

# Dugan Automixer

## Manual

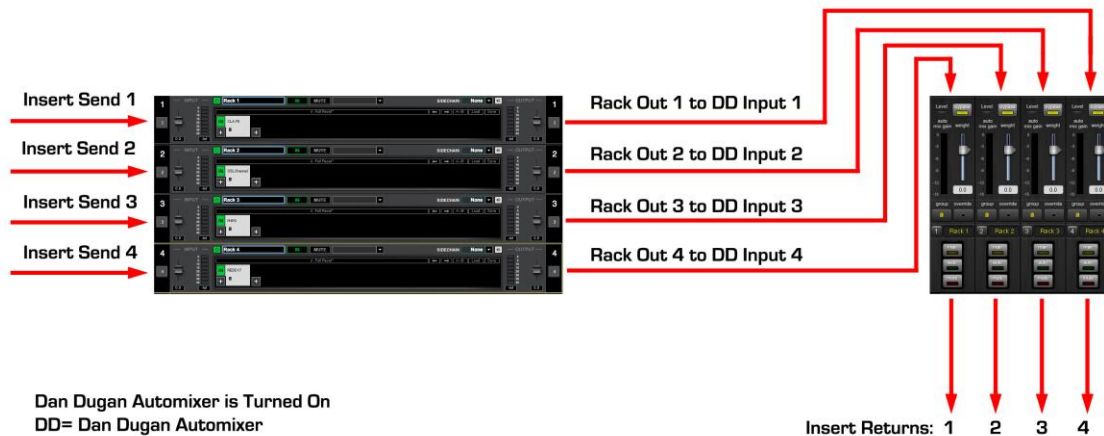


# Table of Contents

<b>Introduction .....</b>	<b>3</b>
<b>Dugan Channel Count.....</b>	<b>4</b>
<b>License &amp; Session Behavior .....</b>	<b>5</b>
<b>The Waves System Bar .....</b>	<b>6</b>
<b>Theory of Operation .....</b>	<b>7</b>
<b>The Dugan Automixer GUI.....</b>	<b>8</b>
<b>Top Pane.....</b>	<b>8</b>
<b>Channel Pane.....</b>	<b>9</b>
Level Indicator.....	9
Bypass .....	9
Channel Modes .....	10
Channel Groups.....	10
Channel Override .....	11
Channel/Rack Number .....	11
Channel Name .....	11
Channel Meter.....	11
Weight.....	12
<b>Master Pane .....</b>	<b>14</b>
On .....	14
Reset .....	14
Meters.....	15
Group Master Modes.....	15
<b>Typical Operation .....</b>	<b>16</b>

## Introduction

The Dugan Automixer plug-in is a MultiRack Native and SoundGrid plug-in only, integrated into the MultiRack system. The Dugan Automixer is inserted on the MultiRack's outputs, post the Racks. All Racks processing occurs prior to the signal reaching the Dugan Automixer plug-in. For example, if MultiRack is inserted on the console channels, then turning the Dugan Automixer On inserts the Automixer between the Rack Outs and Insert Returns, as shown below.



All available Outs are routed through the Dugan Automixer consecutively. All Rack Outs routing values are identical to the Automixer's channel numbers as a result. For example, Rack 1 Mono Out 1 connects to Automixer channel 1; Rack 2 Stereo Outs 3-4 connects to Automixer channels 3 and 4, and so forth.

When turning the Dugan Automixer On, all its channels are bypassed by default.

*For proper operation of the Dugan Automixer: insert MultiRack in post-fader position on the console channels you want processed by the Automixer.*

The Dugan Automixer is installed into the V9 plug-ins folder, which is a designated folder for the MultiRack plug-ins.

- PC – C:\Program Files(x86)\Waves\Plug-ins V9
- Mac – Applications > Waves > Waves Plug-ins V9

The Dugan Automixer opens in a dedicated floating window, captioned as “Dugan Automixer”.

