

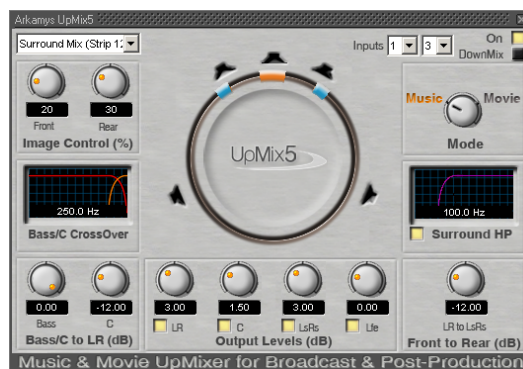


for Pyramix Virtual Studio

V 1.0

Movie & Music Stereo to 5.1 upmixer

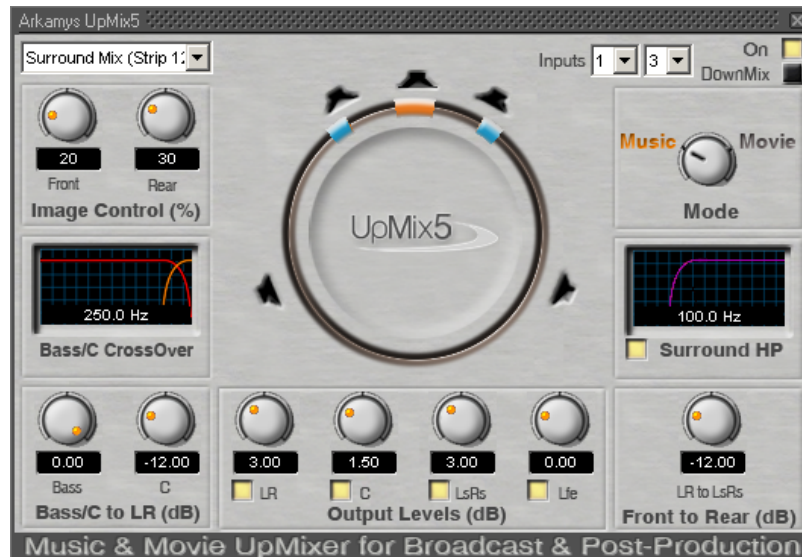
for BroadCast & PostProduction



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Introduction



Description

UpMix5 is a plugin for Pyramix Virtual Studio that upmixes a stereo source to a 5.1 multichannel output. From a FFT analysis of the stereo signal, **UpMix5** discriminates all the 5.1 components. **UpMix5** doesn't use any reverb, nor key compression to get a 5.1 surrounding. This plugin is designed for Broadcast and PostProduction applications on any stereo material: movie or music.

- Respect of the work, timber and dynamic
- Soundstage stability
- LCRS, stereo or mono compatibility for [downmix](#)
- No pumping effect
- User friendly interface

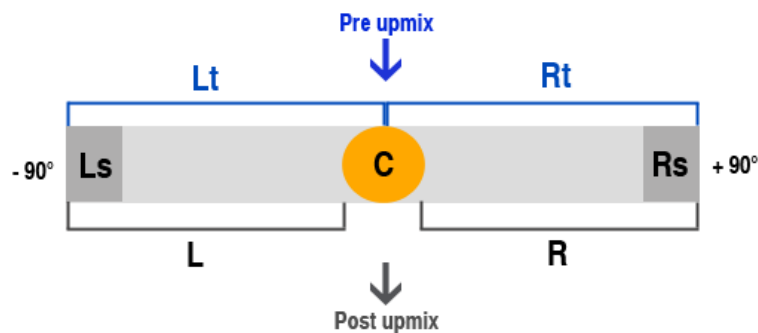
Applications

- Broadcasting: DVB, DAB, satellite radio...
- Music: editing, mixing, mastering
- Movie: editing, mixing, mastering
- Remastering: DVD, feature film, music

UpMix5 Process

UpMix5 discriminates mono, stereo and 'out of phase' components from the original stereo signal.

The mono component is played back in the center speaker (C) and the out of phase component is played in the rear speakers (LsRs). User can choose the width of the final front LR and surround LsRs signals.



