

# DynamicMixer

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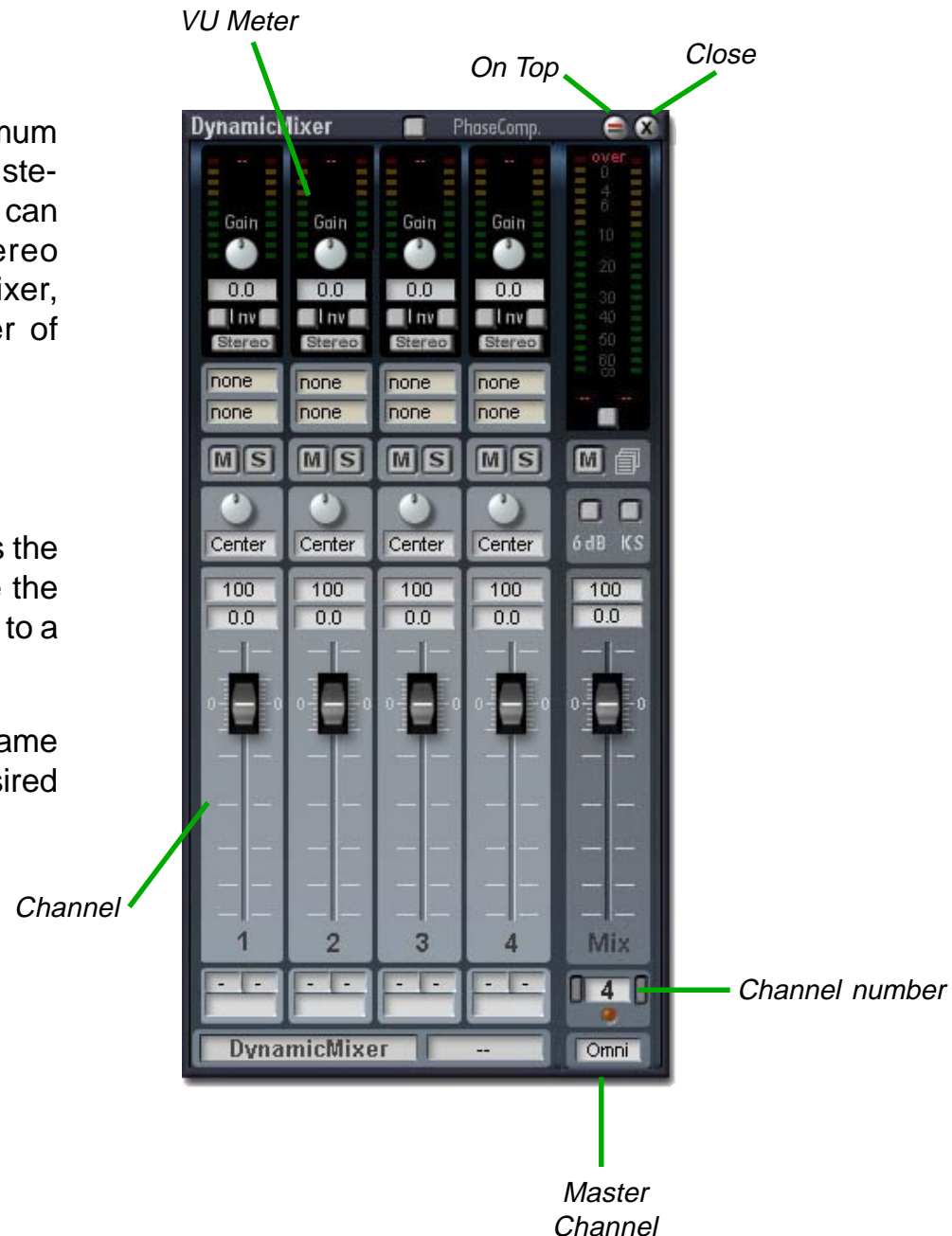
# Introduction

The Dynamic Mixer controls a maximum of 32 input signals through up to 16 stereo/mono channels. Each channel can operate as either a mono or stereo channel. In the context of this mixer, "dynamic" means that the number of channels is freely configurable.

## Interface

The number of channels determines the size of the mixer. You can configure the mixer from a minimum of 4 channels to a maximum of 16.

