

MiMiX - Mixer for Audiobus v2.0

user manual

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1. Introduction

Welcome to MiMiX - a mixer for Audiobus, a lightweight, streamlined app for the iPad that monitors and controls the output levels of connected audio apps.

MiMiX's advanced audio engine offers outstanding sound quality with minimal CPU and memory usage, allowing to use many audio apps simultaneously.

The single screen interface gives You straightforward, intuitive access to all the app's features and parameters, which You can modify real-time.

With MiMiX You can make use of the multi-out capabilities of almost any USB audio interface, routing audio to different outputs.

MiMiX has advanced MIDI capabilities also, enabling total control using virtually any kind of CORE MIDI compliant MIDI controller or even Network or Virtual MIDI applications.

MiMiX makes use of the new Audiobus Remote protocol as well, so it can be controlled using a second iOS device as well.

2. Overview

MiMiX has the following main capabilities:

- Mixing audio coming from max 8 Audiobus streams, each having its own volume, balance/pan and mute/solo controls
- Setting the main volume of the mix
- Monitoring the main mix or any of the incoming streams individually using stereo VU meters, clip indication and waveform displays
- Routing the individual streams to any combinations of output ports of a connected multiple output USB audio device
- Control the mix using MIDI, including hardware, software or network MIDI controllers or apps
- Control the mix using Audiobus Remote
- Save and load its state using Audiobus State Saving feature

3. The main interface

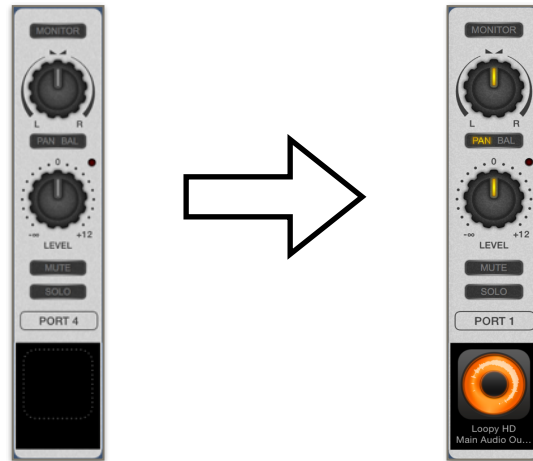
The main interface consists of the following parts:



1. The VU meter. This meter will display the power of the signal for the main mix or one port, depending on which is set to be monitored.
2. The combined scope / setup display. In monitor mode it will display the waveform of one port or the main mix, same as the VU Meter. In setup mode it will display either the output matrix or the MIDI setup screen, depending on which setup is active.
3. The Port controls. Here the various parameters of each port can be adjusted.
4. The Main Mix control. Here the volume of the main mix can be adjusted and the setup modes can be initiated.

4. The port controls

If the port has no connected apps, it will have unlit controls, if the port has connected to an app in Audiobus, the controls will light up:



The port controls consist of the following parts:

1. Monitor button. Pressing this will set the VU meter and the Waveform Display to monitor this port
 2. Pan/Balance knob. This will set the pan or balance of the port.
 3. Pan/balance toggle. It will set how the pan/balance knob will mix the left and right channels.
 4. Saturation indicator. This will light up if the output power of the given port reached +0dB. Keep in mind that clipping will not occur here.
 5. Level knob. It will set the amplification of the volume of the port.
 6. Mute button. Pressing it will mute the port.
 7. Solo button. Pressing it will solo the port according to the chosen solo mode.
 8. Port number
 9. The icon and name of the attached app in Audiobus. The first part of the name is the App name, the second part is the app's output port's name.
- The mute and solo buttons are only responsive if the port has an app attached to it.
 - Tapping on the app icon will switch to that app.
 - Double tapping on a knob will set it to default (12 o'clock, 0dB) value.

