RandomControl®

# fryrender SWAP

user manual

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# Contents



# 01 Introducing fryrender SWAP

FRYRENDER SWAP IS A HIGHLY INNOVATIVE PRODUCT BASED ON OUR PHYSICALLY-BASED RENDER TECHNOLOGY. SHARING A BASE CONCEPT SIMILAR TO FRYRENDER'S *LAYER-BLENDING*: "RENDER-ONCE AND GET AS MANY IMAGES AS YOU NEED", SWAP ENABLES YOU TO **CHANGE MATERIALS** IN YOUR SCENE WHILE KEEPING THE ORIGINAL PHOTOREALISTIC QUALITY OF YOUR IMAGE, **IN REAL-TIME**.

SWAP is aimed at those visualizers who need to discuss, review or simply produce a high number of variations of a given scene or object, and don't have have the time to render all the images.

A typical case of use can be found in product or architectural visualization, where once the geometry is modelled, the artist creates the materials that will determine the final appearance of the elements in the scene. It is often very beneficial to be able to discuss variations on those materials with the client, or even show how different materials can affect the mood of the image as part of a decision-making process. To do so, traditionally you would need to render all the possible variations, one by one. This process is not only tedious and inconvenient, but may even be unfeasible due to hardware, budget or deadline constraints.

With fryrender SWAP you only have to process your scene *once* to get *endless* material changes for a given object. Moreover, the results are displayed in real-time while you tweak the materials, leading to a creativity explosion in your workflow, and better/more results given the same time/effort.

So... *How does fryrender SWAP work?* Put in short, SWAP first builds a data package from your input scene, which, once processed, contains all the information necessary to allow you to change materials in real-time. This process is really easy to carry out. In fact, all you have to do is tell SWAP what object you wish to edit. The application will take care of the rest.

# Product installation and licensing

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Two versions of fryrender SWAP are provided (32-bit and 64-bit). You must pick the one that matches your system configuration.

To install the product, just execute the installable package by double-clicking on it. Optionally, you can provide a destination folder, which is set to *c:\randomcontrol\swap* by default.

In order to run unlocked, fryrender SWAP needs you to provide a valid license file. Launch the application and click the **LICENSE** button. This will open the *RandomControl License Manager* dialog (Figure 1). From that dialog you can access our license activation form by clicking the *Request a software activation* button. Once you have performed a license request, you should receive a *license.ini* file shortly by email. Place this *license.ini* file right next to the *swap.exe* file (located at *c:\randomcontrol\swap\toolsXX\swap.exe* by default) and start the application again.

Once a valid license file is found, the product runs unlocked and can be used normally.

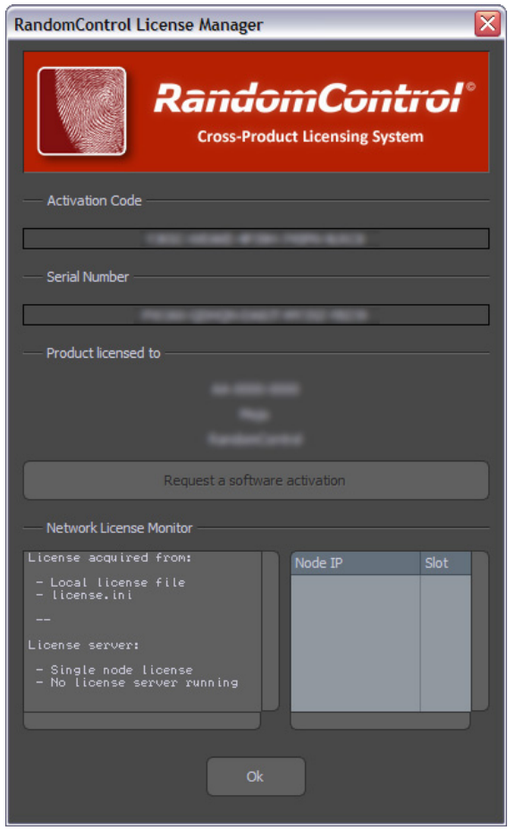


**Fig 1.** RandomControl License Manager.

# 03 Using the application

FRYRENDER SWAP NEEDS AN EXISTING FRYRENDER SCENE IN ORDER TO OPERATE. THE SCENE MUST BE PROVIDED IN THE NATIVE FRYRENDER FORMAT, CONSISTING OF A .FRY FILE, ONE OR SEVERAL .BIN FILES UNDER THE /FRAMES SUBFOLDER, AND THE TEXTURE MAPS USED, PLACED UNDER THE /MAPS SUBFOLDER. SUCH STRUCTURE WILL BE OBTAINED BY USING ANY OF OUR FRYRENDER PLUGINS AND EXPORTING YOUR SCENE LIKE YOU WOULD NORMALLY IN FRYRENDER.

