Opendiem Training

Exercise 3

Opendiem-TRN-0003

Revision	5.0.0		
Status	Initials	Date	Comment
Released	RAC	11/18/2010	Updated format and content

Exercise 3 – Introduction to Opendiem Designer, Part II

Introduction

In Exercise 2 a new Opendiem Project was created and tag variables were displayed in a browser. This exercise utilizes the previously created project to further develop your understanding of various Opendiem Designer features.

Objective

In this exercise you will use Opendiem Designer developing on the previous exercise to create other Opendiem objects that change their properties in relation to device data. Later in the exercise device variables will be altered based on actions performed on Opendiem objects within the browser. On completion of this exercise you will be able to control and monitor any network variable using a variety of objects and formats.

Re-opening the project in Opendiem Designer

Exercise Instructions

From the Windows Start menu select the **Opendiem** folder and select the **Opendiem Designer** icon to run Designer.

If the Exercise 2 project appears in the history list, select it, otherwise select **Open Existing Project** and browse to the Exercise 2 project (`C:\Documents and Settings\Opendiem Server\My Documents\Opendiem\Training`). Enter the Opendiem Server IP address and click **Connect**. The Project Explorer will appear as before, expand the tree to reveal the tag variables. Your screen should look similar to the one below.

Before proceeding we will review some features of Designer designed to minimize data loss in the event of unexpected problems. From the Designer menu select **Tools | Options...** Select the **Advanced** tab and the dialogue shown below will appear.

The Advanced tab contains various options to help recover your project data.

Always create backup copy	When selected, Designer copies the previous version of a screen file as a backup copy every time you save the document. Each new backup copy replaces the previous backup copy. Designer saves the backup copy (with a filename extension .**oscreen0**) in the same folder as the original.
Save AutoRecover Information	When selected, if Designer is forced to terminate unexpectedly or for example you lose power then the next time Designer is started it will attempt to open the AutoRecover file. The AutoRecover file may contain unsaved information that would otherwise be lost from the original document.
AutoSave	Designer automatically saves the project at the interval specified in the box. The interval may be specified in increments of 1 minute.
Save Settings on Exit	Saves the current Designer settings when you shut down Designer.

Opendiem Objects

A Flood Fill Object

We will now add some native Opendiem Objects that change their properties based on the value of device data. First we will place a 'Flood Fill' object on the screen that will automatically fill an object with color proportional to the value of a network variable.

Flood Fill Example

First we will examine how the flood fill feature works and will then follow with an example.

Max Value 30°C ─────── 100 % Max % Fill

20°C ── 50% Fill

Min Value 10°C ─────── 0 % Min % Fill
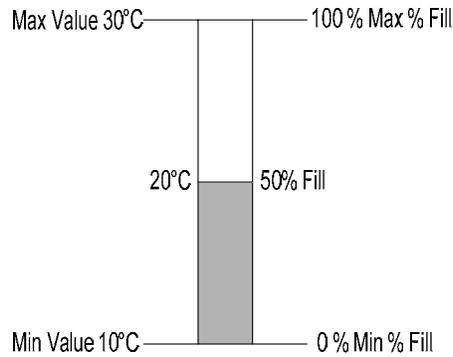
0% Min % fill maps to 10°C Min Value and 100% Max % fill maps to 30°C Max Value. This means that at 20°C the object is 50% flood filled.

Using the Flood Fill

From the Designer Toolbox select the Polygon Object tool.

Tip: By first selecting the Toolbox window and then hovering the mouse over each object a tool-tip will appear.

The first time that any tool is selected Designer shows a *Tips* help screen that provides brief instructions on how to use the particular tool. Click **OK** to remove the help screen.
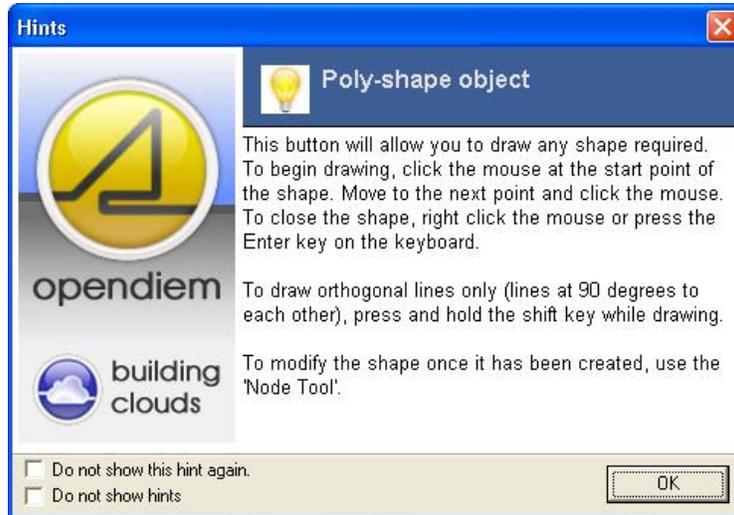
Move the cursor onto the drawing area and the cursor will change to a cross, click on the drawing area and drag out the shape of a rectangle, when you have drawn three sides of the rectangle click the right mouse button or press the **Enter** key on the keyboard and Opendiem Designer will automatically close the shape for you. You should now have a rectangle on the design screen. The Poly-shape Object allows you to create complex shapes, nodes may be added and deleted to create the shape required. Consult the Opendiem Designer Manual or the on-line help to obtain further information.

