Standard Operating Procedure

Labview-Keithley Interface

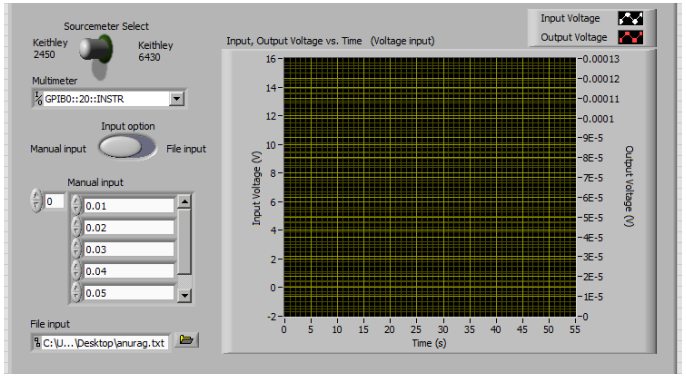
Block Diagram

Keithley 2450

Keithley 2000

Keithley 6430

Labview 2014



Graphical User Interface

Single Measurement

Global parameters

Source Mode
Voltage 0

Compliance Level (A or V)
0.1
Maximum value for the item not regulated by the source

NPLC
1
(0.01-10) Higher NPLC, Higher accuracy, Lower speed

Source Trigger Delay (sec)
0

Export data to Excel

Set the source mode: <Voltage> or <Current>.

Single Measurement | Sweep (Two Probe) | Sweep (Two Probe) + Constant Source | Four Probe | Multiple SMU

SourceMeter
Keithley 2450

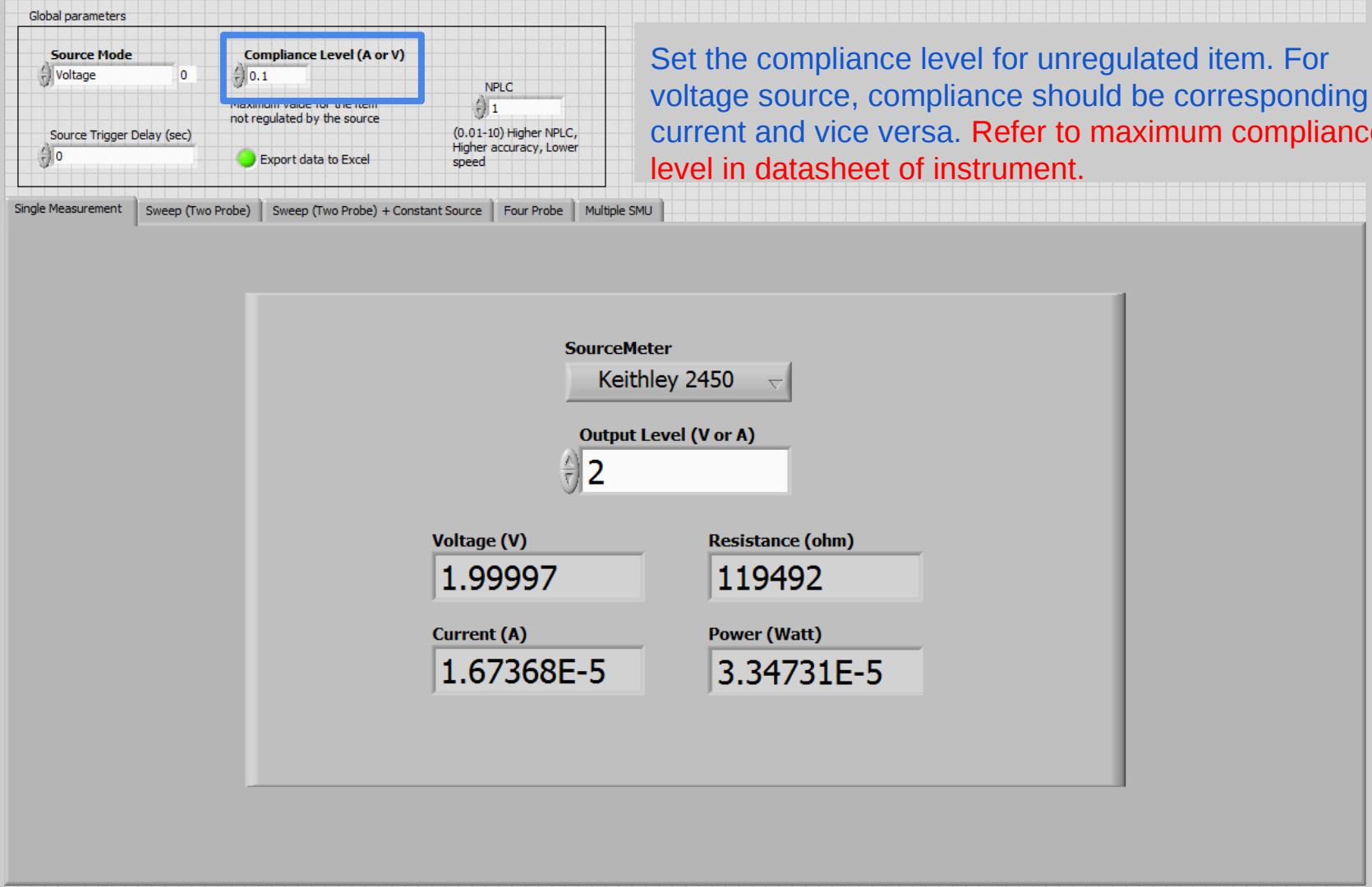
Output Level (V or A)
2

Voltage (V)
1.99997

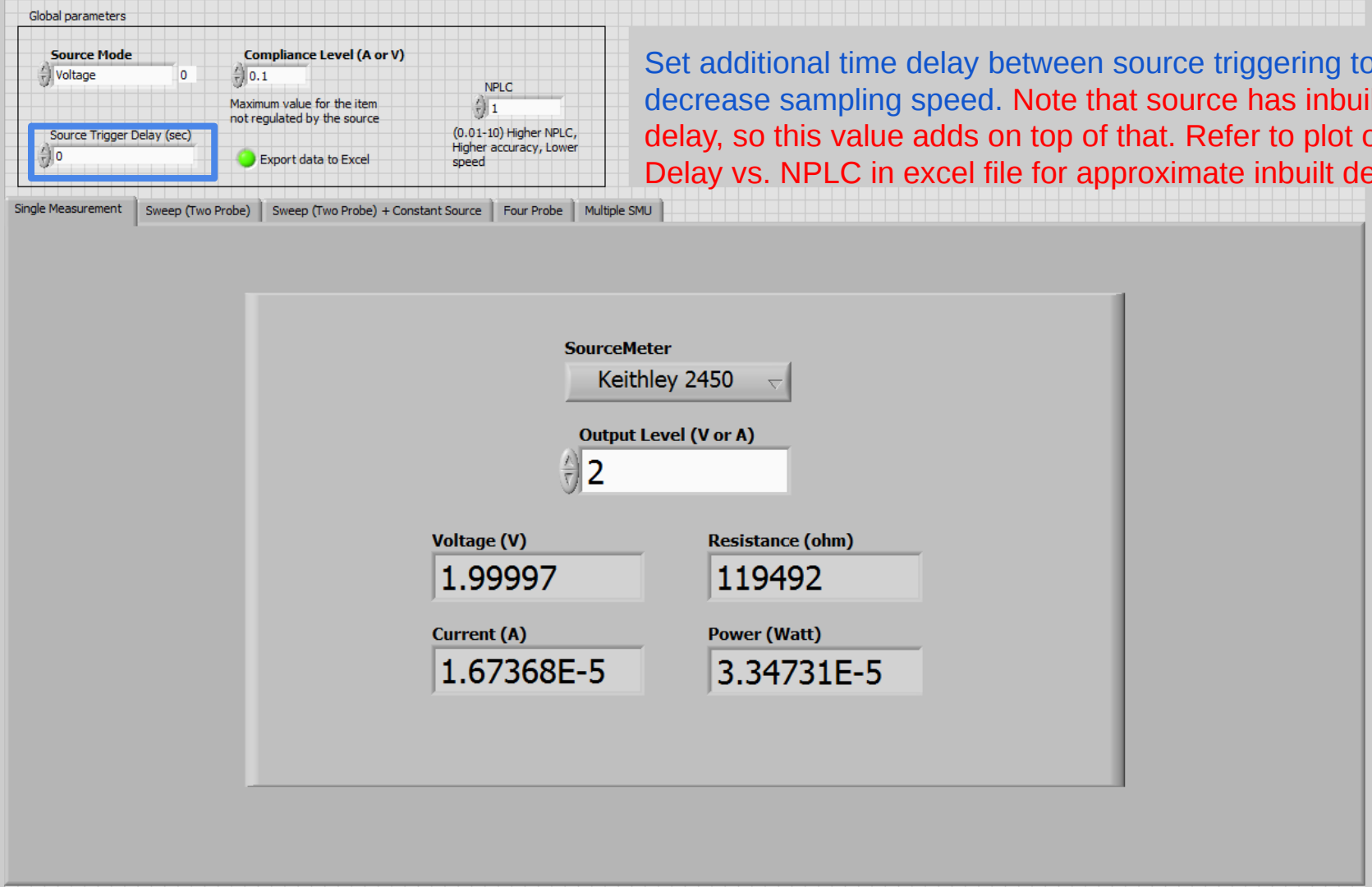
Resistance (ohm)
119492

Current (A)
1.67368E-5

Power (Watt)
3.34731E-5



Set the compliance level for unregulated item. For voltage source, compliance should be corresponding to current and vice versa. Refer to maximum compliance level in datasheet of instrument.



Set additional time delay between source triggering to decrease sampling speed. Note that source has inbuilt delay, so this value adds on top of that. Refer to plot of Delay vs. NPLC in excel file for approximate inbuilt delay.

Global parameters

Source Mode

Voltage 0

Compliance Level (A or V)

0.1

Maximum value for the item not regulated by the source

NPLC

1

(0.01-10) Higher NPLC, Higher accuracy, Lower speed

Source Trigger Delay (sec)

0

Export data to Excel

Export Data to Excel feature not available in Single Measurement mode

Single Measurement | Sweep (Two Probe) | Sweep (Two Probe) + Constant Source | Four Probe | Multiple SMU

SourceMeter

Keithley 2450

Output Level (V or A)

2

Voltage (V)

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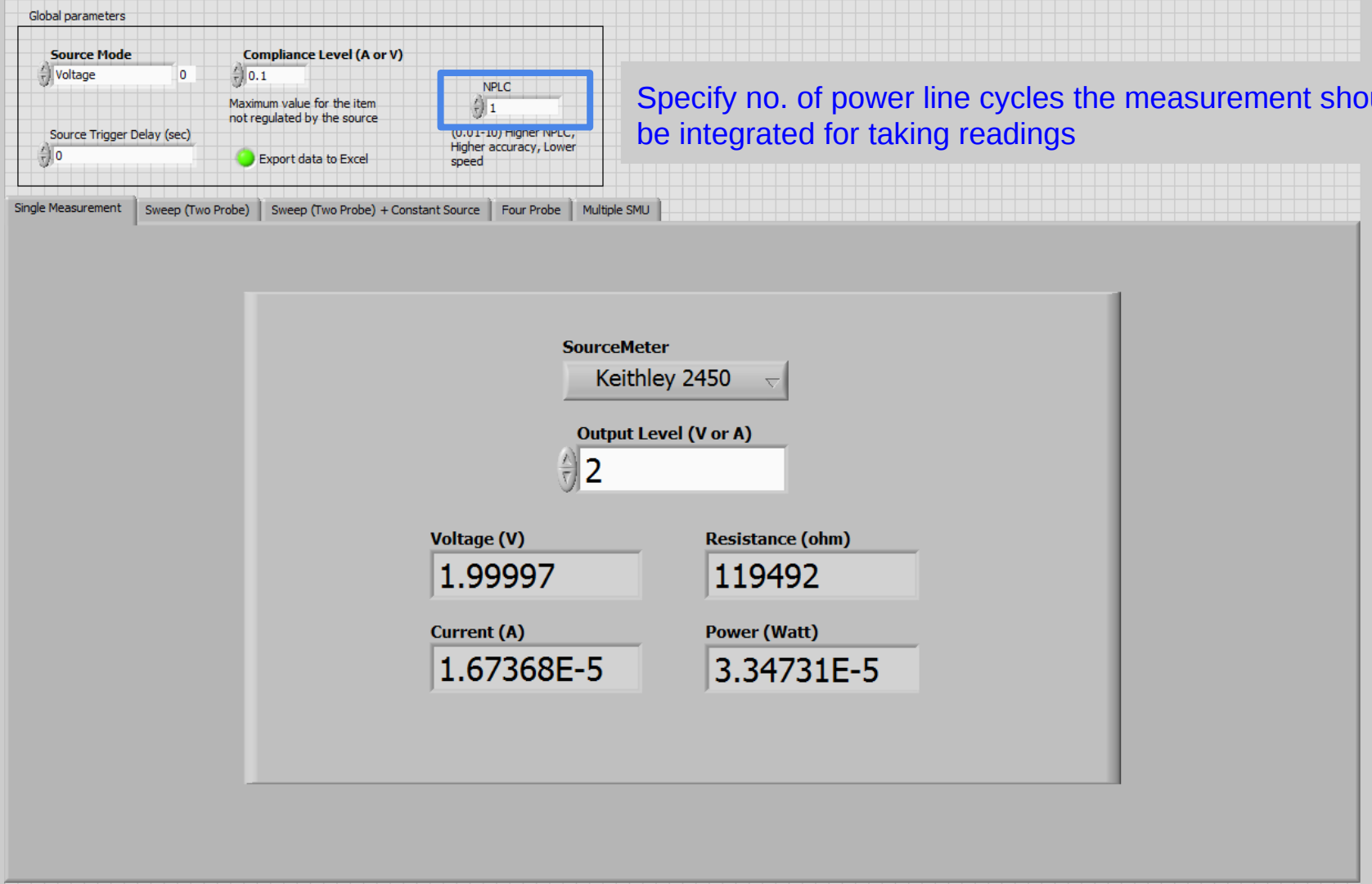
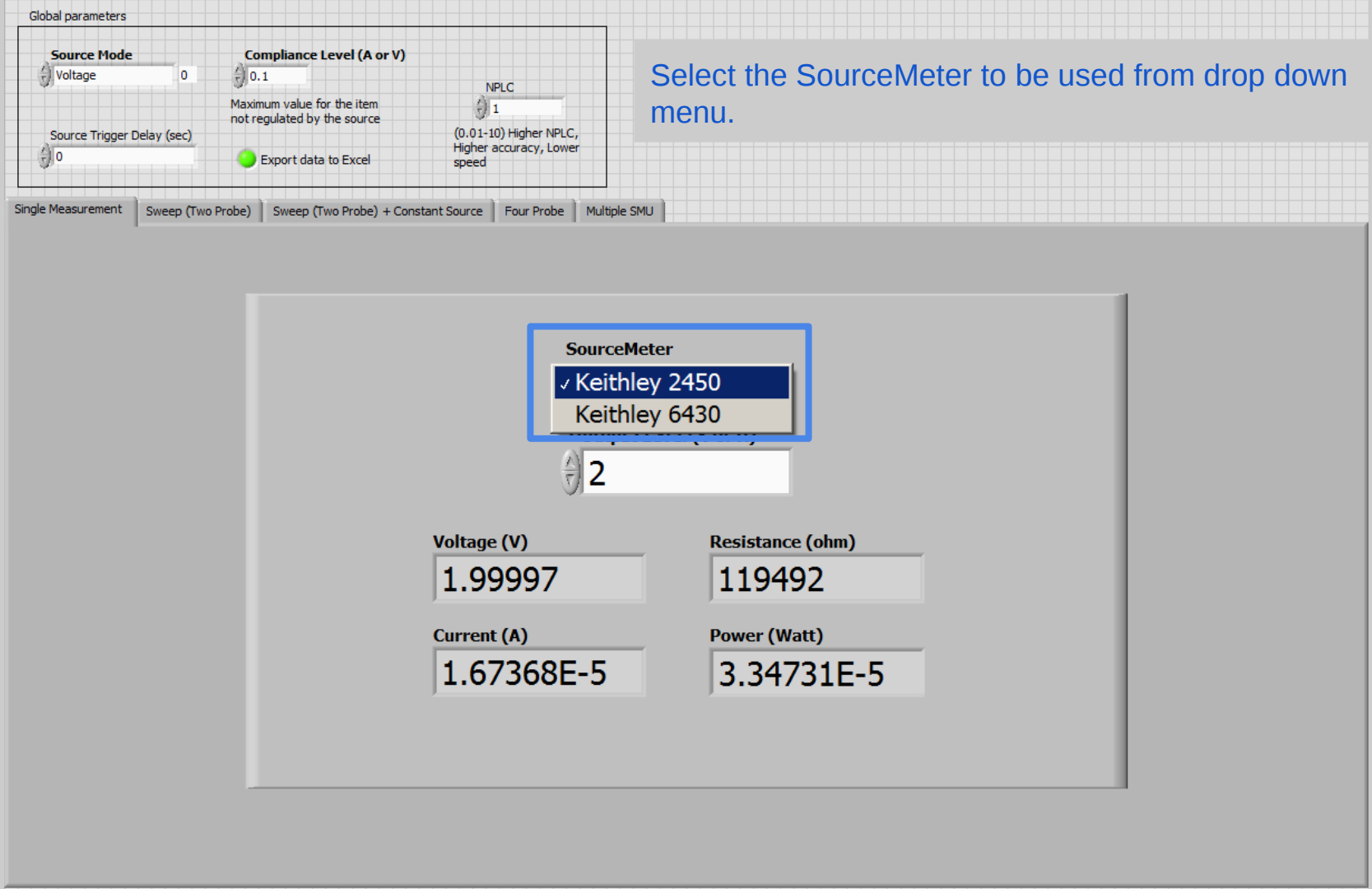


Specify no. of power line cycles the measurement should be integrated for taking readings

Select the SourceMeter to be used from drop down menu.



Global parameters

Source Mode
Voltage 0

Compliance Level (A or V)
0.1
Maximum value for the item not regulated by the source

NPLC
1
(0.01-10) Higher NPLC, Higher accuracy, Lower speed

Source Trigger Delay (sec)
0

Export data to Excel

Specify the output voltage (V) or current value (A) depending on source mode.

Single Measurement | Sweep (Two Probe) | Sweep (Two Probe) + Constant Source | Four Probe | Multiple SMU