The process that enables a fryrender scene to be used in SWAP is divided in three well differenced stages that must be followed in strict order:

## 1. Data generation

The *Generation* stage produces 3 variations of your source scene that will output all the channels needed to perform the material swapping in real-time. This stage is invoked from the **GENERATE** button you will find in the SWAP main toolbar.

The first step is to specify which object you want to do material swapping on (Figure 2). That object will be the one you will be allowed to modify in real-time later. You will also need to select which camera you want to use to render the views.

*Due to the nature of the compositing process used by SWAP, accurate results will be achieved only if the swappable object is completely* **in focus** *in the rendered view.*

Then SWAP will generate three new *.fry* files, called *white.fry*, *black.fry* and *mirror.fry*, next to your

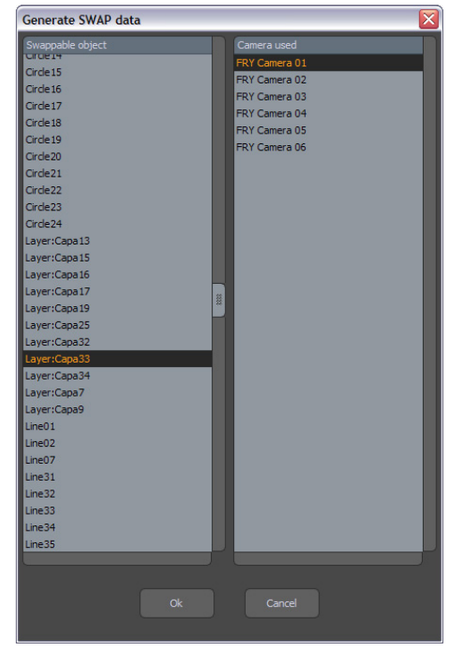


**Fig 2.** Picking an object and a camera to be used in the Generate stage.

scene's source *.fry* file. These new scenes contain certain variations of the original one, and some additional render settings. They all share the geometric data stored in the *.bin* files of the original scene. **Do -not- modify these scenes manually**. Just render them as they are.

## 2. Offline rendering

Once the 3 scenes have been generated, you must render them. The scenes are configured to output the layers needed in the next stage.

Render these scenes just like you would render any other fryrender scene. You can use network rendering and even a FARM service if you want. Note that SWAP will achieve better results if you allow the scenes to render until they are completely clean.

The images resulting from those scenes are the layers that fryrender SWAP will use to perform the real-time compositing. Keep in mind that each scene can output one or several files (channels), and the output paths for these are already configured to be saved into a folder called */swap* inside your scene folder. A detailed description of the output channels follows:

1. The scene *white.fry* is a version of your source scene where the swappable object looks completely white. This scene will output a channel called */swap/white_001_color.hdr*.
2. *black.fry* is a version where the swappable object looks black. The channel output is called */swap/black_001_color.hdr*.
3. The last scene, called *mirror.fry*, generates a channel where the modified object looks like a mirror, called */swap/mirror_001_color.hdr*. This scene will also produce an ambient occlusion channel called */swap/mirror_001_ao.tga* and a mask called */swap/mirror_001_mask.tga*.

You should let each scene cook until they show little or no noise. The *mirror* version of the scene may take a little longer to clean than the other two. Note that this offline render stage needs to be performed **just once** to generate the input layers for the next stage.

## 3. Real-time compositing

### 3.1. *Loading your scene*

When you are done with the offline render stage, the */swap* folder located under the scene folder must contain 5 files called: *white_001_color.*

**Fig 3.** Example of the five layers generated for an interior scene



*hdr*, *black_001_color.hdr*, *mirror_001_color.hdr*, *mirror_001_ao.tga* and *mirror_001_mask.tga*.

*The channels will be stored in their proper location only if the 3 scenes are rendered in the same machine.* **You *will need to copy them to the /swap folder manually*** *if you use network rendering to produce them.*

The compositing stage is where you will begin once you have the channels ready. Note that the generation and rendering stages need take place only once, while you can swap materials as many times as you want, by opening SWAP and pressing **LOAD**.

