



Setup Examples

RTPView Project Program

RTPView Project Program Example

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File Name: RTPView Example.pdf
Last Updated: 1/21/09

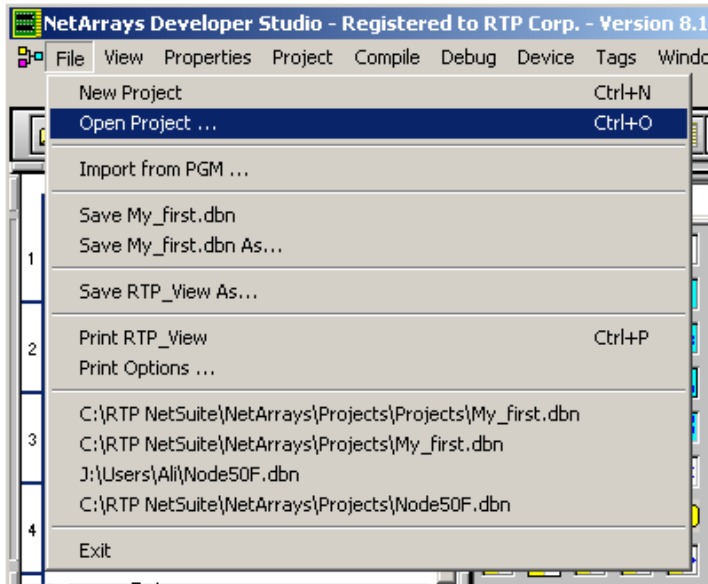
RTPView Project Program

Hardware Setup

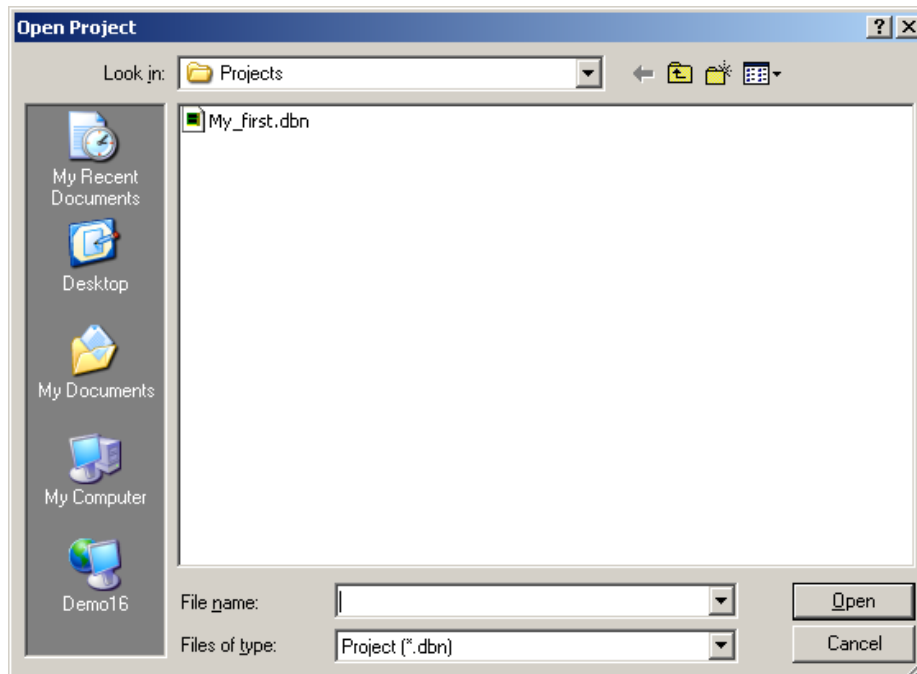
- No physical I/O hardware is required to perform this setup example. You are free to use either an RTP target node configured in a previous setup example, or the NetArrays built-in Simulator.

NetArrays Project

- 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. Click on **File** and select **Open Project...**

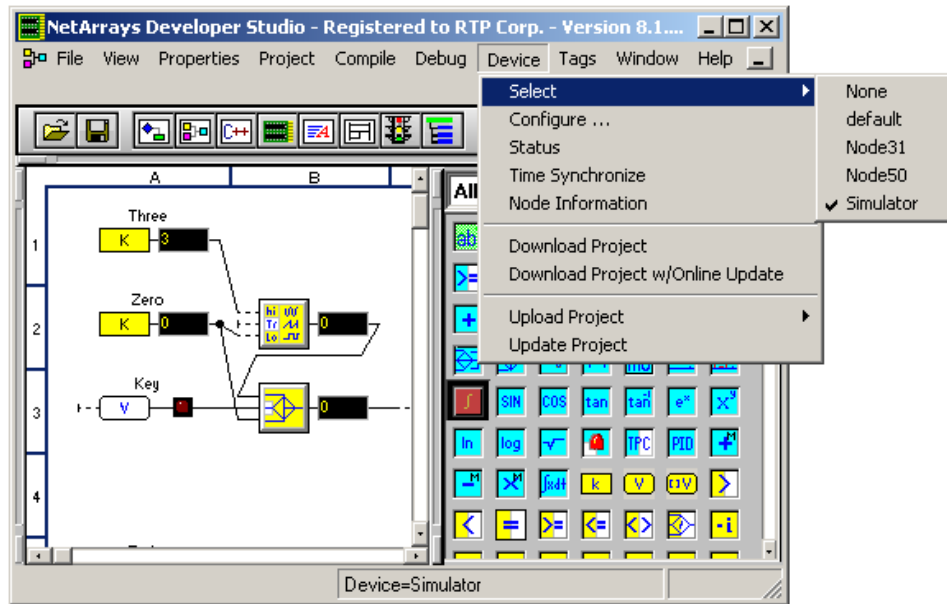


- Select the **My_first.dbn** and click **Open**.

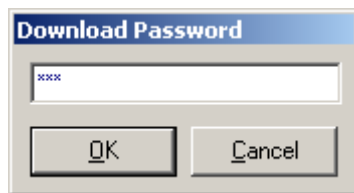


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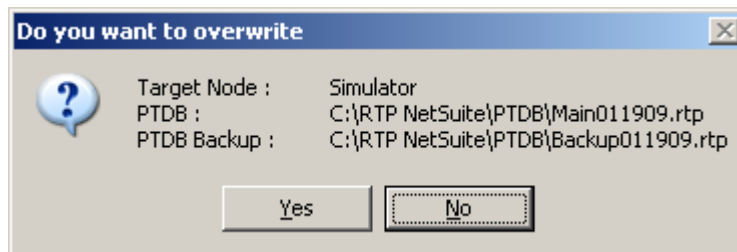
- In the NetArrays **Device** menu, select **Select ▶** and choose the target node you are using to run this example, or the local **Simulator**. In the NetArrays **Device** menu, select **Download Project** to download and run your project on the selected device.



- Enter **rtp** for **Download Password** and type **rtp** and select **OK**.

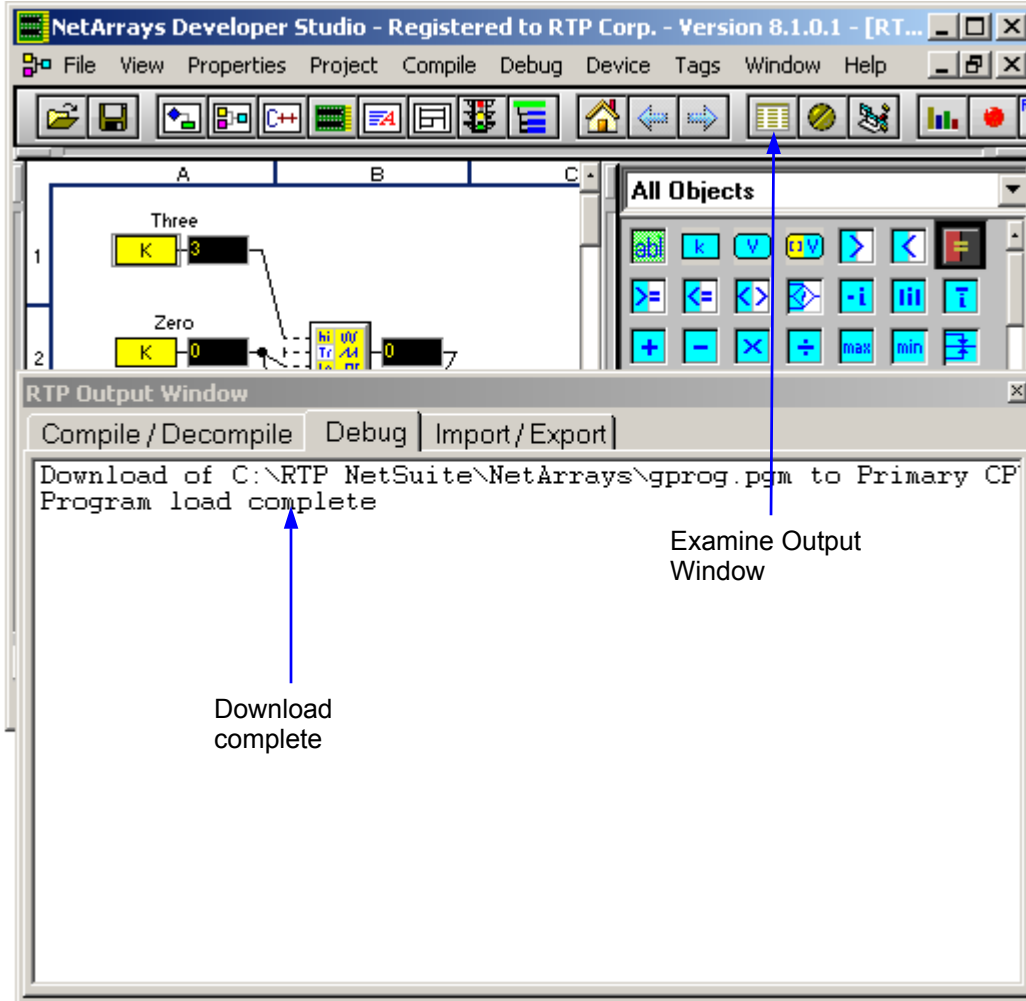


- When prompted select **Yes** for **Do you want to overwrite?**





- 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.

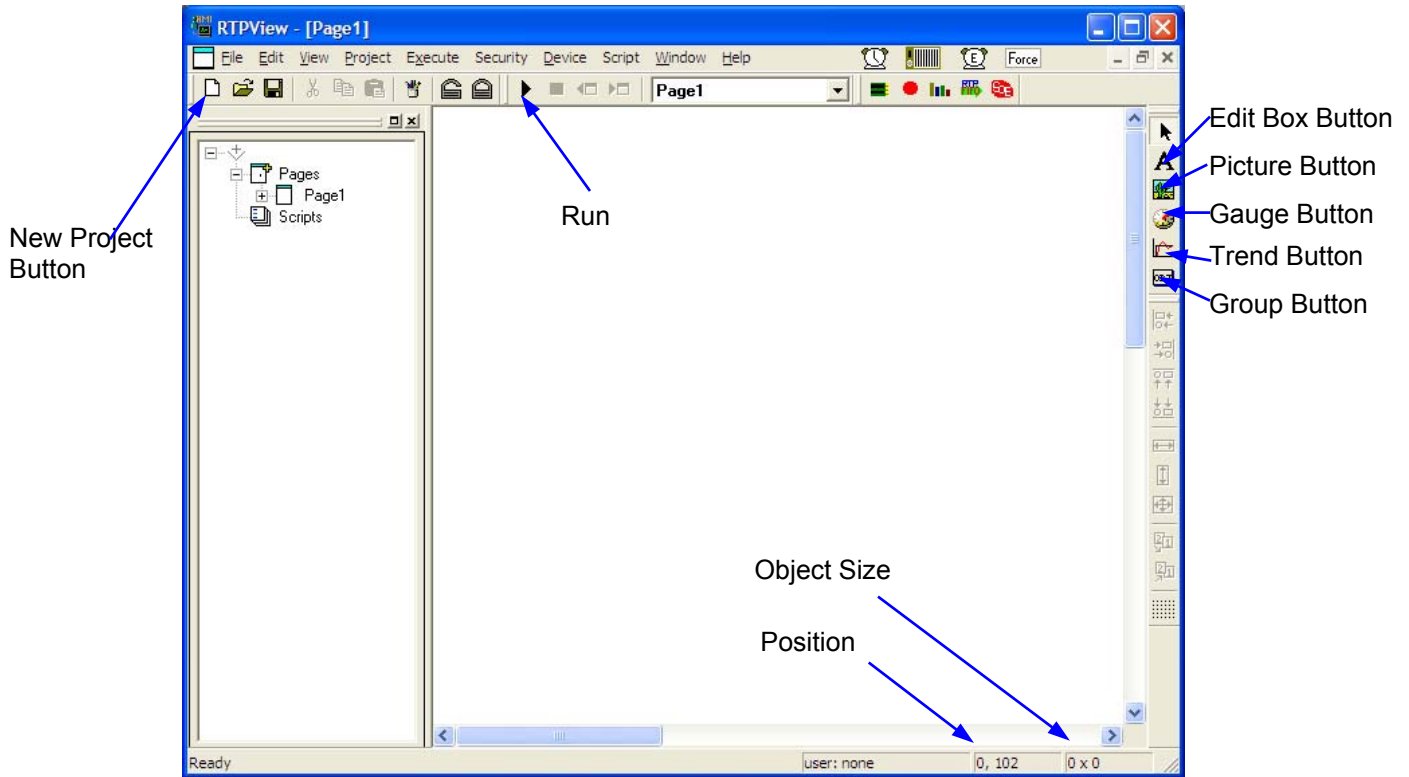
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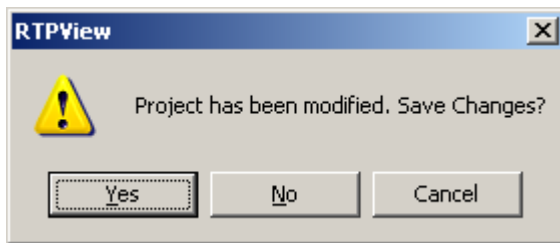
RTPView Project

The RTPView will contain a Fader and a Key Switch that write data to the NetArrays project program, and a Tank, a Temperature Gauge, and A Trend object that read data from the NetArrays project program.

