

SWAM

SWAM String Sections User Manual

v1.4.0

String SECTIONS

Bringing Individual Melodic Expression to Physically Modeled Sections

VIOLINS · VIOLAS
CELLOS · DOUBLE BASSES

Table Of Contents

Before you start	5
Licensing	7
macOS and Windows	7
iOS	7
Specifications	8
Required space after installation	8
Installation	9
macOS and Windows	9
Installation paths	10
iOS	10
Hardware Requirements	11
CPU load	11
Audio interface (sound card)	11
MIDI devices	11
Software Requirements	13
macOS and Windows	13
iOS	13
Using an appropriate range of Expression	14
Introduction	15
Interaction with the product	17
Main window	18
Instrument parameters	18
Main controls	19
Audio section	21
Header section	22
Expressivity	24
Play Modes	25
Left Hand	25
Right Hand	26
Polyphony	29
Timbre	31
Pitch	32
Master Tuning	32
Micro tuning	33
Advanced	40
INSTRUMENT	40
MIDI	41

ROOM	44
Room & Position	44
Search	48
Controller Mapping	49
Mapping Screen	50
Assigned parameter status	50
Unassigned parameter status	55
MIDI Learn	55
MIDI Inputs quick access	57
MIDI Mapping Templates	58
MIDI Mapping Table	59
Main menu	61
Preset Management	64
Preset navigation and selection	65
Saving a User Preset	65
Editing and Exporting Presets	66
Default startup Preset and other options	67
Parameters Lock	69
Settings	70
Audio Settings	70
MIDI Settings	71
Account & License	72
Options	73
Global Settings	74
Local Network Permission	75
Accessibility	80
About	81
iOS	82
iPad	83
Controls	84
Section Size	85
Dynamic Envelope	86
Virtual Bowing	87
On-Screen Keyboard setup	88
iPhone	90
Getting Started	90
Editing	91
On-screen playing surface	92
Key Switches	93

Instruments ranges	96
How to perform the main articulations	97
Détaché	97
Martelé	97
Spiccato	97
Legato	97
Portamento (glissando)	98
Flautando	98
Scratchy Attacks	98
Tremolo	99
Crescendo	99
Bow Direction Behaviour	100
Tips and Troubleshooting	101
No sound	101
Understanding Ambiente	102
Why do SWAM instruments need to use the local network?	103
“Communication between instances failed” warning message	103
Issues when opening Logic Pro projects or templates	103
What are SWAM Templates?	104
Why is it called the SWAM Ecosystem now?	104
Backward compatibility with previous versions: Legacy Reverb mode explained	105
Best practices for adding multiple solo instruments of the same type	106
Technical Support	107

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 the Audio Modeling YouTube channel at youtube.com/c/AudioModeling.

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

More information, tips, FAQ and Troubleshootings at kb.audiomodeling.com.

All SWAM instruments are designed to be PLAYED in real time by shaping the sound like 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 plug-in formats, or running as a standalone application. An example host software could be a sequencer or a Digital Audio Workstation (DAW) such as Camelot Pro, Ableton Live, Cubase, Logic, Pro Tools, LUNA, Reaper, Digital Performer, Studio One, 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 plug-ins and Inter-App Audio (IAA) formats. Example host and DAW softwares are Camelot Pro, GarageBand, Logic Pro, Cubasis and AUM.

These instruments use Audio Modeling's proprietary SWAM (Synchronous Wave Acoustic Modeling) technology conceived by Stefano Lucato. Combined with Physical Modeling, they provide exceptional playability and realism. The sound is not produced by playing back samples, using 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 the instruments are controlled using a suitably capable set of [MIDI controllers](#), as described in this manual.

NOTE: As with a real musical instrument, SWAM instruments allow continuous movement across 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 CC11 or CC7 MIDI messages), a breath or wind

controller (usually 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 “Having Trouble with No Sound? It looks like you’re not sending an expression control message (default CC11) to your SWAM instrument”, with actions to select or [map an external MIDI controller](#).



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, it’s necessary to provide either a MIDI Expression curve or Expression 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](#) paragraph for instructions on how to authorize SWAM products.

To move an authorization to a different computer, please login 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 Paths](#)" paragraph 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

macOS 10.13 (High Sierra) – 26 (Tahoe) *

- Standalone, Audio Units, VST, VST3, AAX 64bit
- NKS (Native Instruments Komplete Kontrol) - VST3 only

Windows 10, Windows 11

- Standalone, VST, VST3, AAX 64bit
- NKS (Native Instruments Komplete Kontrol) - VST3 only

iOS 12 – 26

- Standalone, AUv3, IAA

** Apple Silicon architecture supported natively*

All SWAM apps and plugins navigable by the native accessibility frameworks on macOS and Windows.

Required space after installation

macOS

Product installer is 390 MB. The required space is 37 MB per single plugin format plus 248 MB for shared resources and assets. This results in a total ranging from 396 MB to 988 MB for the complete String Sections (4 instruments). The total range depends on the number of plugin formats installed.

RAM occupancy: about 176 MB for each instrument instance.

Windows

Product installer is 338 MB. The required space is 17 MB per single plugin format plus 248 MB for shared resources and assets. This results in a total ranging from 265 MB to 588 MB for the complete String Sections (4 instruments). The total range depends on the number of plugin formats installed.

RAM occupancy: about 173 MB for each instrument instance.

Installation

macOS and Windows

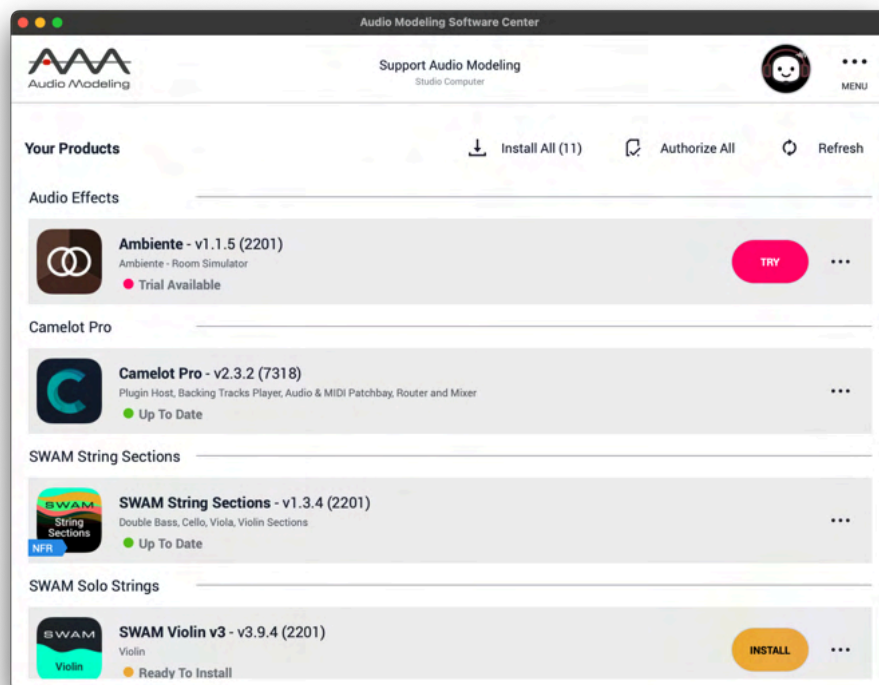
Product Registration and Installation

- 1) login to our Customer Portal (<https://my.audiomodeling.com>); create a new account if you have never signed up;
- 2) select "Register" under the "Products" menu item;
- 3) type the License Key or Redeem code provided, select "Continue";
- 4) download, install and launch the "Audio Modeling Software Center", available both on the Customer Portal and 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: /Users/Shared/Audio Modeling/AMData
- User presets are stored under: ~/Library/Audio Modeling/AMData

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: C:\Users\Public\Documents\Audio Modeling\AMData
- User presets are stored under: %AppData%\Audio Modeling\AMData

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 64, 128, 256, or 512 samples (larger buffers provide higher latency, but less CPU load). Onboard audio devices are often suitable on modern computers, iPad and iPhone.

NOTE: sample rate values lower than 44.1 kHz are not supported.

MIDI devices

SWAM instruments (like any other virtual instrument) can be successfully used without the need for any additional hardware by drawing the controller curves and programming the 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 5 octaves, mod wheel & pitch bend, connected to the computer via USB or an external MIDI interface, equipped with a set of physical continuous MIDI controllers (usually knobs or sliders) to control effects like bow pressure, bow position, tremolo, harmonics, etc.

Although the 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, YDS-120 or YDS-150, Akai EWI (USB, 4000S or 5000), Aodyo Sylphyo, EMEO, Roland Aerophone, Synthophone, EVI (Electronic Valve Instrument), NuRAD, WARBL, Travel Sax, Robkoo R1 - all of them provide excellent results. MIDI Polyphonic Expression devices



like the Seaboard, LUMI 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 and Osmose 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 Paths](#) paragraph 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 on our Knowledge base: audiomodeling.com/support.

iOS

Standalone

We provide a Standalone App of each SWAM String Sections instrument.

Plugins

A DAW (Digital Audio Workstation) or other host capable of running SWAM String Sections 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

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

All real physical instruments require a much greater degree of 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 the maximum 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 in an excessive range of dynamics, leading unavoidably to a poor, unrealistic performance.

Please keep in mind that the key to expressiveness and realism is a 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 over using 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 String Sections is a collection of solo string instruments conceived and developed by Stefano Lucato and the Audio Modeling team. These instruments are based on a Hybrid Modeling technology, combining Physical Modeling, Sample Morphing and Behavioral Modeling techniques.

The SWAM String Sections collection includes four string sections: Double Basses, Cellos, Violas and Violins.

Each section emulates an ensemble of musicians sitting next to each other, with each musician playing a slightly different instrument (varying in body, strings, and bow), resulting in unavoidable tone, timing, intonation and performance differences ("humanization"). Those differences are fundamental to create the typical "ensemble" sound and contribute to the realism of the resulting performance.

Sections are placed in a virtual room, allowing for flexible placement of each group of musicians. Sound reflections and reverberation adjust accordingly, also in accordance with the chosen room dimensions, absorption materials, and microphone positioning.

Furthermore, the placement of multiple sections of the same type is free from phasing artifacts, thanks to the automatic "Anti-Phasing Divisi" selection.

SWAM String Sections instruments come as a Standalone application, VST, VST3, Audio Units and AAX plug-ins for Desktop, and Standalone App, AUv3 and IAA plugins for iOS.

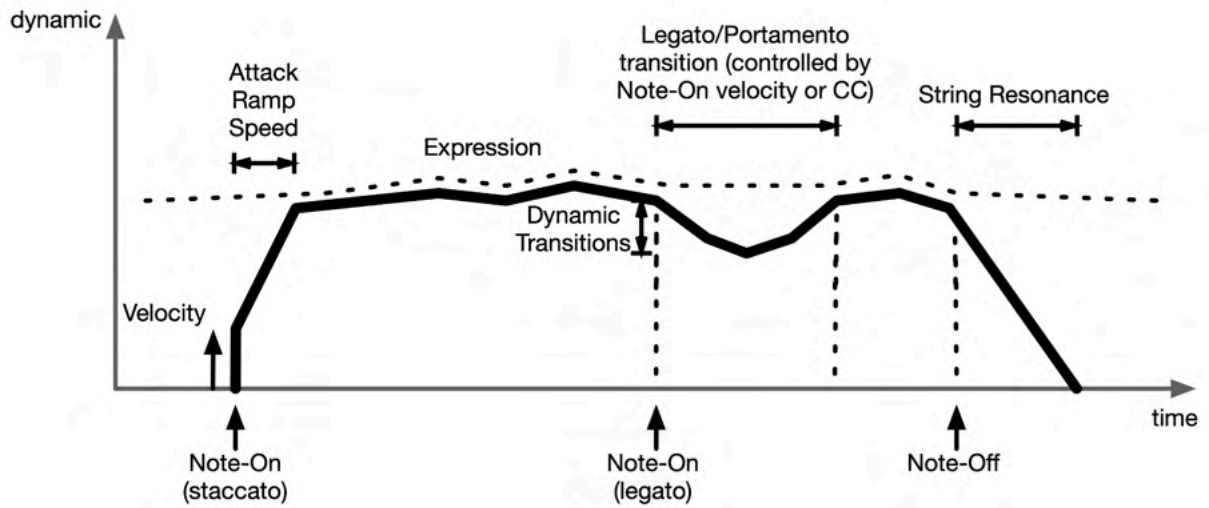
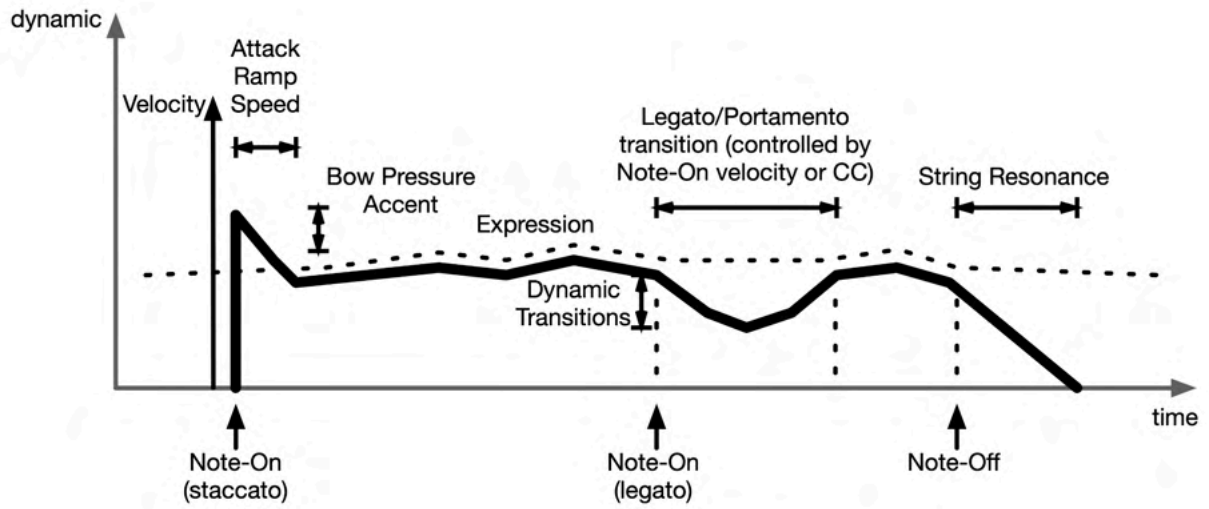
Any section can be virtually played using a bow or pizzicato with a finger.

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 the instrument behavior which are specific to bowed or pizzicato string instruments.

NOTE: when attack is controlled by Note On velocity, the Velocity value acts mainly on Bow Pressure, i.e. dynamic attack is not proportional to the Velocity value, as for the Woodwinds and Brass.

Read [How to perform the main articulations](#) chapter for more info.

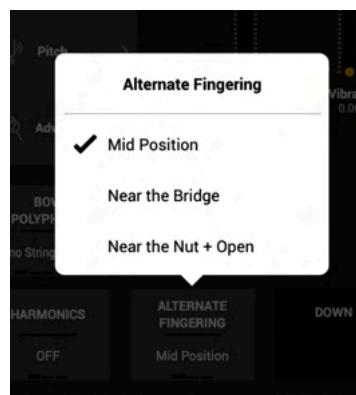
Note: an important setting that influences the "pianissimo" dynamic behavior is described at the [Important note for Expression remapping](#) paragraph.



Interaction with the product

You can control the parameters of SWAM instruments directly through the user interface (UI) using a mouse, finger on touch devices, or other pointing systems like Eye Trackers or OCR. Additionally, interaction is possible via Screen Reader, [keyboard shortcuts](#), or [MIDI](#) for parameters that are mappable and effectively mapped. All SWAM products have been validated by visually impaired users for a high level of accessibility.

Parameters are graphically represented by knobs, sliders, button rows with all options explicitly listed, or toggle buttons. For toggle buttons, you can press and hold to get an explicit list of values.



These buttons also have a small graphical indication of the number of available options via hatching, with the selected value highlighted through a more pronounced mark.



The interface is designed for various uses on different screen sizes, devices, and operating systems. The [Main "... menu](#) on the home screen acts as a guided wizard that provides access to almost all functions.

Next to each object, the contextual "... menu offers access to the most important and contextual options, encouraging users to explore further.

System parameters are categorized on the home screen into different groups to make it easier for less experienced users or infrequent users to understand and get started. However, the experienced and frequent user has access to the [Search](#) button located at the top of the header. This tool provides at the same time an overview of all parameters and a search function to quickly find what is not immediately visible.

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 microtonal settings.

- Advanced: additional parameters, especially for expert users.
- Room & Position: opens Ambiente, the virtual room and positioning environment..

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

Main controls

- Instrument (left/right arrows)

Use the arrows to select the size of the section, i.e. the number of actual players.

- Bow Polyphony (if Play Mode = Bow)
[mapped to Key Switches B+C, B+C#, B+D, B+D#, B+E]
 - Mono String Crossing [B+C]: the instrument is monophonic; legato/portamento is achieved by overlapping two notes. If the legato/portamento involves two adjacent strings, the release of the previous note is stopped in order to avoid a “bichord” during the transition, depending on the interval set with the “Mono CrossString Muting” option (see Play Modes page).
 - Mono Poly Release [B+C#]: the instrument is monophonic; legato/portamento is achieved by overlapping two notes. If the legato/portamento involves two adjacent strings, the release of the first note is not stopped during the legato transition.
 - Double [B+D]: two simultaneous notes can be performed; legato and portamento is not possible if playing overlapping notes. The two selected notes are always on adjacent strings. Priority: last pressed note.
 - Double/Hold [B+D#]: two simultaneous notes can be performed; legato and portamento is possible. The two selected notes are always on adjacent strings. Priority: oldest note. The preferred pair of strings is selected using “Double Hold String Selection”.
 - Auto [B+E]: two simultaneous initial notes can be performed; the first single note played turns the polyphony to Mono. Legato and portamento are also possible for two simultaneous notes. An additional latency is added at the attack in order to detect the double/mono mode. It is possible to change the detection time acting on the “Auto Poly Detection Time” parameter in the Advanced section.
- Pizzicato Poly (if Play Mode = Pizzicato)
[mapped to Key Switches B+F, B+G]

- Mono String Crossing: the instrument is monophonic; legato/portamento is achieved by overlapping two notes. If the legato/portamento involves two adjacent strings, the release of the previous note is stopped in order to avoid a “bichord” during the transition, depending on the interval set with the “Mono CrossString Muting” option (see Play Modes page).
- Polyphony: it’s possible to play multiple notes if they are distributed across different strings.
- Harmonics
[mapped to Key Switch F#]
 - OFF: no overtone.
 - 2: first overtone (one octave higher).
- Alternate Fingering
[mapped to Key Switch D#]
Selects the default position of the left hand on the fingerboard. Note: in order to obtain a portamento on the same string, it is required to check and eventually set the proper AltFing position of the starting note (BEFORE pressing the starting note) and of the ending note (BEFORE pressing the ending note).
 - Mid Position: left-hand stays in the middle of the neck.
 - Near the Bridge: left-hand stays towards the bridge (high position).
 - Near the Nut + Open: left-hand stays near the nut; it is possible to play open strings. Note: vibrato is not possible on open strings.
- Bow/Pizz Position: position of the bow or finger between “sul ponticello” and “sul tasto”.
- Bow Pressure: (if Play Mode = Bow) “Weight” of the bow on the string.
- Tremolo
[mapped to Key Switch G#]
 - OFF: no tremolo.
 - Slow: slow tremolo.
 - Fast: fast tremolo (1.5 x slow tremolo rate).
Tremolo speed and behavior are controlled by the “Tremolo Min Speed” and “Tremolo Mode” parameters on the Play Modes / Right Hand section. A “manual” tremolo is possible using the Key Switch C# (“Manual Bowing:

KeySwitch" parameter set to "Tremolo") or by holding Sustain ("Manual Bowing: Sustain+Note" set to "Tremolo").

Note: even if Gesture Mode is set to Bipolar mode, when Tremolo is active the Gesture Mode is forced to Expression, because the bow change is defined by the auto-tremolo algorithm.



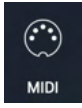

- Bow Lift
[mapped to Key Switch E]
Selects the starting/ending state of the bow. Note: the BowLift parameter acts mainly on the release, stopping the vibration of the string when it is set to "On String". It also acts slightly on the attack, but if you want to obtain a scratchy sound you should act on the velocity and on the bow pressure.
 - Off String: lift the bow away from the strings during release.
 - On String: leaves the bow on the string during release.
- Play Mode
[mapped to Key Switch C]
 - Bow: the instrument is played using the bow.
 - Pizzicato: the instrument is played plucking the strings using the fingers.
- Sordino
 - OFF: no mute applied
 - ON: a sordino is applied to obtain a muted sound
- Room & Position: shows a preview of the sections and microphone positioning in the virtual room, and opens the embedded room simulator view.
- Main Volume: main output volume.

Audio section

- Room & Position: opens Ambiente, the virtual room and positioning environment.
- Pan Pot: pans the output signal left and right. Available only if Ambiente Room Simulator is OFF.
- Main Volume: main output volume. This can be either 'Pre Room' or 'Post Room', depending on the 'Main Volume Processing' parameter located in the Advanced / ROOM page. Selecting 'Pre Room' means the main volume will only affect the source signal, leaving the room ambiance unaltered. Conversely, selecting 'Post

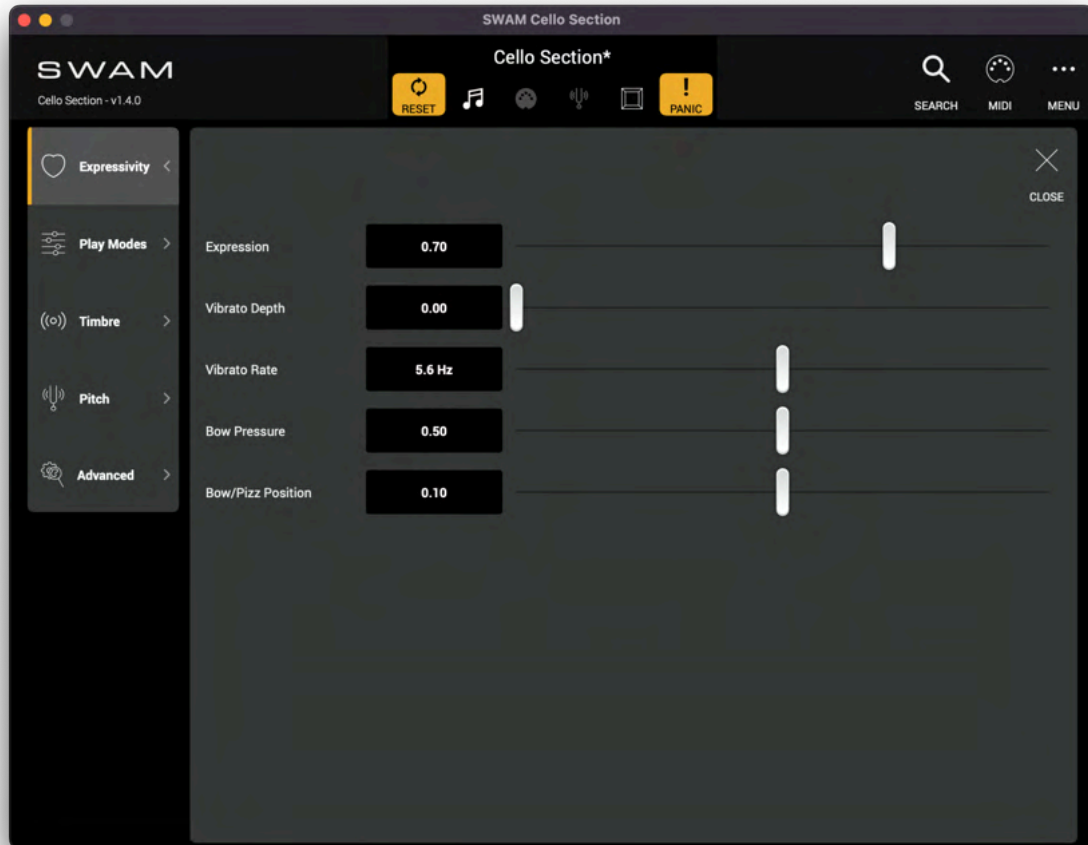
Room' means the main volume will affect the overall output, including both the source signal and the room ambience.

Header section

- 
 - SWAM logo: clicking or touching the SWAM logo opens the About section.
- 
 - Main menu icon: opens the main menu page that provides access to:
 - Preset Manager
 - Reset
 - Controller Mapping
 - Parameter Lock
 - Import
 - Export
 - Settings
 - "Save" and "Save as..."
- 
 - MIDI Mapping icon: opens MIDI mapping management section.
- 
 - SEARCH icon: opens the search screen for browsing parameters all at once with a big picture of the entire system.
- RESET:
 - Initialize: reset the instrument and return to its initial state; this includes sound engine, MIDI mapping, micro tuning and room
 - 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
- Room Simulator: reset or load room simulator parameters
 - Section Position: reset to the default section position.
- PANIC: use this in case of stuck notes.

