Exercise: Introduction to the LabVIEW Environment

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Overview

This exercise will go over the components of the LabVIEW Environment. You will be able to see how the Front Panel interacts with the Block Diagram. You will walk through a series of instructions that will introduce you to changing properties of LabVIEW as well as controls, indicators, and functions.

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Goal

Understand the basic components of the LabVIEW environment and learn the elementary concepts of graphical programming.

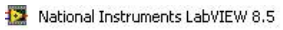
Description

This exercise consists of a series of tasks in which will walk you through launching the LabVIEW environment, changing various options, creating a simple virtual instrument, running the virtual instrument, and using the example finder found in LabVIEW.

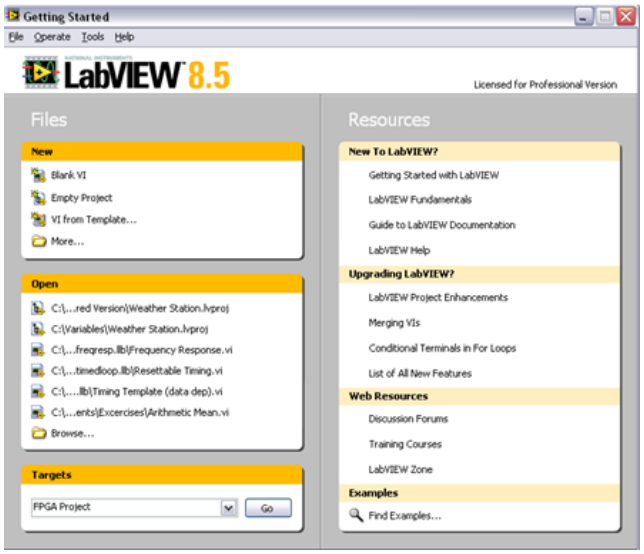
Introduction to the LabVIEW Environment

1. Launch LabVIEW.

   From the start menu, click the **Labview 8.5** program to launch LabVIEW.

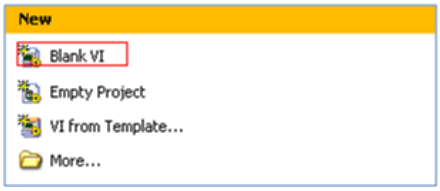


2. Wait for the splash screen to occur and the **Getting Started** menu to be displayed.



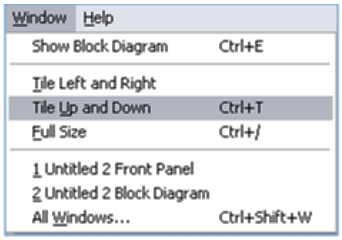
3. Create a blank VI.

   Click **New»Blank VI**



4. Display both the front panel and the block diagram.

   In the window labeled **Untitled 1 Front Panel**, navigate to and select **Tile Up and Down** to concurrently display both the front panel and block diagram on the screen.