*Important Note for MultiRack Native and SoundGrid users – To be able to open the Dugan Automixer window, you need at least one Rack open in the session.*

Open the Dugan Automixer:

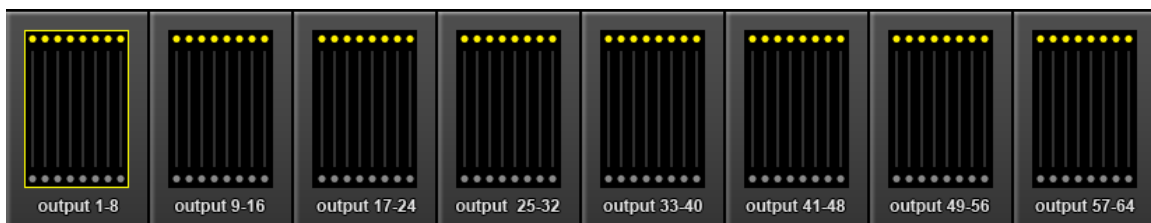
- MultiRack Native and MultiRack SoundGrid: under Audio > Dugan Automixer or press F9.
- MultiRack SoundGrid for DiGiCo: under Advanced > Dugan Automixer or press F9.

Close the Dugan Automixer by clicking on the X symbol at the top right corner. In MultiRack Native and SoundGrid you can minimize the Automixer by clicking on the “minimize” symbol at the top right corner; to return to normal view, click again on the top right corner (collapse button will turn to expand).

*Note that closing the Dugan Automixer window does not stop the Automixer’s processing, it only closes its control window.*

## Dugan Channel Count

The Dugan Automixer opens 64 processing channels, distributed across 8 tabs that are selectable from the top section of the plug-in. Each tab represents 8 channels, as shown below.

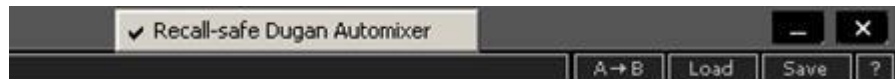


### DiGiCo

- SD7 & SD5 - The Dugan Automixer window opens 64 processing channels, grouped across 8 tabs.
- All other SD models: The Dugan Automixer window opens 32 processing channels, grouped across 4 tabs (the remaining 4 tabs will be grayed out).

**Snapshots** - All plug-in controls are saved in the snapshots, except for Master Pane controls.

**Recall-Safe** - The Dugan Automixer can be set to recall-safe mode by pressing the Recall-Safe button on the plug-in's Master Pane. Alternatively, right-clicking on the top of the Dugan Automixer window provides access to enabling/disabling Recall-Safe.



## License & Session Behavior

There are three possibilities:

1. If the Dugan Automixer is not installed, then its menu item will not be displayed in the MultiRack Native and SoundGrid system. On DiGiCo consoles, the Waves tab > Advanced menu item will show **Dugan Automixer is Not Installed**, and its settings will not be saved with the session file.

When loading an existing session that contains Dugan Automixer processing, the session will load without the Automixer. The Automixer will not be removed from the session file.

2. If the Dugan Automixer is installed but not activated, then its menu item will be grayed out. On DiGiCo consoles, the Waves tab > Advanced menu item will show **Dugan Automixer is Not Activated**, and its settings will not be saved with the session file.

When loading an existing session that contains Dugan Automixer processing, the session will load with the Automixer disabled. The Automixer will not be removed from the session file.

3. If the Dugan Automixer is installed and activated then its menu item will be shown normally. The Automixer will be saved with the session file, even if it's not turned On.

Use **Rescan Licenses** to refresh activation for added licenses:



- MultiRack Native and SoundGrid – Edit > Rescan Present Licenses
- DiGiCo – Waves Tab > Window > Rescan Present Licenses

## The Waves System Bar

All Waves plug-ins share a common feature, the Waves System Bar, which takes care of most administrative functions you will encounter while working with Waves plug-ins. Since the Waves System Bar is virtually identical on all Waves plug-ins, you will always know how to file, compare, load, and copy the parameters of a Waves plug-in, even if you have never before worked with that particular processor.