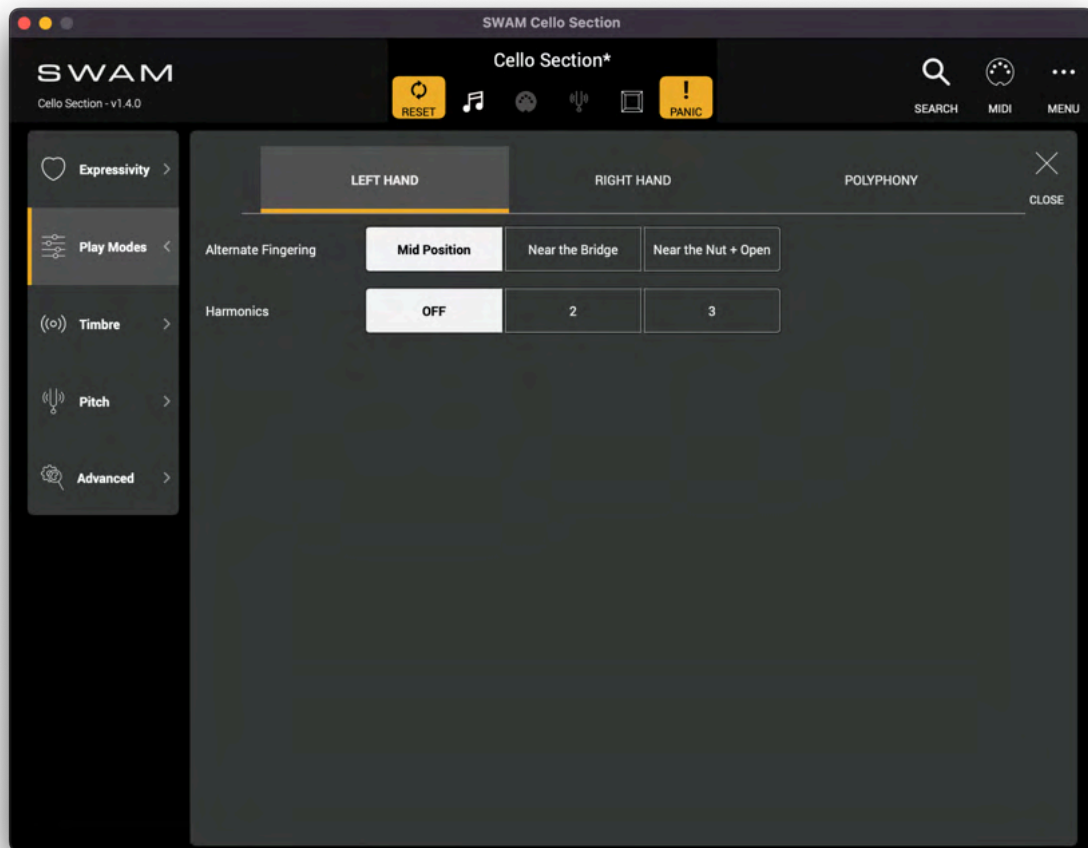
Expressivity



- Expression: main expressive control. On bowed strings, it's mostly related to the bow speed which in turn controls the dynamics.
- Vibrato Depth: controls the amount of vibrato.
- Vibrato Rate: controls the average frequency of the Vibrato applied to the model.
- Bow Pressure: "weight" of the bow on the string.
- Bow/Pizz Position: position of the bow or finger between "sul ponticello" and "sul tasto".

Play Modes

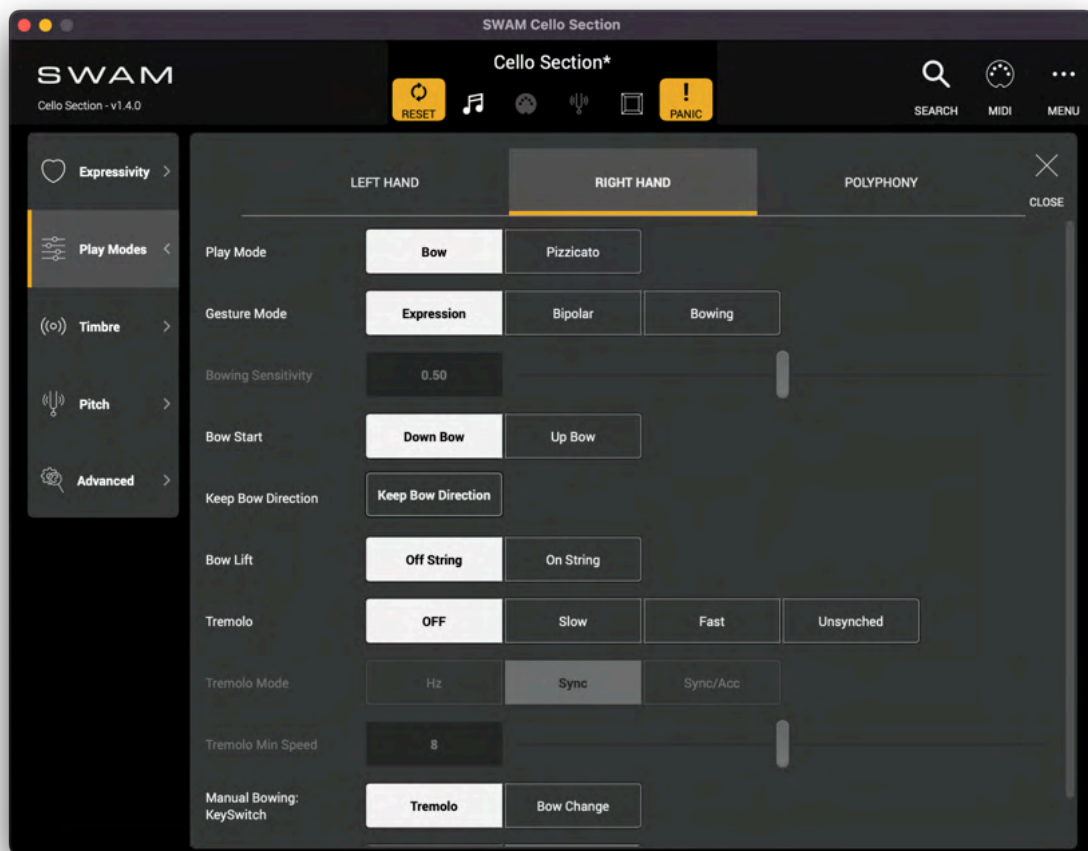
Left Hand



- Alternate Fingering
[mapped to Key Switch D#]
selects the default position of the left hand on the fingerboard. Note: in order to obtain a portamento on the same string, it is required to check and eventually set the proper AltFing position of the starting note (BEFORE pressing the starting note) and of the ending note (BEFORE pressing the ending note).
 - Mid: left-hand stays in the middle of the neck.
 - Bridge: left-hand stays towards the bridge (high position).
 - Nut+Open: left-hand stays near the nut (it is possible to play open strings). Vibrato is not possible on open strings.

- Harmonics
[mapped to Key Switch F#]
 - OFF: no overtone.
 - 2: first overtone (one octave higher).
 - 3: second overtone (twelve semitones higher).

Right Hand



- Play Mode:
[mapped to Key Switch C]
 - Bow: the instrument is played using the bow
 - Pizzicato: the instrument is played plucking the strings using the fingers (mono only).

- Gesture Mode: select the way the Expression is executed for PlayMode = Bow.
[mapped to Key Switch D]
 - Expression: expression is mainly interpreted as the speed of the bow in relation to the bow pressure. If the Expression MIDI CC Min Value is set to 0 (zero) in the MIDI Mapping Curve page, bow change automatically occurs when expression is set to zero for a while. Otherwise, if the Expression MIDI CC Min Value is set to a value different from zero in the MIDI Mapping Curve page, Auto-bow-change never occurs.
 - Bipolar: expression is interpreted as the speed of the bow in a bipolar way; zero speed coincides with CC value = 63. Values below 63 are interpreted as down-bow, while values over 63 are interpreted as up-bow.
In order to use this gesture, the MIDI mapping curve for Expression must be set to "Bipolar" as well. A warning message is displayed otherwise. See "Controller Mapping" section for more details.
Note: this gesture is not suitable for Breath and Wind Controllers. It is intended for pedals, wheels, ribbons, X-Y pads and similar.
 - Bowing: expression is interpreted as the displacement of the bow, the speed is proportional to the speed of the controller change. See also the "Bowing Sensitivity" parameter. Note: this gesture is not suitable for Breath and Wind Controllers. It is intended for pedals, wheels, ribbons, X-Y pads and similar.
- Bowing Sensitivity: when "Gesture Mode" is set to Bowing, this parameter controls how sensitive the bow speed is to the Expression changes.
- Bow Start:
[mapped to Key Switch F]
direction of the bow for staccato notes
 - Down Bow
 - Up Bow
- Keep Bow Direction:
[mapped to Key Switch G]
maintains the current bowing direction constant.
- Bow Lift:
[mapped to Key Switch E]
Selects the starting/ending state of the bow. Note: the "Bow Lift" parameter acts mainly on the release, stopping the vibration of the string when it is set to "On String". It also acts slightly on the attack, but if you want to obtain a scratchy sound you should act on the velocity and on the bow pressure.

- Off String: lift the bow away from the strings during release
- On String: leaves the bow on the string during release
- Tremolo:
[mapped to Key Switch G#]
 - Off: no tremolo.
 - Slow: slow tremolo.
 - Fast: fast tremolo (1.5 x slow tremolo rate).

Tremolo speed and behavior are controlled by the "Tremolo Min Speed" and "Tremolo Mode" parameters on the Play Modes / Right Hand section. A "manual" tremolo is possible using the Key Switch C# ("Manual Bowing: KeySwitch" parameter set to "Tremolo") or by holding Sustain ("Manual Bowing: Sustain+Note" set to "Tremolo").

Note: even if Gesture Mode is set to Bipolar mode, when Tremolo is active the Gesture Mode is forced to Expression, because the bow change is defined by the auto-tremolo algorithm.

- Tremolo Mode: selects the tremolo rate behavior, affected by "Tremolo Min Speed" value:
[mapped to Key Switch A]
 - Hz: the tremolo rate is not synchronized with the current project BPM. Rate is exactly equal to "Tremolo Min Speed" for "Slow" tremolo, or 1.5 times for "Fast" tremolo.
 - Sync: the tremolo rate is synchronized with the current project BPM, using a rate value that is just above "Tremolo Min Speed". Custom accents can be performed acting on the expression (expression "spikes" on the desired strokes).
 - Sync/Acc: the tremolo rate is synchronized with the current project BPM, using a rate value that is just above "Tremolo Min Speed"; an accent is performed every four or three strokes, depending on the selected note length (plain vs triplets).
- Tremolo Min Speed: speed of the tremolo for the "Slow" option (see the Tremolo multi-state button and KeySwitch). If the "Tremolo Mode" is set to "Hz", this value coincides with the "Slow" tremolo rate; the "Fast" tremolo rate is 1.5 times the "Slow" one. If the "Tremolo Mode" is set to "Sync" or "Sync/Acc", this value is a threshold: the tremolo is synchronized with current project BPM selecting a rate just greater than the threshold. The actual value of the tremolo rate is expressed as note

length (e.g. 1/8 means quavers, 1/8T means quaver triplets, 1/16 means semiquavers, 1/16T means semiquaver triplets, and so on). The "Fast" rate is just the shorter note length just below the "Slow" selected value (e.g. if "Slow" corresponds to 1/8T, "Fast" is 1/16).

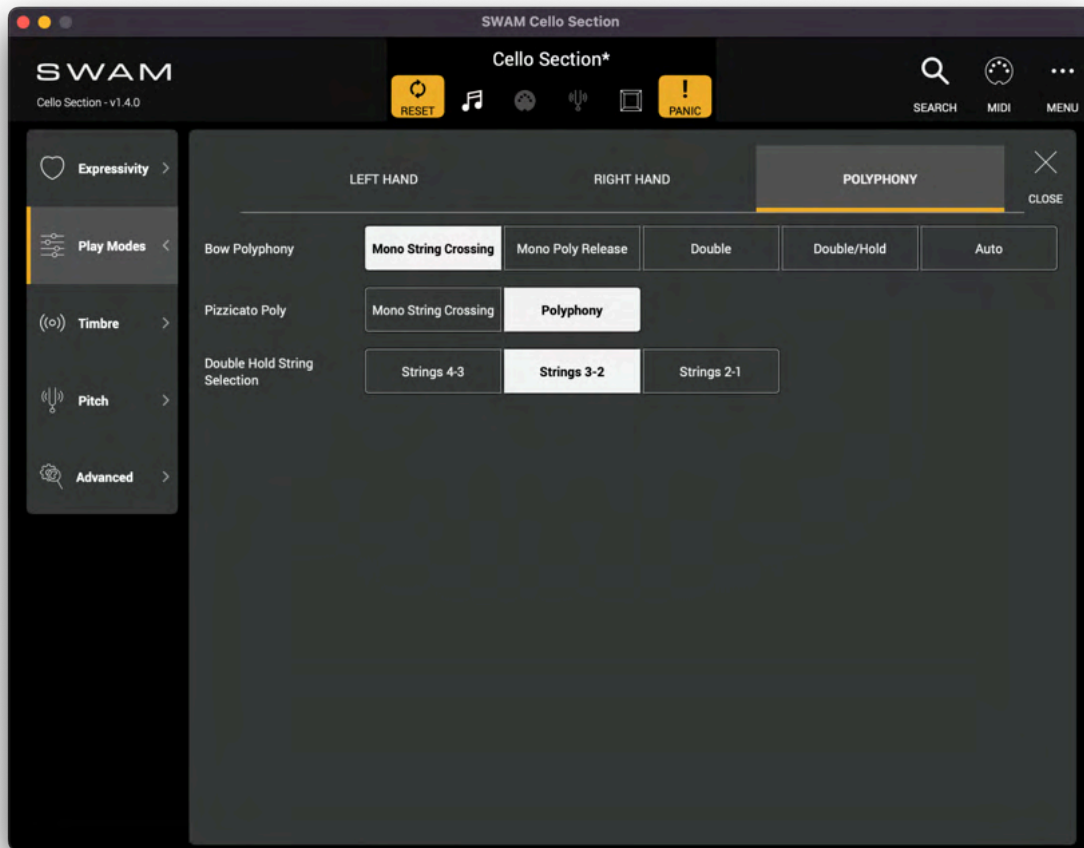
- Manual Bowing KeySwitch: sets the behavior for the C# Key Switch:
 - Tremolo: C# K.S. is set to "Manual Tremolo"; a bow change is performed on both Note-on and Note-off; the velocity of the Key Switch is ignored.
 - Bow Change: C# K.S. is set to "Bow Change", a bow change is performed just on Note-on; the velocity of the Key Switch influences the accent of the bow stroke.
- Manual Bowing Sustain+Note: sets the behavior of the Note-on / Note-off of the currently played note, when Sustain is active:
 - Tremolo: a bow change is performed on both Note-on and Note-off
 - Bow Change: a bow change is performed just on Note-on.

Polyphony

- Bow Polyphony (if Play Mode = Bow)

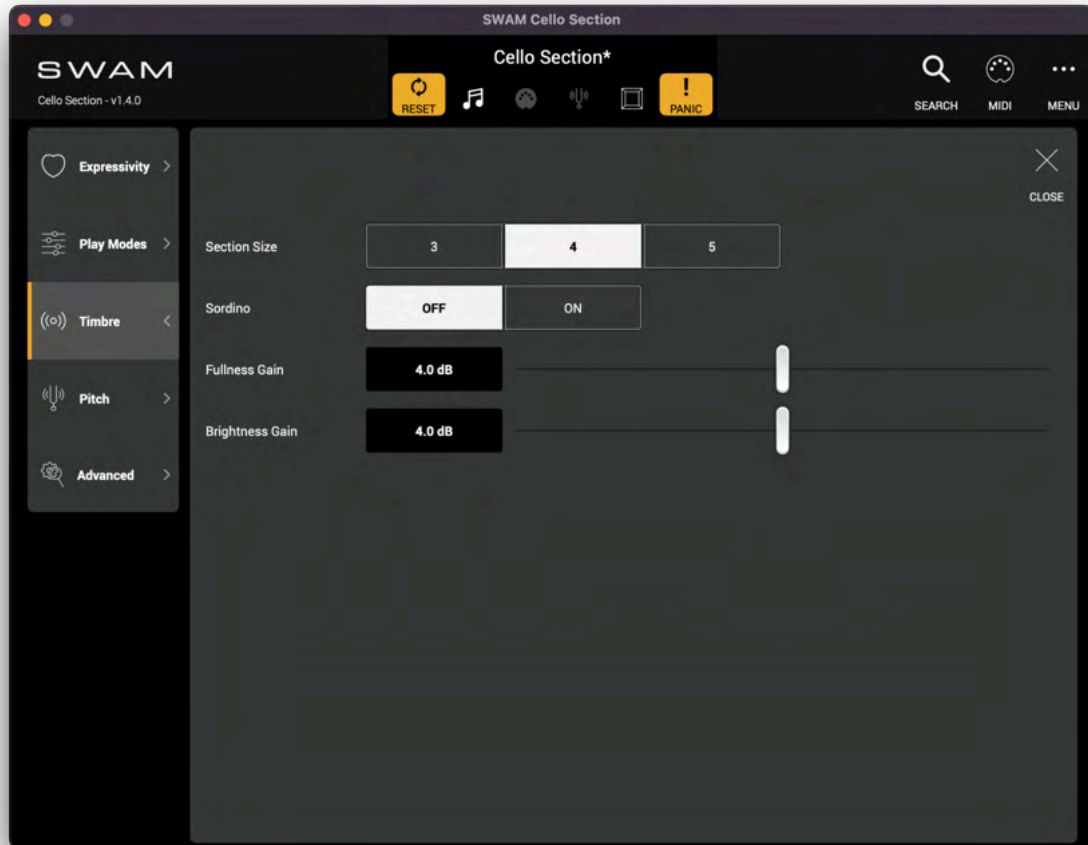
[mapped to Key Switches B+C, B+C#, B+D, B+D#, B+E]

 - Mono String Crossing [B+C]: the instrument is monophonic; legato/portamento is achieved by overlapping two notes. If the legato/portamento involves two adjacent strings, the release of the previous note is stopped in order to avoid a "bichord" during the transition, depending on the interval set with the "Mono CrossString Muting" option (see Play Modes page).
 - Mono Poly Release [B+C#]: the instrument is monophonic; legato/portamento is achieved by overlapping two notes. If the legato/portamento involves two adjacent strings, the release of the first note is not stopped during the legato transition.
 - Double [B+D]: two simultaneous notes can be performed; legato and portamento is not possible if playing overlapping notes. The two selected notes are always on adjacent strings. Priority: last pressed note.
 - Double/Hold [B+D#]: two simultaneous notes can be performed; legato and portamento is possible. The two selected notes are always on adjacent strings. Priority: oldest note. The preferred pair of strings is selected using "Double Hold String Selection".



- Auto [B+E]: two simultaneous initial notes can be performed; the first single note played turns the polyphony to Mono. Legato and portamento are also possible for two simultaneous notes. An additional latency is added at the attack in order to detect the double/mono mode. It is possible to change the detection time acting on the “Auto Poly Detection Time” parameter in the Advanced section.
- Pizzicato Poly (if Play Mode = Pizzicato)
[mapped to Key Switches B+F, B+G]
 - Mono String Crossing: the instrument is monophonic; legato/portamento is achieved by overlapping two notes. If the legato/portamento involves two adjacent strings, the release of the previous note is stopped in order to avoid a “bichord” during the transition, depending on the interval set with the “Mono CrossString Muting” option (see Play Modes page).
 - Polyphony: it’s possible to play multiple notes if they are distributed across different strings.

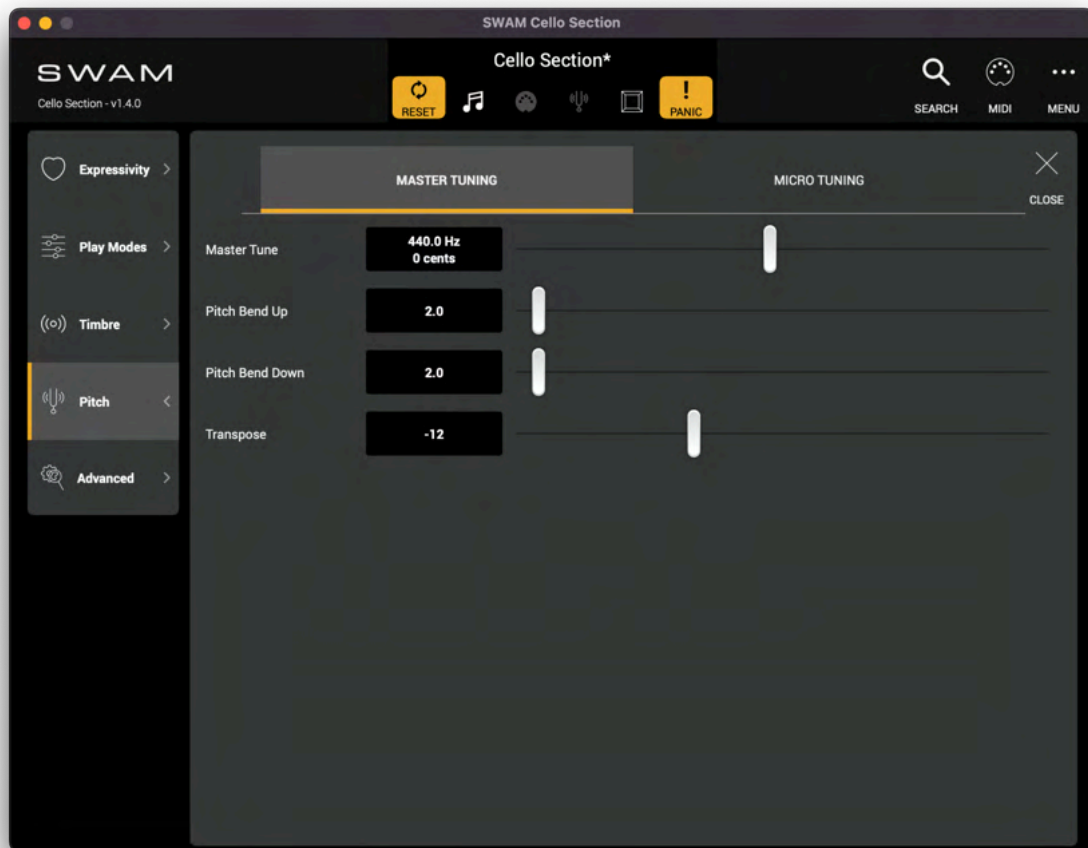
Timbre



- Section Size: select the number of the section players
- Sordino:
 - OFF: no mute applied
 - ON: a sordino is applied to obtain a muted sound
- Fullness Gain: boosts the low frequencies
- Brightness Gain: boosts the high frequencies

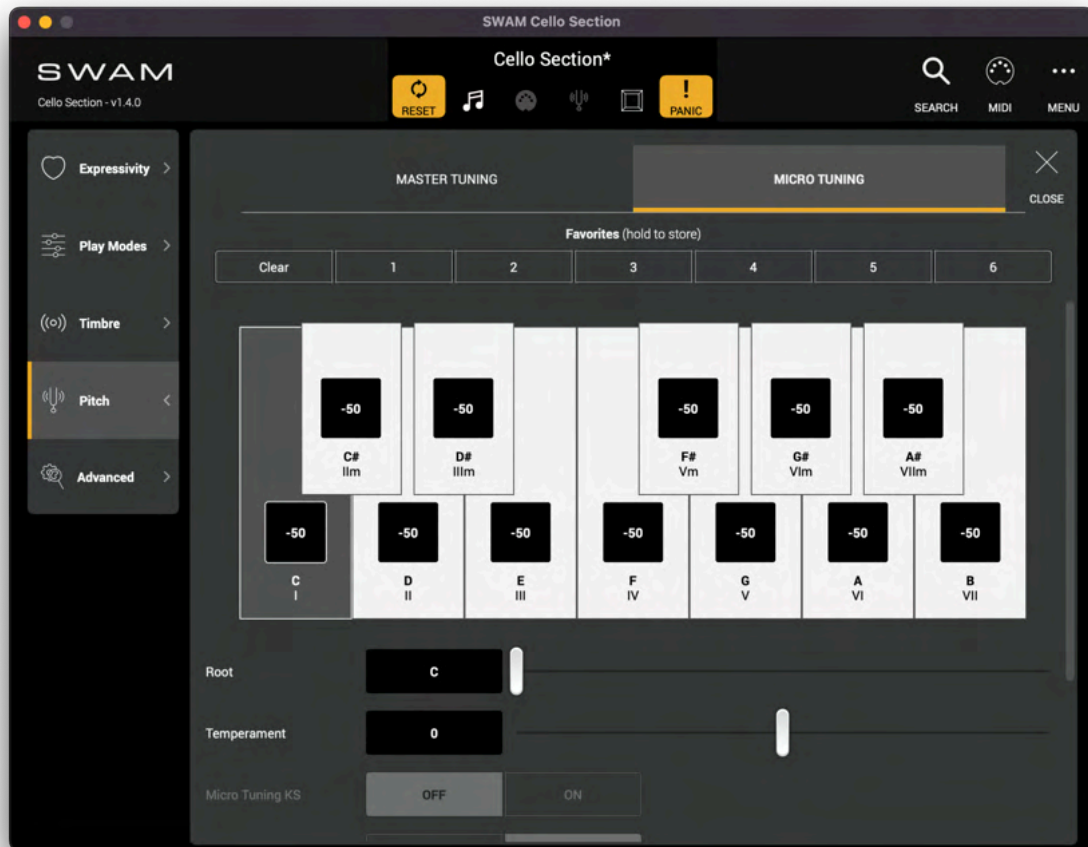
Pitch

Master Tuning



- Master Tune: master tuning of the instrument displayed both in *Hz* and *cents*.
- Pitch Bend Up: the maximum amount of upwards pitch bend, in *semitones*.
- Pitch Bend Down: the maximum amount of downwards pitch-bend, in *semitones*.
- Transpose: the amount to transpose the instrument, in *semitones*

Micro tuning



- Favorites: it's possible to store up to 7 different settings. Click and hold the preset slot to store the current configuration; click on any preset slot 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.
 - Edit: Click on the detune value to adjust. The value is presented in cents (hundredths of a semitone)
- Root: select the root note of Micro tuning scale

- Temperament: 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”

- Micro tuning KS (Key Switches):
 - OFF: disable key switches for micro tuning
 - ON: enable key switches for micro tuning
- Reset Micro tuning KS:
 - OFF Micro tuning KS activation does not reset or affect current detuning
 - ON: Micro tuning KS activation resets the detuning applied.
- Cavit Scale Ultimate (by Cavit Artanlar): enables the “SWAM Micro tuning” SysEx protocol, which allows “Cavit Scale Ultimate” iOS app to control micro tuning and transposition, and to apply musical nuances typical of Arabic and Eastern music.
- MAQAM (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 plug-in.
- MAQAM Transpose:
 - Note: control keyboard transpose
 - Root: control micro tuning transpose



Applying micro tuning through SysEx

It's possible to control Micro tuning and Transposition through MIDI SysEx messages. SWAM responds to a few SysEx protocols: [SWAM Micro tuning protocol](#), [Custom protocol](#) and [Yamaha XG arranger protocol](#).

