

Exercise 2, Mon 14.11.

Problem1.

Do the Chapter 2 from the Getting started with LabVIEW -document.

-Return the VI you saved.

Problem2.

Practice with editing.

In this exercise you will edit and modify an existing VI to look like the panel shown in Figure 4.24. After editing the VI, you will wire the objects in the block diagram and run the program.

1. Open the Editing VI by choosing **Open** from the **File** menu

The front panel of Editing VI contains a number of objects depicted in Figure 4.25. The objective of this exercise is to make the front panel of the Editing VI look like the one shown in Figure 4.24.

2. Add an owned label to the numeric control using the **Positioning** tool by right-clicking on the numeric control and selecting **Visible Items»Label** from the menu. Type the text **Temperature offset** inside the bordered box and click the mouse outside the label or click the **Enter Text** button on the left-hand side of the toolbar.

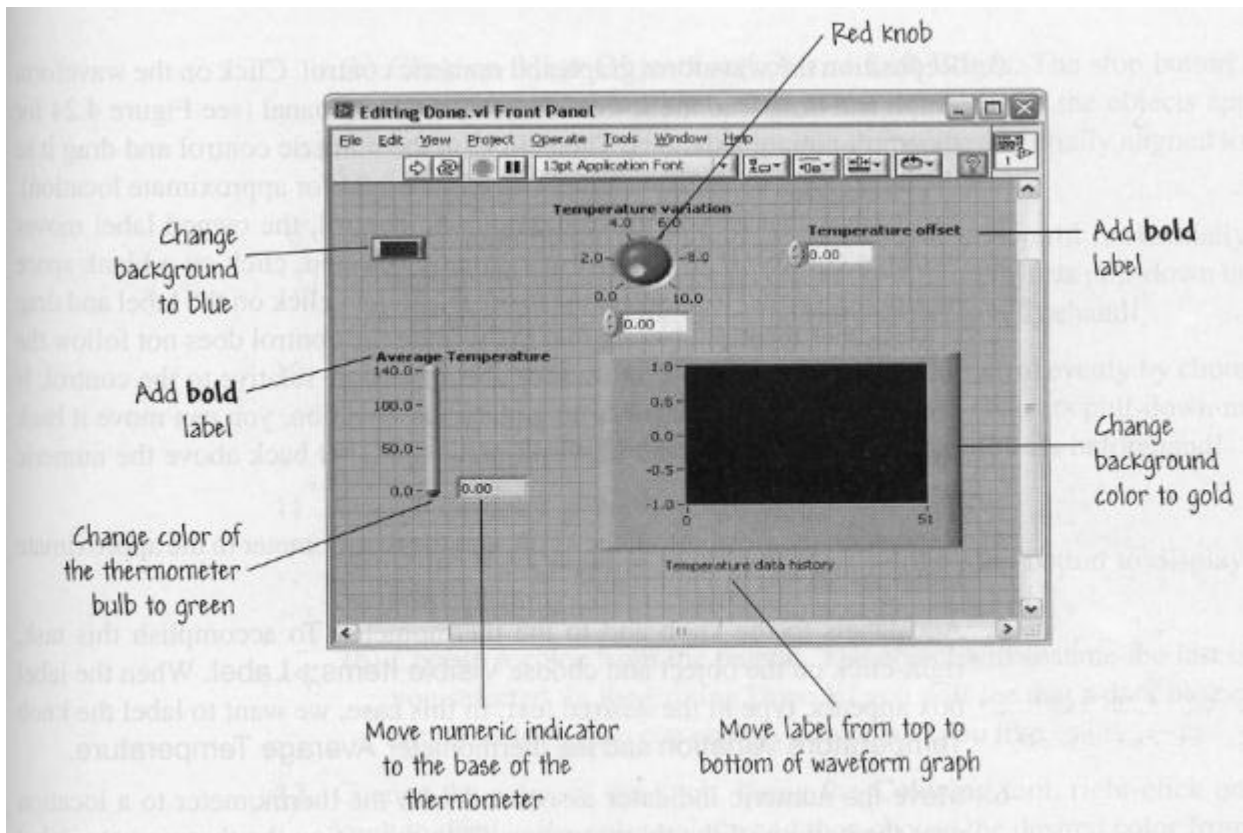


FIGURE 4.24
The front panel for the Editing VI

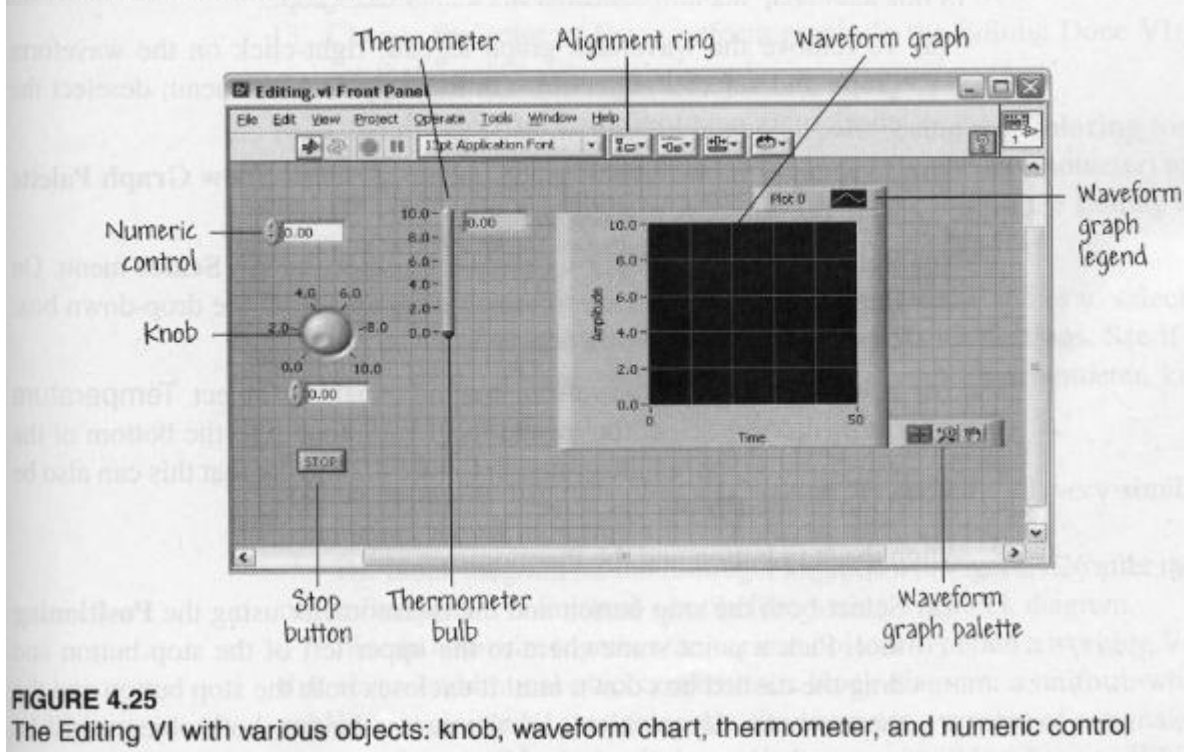


FIGURE 4.25
The Editing VI with various objects: knob, waveform chart, thermometer, and numeric control

3. Reposition the waveform graph and numeric control. Click on the waveform graph and drag it to the lower center of the front panel (see Figure 4.24 for the approximate location). Then click on the numeric control and drag it to the upper right of the front panel (see Figure 4.24 for approximate location).

Notice that as you move the numeric control, the owned label moves with the control. If the control is currently selected, click on a blank space on the front panel to deselect the control and then click on the label and drag it to another location. Notice that in this case the control does not follow the move. You can position an owned label anywhere relative to the control. If you move the owned label to an undesirable location, you can move it back by selecting **Edit»Undo Move** to place the label back above the numeric control.

