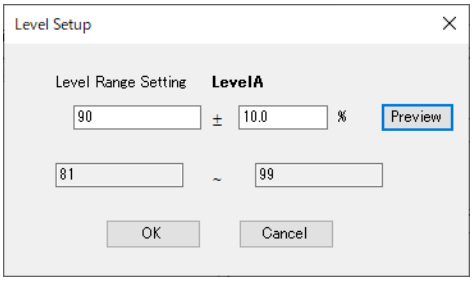
- Pause Setup
  The pause can be set before Item measurement is started.
  If you select [Pause], the dialog box displaying the content set for [Comment] before the measurement of Item is started is displayed and the measurement of Item is paused temporarily. Up to 256 characters can be set for [Comment].
  This function is used when it is necessary to switch the wiring.

- Level Setup
  Set SI-Prefix from p (10^{-12}) to G (10^{9}). When the measurement result is displayed, the Target value is displayed using this setting. The range of Level setting shown below is also set with the value using this SI-Prefix.
  Set the Level at 10 levels from A to J.
  The evaluation is carried out from A in series and the measurement result that is not evaluated as effective Level is set to NG.
  However, when all the levels are invalid settings, it is determined level A, and the action after the determination also follows the setting of level A.
  ERR is the status that the effective measurement data cannot be acquired.



Set the range of Level from lower limit value to upper limit value. The value can be set by the resolution of 1E-10 within the range of -1E+10-1E+10. The value is rounded by seven effective digit numbers.
Only the selected item is valid.
The lower limit value and the upper limit value can be edited by clicking the point you want to set.

Use it when you want to set the level with an error [%] from the target value.
If you click it, the dialog box for setting the range of Level is displayed.



Specify the target value and specify the error [%].
The lower limit value and the upper limit value are displayed in the [Preview].
As for the lower limit value and the upper limit value, the range of the Level setting of the above-mentioned becomes effective.
If you click [OK], the Level is set.

In [Action], set the action to be taken if it is evaluted as this level.

Types of action	Descriptions of behavior
NON	Nothing is carried out.
STOP	Stops the measurement.
Skip_nextSuite	Shifts to the measurement of the next Suite without measuring the remaining Items in Suite that is currently measured.
Skip_nextDevice	Shifts to the measurement of the next device without measuring the remaining Items in Device that is currently measured.
Skip_selectItem	Opens the Item Select screen. [Skip to] Shifts to the measurement of the selected Item. [without Skip] Continues the measurement. Shifts to the next Item. [Stop] Stops the measurement.
POPUP	Displays the dialog box and pauses the measurement. Continue measurement / stop measurement can be selected.

Sets the file to be saved if it is evaluted as this level.

[ScreenCopy]	The ScreenCopy of CurveTracer is saved as a file. The setting of Format etc. of ScreenCopy is made for the common setup (refer to "8.2.4 Common Setup").
[WaveXY]	The measurement XY waveform data is saved as a file by the CSV format.
[WaveYT]	The YT waveform data of the measurement point is saved as a file by the CSV format.When the setting is "interpolation between two points" (=), two points of YT waveform data are saved. The setting of TimeIndex is made for the common setup (refer to "8.2.4 Common Setup").

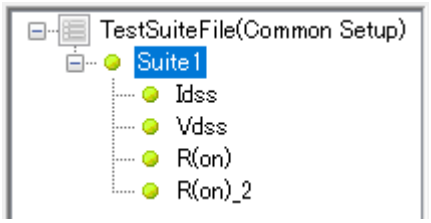
- Save/Cancel
  The edit is fixed by clicking [Save button]. If you click [Cancel button], the edit is discarded and the setting returns to the original setting before Item Setup is opened. If you do not release the edit status by clicking [Save] or [Cancel button], the setting cannot shift to the other setting (Item Setup, Suite Setup, Common Setup).

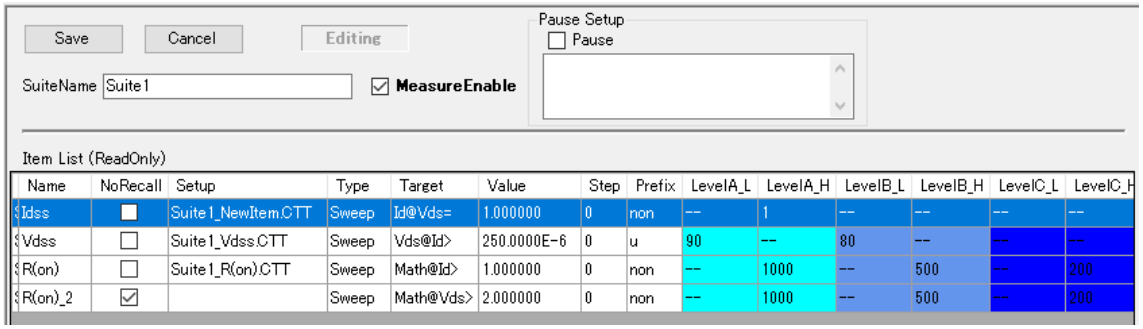
- Trial Measure
  Confirm the setting contents and measure.
  The measurement is executed with the [Start button], and the measurement result is displayed.

8.2.3 Suite Setup

Set the name of Suite that is the collection of measurement items (Item) and validity / invalidity of the measurement.

If you select a hierarchy of Suite from the Tree at the left part of TestSuiteFile Edit screen (right figure), the right part of TestSuiteFile Edit screen changes to the Suite Setup screen shown below (figure below).

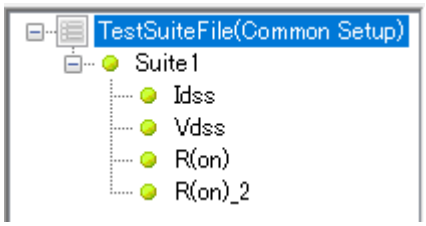




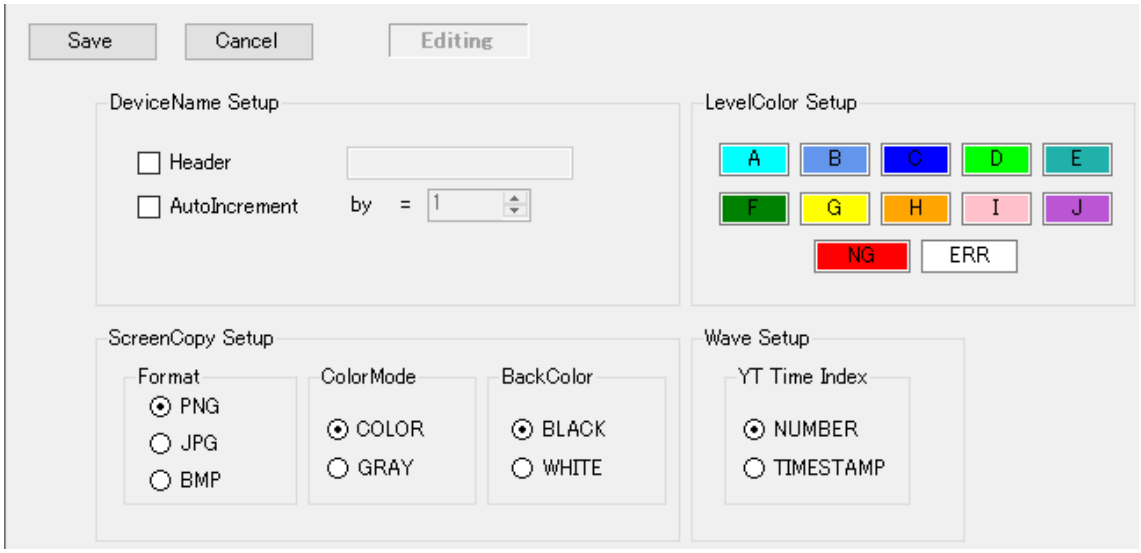
- SuiteName
  Sets the name of Suite. The same name of Suite cannot be set in TestSuiteFile.
  Both of two-bytes and one-byte characters can be set. However, characters shown below cannot be used.
  (One-byte \ : / ? [ ] * < > ‘ “ two-byte ￥ ： ／？ ［ ］ ＊‘)
  Up to 30 characters can be set regardless of two-byte and one-byte characters. If you want to convert the measurement result to Excel to save it, the setting of sheet division has restrictions including DeviceName for both of Device/Suite. For details, refer to "9.3 Conversion and storage."
- MeasureEnable
  Sets validity / invalidity of the measurement. If it is selected, the measurement becomes invalid.
  The setting affects all Items included with the Suite.
- Pause Setup
  A pause can be set before the start of the Suite measurement.
  Marking [Pause] opens the dialog box when the measurement is carried out which displays the contents that were set to [Comment] before the start of the Suite measurement, and then a pause is made. Up to 256 characters can be set to [Comment].
  Use it when switching of wiring is required, etc.
- Save / Cancel
  The edit is fixed by clicking [Save button]. If you change the setting of Suite, the settings of all Items included with the Suite are also changed. If you click [Cancel button], the edit is discarded and the setting returns to the original setting before Suite is opened. If you do not release the edit status by clicking "Save" or [Cancel button], the setting cannot shift to the other setting (Item Setup, Suite Setup, Common Setup).
- ItemList
  Displays the list of Items included with Suite. The setting cannot be changed.
  Right-click to open [Delete menu]. Selected Item (plural and acceptable) can be deleted. The deletion of Item cannot be executed while editing Suite.

8.2.4 Common Setup

Make a setting common to all Suites and Items.



If you select a hierarchy of TestSuiteFile from the Tree at the left part of TestSuiteFile Edit screen (right figure), the right part of TestSuiteFile Edit screen changes to the Common Setup screen shown below (figure below).



- DeviceName Setup
  Makes a setting for the automatic setting of Device Name that is set at the measurement.
  If you select [Header], the prefix character string can be set. "Header", the prefix character string can set both em-size and normal-width. However, the following characters are enabled to be used. (Em-size \ : / ? [ ] * < > and normal-width ￥ ： ／？ ［ ］ ＊‘) It is possible to set it to em-size and normal-width up to barrier and 20 characters or less.
  If you select [AutoIncrement], Device Name to which the value set by [by] is automatically added is set at the measurement.