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




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

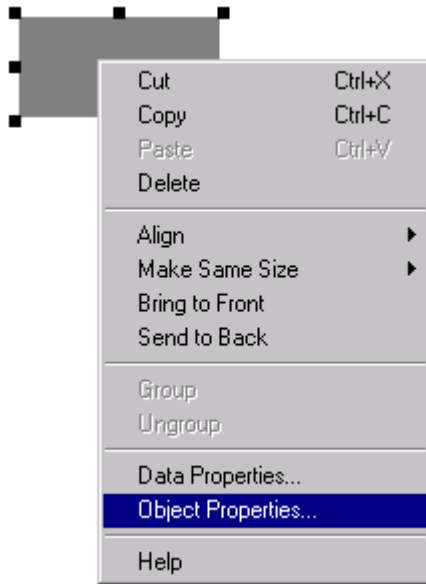


Fader

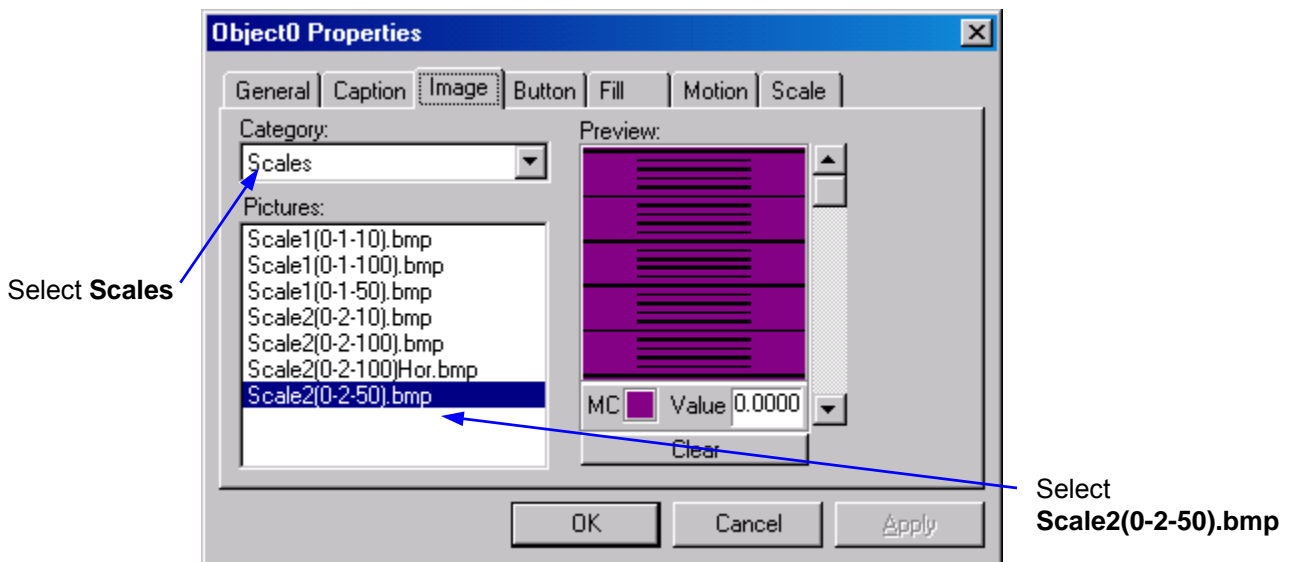
The Fader consists of a static Scale picture object, a Pointer picture object that drives a variable in the NetArrays project program, and an Edit Box object that reads the Fader position from a variable in the NetArrays project program.

Fader Scale

- Click on the  (Picture) button in the Palette toolbar. Move the cursor near the upper left corner of the page and 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. This will display the Object Properties dialog.



- 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.




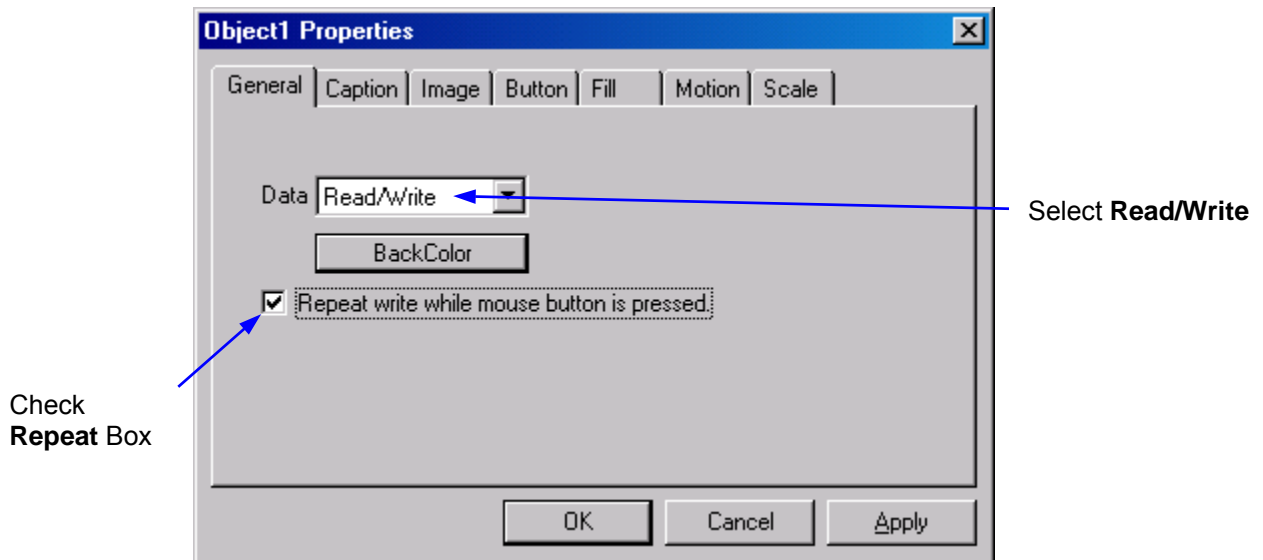
RTPView Project Program Example

- 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.

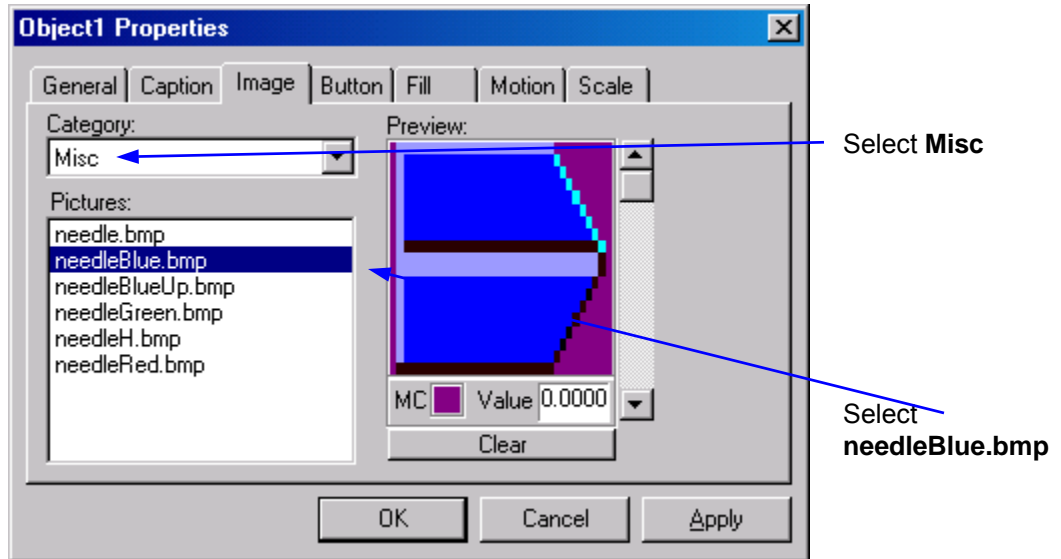


Fader Pointer

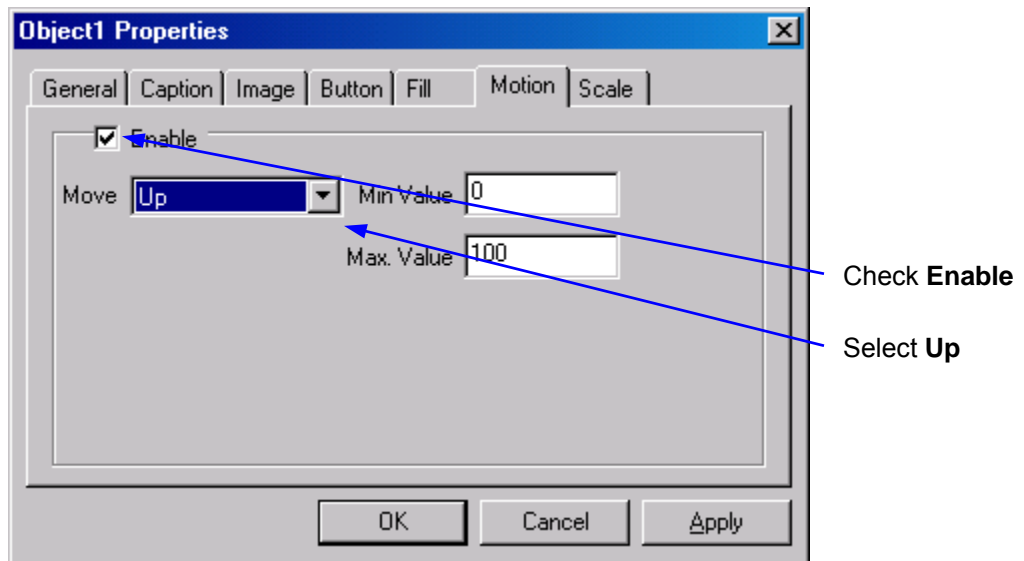
- Click on the  (Picture) button in the Palette toolbar. Move the cursor near the top of the Scale and click the mouse button. A dark gray rectangle will appear over the scale.
- Right-click on the rectangle and select **Object Properties** from the menu.
- In the **General** tab of the Properties dialog,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



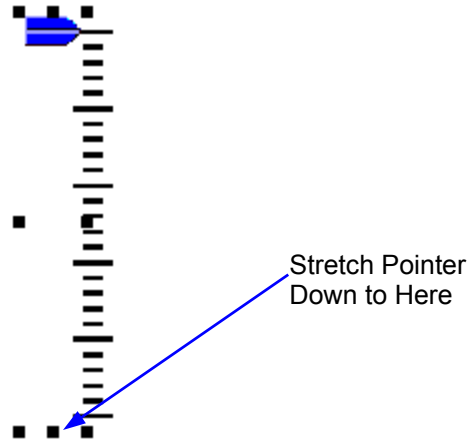
- Click on the **Image** tab of the Properties dialog. From the list of categories, select **Misc**. From the list of Pictures, select **needleBlue.bmp**. The picture will appear in the Preview frame.



- 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.
- 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**.

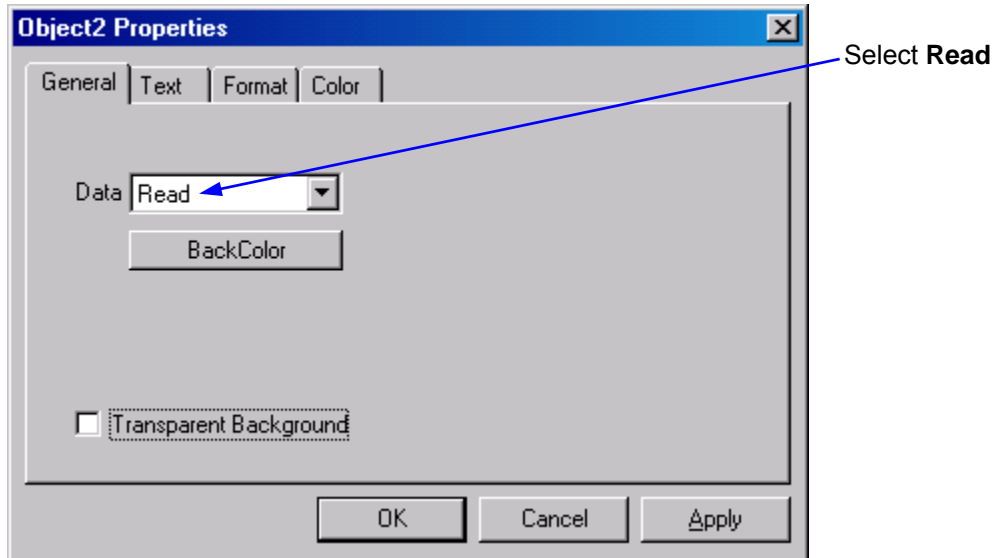


- Click the **OK** button to close the Properties dialog.
- Drag the bottom anchor point of the Pointer down to just below the bottom of the Scale and release it. This determines the motion length for the object.