4. Reposition the stop button, the knob, and the thermometer to the approximate locations shown in Figure 4.24.
5. Add labels to the knob and to the thermometer. To accomplish this task, right-click on the object and choose **Visible Items»Label**. When the label box appears, type in the desired text. In this case, we want to label the knob **Temperature variation** and the thermometer **Average Temperature**.
6. Move the numeric indicator associated with the thermometer to a location near the bottom of the thermometer. Then reposition the thermometer label so that it is better centered above the thermometer (see Figure 4.24).
7. In this next step, we will reformat the waveform graph.
 - (a) To remove the waveform graph legend, right-click on the waveform graph and select **Properties**. On the **Appearance** menu, deselect the check mark next to **Show Plot Legend**.
 - (b) To remove the waveform graph palette, deselect **Show Graph Palette** from the **Appearance** menu.
 - (c) Remove the waveform *x*-axis scale by selecting the **Scales** menu. On the **Scales** menu, be sure to select the *x*-axis from the drop-down box. Deselect the **Show Scale** option.
 - (d) Add a label to the waveform graph—label the object **Temperature data history**. Select the owned label and move it to the bottom of the waveform graph, as illustrated in Figure 4.24. Note that this can also be done on the **Properties** screen.
8. Align the stop button and the thermometer.
 - (a) Select both the stop button and the thermometer using the **Positioning** tool. Pick a point somewhere to the upper left of the stop button and drag the dashed box down until it encloses both the stop button and the thermometer. Upon release of the mouse button, both objects will be surrounded by moving dashed lines.