SourceMeter
Keithley 2450

Output Level (V or A)
2

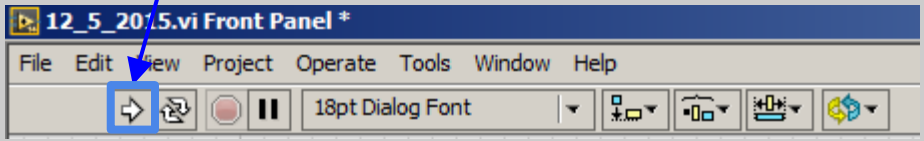
Voltage (V)
1.99997

Resistance (ohm)
119492

Current (A)
1.67368E-5

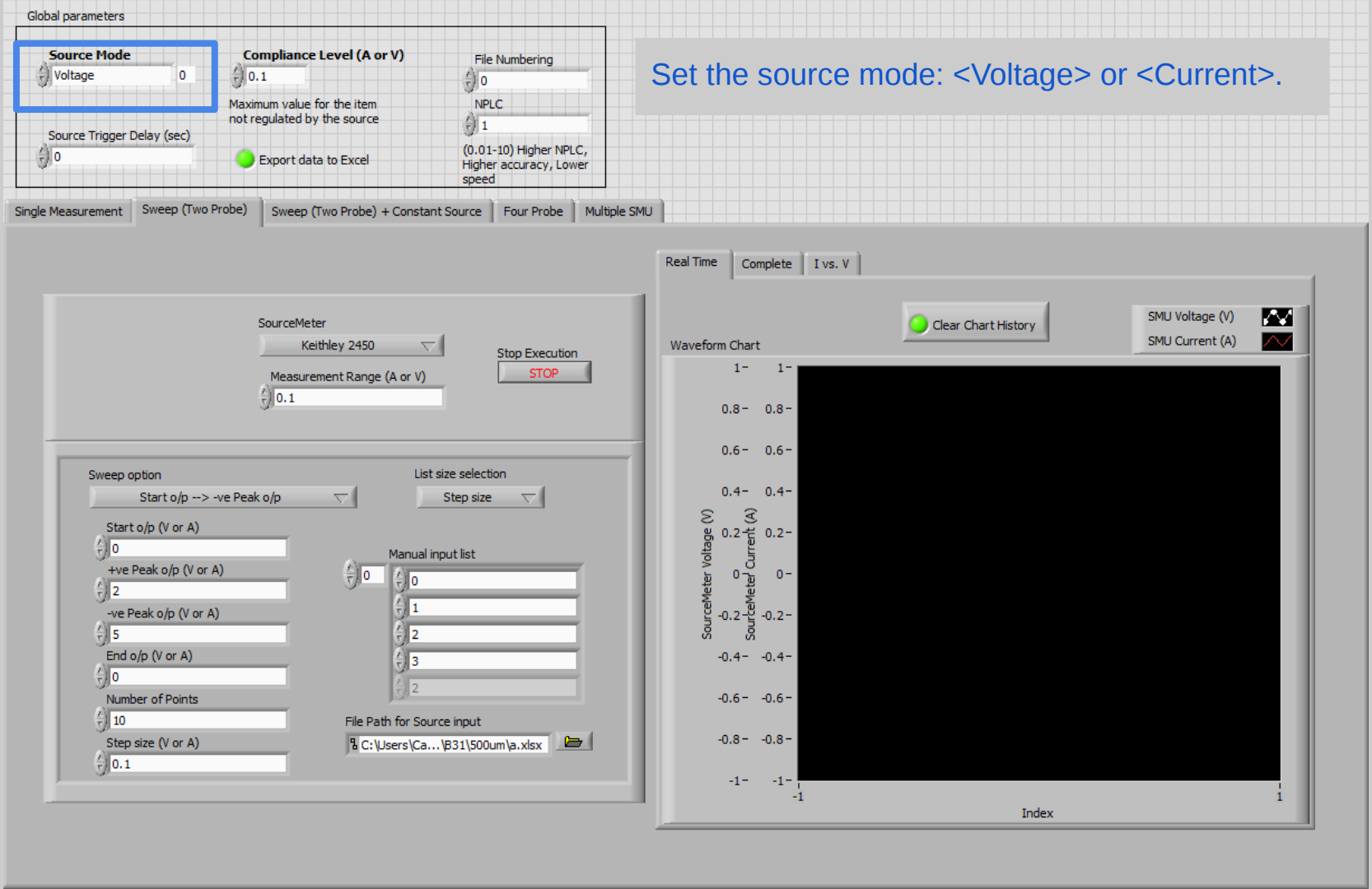
Power (Watt)
3.34731E-5

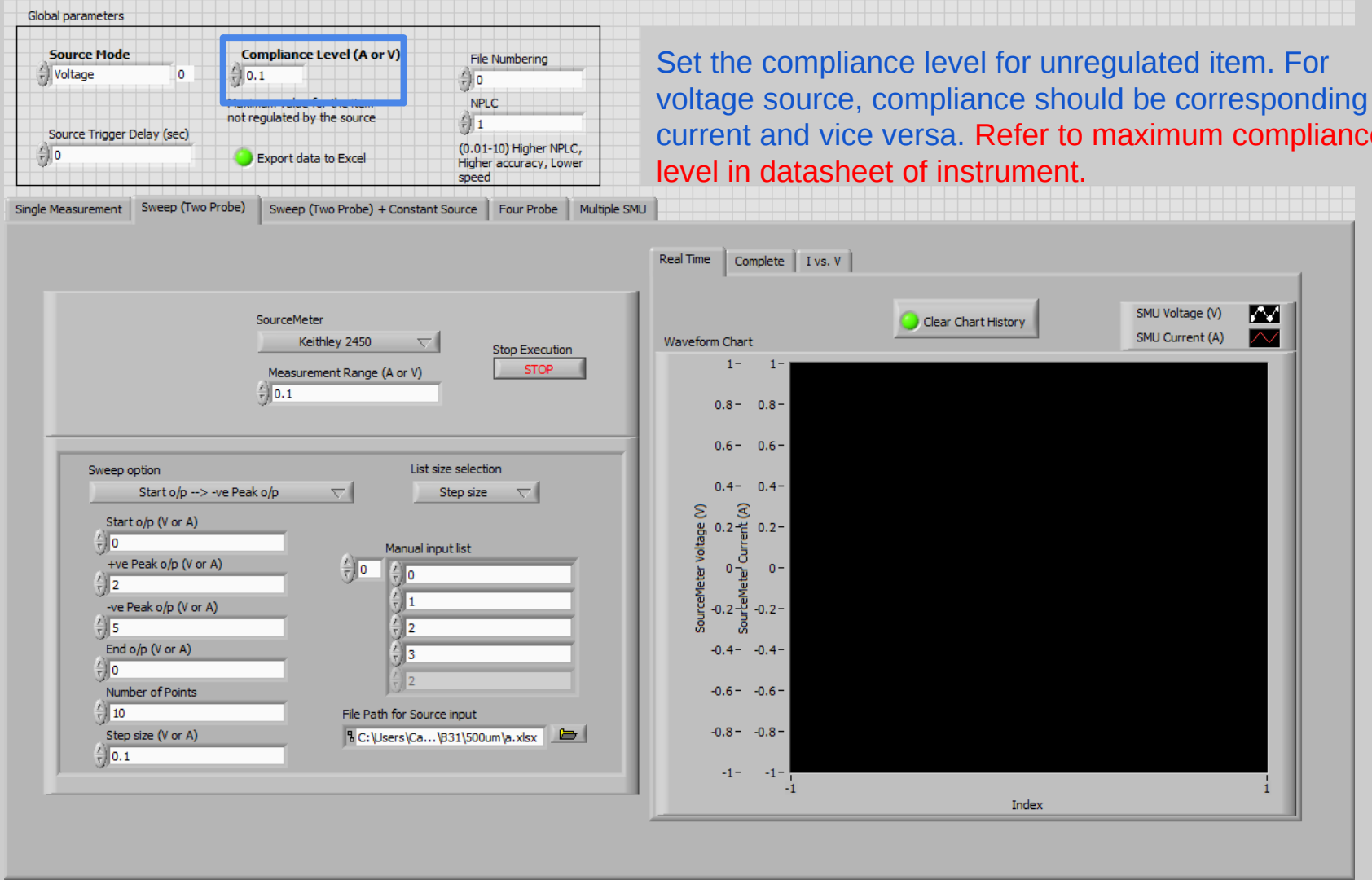
Click on Run Button on the top-left corner of the screen to initiate measurement.



Sweep (Two Probe)

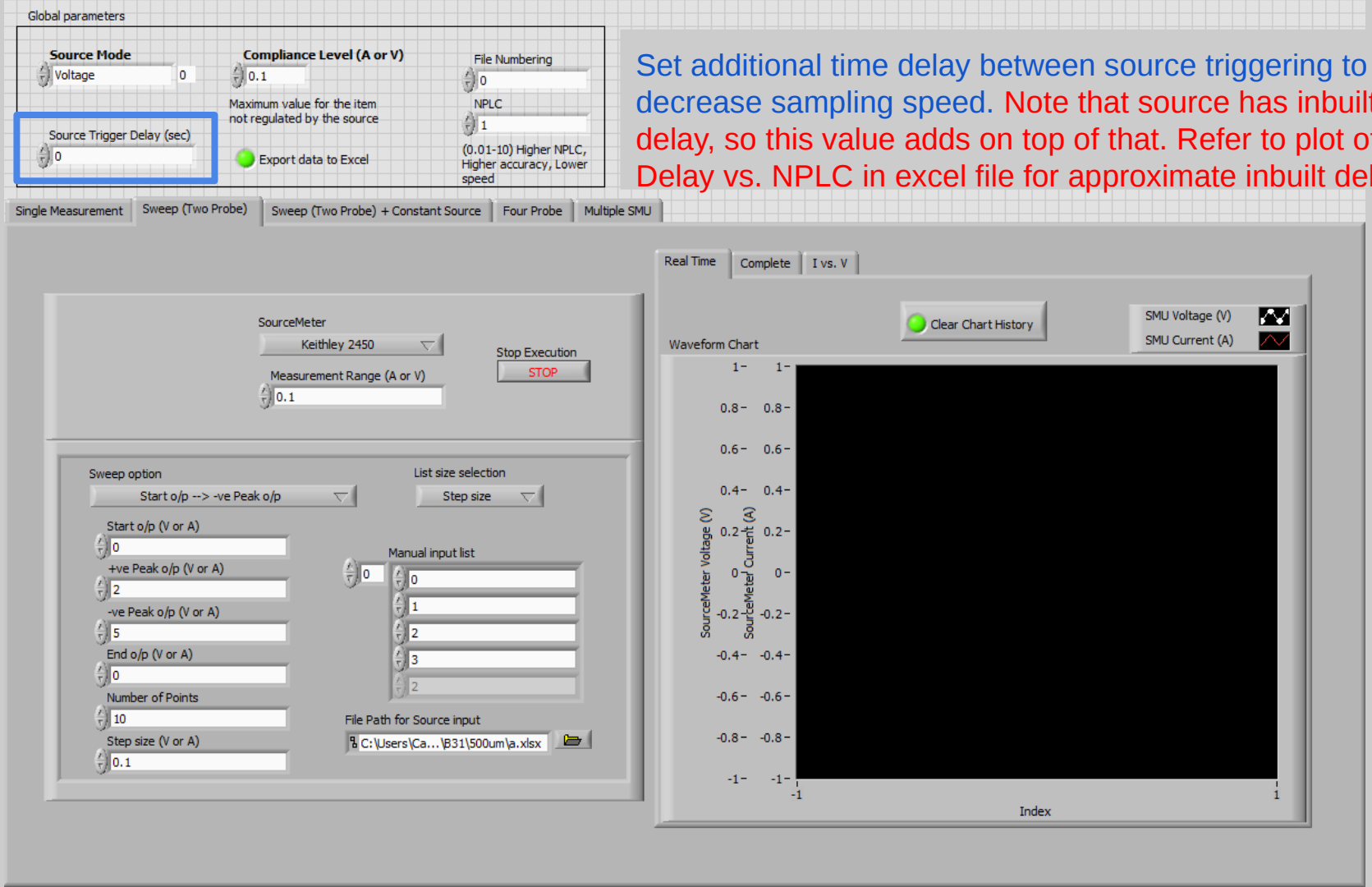
Set the source mode: <Voltage> or <Current>.



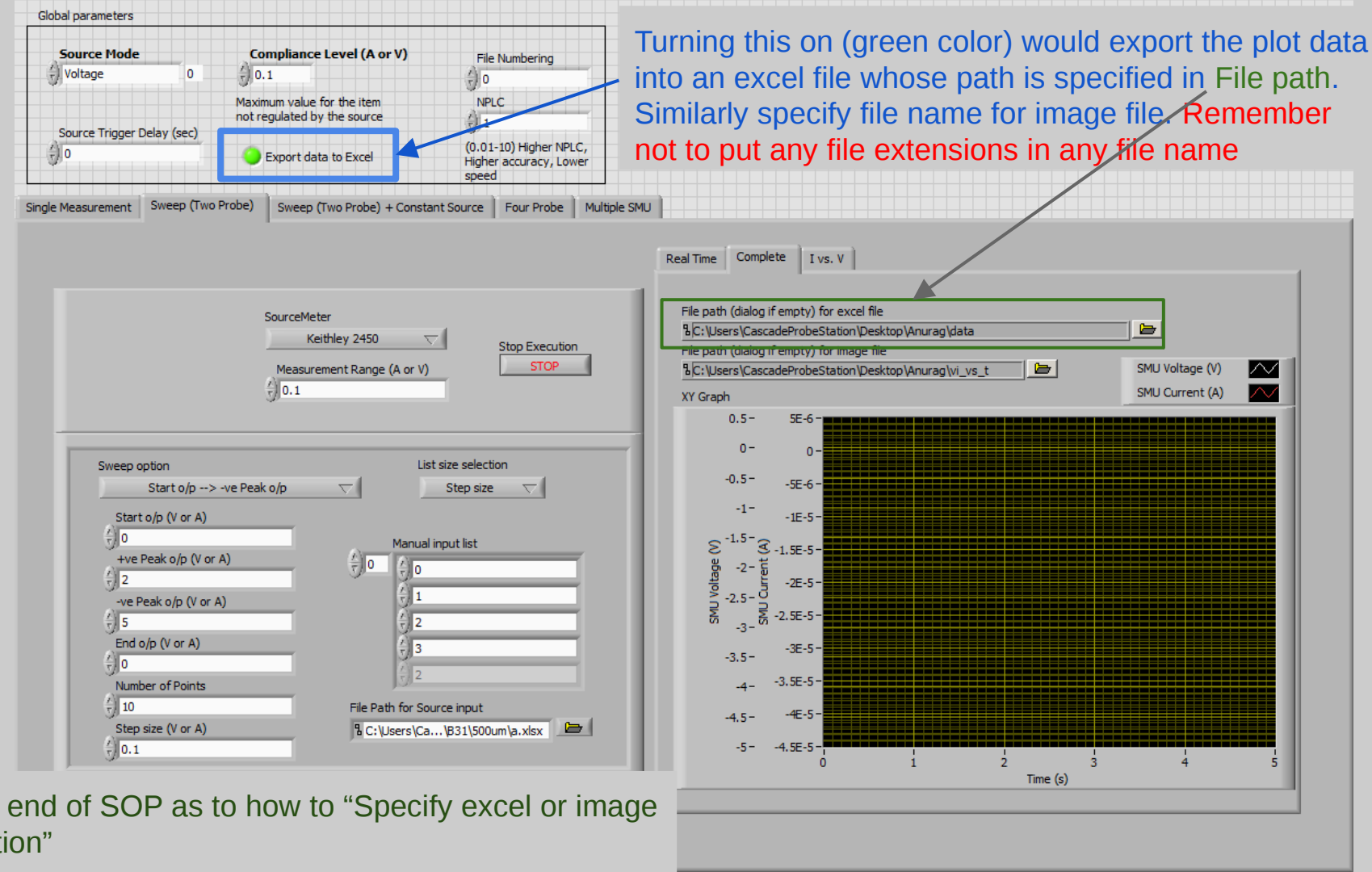


Set the compliance level for unregulated item. For voltage source, compliance should be corresponding to current and vice versa. Refer to maximum compliance level in datasheet of instrument.

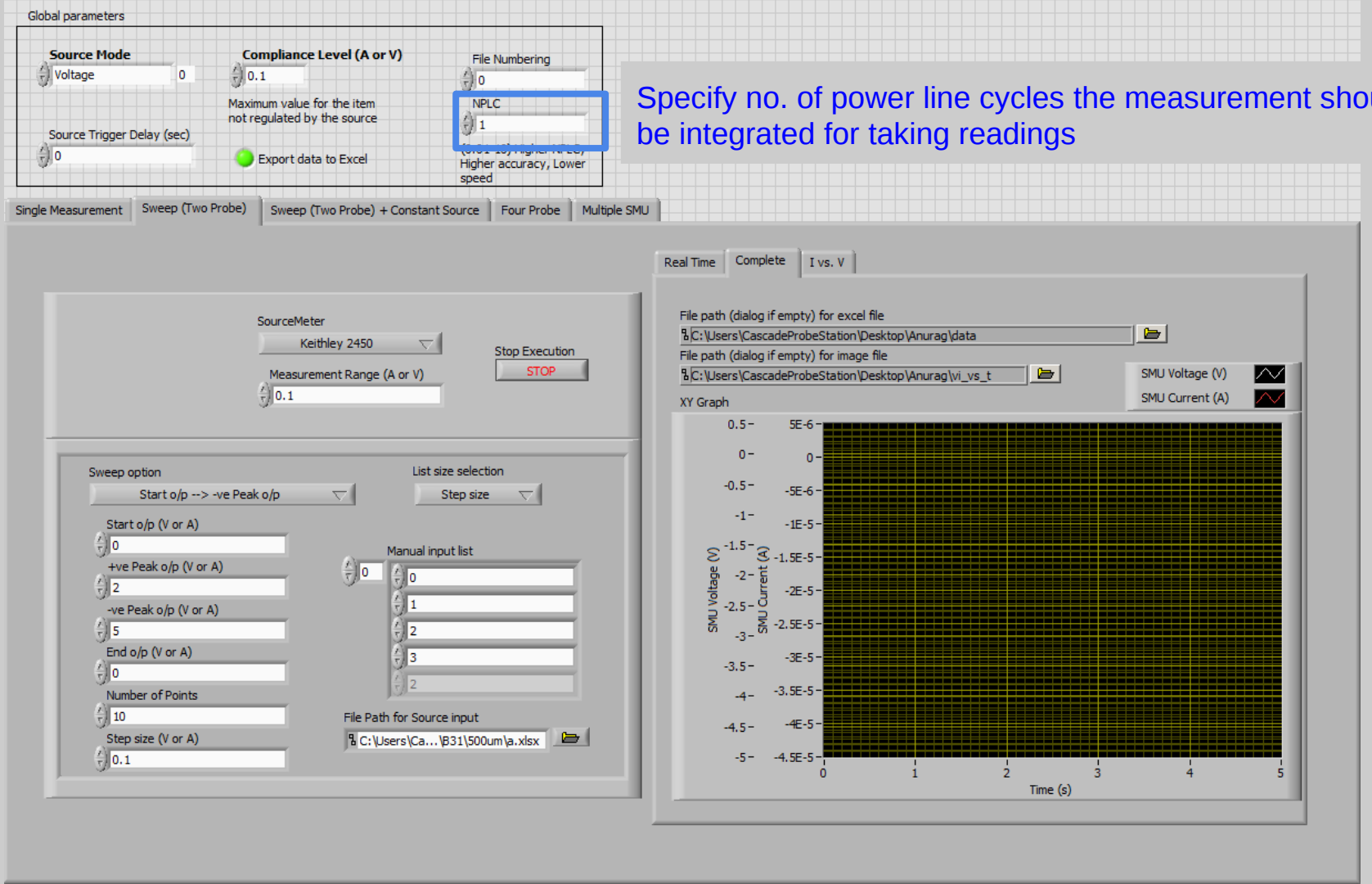
Set additional time delay between source triggering to decrease sampling speed. Note that source has inbuilt delay, so this value adds on top of that. Refer to plot of Delay vs. NPLC in excel file for approximate inbuilt delay.



Turning this on (green color) would export the plot data into an excel file whose path is specified in File path. Similarly specify file name for image file. Remember not to put any file extensions in any file name

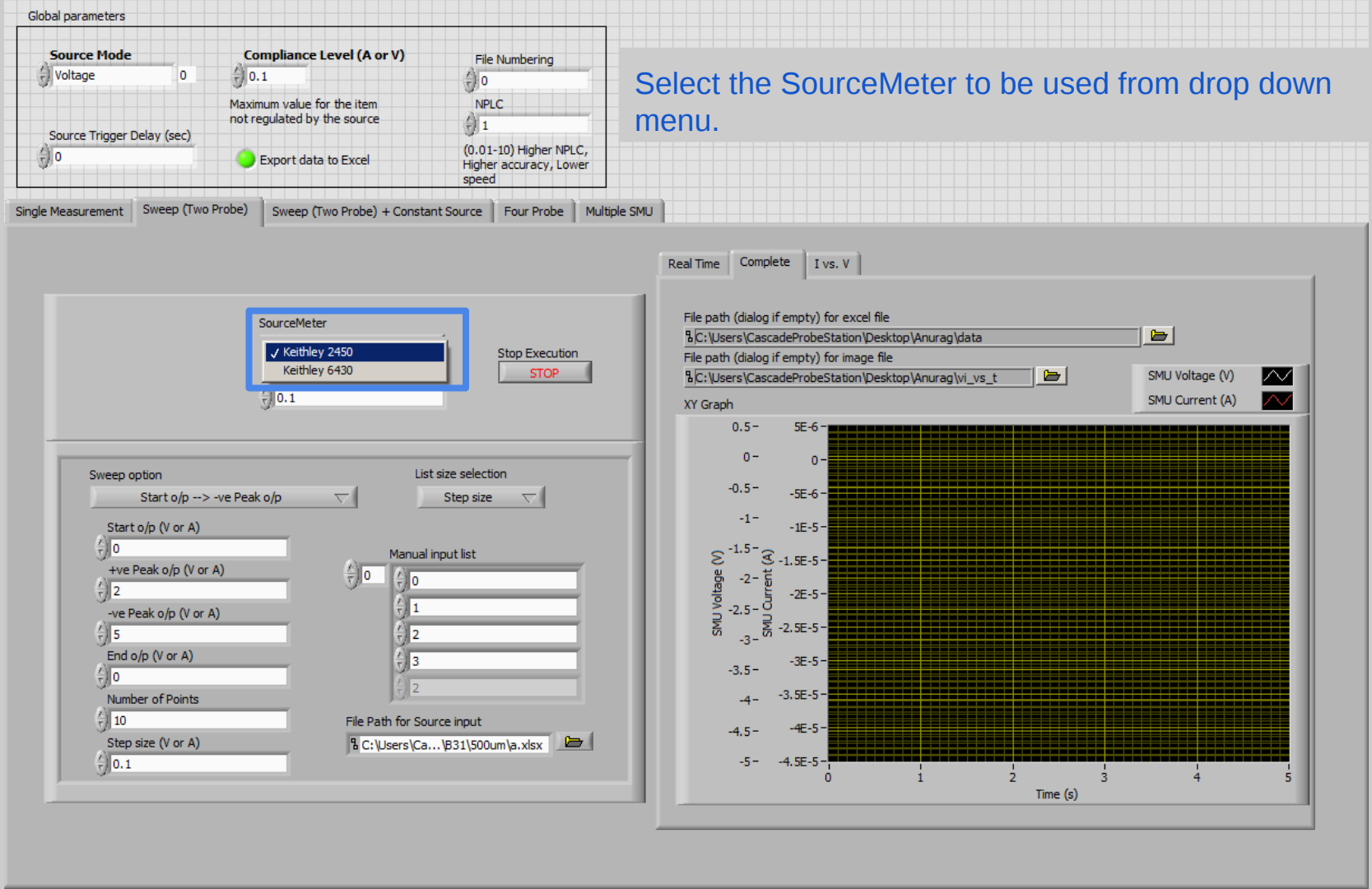


Refer to end of SOP as to how to “Specify excel or image file location”

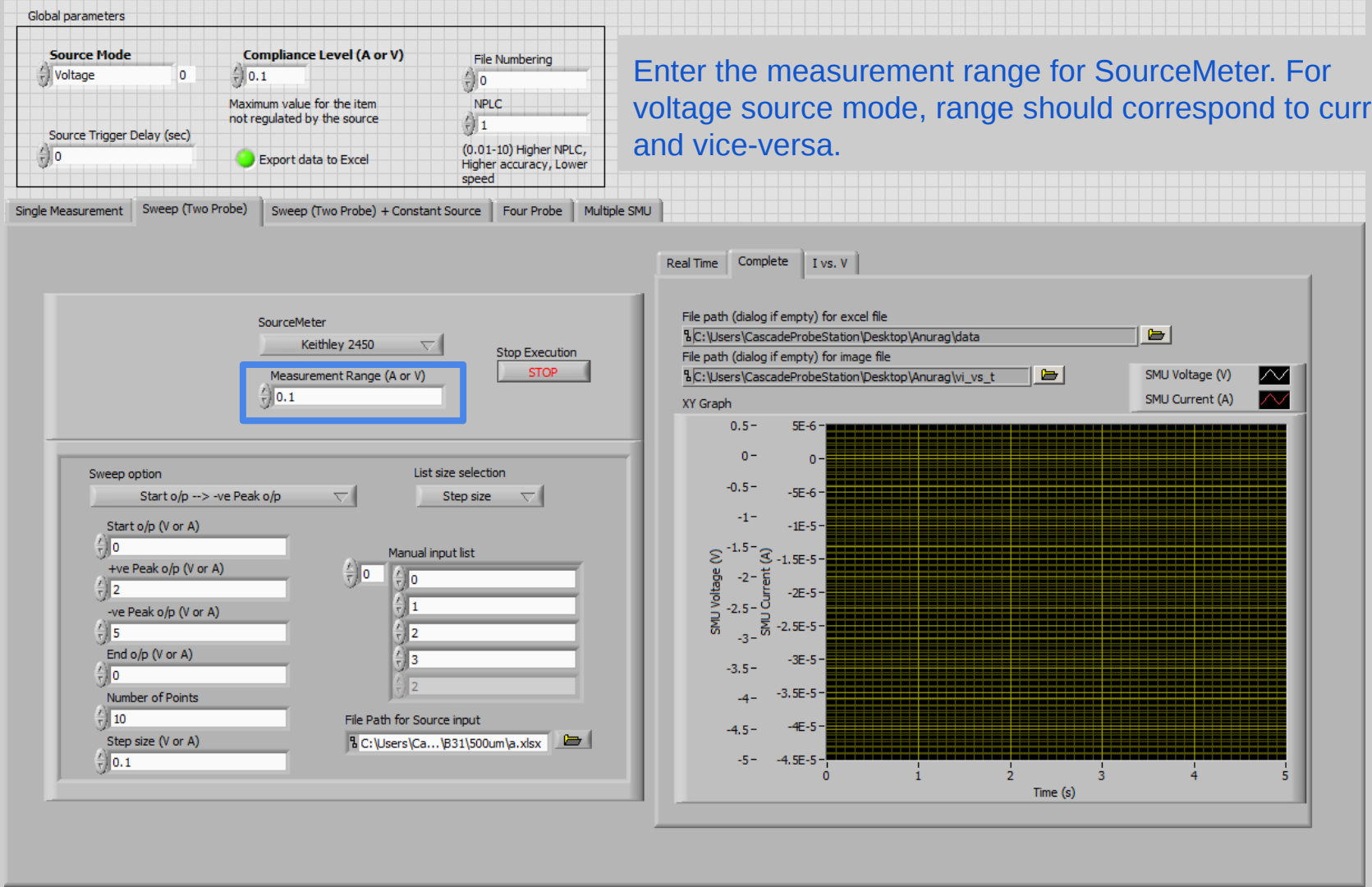


Specify no. of power line cycles the measurement should be integrated for taking readings

