SWAM Solo Woodwinds
User Manual

v3.7.0

Saxophones, Clarinets, Double Reeds, Flutes

Audio Modeling

Table Of Contents

Before you start

Although these instruments are intuitive and easy to play "out-of-the-box," getting excellent results requires a certain amount of practice and experience. Please read this user manual carefully. It contains very important information that will help you achieve the best results in as short a time as possible. In addition, you can listen to the demos on the Audio Modeling website at audiomodeling.com/media, and on Audio Modeling YouTube channel at youtube.com/c/AudioModeling .

The latest versions of all SWAM manuals can be found at audiomodeling.com/manuals. Release Notes are available at audiomodeling.com/support/release-notes.

SWAM instruments are designed to be PLAYED by shaping the sound in real time, as a real instrumentalist would.

The Desktop version will function on any modern computer (see Specifications), using any host application which supports VST, VST3, Audio Units, or AAX plugins, or running as a standalone application. Some examples of host software would be a sequencer or digital audio workstation (DAW) such as Camelot Pro, Ableton Live, Cubase, Logic, Pro Tools, LUNA, etc.
The iOS version is currently available for both iPad and iPhone (see Specifications to check what OS version is supported).. On this mobile platform, SWAM products come as Standalone, AUv3 plugins, and Inter-App Audio (IAA) formats. Some examples of host and DAW software are Camelot Pro, GarageBand, Cubasis and AUM.

These instruments use Audio Modeling's proprietary SWAM (Synchronous Wave Acoustic Modeling) technology, conceived by Stefano Lucato. Combined with physical modeling, SWAM provides exceptional playability and realism. The sound is not produced by playing back samples of pre recorded articulations; these are complex virtual instruments, capable of shaping almost any kind of articulation and phrasing in real time. They can be played using any MIDI device such as a keyboard, breath or wind controller. Indeed, it is essential that SWAM instruments are controlled using a suitably capable set of MIDI controllers, as described in this manual.

NOTE: As with a traditional acoustic musical instrument, SWAM instruments allow playing continuously over the full range of dynamics — from *pp* to *ff* — without producing any phasing artifacts.
To accomplish this, it's necessary to use a suitable continuous physical MIDI controller such as an expression or volume pedal (usually set to send CC11 or CC7 MIDI messages), a breath or wind controller (usually sending CC2 MIDI messages) or one of the many other expressive controllers on the market today.

WITHOUT SUCH A CONTROLLER, THE INSTRUMENT WILL NOT WORK WHEN PLAYED IN REALTIME. Instead, it will display the warning "Expression parameter has to be controlled continuously via MIDI. Constant variation of the Expression is the key of expressive playing.", with actions to select or map an external MIDI controller.

> Expression parameter has to be controlled continuously via MIDI. Constant variation of the Expression is the key of expressive playing.
>
> [MIDI Controller Presets] [Manage MIDI Mapping]

Other physical MIDI controllers, like sliders, knobs or a modulation wheel, can be used for this purpose, although they often do not provide the level of control required for optimal results. Please refer to other sections of this manual for further details.

When used for studio production on a DAW, it's necessary to provide either a MIDI Expression controller curve or parameter automation.

Note: the MIDI note naming convention we use is based on Middle C = C3, corresponding to MIDI note number 60. It's possible to switch to Middle C = C4 from the Options page.

Licensing

macOS and Windows

The License Key we provide can be activated on up to four computers at the same time. Refer to the [Installation](#) section for instructions on how to authorize SWAM products.

To move an authorization to a different computer, please go to the Customer Portal at [my.audiomodeling.com](#) and delete it from the activations list of the corresponding License Key.

The full terms and conditions can be found in the End User License Agreement (EULA) provided with the product. Please refer to the "Installation Path" section of this user manual to locate the EULA on your system.

iOS

Licensing on iOS is managed by Apple. Please refer to AppStore and Apple terms and conditions.

Specifications

Operating Systems and Formats

macOS 10.13 (High Sierra) – 13.3 (Ventura) *
- Standalone, Audio Units, VST, VST3, AAX 64bit
- NKS (Native Instruments Komplete Kontrol)

Windows 10, Windows 11
- Standalone, VST, VST3, AAX 64bit
- NKS (Native Instruments Komplete Kontrol)

iOS 11 – 16
- Standalone, AUv3, IAA

Apple Silicon architecture supported natively

Required space after installation

- SWAM Saxophones
  - Disk space: 500 MB
  - RAM: 100 MB for each instrument instance
- SWAM Clarinets
  - Disk space: 260 MB
  - RAM: 100 MB for each instrument instance
- SWAM Flutes
  - Disk space: 400 MB
  - RAM: 60 MB for each instrument instance
- SWAM Double Reeds
  - Disk space: 475 MB
  - RAM: 100 MB for each instrument instance

Note: disk space has been computed with all plugin formats installed

Installation

macOS and Windows

Product Registration and Installation
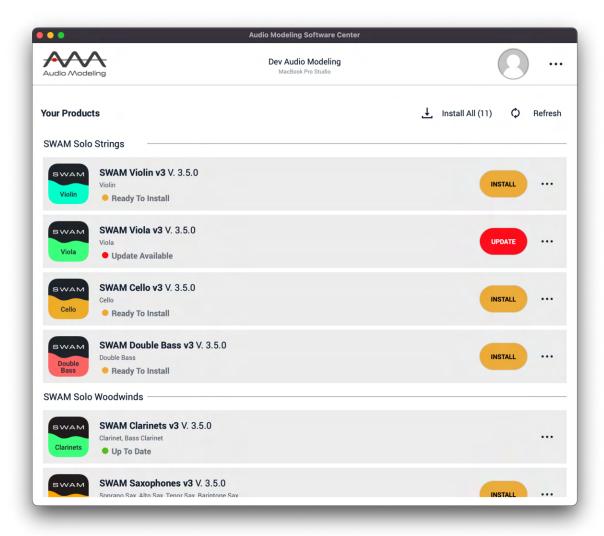
1) login to our Customer Portal (https://my.audiomodeling.com); create a new account if you have never signed up
2) select "Register a new product"
3) type the License Key or Redeem code provided, select "Next"
4) the portal will send an email to you. Click the confirmation link on the email
5) download, install and launch the "Audio Modeling Software Center", available at https://audiomodeling.com/support/install-and-update, to download and authorize the products on your computer.

If you installed a previous version
The updates are managed through the Audio Modeling Software Center.

NOTE: the products can be activated "online" only, i.e. your computer must be connected to the Internet at the time of authorization. If you need to work offline, just connect to the Internet for the time required for the authorization, then disconnect once the authorization is complete.

Installation paths

macOS

- Standalone app, End User License Agreement, Uninstaller are located in the folder chosen in the Audio Modeling Software Center, by default: /Applications/Audio Modeling/(Product name)
- Audio Units plug-ins are located under: /Library/Audio/Plug-Ins/Components
- VST3 plug-ins are located under: /Library/Audio/Plug-Ins/VST3
- VST plug-ins are located under: /Library/Audio/Plug-Ins/VST
- AAX plug-ins are located under: /Library/Application Support/Avid/Audio/Plug-Ins
- Default presets and auxiliary resources are stored under: ~/Library/Audio Modeling/SWAMv3

Windows

- Standalone app, End User License Agreement, Uninstaller are located in the folder chosen in the Audio Modeling Software Center, by default: C:\Program Files\Audio Modeling\(Product name)
- VST3 plug-ins: the installation path is defined in the Audio Modeling Software Center, default: C:\Program Files\Common Files\VST3
- VST plug-ins: the installation path is defined in the Audio Modeling Software Center, default: C:\Program Files\VSTPlugins
- AAX plug-ins are located under: C:\Program Files\Common Files\Avid\Audio\Plug-Ins
- Default presets and auxiliary resources are stored under: %AppData%\Audio Modeling\SWAMv3

iOS

Installation and updates are managed through the AppStore.

Hardware Requirements

CPU load

The realism and expressiveness of the SWAM instrument set can be CPU intensive. It therefore requires a modern computer with at least a 1.6 GHz Core 2 Duo CPU for a single instance of any SWAM instrument. Additional instances will require both a more powerful processor and a low-latency audio driver/device (e.g. ASIO), especially to play the instrument in real time.
Less powerful systems may also prove satisfactory, but may require larger buffer sizes, which incur higher latencies.

Note: This may not necessarily result in an actual problem for music production. Using the freeze feature or bouncing the single MIDI tracks to audio provides a useful remedy.

Audio interface (sound card)

A good quality audio interface with suitable low-latency drivers is required. On Windows, ASIO drivers are recommended. Suggested settings for buffer size at 44.1 or 48 kHz are 128, 256, or 512 samples (larger buffers provide higher latency, but less CPU load). Onboard audio devices are often suitable on modern computers and iPad.

MIDI devices

SWAM instruments (like any other virtual instrument) can be successfully used without the need for any additional hardware by drawing controller curves and programming notes directly in the host sequencer. However, a much more "human" and interactive configuration is recommended, especially when playing in real time, using external MIDI devices: a MIDI keyboard with at least five octaves, mod wheel and pitch bend, connected to the computer via USB or an external MIDI device equipped with a set of physical continuous MIDI controllers (usually knobs or sliders) to control playing techniques like growl, flutter tongue, overblow, etc.

