

RackAFX 6.4.95 Beta Notes

- New GUI Designer built from the ground up with VSTGUI4
 - use the built-in graphics set
 - use your own custom graphic (PNG) files
- VST Template Generator now generates both Synth and FX templates in both VST2 and VST3 versions
- AU Template Generator now generates both Synth and FX templates
- New “User Variables”
 - allow you to store data in presets without allocating controls
 - allow you to add VSTGUI-specific control variables (0.0 -> 1.0) for more GUI customization

New GUI Designer Notes

Adding your own Graphics Files

RackAFX links your plugin to a library that I wrote called Sock2VST3 which contains a set of preloaded graphics files (all PNG types) and all the underlying VSTGUI4 code. If you want to add your own graphics to the GUI designer, you need to do this on a per-plugin basis. This is the same as the normal VSTGUI4 mechanism.

You do this in two steps:

1. drag your new graphics file (PNG only) into the /resources/ folder of your RAFX plug-in
2. edit your <plugin_name>.RC file by right-clicking on it in Visual Studio (it is part of the new Resources filter) and choosing “View Code”

Naming: VSTGUI4 is sensitive to the way you name your file and resource identifier. The simplest way to avoid trouble is to name your file in one word like *bigorangeknob.png*. It is critical that you name the resource with the **identical name as the file, but in all CAPS**.

When you choose View Code for the .RC file, you will see the existing PNG files; the plug-in automatically has one included called *knobvst.png* to give you an example. You can just cut and paste the original line of code and then overwrite with your own. Suppose your file is named “bigorangeknob.png” then here is what the .RC file looks like when you create a new project:

```
KNOBVST.PNG      PNG      "resources\\knobvst.png"
```

And here is what it looks like after you cut/paste/edit:

```
KNOBVST.PNG      PNG      "resources\\knobvst.png"  
BIGORANGEKNOB.PNG  PNG      "resources\\bigorangeknob.png"
```

Don't worry about the added tabs, you can clean this up however you like if it bothers you as:

```
KNOBVST.PNG      PNG      "resources\\knobvst.png"  
BIGORANGEKNOB.PNG  PNG      "resources\\bigorangeknob.png"
```

The naming is the most important part here. Save and close the .RC file when you are done editing.

Graphics

If you are going to add your own custom graphics to the GUI designer you need to be familiar with how VSTGUI4 packages the graphics (it is just like VSTGUI3). You will need a graphics tool like *Photoshop* OR the free and excellent *KnobMan* software to create custom controls.

You can either examine the VSTGUI4 documentation, or look at the sample graphics, or use this list:

Knob: a single graphics file with a strip-animation consisting of a vertical set of images (just like movie film) with the knob in its different positions. RAFX uses 80 images per knob but you can have as many or as few as you want.

Slider: two separate images, one for the background (aka *groove*) and the other for the handle (aka *thumb*) The images must work together graphically. There are both vertical and horizontal sliders available for you.

Momentary Button and On/Off Button: these both use a single graphics file that has the two button graphics for OFF and ON arranged vertically.

LED Meter: two separate images, one for the all-LEDs-off state and the other for the all-LEDs-on state

Analog VU Meter: as with the knobs, these are vertical strip animations that depict the VU meter in its different positions. Like knobs, RAFX uses 80-images per meter. The VU meters in RAFX are found in the KnobMan gallery along with many others.

Radio Buttons: since there is no Radio Button control in VSTGUI4, these use the Vertical Switch control which takes a single vertical graphics file with images of the various states of the buttons when one of them is pressed. This can get to be tedious to design and these controls take up a lot of real-estate so we recommend using the Drop List instead. See the sample graphics files to better understand how to create these files.

Using the GUI Designer

You can use the GUI designer with or without your plugin compiled and loaded. If you use the GUI designer without your plugin compiled and loaded, you will not see any of your personal graphics files.

You can use the GUI designer with or without your plugin compiled and loaded. If you use the GUI designer without your plugin compiled and loaded, you will not see any of your personal graphics files.

The easiest way to learn how to use the GUI designer is to open an existing RAFX plugin and switch to the GUI Designer tab. Then, start with the top part and work down.