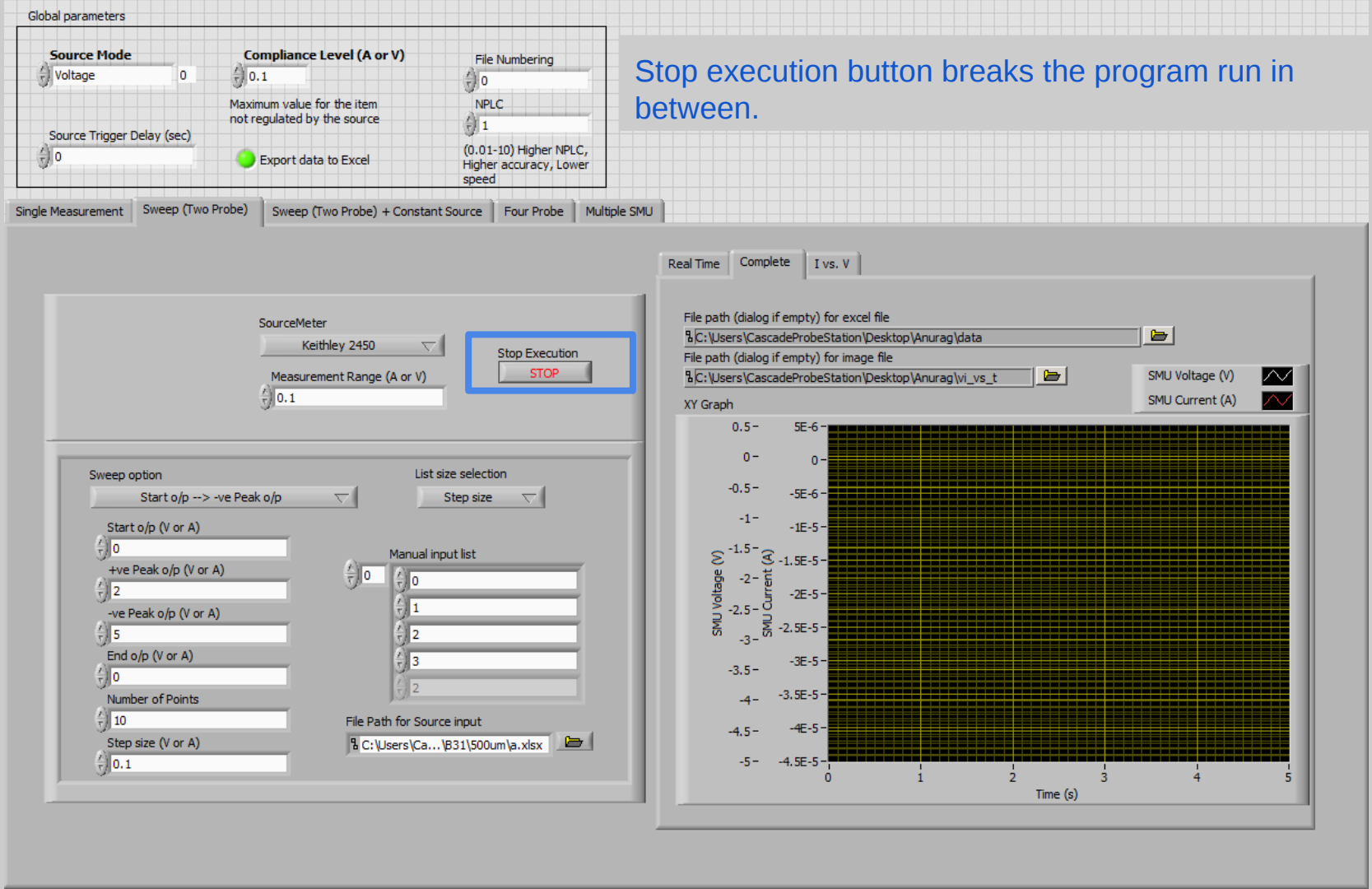
Select the SourceMeter to be used from drop down menu.



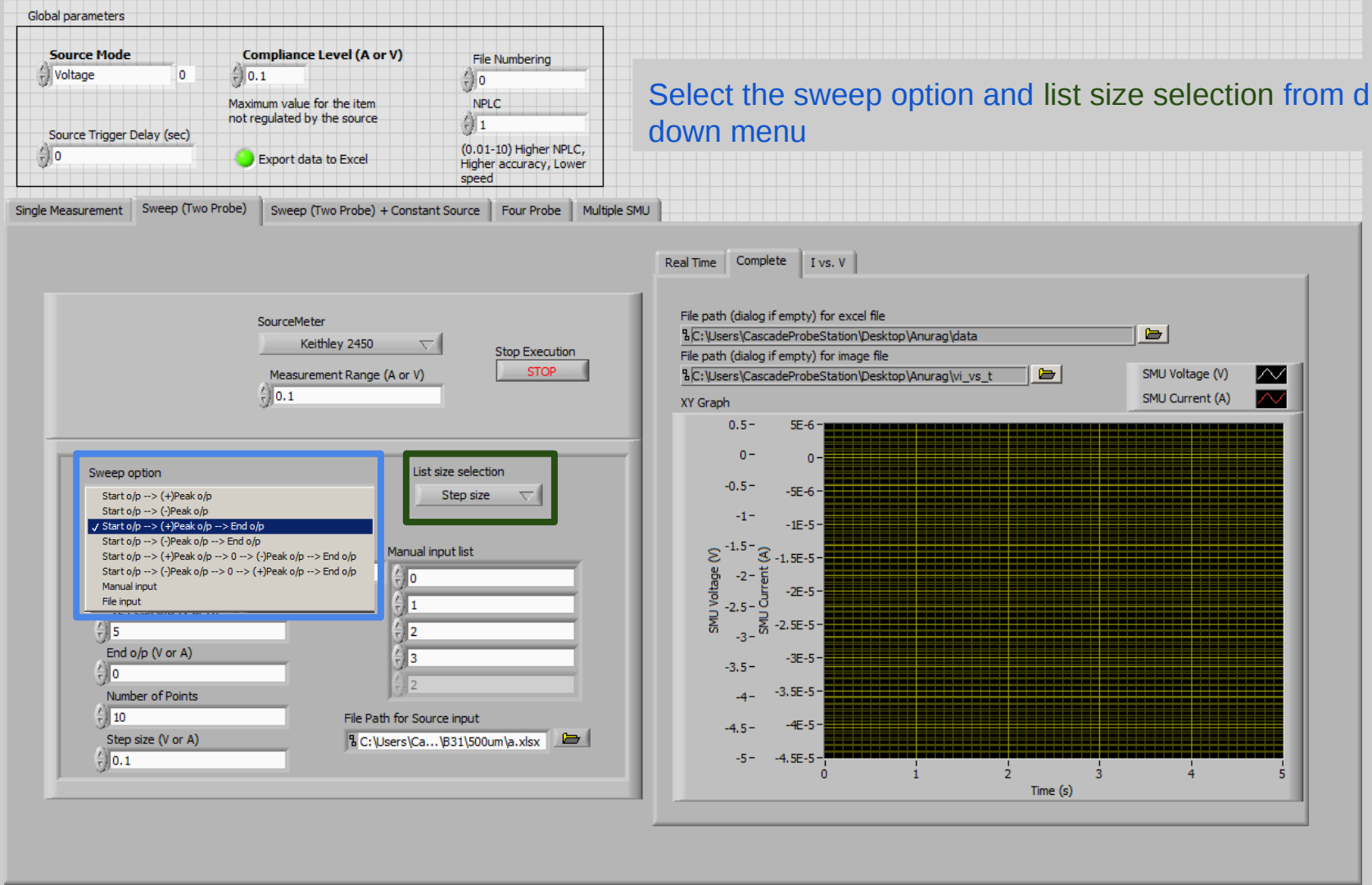
Enter the measurement range for SourceMeter. For voltage source mode, range should correspond to current and vice-versa.



Stop execution button breaks the program run in between.

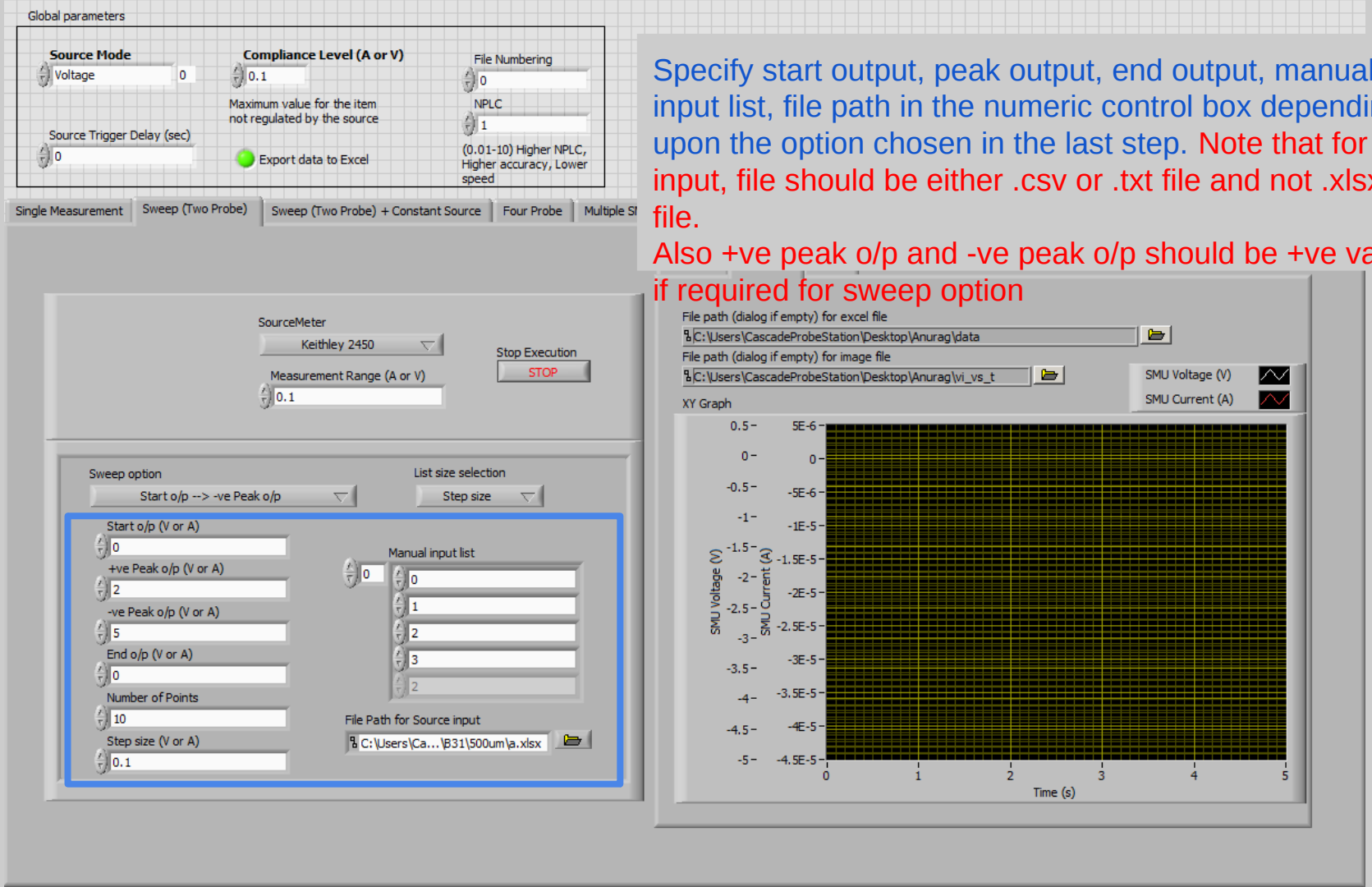


Select the sweep option and list size selection from drop down menu

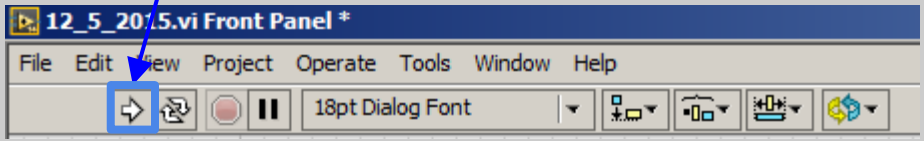


Specify start output, peak output, end output, manual input list, file path in the numeric control box depending upon the option chosen in the last step. Note that for File input, file should be either .csv or .txt file and not .xlsx file.

Also +ve peak o/p and -ve peak o/p should be +ve value if required for sweep option

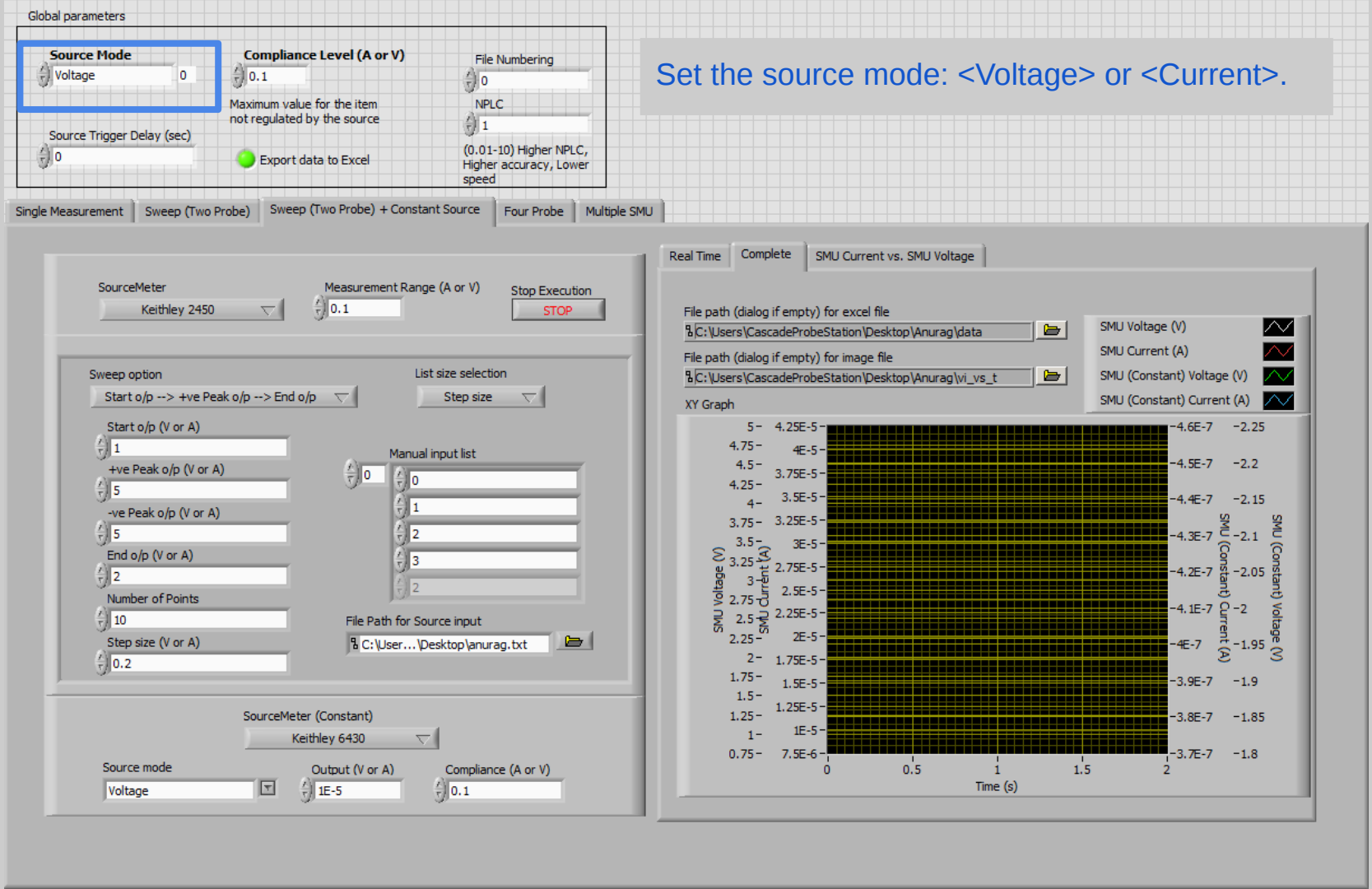


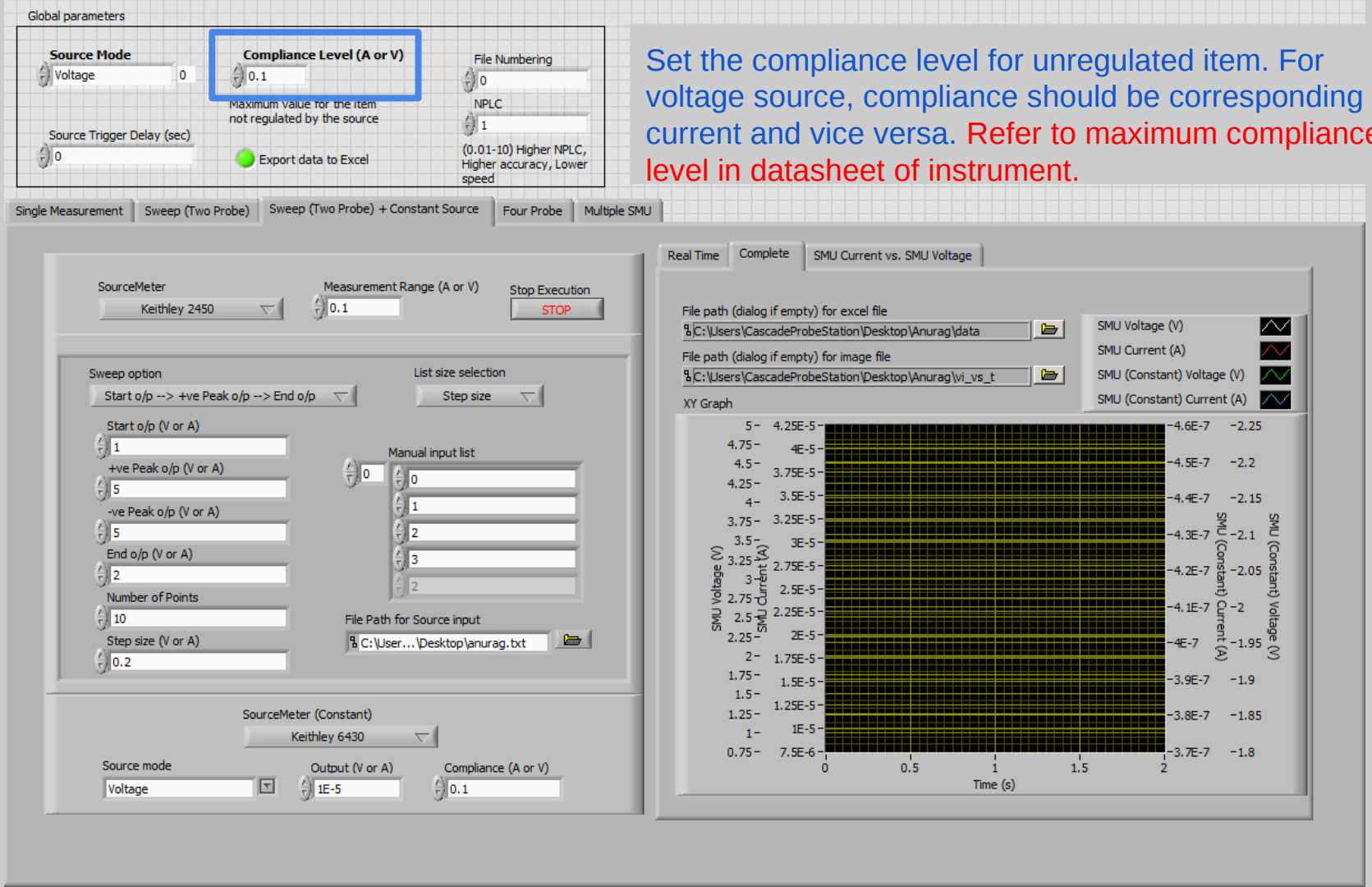
Click on Run Button on the top-left corner of the screen to initiate measurement.