Tip: Holding down the **shift** key while dragging the line out forces the line to be orthogonal, i.e. at right angles to the X / Y axis.

If the Object Properties dialogue is not already visible click the right mouse button over the rectangle and on the drop down menu select **Properties (F4)**. Click on the **Colors** tab and then click on the **Fg** row 0 and select red from the popup palette so the screen looks like the one below.

Click on the **Flood** tab and in the **Max % Fill:** box enter '*100*' and in the **Max** box enter '*30*' representing the upper limit of 100%. In the **Min** box enter '10 ' representing the lower limit of 0%. The flood will now range between 0% for 10 to 100% for 30. The flood can be selected to be either vertical or horizontal.

 From the Project Browser select **any.tag** network variable and drag it onto the **Tag** box. The tag name will be automatically entered as shown below. Click on **OK**.
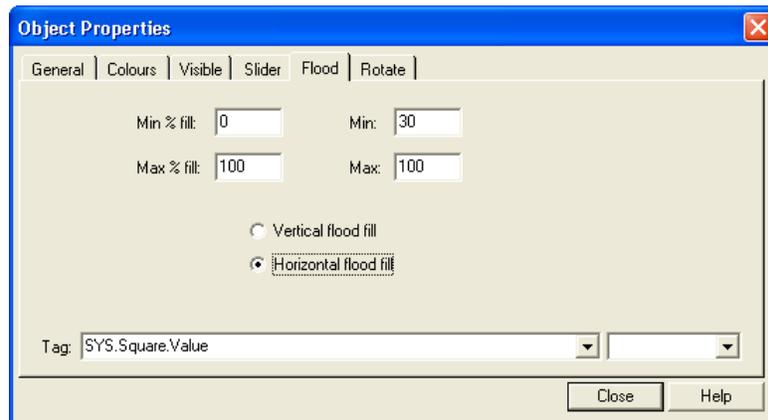
Viewing the result

Start the Web Browser and in the address enter the IP address or URL of the Opendiem Server. Select **Preview Screen on Client** from the icon and select the browser. Switch to the browser to view the results, which should be similar to the example below.

Engine   Connect   Designer

From the Toolbox add a Horizontal/Vertical Gauge and Text to provide scaling information as shown.

Tip: When adding the text for the gauge, create one entry and then right click and select **Duplicate** (or press **CTRL-D**). You can edit the text directly on the design page by double clicking on the text.
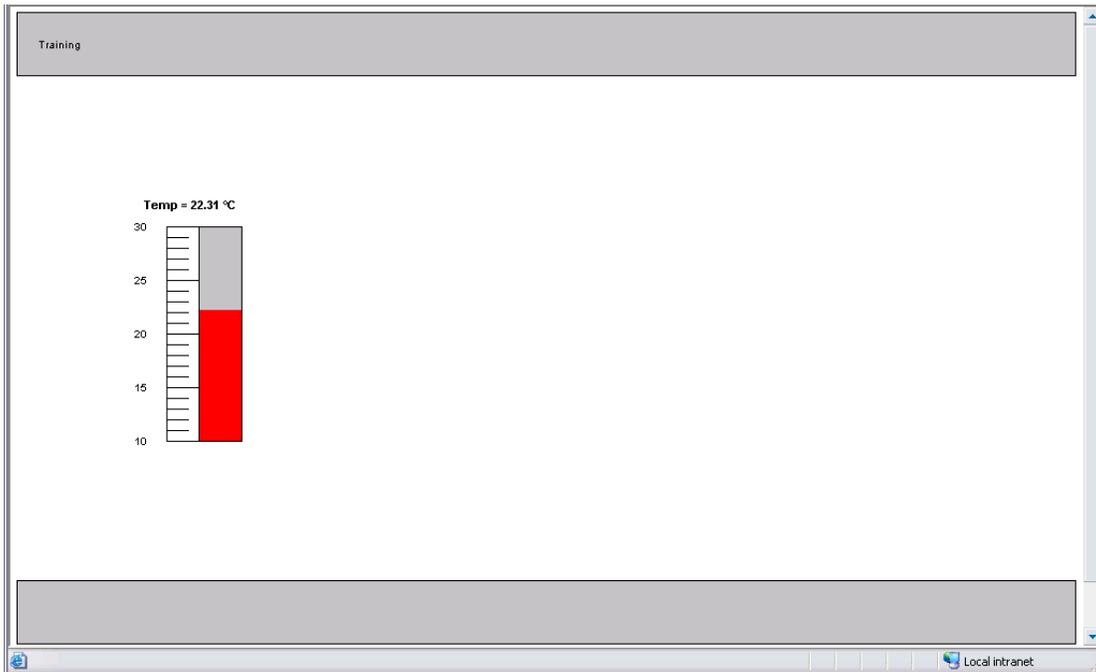
Designer has a zoom capability that is useful when working at fine resolutions. To zoom select the zoom level from the bottom right Zoom tab, or press and hold the CTRL-Shift keys while left clicking the mouse button to zoom in and CTRL-Shift right mouse button to zoom out