- Discrimination between strict mono, strict stereo, 'out of phase' and bass components of the original stereo signal by spectral analysis and re-synthesis
- True stereo Surround channels
- Final [width](#) of the front and/or rear signal Controls
- [LFE, C](#) and [Surrounds](#) frequency bandwidth controls
- [C to LR](#) divergence level Control
- [Bass to LR](#) divergence level Control
- [Extracted stereo to LsRs](#) divergence level Control
- [5.1 balance](#)

Integration of *UpMix5* in a Pyramix Project

Installing UpMix5

This plugin is installed with the Pyramix Virtual Studio Installer. An activation key is needed to run the plugin. You can acquire one from [a Merging distributor](#).

Loading UpMix5

The *UpMix5* plugin has to be loaded in the project mixer by clicking on "Arkamys UpMix5" in the "Add Effect" menu:

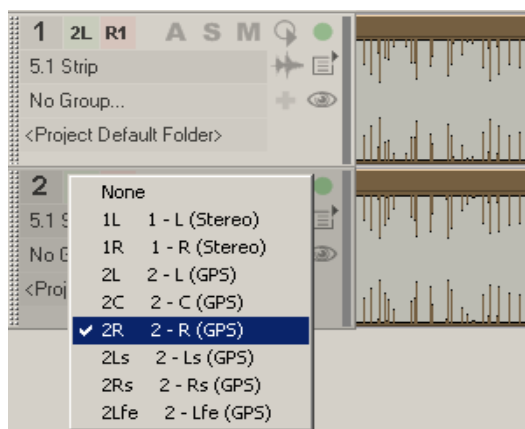


N.B.: *UpMix5* has to be loaded in a 44.1 kHz or 48 kHz project. Version 1.0 does not support higher sampling rates in.

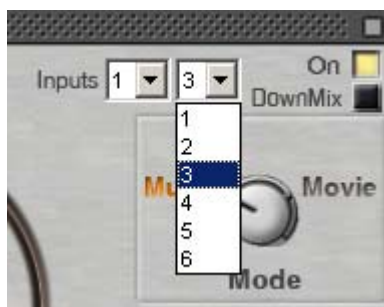
Pyramix 5

In a Pyramix 5 project, **UpMix5** performs a stereo to a 5.1 signal. In a 5.1 configuration, the In/Out indices are: 1 L, 2 C, 3 R, 4 Ls, 5 Rs, 6 Lfe. Thus, it can be normally loaded:

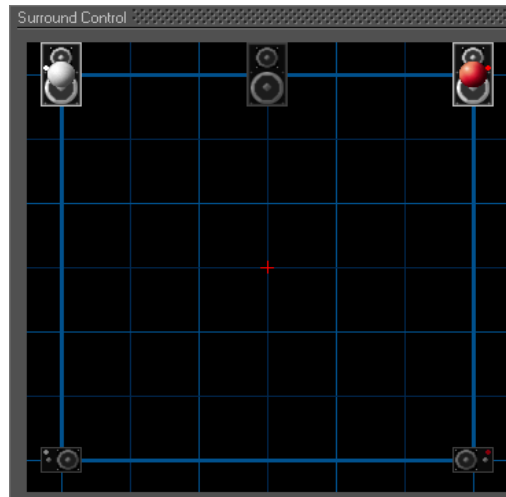
- In a General Purpose Strips (GPS) 6 channels:
 1. In the track editor, user has to choose the two strip inputs corresponding to the stereo (by default L and R correspond to indices 1 and 3).



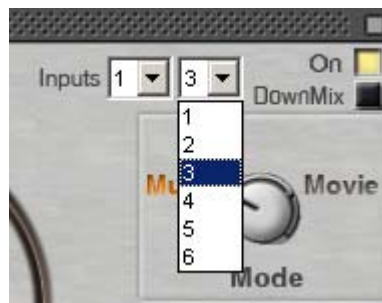
2. In the plugin window, user has to choose the indices matching to the strip inputs selected in the track editor (by default L and R correspond to indices 1 and 3).



- In a Surround Mix Bus. In this case, the strip routed to the Surround Mix bus can be:
 - I. A stereo strip:
 1. In the strip surround pan, user has to choose the two channels corresponding to the stereo (by default L and R) and has to apply a pan on these two channels.



2. In the plugin window, user has to choose the indices matching to the channels selected (by default L and R correspond to indices 1 and 3).

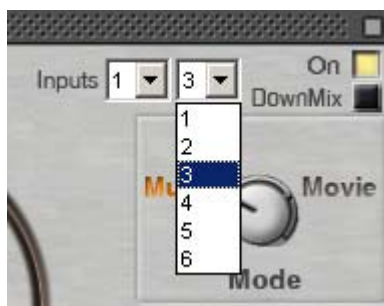


II. A surround strip

1. In the channel routing in the strip, user has to choose the two channels corresponding to the stereo (by default L and R) and has to apply a gain on this two channels.