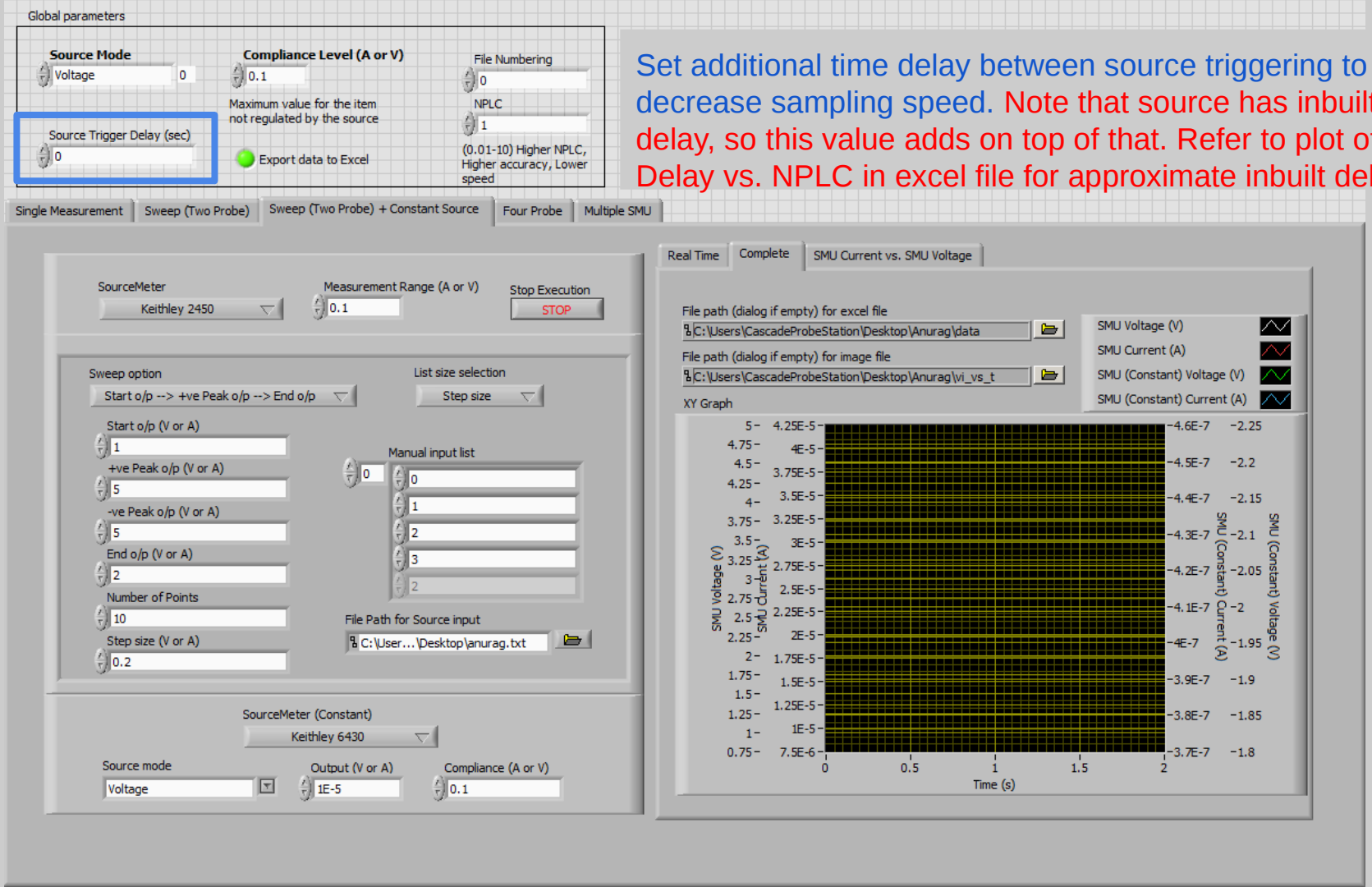
Sweep (Two Probe + Constant Source)

Set the source mode: <Voltage> or <Current>.



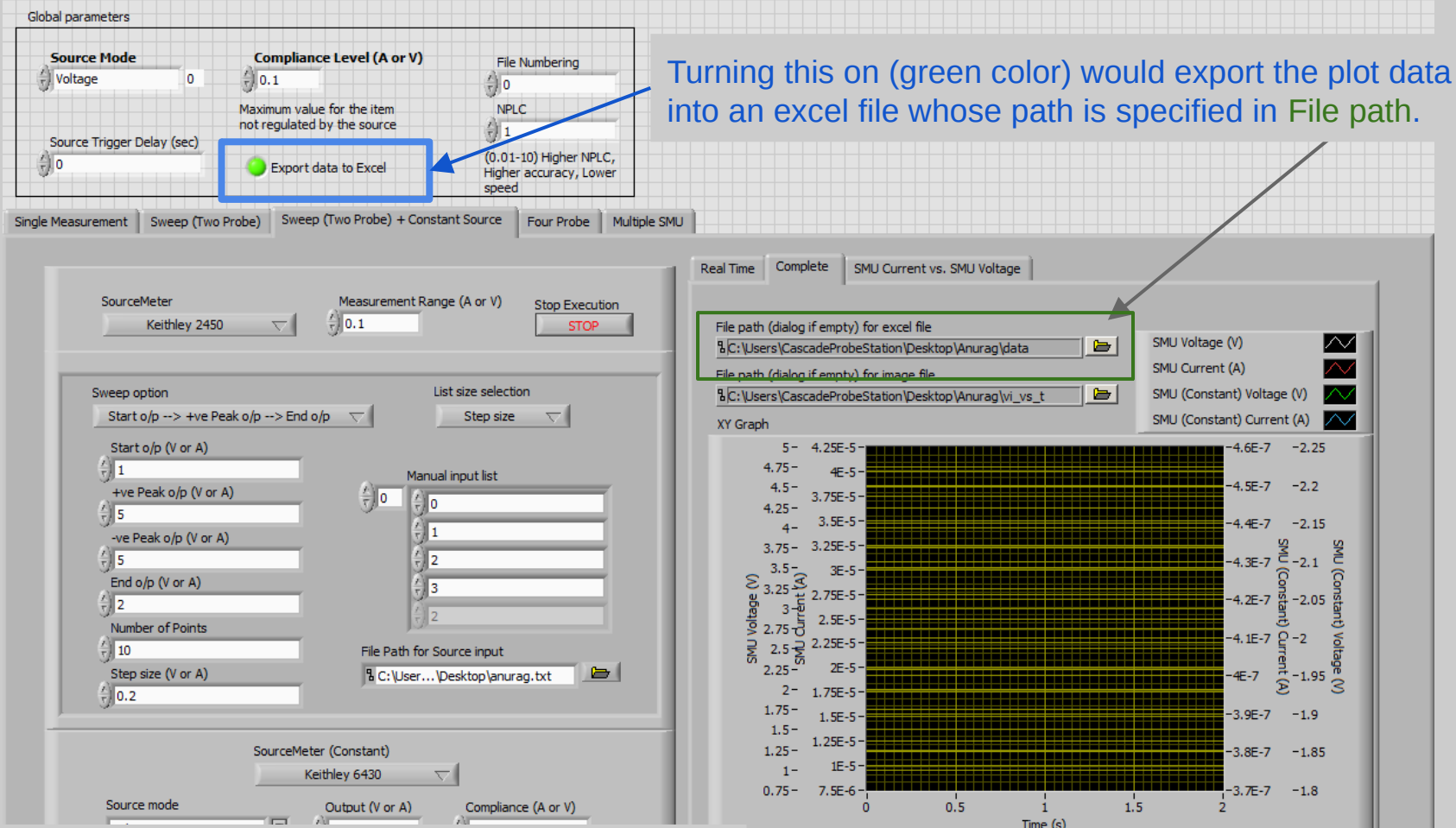


Set the compliance level for unregulated item. For voltage source, compliance should be corresponding to current and vice versa. Refer to maximum compliance level in datasheet of instrument.

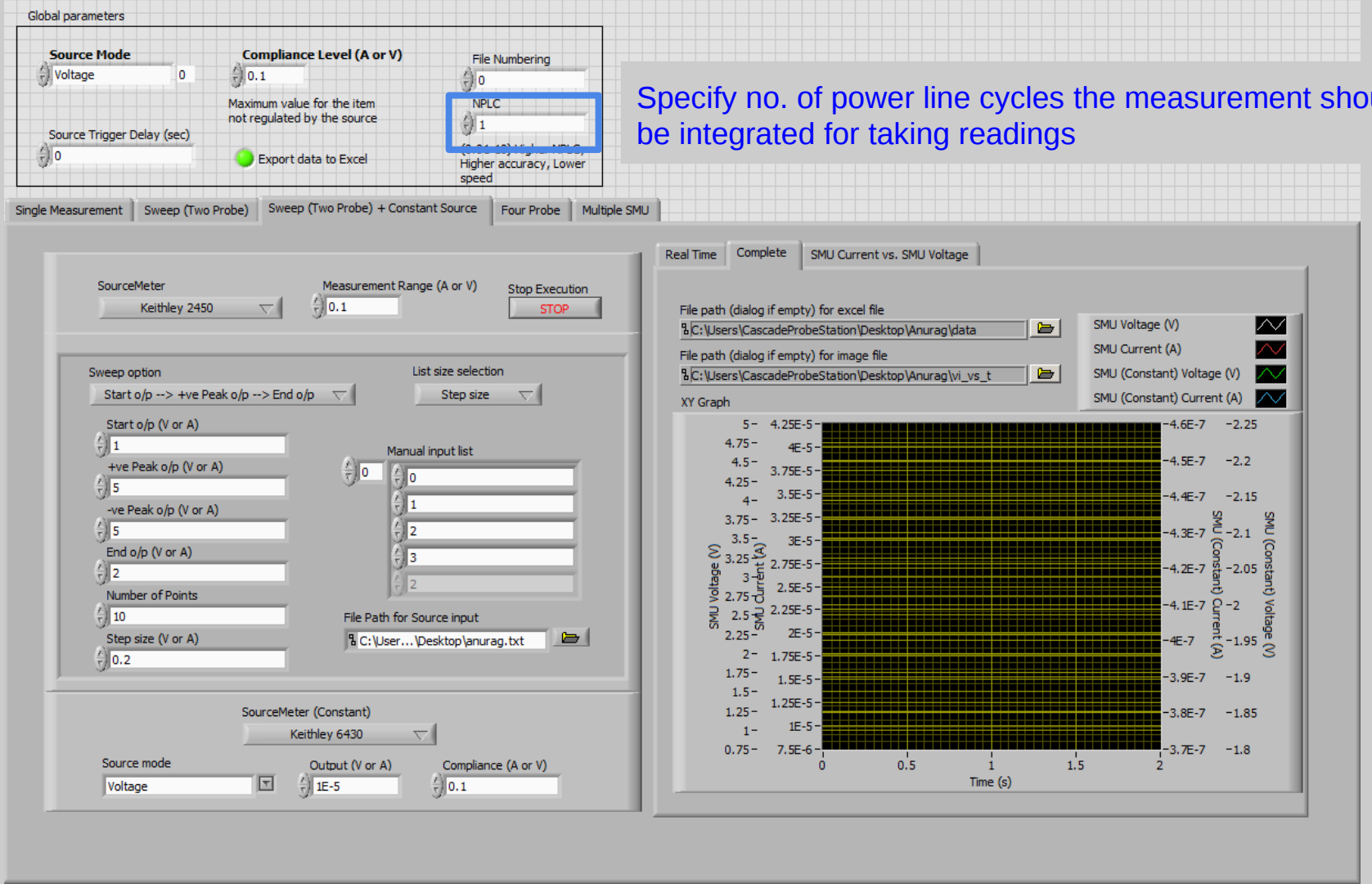


Set additional time delay between source triggering to decrease sampling speed. Note that source has inbuilt delay, so this value adds on top of that. Refer to plot of Delay vs. NPLC in excel file for approximate inbuilt delay.

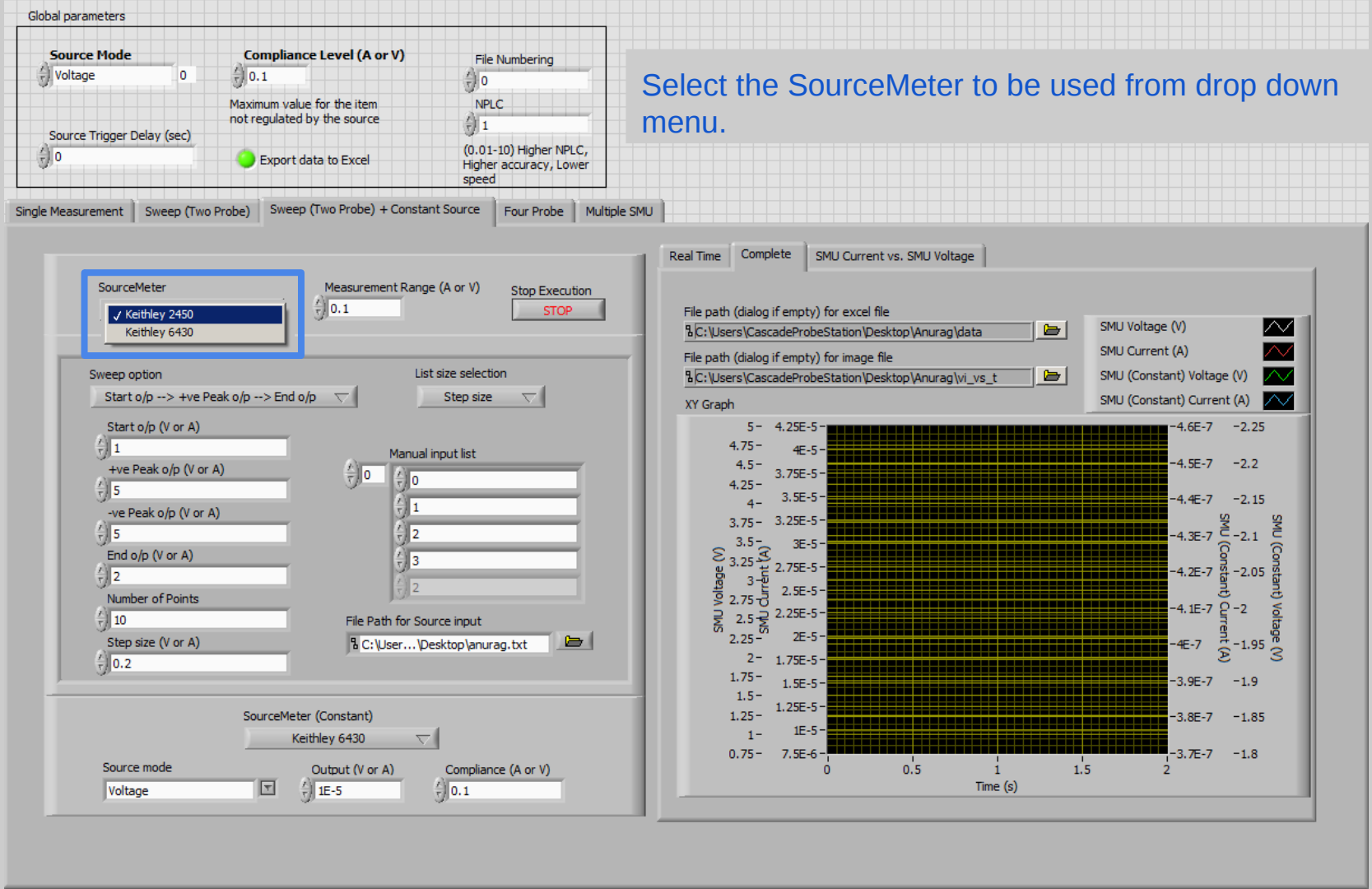
Turning this on (green color) would export the plot data into an excel file whose path is specified in File path.



Refer to end of SOP as to how to “Specify excel or image file location”

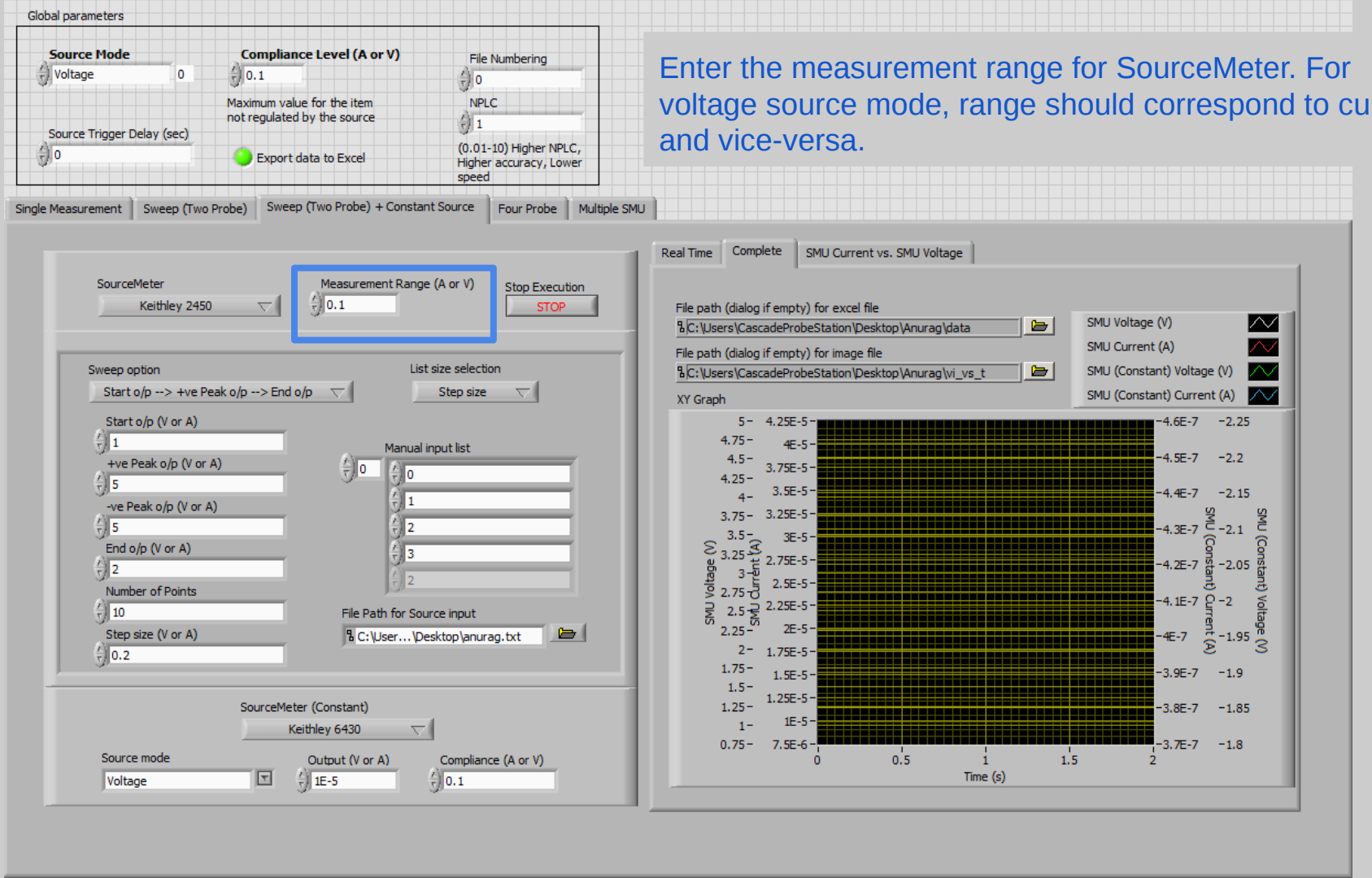


Specify no. of power line cycles the measurement should be integrated for taking readings

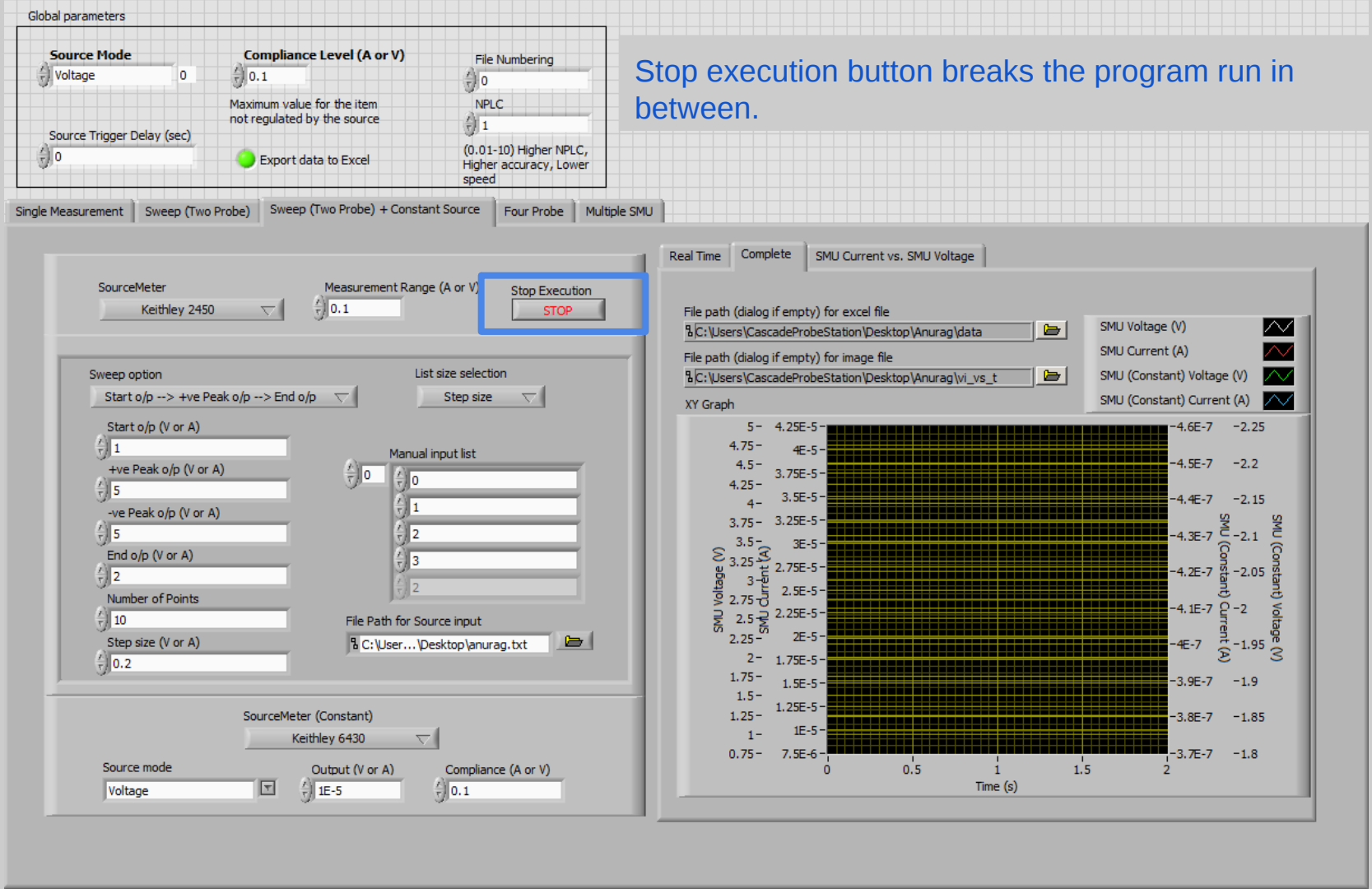


Select the SourceMeter to be used from drop down menu.