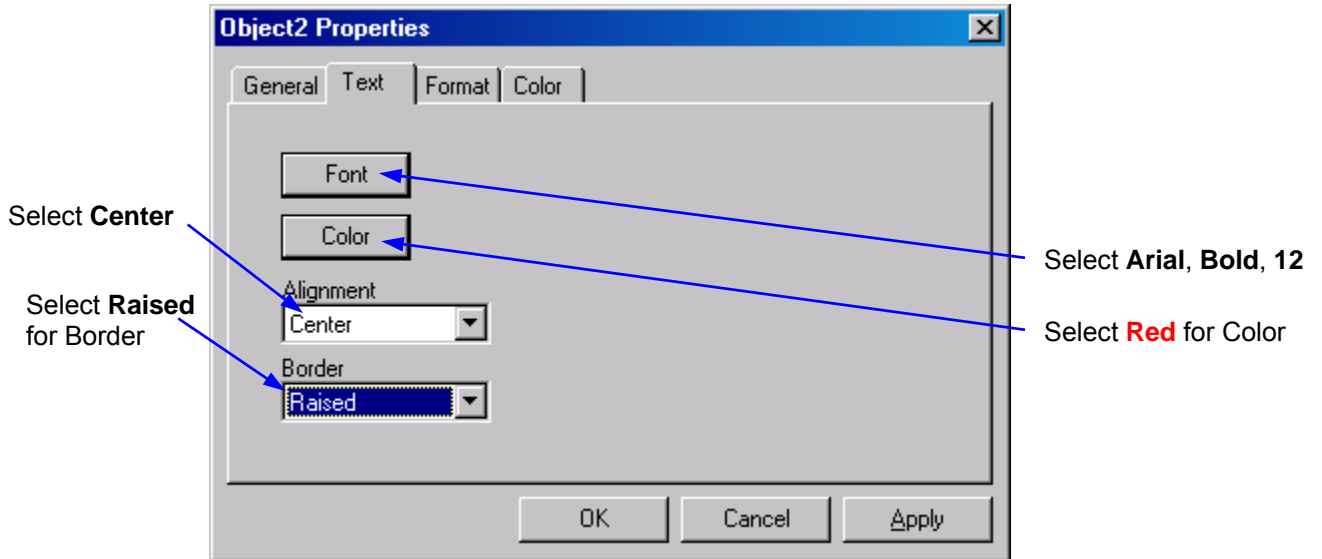


Fader Output Edit Box

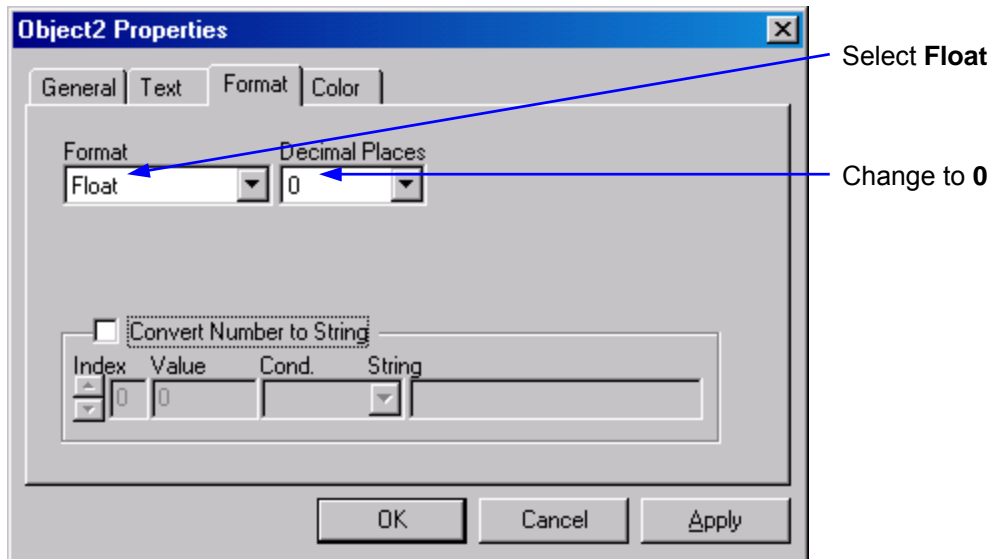
- Click on the **A** (Edit Box) button in the Palette toolbar. Move the cursor under the bottom of the Scale and click the mouse button. A light gray rectangle will appear below the Scale.
- Right-click on the rectangle and select **Object Properties** from the menu.
- In the General tab of the Properties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



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

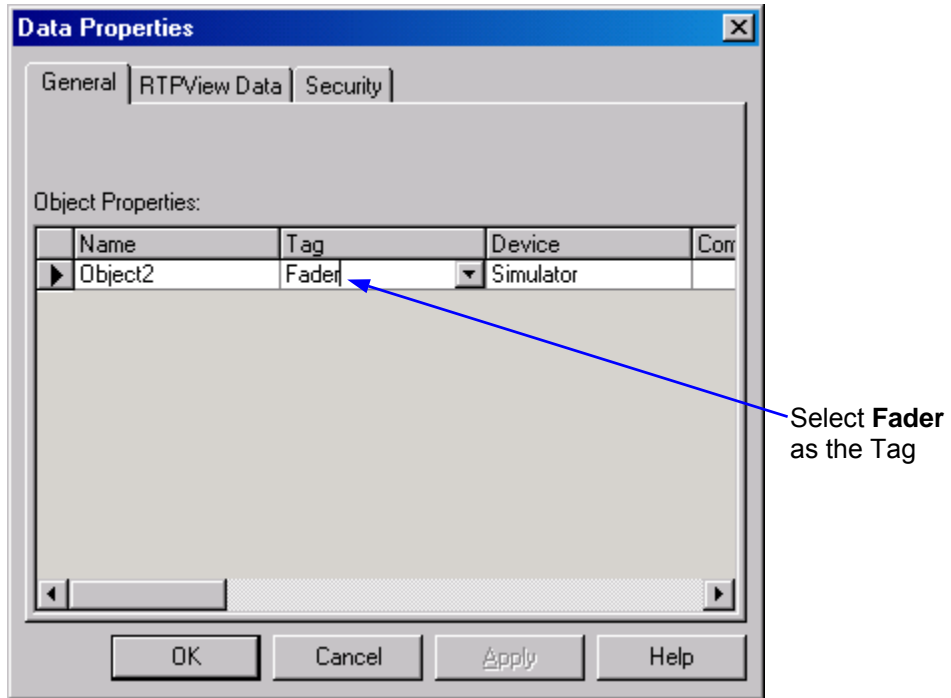


- Click on the **Format** tab. Select **Float** as the text Format, and **0** for the number of Decimal Places. Click the **OK** button to close the Object Properties dialog.

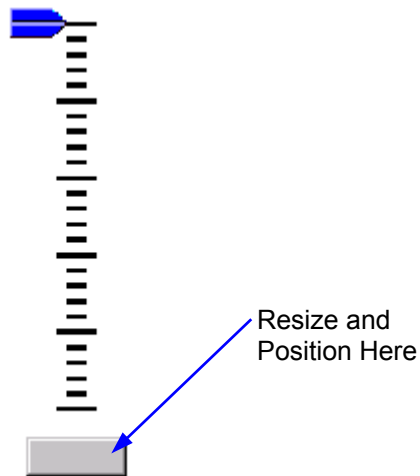


- Right-click on the Edit Box object and select **Data Properties** from the menu.
- Click on the Tag column and select **Fader** from the list of tag names. Click the **OK** button to close the Data Properties dialog. The **Device** will automatically be set to the *device* with the downloaded program.

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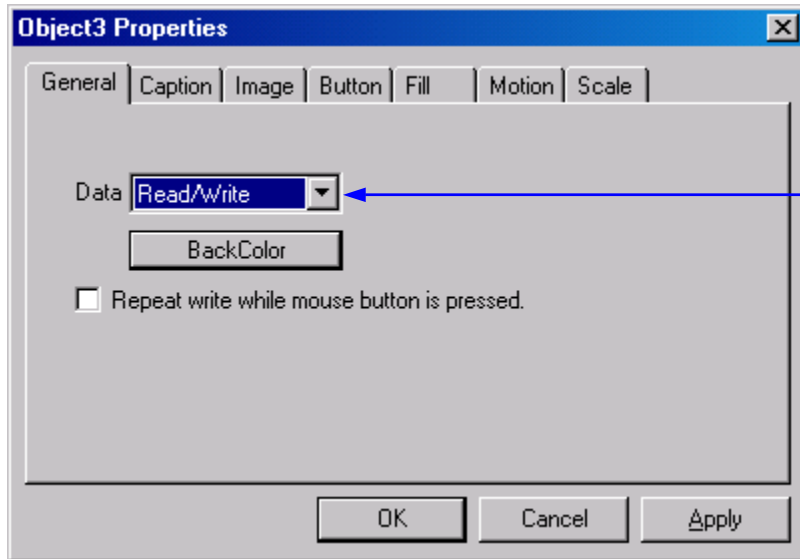
- Resize the Edit Box to about 50 x 20 pixels and position it under the center of the fader scale. The completed Fader assembly should look like the example shown below.



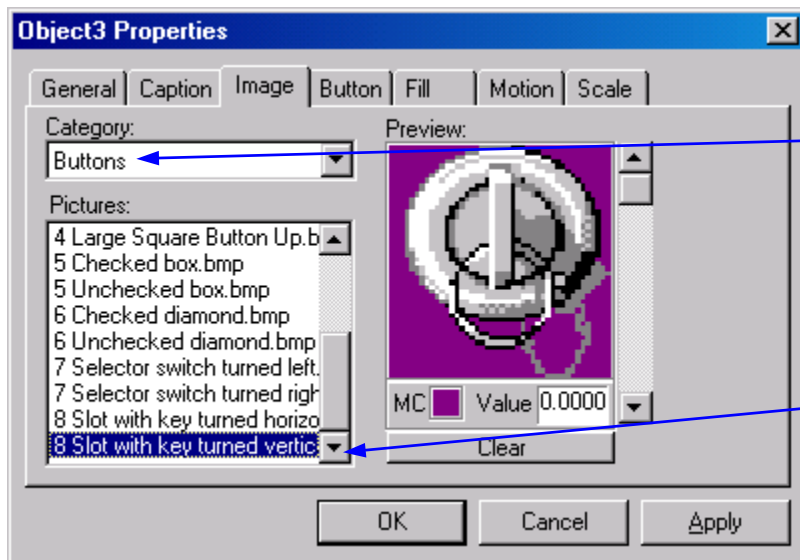
Key Switch

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

- Click on the  (Picture) button in the Palette toolbar. Move the cursor to the right of the Fader and 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 **Read/Write** as the Data property. This object will write a Boolean value to the NetArrays project.



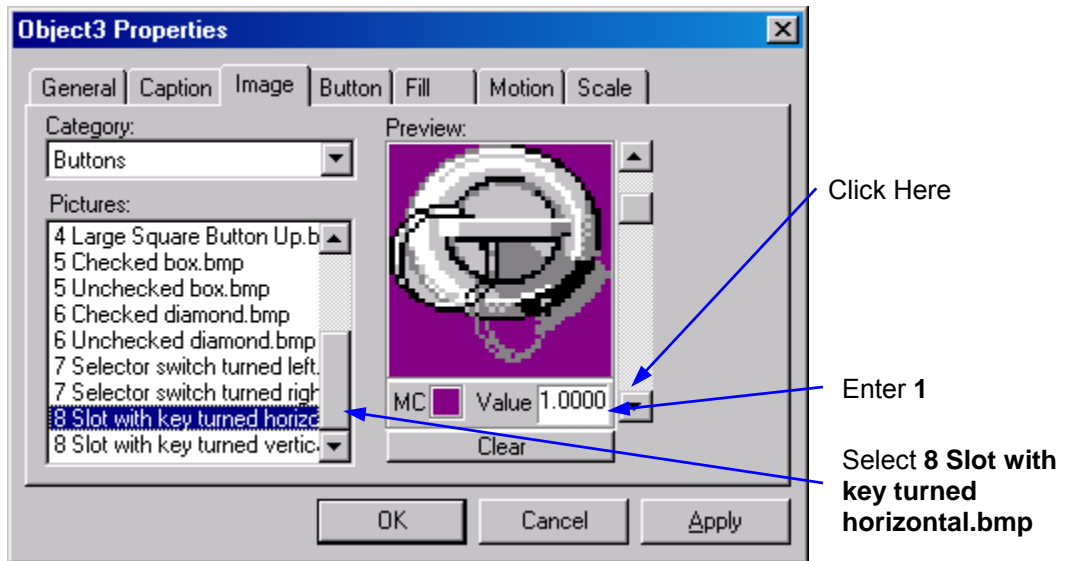
- Click on the **Image** tab. Select **Buttons** as the Category. Click on the scroll down arrow just to the right of the **Pictures** until the **8 Slot with key turned vertical.bmp** as the Picture. The bitmap of the key switch will appear in the Preview frame.



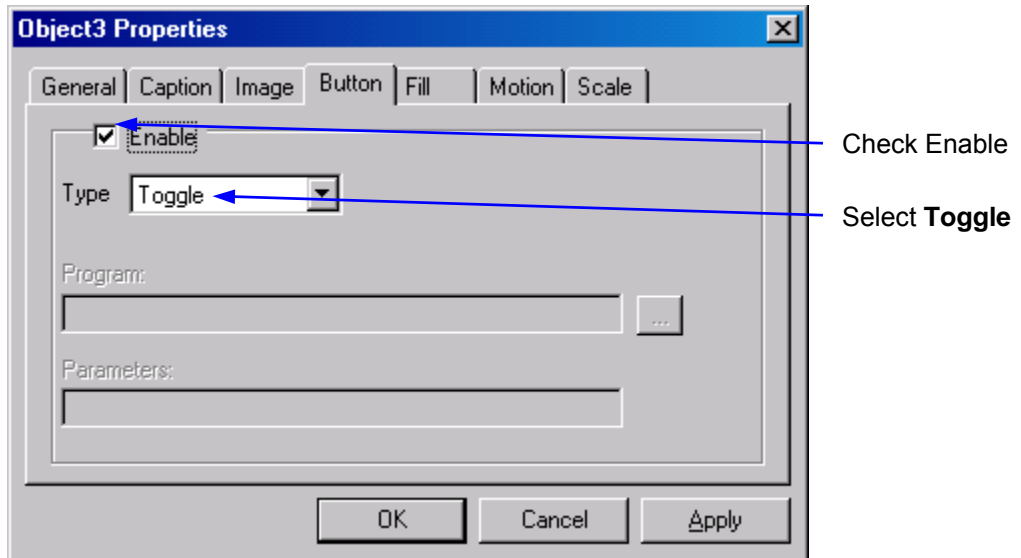
- Click on the scroll down arrow just to the right of the Preview frame. The caption **Image #1** will appear in the Preview frame. Select **8 Slot with key turned**

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.



- 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.



