Exercise 4-4 Improve Application Usability

Goal

Customize the user interface to improve its usability.

Scenario

The product owner is finally ready to implement the user interface feedback that the customer representative provided after viewing the user interface prototype.

- Launch the front panel of `Boiler.vi` as a separate window.
- Customize the run-time window appearance to look less like LabVIEW.
- The **Fuel Control Valve** control is not very intuitive. Either customize its appearance or replace it with a different type of numeric control.
- Reorganize the UI to more logically group controls.
- Create a custom run-time menu to stop the application or load the Help file.

Implementation

1. Update the Boiler VI so that it launches as a separate window.

   ☐ Open **Boiler.vi** from **Boiler.lvlib** in the **Project Explorer** window.

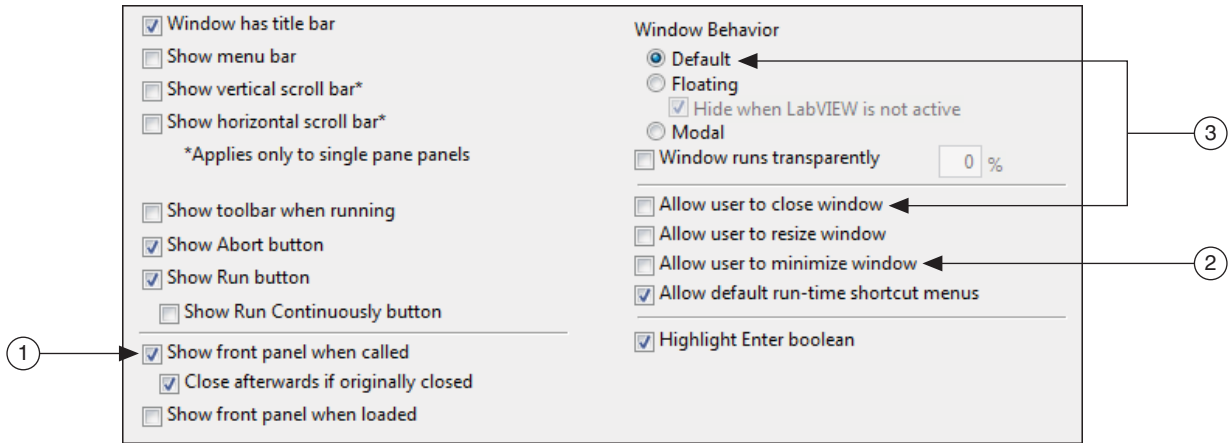
   ☐ Select **File»VI Properties** from the menu and select **Window Appearance** from the **Category** pull-down menu.

   ☐ Uncheck the **Same as VI name** checkbox and enter `Boiler` in the Window title field.

   ☐ Select the **Dialog** radio button.

   ☐ Click the **Customize** button and update the **Customize Window Appearance** dialog box as shown in Figure 4-28.

