



Setup Examples

RTPView Project Program Example

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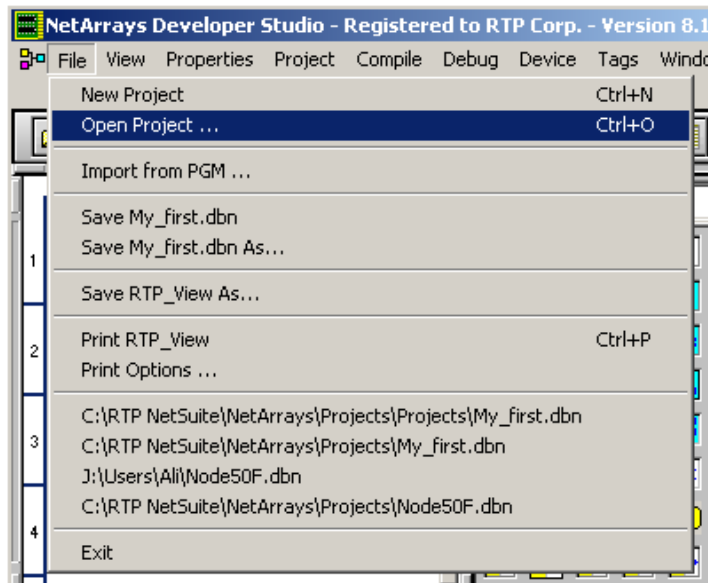
RTPView Project Program

Hardware Setup

- No physical I/O hardware is required to perform this setup example. You are free to use either an RTP target node or the NetArrays built-in Simulator.

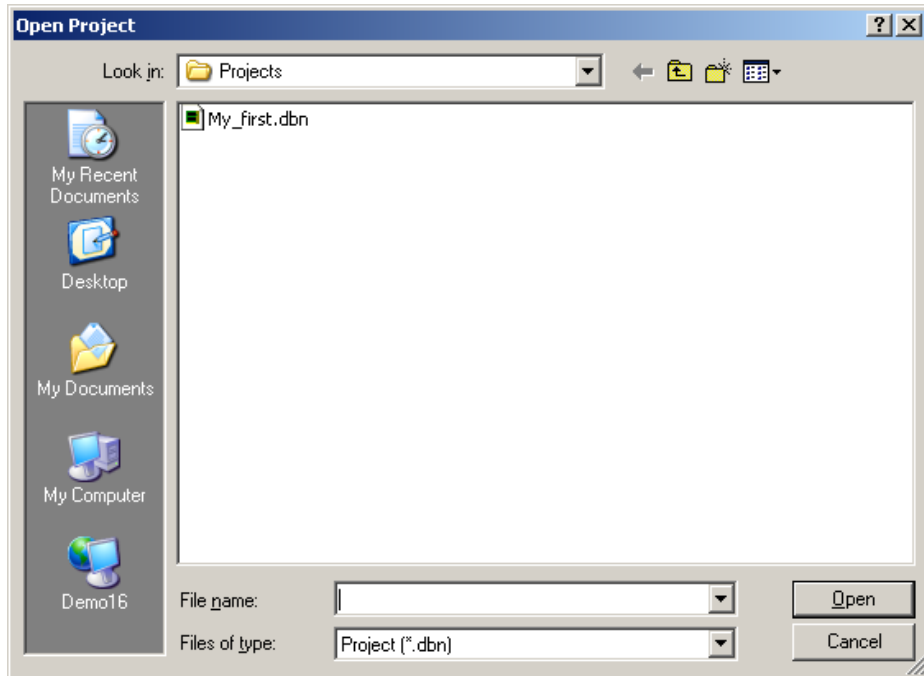
NetArrays Project

- Start NetArrays. On your PC, press  **Start** and select **Programs** ▶ **RTP NetSuite** ▶ **NetArrays**. Open the NetArrays program “My_first.dbn” that was created in the Example “NetArrays Project Development”. If you have not previously created this program, do so now. Left click on **File** and select **Open Project...**

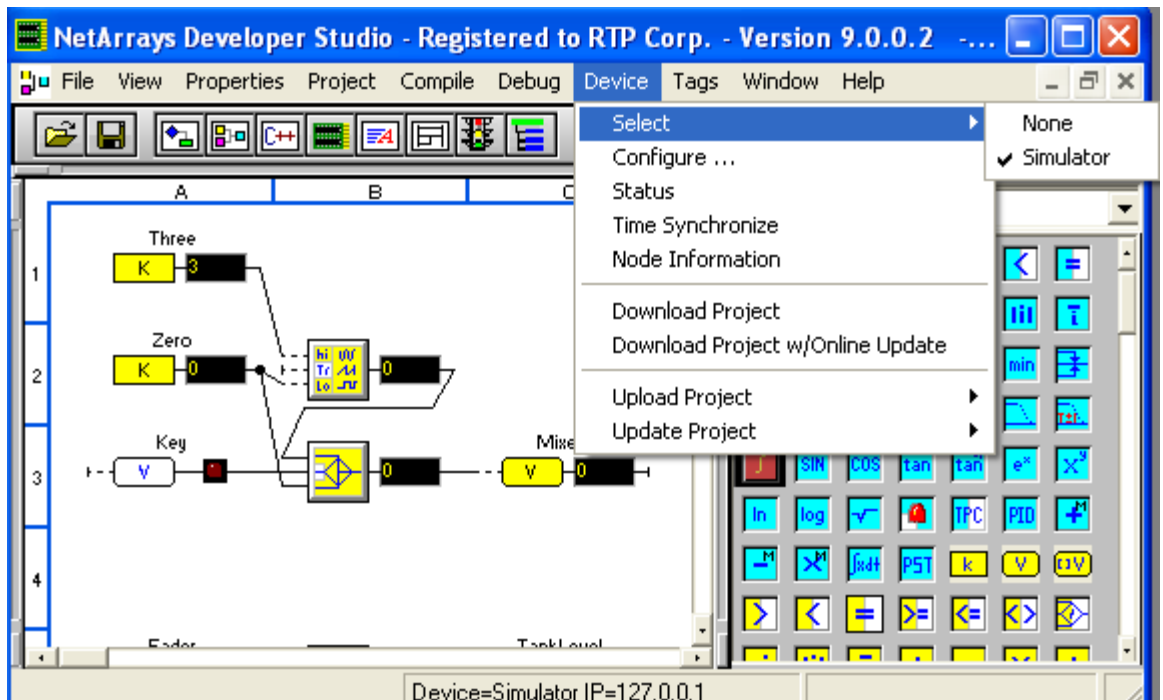


- Select the **My_first.dbn** and left click **Open**.

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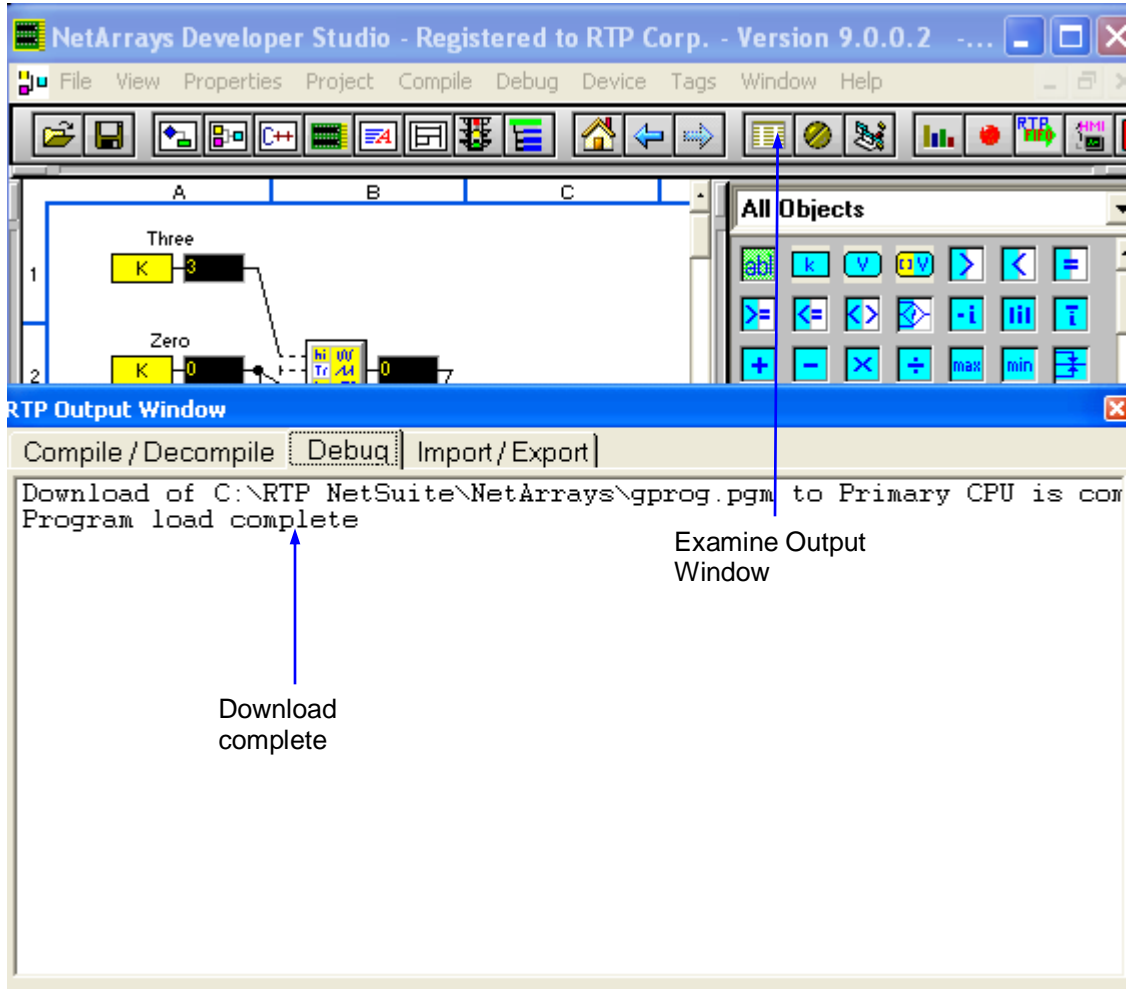
- In the NetArrays **Device** menu, select **Select** and choose the target node you are using to run this example, or the local **Simulator**. In the NetArrays **Device** menu, select **Download Project** to download and run your project on the selected device.



- When prompted select **Yes** for **Do you want to overwrite?**



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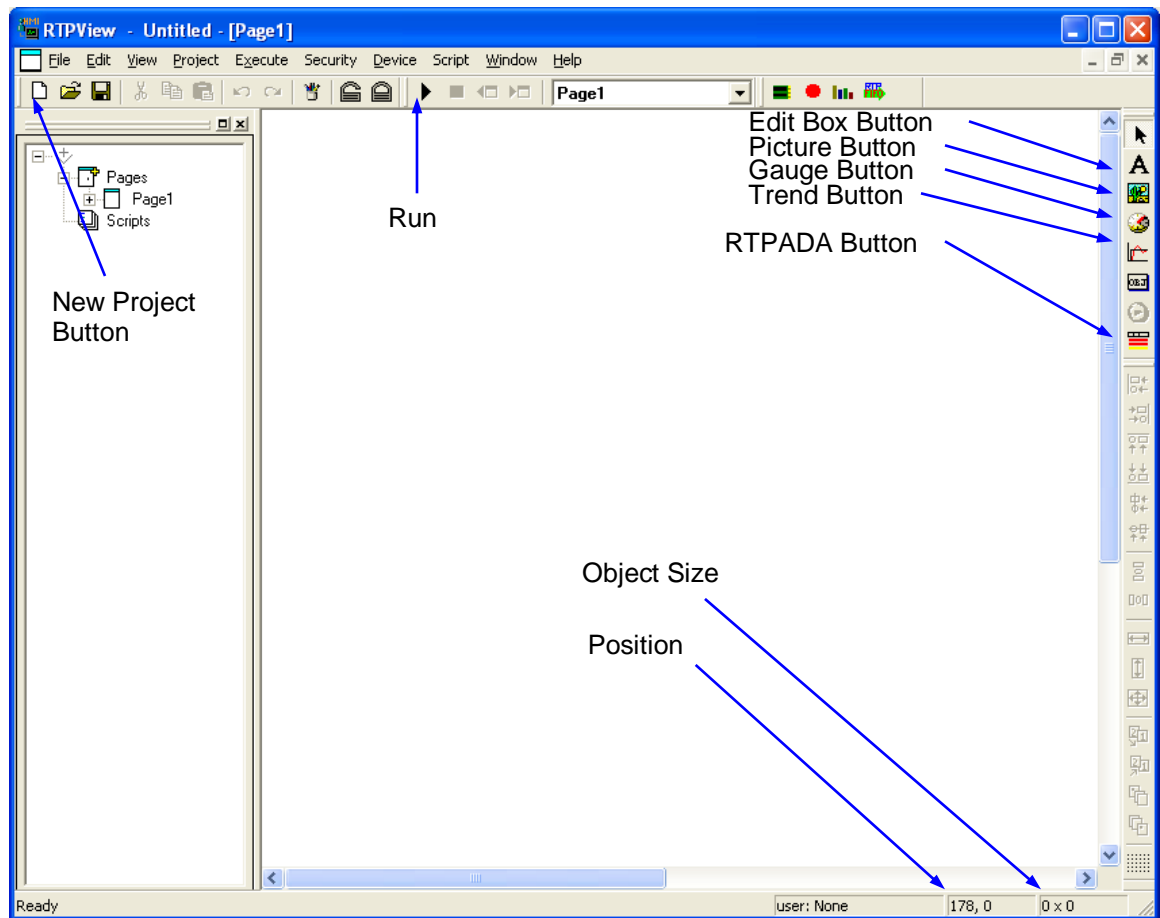
- Examine the Output Window to confirm that the download was successful. This project program must remain running in the target node or **Simulator** while you complete the rest of this setup example.



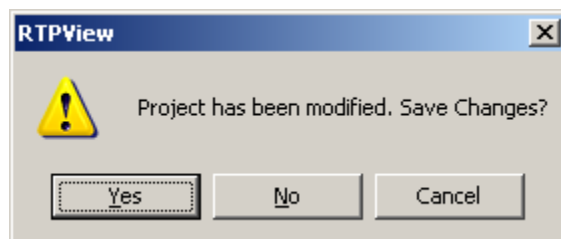
RTPView Project

The RTPView project will contain a Fader slide bar and a Key Switch that write data to the NetArrays project program. An Edit Box, a Tank, a Temperature Gauge, and a Trend object will read data from the NetArrays project program. An RTPADA object will display alarm information created by an RTPADA application. An example using a Popup window will be shown.

- In the NetArrays toolbar, left click the  button to launch RTPView.
- In RTPView, on the  (New Project) button to begin a new project.




- Select **No** to the question: **Project has been modified. Save Changes?**

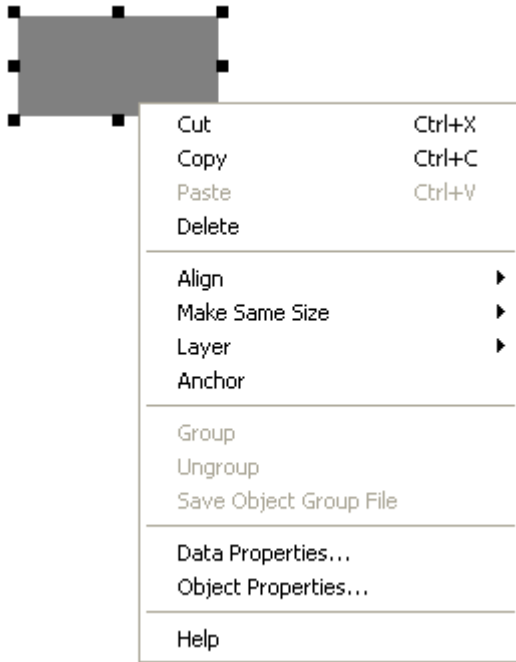


Fader

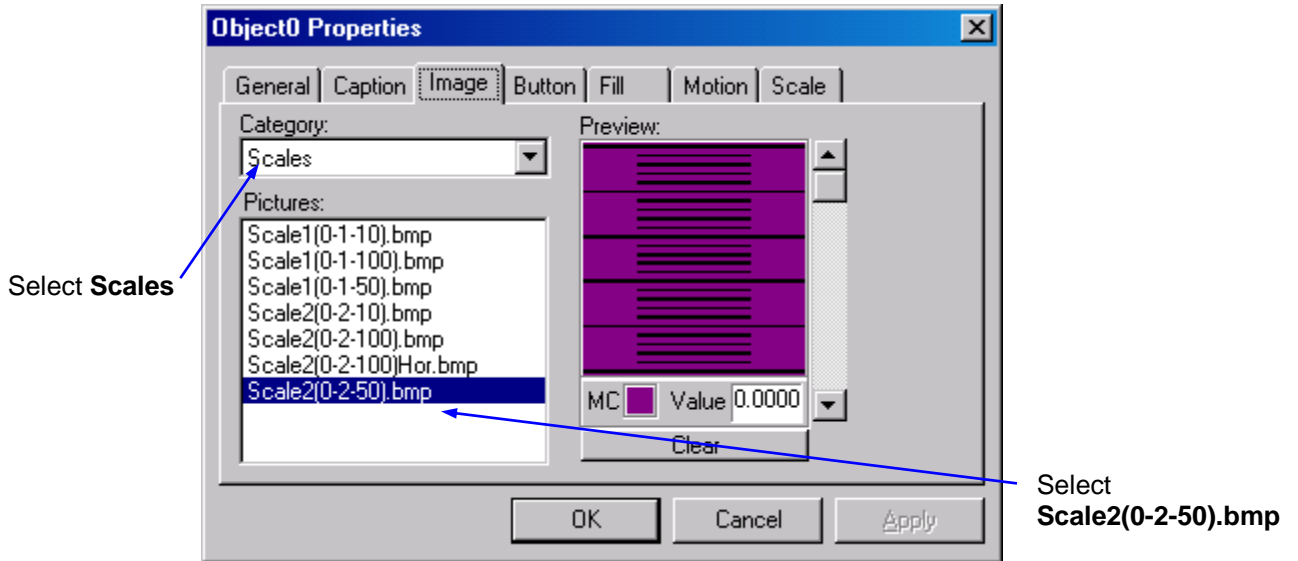
The Fader consists of a static Scale picture object, a Pointer picture object that drives a variable in the NetArrays project program, and an Edit Box object that reads the Fader position from a variable in the NetArrays project program.