### Commands common to all Waves plug-ins:

- **Undo** undoes the last performed action.
- **Redo** redoes the last undone action; there are 6 levels of undo/redo.
- **Setup A/B** toggles between two sets of parameters within the same processor – this is useful when comparing different parameter settings in order to achieve optimal results.
- **Copy A->B** copies the current settings to the second setup register.
- **Save** is used for saving presets in the Waves file format (.xps).

There are two options for saving:

**Save to new file** - Creates a new .xps file wherein multiple presets can be saved.

**Save into preset menu** - Saves the preset into the default list of the plug-in.

Pressing the **?** button will open the manual for the plug-in you are using<sup>1</sup>.

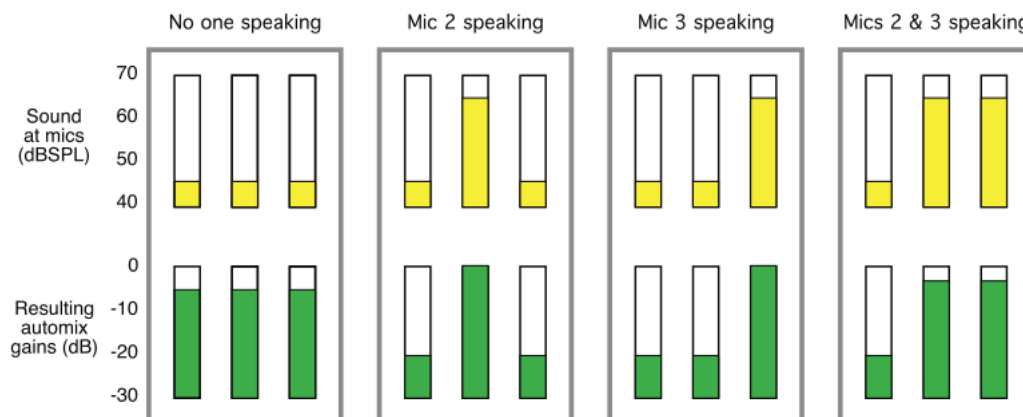
---

<sup>1</sup> Please note: The **?** button does not open the plug-in's manual on the DiGiCo consoles.

## Theory of Operation

The Dugan Automixer uses a patented automatic mixing function that distributes the gain of one open microphone over the entire system, maintaining a natural one-mic ambience. It is essential to distinguish this behavior from the annoying fluctuation of levels and uneven ambience noise in a conventional gating system.

The system automatically manages any number of live microphones in unpredictable dialogue situations. When one person speaks, that microphone's gain level fades up instantly, while the other microphone gains are reduced. When the speaker pauses, all microphone input levels will adjust to medium gain to collectively match the level of one microphone at full gain. The resulting effect will be as if all speakers are sharing one microphone. When several people talk at once, the gain is shared.



The figure above shows automatic mixing with a three microphone system.

1. The first frame shows no one speaking. The sound levels at all microphone inputs are low. The system fades all channels to medium gains, adding them all up to match the level of one microphone at full gain.
2. The second frame shows one person speaking. The system automatically fades his/her gain to full level, while the other two inputs are turned down.
3. The third frame shows a different person speaking. The system automatically fades his/her gain to full level, while the other two inputs are turned down.

- The fourth frame shows two people speaking simultaneously. The system automatically shares the gain between them, while the other input is turned down.

