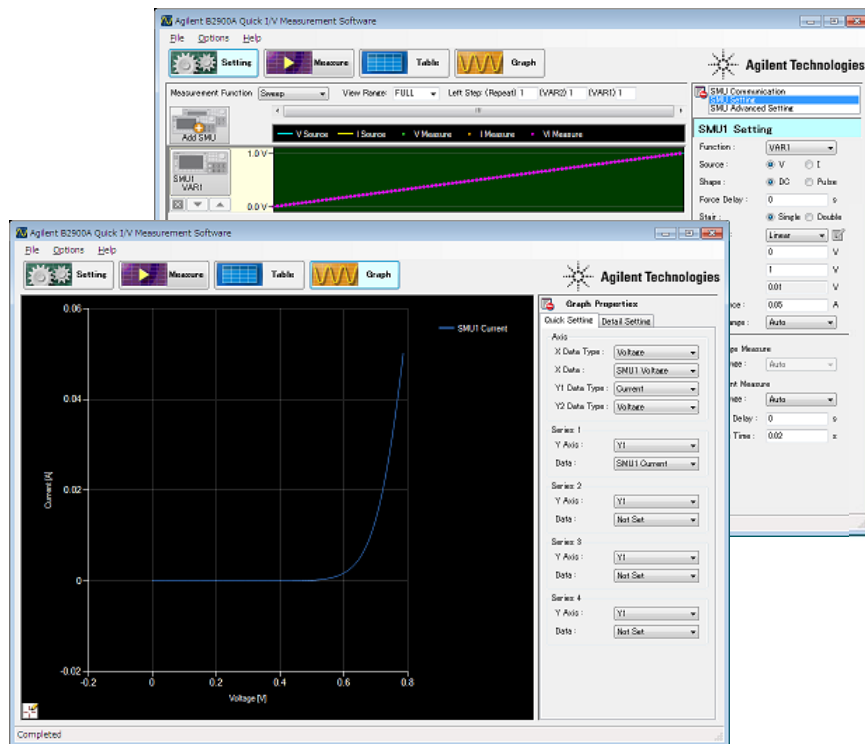


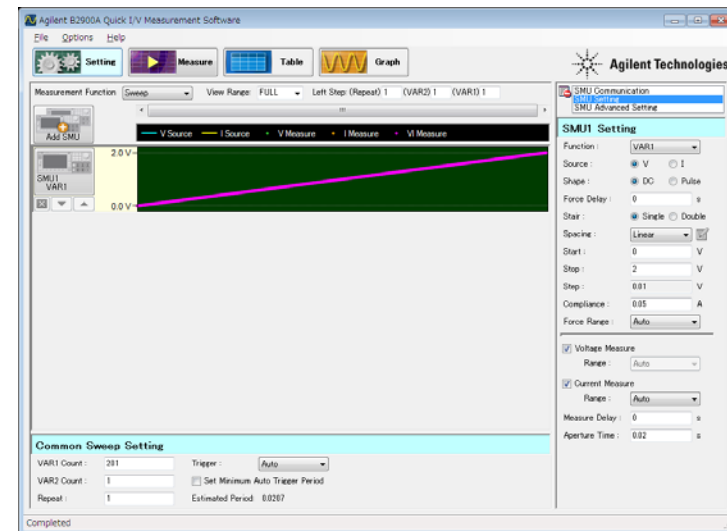
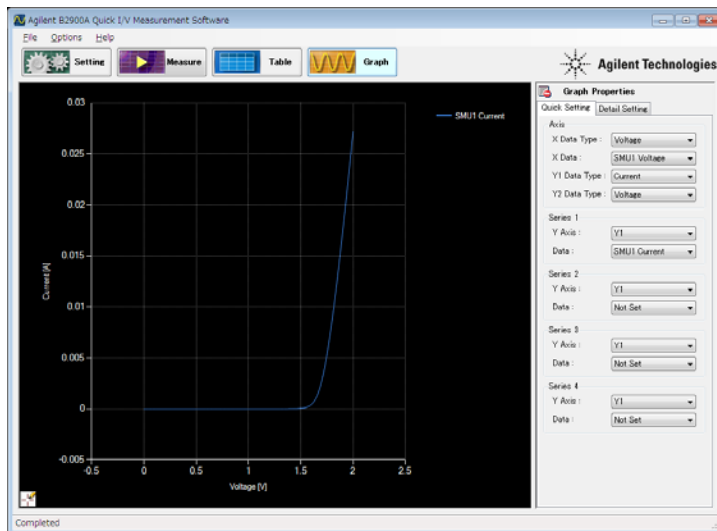
How to use Agilent B2900A Quick I/V Measurement Software

Agilent Technologies



Agilent B2900A Quick I/V Measurement Software

- ✓ Free PC-based software
- ✓ Communication via GPIB, USB or LAN ports
- ✓ Up to 4 SMU Channels supported (in any configuration of instruments)
- ✓ Software can be downloaded from Agilent website



Contents

1. Pre-Requirements
2. Agilent B2900 A Quick I/V Measurement Software's interface at a glance
3. Identify Connected B2900A Series instruments
4. Identify Each B2900A Series Channel
5. Sweep Measurement Condition Setup
6. Interface to set up List Sweep Source Data
7. How to copy from a spreadsheet to the List Sweep's List Edit Window
8. IV Sweep Measurement Setup Example
9. Sampling Measurement Setup
10. I-t Sampling Measurement Setup Example
11. Setting up the Arbitrary Waveform Source Condition
12. Setup Example to source Sinusoid Waveform
13. Using Table View
14. Using Graph View

1. Pre-Requirements

Please install the software on your PC before proceeding.

- [Agilent IO Libraries Suite 16.0 or greater \(Link\)](#)
 - [Agilent B2900A Quick IV Measurement Software \(Link\)](#)
- You will be required to install Microsoft .NET framework 4.0 or greater during the installation if you don not already have it. In that case, you PC needs a LAN connection to the internet in order to install it.

2. Agilent B2900 A Quick I/V Measurement Software Interface at a glance

Setting View:

Interface to connect with instruments and set the measurement conditions.

Run Measurement:

Execute the measurement currently loaded in the settings.

Table View:

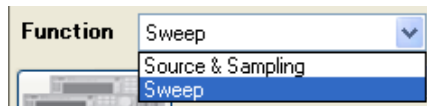
Interface to view the last measurement data list.

Graph View:

Interface to view the last measurement result graph.

Measurement Function:

You can select either the "Source & Sampling" or "Sweep" measurement functions.