Fine positioning of an object can be achieved by using the keyboard cursor keys. Additionally, fine control of an objects size can be achieved by a combination of the **cursor** keys and the **Shift** and **Ctrl** keys. To increase an objects size press and hold the **Shift** key whilst pressing the **cursor** keys, conversely to shrink an object press and hold the **Ctrl** key whilst pressing the **cursor** keys.

Creating Control Objects

Opendiem objects may be used to control device variables; in the following examples we will create 'Click Action' objects that allow mouse actions to change network variable values from the browser and we will also create a direct keyboard entry control.

Engine   Connect   Designer

Adding a Spin Button Control

Hold down the **Shift** key on the keyboard and drag the a LNS network variable such as 'nviSetPoint' onto the Design Page, a **'%v'** symbol will appear on the design page, this is the placeholder for the setpoint value. Double click on the **'%v'** and type '**Setpoint'** in front of the placeholder. From the Object Properties select the **Style** tab and check the **Spin Dials** box to turn the text into a Spin Button control. Enter the minimum and maximum range for the value and specify an increment level. The size of the 'Spin Button' will be directly proportional to the area of the text control, size the control to give the desired button size. Your screen should be similar to the one below.
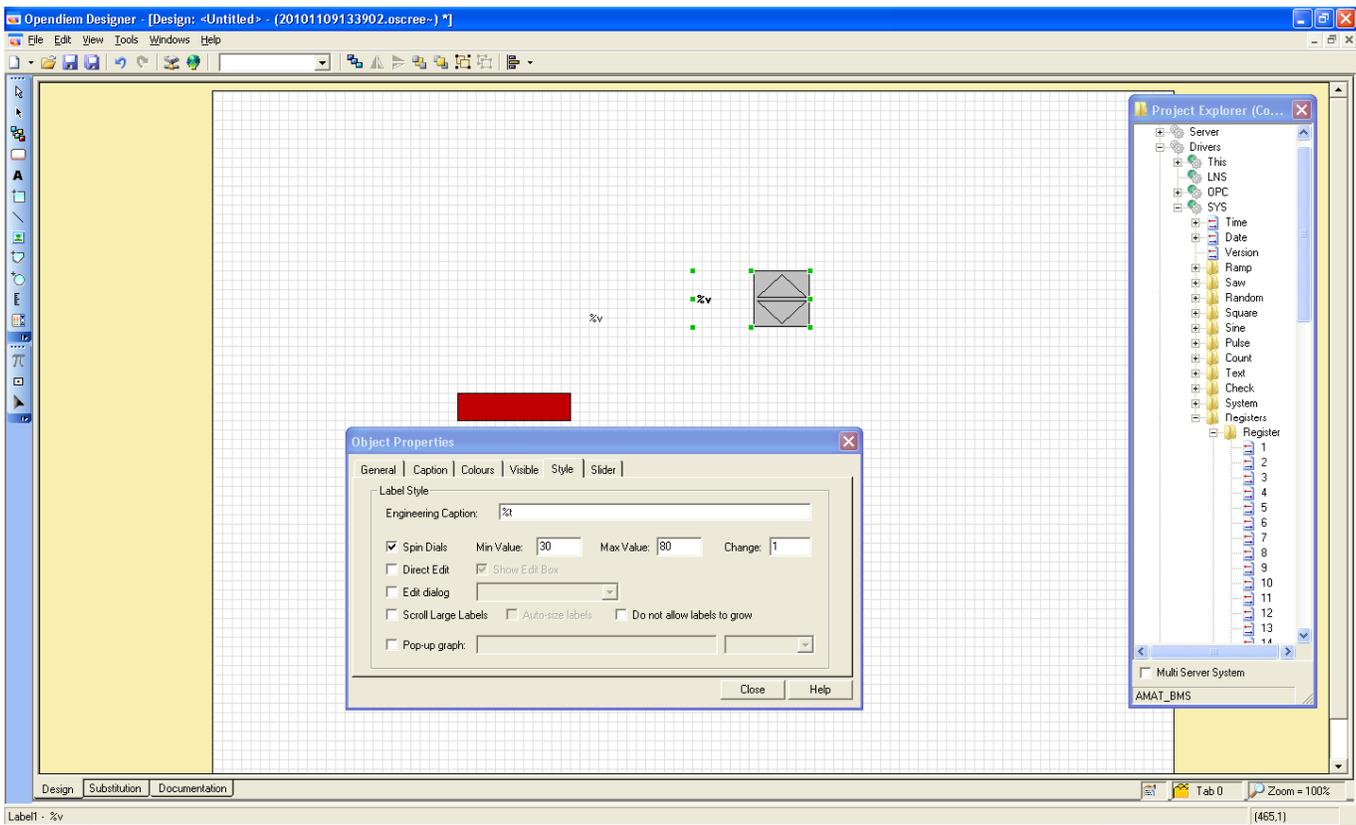
Preview the screen on the browser and verify that the setpoint control behaves as expected.

