Getting Started with LabVIEW Vis for BE172

Introduction

Custom LabVIEW Virtual Instruments (VIs) provide the interface for controlling the computer hardware for most of the experiments. This guide will introduce you to the functions and features of the VIs through step-by-step instructions on how to acquire data, and make measurements with graph cursors.

Collecting a Time Series

Data acquisition for any experiment consists of four steps as outlined below:

1. Start the VI running in Labview
2. Configure Hardware Parameters
3. Acquire Data
4. Save Data

1) Start the VI

i.   Download the *LabVIEW* library named **Bioeng Lab.llb** using the instructions on the course Website. Click on the llb file to run the VI in Labview.

ii.   A window will pop up showing the VIs in the library. (The **ECG Waveform Generator.vi** is used only in the Biopotential lab. It is simple and self-explanatory. The remainder of this guide focuses on the **Data Acquisition.vi**.) Select Data Acquisition.vi and click **OK**. You will be presented with the following panel

The VI will automatically be running, you do not need to click on the arrow, red stop or pause in the very top strip at any time.

2) Configure Hardware Parameters

    i.   The default **Acquisition Time** and **Sampling Rate** should are 3 sec. and 1000 samples/sec., these can be adjusted as needed.

    ii.   Enter calibration parameters determined in your experiment for the appropriate channel(s). These settings will provide offsets and conversions in the output data file.

3) Acquire Data

Acquisition starts immediately after the green **START** button is pressed and lasts for the length of the specified time. The acquired data will be displayed on the graph, but not saved until step 4.

4) Saving Data

    i.   If you wish to include some comments/notes (e.g., experimental conditions of the trial) together with the data, enter them in the **Comments/Notes** box. The text in this box will be saved in the header of the output data file.

    ii.   Click on the **Save to File** button. Browse to the desired location, give a filename when prompted and click **Save**.

A sample output file is shown below. Note that all the configuration parameters are included in the header. These are useful for subsequent data analysis.
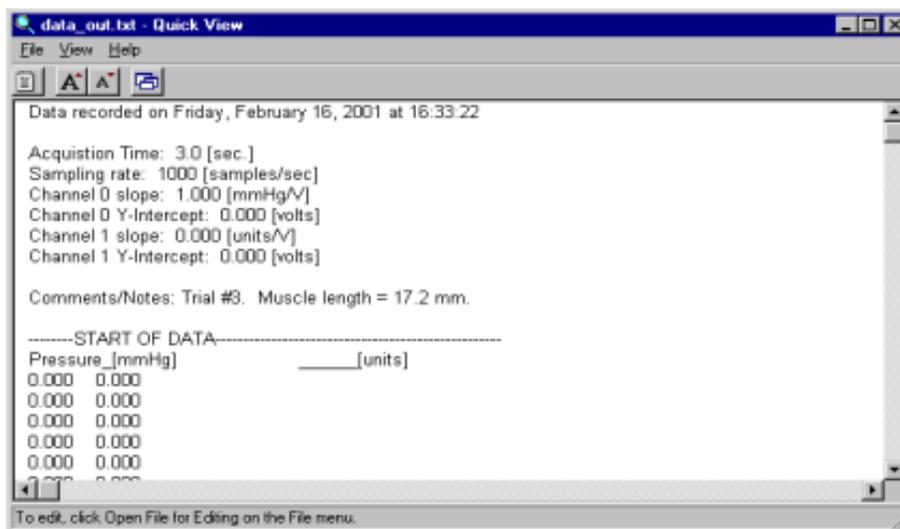

Note that only y data is saved in the output file, x data (time) needs to be calculated as needed.