Fader Scale

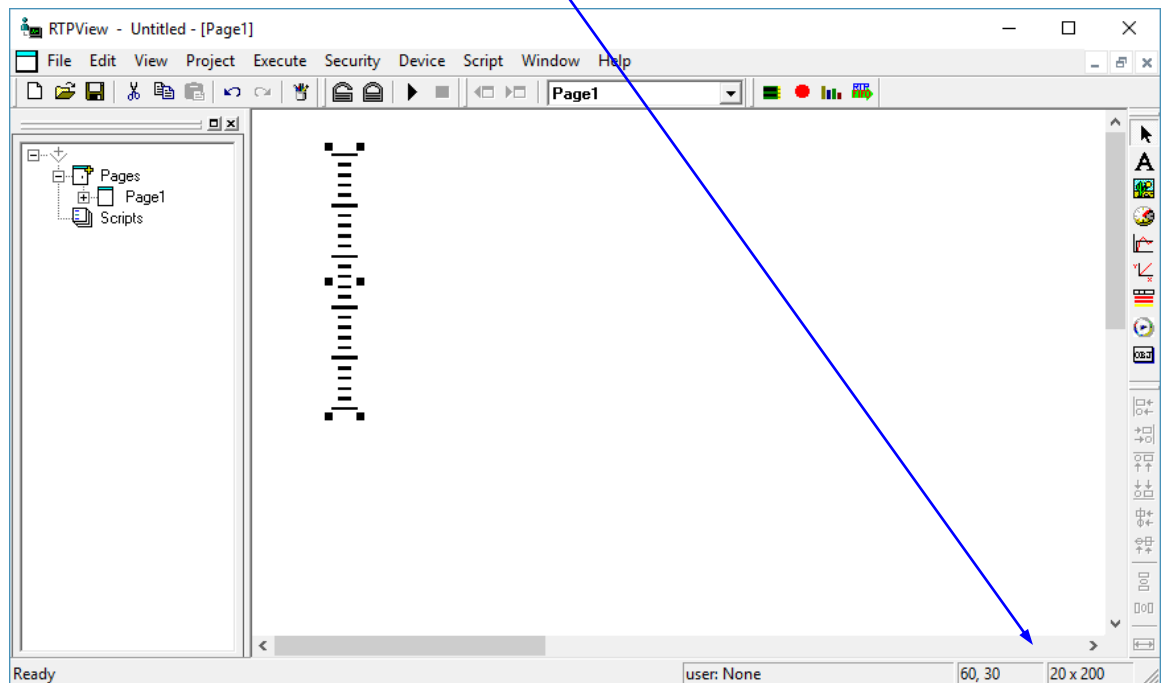
- Left click on the  (Picture) button in the Palette toolbar. Move the cursor near the upper left corner of the page and left click the left mouse button. A dark gray rectangle will appear on the page.
- Right-click on the rectangle and select **Object Properties** from the menu. This will display the Object Properties dialog.




- Left click on the **Image** tab of the Properties dialog. From the Category list, select **Scales**. From the list of Pictures, select **Scale2(0-2-50).bmp**. The picture will appear in the Preview frame.



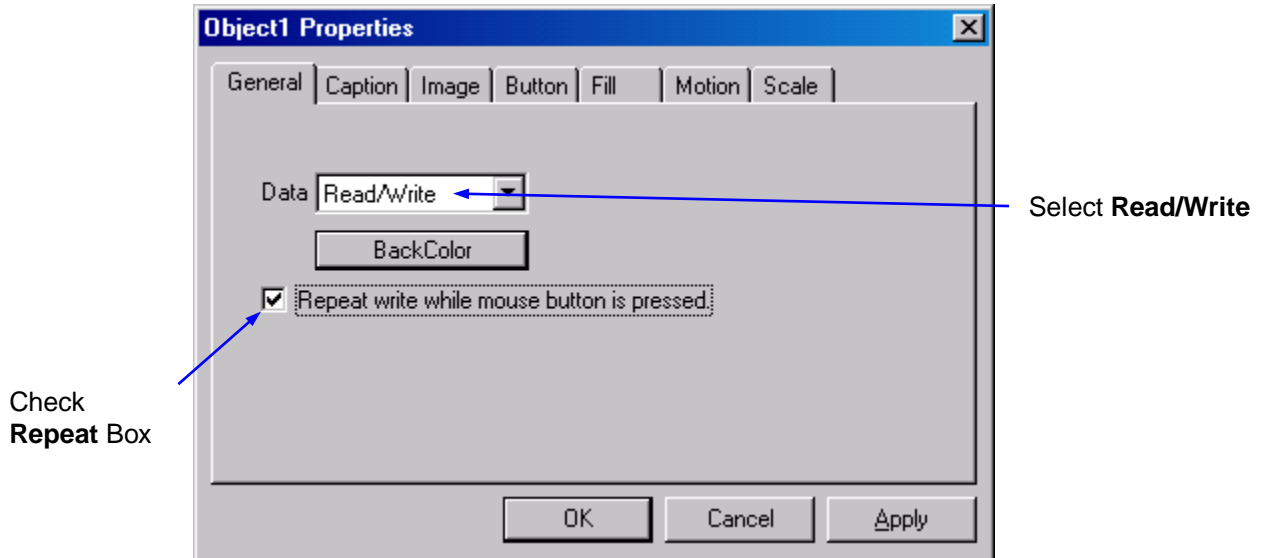
- Left click the **OK** button to close the Properties dialog.
- Select the Scale object, press and hold the Shift key, and use the arrow keys to adjust the size of the Scale to 20 x 200 pixels. Release the Shift key and use the arrow keys to position the Scale at coordinates 60, 30. It should look like the following example. The object size and coordinates can be viewed in the bottom right corner of the RTPView window.



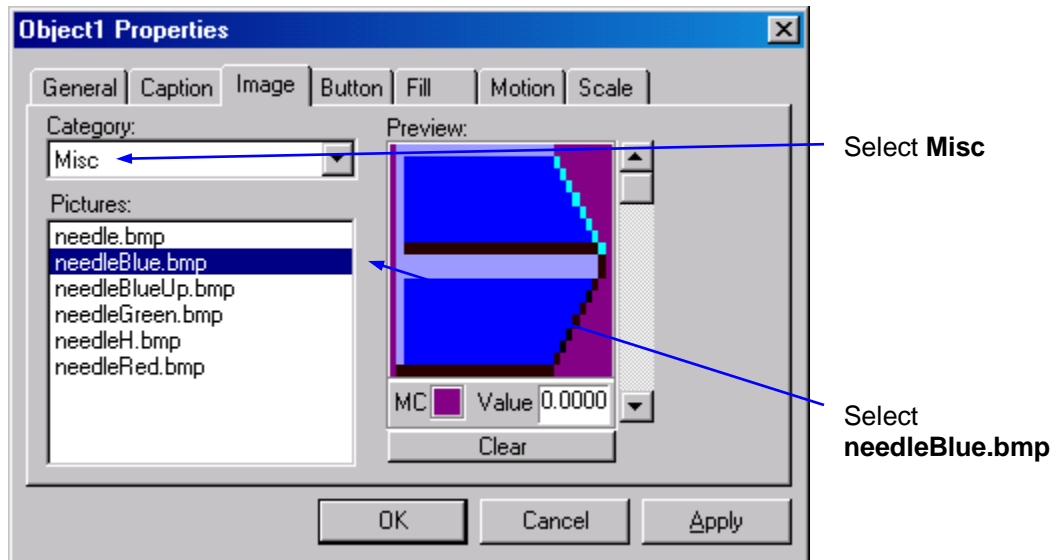
Fader Pointer

- Left click on the  (Picture) button in the Palette toolbar. Move the cursor near the top of the Scale and left click the mouse button. A dark gray rectangle will appear over the scale.
- Right-click on the rectangle and select **Object Properties** from the menu.

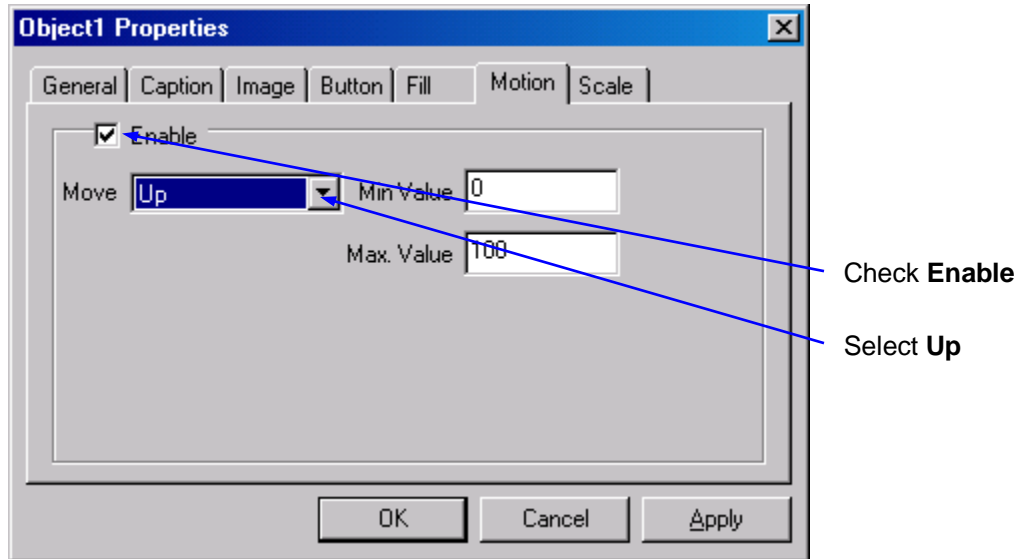
- In the **General** tab of the Properties dialog, select **Read/Write** as the **Data** property. Check the check box to the left of **Repeat write while mouse button is pressed**. RTPView will write the output of this object as it is being moved.



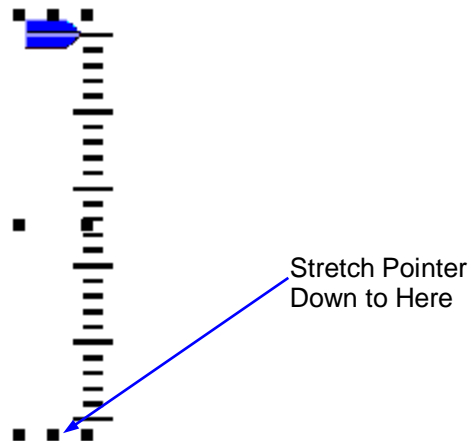
- Left click on the **Image** tab of the Properties dialog. From the list of categories, select **Misc**. From the list of Pictures, select **needleBlue.bmp**. The picture will appear in the Preview frame.



- Left click the **OK** button to close the Properties dialog.
- Select the Pointer object, press and hold the Shift key, and use the arrow keys to adjust the size of the Pointer to 30 x 15 pixels. Release the Shift key and use the arrow keys to position the Pointer at coordinates 36, 26. This positions the Pointer at the top of the Scale.
- Right-click on the Pointer object again and select **Object Properties** from the menu.
- Left click on the **Motion** tab of the Properties dialog. Check the **Enable** checkbox to enable motion control for the object. Select **Up** as the Move property. Leave the **Min Value** at **0** and the **Max Value** at **100**.



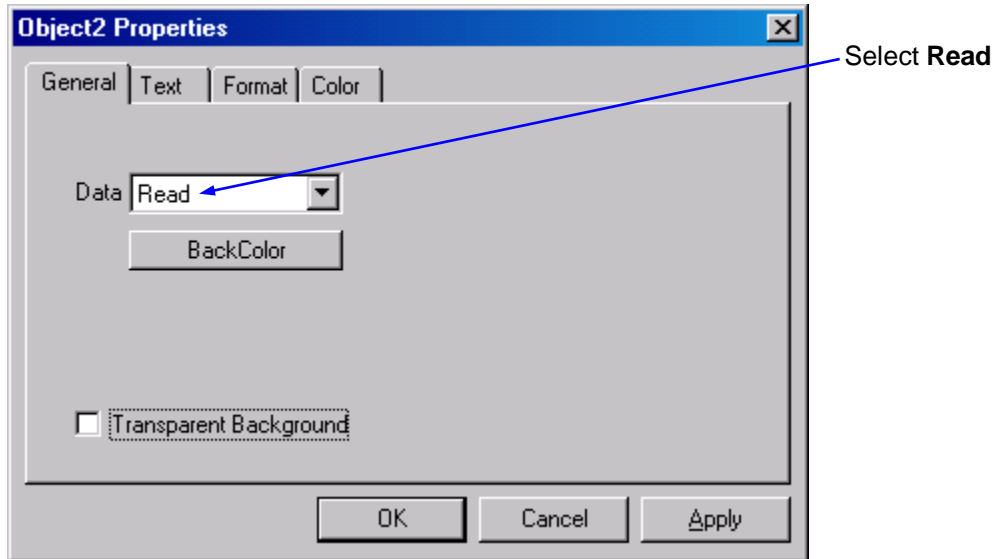
- Left click the **OK** button to close the Properties dialog.
- Drag the bottom anchor point of the Pointer down to just below the bottom of the Scale and release it. This determines the motion length for the object. In run mode, sliding the pointer up and down the track will create a value ranging from the defined minimum to the defined maximum.



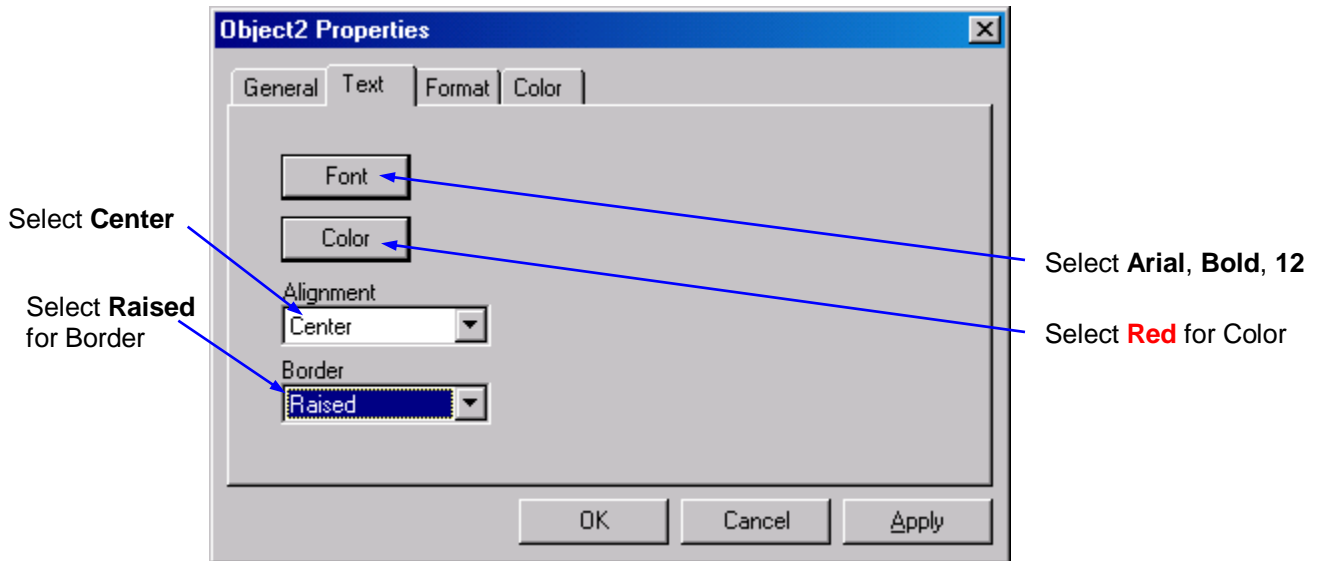
- Right-click on the Pointer object and select **Data Properties** from the menu.
- Left click on the Tag column and select **Fader** from the list of tag names. Left click the **OK** button to close the Data Properties dialog. The **Device** will automatically be set to Simulator (or the *device* with the downloaded program).

Fader Output Edit Box

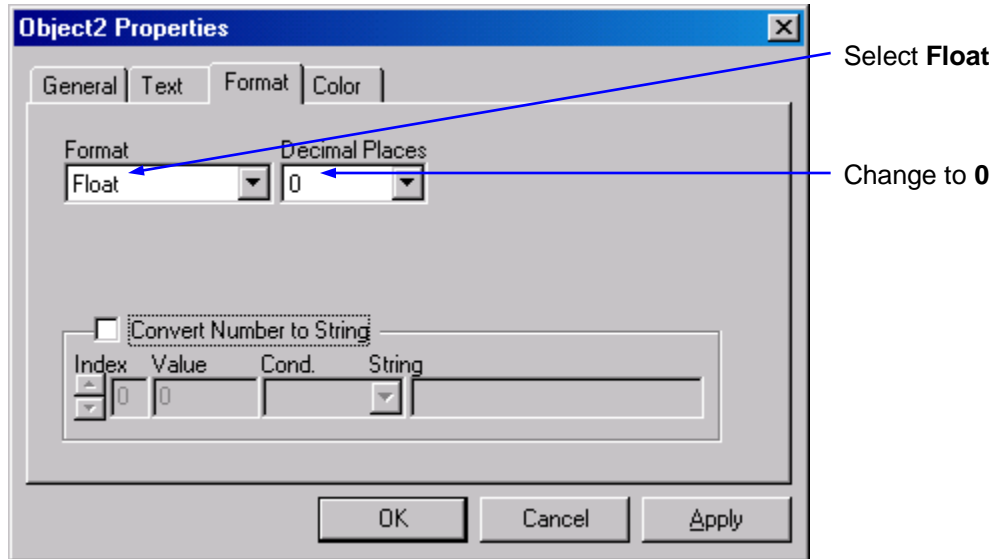
- Left click on the **A** (Edit Box) button in the Palette toolbar. Move the cursor under the bottom of the Scale and left click the mouse button. A light gray rectangle will appear below the Scale.
- Right-click on the rectangle and select **Object Properties** from the menu.
- In the General tab of the Properties dialog, select **Read** as the Data property.



