1 Impedance Analyzer Sample Application

-1 Overview

The Impedance Analyzer Sample Application is a sample application for use with impedance analyzers.

(1) Functionality

This software provides the following functionality:

- LCR mode measurement
- Configuration of LCR mode measurement conditions
- Display of LCR mode measured values
- Saving of LCR mode measurement data
- ANALYZER mode measurement
- Configuration of ANALYZER mode measurement conditions
- Display of ANALYZER mode measured values as a graph
- Display of ANALYZER mode measured values as a list
- Saving of ANALYZER mode measured value lists
- Calculation of measurement accuracy
- Calculation of the measurement range
- Acquisition of measurement screens
- Measurement of communications times

(2) Measurement methods

The sample application provides the following six measurement methods:

- Frequency characteristics (measurement while varying the frequency)
- Power characteristics (measurement while varying the power)
- Voltage characteristics (measurement while varying the voltage)
- Current characteristics (measurement while varying the current)
- Time interval measurement (measurement over a user-specified time interval) *1
- "Acquire by pressing ENTER" measurement (one-time measurement) *1

*1 LCR mode only

(3) Operating environment

Supported operating systems	Windows 10 (32-bit/64-bit) Windows 11
Software environment	Microsoft .NET Framework 4.0
CPU	1 GHz or greater
RAM	512 MB or greater
Display resolution	1024 X 768 pixels or greater
Hard disk	At least 5 MB available
Communications interfaces	RS-232C, GPIB, USB, LAN

Table 1-1 Operating environment

The following cables are required in order to connect the impedance analyzer to a computer:

- RS-232C connection: RS-232C cross cable (9-pin female to 9-pin female)
- GPIB connection: National Instruments GPIB-USB-HS
- USB connection: USB cable (AB type)
- LAN connection: LAN cross cable

(4) Supported products

This software can be used with the following products:

- IM7580A
- IM7581
- IM7583
- IM7585
- IM7587

-2 Start screen

The start screen is displayed when the Impedance Analyzer Sample Application is launched.

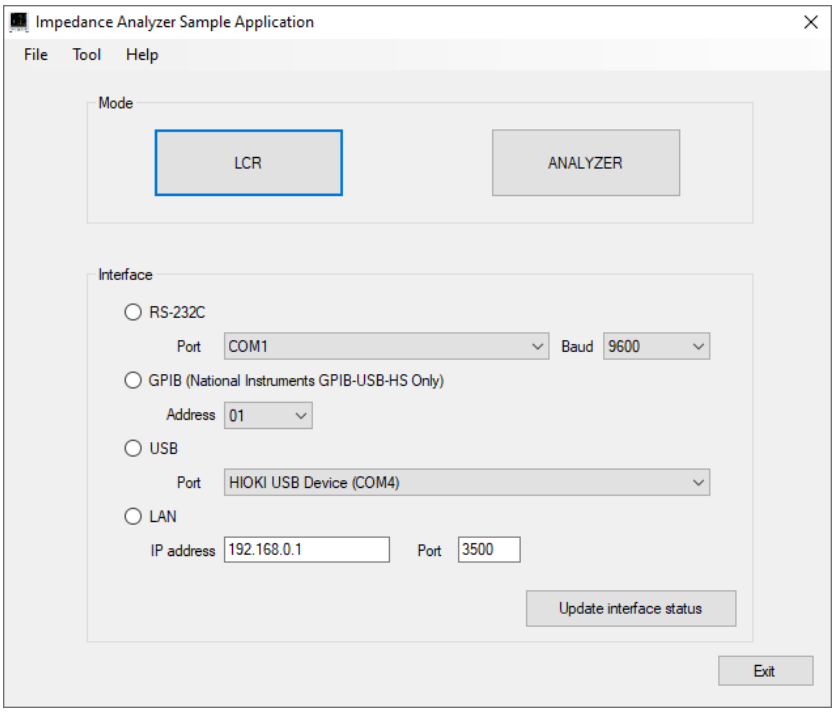


Figure 2-1 Start screen

Select the interface you're using to connect the impedance analyzer and switch to a function screen.

-3 LCR mode

You can perform LCR mode measurement.

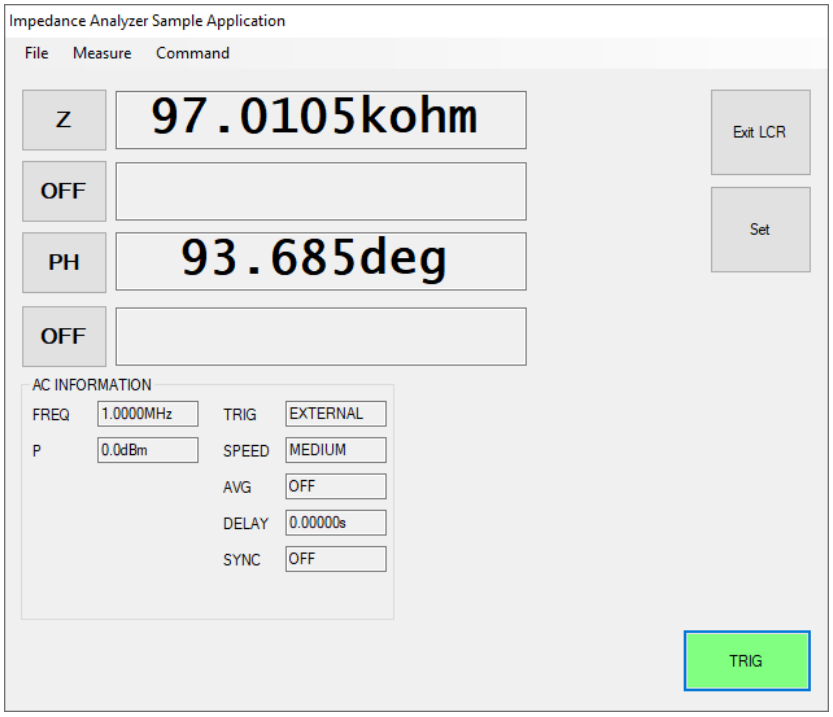


Figure 3-1 LCR mode screen

(1) LCR settings

You can set the measurement conditions used in LCR mode.