Once you click **LOAD**, SWAP will ask you to pick the source *.fry* scene. This scene file must be the same one which was used in the *Generate* stage. The reason for this is that, besides producing the *white*, *black* and *mirror* versions of your scene, the *Generate* stage also tagged the original scene file with

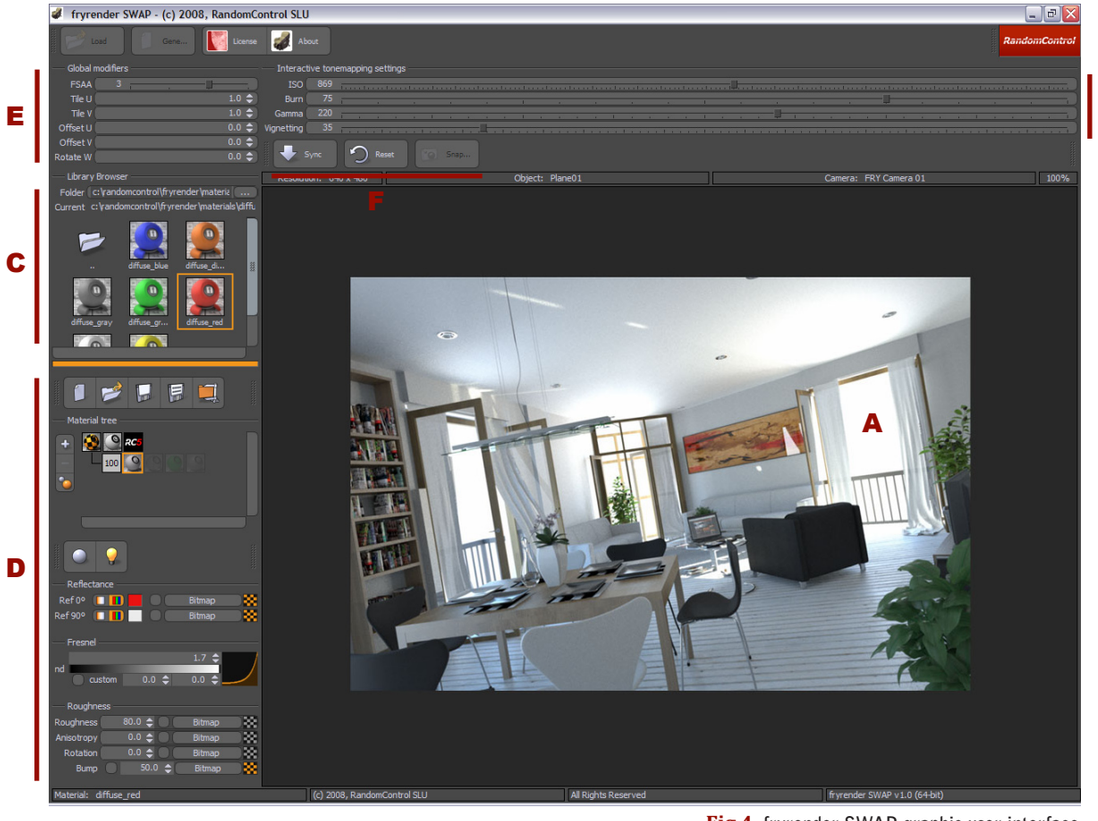


**Fig 4.** fryrender SWAP graphic user interface

the file paths of the 5 resulting channels, so that SWAP is able to find them.

## 3.2. *Swapping materials*

After a scene is properly loaded into SWAP, the application displays its main graphic user interface (Figure 4):

- On the central part you will find the viewport (**A**) where the resulting image will be displayed. This viewport can be zoomed in and out using the mouse wheel, and panned by dragging with the left mouse button.
- The top-right part (**B**) holds the tonemapping parameters, used to control how the image is converted from High Dynamic Range to a RGB image displayable by a computer screen. These parameters have the same meaning and ranges than those you will find in fryrender's tonemapping.
- The left part of the window holds the materials Library Browser (**C**). When you pick a material, a compact version of fryrender's Material Editor is docked below (**D**). You can then modify the material and make the changes effective by clicking on the **SYNC** button located under the tonemapping controls (**F**).
- An additional set of parameters called *Global Modifiers* is available on the top of the left column (**E**). From there you can adjust the antialiasing quality (*FSAA*) of the swappable object, and tweak the texture mapping UVs via the *Tiling*, *Offset* and *Rotation* parameters.
- fryrender SWAP also enables you to save the variations of your scene into regular RGB images by using the **SNAPSHOT** button in the (**F**) toolbar. The snapshot images will be stored under the */snapshots* folder, next to the source *.fry* file. Snapshots will be named incrementally (*swap_001.tga*, *swap_002.tga*, ...).