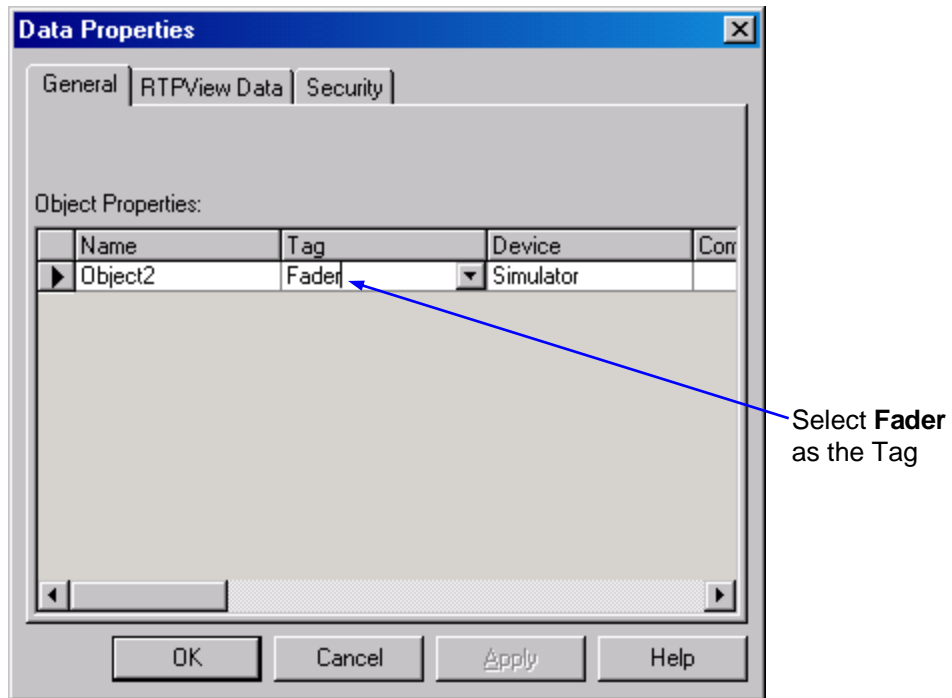
- Left click on the **Text** tab. Press the **Font** button and change the Font settings to **Arial, Bold, 12**. Left click the **OK** button the close the Font dialog.
- Left click on the **Color** button and select **Red** for the text color. Left click the **OK** button the close the Color dialog.
- Select **Center** for the **Alignment** and **Raised** for the **Border** type.



- Left click on the **Format** tab. Select **Float** as the text Format, and **0** for the number of Decimal Places. Left click the **OK** button the close the Object Properties dialog.

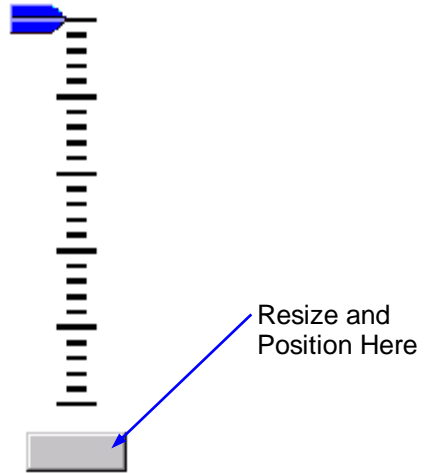


- Right-click on the Edit Box object and select **Data Properties** from the menu.
- Left click on the Tag column and select **Fader** from the list of tag names. Left click the **OK** button to close the Data Properties dialog. The **Device** will automatically be set to Simulator, if that is the *device* with the downloaded program.




- Resize the Edit Box to about 50 x 20 pixels and position it under the center of the fader scale. The completed Fader assembly should look like the example shown below.

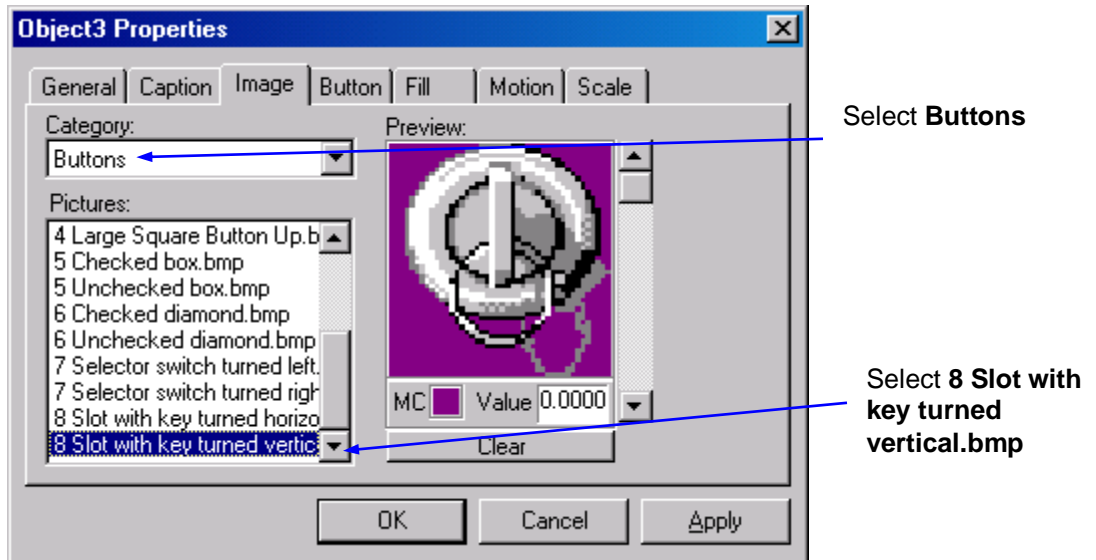
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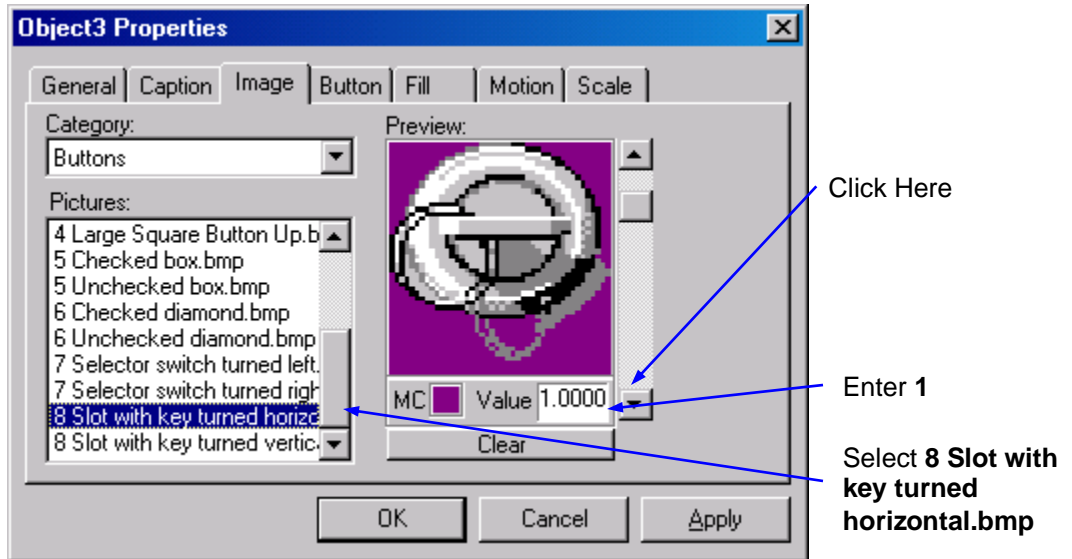
Key Switch

The Key Switch is a button Picture object that turns the Tank Mixer on and off.

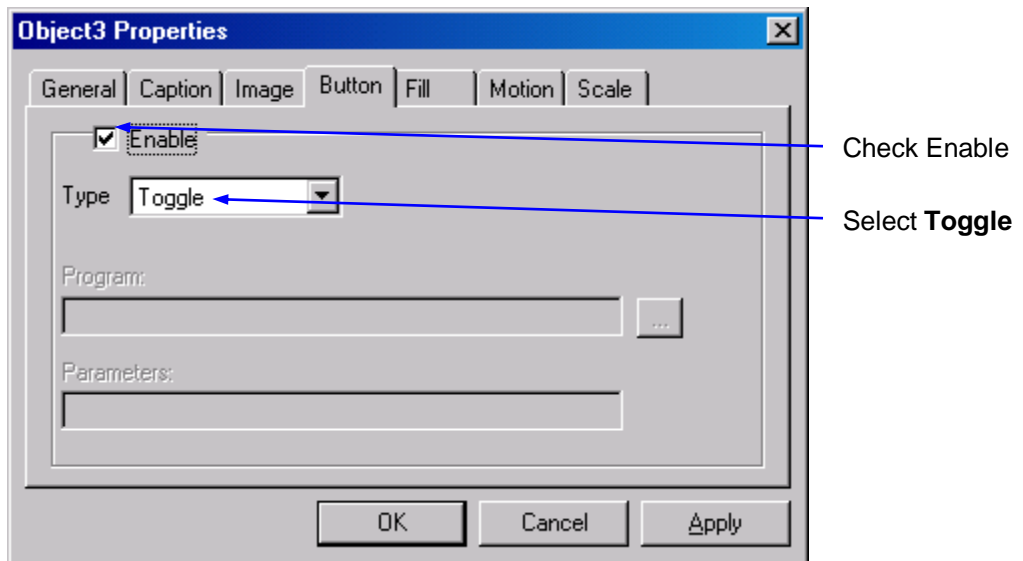
- Left click on the  (Picture) button in the Palette toolbar. Move the cursor to the right of the Fader and click the left mouse button. A dark gray rectangle will appear on the page.
- Right-click on the rectangle and select **Object Properties** from the menu.
- In the General tab of the Properties dialog, select **Read/Write** as the Data property. This object will write a Boolean value to the NetArrays project.
- Left click on the **Image** tab. Select **Buttons** as the Category. Select **8 Slot with key turned vertical.bmp** as the picture. The bitmap of the key switch will appear in the Preview frame.



- Left click on the scroll down arrow just to the right of the Preview frame. The caption **Image #1** will appear in the Preview frame. Select **8 Slot with key turned horizontal.bmp** as the Picture. The second bitmap of the key switch will appear in the Preview frame.
- Change the entry in the Value field below the Preview to **1**.



- Left click on the **Button** tab. Check the **Enable** checkbox to allow the picture object to function as a button. Select **Toggle** as the button Type. Each time the object is clicked, its output changes state.



- Left click on the **OK** button to close the Object Properties dialog.
- Select the key switch object and resize it to about 52 x 52 pixels. Move the object to coordinates 172, 25. It should look like the example shown below.




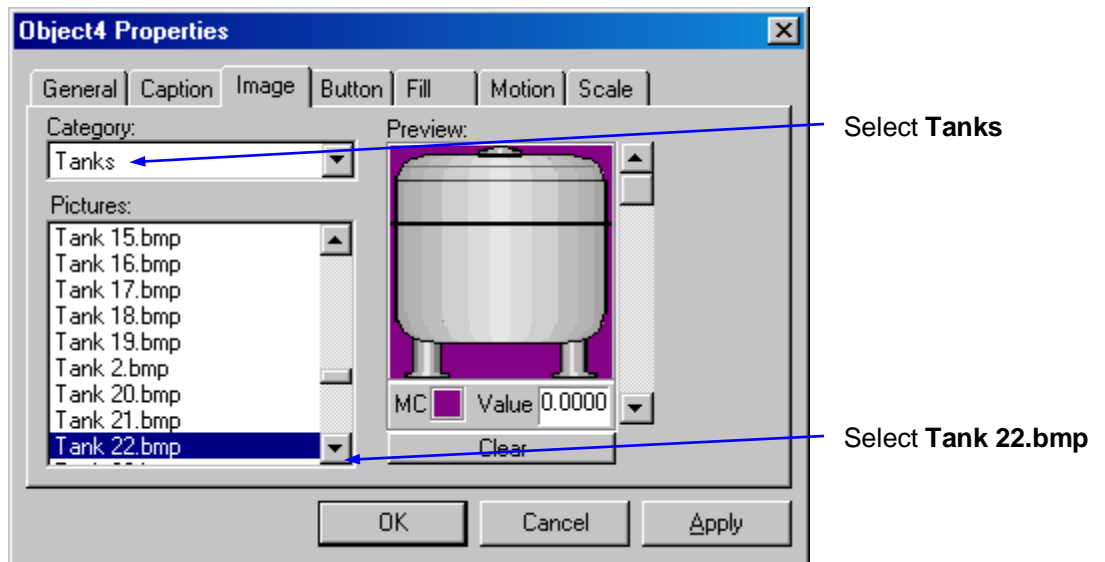
- Right-click on the Picture object and select **Data Properties** from the menu.
- Left click on the Tag column and select **Key** from the list of tag names. Left click the **OK** button to close the Data Properties dialog.

Tank

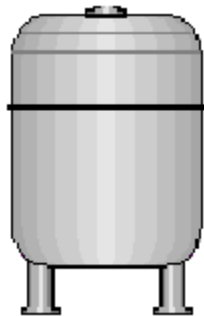
The Tank consists of a static Tank picture image, a Cutaway fill picture, and a Mixer picture image.

Tank Image


- Left click on the  (Picture) button in the Palette toolbar. Move the cursor to the right of the Key Switch and click the left mouse button. A dark gray rectangle will appear on the page.
- Right-click on the rectangle and select **Object Properties** from the menu.
- Left click on the **Image** tab. Select **Tanks** as the Category, and **Tank 22.bmp** as the Picture. The bitmap of the tank will appear in the Preview frame. Left click the **OK** button to close the Object Properties dialog.

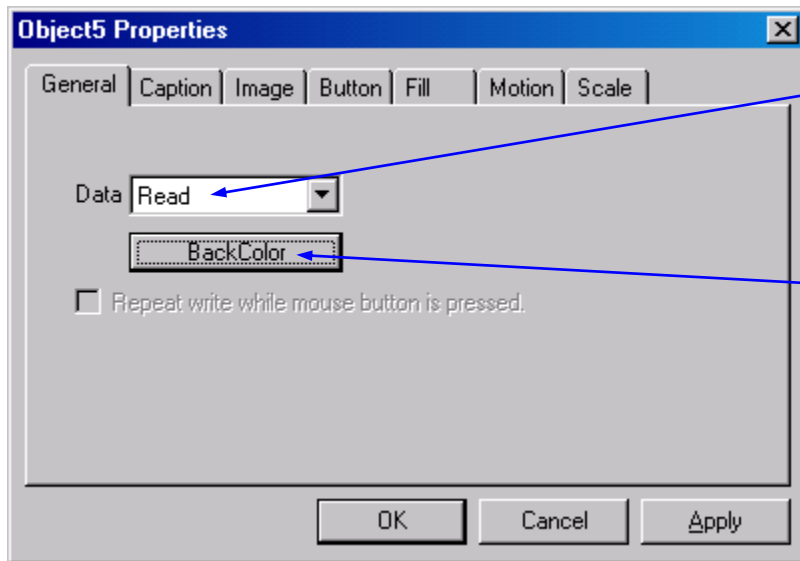


- Select the Tank object, press and hold the Shift key, and use the arrow keys to adjust the size of the Tank to 100 x 155 pixels. Release the Shift key and use the arrow keys to position the Tank at coordinates 230, 70. The Tank should look like the example shown below.



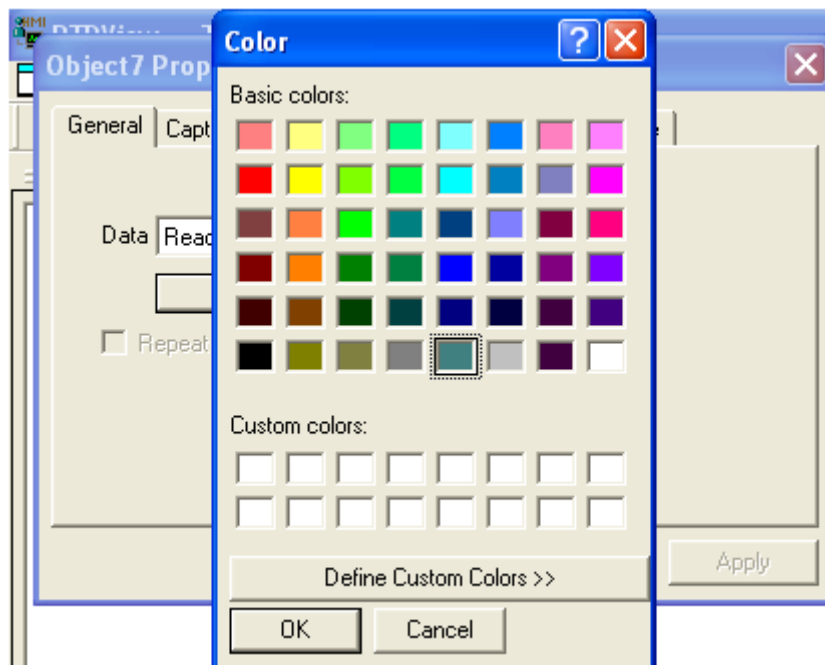
Tank Cutaway

- Left click on the  button in the Palette toolbar. Move the cursor over the Tank object and left click the mouse button. A dark gray rectangle will appear over the Tank.
- Right-click on the rectangle and select **Object Properties** from the menu.
- In the General tab of the Properties dialog, select **Read** as the Data property. This object will be controlled by a floating-point value from the NetArrays project.
- Left click on the **BackColor** button. Select a contrasting Background color, such as the one shown below. Left click on the **OK** button to close the Color dialog. This will be the color of an empty tank cutaway.