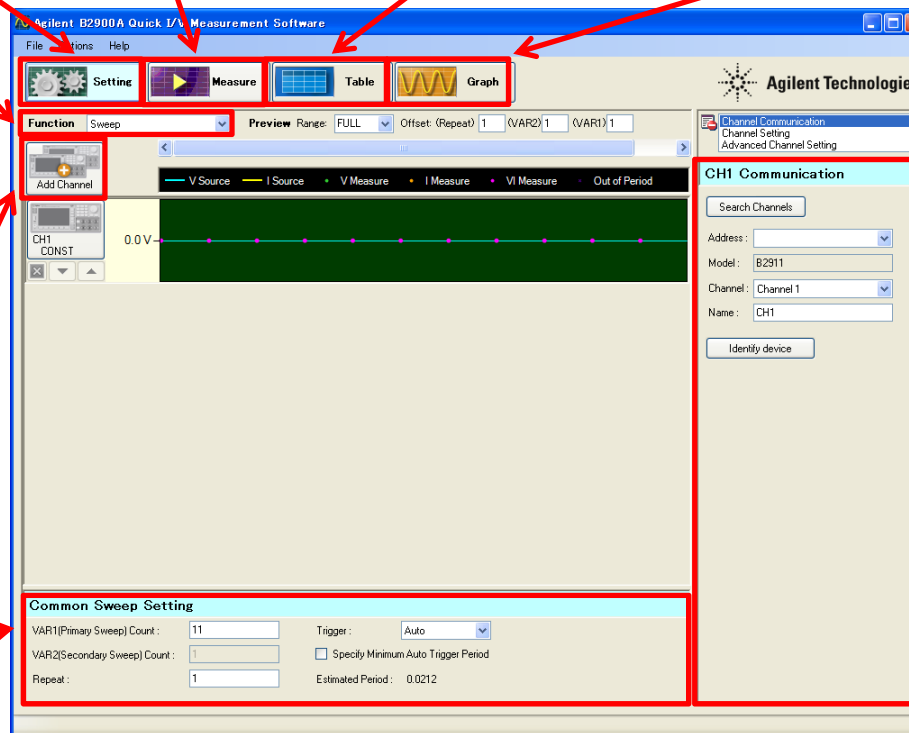


Add Channel:

Adds a new measurement channel. Up to four channels are supported.

Common Setting:

You can specify common measurement parameters, such as the number of sweep steps, triggering, the number of sample points, etc.



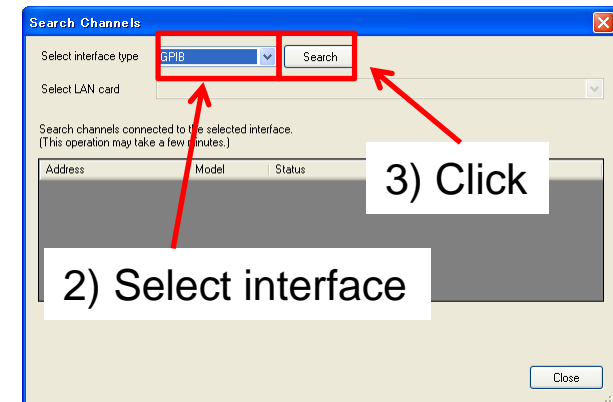
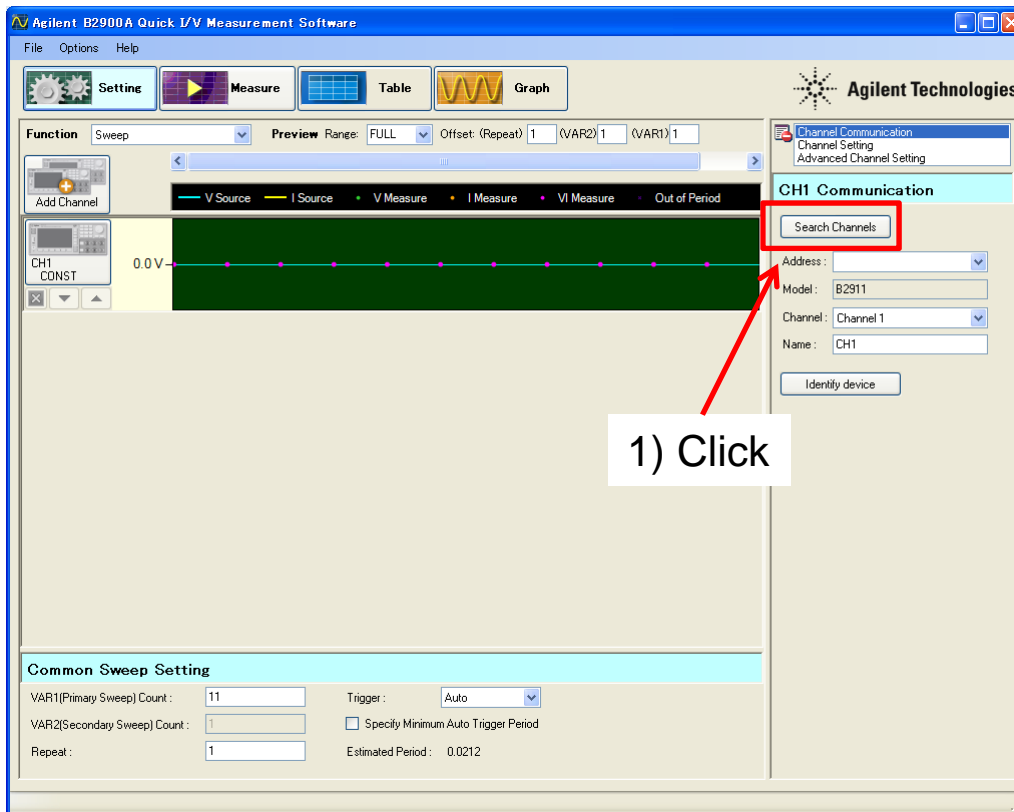
Setting Panel:

Parameters displayed for Channel Communication
Channel Setting
Advanced Channel Setting

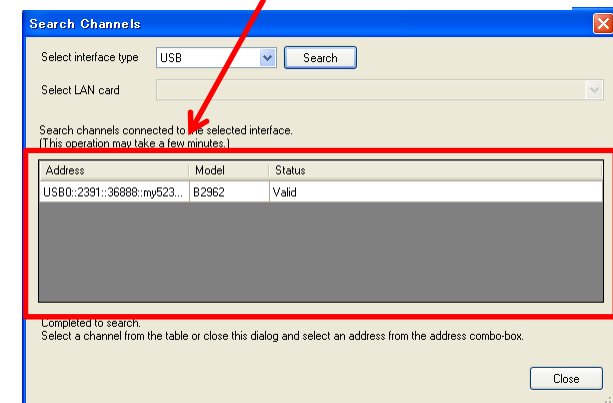
A "Help" menu is also available to aid with using the software

3. Identify Connected B2900A Series instruments

After connecting the interface cable, click “Search Channel” to identify B2900A Series instruments.



You'll see a list of addresses



4. Identify Each B2900A Series Channel

After selecting a channel, select from the list the address of the instrument you want to use. Then identify the channel of the instrument that you want to use. All channels you want to use must be individually set up in this way.

The screenshot shows the software interface with the following elements:

- 1) Select Channel:** A red box highlights the 'CH1 CONST' button in the 'Add Channel' section.
- 2) Select the address:** A red box highlights the 'Address' dropdown menu in the 'CH1 Communication' section.
- 3) Select the channel:** A red box highlights the 'Channel' dropdown menu in the 'CH1 Communication' section.
- 4) Click to identify:** A red box highlights the 'Identify device' button in the 'CH1 Communication' section.