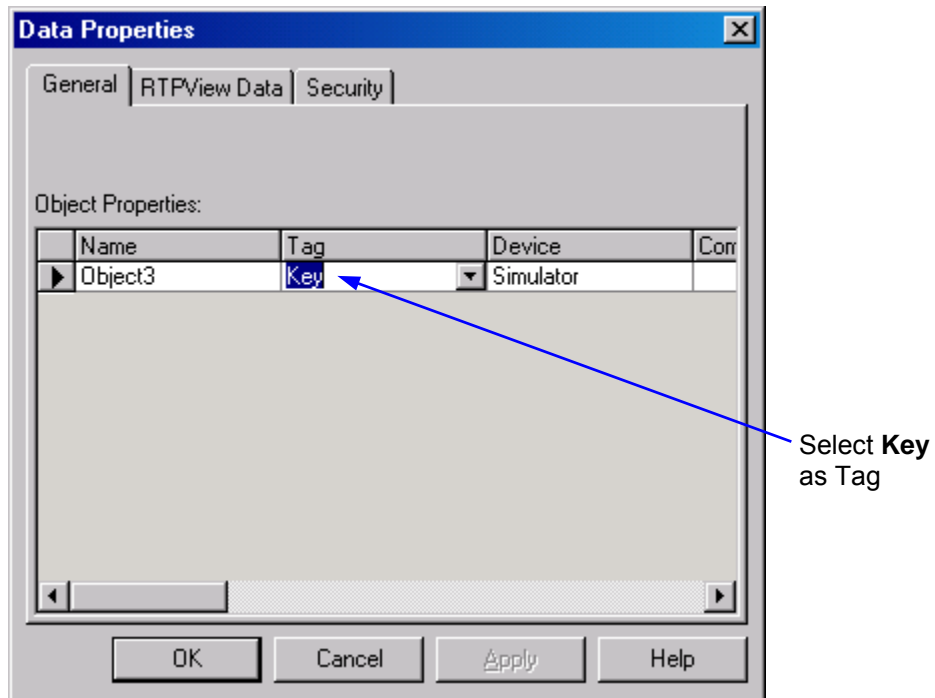
- Click on the **OK** button to close the Object Properties dialog.
- Select the key switch object and resize it to about 52 x 52 pixels. Move the object to coordinates 172, 25. It should look like the example shown below.



- Right-click on the Key switch object and select **Data Properties** from the menu.

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- Click on the Tag column and select **Key** from the list of tag names. Click the **OK** button to close the Data Properties dialog.

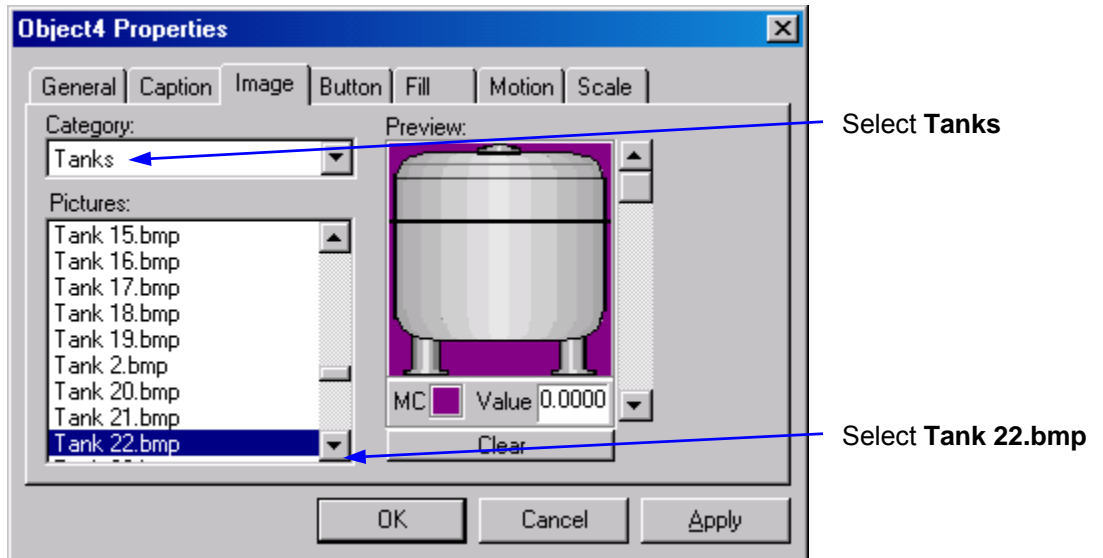


Tank

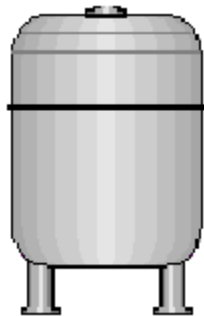
The Tank consists of a static Tank picture image, and Cutaway fill picture, and a Mixer picture image.

Tank Image


- Click on the  (Picture) button in the Palette toolbar. Move the cursor to the right of the Key Switch and 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.
- 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. Click the OK button to close the Object Properties dialog.

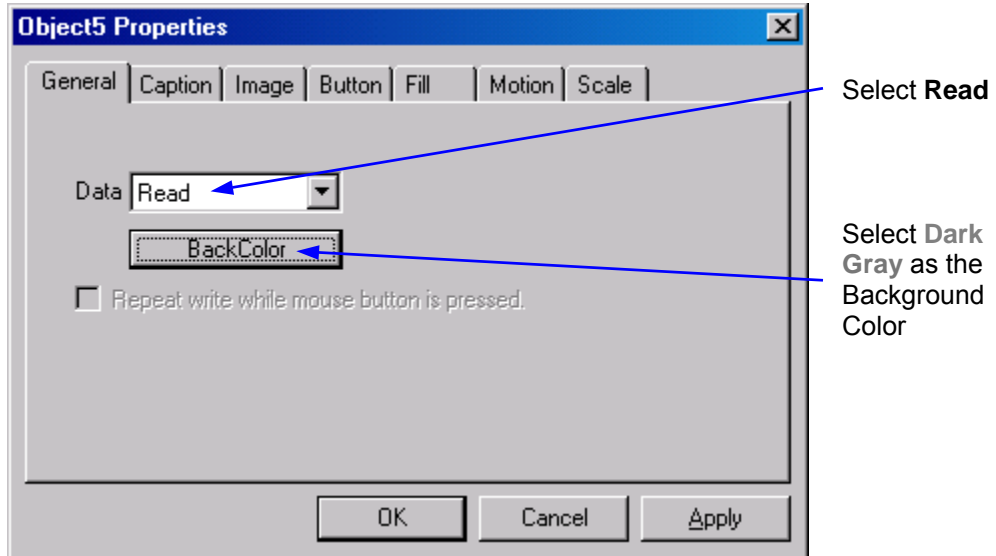


- Select the Tank object, press and hold the Shift key, and use the arrow keys to adjust the size of the Tank to 100 x 155 pixels. Release the Shift key and use the arrow keys to position the Tank at coordinates 230, 70. The Tank should look like the example shown below.

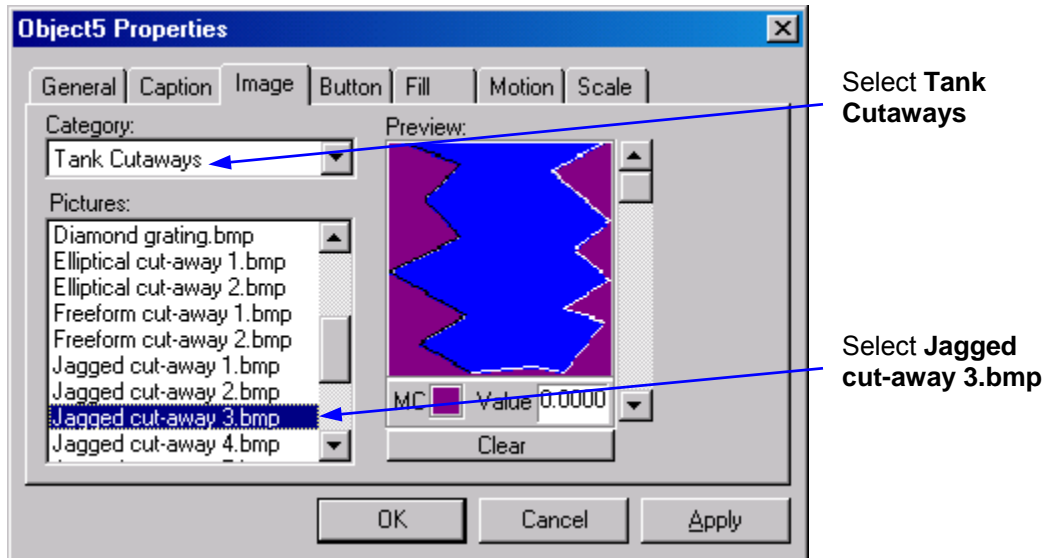


Tank Cutaway

- Click on the  button in the Palette toolbar. Move the cursor over the Tank object and 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.
- Click on the **BackColor** button. Select **Dark Gray** as the Background color. Click on the **OK** button to close the Color dialog. This will be the color of an empty tank cutaway.



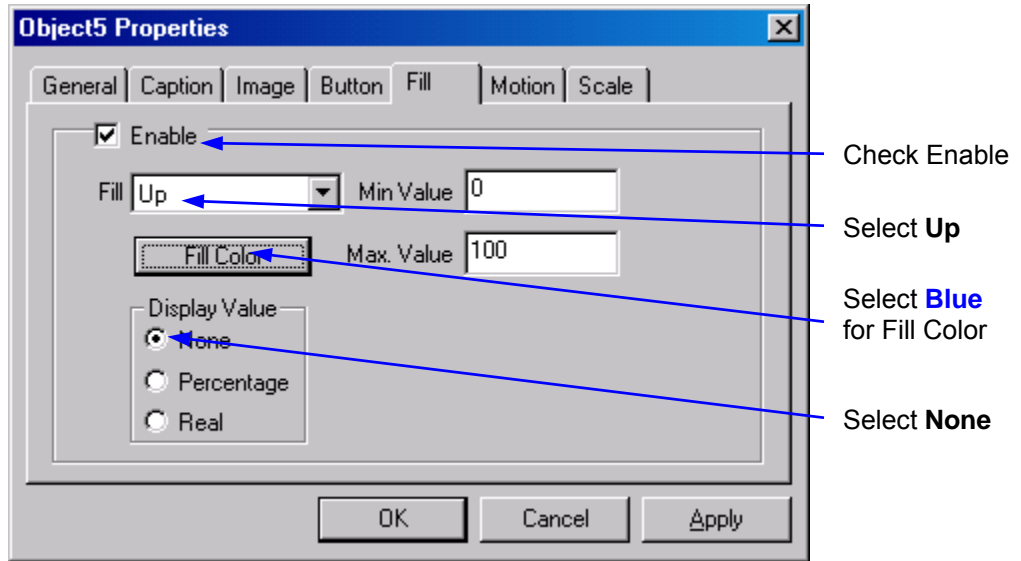
- Click on the **Image** tab. Select **Tank Cutaways** as the Category, and **Jagged cut-away 3.bmp** as the Picture. The bitmap of the cutaway will appear in the Preview frame.



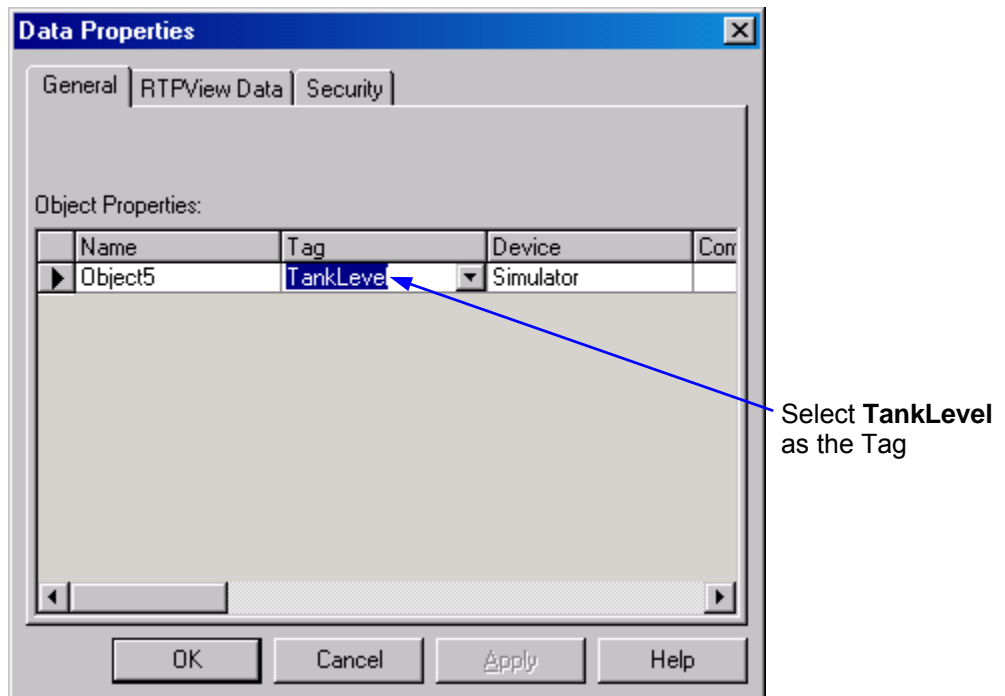
- Click on the **Fill** tab. Check the **Enable** checkbox. Select **Up** as the Fill function. Leave the Min Value and Max. Value fields at their default values (0 and 100).

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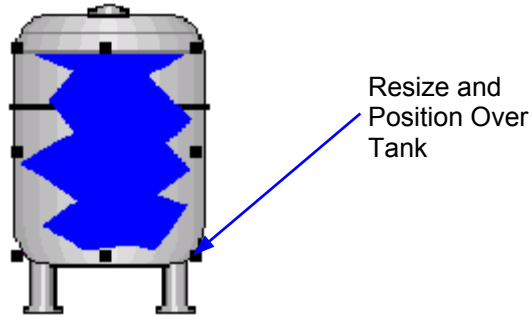
Click on the **Fill Color** button and select **Blue** as the fill color. Click on the **OK** button to close the Color dialog. Click on the Display Value **None** radio button.




- Click on the **OK** button to close the Object Properties dialog.
- Right-click on the cutaway object and select **Data Properties** from the menu.
- Click on the Tag column and select **TankLevel** from the list of tag names. Click the **OK** button to close the Data Properties dialog.

