

BT4560-50

BT4560

Application Software

User's Manual

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1. Overview

This PC application software, "BT4560 Application Software", transfers measurement data from BT4560 Impedance Meter to PC and displays measurement result visually. And also makes available measurement parameters setting per PC.

1.1. PC Requirement

Recommended PC Requirements :

OS	Windows 10 (32-bit/64-bit) Windows 11
Software Environment	Microsoft .NET Framework 4.0 or 4.5 (Essential)
CPU	CPU clocked at 1 GHz or greater
Memory	512MB memory or more
Display	1920×1080 dots or more
Hard Disk	550MBhard disk space or more
Communication interface	USB2.0 (virtual COM port)

2. Install Method

2.1. Install

2.1.1. Install USB Driver

Step1 : Double click [PL2303_Prolific_DriverInstaller_vX.XX.X.exe] then following dialog will appear. ("X" of the actual file name will be displayed as the version number.)
Click [Next]
(You can choose [Cancel] to exit) (Fig 2-1)

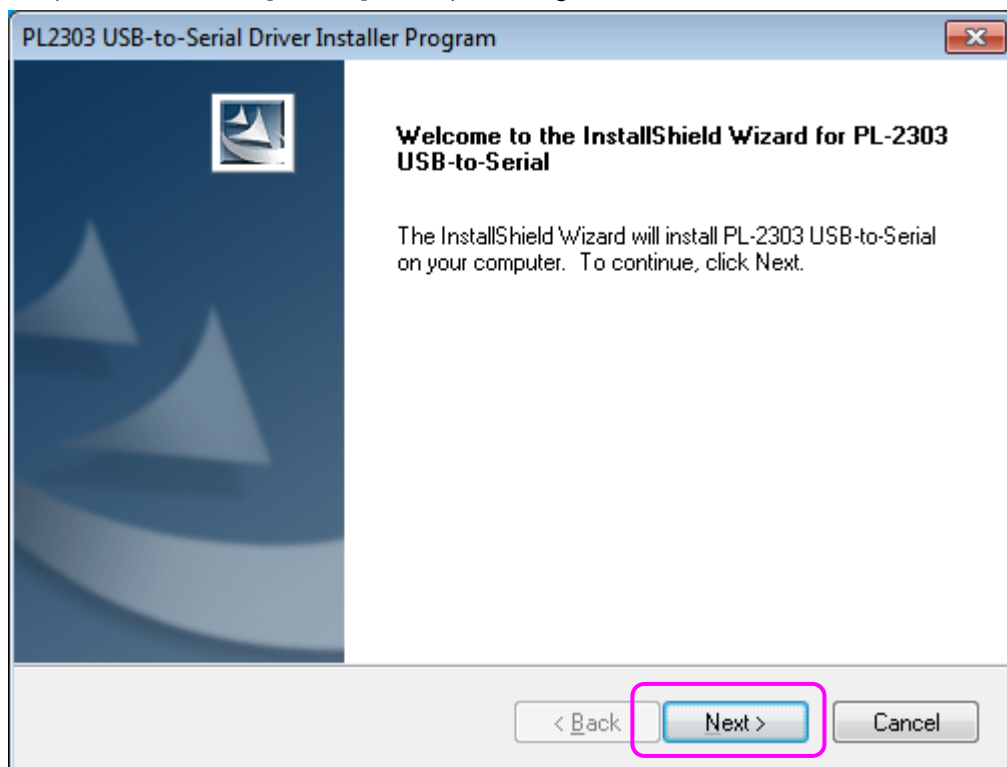


Fig 2-1

Step2 : If the driver is installed successfully, Click [Finish]. (Fig 2-2)

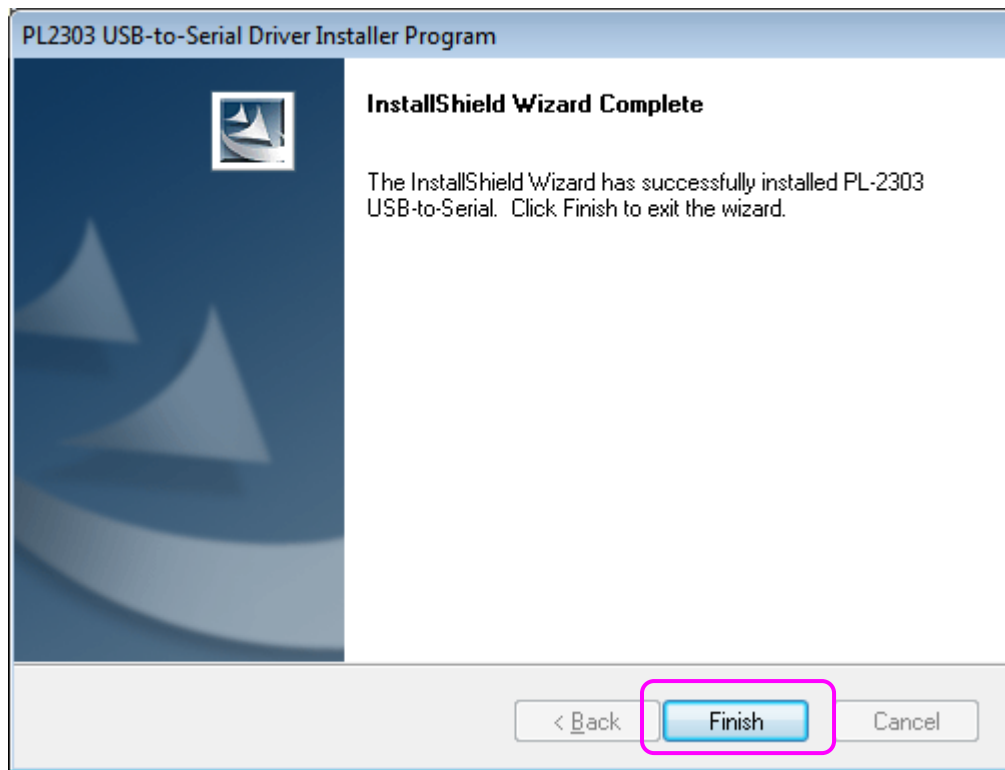


Fig 2-2

2.1.2. Install BT4560 Application Software

Step 1 : Double click [setup.exe].

Note : If Microsoft .NET Framework 4.0 or 4.5 has not been installed, the following error message appears. (Fig 2-3)

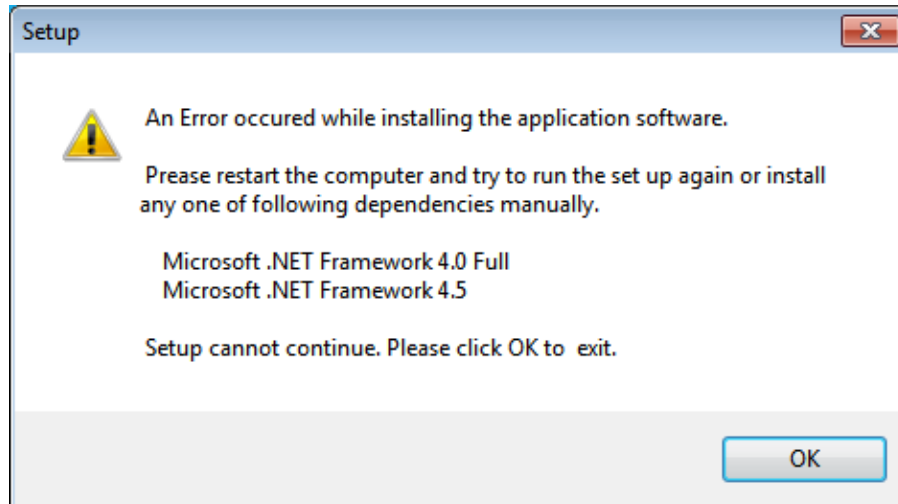


Fig 2-3

Click [OK] to exit. Please re-install the BT4560 Application Software after installing Microsoft .NET Framework.

Step2 : Click [Next]. (Fig 2-4)

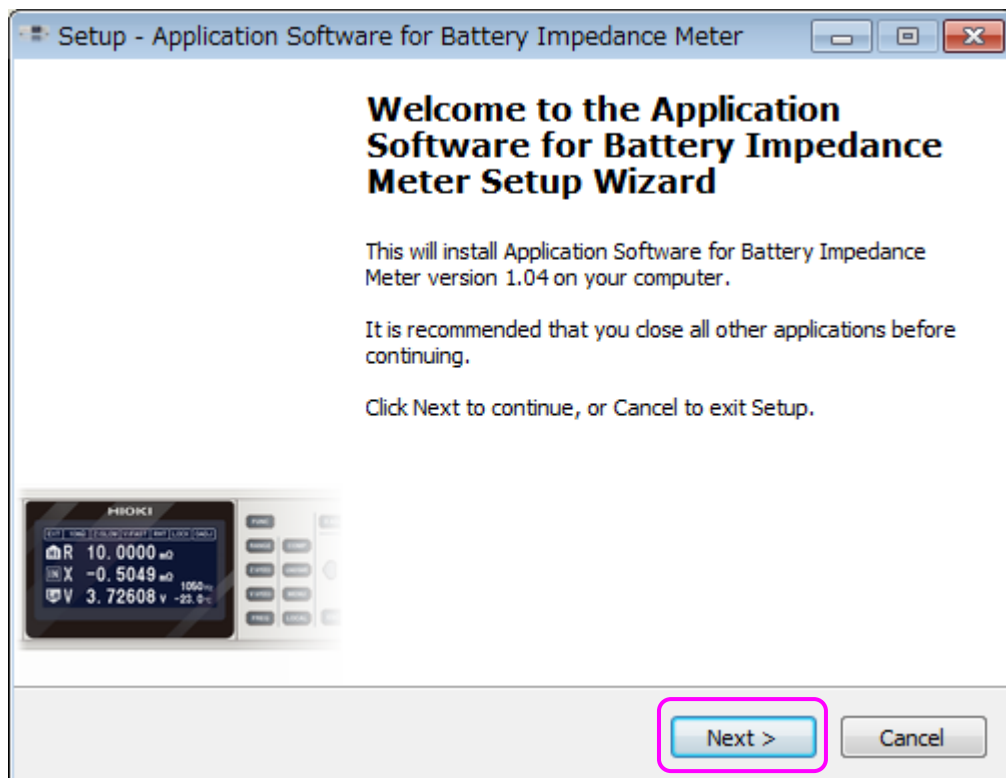


Fig 2-4

Step3 : Click [Next]. (Fig 2-5)

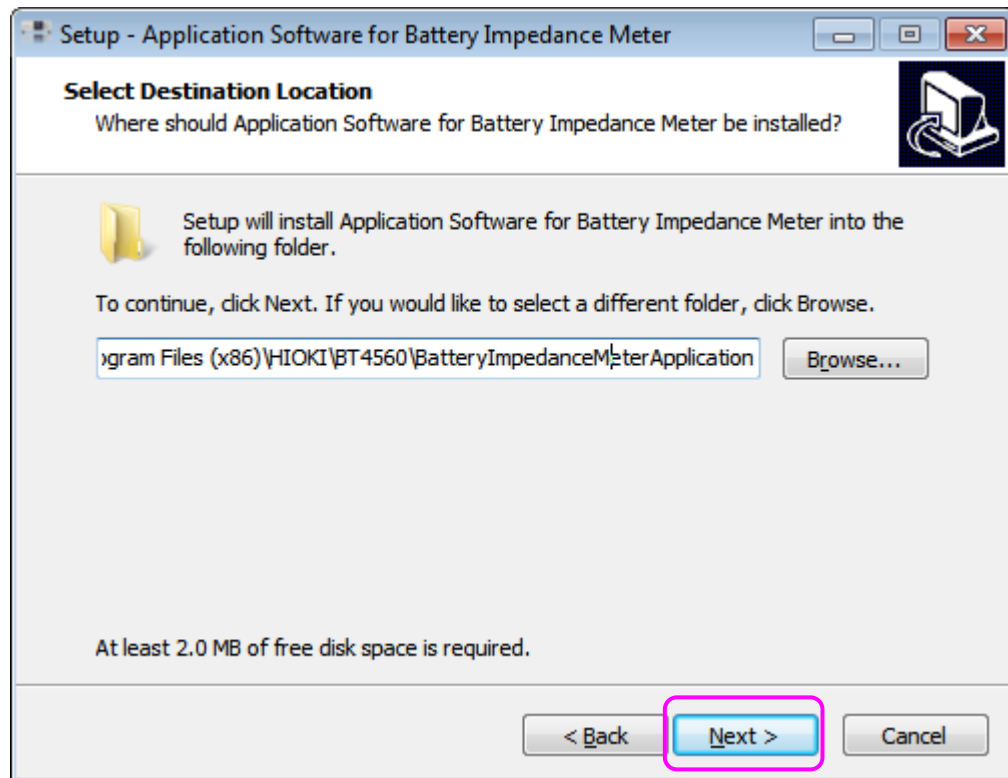


Fig 2-5

Step4 : Click [Next]. (Fig 2-6)