To move the mixer, "grab" the outer frame with the mouse and drag it to the desired location.



## Connections

To provide the greatest amount of flexibility this mixer offers a large number of inputs and outputs. For example, each channel provides its own direct outputs. The actual number of connections available depends on the number of channels and whether they are configured as stereo or mono.

The connections in detail:

### Inputs

MIDI In: **MIDI** input (green)

Mono channels: **In1** to **In16**

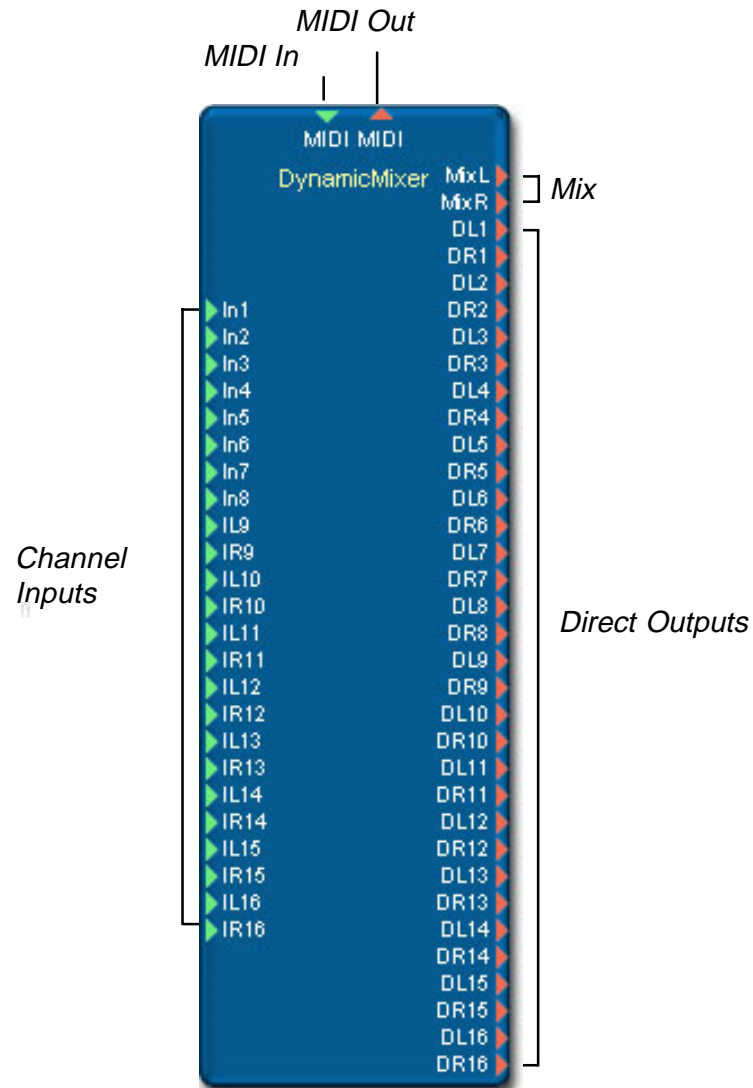
Stereo channels: **I1L/R** to **I16L/R**

### Outputs

MIDI Out: **MIDI** output (red)

Mix: **MixL**, **MixR**

Mono/Stereo channels: **D1L/R** to **D16L/R** (direct outputs)



# Controls

## General

### Level Meter

The level meters operate as peak meters whereby they display the maximum signal levels (as opposed to averaged levels). A *peak hold* function displays the signal peaks in the display for a brief period of time. A *margin* display lies beneath each meter. This indicates the highest peak level reached so far. A margin reset function clears (resets) all margin displays.

Each 'LED' is associated with a specific signal level and lights up when that level is reached or exceeded.

### Master Level Meter

**Red LED:** The red LED indicates a level of -0.01dB. Strictly speaking this is not an *over* condition, but it does indicate a very high signal level. To be safe you should not allow analog input signals to exceed -3.0dB.

With digital signals, such as those from a wave player, you can let the red LED flash more frequently. This does not indicate overs, just a high signal level. If the digital input signal has been compressed and normalized this LED will light up quite often.