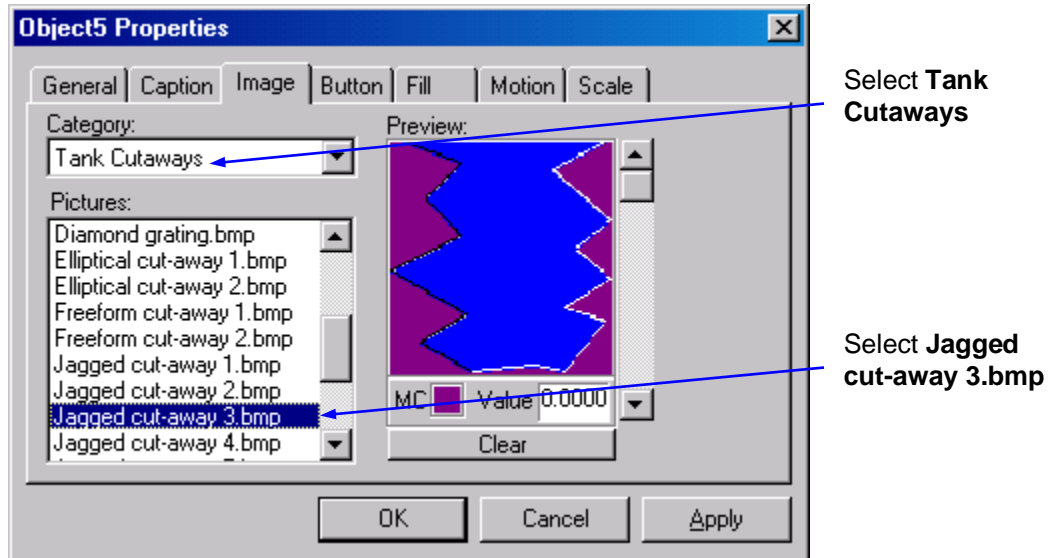


Select **Read**

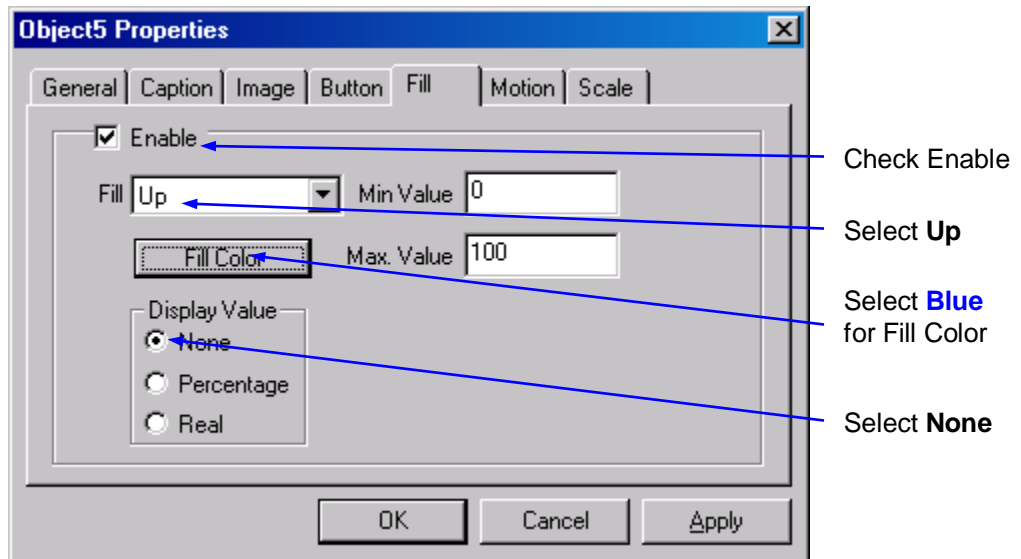
Select **Dark Gray** as the Background Color



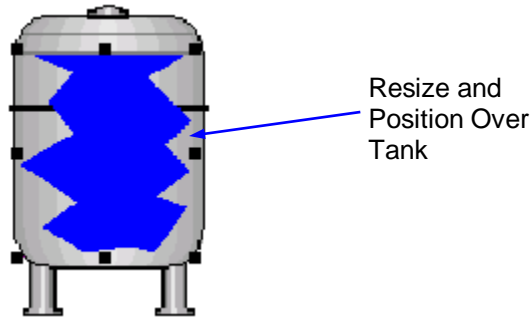
- Left click on the **Image** tab. Select **Tank Cutaways** as the Category, and **Jagged cut-away 3.bmp** as the Picture. The bitmap of the cutaway will appear in the Preview frame.



- Left click on the **Fill** tab. Check the **Enable** checkbox. Select **Up** as the Fill function. Leave the Min Value and Max. Value fields at their default values (0 and 100). Left click on the **Fill Color** button and select **Blue** as the fill color. Left click on the **OK** button to close the Color dialog. Left click on the Display Value **None** radio button.




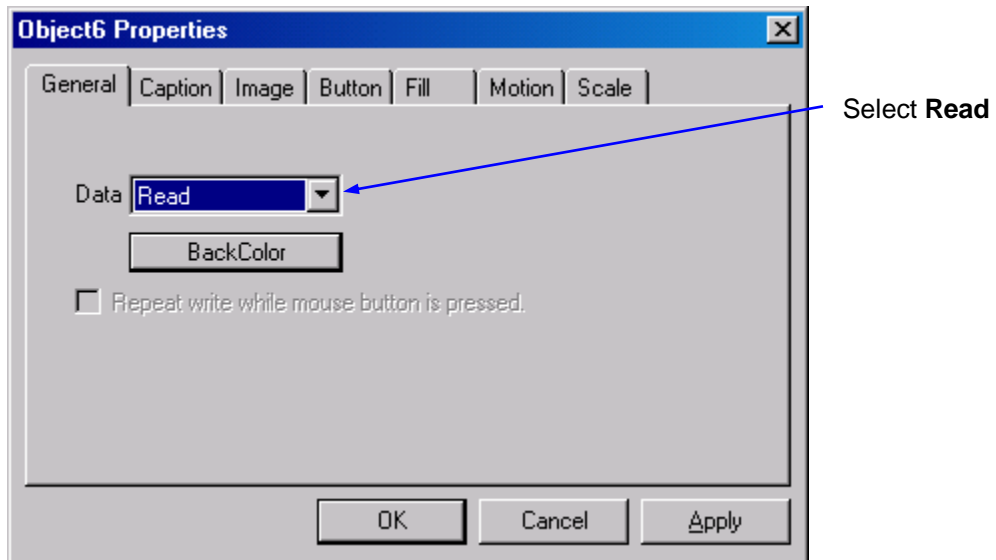
- Left click on the **OK** button to close the Object Properties dialog.
- Right-click on the cutaway object and select **Data Properties** from the menu.
- Left click on the Tag column and select **TankLevel** from the list of tag names. Left click the **OK** button to close the Data Properties dialog.
- Select the cutaway and resize it to about 85 x 100 pixels. Move the object so that it overlays the Tank as shown in the example below.



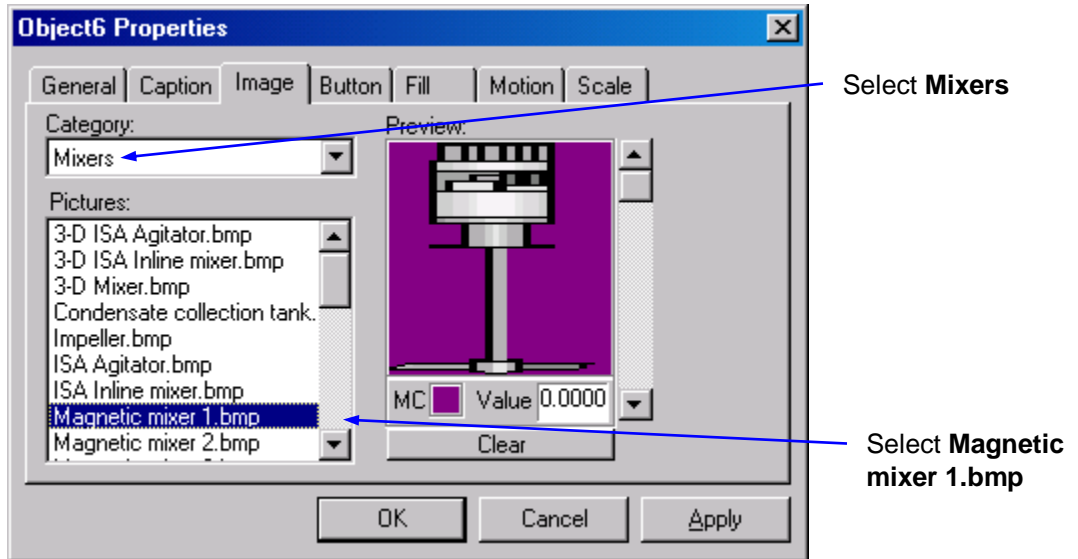
Tank Mixer

The following will show how to add automation to RTPView by having different pictures linked to a controlling variable. The example mixer has 4 positions driven by an integer variable stepping through values from 0 to 3.

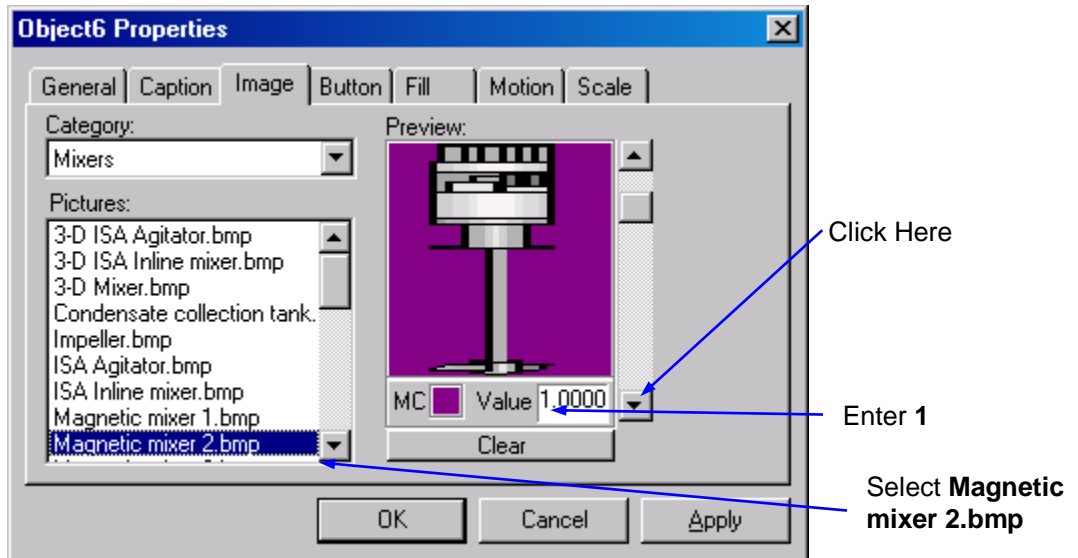
- Left click on the  button in the Palette toolbar. Move the cursor over the Tank object and left click the mouse button. A dark gray rectangle will appear over the Tank.
- Right-click on the rectangle and select **Object Properties** from the menu.
- In the General tab of the Properties dialog, select **Read** as the Data property. The image displayed will be controlled by the Waveform Generator in the NetArrays project.



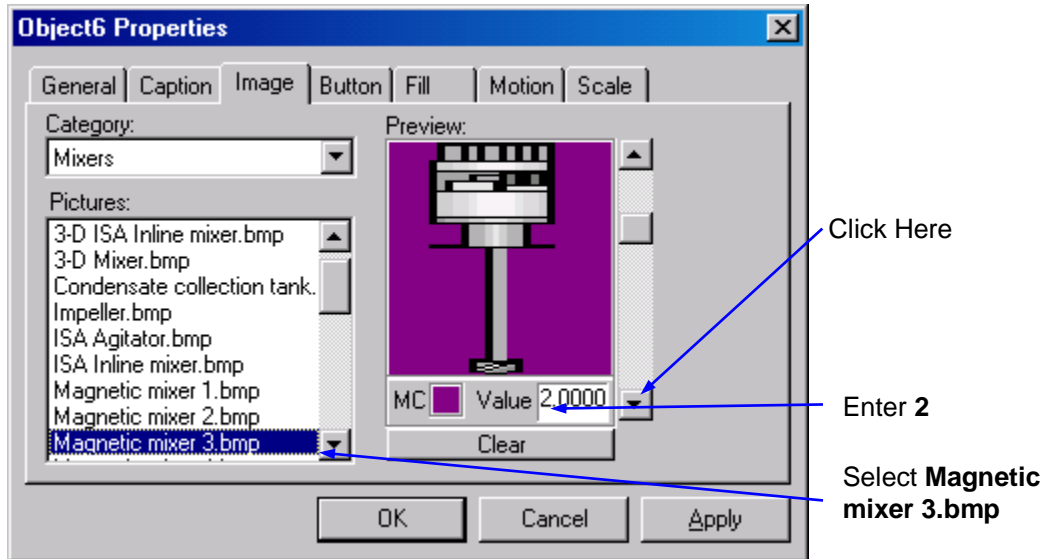
- Left click on the **Image** tab. Select **Mixers** as the Category, and **Magnetic mixer 1.bmp** as the Picture. The bitmap of the mixer will appear in the Preview frame.



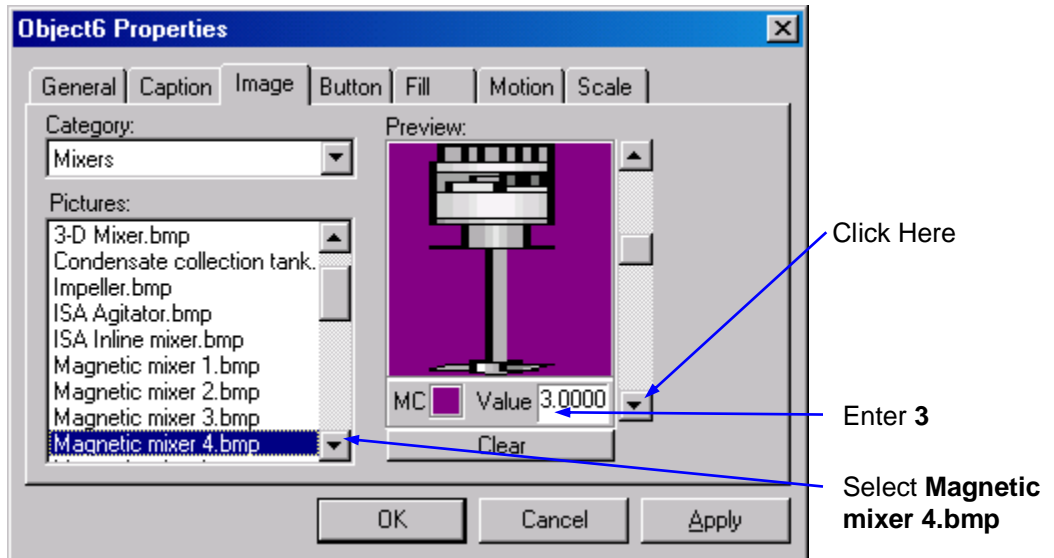
- Left click on the scroll down arrow just to the right of the **Preview** frame. The caption **Image #1** will appear in the Preview frame. Select **Magnetic mixer 2.bmp** as the Picture. The second mixer bitmap will appear in the Preview frame.
- Change the entry in the **Value** field below the Preview to 1.



- Left click on the scroll down arrow again. The caption **Image #2** will appear in the Preview frame. Select **Magnetic mixer 3.bmp** as the Picture. The third mixer bitmap will appear in the Preview frame.
- Change the entry in the **Value** field to 2.

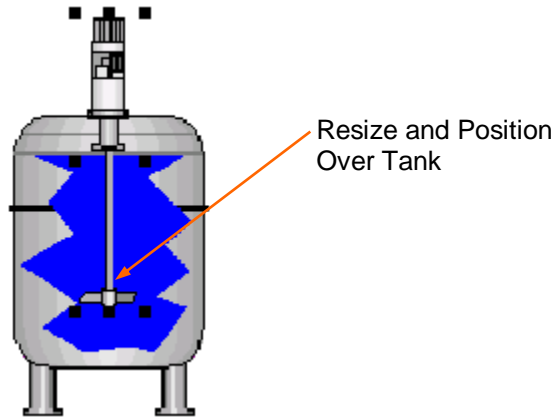


- Left click on the scroll down arrow again. The caption **Image #3** will appear in the Preview frame. Select **Magnetic mixer 4.bmp** as the Picture. The last mixer bitmap will appear in the Preview frame.
- Change the entry in the **Value** field to 3.



- Left click on the **OK** button to close the Object Properties dialog.
- Select the mixer object and resize it to about 30 x 145 pixels. Move the object so that it appears over the Tank as shown in the following example.


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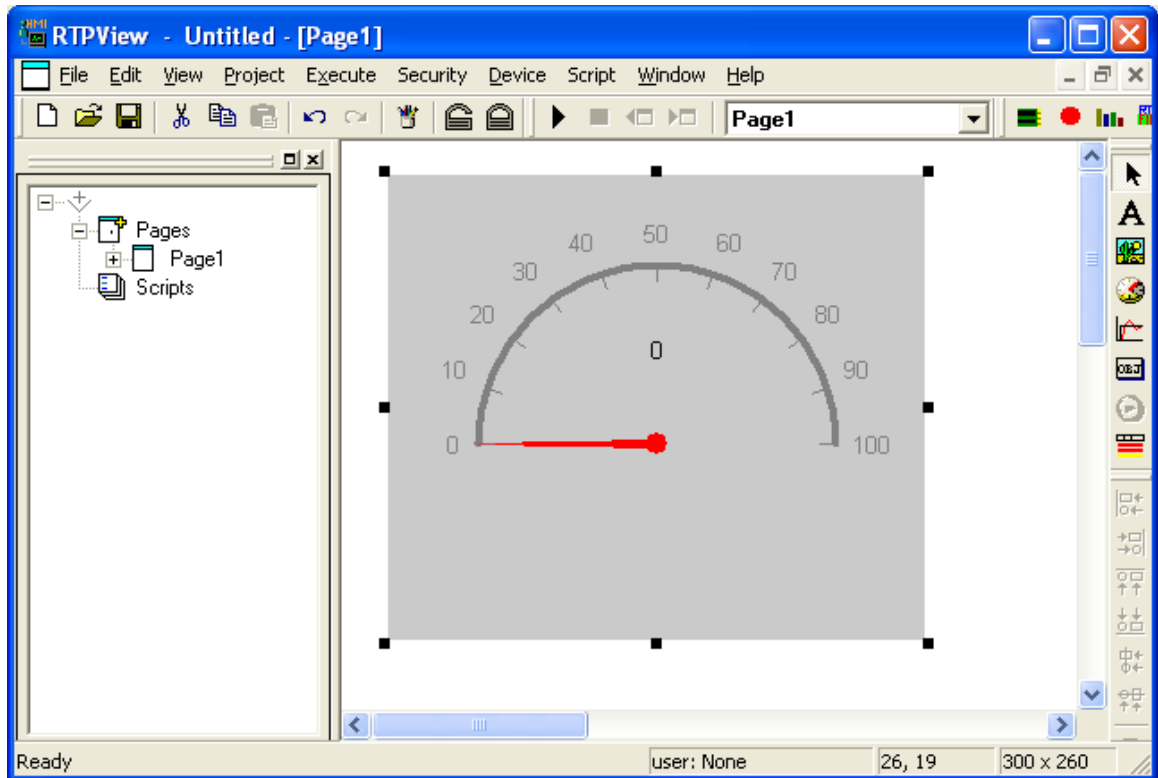



- Right-click on the mixer object and select **Data Properties** from the menu.
- Left click on the Tag column and select **Mixer** from the list of tag names. Left click the **OK** button to close the Data Properties dialog.