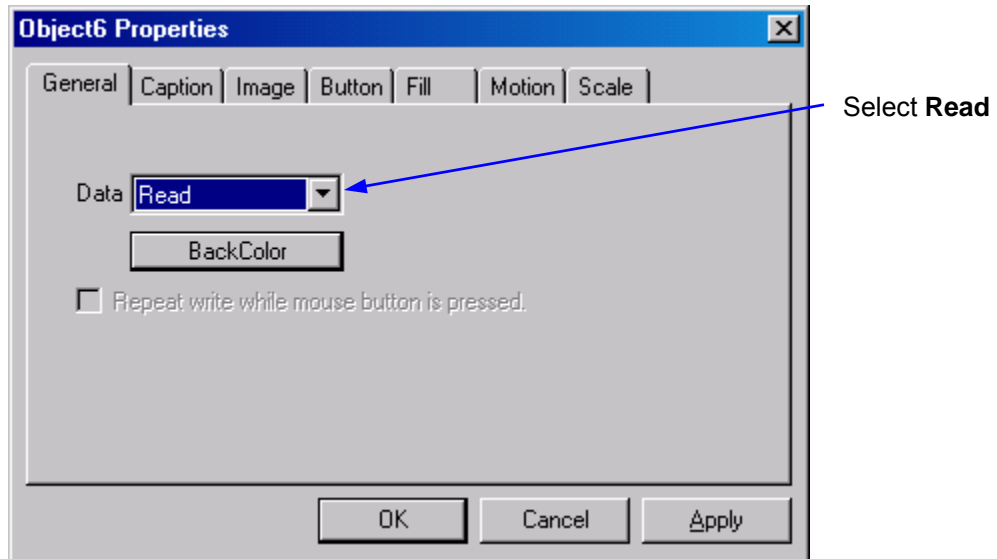


- Select the cutaway and resize it to about 85 x 100 pixels. Move the object so that it overlays the Tank as shown in the example below.

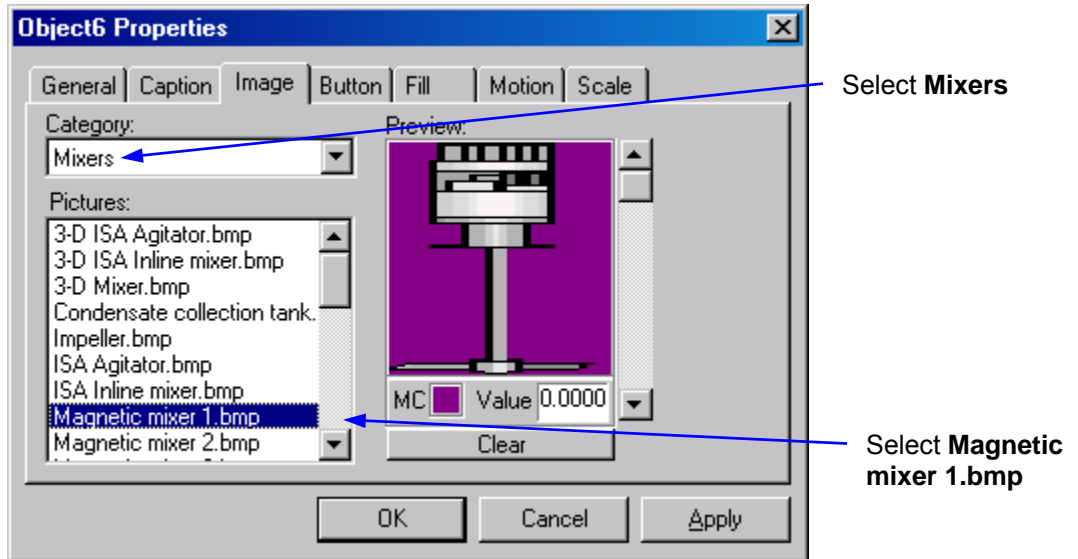


Tank Mixer

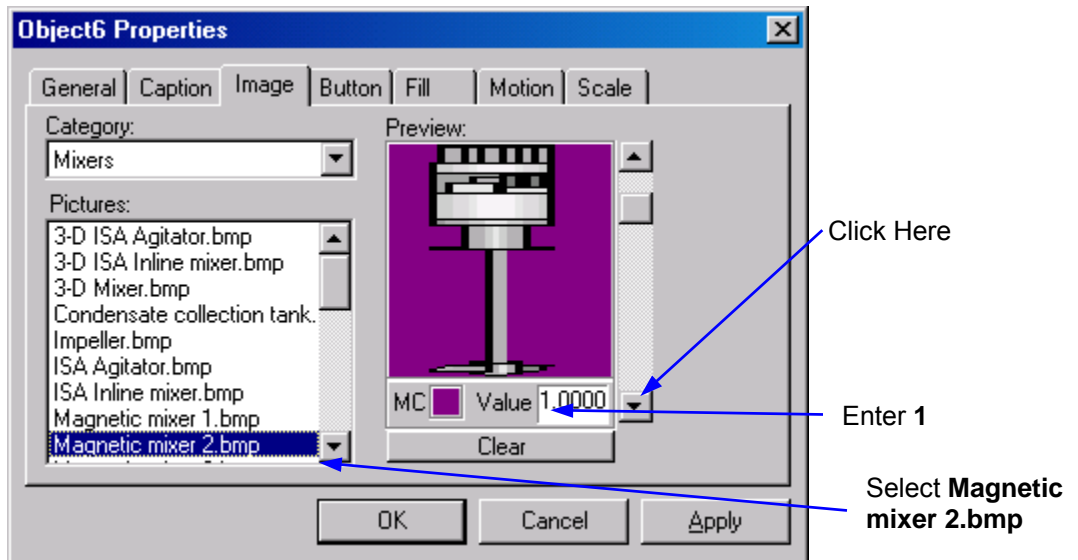
- Click on the  button in the Palette toolbar. Move the cursor over the Tank object and click the mouse button. A dark gray rectangle will appear over the Tank.
- Right-click on the rectangle and select **Object Properties** from the menu.
- In the General tab of the Properties dialog, select **Read**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



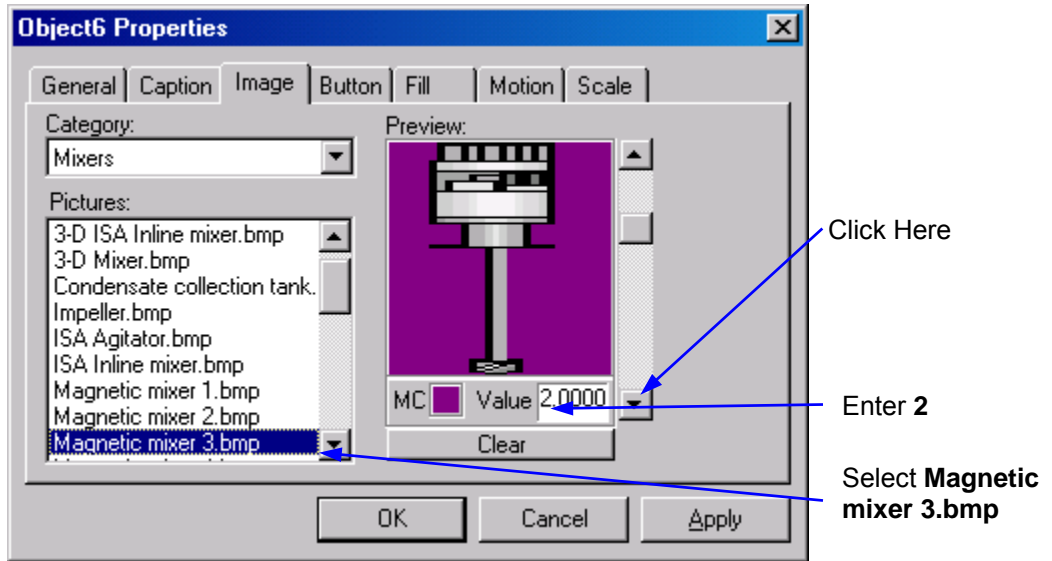
- Click on the **Image** tab. Select **Mixers** as the Category, and **Magnetic mixer 1.bmp** as the Picture. The bitmap of the mixer will appear in the Preview frame.



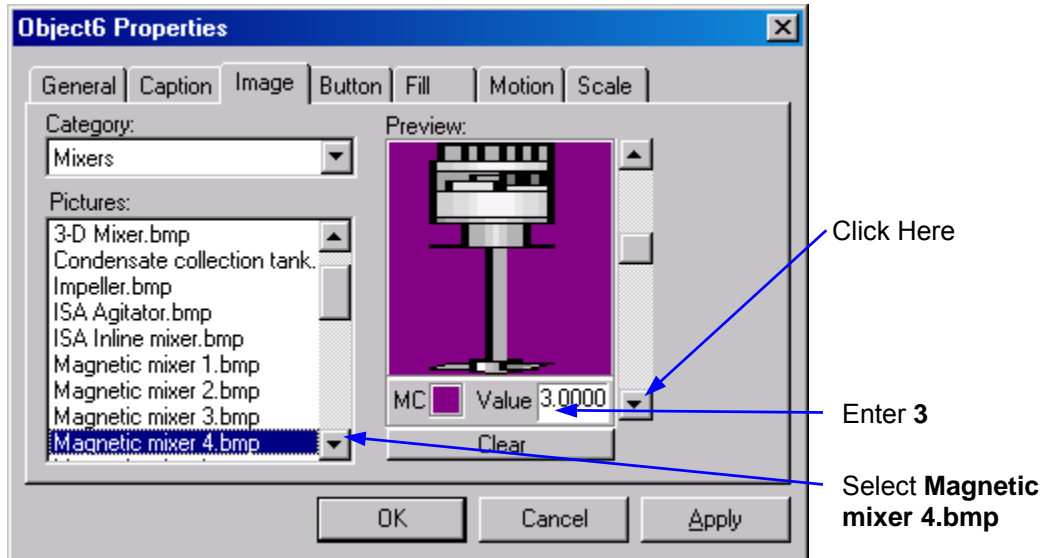
- Click on the scroll down arrow just to the right of the **Preview** frame. The caption **Image #1** will appear in the Preview frame. Select **Magnetic mixer 2.bmp** as the Picture. The second mixer bitmap will appear in the Preview frame.
- Change the entry in the **Value** field below the Preview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



- 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.

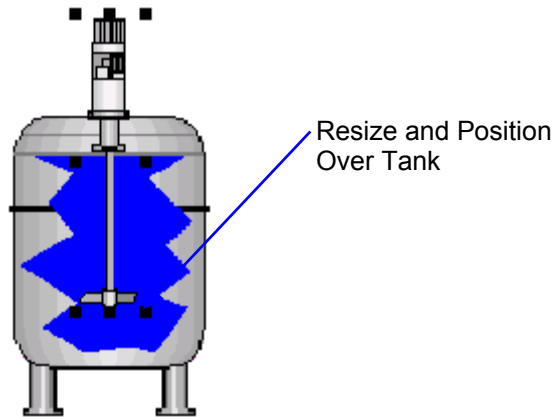


- Click on the scroll down arrow again. The caption **Image #3** will appear in the Preview frame. Select **Magnetic mixer 4.bmp** as the Picture. The last mixer bitmap will appear in the Preview frame.
- Change the entry in the **Value** field to 3.

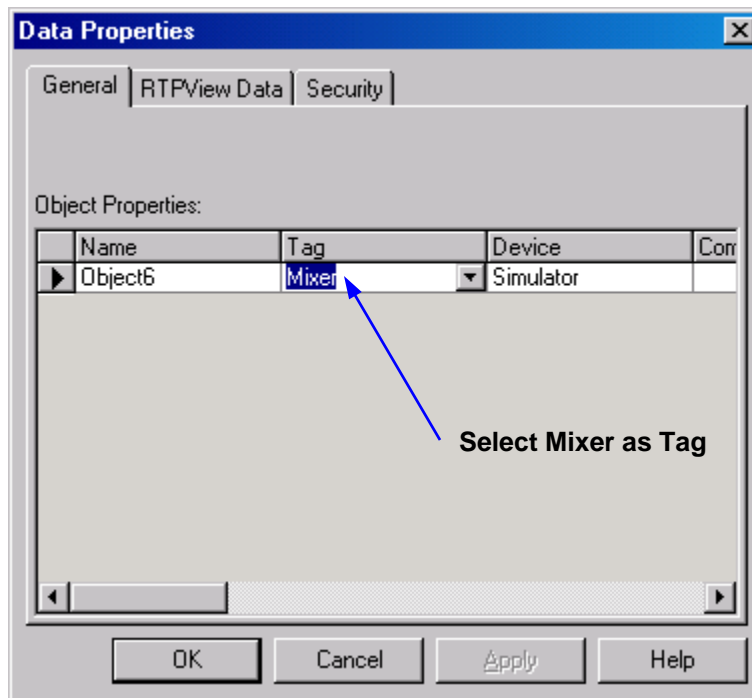


- Click on the **OK** button to close the Object Properties dialog.
- Select the mixer object and resize it to about 30 x 145 pixels. Move the object so that it appears over the Tank as shown in the following example.

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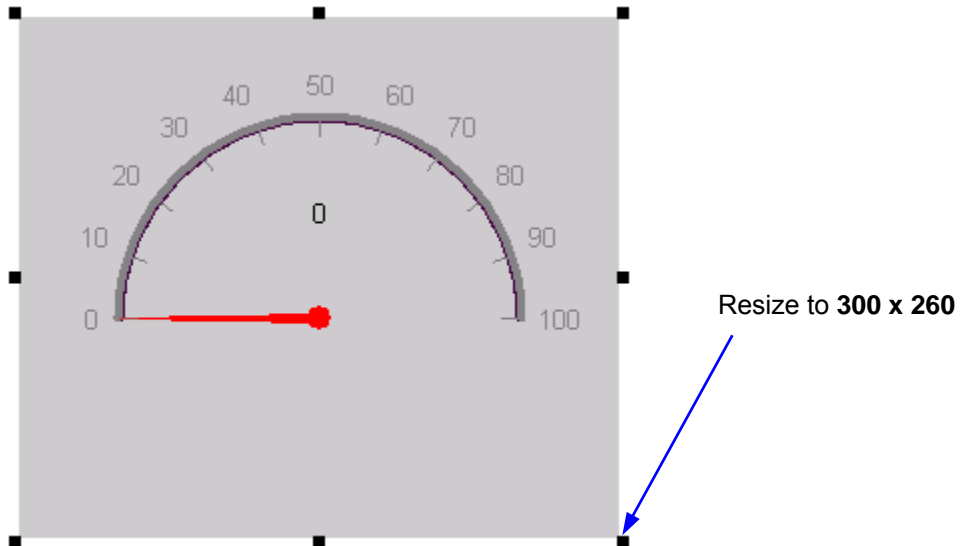
- Right-click on the mixer object and select **Data Properties** from the menu.
- Click on the Tag column and select **Mixer** from the list of tag names. Click the **OK** button to close the Data Properties dialog.