2. In the plugin window, user has to choose the indices matching to the strip inputs selected in the track editor (by default L and R correspond to indices 1 and 3).



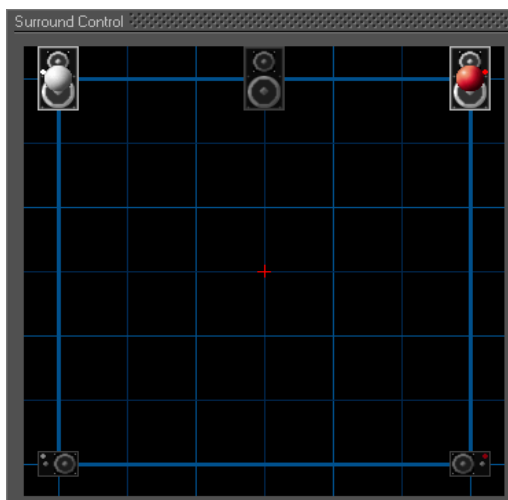
N.B.: **UpMix5** can be loaded on different other configurations, but there are the most common and useful ways to upmix a signal in a Pyramix 5 project.

N.B.: If the plugin is loaded in a stereo or a mono strip / bus, the process is deactivated.

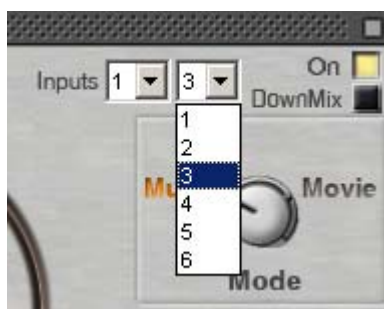
Pyramix 4

In a Pyramix 4 project, **UpMix5** performs a stereo to a 5.1 signal. In a 5.1 configuration, the In/Out indices are: 1 L, 2 C, 3 R, 4 Ls, 5 Rs, 6 Lfe. Thus, it can be normally loaded in a Surround Mix. In this case, the input strips can be stereo strips:

1. In the strip surround pan, user has to choose the two channels corresponding to the stereo (by default L and R) and has to apply a pan on these two channels.



2. In the plugin window, user has to choose the indices matching to the channels selected (by default L and R correspond to indices 1 and 3).



N.B.: **UpMix5** can be loaded on different other configurations, but this is the most common and useful way to upmix a signal in a Pyramix 4 project.

N.B.: If the plugin is loaded in a stereo or a mono strip / bus, the process is deactivated.

Controlling UpMix5

Control Types

Five kinds of controls are available:

Push Button

This is an "activate" two state button.

Clicking the button makes a yellow light appears / disappears:

- yellow light on : button on, function related activated
- no light : button off, function related deactivated



Knob

This is a standard knob. It controls a range of values (percentage, level in dB...). The value changes by maintaining left click and moving horizontally or by entering the value in the edit area.

The double left click moves the knob to its default value. The default value is symbolized by an orange led lighting.



Selector

This selector knob controls a finite number of states, corresponding to processing modes. The value changes by maintaining left clicking and moving horizontally.

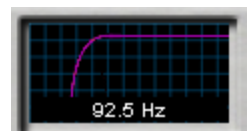
The double left click moves the knob to its default value. The default value is symbolized by an orange label lighting.



Graphic

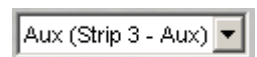
This is a slider represented by a graphic. It controls a range of frequencies corresponding to a frequency filter, which function is shown by the curve. The value changes by maintaining left clicking and moving horizontally or by entering the value in the edit area.

The double left click moves the slider to its default value.



List Selection

This is a list containing a limited number of choices. A single left click on the arrow shows all the proposals; a second click on one item selects it.



Control Descriptions

Channel Selection



The *Channel Selection* list shows which instance of the plugin is currently in use. Clicking the arrow drops down a list of all instances of this plugin. Click on a name to select an instance from the list. The control values will change to reflect the current state. This feature enables all instances of a particular plugin to be controlled from the same interface window without opening different windows for each instance.

Inputs Selection



The *Inputs Selection* list show which input channels are selected. The first list represents the Left channel and the second list the right channel of the stereo input. The inputs 1 and 3 are the default stereo inputs.

If the plugin is loaded on a stereo or mono strip / bus, *Input Selection* is disabled.