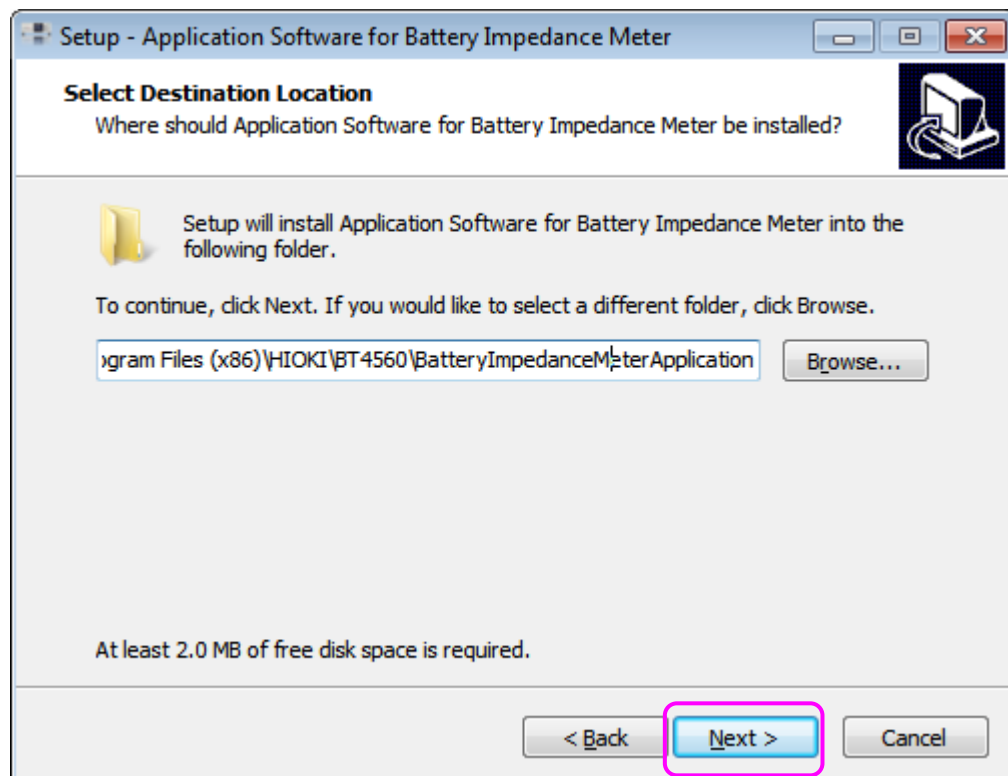


Fig 2-6

Step5 : Check [Create a desktop icon] or not, then click [Next]. (Fig 2-7)

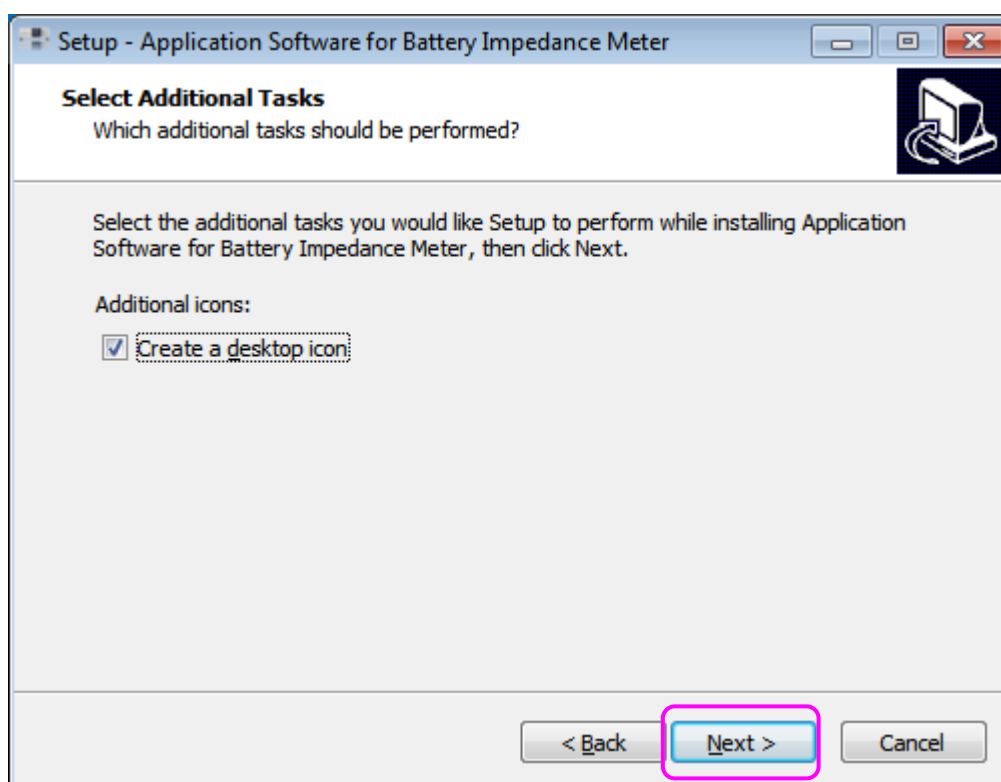


Fig 2-7

Step6 : Click [Install]. (Fig 2-8)

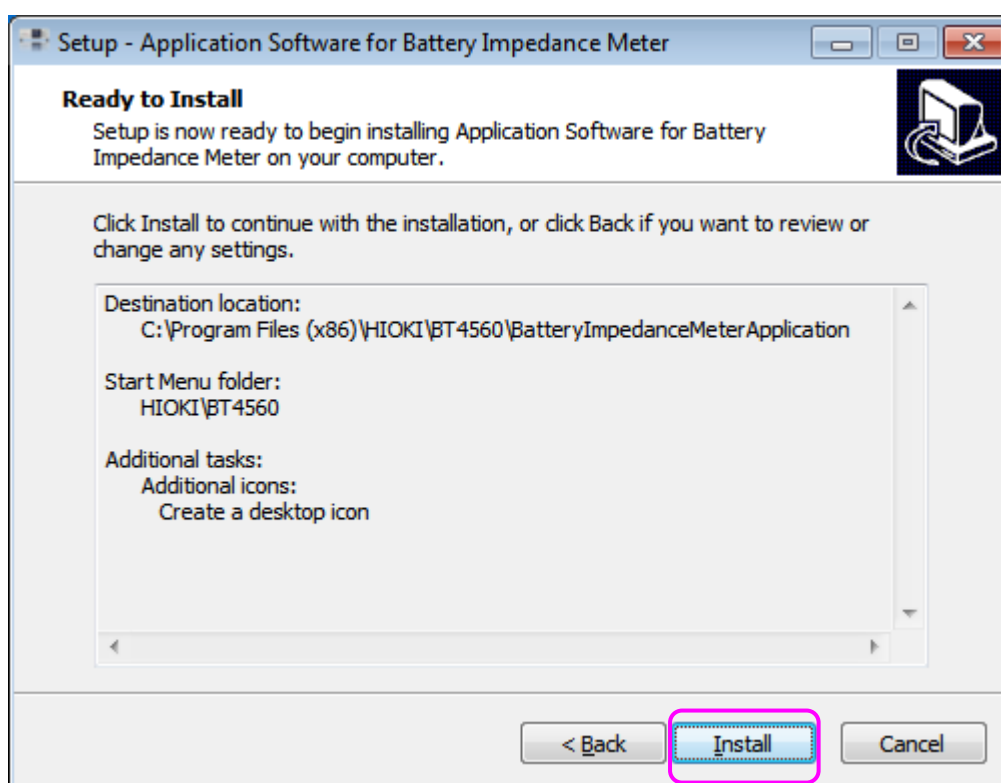


Fig 2-8

Step7 : Click [Finish] to finish the install. (Fig 2-9)

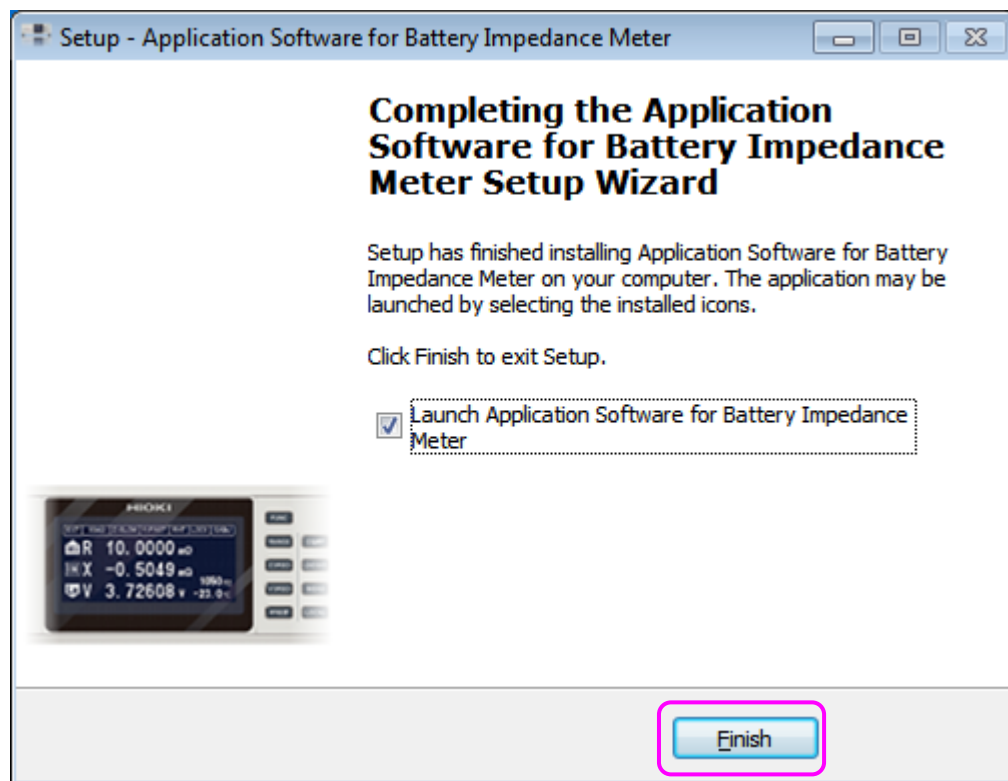


Fig 2-9

2.2. Uninstall

2.2.1. Uninstall USB Driver

Step 1 : Double click [PL2303_Prolific_DriverInstaller_vX.XX.X.exe] ,then the following dialog will appear. ("X" of the actual file name will be displayed as the version number.)
Choose [Remove], and click [Next].
(You can choose [Cancel] to exit.) (Fig 2-10)

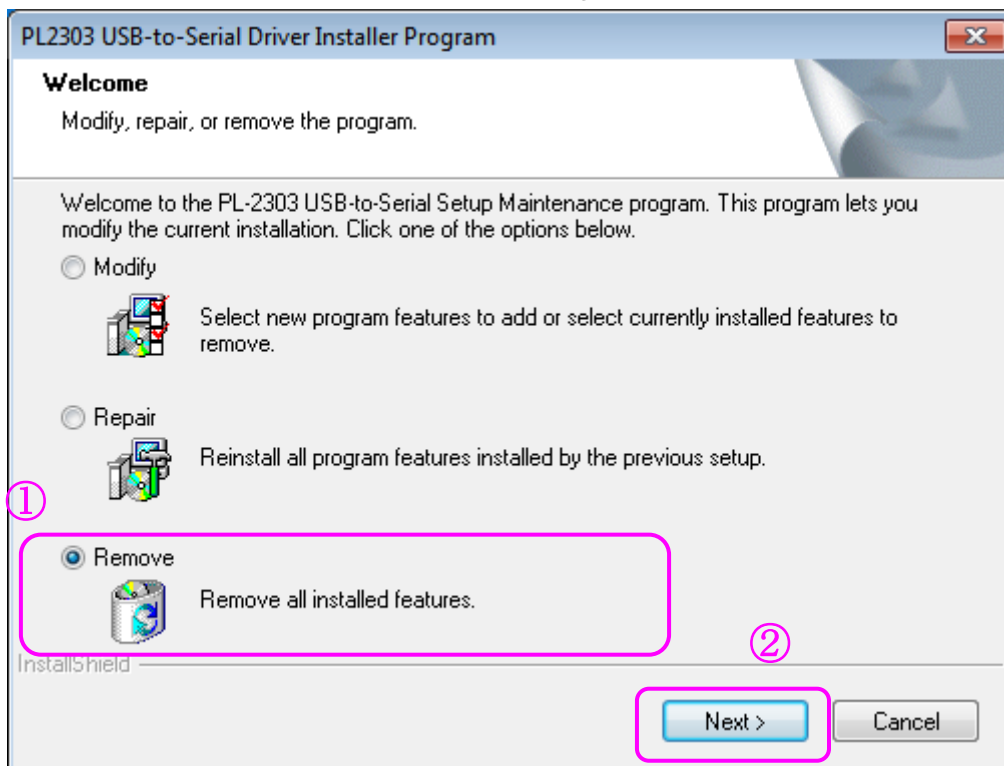


Fig 2-10

Step 2 : Click [Yes]. (Fig 2-11)

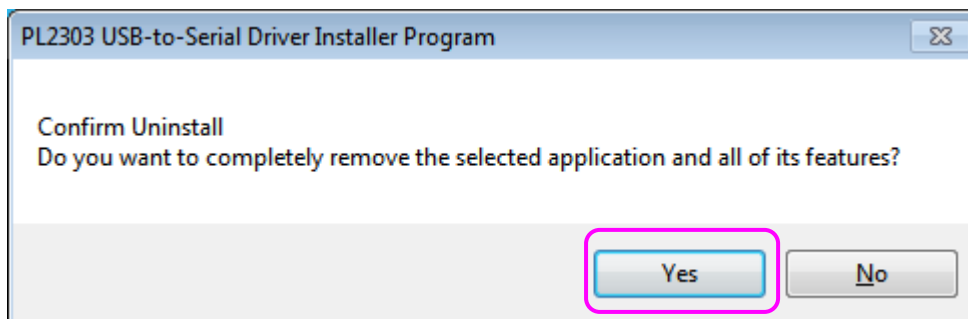


Fig 2-11

Step 4 : Click [Finish] to finish the uninstall. (Fig 2-12)

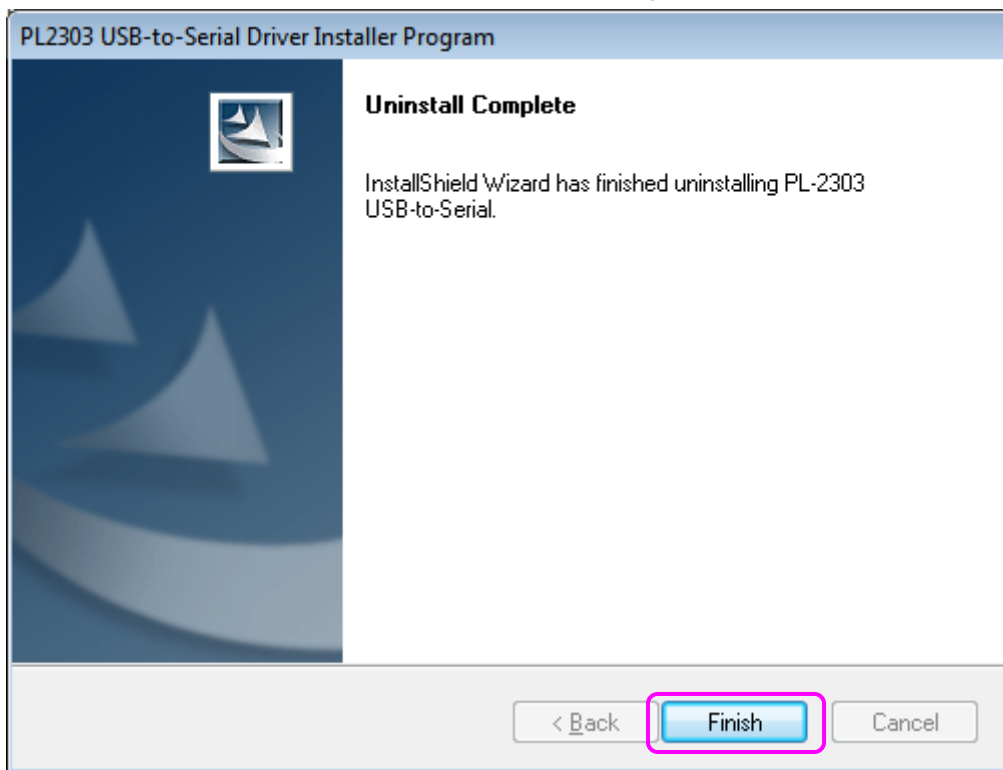


Fig 2-12

2.2.2. Uninstall BT4560 Application Software

Step 1 : Windows 10, Click [Start]—[Windows System]—[Control Panel]—[Programs and Features]—[Application Software for Battery Impedance Meter] then the following dialog will appear.