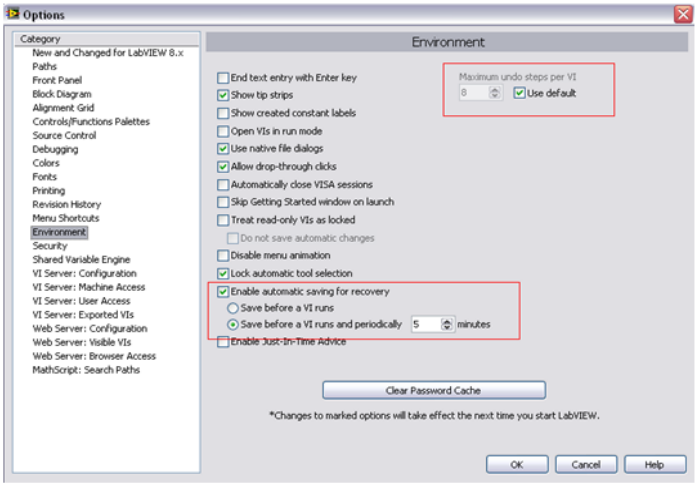


5. Customize the options in LabVIEW.

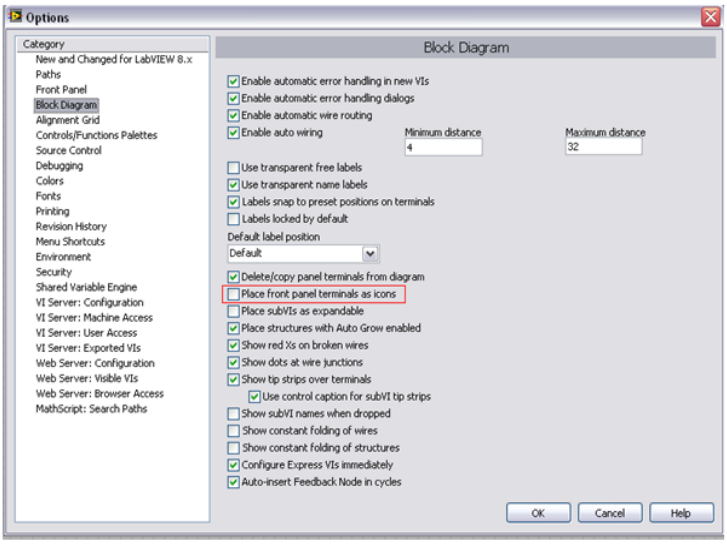
   Navigate to and select **Tools»Options** to bring up the Options window for LabVIEW.

Click on the **Environment** submenu. In this menu, there are going to be a few settings of interest:

- **Maximum undo steps per VI** – This option sets the maximum amount of “undo” steps the user can make for each individual vi. This number can be increased if the user desires and the physical memory on the system allows it.
- **Automatic Saving Settings** – This option sets how LabVIEW auto saves the current project. This can be adjusted to your preferences.



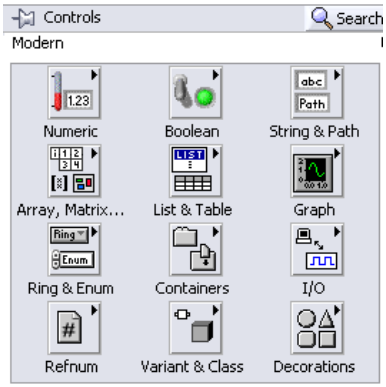
Next click on the **Block Diagram** submenu on the left. In this options menu, one useful option to note is the **Place front panel terminal as icons**. Many people prefer this option to be disabled as it cleans up the block diagram and makes front panel elements easier to read on the block diagram.



Close the options menu by clicking **OK**.

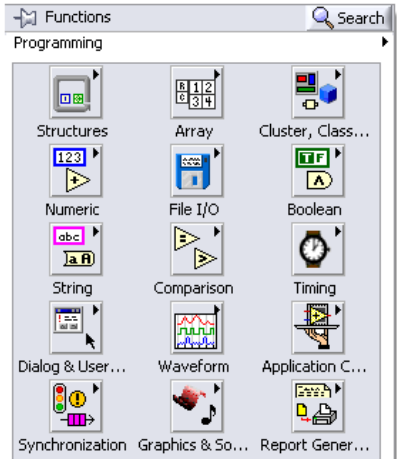
6. Create a **Numeric Control** on the front panel.

Right click anywhere within the front panel. This brings up the controls palette with all of the available controls.
Select **Modern»Numeric»Numeric Control** from the controls palette and then click on an empty space on the front panel. Notice how an element also appears on the block diagram that corresponds to the control.

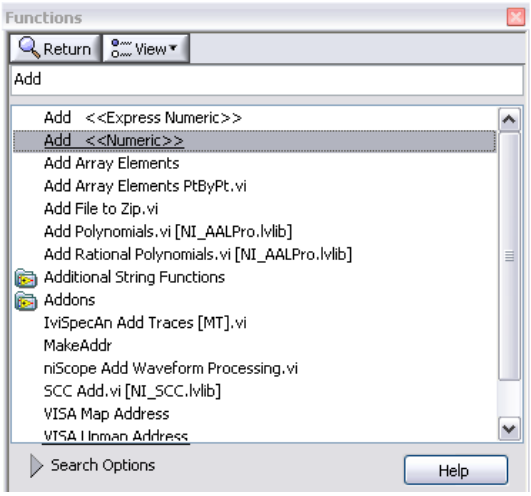


7. Use the **Search** feature to place an **Add** function on the block diagram.

Right click anywhere on the block diagram. This brings up the functions palette with all of the available functions. To place a function on the block diagram click the function on the functions palette and then click on an empty space on the block diagram.



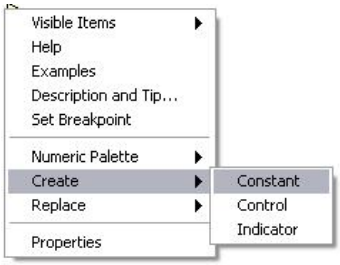
To search for a specific function within the functions palette, click the **Search** button on the functions palette. This brings up the search window. In the search field type “Add”.