- ScreenCopy Setup
  Sets the format etc. of a ScreenCopy file that is acquired when [ScreenCopy] is selected for Level evaluation of Item Setup.
  Format　　Selects the file format from PNG/JPG/BMP
  ColorMode　Selects the display color from COLOR(Full color) / GRAY(Gray scale)
  BackColor　Selects the background color from BLACK/WHITE

- Wave Setup
  Sets the TimeIndex of YT waveform data file when [WaveYT] is selected for Level evaluation of Item Setup.

- LevelColor Setup
  Sets the color for each Level used for displaying the measurement result of the main form.
  If you click the character string of each Level, the screen for specifying the color is opened.

- Save / Cancel

The edit is fixed by clicking [Save button]. The edit is discarded by clicking [Cancel button] and the setting returns to the original setting before Common Setup is opened. If the edit status is not released by clicking [Save] or [Cancel button], the setting cannot shift to the other setting (Item Setup, Suite Setup).

8.2.5 Termination of edit

When the edit is terminated, select [Save+Exit] or [Discard+Exit] of the menu [File].
For [Save+Exit], the edit is terminated by saving the content of edit in TestSuiteFile. An imported or acquired SETUP file is also stored in the SETUP folder corresponding to TestSuiteFile.
For [Discard+Exit], the edit screen is reset to the original status before the edit screen is opened without saving the content of edit in TestSuiteFile. An imported or acquired SETUP file is also discarded and the status is reset to the original status before the edit screen is opened.

8.3 Notes on TEMPLATE file

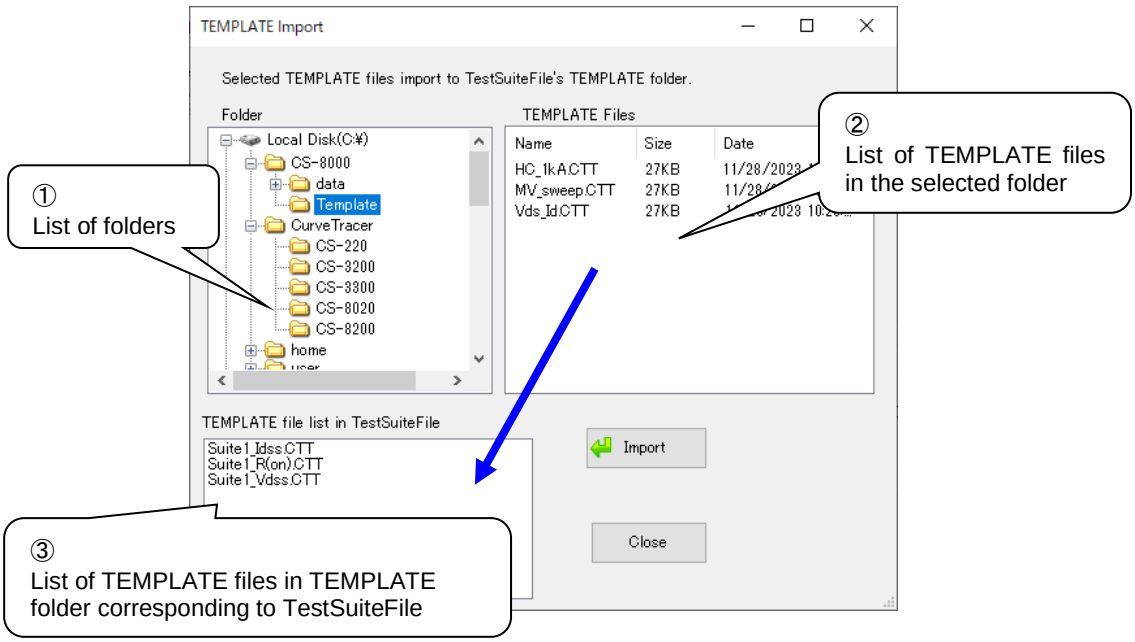
The setting of Curve Tracer for each Item is specified by a TEMPLATE file.

8.3.1 About making the TEMPLATE file

< About measurement mode>
The setting of the main unit of the Curve Tracer on the measurement of each Item is specified with the TEMPLATE file. The SWEEP MODE of the Curve Tracer set by Item setting [Measure Setup]-[Type] of TestSuiteFile. For example, if [Measure Setup]-[Type] is set to 1-Point by the Item setting even when the TEMPLATE file with the Curve Tracer set to SWEEP, SWEEP MODE=NONE will be set.
.

8.3.2 Specification and preservation of the TEMPLATE file

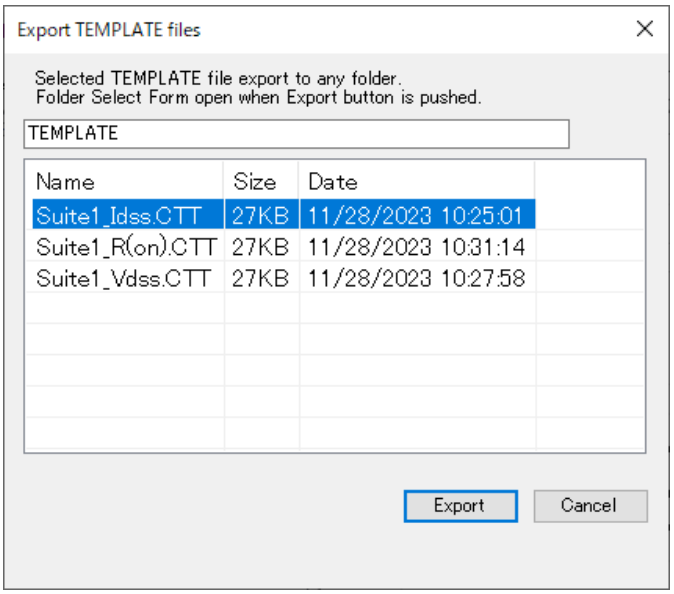
When you specify a TEMPLATE file for the Item Setup, only .CTT files stored in the TEMPLATE folder corresponding to TestSuiteFile ([Work Folder]\[TestSuiteFile name folder]\TEMPLATE) can be specified. A SETUP file can be added to the TEMPLATE folder by clicking the menu on TestSuiteFile Edit screen, [TEMPLATE]-[Import].



Select the folder in which a TEMPLATE file you want to specify is stored in ① and select a TEMPLATE file in ② (more than one file can be selected). If you click [Import button], the file is copied in the TEMPLATE folder. More than one file can be specified. TEMPLATE files in the TEMPLATE folder that currently correspond to TestSuiteFile are displayed in ③.
A TEMPLATE file can be also moved in a same way by pressing [Import button] on [Open TEMPLATE files] screen that is opened by clicking [>>] [reference button] on [Curve Tracer Setup] of the Item setup screen. (Refer to 8.2.2 Item Setup.)

CAUTION: If the edit is discarded by selecting [Discard+Exit], for example, when the edit of TestSuiteFile is terminated, a TEMPLATE file that is imported or acquired during the edit.

In order to move a TEMPLATE file stored in a TEMPLATE folder corresponding to TestSuiteFile to other location, use the menu [TEMPLATE]-[Export] on TestSuiteFile Edit screen.



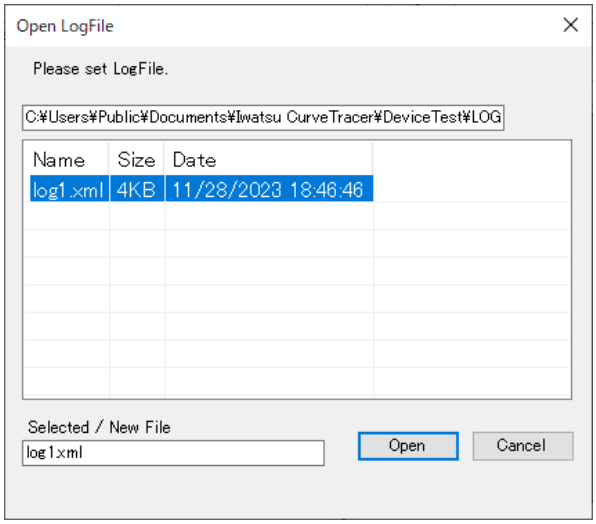
The list of TEMPLATE files in TEMPLATE folder is displayed. Select a TEMPLATE file you want to move (more than one file can be selected) and press [Export button]. Specifying folder screen is opened. The selected TEMPLATE file is copied in the specified folder.

9 LogFile

LogFile is .xml file in XML format in which the content of TestSuiteFile and the measurement result when the measurement is carried out are described.
LogFile depends on TestSuiteFile and is stored in a LOG folder corresponding to TestSuiteFile.
When the content of TestSuiteFile in the dependence origin is not corresponding to the content of TestSuiteFile that has been described to LogFile (When TestSuiteFile is edited so on after measurement), the additional measurement and the re-measurement cannot be executed. Up to 10,000 devices can be stored in one LogFile.

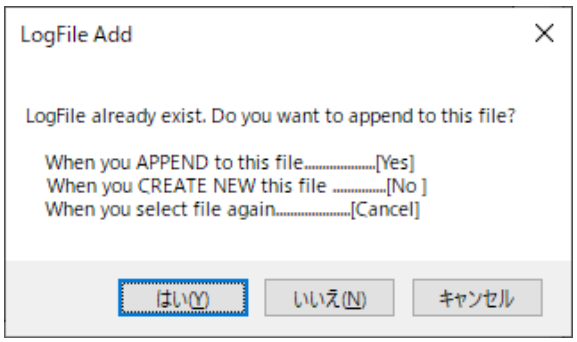
9.1 Setting at measurement

If the measurement is started by clicking the menu on the main screen, [Measure]-[Start] or [Start button] on the toolbar, "Open LogFile" screen is opened.