Although dynamics can be controlled by another physical controller (knob, slider, ribbon, XY pad), a pedal is highly recommended. As an alternative, a breath controller, such as a Yamaha BC3, TEControl BC and BBC2, Photon by IMOXPLUS, or Hornberg Research HB1 can be used. Woodwind or brass players may prefer to use a wind controller such as a Yamaha WX or YDS-150, Akai EWI (USB, 4000S or 5000), Aodyo Sylphyo, EMEO, Roland Aerophone, Synthophone, EVI (Electronic Valve Instrument), NuRAD, WARBL, or Travel Sax, Robkoo R1 - all of which provide excellent results. MIDI Polyphonic Expression devices like the Seaboard and Lightpad by ROLI, LinnStrument by Roger Linn Design, or the Instrument 1 by Artiphon are fully supported.

Alternative controllers include Neova Ring by Enhancia, Toucé by Expressive E, Sensel Morph, Joué, and Leap Motion by Ultraleap.

Note: On EWI 4000s or similar, please do not set the option to mix the pitch bend or vibrato to breath sensor ("Pb" or "bo" options on EWI 4000s). This can produce unnatural vibrato behavior. SWAM engine applies the right behavioral models to the relationships between pitch and dynamics based on the physics of the instrument. These relationships are different for each musical instrument.

Software Requirements

macOS and Windows

Standalone

We provide a Standalone version of each instrument. Please check the Installation Path section of this User Manual to locate the applications.

Plugins

A DAW (Digital Audio Workstation) or other host capable of running VST2.4, VST3, Audio Units, or AAX plugins is needed to run the SWAM instruments. If you do not have a host application capable of running VST or AU plugins, you can install a free host application such as **Camelot Free** for desktop (camelotpro.com).

A list of compatible hosts and DAWs can be found in our Knowledge Base:
audiomodeling.com/support.

iOS

Standalone

We provide a Standalone app of each SWAM Solo String instrument.

Plug-ins

A DAW (Digital Audio Workstation) or other host capable of running SWAM Solo String instruments as AUv3 or IAA plugins is needed.

If you do not have a host application capable of running AUv3 plugins, you can get our **Camelot Pro** live performance host on the AppStore.

Using an appropriate range of Expression

Expression control is an extremely important aspect for getting the optimal expressiveness and realism with virtual instruments.

All real physical instruments require much greater physical effort to achieve the highest possible dynamics for that instrument. This is not the case for most physical MIDI controllers; it is indeed very easy to push an expression pedal or a slider, to its maximum position and leave it there forever. Oddly enough, even breath and wind controllers tend to jump very easily to the highest dynamics (unless carefully set), so that the most expressive range (mp to mf) is seldom exploited. This results all too often in the virtual instrument being played at the highest extreme of dynamics, leading unavoidably to a poor, unrealistic performance.

Please keep in mind that the key to expressiveness and realism is the proper use of dynamics. Always monitor the input expression value on the main display and adjust the dynamics accordingly. A useful trick is to set the overall monitoring volume fairly high. This automatically prevents any inclination toward overusing the higher levels of dynamics.

The Expression slider on the main GUI becomes "hot", i.e. with a red halo surrounding it, if the level of expression stays constantly above 75%. When you see such a red alert warning, please consider avoiding such extensive use of higher dynamics.

It's also important to optimize the general volume of your loudspeakers/headphones at an average value of Expression. Too low an output level would easily induce the user to use high Expression levels, usually yielding excessively "biting" sounds.
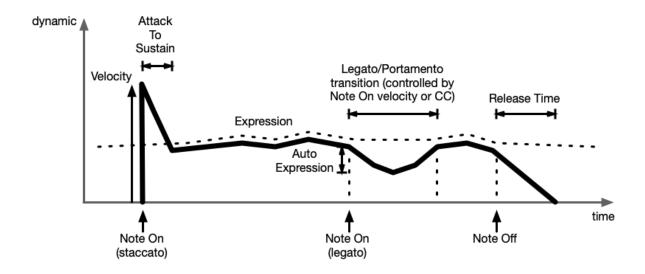
Introduction

SWAM Solo Woodwinds is a collection of solo instruments conceived and developed by Stefano Lucato and the Audio Modeling team. These instruments are based on a hybrid technology that combines Sample Morphing technique and Physical Modeling synthesis. SWAM stands for Synchronous Waves Acoustic Modeling, and it is a proprietary technology that exploits the knowledge of phase and length of each waveform period.
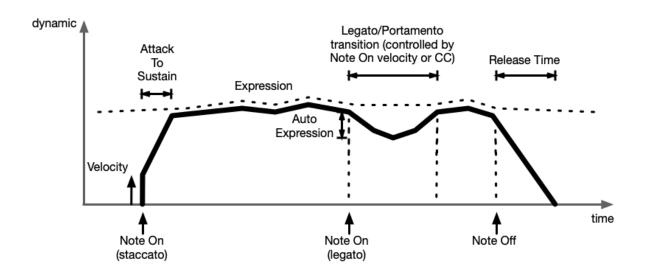
The SWAM Solo Woodwinds collection includes **four products**: Saxophones, Clarinets, Double Reeds, and Flutes.

Each product provides multiple instruments, each one comes as a Standalone application, VST, VST3, Audio Units and AAX plugins for desktop; and Standalone App, AUv3 and IAA plugins for iOS.

In addition to standard SWAM controls such as staccato/legato (with velocity- or CC-controlled portamento time), dynamic expression, and vibrato depth and frequency, there are several additional parameters to control instrument behavior which are specific to woodwind playing techniques.

Main window

The main window shows the most important parameters, instrument monitors and animations.

Instrument parameters

All parameters have been grouped in six categories:

- Expressivity: parameters that allow the physical player's expressivity to affect the instrument.
- Play Modes: parameters that act on the details of how the emulated player plays the instrument.
- Timbre: parameters that affect the instrument's timbre.
- Pitch: Master Tuning, Pitch, Transposition and Micro Tuning settings.
- Advanced: additional parameters, especially for expert users.
- Effects: audio signal processing applied at the final stage.

The most common and important parameters are presented on the main GUI.

Main controls

- <u>Instrument</u> (left/right arrows)
  Use the arrows to select different instrument timbres (corresponding to different instruments or microphone placements).
- <u>Flutter</u>: flutter tongue intensity.
- <u>Growl</u>: growl intensity. For a "cleaner" sound, this should be set to zero.
- <u>Breath Noise</u>: breath noise intensity.
- <u>Key Noise</u>: key noise intensity.
- <u>Pipe Model</u>:
  - Keys: the instrument model is controlled by Keys.
  - Slide: the instrument model is controlled by a Slide.
- <u>Formant:</u> changes the formants, thus the timbre of the instrument.
- <u>Harmonic Structure</u>: spectral characteristics of the instrument (balance between odd and even harmonics).
- <u>Overblow</u>: clicking this option triggers overblow on any quick changes to the dynamics.
- RESET:
  - Initialize: reset sound engine parameters and MIDI mapping.
  - Advanced:
    - Reload "current preset": reload the current selected preset, losing all changes made from the latest saved settings.
    - Sound Engine: reset or load sound engine parameters.
    - MIDI Mapping: reset or load MIDI mapping settings.
    - Micro Tuning: reset or load micro tuning settings.
- PANIC: use this in case of stuck notes.

Audio section

- <u>Effects :</u> open the onboard FX section applied to the final stage of the signal flow.
- <u>Pan Pot</u>: pans the output signal left and right.
- <u>Volume</u>: main output volume.

Header section

- <u>SWAM logo</u> **SWAM** *Tenor Sax - v3.7.0* : selection of the SWAM logo open the Settings section

- <u>Main menu icon</u> **···** : opens the main menu page that provides access to:
    - Save & Load
    - Reset
    - Controller Mapping
    - Parameter Lock
    - Import
    - Export
    - Settings

- <u>MIDI Mapping icon</u> **MIDI** : open MIDI mapping management section.

- <u>Playing Surface icon</u> (only for iPadOS version) **PLAY** : open the playing surface for playing the instrument on the iPad glass.
  NOTE: on iPhone, the playing surface is available rotating the device to landscape orientation.
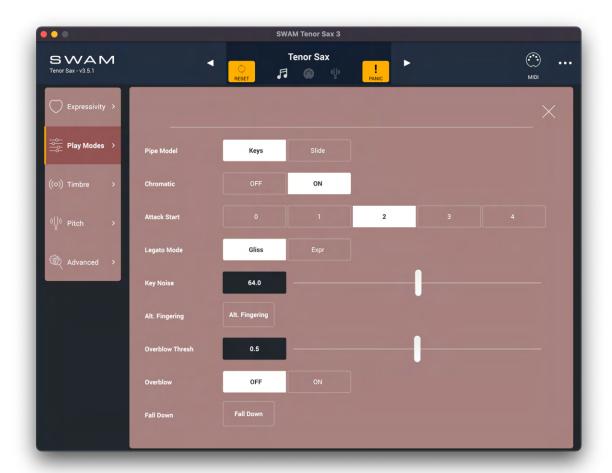
Expressivity

- <u>Expression</u>: main expressive control.
- <u>Vibrato Depth</u>: controls the amount of vibrato.
- <u>Vibrato Rate</u>: controls the average frequency of the vibrato applied to the model.
- <u>Growl</u>: growl intensity. For a "cleaner" sound, this should be set to zero.
- <u>Flutter</u>: flutter tongue intensity.