On



The *On/Off* push button allows user to activate or deactivate the upmixing process in order to compare with original material. The signal is always routed through the plugin in both On and Off positions. Thus, there is no latency difference between the two states (activated and deactivated).

The aim of the *On/Off* button is to compare the original stereo with the processed stereo. Therefore, if the input channels chosen with the inputs selection are not the default channels (indices 1 and 3) but other indices (for instance 4 and 5), deactivating the process will output this stereo on the L and R channels of the Surround Strip / Bus.

Mode Selection



The *Mode Selection* allows user to switch between Movie/Music operating modes. Movie mode privileges the diffusion of the centered mono component in the center speaker while Music mode lets the user control the center phantom image.

Default mode: Music Mode.

Image Control



User can choose the width between Left and Right of the final front and surround signals.

Front Image

This knob controls the width of the two front stereo speakers. It corresponds to a percentage. The value varies from narrow (0) to wide (100). There are two default values:

Default Front Width value in Movie Mode: 50

Default Front Width value in Music Mode: 20

Rear Image

This knob controls the width of the two surround stereo speakers. It corresponds to a percentage. The value varies from narrow (0) to wide (100). There are two default values:

Default Rear Width value in Movie Mode: 50

Default Rear Width value in Music Mode: 30

Mono Component Processing

CrossOver Filter



User can control a *Crossover Filter* applied on the extracted mono component, where low frequencies are routed to the front LR channels and the subwoofer, while high frequencies are sent to the center speaker. Once mono part is extracted from the original signal, it didn't remain in the front stereo component (LR) anymore if no divergence is applied. The CrossOver allows the user to choose the amount of bass routed to LR speakers. Routing the bass component only in the C speaker instead of the two front LR speakers can indeed give a lack of energy in bass frequencies.

CrossOver frequency Range: 20.0 Hz to 250.0 Hz

Default CrossOver frequency: 250 Hz.

Bass Management and Center Divergence



Thus, two divergence controls allow user to control the amount of C and bass signals sent to the front LR channels. Both divergences are applied after the CrossOver filter. The amount of C in LR is dynamically shown on the surround circle with the yellow figure.

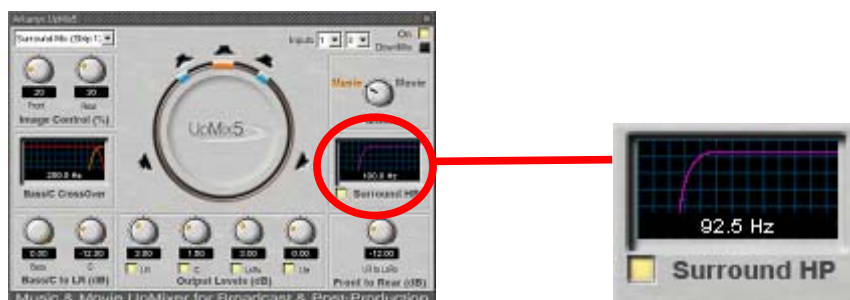
Bass Divergence Range: -Inf to +6.00 dB

Default Bass Divergence: 0.00 dB

Center Divergence Range: -Inf to +6.00 dB

Default Center Divergence: -12.00 dB

Surround Processing



High Pass Filter

A *High Pass Filter* (with tunable cut-off frequency) can be applied on the extracted rear component to prevent bass frequencies from being played in the surround monitors.

High Pass frequency Range: 50.0 Hz to 250.0 Hz

Default High Pass frequency: 100 Hz

High Pass Filter Activation

The surround *High Pass Filter* can be activated / deactivated with a push button.

Stereo Divergence



A part of the extracted stereo component can be routed to the rear channels allowing a more accurate enhancement effect. The *Front to Rear Divergence* is applied before the center divergence to LR and before the surround High Pass filter. Therefore, any bass or mono central component can be sent to the surround speakers. The amount of LR in LsRs is dynamically shown on the surround circle with the green figure.

Front Divergence Range: -Inf to +6.00 dB

Default Front divergence: -12.00 dB

Output Levels



A 5.1 balance allows user to control front L/R, center, surrounds and subwoofer output levels. Each level can be muted by deactivating the corresponding push button.

