DeathRay User Manual

When DeathRay is first launched and empty device control window is presented to the user. It should look like this:

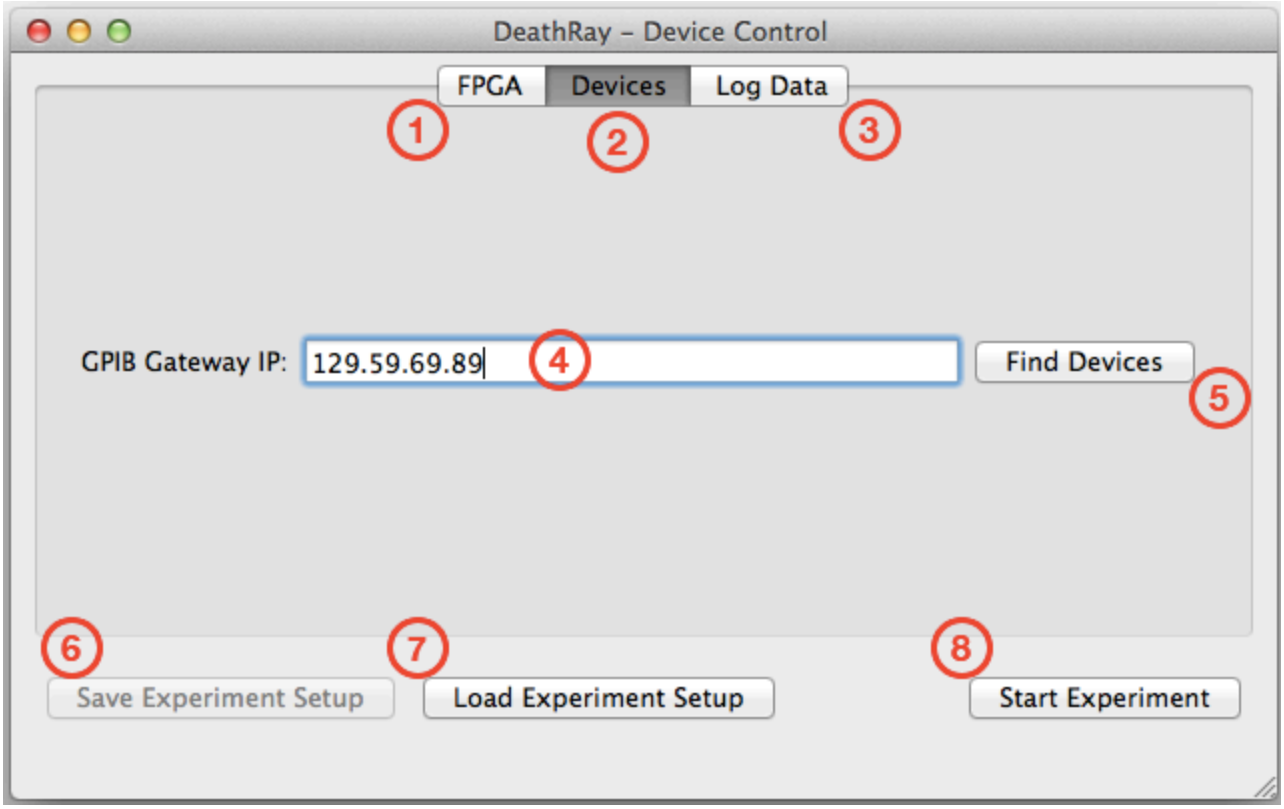

Figure 1: Device Control Window - Devices - GPIB Gateway IP

(1), (2), and (3) are the three tabs of the main tab bar. They allow you to select (1) FPGA control, (2) Device control, and (3) Data Logging. (1) and (3) will be explained in more detail below.

If you would like to set up GPIB devices for your experiment, enter the IP address of your gateway in the the box labeled (4). You can read this IP off of the front of your GPIB gateway. Make sure all the devices you want to access are plugged in to this gateway. If you are having trouble finding the devices, make sure you can access the gateway by typing it's IP into your web browsers address bar.

Once you have entered your IP you should click Find Devices (5). This scans

the GPIB gateway for all attached devices and will display the results. This process may take about 30 seconds. Sometimes there is a bug where if an incorrect IP is entered, the program may stall and require a restart. If nothing happens after 30 seconds you may need to restart DeathRay. Make sure the IP you entered is correct, and that you can access the HTTP interface through your browser.