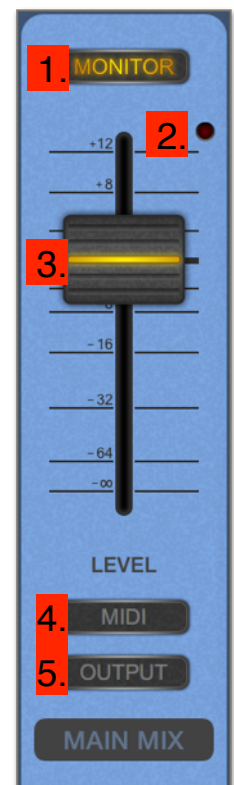


5. The main mix controls

The main mix control consist of the following parts:

1. Monitor button. Pressing this will set the VU meter and the Waveform Display to monitor the main mix. If an USB audio interface is connected which has multiple output ports, repeatedly pressing this button will cycle through the available output pairs.
2. Clip indicator. This will light up if the output power of the main mix reached +0dB. Keep in mind that clipping will occur here, so if this indicator lights up, the output audio will be distorted.
3. Main level slider. It will set the amplification of the volume of the main mix.
4. MIDI Setup button. Pressing this will set MiMiX to MIDI setup mode.
5. Output Matrix Setup button. Pressing this will set MiMiX to output setup mode.

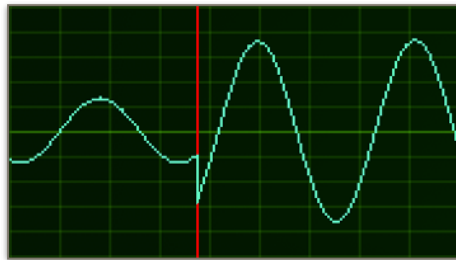
Double tapping on the main level slider will set it to default (0dB) value.



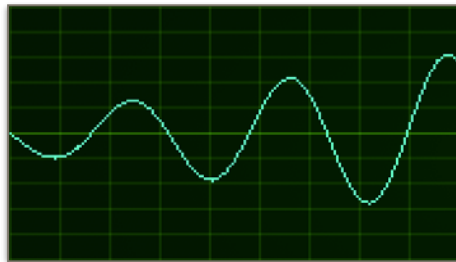
6. Special features of the audio engine

The audio engine of MiMiX uses 32-bit floating point precision along with coprocessor vector arithmetics acceleration which makes it crystal clear and has a minimal CPU impact.

It has a special algorithm built in which makes sudden changes in volume settings smooth. When a port is muted, un-muted or has a sudden change in the volume, the engine doesn't change the amplification of the port in an instant, since it would cause an audible click sound:



Instead of this, it will create a short smooth transition:

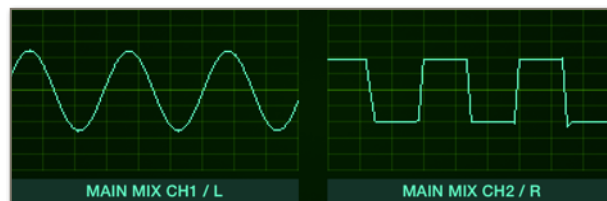


This transition is too short to be audible but it will eliminate all unwanted clicks and pops.

7. Panning versus balance

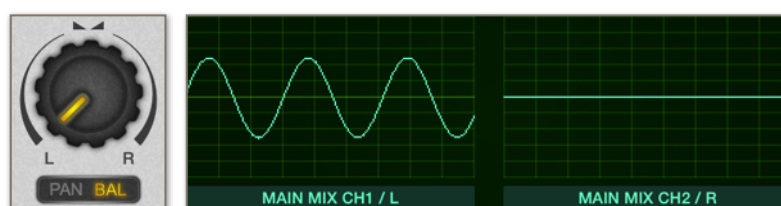
The MiMiX audio engine has two ways of treating a the stereo field of a stream: panning and balance. There is a huge difference between the two, and for each port it can be chosen (using the pan/balance button) which algorithm is to be applied.

Suppose we have a stereo signal which have a sinus wave on the left channel and a square wave on the right channel:



If we set the PAN/BAL button to BAL mode on the port the signal is coming from and rotate the pan/balance knob to left, the right channel will be suppressed and if we rotate the pan/balance knob to right, the left channel will be suppressed. The balance control takes the stereo source and varies the relative level of the two channels. The left channel will never come out of the right speaker and the right channel will never come out of the left speaker by the action of a balance control.

So, when we turn the balance knob to the extreme left, we will only hear the sine wave, coming form the left speaker:



Alternatively, if we turn the balance knob to the extreme right, we will only hear the square wave, coming from the right speaker:

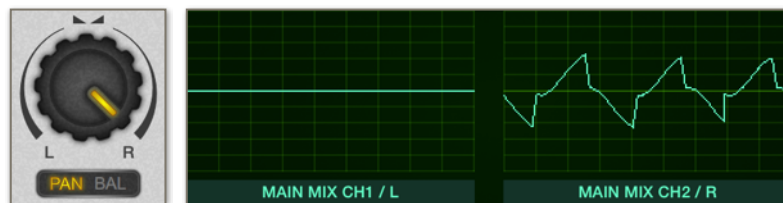


This setting is good to balance the power levels of the two channels.