- 1. Yellow LED: -0.5dB
- 2. Yellow LED: -3.0dB**
- 3. Yellow LED: -4.0dB
- 4. Yellow LED: -6.0dB
- 5. Yellow LED: -8.0dB
- 6. Yellow LED: -9.0dB



Green LEDs (1-14): -10.0dB, -12.0dB, -18.0dB, -20.0dB, -24.0dB, -28.0dB, -30.0dB, -36.0dB, -40.0dB, -45.0dB, -50.0dB, -55.0dB, -60.0dB, *Signal LED* -96.0dB

### "Signal-LED"

**-96.0dB**

It is normal for the *Signal LED* to remain lit when an analog source is connected to the respective input. This is because most analog devices have a signal-to-noise ratio of less than 96dB.

### Channel Level Meter

**Red LED: -0.01dB**

- 1. Yellow LED: -1.0dB
- 2. Yellow LED: -3.0dB**
- 3. Yellow LED: -6.0dB
- 1. Yellow LED: -12.0dB
- 2. Green LED: -18.0dB
- 3. Green LED: -24.0dB
- 4. Green LED: -36.0dB
- 5. Green LED: -48.0dB
- 6. Green LED -96.0dB**



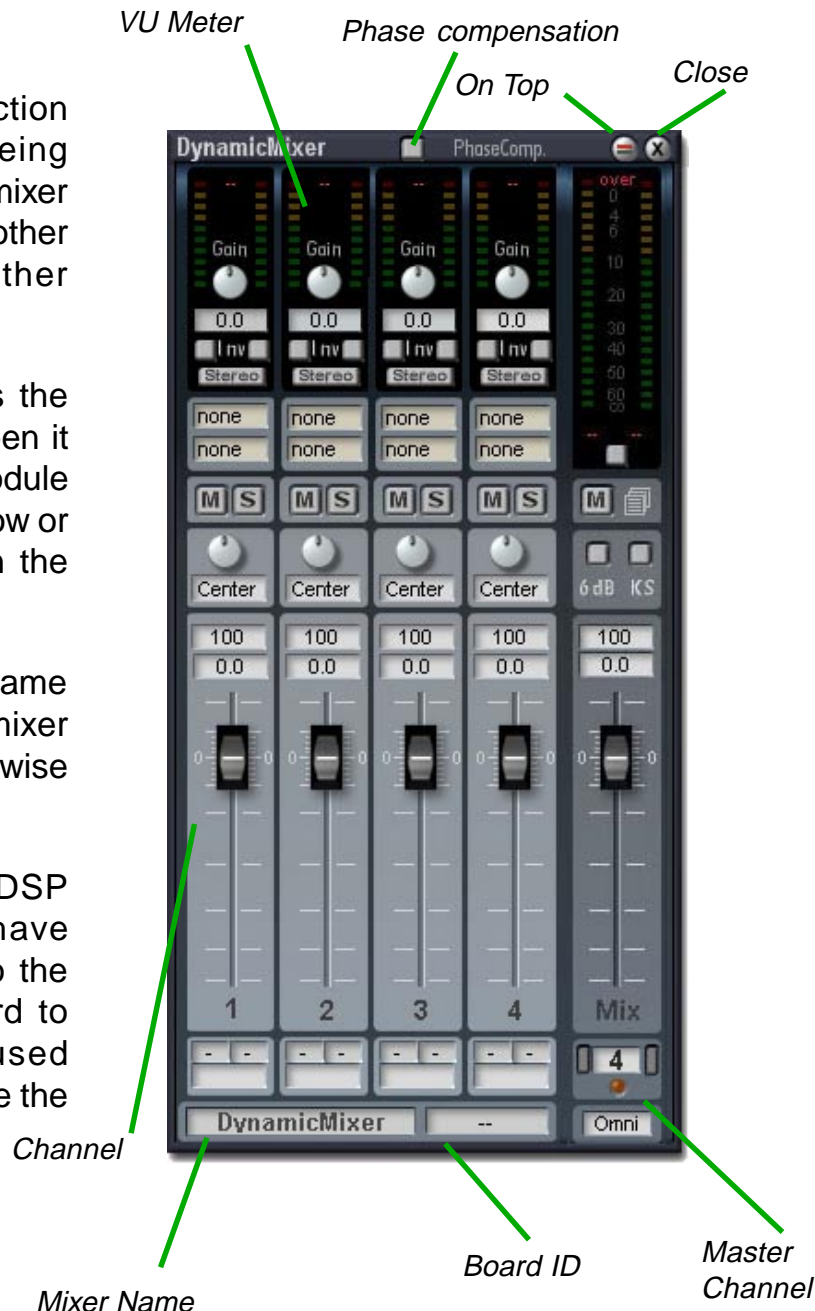
## Global Functions

**On Top:** When enabled this function prevents other windows from being drawn over the mixer panel - the mixer therefore remains "on top" of any other windows. When not enabled, other windows can obscure the mixer.

**Close:** The Close button removes the mixer panel from the display. To open it again, double click on the mixer module representation in the Routing Window or on the minimized mixer graphic in the Device bar.

**Mixer Name:** You can type in any name you like here. The name of the mixer module in the Routing Window likewise changes.

**Board ID:** If you have multiple DSP boards in your system and have connected several external I/Os to the mixer, you can select which board to assign to the mixer. When used appropriately this feature can relieve the DSP system dramatically.



For example, if you connect multiple hardware inputs such as an ADAT source module to the mixer inputs, and these inputs are located on a different board than the one used to process the mixer channels, you can change the board ID to ensure that the board with the ADAT inputs is the one used to process the mixer channels. This saves significant STDm connections between boards when you are using a lot of channels. You might also want to select a particular board to distribute the DSP load for performance reasons. Experiment a little with this setting to see how it affects your system.



## Phase Compensation

The switchable phase compensation feature permits phase-aligned operation of all mixer input channels. It makes no difference whether the input signal comes from an internal device (synthesizer, sampler etc.) or via an I/O module. Thus, external signals can also be handled in the mixer in a phase-accurate manner, as long as they arrive phase-aligned at the hardware inputs.