If devices are successfully found they will be displayed as in the following window:

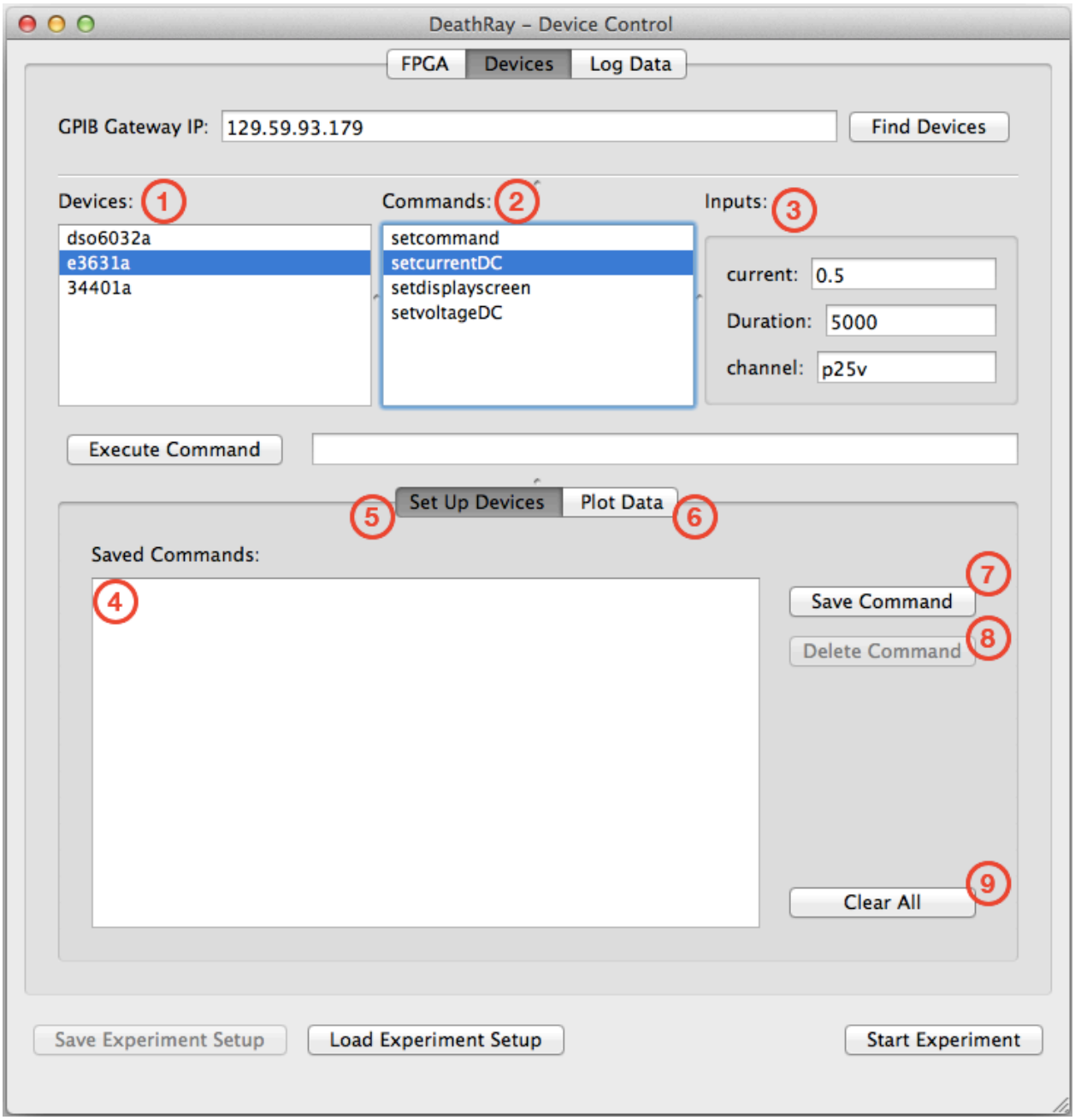

Figure 2: Device Control - Devices - Set up Devices

Pane (1) will contain a list of all the found devices. They will be listed as they are officially identified. This name is usually on the front panel of the device. If a device has commands pre-written for it they will all show up in Pane (2). As a command is selected, the possible inputs in (3) will change, and allow you to modify them. If a device has no pre-written commands you should only see ‘setcommand’ displayed in (2). This will allow you to send an arbitrary SCPI command to the device.