Play Modes

- <u>Pipe Model</u>:
  - ○ Keys: the instrument model is controlled by Keys.
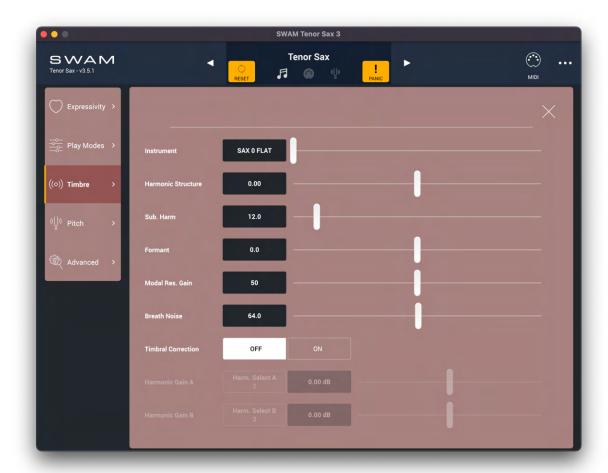 - ○ Slide: the instrument model is controlled by a Slide.
- <u>Chromatic</u>
  - ○ OFF
  - ○ ON: activates an automatic chromatic scale during slow portamentos on larger intervals.
- <u>Attack Start</u>: progressively cuts the attack for a more immediate attack response. Only by setting this to "0" can the complete original attack be played.
- <u>Legato Mode</u>: two different types of legato can be selected:
  - ○ Gliss legato with portamento (glissando).
  - ○ Expr straight legato (no portamento).
- <u>Key Noise</u>: key noise intensity.
- <u>Alt. Fingering</u>: plays the current note with a different key (i.e. a different pipe path)
- <u>Overblow Threshold</u>: crossfade between a brief squeak on attack ("S"), or a longer overblow ("O"), if overblow is triggered by a CC. Not active if the overblow is triggered by the keyswitch [Squeak does not apply for Flutes].

- <u>Overblow</u>: clicking this option triggers overblow on any quick changes to the dynamics.
- <u>Fall Down</u>: clicking this button triggers a fall. This effect is also assigned to keyswitch C.

Timbre

- <u>Instrument</u>: changes the instrument timbre (corresponding to different instruments or microphone placements).
- <u>Harmonic Structure</u>: spectral characteristics of the instrument (balance between odd and even harmonics).
- <u>Sub. Harm</u>: subharmonic intensity. [The Sub Harm parameter is not available for the Flutes].
- <u>Formant</u>: changes the formants, and thus the timbre, of the instrument.
- <u>Modal Res. Gain</u>: changes the amount of lower harmonics persistence.
- <u>Breath Noise</u>: breath noise intensity.
- <u>Timbral Correction</u>: enables or disables the Harmonics Timbral Shaping.
  - Harmonic A Gain: the gain amount for harmonic selected by "Harm. A"

○ Harmonic B Gain *(locked on iOS)*: the gain amount for harmonic selected by "Harm. B"

Pitch

Master Tuning

- <u>Master Tune</u>: master tuning of the instrument displayed both in *Hz* and *cents*.
- <u>Pitch Bend Up</u>: the maximum amount of upward pitch bend, in *semitones*.
- <u>Pitch Bend Down</u>: the maximum amount of downward pitch bend, in *semitones*.
- <u>Transpose</u>: the amount to transpose the instrument, in *semitones*

Micro Tuning

- **Save icon** : save the current Micro Tuning settings as a User preset

- **Import icon** : import a Micro Tuning preset as User preset

- **Preset list icon** : open the list of Micro Tuning presets. User presets are listed after the Factory presets
- **Favorites**: it is possible to store up to seven different settings. Click and hold the preset slot to store the current configuration; click on any preset slot to recall the preset. Click on the Clear button to reset the current configuration to the default state
- **Micro Tuning Keys:**
  - **Activation**: Click on any key to toggle the detune, by the amount shown on the button.

- ○ <u>Edit</u>: Click on the detune value to adjust. The value is presented in cents (hundredths of a semitone)
- <u>Root</u>: select the root note of the micro tuning scale
- <u>Temperament</u>: if set higher than zero, this applies a kind of "spread intonation":
    - ○ it does not affect the pitch in the middle of the instrument
    - ○ the higher the pitch, the more upward detuning is applied
    - ○ the lower the pitch, the more downward detuning is applied

This means that the overall intonation of the instrument can be "spaced apart."

If set lower than zero, it does the opposite: it applies a kind of "compressed intonation."

- <u>Microtuning KS</u>:
    - ○ OFF: disable key switches for microtuning
    - ○ ON: enable key switches for microtuning
- <u>Reset Microtuning KS</u>:
    - ○ OFF Microtuning KS activation does not reset or affect current detuning
    - ○ ON: Microtuning KS activation resets the detuning applied.
- <u>Cavit Scale Ultimate</u> (by Cavit Artanlar): enables the "SWAM Microtuning" SysEx protocol, which allows "Cavit Scale Ultimate" iOS app to control microtuning and transposition, and to apply musical nuances typical of Arabic and Eastern music.
- <u>MAQAM</u> (by Mazeka Toys - mazekatoys.com):
    - ○ OFF: remove the factory MIDI MAQAM configuration.
    - ○ ON: apply MAQAM factory mapping. (Note: all mappings to parameters assigned to CC from 102 to 114 will be removed). This allows the use of a MAQAM remote controller to apply micro tuning and transposition on the fly. Note: be sure MAQAM is connected properly through a MIDI interface so that MIDI events can reach the SWAM application or plugin.
- <u>MAQAM Transpose</u>:
    - ○ Note: control keyboard transpose.
    - ○ Root: control micro tuning transpose.

Applying microtuning through SysEx

It's possible to control Microtuning and Transposition through MIDI SysEx messages. SWAM responds to a few SysEx protocols: <u>SWAM Microtuning protocol</u>, <u>Custom protocol</u> and <u>Yamaha XG arranger protocol</u>.

SWAM Microtuning protocol

Note: Be sure "Cavit Scale Ultimate" switch is set to ON in the Pitch / Microtuning view.

```
Byte 1 - Beginning of sysex: F0H
Bytes 2, 3, 4 - Audio Modeling Manufacturer ID: 00H 21H 2DH
Bytes 5, 6 - Model ID: 00H 00H
Byte 7 - Command type: 00H (Read), 01H (Write)
Byte 8 - Category: 00H (System)
Byte 9 - Parameter: 00H (Transpose), 01H (Microtuning)
... - Data bytes
Byte N - End of sysex message: F7H



Data bytes

Transpose (1 byte):
Byte 10 - Transposition value in semitones: 00H -> 7FH
      < 40H: negative transposition
      40H: 0 cents
      > 40H positive transposition

Microtuning (3 bytes):
Byte 10 - MIDI note number: 00H -> 7FH
Byte 11 - Sign:
      <= 40H positive
      > 40H negative
Byte 12 - Microtuning value in cents: 00H -> 64H (0 to 100 cents)
```

Custom Protocol

This protocol allows to change both Microtuning and Transposition on the fly through SysEx messages.

1) Microtuning message

Each message is 4 bytes:

```
1st byte: Beginning of sysex (F0)
2nd byte: Note value (00=C, 02=C#, 04=D, ..., 12=A, 14=A#, 16=B)
3rd byte: Detuning value (00 = 0, 4E = -50)
4th byte: end of sysex (F7)


F0 10 10 F7: reset all notes to not detuned
```

Examples:

```
F0 00 4E F7: Note C = -50 cents
F0 10 4E F7: Note G# = -50 cents
F0 16 00 F7: Note B = 0 cents
```

2) Transpose message

Each message is 3 bytes:

```
1st byte = Beginning of sysex (F0)
2nd byte = Transpose value (37=-9, 38=-8, 39=-7, 3A=-6 ... 40=0 ... 48=+8, 49=+9)
3rd byte = End of sysex (F7)

F0 10 F7: reset transpose to 0
```

Yamaha XG arranger protocol

Each message is 9 bytes:

```
1st byte: Beginning of sysex (F0)
2nd byte: Manufacturer ID - Yamaha (43)
3rd byte: Device ID
4th byte: Model ID - XG (4C)
5th byte: Address High (08)
6th byte: Address Mid (00)
7th byte: Address Low - Note value (41=C, 42=C#, 43=D, ..., 4C = B)
8th byte: Detuning value (04=-60, 05=-59, 06=-58, ..., 40=0, ..., 7B=+59, 7C=+60)
9th byte: End of sysex (F7)
```

Examples:

```
F0 43 10 4C 08 00 41 5E F7: Note C = +30 cents
F0 43 10 4C 08 00 41 18 F7: Note C = -40 cents
F0 43 10 4C 08 00 4A 0E F7: Note A = -50 cents
```

Applying microtuning using key switches

You can also apply microtuning to notes using key switches. To do this you must first go to Advanced -> MIDI and enable the key switches using the "KS Octave" parameter.
Then go to Pitch -> MICRO TUNING and set the "Microtuning KS" parameter to "ON".

This parameter can be assigned to a MIDI Control Change. A handy mapping is CC "64", i.e. the Sustain pedal, which is the most suitable option for this task.
When "Microtuning KS" is active, you can press the appropriate key switches that correspond to the notes you would like to detune. For example, by pressing the E1 key switch detuning will be applied to all E notes.

How to detune selected notes

1. Set the "Microtuning KS" parameter ON by pressing and holding down the Sustain pedal (or send a value greater than 64 via the CC you have assigned for Microtuning KS); the key switches will turn light gray.