Global Controls

These controls are at the top of the GUI Designer Form:

Clear All:

- removes all of your controls

Write:

- writes the current GUI file; the file is automatically written whenever you leave the GUI designer but you may wish to update your GUI data periodically in case you experience a crash

Snap To Grid:

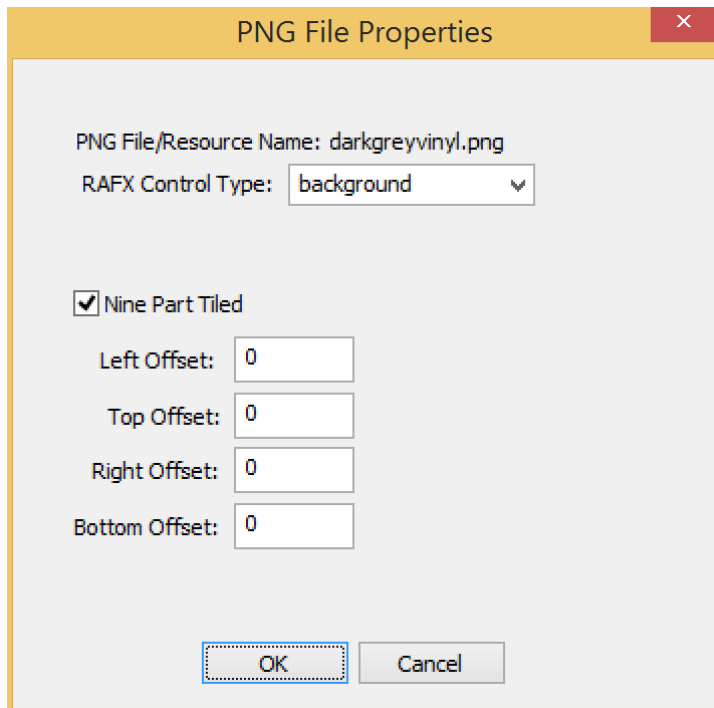
- sets the size in pixels of the mouse-snap option Hold the <Shift> key while dragging to temporarily disable the snap-to-grid. You can also set the grid size to 1 to achieve the same thing.

Frame Controls

Below the global controls you choose the background image or background color for the main GUI frame. If you don't see the color you like, choose Add New Color from the drop down menu. Background images take precedent over background colors, so if you choose an image from the list, the background color will be hidden. You can also set the color of all the "blurb" text at once. This is useful if you change background colors/graphics from a light to a dark color or vice versa. Below the Frame controls are the meat of the GUI Designer.

Setting Up your PNG Files

Before doing anything else, take some time to examine the PNG tab on the GUI Designer form. This lists all the built-in and user-added PNG files. To streamline GUI development, RAFX uses custom filters to split out the different graphics types, backgrounds, knobs, slider backs, slider handles, etc... This makes the drop down menus much less confusing when changing graphics. Double click on a row in the PNG file list and you will get a dialog that lets you choose the filter and set the tiling offsets.



RAFX Control Type

Use the RAFX Control Type drop down list and choose the kind of graphics file you have added as a custom graphic. The choices are named after the controls they are implementing:

background	a background image
knob	a knob image, usually 42x42 or 52x52 in size
onoff button	on/off
other knob	a random knob that has any size
assign button	assignable buttons (RAFX B1 B2 and B3)
radio button	vertical switch graphics (see above)
vslider back	vertical slider background
vslider handle	vertical slider handle
hslider back	horizontal slider background
hslider handle	horizontal slider handle
analog vu	analog VU meter
vuoff	LED Meter OFF
vuon	LED Meter ON
vuoff invert	Inverted LED Meter ON
vuon invert	Inverted LED Meter OFF
alphaknob 270	Alpha Knob that rotates 270 degrees
alphaknob 360	Alpha Knob that rotates 360 degrees
user image	any image you like

Nine-Part Tiled

You can tile images which works great for backgrounds. The traditional way of tiling images is to simply repeat them forever in the X and Y dimensions. In order to use this kind of tiling, set all the offsets to 0. This is the preferred way of tiling images.

However, you can also tile images in a way that allows them to keep their left, right, top, bottom and four corners intact while tiling the interior. This allows you to stretch non-rectangular graphics while preserving the edges, for example a background with round edges will maintain the round radii of the corners. Typically, you set each offset to 25 (%).

The drawing mechanism internal to VSTGUI4 that handles tiling when the offsets are non-zero is very slow and will make your GUI sluggish if you use too many of these controls. **We recommend avoiding the nine-part-tiling unless using the traditional method (all offsets = 0, which does not have issues when rendering).**

Templates

The Templates list contains all of the pre-built templates that resemble the old GUI Designer control clusters. Each is a combination of one or more graphics objects. For example, Knob Group A contains a cluster comprising one text label, one knob and one edit control. When you drag a template row into the GUI designer the whole set of controls will drag together. When you drop the control group, a red line shows up around it. The red line shows you the View Container, which holds the inner controls. The View Containers on all Templates are transparent, so you see through them. If you move your mouse around inside the container, you will see individual controls highlighted. This is important - be careful!

To move the entire group of controls, move the mouse until the outer view container is highlighted. Then, click and drag the group of controls. You can also fine-tune the inner control locations by dragging them around inside the container. Hold the <Shift> key to temporarily disable the Snap to Grid functionality. You can also drag and resize any of the controls including the outer container.