A spin button control with the **'%v'** removed from the caption provides a useful technique for controlling variables by greater amounts. Try duplicating the spin control and this time set the **Change** to 10 as shown below, the control will now allow quick editing of any value with a few clicks.

Engine   Connect   Designer

Adding a Direct Edit Control

It is also possible to provide the user with a direct keyboard entry control, using this feature the user can type any valid value into the edit box for rapid data entry.

From the Designer screen shown above select the **Direct Edit** box, note that the control can be configured for **Spin Dials** or **Direct Edit**.
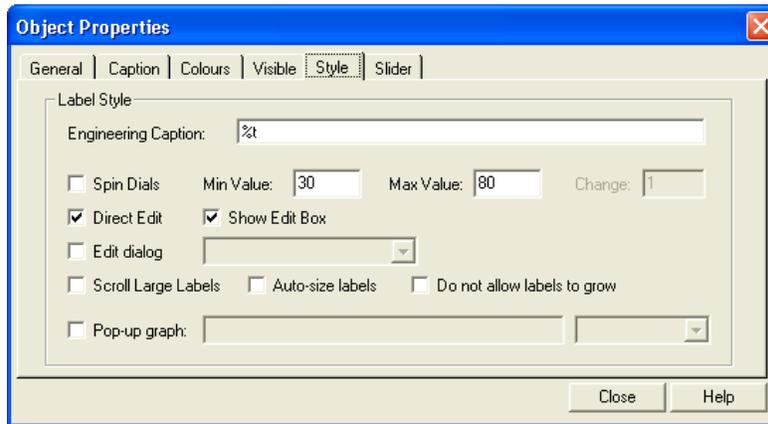
Click on OK, note that the spin control has now changed to an empty rectangle, this is the control that the user clicks on to enter edit mode.

Save your work and preview the screen in the browser, test the control by clicking in the box and entering values from the keyboard; verify that only valid ranges of values may be entered.

Adding a Click Property to the Edit Control

The Direct Edit control above shows a grey box for the user to click on to enter edit mode, a more intuitive control can be made by adding a click action property to the object to make it editable. We will construct a more user friendly version next.

Click on the **General** tab of the text object that shows the setpoint value as shown below.
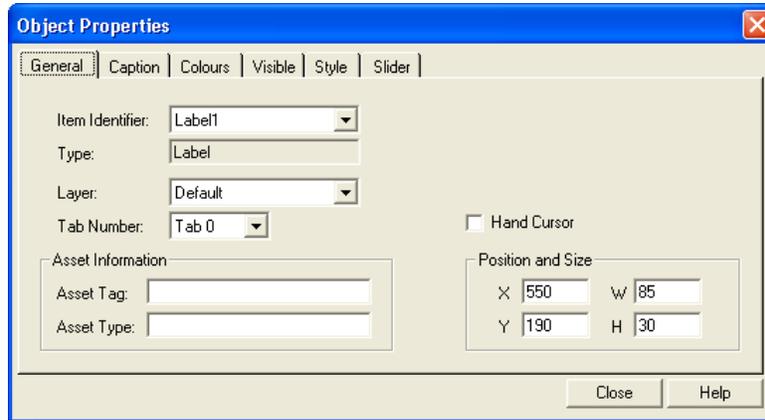
Note the **Item Identifier** for the object (in this example it is **Label1**).