Figure 4-28. Customize Window Appearance Dialog Box for Boiler VI



1 Note that the front panel displays when the Boiler VI is called and closes when the Boiler VI finishes executing.

2 The user does not have the ability to minimize or resize the Boiler VI window.

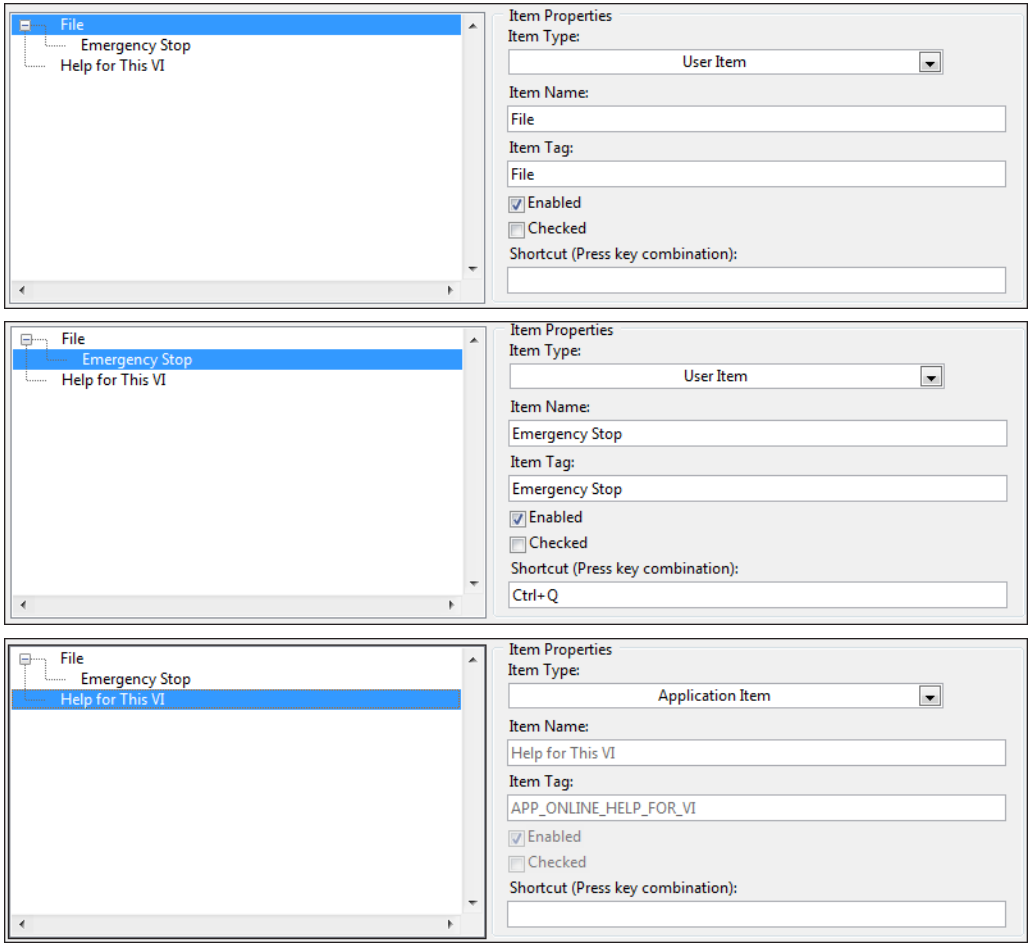
3 Select **Default** as the **Window Behavior** and remove the checkmark from the **Allow user to close window** checkbox.

- ☐ Click **OK** to accept changes in the **Customize Window Appearance** and **VI Properties** dialog boxes.
- ☐ Save and close the Boiler VI.
- ☐ Run the Main VI to view the result of these changes.

2. Customize the run-time window appearance of Main VI so that it looks less like a LabVIEW dialog box.
   - ☐ Open **Main.vi** from the **Project Explorer** window.
   - ☐ Select **File»VI Properties** from the menu and select **Window Appearance** from the **Category** pull-down menu.
   - ☐ Uncheck the **Same as VI name** check box and enter `Boiler Controller` in the Window title field.
   - ☐ Select the **Top-level application window** radio button.
   - ☐ Click **OK** to accept changes in the **VI Properties** dialog boxes.
   - ☐ Run the Main VI to view the changes to the UI when executing as a top-level application window.
3. Create a custom run-time menu to stop the application and load the Help file.
   - ☐ In the Main VI select **Edit»Run-Time Menu** from the LabVIEW menu.
   - ☐ In the **Menu Editor** dialog box, select **Custom** from the pull-down menu.

☐ Add menu items as shown in Figure 4-29.

Figure 4-29. Custom Run-Time Menu for the Main VI



☐ Select **File»Save** and save the custom menu as `Main.rtm` in the `<Exercises>\LabVIEW Core 3\Course Project` directory.

☐ Close the menu editor.

