1) For such a test, all we need is a measurement result window and a starting button that allows us to display:

   - Y-axis: current reading (or any kind of output / for example, the output from lock-in amp may not be current)

   - X-axis: time

   - What I propose is to have two windows, one for the output from lock-in amplifier and another for the output from optical power monitor. Since both are connected to LabView, I believe we are ready to start.

   - Next thing I would like to do is the same thing, BUT with Keithley 2602 SMU. The algorithm should be the same except that output reading is from SMU instead of lock-in amplifier.

   - Could you please let us know when we could do the test together with your advice?

2) Keithley 2602 SMU will be used in the main program.

    - As you stated in the Word file, we need to measure current by sweeping voltage.

    - For this simple current-voltage (I-V) measurement, the algorithm is simple: 1. Change voltage in SMU -> 2. Read current from SMU -> 3. Change voltage in SMU -> iteration... Then display current (y-axis) vs. voltage (x-axis)

    - For I-V measurement, we should already have the capability to adjust the voltage.

    - For photocurrent vs. wavelength or photocurrent mapping, we will set a 'fixed' voltage in LabView and collect current by changing either wavelength or location.

        \* For photocurrent measurement, the algorithm is: 1. Change wavelength in tunable laser -> 2. Read current from SMU (or lock-in amplifier) -> 3. change wavelength...

        \* For photocurrent mapping, the algorithm is: 1. Change location in piezo controller -> 2. Read current from SMU (or lock-in amplifier)

    - If you need any more information, please feel free to let me know.

3) Yes, WiTec control scanning and data acquisition software should be a good one to benchmark.

\* Note: If you think the work I am stating above is going beyond what we agreed, please feel free to let me know. I can pay you more. There is nothing more important for us at this moment than getting a good LabView code in a short time frame. Thanks!

https://ssl.gstatic.com/ui/v1/icons/mail/images/cleardot.gif

But, I like Alex's 5G interface more; I would like to have multiple windows at the bottom. For example, we must have at least 3 windows for the final figure that is photocurrent intensity vs. wavelength.  
  
   1) Signal from a monitor photodetector   
   2) Signal from our actual sample  
   3) Normalized signal from our actual sample  
  
Alex: The schematic for experiments can be found from the link below. We here need to collect signal from a regular PD to LabVIEW. This adds another component to connect to LabVIEW. Initially, we decided to have 3 to control: tunable laser, Keithley, LIA. But, let us not connect to Keithley as it is not necessary. Instead, we can connect to a regular PD. We will let you know what kind of PD we will have to connect. Alex, could you please let me know if this is okay with you?

Donguk info:

So, we need to connect LabView to these components.

   1) Piezo stage controller (two axis, X and Y) / KIM101 / <https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=9790>

       - Need to be able to scan over an area by setting parameters as below

       - X\_start, X\_end, Y\_start, Y\_end, X\_number\_of\_step, Y\_number\_of\_step, Integration\_time\_for\_each\_point, Delay time

       - At each point, it will integrate over the time you set, and move onto the next point, and so on.

       - The result will be 2D color map with signal at each point over the area such as this: <https://www.researchgate.net/figure/Photocurrent-mapping-Schematic-of-TE-a-excitations-used-to-generate-photocurrent-maps_fig3_280061338>

       - You need this function only for photocurrent mapping, for which laser wavelength tuning is not needed.

   2) OPA laser (you have the driver already)

       - You need to be able to tune the wavelength by setting parameters already as in your interface.

   3) Lock-in amplifier / SR810 / <https://www.thinksrs.com/downloads/pdfs/manuals/SR810m.pdf>

       - Should be able to get the output signal from SR810

       - The signal will be used for both photocurrent mapping as well as photocurrent vs. wavelength plot (you already have this)

   4) Thermal detector

       - We need to connect this and measure the signal intensity monitor (actually, it is pump intensity monitor)

   5) Keithley 2602

       - We decided to have this in order to measure I-V curve

       - For this, we need to sweep voltage and get the current

       - But, we need to get the current from both Keithley as well as SR810

       - You do not need to worry about it, but all we need for now is to just connect Keithley to LabView and have the function for adjusting voltage and measuring current

Sorry to trouble you. Could you kindly add in another component into our labview program?

The component is Thorlabs KIM101 Piezo Inertia Motor Controller. It is used to drive 2 actuators (x and y axis) that will move the device stage. For your reference I have attached the details of the component below:

Product Page (KIM101): <https://www.thorlabs.com/thorproduct.cfm?partnumber=KIM101>

Instruction Manual: <https://www.thorlabs.com/drawings/8e1c71a59d01574-9F7C633B-E3A7-4D8C-A7F9C7B3CCB3CACE/KIM101-KinesisManual.pdf>

Driver download page: <https://www.thorlabs.com/software_pages/viewsoftwarepage.cfm?code=Motion_Control>

For the driver, we used "Kinesis 32-bit software for 64-bit Windows".