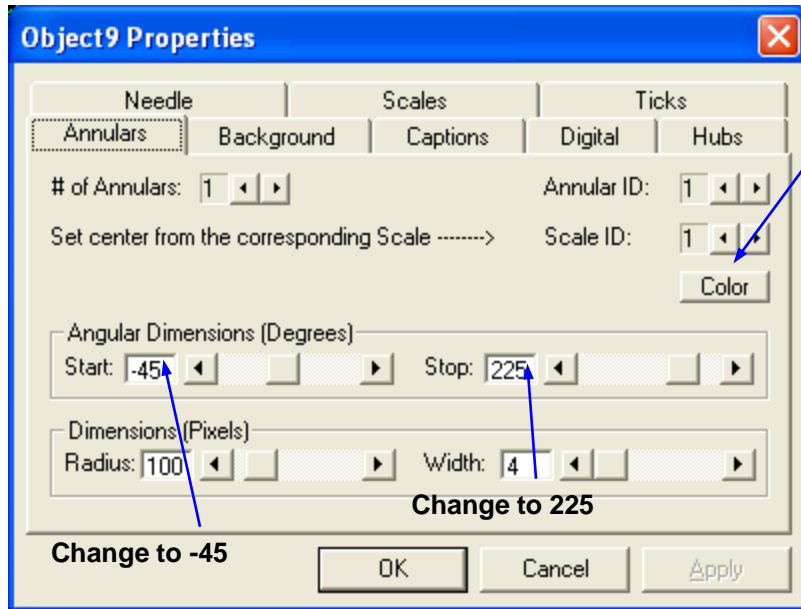
Temperature Gauge

The Temperature Gauge displays Celsius temperatures derived from the Fader output in the RTPView project. It is created with a Gauge object.

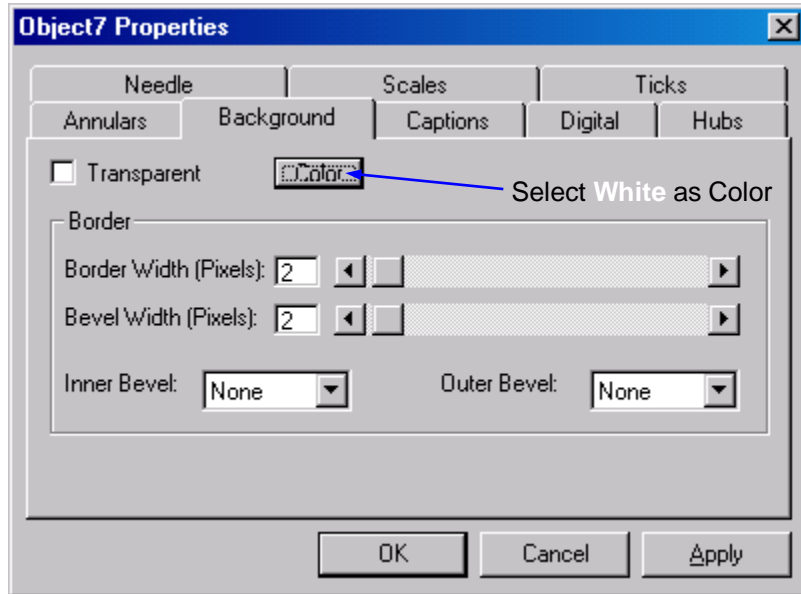
- Left click on the  (Gauge) button in the Palette toolbar. Move the cursor to the right of the Tank and left click the mouse button. The Gauge object will appear on the page.
- Select the Gauge object, press and hold the Shift key, and use the arrow keys to adjust the size of the Scale to 300 x 260 pixels.



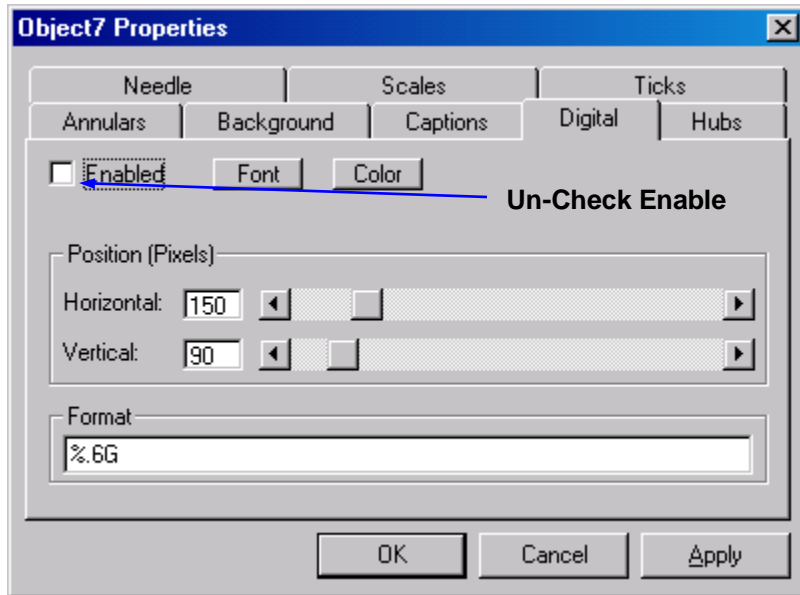
- Right-click on the **Gauge** and select **Object Properties** from the menu.
- In the **Annulars** tab of the Properties dialog, left click on the **Color** button and select **Blue** as the color of the annular. Left click on the **OK** button to close the Color dialog. Change the **Angular Dimensions Start parameter** to **-45** degrees and the **Stop parameter** to **225** degrees. (Note that to enter a negative value, you must use the decrement key . Positive values can be entered directly.) Leave the **Radius** and **Width Dimensions** at the default values (100 and 4).



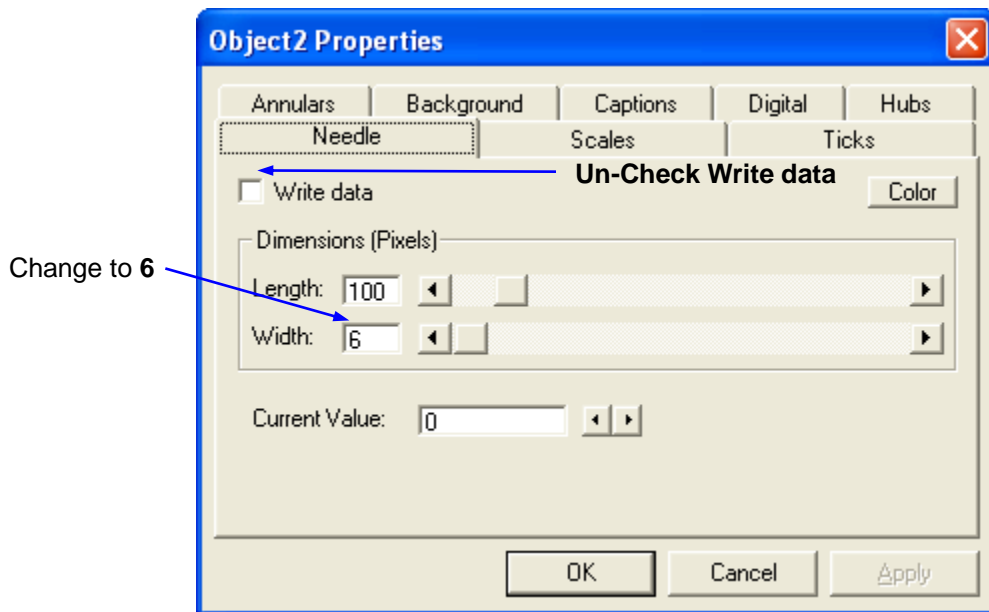
- Left click on the **Background** tab of the Properties dialog. Left click on the **Color** button and select **White** as the background color. Left click **OK** to close the Color dialog. Leave the **Border** parameters at the default values (**None**).




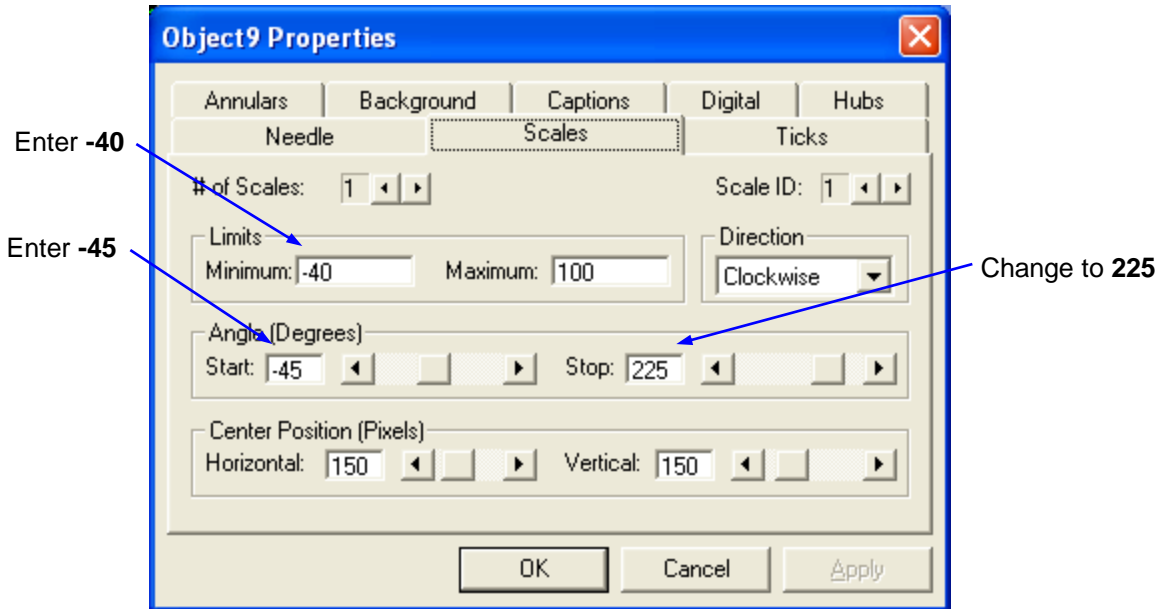
- Left click on the **Digital** tab of the Properties dialog. Un-check the **Enable** checkbox to disable the digital value display.



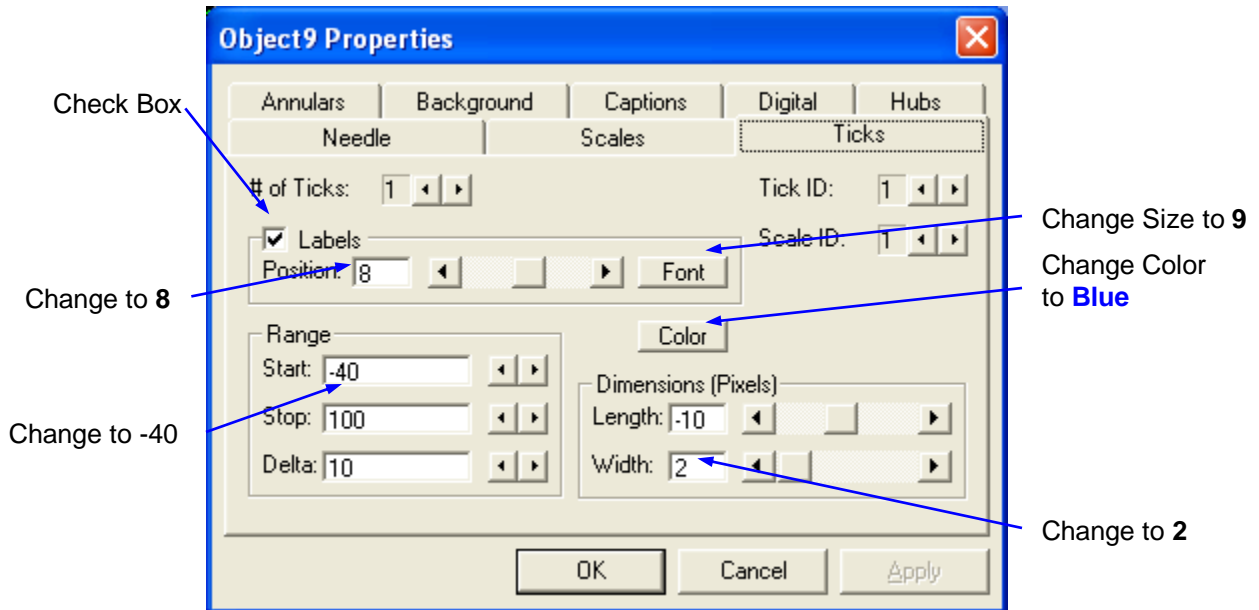
- Left click on the **Needle** tab of the Properties dialog. Un-check the Write data checkbox. This object will be reading data. Change the Width to **6** pixels.



- Left click on the **Scales** tab of the Properties dialog and enter the value **-40** into the **Limits Minimum** field. Leave the **Limits Maximum** field at its default value (**100**). Leave the **Direction** setting at **Clockwise**. Change the **Start Angle** to **-45** degrees and the **Stop Angle** to **225** degrees. (Note that to enter a negative value, you must use the decrement key . Positive values can be entered directly.) Leave the **Horizontal** and **Vertical** Center Positions at the default settings (**150** and **150**).

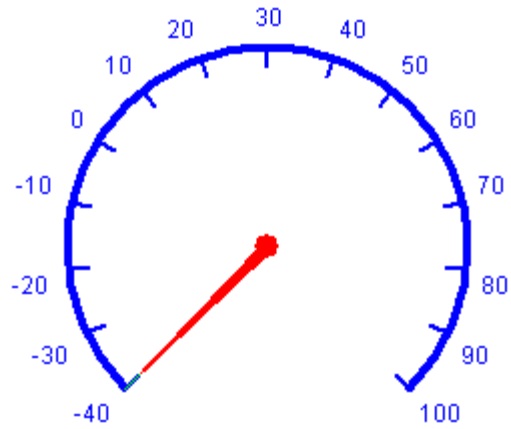


- Left click on the **Ticks** tab of the Properties dialog and check the Labels checkbox. Change the label **Position** to **8**. Left click the **Font** button and change the **Size** to **9**. Left click **OK** to close the Font dialog. Left click on the **Color** button and select **Blue** as the color of the Ticks. Left click **OK** to close the Color dialog
- Change the **Start Range** to **-40**. Leave the **Stop Range** and **Delta** at their default values (**100** and **10**). Leave the **Length** Dimension at the default value (**-10**). Change the **Width** Dimension to **2**.



- Left click on the **OK** button to close the Object Properties dialog.
- The temperature gauge should look like the example shown below. Select the object and reposition it to coordinates 350, 5.


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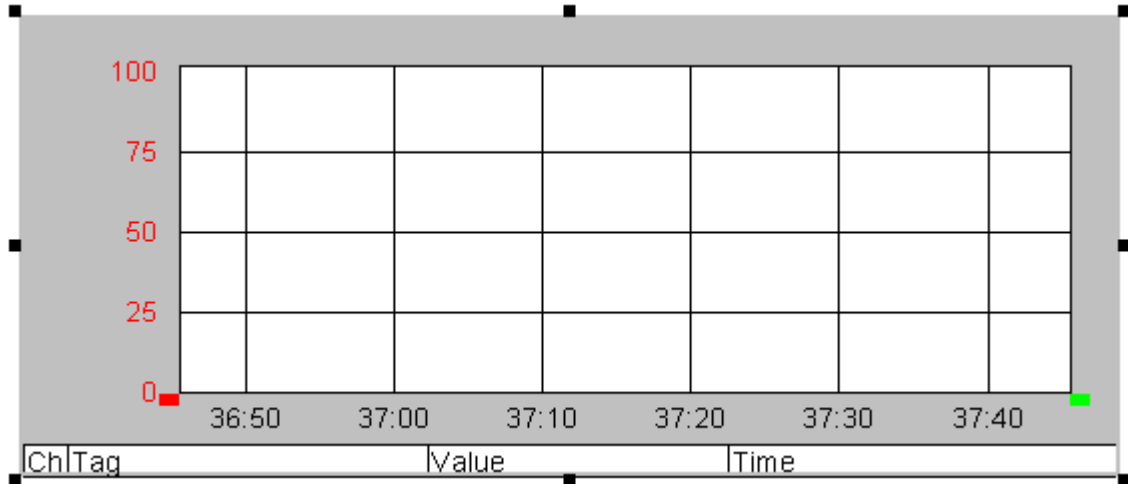


- Right-click on the Temperature Gauge object and select **Data Properties** from the menu.
- Left click on the **Tag** column and select **Celsius** from the list of tag names. Left click the **OK** button to close the Data Properties dialog.