Next Uncheck the show Edit box in the style tab for Label8, add a button control to the design screen and give it a meaningful label as shown below.
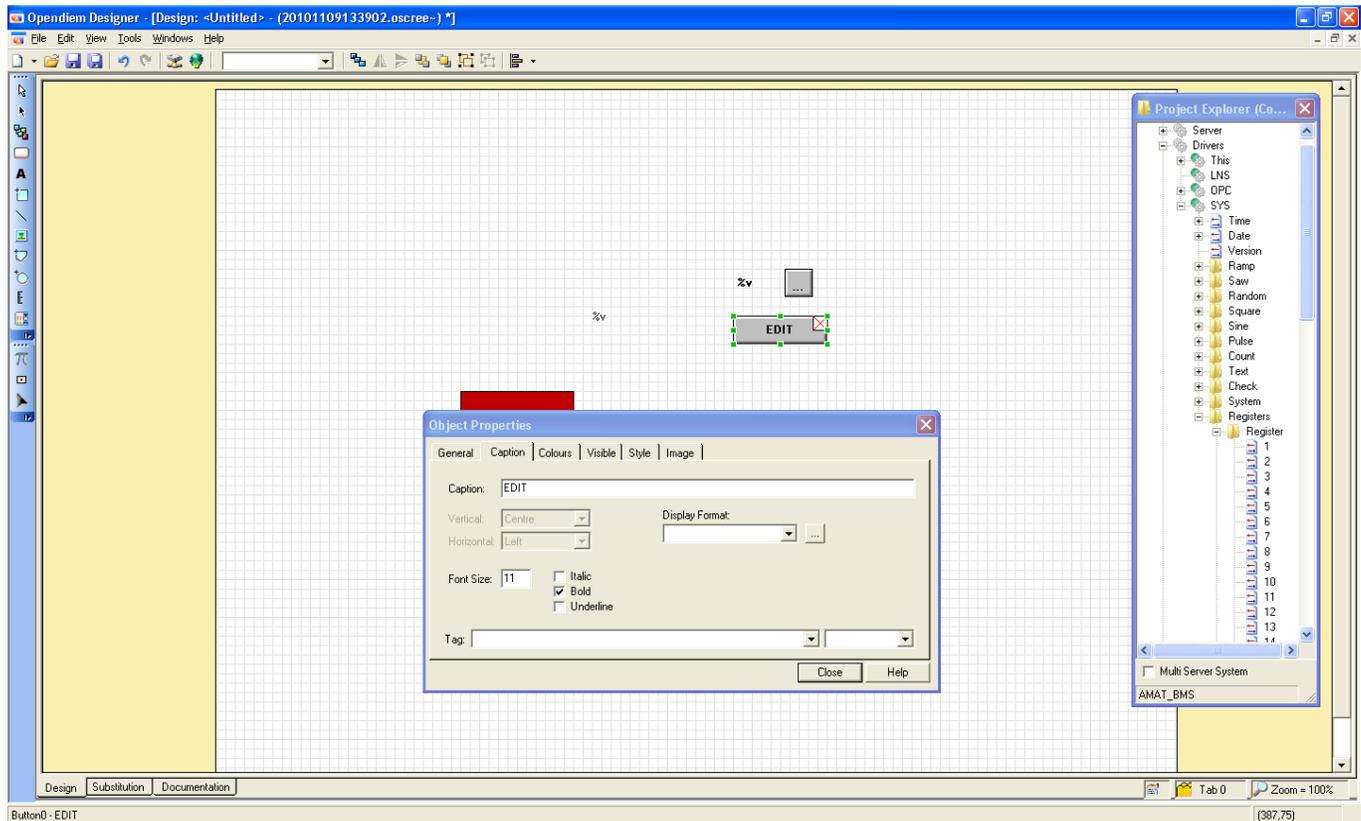
Right Click on the Button and select Actions, select the **Property** tab. In the **Object** drop down list select the identifier of the object noted earlier, in the **Property** drop down list select **Edit** as shown below and **Value** drop down list Select True. This will put the control in edit mode when clicked on by the user. Save your work and test the operation in a browser. Note that the control object could be any object that supports the click action properties including graphical buttons and images.
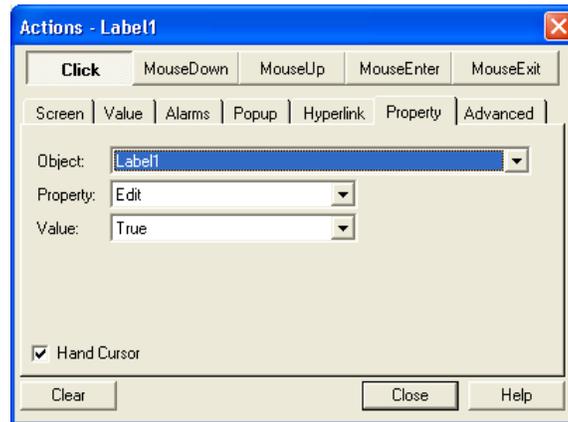
Adding a Slider Control

A slider control will be created that will allow us to change the value of the setpoint based on where the user positions an object on the browser screen.

First we will examine how the slider feature works and will then follow with an example.