Phase compensation of all inputs is not always necessary. Activation of this feature imposes an additional demand upon DSP computing capacity and should therefore be done only when it is truly useful.

Compensation balances delays on the order of a few samples. These delays are significant only under certain conditions. For example, uncorrelated signals such as a piano and a separately-recorded voice can be shifted by a handful of samples relative to one another with no audible effect. These differences are too small to be perceived as timing shifts.

When, on the other hand, a piano has been recorded simultaneously via multi-

ple microphones, the spatial image will be correctly reproduced only if all of these highly-correlated signals are processed without delays relative to one another. Thus, the use of phase compensation is advisable when mixing recordings of a single sound source or image made with multiple microphones. The less correlated the signals are, the less critical is the maintenance of proper phase alignment. A delay of a few samples in one signal corresponds to a distance difference of a few centimeters. Thus, the effects of phase shifts in this range are greatest with close miking.

Note that precise phase alignment is often achievable without explicitly activating phase compensation, since channels are inherently phase-aligned with one another within specific groups in each mixer. In the DynamicMixer they are: 1-4, 5-8, 9-12, 13-16. In the MicroMixer, all channels are inherently phase-aligned. Thus, explicit phase compensation is necessary with this mixer only when it is desired that signals from different sources arrive phase-aligned at the mixer inputs.

The extent to which the difference between compensated and uncompensated signals is audible depends upon the signals themselves, and especially upon the degree of correlation between them. You can easily assess the extent of the effect directly by mixing a multitrack recording with the STM2448/4896 (without using any effects) and switching on phase compensation. Each channel includes a switchable delay which can be varied between 0 and 200 samples. A delay in one channel of 2-4 samples corresponds to the sort of delays which may be encountered in a real situation if compensation is not used. Check whether this delay seems to in any way alter the perceived spatial image. If not, crank up the delay further. The delay is now beyond that which might realistically be encountered, but makes the effect more noticeable.

Problems with mono compatibility, such as a noticeable loss of highs in the mono mix as compared with the stereo mix, can also occur. The Mono button in the Master section can be used to check this.

## Channel Strip

Each of the 16 channel strips can be configured for either mono or stereo operation.