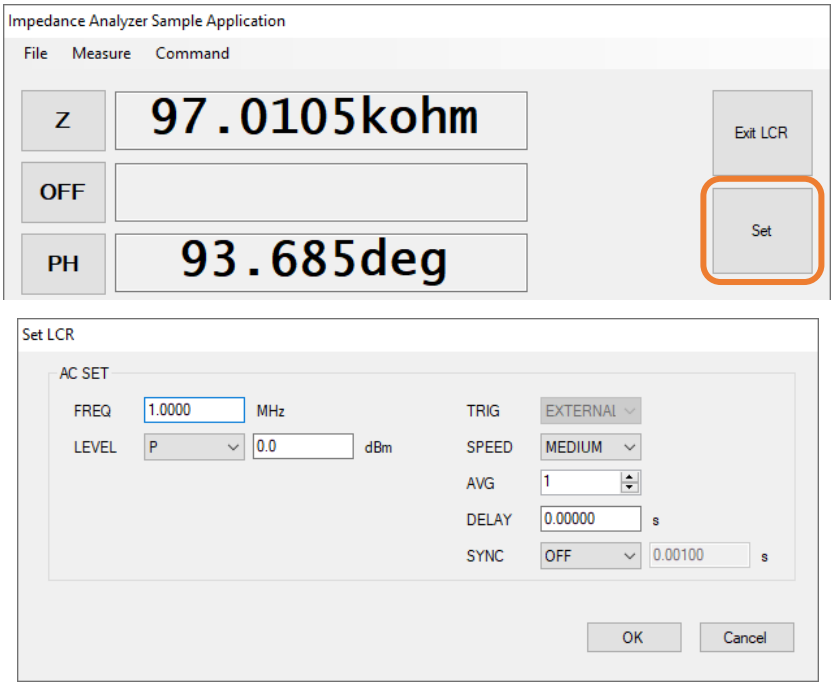


Figure 3-2 LCR settings screen

(2) Frequency, voltage, and current characteristics measurement

You can make measurements while varying the frequency, power, voltage, or current. Measurement data can be saved as a Microsoft Excel or CSV file.

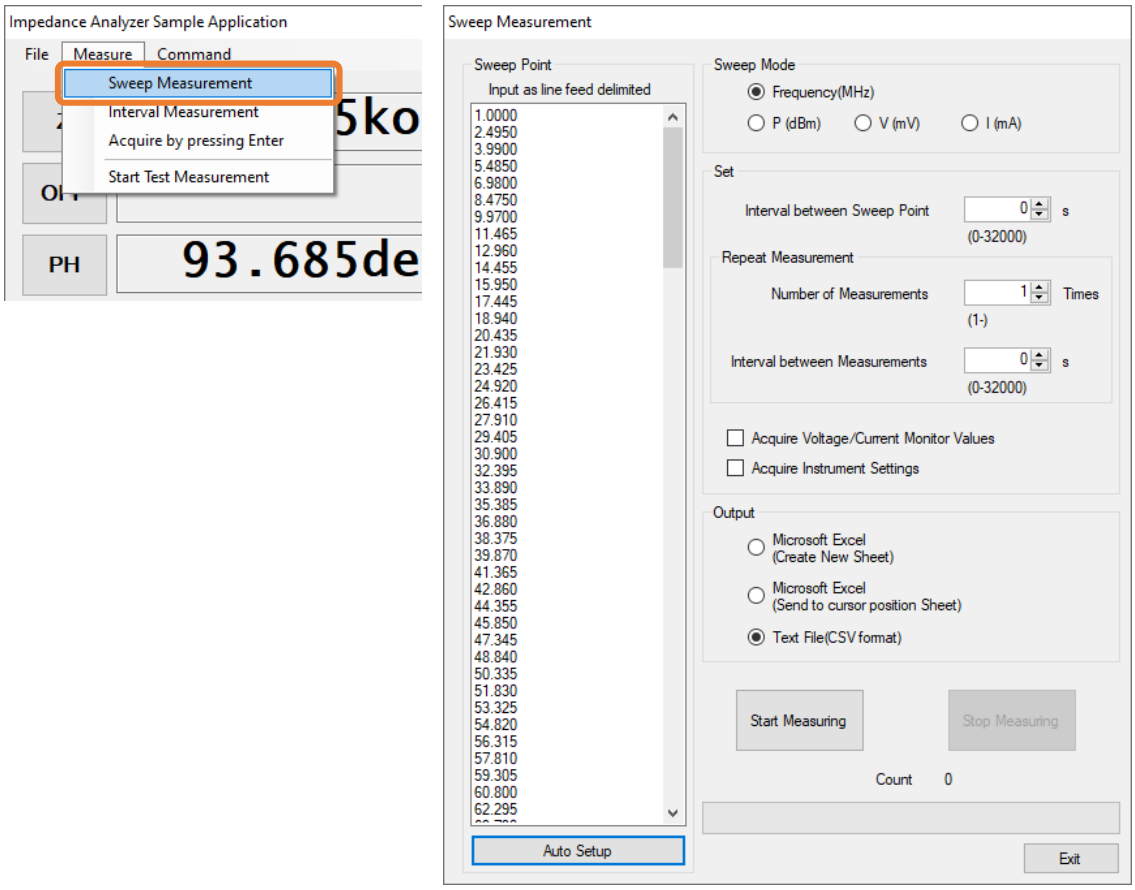


Figure 3-3 Frequency/voltage/current characteristics measurement screen

You can set automatically set sweep points by specifying the start value, end value, and number of data points.