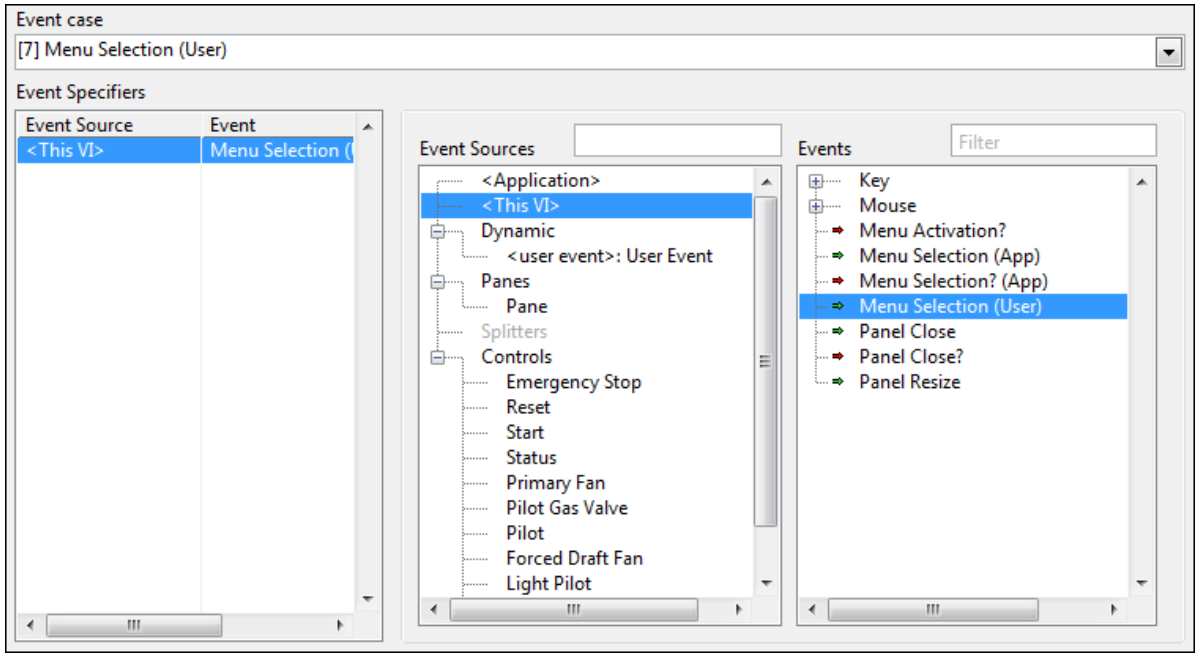
☐ Click **Yes** when prompted to change the run-time menu.

4. Modify the EHL to include an event case for menu selection.

   ☐ In the EHL, right-click the Emergency Stop: Value Change event and select **Duplicate Event Case** from the shortcut menu.

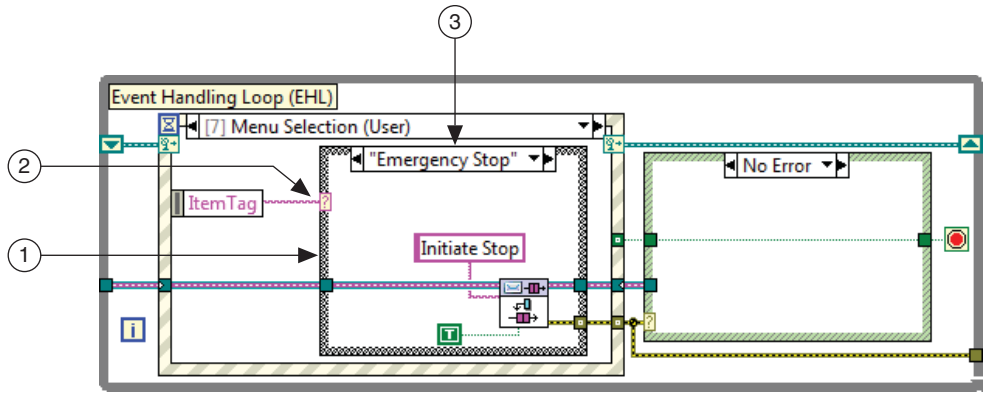
   ☐ Add a new event to the EHL Event structure as shown in Figure 4-30.

Figure 4-30. Menu Selection Event for the EHL



□ Modify the event as shown in Figure 4-31 and Figure 4-32.

Figure 4-31. Block Diagram for Menu Selection Emergency Stop Event

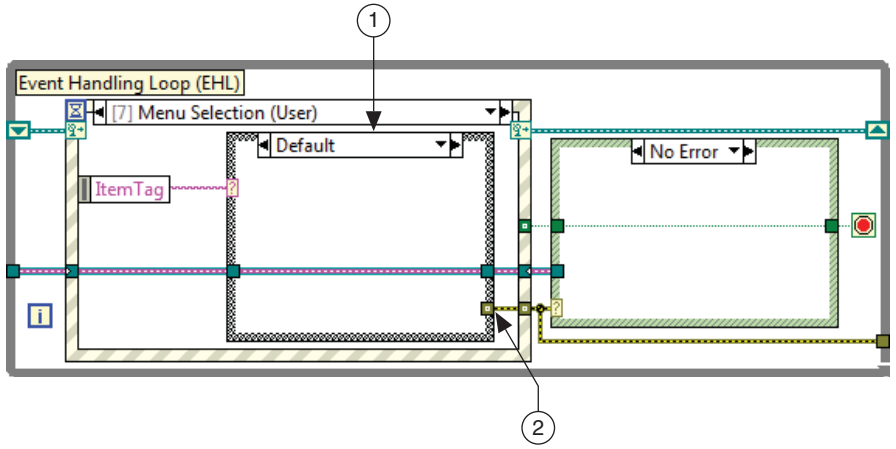


1 **Case Structure**—Place a Case structure around the Enqueue Message VI.