**Level Meters:** In mono mode only the left level meter is used.

**Margin:** The margin display shows the highest level reached so far in the left or right channels. This value, expressed in dB, remains unchanged until a higher level is measured, or until the margin is reset.

**Gain:** Sets the pre-amplification level of the input signal. This level affects the channel strip's entire signal path. The associated text field indicates the amplification level in dB, and allows you to type in a numerical value. The maximum boost is +24dB.

**Inv.:** These buttons invert (shift the phase by 180 degrees) their respective input signals when pressed. For example, if you mic a snare drum from above (left)



and below (right), pressing the right Inv button will invert the phase of the lower microphone.

Use this feature to eliminate undesirable phase cancellations. In mono channels only the left button has an effect.

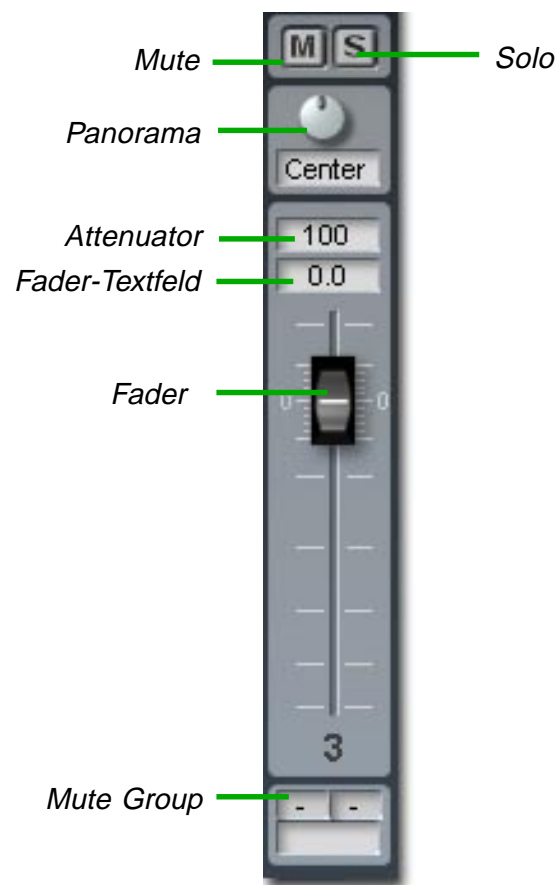
**Stereo:** Enables this channel as a stereo channel. Any channel can operate as either a stereo or mono channel. Mono channels use the left level meter, the left Inv button, and the left peak/signal display. When you switch from stereo to mono mode any connections to the right channel are lost. The left input for channel 1, for example, is renamed from IL1 to In1. The inserts automatically switch from stereo to mono, and any stereo insert effects are removed.

**Inserts:** Two insert slots are available in each channel strip. A slot is empty when it displays "none". To load an insert effect, drag it from the file browser and drop it into the desired slot. The name of the effect then appears in the text field.

**Mute:** The Mute button (M) removes the signal from the mix or restores it. If this channel belongs to a group, the other channels in this group are also muted or unmuted.

**Solo:** This button puts the channel in solo mode.

**Panorama:** Controls the proportion of the signal sent to the left and right master buses. This determines the virtual position of the sound in the stereo field. When pan is adjusted to full left (Left) the signal is passed only to the left master bus. In the central position (Center) both sides receive an equal proportion of the signal, and the signal is attenuated by 3 dB (crossfade mode). At the full right (Right) position, the signal is fed only to the right master bus. In the case of stereo channels, the left channel is permanently assigned to the left master bus and the right channel to the right master bus. Therefore there is no cross fading between channels.



When a channel is in stereo mode, the pan control acts as a balance control. In the center position, the input signal is passed through unattenuated and independent of the channel strip's selected pan mode. If the control is turned gradually from center to full left, the right channel signal will be gradually faded down until it is no longer audible, while the level of the left channel signal remains unchanged.

**Attenuator:** Use the attenuator to adjust the fader's control range. The advantage of using the attenuator is that, despite the reduction of the level by the attenuator, the full travel of the fader is still available. This is especially significant when using MIDI automation, where only 127 steps are available.