Specify the storage destination LogFile of the measurement result.
For a new measurement, input an arbitrary file name in [Selected / New File] .
For the additional measurement, select an existing LogFile from the list .

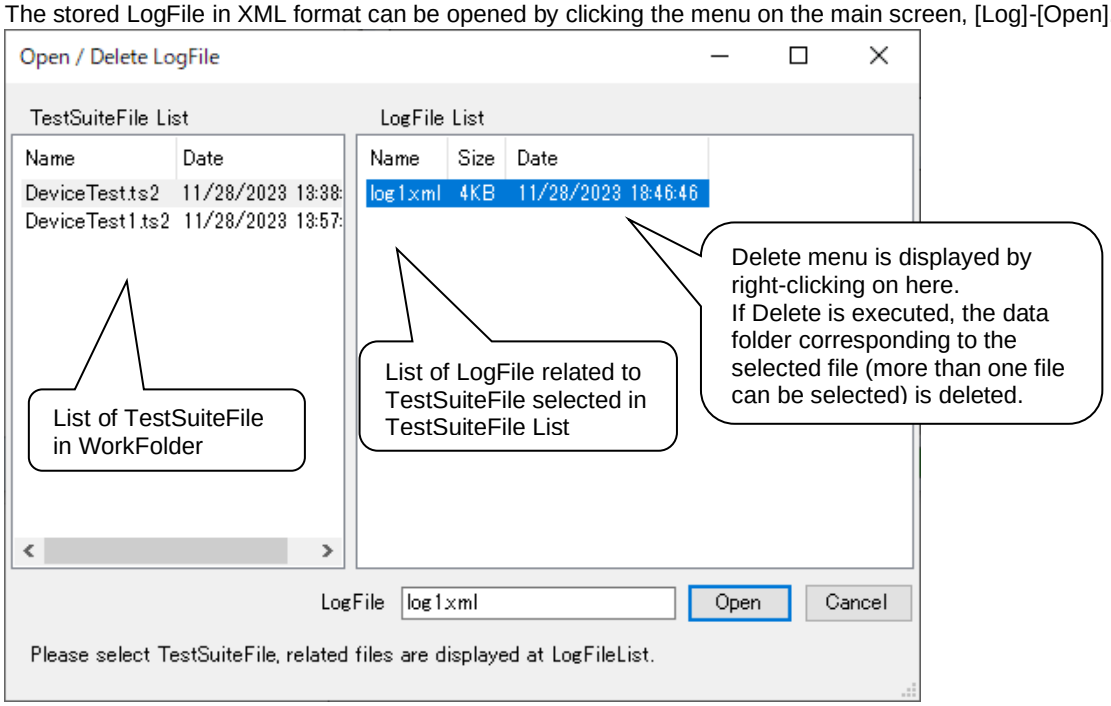
When existing LogFile is selected, you will be asked to append to the file..



If you select APPEND, the selected LogFile is opened and the measurement is added to the displayed measurement result as a next device.
If you select CREATE NEW, selected LogFile and related data (ScreenCopy files etc.) are deleted, and c reates a new selected LogFile and saves the measurement results.
CAUTION:
If the Item configuration of TestSuiteFile when the selected LogFile is measured does not correspond to that of current TestSuiteFile, cannot append to LogFile. If the level setting is not correspondent, the resetting of the measurement result of LogFile at the level of current TestSuiteFile is requested. If the setting is made again, can append to LogFile.

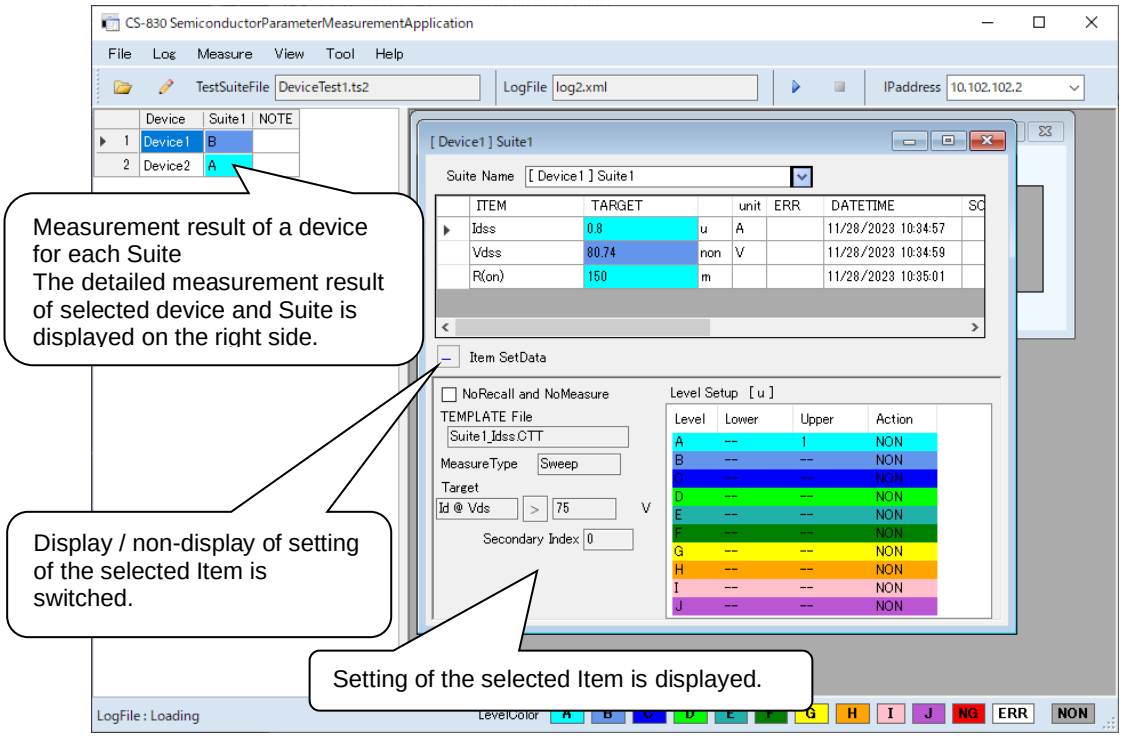
9.2 Browse and re-measurement of LogFile

The stored LogFile in XML format can be opened by clicking the menu on the main screen, [Log]-[Open].



① LogFile depends on TestSuiteFile. Select TestSuiteFile on which LogFile you want to open depends from [TestSuiteFileList].

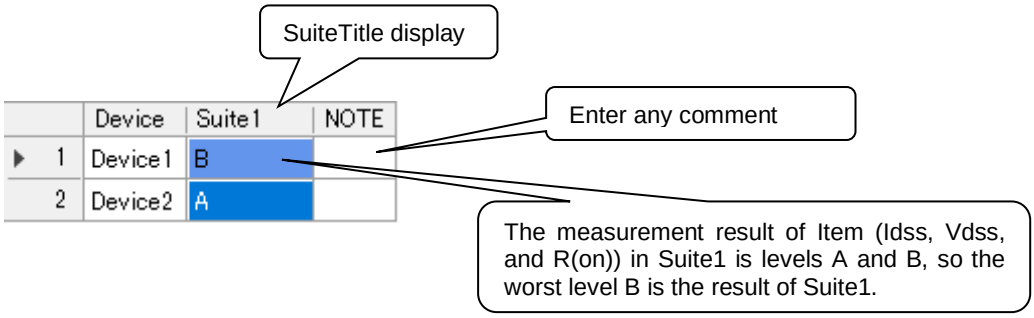
② The list of relevant LogFile is displayed. Select LogFile you want to open.
LogFile is opened by clicking [Open button] and the measurement result is displayed on the main screen.



<Display of Suite measurement result>

The measurement result of a device for each Suite is displayed. The Item level in Suite at the worst is

displayed.

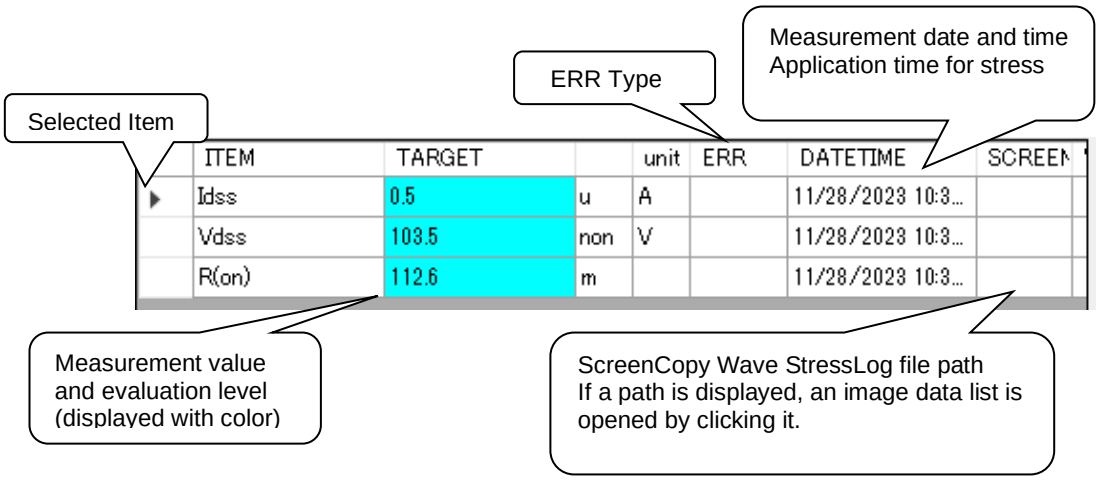


NOTE row can be written arbitrarily. Use it to describe the special note etc. of each device.

If you right-click on each cell, the menu of re-measurement is displayed.

Menus	Clicked positions	Operations to be executed
Retry Suite	Row header (SuiteTitle display part)	Only the selected Suite is re-measured up to the measured final device. The measurement result is updated for the re-measurement item only.
Retry Device	Device row (Device Name display part)	All Suites are re-measured for the selected device only. The measurement result is updated for the re-measurement item only.
Retry	Cell (Suite measurement result display part)	Only the selected Suite of the selected device is measured. The measurement result is updated for the re-measurement item only.