Properties for a Slider Object

From/To   Specifies how far the object moves across the screen. This maps to the min and max value.

Min/Max   Min and Max values of the specified variable.

Editable   Makes the object editable so it can be manually moved across the screen using the mouse.

Tag   The Tag to be referenced by this object.

Slider Example

30 **Max** ———— **To: -50 (Offset)**

20 ·········· **0**
Offset (Pixels)

10 **Min** ———— **From: 50 (Offset)**
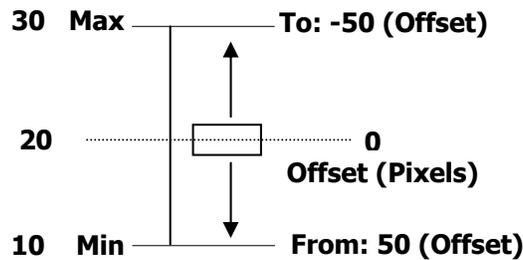
-50 Offset maps to 30 Max Value and 50 offset maps to 10 Min Value. The zero position is the place where the object was placed at design time (i.e. zero offset) and the slider's range of movement is 50 pixels up or down.

Slider Movement

X

Y
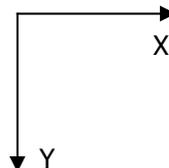
Using the Slider property

Click on the **Panel** tool and drag out a panel. Make the panel 9 grid squares wide. When you release the mouse button the properties box will automatically appear, select the **Style** tab and select **Raised** then **OK**.

Tip: Click on the toolbox *title bar* first and when you hold the mouse pointer over any of the icons a '*tool tip*' message will appear describing the icon function.
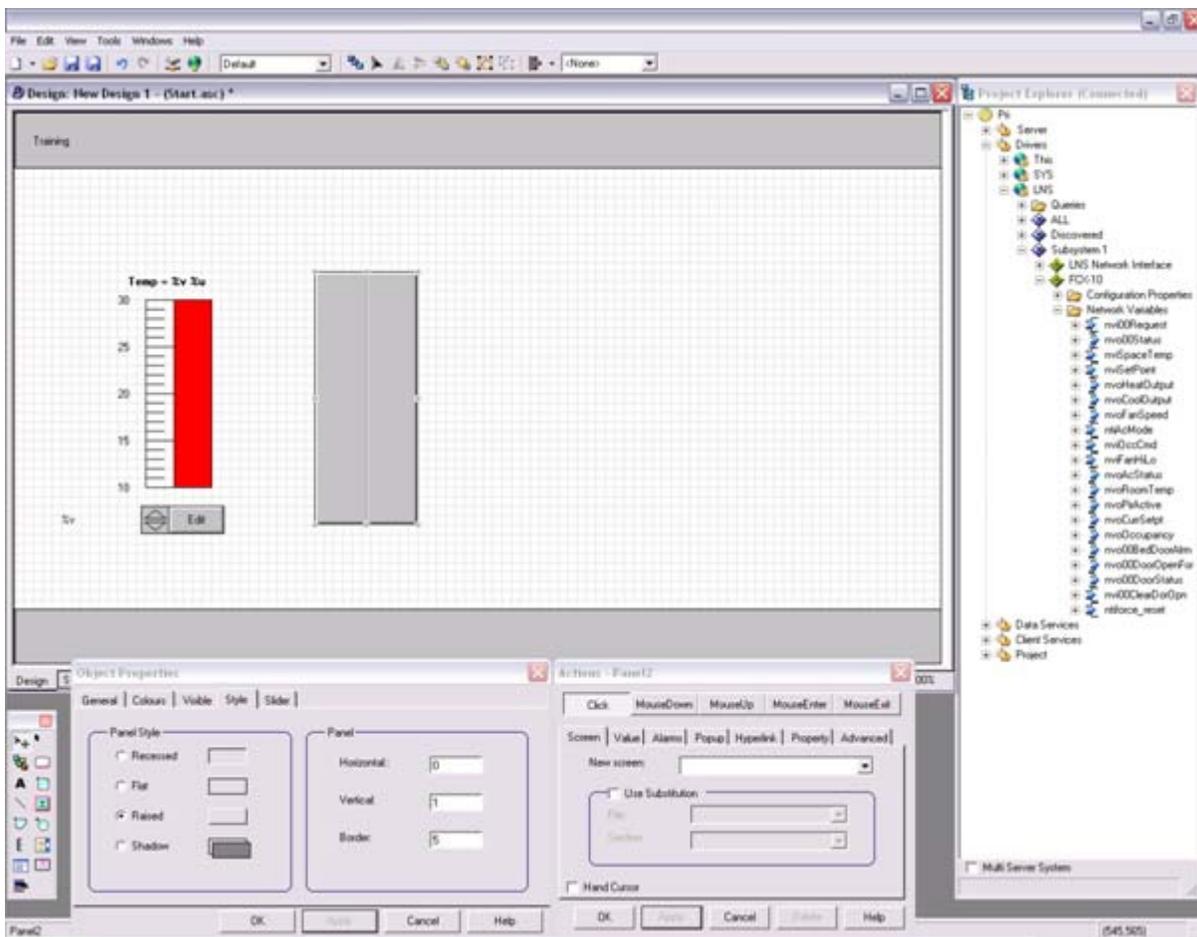
Figure 1 First Stage of Slider Panel

The Panel settings allow you to place gridlines on the Panel, set a vertical line and a 5 pixel border between the line and the edge of the panel as shown.