Other visible elements include the 'Function' menu (Sweep), 'Preview Range' (FULL), 'Offset' settings, 'Common Sweep Setting' (VAR1 Count: 11, Trigger: Auto), and 'Channel Communication' options (Channel Setting, Advanced Channel Setting).



You'll see the VISA address of the unit on the software and the instrument GUI

The instrument GUI displays the following information:

- Channel 1:** Output: VOLTS, Mode: Ch 1, Source: Ch 1, Limit: +100.0000 μ A. The VISA address is displayed as `USB0::2391::36888::my52350002::0::V`.
- Channel 2:** Output: VOLTS, Mode: Ch 1, Measure: Ch 1, Limit: +100.0000 μ A. The display shows 'OFF' and '000.0000mV'.

Navigation buttons at the bottom include Config, Function, Trigger, Result, File, and More... The status bar shows REM, LAN, and D.

5. Sweep Measurement Conditions Setup (1)

After selecting the “Sweep” function, the channel and the “Channel setting”, you will see the interface to set up the source and measurement parameters.

The screenshot shows the software interface with several key areas highlighted by red boxes and arrows:

- 1) Select the function:** The 'Function' dropdown menu is set to 'Sweep'.
- 2) Select Channel:** The 'Add Channel' button and the 'CH1 VAR1' channel selection are highlighted.
- 3) Select “Channel Setting”:** The 'Channel Setting' menu item is highlighted in the top right.
- Measurement Parameters:** The 'CH1 Setting' panel is highlighted, showing parameters for Source Function, Mode, Shape, Sweep, Start, Stop, Step, Compliance, and Source Range.

Two inset images show dropdown menus:

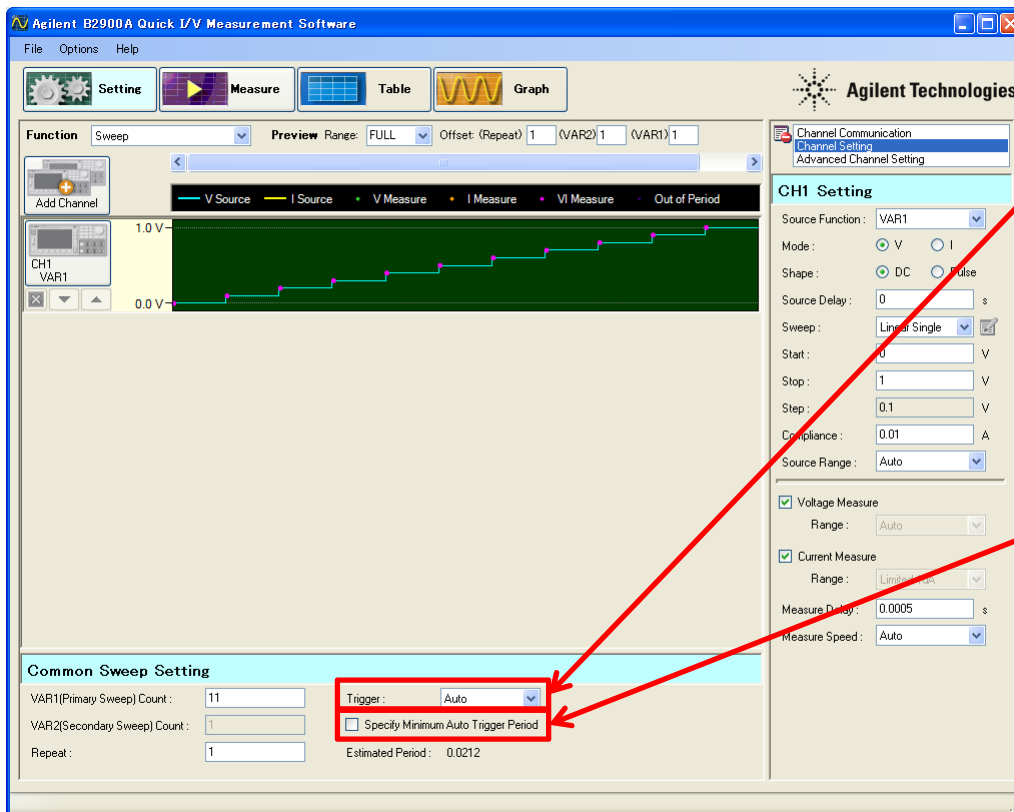
- The first inset shows the 'Source Function' dropdown with options: CONST, VAR1, VAR2, OPEN, IGNORE.
- The second inset shows the 'Sweep Mode' dropdown with options: Linear Single, Linear Double, Log Single, Log Double, List, 0.1.

Annotations include: '3) Select “Channel Setting”', 'You can select Source Function', and 'You can select Sweep Mode, when you Specify VAR1, VAR2 as Source Function'.

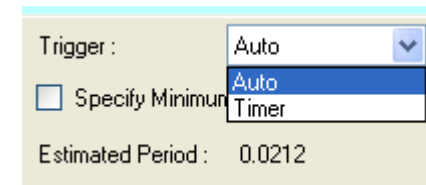
5. Sweep Measurement Conditions Setup (2)

~ How to specify TIMER Trigger and Period ~

In the Sweep measurement function, you can select “Timer” as Trigger Mode and specify a period. This enables you to step source signals at constant time intervals.



1) Set Trigger Mode to Timer



2) Specify Trigger Period

6. Interface to set up List Sweep Source Data (1)

The screenshot displays the Agilent B2900A Quick I/V Measurement Software interface. The main window is titled "List Edit" and features a "List Data" table on the left with rows numbered 0 to 27. The central area is divided into several sections:

- List Graph:** A large black rectangular area at the top.
- Function:** A dropdown menu set to "Line". Below it, a description reads: "Generates array data of a straight line from the Start value to the End value."
- Parameters:** A table with the following values:

Start	0
End	0
Point	2
- Function Data:** A small graph showing a horizontal line.
- Start:** A text field with the instruction: "Enter the start value or Select Selected Start/End Value."
- Apply Data:** Two dropdown menus: "Calculate" set to "Through" and "Operation" set to "Append".
- Buttons:** "Preview", "Commit", "OK", and "Cancel" buttons are located at the bottom.

In the background, the "CH1 Setting" panel is visible. A red box highlights a button in the "Source Delay" section, which is pointed to by a blue arrow. A red arrow points from the text below to this button.

After selecting List as Sweep Mode, click this button to open List Edit Window

6. Interface to set up List Sweep Source Data (2)

List Data:

Show the generated list data as a text table. You can edit the cell value.

The right-click menu is also available.