SWAM Micro tuning protocol

Note: Be sure "Cavit Scale Ultimate" switch is set to ON in the Pitch / Micro tuning 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 (Micro tuning)
... - 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

Micro tuning (3 bytes):

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



Custom Protocol

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

1) Micro tuning 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 (values between 0x10 and 0x1F are allowed)
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)

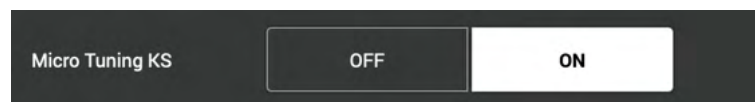
Examples:

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 micro tuning using key switches

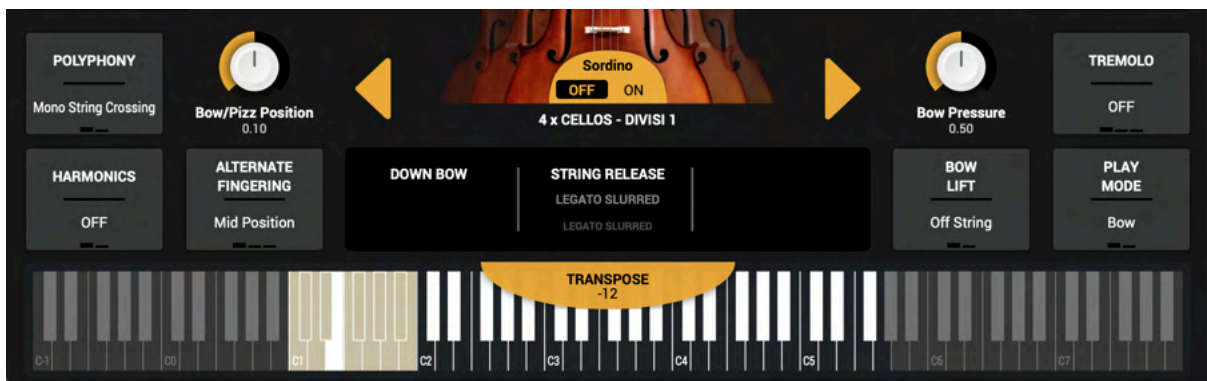
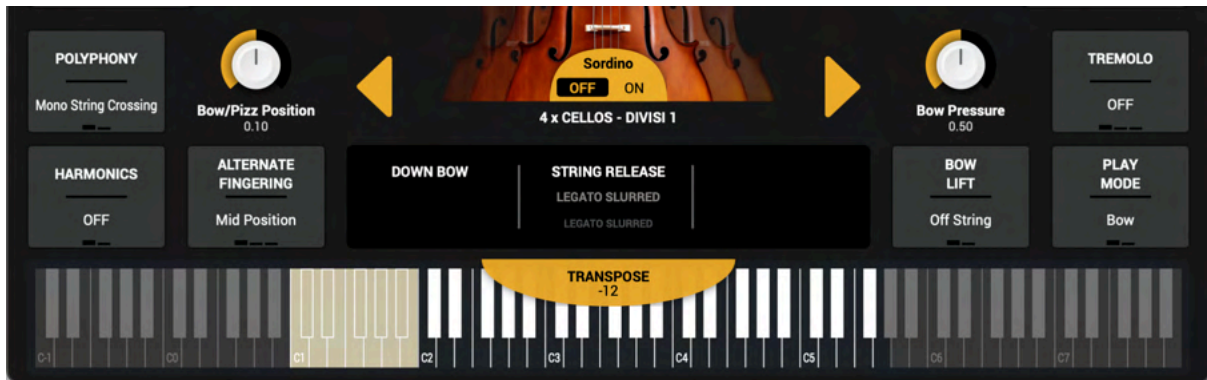
You can also apply micro tuning to notes using key switches. To do this you must first go to Advanced -> MIDI and enable the key switches using the "KS Octave" parameter.

Then go to Pitch -> MICRO TUNING and set the "Micro tuning 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 "Micro tuning 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.



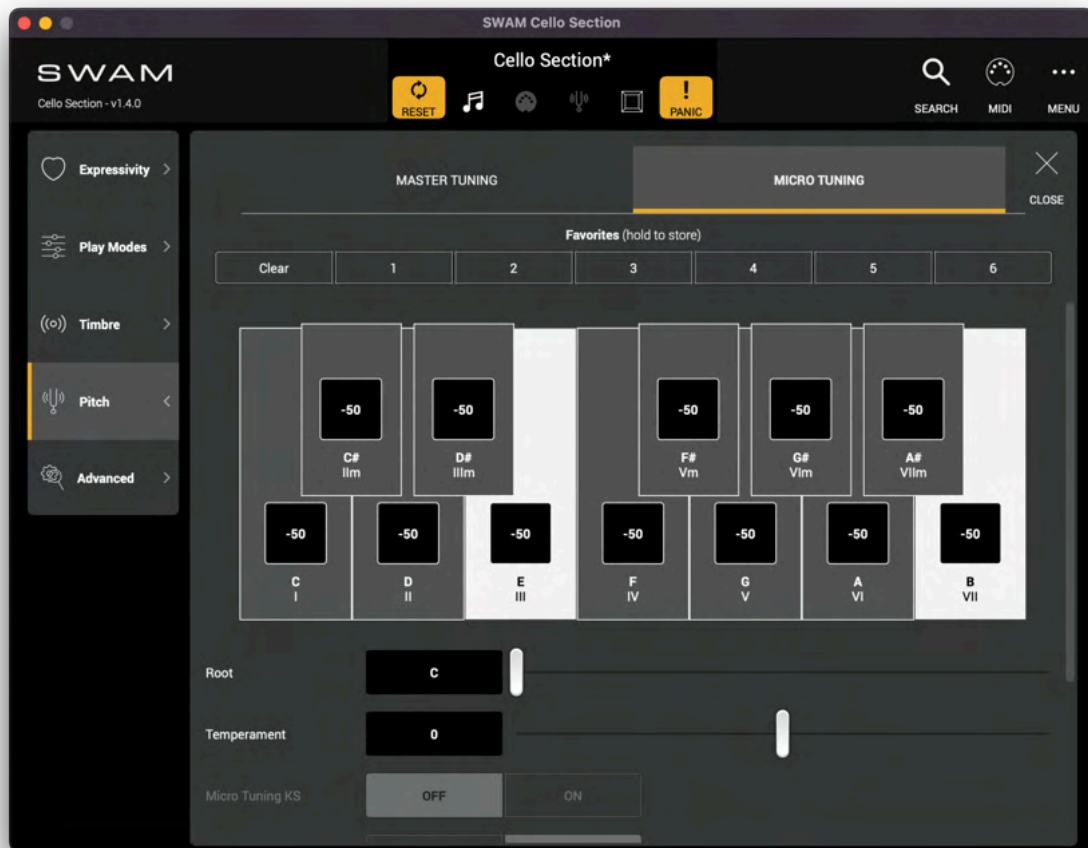
How to detune selected notes

1. Set the "Micro tuning 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 Micro tuning 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 Micro tuning KS" parameter is ON, as soon as you re-enable Micro tuning 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 micro tuning scales on the fly.

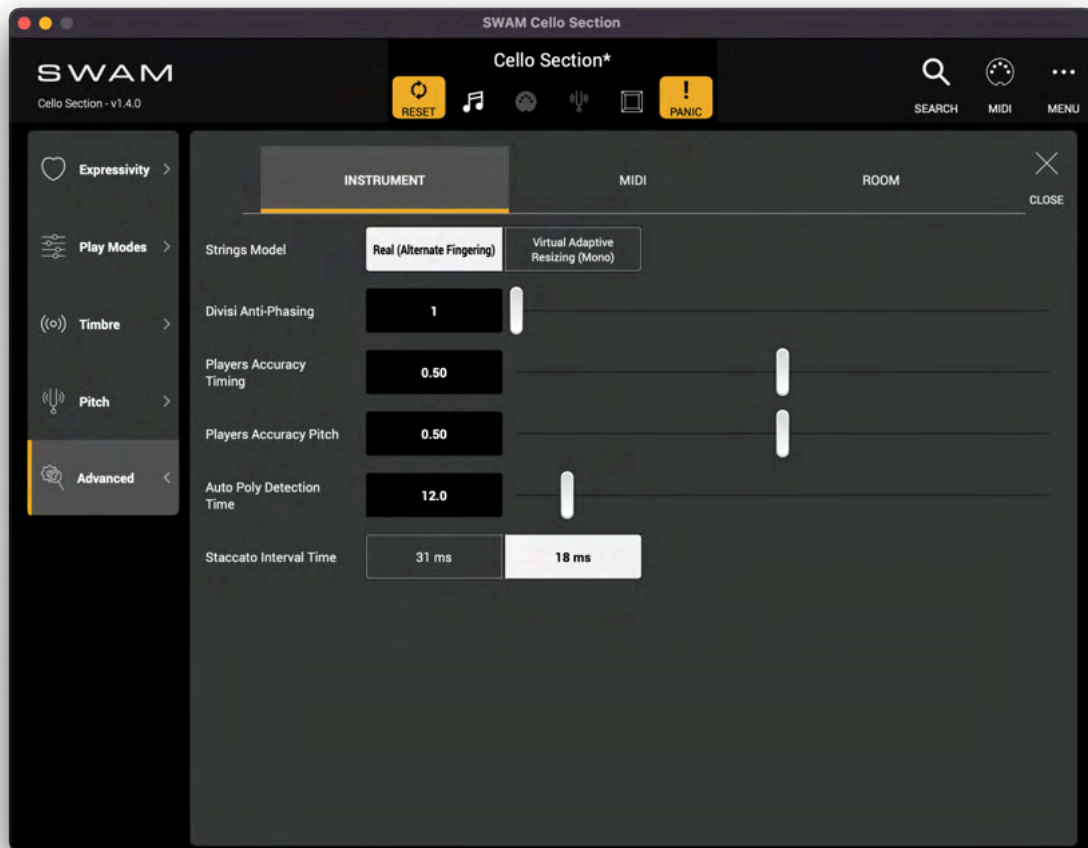
If you don't want to reset the micro tuning every time you re-enable Micro tuning KS set "Reset Micro tuning KS" parameter to OFF.

Micro tuning Templates

From the Main "... Menu and Preset Manager it is possible to Save and Recall Micro tuning Templates. A list of Factory Micro tuning Templates is provided.

Advanced

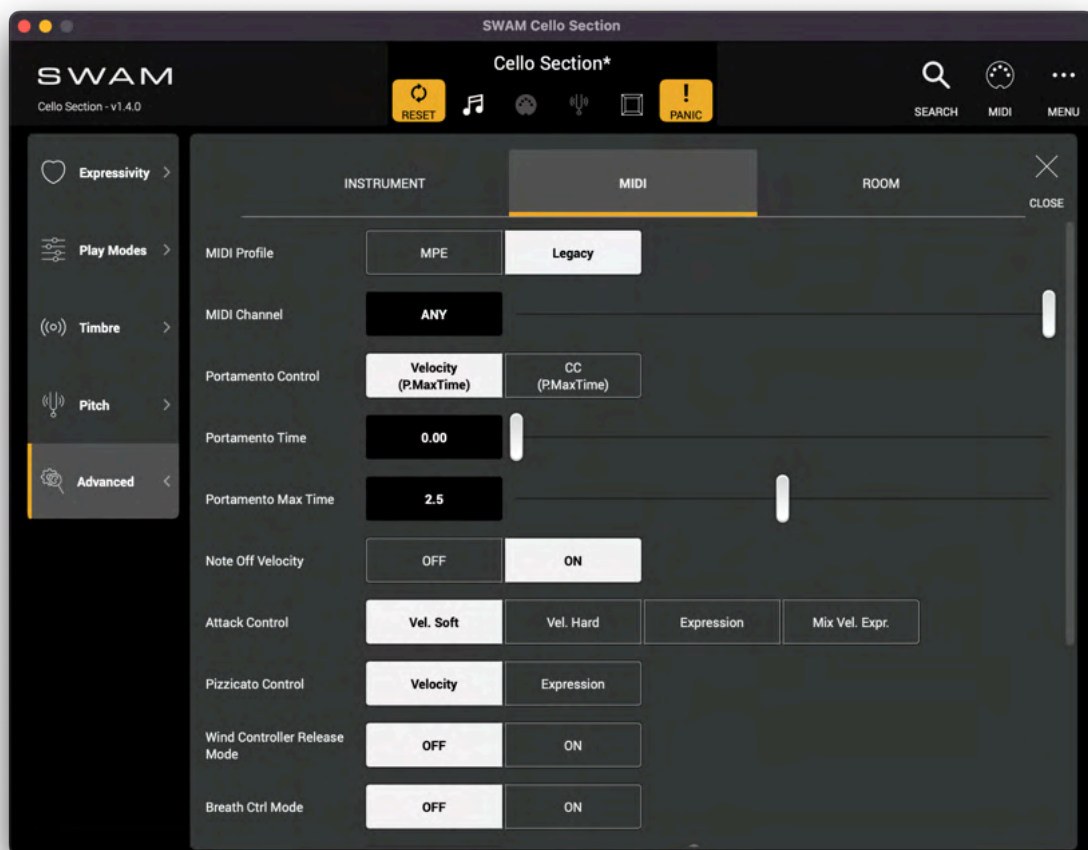
INSTRUMENT



- String Model
 - Real (Alternate Fingering): the model emulates a section of instruments with four strings with fixed thickness and tension.
 - Virtual Adaptive Resizing (Mono): the model emulates a section of instruments with just a single string that ideally has different thickness and tension, depending on the actual played note. This way is possible to bend up from the lowest note to the highest one with no jumps: set Pitch Bend range to 48 semitones, play the lowest note, and move the Pitch Bend all the way up.
Since the instrument has just one string, polyphony is not possible (all parameters related to "Polyphony" are disabled).

- Divisi Anti-Phasing: when placing multiple instances of the same section in the virtual room, it's highly recommended to select a different "Divisi Anti-Phasing" number to avoid phasing artifacts. The selection is normally managed automatically by the system, but under some circumstances it can happen that multiple sections have the same number; in that case, a warning message is shown. Please assign a different number manually from this screen.
- Players Accuracy Timing: controls the timing precision of the virtual musicians within the same section.
- Players Accuracy Pitch: controls the pitch precision of the virtual musicians within the same section.
- Staccato Interval Time: minimum time separation between a note-off event and a consequent note-on event to be interpreted as "staccato" articulation. 18 ms is suitable for fast staccato notes, but higher execution precision is required.

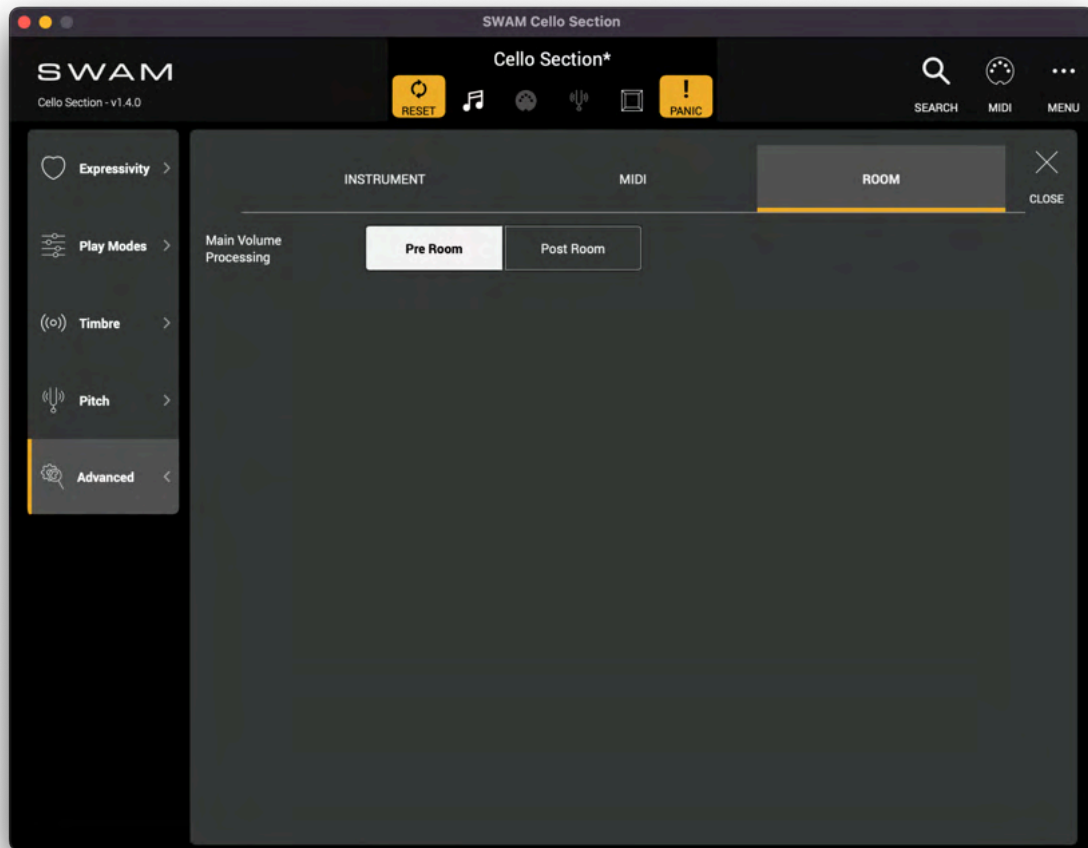
MIDI



- MIDI Profile:
 - MPE: for MIDI Polyphonic Expression compatible devices.
 - Legacy: MIDI 1.0 devices.
- MIDI Channel: the MIDI channel the sound generator receives notes and controllers that affect the sound (default is ANY). Note that this can be different from Key Switches MIDI Channel, so it is possible to control Key Switches from a different device on a different Channel. 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 Time: midi CC control for the portamento time, in relation to the max portamento time.
- Portamento Max Time: controls the maximum portamento time. Set it to OFF to disable portamento (no portamento when this value is < 1.1).
- 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. Soft - controlled weakly by the Note On velocity.
 - Vel. Hard - controlled strongly by the Note On velocity.
 - Expression - controlled by the shape of expression control.
 - Mix Vel. Expr. - controlled by both the velocity and the initial expression.
- Pizzicato Control:
 - Velocity: control pizzicato play mode through velocity.
 - Expression: control pizzicato play mode through expression.
- Wind Controller Release Mode: useful especially for handling Wind Controllers, as they send Note Off events when Expression reaches the minimum value.

- Breath Ctrl Mode (Breath Control Mode):
 - OFF: disabled.
 - ON: suitable for Breath Controllers. When Play Mode is set to Bow, allows the player to produce another note attack, using the breath envelope, while holding a note.
- Breath Ctrl Hi-Res Threshold: (Breath Control Hi-Resolution Threshold) set the threshold for the Note On to be triggered when using MIDI Hi-Resolution messages for the Expression parameter, when Breath Control Mode is ON.
- Breath Ctrl Attack Sens.: (Breath Control Attack Sensitivity) controls the sensitivity of the Note On attack strength for notes triggered in Breath Control Mode.
- KS MIDI Channel (Key Switches MIDI Channel): select which MIDI channel will be used to receive key switch information. Select from channel 1 to 16 or ANY.
- KS Octave (Key Switches Octave Transpose): allows you to transpose the Key Switches to begin in the octave from C-1 to C2, or turn off key switches (OFF).
- KS Velocity Remap (Key Switches Velocity Remapping): since some Key Switches are velocity-dependent, this parameter controls the distribution of the thresholds between states.

ROOM



- Main Volume Processing:
 - Pre Room: the volume control is applied to the sound source, but not to the virtual room. This ensures that reverb is not affected by eventual volume automation.
 - Post Room: the volume control is applied to the sound signal after the virtual room processing. In case of volume control, reverb is also affected.

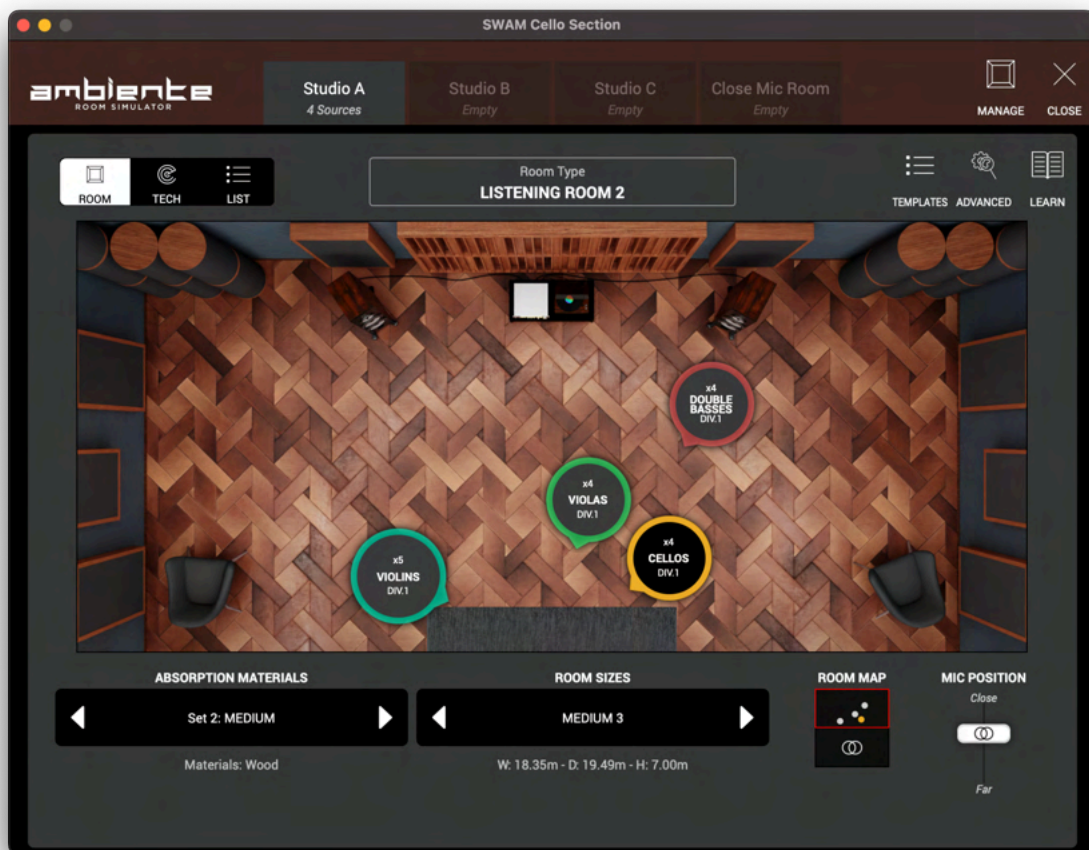
Room & Position

All SWAM instruments now come equipped with the revolutionary Ambiente room simulator. This significant evolution allows SWAM instruments to "talk" to each other and share the same virtual room. Unlike a simple reverb, Ambiente is a sophisticated spatializer that lets you place instruments in specific locations within a virtual space.

With Ambiente, you can utilize up to four distinct rooms simultaneously. Three of these rooms are fully customizable, allowing you to choose room size, materials, and microphone

distance. The fourth room is designed for close-miking all sources, enabling seamless integration with third-party spatializers or external reverbs.

Each SWAM instance communicates with others, sharing room and instrument position information. This means you can manage this functionality from any SWAM instrument without opening each one individually. Communication is handled through a local network protocol, so no internet connection is required, but certain technical requirements must be met. For more details, please refer to the [Global Settings](#) paragraph.



Using the Ambiente room simulator

Overview of the Interface

In the Ambiente room simulator, you will find four tabs at the top of the interface representing the four available rooms. The first three tabs correspond to the customizable rooms, while the last tab represents the "Close Mic" room. To select a room, simply click on the corresponding tab.

Header Controls

In the header, at the top right corner, there are two important buttons:

- **Manage:** This button allows you to manage the current room, including renaming the room and moving instruments to this or other rooms.
- **Advanced:** reveals additional room customization options.
- **Close:** This button closes the room simulator and returns you to the main instrument view.

Options in the Advanced page

- **Reverb Modulation:** when set to ON, reverb has a lush, silky sound, but it requires more CPU power.
- **Source Delay Mode:** in real acoustic environments sound travels at a given speed, so there is a latency between the sound generation time and the time the sound signal is captured by the microphone (or listener's ears). This applies also to the traveling time of the sound waves reflected by the room surfaces.
Source Delay Mode controls how the sound traveling time is computed.
 - **No Delay:** to avoid extra latency when playing the section in real-time, direct sound traveling time is ignored. Traveling time of the reflected waves is computed subtracting the direct wave traveling time.
 - **Real Delay:** direct sound traveling time is not ignored, behaving like in the real acoustic environment. This can lead to latency, when playing the instrument in real-time.
 - **Nearest:** direct sound traveling time is ignored for the section closest to the microphone only. All other sound wave traveling latencies are computed accordingly.

Main Screen Views

The main screen offers three views for managing your instruments:

- **Room View:** This graphical interface represents the room as viewed from above. You can drag and drop instruments to position them within the space.
- **Tech View:** For precise positioning, Tech View shows scaled dimensions, allowing for accurate placement and size visualization. Room dimensions and heights are displayed, with concentric guides marking distances from the room center. The dashed area indicates allowable source placement. Vertical scrolling is available via buttons on the right side, while microphone positioning is controlled from the bottom.
- **List View:** This list-based interface allows for easier management of instrument positions, particularly useful for screen reader users.

Room Type Selector and Room Customization

Above the main view, you will find the Room Type selector, which lets you choose from up to 18 different room types. These types are derived from combinations of parameters such as absorption materials and room size, which can be adjusted in the lower section of the interface.