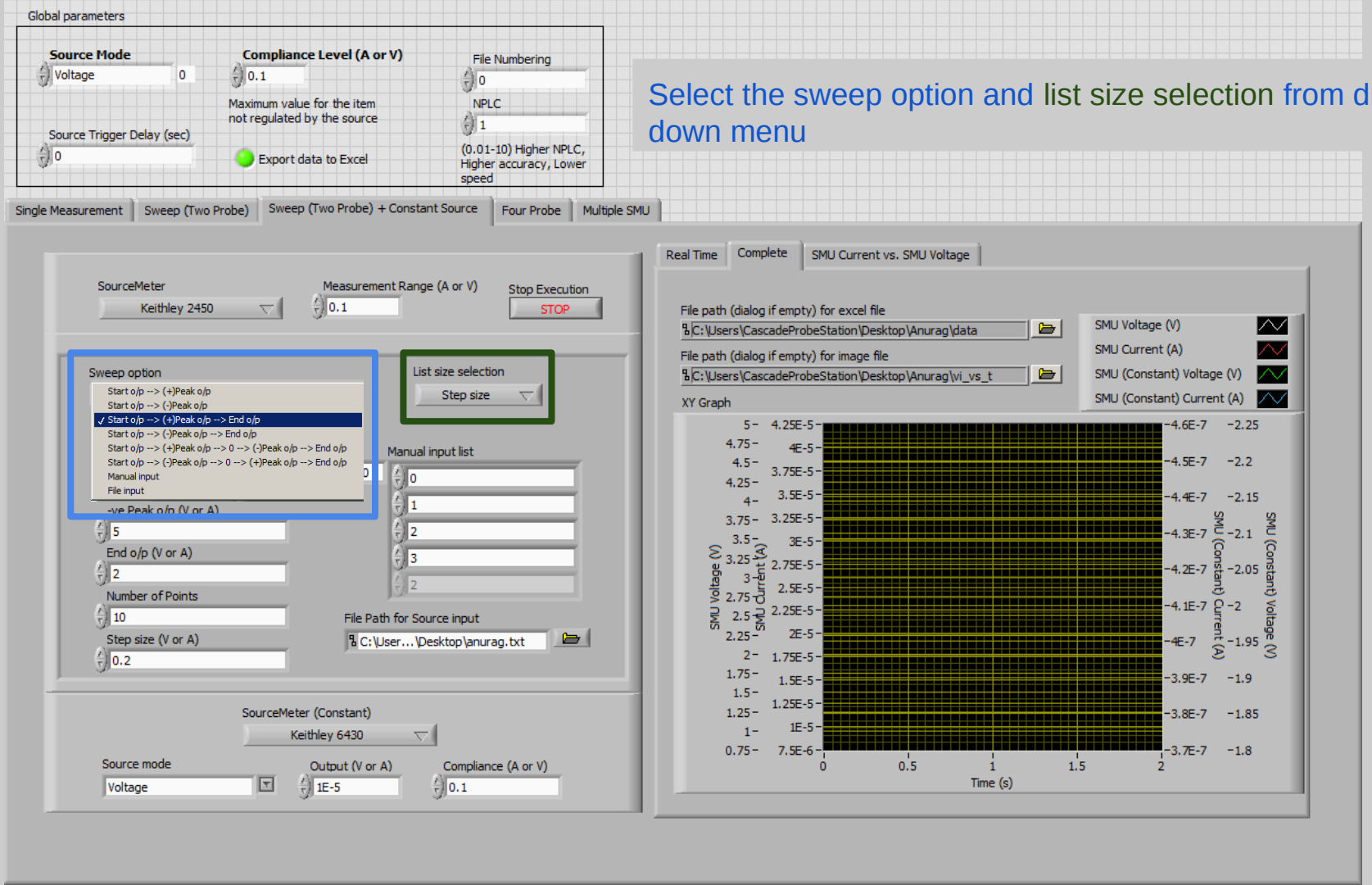
Enter the measurement range for SourceMeter. For voltage source mode, range should correspond to current and vice-versa.



Stop execution button breaks the program run in between.

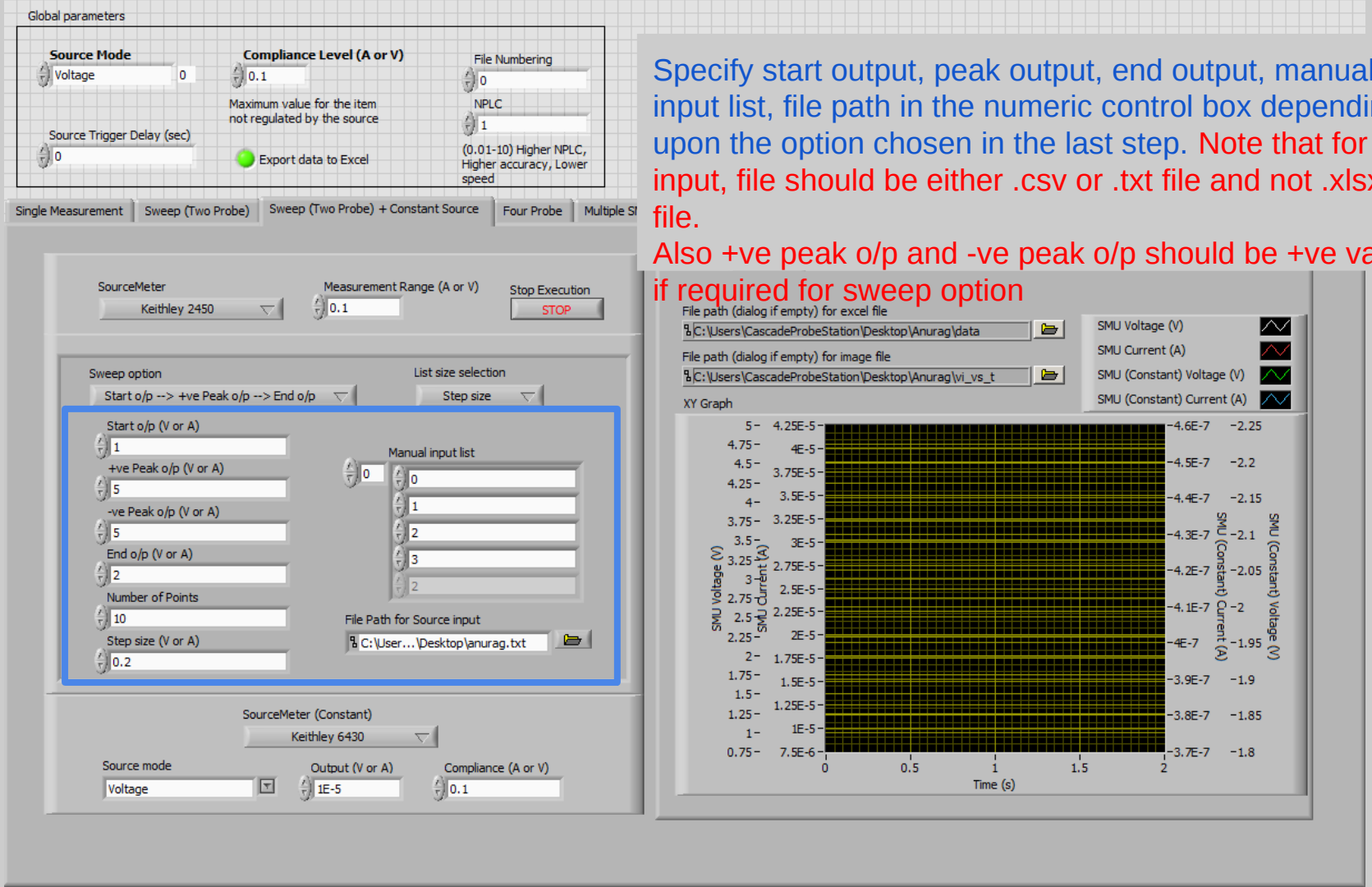


Select the sweep option and list size selection from drop down menu

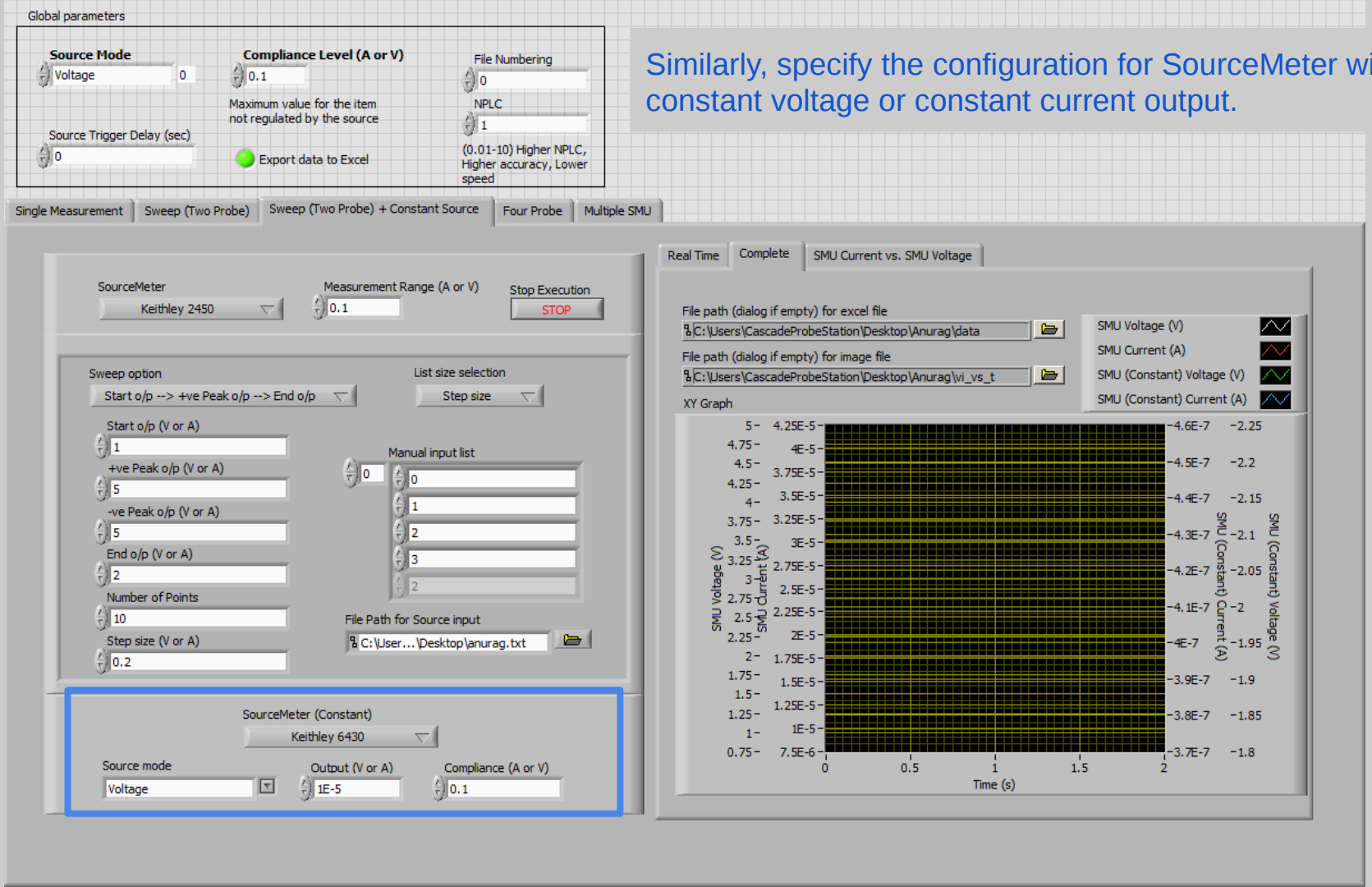


Specify start output, peak output, end output, manual input list, file path in the numeric control box depending upon the option chosen in the last step. Note that for File input, file should be either .csv or .txt file and not .xlsx file.

Also +ve peak o/p and -ve peak o/p should be +ve value if required for sweep option

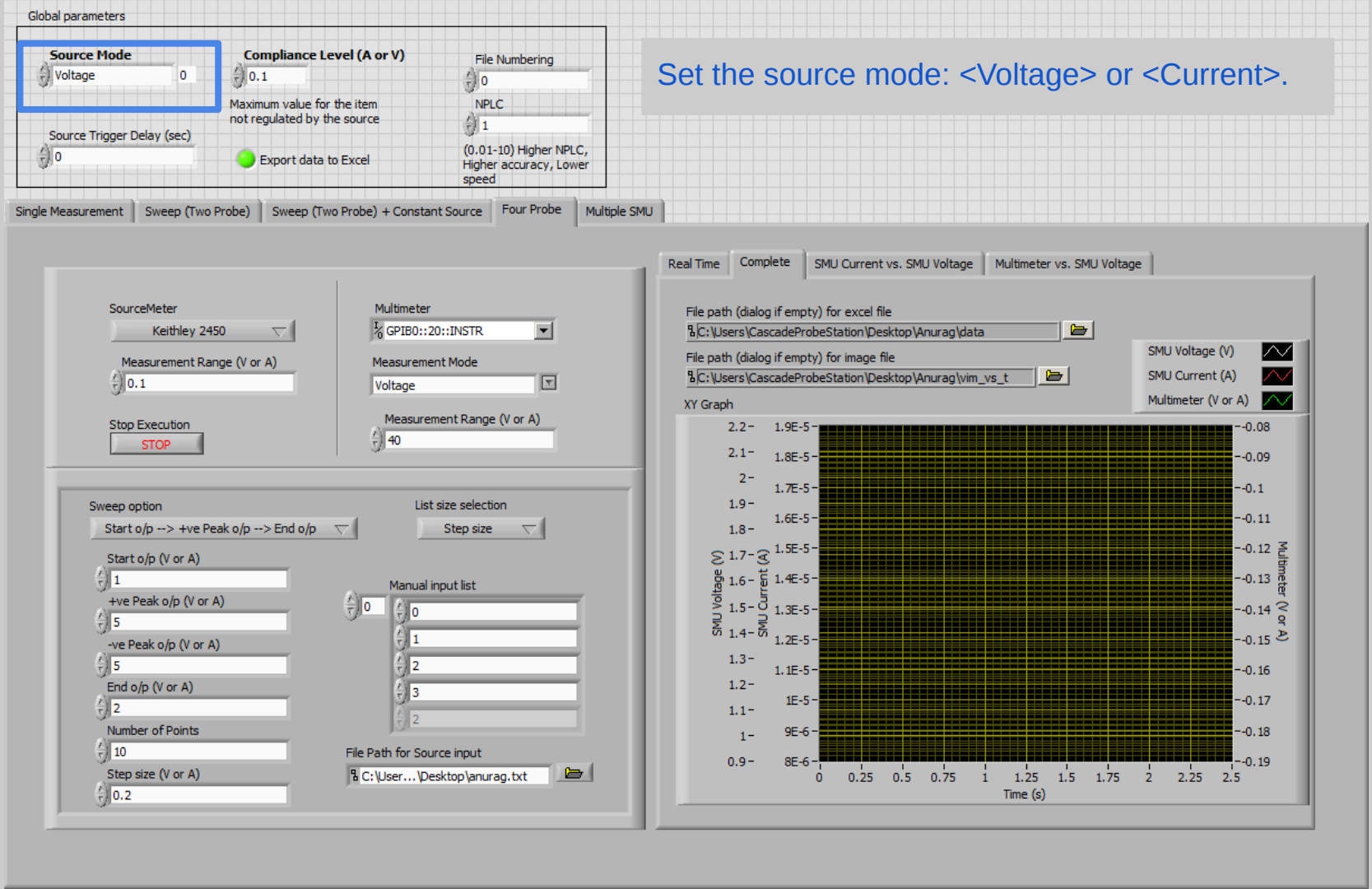


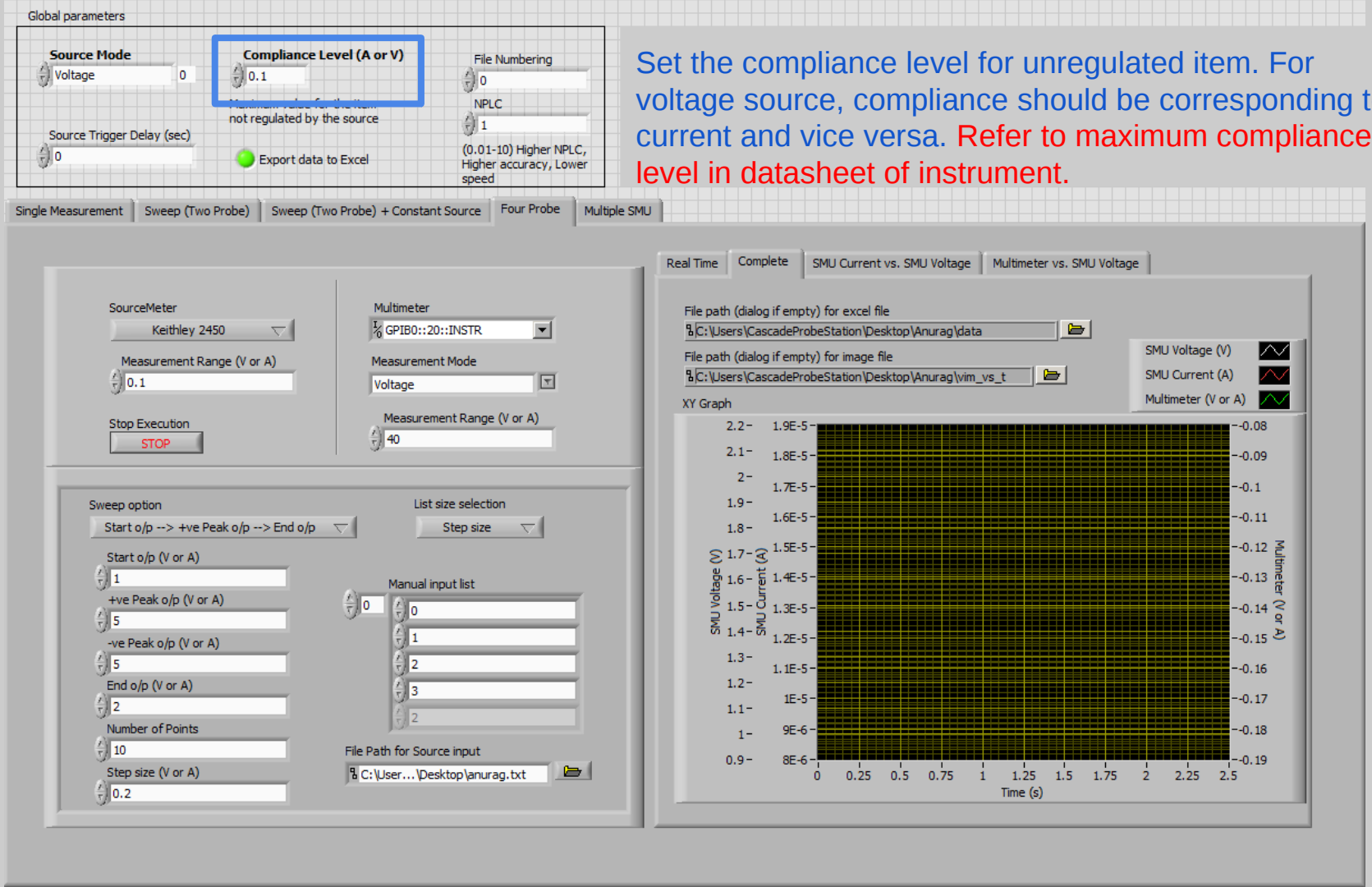
Similarly, specify the configuration for SourceMeter with constant voltage or constant current output.



Four Probe

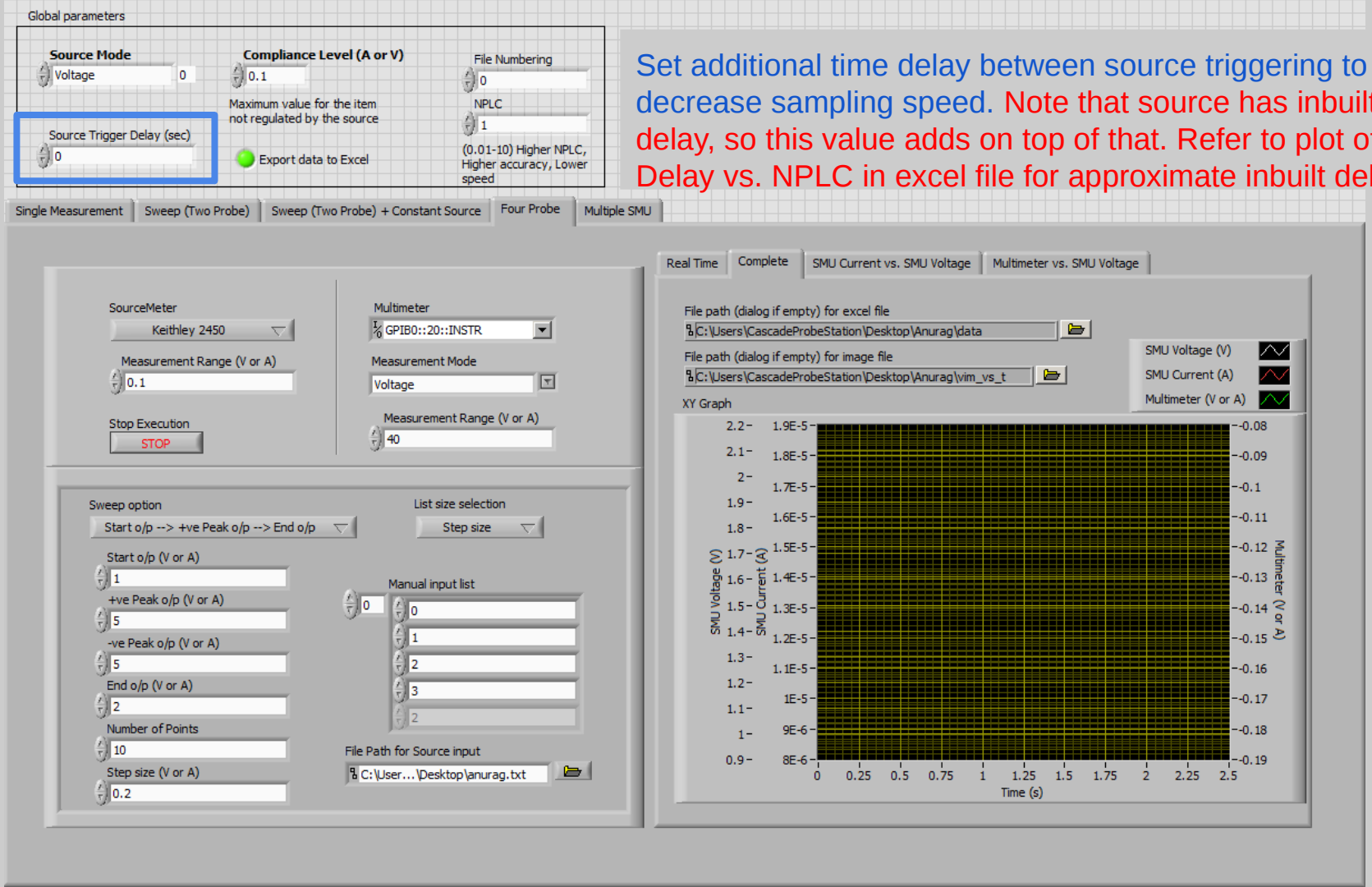
Set the source mode: <Voltage> or <Current>.