2. Press any key switches (even multiple at the once) that correspond to the notes you want to detune.

3. Exit "setup" mode by releasing the sustain pedal (or send a value below 64 via the CC assigned for this task).

For example: if you need an Arabic scale in C and want to detune all E and B notes -50 cents, the steps would be:

1. Press and hold the sustain pedal

2. Press E1 and B1

3. Release the sustain pedal

The affected notes and the detune amount is displayed in the Pitch -> MICRO TUNING page.

If the "Reset Microtuning KS" parameter is ON, as soon as you re-enable Microtuning KS (by pressing the Sustain pedal or sending a value greater than 64 via the CC you have assigned for this task), the current detuning of all the notes will be cleared.

Keeping the pedal pressed, you can immediately detune a new set of notes by pressing the appropriate key switches.

This allows you to apply different microtuning scales on the fly.

If you don't want to reset the microtuning every time you re-enable Microtuning KS set "Reset Microtuning KS" parameter to OFF.

Advanced

Instrument
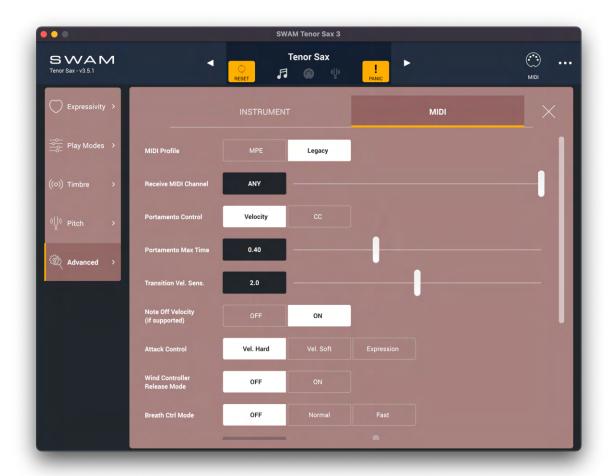
- <u>Random Dynamic</u>: controls random modulation of dynamics and pitch.
- <u>Dynamic Pitch</u>: amount of pitch modulation applied while changing the dynamics.
- <u>Panpot Type</u> *(locked on iOS)*
    - Dyn1, Dyn2 - emulates small movements of the player.
    - Acoustic - adjusts the position of the instrument in the sound field, but does not affect the reverb.
    - Balance - affects both the instrument and the reverb.
- <u>Dynamic Harmonic</u>: Amount of overtone harmonics and subharmonic modulation for attack and changes in dynamics [this parameter is not available for the Flutes].
- <u>Release Time</u>: release time on note off.
- <u>Attack To Sustain</u>: affects the velocity-dependent duration of the transition from attack to sustain.
- <u>Auto Expression</u>: the slider controls the depth of legato transitions.

- <u>Breathy ppp</u>: adds a breathy, noisy pianissimo layer useful when playing certain jazzy styles. Acting on this option triggers a complete reload of all audio resources, so any currently active note will be terminated.
- <u>Vibr. Rand. Rate</u>: randomization of vibrato intensity and rate.

MIDI

- <u>MIDI Profile:</u>
    - MPE: for MIDI Polyphonic Expression compatible devices.
    - Legacy: MIDI 1.0 devices.
- <u>Receive MIDI Channel</u>: is the MIDI channel over which the sound generator receives notes and controllers that affect the sound (default is ANY). Note that this can be different from the keyswitches MIDI channel, so it is possible to control keyswitches from a different device. For MPE Devices this is forced to ANY.
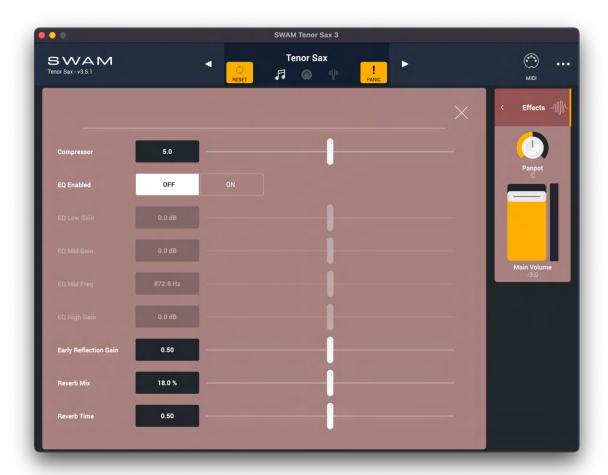
- Portamento Control:
    - Velocity: the portamento time is controlled by the note on velocity of overlapping notes.
    - CC: the portamento time is controlled by a MIDI Continuous Control (such as Control Change, AfterTouch, NRPN)
- Portamento Max Time: controls the portamento time, set to OFF to disable portamento (no portamento when this value is < 0,15).
- Transition Vel. Sens: controls the relationship between velocity and portamento duration when Portamento Control is set to Velocity.
- Note Off Velocity (if supported):
    - OFF: fixed Note Off velocity at 112
    - ON: get legato retrigger velocity from note off velocity
- Attack Control - how the attack of the note is controlled:
    - Vel. Hard - controlled strongly by the note on velocity.
    - Vel. Soft - controlled weakly by the note on velocity.
    - Expression - controlled by the shape of expression control.
- Wind Controller Release Mode: overrides the current Release Time value with the lowest value and disables the Release Time parameter. Useful especially for Wind Controllers, as they send Note Off events when Expression reaches the minimum value. This setting makes the instrument more responsive, e.g. when double- or triple-tonguing.
- Breath Ctrl Mode (Breath Control Mode):
    - OFF
    - ON: suitable for Breath Controllers, allows the player to produce another note attack by using the breath envelope while holding a note.
- Breath Ctrl Attack Sens.: (Breath Control Attack Sensitivity) controls the sensitivity of the note on attack strength for notes triggered in Breath Control Mode.
- Breath Ctrl Hi-Res Threshold: when Breath Control Mode is set to ON, (Breath Control Hi-Resolution Threshold) sets the threshold for a note on event to be triggered when using MIDI Hi-Resolution messages for the Expression parameter.
- KS MIDI Channel (Keyswitches MIDI Channel): select the MIDI channel to receive keyswitch information. Select from channel 1 to 16 or ANY.
- KS Octave (Keyswitches Octave Transpose): allows you to transpose = keyswitches to begin in the octave from C-1 to C2, or turn off keyswitches (OFF).
- KS Velocity Remap (Keyswitches Velocity Remapping): since some keyswitches are velocity-dependent, this parameter controls the distribution of the thresholds between states.

Effects

- <u>Compressor</u>: controls how much dynamic compression is applied to the output.
- <u>EQ Enabled</u>: enables or disables the Equalizer (see next).
- <u>EQ Low Gain, EQ Mid Gain, EQ Mid Freq, EQ High Gain</u>: Equalizer parameters. Note that frequency ranges differ between instruments, as they have been calibrated for the harmonic contents of each instrument.
- <u>Early Reflection Amount</u>: amount of Early Reflections mixed in, useful especially for building sections.
- <u>Reverb Mix</u>: controls the amount of reverb added to the dry signal.
- <u>Reverb Time</u>: controls the decay time of the reverb tail.

Controller Mapping

The MIDI Controller Mapping section allows the user to manage the mapping between external MIDI controllers and instrument parameters.

Click on the MIDI mapping icon in the header header to enter the "Touch & Assign" mode.
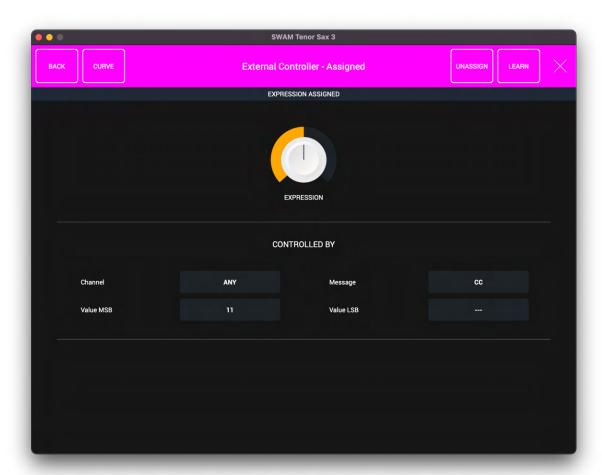
In this view, parameters to which a controller has been assigned are highlighted as a purple area with dashed borders; while parameters to which no controller has been assigned are highlighted as a green area. Parameters not highlighted at all are not available for mapping. In this mode, it is possible to browse every view in the entire interface to configure and map any available parameter.

- To create or edit a parameter mapping, click directly on the parameter to access its mapping screen.
- Click on the "MAPPING TABLE" button in the header to view the list of all parameters and their mapping status, and to manage sound engine parameters that have a direct effect on playability results with different controller types.
- Click on the "X" button in the header to exit Controller Mapping mode.