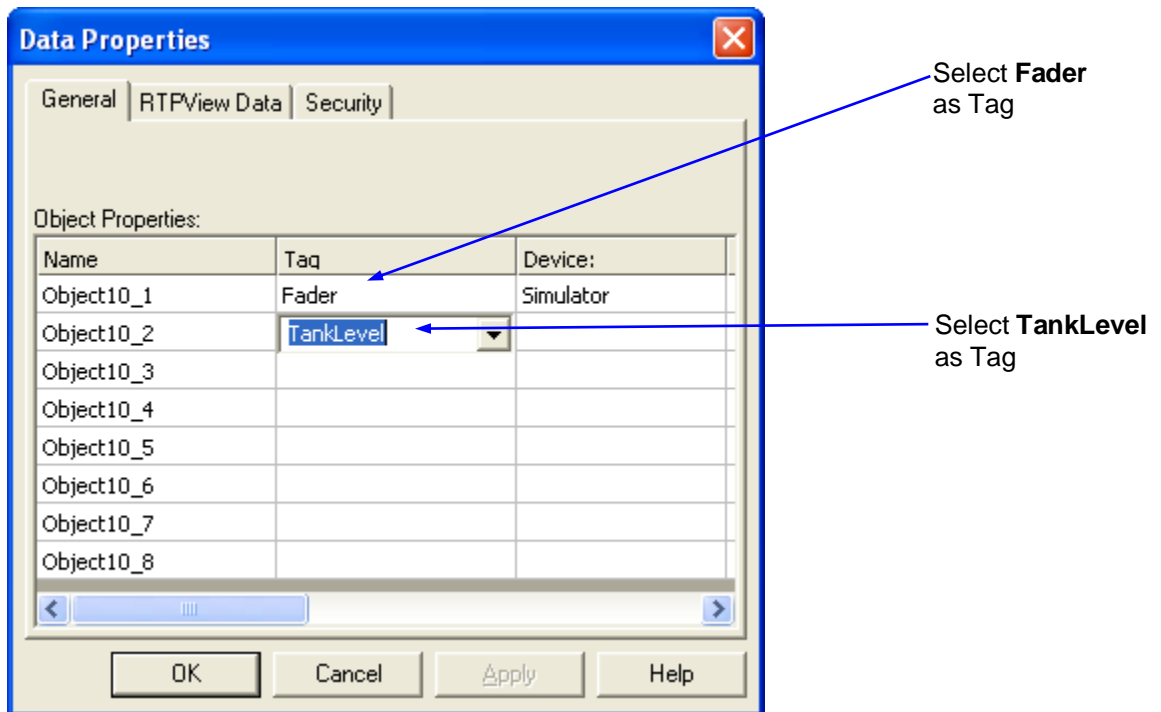
Trend

The Trend object will plot the values of the **Fader** and the **TankLevel** variables.

- Left click on the  (Trend) button in the Palette toolbar. Move the cursor below the other objects and left click the mouse button. The Trend object will appear on the page.

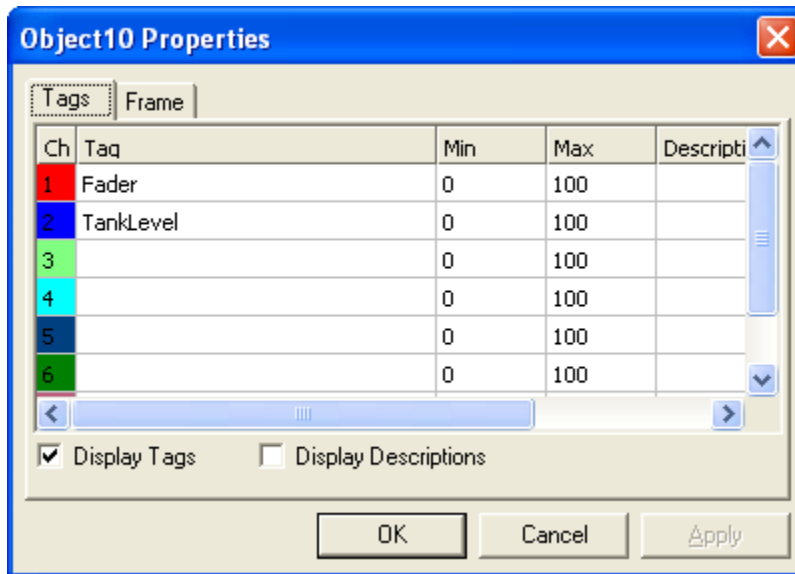


- Right-click on the Trend and select **Data Properties** from the menu.
- Select **Fader** as the **Tagname** in the first row. Select **TankLevel** as the **Tagname** in the second row. The **Device** will automatically be set to Simulator (the *device* with the downloaded program). Left click the **OK** button to close the Data Properties dialog.

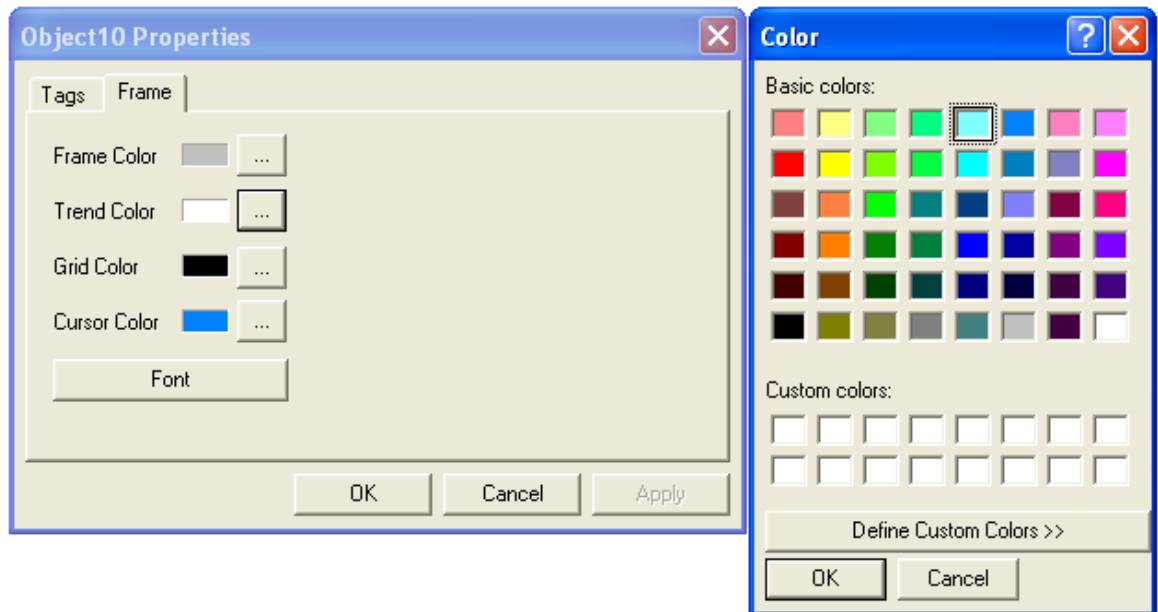


RTPView Project Program Example

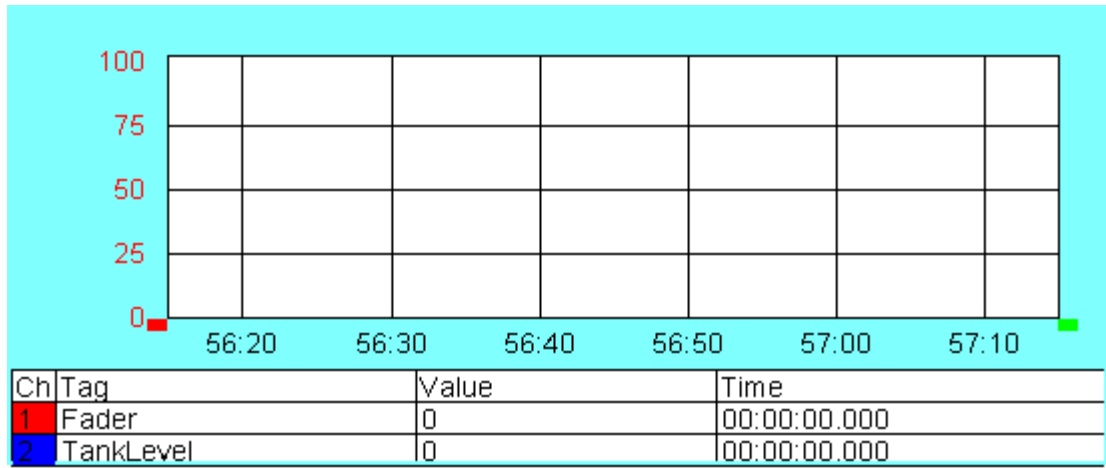
- Right-click on the Trend and select **Object Properties** from the menu. Leave the **Min** and **Max** entries at the default values of **0** and **100**.)



- Left click on the **Frame** tab. Select **Frame Color** and chose **Light Blue**. Click the **OK** button to close the Frame Color dialog. Left click the **OK** button to close the Object Properties dialog.





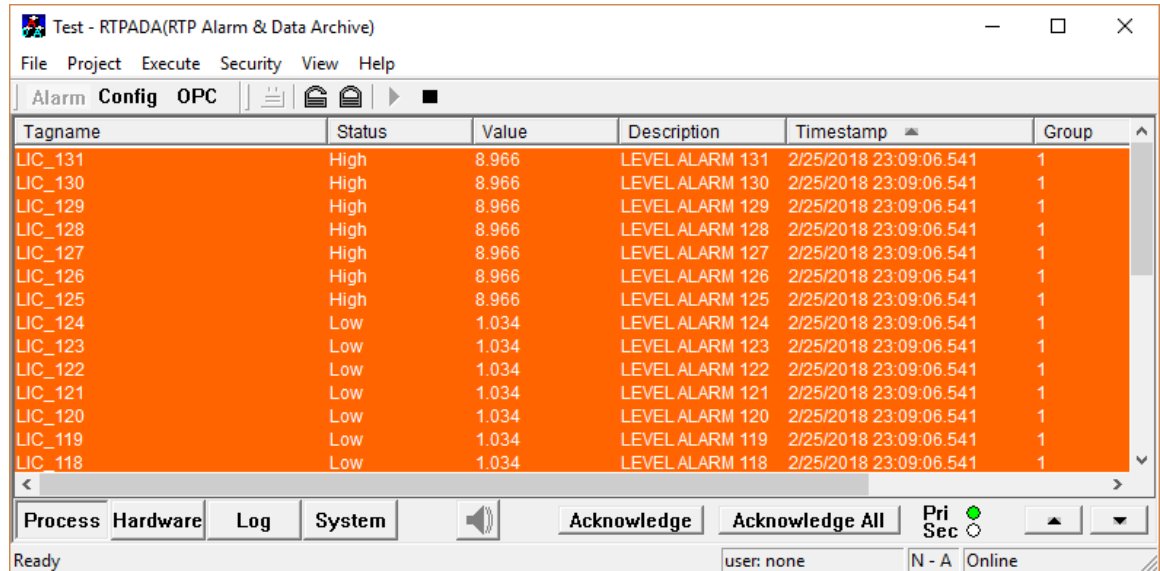
RTPView Project Program Example



RTPADA Display

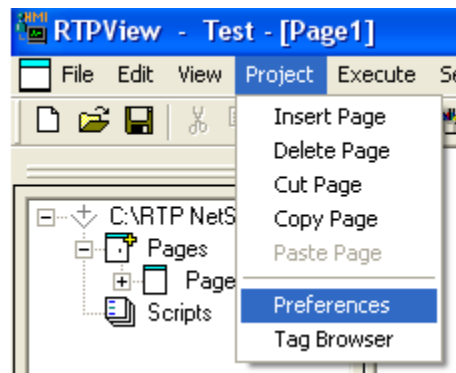
The following section will initiate RTPADA to create alarms for RTPView to monitor.

- In the NetArrays toolbar, left click the  button to launch RTPADA.
- Open the previously created RTPADA file **Test**.
- Left click on the  (Run) button in the toolbar.
- Verify that RTPADA is running by observing **Online** in the lower right hand corner. Alarms may or may not be observed depending on the value of the input variables.

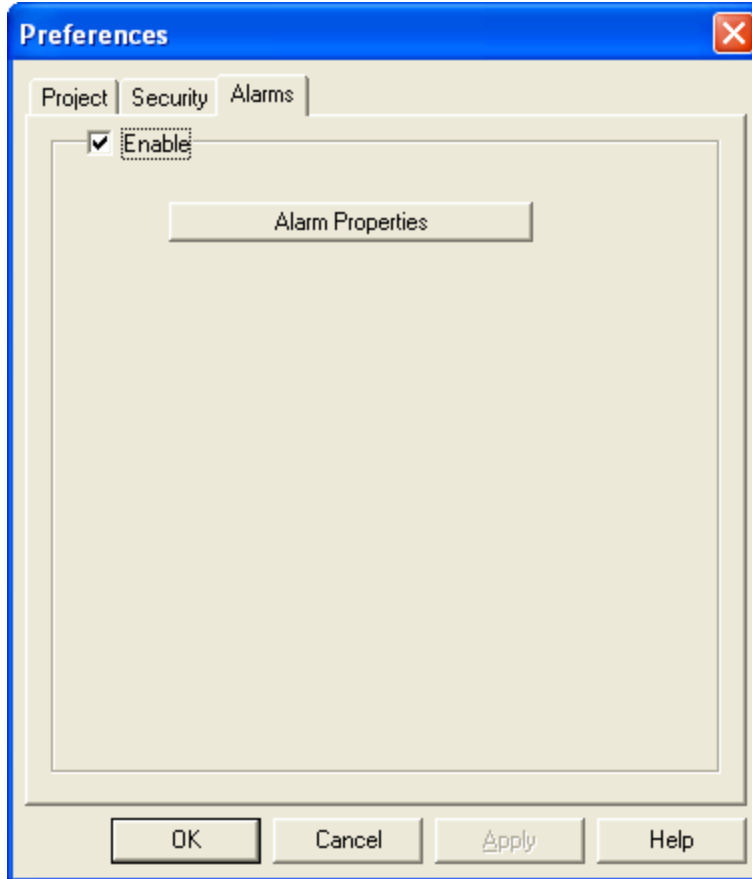


The following section will prepare RTPView to display the RTPADA alarms.

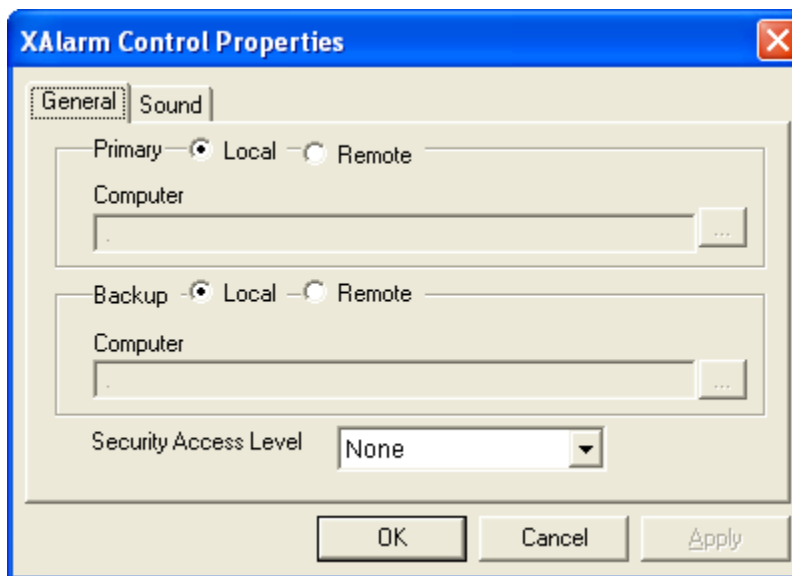
- In RTPView left click on **Project** and Select **Preferences**.




- Left click on the **Alarms** Tab and check **Enable**.



- Left click on **Alarm Properties** and ensure that **Local** is Selected. Left click the **OK** button to close the Alarm Properties dialog. Left click the **OK** button to close the Preferences dialog.



- Left click on the  (RTPADA) button in the Palette toolbar and position the cursor below the Trend object. Left click to place the object on the page. With the mouse, grab the right center handle and make the RTPADA object approximately the same size as the Trend object.

RTPView Project Program Example



- When RTPView is run and RTPADA reports an error, the alarms will be visible here. This RTPView object provides the same view as the RTPADA Alarm window.

At this point your project should look like the example below.

RTPView Project Program Example

The screenshot displays the RTPView software interface for a tank control system. The window title is "RTPView - Test - [Page1]". The menu bar includes File, Edit, View, Project, Execute, Security, Device, Script, Window, and Help. The toolbar contains various icons for file operations and execution. The main workspace shows a control panel with the following elements:

- Level Indicator:** A vertical scale on the left with a blue bar at the bottom and a "0" label.
- Tank Diagram:** A central illustration of a cylindrical tank with a stirrer and a sensor on top.
- Gauge:** A semi-circular gauge on the right with a scale from -40 to 100 and a red needle pointing to approximately 10.
- Data Table:** A table with a cyan background showing data points over time.
- Log Window:** A window at the bottom with a "Pri Sec" label and a grey bar.

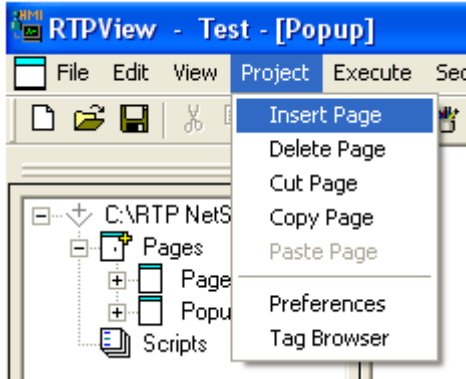
Ch	Tag	Value	Time
1	Fader	0	13:45:41.774
2	TankLevel	0.06099424	13:45:41.774

Ready user: None 297, 0 0 x 0

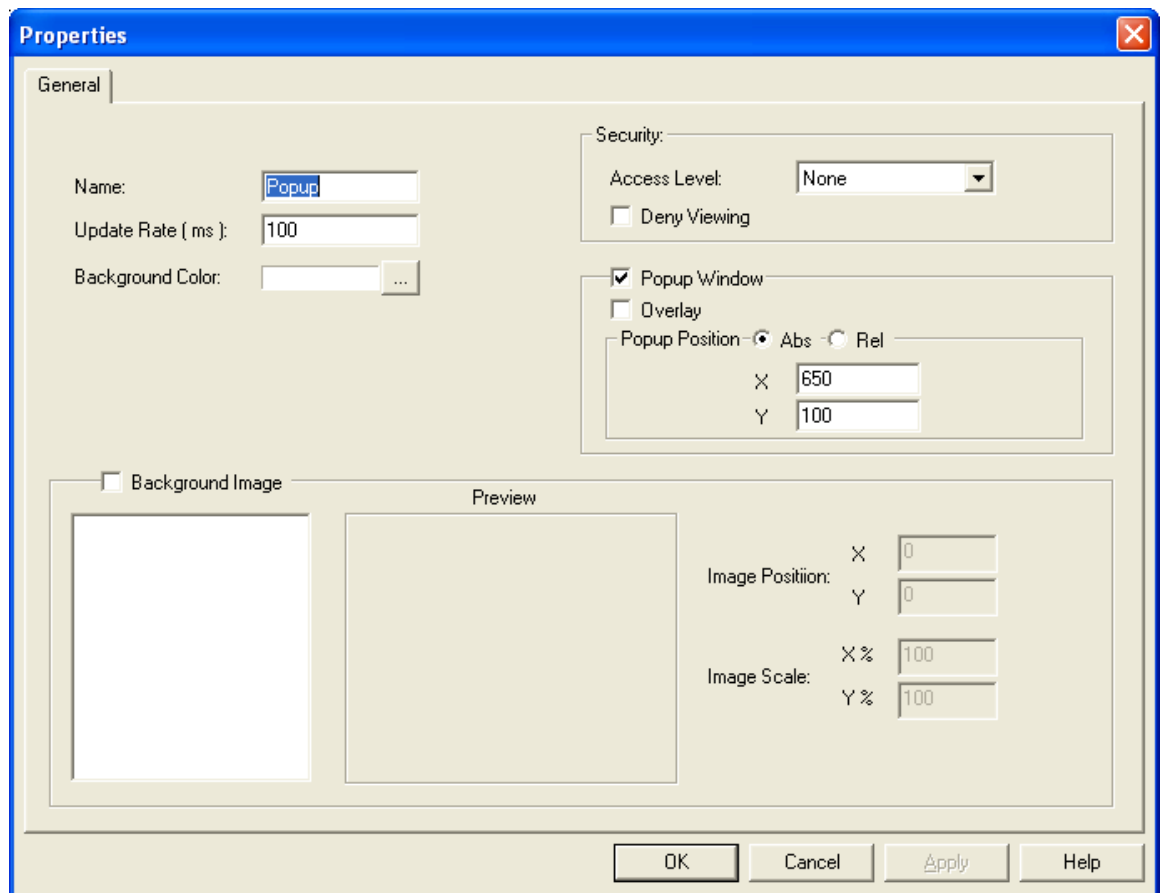
Popup Window

The following section will show how to use a Button Picture to implement functions, specifically a Popup window.