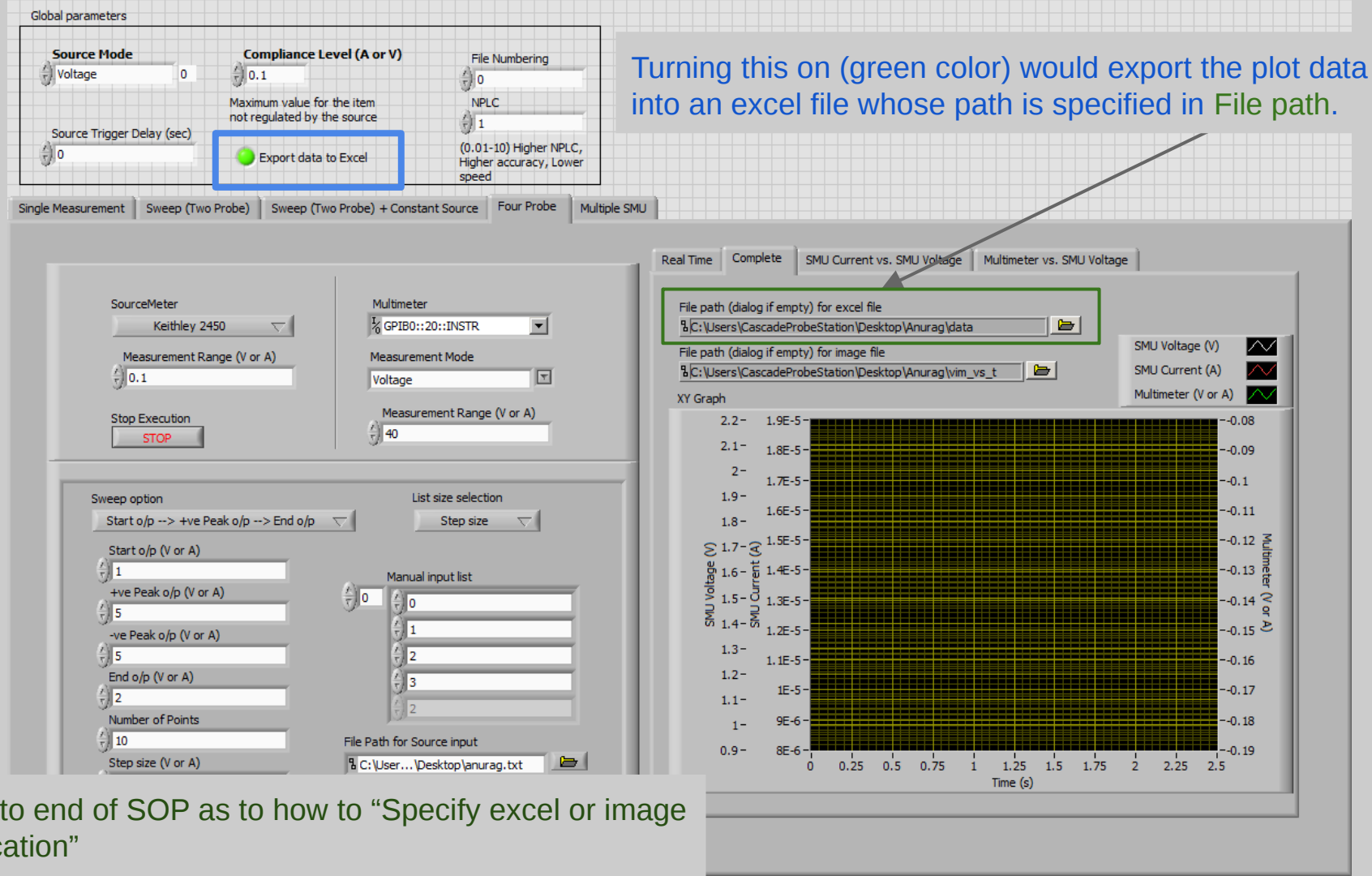


Set the compliance level for unregulated item. For voltage source, compliance should be corresponding to current and vice versa. Refer to maximum compliance level in datasheet of instrument.

Set additional time delay between source triggering to decrease sampling speed. Note that source has inbuilt delay, so this value adds on top of that. Refer to plot of Delay vs. NPLC in excel file for approximate inbuilt delay.

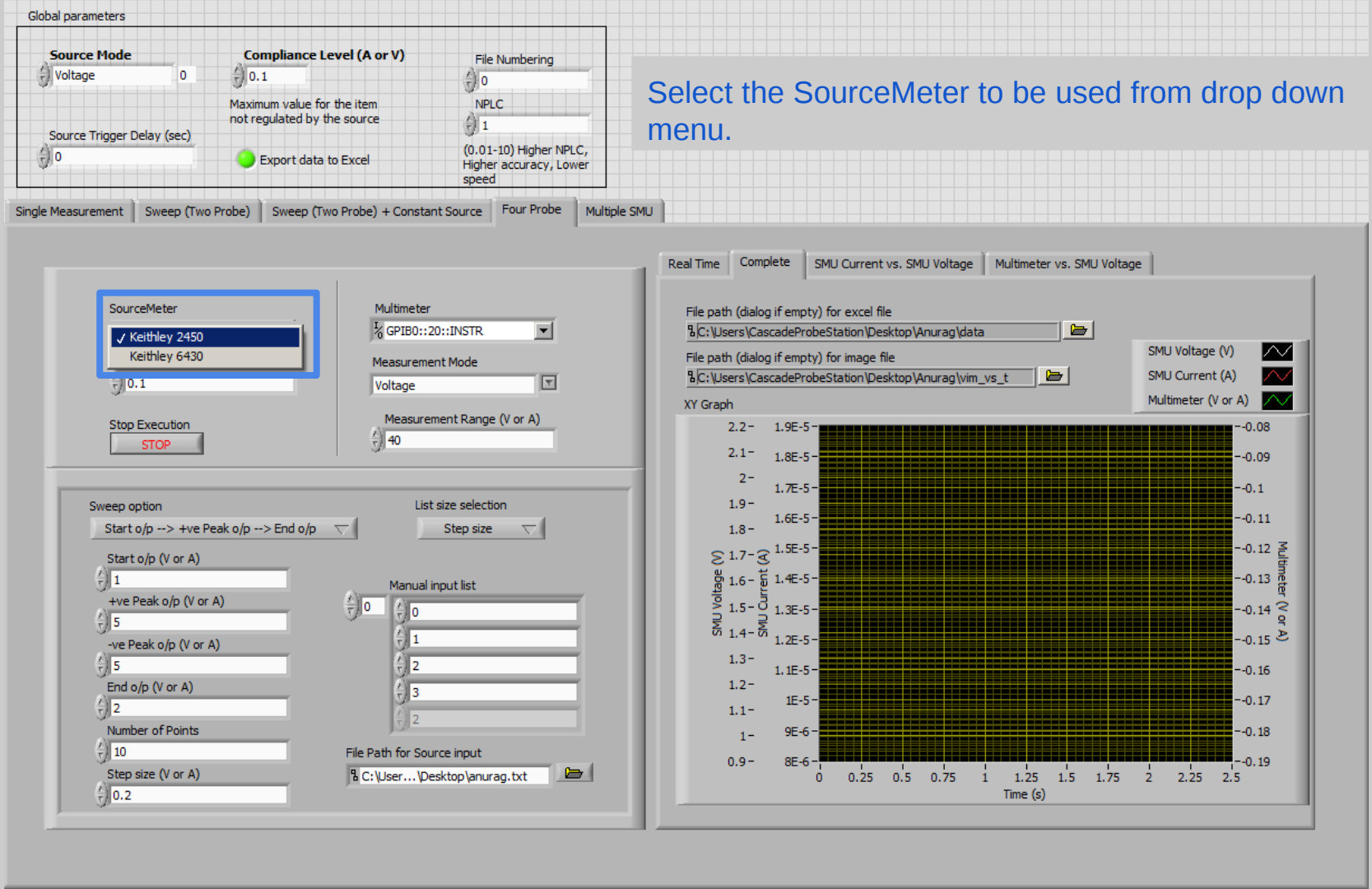


Turning this on (green color) would export the plot data into an excel file whose path is specified in File path.

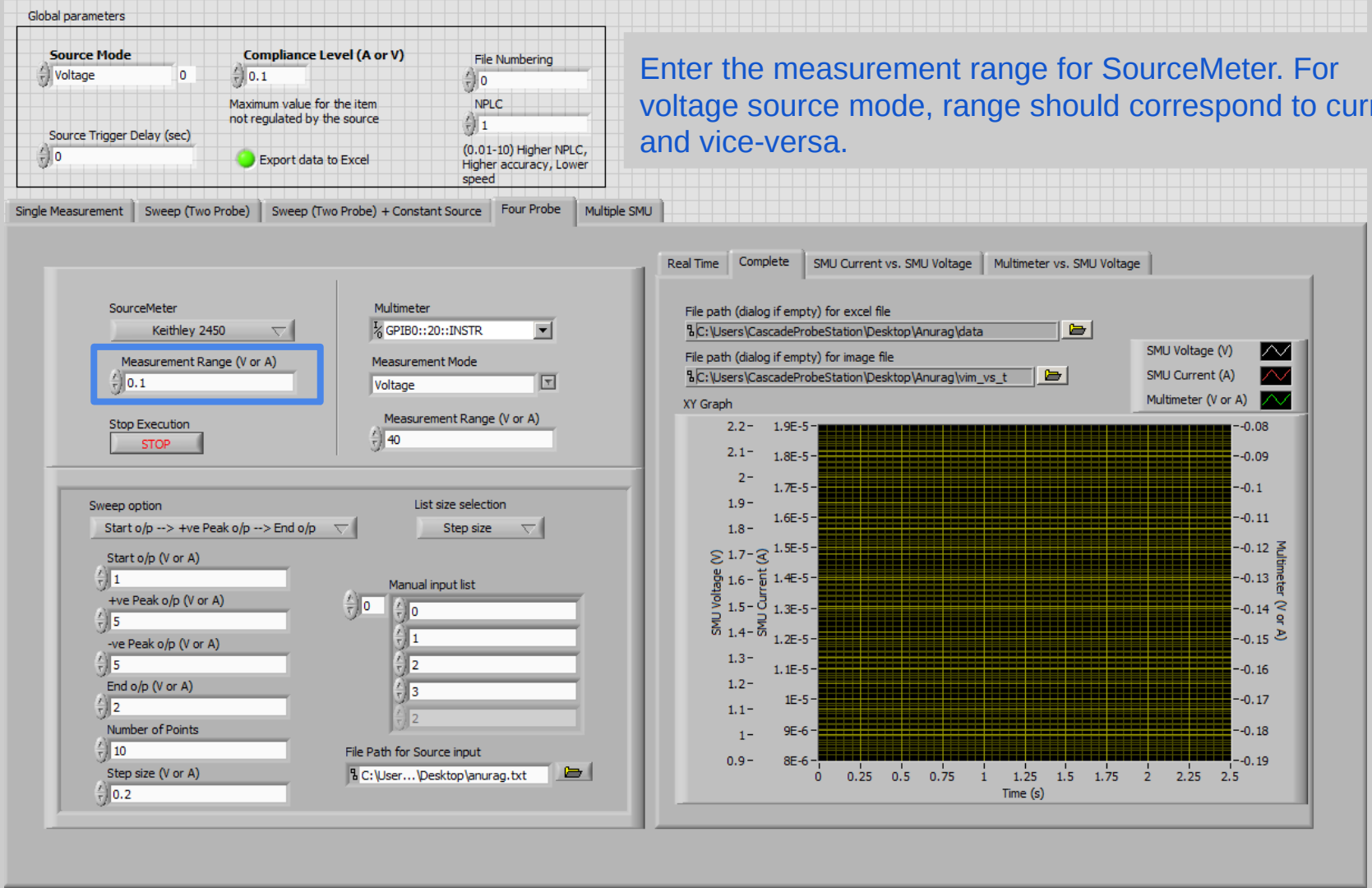


Refer to end of SOP as to how to “Specify excel or image file location”

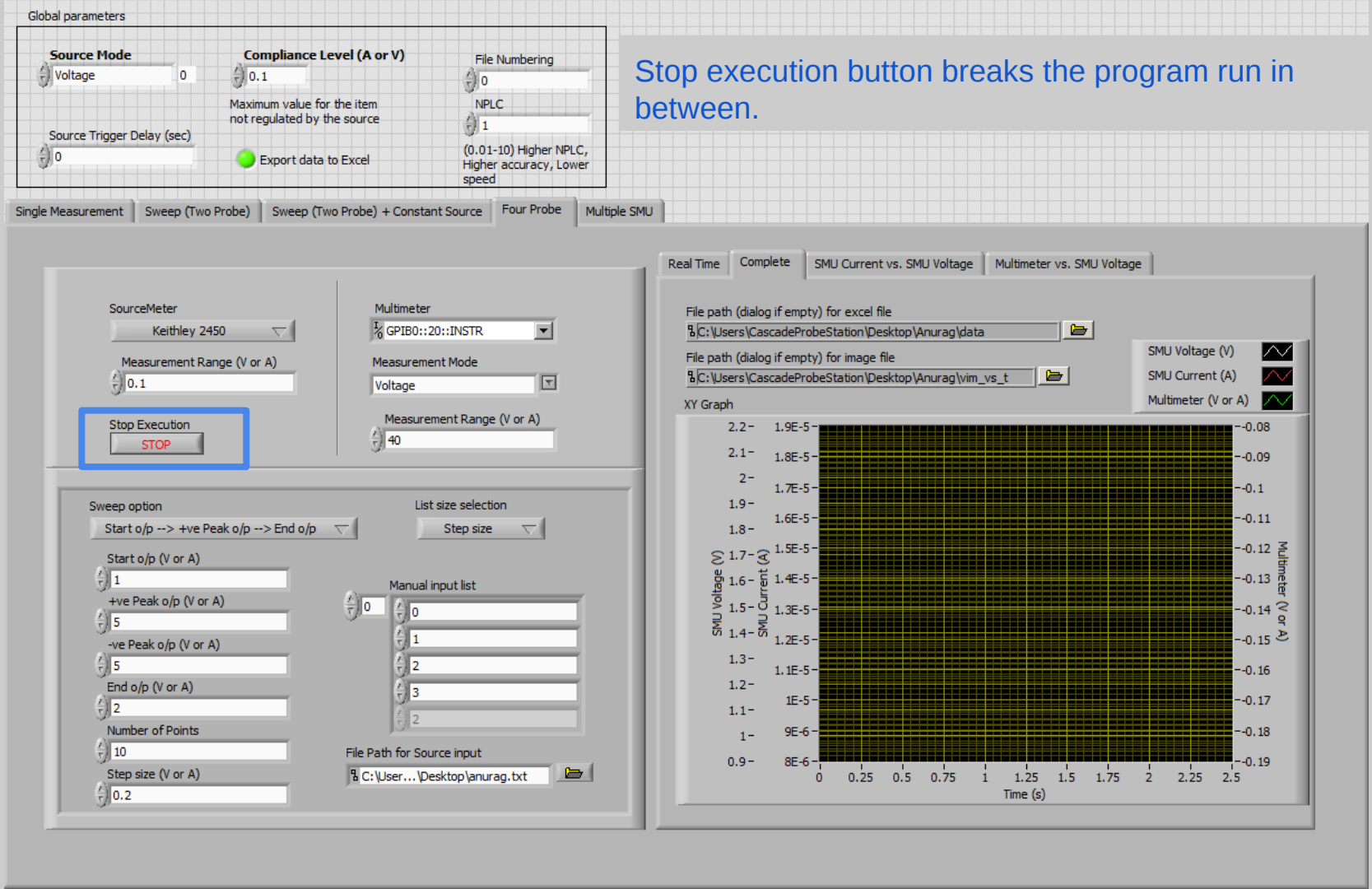
Select the SourceMeter to be used from drop down menu.



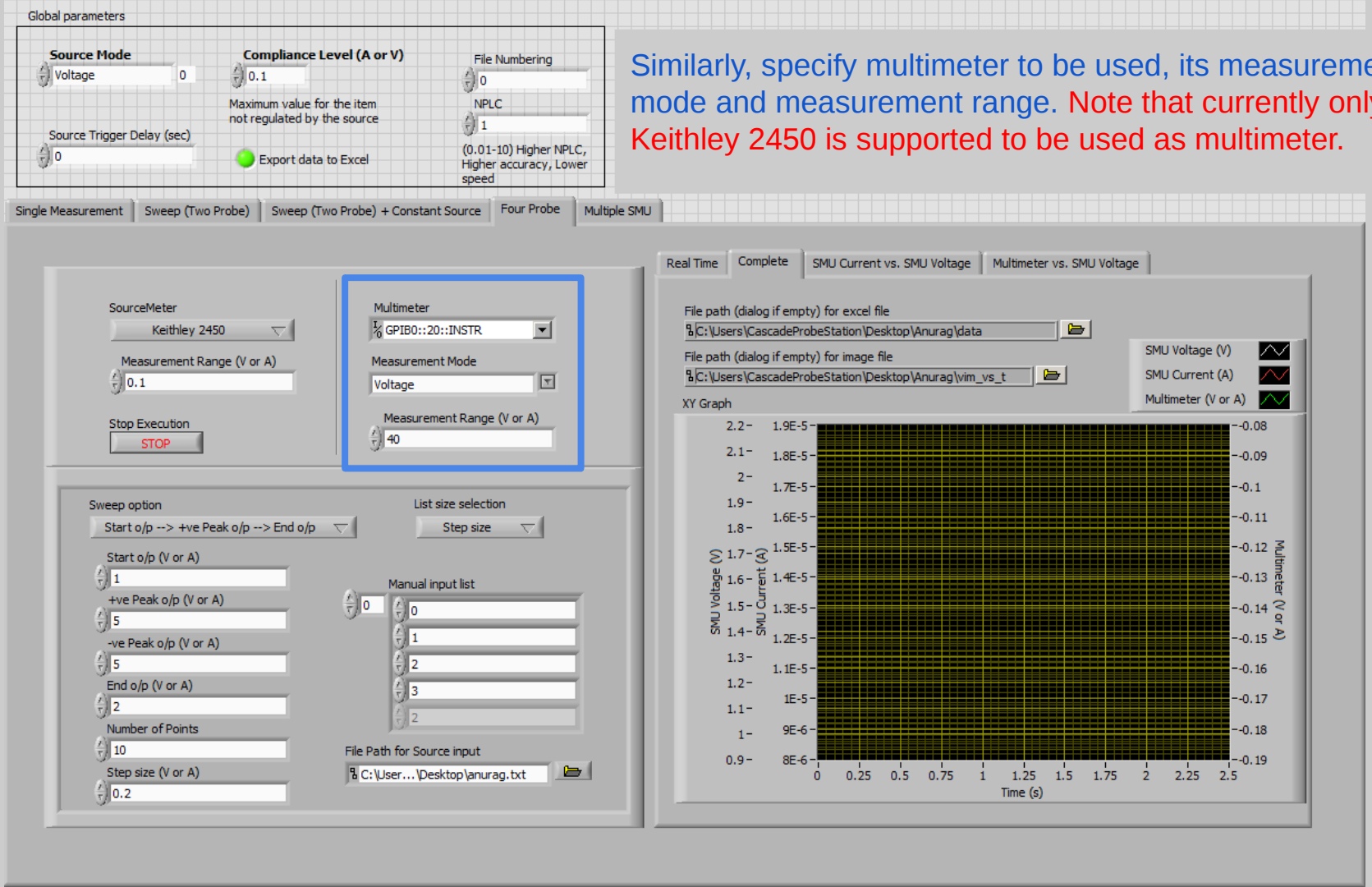
Enter the measurement range for SourceMeter. For voltage source mode, range should correspond to current and vice-versa.



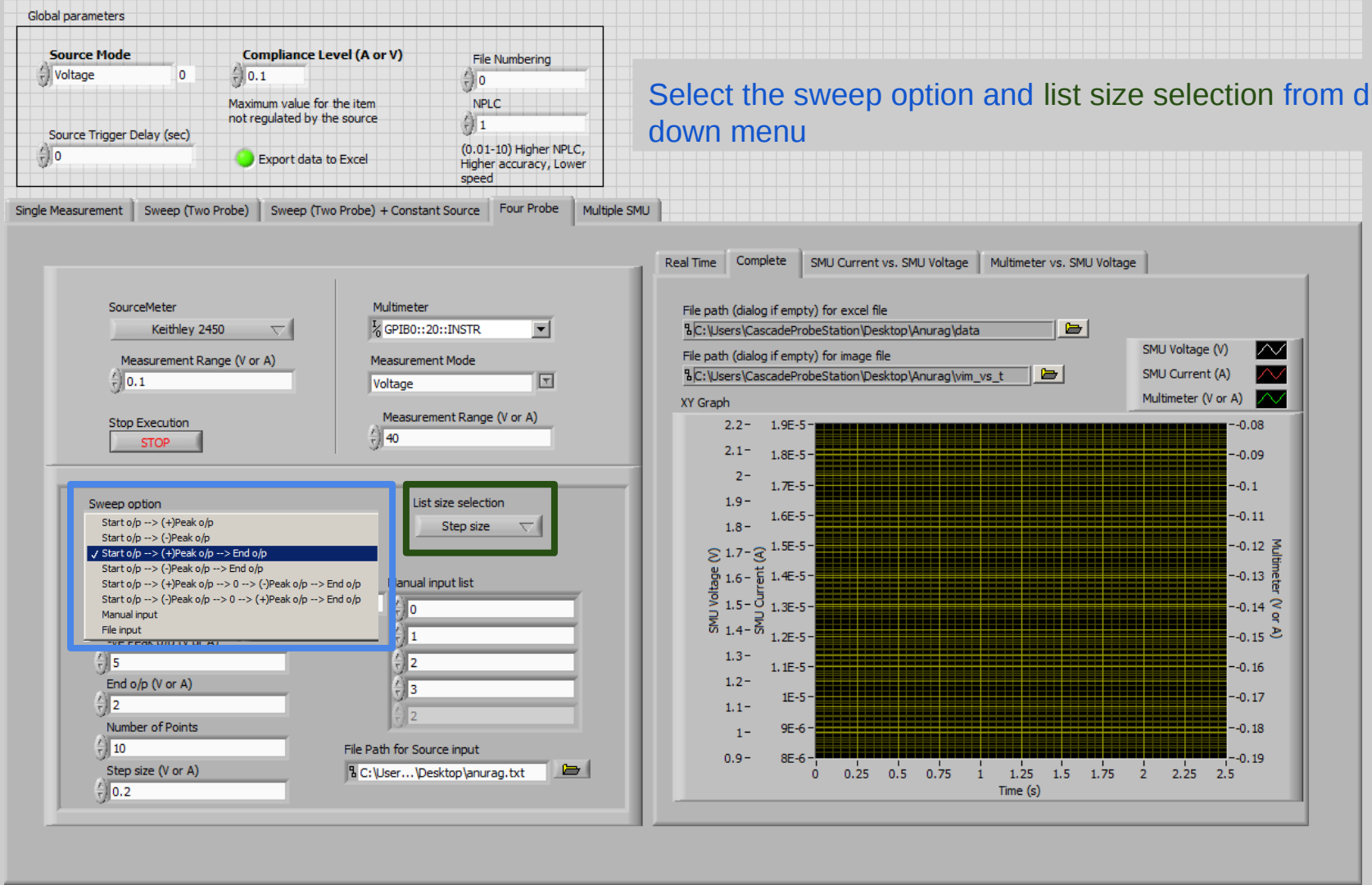
Stop execution button breaks the program run in between.