LR

LR Level Range: -Inf to +6.00 dB

Default LR Level : 0.00 dB

C

C Level Range: -Inf to +6.00 dB

Default C Level : 0.00 dB

LsRs

LsRs Level Range: -Inf to +6.00 dB

Default LsRs Level : 0.00 dB

Lfe

Lfe Level Range: -Inf to +6.00 dB

Default Lfe Level : 0.00 dB

DownMix



This push button applies a stereo downmix to the 5.1 processed output signal. It corresponds to the downmix described by the ITU (ITU-R BS.775) with the specific BBC Research Department recommendation:

- $L = L + C * (-3 \text{ dB}) + Ls * (-6 \text{ dB})$
- $R = R + C * (-3 \text{ dB}) + Rs * (-6 \text{ dB})$

Presets

The preset menu appears by right-clicking on the plugin:



BroadCast

This preset family has been designed for the principal applications needing a 5.1 broadcasting. Special care has been given to these presets to produce the more accurate surround effect.

"5.0 Documentary" preset is dedicated to broadcast configurations without subwoofer, while all others broadcast presets are designed for 5.1 broadcasting. They make use of [movie or music mode](#) depending on the final application; for instance: "music video" and "jingle" are based on the music mode.

"BROADCAST 5.1 Web Streaming" concerns all media broadcasting a 5.1 signal on the web (Web TV, Web radio, Media component of any web site....).

Movie

These presets are grouped by the type of movie to be processed: Action movie, comedy, drama...

All the movie presets are designed to diffuse the centered mono component in the center speaker. The [movie mode](#) is privileged in this preset category.

A special preset named "*MOVIE LCRS Generic*" has been designed for all movies using mono surround signal.

Music

These presets are grouped by the type of music to be processed: Pop, rock, Live...

All the music presets are designed to let the user control the center phantom image. The [music mode](#) is privileged in this preset category.

Post

This preset family has been designed for the Post Production needing a 5.1 ambience. Special care has been given to these presets to produce the more accurate surround effect.

All the post presets are designed to let the user control the center phantom image. The [music mode](#) is privileged in this preset category.

Faq

Configuration

What is the plugin CPU consumption?

The plugin is taking 31 % of CPU on a single 200 MHz Mykerinos Board.

What are the available sampling rates?

UpMix5 v 1.0 is designed for sample rates up to 48 kHz.

On which kind of strip / bus can I load the plugin?

The plugin can be [loaded on 6 channels strip or bus](#): on GPS 6 strips or on surround mix bus.

If it is loaded on a mono or stereo strip / bus, the process is bypassed.

How can I route my inputs to the plugin?

- If *UpMix5* is [loaded on a strip](#): the stereo In L and the stereo In R tracks are selected with the *Input Selector* in the track editor, then the matching input indices are to be selected in the *Input Selector* of the plug.
- If *UpMix5* is [loaded on a bus](#): the strip routing panel of the bus is used to route the stereo input signal, the input stereo has to be panned.

In both cases, the two *Input Selection* lists allow user to choose any input of the strip / bus as the stereo input.

How can I route my outputs from the plugin ?

The 6 output channels of the plugin are configured as: 1 L, 2 C, 3 R, 4 Ls, 5 Rs, 6 Lfe.

This configuration cannot be change in *UpMix5* v 1.0.

Which other Pyramix option is mandatory in order to use this plugin ?

This plugin requires the Surround Sound Mixing "PSO-SSM" option to be active in the Pyramix system. For Pyramix Native systems, the Media Bundle "PSB-MEDIA" option is furthermore mandatory.

Use

Can I use the plugin in render mode?

In Pyramix 5.0 and 4.X, the render mode allows to process only two channels. Thus, it is not possible to use the plugin in render mode.

Is there a latency induced?

The process generates a 960 samples latency that can be compensated with the delay compensation function in the mixer window.

Are dynamic processes included?

In v1.0, no dynamics are applied. You are free to use your preferred effects to finalize your project.

Do my two surround speakers produce a mono signal?

The surround signal is a true stereo signal. Nonetheless, a mono surround signal can be realized if the [Rear Image](#) value is 0.

Can I create different output configurations (5.1, LCRS, LCR....)?

You can create 5.1, 5.0, LCRS or LCR signal thanks to [divergences](#) and [output levels](#). You are not limited to a specific configuration.

Is my processed signal stereo compatible?

In all different configurations (5.1, 5.0, LCRS, LCR...), the process is fully stereo compatible. You can verify this compatibility using the [Downmix](#) control.

Requirements

Minimum

- Pyramix Virtual Studio 4 with Surround Sound Mixing option active.
- Mykerinos Board MYK-MB1.

Recommended

- Pyramix Virtual Studio 5 with Surround Sound Mixing option active.
- Mykerinos Board MYK-MB5 or multiple board configuration.

Contacts



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