To setup a cluster of controls to map to a single variable (i.e. the knob and edit box both connect to the same value and when one changes the other also changes), move the mouse so the outer view container is highlighted and then right-click. A pop-up dialog appears that contains sections for each of the controls. The Control Tag connects the control to a RAFX control (and underlying variable). You can change the attributes of the various controls in the cluster from just one location.

You can also setup the controls individually by moving the mouse so that an inner control is highlighted, then right-click. Typically, you won't do this unless you have some very strange control where the knob, edit box, and text label are for some reason referring to different variables.

Objects

You can also choose to add individual objects to the GUI and this list displays all the VSTGUI4 objects that RAFX supports (note that this is a sub-set of the total). You can drag and drop these controls, right-click and set them up individually. You can also combine these graphic objects into your own Templates and save them to make GUI design even easier. When you add objects with images, all the controls will autosize when you change graphics **except** the analog VU meter. The reason is the the analog VU meter images are usually non-square making it difficult for RAFX to figure out the dimensions. You set put the same attributes here as you do for the clusters, only one at a time.

User Templates

To make a User Template, first start by dragging a Group Frame object from either the Templates or Objects list. The Group Frame is a View Container object. When you drag the View Container, it looks like a black box. You can change this to be transparent later. You can also change the background image for the container which makes it easy to see the controls. You can stretch out the container to any size you want.

With the View Container in place and stretched out to your desired shape, you can now drag Templates or Objects into the container. Once dropped, you can drag the entire container around and the controls will follow. You can freely drag and drop controls from one container to another. You can also have containers within containers within containers... When dragging out of a back-container into a front-container, your control may temporarily disappear until you release the mouse, freeing the control from it's old container and old z-order.

When you have a set of controls ordered as you like, and before assigning any control tags, you can right click on the view container and choose "Save As" which will save the template into the User Templates list. Now, you can just peel off as may control groups as you like. This is great when you have repeated sets (rows or columns or groups) of controls. To delete a User Template, right click on it in the list and choose Delete.

Moving On

If you want to extend the GUI controls beyond what RAFX supplies, you are urged to study the VSTGUI4 system. The package is FREE and works with any plugin API, though implementation is not trivial. You can even create completely custom GUIs programatically within RAFX. See the website for some sample code (coming soon...). VSTGUI4 also includes other controls such as animations and file-open/save controls. See the VSTGUI4 documentation and sample code for more information.

You can also open your GUI in any VST3 client while in Debug mode in Visual Studio and right-click and chose "Open UI Editor" to get the VST3 GUI Designer. Here, you can add more types of controls and more advanced features like animation. However, these new controls will only appear in VST2/VST3 clients. They will not appear in RAFX or AU. Another option is to edit the XML file directly (named RackAFX.uidesc) but the RAFX GUI designer is the easiest way to go.

AU and VST Porting

The Make AU and Make VST buttons now generate ported versions of your plugin with the VSTGUI4 GUI intact.

AU:

The project is fully self contained with the VSTGUI4 files embedded in the project. The ported project can be placed anywhere in your folder hierarchy. The ported project only works in OS10.7 and later.

VST:

The VST port produces two projects, the old fashion VST2 version without the VSTGUI4 GUI and the VST3 version. The VST3 version includes the VSTGUI4 GUI and will produce a DLL that is compatible with both VST2 and VST3. This way, you can port the VSTGUI4 GUI out to both APIs.

AU and VST Templates

The AU and VST Template generators have been revamped as well. The current options are:

AU:

Now only supporting OS10.7 and later; you can create FX and Synth Templates with the standard Cocoa GUI attached (not VSTGUI4). If you want VSTGUI4 you will need to add that manually. I will have a sample AU project on the website that does not include any RAFX stuff.

VST2/VST3:

You can now export both FX and Synth plugins in VST2 and VST2/3 formats.

VST2:

The VST2 template creates a standard VST2 project; it is up to you to connect the GUI of your choice.

VST3:

The VST3 template uses VSTGUI4 to connect simple volume and mute controls as an example for you. The VST3 template generates a DLL that is BOTH VST2 and VST3 compatible. This way you have the VSTGUI4 GUI in both.

VST3 requires that you download the VST3 SDK and place the RAFX AU template or ported project in the proper hierarchy since the #included files must maintain the same folder hierarchy.

User Variables

You can now declare user variables that do not connect to any GUI controls, but which are saved in your Preset files. This allows you to save all kinds of data in the preset files without needing a control for them. You can choose *int*, *double*, *float* or *UINT* data types for user variable storage. You can also declare a *VSTGUI4* variable which is a *float* that always ranges

from 0.0 to 1.0. This way, you can connect VSTGUI4 controls to non-RAFX controls. This aids in customization.