## The Dugan Automixer GUI

The Dugan Automixer interface is divided into three panes:

<b>Top Pane</b>	Tabs for all channels.
<b>Channel Pane</b>	man(ual), auto, mute, override, group, weight, bypass, and channel name controls
<b>Master Pane</b>	override, mute, meters, recall-safe, reset, and on controls

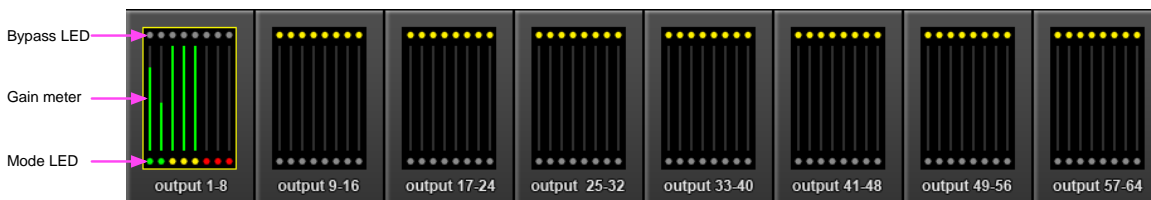
### Top Pane

The Top Pane provides an overview display for all channels. It is divided into 8 tabs, allowing access to 64 channels of processing, in groups of eight.

### DiGiCo

- SD7 & SD5 - The Dugan Automixer window opens 64 processing channels in 8 tabs.
- All Other SD Models: The Dugan Automixer window opens 32 channels, grouped across 4 tabs (the remaining 4 tabs will be grayed out).

Click or tap on each tab to access its channels in the Channel Pane.



- Bypass LED** – Lights up in yellow when the respective channel is in bypass.
- Gain meter** – Shows instantaneous gain for the respective channel.
- Mode LED** – Lights up in green when channel is in Auto mode, in yellow when in Manual mode, and in red when Muted.



## Channel Pane

The Channel Pane contains the controls and indicators for each channel. Channels are always in one of three modes: *man(ual)*, *auto*, or *mute*. The active channel mode illuminates. All transitions are made with a smooth, rapid fade. Select a channel mode by pressing the individual mode buttons or by loading a preset.



## Level Indicator

Each channel has a level LED that lights up in green when the audio level is adequate for automatic mixing. It should remain green when no one is talking.

If the level indicator blinks, you need more gain ahead of the Dugan Automixer to ensure enough ambience noise. On the console, raise the mic preamp gains (head amp gains) of all the microphone channels to maintain your balance, and lower the master fader to compensate. If this is impossible or undesirable, try raising all the Dugan Automixer's Weight controls by the same amount.

## Bypass

When bypass is active, the signal passes through without automixing. That channel appears inactive, with all lights extinguished.



To deactivate bypass, you can:

Click bypass again

- OR -

Click any of the three channel mode buttons

## Channel Modes



- **Man** - Changing channel modes initiates a short fade to the new mode. Like radio buttons, you can only choose one mode at a time. In *man* mode there is no automixing, and the signal passes through at unity gain. *Man* and *bypass* modes perform similar functions, with the difference that switching to *man* makes a smooth transition and should therefore be used during live productions. *Bypass* is for channels not used for automixing and ignores Master OVERRIDE and MUTE.
- **Auto** - This is the normal Dugan automixing mode.
- **Mute** - The channel's output is muted when *mute* is active.

## Channel Groups

Each channel can be assigned to one group: a, b, or c. Each group functions as a separate and independent automatic mixer that can span across multiple Dugan channels and tabs.



Applications where groups are helpful include:

1. **Separate Rooms** - Assign the microphones in each room to different groups so that they can function as separate automatic mixers.

2. **Stereo Panning** - Assign the microphones panned left, right, and center to groups a, b, and c, respectively, to maintain a stable stereo ambience. To assign a channel to a group, select the desired group letter from the pull-down menu. The channel strip background is tinted green (group b) or blue (group c); group a is not tinted (see below). A set of OVERRIDE and MUTE buttons is enabled in the Master Pane for each group.

### Channel Override

Override can be used to smoothly mute all microphones, except for one (the host or chairperson). Any number of microphones can be included in the override group. To assign channels to an override group, activate the override button on each channel. Pressing the Master OVERRIDE button puts channels with lit up override buttons into *man* mode. All other channels are muted. Press the Master OVERRIDE button again to restore the previous setting.