Now if we set the PAN/BAL button to PAN mode on the port the signal is coming from, the pan knob turned right will send the left channel to the right speaker so we will hear the combination of the sine and square wave from there:



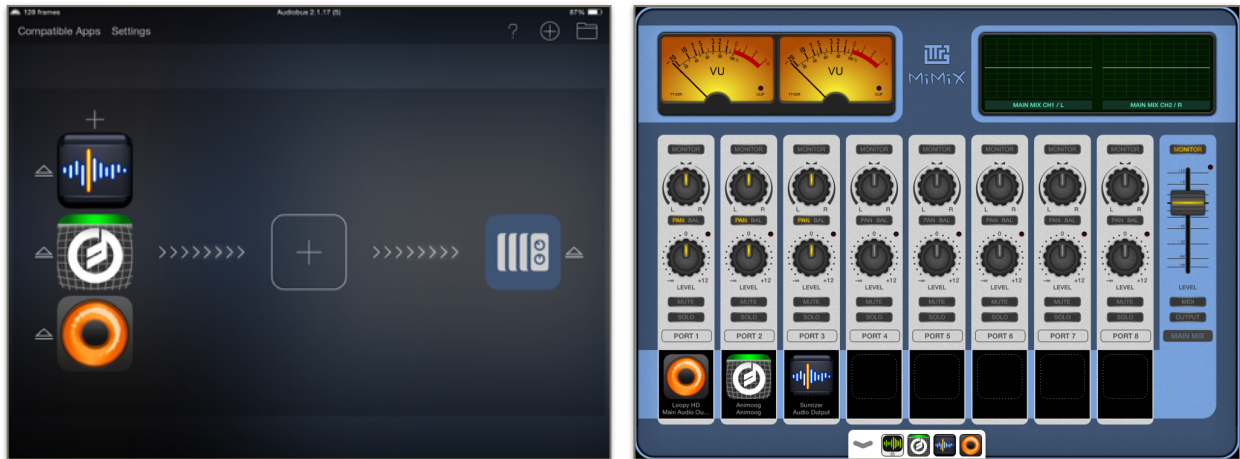
And the pan knob turned left will send the right channel to the left speaker so we will hear the combination of the sine and square wave from there:



The pan control is good to position the sound in the stereo field.

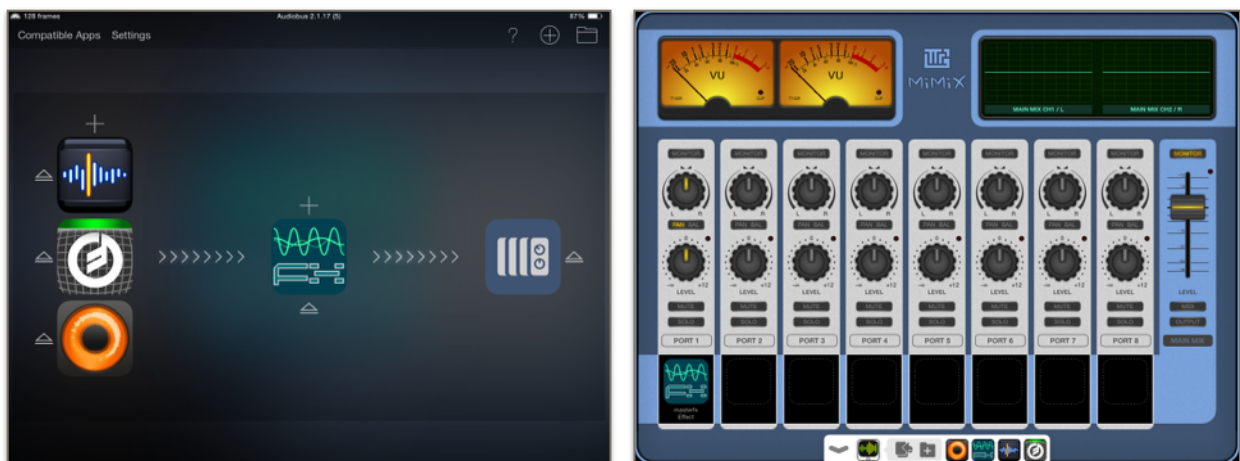
8. Basic usage scenarios

First we add 3 different apps to Audiobus's input slot in the same lane, and add MiMiX to the output slot:



In MiMiX, the three apps will occupy ports 1-3, allowing to control the audio streams of all three individually.