- Select **Project** and **Insert Page**.

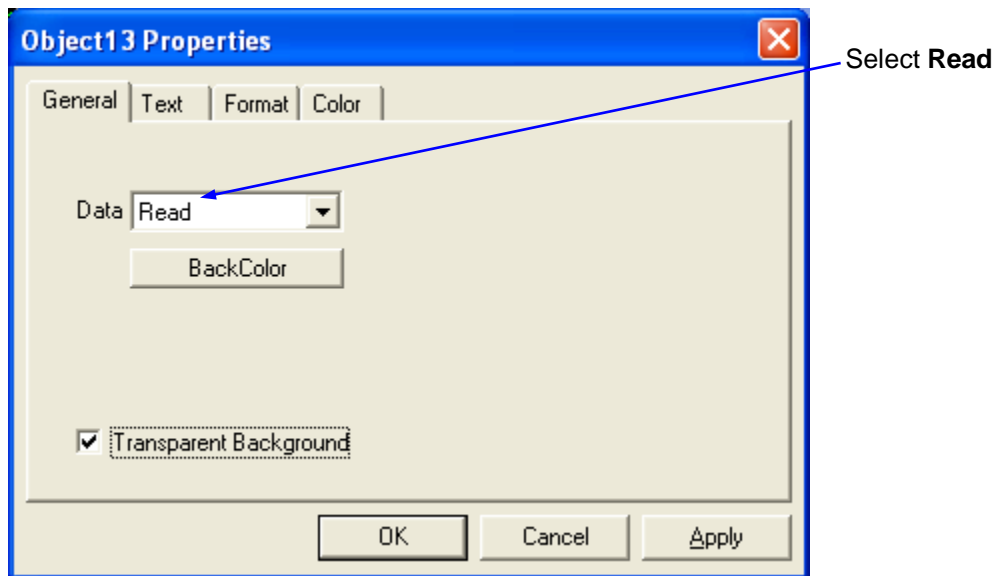


- In the page Data Properties, change Name to **Popup**. Change Update Rate (ms) to **100**, Check **Popup Window**, set X to **650** and Y to **100**. Left click on the **OK** button to close Page Properties.

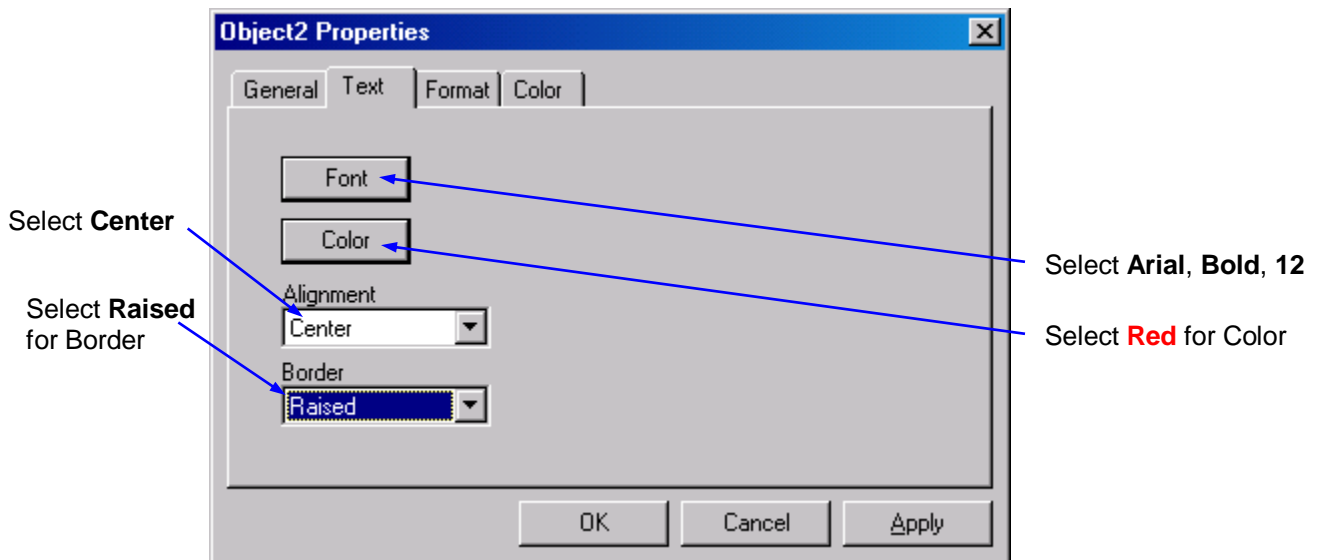


- Left click on the **A** (Edit Box) button in the Palette toolbar. Move the cursor near the upper left hand corner of the Popup page. A light gray rectangle will appear below the Scale.

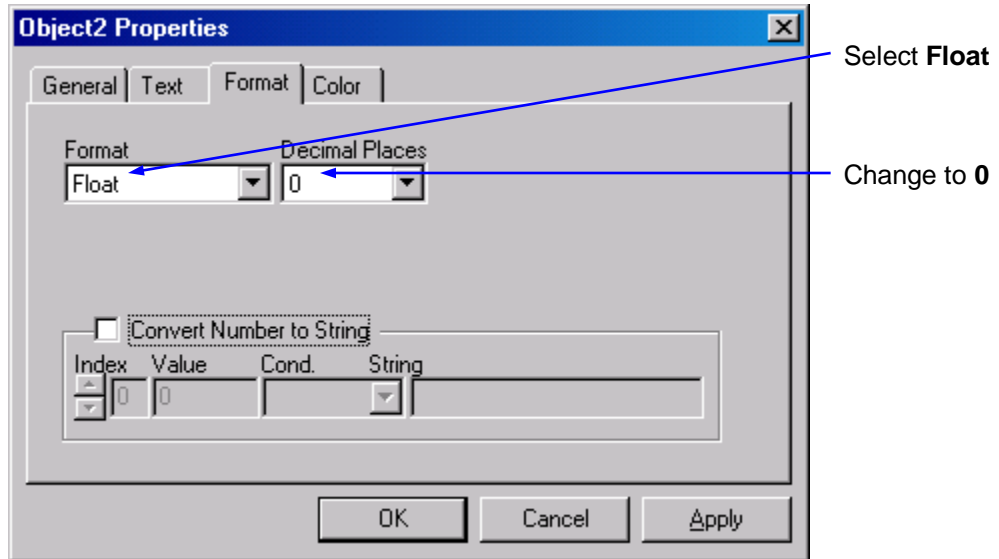
- Right-click on the rectangle and select **Object Properties** from the menu.
- In the General tab of the Properties dialog, select **Read** as the Data property. Check **Transparent Background**.



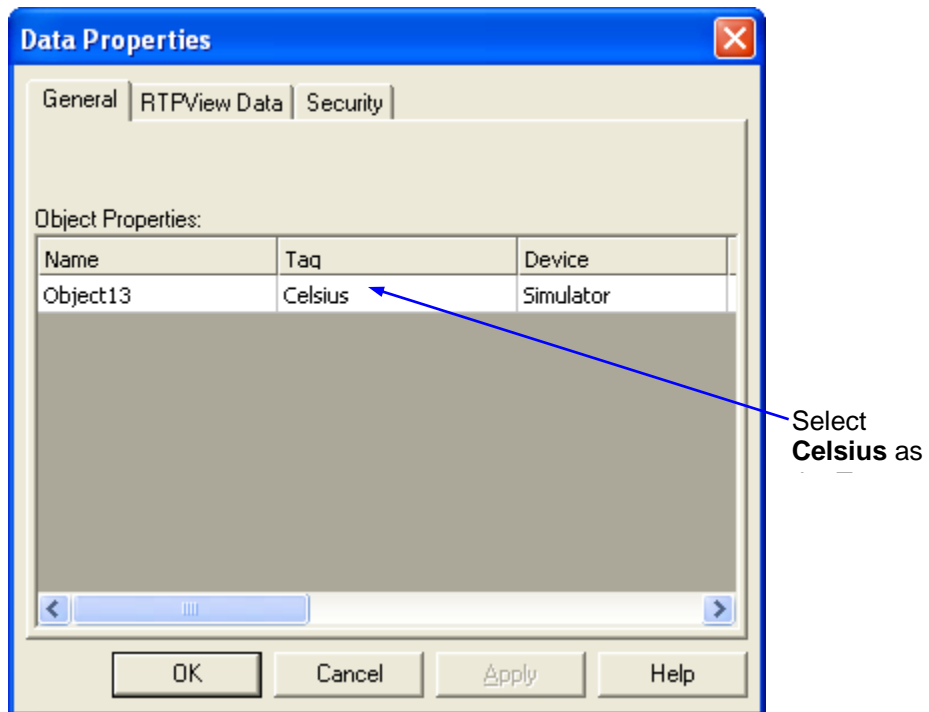
- Left click on the **Text** tab. Press the Font button and change the Font settings to **Arial, Bold, 12**. Left click the **OK** button the close the Font dialog.
- Select **Center** for the **Alignment** and **Raised** for the **Border** type.



- Left click on the **Format** tab. Select **Float** as the text Format, and **0** for the number of Decimal Places. Left click the **OK** button the close the Object Properties dialog.

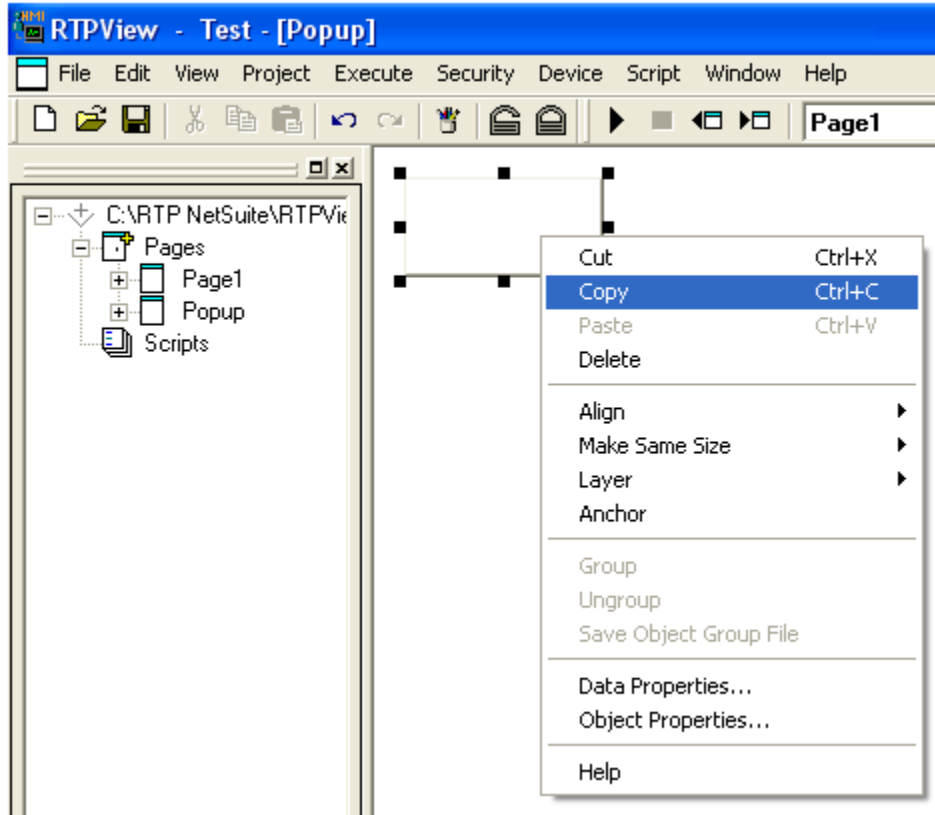


- Left click the **OK** button to close the Object Properties dialog.
- Right-click on the Edit Box object and select **Data Properties** from the menu.
- Left click on the Tag column and select **Celsius** from the list of tag names. Left click the **OK** button to close the Data Properties dialog.

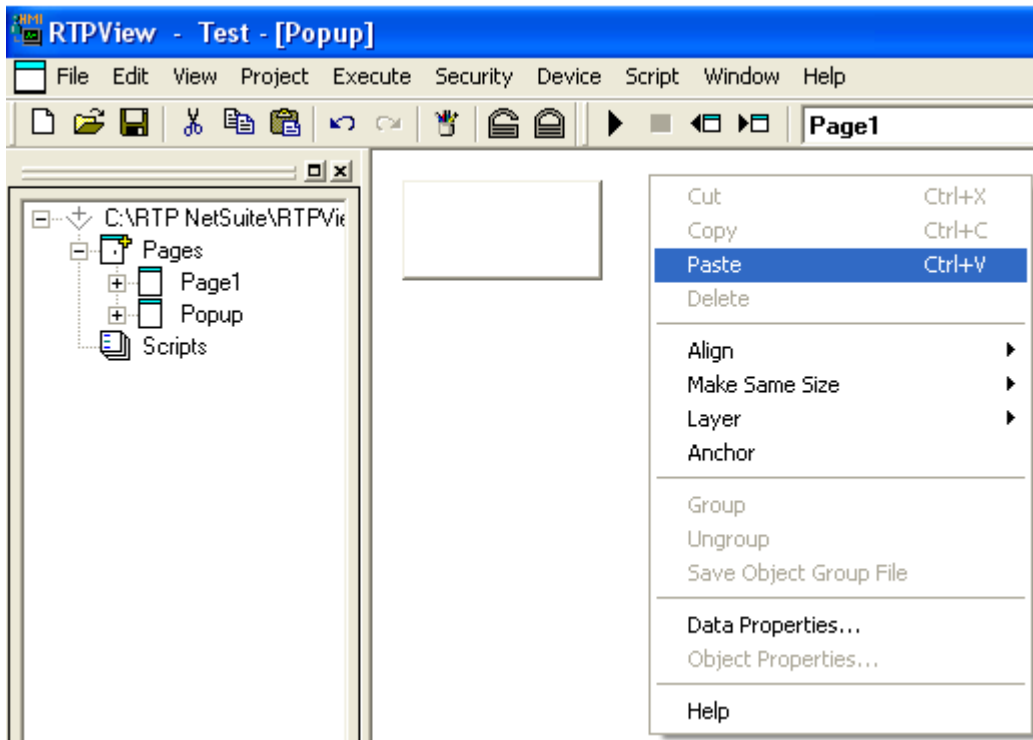


- Position the Edit Box at 15, 15.
- Right Click on the Edit Box and Select **Copy**.

RTPView Project Program Example




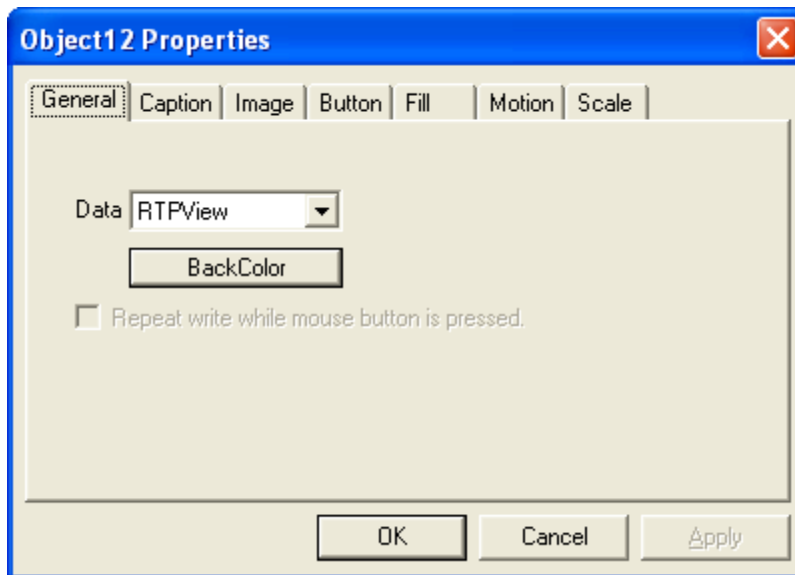
- Position the Cursor to the right of the Edit Box, Right Click, and Select Paste.