Once you have selected a device, a command, and modified it’s inputs you can either execute it immediately by clicking Execute Command or save it for later execution by clicking Save Command (7). This will store it in the Saved Commands box (4) where it will be execute when you click Start Experiment. You may delete a command with button (8) or clear all commands with button (9). Once you have set up the devices to your satisfaction, you can click on the Plot Data tab (6). Clicking on this tab will display the following:

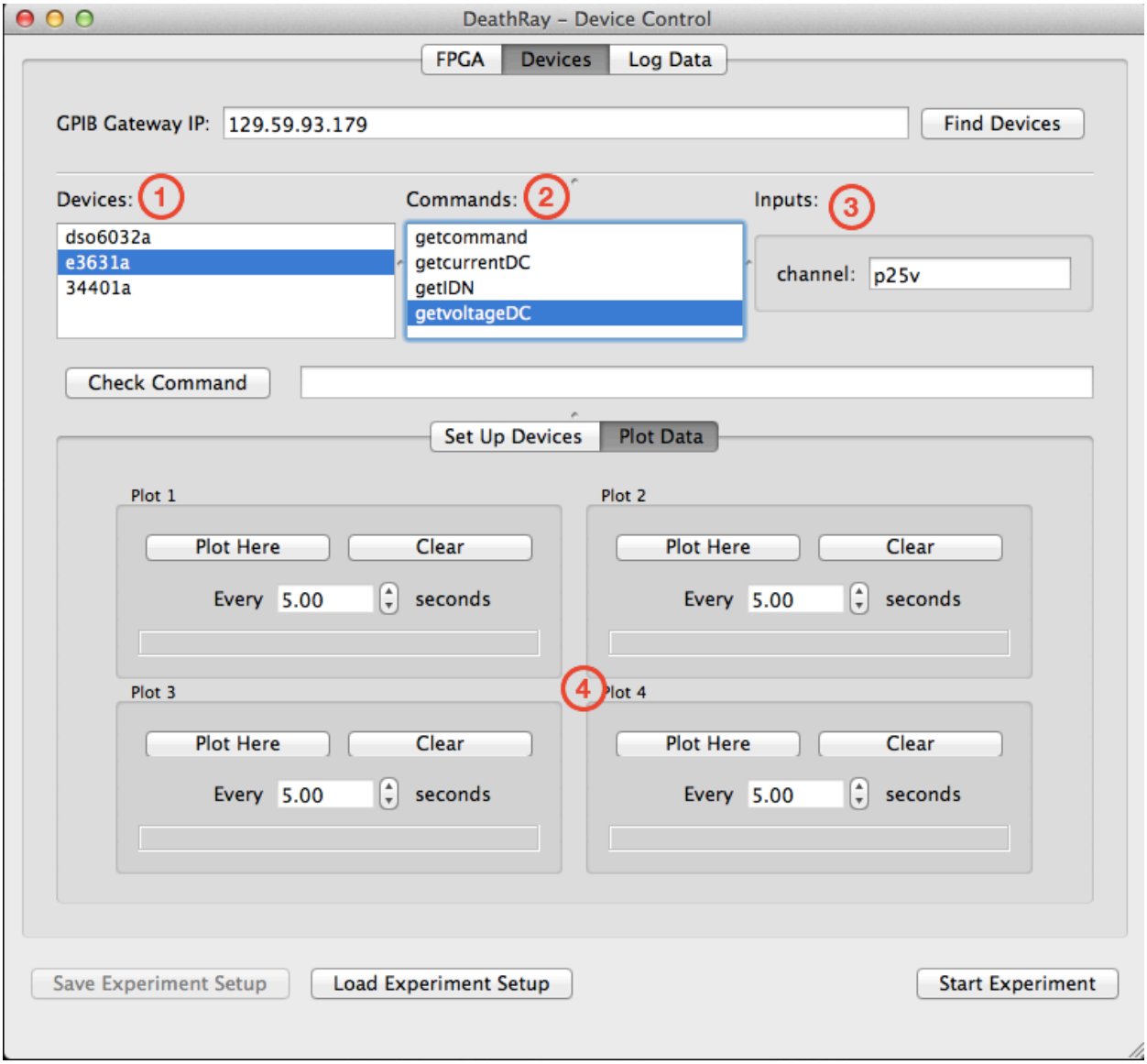

Figure 3: Device Control - Devices - Plot Data

With (1), (2), and (3) you have the same device and command selection interface as before. However this time all the commands are 'get' commands, which mean they return something that you can display. Once a command is selected and the input's are entered, you can click Plot Here in one of the 4 spaces. If the selected command returns numerical data it will be plotted once every user defined interval. If the returned data is not numerical, it will simply be displayed to the user as a list.