<Display of Item measurement result>
Displays a list of measurement results for Items in the selected Suite of the selected device.
Display Item name,Target measurement value and level(color),SI-prefix,Unit,Error type,Date and Time,Screencopy file,Wave file,StressLog file,Measurement value(Vds,Id,Vgs,Ig,Math,Vsmu,Ismu,Iss)



ERR Type	Factor	Level
(NON)	Normal termination	A-NG
DATA	Waveform data none, object point none.	ERR
SETUP	Failing in Recall of the TEMPLATE file	ERR
STOP	Measurement discontinuance (STOP button on the application pressing) *	ERR
LEV	Failing in the Level judgment	ERR
OVH	Curve Tracer abnormality (overheat, overdrive and so on)	ERR
SYS	communication error *	NON
ACT	Failing in the Action processing after the Level judgment	A-NG
OVER	Acquisition range exceeded. DATA LIST of Curve Tracer is ERR	A-NG
EOVD	Overdrive of external unit	A-NG
LIM	Measurement stops due to exceeding the limit range while applying stress.	ERR
CMP	Measurement stops due to Comparison judgment while applying stress	ERR
OUTPUT	Output was stopped (Interlock / OutputEnable=OFF / Measurement stop while applying stress, etc.) *	ERR

* : CS-830 measurement stops

If you right-click on each line, the menu of re-measurement is displayed.

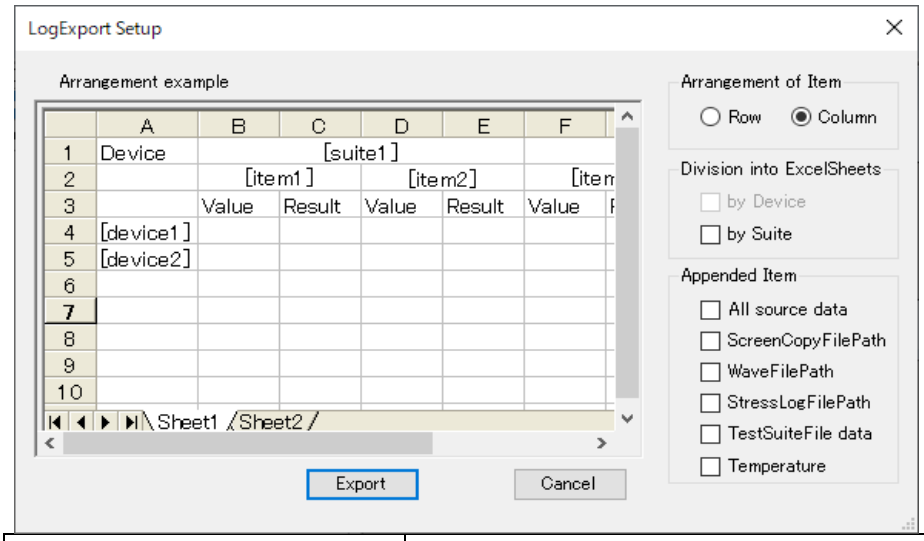
Menu	Operation to be executed
Retry Item	Only the selected Item of the selected device is re-measured. The measurement result is updated for the re-measurement item only.

CAUTION:
If the Item configuration of TestSuiteFile when the selected LogFile is measured does not correspond to that of current TestSuiteFile, the display of the TestSuiteFile name on the main screen becomes a gray display, and cannot be measured again. Moreover, Item and Suite that can be measured again depend on the setting of [MeasureEnable] of present TestSutieFile even when the composition of Item is corresponding. If Level setting is not correspondent, the resetting of the Level of measurement result of LogFile at the level of current TestSuiteFile is requested. If the setting is made again, the additional measurement is enabled.
The item for which MeasureEnable is set in TestSuiteFile when the re-measurement is executed is the target of measurement.
NOTE row in the list of Suite measurement result on Main screen can be written arbitrarily. Use it to describe the special note etc. of each device. The content of writing is not automatically saved, so save LogFile by clicking the menu Log-Save.

9.3 Export

The displayed measurement result can be stored by converting it to an Excel file or CSV file.

- CSV file conversion
  If you click the menu on the main menu, [Log]-[Export]-[toCSV], the screen for specifying a file is opened and the data converted to CSV format is saved in an arbitrary file in the format shown below. ScreencopyFile, HardcopyFile and StressLogFile are saved in a data folder with the same name as the CSV file. The file path written in the CSV file is the relative path to the file in the data folder.
  It is assumed, "9.91E+37" when the value is not Target expressible (It is infinite in division etc. by 0) as the numerical value.
  <Format of measurement result>
  "Device Name", "Suite name", "Item name", Target value, "Level", Vds, Id, Vgs, Ig, Math, Vsmu, Ismu, Iss, "ScreenCopy file path", "Wave file path", and "StressLog file path"
- Excel file conversion
  If you click the menu on the main screen, [Log]-[Export]-[toExcel], "LogExport Setup" screen is opened.



Setting items		Details
Arrangement of Item		Specifies the allocation direction of Item from row direction (Row) / column direction (Column).
Division into ExcelSheets		Specifies the method for dividing data into ExcelSheet.
Appended Item	All source data	Stores not only Target value displayed in the measurement result, but also the measurement results of Vds, Id, Vgs, Ig, Math, Vsmu, Ismu and Iss.
	ScreenCopy FilePath	Stores the path of a ScreenCopy file that is acquired during the measurement. *
	WaveFilePath	Stores the path of a waveform data file (XY,YT) that is acquired during the measurement. *
	StressLogFilePath	Stores the path of a stress application log file that is acquired during the stress application. *
	TestSuiteFile data	Stores the content of TestSuiteFile set. It is stored in the first seat.
	Temperature	When TempRegulator is used, stores the temperature at the time of measurement.

* : A data folder with the same name as the Excel file will be created and the target file will be saved in it. The file path written in the Excel file will be a relative path to the file in the data folder.

An example of allocation with the specified setting is displayed at the left part.

The screen for specifying the file of storage destination is opened and the data can be saved in an arbitrary file by clicking [Export button].
The conversion storage processing is cancelled by clicking [Cancel button].
The conversion preservation processing can be discontinued by clicking the [Stop button] on the dialog screen displayed while converting. When the specified Excel file has already opened, the conversion preservation processing cannot be done. Please click the [Export button] again after shutting the Excel file.
It is assumed, "9.91E+37" when the value is not Target expressible (It is infinite in division etc. by 0) as the numerical value.

CAUTION: Restriction at the conversion to Excel
- The number of rows after the conversion is up to 16,384 rows.
- The number of columns after the conversion is up to 1,048,576 columns.
- The number of sheets after the conversion is up to 100 sheets.
- If both of Device division and Suite division are specified for [Division into ExcelSheet], the maximum character string length of "Device name_Suite name" is 30 characters.

For the data exceeding the restrictions above, a warning is displayed when the conversion is executed and the data cannot be converted.

10 Measurement

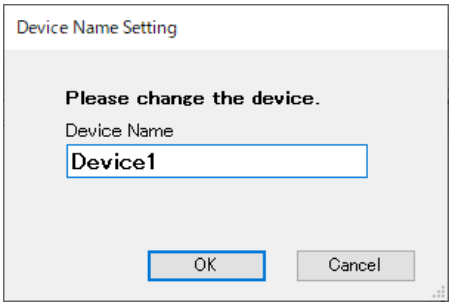
Open TestSuiteFile you want to measure by clicking [File]-[Open] on the main menu or [Open button] on the toolbar.

Start the measurement by clicking the menu on the main screen, [Measure]-[Start] or [Start button] on the toolbar.

Specify the storage destination LogFile. If a new file is specified, a new measurement is executed. If an existing file is specified, the additional measurement is executed.

10.1 Specification of Device Name

If the measurement is started, Device Name Setting screen is opened.



Input an arbitrary Device Name.

Both of two-byte and one-byte characters can be input for the Device Name. However, characters shown below cannot be used.

(One-byte \ : / ? [ ] * < > ‘ “　two-byte ￥ ： ／ ？ ［ ］ ＊‘)

Up to 30 characters can be set regardless of two-byte and one-byte characters. The same Device Name cannot be set in the LogFile. Up to 10,000 devices can be measured in one LogFile.

The initial value is displayed according to the [DeviceNameSetup] set for the [Common Setting] of TestSuiteFile.

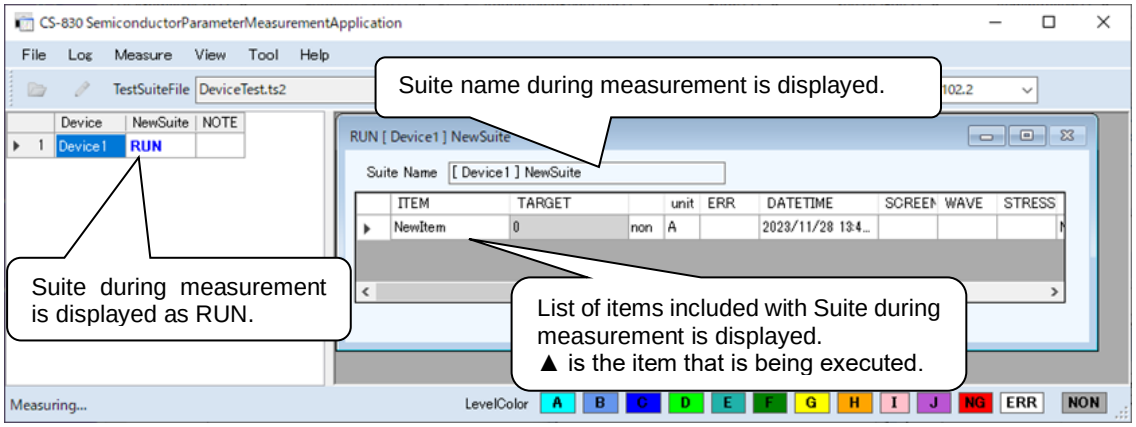
- If [Header] is set
  The character string set for Header character string is displayed at the beginning.
  If a character string is input again on the Device Name Setting screen, the character string that was input anew is displayed on the Device Name Setting screen of the next device. If the measurement is terminated, Header character string that is set for the DeviceNameSetup of TestSuiteFile is displayed for the next measurement.