# 04 Supported materials features

FRYRENDER SWAP USES A REAL-TIME COMPOSITING ENGINE TO MODIFY THE APPEARANCE OF A GIVEN MATERIAL IN THE SCENE, AS WELL AS ITS EFFECT IN THE GLOBAL ILLUMINATION. THIS TECHNIQUE IS SUITABLE FOR MOST MATERIALS PRESENT IN ARCHITECTURAL AND PRODUCT VISUALIZATION SCENES. HOWEVER, THE USER MUST KEEP IN MIND THAT THIS PROCESS CAN'T MATCH ALL THE FEATURES IN A CONVENTIONAL RENDER MADE WITH FRYRENDER, AND HENCE, NOT EVERY POSSIBLE PHENOMENON CAN BE REPRODUCED DYNAMICALLY BY SWAP.

The table displayed below summarizes which FRYRENDER features are supported, and which can't be simulated in real-time by SWAP. The user must consider this information when creating scenes or materials that will be loaded in fryrender SWAP.

| CHANGES IN | SUPPORTED |
|---|---|
| **Ref 0° / Ref 90°** | ✓ |
| **Roughness / Roughness Map** | ✓ |
| **Multiple Layers** | ✓ |
| **Layer Weight / Weight Map** | ✓ |
| **Bump** | ✓ |
| **nd / Fresnel** | ✓ |
| Opacity | × |
| Transmittance | × |
| SSS / S5 | × |
| Displacement Mapping | × |
| Anisotropy | × |

# 05 Practical examples

The images displayed in this page are examples of real scenes edited using FRYRENDER SWAP.

**Fig 5.** Example of an interior scene which floor object was tagged as swappable. Note how the changes not only affect the appearance of the very floor, but also all the other objects through Global Illumination.

**Fig 6.** The images above depict different versions of the same object obtained by changing its main material. Note the changes in the roughness, bump and textures of the materials used.

# 06 Troubleshooting

## This section holds answers to the most common problems that might be found when installing and using fryrender SWAP

**Q** ***I have installed SWAP successfully, but the user interface is disabled when I run the application.***

**A** Make sure you have licensed the application and you have placed the *license.ini* file next to the *swap.exe* file.

**Q** ***I'm trying to load a scene into SWAP, but I'm getting an error message.***

**A** In order to load a scene in SWAP, you need to proceed through the *Generation* and *offline render* stages before. Possible causes for a load failure are:

- You are not loading the same *.fry* file used in the *Generation* stage, and thus your file is not tagged with the information that SWAP needs to locate the input layers. You can check this by opening the .fry file in a regular text editor and check for the existence of the "*swapDef*" block near the end.
- Not all the layers have been generated, or they can not be located at the */swap* folder under your scene folder.

**Q** ***How do I export my scene to be used in SWAP?***

**A** fryrender SWAP reads normal fryrender (*.fry*) scenes, so you don't need to do anything special other than exporting your scene from your host 3D application using any of the available plugins.

**Q** ***I'm not getting the expected results when I modify my materials.***

**A** Please note that SWAP's real-time compositing technique will produce a close approximation to the unbiased render you would get by using fryrender, but it also has some limitations: It will work perfectly with most materials, but there are certain features such as Displacement Mapping or transparency (refractions and subsurface scattering) that just cannot be simulated in real time due to their complexity. Refer to the *Supported materials features* section for a detailed description on what features are supported.

**Q** ***Why doesn't the Generate stage start the rendering automatically?***

**A** The reason for this is that each user might wish to carry out the layer rendering process in a different way: while some users might want to render the scenes right in the same machine where they are running SWAP, others might want to use network rendering or even a FARM service to make an efficient use of their computational power.

**Q** ***SWAP says it can't start the DirectX 9 HAL.***

**A** SWAP is a very modern DirectX-based application, so you might need to upgrade the version of DirectX installed in your computer to the latest available (DirectX9.0c or higher).

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