Referring back to the first screen shot, Button (6) Save Experiment Setup will become activated when you make any changes to initiate a new experiment, such as save a command or select data to plot. It will allow you to select a location and file name for a save experiment file. Button (7)

Load Experiment Setup will allow you to locate and load a file created by DeathRay that contains all the settings of a previously saved experiment. Button (8) allows you to start the experiment. It will leave the Device Control window and show the Plotting window. If nothing is selected to plot, it will simply show a blank window.

Now if tab (1) is clicked it will bring you to the following window:

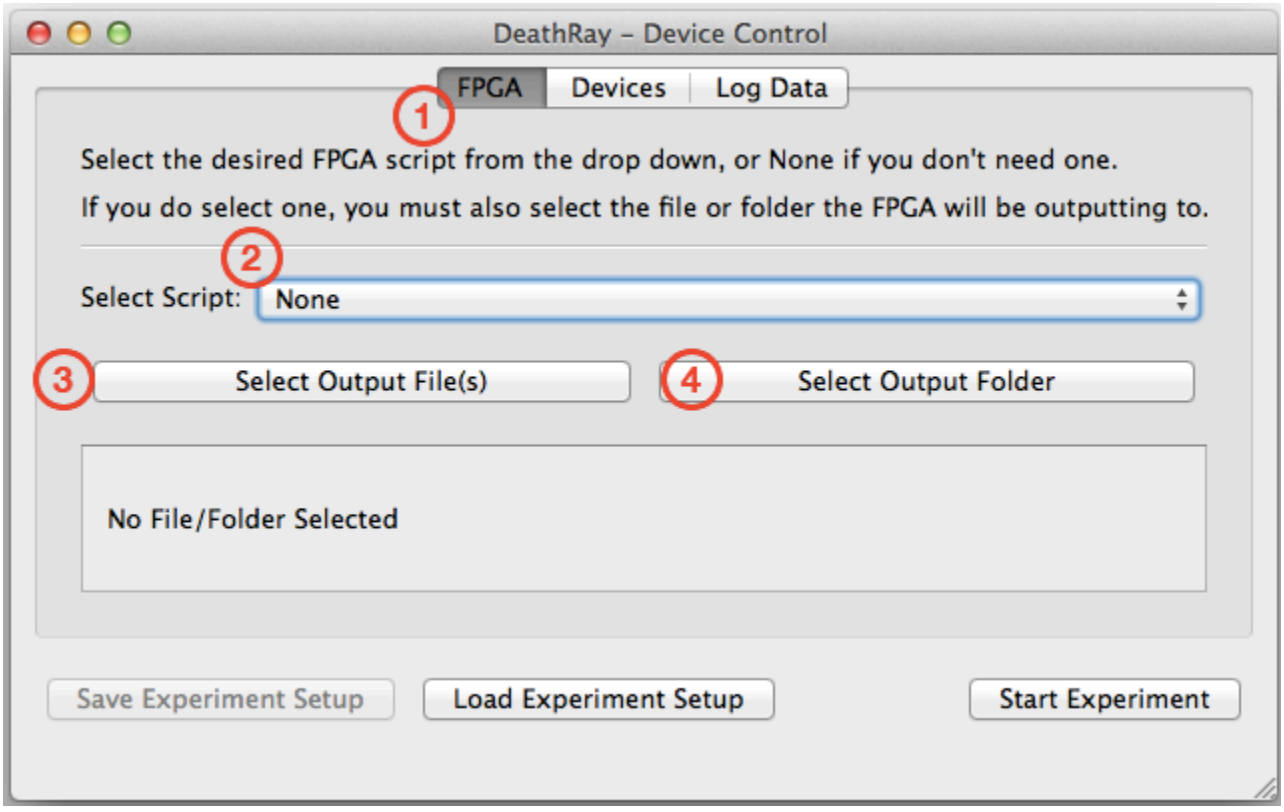

Figure 4: Device Control Window - FPGA

This is the FPGA control window. You can select your FPGA script from the drop down labeled (2). This drop down is populated automatically by crawling the fpga_scripts folder. If you put a new script in here, make sure to run ./DeathRay reload before you launch DeathRay to let the app know about it. If you select a FPGA script, you must also let DeathRay know where the FPGA will be outputting it's files. If the script will be outputting to a folder select a folder (4), if the script is outputting to a file, select that file (3).