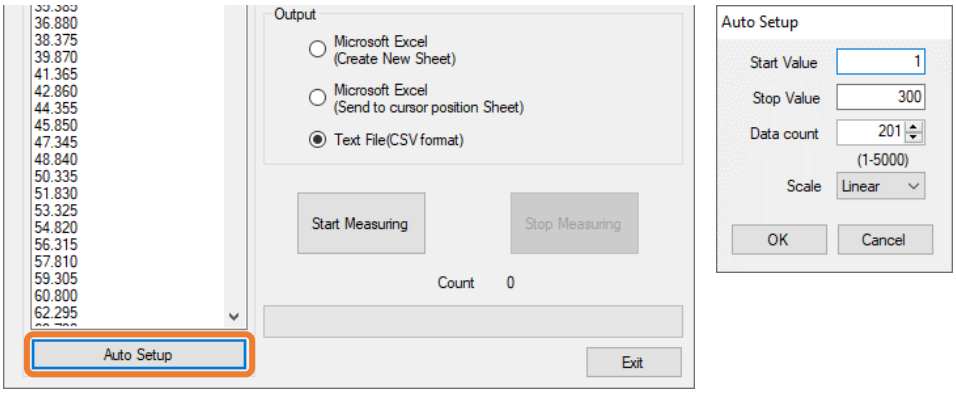


Figure 3-4 Sweep point automatic setup screen

Example CSV file saved during frequency/voltage/current characteristics measurement

```
MODEL,IM7580A
Serial NO.,000000000
Ver,V1.24

DATE,2023-05-23
TIME,16:03:48

AC SETTINGS
FREQ,300.0000,MHz
P,0.0,dBm
SPEED,MEDIUM
AVG,OFF
DELAY,0.00000,s
TRIG SYNC,OFF

周波数(MHz),AC Status,Z,PH,AC Vmoni,AC Imoni
1.0000,3,  97.9488E+03,   93.910,  446.985E-03,  4.56346E-06
2.4950,3,  27.7508E+03,   90.733,  446.409E-03,  16.0864E-06
3.9900,3,  16.6861E+03,   91.835,  445.878E-03,  26.7214E-06
5.4850,3,  12.0800E+03,   92.763,  445.370E-03,  36.8684E-06
6.9800,3,  9.55111E+03,   93.633,  444.885E-03,  46.5793E-06
                                    :
```

(3) Time interval measurement

You can make measurements at a user-specified time interval. Measurement data can be saved as a Microsoft Excel or CSV file.

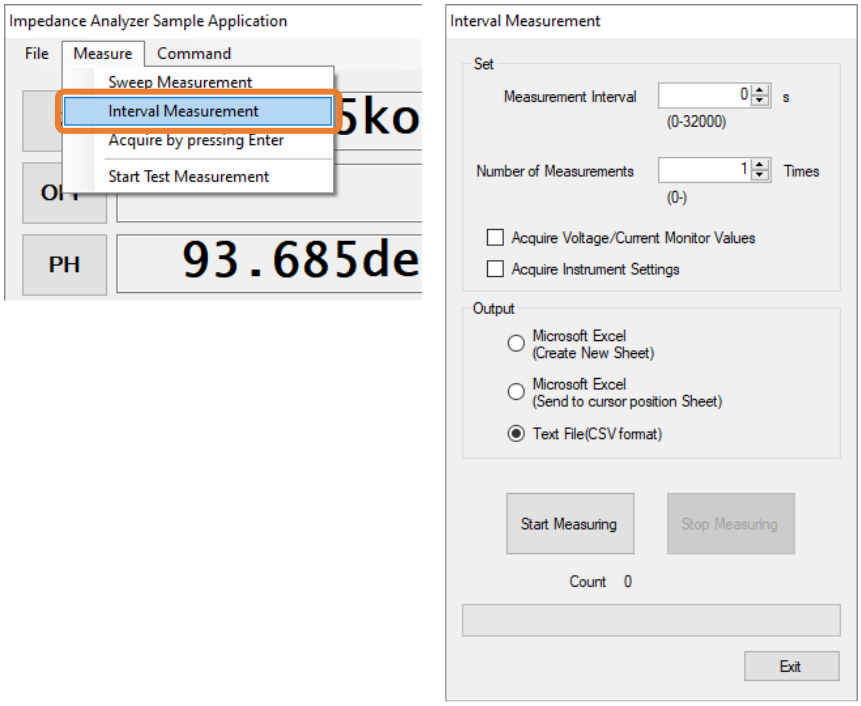


Figure 3-5 Time interval measurement screen

Example CSV file saved during time interval measurement

```
MODEL,IM7580A
Serial NO.,000000000
Ver,V1.24

DATE,2023-05-23
TIME,16:05:57

AC SETTINGS
FREQ,300.0000,MHz
P,0.0,dBm
SPEED,MEDIUM
AVG,OFF
DELAY,0.00000,s
TRIG SYNC,OFF

DATE,TIME,AC Status,Z,PH,AC Vmoni,AC Imoni
2023-05-23,16:05:57,3,  189.283E+00,   81.252,  353.765E-03,  1.86898E-03
2023-05-23,16:05:57,3,  189.270E+00,   81.251,  353.760E-03,  1.86908E-03
2023-05-23,16:05:57,3,  189.277E+00,   81.250,  353.763E-03,  1.86902E-03
2023-05-23,16:05:57,3,  189.286E+00,   81.252,  353.766E-03,  1.86895E-03
2023-05-23,16:05:57,3,  189.276E+00,   81.249,  353.762E-03,  1.86903E-03
                                    :
```

(4) "Acquire by pressing ENTER" measurement

You can make measurements whenever the ENTER key is pressed. Measurement data can be saved as a Microsoft Excel or CSV file.