Click [Yes] to uninstall the software. (Fig 2-13)

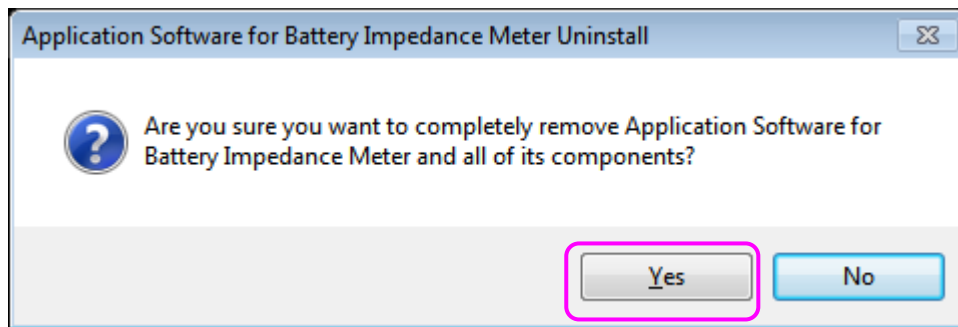


Fig 2-13

Step 2 : Click [OK] to finish the uninstall. (Fig 2-14)

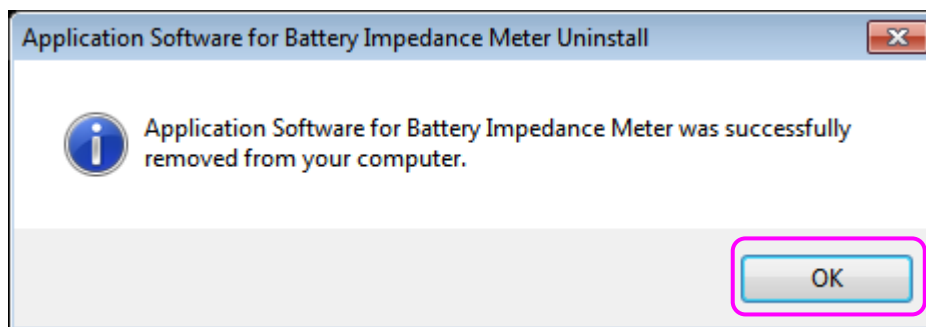


Fig 2-14

3. How to use

3.1. Start-up screen

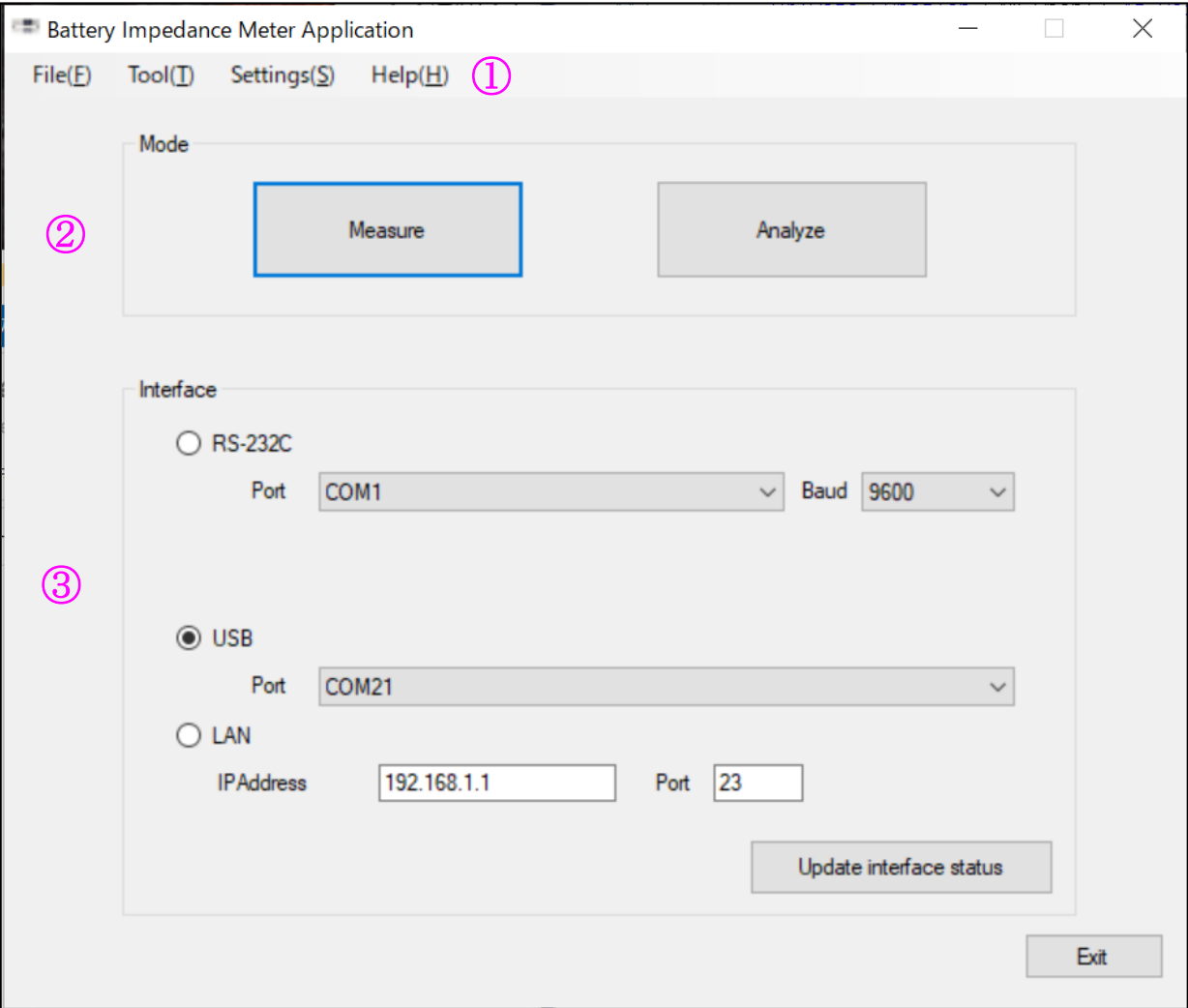


Fig 3-1. Start-up screen

No	function	Summery
1	Menu bar	File , Tools, Help
2	Mode	Start the measurement screen. Start the Analysis screen.
3	Interface	Select the USB port. Select the RS-232C port and the baud rate. Input the LAN IP address and port. Update the interface's status.

Table 3-1. Functions of start-up screen

3.1.1. Menu bar

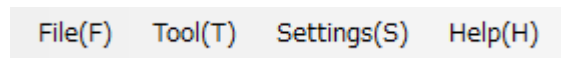


Fig 3-2

[File] : Exit
 [Tool] : Calc Accuracy, Language
 [Help] : Version

3.1.2. Start Measurement/Analysis screen

Select the interface(USB or RS-232C or LAN), then start the measurement/analysis screen. (Fig 3-3)

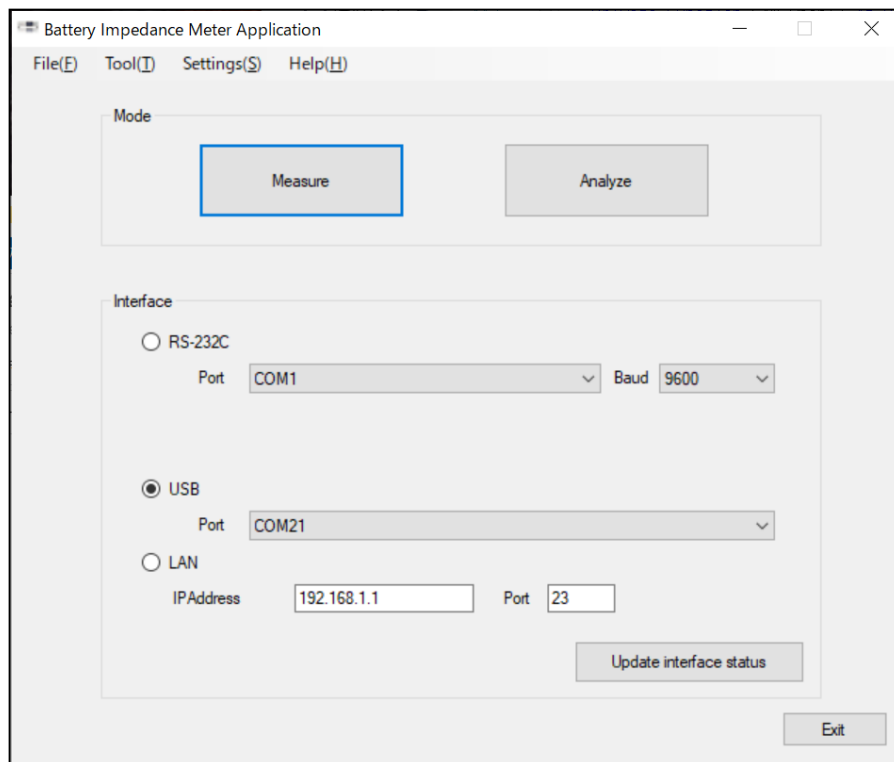


Fig 3-3. Start the measurement/analysis screen

- (1) If USB interface checked, select the port name.
 If RS-232C interface checked, select the port name and the baud rate which has been set on the instrument.If you cannot select the interface, click [Update interface status].
 If LAN interface checked, input the IP address and the port.(Equipped models only)
- (2) Click [Measure] to start the measurement screen.Click [Analyze] to start the analysis screen.

- (3) The Measurement/Analysis screen appears if the communication between the application and the instrument succeed.

If the communication fails, the message will appear. Click [OK], then check the interface setting and the cable connection.

3.1.3. Calculate Accuracy

- (1) Select [Tool]-[Calc Accuracy] of menu bar.

- (2) [Calc Accuracy] screen will appear. (Fig 3-4)

The screenshot shows the 'Calc Accuracy' dialog box. It has a title bar 'Calc Accuracy'. Inside, there's a 'MODEL' dropdown set to 'BT4560'. Below it is a '[SET]' section containing 'PARA' (R-X), 'SPEED' (MEDIUM), 'FREQ (Hz)' (1.00), 'TEMP (deg C)' (23), and 'RANGE (mohm)' (10mohm). Below that is a '[MEAS VALUE]' section with 'R =' and 'X =' fields, both showing '0' and 'mΩ'. A green 'Calculate' button is in the center. Below that is a '[MEAS Accuracy]' section with 'R =' and 'X =' fields, each followed by '±' and an empty box, and 'mΩ'. An 'Exit' button is at the bottom right.

Fig 3-4. Calculate Accuracy

- (3) Select PARA in the [SET] section, then set the condition of the accuracy calculation.

- (4) Input measurement values of each parameter in the [MEAS VALUE] section.

- (5) Click [Calculate].

The accuracy under the configured setting will be displayed in the [MEAS Accuracy] section.

3.1.4. Language

- (1) Select [Tool]-[Language] of menu bar.
- (2) [Language] screen will appear. (Fig 3-5)

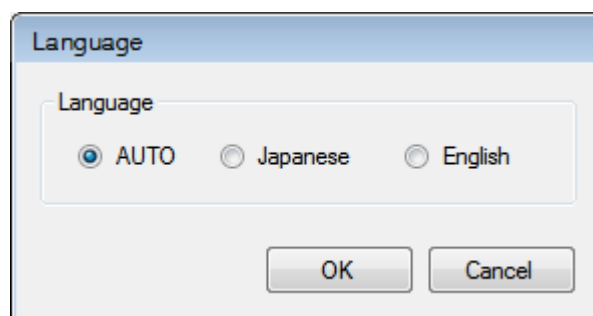


Fig 3-5. Language

You can switch the Japanese character, English character and the character determined by the execution environment(Japanese or English).

3.1.5. Export Settings

- (1) Select [Settings]-[Export] of menu bar.
- (2) [Export Settings] screen will appear. (Fig 3-6)

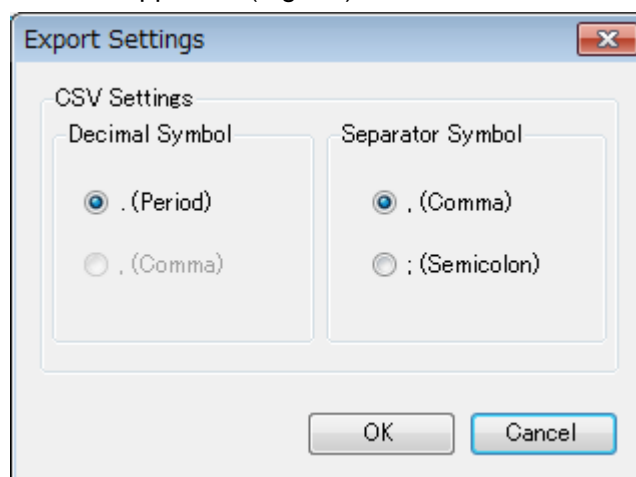


Fig 3-6. Export Settings

You can switch the decimal symbol and the list separator to export data in the CSV format.