### Channel/Rack Number

This button displays the MultiRack output channel number, where a specific Dugan channel is inserted. Clicking the button minimizes the Dugan Automixer window and opens the respective MultiRack Rack that is connected to the same output channel. On the DiGiCo SD consoles, pressing this button closes the Dugan Automixer window and opens the respective Rack.

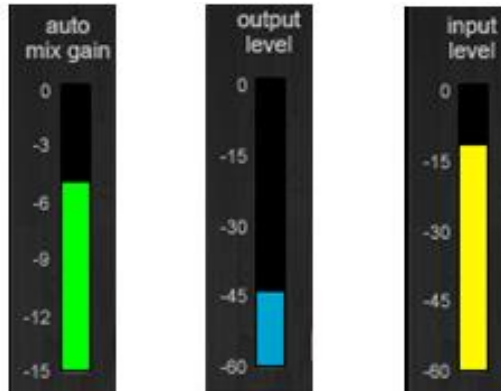
### Channel Name

The Dugan channel and the Rack that is connected to the same output channel are linked and share the same name. Changing the Dugan channel name also renames its respective Rack and vice versa.

### Channel Meter

The channel meter has three display modes.

	Meter Displays	Meter Color
Auto mix gain	Action of the Dugan Speech System	Green
Input	Input level to the channel	Yellow
Output	Output level of the channel	Blue



The default meter display is *auto mix gain*. This is the most useful choice during normal operation.

The input and output meters can be used when setting or checking levels. Click on the Master meters button to toggle through the three meter display modes.

## Weight

The weight controls set the side-chain levels for each channel into the control system. This establishes the relative sensitivity of the automatic mix for the channels in use. They do not change the mix levels. When the weight controls are balanced, each microphone has an equal opportunity to take over the system: when one person talks into one microphone, he/she is assigned the full auto mix gain and the other microphones are lowered.



The weight controls should be used to balance the channel auto mix gain indicators when no one is talking. If a board preamp trimmer is lowered, that channel's weight control can be raised to re-balance the automixing, and vice-versa. Weight levels can be changed by dragging the faders up or down, or by entering dB values in the value boxes below the faders.

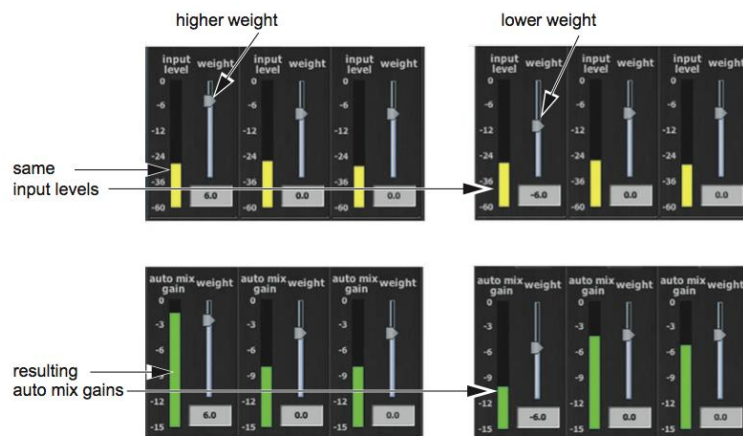
- PC – Ctrl+Click the weight slider to reset its value to 0.
- Mac – Option+Click the weight slider to reset its value to 0.

It should be noted that the Speech System works by detecting the ratios of the levels between channels, not their absolute levels. The weight control is not a gate threshold! The following example explains how weight works (see figure below).

Raising the weight control for one channel:

1. Increases that channel's auto mix gain display during ambience and decreases it slightly for the other channels;
2. Makes it more difficult for others to be heard when someone speaks into the channel with the higher weight setting.

It is important to understand that weight does not determine that microphone's level in the mix when that person speaks alone, but only its sensitivity during automatic mixing compared to other channels.