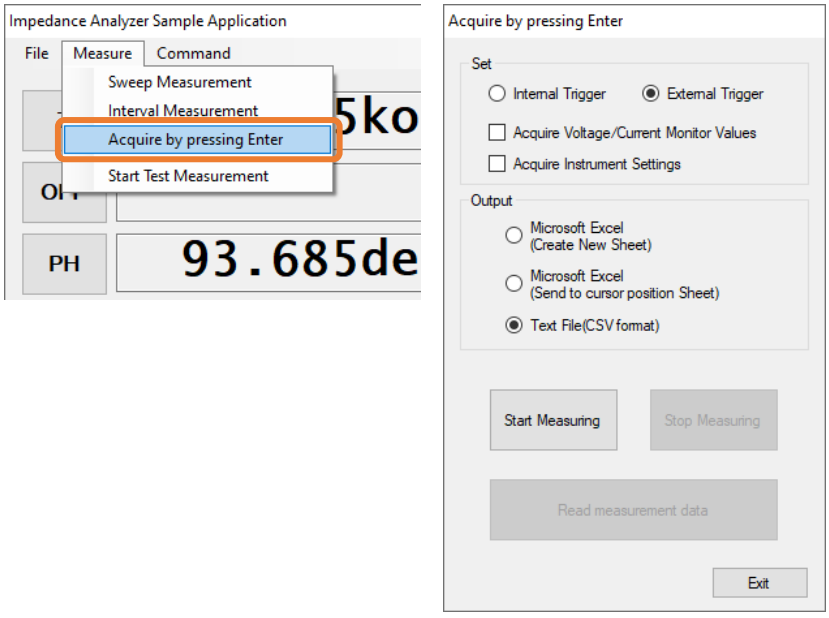


Figure 3-6 "Acquire by pressing ENTER" screen

Example CSV file saved during "acquire by pressing ENTER" measurement

```
MODEL,IM7580A
Serial NO.,000000000
Ver,V1.24

DATE,2023-05-23
TIME,16:08:43

AC SETTINGS
FREQ,300.0000,MHz
P,0.0,dBm
SPEED,MEDIUM
AVG,OFF
DELAY,0.00000,s
TRIG SYNC,OFF

DATE,TIME,AC Status,Z,PH,AC Vmoni,AC Imoni
2023-05-23,16:08:44,3,  189.288E+00,   81.251,  353.767E-03,  1.86893E-03
2023-05-23,16:08:44,3,  189.293E+00,   81.254,  353.769E-03,  1.86889E-03
2023-05-23,16:08:45,3,  189.291E+00,   81.249,  353.768E-03,  1.86891E-03
2023-05-23,16:08:45,3,  189.277E+00,   81.257,  353.763E-03,  1.86902E-03
2023-05-23,16:08:45,3,  189.290E+00,   81.253,  353.768E-03,  1.86892E-03
                                    :
```

(5) Test measurement

You can perform a series of measurements under the set measurement conditions and display the results.

To start test measurement, choose [Start Test Measurement] on the [Measure] menu.

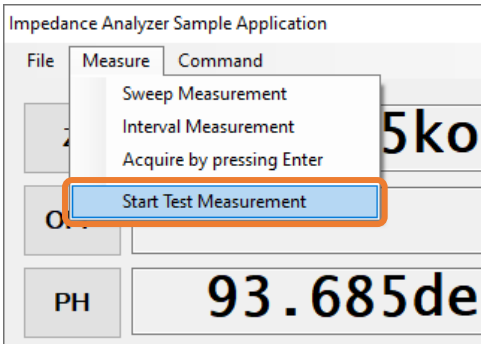


Figure 3-7 "Start Test Measurement" menu command

To stop test measurement, choose [Stop Test Measurement] on the [Measure] menu.

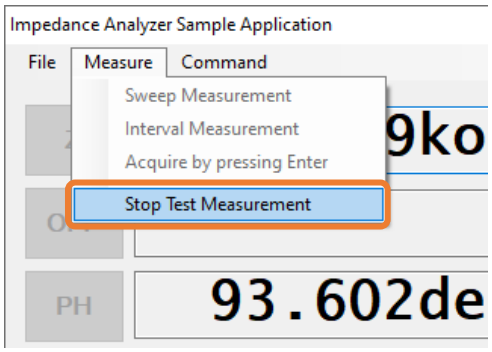


Figure 3-8 "Stop Test Measurement" menu command

-4 ANALYZER mode

You can perform measurements in ANALYZER mode. You can save a graph of measured values as a BMP file, or a list of measured values as a CSV file.