- If [AutoIncrement] is set
  The initial value is 0 and the value that is automatically increased by the value set by "by" is displayed. If the value is input anew on the Device Name Setting screen, the value becomes the initial value and the value adding the value set by "by" to the value that was input anew is displayed on the Device Name Setting screen of the next device. If the measurement is terminated, the next measurement is started from the initial value 0.

- If both of [Header] and [AutoIncrement] are set
  Header character string part and Increment value part are separately displayed on the Device Name Setting screen. Each item is set by the operation described before. For Increment value part, only value can be input.

10.2 Display during measurement

The main screen is displayed as shown below during the measurement.



10.3 Pause of measurement

If [Pause] is set for the Item Setup of TestSuiteFile, the screen displaying the comment set for [Comment] of [PauseSetting] is opened before the item is measured and the measurement is paused. If you click [OK button], the measurement is restarted. If you click [Cancel button], the measurement is cancelled.

10.4 Level evaluation

The value of measured target is evaluated within the level range set for Item Setup of TestSuiteFile.
The evaluation is carried out within the level range of effective setting from A to J in series. If the measurement result does not reach the effective level, it is evaluated as level NG. However, when all the levels are invalid settings, it is determined level A, and the action after the determination also follows the setting of level A. If a measurement value cannot be acquired properly, such as when no measurement point is specified in [Target], the measurement result is evaluated as level ERR.

The [Action] of the level set for Item Setup of TestSuiteFile is executed at the evaluated level.
For details on the action, refer to "8.2.2 Item Setup".
If [ScreenCopy] of the evaluated level is selected, the ScreenCopy of Curve Tracer is acquired as a file after Item measurement is terminated. The format of the ScreenCopy is specified by Common Setup of TestSuiteFile.
The ScreenCopy file is automatically created and stored in LogDataFolder corresponding to LogFile that is being measured in Work Folder with a configuration shown below (refer to "7 Configuration of file").
LogDataFolder\[Device name]\[Suite name]\[Item name]_yyyyMMdd;HHmmss.[format extension]
(yyyyMMdd;HHmmss is the time stamp)

10.5 Termination of measurement

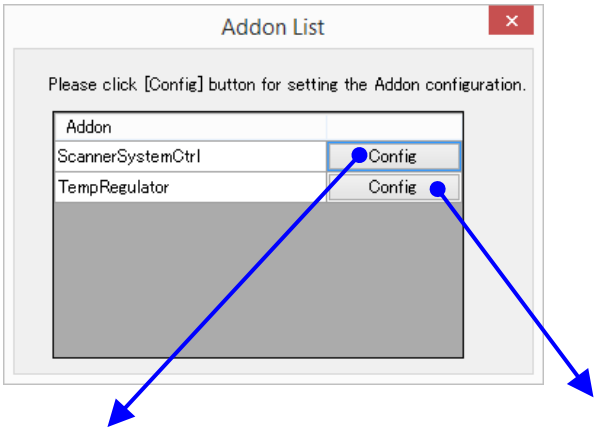
The measurement is terminated by clicking [Cancel button] on the Device Name Setting screen. The normal termination of the measurement is displayed.
The measurement can be also terminated by clicking [Cancel button] on the Pause screen. In this case, the interrupted termination of the measurement is displayed. The measurement can be also terminated by clicking [Measure]-[Stop] on the main screen or [Stop button] on the toolbar. In this case, the interrupted termination of the measurement is also displayed.

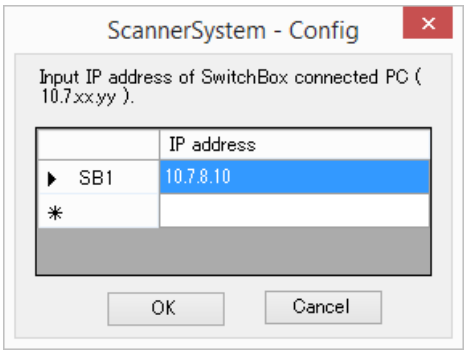
11 Addon function

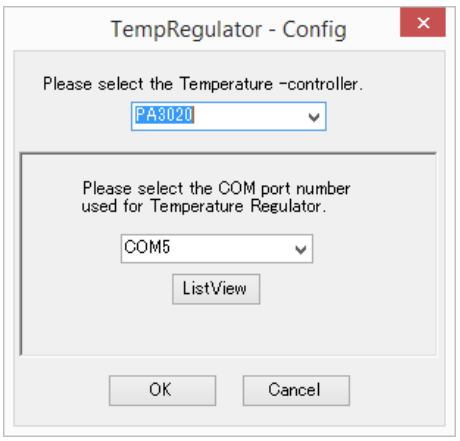
The control of devices other than the Curve Tracer can be incorporated into the automatic measurement as the Addon function.
The scanner system (CS-700) and the fixture with a temperature regulator are controlled.
The temperature controller is explained using PA-3020 as an example.

11.1 AddonConfiguration

Make the configuration settings of the Addon function.
Clicking [Tool] and then [AddonConfiguration] on the Menu on the main screen opens Addon List as below.







Specify the IP address that is set to SwitchBox of the scanner system. The upper 2 bytes are fixed as 10.7.xx.yy. (*1)
The SwitchBox name is sequentially numbered automatically.

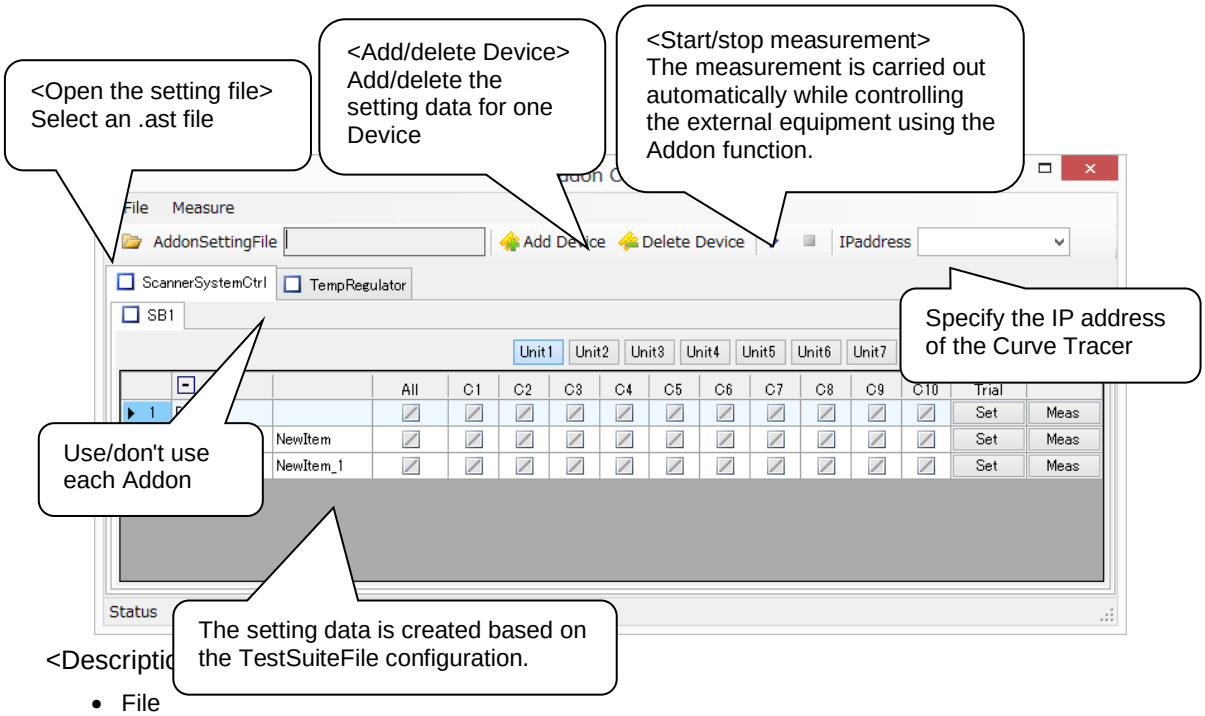
Select the temperature regulator to be used from the list shown in the upper part. Specify the COM port number connected to the selected temperature regulator.
Clicking the [ListView] button displays a list of COM ports used on the PC.

*1: Subnet mask of the scanner system's SwitchBox is fixed at 255.255.0.0. Set IP addresses of the Curve Tracer and the PC on which the CS-830 is installed in line with 10.7.xx that is set to SwitchBox.

11.2 AddonControl

Clicking [Tool] and then [AddonControl] on the Menu on the main screen opens the Addon function control screen.
The start/stop of the automatic measurement using the Addon function and the creation of each Addon setting data, etc. are carried out.

Automatic measurements are carried out based on the TestSuiteFile configuration that is open on the main screen. Before the measurement of each Device or Item, Addon is executed in accordance with the Addon setting data.
When opening the control screen, Addon setting data for one device is created as the default data based on the TestSuiteFile configuration, and data is then added/deleted for each device.
For this reason, AddonControl cannot be executed unless TestSuiteFile is open on the main screen.



<Descriptio

- File

Menus	Descriptions
Open	New/Open of AddonSettingFile (.ast setting data files). The screen to specify the file opens.
Save	Overwrites and saves the opened Addon settings files with the displayed settings.
SaveAs	Saves the displayed settings by specifying the file name. The screen to specify the file opens.
Load from LogFile	Loads the Addon settings in the displayed LogFile.
Exit	Closes the AddonControl screen.

- Measure

Menus	Descriptions
Start	The measurement is carried out automatically while controlling the external equipment using the Addon function.
Stop	Stops the automatic measurement that uses the Addon function.