Room Map and Microphone Distance

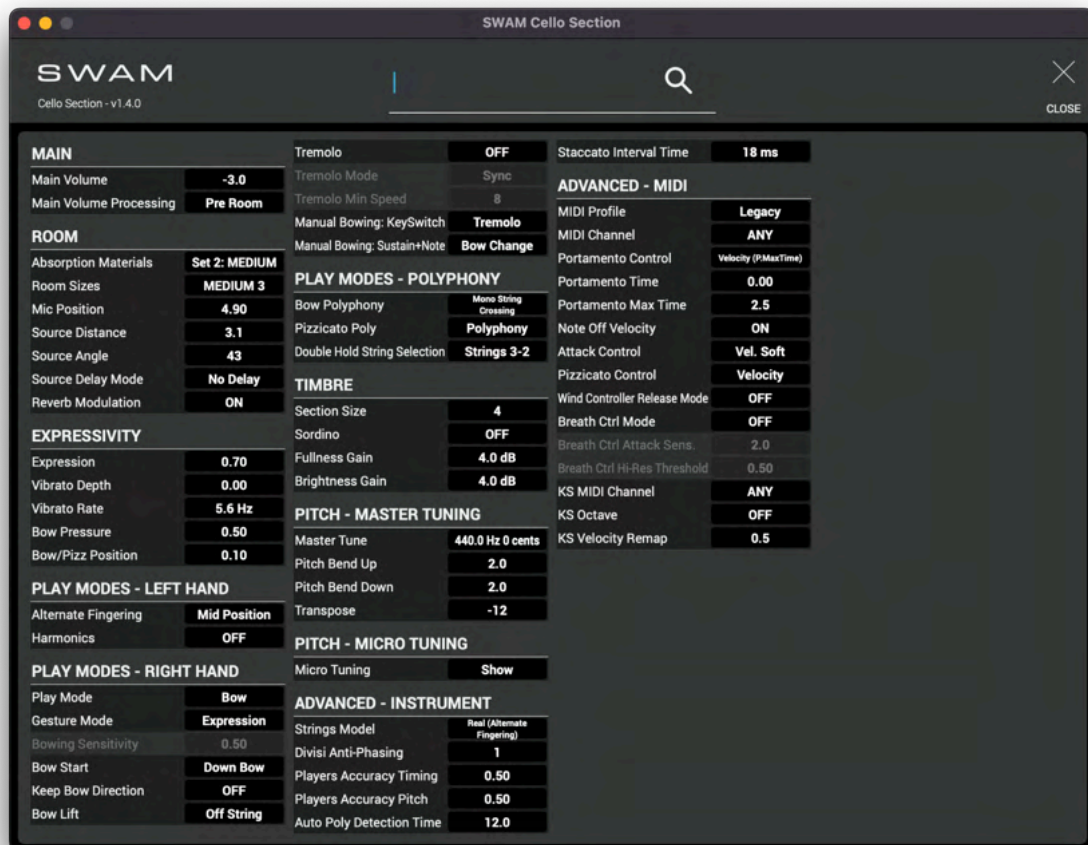
In the lower section, you'll find the room map, a small representation of the room showing the distance from the stereo recording microphone. You can adjust the microphone distance using the fader located to the right of the room map.

Templates Shortcut

A shortcut to the Templates section is available for quickly loading preset room and microphone configurations, whether they are Factory presets or user-defined settings.

With these features, the Ambiente room simulator provides a powerful and flexible environment for positioning your instruments, enhancing your workflow, and unleashing your creativity.

Search



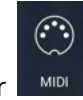
The Search view has been created to improve the experience to beginners, experts and visually impaired users. . Beginners can find any parameter by a handy search feature without the need to browse all sections. For expert users, it offers a streamlined page where all parameters can be easily located, viewed and compared, to have the big picture of the sound engine. Simultaneously, it is designed to be accessible, compatible with screen readers, facilitating seamless navigation for users who are blind or visually impaired.

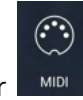
The "Search Parameter" field allows users to highlight only those parameters containing the entered text. This feature ensures that, when using a screen reader, only the relevant parameters are vocalized by the text-to-speech synthesis.

Start typing in the search field, and matching results will be highlighted. Clicking or tapping on a parameter will open a popup window with the edit controls.

Controller Mapping

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



To access this page, click on the MIDI mapping icon in the header , or from the Main Menu -> Controller Mapping -> Assign & Learn. By default, the "ASSIGN" mode is selected.

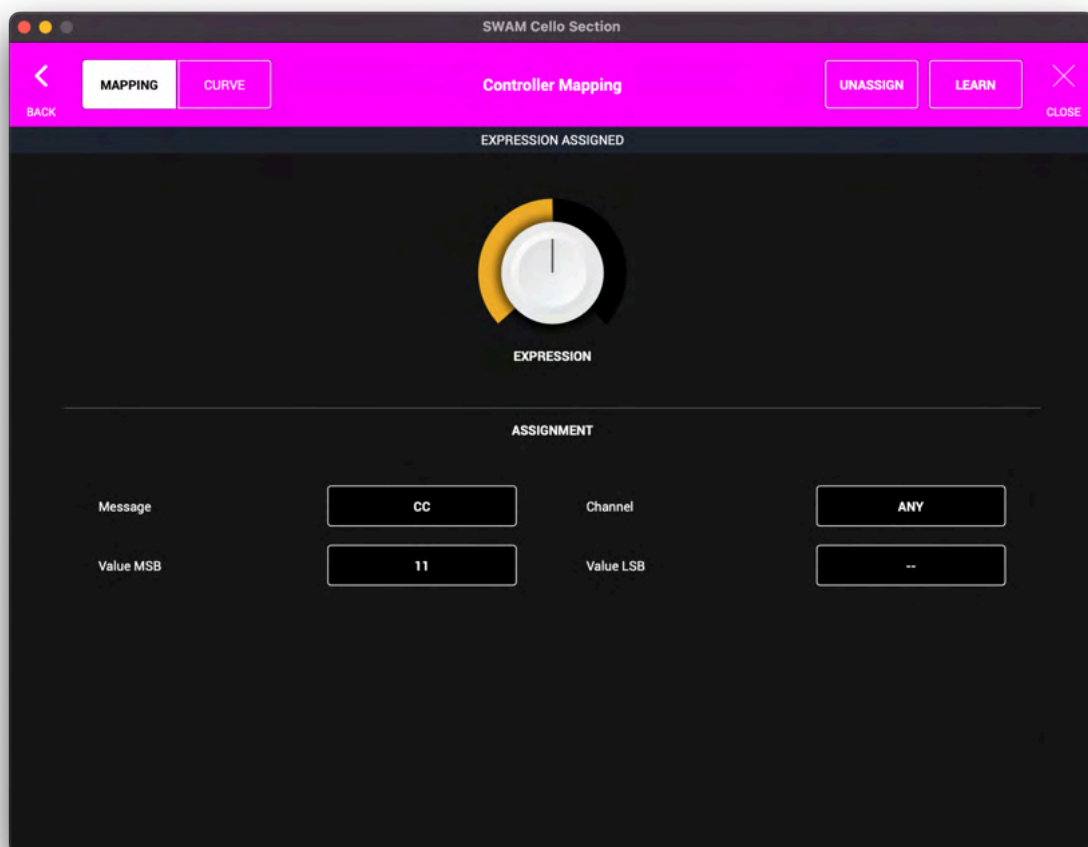


In this view/context, the parameters assigned to a controller are highlighted with a purple area with dashed borders; parameters which are not assigned are highlighted with a green area. Parameters not highlighted are not available for mapping. It is possible to browse the entire interface in this mode to select and manage any parameter for mapping.

- To map or edit a parameter mapping, click directly on the parameter to access the [mapping screen](#) for that parameter.
- Click on the “[TABLE](#)” button in the top header to view the list of all parameters, their mapping status and to manage the sound engine parameters that have a direct effect on playability results with different controller types.
- Click on “[Templates](#)” for quickly loading MIDI Controller presets and configurations, whether they are Factory presets or user-defined settings.
- Click on the “X” button in the top header to exit from Controller Mapping mode.

Mapping Screen

Assigned parameter status



- Back: goes back to the previous screen
- CURVE: show the MIDI remapping curve for the selected mapping

- UNASSIGN: removes the current mapping and goes back to MIDI Learn mode
- LEARN: turns ON/OFF the MIDI LEARN to edit or remap the current parameter.
- X / Close: close the mapping screen and turn off the MIDI Mapping Mode.
- ASSIGNMENT section:
 - Message: MIDI message type:
 - CC: Control Change (1 byte value).
 - CC-HIRES: two coupled Control Change messages, MSB and LSB.
 - After Touch: Channel Pressure or AfterTouch messages (1 byte value).
 - NRPN: Non-Registered Parameter Number (CC99, CC98).
 - Channel: determines what MIDI channel this controller will be affected by, from 1 to 16, or ANY.
 - 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's 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 7-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 depressed. This pressure information, commonly called "Aftertouch", may be used to control some aspects of the sound produced by a synthesizer or software*

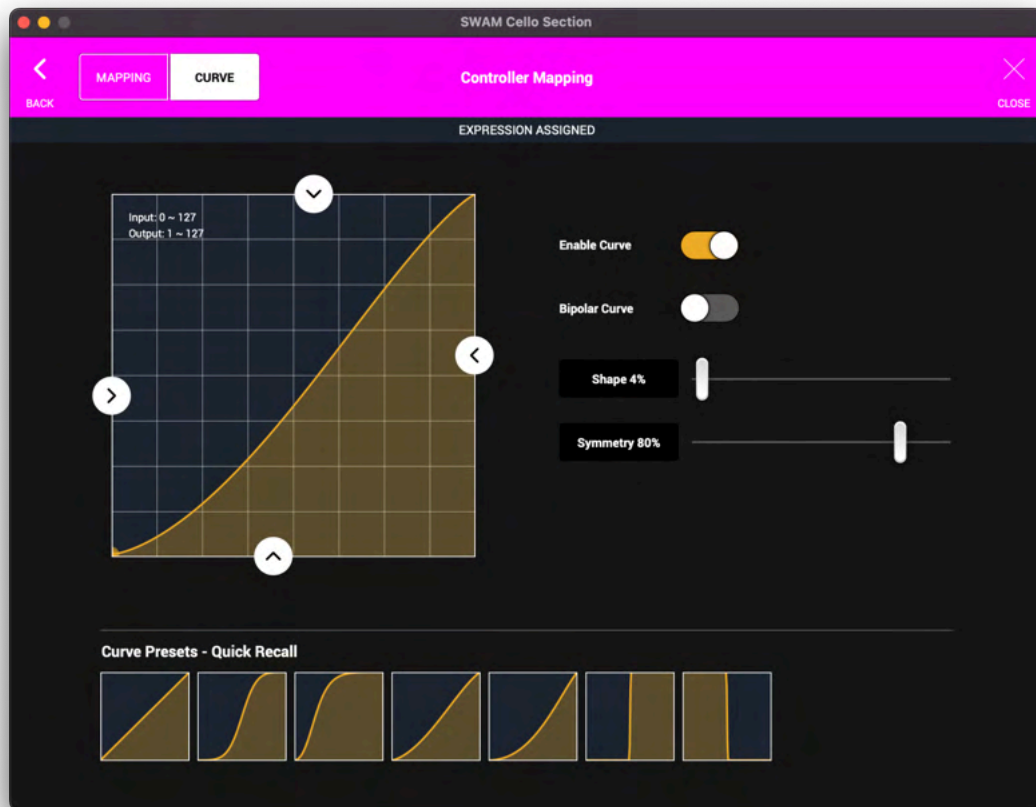
instrument. AT is a standard 7-bit MIDI message, allowing a total of 128 values of resolution.

- *CC-HIRES messages are a combination of two CC messages coupled together, thus providing a resolution of 14-bit, i.e. 16384 levels, for the representation of 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, providing a resolution of 14-bit, i.e. 16384 levels, for the representation of values.*
- *MSB means "Most Significant Byte". For CC messages, it is the only byte representing the control value. For CC-HIRES and NRPN messages, it is the most significant part of the two-byte message.*
- *LSB means "Least Significant Byte" and is only for CC-HIRES and NRPN messages. It is the least significant part 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. The curve can be used to adjust the controller-to-parameter behavior with:
 - **Input Min** (left arrow): the minimum threshold on the controller input value. Values below this value will produce the "Out Min" value (or the "Out Max" value, if the curve is "inverted").
 - **Input Max** (right arrow): the maximum threshold on the controller input value. Values above this value will produce the "Out Max" value (or the "Out Min" value, if the curve is "inverted").
 - **Output Min** (bottom arrow): the minimum output value.
 - **Output Max** (upper arrow): the maximum output value.
 - **Enable Curve**: turn on / off the remapping function.
 - **Bipolar Curve**: useful for "bipolar" controls, i.e. where 64 is considered the "zero" of the controller. The parameters of the remapping curve are referred to just one side and then applied to the "negative", antisymmetric side. Bipolar Curve is mandatory for the Expression parameter in case "Bipolar" is selected for the "Gesture Mode" parameter.

- Shape: controls the shape of the remapping curve (be aware, small changes can produce high variations, depending on the Symmetry parameter).
- Symmetry: controls the symmetry of the remapping curve shape.



Important note for Expression remapping

“Pianissimo” dynamics are faithfully modeled. An important thing to note is that in real life it’s impossible to fade from/to nothing. There is always a small gap between silence and the sound generation.

For this reason, in SWAM String Sections there are four “pianissimo” conditions, depending on the minimum MIDI value of Expression (when the remapping curve is disabled or linear):

- Expression value = 0 or 1: bow speed is so low that friction makes the bow stop. No sound is produced.
- Expression value = 2: bow speed is still slow, but the string can barely vibrate. A scratchy sound is produced.
- Expression value = 3: bow speed overcomes the bow/string friction. A clean sound is produced.

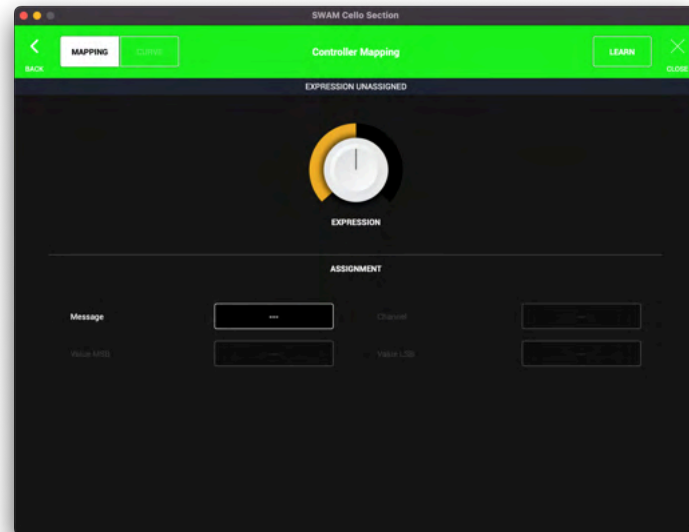
With this in mind, it’s possible to act on the minimum value of the remapping curve to set the desired behavior when the input MIDI value for the Expression parameter is zero. Each curve has a different function, so be sure the output expression value reflects your desired result. As an example, check the the following minimum value (bottom handle) given for a linear remapping curve:

- 1) value = 3: clean pianissimo sound, bow doesn’t stop;
- 2) value = 2: scratchy sound. This value should be used for transitions from / to zero only (i.e. we recommend to avoid setting the minimum remapping value to 2);
- 3) value = 1: sound produced when the Expression value increases and exceeds 2; sound stops when the Expression value decreases below 1;
- 4) value = 0: sound produced when the Expression value increases and exceeds 3; sound stops when the Expression value decreases below 2;



Unassigned parameter status

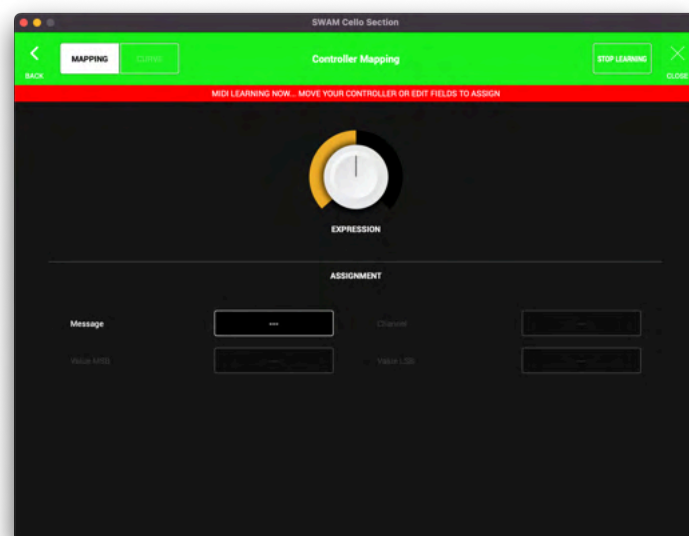
Any click on an unassigned parameter goes to this screen.



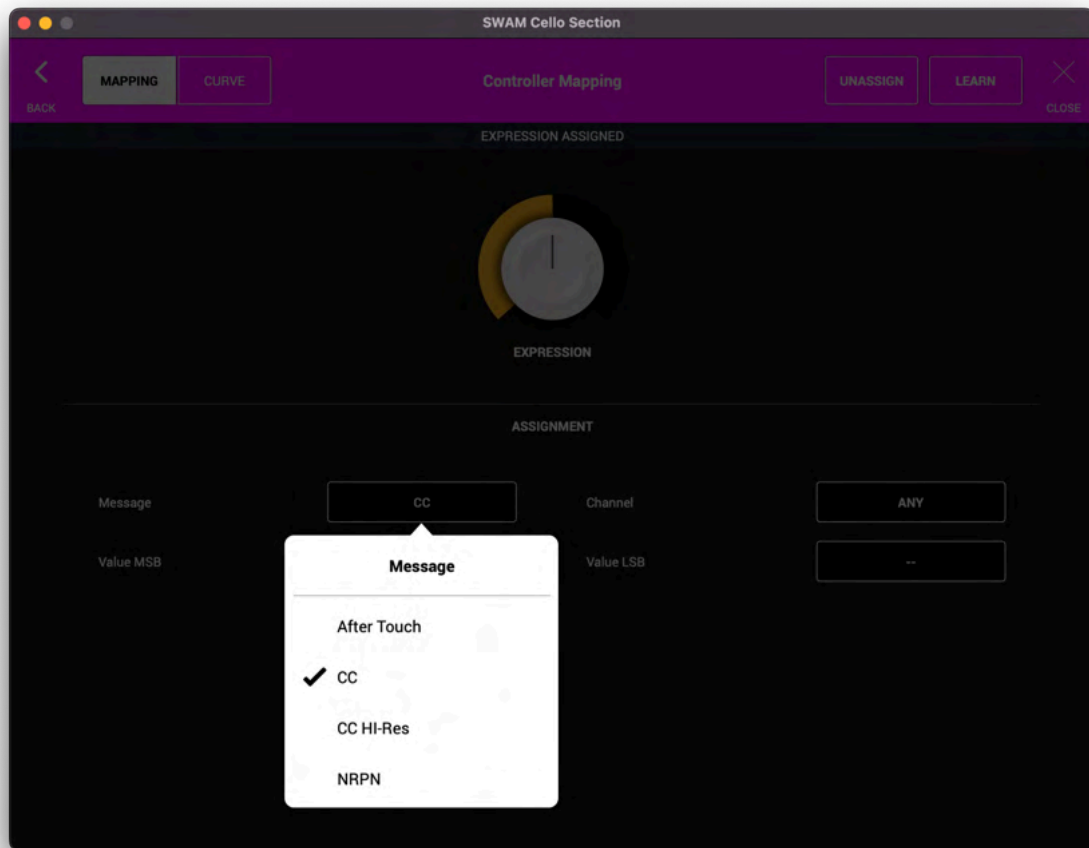
MIDI Learn

If "LEARN" is active, SWAM automatically listens for MIDI input messages while in LEARN MODE. Move the controller you want to connect to automatically complete the mapping.

The area "Controlled by" will be automatically filled in by MIDI Learn but can still be edited by manual input as well.



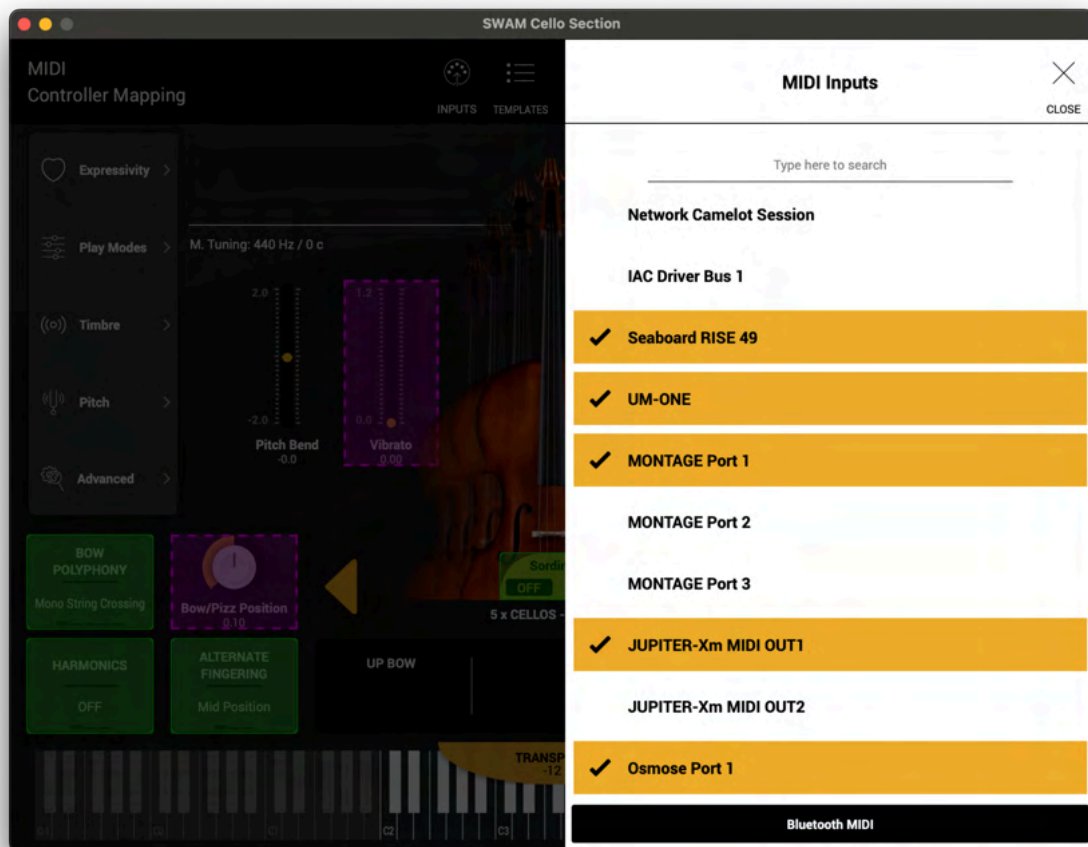
The list of values of the “Message” parameter can be accessed with a long press gesture (click & hold).



MIDI Inputs quick access

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


MIDI Mapping  by clicking on the “INPUTS” icon 

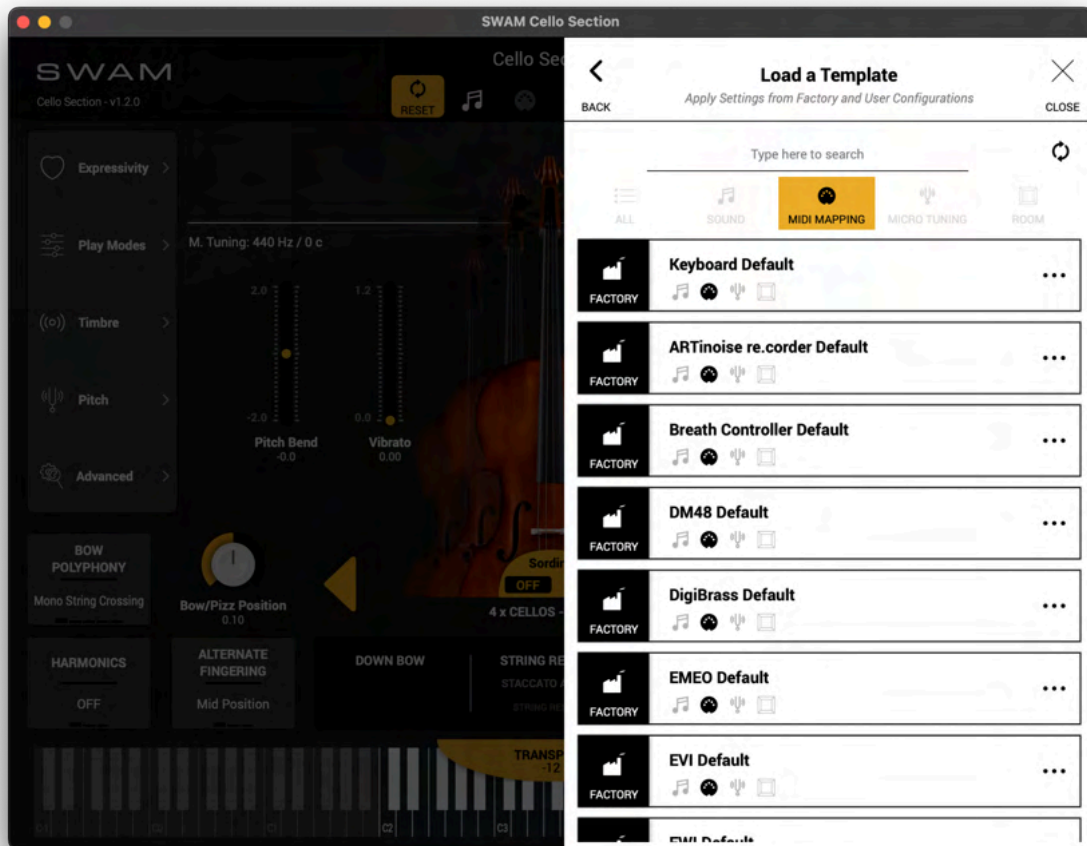


Note: the MIDI Inputs panel shows up automatically at startup, if no MIDI Input has been selected before or if any previous connection has not been found.