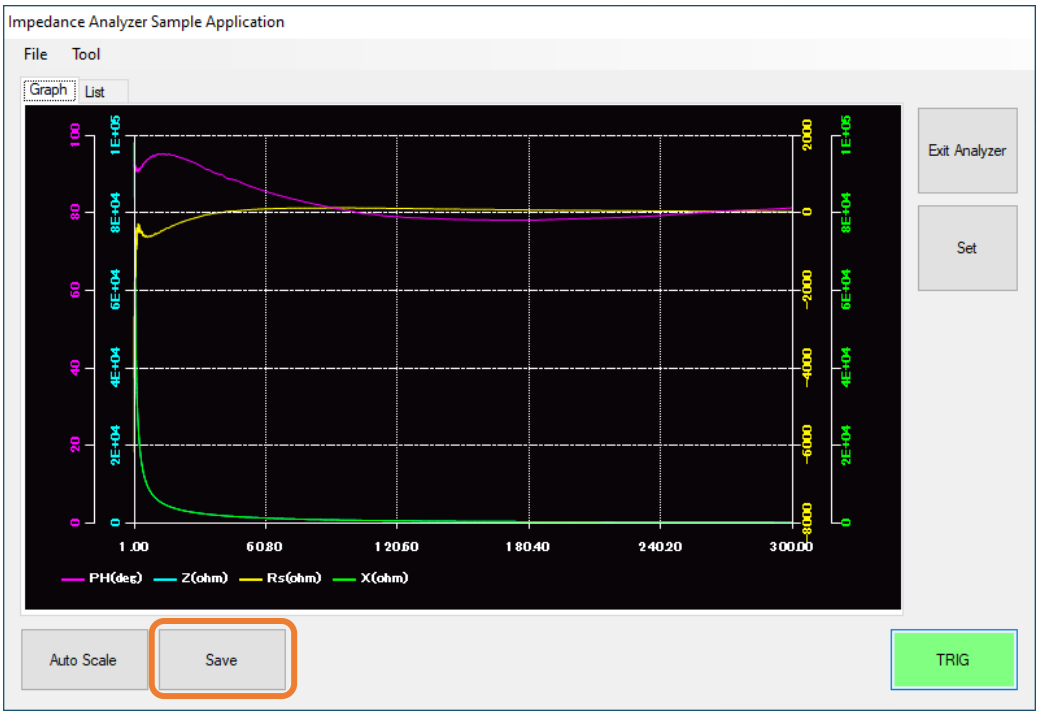


Figure 4-1 ANALYZER mode graph screen

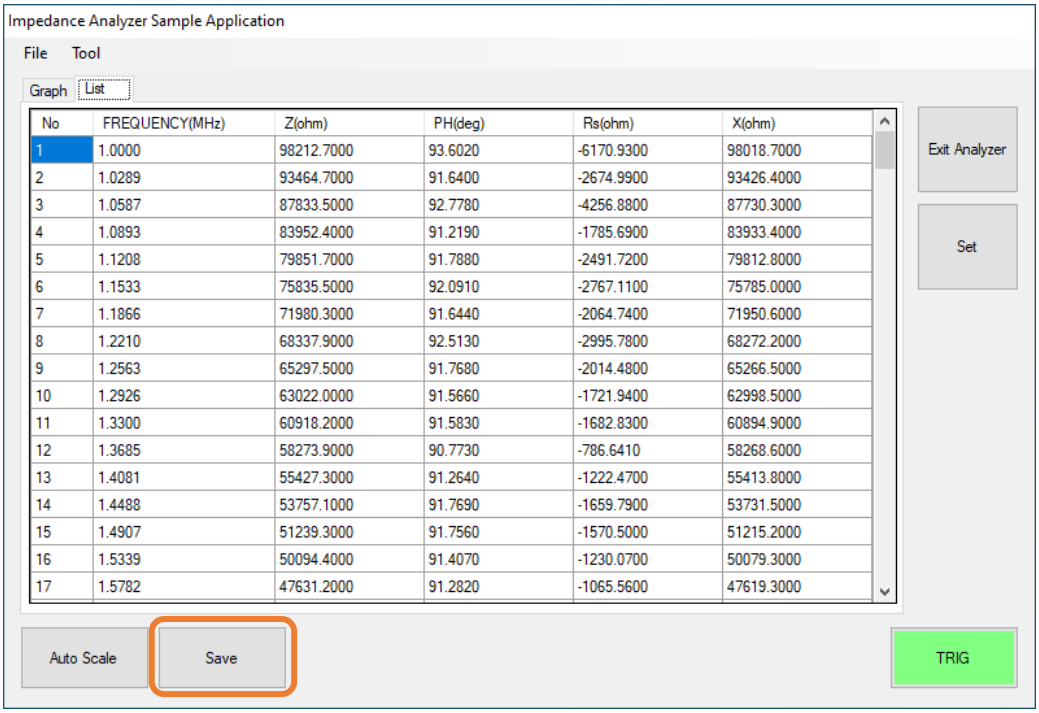


Figure 4-2 ANALYZER mode list screen

(1) ANALYZER settings

You can set the measurement conditions to use in ANALYZER mode.

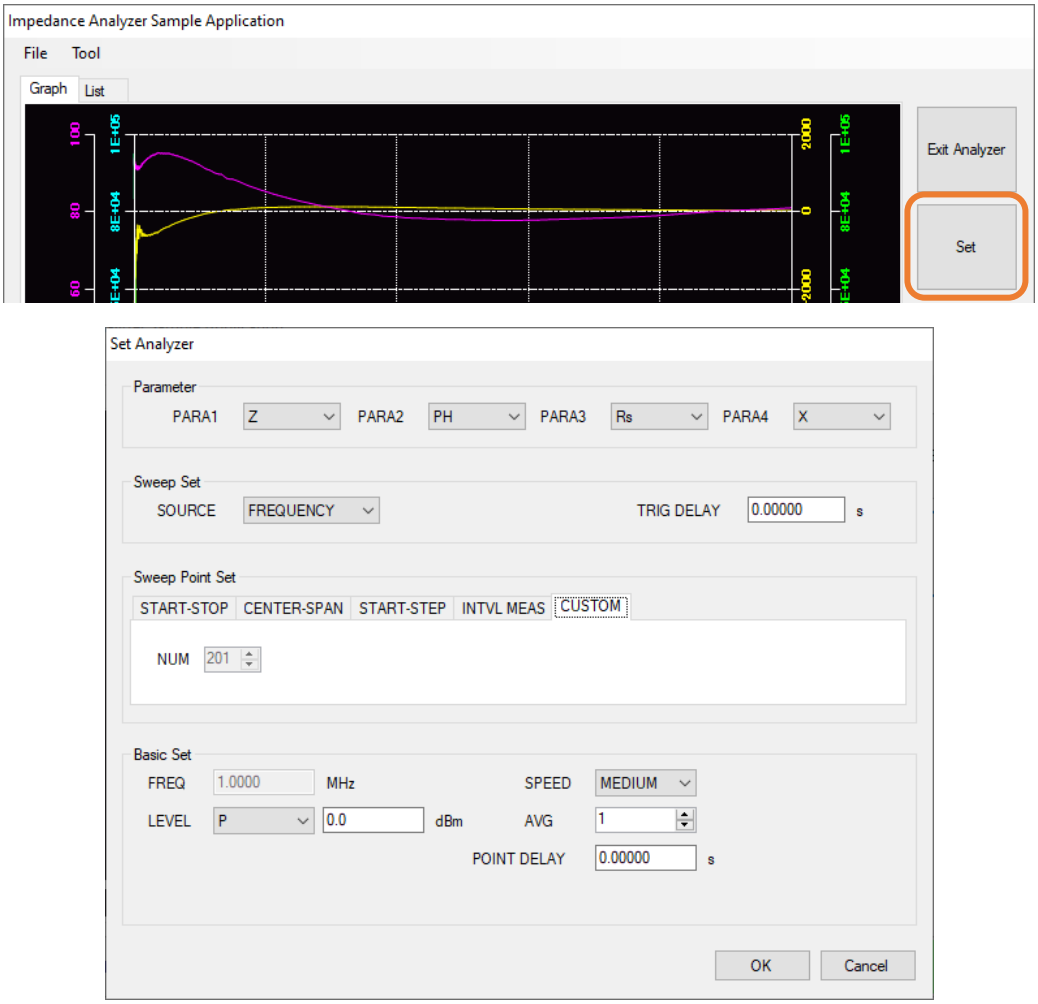


Figure 4-3 ANALYZER settings screen

***Changing the sweep point setting invalidates the calibration.**

(2) Graph settings

You can set whether to show each parameter on the graph screen in ANALYZER mode as well as each parameter's color and scale, and you can set whether to show the grid.