3.1.6. Version

- (1) Select [Help]-[Version] of menu bar.
- (2) [Version] screen will appear. (

Fig 3-7)

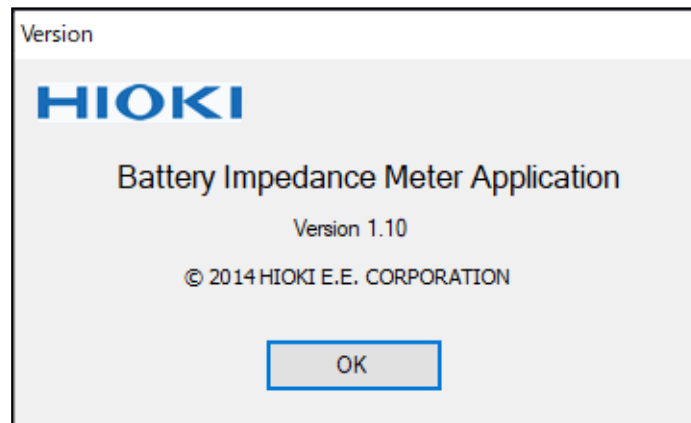


Fig 3-7. Version

You can check the version of BT4560 Application Software.

3.1.7. Manual

(1) Select [Help]-[Manual] of menu bar.

(2) You can see this PDF manual.

3.1.8. Exit Application

To exit BT4560 Application Software, click  or select [File]-[Exit] of menu bar.

3.2. Measurement screen

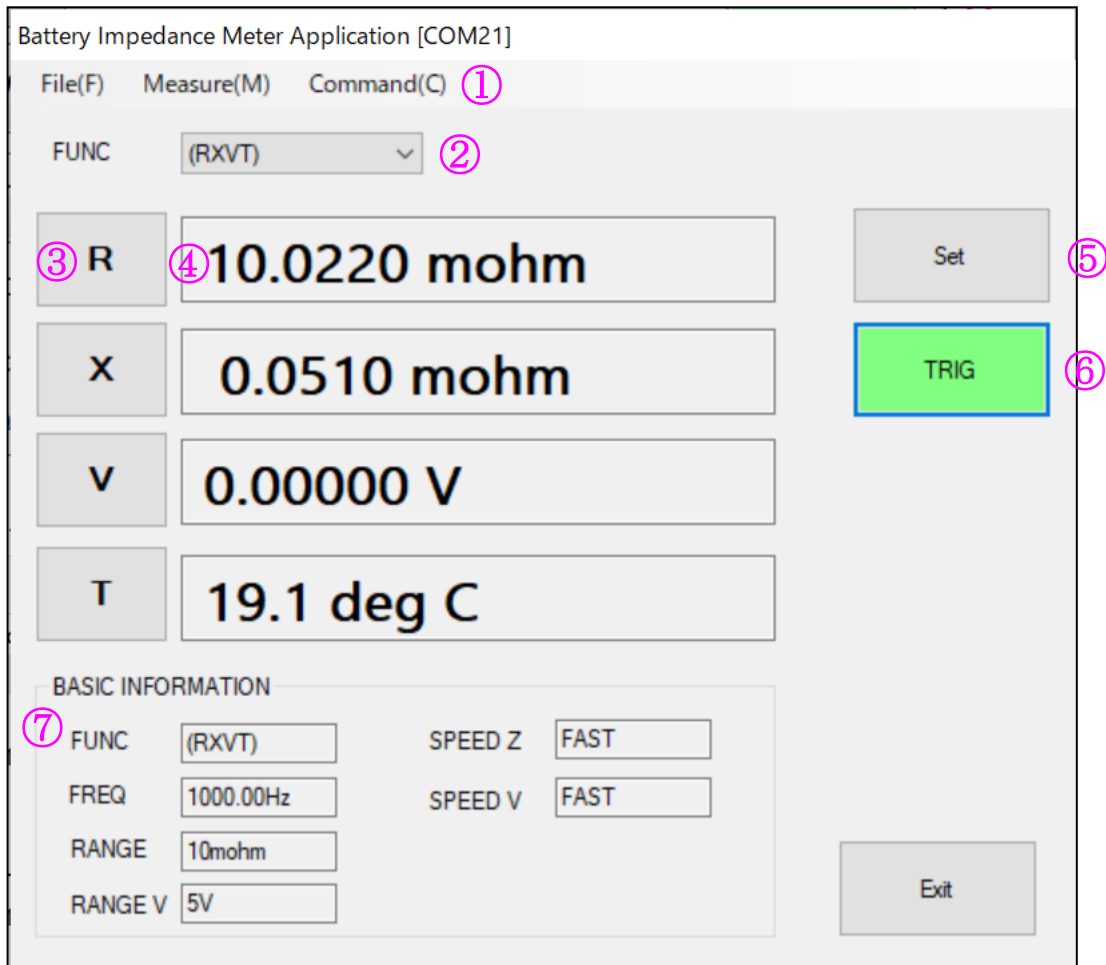


Fig 3-8. Measurement screen

No	function	summery
1	Menu bar	File, Measure, Command
2	Measurement function	Sets the measurement function of the instrument.
3	Displays measurement parameters	Displays the measurement parameters.
4	Displays measurement result	Displays the measurement result of the parameters.
5	Sets measurement condition.	Sets the measurement conditions like measurement frequency, measurement speed.
6	Measure	Performs measurement once under the current measurement conditions.
7	Displays measurement condition	Displays the current measurement conditions.

Table 3-2. Functions of measurement screen

3.2.1. Menu bar

A screenshot of a software menu bar with three items: 'File(F)', 'Measure(M)', and 'Command(C)'. Each item has a blue underline and a small blue square icon to its left.

Fig 3-9

[File] :	Exit
[Measure] :	Sweep Measurement, Interval Measurement Acquire by pressing enter, Start/Stop Test Measurement
[Command] :	Send Arbitrary Command

3.2.2. Set measurement function

- (1) Click the FUNC combo box. (Fig 3-10)
- (2) Select a measurement function from the drop-down list.

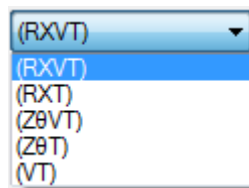


Fig 3-10. Set measurement function

3.2.3. Set measurement condition

- (1) Click [Set].
- (2) [Set] screen will appear. (Fig 3-11)
- (3) Set the measurement conditions, then click [OK]

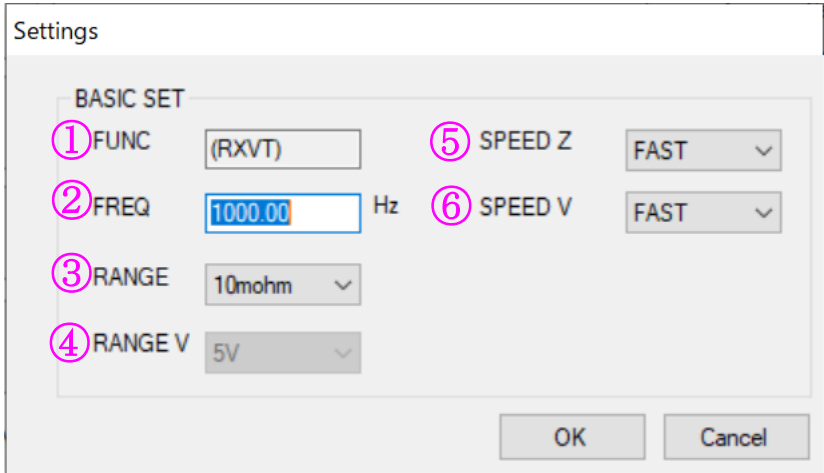


Fig 3-11. Set measurement condition

No	setting	summery
1	FUNC	Displays the measurement function.
2	FREQ	Sets the measurement frequency in Hz. Can be input from 0.01 Hz to 10000.0 Hz. Measurement frequency range BT4560 : 0.10 Hz to 1050.0 Hz BT4560-50 : 0.01 Hz to 1050.0 Hz (Above 1050Hz only for special order specifications)
3	RANGE	Sets the measurement range of impedance. 3mΩ/10mΩ/100mΩ can be selected.
4	RANGE V	Sets the measurement range of voltage (Specification for special order only)
5	SPEED Z	Sets the measurement speed of impedance. SLOW/MEDIUM/FAST can be selected.
6	SPEED V	Sets the measurement speed of voltage. SLOW/MEDIUM/FAST can be selected.

Table 3-3. Settings of measurement condition

Note:Specification for special_order item is conform to its instrument specification.

3.2.4. Measure once

- (1) Click [TRIG].
- (2) The measurement will be performed the under the current measurement condition, then the result will be displayed. (Fig 3-12)

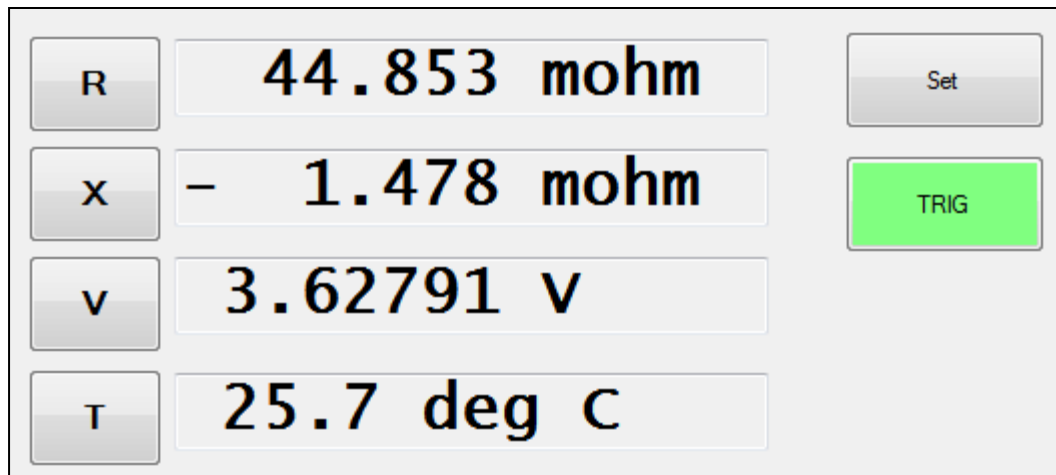


Fig 3-12. Display measurement values

Note : After clicking [TRIG], the application software stays the standby state(no operations are accepted) until the last executed measurement finishes.

To stop the running measurement, press [LOCAL] on the instrument's front panel.

3.2.5. Test Measurement

- (1) Select [Measure]-[Start Test Measurement] of menu bar. (Fig 3-13)
- (2) The measurement will be performed consecutively under the current measurement condition, then the result will be displayed.
- (3) To finish the measurement, select [Measure]-[Stop Test Measurement] of menu bar. (Fig 3-14)

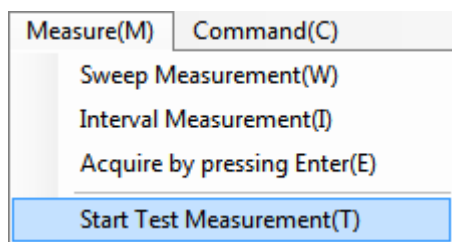


Fig 3-13

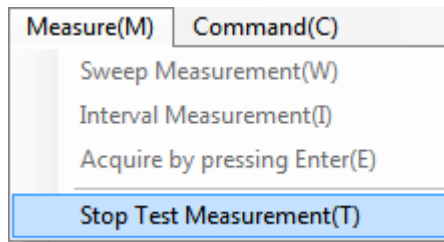


Fig 3-14

Note : After selecting [Stop Test Measurement], the application software stays the standby state(no operations are accepted) until the last executed measurement finishes.

To stop the running measurement, press [LOCAL] on the instrument's front panel.

3.2.6. Sweep Measurement

- (1) Select [Measure]-[Sweep Measurement] of menu bar.
- (2) [Sweep Measurement] screen will appear. (Fig 3-15)
- (3) Set [Sweep point] section, [Sweep Mode] section, [Set] section, and [Output] section, then click [Start Measuring].