Similarly, specify multimeter to be used, its measurement mode and measurement range. Note that currently only Keithley 2450 is supported to be used as multimeter.

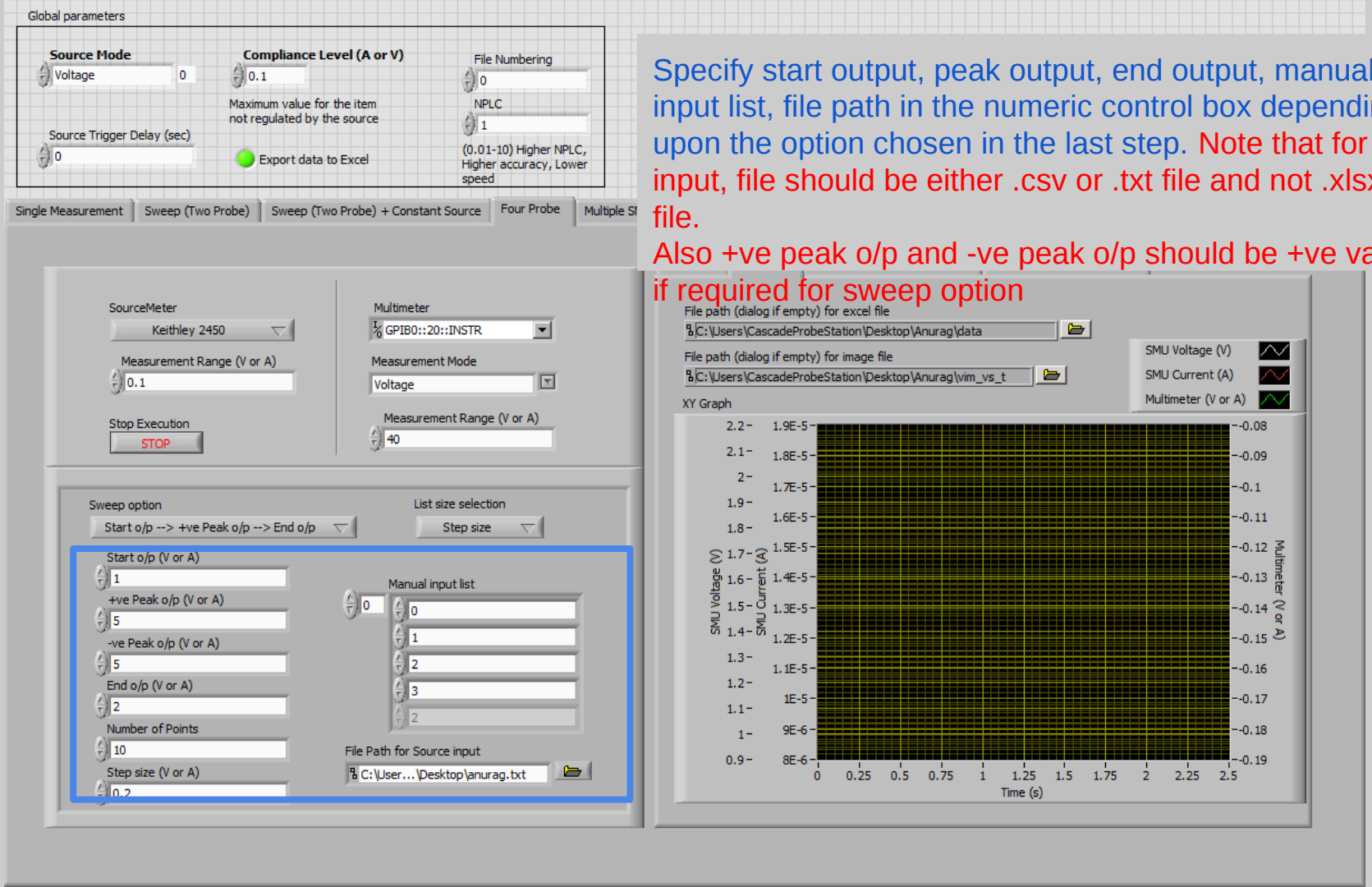


Select the sweep option and list size selection from drop down menu

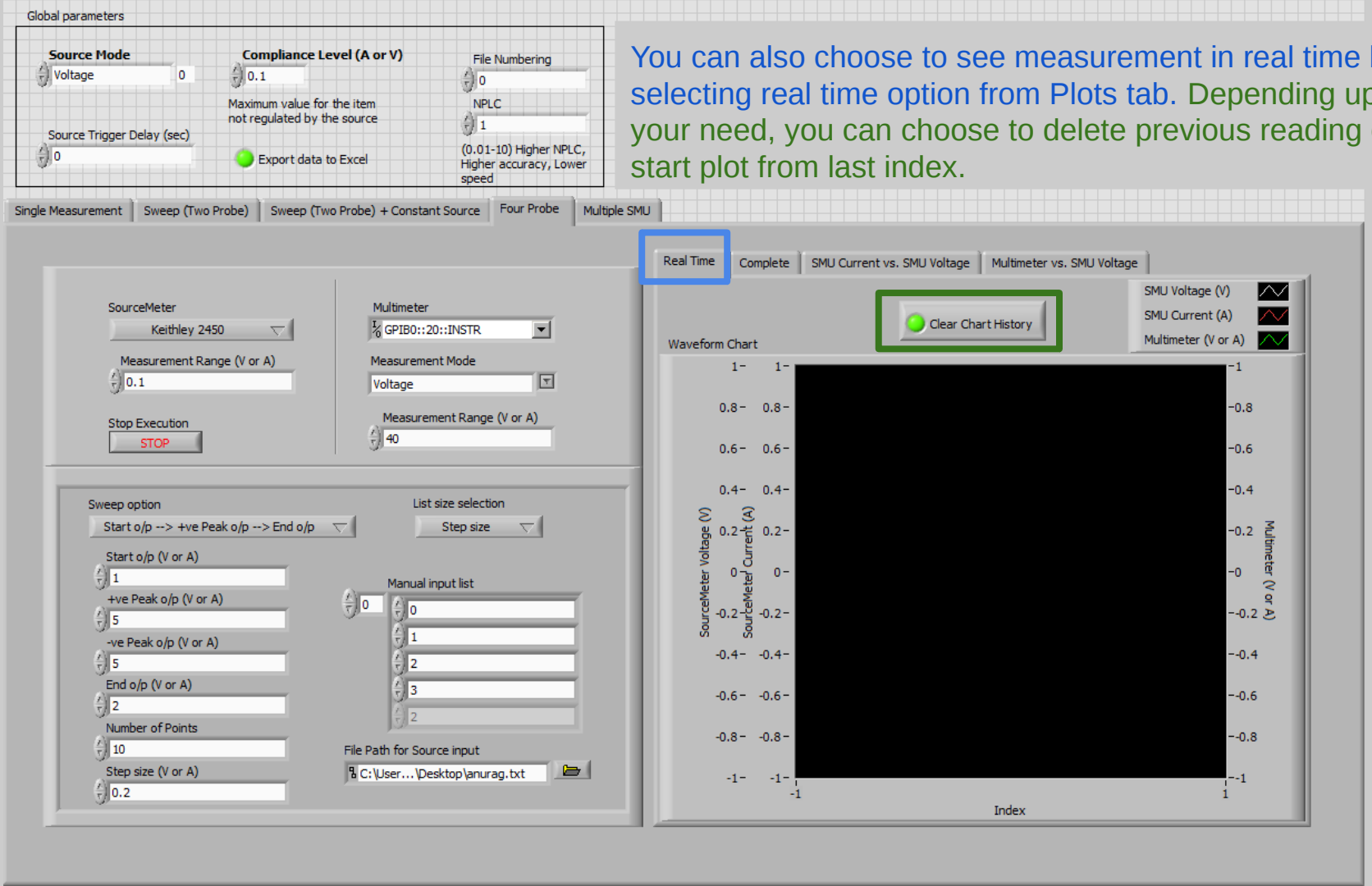


Specify start output, peak output, end output, manual input list, file path in the numeric control box depending upon the option chosen in the last step. Note that for File input, file should be either .csv or .txt file and not .xlsx file.

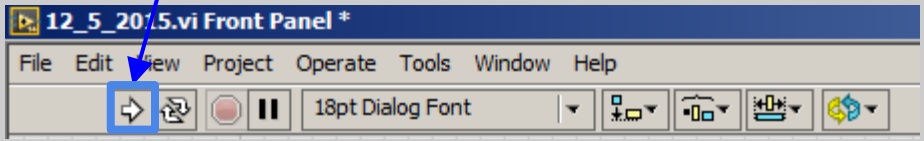
Also +ve peak o/p and -ve peak o/p should be +ve value if required for sweep option



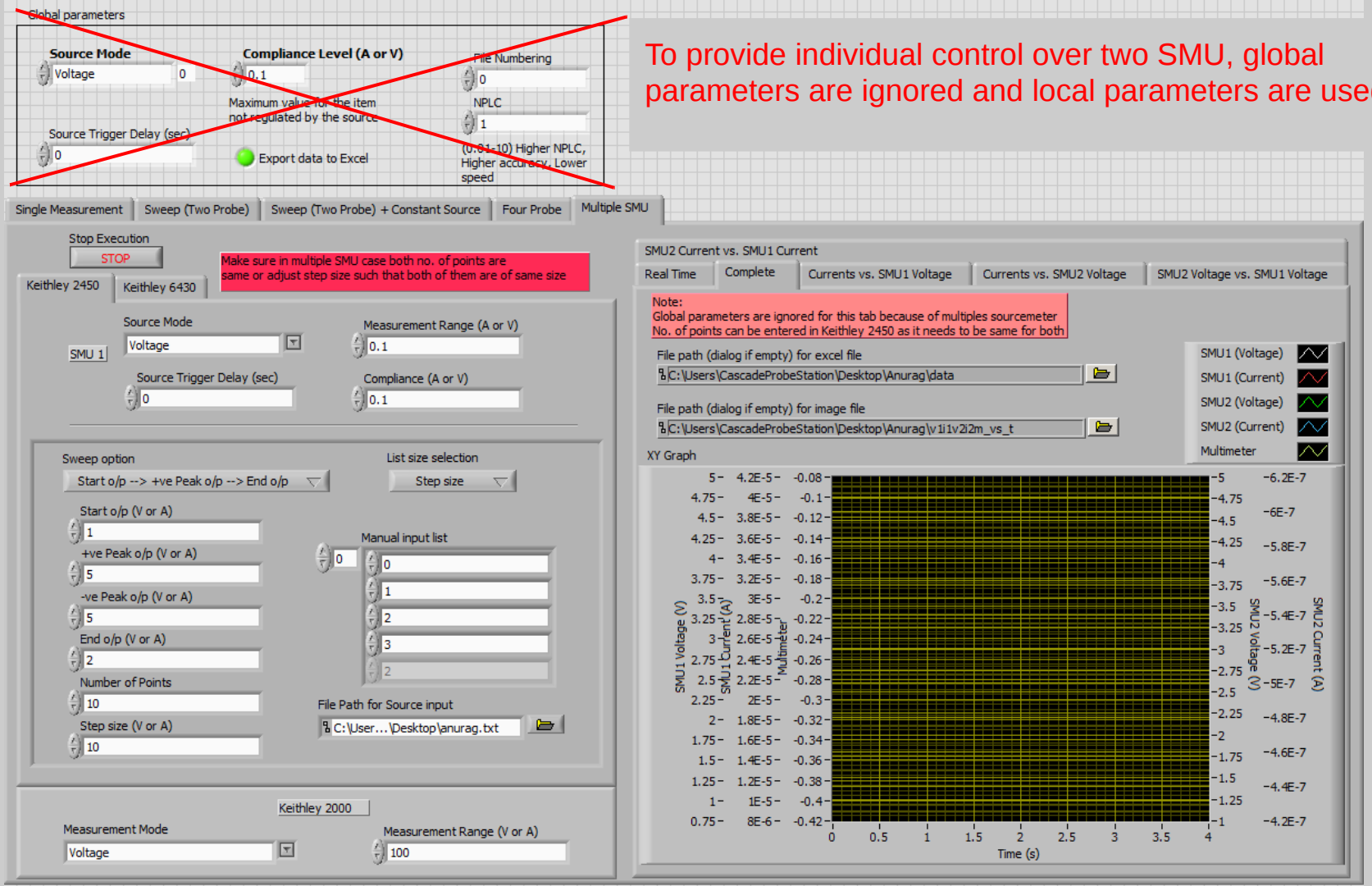
You can also choose to see measurement in real time by selecting real time option from Plots tab. Depending upon your need, you can choose to delete previous reading or start plot from last index.



Click on Run Button on the top-left corner of the screen to initiate measurement.

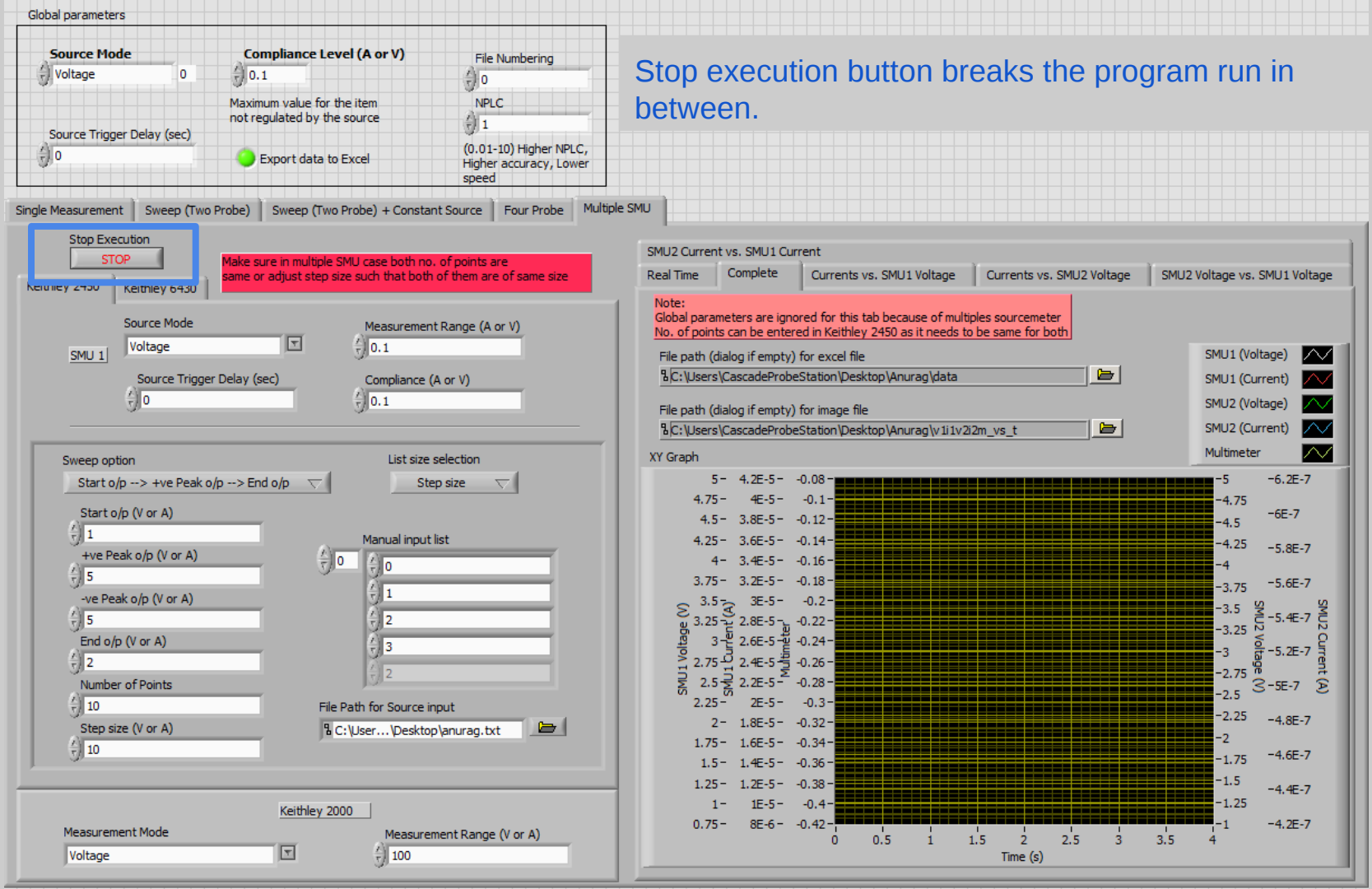


Multiple SMU

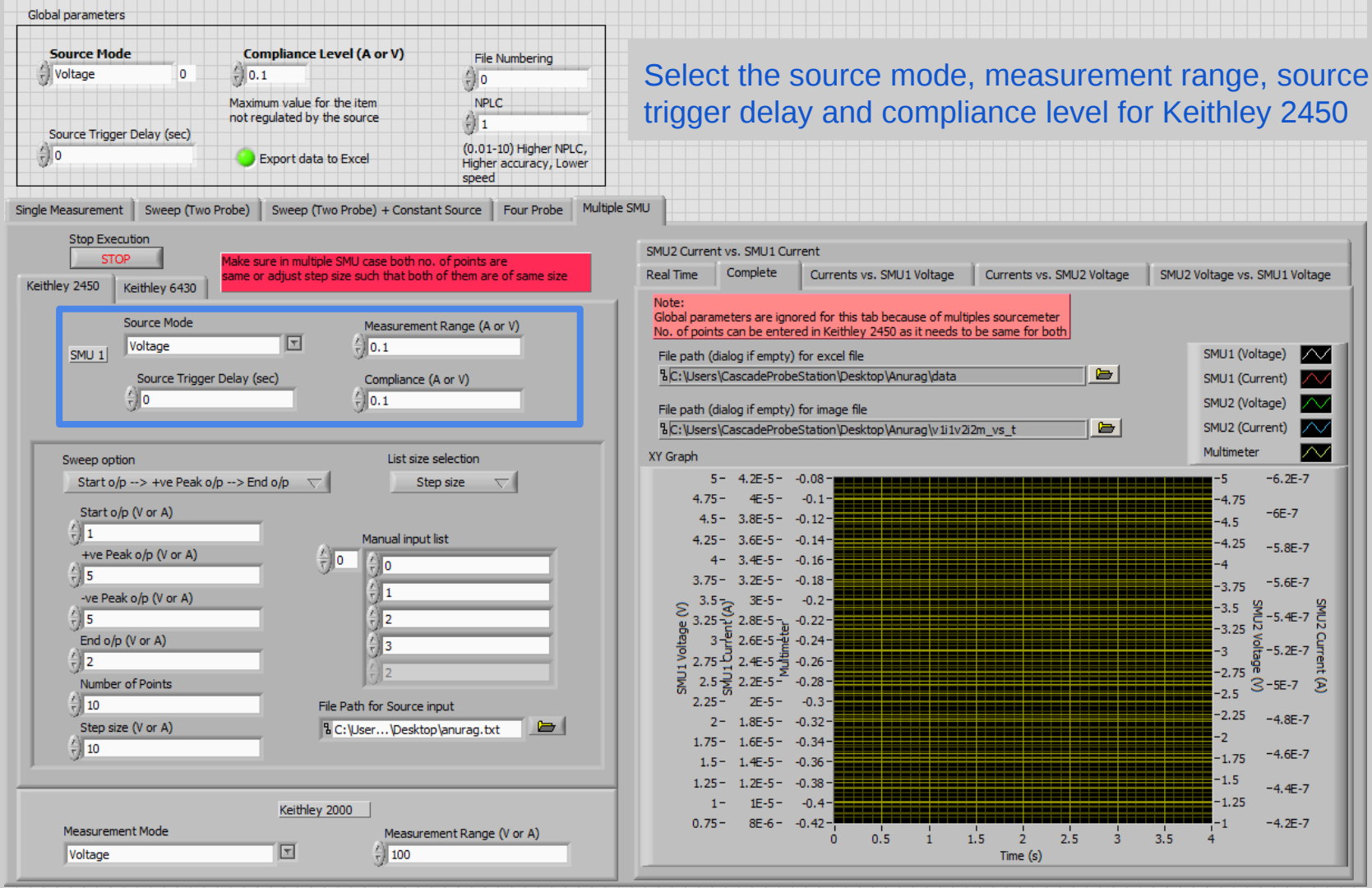


To provide individual control over two SMU, global parameters are ignored and local parameters are used

Stop execution button breaks the program run in between.