MIDI Mapping Templates

It's possible to recall a predefined set of both pre-defined assignments for well known MIDI

Controllers and User MIDI assignments through the TEMPLATES icon .



These entries allow us to recall predefined sets of assignments without impacting on the Sound parameters. This is useful when switching between different physical MIDI controllers without losing the timbre and sound behavior obtained acting on the Sound parameters.

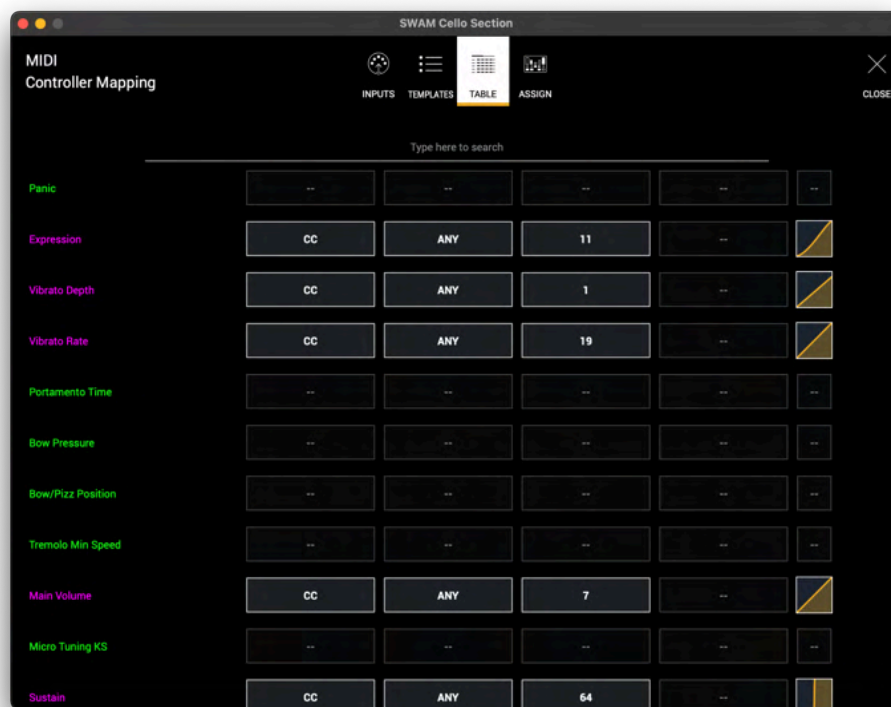
A list of Factory Templates for the most known MIDI controllers is provided.

MIDI Mapping Table

The “MIDI Mapping Table”, available clicking on the MIDI mapping icon in the header

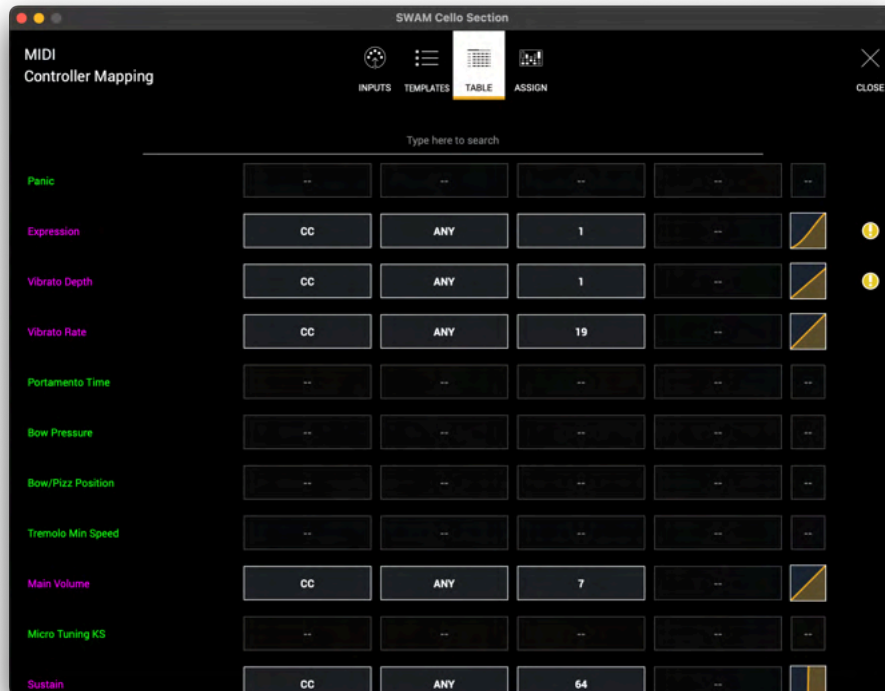
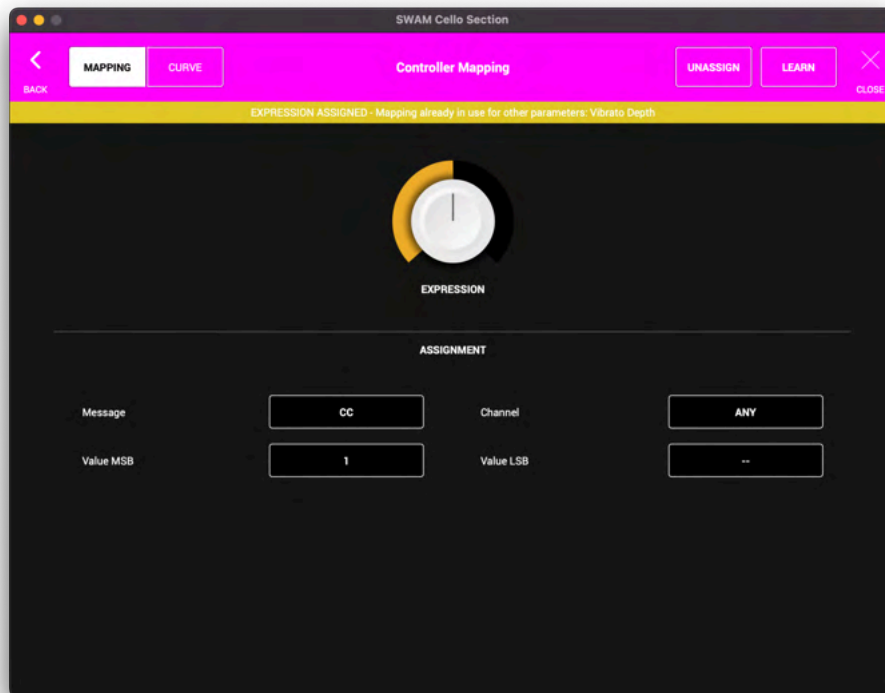


, or from the Main Menu -> Controller Mapping -> MIDI Mapping & Quick Reset, screen recaps all the mapping settings, providing the big picture of all mappings.

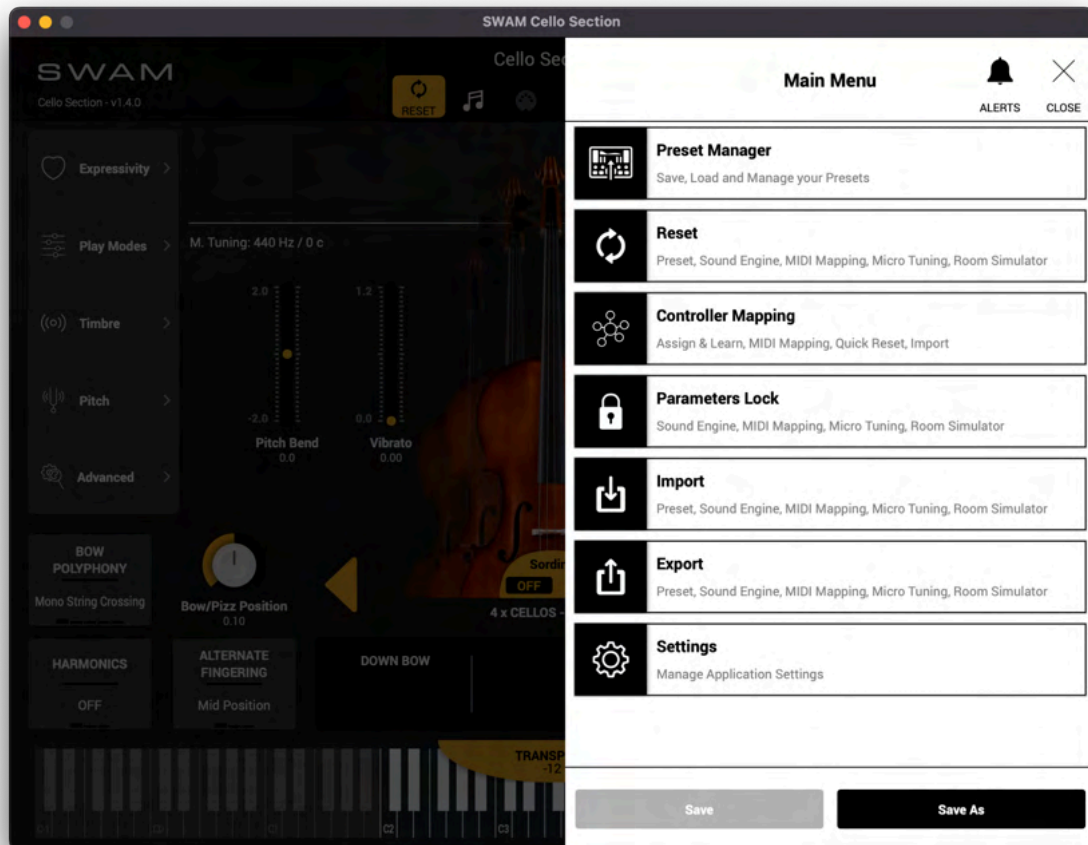


This is the list of all the parameters that can be mapped individually by the process described above. Click on any row to create a new assignment, or to edit an existing assignment.

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 Table 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



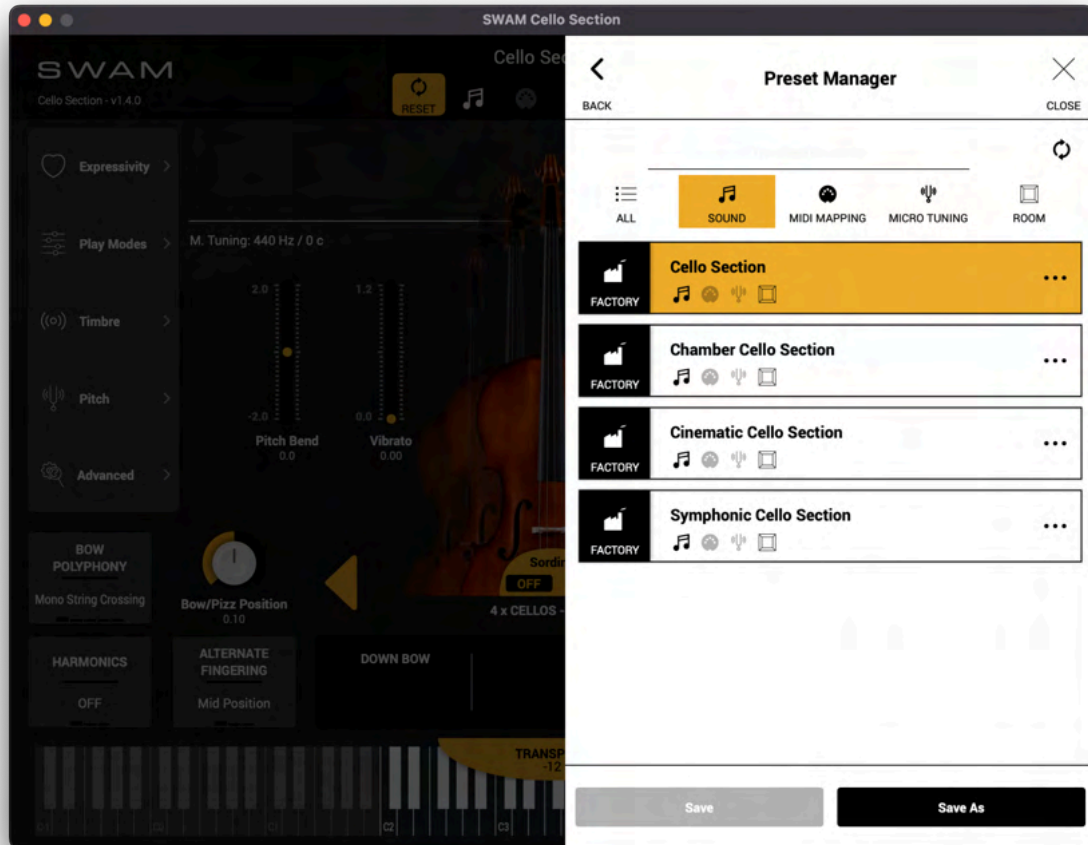
The Main Menu is available when clicking on the top-right  icon.

- Preset Manager: open the Preset Management window.
- Reset:
 - Initialize: reset the instrument and return to its initial state; this includes sound engine, MIDI mapping, micro tuning and room
 - Advanced:
 - Reload “current preset”: reload the current selected preset, losing all changes made from the latest
 - Sound Engine: reset or load sound engine parameters

- MIDI Mapping: reset or load MIDI mapping settings
- Micro Tuning: reset or load micro tuning settings
- Room Simulator: reset or load room simulator parameters
- Section Position: reset to the default section position
- Controller Mapping:
 - Assign & Learn: open MIDI mapping management section
 - MIDI Mapping & Quick Reset: open MIDI parameters list & Quick Reset
 - Import: controller mapping from file
- Parameter Lock:
 - Sound Engine Parameters: freeze the sound when browsing your Presets
 - External Controller Mapping: keep the same MIDI Controller Mapping with different Presets
 - Micro Tuning Settings: keep the same micro tuning settings with different Presets
 - Room Simulator Settings: keep the same room simulator settings with different Presets
- Import:
 - Preset: load whole *.swam* preset file
 - Sound Engine Parameters: load a sound settings
 - MIDI Mapping: load MIDI mapping settings
 - Micro Tuning: load micro tuning settings
 - Room Simulator: load room simulator settings
- Export:
 - Preset: save the current instrument state as a *.swam* preset file
 - Sound Engine Parameters: save only sound engine parameters settings
 - MIDI Mapping: save only external controller settings

- Micro Tuning: save only micro tuning settings
- Room Simulator: save only room simulator settings
- 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).
 - Options: shows a list of global settings for the application or plugin
 - Accessibility: Settings and Keyboard Shortcuts
 - Window Size: show a small popup window that allows to set 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, access to the online resources and show the Credits

Preset Management



SWAM presets are organized into four groups of parameters and settings: Sounds, MIDI Mapping, Micro Tuning, and Room. A preset is a container that can store different types of data, specifically:

- Sounds: parameters of the sound engine.
- MIDI Mapping: how parameters are mapped through MIDI controllers.
- Micro Tuning: management of the micro tuning engine.
- Room: settings of the Ambiente room simulator.

User presets can be added, edited, and deleted. Factory presets cannot be edited or deleted; any "Save As" action performed on a Factory preset generates a User preset.

We also provide "templates" that allow you to reset a subset of parameters without losing your global state. For example, you can switch from the default Seaboard mapping to the default Wind controller mapping without losing your sound configuration.

Preset navigation and selection

To open the list of available presets, select the Preset name area in the header of the main view, or navigate to Main Menu -> Preset Manager.

Presets can be searched by typing keywords in the Search area and can also be filtered by type: Sound, MIDI Mapping, Micro Tuning, or Room.

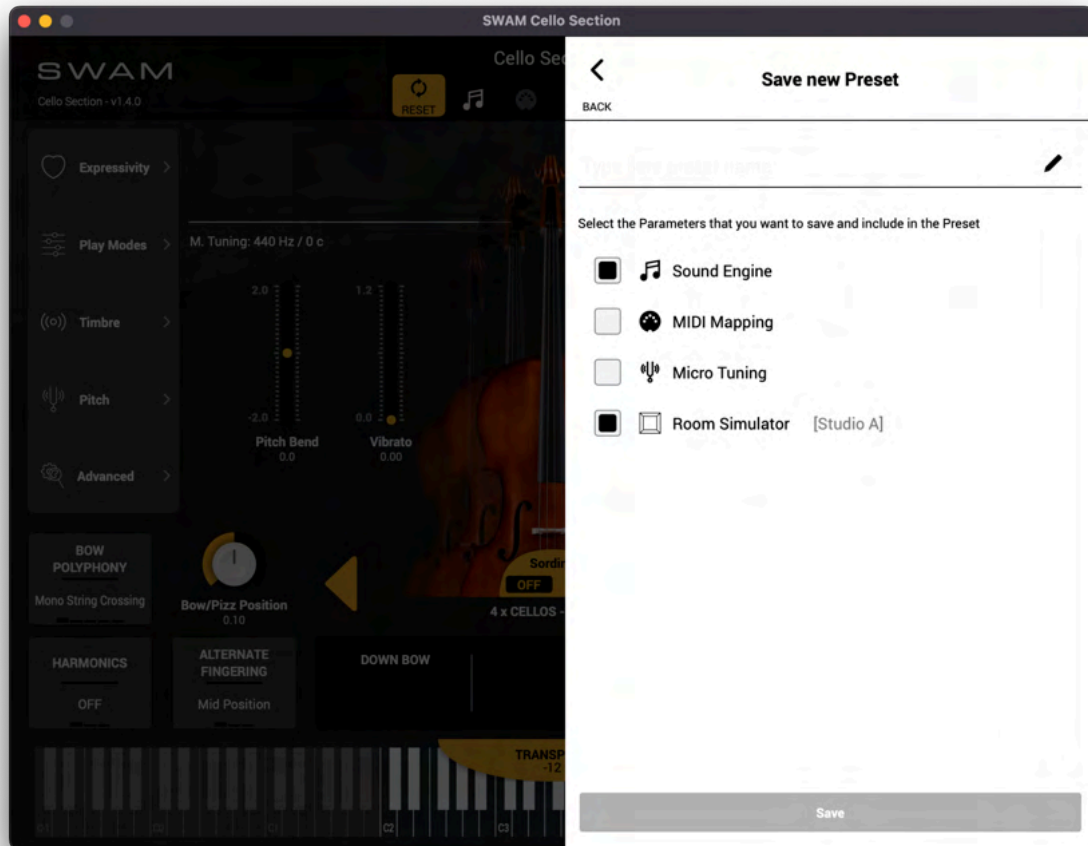
To select a preset, click on the desired item in the list, or use the keyboard accessibility commands if a screen reader is active.

For details on preset compatibility across different product releases, please refer to the [Backward compatibility with previous versions: Legacy Reverb mode explained](#) section.

Saving a User Preset

There are two methods to save a User preset:

1. **Save As:** This option allows you to create a new User preset based on the current settings of an existing preset, including Factory presets. To use this option:
 - Select the desired preset.
 - Modify the parameters as needed.
 - Click the "Save As" button.
 - Select one or more groups to include in the new preset: Sound, MIDI, Micro Tuning, Room.
 - Enter a name for the new User preset and save it. The new preset will now appear in the list of User presets.
2. **Duplicate:** This option creates an exact copy of the selected preset, which can then be modified. To use this option:
 - Select the preset you want to duplicate.
 - Click on the contextual menu (represented by the "..." icon)
 - Click the "Duplicate" button.
 - The duplicated preset will now appear in the list of User presets, you can then rename and edit as needed.



Editing and Exporting Presets

In the preset list, the contextual menu (represented by the "..." icon) provides additional options. Note that the "Edit" and "Export" options are available only for the currently selected preset. Therefore, it is possible to modify and export only the preset that is currently selected.

To edit a preset:

- Select the preset you want to modify.
- Click the "..." icon next to the preset.
- Choose "Edit" from the contextual menu.
- On the next panel you can rename the preset as well as select the parameter groups you want to store and include in the current preset (sound engine, midi mapping, micro tuning and room simulator).

To export a preset:

- Select the preset you want to export.
- Click the "..." icon next to the preset.
- Choose "Export" from the contextual menu.

We also provide "templates" that allow you to reset a subset of parameters without losing your global state. For example, you can switch from the default Seaboard mapping to the default Wind controller mapping without losing your sound configuration.

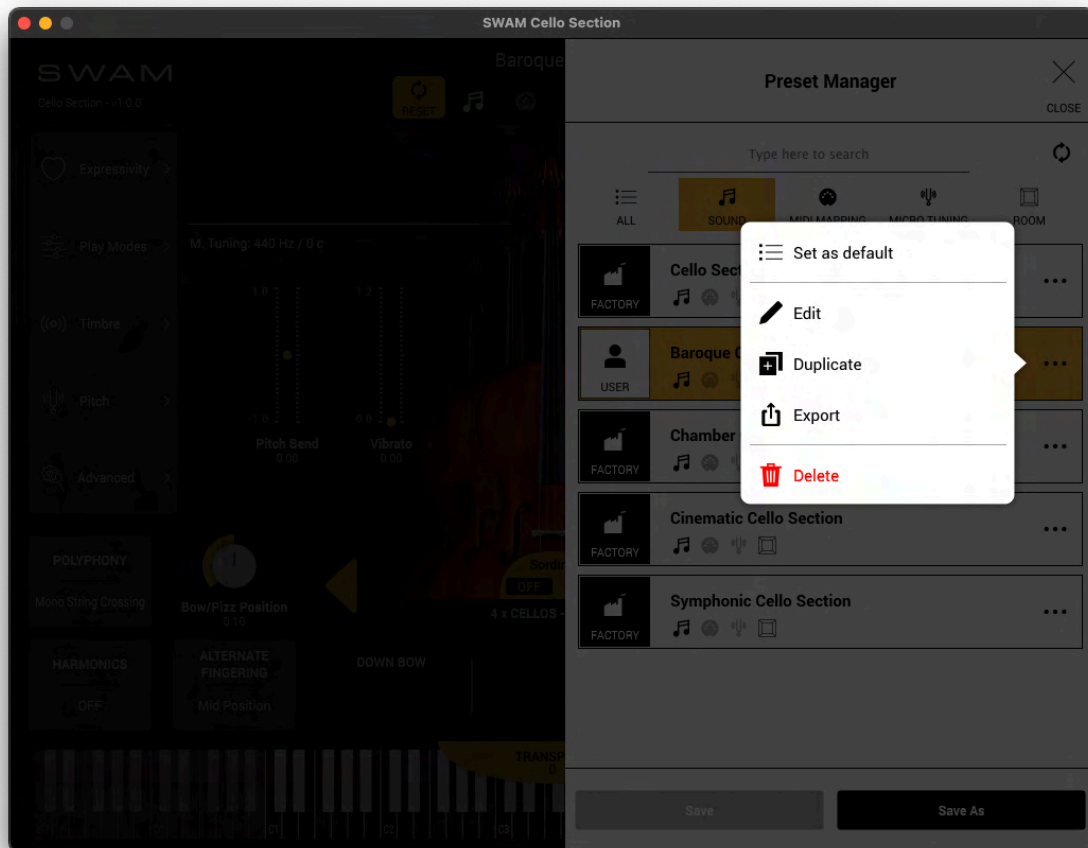
Presets can be recalled either in their entirety or partially. Partial recall is done through templates, which allow loading data from the MIDI Mapping, Micro Tuning, and Room groups without affecting the sound settings. Templates are also contextually available in their respective areas of interest.

Default startup Preset and other options

Any preset can be selected to become the "default" one, i.e., the one loaded at startup. To do this, click on the "..." contextual menu next to the preset name and choose "Set as default."

In addition to setting a preset as default, the contextual menu provides several other options:

- **Edit:** Modify the currently selected preset.
- **Export:** Export the currently selected preset.
- **Delete:** Remove a User preset if necessary. Note that this option is only available for User presets and not for Factory presets.



To summarize, the contextual menu allows you to:

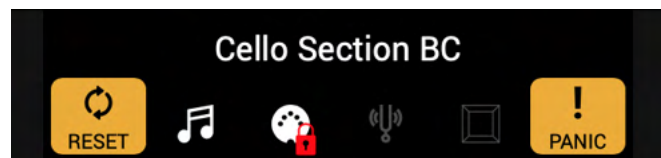
- Set a preset as the default.
- Edit the currently selected preset.
- Export the currently selected preset.
- Delete a User preset.

These options make it easy to manage your presets efficiently, ensuring you have quick access to your preferred settings and the ability to customize and organize your presets as needed.

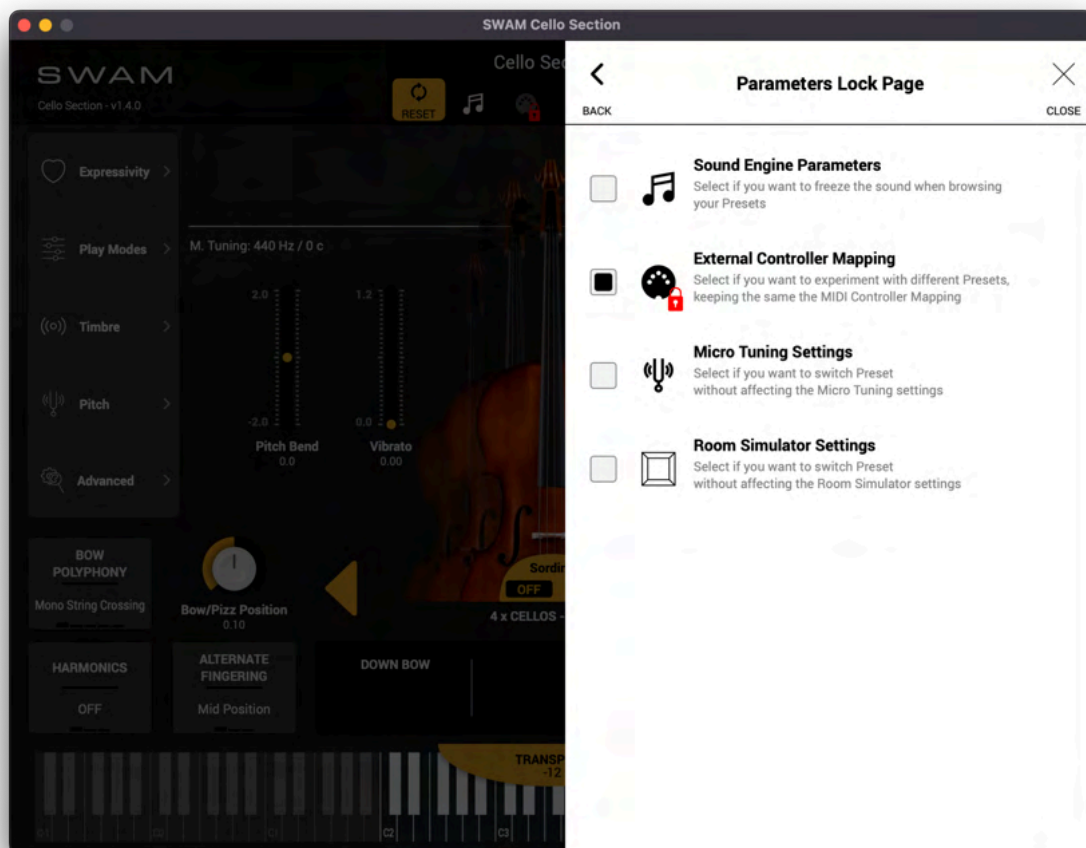
Parameters Lock

The “Parameter Lock” feature allows you to switch presets without affecting the category of parameters that is locked.