- Select all rows
- Insert row
- Delete row(s)
- Delete all rows
- Copy row(s)

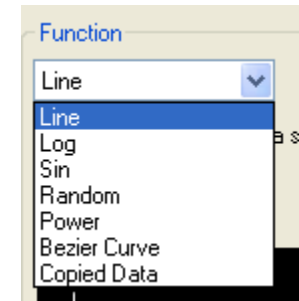
The screenshot shows the 'List Edit' dialog box. On the left is a table with columns 'List Data' and values: 0: 0.000E+000, 1: 100.000E-003, 2: 200.000E-003, ..., 10: 1.000E+000. A right-click context menu is open over the table with options: Select all rows, Insert row, Delete row(s), Delete all rows, Copy row(s). On the right is a 'List Graph' showing a step function. Below the graph is the 'Function' section with a dropdown set to 'Sin', a description 'Generates a sine curve data array. Amplitude * sin(XStep * N + XStart) + Offset', and a 'Function Data' graph showing a sine wave. To the right of the function section is a 'Parameters' table: Amplitude: 2, Offset: 1, X Start: 0, X Step: 1, Point: 360. Below the function section is the 'Apply Data' section with 'Calculation' set to 'Through' and 'Operation' set to 'Append'. There are 'Preview', 'Commit', 'OK', and 'Cancel' buttons.

List Graph:

Show the generated list data as a graph.

Function:

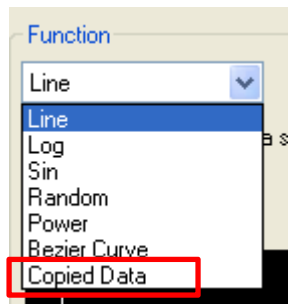
Generate temporary list data by specifying the function and parameters.



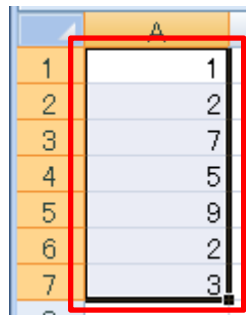
Apply Data:

Apply the generated temporary function data to the list data.

7. How to copy data from a spreadsheet to the List Sweep's List Edit Window (1)



1) Select "Copied Data" as Function



2) Copy [Ctrl-C] data

The main screenshot shows the 'List Edit' window. On the left is a 'List Data' table with rows 0 through 27. The central 'List Graph' area contains a text box with the instruction: '3) Click the Function Data area and paste [Ctrl-V] data'. Below this is the 'Function' dropdown set to 'Copied Data' and a description: 'Uses the copied array data. Select rows and copy data by context menu Drop or paste(Ctrl-V) data to function graph'. A 'Function Data' graph is shown below, displaying a step function with values 1, 2, 7, 5, 9, 2, 3. At the bottom, the 'Apply Data' section has 'Calculation' set to 'Through' and 'Operation' set to 'Append'. The 'Commit' button is highlighted with a red box.

4) Press Commit to apply data

A screenshot of the 'List Edit' window showing the 'List Data' table after the data has been applied. The data values are: 1.000E+000, 2.000E+000, 7.000E+000, 5.000E+000, 9.000E+000, 2.000E+000, and 3.000E+000.

List Data
0
1
2
3
4
5
6
7

7. How to copy data from a spreadsheet to the List Sweep's List Edit Window (2)

1) Select "Copied Data" as Function

2) Select data

3) Drag and Drop data to Function Data area

4) Press Commit to apply data

Function	Parameters
Line	
Line	
Log	
Sin	
Random	
Power	
Bezier Curve	
Copied Data	

	A
1	1
2	2
3	7
4	5
5	9
6	2
7	3

Function	Parameters
Copied Data	

Function Data

Function	Parameters
Through	Uses the array data generated by the function
Append	Appends the data after the present list data

List Data	
0	1.000E+000
1	2.000E+000
2	7.000E+000
3	5.000E+000
4	9.000E+000
5	2.000E+000
6	3.000E+000
7	

8. IV Sweep Measurement Setup Example

The screenshot displays the Agilent B2900A Quick I/V Measurement Software interface. The main window is titled "Agilent B2900A Quick I/V Measurement Software" and includes a menu bar (File, Options, Help) and a toolbar with icons for Setting, Measure, Table, and Graph. The "Function" dropdown is set to "Sweep". The "Preview" section shows "Range: FULL", "Offset: (Repeat) 1", "(VAR2) 1", and "(VAR1) 1". A graph shows a linear sweep from 0.0 V to 2.0 V. The "CH1 Setting" panel is open, showing "Source Function: VAR1", "Mode: V", "Shape: DC", "Sweep: Linear Single", "Start: 0 V", "Stop: 2 V", "Step: 0.02 V", "Compliance: 0.1 A", and "Source Range: Auto". The "Measure Settings" panel is also open, showing "Voltage Measure" and "Current Measure" both checked, with "Range: Auto", "Measure Delay: 0.1 s", and "Measure Speed: Auto". The "Common Sweep Setting" panel at the bottom shows "VAR1(Primary Sweep) Count: 101", "Trigger: Auto", "VAR2(Secondary Sweep) Count: 1", "Repeat: 1", and "Estimated Period: 0.1207". Red boxes highlight the "VAR1(Primary Sweep) Count" field, the "CH1 Setting" panel, and the "Measure Settings" panel. Red arrows point from text labels to these areas.

Source Settings →

Measure Settings →

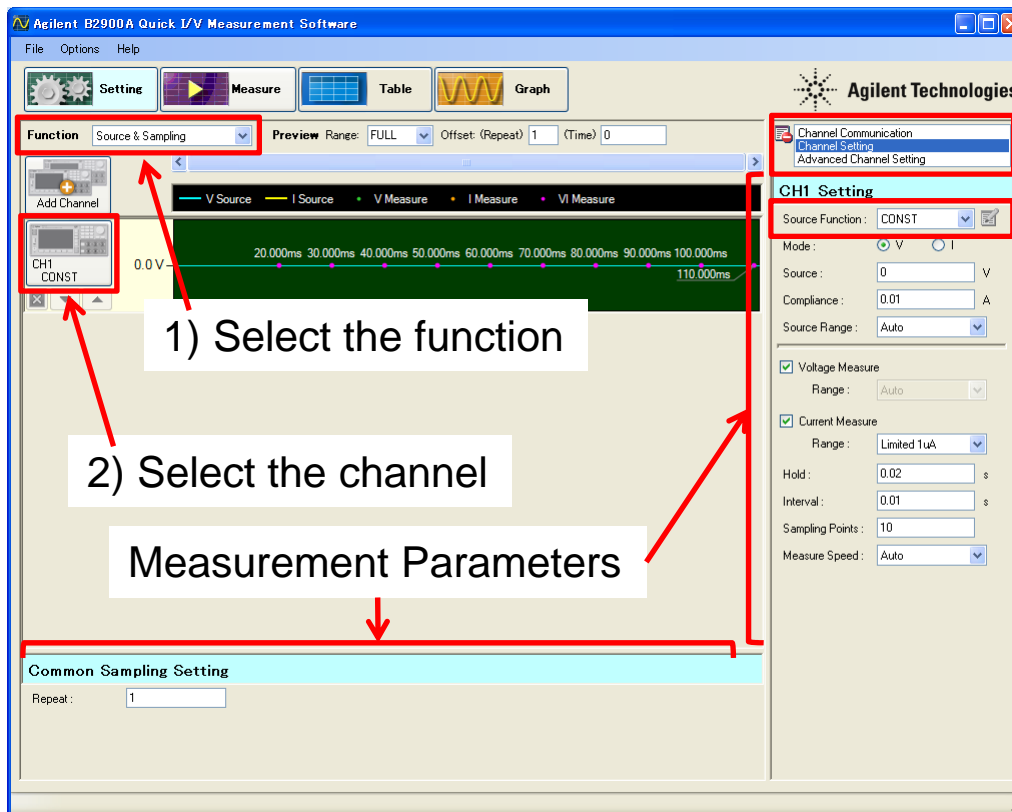
Number of Sweep Points is defined by VAR1 Count