If you click on Log Data you will see the following window:

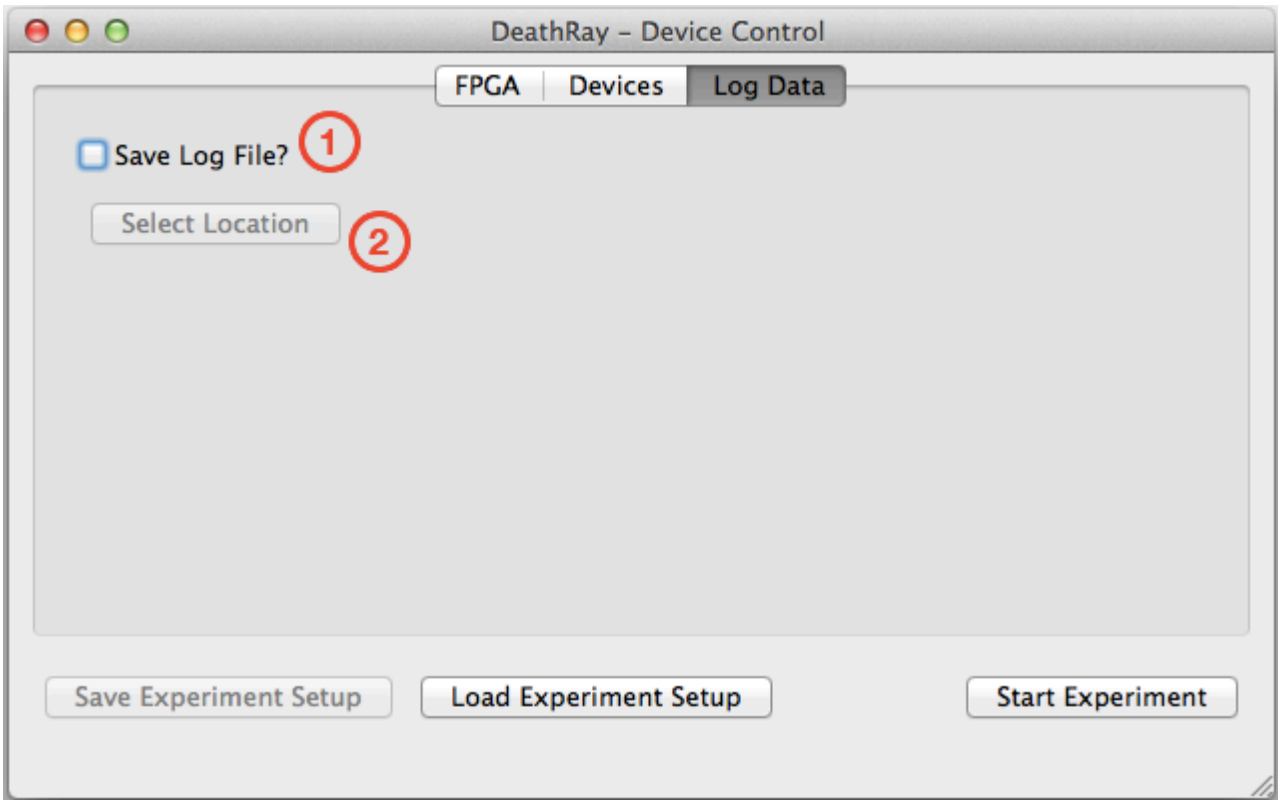

Figure 5: Device Control Window - Log Data

This window has only two self explanatory options. Check Box (1) lets you indicate if you want to log your data, and Button (2) lets you choose where to log if you have selected to log data. If you do not choose to log data in this window, you will have the option after you start and experiment.

If at this point you have set up the experiment to your satisfaction, you may click Start Experiment. If any of the saved commands fail, you will be alerted in the statusbar. You either need to modify them so they work (test by using the Execute Command button) or simply delete them. Once all commands are able to execute properly, you will see the following window when you click Start Experiment:

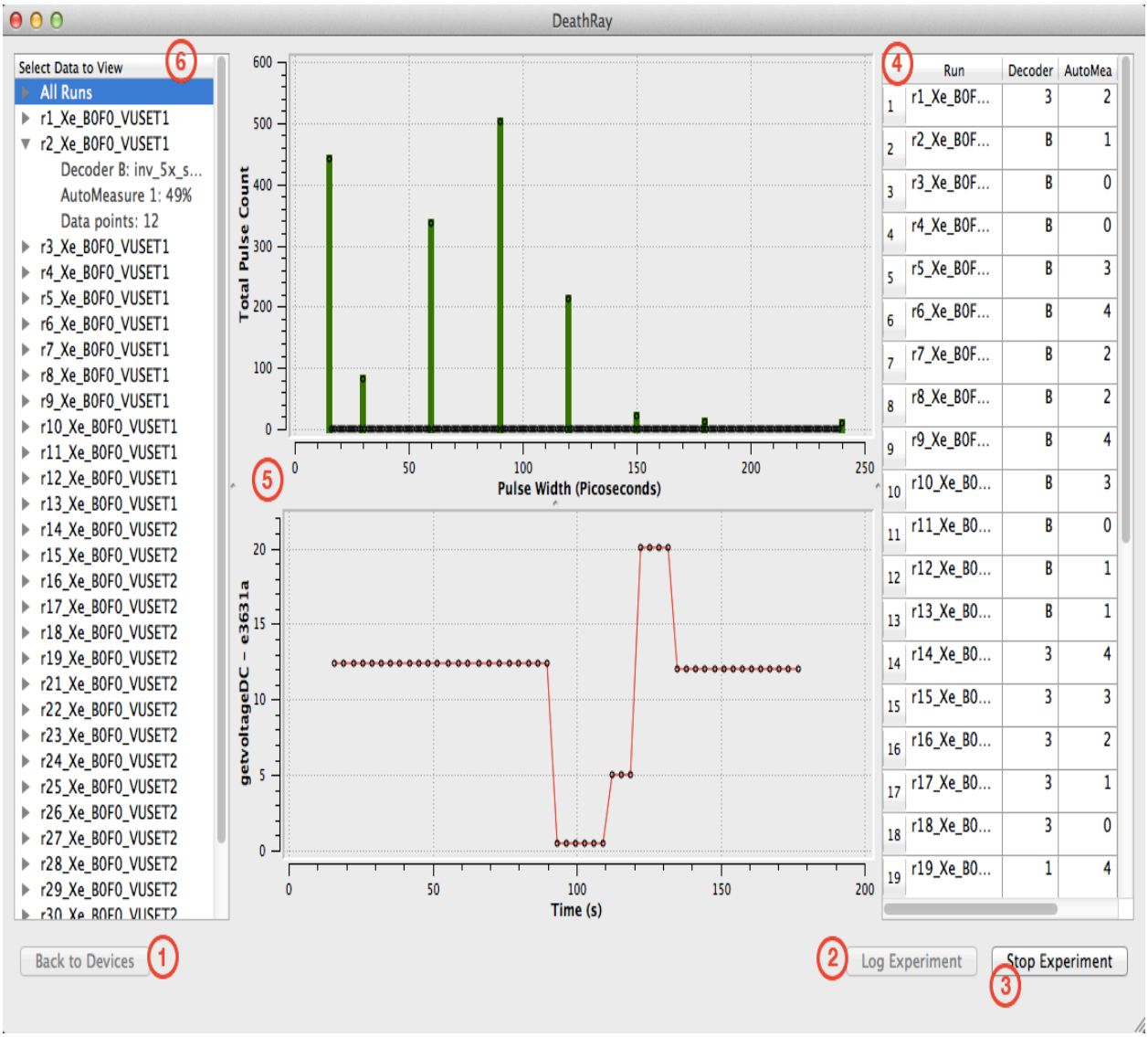

Figure 6: Analysis Window

This is where you can monitor the progress of your experiment and the present state of your devices.

Button (1) should be enabled if everything is working properly. It will re-display the device control window and allow you access to the devices. Stop Experiment (3) will stop polling the devices and stop displaying new information for all the GPIB devices. It will not however stop the FPGA from updating it's files as that is out of DeathRay's control. Once Stop Experiment is clicked you will be able to use button (2) to log your experiment data if you did not decide to do this previously. You must log data before you quit DeathRay or it will be lost forever.

Panels (6) and (4) will only be shown if an FPGA script was previously

selected. Panel (6) allows you to select from the many plottable datasets that are presented by an FPGA script. Panel (4) displays the datatable defined by the FPGA script.

Section (5) is where all the plots are drawn. Up to 4 plots may be displayed at once, and should be filled out in order. These plots will update live according to the user selected time interval and when the FPGA writes to a new file.