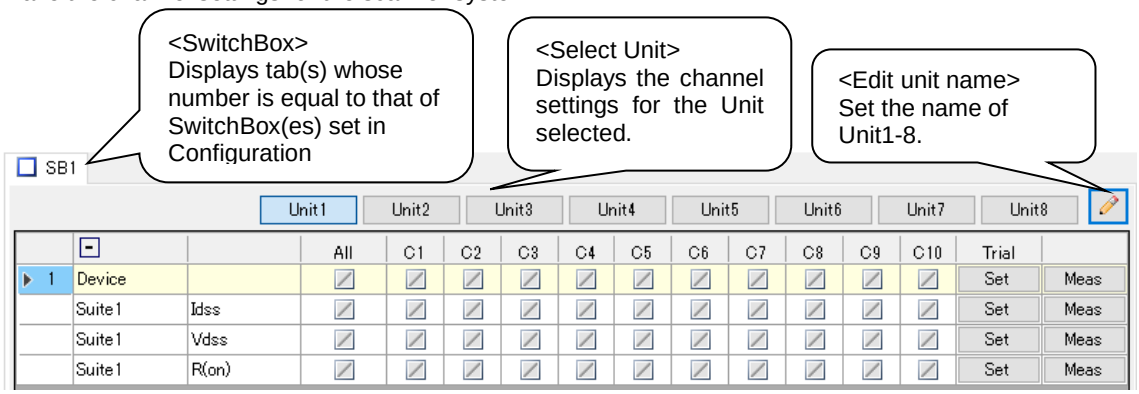
11.2.1 AddonSettingFile (the setting data file)

AddonSettingFile is the Addon setting data file that retains the Addon settings for multiple devices with the Suite and Item TestSuiteFile configuration displayed on the main screen as one device. Files with the .ast extension can be saved and read.

When opening the existing AddonSettingFile, the current Item configuration takes precedence over the Item configuration saved in AddonSettingFile if they are different. The Addon settings of the Item that does not exist in AddonSettingFile become the default values, and the Item that exists only in AddonSettingFile is ignored. The number of devices is to be set in AddonSettingFile.
This conversion does not affect AddonSettingFile itself. To apply the conversion to the file, overwrite and save AddonSettingFile.

11.2.2 ScannerSystemCtrl: Settings for the scanner system

Make the channel settings for the scanner system.



ON:	Sets the channel to ON.
OFF:	Sets the channel to OFF.
Don'tCare:	Does not change the channel setting. (Default value)

At the start of the automatic measurement, all channels are reset to OFF.

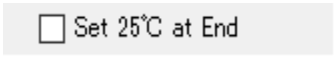
- Trial Set
  Clicking the [Set] button executes the Addon for the clicked Item or Device.
  Make the settings for all Units in all SwitchBoxes of ScanUnitSystem. All the settings from the top line down to the clicked line will have been configured in order.

- Trial Measure
  Clicking the [Meas] button carries out the measurement of the clicked Item and displays the measurement results in a pop-up window.
  Addon is not executed and only the measurement is carried out. Device is excluded from the measurement.

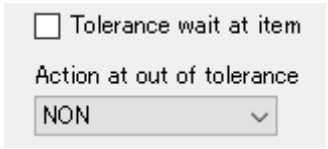
11.2.3 TempRegulator: Settings for the fixture with a temperature regulator

Make the temperature settings, etc. for the fixture with a temperature regulator.

Set the parameters of the temperature regulator.



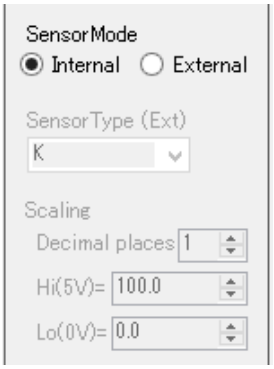
Set the temperature to 25°C at the end of the measurement.



If you check [Tolerance wait at item], when you get the temperature before measuring each item, if it is out of the Tolerance range, it waits to be within the Tolerance range. The Wait and Timeout for each temperature setting are used.

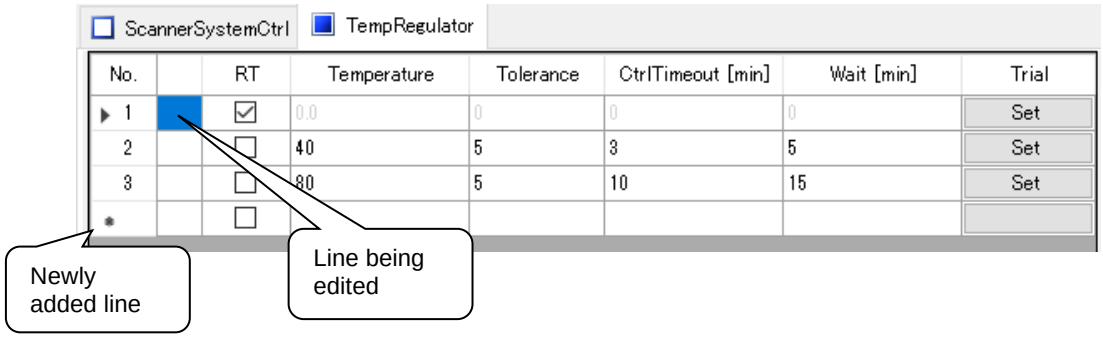
In [Action at out of tolerance], set the action when it is judged to be out of the Tolerance range.

Action	Description
NON	Nothing is done. Continue temperature control/measurement.
STOP	Stops temperature control/measurement.
SKIP_nextTemp	The display moves to the next temperature setting. Subsequent measurements at the current temperature setting are skipped.
POPUP	Displays a dialog and pauses. In the dialog, you can select an Action other than POPUP.
ITEM ERR	Action on LevelERR of MeasurementItem.



Set the parameter in a left chart. This setting is different depending on the type of temperature regulator selected with [AddonConfiguration].
Here, it explains PA3020.
Select an external sensor, an internal sensor in [SensorMode].
Select the sensor type used with temperature regulator in [SensorType] when you select an external sensor.
Set [Scaling] when you set the sensor type to VOLT.

Set the following temperatures. The automatic measurement sets the temperatures in the order of No. and measures at the same temperature the number of devices that were created as the Addon setting data.



Operations such as the start of the measurement cannot be carried out while each cell is being edited. Carry out the operation after quitting the editing state by moving to another cell, etc.
Clicking the head of the line to select the line and right-clicking it displays the Menu of the line. Lines can be deleted or inserted.

- RT
  This setting measures at the current temperature, it does not set the temperature. The temperature is acquired.
  Setup of the [Temperature],[Tolerance],[Timeout],[Wait] is invalid. [Trial Set] is invalid.

- Temperature
  Setting range: 0-500°C
  Makes the temperature settings. When the set temperature is reached, measurement starts after the time set in Wait has passed.

- Tolerance
  Setting range : 0 - 500°C
  Set the allowable temperature range for the preset temperature.
  (Temperature-Tolerance) - (Temperature+Tolerance) is within the allowable temperature range.

- Ctrl Timeout
  Setting range: 0-100 minutes
  Sets the allowable time in minutes from the start of temperature setting to the completion of [Wait] as ([CtrlTimeout] + [Wait]).
  If it is set to 0 second, waits for the temperature to reach the set temperature unlimitedly without checking for time-out.
  If the temperature does not reach the tolerance range within the [CtrlTimeout] period, or if the allowable time is exceeded before [Wait] is completed, the action set in [Action at out of tolerance] will be executed.

- Wait
  Setting range: 0-1000 minutes
  Sets the time in minutes from the attainment of the temperature set to Temperature to the start of the measurement.

- Trial Set
  Clicking the [Set] button controls the temperature regulator in accordance with the settings of the clicked line.
  The check for Timeout and the control of Wait after the attainment of the set temperature are also carried out.

Temperature control before Item measurement

If the current temperature is within the Tolerance range, the Item measurement will be performed immediately. If it is out of the range, it will be immediately determined to be out of range when [Tolerance wait at item] is not checked. When it is checked, wait until the time within the Tolerance range exceeds the [Wait] setting, and If it is not completed within the time of [CrtlTimeout] + [Wait], it is judged to be out of the Tolerance range (Timeout).

Display of measurement temperature

The temperature before each item measurement is saved to the Log file. It is displayed in the Temperature column of the result display of each Item on the main screen. It is displayed in red with a high temperature warning, and in pink when it is out of the Tolerance range.

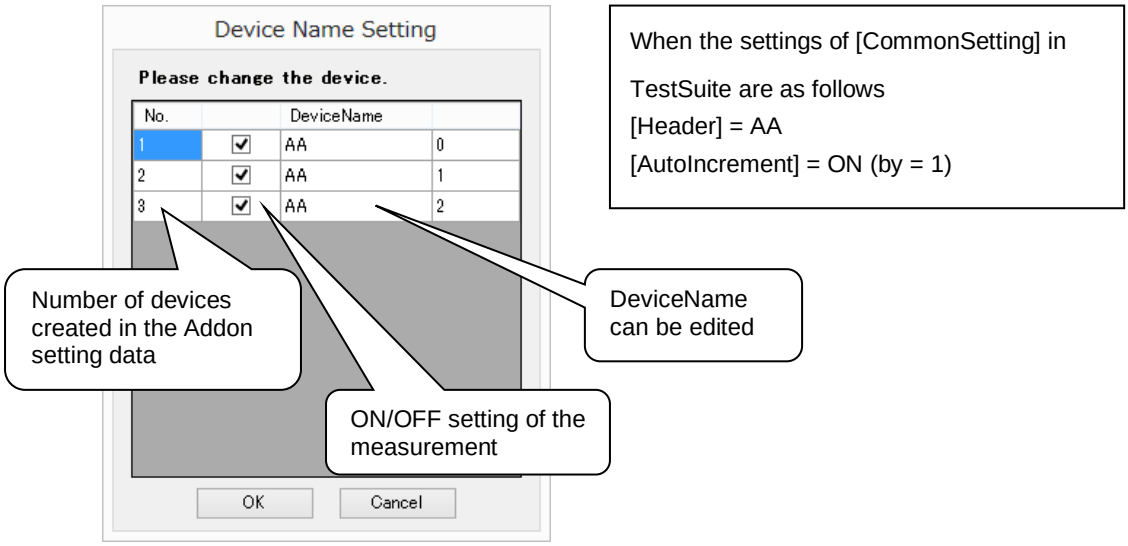
11.2.4 Add or delete Device

Clicking the [AddDevice] button adds the Addon setting data for one device as the default value.
Clicking the [DeleteDevice] button displays the delete confirmation of the selected device.
Clicking the [Yes] button deletes the Addon setting data of the target device.
However, deletion cannot be carried out if there is only one device.
These operations affect all of the Addon settings.
Device cannot be added or deleted with [TempRegulator].