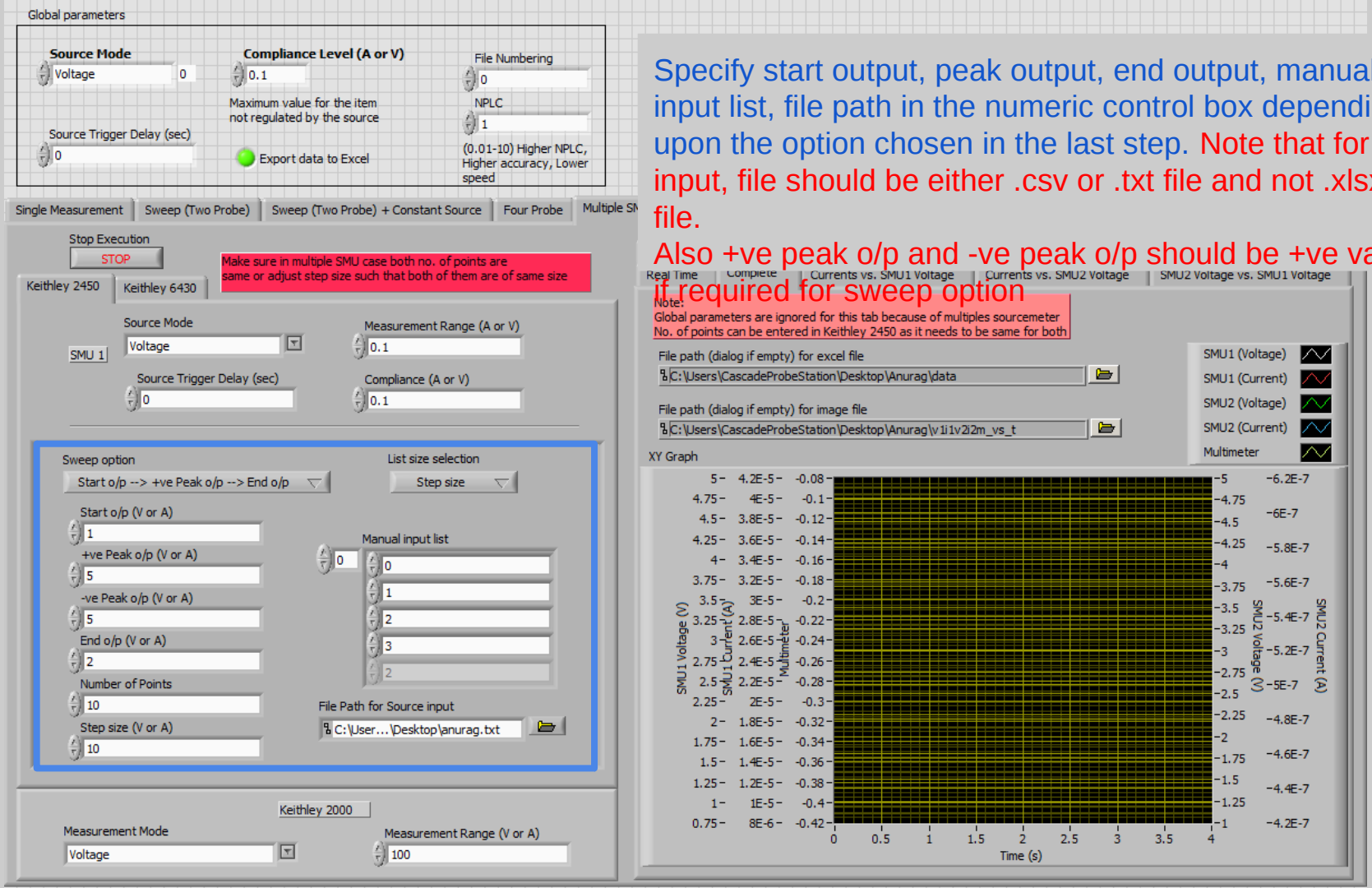


Select the source mode, measurement range, source trigger delay and compliance level for Keithley 2450

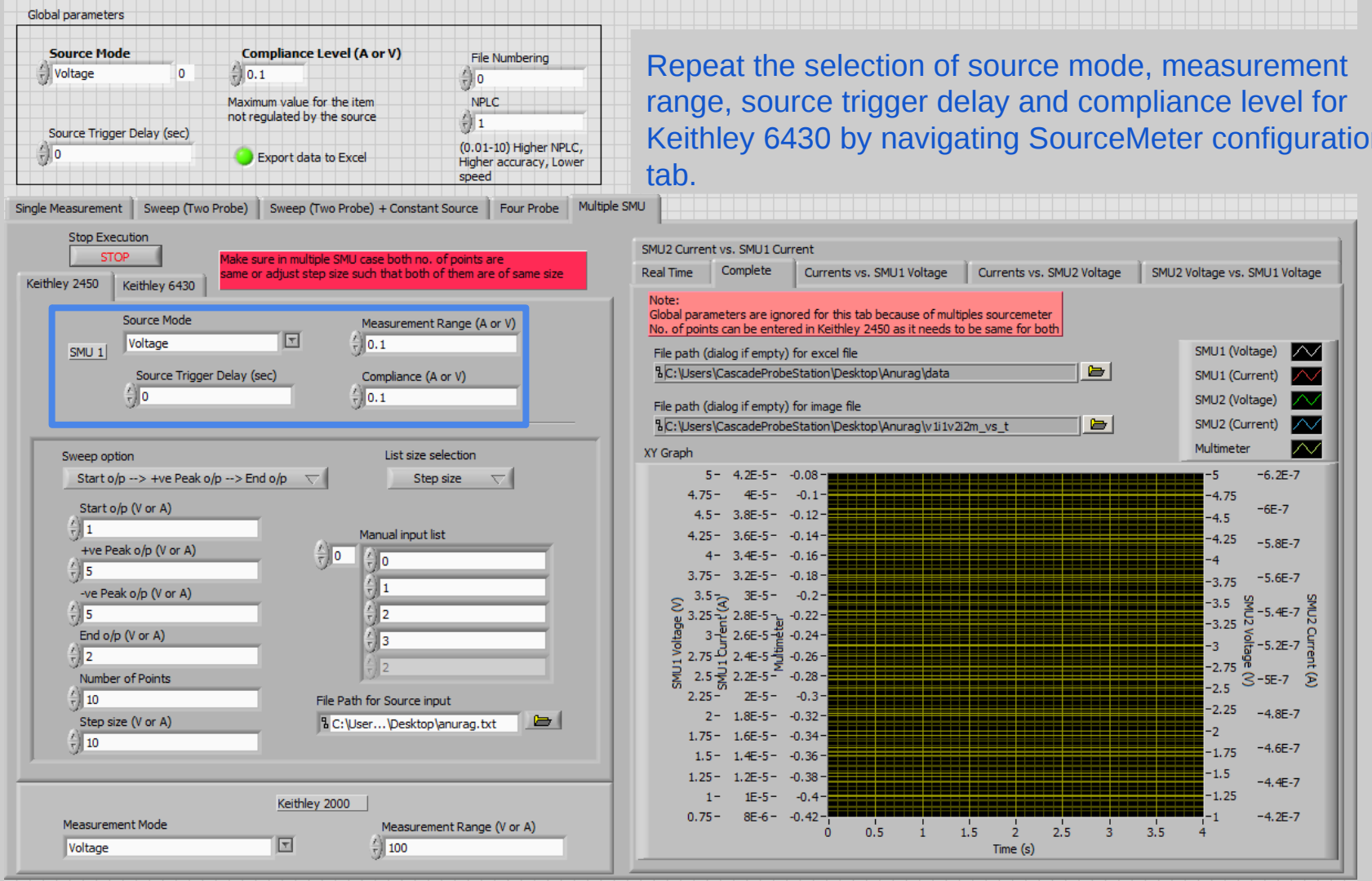


Specify start output, peak output, end output, manual input list, file path in the numeric control box depending upon the option chosen in the last step. Note that for File input, file should be either .csv or .txt file and not .xlsx file.

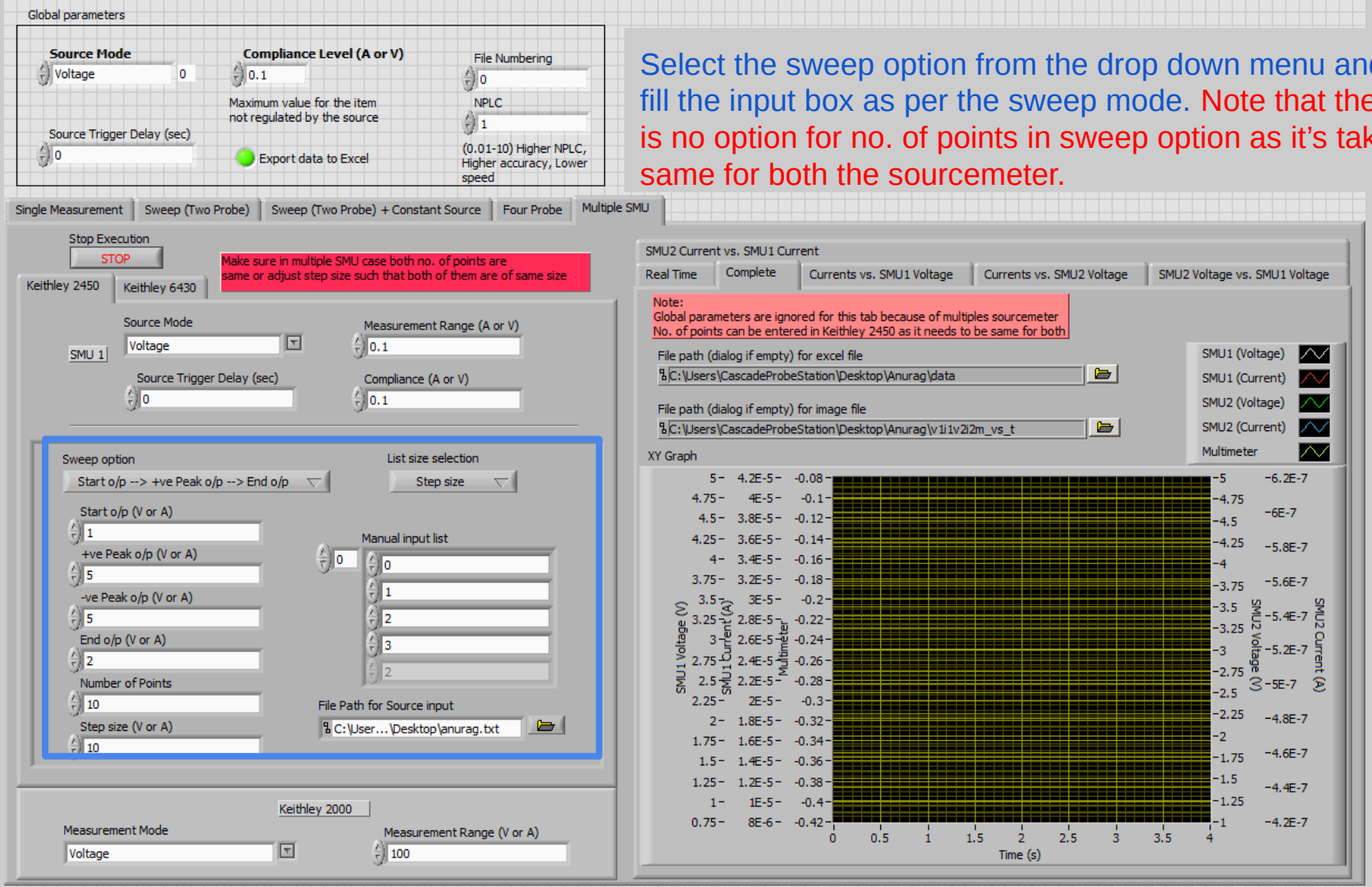
Also +ve peak o/p and -ve peak o/p should be +ve value if required for sweep option



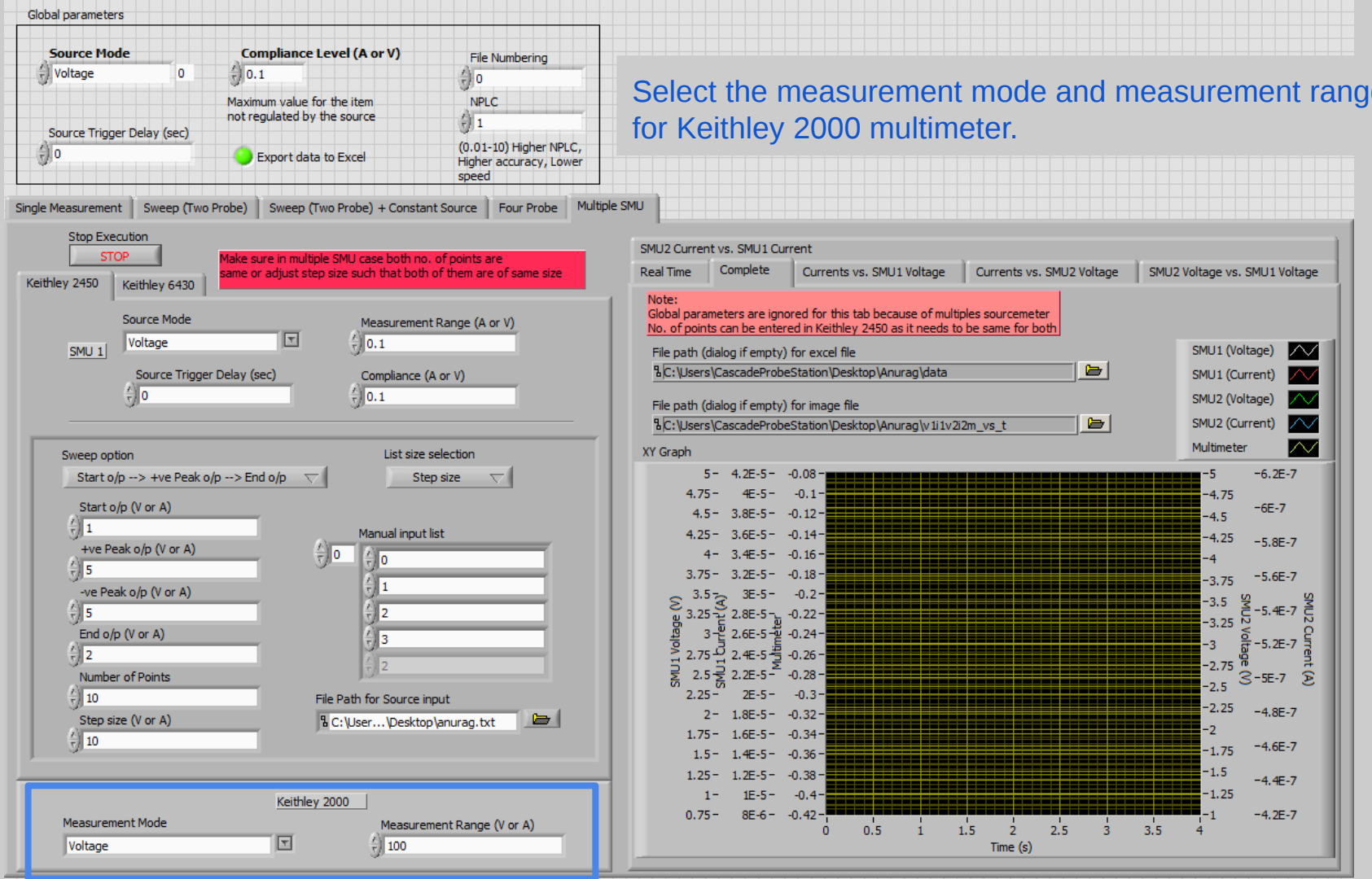
Repeat the selection of source mode, measurement range, source trigger delay and compliance level for Keithley 6430 by navigating SourceMeter configuration tab.



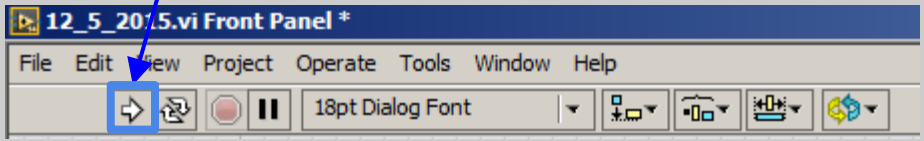
Select the sweep option from the drop down menu and fill the input box as per the sweep mode. Note that there is no option for no. of points in sweep option as it's taken same for both the sourcemeter.



Select the measurement mode and measurement range for Keithley 2000 multimeter.



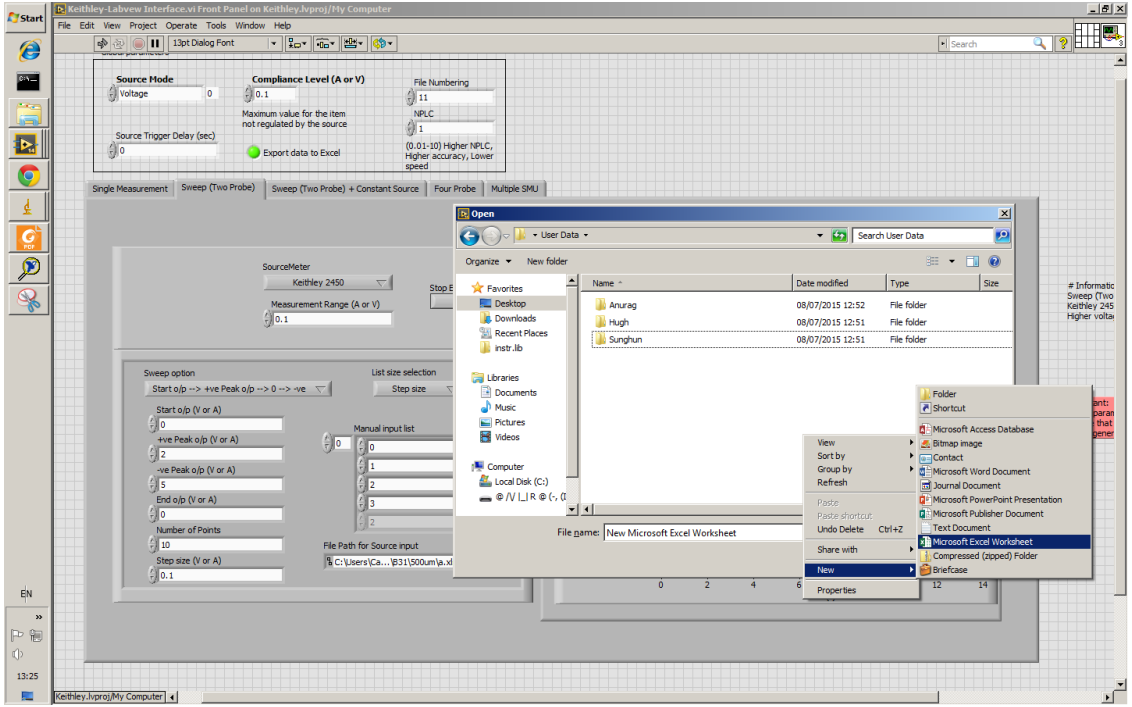
Click on Run Button on the top-left corner of the screen to initiate measurement.



Specifying excel or image file location

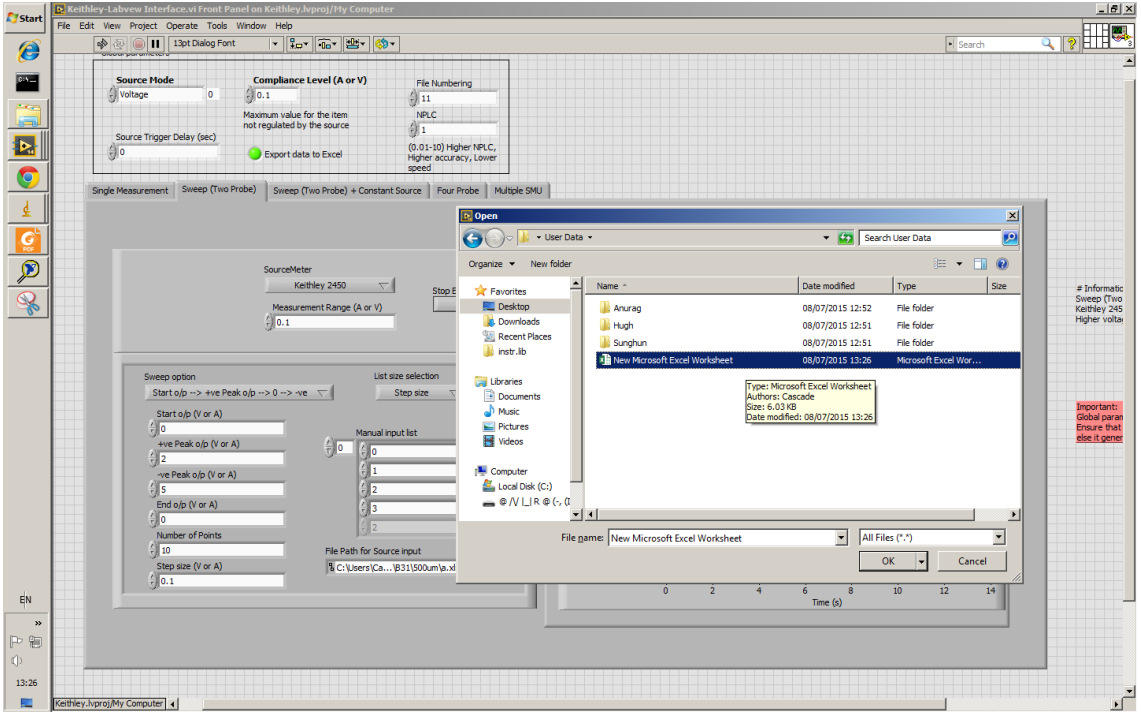
Go to Plot tab and click on browse button.

In case your source folder does not contain a file, you need to create a new excel file (or any file) as illustrated on right.



Specifying excel or image file location

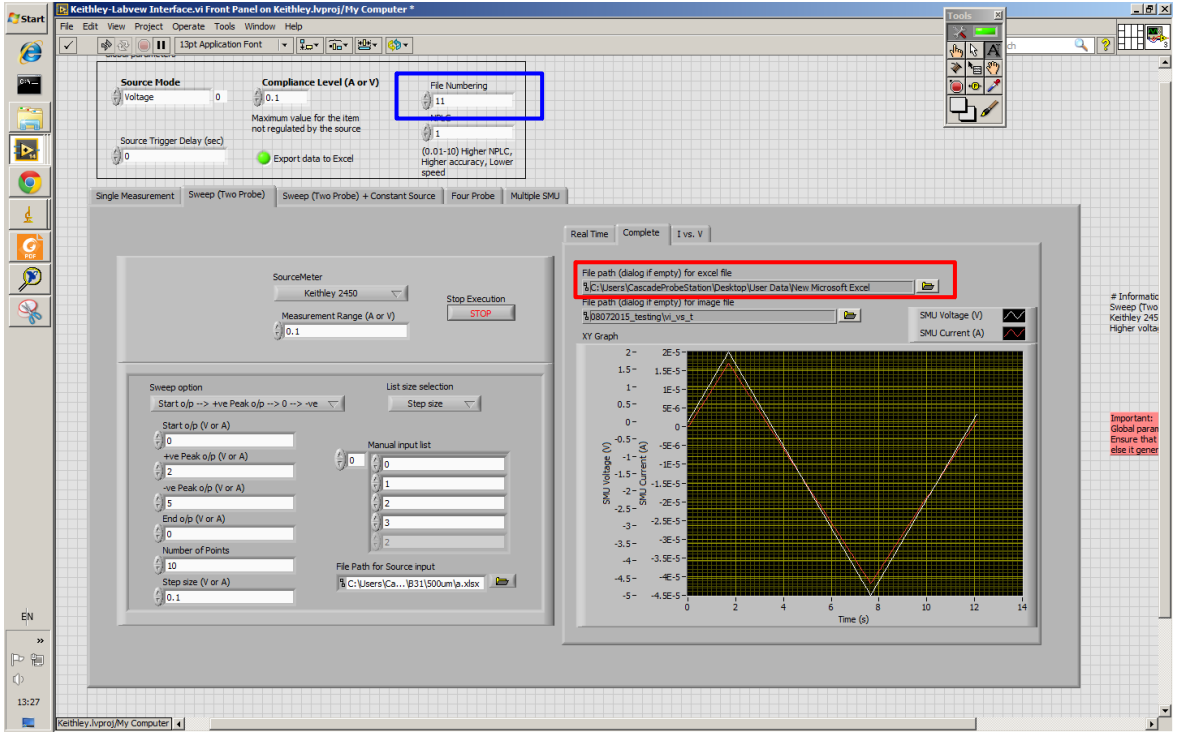
Select that file and click on Ok



Specifying excel or image file location

Now you can give any name to your output file by manually editing the highlighted area (for specifying excel file). Similarly one should specify file name for image file too.

In the Global parameter window on top, you can define starting file Number for all excel and image file in File Numbering numeric box.



SOP Lab 3.27

http://tinyurl.com/sop-lab-3-27