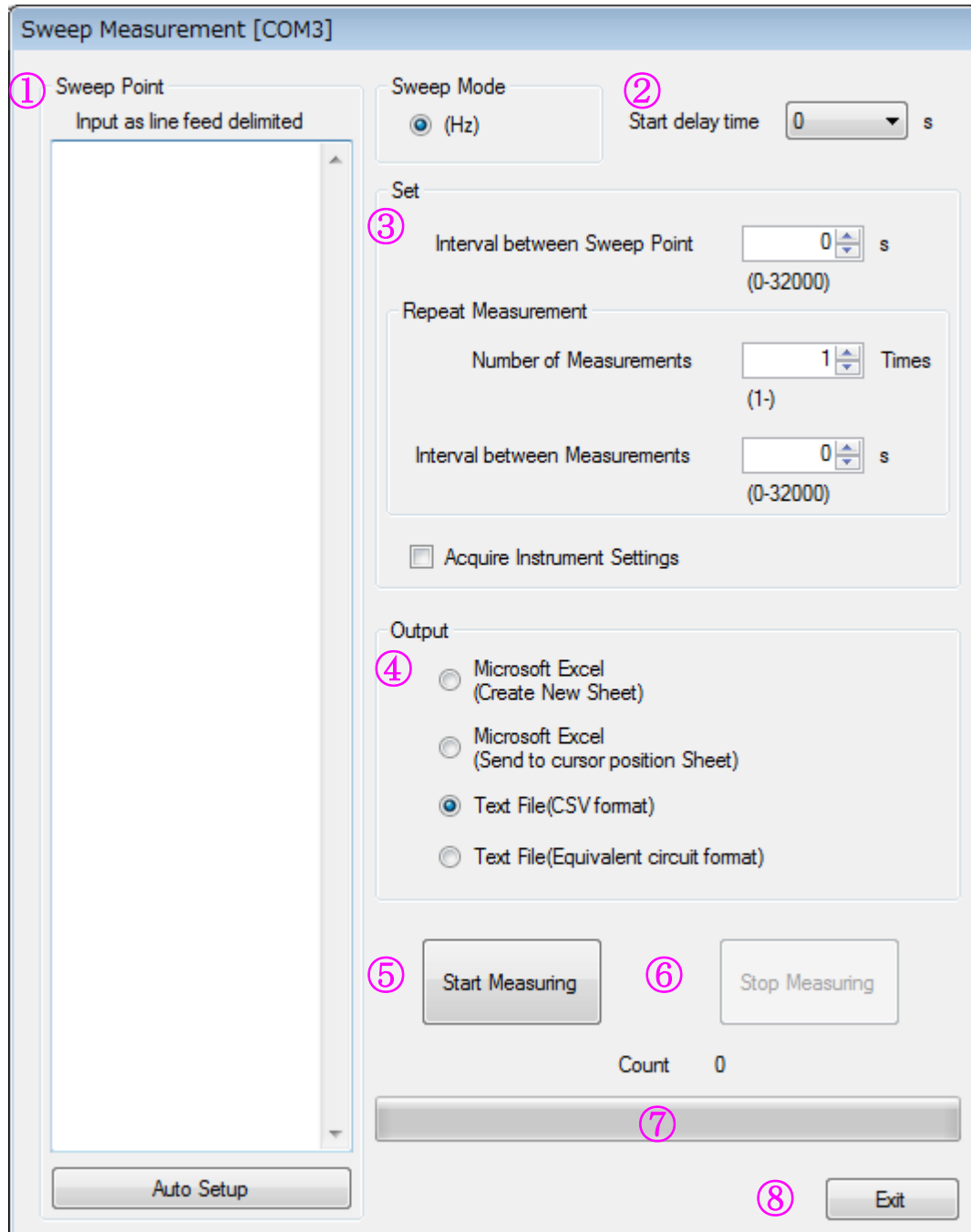


Fig 3-15. Sweep Measurement

No	function		summery
1	Sweep Point	Input manually	①Input sweep points as line feed delimited.
		Input automatically	<p>①Click [Auto Setup].</p> <p>②[Auto Setup] screen will appear. (Fig 3-16)</p> <p>③Set [Start Value], [Stop Value], [Data count] and [Scale], then click [OK]</p> <div data-bbox="845 584 1219 994" data-label="Image"> </div> <p style="text-align: center;">Fig 3-16</p> <p>(Example)</p> <p>If Start value=10.0, Stop value=50.0, Data count=5 and Scale=Linear, the sweep points will be {10.0, 20.0, 30.0, 40.0, 50.0}.</p>
2	Start delay time		<p>Sets the time to delay the start of measurement.</p> <p>0 /3 /5 /10 seconds can be selected.</p>
3	Set	Interval between sweep point	Sets the time interval between the end of the point's measurement and the start of the next point's measurement.
		Number of measurements	Sets the repeat count of sweep measurement.
		Interval between measurements	Sets the time interval between the end of the sweep measurement and the start of the next sweep measurement.
		Acquire Instrument setting	Check ON if you want to include the instrument setting like measurement function, measurement speed and measurement range.
4	Output	Microsoft Excel (Create New Sheet)	Sets the output setting as creating new Microsoft Excel sheet and sending the measurement result to the sheet.

		Microsoft Excel (Send to cursor position Sheet)	Sets the output setting as sending the measurement result to the cursor position of current Microsoft Excel sheet.
		Text File (CSV Fromat)	Save the measurement result in the text file(CSV format).
		Text File (Equivalent circuit Fromat)	Save the measurement result to import for ZView.
5	Start Measuring		Starts the sweep measurement.
6	Stop Measuring		Stops the sweep measurement.
7	Display status		Displays the status of measurement.
8	Exit		Exits the sweep measurement screen.

Table 3-4 Functions of Sweep Measurement

Note : After clicking [Stop Measuring], the application software stays the standby state(no operations are accepted) until the last executed measurement finishes.

To stop the running measurement, press [LOCAL] on the instrument's front panel.

Note : After clicking [OK], the application software re-calculate the frequency based on the [Sweep Point] setting. In this process, the frequency values input will be changed to the values which can be handled by the instrument and the duplicated values will be removed from the set of sweep points.

Thus, the value and the number of the sweep points input may differ from the actual set of sweep points used by measurement.

Note : ZView format example

"ZView Calculated Data File:"

"MODEL BT4560 SerialNO 140933666 Ver V1.04"

DATE 2017-07-27 TIME 14:08:58

Frequency (Hz), None (0), None (0), Time (s), Z' (Ohm), Z'' (Ohm), None (0), None (0), None (0)

1000.00,0,0,1,+3.55231E-02,+2.85272E-04,0,0,0

930.00,0,0,2,+3.56686E-02,-4.26561E-05,0,0,0

870.00,0,0,3,+3.58073E-02,-3.21429E-04,0,0,0

...

3.2.7. Interval Measurement

- (1) Select [Measure]-[Interval Measurement].
- (2) [Interval Measurement] screen will appear. (Fig 3-17)
- (3) Set [Set] section and [Output] section, then click [Start Measuring].

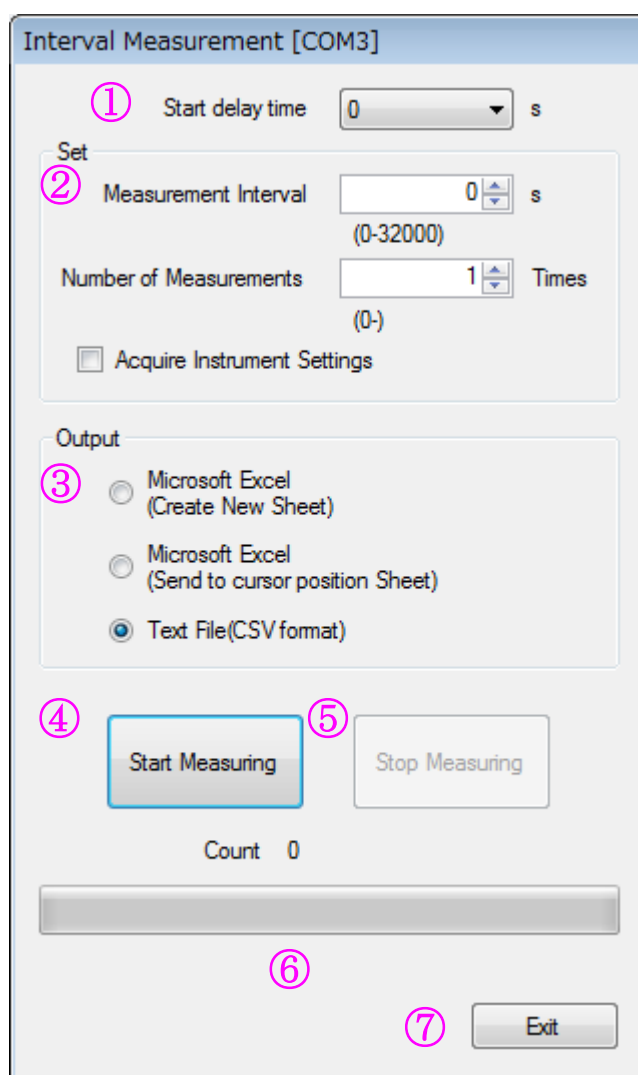


Fig 3-17. Interval Measurement

No	function		summery
1	Start Delay time		Sets the time to delay the start of measurement. 0 /3 /5 /10 seconds can be selected.
2	Set	Measurement Interval	Sets the time interval between the end of the measurement and the start of the next measurement.
		Number of	Sets the number of interval measurement.

		Measurements	
		Acquire Instrument setting	Check ON if you want to include the instrument setting like measurement function, measurement speed and measurement range.
3	Output	Microsoft Excel (Create New Sheet)	Sets the output setting as creating new Microsoft Excel sheet and sending the measurement result to the sheet.
		Microsoft Excel (Send to cursor position Sheet)	Sets the output setting as sending the measurement result to the cursor position of current Microsoft Excel sheet.
		Text File (CSV Fromat)	Save the measurement result in the text file(CSV format).
4	Start Measuring		Starts the interval measurement.
5	Stop Measuring		Stops the interval measurement.
6	Display status		Displays the status of measurement.
7	Exit		Exits the interval measurement screen.

Table 3-5. Functions of Interval Measurement

Note : After clicking [Stop Measuring], the application software stays the standby state(no operations are accepted) until the last executed measurement finishes.

To stop the running measurement, press [LOCAL] on the instrument's front panel.

3.2.8. Acquire by pressing Enter

- (1) Select [Measure]-[Acquire by pressing Enter].
- (2) [Acquire by pressing Enter] screen will appear. (Fig 3-18)
- (2) Set [Set] section and [Output] section, then click [Start Measuring]

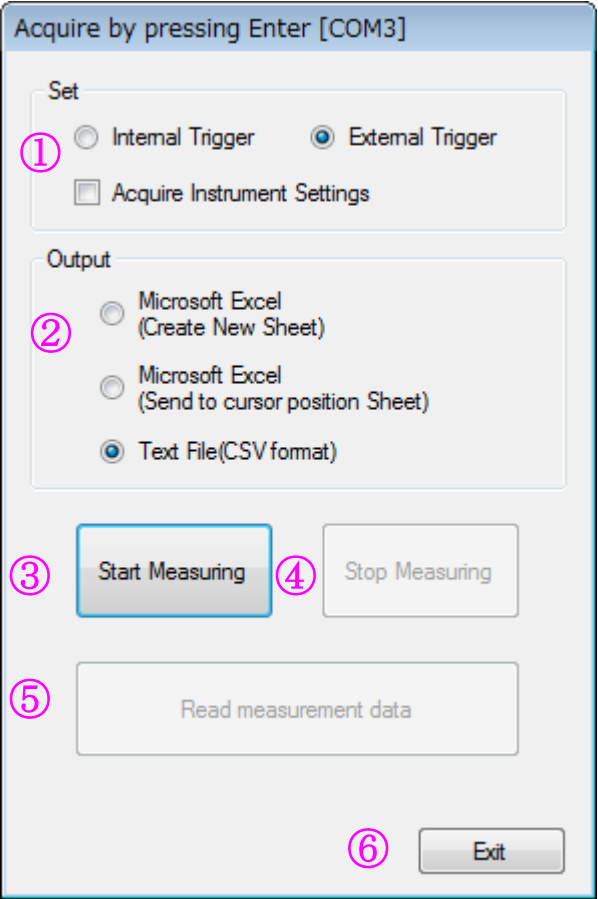


Fig 3-18. Acquire by pressing Enter

No	function		summery
1	Set	Internal Trigger	Changes the trigger source to internal. By this setting, the instrument becomes Free-Run State. The measurement result will be acquired in non-synchronous way by pressing Enter key or by clicking [Read Measurement data].
		External Trigger	Changes the trigger source to external. By this setting, the instrument becomes Trigger Wait State. The measurement result will be acquired in synchronous way by pressing Enter key or by clicking [Read Measurement data].

		Acquire Instrument setting	Check ON if you want to include the instrument setting like measurement function, measurement speed and measurement range.
2	Output	Microsoft Excel (Create New Sheet)	Sets the output setting as creating new Microsoft Excel sheet and sending the measurement result to the sheet.
		Microsoft Excel (Send to cursor position Sheet)	Sets the output setting as sending the measurement result to the cursor position of current Microsoft Excel sheet.
		Text File (CSV Fromat)	Save the measurement result in the text file(CSV format).
3	Start Measuring		Starts the interval measurement. If the trigger source is set to external, the instrument becomes Trigger Wait State.
4	Read measurement data		After starting measurement, click this button or press Enter key to acquire the measurement value.
5	Stop Measuring		Stops the measurement.
6	Exit		Exits the [Acquire by pressing Enter] screen.

Table 3-6 Functions of Acquire by pressing Enter

Note : After clicking [Stop Measuring], the application software stays the standby state(no operations are accepted) until the last executed measurement finishes.

To stop the running measurement, press [LOCAL] on the instrument's front panel.

3.2.9. Send Arbitrary Command

- (1) Select [Command]-[Send Arbitrary Command].
- (2) [Send Arbitrary Command] screen will appear. (Fig 3-19)
- (3) Input command as the string of characters, then click [Send].
Received data will be displayed in [Receive Data] section, if any.