The Parameters Lock function is available with a long press on the Preset name area,



or from Main Menu -> Parameters Lock.

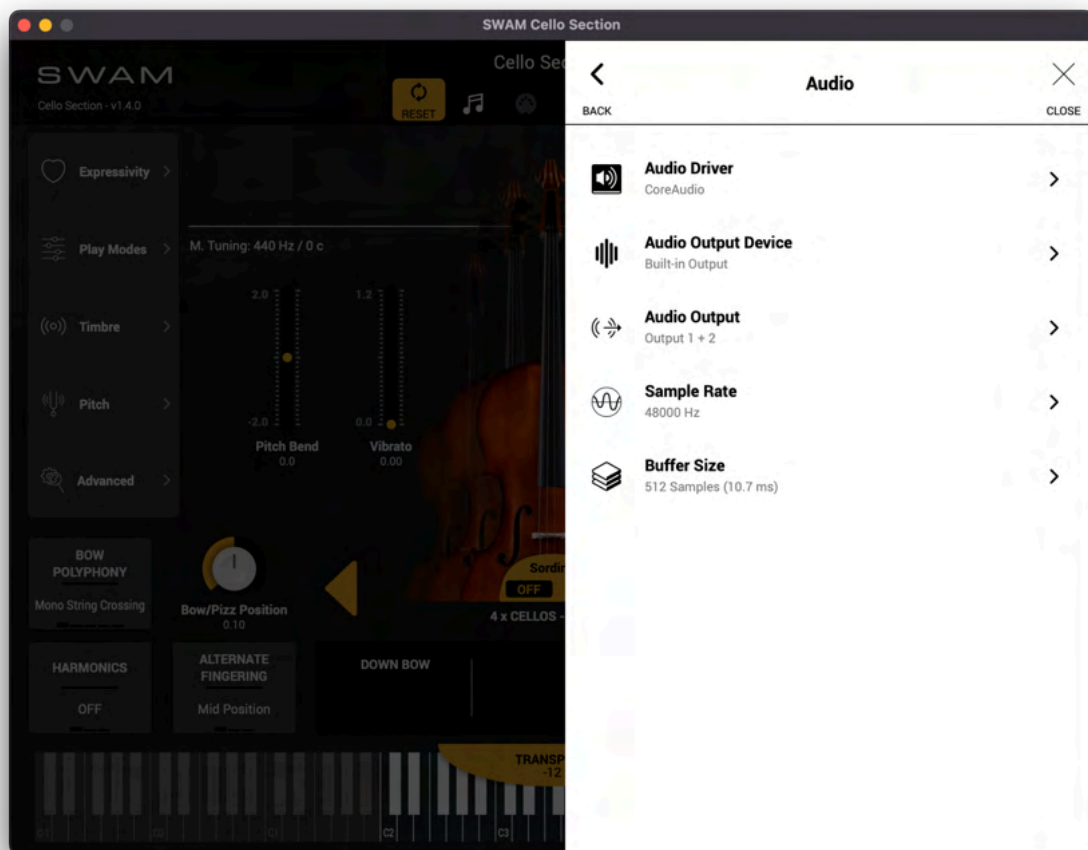


- Select “Sound Engine Parameters” if you want to freeze the sound when browsing your presets.

- Select “External Controller Mapping” if you want to experiment with different presets, keeping the same MIDI controller mapping. Useful if you want to change sound but keep playing with your MIDI controller.
- Select “Micro Tuning Settings” if you want to switch presets without affecting the micro tuning settings.
- Select “Room Simulator Settings” if you want to switch presets without affecting the room simulator settings.

Settings

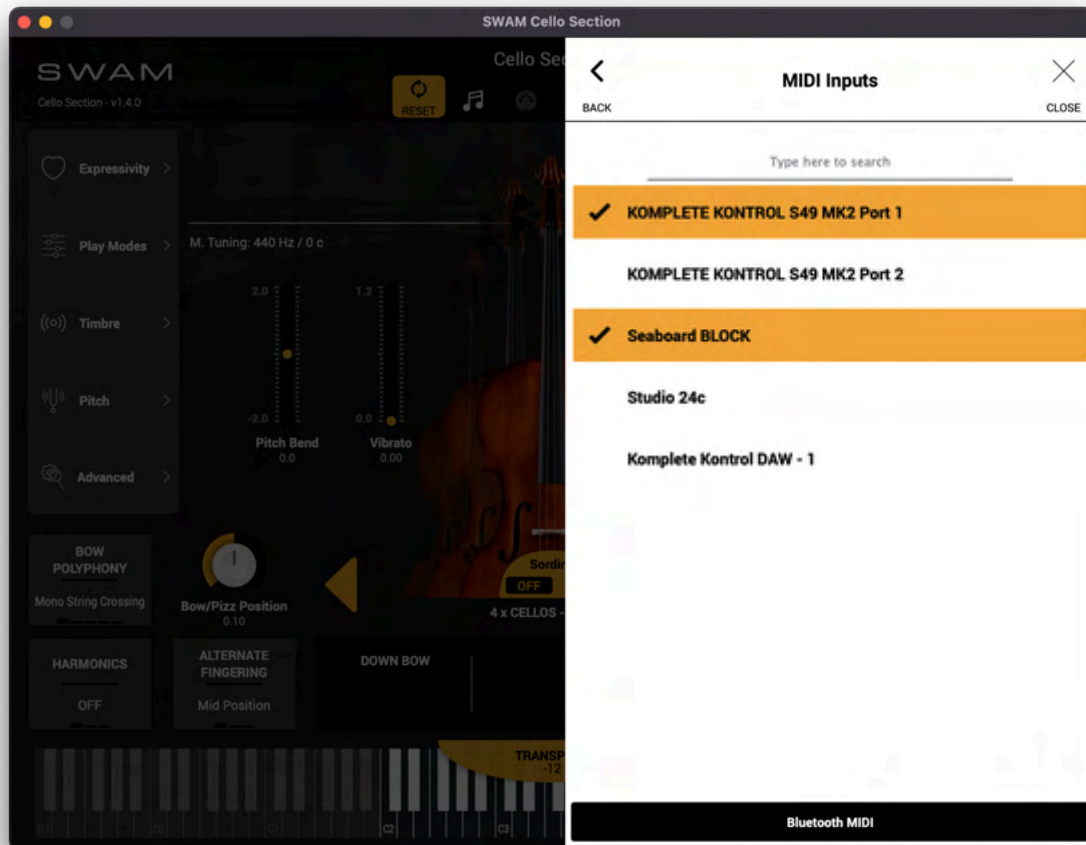
Audio Settings



The Audio Settings page is available for the Standalone version only and allows to select the proper Audio device, Output port, Active channels, Sample Rate and Buffer Size.

For real-time playing, a combination of Buffer Size and Sample Rate should provide a maximum latency of about 10 ms.

MIDI Settings

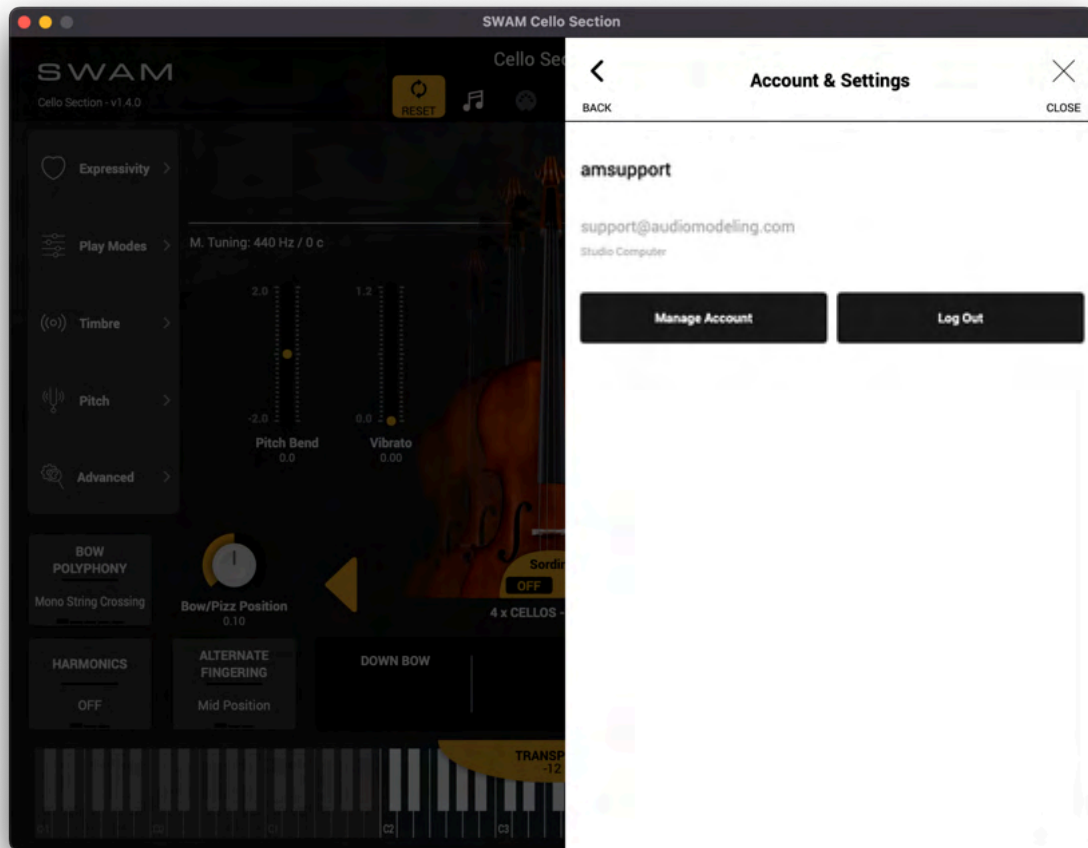


The MIDI Settings page is available for Standalone version only and allows you to select one or more MIDI devices to control the instrument.

It's also possible to use a Bluetooth MIDI device by selecting "Bluetooth MIDI".

Once you have correctly selected your MIDI controller(s), be sure that suitable [MIDI mapping](#) has been configured, eventually through [MIDI Templates](#).

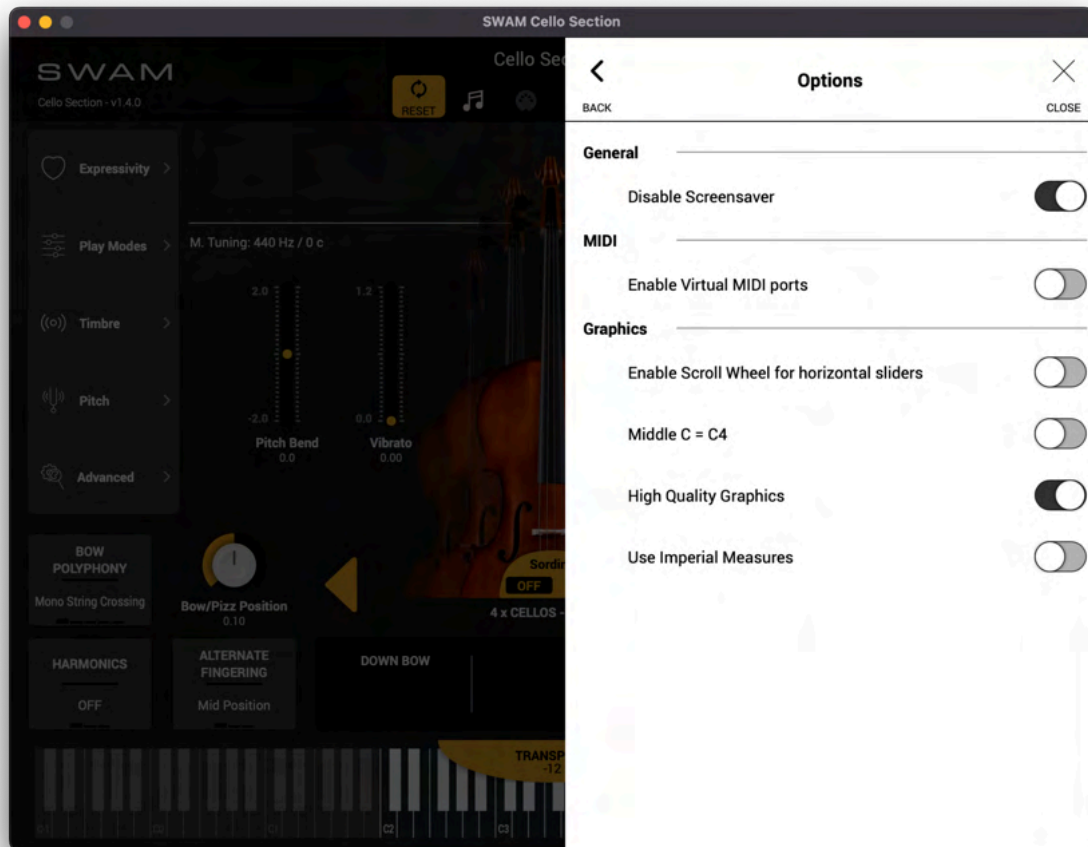
Account & License



The Account & License shows the user currently logged in.

- Manage account: opens the Audio Modeling Customer Portal in a Web Browser
- Log out: logs the user out from the application

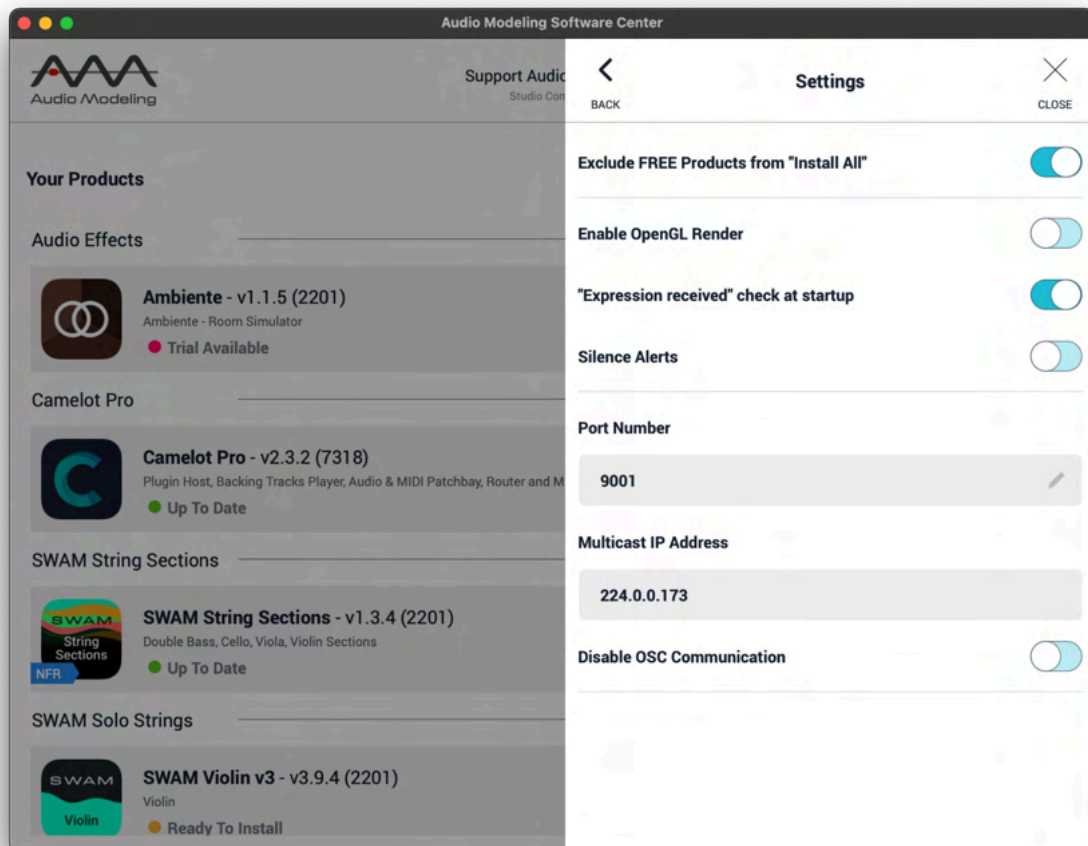
Options



- Disable screensaver: avoid screensaver activation when the App is open
- Enable virtual MIDI ports (macOS 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
- Enable scroll wheel for horizontal sliders: allow the use of the scroll wheel for changing slider values
- Middle C4: set octave notation so that Middle C is C4, corresponding to MIDI note number 60. If deselected, Middle C is C3.
- High Quality Graphics: quality level of User Interface details, like shadows and gradients. Turn off for lower CPU usage

Global Settings

Common / global settings for all products are managed from the Audio Modeling Software Center application. Click on the "... " menu and select the "General" option.



These settings apply to all installed SWAM products

- Enable OpenGL Render: when selected, render the graphics of SWAM instruments.
- "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)
- Silence Alerts: silences all alerts in SWAM instances
- Port Number: (OSC Settings) used for the intercommunication of SWAM String Sections instances via Open Sound Control (OSC) UDP network messages on port 9001. You can change the port number and select a port from 5000 to 9999.

- Multicast IP Address: (OSC Settings) used for the intercommunication of SWAM String Sections instances via Open Sound Control (OSC) exclusively on 224.0.0.173 IP address.

Local Network Permission

NOTE: providing local network permission to your DAW or standalone SWAM String Section instances is mandatory to allow proper communication between SWAM instruments.

macOS

Method 1: Allow Local Network Access for Applications

When an app attempts to access the local network for the first time, macOS prompts a message such as:

"[AppName] would like to find and connect to devices on your local network."

If you denied access or want to verify permissions, follow these steps:

macOS 15 (Sequoia) & onward

1. Open System Settings.
2. Go to Privacy & Security.
3. Scroll down to Local Network.
4. Find the app that needs local network access and toggle it on.

macOS 14 (Sonoma)

1. Open System Settings.
2. Navigate to Network.
3. Open Firewall.
4. If the Firewall is turned on open Option and Ensure the app is authorized to connect to the local network.

Reference:

[Control access to your local network on Mac](#)

Method 2: Configure the Firewall to Allow Incoming Connections

If the firewall is active, it may block some local network connections. You need to configure it to allow traffic for the required applications.

macOS 14 (Sonoma) & onward

1. Open System Settings.

2. Go to Network.
3. Select Firewall.
4. Click Options if the firewall is turned on.
5. Ensure the application is listed and allowed to accept incoming connections.

macOS 13 & 12 (Ventura & Monterey)

1. Open System Preferences.
2. Go to Security & Privacy.
3. Click the Firewall tab.
4. If the firewall is enabled, click Firewall Options.
5. Verify that the application is listed as allowed.
6. If it is not listed, click +, select the app, and choose Allow incoming connections.

Reference:

[Change Firewall settings on Mac](#)

Method 3: Verify VPN Settings for Local Communication

Certain Wi-Fi networks or VPNs may block local traffic.

1. If using a VPN, try temporarily disabling it to ensure it is not blocking local traffic.

Reference:

[About privacy and Location Services in macOS](#)

After completing these steps, your application can:

- Scan the local network for devices.
- Communicate with other devices on the network.
- Avoid being blocked by firewall or security settings.

Windows

Method 1: Allow Applications Through Windows Defender Firewall

Windows Defender Firewall may block applications from accessing the local network. To permit an app through the firewall:

1. Open Windows Security:
 - Click on the Start menu.
 - Type Windows Security and press Enter.
2. Navigate to Firewall & Network Protection:
 - In the Windows Security window, select Firewall & network protection.
3. Access Allowed Apps:

- Scroll down and click on Allow an app through firewall.
- 4. **Modify Settings:**
 - Click on the Change settings button.
 - If prompted by User Account Control (UAC), click Yes to grant permissions.
- 5. **Locate and Enable the Application:**
 - In the list of applications, find the app you want to allow.
 - Check the box next to the application's name.
 - Ensure the appropriate network types (Private and/or Public) are selected.
- 6. **Add Missing Applications:**
 - If the app isn't listed:
 - Click on Allow another app....
 - Use the Browse button to locate the application's executable file.
 - Click Add, then ensure it's selected in the list.
- 7. **Save Changes:**
 - Click OK to apply the settings.

Method 2: Configure Network Discovery and File Sharing Settings

To ensure your applications can communicate over the local network, enable Network Discovery and File Sharing:

1. **Open Settings:**
 - Press Win + I to open the Settings app.
2. **Navigate to Network & Internet:**
 - Click on Network & Internet in the left-hand menu.
3. **Access Advanced Network Settings:**
 - Scroll down and select Advanced network settings.
4. **Change Advanced Sharing Settings:**
 - Under More settings, click on Advanced sharing settings.
5. **Enable Network Discovery and File Sharing:**
 - Expand the Private network profile.
 - Toggle on Network discovery and check Turn on automatic setup of network connected devices.
 - Toggle on File and printer sharing.
6. **Save Changes:**
 - Click Save changes to apply the settings.

By following these methods, your applications should now be able to:

- Discover other devices on the local network.
- Communicate without being blocked by Windows Defender Firewall.
- Operate with the necessary permissions for local network access.

For more detailed information, you can refer to the official Microsoft documentation on [Allowing apps to communicate through Windows Defender Firewall](#).

iOS

Method 1: Grant Local Network Access to Applications

When an app first attempts to access the local network, iOS displays a prompt:

"[AppName] would like to find and connect to devices on your local network.
This app will be able to discover and communicate with devices on the
networks you use."

If access was denied or if you need to verify permissions, follow these steps:

1. Open Settings.
2. Scroll down and find the app that requires local network access.
3. Tap on the app.
4. Ensure that Local Network is toggled ON.

Alternative way to check all apps at once (iOS 16 & onwards):

1. Open Settings.
2. Go to Privacy & Security.
3. Tap Local Network.
4. You will see a list of all apps that have requested local network access.
5. Ensure the required apps are enabled.

Reference:

- [If an app would like to connect to devices on your local network](#)

Method 2: Check Wi-Fi Network Settings

Some Wi-Fi configurations may prevent local network communication.

1. Open Settings.
2. Tap Wi-Fi.
3. Find the connected network and tap the (i) button next to it.
4. Check if Private Wi-Fi Address is enabled.
 - If local communication issues persist, try disabling this setting temporarily.
5. Ensure Limit IP Address Tracking is OFF, as it may interfere with local discovery.

Reference:

- [About privacy and Location Services in iOS, iPadOS, and watchOS](#)

Method 3: Check Firewall, VPN, or Proxy Settings

VPNs, firewalls, or proxy configurations can block local network traffic.

1. Open Settings.
2. Go to General > VPN & Device Management.
3. If a VPN is active, try temporarily disabling it to see if local network communication improves.
4. If a Proxy is enabled:
 - Go to Wi-Fi.
 - Tap (i) next to the connected network.
 - Scroll down to HTTP Proxy and check if it's set to Manual or Auto.
 - If enabled, try setting it to Off temporarily.