2 Wire **ItemTag** to the case selector. This case sends an Initiate Stop message to the MHL if the ItemTag is Emergency Stop.

3 Change the name to `Emergency Stop`.

Figure 4-32. Block Diagram for Menu Selection Default Event



1 Change the name of the default case to `Default`.

2 Right-click the tunnel and select **Use Default If Unwired** from the shortcut menu.

☐ Run the Main VI to test your changes.

Test the Application

Verify that previous functionality still works and that user interface events result in execution of the appropriate case in the boiler controller. There is no need to test the entire VI, since you've done that after each step of this exercise.

1. Update the build specification and test the new executable.

   ☐ Right-click the Main Application build specification and select **Build** from the shortcut menu.

   ☐ Click the **Explore** button when LabVIEW finishes the build.

   ☐ Double-click `Boiler Controller.exe` to run the application.

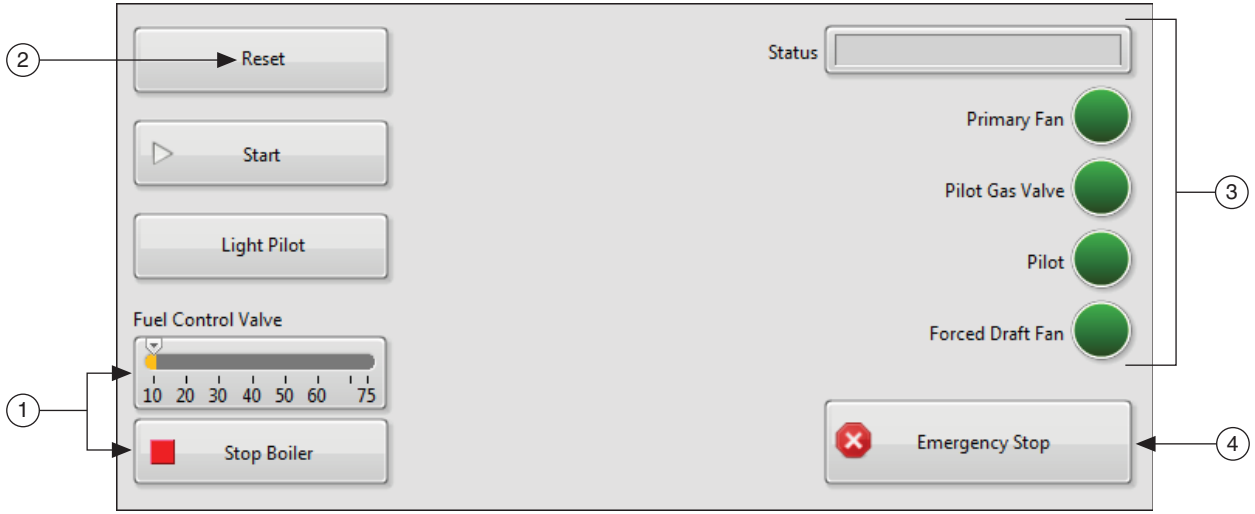
   ☐ Verify the previously implemented functionality.

- ☐ Verify the changes you made in this exercise.
  - Is the window appearance as expected?
  - Does the front panel of the Boiler VI appear when you run the Main VI?
  - Use the slider to change the value of Fuel Control Valve.
  - View the Help file from the menu.
- ☐ Verify that selecting **File»Emergency Stop** from the menu or pressing <Ctrl-Q> halt the application and close both windows.

Challenge

1. Reorganize the UI to more logically group controls as shown in Figure 4-33.

Figure 4-33. Reorganized Main VI Front Panel



1 Group these controls together because you only use them after the boiler is running.

2 Center-align the text for each Boolean button.

3 Right-justify all indicators.

4 Emergency Stop in the bottom-right fits the general expectation for the Stop buttons to be in the bottom-right corner of the window.

End of Exercise 4-4