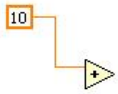
Place the **Add <<Numeric>>** function on the block diagram. This can be done by dragging the search result directly from the search window to the block diagram.

8. Create a constant input for the **Add** function with representation **I32**

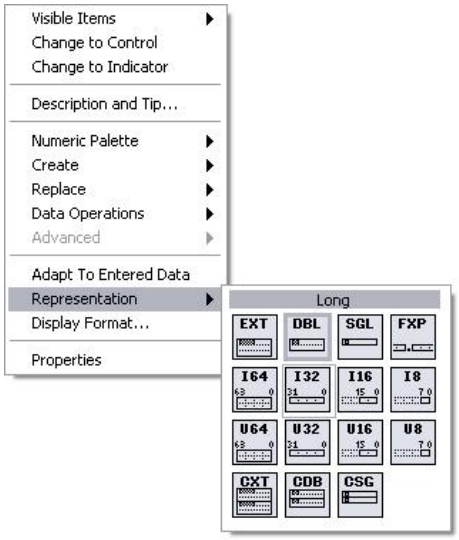
Right click the first input of the **Add** function and select **Create»Constant.**



Give the constant a value of **10**.
Move the control to a different part of the block diagram by clicking and holding it, and then dragging it to a different location.

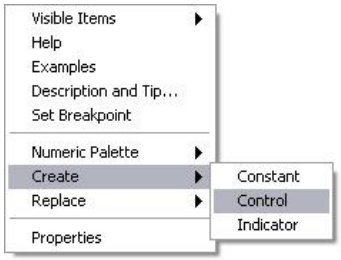


Right click the constant and select **Representation»I32.** This changes the numeric representation of the constant to a 32-bit integer, also known as a **long**.

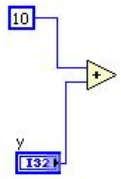


9. Create a control for the second input of the **Add** function.

Right click the second input of the **Add** function and select **Create»Control.**

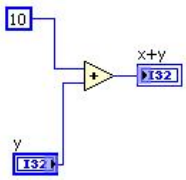


Move the control to a different position of the block diagram by clicking and holding it, and then moving the mouse to an unused spot in the block diagram.



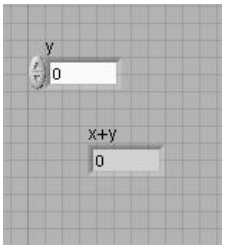
10. Create an indicator output for the **Add** function.

    Right click the output of the **Add** function and select **Create»Indicator**. Notice how the representation of the output matches that of the input terminals.

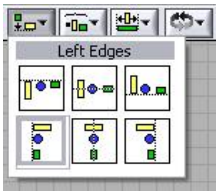


11. Left align the elements on the front panel

    Move the **Numeric Indicator** below the **Numeric Control** as seen below by clicking and holding the **Numeric Indicator** and dragging it below the **Numeric Control**.

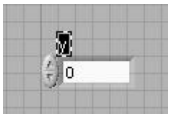


Highlight both elements and then select **Left Edges** from the **Align Objects** menu.

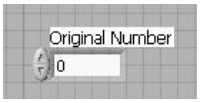


12. Rename the control and indicator on the front panel.

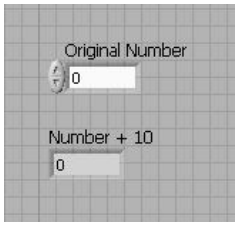
    Double click the "y" text label of the numeric control to select the text.



With the keyboard, type "Original Number" to change the name of the control.

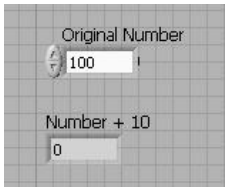


Repeat this process for the **Numeric Indicator.** Name the indicator "Number + 10".



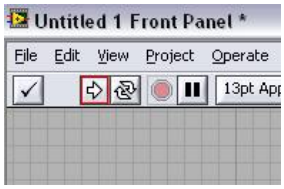
13. Give a value of **100** to the **Original Number** control.

    On the front panel, double click the number box of the **Original Number** control and type in a value of **100**.



14. Run the VI.

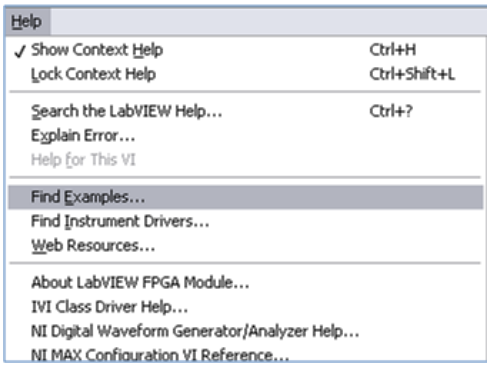
    Click the **Run** button on the toolbar of the front panel.