Engine   Connect   Designer

Select the **Panel** tool from the toolbox again and draw a panel on the slider as shown. The **Properties** box will automatically appear, select the **Style** tab and select **Raised**, in the **Horizontal:** box enter ⬚ to instruct Designer to put a horizontal line across the panel. Select the **Slider** (X-Y) tab. Drag a **nviSetPoint** icon from the Project Browser onto the **Tag :** box, select **Editable** for the *Y axis*. Enter the values '*180*' in the **From :** box, '*20*' in the **Max :** box, '*10*' in the **Min :** box and '*20*' in the **Steps :** box. Note that the number of steps must divide equally into the range for the **Steps** to work as expected.

Tip: Select the *Node* tool from the toolbar and then click on the Panel designated as the Slider and Designer will draw an arrowed line showing the *From:* and *To:* range of the Slider as shown below. Note that when changing the range values (*From:* and *To:*) it is only necessary to click **Apply** to see the effect of the new range.
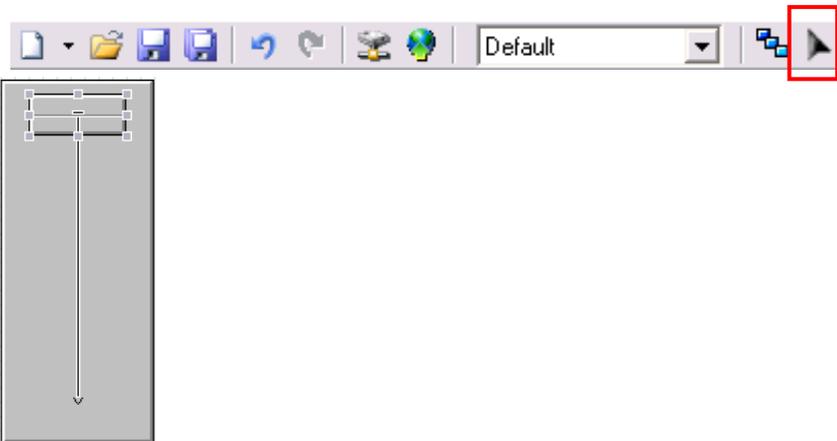
Preview the screen in the browser and try dragging the slider to set a new value for the setpoint.

Use the skills that you have just learned to add a Gauge and Text to the control, experiment with the *Z-Order* of components to make them appear as desired. Your screen should look similar to the one below when you have finished.

Tip: You can use CTRL and + and CTRL and – to move an object up and down in the *Z-Order.* You can use CTRL-D to duplicate an item such as the text labels.
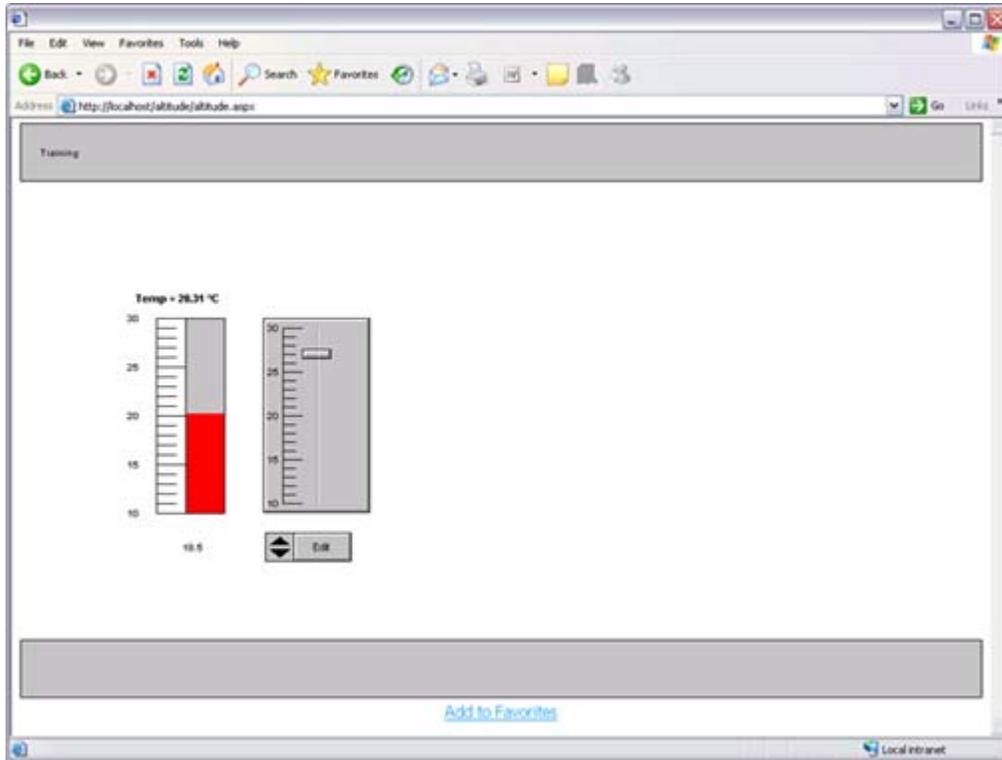
Adding a Click Action object