- (b) Click on **Align Objects** and choose **Left Edges**. The stop button and the thermometer will then align to the left edges. If the objects appear not to move at all, this indicates that they were essentially aligned to the left edges already.
9. Align the stop button, the knob, and the numeric control horizontally by choosing the **Vertical Centers** axis from the **Align Objects** pull-down menu in the toolbar. Remember to select all three objects beforehand!
10. Space the stop button, the knob, and the numeric control evenly by choosing the **Horizontal Centers** axis from the **Distribute Objects** pull-down menu in the toolbar. Again, remember to select all three objects beforehand!
11. Change the color of the stop button.
 - (a) Using the **Coloring** tool, right-click on the stop button to display the color palette.
 - (b) Choose a color from the palette. The object will assume the last color you selected. In the Editing Done VI you will see that a dark blue color was selected—you can choose a color that you like.
12. Change the color of the knob. Using the **Coloring** tool, right-click on the knob to display the color palette and then choose the desired color from the color palette. In the Editing Done VI you will find that a red/pink color was selected—you can choose a color that suits you.
13. Change the color of the waveform graph. In the Editing Done VI you will see that a gold color was selected.
14. Change the color of the thermometer bulb. Using the **Coloring** tool, right-click on the thermometer bulb (at the bottom of the thermometer) to display the color palette and then choose the desired color. In the Editing Done VI you will find that a green color was selected.
15. Change the font style of the owned labels. Use the cursor to select each of the labels and then select **Style»Bold** from **Text Settings**. See if you can do this for all three of the owned labels at once: thermometer, knob, and numeric control.

At this point, the front panel of the Editing VI should look very similar to the front panel shown in Figure 4.24.

The block diagram for the Editing VI is shown in Figure 4.26 after the editing of the front panel is finished—but before wiring the block diagram.

We can now wire together the various objects to obtain a working VI. Notice that several additional objects are on the block diagram: a uniform white noise subVI, a mean subVI that computes the mean (or average) of a signal, a While Loop, and an Add function. In later chapters, you will learn to use While Loops

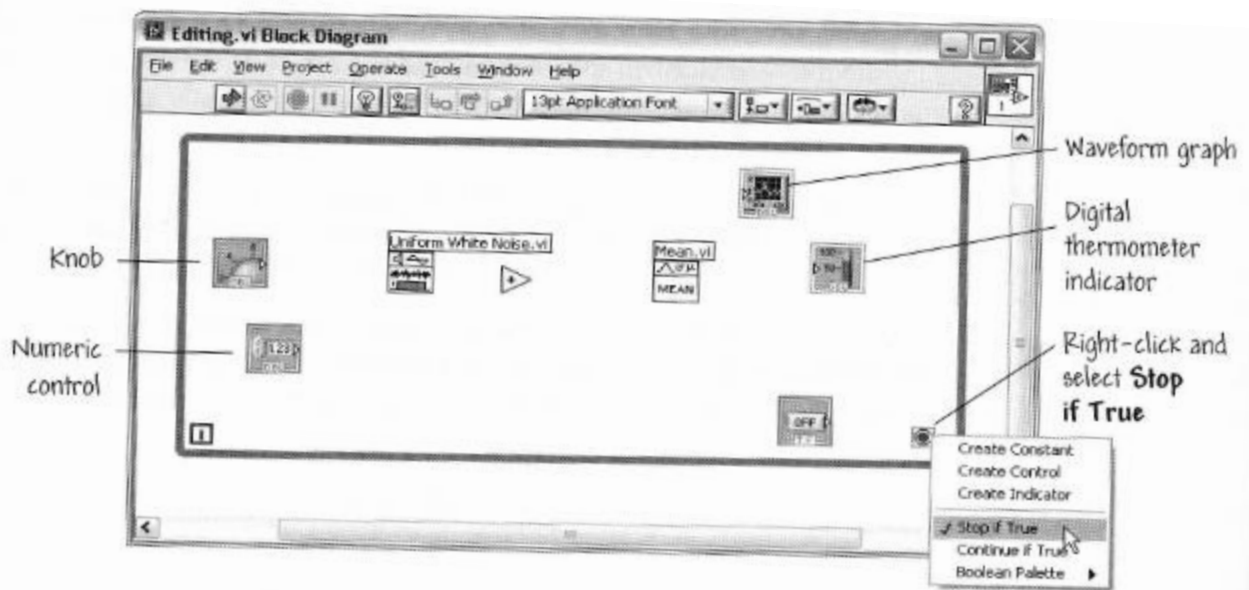


FIGURE 4.26
The block diagram for the Editing VI—before wiring

and learn how to use preexisting subVIs packaged with LabVIEW. For instance, the **Uniform White Noise.vi** is located on the **Functions** palette under the **Signal Processing** » **Signal Generation** subpalette.