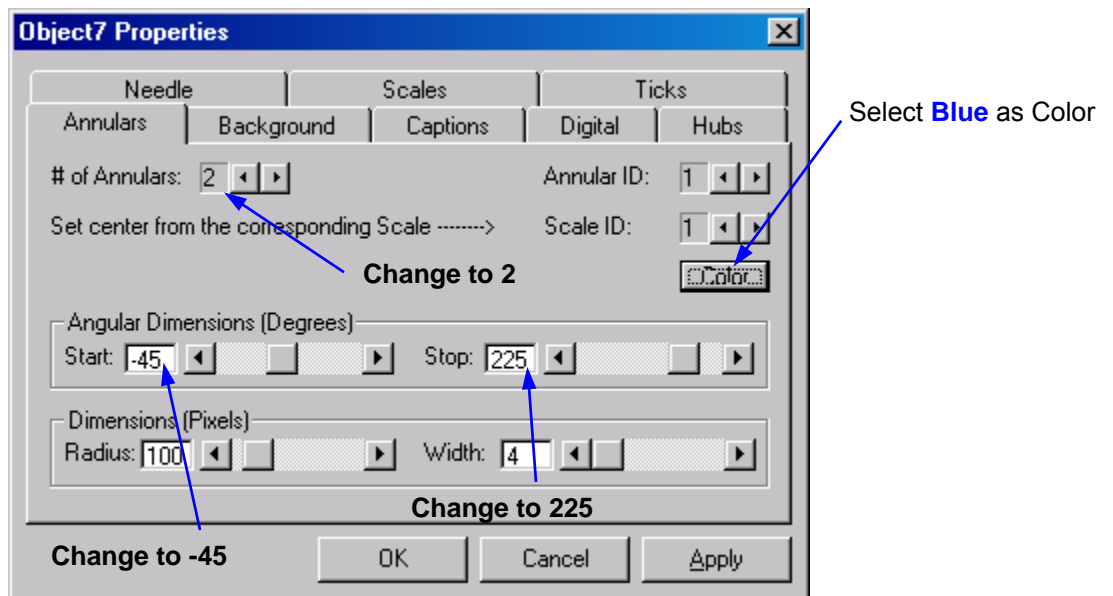
Temperature Gauge

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

- Click on the  (Gauge) button in the Palette toolbar. Move the cursor to the right of the Tank and 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.

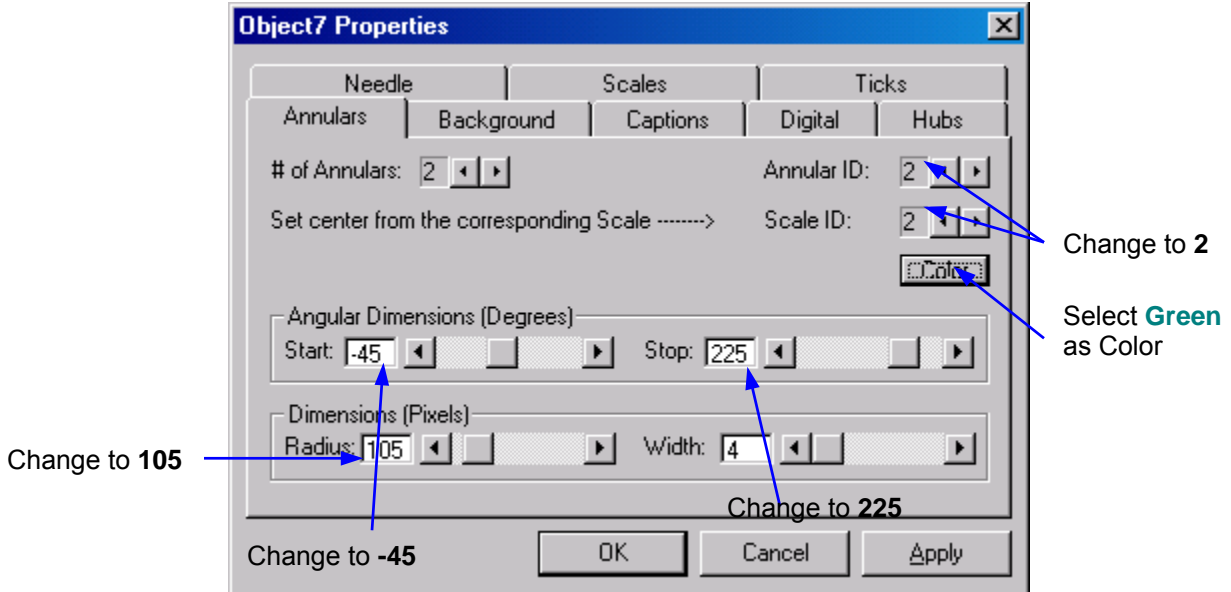


- Right-click on the **Gauge** and select **Object Properties** from the menu.
- In the **Annulars** tab of the Properties dialog, increase the **# of Annulars** to **2**. The **Annular ID** and **Scale ID** fields should indicate **1**. Click on the **Color** button and select **Blue** as the color of the first annular. 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. Leave the **Radius** and **Width** **Dimensions** at the default values (100 and 4).

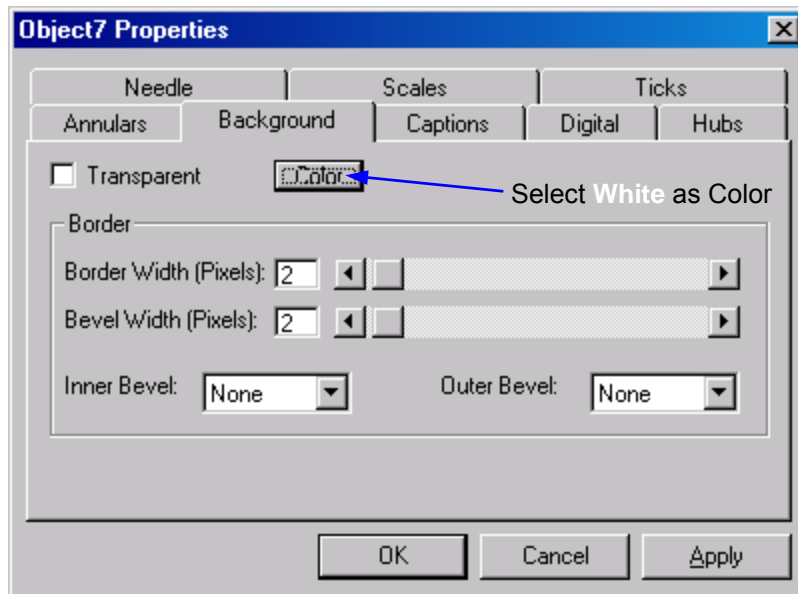


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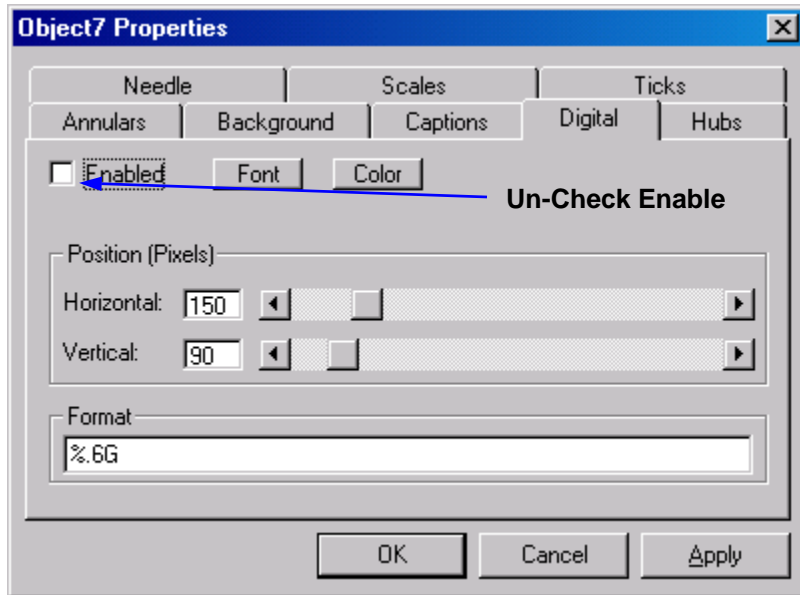
- Change the **Annular ID** to **2** and the **Scale ID** to **2** to select the second annular.
- Click on the **Color** button and select **Green** as the color of the second annular. Click on the **OK** button to close the Color dialog. Change the **Angular Dimensions** Start to **-45** degrees and the Stop to **225** degrees. Change the **Radius Dimension** to **105**. Leave the **Width Dimension** at the default value (4).



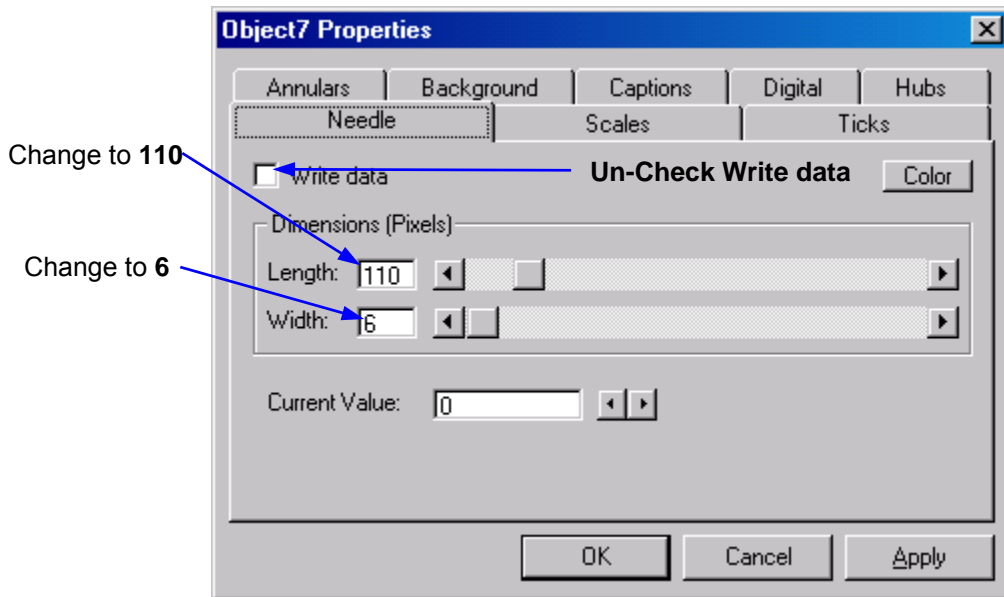
- Click on the **Background** tab of the Properties dialog. Click on the **Color** button and select **White** as the background color. Click **OK** to close the Color dialog. Leave the **Border** parameters at the default values (**None**).



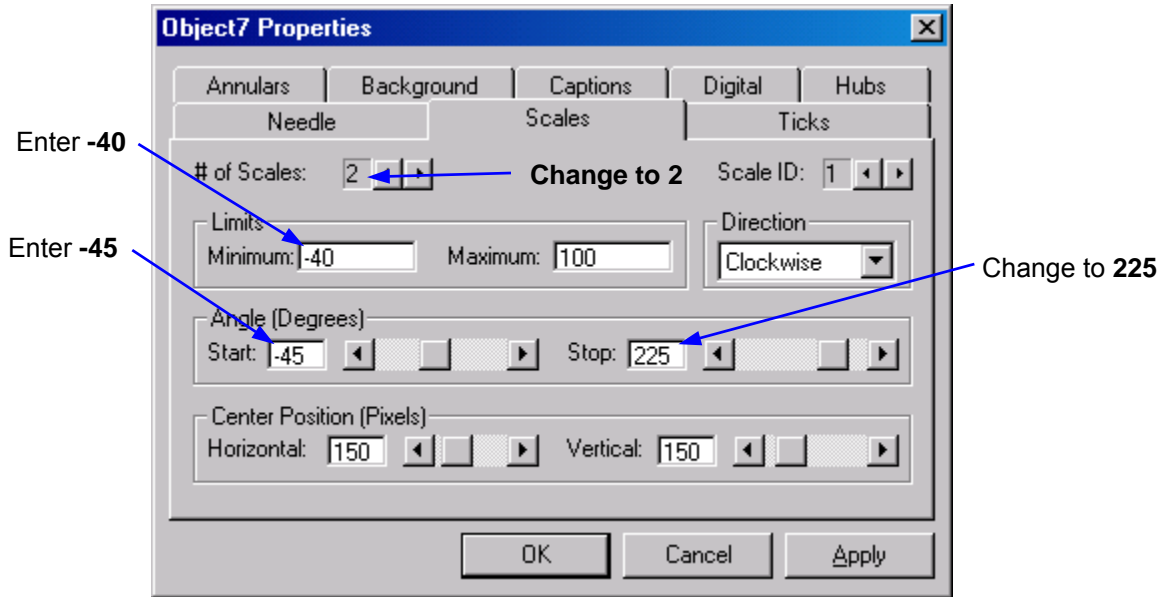
- Click on the **Digital** tab of the Properties dialog. Un-check the Enable checkbox to disable the digital value display.