Mapping Screen

Assigned parameter status

- <u>Back:</u> returns to the previous screen
- <u>CURVE</u>: show the MIDI remapping curve for the selected mapping
- <u>UNASSIGN:</u> removes the current mapping and enters MIDI Learn mode
- <u>LEARN:</u> turns ON/OFF the MIDI LEARN function to edit or remap the current parameter
- <u>X</u>: close the mapping screen and turn off Controller Mapping Mode

- **Controlled By** section:
  - **Channel**: set the MIDI channel over which controller data will be received, from 1 to 16, or ANY.
  - **Message**: MIDI message type of the received controller data:
    - CC: Control Change (1 byte value).
    - CC-HIRES: two coupled Control Change messages, MSB and LSB.
    - AT: Aftertouch (1 byte value).
    - NRPN: Non-Registered Parameter Number.
  - **CC# MSB**: available only for Message = CC, CC-HIRES, NRPN:
    - if Message = CC, MSB is the CC number.
    - if Message = CC-HIRES, MSB is the Most Significant Byte of the two-byte hi-resolution message, from CC0 to CC31.
    - if Message = NRPN, MSB is the Most Significant Byte of the two-byte NRPN message.
  - **CC# LSB**: available only for Message = CC-HIRES, NRPN:
    - if Message = CC-HIRES, LSB is the Least Significant Byte of the two-byte hi-resolution message, from CC32 to CC63.
    - if Message = NRPN, LSB is the Least Significant Byte of the two-byte NRPN message.

NOTE:
- *CC means "Control Change." It is a standard MIDI message used to control a wide variety of functions in a synthesizer or software instrument. The value of a CC is represented by a seven-bit byte, allowing a total of 128 values of resolution.*
- *AT means "Aftertouch". Some MIDI devices have the ability to sense the amount of pressure which is being applied to the keys or the touch surface while they are being held down. This pressure information, commonly called "Aftertouch," may be used to control aspects of the sound produced by a synthesizer or software instrument. AT is a standard 7-bit MIDI message, allowing a total of 128 values of resolution.*
- *CC-HIRES messages are a combination of two CC messages coupled together, thus providing 14-bit resolution, i.e. 16384 levels, for the represente values.*
- *NRPN, i.e. "Non-Registered Parameter Number," extends the number of controllers available via MIDI. They are typically used to send parameter data to a synthesizer and software instruments in order to edit sound patches or other data, and provide 14-bit, i.e. 16384 levels, for the represente values.*
- *MSB means "Most Significant Byte." For CC and AT messages, it is the only byte representing the control value. For CC-HIRES and NRPN messages, it is the largest-value portion (coarse resolution) of the two-byte message.*
- *LSB means "Least Significant Byte" and is only for CC-HIRES and NRPN messages. It is the smallest-value portion (fine resolution) of the two-byte message.*
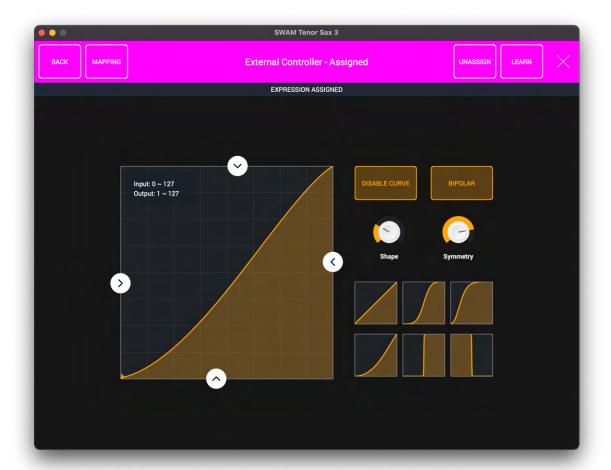
For more details on what CC, NRPN, MSB, LSB, please refer to MIDI specifications at https://midi.org

- CURVE : click on the button to show the mapping curve, which displays how input values from the controller are transformed into parameter values. The controller (input) and parameter (output) ranges are shown in the upper left corner of the curve display. . The curve can be modified using these adjustments:
  - Input Min (left arrow): sets the minimum controller value that will cause an increase in the parameter above the assigned Output Min value (or the Output Max value, if the curve is inverted).Drag the arrow to change the value.
  - Input Max (right arrow): sets the controller value that will produce the maximum parameter value, as defined by the Output Max setting (or the Output Min value of the curve is inverted). Drag the arrow to change the value.
  - Output Min (bottom arrow): the minimum output value. Drag the arrow to change the value.
  - Output Max (upper arrow): the maximum output value. Drag the arrow to change the value.
  - Shape: controls the shape of the remapping curve (be aware, small changes can produce large variations, depending on the Symmetry parameter).
  - Symmetry: controls the symmetry of the remapping curve.
  - DISABLE CURVE: bypasses the remapping curve.
  - BIPOLAR: useful for bipolar controls, i.e. where a value of 64 is considered the zero point of the controller. The parameter of the remapping curve is referred to just one side and then applied to the negative, antisymmetric side

Note that either the X or Y axis of the curve can be inverted simply by dragging the arrows affecting the axis to the opposite side of the curve display. In-between settings are also possible, so experiment!
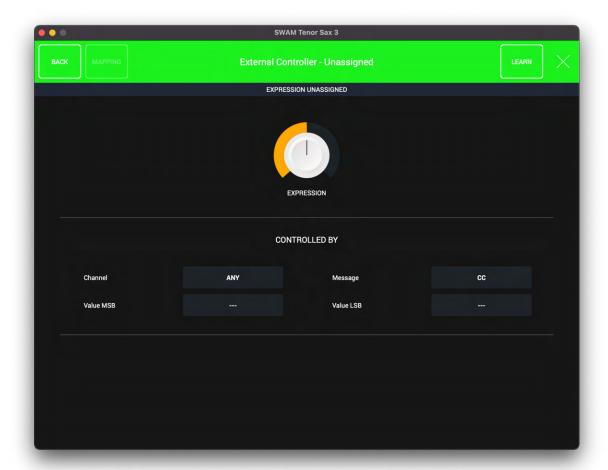
Unassigned parameter status

Any click on an unassigned parameter available for mapping goes to this screen.
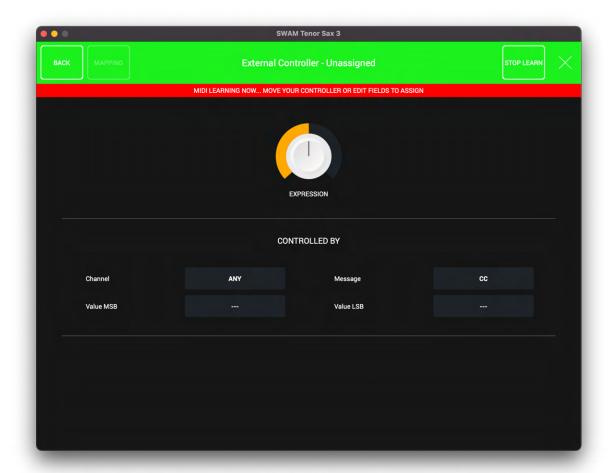
If "LEARN" is active, SWAM automatically listens for MIDI input messages while in LEARN MODE. Move the controller you want to assign to the parameter to automatically complete the mapping.

The values in the "Controlled by" area will be automatically filled in by MIDI Learn, but can still be edited manually.
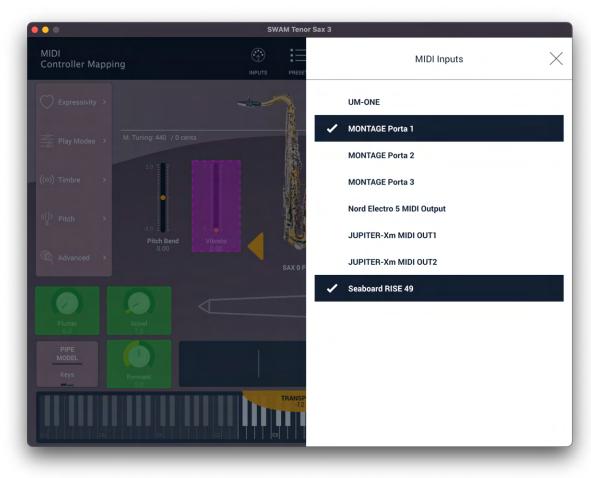
MIDI Inputs quick access

For the Standalone version of the app, a quick access to the MIDI input devices is available

from the MIDI Mapping [MIDI] view by clicking on the "INPUTS" icon [INPUTS]
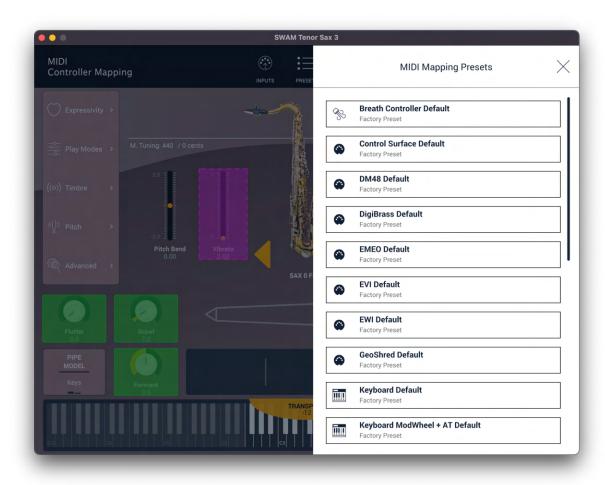
MIDI Mapping Presets

The PRESETS icon offers access to both factory presets of mappings for well-known physical

MIDI controllers, and user-created mapping presets. PRESETS .