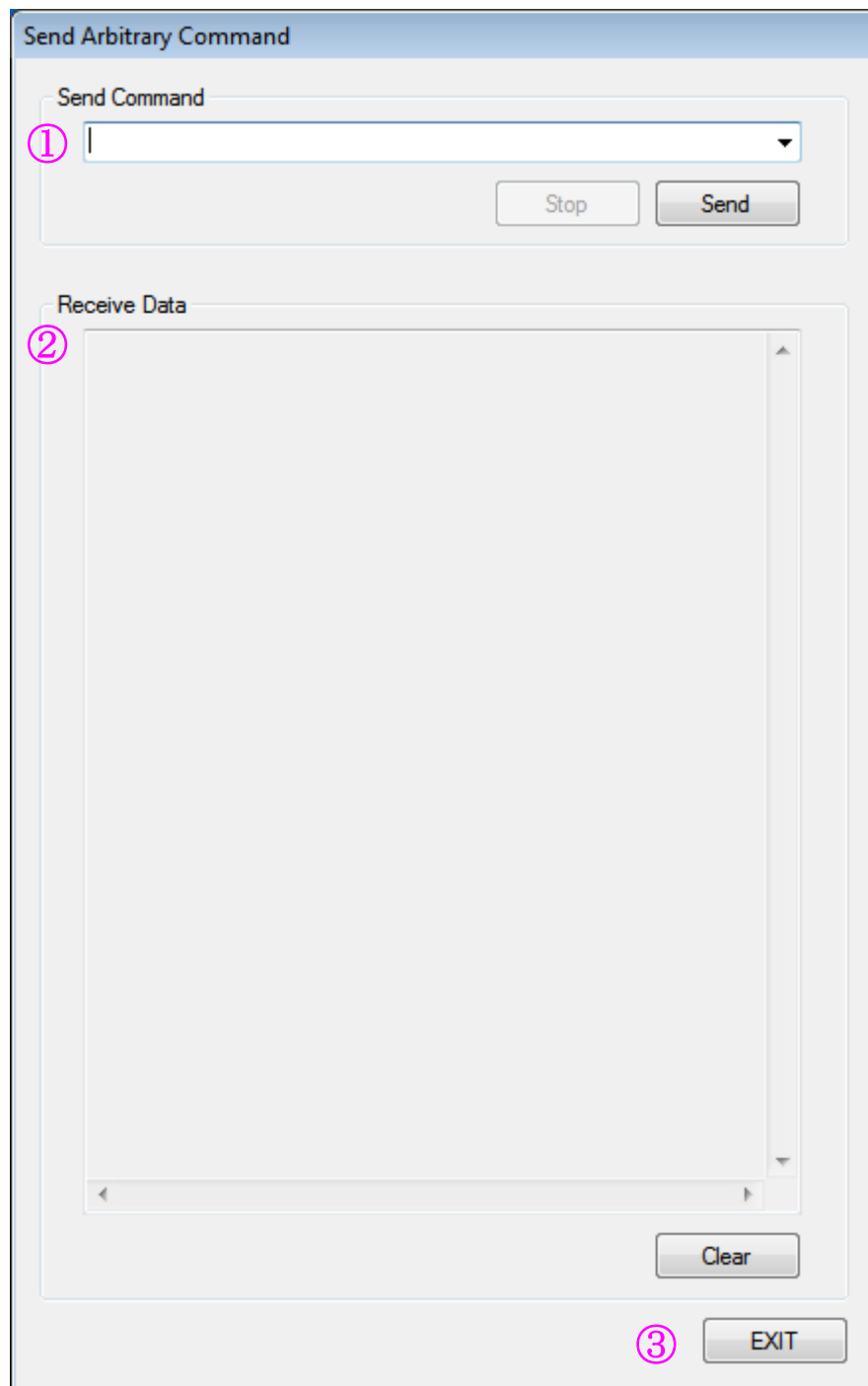
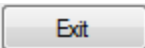


Fig 3-19. Send Arbitrary Command

No	機能		概要
1	Send Command	Input Send Command	Input the sending command as the string of characters. To display the list of sent commands, click ▼ of the combo box.
		Send	Sends the command input.
		Stop	Stops waiting for response.
2	Receive Data	Display received data	Displays the received data.
		Clear	Clears the received data.
3	Exit		Exits [Send Arbitrary Command] screen.

Table 3-7 Functions of Send Arbitrary Command

3.2.10.Exit Measurement screen

To exit the measurement screen, click  or select [File]-[Exit] of menu bar.

3.3. Analysis screen

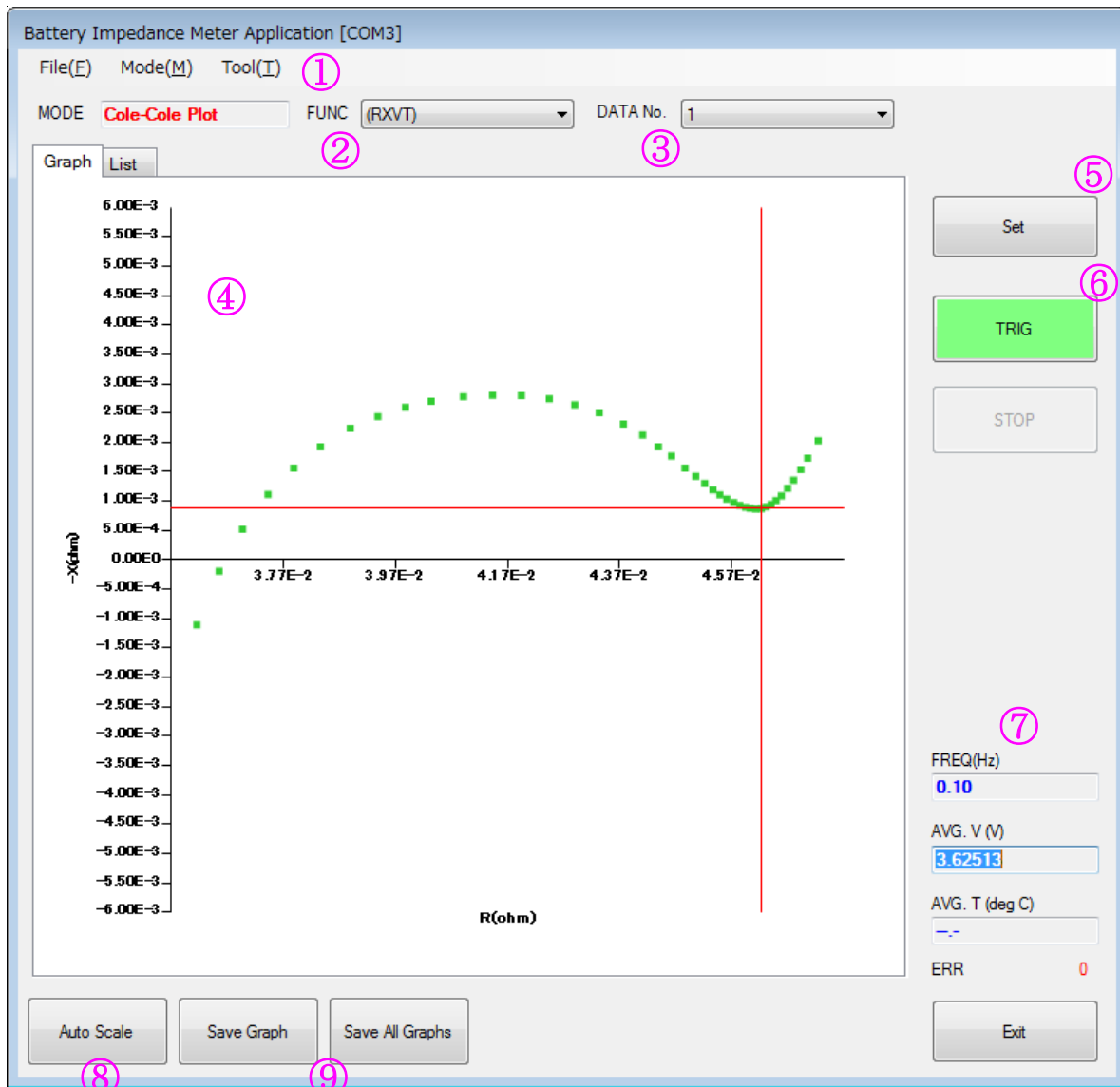


Fig 3-20. Analysis screen

No	function	summery
1	Menu bar	File, Mode, Tool
2	Measurement function	Sets the measurement function of the instrument.
3	Selects the data number of repeat measurement	Selects the data number of repeat measurement. The graph and the list will be updated to the selected set of sweep measurement data.
4	Displays measurement result	Displays the measurement result in a graphic and a list form.
5	Sets measurement condition	Sets the measurement conditions like measurement frequency, measurement speed and sweep settings.

6	Measure	Performs sweep measurement under the current measurement conditions.
7	Displays measurement status	Displays the measurement status like the measuring frequency, the average voltage and the average temperature. It also shows the number of measurements that have been abnormal.
8	Auto Scale	Executes the auto-scaling of the graph area.
9	Save/Save All	Save the graph(s) or list(s).

Table 3-8 Functions of analysis screen

3.3.1. Menu bar

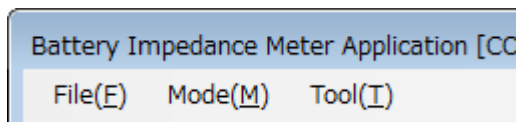


Fig 3-21

[File] : Exit
 [Mode] : Cole-Cole Plot / Parameter
 [Tool] : Graph set

3.3.2. Change Analysis mode

- (1) Select [Mode]-[Cole-Cole Plot] to change the analysis mode to Cole-Cole Plot.
 The selected mode will be displayed in the [Mode] edit. (Fig 3-22)
- (2) Select [Mode]-[Parameter] to change the analysis mode to Parameter.
 The selected mode will be displayed in the [Mode] edit. (Fig 3-23)

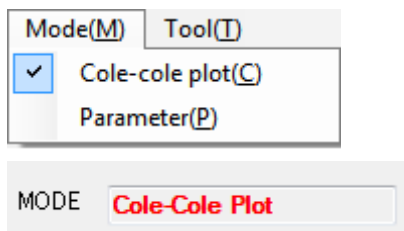


Fig 3-22

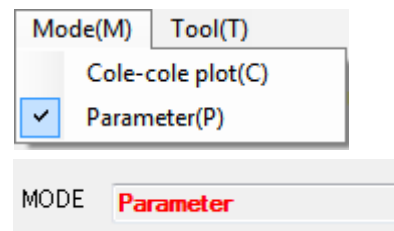


Fig 3-23

3.3.3. Set measurement function

(1) Click the FUNC combo box.

(2) Select a measurement function from the drop-down list.

If the analysis mode is set to Cole-Cole Plot,

(R,X,V,T), (R,X,T) can be selected.

(Fig 3-24)

If the analysis mode is set to Parameter,

(R,X,V,T), (R,X,T), (Z,θ,V,T), (Z,θ,T), (V,T) can be selected. (Fig 3-25)

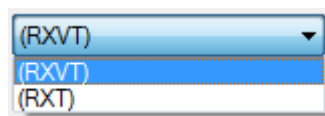
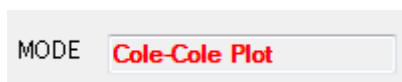


Fig 3-24

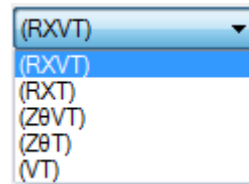
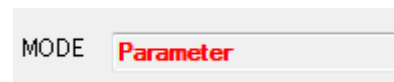


Fig 3-25

3.3.4. Set measurement condition

- (1) Click [Set].
- (2) [Set] screen will appear. (Fig 3-26)
- (3) Set the measurement conditions, then click [OK].

Settings [COM21]

Parameter

① PARA1 R PARA2 X

Sweep Set

② SOURCE FREQUENCY DRAW REAL ③ START DELAY 0 s

Sweep Point Set

START-STOP CENTER-SPAN START-STEP

④ START 1000.00 Hz STOP 0.10 Hz NUM 41 (1 - 1050) SCALE LOG

⑤

⑥ Auto setup

Measurements are made according to this sweep point list.

*Measurement frequency range
0.1 - 1050 Hz(BT4560)
0.01 - 1050 Hz(BT4560-50)
With special products, it is possible to measure more than that.

Repeat Meas

⑦ REPEAT 1 (1 - 1000) INTERVAL 1 (0 - 60) s

Basic Set

⑧ FUNC (RXVT) SPEED V FAST

FREQ 10.00 Hz SPEED Z FAST

RANGE 10mohm RANGE V 5V

File

⑨ ☐ Acquire Instrument Settings ☒ Output No.

OK Cancel

Fig 3-26. Set measurement condition

No	setting		summery
1	Parameter	PARA1	Sets the first parameter of the graph and the list. If the measurement function is set to (R,X,V,T), R/X/V/T/OFF can be selected. If the analysis mode is set to Cole-Cole Plot, the control becomes disabled.
		PARA2	Sets the second parameter of the graph and the list. If the measurement function is set to (R,X,V,T), R/X/V/T/OFF can be selected. If the analysis mode is set to Cole-Cole Plot, the control becomes disabled.
2	Sweep Set	SOURCE	Selects the type of sweep point. Only [Frequency] can be selected.
		DRAW	Sets the method of drawing the graph and the list. If [REAL] is selected, the graph and the list will be drawn per every single measurement. If [AFTER] is selected, the graph and the list will be drawn per every repeat measurement.
3	START DELAY		Sets the time to delay the start of measurement. 0 /3 /5 /10 seconds can be selected.
4	Sweep Point Set (tab selection)	START-STOP	Sets the [START], [STOP], [NUM] and [SCALE] to configure the sweep points. (Example) If START=10.0, STOP=50.0, NUM=5 and SCALE=LINEAR, the sweep points will be {10.0, 20.0, 30.0, 40.0, 50.0}.
		CENTER-SPAN	Sets the [CENTER], [SPAN] and [NUM] to configure the sweep points. (Example) If CENTER=30.0, SPAN=40.0 and NUM=5, the sweep points will be {50.0, 40.0, 30.0, 20.0, 10.0}.
		START-STEP	Sets the [START], [STEP] and [NUM] to configure the sweep points.

			(Example) If START=10.0, STEP=10.0 and NUM=5, the sweep points will be {10.0, 20.0, 30.0, 40.0, 50.0}.
		INTVL MEAS	Sets the [POINT] (Hz), [INTERVAL](s) and [NUM] . If the analysis mode is set to Parameter, this cannot be set.
5	Sweep point list	Measurements are made at the frequencies entered in this list. Automatically set according to the Sweep Point Settings tab, or enter the frequency directly.	
6	Auto setup	Create a frequency list according to the inputs on the Sweep Point tab settings and output it to the Sweep Point list. If the measurement frequency list is entered according to the Sweep Point Settings tab, be sure to press this button to apply it to the sweep point list.	
7	Repeat Meas	REPEAT	Sets the repeat count of sweep measurement.
		INTERVAL	Sets the time interval between the end of the sweep measurement and the start of the next sweep measurement in seconds, minutes or hours.
8	Basic Set	FUNC	Displays the measurement function.
		FREQ	Sets the measurement frequency in Hz.
		RANGE	Sets the measurement range of impedance. 3mΩ/10mΩ/100mΩ can be selected.
		RANGE V	Sets the measurement range of voltage. (Specification for special order only)
		SPEED Z	Sets the measurement speed of impedance. SLOW/MEDIUM/FAST can be selected.
		SPEED V	Sets the measurement speed of voltage. SLOW/MEDIUM/FAST can be selected.
9	File	Acquire Instrument Settings	Specifies whether to import BT4560 settings such as function, measurement speed, and range to the measurement result file.
		Output No.	Specifies whether the measurement number is output to the measurement result file.