Now, if we add an effect app to the effect slot in the previous scenario, we will get a very different setup:



Here Audiobus will combine the outputs of the three apps in the input slot, run through the effect app and send the output of it to MiMiX. Thus, MiMiX will only see one stream, the output of the effect app, and put it in the first port. This way You can only control this one combined audio stream.

You can create more sophisticated setups if You have the multi-lane feature of Audiobus.

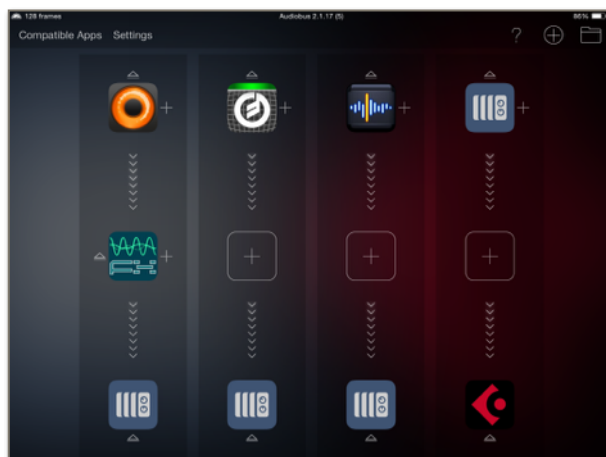
As we add 3 lanes and add an input app for each lane, we will get a setup quite similar to our first example:



Though this looks similar, it behaves quite differently. If we add an effect app to lane 1, the effect app will only filter the input of the first lane, leaving the two others intact:



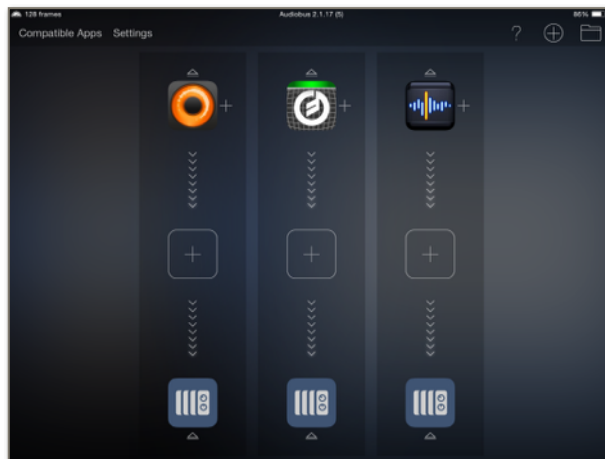
Lastly, we can add MiMiX to the input slot of another lane as well, so we can send the output of the main mix to another app to record or further process it:



9. MiMiX and IAA

Along Audiobus, MiMiX can also be an IAA sender, so, instead of putting MiMiX in the input slot, we can add it as a source to any IAA capable app for recording or further processing its output.

First, we have to set up the input lanes as before:



Now, if we open our IAA capable app outside Audiobus, we can select MiMiX Output as an IAA source:

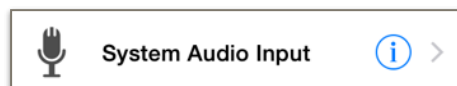


This way, You can connect MiMiX to an IAA capable recording app even if it has no Audiobus support. MiMiX will now behave just like it does when it sits in the Audiobus input slot.

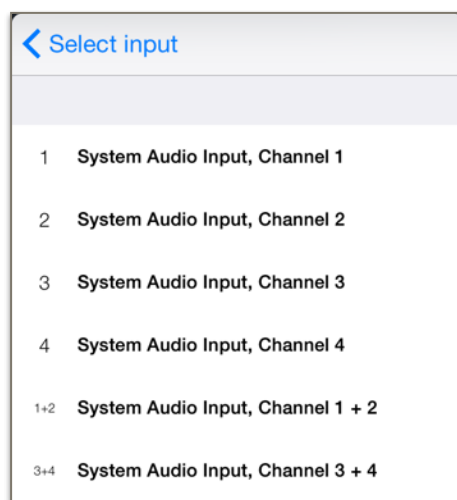
10. Hardware audio interfaces - multiple inputs

With MiMiX, You can make use of the multiple input and output ports of Your USB audio interface. To mix the input ports, do the following:

In Audiobus, press the + sign to add an input app, choose System Audio Input and press the blue (i) icon:



Now choose one of the input ports shown:



In this example, we add the 4 mono channels to our setup one by one:



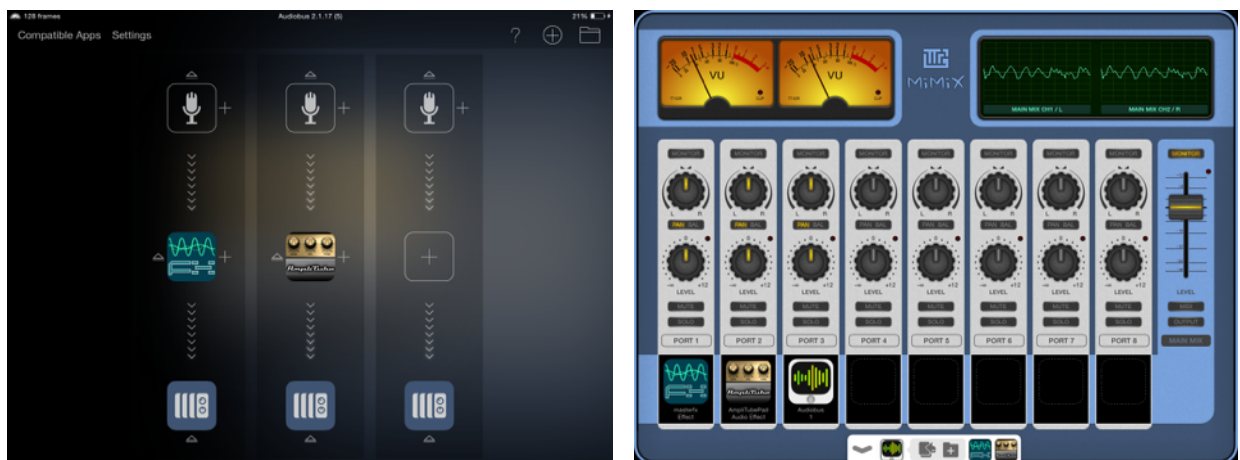
This way we can control the levels of each incoming audio signal individually, so we can mix the signals of a bunch of hardware like microphones, guitars or synthesisers.

Also, using multiple lanes a quite interesting setup can be achieved:



In this example we put the same System Audio input to each lane and add a different effects app into the effect slot. This way, using the SOLO control we can choose which effect should be applied or mix the two effects in any way.

Also, if we add a third lane with the same System Audio input but add no effect app, we will have a dry signal and two wet signals, so we can mix these three together in any way we like:



These setups work like an effect stomp box and can be extremely useful for live uses.

11. Hardware audio interfaces - multiple outputs

With MiMiX, You can route the audio of any port to any chosen output port pair on an attached USB audio interface.

Pressing the OUTPUT button on MiMiX (under the main volume slider) will turn on the Output Matrix Setup, which will replace the waveform display.



The Output Matrix has two parts. On the left side there are the buttons for choosing the port to be set, along with a mini-display of outputs. On the right side the available and selected output channels are shown for the selected port. By default, channel pair 1-2 is selected so the port will sound only on the first stereo pair.

PORTS				OUTPUT CHANNELS		
PORT 1		PORT 2		CH 1-2	CH 3-4	CH 5-6
PORT 3		PORT 4		CH 7-8	CH 9-10	CH 11-12
PORT 5		PORT 6		CH 13-14	CH 15-16	CH 17-18
PORT 7		PORT 8		CH 19-20	CH 21-22	CH 23-24

If You tap the CH 3-4 button, it will light up and Port 1 will sound on both the first and the second stereo pair.

PORTS				OUTPUT CHANNELS		
PORT 1		PORT 2		CH 1-2	CH 3-4	CH 5-6
PORT 3		PORT 4		CH 7-8	CH 9-10	CH 11-12
PORT 5		PORT 6		CH 13-14	CH 15-16	CH 17-18
PORT 7		PORT 8		CH 19-20	CH 21-22	CH 23-24

If You tap CH 1-2 it will go dark and Port 1 will sound only on the second stereo pair. See how the mini display next to the port reflects the changes.