11.2.5 Automatic measurement

Clicking the [Start] button or [Measure] and then [Start] on the Menu starts the automatic measurement.
The measurement proceeds in accordance with TestSuiteFile that is open on the main screen. Before the measurement of each Item and Device is carried out, the Addon is executed in accordance with the Addon setting data.
In the case of using the fixture with a temperature regulator, the temperature regulator is controlled by the temperature set to the Addon setting data, and the automatic measurement is carried out at the same temperature for the number of devices created in the Addon setting data.

The flow after the start of the automatic measurement is mostly the same as the normal automatic measurement starting from the main screen (refer to “4.3 Measurement”).
The automatic measurement is carried out for the number of devices set in the Addon setting data, so make the DeviceName settings for the number of the set devices on the DeviceName setting screen. Start the measurement with the [OK] button.
The check boxes set the ON/OFF of the measurements. If the box is set to OFF, the Addon settings and the measurement for the set device number are not carried out. The ON settings can only be made for a sequential device number from 1.



When the measurement of the specified number of devices is complete, the DeviceName setting screen opens again. Replace the device, set DeviceName, and restart the measurement with the [OK] button. The [Cancel] button quits the measurement.
In the case of using the fixture with a temperature regulator, the set temperature is added at the end of DeviceName as the temperature information in such a way as "DeviceName; temperature". When the automatic measurement has been carried out for all the temperatures set in the Addon setting data and the measurement is complete, the DeviceName setting screen opens.

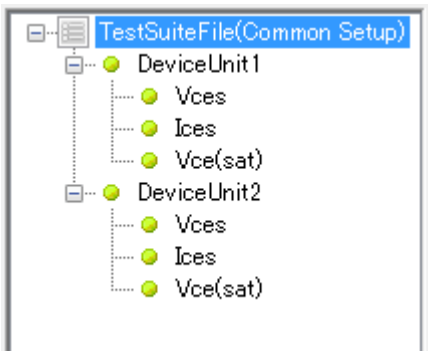
To Stop the measurement while the measurement is being carried out, click the [Stop] button or [Measure] and then [Stop] on the Menu.
Neither editing of each Addon setting nor change of the number of devices can be made during the measurement.

CAUTION: In the case of using the fixture with a temperature regulator, be sure that the PC on which the application is running does not go to sleep until the set temperature is reached as well as during the Wait time after the set temperature has been reached.

11.2.6 Examples of Addon function settings

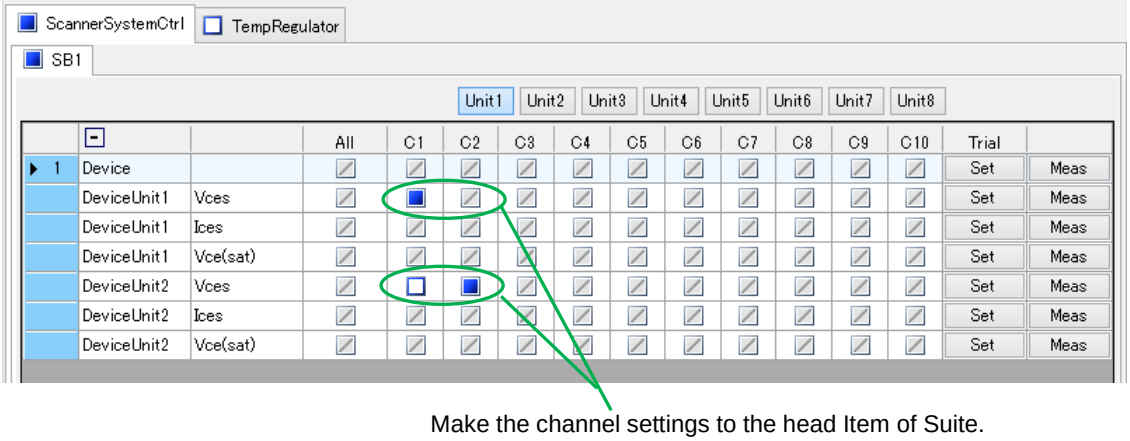
- Try measuring a 2-in-1 device using the scanner system

The settings for automatically measuring a 2-in-1 device in which two units are mounted on a single device by the scanner system's wiring switching are described below.
<Measurement contents>
Common to each unit on the device: Vces, Ices, and Vce(sat)



TestSuiteFile configuration

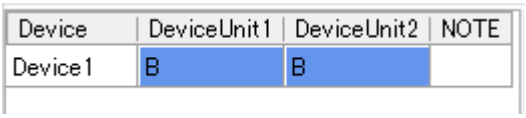
<Addon settings>
Only Unit 1 of the scanner system is to be used.
Addon setting data for wiring Channel 1 to the first unit on the device and Channel 2 to the second unit



Make the channel settings to the head Item of Suite.

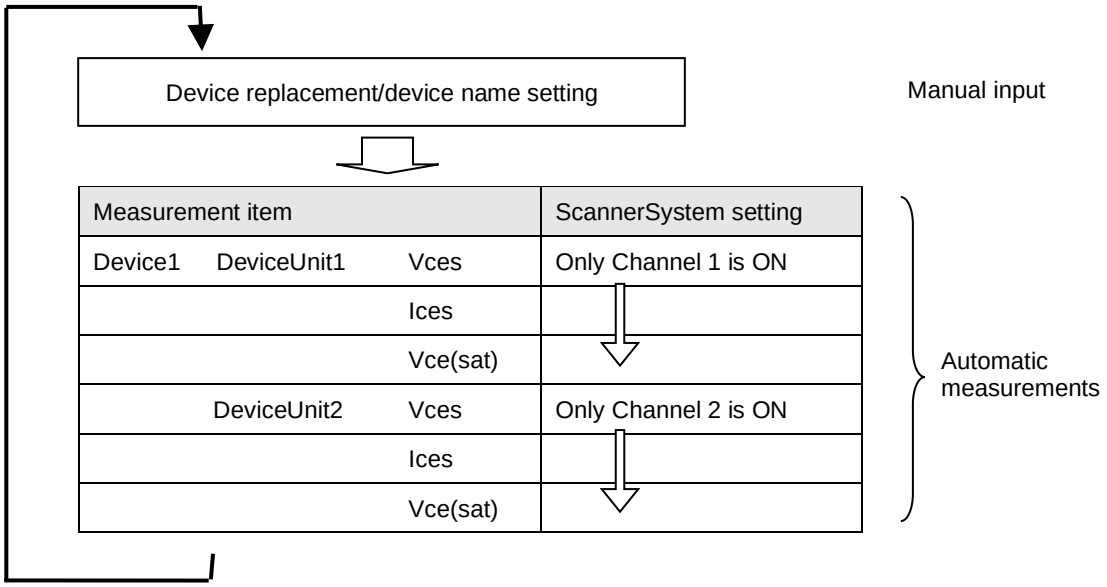
Set to Don'tCare where there is no change to the settings.
At the start of the measurement, the settings are reset (all Channels to OFF).

<Measurement>
The automatic measurement is carried out in the following manner.



Device	DeviceUnit1	DeviceUnit2	NOTE
Device1	B	B	

Measurement results LOG display

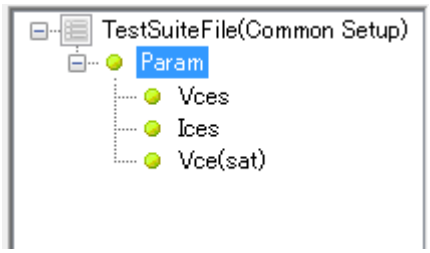


- Try measuring two devices using ScanUnitSystem

The settings for automatically measuring two devices by the scanner system's wiring switching are described below.

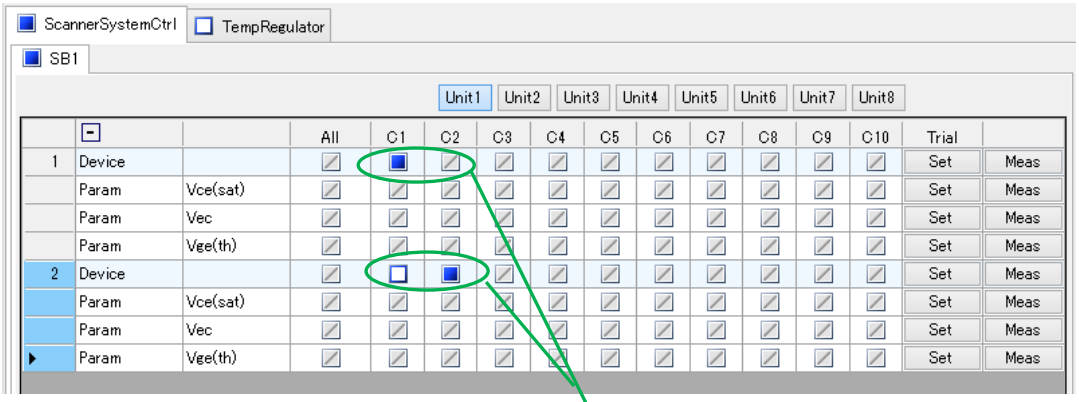
<Measurement contents>

Vces, Ices, and Vce(sat)



TestSuiteFile configuration

<Addon settings>
Only Unit 1 of the scanner system is to be used.
Addon setting data for wiring Channel 1 to the first device and Channel 2 to the second device



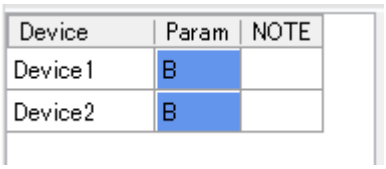
Add a device with [AddDevice].