* The settings and the range of settings may differ in the custom-made specifications.

Table 3-9 Set measurement condition settings

Note : After clicking [OK], the application software re-calculate the frequency based on the [Sweep Point] setting. In this process, the frequency values input will be changed to the values which can be handled by the instrument and the duplicated values will be removed from the set of sweep points.

Thus, the value and the number of the sweep points input may differ from the actual set of sweep points used by measurement.

To check the data count of the actual set of sweep points, open the [Set] screen again and check the [NUM] value in the [Sweep Point Set] section.

3.3.5. Sweep measurement / analysis

(1) Click [TRIG].

(2) The sweep measurement will be performed under the current measurement condition, then the result will be displayed in a graphic and a list form.

If the analysis mode is set to Cole-Cole Plot, the graph and the list will be displayed as following. (Fig 3-27, Fig 3-28)

(3) To stop the sweep measurement, click [STOP].

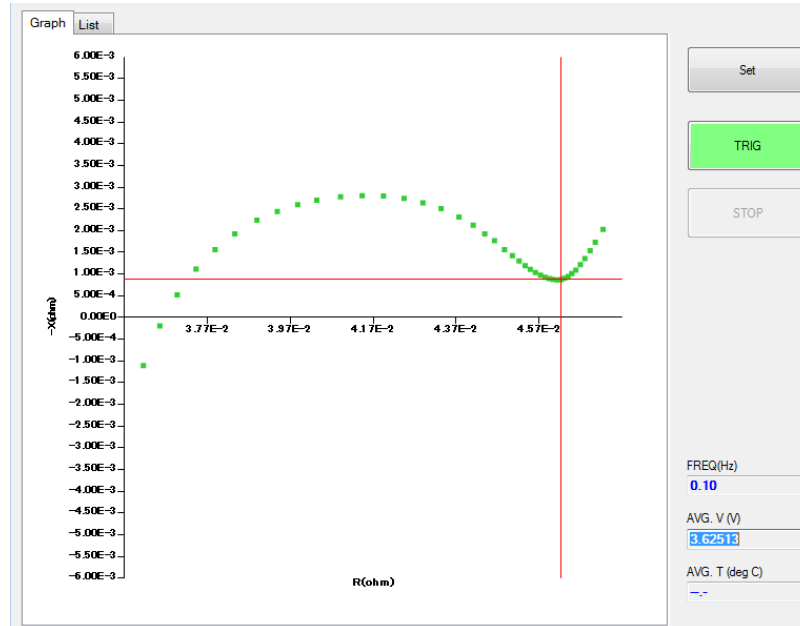


Fig 3-27. Graph (Cole-Cole Plot)

Graph List					
No	FREQUENCY(Hz)	R(ohm)	X(ohm)	V(V)	T(deg C)
1	1050.00	3.63141E-02	2.35548E-03	3.62791E+00	2.56671E+01
2	1000.00	3.63918E-02	2.10871E-03	3.62791E+00	2.56672E+01
3	960.00	3.64660E-02	1.89573E-03	3.62791E+00	2.56672E+01
4	910.00	3.65481E-02	1.63960E-03	3.62791E+00	2.56672E+01
5	870.00	3.66240E-02	1.41921E-03	3.62791E+00	2.56670E+01
6	830.00	3.66919E-02	1.21580E-03	3.62792E+00	2.56670E+01
7	800.00	3.67564E-02	1.05955E-03	3.62791E+00	2.56670E+01
8	760.00	3.68419E-02	8.46659E-04	3.62791E+00	2.56670E+01
9	730.00	3.69085E-02	7.15067E-04	3.62791E+00	2.56670E+01
10	690.00	3.70262E-02	4.79162E-04	3.62791E+00	2.56670E+01
11	660.00	3.70953E-02	3.10081E-04	3.62791E+00	2.56670E+01
12	630.00	3.71950E-02	1.62023E-04	3.62791E+00	2.56674E+01
13	600.00	3.72911E-02	2.77023E-06	3.62791E+00	2.56674E+01
14	580.00	3.73397E-02	-1.18798E-04	3.62791E+00	2.56674E+01
15	550.00	3.74402E-02	-2.74338E-04	3.62791E+00	2.56674E+01
16	520.00	3.75308E-02	-4.25336E-04	3.62791E+00	2.56671E+01
17	500.00	3.76130E-02	-5.28514E-04	3.62792E+00	2.56671E+01
18	480.00	3.77058E-02	-6.42431E-04	3.62791E+00	2.56671E+01
19	460.00	3.77883E-02	-7.65146E-04	3.62791E+00	2.56668E+01
20	440.00	3.78762E-02	-8.57109E-04	3.62791E+00	2.56668E+01
21	420.00	3.79736E-02	-9.78892E-04	3.62791E+00	2.56668E+01
22	400.00	3.80604E-02	-1.06403E-03	3.62791E+00	2.56668E+01
23	380.00	3.81749E-02	-1.18007E-03	3.62791E+00	2.56670E+01
24	360.00	3.82787E-02	-1.28564E-03	3.62791E+00	2.56670E+01

Set
TRIG
STOP
FREQ(Hz)
0.10
AVG. V (V)
3.62791
AVG. T (deg C)
25.7

Fig 3-28. List (Cole-Cole Plot)

Note : After clicking [STOP], the application software stays the standby state(no operations are accepted) until the last executed measurement finishes.

To stop the running measurement, press [LOCAL] on the instrument's front panel.

3.3.6. Graph Display

The status of graph display differs depending on the analysis mode selected.

analysis mode	status of graph display	
Cole-Cole Plot	X axis	R: Displays the resistance component of the impedance in ohm.
	Y axis	- X: Displays the sign inversion of the reactance component of the impedance in ohm.
Parameter	X axis	Displays the frequency in Hz.
	Y1 axis	Displays the component of the Parameter1 selected. The axis will be displayed in the left most of the graph area.
	Y2 axis	Displays the component of the Parameter2 selected. The axis will be displayed in the right most of the graph area.

Table 3-10 Status of graph display

3.3.7. Graph Operation

The operation of graph differs depending on the analysis mode selected.

function	analysis mode	operation summary
----------	---------------	-------------------

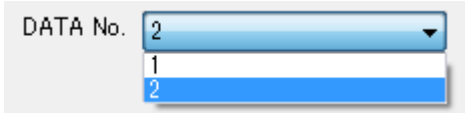




Displays the repeat measurement data	Cole-Cole Plot	<p>(1) Click [Data No.] combo box.</p> <p>(2) Select the number of repeat measurement.</p> <p>(3) The selected data set will be displayed in a graphic or a list form.</p> 
	Parameter	
Auto scale	Cole-Cole Plot	<p>(1) Click .</p> <p>(2) Maximum/minimum value of X and Y axis will be changed based on whichever greater range of R value or -X value.</p>
	Parameter	<p>(1) Click .</p> <p>(2) Maximum/minimum value of Y1 will be changed based on the range of parameter1 value. Maximum/minimum value of Y2 will be changed based on the range of parameter2 value.</p>
Zoom (drag with the mouse)	Cole-Cole Plot	<p>(1) Press the left button of the mouse on the graph area.</p> <p>(2) Drag the mouse and make a rectangle.</p> <p>(3) Lift the left button of the mouse up on the graph area. (Fig.3-29)</p> <p>(4) Graph will be zoomed by the rectangle. (Fig.3-30)</p> <p>(5) To cancel the zoom, click  button of X and Y axis.</p>
	Parameter	<p>(1) Press the left button of the mouse on the graph area.</p> <p>(2) Drag the mouse along the X axis.</p> <p>(3) Lift the left button of the mouse up on the graph area.(Fig.3-31)</p> <p>(4) Graph will be zoomed along the X axis.(Fig.3-32)</p> <p>(5) To cancel the zoom, click  button of X axis.</p>
Scaling (Ctrl+mouse wheel)	Cole-Cole Plot	<p>(1) Press the Ctrl key.</p> <p>(2) To scale up the graph, move the mouse wheel forward while holding down the Ctrl key To scale down the graph, move the mouse wheel backward while holding down the Ctrl key.</p>

Table 3-11 Graph operation

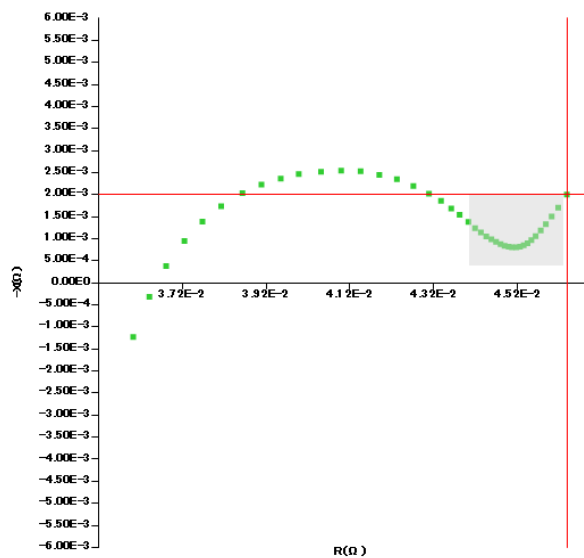


Fig 3-29. Zoom (Cole-Cole Plot)

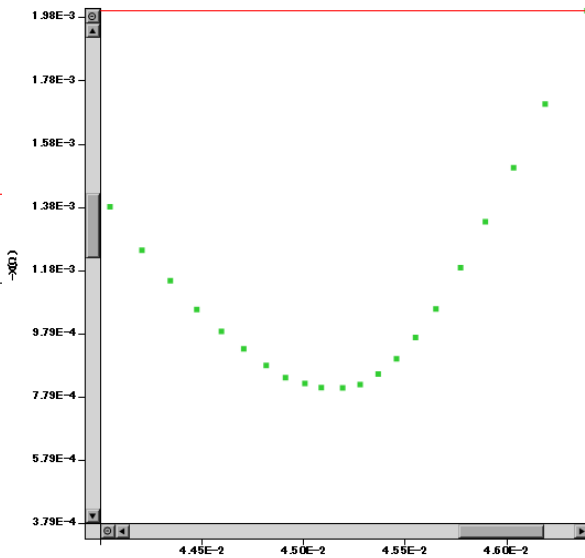


Fig 3-30. Zoom (Cole-Cole Plot)

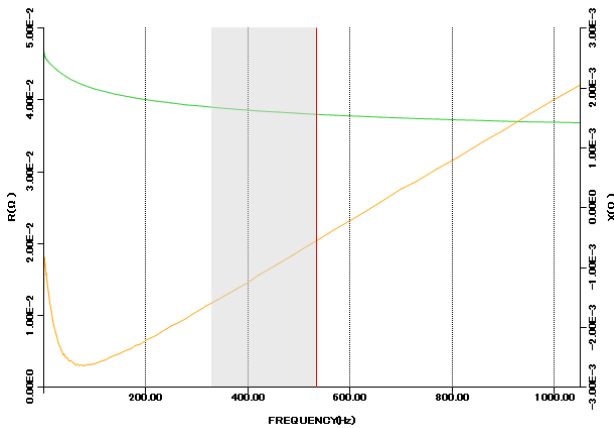


Fig 3-31. Zoom (Parameter)

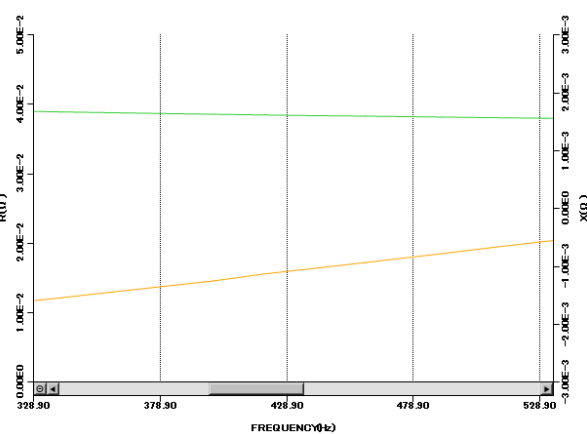


Fig 3-32. Zoom (Parameter)

3.3.8. List operation

function	analysis mode	operation summary
Displays the repeat measurement data	Cole-Cole Plot	(1) Click [Data No.] combo box. (2) Select the number of repeat measurement. (3) The selected data set will be displayed in a graphic or a list form.
	Parameter	

DATA No.

2

1

2

Table 3-12 Functions of list operation

3.3.9. Save Graph (Save as...)

- (1) Select [Graph] tab.

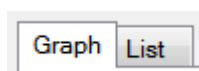


Fig 3-33

- (2) Click [Data No.] combo box, then select the number of repeat measurement to save.

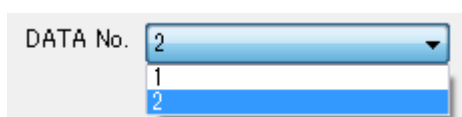


Fig 3-34

- (3) Click , or select [File]-[Save Graph] of menu bar.

- (4) [Save As...] screen will appear.

Determine the folder path to save, the file name and the file type (BMP/JPEG/PNG/GIF), then click [Save(s)].