PORTS				OUTPUT CHANNELS		
PORT 1		PORT 2		CH 1-2	CH 3-4	CH 5-6
PORT 3		PORT 4		CH 7-8	CH 9-10	CH 11-12
PORT 5		PORT 6		CH 13-14	CH 15-16	CH 17-18
PORT 7		PORT 8		CH 19-20	CH 21-22	CH 23-24

MiMiX can use a maximum of 12 stereo pairs at the output, but only those are enabled which are supported by the attached hardware. When no hardware is attached, only channel pair 1-2 will be usable. You can still disable channel 1-2 for any port in this scenario but it will effectively only mute that port as it won't be routed anywhere else.

If You add MiMiX to the input slot of a new lane in Audiobus:



the output button for CH 1-2 will become Audiobus for each port:

PORTS				OUTPUT CHANNELS		
PORT 1		PORT 2		AUDIOBUS	CH 3-4	CH 5-6
PORT 3		PORT 4		CH 7-8	CH 9-10	CH 11-12
PORT 5		PORT 6		CH 13-14	CH 15-16	CH 17-18
PORT 7		PORT 8		CH 19-20	CH 21-22	CH 23-24

Here MiMiX will not allow audio to go out on the first stereo pair, since the app in the output slot, which has MiMiX in the input slot will also monitor the sound on stereo pair 1 and this would cause duplicate signal on that physical channel.

Having Audiobus in the output channel instead of CH 1-2 also has a benefit: we can control which port would go to the Audiobus mix, enabling of the use

of a click track for a drummer for example. If we want to achieve this, send the click track to CH 3-4 and send all the other tracks to Audiobus only. This way the click track won't appear in the recording but will sound on the second stereo pair of the interface.

If You plug in or remove the USB audio interface, the output matrix will or will not reset to default depending on how You set it up in the System Setting app. See the System Setting section for details.

MiMiX was tested for multiple outputs and confirmed working using the following USB interfaces:

- AKAI EIE (Red)
- Focusrite Scarlett line (6i6, 18i8 etc)
- Apogee Duet
- iConnectAUDIO4+
- RME UCX *

Theoretically any Class Compliant USB audio interface should work with MiMiX.

** Remark: the RME UCX must be enabled for multi-out mode by turning the setting Options -> RME Interface Settings -> I/O Options: Output Channel Count req. -> Multichannel option ON in the TotalMix FX App.*

12. MIDI setup

MiMiX can be controlled remotely using standard MIDI CC messages. These can be generated using any CORE MIDI compliant USB MIDI controllers connected with the Camera Connection Kit, with older GENERAL MIDI controllers connected to an USB MIDI interface, with CORE MIDI compliant software running on the iPad or MIDI software running on a computer connected via Network MIDI.

MiMiX is tailored to be set up so any kinds of interfaces can be used. Pressing the MIDI button on MiMiX (under the main volume slider) will turn on MIDI Setup, which will replace the waveform display.



The MIDI Settings display consists of the following parts:

MIDI IN PORTS	MIDI SETTINGS	PRESETS
MiMiX Virtual Input	< MIDI IN Channel: OMNI >	Preset 1
Network Session 1	< MUTE: Toggle (>0 toggles) >	Preset 2
Loopy HD	< SOLO: Switch (0 off, >0 on) >	Preset 3
Animoog	Knob Pickup Multi Solo	Preset 4

- MIDI In Ports: the incoming MIDI port seen by MiMiX. The ports, that are active light up, the inactive ones are dark. Pressing a port will toggle between active and inactive state. Note that this part is scrollable, so if more than 4 ports are available You can scroll down to modify the remaining ports setting. MiMiX will only react to messages coming from active ports.
- MIDI Settings: these are the settings which control how MiMiX will behave upon an incoming MIDI message. There are five settings here:
 - MIDI In Channel: the MIDI channel MiMiX responds to. It can be a value of 1-16 and OMNI, which means any channel.
 - MUTE: this controls the behaviour of the MUTE buttons

- SOLO: this controls the behaviour of the SOLO buttons
- Knob Pickup: this controls if the Knob Pickup feature is turned on or off.
- Multi Solo: this controls if the Multi Solo feature is turned on or off.
- Presets: there are four MIDI presets in MiMiX. Port settings, Midi Settings and learnt MIDI CC values are saved in a preset. Changing a setting will automatically save into the active preset. Presets are useful if You have different sets of MIDI gear so You have the ability to swap between them.