Loading a preset does not change current sound parameters. . This is useful for switching between different physical MIDI controllers without losing the timbre and sound behavior defined by the existing parameters.
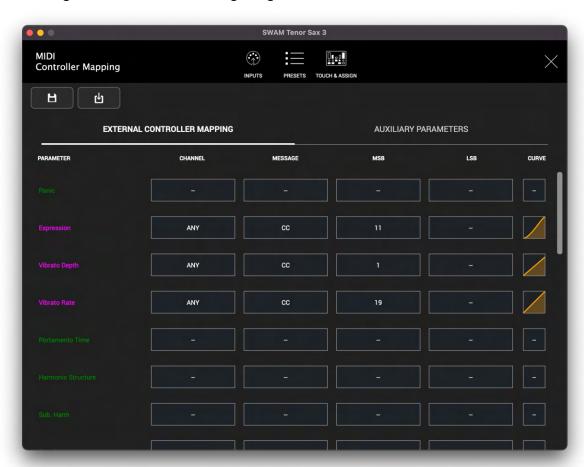
Mapping Table

The "MAPPING TABLE" screen provides the big picture of all mappings and the configuration of auxiliary parameters. To access this view, click on the "MIDI" icon and then on the "MAPPING TABLE" icon.

The screen is organized in two tabs:
- External Controller Mapping: this is a list of all parameters that can be mapped individually by the process described above. Click any row to create a new assignment, or edit an existing assignment.
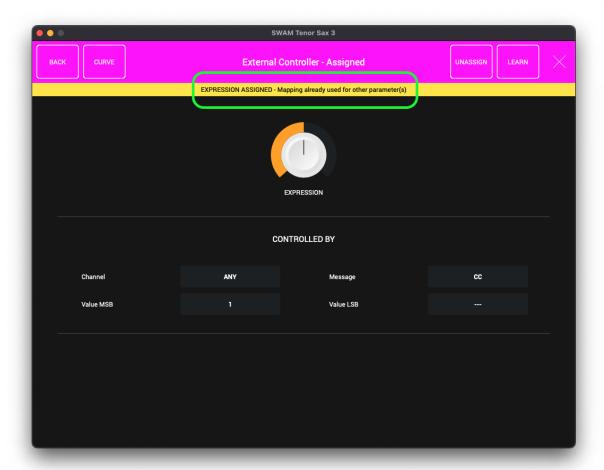
- Auxiliary Parameters: settings and parameters that have a key role in managing the sound engine's response to different controllers. Most of the entries can be found in the "Pitch" and "Advanced" sections as well. These parameters are saved along with the External Controller mapping entries to ensure consistent controller presets.
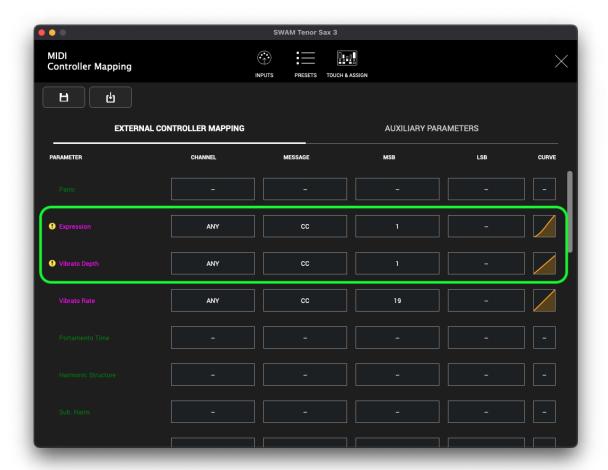
When editing the midi mapping, the system runs a check if the external control (for example a CC message) is already assigned to map another parameter. This check, in case of multiple assignments, shows a warning message displaying a yellow header in the parameter screen ("Mapping already used for other parameter(s)") and a yellow icon on the MIDI Mapping List summary screen.

This warning message is displayed to help avoid unintended multiple assignments, but multiple assignments are allowable and will function, should you have a need to make them. In that situation, simply disregard the warning.
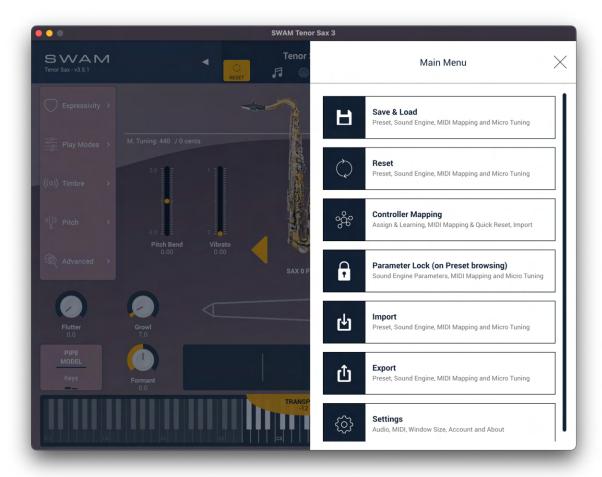
Main menu

The Main Menu appears when the "three-dot" icon. in the top right of the header is clicked.

- **Save & Load**: open the Preset Management window.
- **Reset**:
  - Initialize: reset sound engine parameters
  - Advanced:
    - Reload: reload the current selected preset, losing all changes made since the last save or load.
    - Sound Engine: reset or load sound engine parameters
    - MIDI Mapping: reset or load MIDI mapping settings
    - Micro Tuning: reset or load micro tuning settings

- Controller Mapping:
  - Assign & Learn: open MIDI Mapping view.
  - MIDI Mapping & Quick Reset: open MIDI parameters list & Quick Reset
  - Import: controller mapping from file
- Parameter Lock:
  - Sound Engine Parameters: do not allow sound parameters to change when browsing Presets
  - External Controller Mapping: keep the same MIDI Controller Mappings when changing Presets
  - Micro Tuning Settings: keep the same micro tuning settings when changingPresets
- Import:
  - Preset: load a .swam preset file
  - Sound Engine Parameters: load a .swamse preset file
  - MIDI Mapping: load a .swamec preset file.
  - Micro Tuning: load a .swammt preset file
- Export:
  - Preset: save the current instrument state as a .swam preset file
  - Sound Engine Parameters: save sound engine parameters as a .swamse preset file
  - MIDI Mapping: save external controller settings as a .swamec preset file
  - Micro Tuning: save micro tuning settings as a .swammt preset file
- Settings:
  - Audio: open the "Audio Setup" window (available for the Standalone app only).
  - MIDI: open the "MIDI Setup" window (available for the Standalone app only).
  - Window Size: show a small popup window that allows setting the GUI orientation and zoom factor.
  - Account & License: open the "Account & License" window.
  - About: open the "About" page, where it's possible to check the version and build number, have access to the online resources, and show the credits.
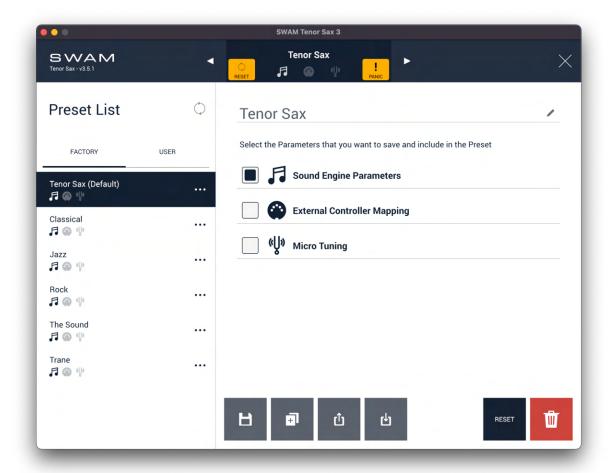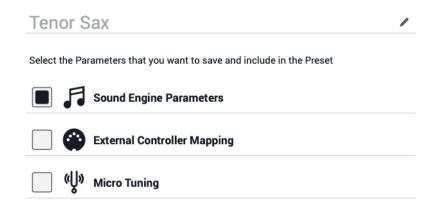
Preset Management

- <u>Preset List</u>: Select presets from the list on the left of the window.. The SWAM presets are organized into two groups: Factory and User. User presets can be added, edited and deleted. Factory presets cannot be edited or deleted; any save action performed on a Factory preset generates a User preset.

Default startup Preset

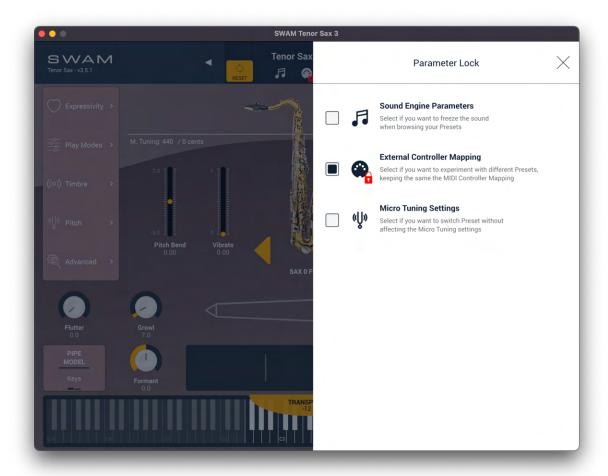Any preset can be selected as the default, i.e. the preset loaded at startup: just click on [...] next to the preset name and choose "Set as default".

Tenor Sax

Select the Parameters that you want to save and include in the Preset

☑ 🎵 Sound Engine Parameters

☐ 🎨 External Controller Mapping

☐ 📶 Micro Tuning

- Shows the preset components, such as Sound Engine Parameters, External Controller Mapping and Micro Tuning settings. From this area it is possible to choose the parameters that you want to include in the SWAM preset.