Condition

DUT	: LED
Source Mode	: Voltage
Start Value	: 0 V
Stop Value	: 2 V
Points	: 101
Current Limit	: 100 mA
Measurement Speed	: Auto
Measurement Range	: Auto
Measurement	
Trigger Delay Time	: 100 ms

9. Sampling Measurement Setup

After selecting the “Source & Sampling” function, the channel and the “Channel setting”, you will see the interface to set the source and measurement parameters.



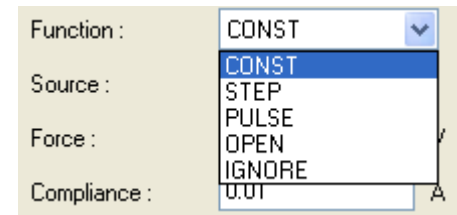
1) Select the function

2) Select the channel

Measurement Parameters

3) Select “Channel Setting”

You can select Source Function



10. I-t Sampling Measurement Setup Example

The screenshot displays the Agilent B2900A Quick I/V Measurement Software interface. The main window is titled "Agilent B2900A Quick I/V Measurement Software" and features a menu bar (File, Options, Help) and a toolbar with icons for Setting, Measure, Table, and Graph. The interface is divided into several sections:

- Function:** Source & Sampling. Preview Range: FULL. Offset: (Repeat) 1 (Time) 0.
- Channel Communication:** Channel Setting, Advanced Channel Setting.
- CH1 Setting:** Source Function: STEP. Mode: V (selected), I. Source Delay: 0.04 s. Base Value: 0 V. Bias Value: 2 V. Compliance: 0.1 A. Source Range: Auto.
- Voltage Measure:** Range: Auto.
- Current Measure:** Range: Limited 100mA. Hold: 0.02 s. Interval: 0.01 s. Sampling Points: 101. Measure Speed: Auto.
- Common Sampling Setting:** Repeat: 1.

A graph in the center shows a step function with a voltage source (V Source) and a current source (I Source). The voltage source is set to 2.0 V and the current source is set to 2.000 V. The graph shows a step function with a 40.000ms interval and a 2.000 V bias.

Two red boxes highlight the "CH1 Setting" and "Voltage Measure/Current Measure" sections. Red arrows point from the text "Source Settings" and "Measure Settings" to these respective sections.

Condition

DUT	: LED
Source Mode	: Voltage
Base Value	: 0 V
Bias Value	: 2 V
Points	: 101
Current Limit	: 100 mA
Measurement Speed	: Auto
Measurement Range	: 100 mA (Limited)
Hold Time	: 20 ms
Measurement Interval	: 10 ms

11. Setting up the Arbitrary Waveform Source Condition

When you select “Source & Sampling” as the function, the channel and then “Channel setting”, you’ll see the interface to the source and measurement parameters.

The screenshot shows the Agilent B2900A Quick I/V Measurement Software interface. The main window is titled "Agilent B2900A Quick I/V Measurement Software" and features a menu bar (File, Options, Help) and a toolbar with icons for Settings, Measure, Table, and Graph. The "Function" dropdown is set to "Source & Sampling". The "Channel" dropdown is set to "CH1 CONST". The "Source Parameters" panel on the right shows "Source Function: CONST" selected. The "Measurement Parameters" panel at the bottom shows "Common Sampling Setting" with "Repeat: 1".

3) Select “Channel Setting”

You can select Source Function

1) Select the function

2) Select Channel

Source Parameters

Measurement Parameters

Source Function :	CONST
Mode :	CONST
Source :	V
Compliance :	A
Source Range :	SINUSOID

12. Setup Example to source Sinusoid Waveform

The screenshot displays the Agilent B2900A Quick I/V Measurement Software interface. The main window shows a graph of a sinusoidal waveform with the following parameters: Amplitude: 3.0 V, Offset: 0.0 V, Frequency: 100 Hz, and 5 waveforms. The waveform is plotted on a grid with time markers from 0.00ms to 42.500ms. The interface includes a 'Function' dropdown set to 'Source & Sampling', a 'Preview' range of 'FULL', and an 'Offset (Repeat)' of 1. The 'CH1 Setting' panel on the right is highlighted with a red box and contains the following settings: Source Function: SINUSOID, Mode: V, Amplitude: 2 V, Offset: 1 V, Frequency: 100 Hz, Compliance: 1 A, Source Range: Auto, and # of Waveforms: 5. Below this, the 'Voltage Measure' and 'Current Measure' sections are also highlighted with a red box, showing settings for Range, Hold, Interval, Sampling Points, and Measure Speed. The 'Common Sampling Setting' panel at the bottom shows a 'Repeat' value of 1.