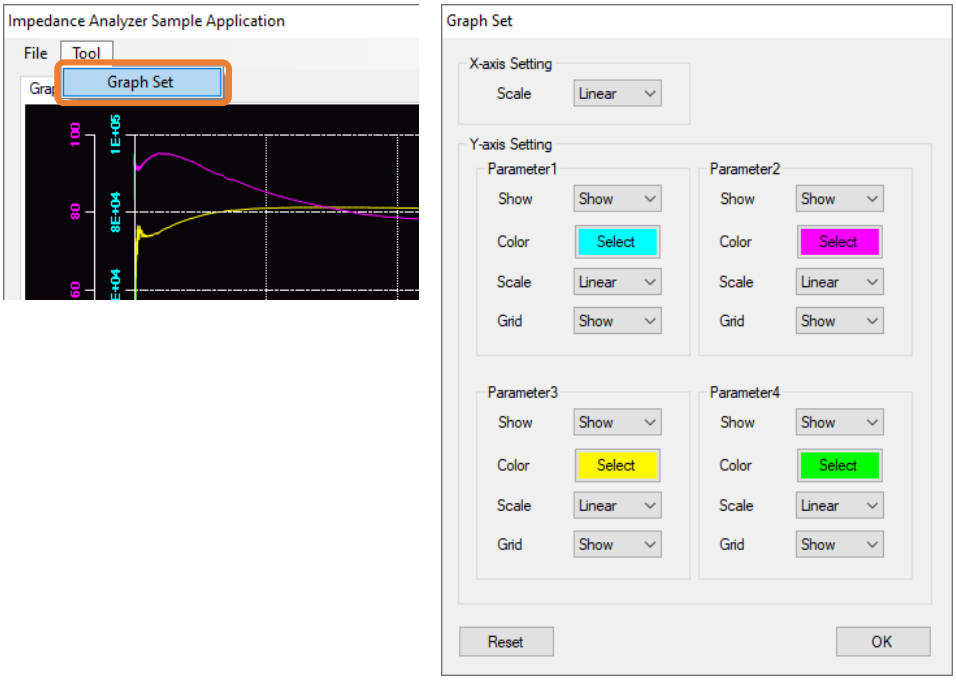
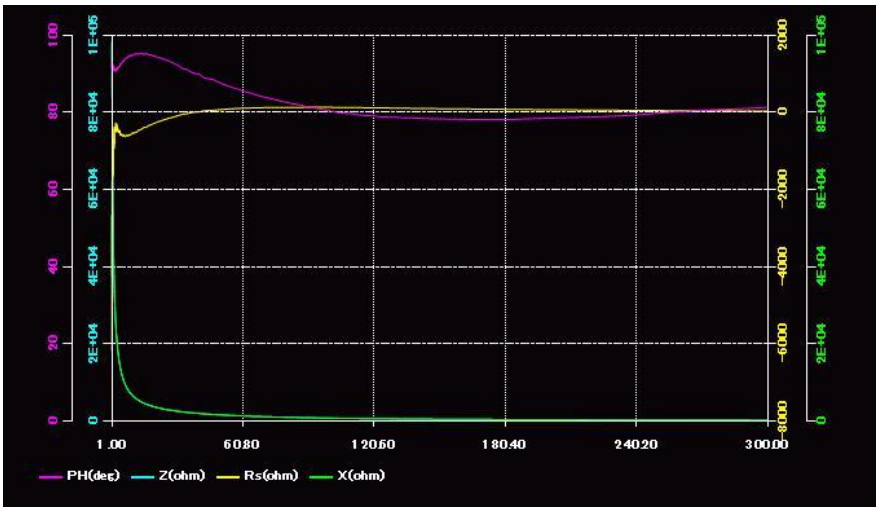


Figure 4-4 Graph settings screen

(3) Example BMP file created by saving a measured value graph in ANALYZER mode



(4) Example CSV file created by saving a measured value list in ANALYZER mode

```
No.,FREQUENCY(MHz),Z,PH,Rs,X
1,1.0000,98212.7000,93.6020,-6170.9300,98018.7000
2,1.0289,93464.7000,91.6400,-2674.9900,93426.4000
3,1.0587,87833.5000,92.7780,-4256.8800,87730.3000
4,1.0893,83952.4000,91.2190,-1785.6900,83933.4000
5,1.1208,79851.7000,91.7880,-2491.7200,79812.8000
6,1.1533,75835.5000,92.0910,-2767.1100,75785.0000
7,1.1866,71980.3000,91.6440,-2064.7400,71950.6000
8,1.2210,68337.9000,92.5130,-2995.7800,68272.2000
9,1.2563,65297.5000,91.7680,-2014.4800,65266.5000
10,1.2926,63022.0000,91.5660,-1721.9400,62998.5000
                                    :
```

-5 Accuracy calculation

You can set measurement conditions and calculate the measurement accuracy.