Graph Cursors, Making Measurements

The acquired data is plotted on the graph of the panel. Usually, you want to look at only a portion of the acquired sequence. This section describes the tools available for controlling the view of the graph and how to use cursors for making measurements from the screen display.
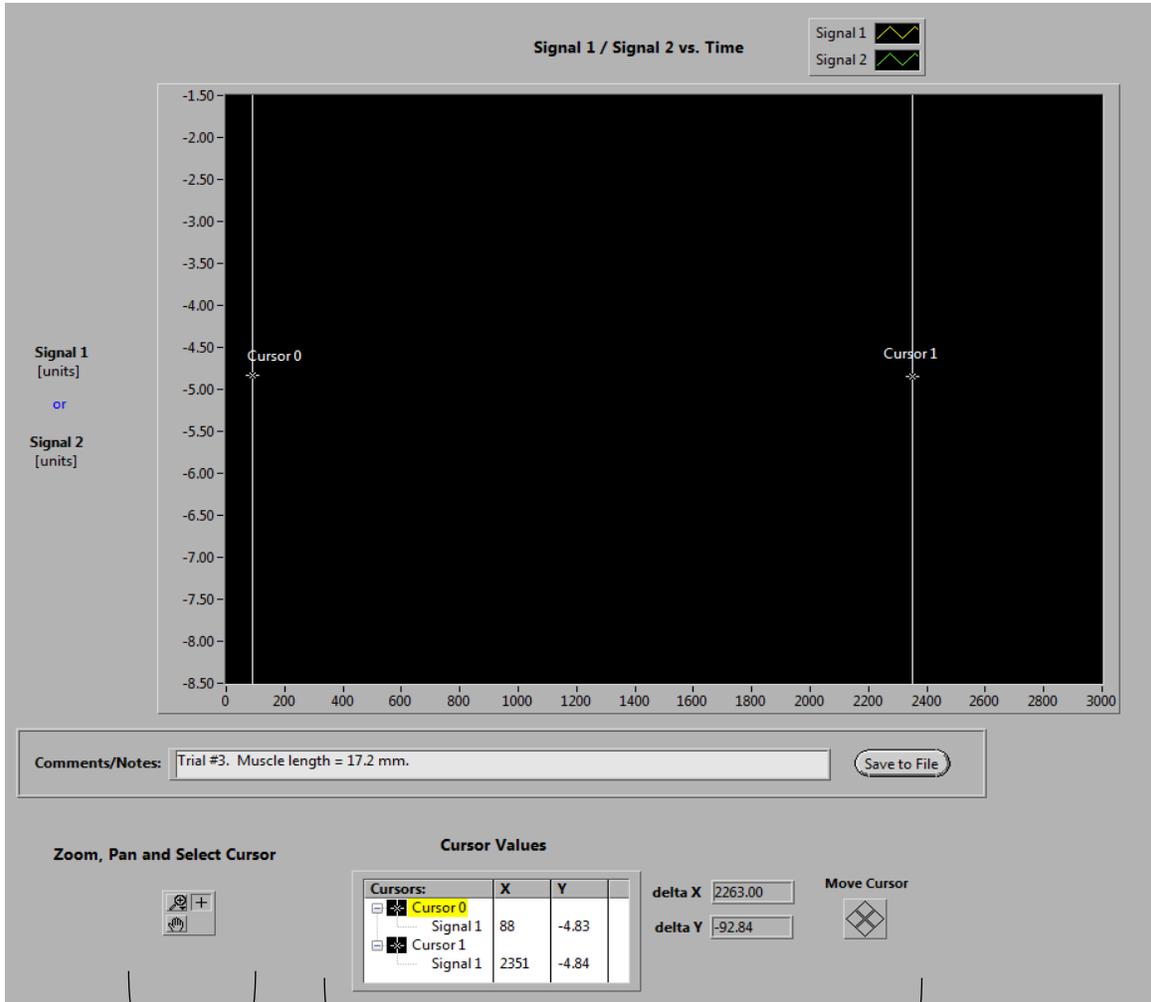
Graph Palette   Cursor Display

Graph Pallete

The tools in the Graph Palette allow for panning and zooming. They are accessed by clicking one of the three options show above. These tools are explained below

Cursor Tool

For normal operation, this tool should be selected. In this mode, you can click on the graph, move the cursors, and swap the cursor lock channel (move the cross-hair).

Panning Tool

Switches to a mode in which you can scroll the visible data by clicking and dragging the plot area of the graph.

Zoom Tool

There are six zoom modes:

Zooming by Rectangular Region. The new view is defined by the selected region. Click-and-drag the mouse cursor to specify the desired region.

Zoom by Time Segment. The new x-axis limits are defined by the selected region; the y-axis limits remain unchanged. Click-and-drag the mouse cursor to specify the desired region.

Zoom by Amplitude Segment. The new y-axis limits are defined by the selected region; the x-axis limits remain unchanged.

Undo Last Zoom. Resets the graph to its previous setting.

Zoom in about a Point. If you hold down the mouse button on a specific point, the graph continuously zooms in until you release the mouse button.

Zoom out about a point. If you hold down the mouse button on a specific point, the graph continuously zooms out until you release the mouse button.

Cursor Values

Cursor Values

Cursors:	X	Y			
⊟ Cursor 0				delta X	2263.00
Signal 1	88	-4.83		delta Y	-92.84
⊟ Cursor 1					
Signal 1	2351	-4.84			

Move Cursor

This window shows the current X and Y values of the 2 cursors and the difference (delta X/Y) between the 2 cursors. Move cursor control is for fine movements.