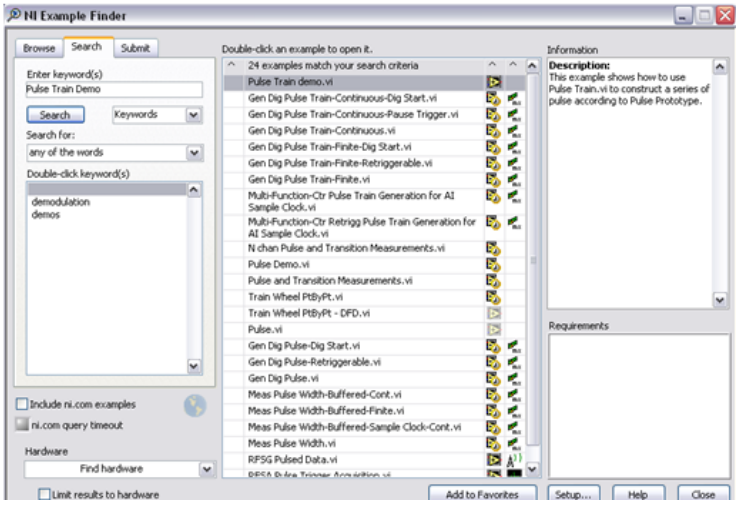
    Observe how the VI takes the number from the **Original Number** control and add the constant's value of **10** to it. It then displays the result in the **Number + 10** indicator.

15. Use the **Example Finder** to find a simple pulse train example.

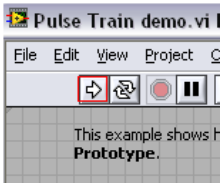
    To access the NI Example Finder, navigate to **Help»Find Examples...** of either the block diagram or the front panel.



    This brings up the **Example Finder**. The example finder contains a database of example VIs written by National Instruments. Click on the **Search** tab. In the search field type “Pulse Train Demo”. Double click the first result to bring up the example VI.

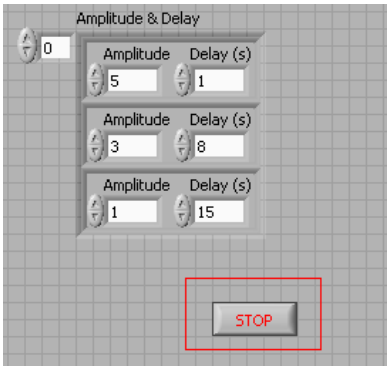


    On the front panel of the example that opens click the run panel to start the VI.



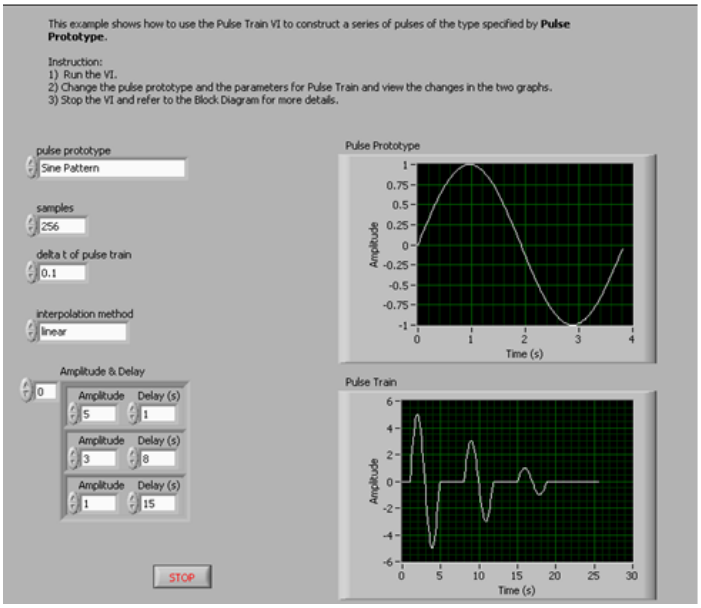
Observe how a waveform graph is generated based off of the options on the front panel.

Click the **STOP** button on the front panel.



Change the “pulse prototype” option to “Sine Pattern” by clicking the up arrow on the control.

Run the VI again and observe the generated Sine Wave.



16. Close both VIs and do not save changes.

END OF EXERCISE