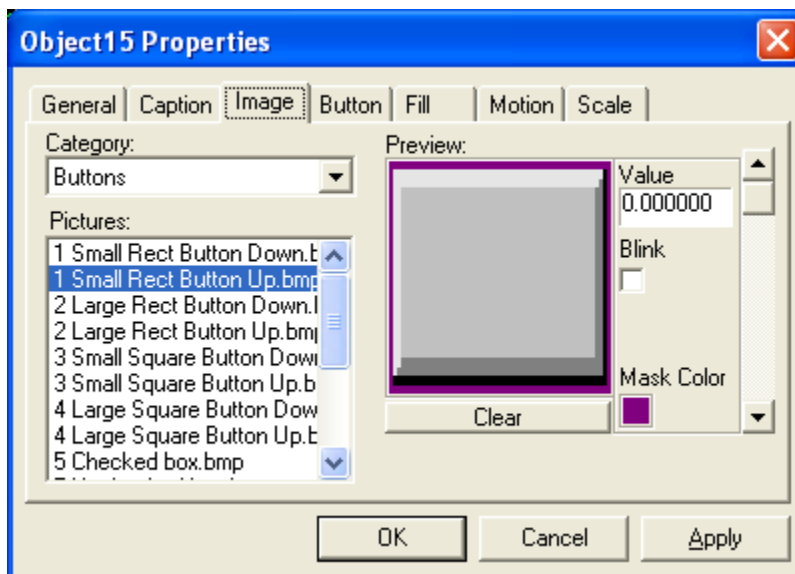
- Right-click on the Edit Box object and select **Data Properties** from the menu.

RTPView Project Program Example

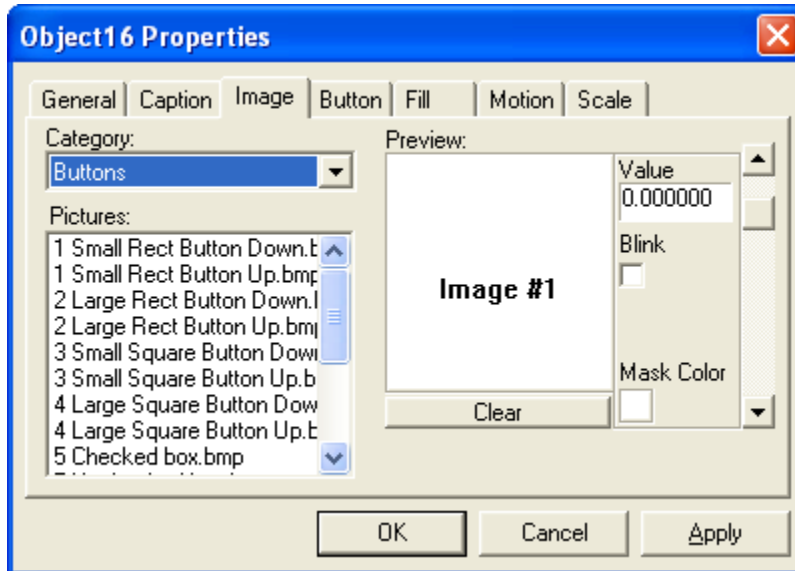
- Left click on the Tag column and select **TankLevel** from the list of tag names. Left click the **OK** button to close the Data Properties dialog.
- Position the Edit Box at 125, 15.
- Return to Page 1 by clicking on Page 1 in the left pane.
- Left click on the  (Picture) button in the Palette toolbar. Move the cursor to the right of the Gauge and left click the mouse button. A dark gray rectangle will appear on the page.
- Right-click on the rectangle and select **Object Properties** from the menu.
- In the General tab of the Properties dialog, select **RTPView** as the Data property. This object will open the Popup window.



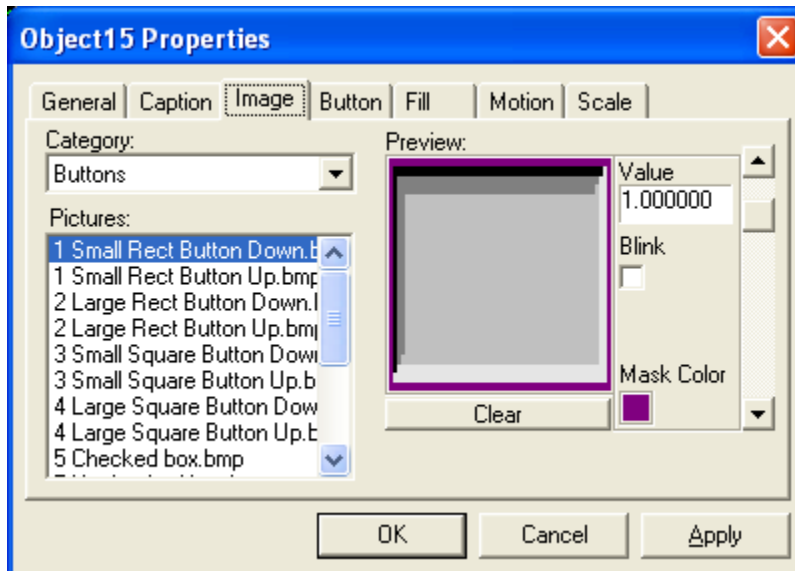
- Select **Image** tab, category **Buttons**. Select **1 Small Rect Button Up**.



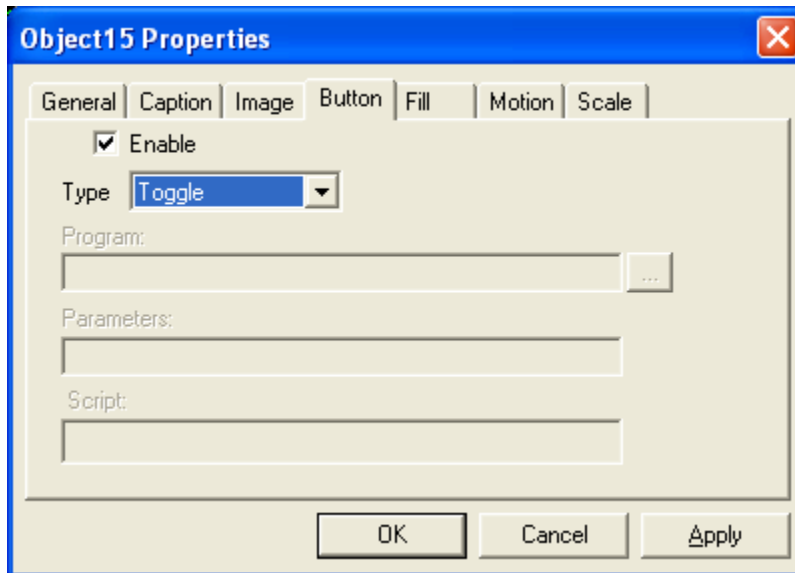
- Left click the down arrow to show Image #1.



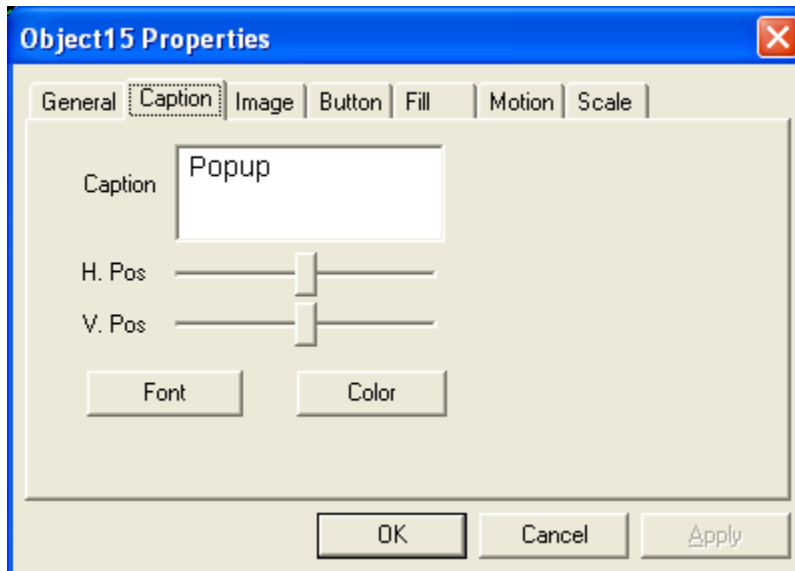
- Select **1 Small Rect Button Down**, and change Value to 1.



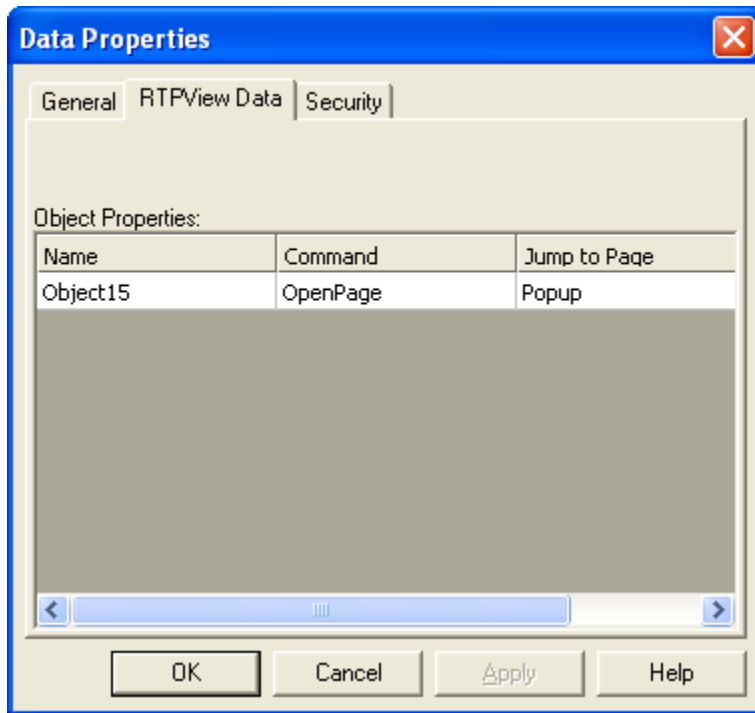
- Select the **Button** Tab.
- Check **Enable**, type **Toggle**.



- Left click on the **Caption** tab and type in **Popup**.



- Left click the **OK** button to close the Object Properties dialog.
- Position the picture object at 650, 25.
- Right Click and Select **Data Properties**. Select **Open Page** for Command and **Popup** for Jump to Page.

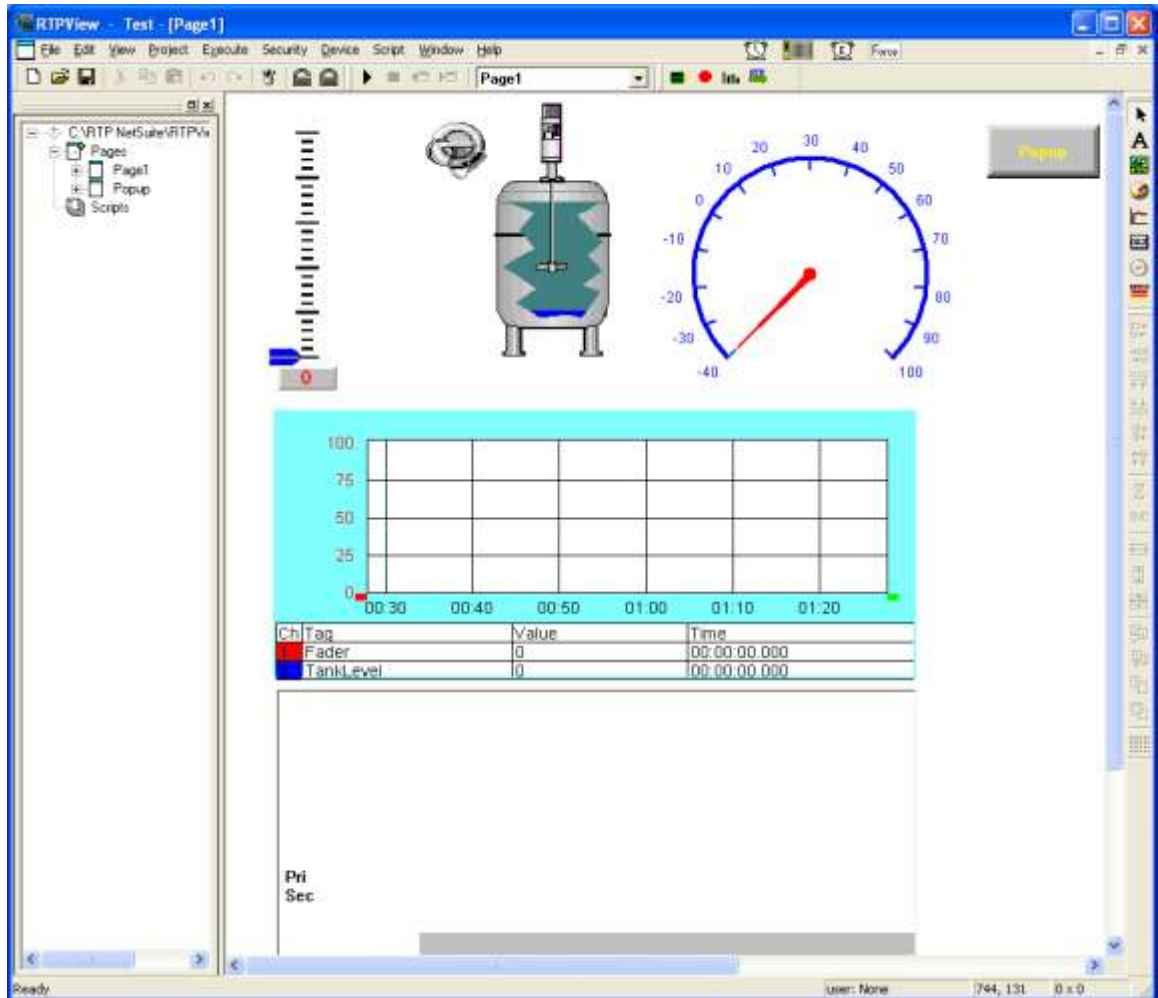


- Left click the **OK** button to close the Data Properties dialog.

In a similar fashion buttons can be added to do other functions such as **Go to Page** or open an **Overlay** page.

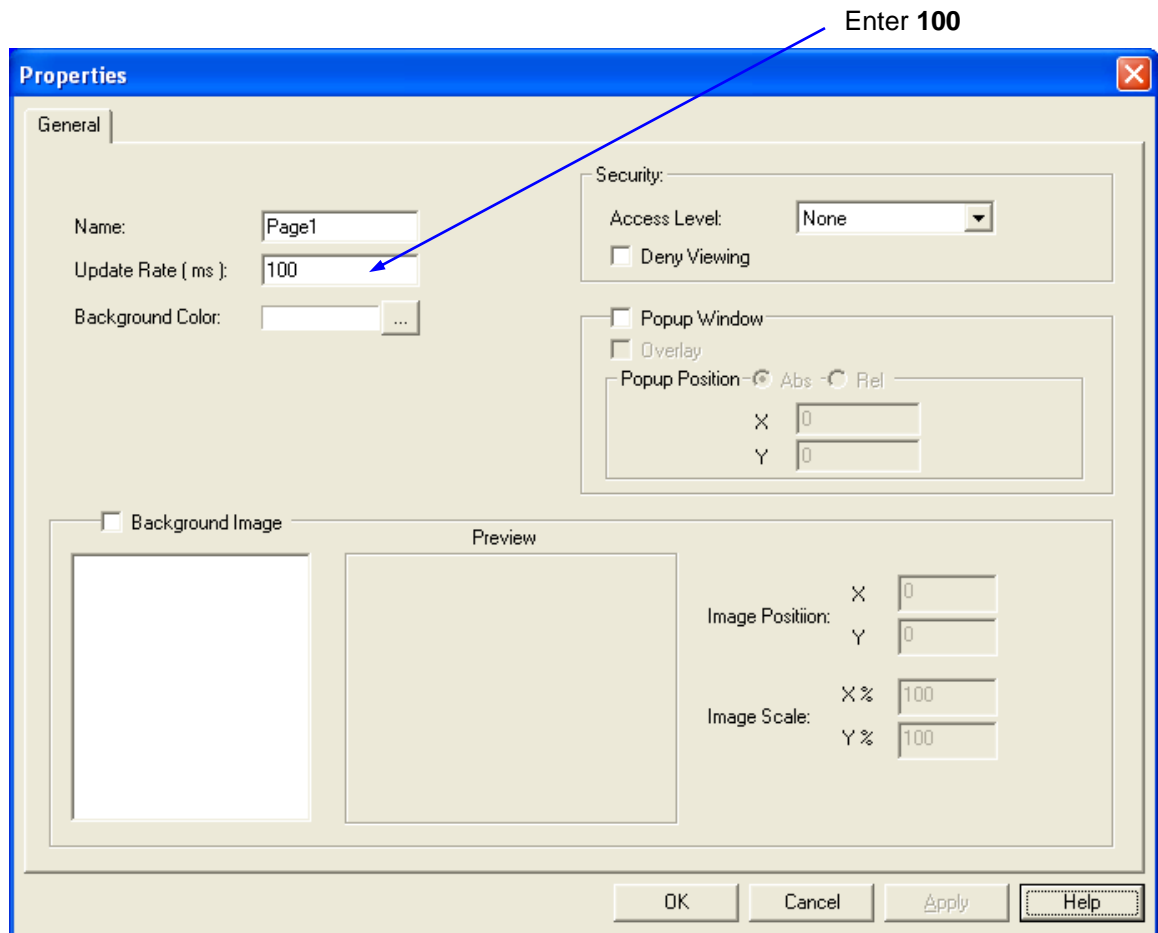
Finishing and Saving the Project

Your finished project Page 1 should look like the example below.



Page Properties


- Right-click on any empty space within the page and select **Data Properties** from the menu.
- Enter the value **100** in the **Update Rate (ms)** field. This will speed up the execution rate and provide smoother motion of the objects. Left click on the **OK** button to close Page Properties.



This completes the RTPView project. Save the project by clicking on **File** and select **Save Project as...** Navigate to the RTPView directory, type in MyFirst, and left click **Save**.

Verification

Now that the RTPView project is completed, we will now run the project.

- Left click on the  (Run) button in the toolbar.
- Left click on the Fader pointer and drag it up to mid scale and release it. Observe that the Tank appears to fill to the same level and that the Temperature Gauge needle moves to mid scale. Also observe that the Trend object plots the values of both the Fader output and the level in the Tank.
- Left click on the Key switch and the Mixer will start running sequencing through its four positions.
- Move the Fader pointer to any other position on the scale.
- The RTPADA object will display alarms as they occur. The four alarm windows can be selected as in RTPADA operation.
- Left click on the **Popup** button. The Popup page will become visible.
- If any of the objects do not behave as expected, stop the project and recheck the configuration of the object's properties.