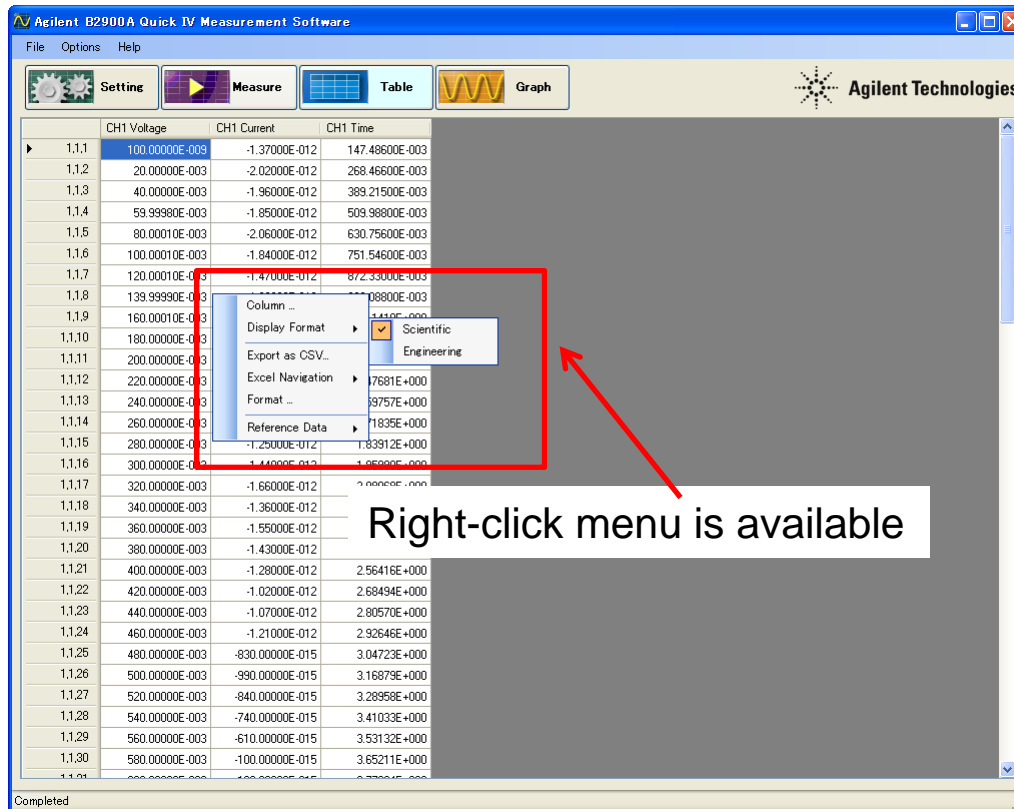
Source Settings →

Measure Settings →

Condition

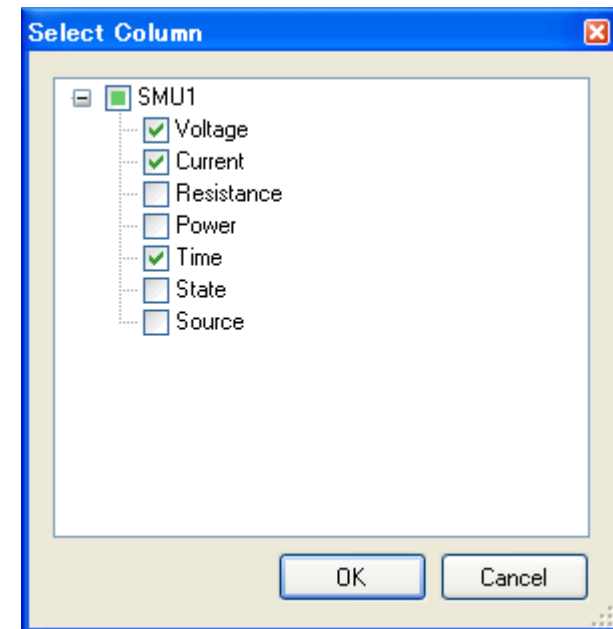
Source Mode	: Voltage
Amplitude	: 2 V
Offset	: 1 V
Frequency	: 100 Hz
Current Limit	: 1 A
Source Range	: Auto
Number of Waveforms	: 5
Hold	: 0 ms
Interval	: 50 us
Sampling Points	: 1001
Measure Speed	: Auto

13. Using Table View (1)



Column ...

You can add/delete the displayed column data

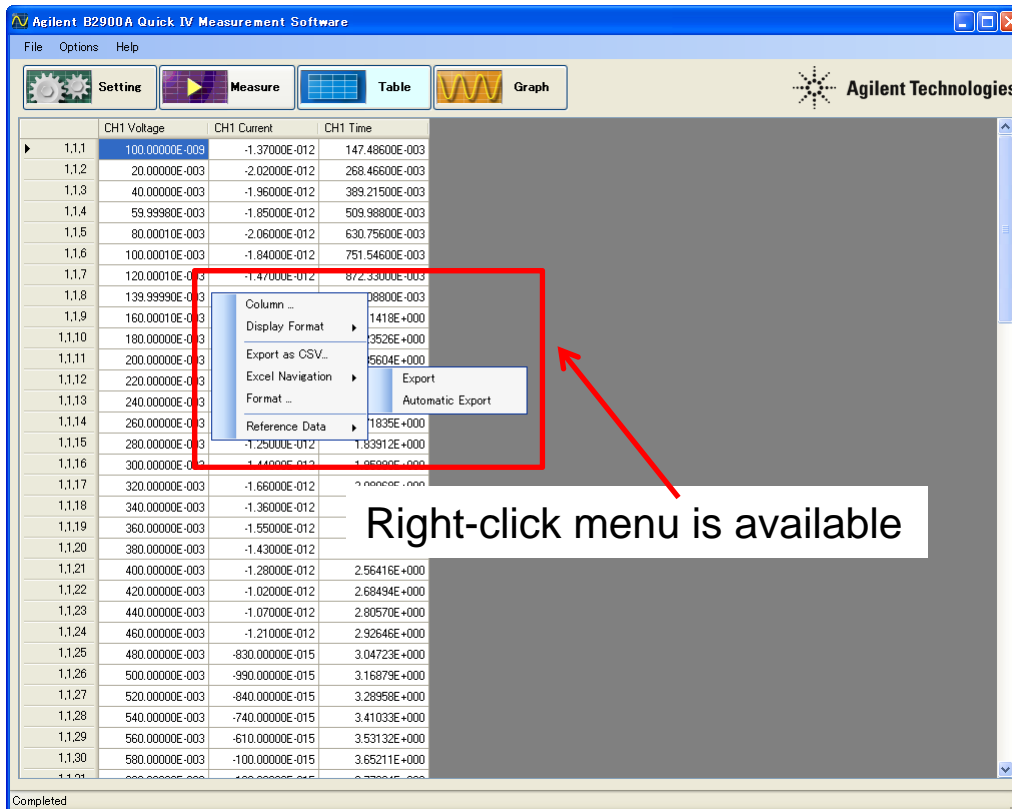


Display Format

You can select the number format for the displayed data

- ✓ Scientific (ex. 1.234E-005)
- ✓ Engineering (ex. 12.34u)

13. Using Table View (2)

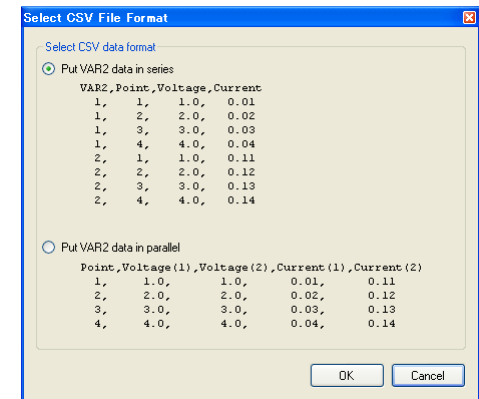


Export as CSV ...

You can save the table data to a CSV file formatted as specified in "Select CSV File Format" dialogue below.

Format ...

You can specify its data format for a CSV file.