- 💾 Save: save current preset.

- 🗐 Duplicate: duplicate current preset to create a new one.

- ⬆ Export preset: open export options.
  NOTE: compatibility of preset exports with future releases is not guaranteed. It is strongly recommended that users archive custom presets in a custom folder at a different location to the default preset folder.

- ⬇ Import preset: open import options.

- RESET RESET: reset parameters to the default state.

- 🗑 DELETE: delete the selected User preset.

Parameter Lock

The Parameter Lock is made to appear by pressing and holding on the current preset label:
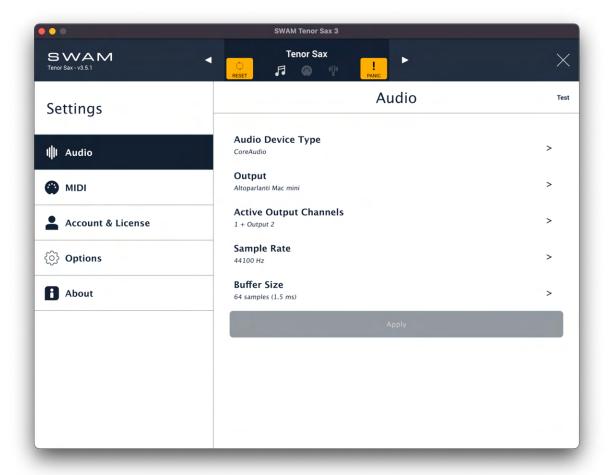

Switch presets without affecting the category of parameters that is locked.

- Select "Sound Engine Parameters" if you want to prevent changes to the sound when browsing your presets.
- Select "External Controller Mapping" if you want to experiment with different presets while keeping the same MIDI controller mapping.
- Select "Micro Tuning Settings" if you want to switch presets without affecting the micro tuning settings.

Settings
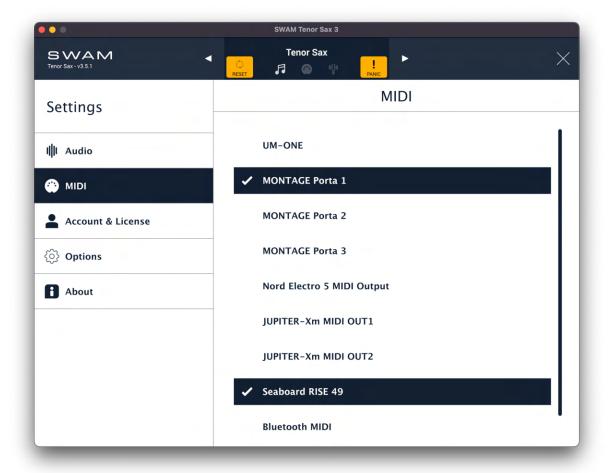
Audio Settings

The Audio Settings page is available for Standalone version only, and allows selecting the proper Audio Device, Output port, Active Output Channels, Sample Rate and Buffer Size.
For real-time playing, the combination of Buffer Size and Sample Rate should result in a maximum latency of about 10 ms.
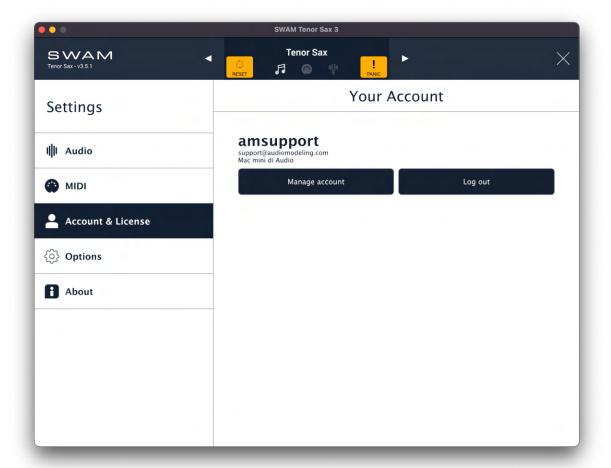
MIDI Settings

The MIDI Settings page is available for Standalone version only and allows you to select one or more MIDI devices to control the instrument.
It's also possible to use a Bluetooth MIDI device by selecting "Bluetooth MIDI".
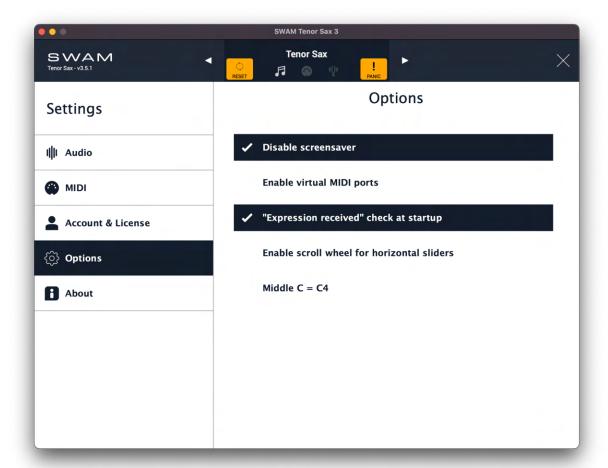
Account & License

The Account & License view shows the user currently logged in.
- Manage account: opens the Audio Modeling Customer Portal in a web browser.
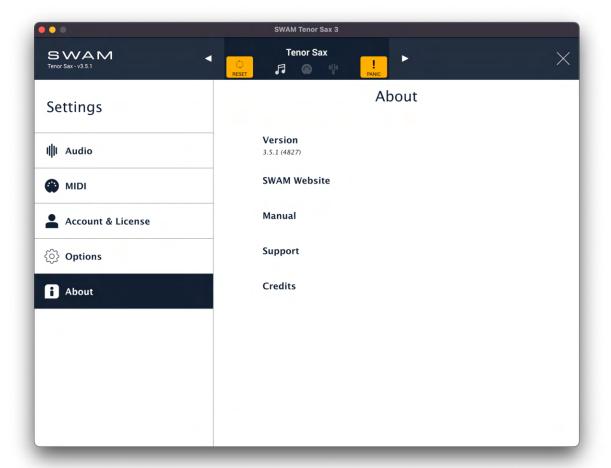- Log out: logs the user out of the application

Options

- Disable screensaver: avoid screensaver activation when the app is open
- Enable virtual MIDI ports (macOS and iOS only): enable an Input and Output virtual MIDI port to control the instrument from an external app, or use the SWAM app to control another music app
- "Expression received" check at startup: when selected, warns the user to check the controller mapped to the Expression parameter if a note is received before an Expression event (for Desktop version only)
- Enable scroll wheel for horizontal sliders: allow the use of the scroll wheel for changing slider values
- Middle C = C4: set octave notation so that Middle C is C4, corresponding to MIDI note number 60. If deselected, Middle C is C3.

About

The About page shows the current version and build number, as well as a few other options:
- Version: the current version and build number of the app. On a desktop machine, click on "Version" to open the Customer Portal and check for updates.
- SWAM Website: opens the SWAM section of the Audio Modeling website in a web browser.
- Manual: opens the online User Manual page in a web browser.
- Support: opens the Support Center page in a web browser.
- Credits: shows the credits page

iOS

SWAM apps for iOS are available for iPad and iPhone. Both of those versions share the same engine and GUI elements as the desktop versions, with a few exceptions to adapt the user experience to the specifics of the devices.

- A few advanced parameters are unavailable (locked) on iPad and iPhone. However, desktop presets that include changes to these parameters can be imported to iOS without problem.
- iPad and iPhone offer on-screen, touch-based playing surfaces.
- iPhone has a different layout, but is consistent with the desktop and iPad versions: the same graphical elements and controls are reorganized to maximize the experience on a smaller screen.

List of locked parameters on iOS version

Currently, the following parameters are "locked" on both iPad and iPhone versions:

- Chromatic
- Legato Mode
- Overblow Thresh
- Harmonic Structure
- Formant
- Modal Res. Gain
- Random Dynamic
- Dynamic Harmonic (only for Saxophones, Double Reeds and Clarinets)
- Flutter (only for Saxophones, Double Reeds and Clarinets)
- Pipe Split (only for Flutes)
- Dynamic Pitch
- Attack To Sustain
- Auto Expression
- Vibr. Rand. Rate
- Panpot Type
- Harmonic Gain

Unlocking through In-App Purchase will be provided in future.

iPad

The GUI on the iPadOS version is identical to that of the desktop version. In addition, you

will find a "PLAY"icon ▦ PLAY that accesses a dedicated, on-screen, touch playing surface.

The on-screen playing surface has the following purposes:
- Provide an onboard screen keyboard to perform at basic level without using any external controller
- Provide a visual feedback representation of the sound evolution (Dynamic Envelope)
- Provide direct controls of the most useful performance parameters (Expression, mute selection, control faders.

NOTE: To record and playback on a DAW what is played on the on-screen playing surface, the "SWAM On-Screen Keyboard" MIDI preset must be selected (see the MIDI Mapping Presets section).