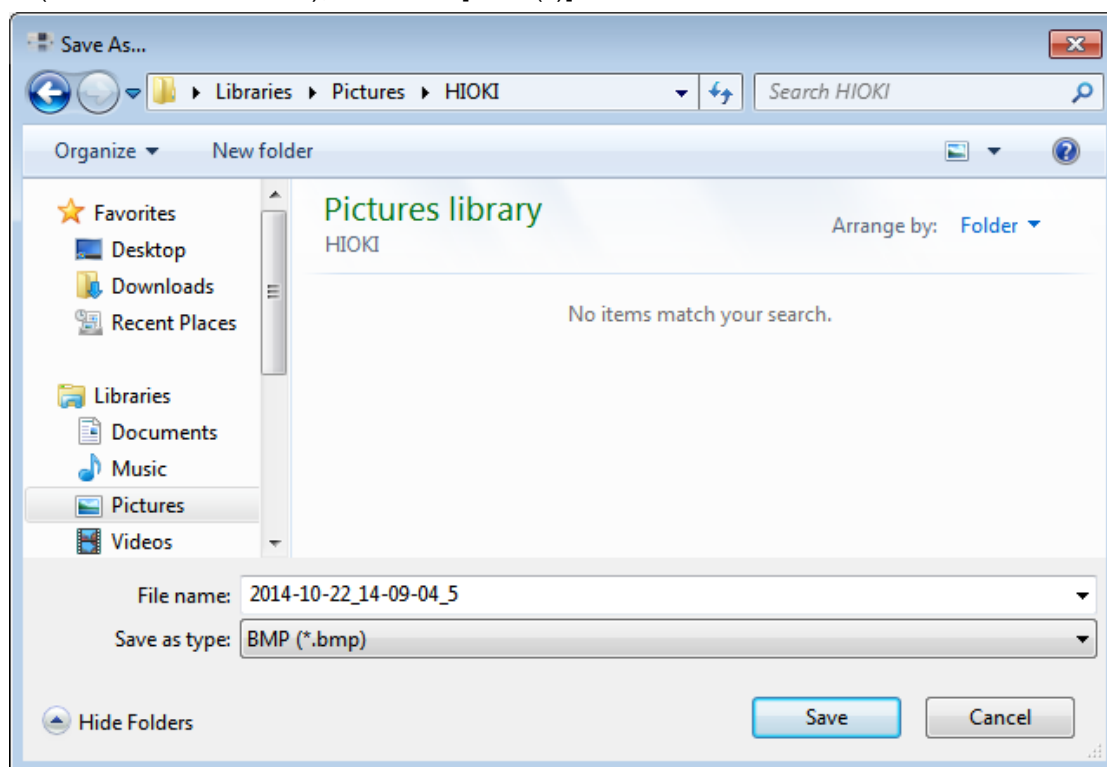


Fig 3-35

- (3) The graph will be saved in the image format.

3.3.10.Save Graph (Save All)

(1) Select [Graph] tab.

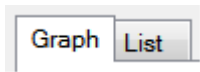


Fig 3-36

(3) Click , or select [File]-[Save All Graphs] of menu bar.

(4) [Browse For Folder] screen will appear. Select the target folder to store the files.
If you want to create new folder to store files, click [Make New Folder (N)] and select the folder.
To save files, click [OK].

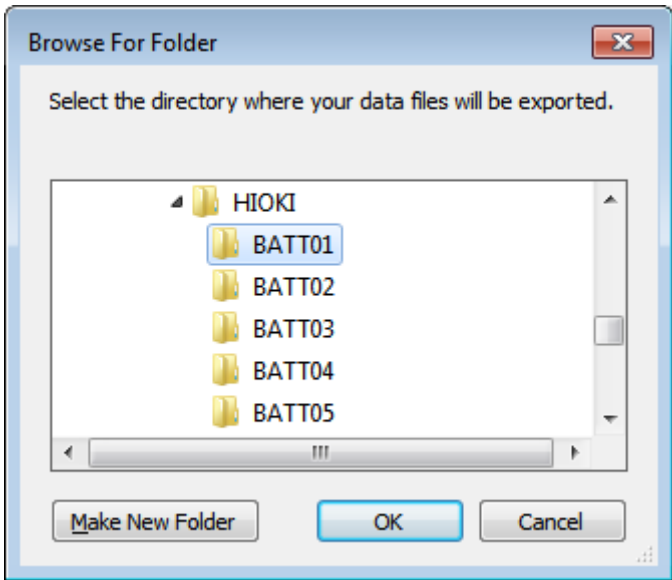


Fig 3-37

(3) All the graph will be saved in the BMP format.

If files are saved successfully, the completion message will appear. (Fig 3-38)

The file names will be automatically given to each file in the following format.

<div><Date>_<Time>_<Data No.>.bmp</div>
<Date> : The date when the Nth repeat measurement started (YYYY-MM-DD)
<Time> : The time when the Nth repeat measurement started (hh-mm-ss)
<Data No.> : N: Number of the repeat measurement. (1~)

Table 3-13 Format of file name

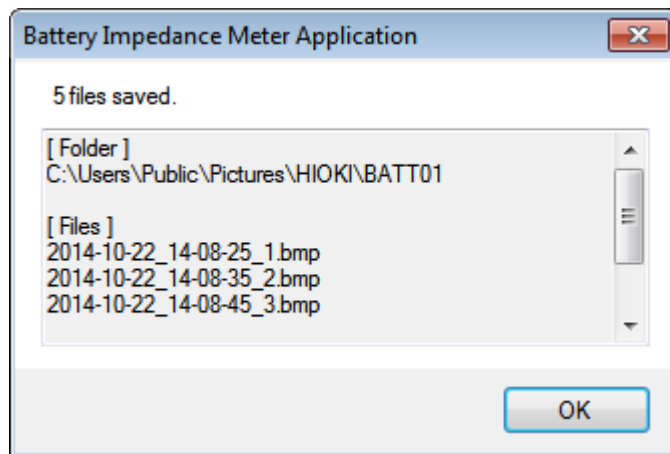


Fig 3-38. Completion message

3.3.11. Save List (Save as...)

- (1) Select [List] tab.

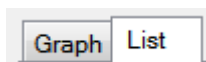


Fig 3-39

- (2) Click [Data No.] combo box, then select the number of repeat measurement to save.

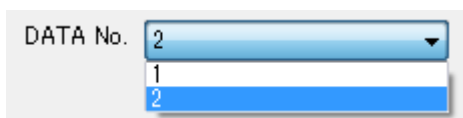


Fig 3-40

- (3) Click , or select [File]-[Save List] of menu bar.

To perform equivalent circuit analysis using ZView, select [File]-[Save Equivalent circuit] of menu bar. See 3.2.6 for the output format.

- (4) [Save As...] screen will appear.

Determine the folder path to save, the file name and the file type (CSV/Text), then click [Save(s)].

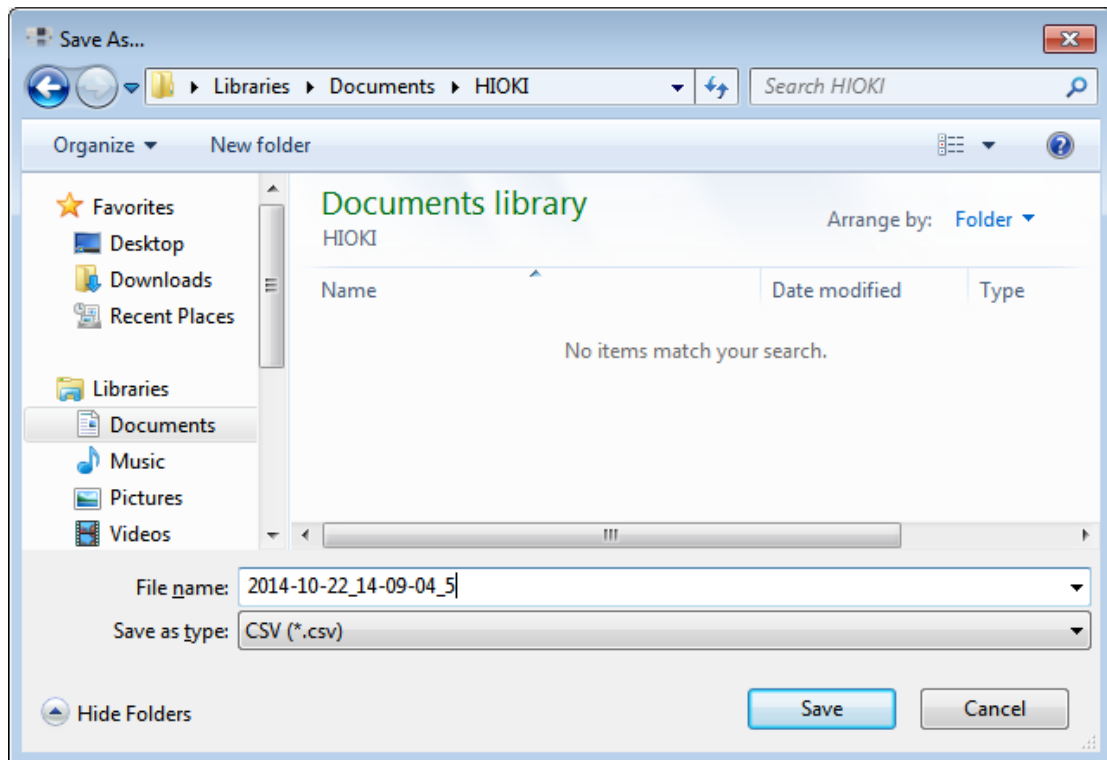


Fig 3-41

- (3) The List will be saved in the text format.

3.3.12.Save List (Save All)

- (1) Select [List] tab.

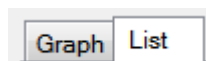
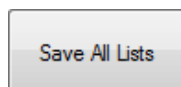


Fig 3-42



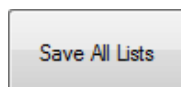
- (3) Click , or select [File]-[Save All Lists] of menu bar.
- (4) [Browse For Folder] screen will appear. Select the target folder to store the files.
If you want to create new folder to store files, click [Make New Folder (N)] and select the folder.
To save files, click [OK].



Fig 3-43

- (3) All the graph will be saved in the CSV format.
If files are saved successfully, the completion message will appear. (Fig 3-44)
The file names will be automatically given to each file in the following format.

<div><Date>_<Time>_<Data No.>.csv</div>
<Date> : The date when the Nth repeat measurement started (YYYY-MM-DD)
<Time> : The time when the Nth repeat measurement started (hh-mm-ss)
<Data No.> : N: Number of the repeat measurement. (1~)

Table 3-14 Format of file name

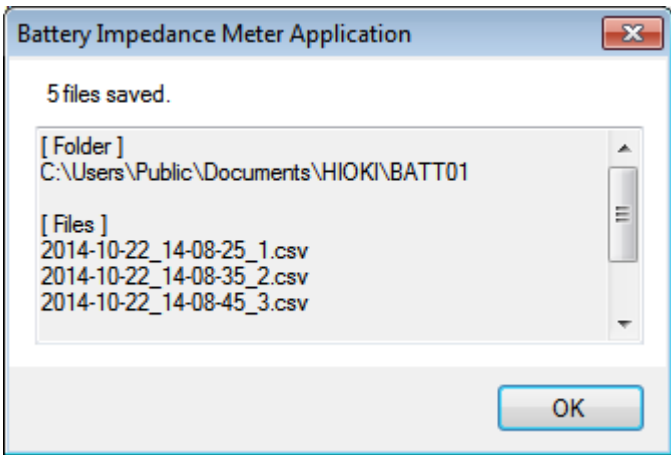


Fig 3-44. Completion message

3.3.13.Graph Set

- (1) Select [Tool]-[Graph Set] of menu bar.
- (2) [Graph Set] screen will appear.
If the analysis mode is set to Parameter, the screen will be displayed as following.
(Fig 3-45)
- (3) Set the display setting of graph.
- (4) Click [OK] to apply changes and exit.
Click [Cancel] to discard changes and exit.
Click [Reset] to reset to the default setting.

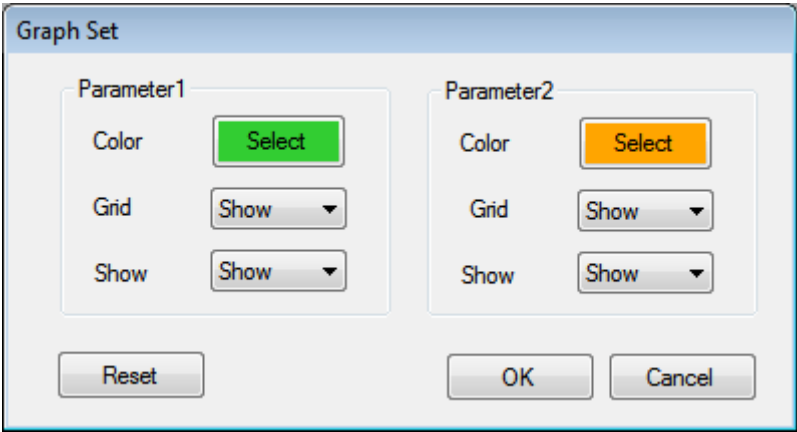
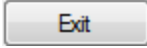


Fig 3-45. Graph Set

Analysis mode	settings	summery
Cole-Cole Plot	Color	Changes the plot color of parameter1. Changes the plot color of parameter2.
	Grid	Switches the show/hide status of Y axis grid of parameter1. Switches the show/hide status of Y axis grid of parameter2.
	Show	Switches the show/hide status of parameter1. Switches the show/hide status of parameter2.
Parameter	Color	Changes the plot color.
	Grid	Switches the show/hide status of X and Y axis grid.

Table 3-15 Graph Set settings

3.3.14.Exit analysis screen

To exit the analysis screen, click  or select [File]-[Exit] of menu bar.

4. Troubleshooting

4.1. Install fails

BT4560 Application Software requires Microsoft .NET Framework 4.0 or 4.5.

Check if Microsoft .NET Framework has been installed.

4.2. USB communication fails

This application uses a virtual COM port.

This application is not supported for a virtual machine.

The COM port number allocated to the USB port will vary with the computer on which the software is used. Use the following method to check the allocated COM port number.

(1) Open device manager.

- Windows 10

[Desktop]—[Right Click on the Start]—[Device Manager]

(2) The “x” in “Prolific USB-to-Serial Comm Port (COMx)” in the list of ports (COM and LPT) indicates the COM port number.

4.3. Application Software does not recognize BT4560

Check if the USB driver software (PL2303_Prolific_DriverInstaller) has been installed.

Depending on the timing of the USB cable connection, application may not automatically recognize the BT4560. In that case, please turn on the power of the BT4560 again.