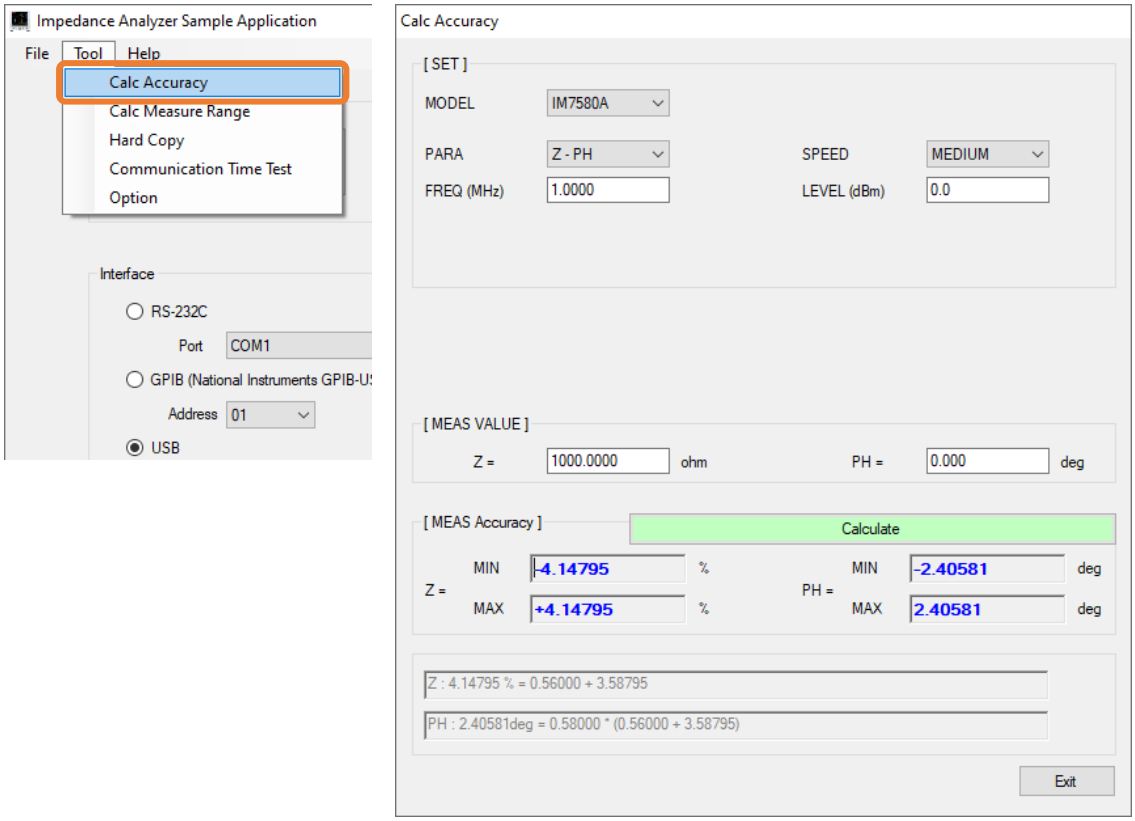


Figure 5-1 Accuracy calculation screen

-6 Measurement range calculation

You can set measurement conditions and calculate the measurement range.

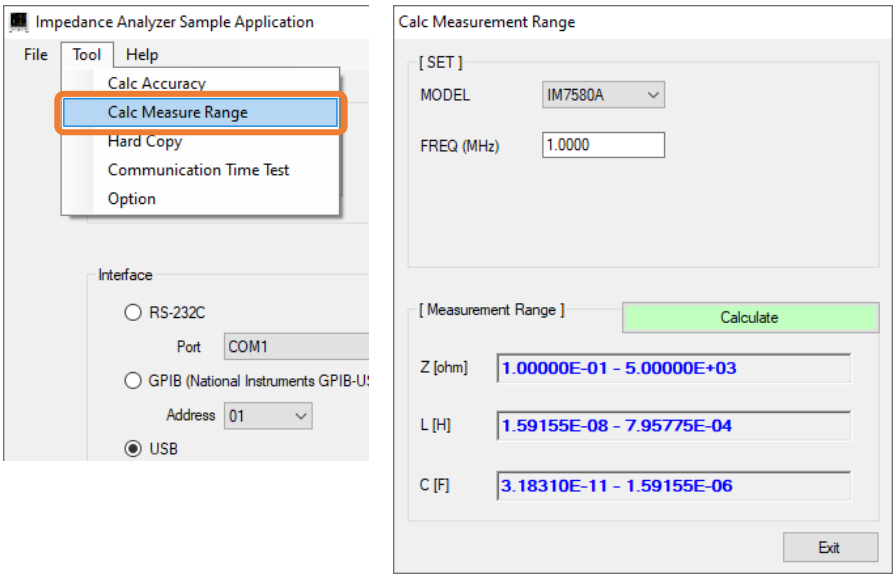


Figure 6-1 Measurement range calculation screen

-7 Screenshots

You can save the measurement screen as a BMP file.