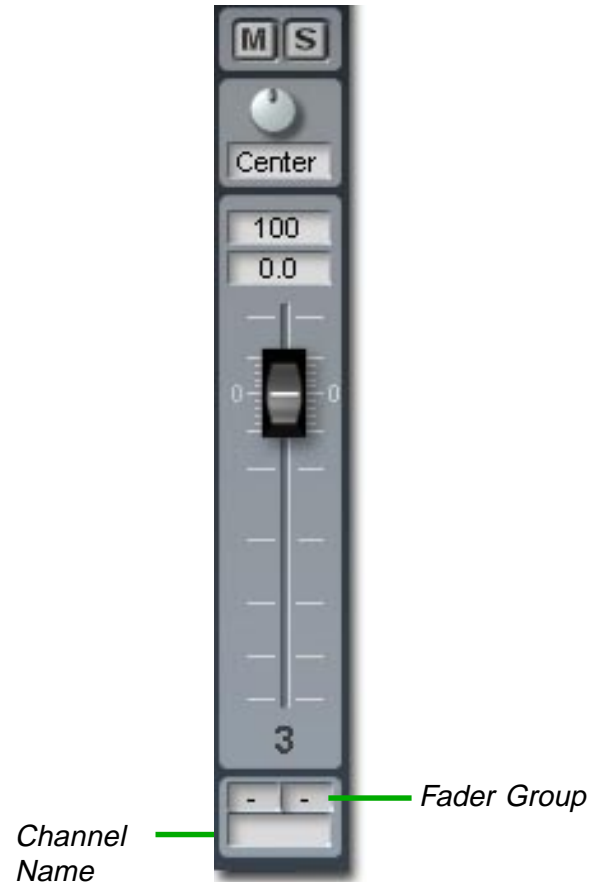
**Fader:** The fader controls the channel's output level. The text field above the fader shows the current signal amplification. You can enter values into this field. The range is from no signal (inf.) to about 12dB of amplification. The text field displays values from 0 to 127 (MIDI) where a value of 100 corresponds to 0dB of amplification

**Mute Group:** You can assign a channel to a group to link the mute buttons of all channels in that group. Use the Mute Group textfader to select the group for that channel. When more than one channel is assigned to the same group, the mute buttons of all channels in the group operate together whenever one of them is pressed. You can choose from among 4 groups.



**Fader Group:** A fader group is similar to a mute group, but in this case the groups link the master faders instead of the mute buttons. When you move the master fader of a channel assigned to a group, the faders of any other channels in that group will move also. Channels in a fader group maintain their relative levels. You can assign a channel to one of 4 fader groups. To resume independent operation for a channel, remove it from any group assignment.

**Channel Name:** Here you can enter any name you choose to identify the channel (for example, "Bass").



## Master Channel

All signals are sent to the Mix outputs through the Master Channel.

**Level Meters:** The Level Meters indicate the overall level of the mix. Use the fader to reduce the level if it is too hot.

**Margin:** The margin displays show the highest level reached so far in the left and right channels. This value, expressed in dB, remains unchanged until a higher level is measured, or until the margin is reset.