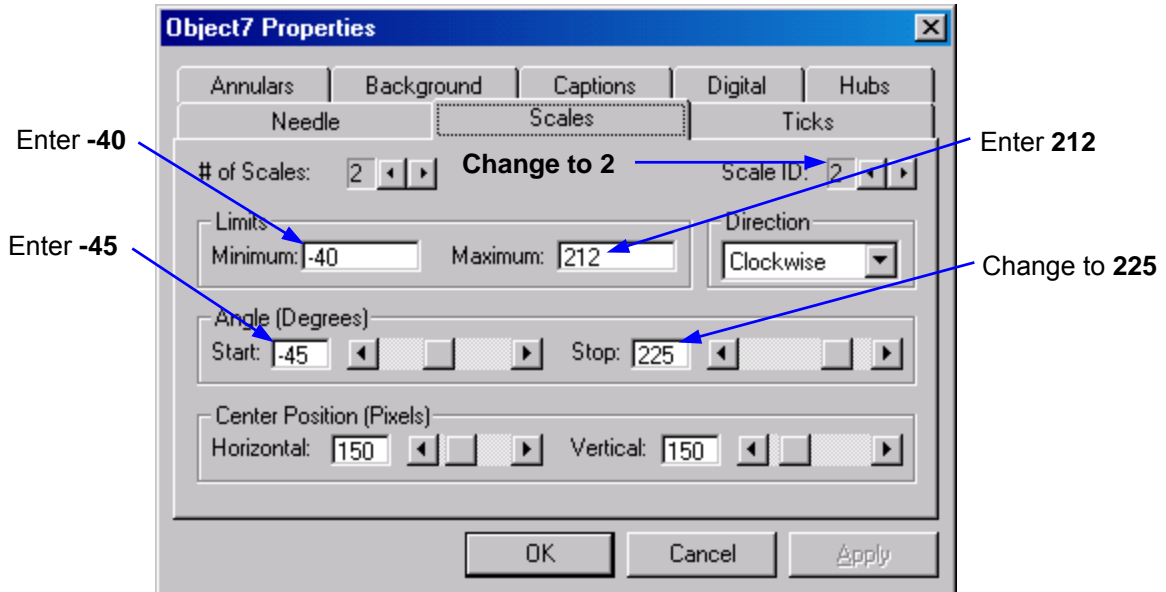
- Click on the **Needle** tab of the Properties dialog. Un-check the Write data checkbox. This object will be reading data. Change the Length to **110** pixels and the Width to **6** pixels.



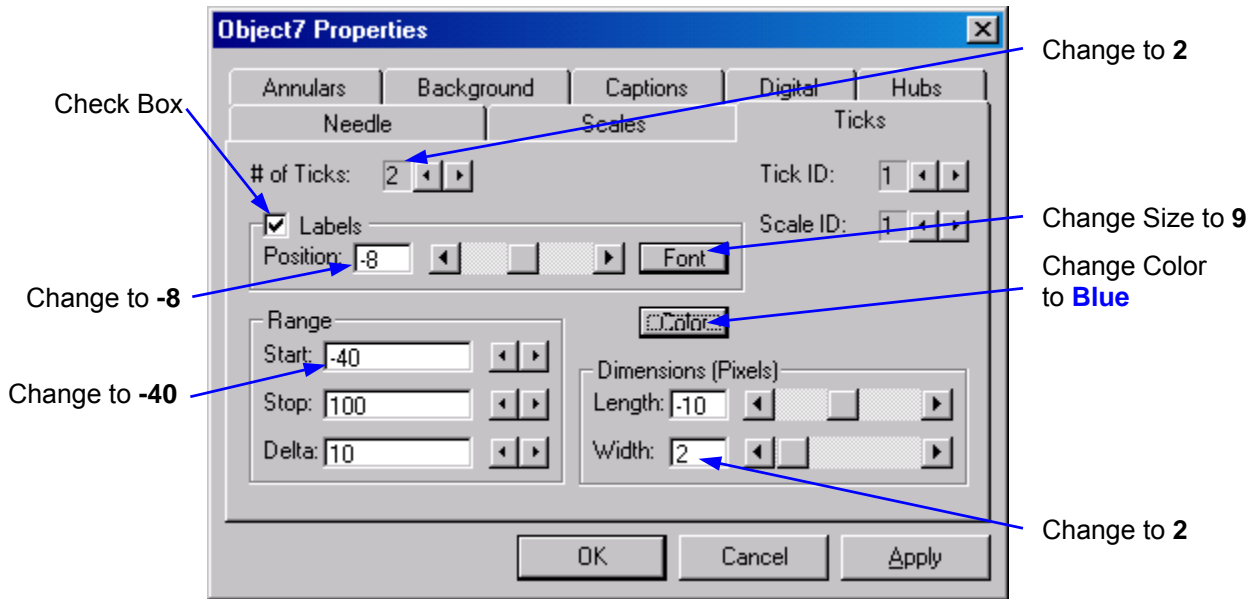
- Click on the **Scales** tab of the Properties dialog. Increase the **# of Scales** to **2**. The **Scale ID** field should indicate **1**. Enter the value **-40** into the **Limits Minimum** field. Leave the **Limits Maximum** field at its default value (**100**). Leave the **Direction** setting at **Clockwise**. Change the **Start Angle** to **-45** degrees and the **Stop Angle** to **225** degrees. Leave the **Horizontal** and **Vertical** Center Positions at the default settings (**150** and **150**).



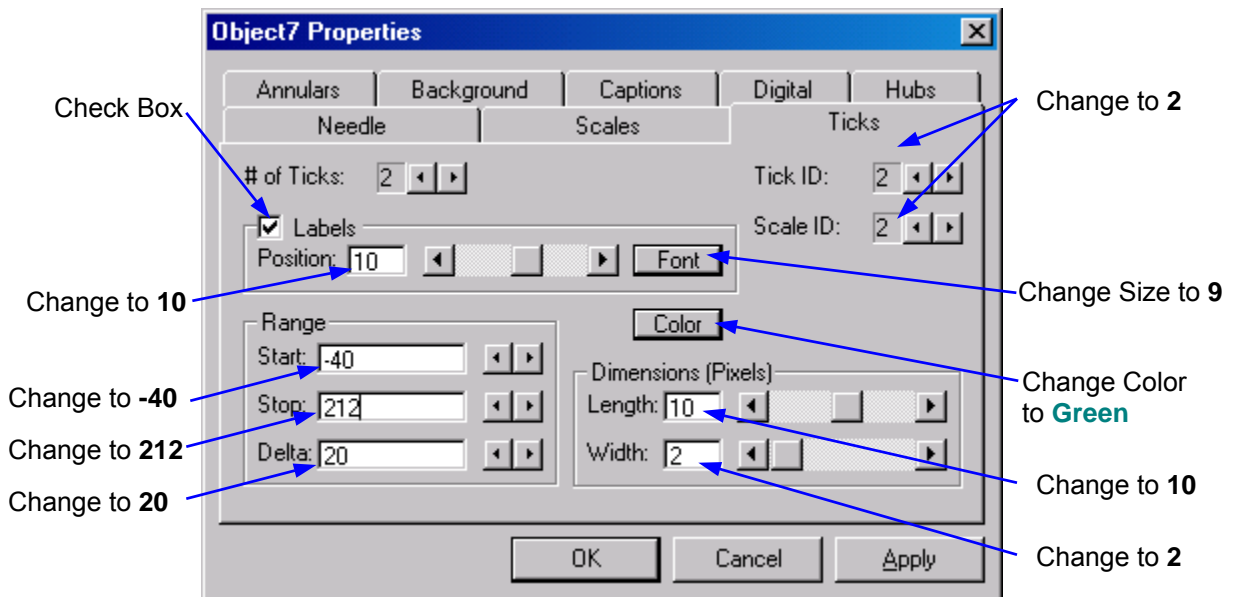
- Change the Scale ID to 2 to select the second scale.
- Enter the value -40 into the **Limits Minimum** field. Enter the value 212 into the **Limits Maximum** field. Leave the **Direction** setting at **Clockwise**. Change the **Start Angle** to -45 degrees and the **Stop Angle** to 225 degrees. Leave the **Horizontal** and **Vertical** Center Positions at the default settings (150 and 150).



- Click on the **Ticks** tab of the Properties dialog. Increase the **# of Ticks** to 2. The **Tick ID** and **Scale ID** fields should indicate 1. Check the **Labels** checkbox. Change the label **Position** to -8. Click the **Font** button and change the **Size** to 9. Click **OK** to close the Font dialog. Click on the **Color** button and select **Blue** as the color of the Ticks. 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.

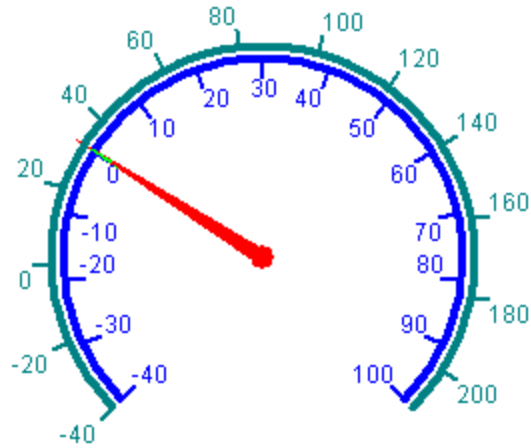


- Change the **Tick ID** to **2** and the **Scale ID** to **2**. Check the **Labels** checkbox. Change the label **Position** to **10**. Click the **Font** button and change the **Size** to **9**. Click **OK** to close the Font dialog. Click on the **Color** button and select **Green** as the color of the Ticks. Click **OK** to close the Color dialog
- Change the **Start Range** to **-40**. Change the **Stop Range** to **212**. Change the **Delta** value to **20**. Change the Length Dimension to **10** and the **Width** Dimension to **2**.

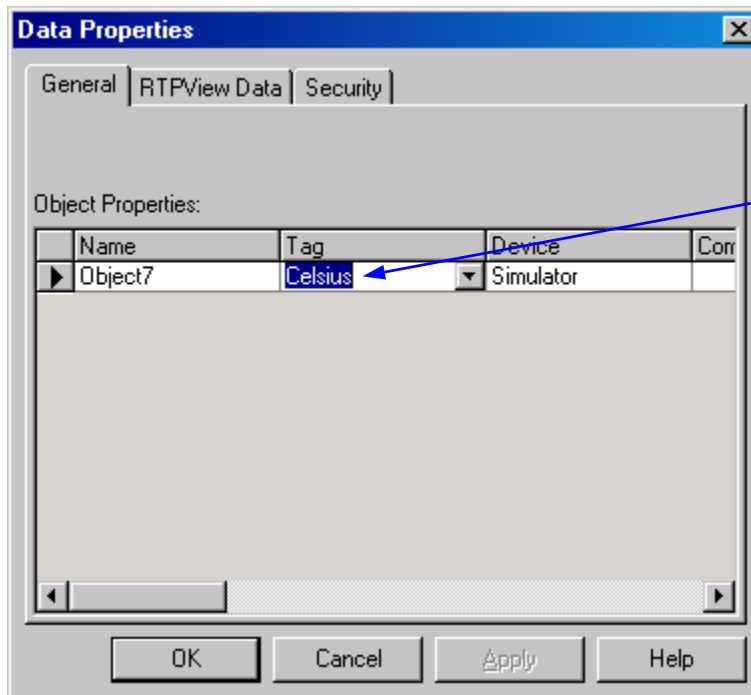


- Click on the **OK** button to close the Object Properties dialog.
- The temperature gauge should look like the example shown below. Select the object and reposition it to coordinates 350, 5.

RTPView Project Program Example




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



Select **Celsius**
as Tag

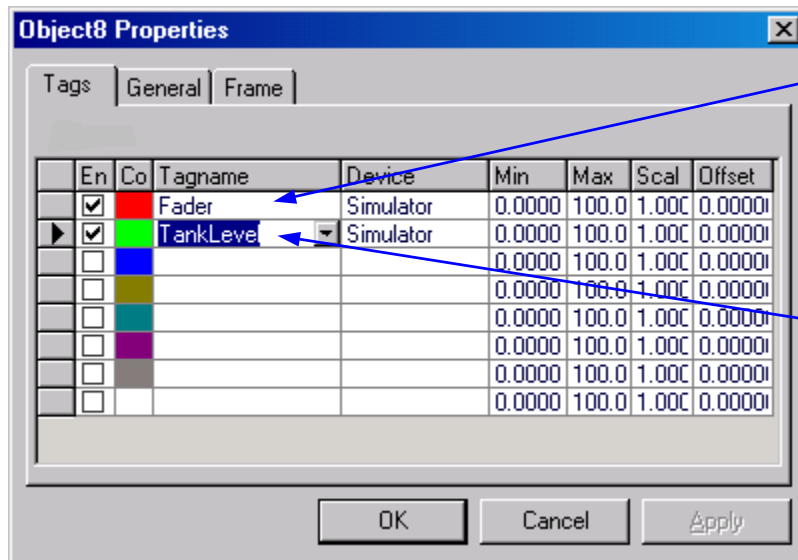
Trend

The Trend object will plot the output of the Fader and the Tank fill level. It consists of a single Trend object.

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



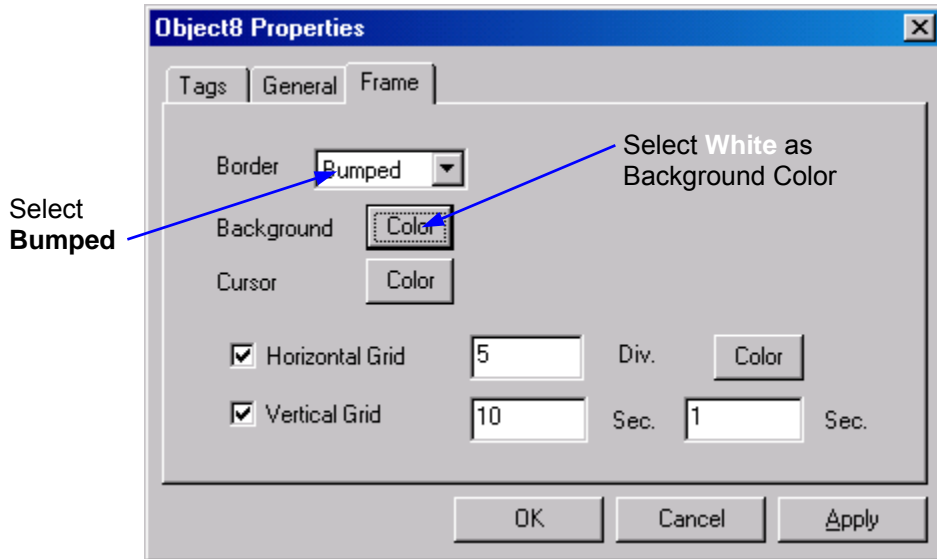
- Right-click on the Trend and select **Object Properties** from the menu.
- Select **Fader** as the **Tagname** in the first row. Select **TankLevel** as the **Tagname** in the second row. Leave the **Min**, **Max**, **Scale**, and **Offset** entries at the default values. (Both of these variables range from 0 to 100.)