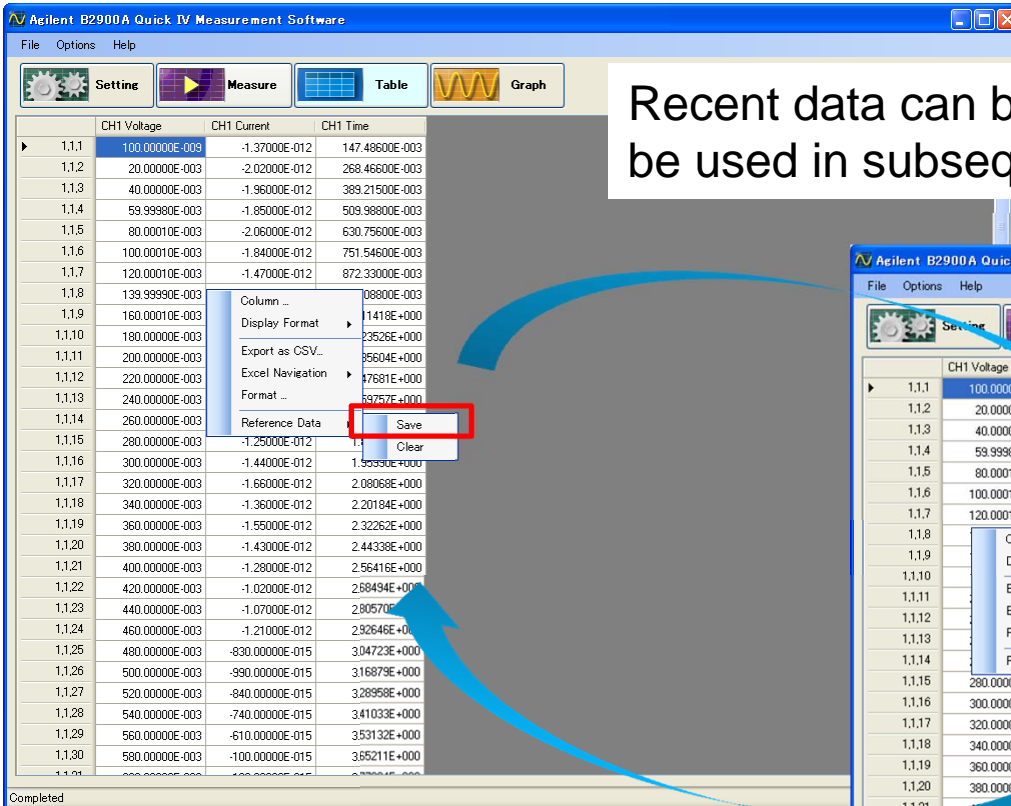


Excel Navigation

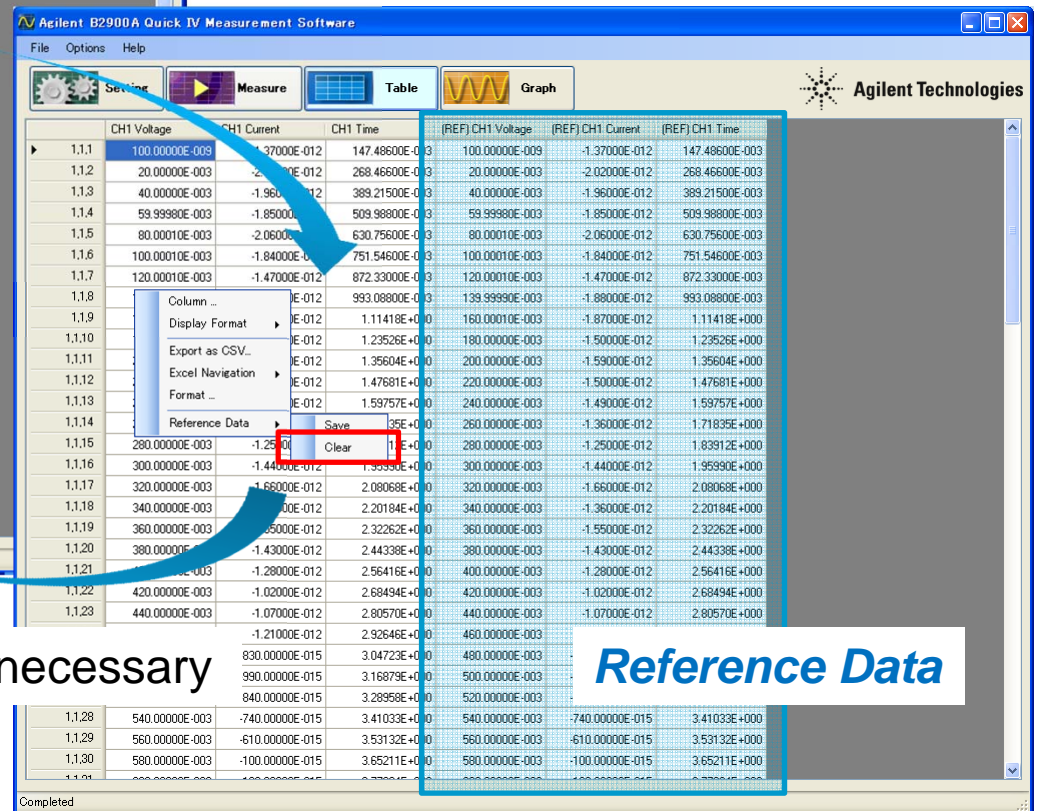
You can run Microsoft Excel and export the table data directly to it ...

- ✓ Manually after measurements (when Export is selected)
- ✓ Automatically after each measurement (when Automatic Export is selected)

13. Using Table View (3)



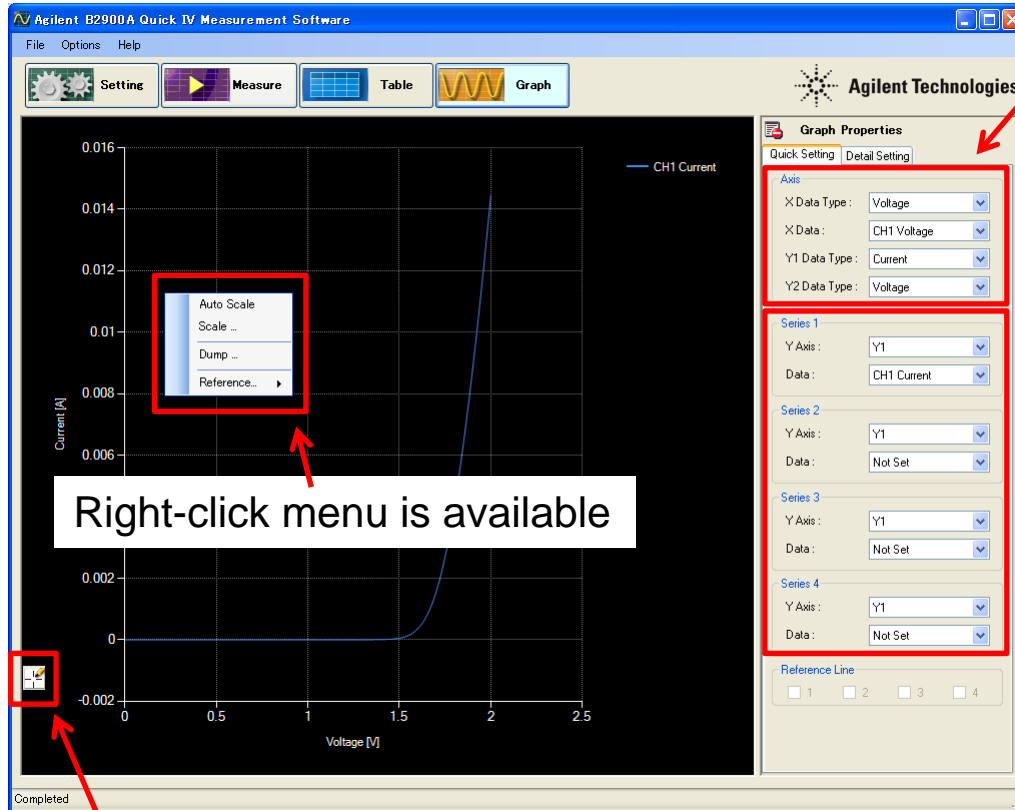
Recent data can be saved as reference data, which can be used in subsequent measurements