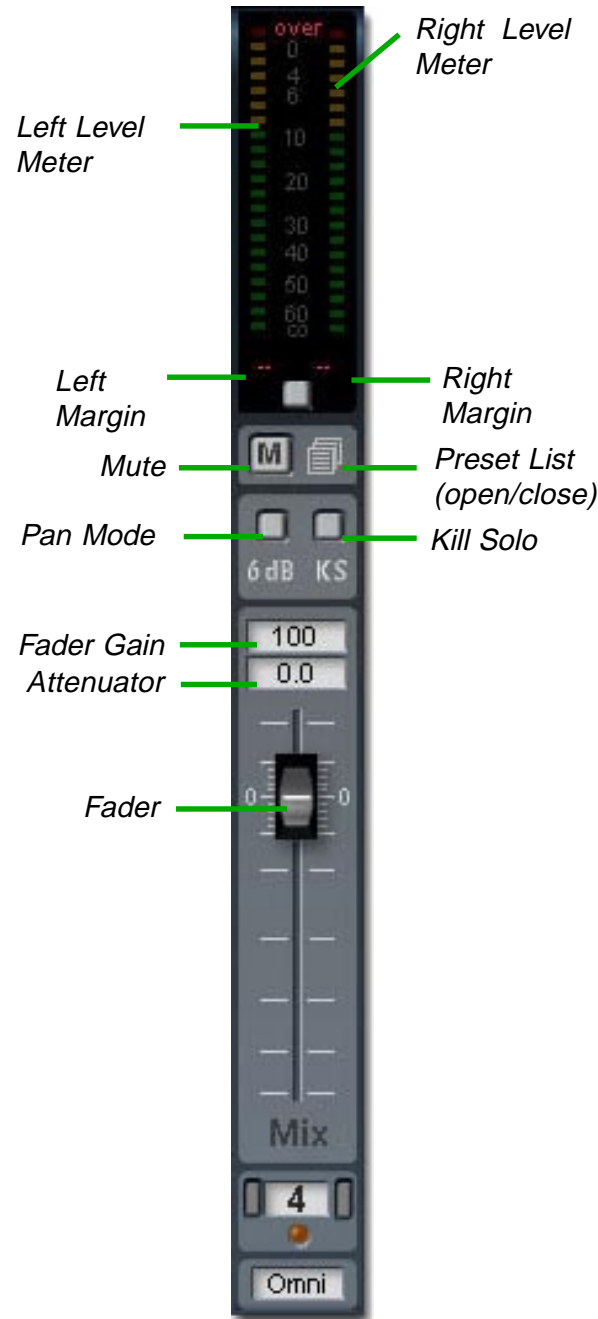
**Margin Reset:** Clears the values in the margin displays of all mixer channels.

**Mute:** Silences the mix output.

**Preset List:** Opens or closes the Preset List.

**Pan Mode:** Switches between the two pan modes: crossfade (3dB) and linear (6dB). When the button is pressed linear mode is active.

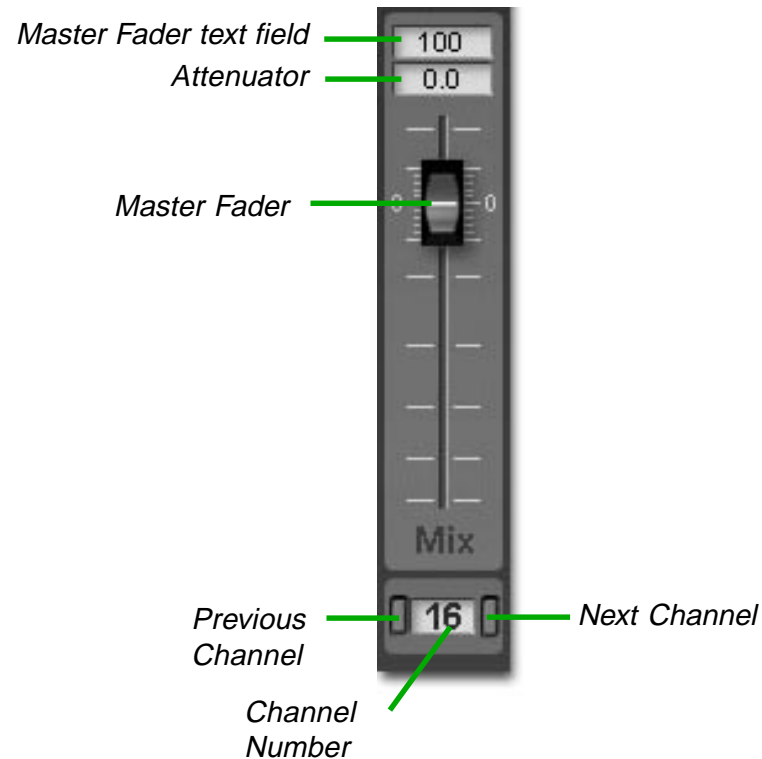
**Kill Solo:** Takes all channels currently in solo mode out of solo.



**Attenuator:** Use the attenuator to adjust the fader's control range. The advantage of using the attenuator is that, despite the reduction of the level by the attenuator, the full travel of the fader is still available. This is especially significant when using MIDI automation, where only 127 steps are available.

**Master Fader:** Controls the overall level of the mix. The maximum amplification is +12dB (also dependent on the Attenuator setting).

**Channel Number:** Shows the number of the currently active channel.



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