Select **Fader** as Tag

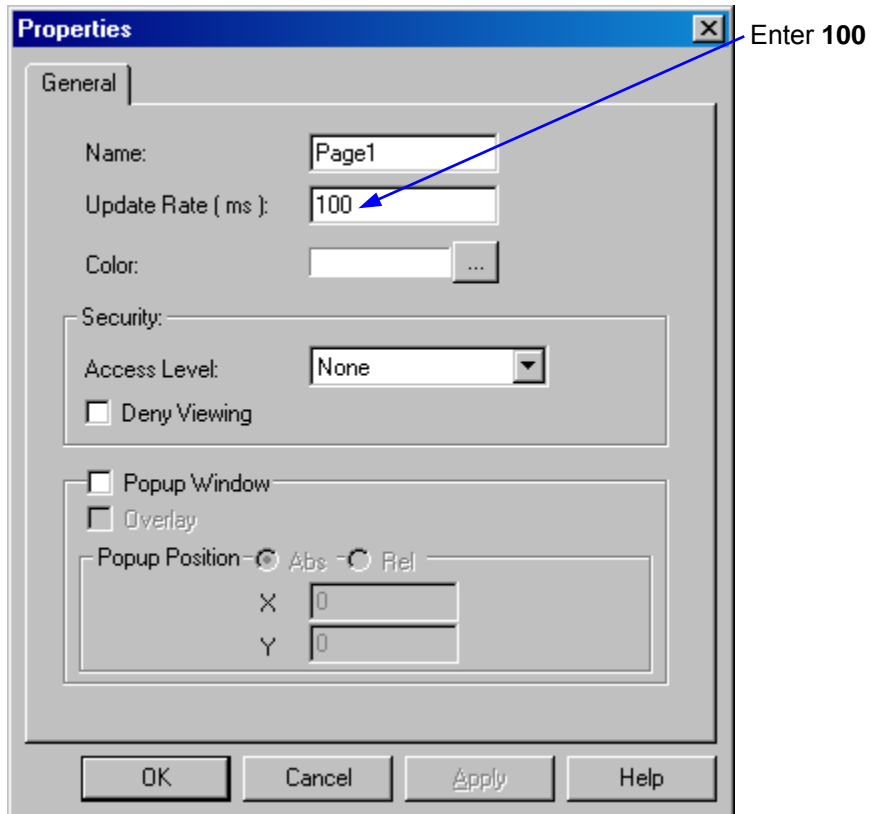
Select **TankLevel** as Tag

- Click on the **Frame** tab. Select **Bumped** as the **Border** type. Click on the **Background Color** button and select **White**. Click the **OK** button to close the Color dialog. Click the **OK** button to close the Object Properties dialog.



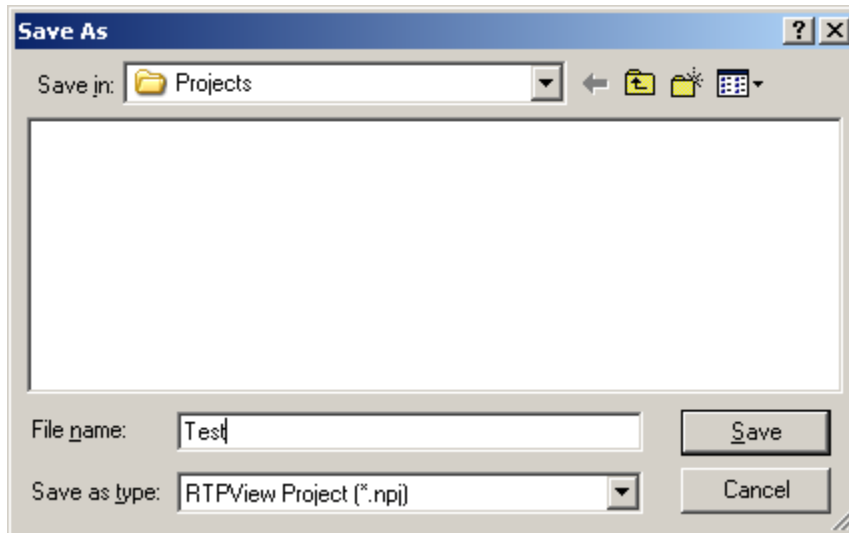
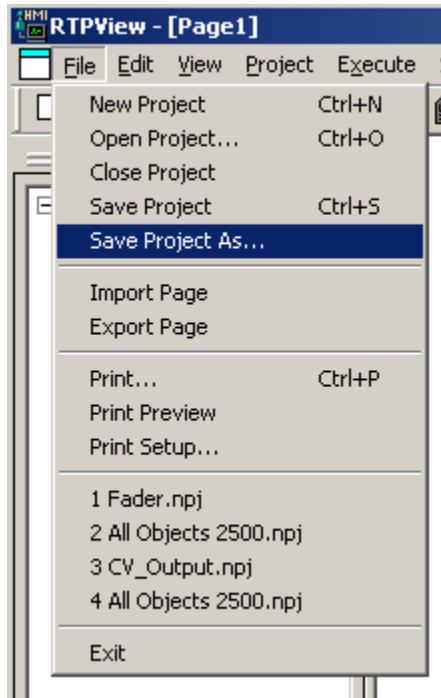
Page Properties

- 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. Click on the **OK** button to close Page Properties.



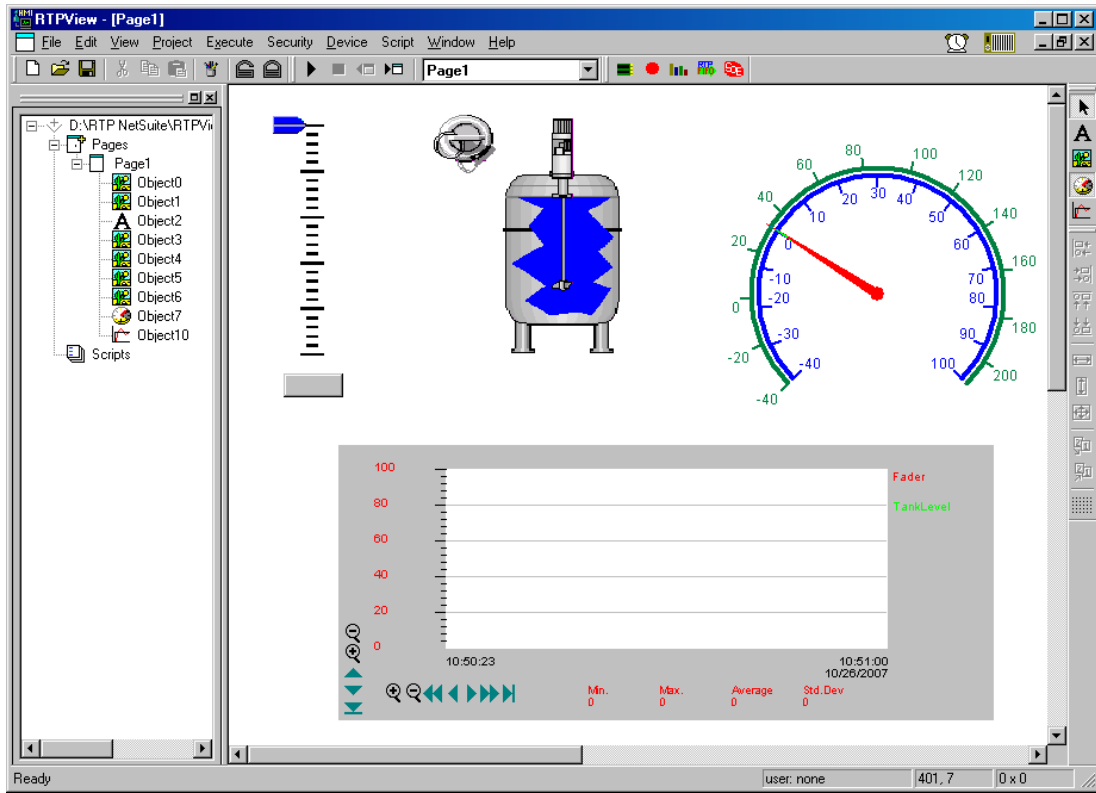
RTPView Project Program Example

This completes the RTPView project. Save the project by clicking on **File** and select **Save Project as...** Navigate to the RTPView directory, type in a name (such as **Test**), and click **Save**.




Your project should look like the example below.

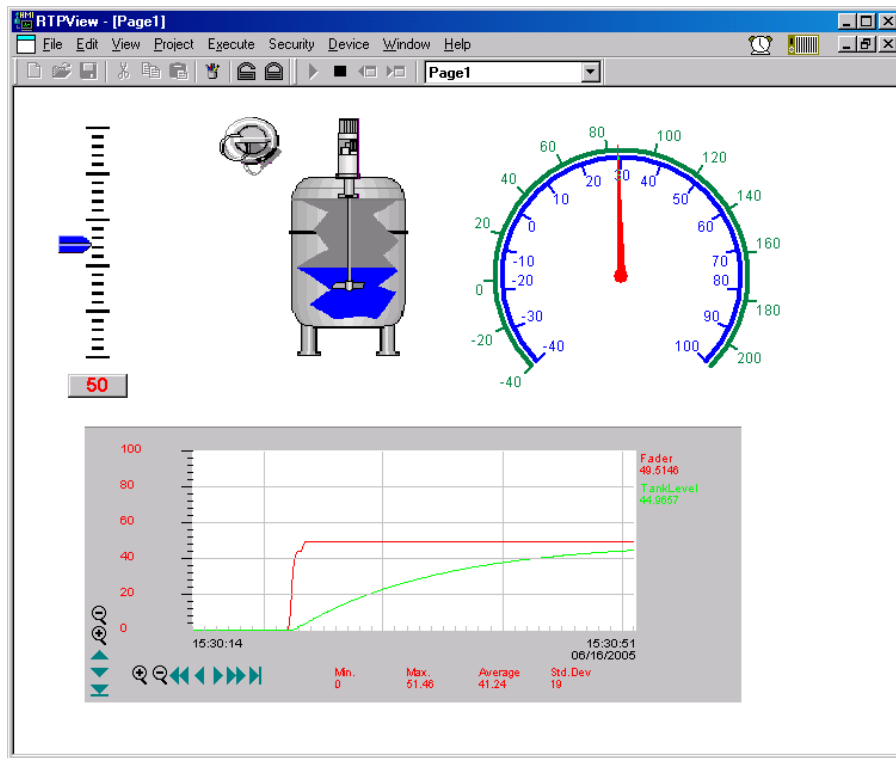
RTPView Project Program Example



Verification

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

- Click on the  (Run) button in the toolbar.
- 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.
- Click on the Key switch and the Mixer will appear to start running.
- Move the Fader pointer to any other position on the scale.
- If any of the objects do not behave as expected, stop the project and recheck the configuration of the object's properties.



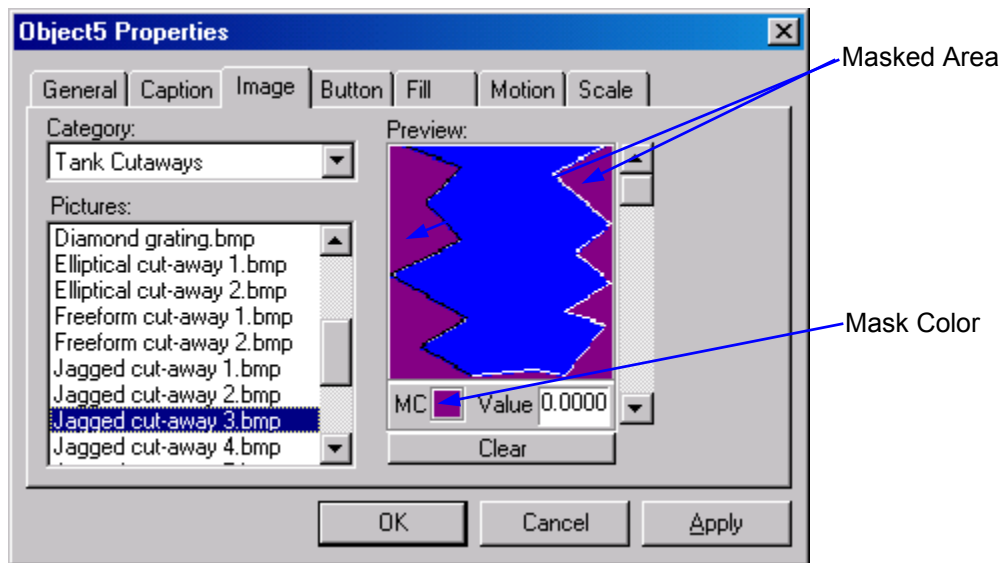
Congratulations! You have successfully completed and run an RTPView project program.

Including Your Own Images in RTPView

The previous examples used only picture images that were supplied with RTPView. In addition to the included images, you can add any of your own bitmap images into your RTPView project. All you have to do is save your bitmap in one of the RTPView/Picture directories, or create your own category directory. However, there are some important issues to consider when you adding your own picture images.

If you look through the Bitmap images in the RTP NetSuite\RTPView\Pictures directory, you will notice that all the bitmap files are about 150 pixels square or smaller. They may be stretched or compressed as required in the RTPView page.

All images are assigned a Mask Color. RTPView monitors each pixel of the masked portion of the image and replaces it with the appropriate pixel from behind the image. For example, in the Tank Cutaway used in the previous example, the masked area was replaced with areas of the Tank image.



The mask color must not be a color that is part of the displayed image. Note that the supplied bitmap files use purple as the mask color. This particular color is not part of the intended display. The default mask color assigned by RTPView is the color of the upper leftmost pixel in the bitmap. You can change the selected mask color by clicking on color in the Image Preview of the Object Properties dialog. The selected mask color is displayed in the MC box below the Preview.

When creating a bitmap file, crop the image to remove as much blank background as possible. This will greatly reduce the size of the bitmap file.

After cropping, change the color of the upper-left pixel in the bitmap image. For example, you could change it from white to purple as shown in the figure on the next page. The purple (or other color) pixel will then become the default mask color when the picture object is placed onto the RTPView page.

Note that if the bitmap is large, it will be severely compressed in the Image Preview, and it may be difficult to select another mask color from the Preview.

RTPView Project Program Example

When using “line art” drawings (for example, thin black lines on a large solid background), **do not** select the background as the mask color. Use another color, which is not part of the line art drawing, as the mask color.

When using photographic images, make sure the mask color does not occur anywhere else in the image. This will create unintended small holes in the image.