Reference data can also be cleared if necessary

Reference Data

14. Using Graph View (1)



Right-click menu is available

Clicking this button enables you to make use of the marker function

View	Series	X Value	Y Value	Index
<input type="checkbox"/> Marker 1	OFF Series 1			
<input type="checkbox"/> Marker 2	OFF Series 2			
Delta				

Axis Group Box

You can specify Data type for each axis

Series Group Box

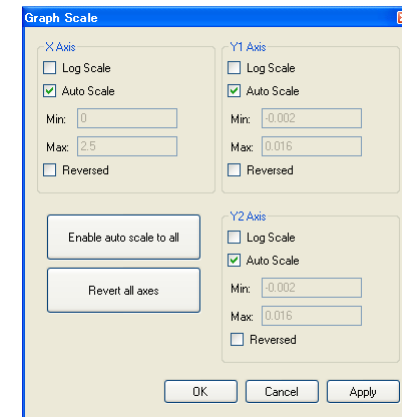
You can select data for each axis

Auto Scale

You can execute auto scaling

Scale ...

You can set up the scale parameters for each axis

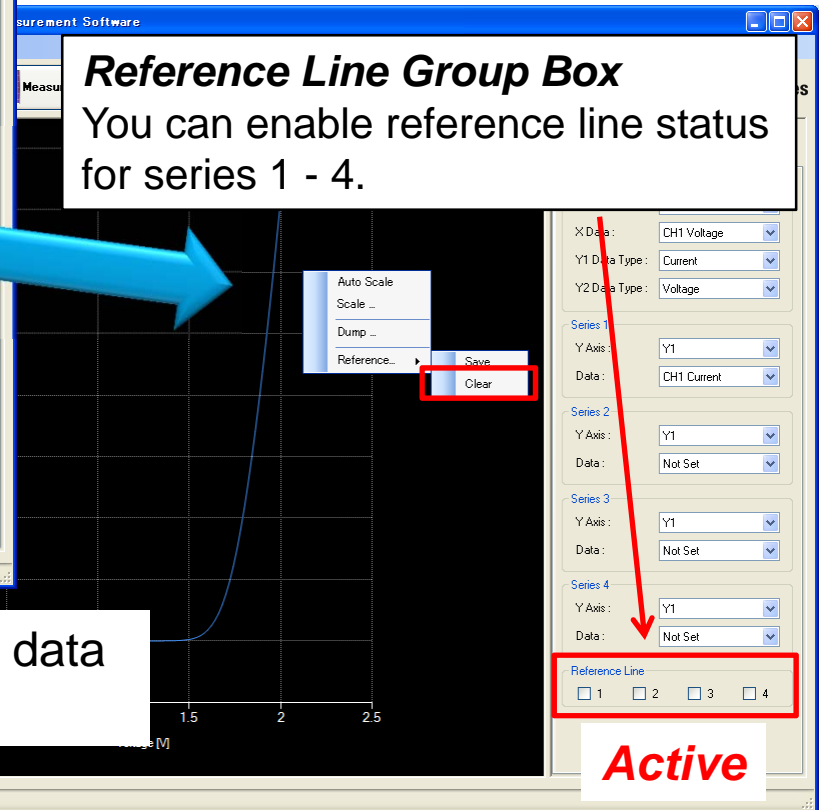
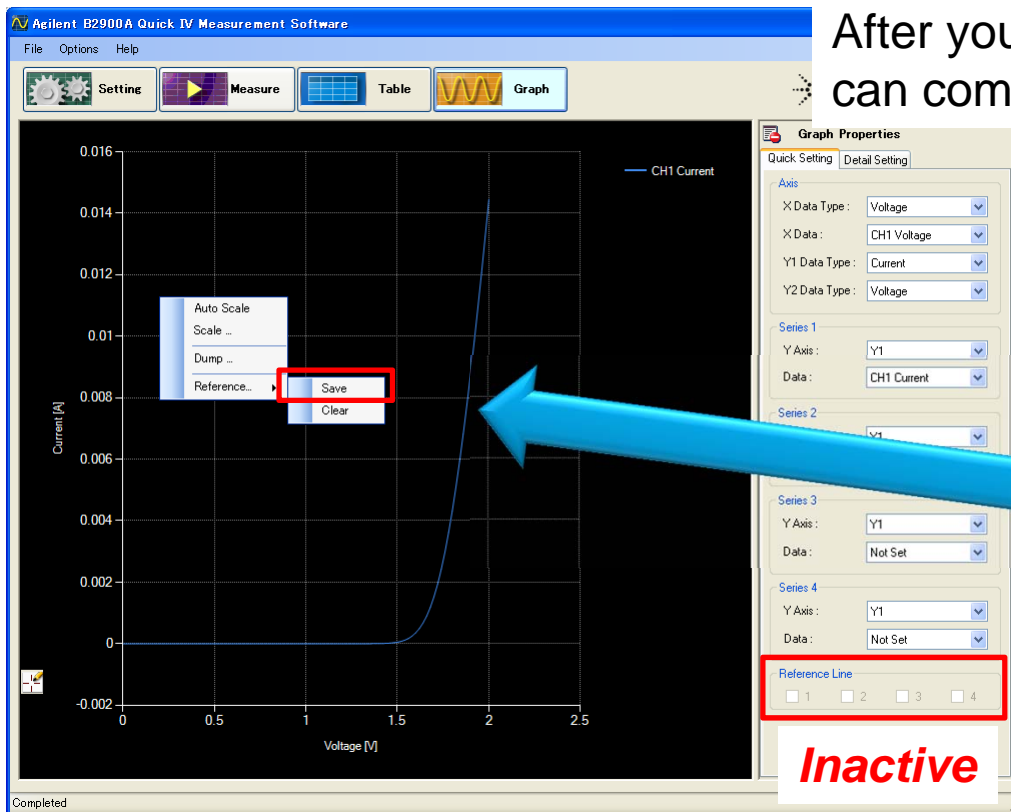


Dump

You can export an image of the graph

14. Using Graph View (2)

After you save data as reference data, you can compare other data against it.



For example, if you check box #1, the reference data corresponding to this location is displayed.