Click Actions can be added which make a specific action occur e.g. load a new screen, propagate a network variable, set a register value, load an alarm list box, load a custom dialogue box, execute a hyperlink, send an email or run some script. Access click actions by right clicking on an object and choosing "Actions". There are five action types each of which can be configured with the above actions:

Click	Executed after the main mouse button is pressed and released on an object.
MouseDown	Executed when the main mouse button is pressed on an object.
MouseUp	Executed when the main mouse button is released over the same object that the mouse button was pressed down on.

| MouseEnter | Executed when the mouse pointer is moved over an object. |
| MouseExit | Executed when the mouse pointer is moved off an object. |

Adding a Graduated Color Control

Static and dynamic changes can be made to colors. Linking the display color to a variable value can configure a range of colors. All objects except Pictures and Smart Components have color properties that can be configured.

First we will examine how the graduated color feature works and will then follow with an example.

Color Properties

Foreground (fg)	Click on the required box to display a color palette
Background (bg)	from which to select a color. To edit the value
Border (bd)	linked to the color, double click the value then
	enter the new value and press enter.

Various values can be added each with a different set of colors so, when linked to a variable, the object will change color as the variable value changes.

For Example:
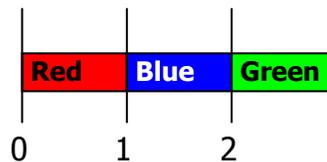
In the example, the object will be red when the value is between 0 and 1, blue when the value is between 1 and 2, and green when the value is greater than 2.

Graduate   The color of an object may be automatically
                  graduated between a numerical range. For
                  example to continuously vary a color between pink
                  and bright red depending on the value of the
                  variable.

                  For Example:

                  Select Light Pink for the foreground color at a
                  value of 0. Double-click on the ellipses (**...)** on the
                  second row and enter 100. Select Bright Red as
                  the foreground color. Check the **Graduate** box
                  next to **Foreground**.

                  Pink   Red

                  0   100
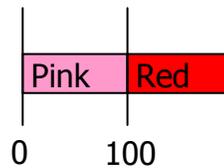
                  In the example the object will be pink when the
                  value is 0, bright red when the value is 100 and in
                  between 0 and 100 the color will linearly graduate
                  between the two colors depending on the variable
                  value.

Tag   The Tag linked to this Color.

Changing the Color based on a Network Variable

Draw a Panel object on the screen and set the Color properties to continuously vary the color
between pink and bright red based on the **nvoRoomTemp** network variable. Verify the behavior
in the browser.

Engine   Connect   Designer
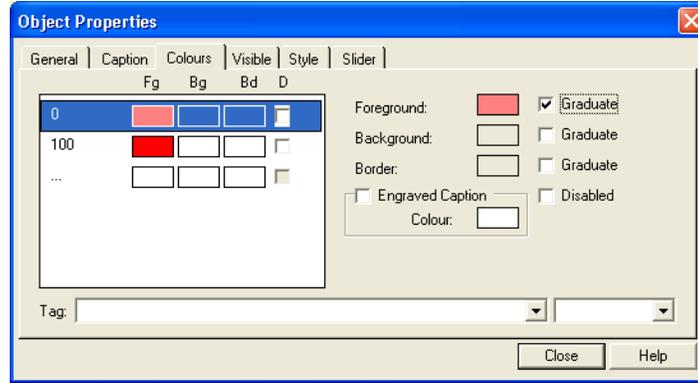
End of Exercise 3

In this exercise we expanded on the new project created in Exercise 2 and used Opendiem Designer and the LNS driver to create a variety of Designer objects that allowed us to monitor and control network variables through a standard web browser in real time.

Engine   Connect   Designer

Notes:

Building Clouds
3229 Whipple Road
Union City, CA 94587

Email: support@buildingclouds.com
http://www.buildingclouds.com