The MUTE and SOLO button behaviour can be the following:

- GM (<64 off, >=64 on): General MIDI mode. CC values lower than 64 will turn the button off, greater or equal of 64 will turn the button on
- Switch (0 off, >0 on): Switch mode. CC value of 0 will turn the button off, greater than 0 will turn the button on
- Toggle (>0 toggles): Toggle mode. CC values greater than 0 will toggle the button, 0 value will do nothing
- InvGM (<64 on, >=64 off): Inverse General MIDI mode. General MIDI mode. CC values lower than 64 will turn the button on, greater or equal of 64 will turn the button off
- InvSwitch (0 on, >0 off): Inverse Switch mode. CC value of 0 will turn the button on, greater than 0 will turn the button off
- GM Toggle (>64 toggles): General MIDI Toggle mode. CC values greater than 64 will toggle the button, 0 value will do nothing

With these modes any kind of MIDI pad can be configured to behave correctly. Pressure sensitive pads will send CC values depending on press velocity, so a light tap will only produce a CC value in the lower regions, like 15 or 20 so in General MIDI mode this would behave not as expected. These pads should be configured to Switch or Toggle mode.

Some pads are called toggle pads. Pressing them first would produce a MIDI CC of value greater than 0, depending on press velocity, or 127 if they are not velocity sensitive. Pressing them again would send a CC value of 0. These pads should be configured as Switch type.

Some pads are called temporary pads. Pressing them would produce a MIDI CC of value greater than 0, depending on press velocity, or 127 if they are not velocity sensitive. Releasing them again would send a CC value of 0. These pads should be configured as Toggle type.

The Knob Pickup feature is useful when a controller with multiple banks are used. These controllers have a few knobs and some mechanism to change banks. These are set up so if Bank 1 is set, Knob 1 will send a given CC but if

Bank 2 is set the same knob will send a different CC, so for example if there are 4 knobs with 2 banks You can set MiMiX that in Bank1 Knob 1 will control Port1, Knob2 Port2 and so on and in Bank2 Knob1 controls Port5, Knob2 Port6 etc.

Now, if You turn Knob1 to some value in Bank1 it will move the knob in Port1. If You change the bank to 2, the knob on the controller will supposedly not be at the same value as the knob on Port5, so moving the knob on the controller will make the knob on Port5 jump suddenly to the new value, making a sudden change in volume.

This is where Knob Pickup will come handy. If turned on, the knob in MiMiX will not respond to the controller until the value sent by the controller is close to the value of the knob in MiMiX. If it is close, the knob in MiMiX will “pick up” the changes and it will respond to changes until the change becomes too big. Thus, when changing banks you can turn the knob on the controller to the value where the knob in MiMiX is without sudden unwanted changes in the volume.

Multi Solo mode will be explained in the MUTE and SOLO modes section.

13. MIDI learn

MiMiX's knobs and buttons are pre-configured to respond to some default CC values:

- Volume of ports 1-8: CC 16 - CC 23
- Balance/pan of ports 1-8: CC 24 - CC 31
- MUTE of ports 1-8: CC 80 - CC 87
- SOLO of ports 1-8: CC 88 - CC 95
- Main Volume: CC 7

When put in MIDI Setup mode, MiMiX will outline the knobs, buttons and slider controllable by MIDI with red and it will show the CC number for the given control along with them. However, these CC numbers can be changed via the MIDI learn feature. Tapping on any outlined control will put MiMiX into MIDI Learn mode:



The control You tapped will be outlined in bright red and will have a - and a + sign around the CC label. The others will be outlined with pale red colour. A hint message will appear on the waveform display instead of the MIDI settings. Tapping on this message will exit MIDI Learn mode.



In this mode any CC message sent to MiMiX will change the CC of the selected control. The CC can be changed manually pressing the + and - buttons as well.

14. MUTE and SOLO modes

Regarding mute and solo, MiMiX can be in two states:

- normal mode: pressing the MUTE buttons will toggle the mute state of the given port. Pressing any SOLO button will make MiMiX go into solo mode, muting all ports but the one on which the SOLO button was pressed. This port will be soloed, all others are muted.
- solo mode: there are two solo modes, settable in the MIDI settings with the Multi Solo toggle:
 - single solo: only one port can be soloed. Pressing any SOLO button other than the currently soloed one will move the solo to that port, muting the previous one. Pressing the currently selected SOLO button will put MiMiX back to normal mode
 - multi solo: any number of ports can be soloed. This works like the inverse of mute, one can select which ports are not muted. As long as at least one port is in solo, pressing any solo button will toggle its solo state. Pressing the SOLO button on last remaining soloed port will put MiMiX back to normal mode

Depending on how You set MiMiX up in the System Settings app the mute states can be remembered through a solo session.