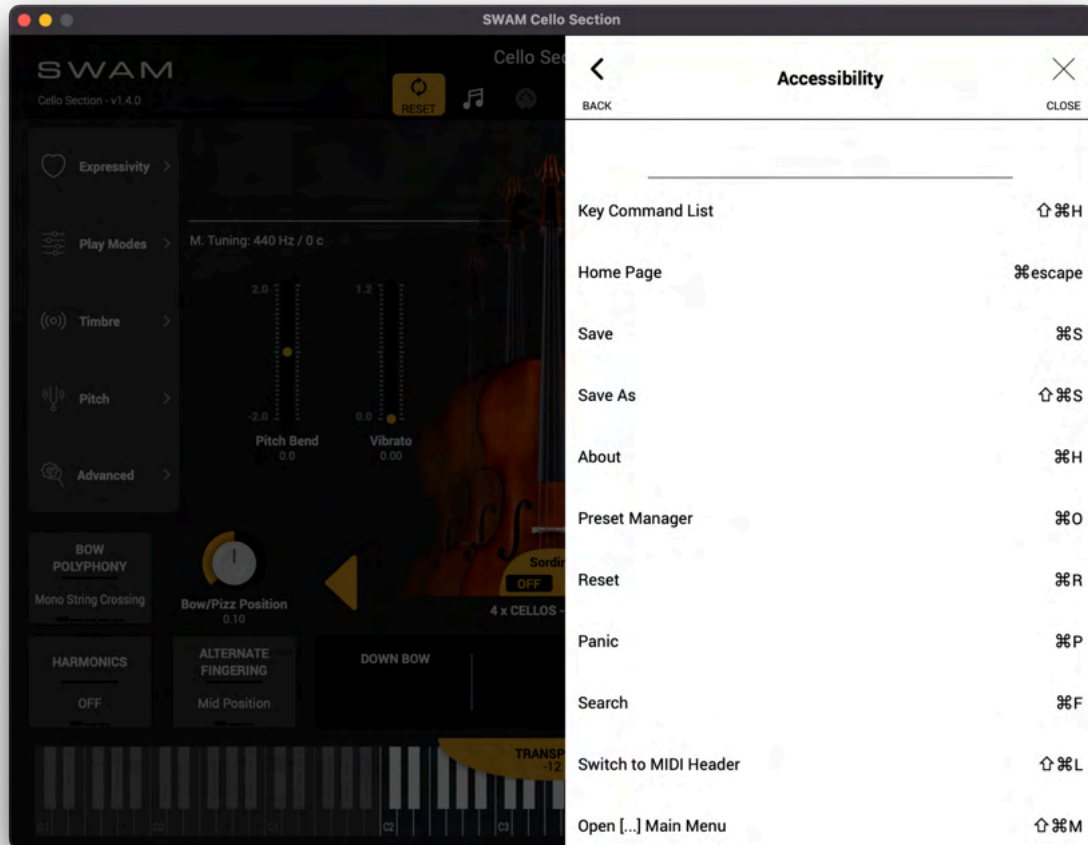
Reference:

- [View and edit your Access Point Name \(APN\) on your iPhone and iPad](#)

After following these steps, your application can:

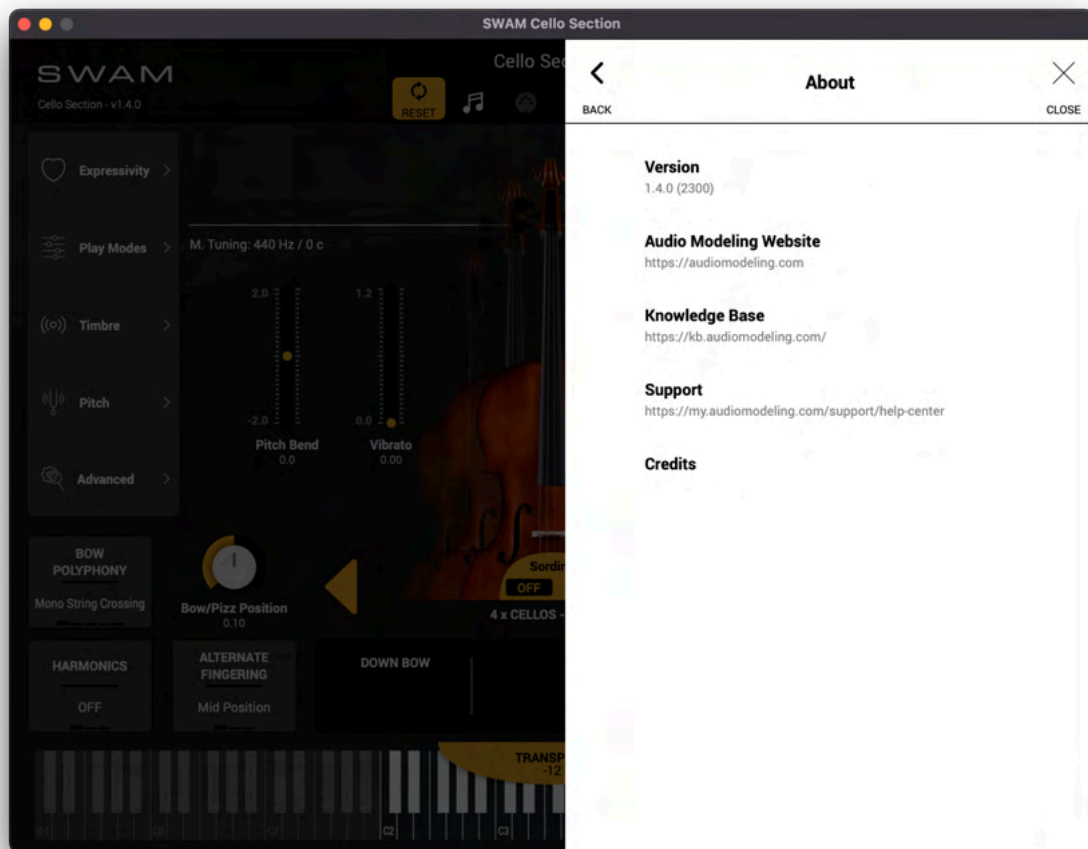
- Discover other devices on the local network.
- Communicate without being blocked by iOS privacy settings.
- Work properly even when running in the background.

Accessibility



Keyboard shortcuts are not only a powerful tool for expert users but also an essential aid for blind or visually impaired users, providing direct access to functionalities. We have carefully designed these shortcuts to be intuitive and easy to remember, ensuring that all users can navigate and utilize our software efficiently. You can find and review all the available keyboard shortcuts in the Accessibility page.

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 Desktop, 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.

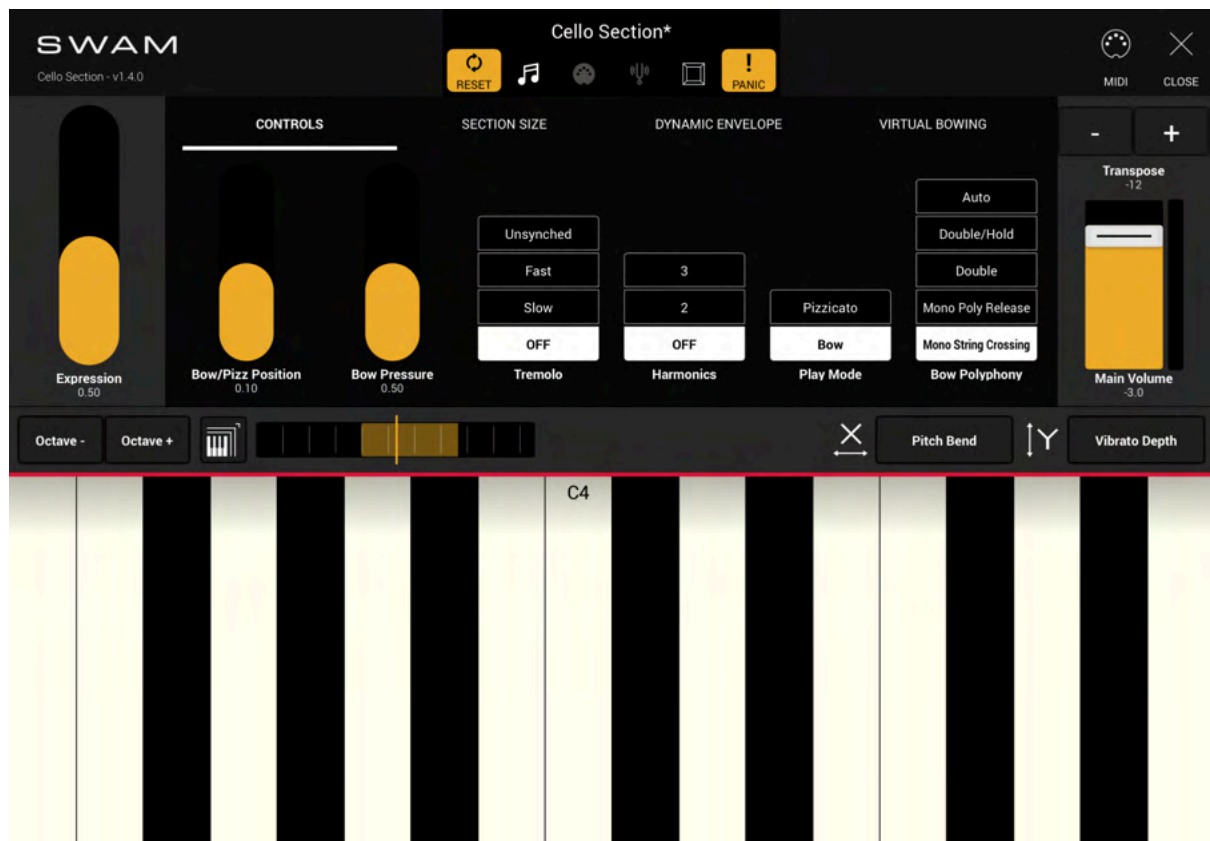
- iPad and iPhone offer on-screen, touch-based playing surfaces.

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.

iPad

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

will find a “PLAY” icon  that accesses a dedicated, touch playing surface.



The on-screen playing surface has the following purposes:

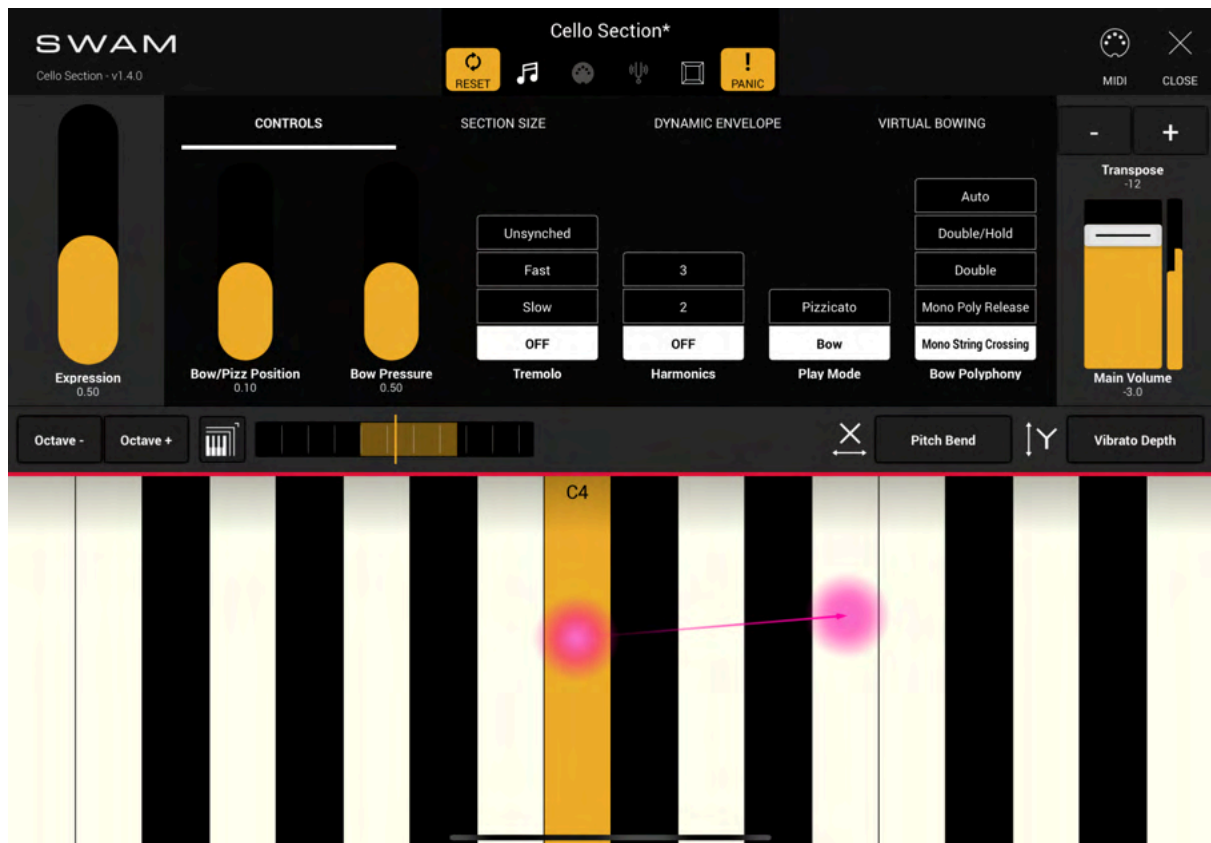
- Provide an onboard screen keyboard to perform at basic level without using any external controller
- Provide a visual feedback representation of the sound evolution (Dynamic Envelope)

Provide direct control of the most useful performance parameters (expression, instrument selection, control faders, and selectors), plus a dedicated area to mimic the gesture of bowing directly on the iPad surface.

NOTE: To record and playback on a DAW what has been played on the On-screen playing surface, the "SWAM On-Screen Keyboard" MIDI Mapping Templates must be selected. (see the [MIDI Mapping Templates](#) section.)

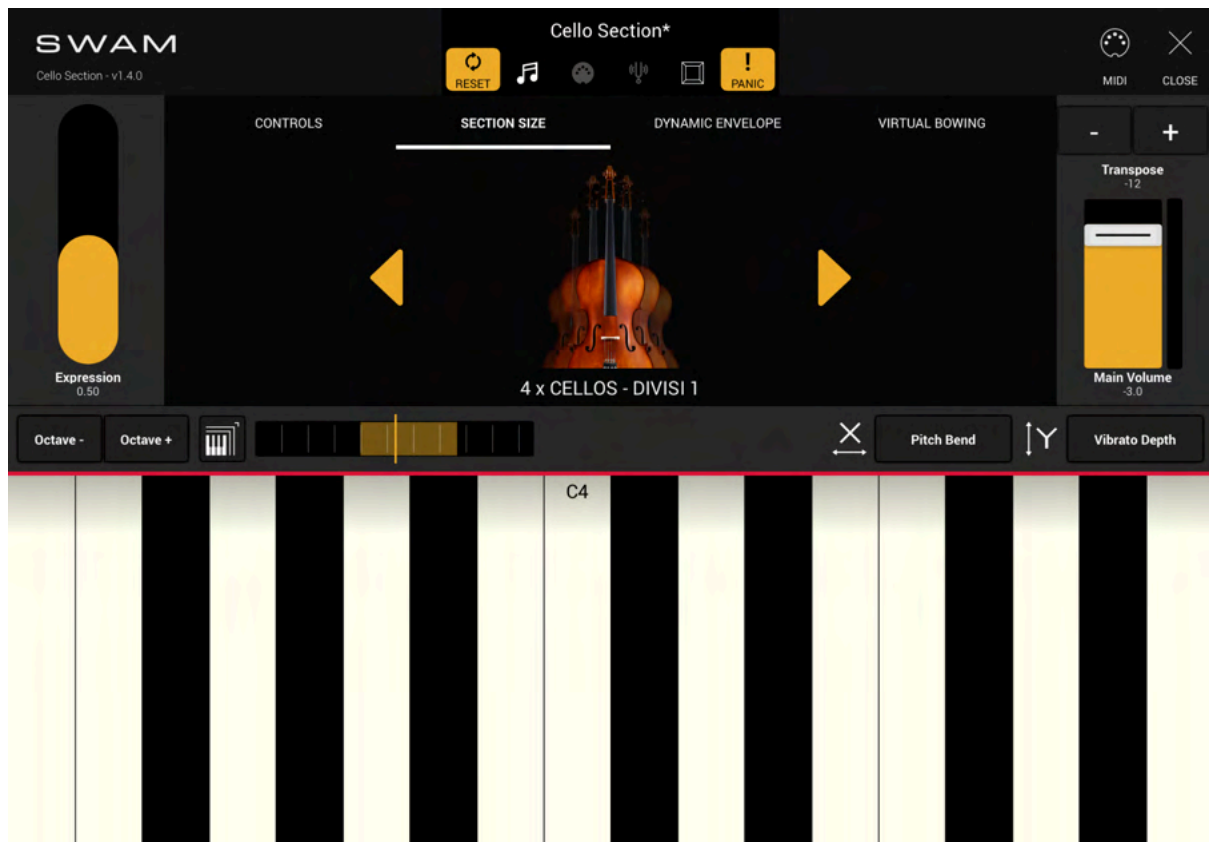
The dynamic areas can be selected just by tapping on the tab name: Controls, Section Size, Dynamic Envelope, Virtual Bowing.

Controls



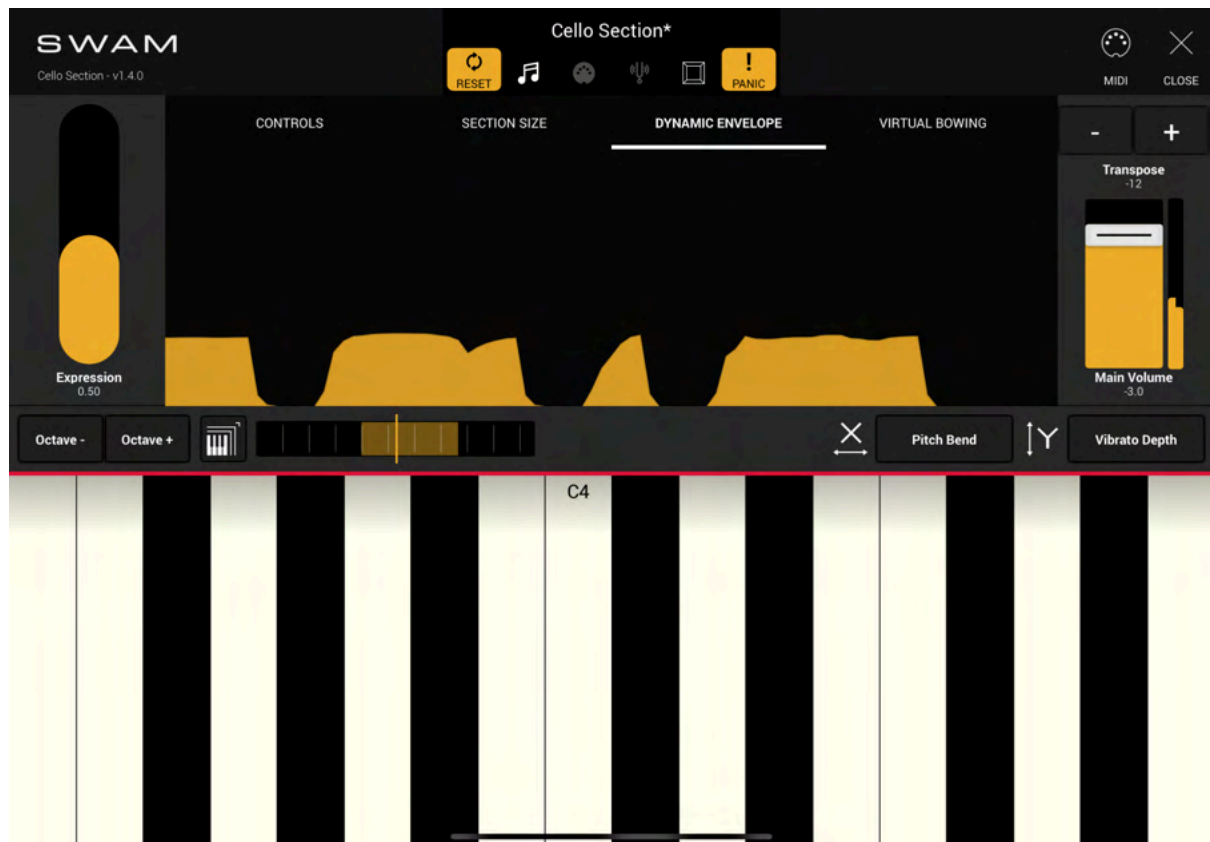
This view provides faders and selectors that are very handy in live performance for tweaking the sound in real time, or to add subtle expressive details when needed. Play and tweak them in real time using the onboard keyboard, or use them as an extra control surface when playing with an external controller.

Section Size



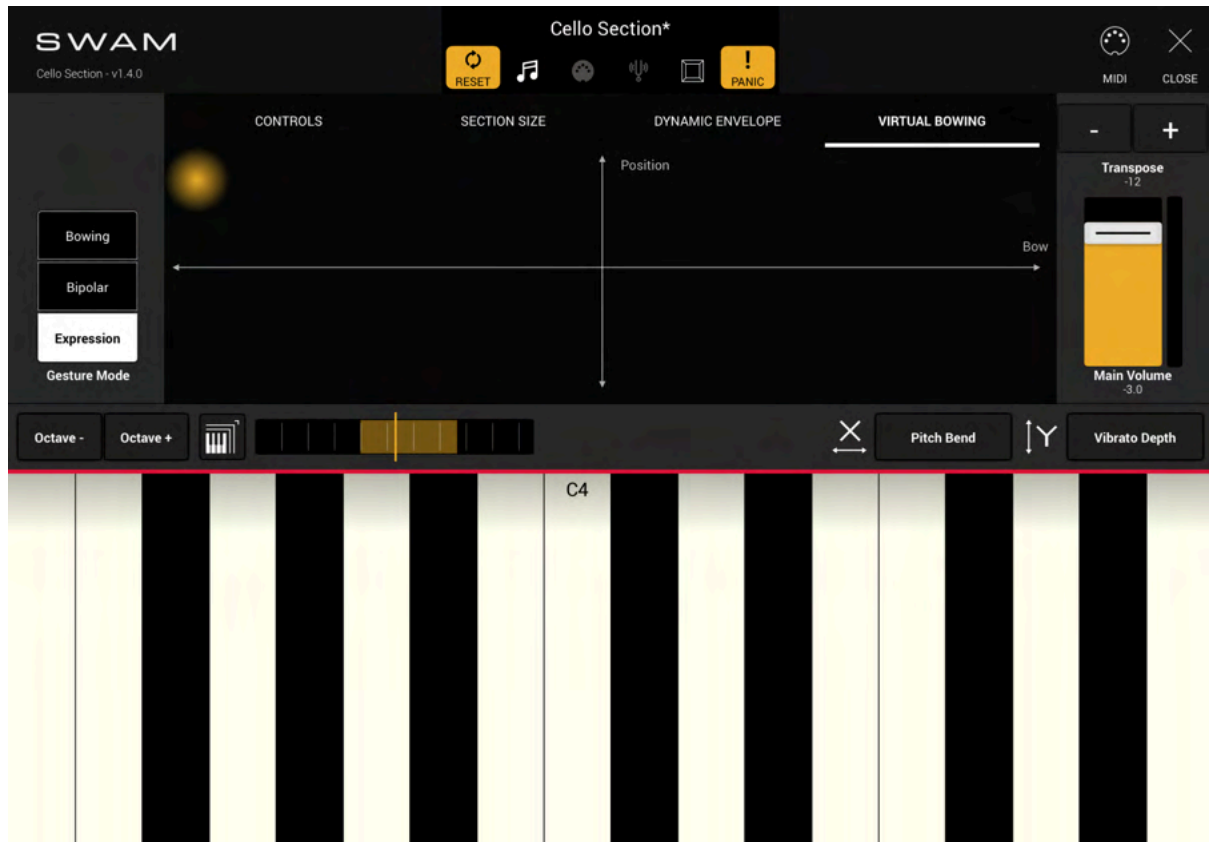
This view shows the section size selector. Use the arrows to select the number of the section players.

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.

Virtual Bowing



Virtual Bowing is an XY pad that allows the user to control Expression (X axis) and Bow Position (Y axis) in real time. It's especially suitable when "Gesture Mode" is set to "Bowing"; in that case, the user controls the bow's motion back and forth, mimicking the gesture of a real player. Keyboard Y-axis gestures can be assigned to the "Bowing Sensitivity" parameter, allowing the user to control how strong the bow stroke is.

On-Screen Keyboard setup

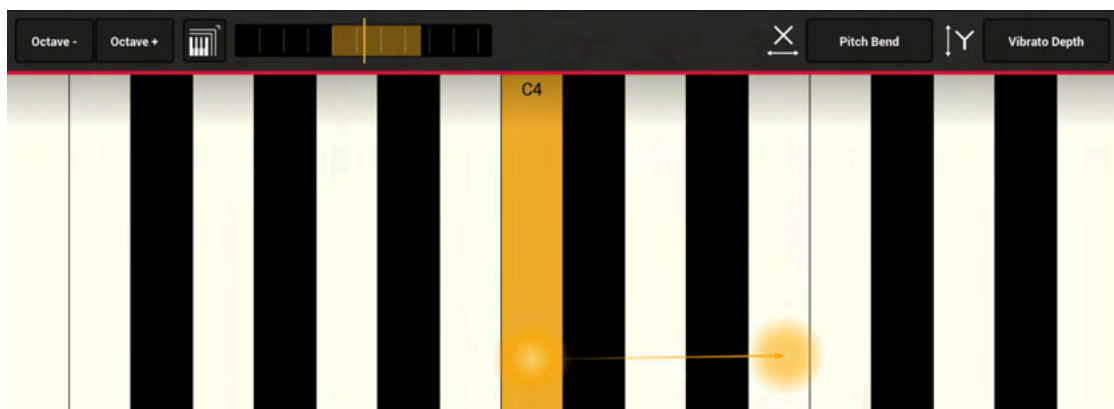
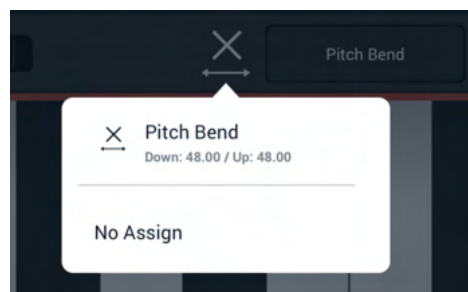


The keyboard has a toolbar with dedicated controls to:

- 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.

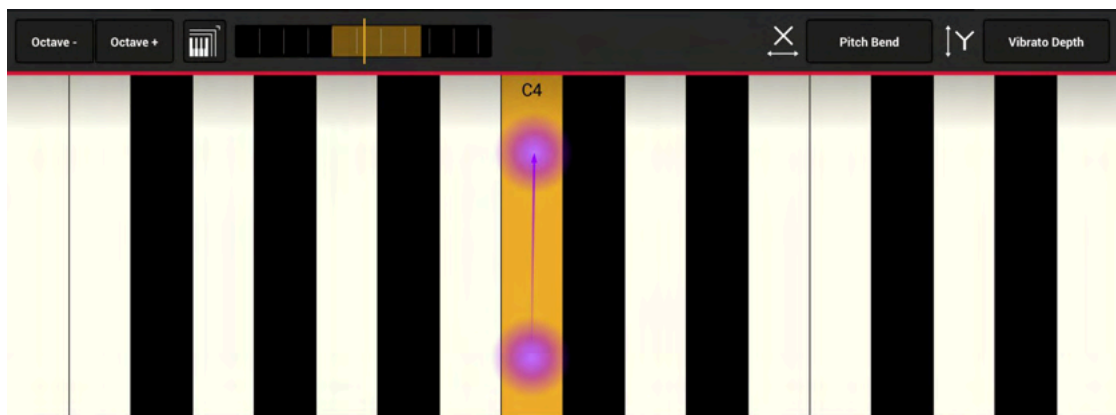
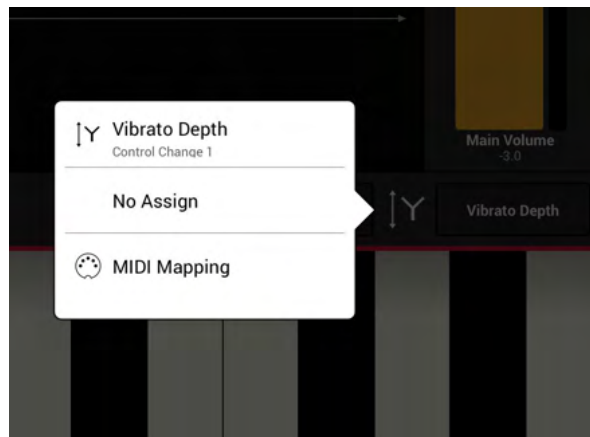
X: Pitch Bend control along the X axis.