Go ahead and wire the Editing VI block diagram so that it looks like the block diagram shown in Figure 4.27. If you run into difficulties, you can open and examine the block diagram for the Editing Done VI (which can be found in Chapter 4 of the Learning directory).

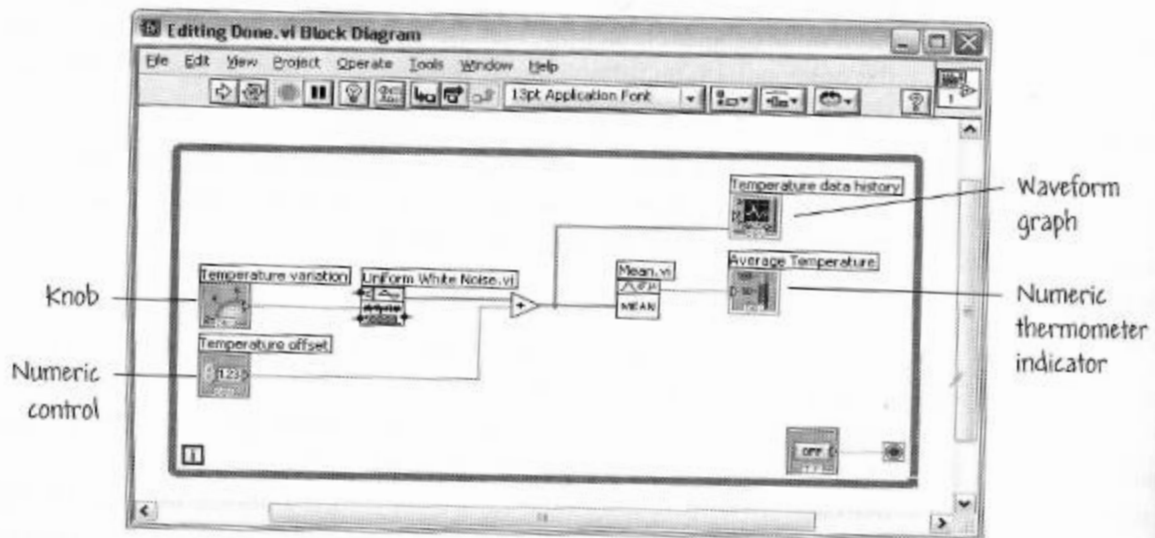


FIGURE 4.27
The block diagram for the Editing Done VI—after wiring

A few wiring tips:

1. To wire the objects together with the **Wiring** tool, click and release on the source terminal and drag the **Wiring** tool to the destination terminal. When the destination terminal is blinking, click and release the left mouse button.
2. To identify terminals on the Add function, right-click on the icon and select **Visible Items»Terminal** to see the connector. When the wiring is finished, right-click again on the function and choose **Visible Items»Terminal** to show the icon once again.
3. To bend the wires as you connect two objects, click with the left mouse button on the bend location with the **Wiring** tool.

After you have finished wiring the objects together, switch to the front panel by selecting **Show Front Panel** from the **Window** menu. Use the **Operating** tool to change the value of the front panel controls. Run the VI by clicking on the **Run** button on the toolbar.

The **Average Temperature** indicator should be approximately the value that you select as the **Temperature offset**. The amount of variation in the temperature history, as shown on the **Temperature data history** waveform graph, should be about the same as the setting on the **Temperature variation knob**.

When you are finished editing and experimenting with your VI, save it by selecting **Save As** from the **File** menu. Remember to save all your work in the **Users Stuff** folder in the **Learning** directory. Close the VI by selecting **Close** from the **File** menu. ◆

-Return the saved VI

Problem3.

Practice with Debugging. Open the Using Supplied Probes.vi and experiment with the probes as instructed in the Block Diagram (You can find the VI also from Help >> Find Examples >> Fundamentals >> Debugging >> Using Supplied Probes.vi). Note that you can add Probes to the block diagram even if the VI is running. Try different conditional breakpoints in the Condition terminal of the Probe Watch Window. When Condition

breaks the execution of the VI you can continue with the Pause button which has now turned red .

-You don't need to return anything from this exercise.