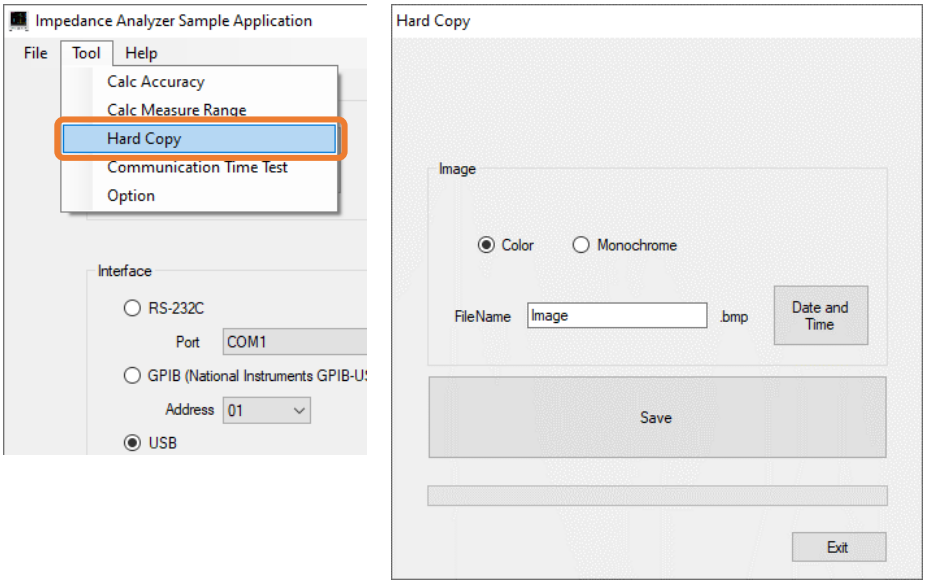


Figure 7-1 Screenshot screen

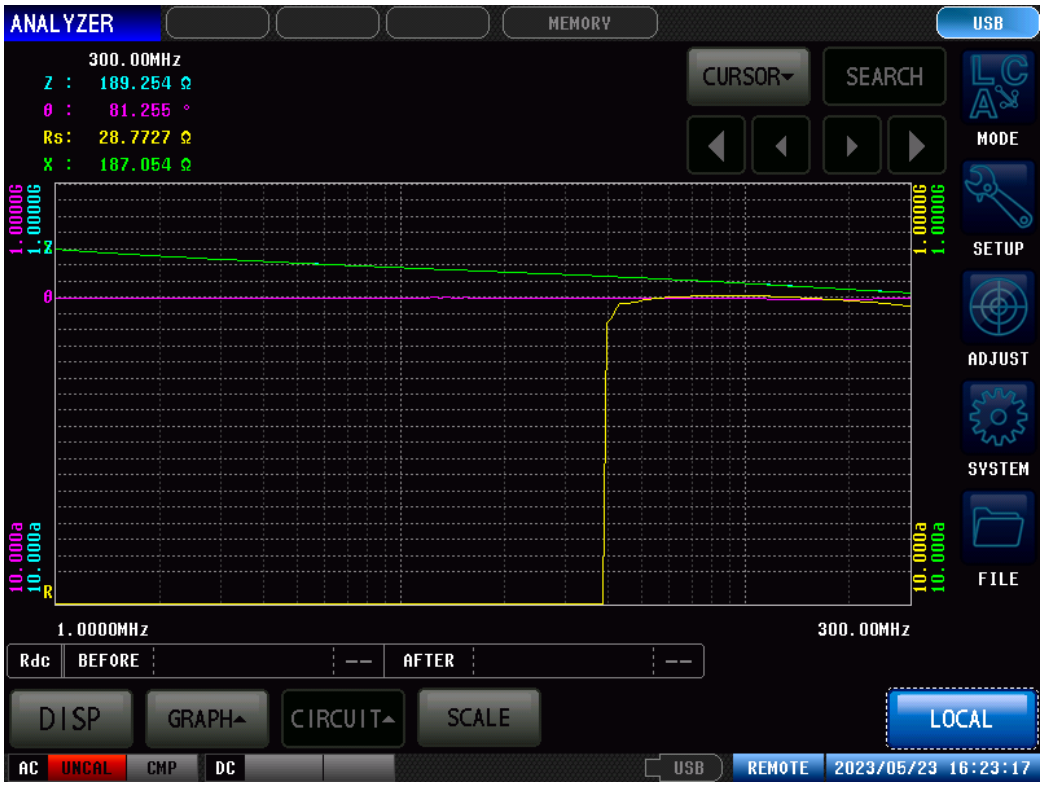


Figure 7-2 Example BMP file created by saving the measurement screen

-8 Measurement of communication times

You can send a communications command and measure the communication time.

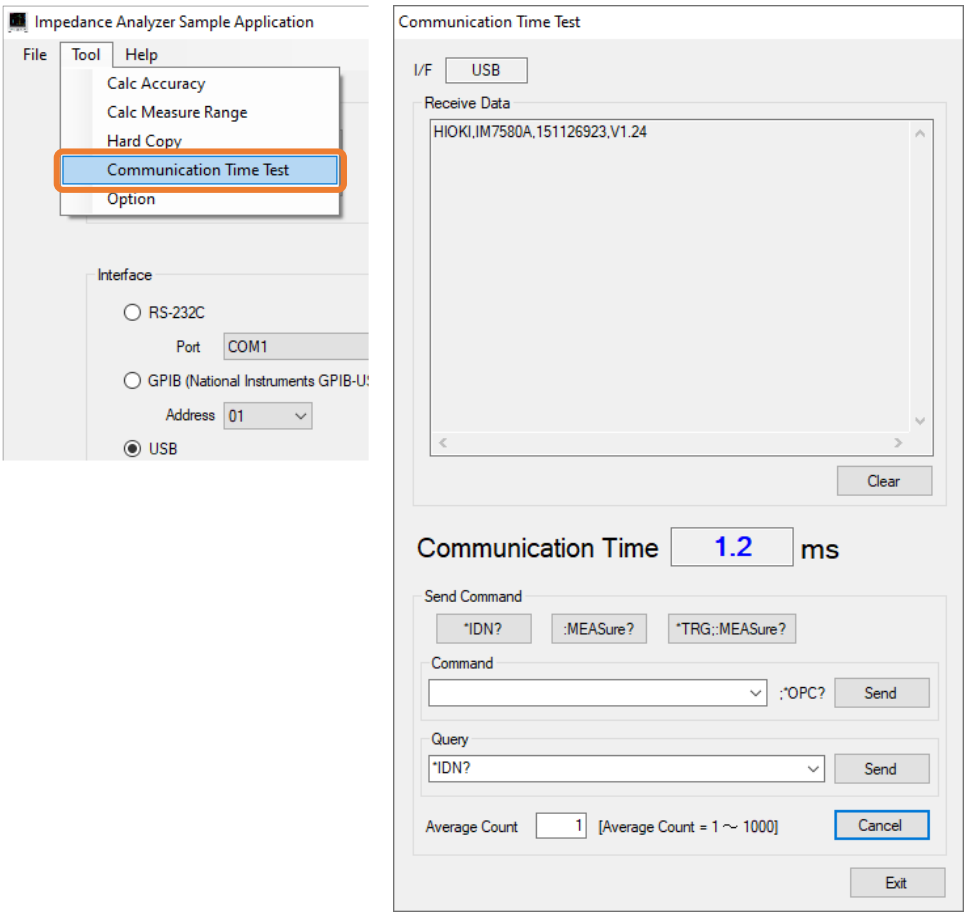


Figure 8-1 Communication time measurement screen

-9 Option

You can set the display language and CSV save format.

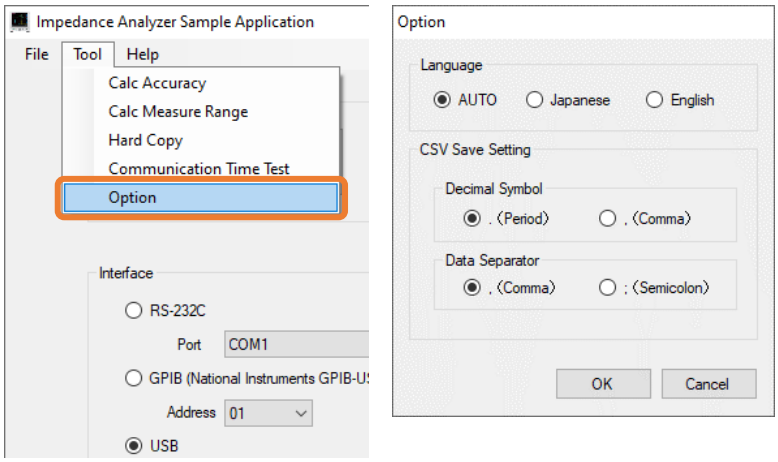


Figure 9-1 Option screen

(1) Language

You can set the display language.

"AUTO" will automatically switch to the language of the OS.

(2) CSV Save Setting

You can set the CSV save format.