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



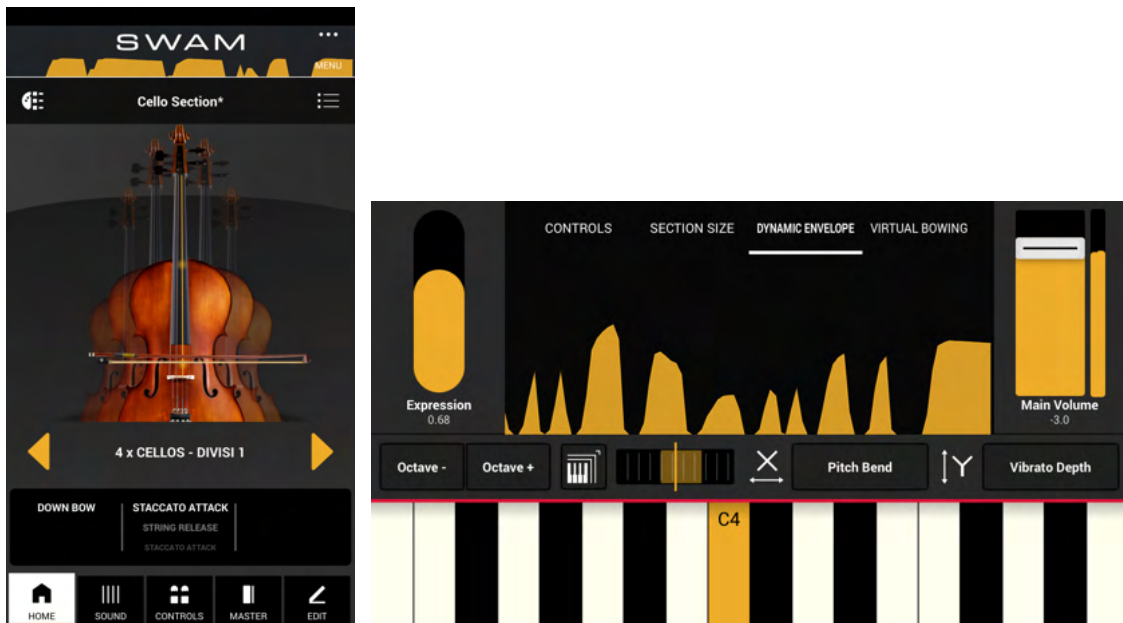
Y: Parameter control along the Y axis

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.

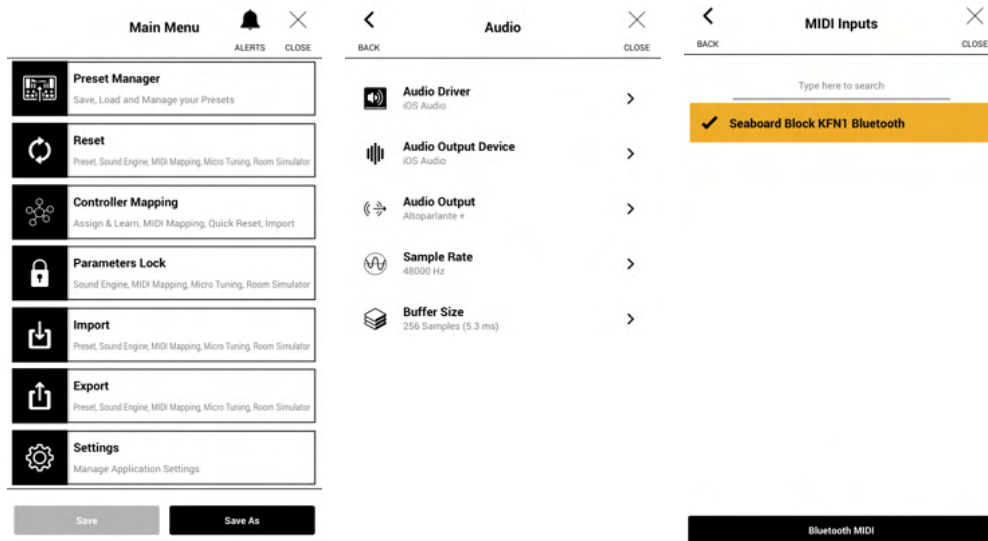



Getting Started


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.

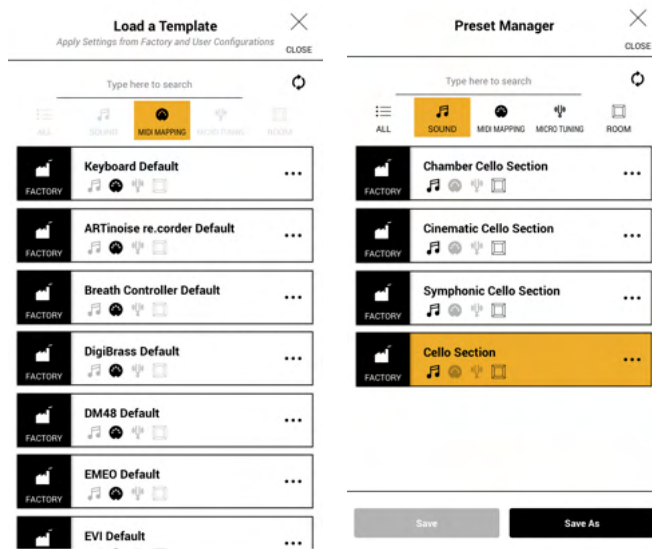
Audio settings are under MENU -> Settings -> Audio. Check that the Active Output Channels, Sample Rate and Buffer Size are correctly selected.

MIDI settings are under 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 MENU -> Controller Mapping -> MIDI Mapping & Quick Reset -> TEMPLATES.


Finally, load a Sound preset from the list, selecting the the "Preset Manager" 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 templates for a plug & play mapping of several external MIDI controllers.

The "Preset Manager" 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 templates, 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.

Key Switches

Some parameters of SWAM instruments can also be triggered by the use of key switches. If there is an overlap in the instrument range after transposition, the key switches can be moved down one octave using the "KS Octave" parameter (see Advanced section). Key switches can be disabled by turning "KS Octave" to "OFF".

Key switches are colored red on the instrument's virtual keyboard.

Important note about Key Switches: "latch" Key Switches are sensitive to the KS velocity, even for two-state Key Switches. This way a sequence can be played correctly even if it is not started from the beginning; otherwise a "latch" status could work differently from how it should.

"KS Velocity Remap" adjusts the distribution of the KeySwitch values

The Key Switches provided are:

- C = Play Mode (at next Note On)
 - Low Velocity = Bow
 - Mid Velocity = Pizzicato
 - High Velocity = Pizzicato
- C# = Manual Bowing
(see "Manual Bowing: KeySwitch" in Play Modes/Right Hand section)
 - Tremolo: Note-on / Note-off
 - Bow Change: Note-on only
- D = Gesture Mode (at next Note On)
 - Low Velocity = Expression
 - Mid Velocity = Bipolar
 - High Velocity = Bowing
- D# = Alternative Fingering (at next Note On)
 - Low Velocity = Mid Position
 - Mid Velocity = Near the Bridge

- High Velocity = Near the Nut + Open
- E = Bow Lift
 - Off String (default)
 - While this key is held = On String
- F = Bow Start
 - Down Bow
 - Up Bow
- F# = Harmonics
 - Off (default)
 - 2nd harmonic
- G = Keep Bow Direction
 - OFF (default)
 - While this key is held = ON
- G# = Tremolo
 - OFF (default)
 - Low Velocity = Slow
 - High Velocity = Fast
- A = Tremolo Mode (at next Note On)
 - Low Velocity = Hz
 - Mid Velocity = Sync
 - High Velocity = Sync/Acc
- A# = Sordino (at next Note On)
 - Low Velocity = OFF
 - High Velocity = ON
- B = 2nd page

2nd page of Key Switches (hold B Key Switch)

- B+C: Bow Mono String Crossing
- B+C#: Bow Mono Poly Release
- B+D: Bow Double
- B+D#: Bow Double/Hold
- B+E: Bow Auto
- B+F: Pizzicato Mono String Crossing
- B+F#: Preferred strings 4-3 (for Double/Hold only)
- B+G: Pizzicato Polyphony
- B+G#: Preferred strings 3-2 (for Double/Hold only)
- B+A#: Preferred strings 2-1 (for Double/Hold only)

Instruments ranges

	Middle C = C3		Middle C = C4	
	Additional range	Regular range	Additional range	Regular range
SWAM Violin Section		G2 - D6		G3 - D7
SWAM Viola Section		C2 - G5		C3 - G6
SWAM Cello Section		C1 - G4		C2 - G5
SWAM Double Bass Section	C0 - D#0	E0 - A3	C1 - D#1	E1 - A4

Notes:

- Ranges are provided in Concert (or Natural) pitch.
- Middle C can be switched from C3 to C4 in Main Menu -> Settings -> Options.
- To extend the lower range of the instrument act on the "String tuning" parameter in the "Advanced" page.
- SWAM Cello Section and SWAM Double Bass Section are transposed -12 semitones by default. Set the Transpose parameter to 0 to play with real pitch.

How to perform the main articulations

Almost all articulations are performed by the combination of the three principal controls: Note On velocity, expression, and bow-pressure. The instrument is so versatile that multiple articulations can be combined together - for example, tremolo/vibrato, tremolo/glissando, glissando/vibrato, glissando/harmonics/crescendo are possible. Here's a short list of main articulations.

Détaché

Detaché articulations are performed by separating the notes while pressing the Sustain pedal: the Note Off of the first note must happen before the Note On of the second note. A Slurred Legato is performed when the notes are overlapped while pressing the Sustain pedal.

Martelé

Set the "Bow Lift" parameter to "On String" and use high velocities and high expression at Note-on, then decrease the expression.

If you want to obtain a scratchier attack, set the "BowPressure" to a high value (0.65 – 0.80) just before the attack. Then, quickly decrease it to the desired value while decreasing the expression.

Spiccato

Set the "Bow Lift" parameter to "Off String" and play short staccato notes.

Legato

Slurred legato

A pure "slurred" legato is performed by overlapping the second note to the first, using a high value of Note On velocity for the second note, when the second note is selected on the same string as the first one.

Cross-string legato

A "cross" legato is performed by overlapping the second note to the first, using a high value of Note On velocity for the second note, when the second note is selected on a different string than the first one.

The choice Slurred vs Cross-string legato is mainly determined by the "Alternate Fingering" parameter. Setting the "Alternate Fingering" parameter BEFORE pressing a note determines which string is selected for the pressed note.

The actual threshold between portamento (see next paragraph) and legato is influenced by the "Portamento Max Time" parameter.

The legato transition "quality" is influenced by the "Dynamic Transitions" parameter.

Portamento (glissando)

A glissando between two notes is obtained by overlapping the second note to the first, using a low value of Note On velocity for the second note. If the "Portamento Control" parameter is set to "CC" just overlap the second note after setting the "Portamento Control" CC value to a low value (depending on the MIDI mapping curve defined for the "Portamento Time" parameter - See "Controller Mapping" section).

The actual portamento time and the threshold between portamento and legato are influenced by the "Portamento Max Time" parameter.

How to obtain a portamento on the same string

To obtain a wide portamento on the same string, avoiding a split portamento across two strings, you need to control the starting and ending position of the finger on the fingerboard acting on the "Alternate Fingering" parameter.

To do this in real-time, use the "Alternate Fingering" Key Switch D# or control the "Alternate Fingering" parameter through a MIDI CC (see "Controller Mapping" section).

Note that the effective finger position changes at the next Note On, so you have to be able to set the right finger position BEFORE pressing the portamento starting note and also BEFORE pressing the portamento ending note.

Example:

1. Set the "Alternate Fingering" position to "Nut+Open" (K.S. D# - high velocity, MIDI CC – high value).
2. Press the note E3, it should perform on the string D, near the nut.
3. Set the "Alternate Fingering" position to "Bridge" (K.S. D# - mid velocity, MIDI CC – mid value).
4. Press the note E4, it should perform on the same string D, near the bow.

Flautando

To get a "flautato" sound, set the "Bow Pressure" parameter to a very low value. The text "Flautando" is shown near the Bow Pressure slider on the main GUI.

Scratchy Attacks

To obtain a scratchy attack sound, set the "Bow Pressure" parameter to the maximum value and play with high expression. The text "Scratch" is shown near the Bow Pressure slider on the main GUI.

Tremolo

Auto-tremolo

This selects if you want a "Slow" tremolo or a "Fast" tremolo. If the "Tremolo Mode" is set to "Sync" or "Sync/Acc", the tremolo will be synchronized with the project tempo (BPM). Custom accents can be performed by acting on the expression (make expression "spikes" on the desired strokes).

Manual-tremolo

- Using Key Switch C#: be sure that Key Switches are active (Advanced / MIDI section). Set the "Manual Bowing: KeySwitch" to "Tremolo" (Play Modes / Right Hand section); press and release the Key Switch C# while playing the notes; a bow-change is performed at both Note On and Note Off.
- Using the currently playing note: set the "Manual Bowing: Sustain+Note" parameter to "Tremolo"; hold the Sustain pedal, press and release the currently playing note; a bow-change is performed at both Note On and Note Off.

You can adjust the "Bow Pressure" parameter in order to obtain a smooth or hard tremolo.

Bowing

Set the Gesture Mode to Bowing and move your expression controller back and forth.

Adjust the "Bowing Sensitivity" parameter to modify the amount of bow speed in function on how fast the controller speed varies.

Two special overrides give the performer direct control. Holding the Sustain pedal will force a bow change on every staccato note, even against the normal rules. Conversely, holding the "Keep Bow Direction" KeySwitch (G) will always maintain the same bow direction, regardless of phrasing. This last command has the highest priority in the system. This function can also be mapped to any CC.

This design provides both natural bowing behaviour that follows the musical line and the flexibility for the performer to impose control when needed.

Crescendo

Standard Crescendo: Crescendo is performed acting only on the Expression, starting from a low value (or from "niente") and increasing it as desired.

Wider Crescendo: A wider effect can be obtained by mapping the "Bow Pressure" parameter to the same MIDI event that controls the Expression (see "Controller Mapping" section).

For example:

- Expression: CC 11 – Min = 0, Max = 127
- Bow Pressure: CC 11 – Min = 55, Max = 80

Start “from nothing” (fade-in): set the Expression to zero, hit the key with a very low value of the velocity (under MIDI value 10), then increase the Expression as desired.

Open String Pizzicato Strum

The procedure to play an open-string strum is:

“Play Mode” - set to “Pizzicato”

“Alternate Fingering” - set to “Near the Nut + Open”.

Press Sustain pedal and play the desired open strings, staccato.

Bow Direction Behaviour

The bowing engine determines bow direction according to the phrasing and articulation of the performance.

When a phrase is interrupted by a clear pause, the bow naturally resets to its default direction and position before resuming, according to the set “Bow Start” parameter.

Very short separations between notes (threshold set by the Staccato Interval Time parameter) are interpreted as legato connections, so the bow continues in the same direction. Instead, when staccato notes are played in close succession the bow direction changes with each new attack, though the bow position is not fully reset. Longer stretches of continuous legato playing without a break will eventually force a bow change to preserve a realistic alternation.

Other musical conditions also influence the result. Rapid passages that demand continuous energy, or strongly accented attacks, may trigger a bow change even if the musical line is still connected. This ensures that the simulated bowing remains consistent with natural technique, where alternating directions are required for balance and articulation.

Tips and Troubleshooting

For comprehensive information, FAQs, and more detailed articles, please refer to our Knowledge Base at kb.audiomodeling.com.

No sound

The three most common causes for not getting any sound from a SWAM instrument are:

1. The audio device or audio output may not be correctly assigned. In the Standalone app, navigate to Main Menu -> Settings -> Audio, and select the proper audio device and output channels. If you are using a DAW or host, consult the user manual of the host application.
2. The MIDI device may not be correctly selected. In the Standalone app, navigate to Main Menu -> Settings -> MIDI, and select the proper MIDI device. If you are using a DAW or host, consult the user manual of the hosting application.
3. The Expression parameter may not have been moved, automated, or controlled by an external MIDI device since the instrument was instantiated.

Ours are expressive instruments. Unlike standard sample libraries, our instruments do not work until the Expression control is changed by an Expression pedal, Breath Controller, wheel, knob, slider, Wind Controller, Seaboard, LinnStrument, Touché, mobile App capable of sending MIDI data, or other MIDI CC11 source.

Can a saxophone emit a sound without blowing into it? Can a violin emit a sound without moving the bow?

Please watch this introductory playlist:

<https://youtube.com/playlist?list=PLT7gu1yXoV4HpBDsrDKbVjJKOlhttpsNAI>

We provide Factory presets for several MIDI controllers: click "MIDI", click "PRESETS", and choose a preset from the list

The default mapping for the Expression control at startup is the MIDI CC11, which is typically assigned to a keyboard Expression pedal.

The Expression assignment can be customized to match your controller: click "MIDI", click on the Expression Slider, and input the MIDI CC number.

For MIDI keyboards not equipped with an Expression pedal, a good start often is to map Expression to CC1 (Mod Wheel) and Vibrato Depth to AfterTouch (AT).

You can use the "Learn" button and move your controller. In this mode, the instrument recognizes the first incoming CC number and automatically assigns it to the Expression setting.

Even without a physical controller, on a DAW or sequencer you need to draw expression curves (or envelopes) or automation. Please refer to the user manual of your DAW in order to know how to provide MIDI CC curves or automation.

You can find "Getting Started" for most DAWs on our knowledge base <https://kb.audiomodeling.com/en/c/how-to>

Understanding Ambiente

What is Ambiente and why should I use it?

Ambiente is a sophisticated room simulator initially developed as an essential component of SWAM String Sections. Unlike standard reverb effects, Ambiente positions instruments within a 3D virtual space, simulating the reflections of sound waves through geometric calculations. This creates a more realistic spatial experience.

Why use Ambiente if you already have effects and reverbs?

Ambiente provides more immersive and precise spatial positioning than traditional reverb effects. It enhances the natural and authentic sound of SWAM Solo Strings, SWAM Solo Woodwinds, and SWAM Solo Brass, significantly elevating the realism and coherence of soundscapes.

Can I move just one section to a different room?

No, the SWAM String Sections are designed to function as a unified entity within the same room environment to maintain consistency and avoid paradoxical situations.

What is the purpose of having multiple rooms in the Ambiente room simulator?

The Ambiente room simulator offers the flexibility to choose and shape sounds in different rooms, similarly to how different recording studios use various acoustic environments. Larger rooms can be used for string sections to produce a broad, reverberant sound, while smaller rooms can be used for solo instruments to create a more intimate sound.

Communication Between Instances

One of the key features of Ambiente is its intelligent communication between instances, including the Ambiente standalone effect plugin. Ambiente enables centralized control,

allowing you to manage the position, microphone distance, and room properties for all sources from any instance of SWAM or the plugin.

Why do SWAM instruments need to use the local network?

With the introduction of SWAM String Sections and the 3.8.0 update for SWAM Solo Instruments, all products now feature the Ambiente room simulator. This simulator communicates with other plugin instances across the local network, allowing synchronized operations and settings across all instances, saving time, reducing errors, and ensuring consistent results.

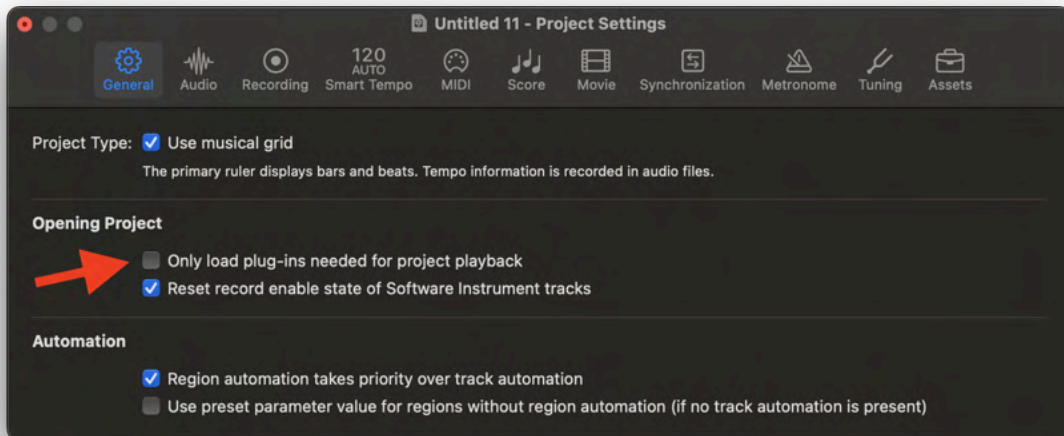
“Communication between instances failed” warning message

If you encounter a communication error between SWAM plugin instances, it may be due to insufficient network permissions. This issue can typically be resolved by ensuring that multicast communication is enabled for SWAM instances. For instructions on how to set local network permissions, please refer to the [Local Network Permission](#) section in this manual.

Issues when opening Logic Pro projects or templates

When opening Logic Pro projects or templates that have been saved without MIDI data, if the "Only load plug-ins needed for project playback" option is enabled in your project settings (File -> Project Settings), SWAM instruments in Ambiente will not be displayed until you open each plugin instance. This occurs because Logic Pro disables plugins on tracks without MIDI data, preventing Ambiente from communicating with the other SWAM instances until each plugin is selected and enabled.

We strongly recommend deselecting the "Only load plug-ins needed for project playback" option.



What are SWAM Templates?

Templates replace "Quick Reset" and "MIDI Preset" to clarify the difference between applying/resetting settings and recalling a complete preset. In the SWAM ecosystem, "Presets" mainly refers to the synthesis engine and sound engine data, combined with other settings like MIDI Mapping, Micro Tuning, and Room Simulator configurations.

When applying a template, you modify specific system parts, such as MIDI Mapping or Room Simulator settings, without altering the sound. This terminology shift helps users better understand and utilize the different functionalities within the SWAM ecosystem.

Why is it called the SWAM Ecosystem now?

With the introduction of SWAM String Sections and update 3.8.0 for SWAM Solo Instruments, all products now include the Ambiente room simulator, which is available also as a standalone plugin. This integration allows instruments and audio tracks to interact within the same virtual room, making it possible to build a cohesive orchestral sound.

Backward compatibility with previous versions: Legacy Reverb mode explained

Ensuring compatibility for DAW projects

When updating to SWAM v3.8.0, DAW projects saved with versions 3.7.x or earlier will automatically open with Legacy Reverb Mode enabled, deactivating the new Ambiente room simulator to ensure consistent sound results. This allows users to continue their work without unexpected changes in audio output.

Preset import and Legacy Reverb mode notification

Presets saved in version 3.7.x or earlier can be imported into v3.8.x, and the default setting will apply the new room simulator. Users will be notified of this change, with the option to switch back to Legacy Reverb mode if the original sound is preferred.

Compatibility of presets between versions

- Forward Compatibility: Presets created in version 3.7.x or earlier are fully compatible with v3.8.x.
- Backward Compatibility: Presets saved in version 3.8.x are not guaranteed to be compatible with earlier versions and may result in errors.

Transition information for new Ambiente room simulator

1. **Standalone Mode**: When opening the new version 3.8.x in standalone mode, instruments will start with the room simulator active. A popup will notify users that the instrument now has a Ambiente room simulator effect instead of the basic reverb from previous versions.
2. **DAW Projects**: When opening a DAW project using v3.7.x instruments after updating to v3.8.x, instruments will start in Legacy Reverb mode to preserve the project's sound. It is recommended to manually switch to the room simulator by deactivating Legacy Reverb mode.
3. **Importing Presets**: When importing a preset saved from version 3.7.x or earlier, the instrument will start with the room simulator active, and a popup will notify the user of this change. Users can switch to Legacy Reverb mode if desired.
4. **Loading Presets**: When loading a Factory or User preset in v3.8.x that uses a different room setting than the current one, the instrument will ask if you want to overwrite the current room or keep the existing settings.

5. **DAW Sessions:** When loading a new instrument with a different room setting than the current one in a DAW session, the instrument will adopt the current room setting.
6. **Loading Room Templates:** When loading a Room Template in a DAW session, the current room will be replaced with the template room setting.

Best practices for adding multiple solo instruments of the same type

When adding multiple solo instruments of the same type, it's essential to address potential phasing issues, especially when these instruments play in unison or occupy the same spatial position. Here are some best practices:

Understanding phasing issues

Phasing occurs when identical instruments play together, causing interference patterns. To mitigate these issues, SWAM instruments offer several solutions.

Utilizing the Ambiente room simulator

Ensure instruments do not overlap in the same position within the room simulator to avoid phasing issues. Carefully place each instrument in a unique position for a balanced and natural sound.

Customizing instrument characteristics

- **Different Instrument Bodies for Solo Strings:** Select different instrument bodies (e.g., Cremona, Firenze) to diversify sound characteristics.
- **Unison Anti-Phasing for Solo Brass:** Adjust the Unison Anti-Phasing parameter to minimize phasing problems.
- **Different Instruments for Solo Woodwinds:** Choose different woodwind sounds to avoid phase-related distortions.
- **Using Divisi for orchestral sections:** Employ the "divisi" technique to divide a section of instruments so they play different parts, reducing the risk of phasing issues.



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 login to the Customer Portal at <https://my.audiomodelin.com>, browse to the "Support" section, choose the appropriate category and follow the instructions to open a support Ticket .

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 DAW project that shows the issue is usually very helpful.