Lowering the weight control for one channel:

1. Decreases the auto mix gain display during ambience for that channel and increases it slightly for the other channels;
2. Makes it more difficult for that channel's speaker to be heard over other speakers.

For optimal performance, balance the weight controls so that the channel gains display approximately equal levels when no one is talking. If there is ongoing noise near one microphone (e.g., computer fan or air vent), suppress it by reducing that channel's weight. Of course, you will hear that noise increase when a person speaks into that microphone.

## Master Pane



### On

Click the On button to turn the Dugan Automixer On and insert into the MultiRack's output channels. Please note that the plug-in stays On even when its window is closed. To turn the Dugan Automixer Off, click the button again.

When The Dugan Automixer is On, an indicator will appear on the MultiRack window, as shown below.



### Reset

Click the reset button to restore the Dugan Automixer to factory default settings, which is effectively the same as loading the Reset preset.

This resets the following:

1. Channel Modes
2. Channel Override buttons
3. Weights to 0 dB
4. Groups to a

Controls that are not affected by the reset button and that maintain their current state are:

1. Master On
2. Recall-Safe
3. Meters
4. Master OVERRIDE
5. Master MUTE

## Recall-Safe

Click the Recall-Safe button to activate recall-safe mode for the Dugan Automixer plugin. This button works the same as the MultiRack's recall-safe function, preventing snapshots from changing the Automixer's settings.

## Meters

Click on the Master meters button to toggle through the three meter display modes.

	Meter Displays	Meter Color
Auto mix gain	Action of the Dugan Speech System	Green
Input	Input level to the channel	Yellow
Output	Output level of the channel	Blue

## Group Master Modes

A set of group master mode buttons becomes enabled in the Master Pane for each group in use.

## Override

Activating the Master OVERRIDE button has the following effect on individual channels:

Channel override button active: puts the channel in *man* mode with full gain (no automixing);

- OR -

Channel override button inactive: mutes the channel.

Select the channels you want to include in the override group by activating their respective override button.

Remove channels from the override group by deactivating their override button.

Press the OVERRIDE button to activate override for a group. Press it again to deactivate override for the group.

## Mute

Press the MUTE button to mute a group. Press it again to unmute the group.

# Typical Operation

This section creates a setup that will work for most applications.

*For proper operation of the Dugan Automixer: insert MultiRack in post-fader position on the console channels you want processed by the Automixer.*

Initially, set the mixer's or the Racks' faders to unity gain.

1. Open the Dugan Automixer:
  - MultiRack Native and MultiRack SoundGrid: under Audio > Dugan Automixer or press F9.
  - MultiRack SoundGrid for DiGiCo: under Advanced > Dugan Automixer or press F9.
2. Turn On The Automixer from the Master Pane.
3. Activate auto mode for all live microphone channels
4. Make sure all unused channels are bypassed (all channels are bypassed by default).
5. Speak into each microphone normally at the desired distance from it. Increase the mixer's input gain to just below clipping for best automatic mixing performance.

***Technical Note:** The input gain before the Dugan Automixer should be high enough to keep the level LED lit green during periods of silence. If the input gain controls are set too low, the inputs will drop below the minimum operating level, and the consistency of the ambience noise level is disrupted.*

6. Adjust each live microphone's channel weight setting until the fluctuating ambient noise registers at approximately equal levels on all auto mix gain meters.



Note that raising one channel's weight setting causes its automix gain to rise and the other channels' automix gain to fall. With balanced weight settings, all microphones should have equal access to the system gain.

7. During the event, adjust the faders to refine your mix. It is usually not necessary to adjust the Dugan Automixer's controls during the event. Since the Dugan Speech System manages gain, there is no need to mute live microphone channels (on the mixer or MultiRack) unless there is undesired noise. When such noise occurs, the Dugan Automixer's gain displays will point you to the channel you want to mute.

Please note: If channel clipping occurs, lower the preamp gain (head amp gain) on the console, and increase the channel's weight setting on the Dugan Automixer to re-establish the ambient noise balance.