The dynamic areas can be selected just by tapping on the tab name: Control, Instrument, Dynamic Envelope.
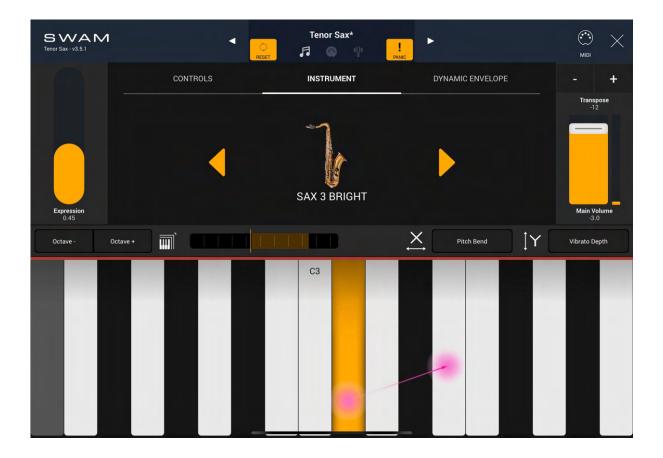
Controls

This view provides faders and buttons that are very handy in live performance for tweaking the sound in real time, or adding subtle expressive details, when needed. Play and tweak in real time using the onboard keyboard, or use them as an extra control surface when playing with an external controller.

Instrument

This view shows the instrument selector. Use the arrows to select different instrument timbres.

Dynamic Envelope

This view shows how the sound evolves in real time. The more you change the Expression setting and other parameters, the more interestingly and expressively a SWAM instrument plays. Adjust the Expression setting to create nuance in the sound; use the Dynamic Envelope for visual feedback.
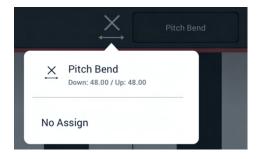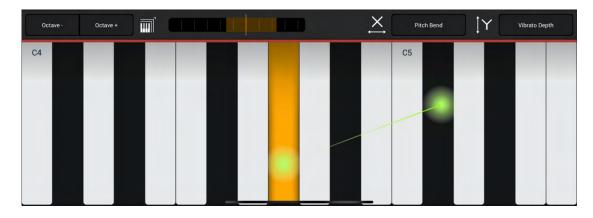
On-Screen Keyboard Setup

The keyboard has a toolbar with dedicated controls to:
- Shift the pitch by octave (Octave - and Octave + buttons)
- Manage the keyboard size: Select a smaller size to fit more keys on the screen/
  - Small (show 1 octave/13 keys)
  - Medium (show 1.5 octaves/18 keys)
  - Large (show 2 octaves/25 keys)
- Scroll the keyboard: Drag the ribbon to adjust the starting point of the keyboard.
- X and Y axis (direction) assignment: Configure modulation behavior for finger movement along the horizontal and vertical axes.

X: Pitch Bend Control Along the X Axis.

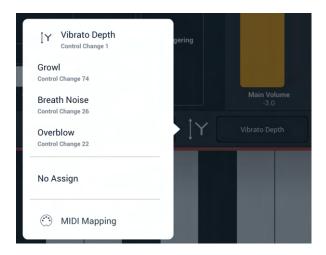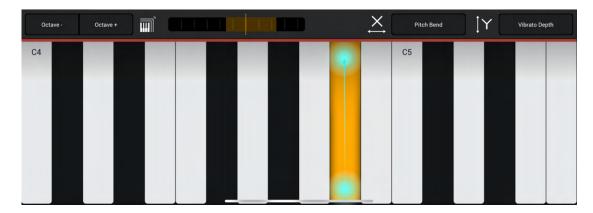Tap on the "X" to show pitch bend range or unassign pitch bend control.

Y: Parameter Control Along the Y Axis

Tap on the "Y" to change the parameter assignment for a Y-axis gesture (by default assigned to Vibrato Depth), and to check what MIDI control is mapped to the parameter. A shortcut to the MIDI Mapping page is provided to make it easy to change the MIDI

mapping for the controlled parameter. This is useful when using the control surface for recording MIDI on a DAW, or controlling an external instrument.

iPhone

Keep the iPhone in portrait orientation for editing any parameter or configuration, rotate to landscape orientation to play the instrument using the on-screen surface.
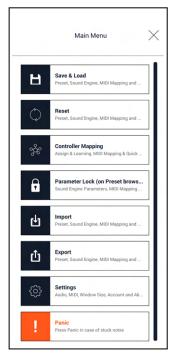

Getting Started

To get started, be sure to check the Audio and MIDI settings, especially if you are using an external audio device or external MIDI controller.
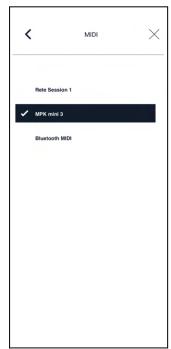
Audio settings are under Main … ("three dots") menu -> Settings -> Audio. Check that the Active Output Channels, Sample Rate and Buffer Size are correctly selected.

MIDI settings are under Main … ("three dots") menu -> Settings -> MIDI. Select the MIDI port corresponding to the MIDI controller you are using to play the instrument.
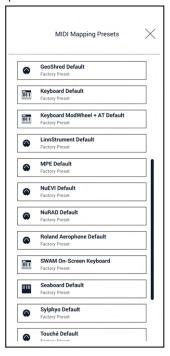
Select the MIDI mapping preset that best matches your MIDI controller. This is done from

the MIDI Preset List icon on the Home page, or under Main … ("three dots") menu -> Controller Mapping -> MIDI Mapping & Quick Reset -> PRESETS.

Finally, load a Sound preset from the list, selecting the the "Sound Preset List" icon .
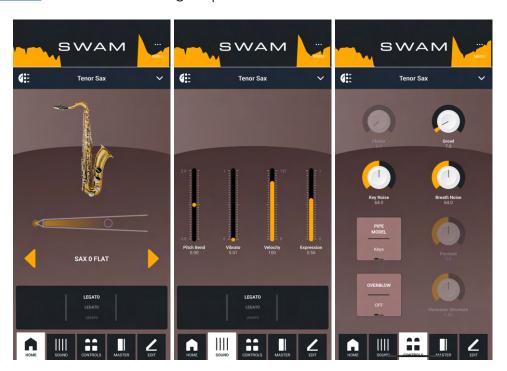
Editing

Portrait orientation is most suitable for editing the instrument, tweaking the sound, and performing advanced settings.

The … ("three dots") menu on the top-right corner is the same as in the desktop and iPad versions. Refer to the "Main Menu" paragraph for details.

The "MIDI Preset List" icon gives you quick access to MIDI presets for a plug & play mapping of several external MIDI controllers.

The "Sound Preset List" icon is a shortcut to Sound presets selection and management.

On the iPhone, the Main Window has been split into five sections: Home, Sound, Control, Master and Edit. Use the navigation icons on the footer to reach the sections. Refer to the Main Window section and following chapters for details.
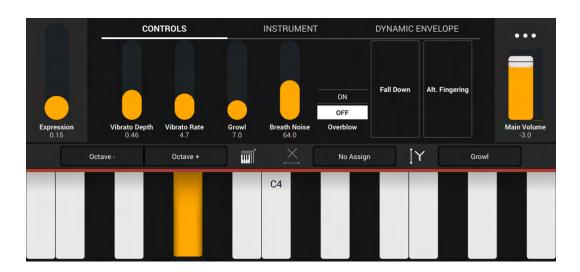
On-screen playing surface

Be sure to select the "SWAM On-Screen Keyboard" entry from the list of MIDI presets, then rotate the iPhone to landscape orientation to access the on-screen playing surface.

Controls and features are identical to the iPad version. Please refer to the earlier iPad section for a detailed description.

Controls

Instrument

Dynamic Envelope

Quick access menu

A … ("three dots") menu is available in the top right corner for quick access to sound parameter initialization, and sound and microtuning preset recall, and MIDI mapping selection.

Key Switches

Depending on the "KS Octave" parameter, Key Switches can be positioned beginning at any octave from C-1 to C2, or they can be disabled.

By default, the Key Switches are positioned starting from C1 (MIDI note 24), where C3 (MIDI note 60) = Middle C. You can change the MIDI channel from which Key Switches receive note events through the "KS Channel" setting. This can be useful when controlling Key Switches from a separate keyboard.

The Key Switch state depends on the Note On velocity. The velocity curve can be adjusted using the "KS Velocity Remap" parameter.

The Key Switches provided are:
- C triggers a short fall.
- C# switches between two legato modes: Gliss and Expr;
- D triggers a "squeak" (a short overblow on attack) or a continuous overblow, depending on the timing and velocity:
  - A low KS velocity triggers a squeak (if the KS is pressed before note on).
  - A higher KS velocity plays a continuous overblow (if the KS is pressed before note on).
- D# behaves like D in latch mode.
- E triggers the Alternate Fingering (momentary)

Flutes only:

- F behaves like E in latch mode.

Known issues / Open points

- Window resizing for plugins: on some hosts and DAWs, it's required to close and reopen the plugin window to apply the new size.

Technical Support

Before requesting technical support, please make sure you have carefully read the **User Manual** and the **FAQs** on our Support Center at audiomodeling.com/support.
There, you'll quickly find appropriate answers to most questions.

Should you still need technical support, please contact the SWAM support team at support@audiomodeling.com or open a ticket through our Support Center.

Note: Please ensure you enter your email address carefully — it's not possible for us to reply to an incorrect email address.

When requesting technical support, please don't forget to provide as much system information as possible, including your type of computer, OS, audio interface, host application, software version, etc. If the problem can be replicated, a MIDI and/or an audio file is usually very helpful.

In order to provide effective and quick support, please include a reference to either the user account, order number or one of the License Keys.