Make the channel settings for each device.

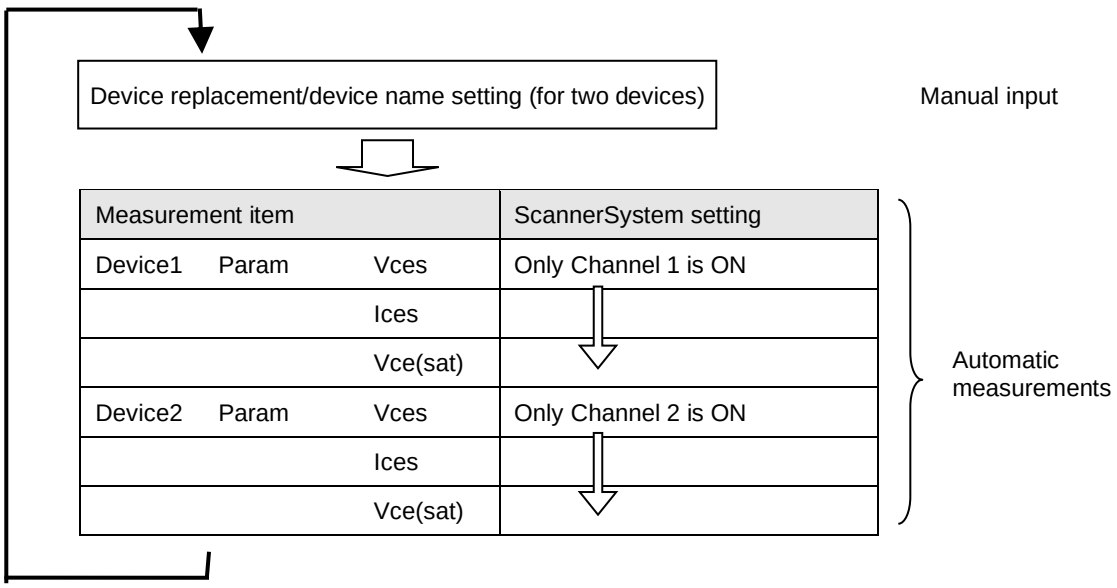
At the start of the measurement, the settings are reset (all Channels to OFF). Set to Don'tCare where there is no change to the settings.

<Measurement>

The automatic measurement is carried out in the following manner.



Measurement results LOG display

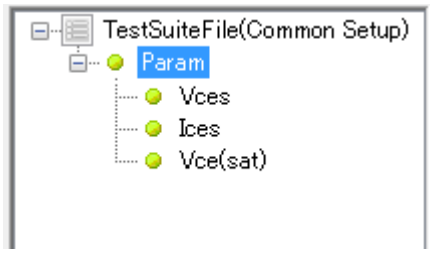


- Try measuring two devices using ScanUnitSystem and TempRegulator

The settings for automatically measuring two devices by automatically setting the temperature using the scanner system's wiring switching are described below.

<Measurement contents>

Vces, Ices, and Vce(sat)



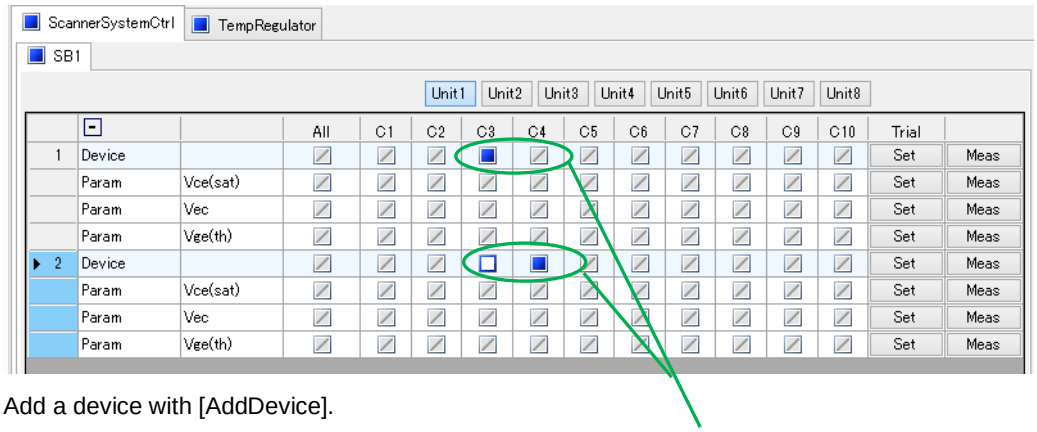
configuration

TestSuiteFile

<Addon settings>

Only Unit 1 of the scanner system is to be used.

Addon setting data for wiring Channel 3 to the first device and Channel 4 to the second device



Add a device with [AddDevice].

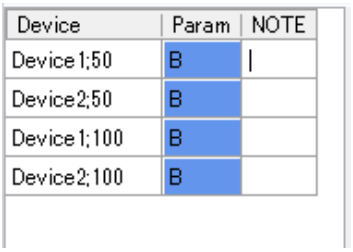
Make the channel settings to each device.

At the start of the measurement, the settings are reset (all Channels to OFF). Set to Don'tCare where there is no change to the settings.

The settings for making measurements at temperatures of 50°C (Wait = 5 minutes) and 100°C (Wait = 10 minutes)

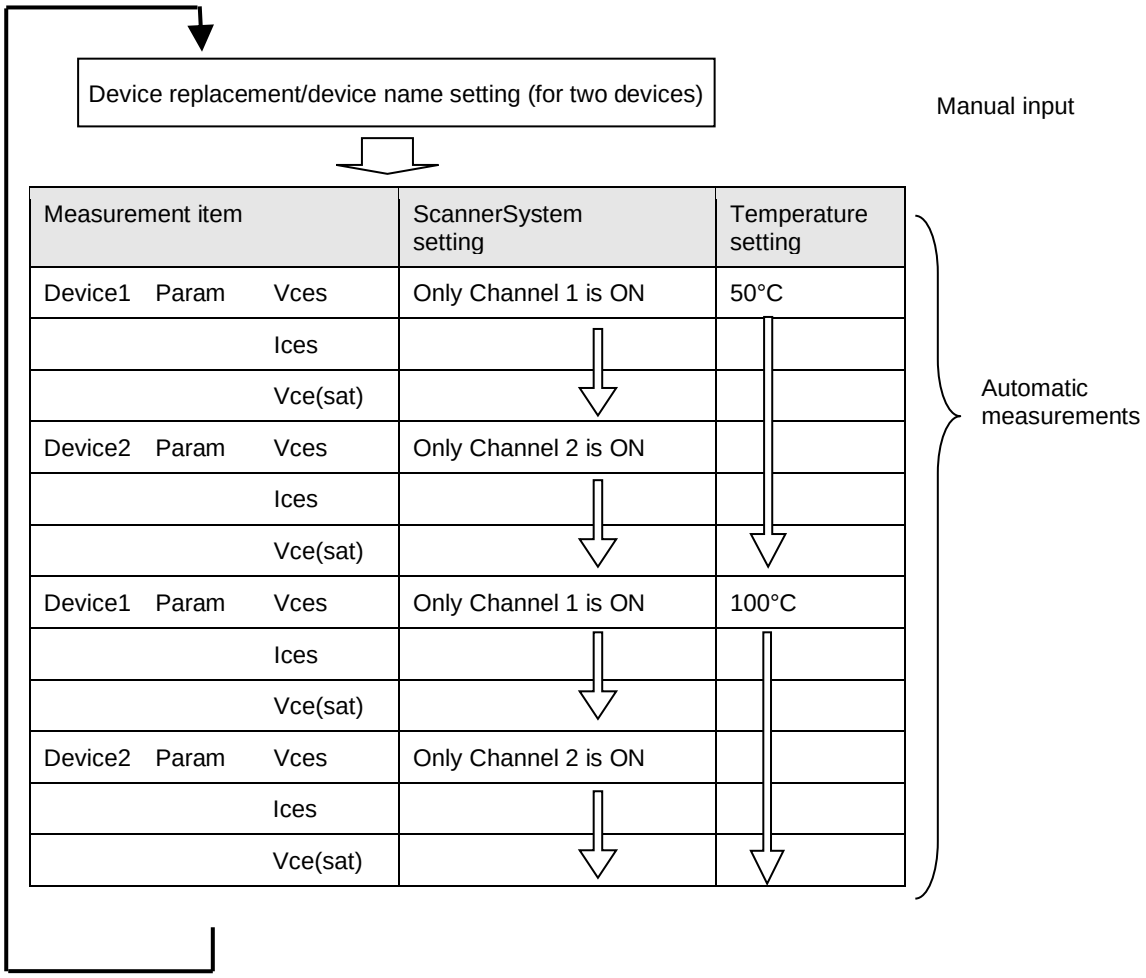
<Measurement>

The automatic measurement is carried out in the following manner.



Device	Param	NOTE
Device1;50	B	
Device2;50	B	
Device1;100	B	
Device2;100	B	

Measurement results LOG display



Measurement item			ScannerSystem setting	Temperature setting
Device1	Param	Vces	Only Channel 1 is ON	50°C
		Ices		
		Vce(sat)		
Device2	Param	Vces	Only Channel 2 is ON	
		Ices		
		Vce(sat)		
Device1	Param	Vces	Only Channel 1 is ON	100°C
		Ices		
		Vce(sat)		
Device2	Param	Vces	Only Channel 2 is ON	
		Ices		
		Vce(sat)		

Memo

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