Standard Operating Procedure

Labview-Keithley Interface

Block Diagram



Keithley 2450



Keithley 2000



Keithley 6430





Graphical User Interface

Single Measurement





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.













Sweep (Two Probe)





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.





efer to end of SOP as to how to "Specify excel or image le location"

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

Time (s)

5E-6

-5E-6-

-1E-5-

-2E-5-

-2.5E-5

-3.5E-5-

-4E-5

-4.5E-5

-3E-5-

3 -1.5E-5 -

0 -

SMU Voltage (V)

SMU Current (A)

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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





Sweep (Two Probe + Constant Source)





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.



Global parameters Source Mode Compliance Level (A or V) File Numbering () Voltage 0 (0.1 ÷) 0 Maximum value for the item NPLC not regulated by the source 1 1 Source Trigger Delay (sec) (0.01-10) Higher NPLC, ÷) 0 Export data to Excel Higher accuracy, Lower speed

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.





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



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









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





Four Probe





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.



Global parameters Source Mode Compliance Level (A or V) File Numberina () Voltage 0 (0.1 ÷10 Maximum value for the item NPLC not regulated by the source 1 1 Source Trigger Delay (sec) (0.01-10) Higher NPLC, ÷) 0 Export data to Excel Higher accuracy, Lower speed Single Measurement Sweep (Two Probe) Sweep (Two Probe) + Constant Source Four Probe

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.





file location"





Step size

Manual input list

lo

File Path for Source input

Sweep option

÷) 5

/) 5

÷) 2

10

() 0.2

Start o/p (V or A)

+ve Peak o/p (V or A)

-ve Peak o/p (V or A)

End o/p (V or A)

Number of Points

Step size (V or A)

Start o/p --> +ve Peak o/p --> End o/p

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











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





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.





Multiple SMU

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

Single Measurement Sweep (Two Probe) Sweep (Two Probe) + Constant Source Four Probe

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 Complete Currents vs. SMU1 Voltage Currents vs. SMU2 Voltage SMU2 Voltage vs. SMU1 Voltage if required for sweep option Global parameters are ignored for this tab because of multiples sourcemeter No. of points can be entered in Keithley 2450 as it needs to be same for both SMU1 (Voltage) \sim File path (dialog if empty) for excel file %C:\Users\CascadeProbeStation\Desktop\Anurag\data SMU1 (Current) SMU2 (Voltage) File path (dialog if empty) for image file %C:\Users\CascadeProbeStation\Desktop\Anurag\v1i1v2i2m vs t SMU2 (Current) Multimeter \sim XY Graph 5- 4.2E-5- -0.08 -6.2E-7 -5 4E-5-4.75--0.1 4.75 -6E-7 4.5- 3.8E-5- -0.12-4.5 4.25 - 3.6E-5 - -0.14 -4.25 -5.8E-7 4- 3.4E-5- -0.16-3.75 - 3.2E-5 --0.18--5.6E-7 -3.75 3E-5--0.2-3.5--3.5 -5.4E-7 3.25 - 2.8E-5 - -0.22 --3.253-₽ 2.6E-5-₽ -0.24-हून -5.2E-7 -3 2.75 0 2.4E-5 - -0.26 -2.75 R 2.5 ₹ 2.2E-5 - -0.28 F 3-5E-7 -2.5 2.25-2E-5--0.3--2.25 -4.8E-7 2- 1.8E-5- -0.32--2 1.75- 1.6E-5- -0.34--4.6E-7 1.75 1.5- 1.4E-5- -0.36--1.5 1.2E-5 - -0.38 1.25--4.4E-7 1.25 1E-5--0.4 0.75-8E-6- -0.42 -4.2E-7 0.5 1.5 2.5 3.5 Time (s)

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

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

Single Measurement Sweep (Two Probe) Sweep (Two Probe) + Constant Source Four Probe

Multiple SMU

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.

Single Measurement Sweep (Two Probe) Sweep (Two Probe) + Constant Source Four Probe

Multiple SMU

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

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

	Al ven Project operate tools willow hep		► Search	٩
	Source Hode Compliance Level (A or V) File Number Voltage 0 0.1 11 Source Trigger Delay (sec) 0 0.1 10 0 0 0 0.1 11 Maxmum value for the item not regulated by the source 0 1 10 0 0 0 0 0 1 0 0 0 0 0 1 0 0 0 0 0 1 1 Source Trigger Delay (sec) © Export data to Excel 1 <td< th=""><th>hng</th><th></th><th></th></td<>	hng		
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		instr.lib	08/07/2015 12:51 File folder	
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			0 2 4 6 8 10 12 14 Time (s)	

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