If there are muted ports when You initiate solo mode, the muted ports get remembered by MiMiX. When solo mode ends and MiMiX goes back to normal mode it can either restore the saved mute states or reset them (unmute all ports)

15. State saving

State Saving is Audiobus's feature to save and load a given setup. MiMiX supports this feature. Upon saving a state, MiMiX will save the following settings:

- The order and positions of the apps connected to MiMiX
- The main volume
- The volumes of all ports
- The balance/pan type of all ports
- The balance/pan of all ports
- The mute state of all ports
- The solo state of all ports
- The previous mute state of all ports if in solo mode
- The output matrix setup
- The selected MIDI preset
- The multi solo mode set in the selected MIDI preset

16. Audiobus Remote support

Audiobus Remote is a new app created by Audiobus to have the ability to control any Audiobus enabled app using a second device running the Audiobus Remote app.

MiMiX supports this feature and from the remote both the main volume and the volumes and mute/solo states of all ports can be controlled.

The triggers in Remote can be customised in MiMiX's global settings (in the System Setting app). By default, volume triggers are visible and the port names are shown:



On the left side, the hollow triangles control the main volume.

In the 4x6 trigger matrix

- the first two rows are the volume triggers for port 1-4,
- in the 3rd. row are the mute/solo triggers for ports 1-4
- in the 4th. row are the mute/solo triggers for ports 5-8
- in the last two rows are the volume triggers for port 5-8

Tapping on the up-facing triangles will move the volume of the given port up a bit, tapping the down facing one will move it down a bit. Be aware that tapping and holding will not move the volume continuously.

The volume and mute/solo triggers will be disabled if a port has no app attached to it.

Volume triggers can be turned off so MiMiX will accommodate much less space in Remote:



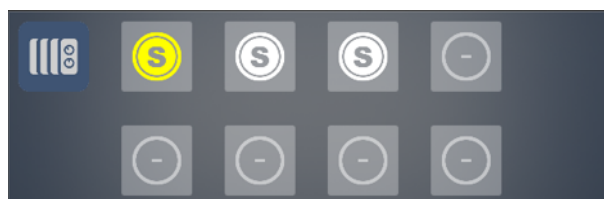
Port names also can be turned off if the labels are too small to be readable:



In any mode, tapping the mute triggers (with the M sign) will toggle the mute state of the given port, turning the trigger of the muted port yellow:



Tapping and holding the mute trigger (with the M sign) for more than half a second will set MiMiX into solo mode with solo turned on the port which was tapped and held:



Now, if the multi-solo mode is off, tapping any white solo trigger will move the solo to the chosen port. Tapping on the yellow trigger will turn off solo mode.

If the multi-solo mode is on, tapping any trigger will toggle its solo mode given at least one port remains in solo. If there is only one port in solo mode, tapping it will turn solo mode off.

17. System settings

MiMiX has its global settings in the System Settings app (with the gears icon). In there there are five sections:

- Allow MiMiX to access the microphone: this setting should always be ON. Disabling it will cause the audio engine of MiMiX to stop.
- General settings:
 - Remember MUTE states after SOLO: if You enter SOLO mode with some ports muted, MiMiX will revert those port to mute after You exit solo mode if this setting is ON. When OFF, all port will be unmuted upon exiting SOLO mode.
- Multi-out hardware:
 - Reset output routing upon device change: if this setting is ON, removing or attaching an USB audio interface will reset the output matrix to its default values, having CH 1-2 on and all the others off for all ports. If this setting is off, changing the audio interface will not affect the setup of the output matrix.
- Audiobus Remote:
 - Show volume triggers: if this setting is on, MiMiX will show the main volume triggers along with a 4x6 button matrix of port volumes increase/decrease and mute/solo triggers in Audiobus Remote. If this setting is off, only the port mute/solo triggers will be shown.
 - Show port names: if this setting is on, MiMiX will show the port names on the mute/solo triggers in Audiobus Remote. If the settings if off, only simple icons will be shown. If Audiobus Remote runs on an iPhone, the off state is recommended since the triggers are too small to be clearly readable.
- About:
 - Version: the version and build number
 - Acknowledgements

Please keep in mind that changes in the Audiobus Remote section need a restart of the MiMiX app.

18. Customer support

Feel free to ask question and post suggestions.

You can send me an e-mail at support@ttrgames.hu

or visit the MiMiX webpage at ttrgames.hu/mimix