

TORNADO A1



USER MANUAL. VERSION 1.20

WWW.GLOBAL-DJ.COM

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Tornado A1 is a professional MIDI controller intended for creation and visualization of musical effects by means of hand motions, without touching the equipment. It gives the possibility to control parameters of virtual music synthesizers and effects in a visual way in the public eye and thus to create spectacular live show. Tornado A1 strengthens DJ's contact with dancing people, helps to create good mood.

Tornado A1 is the system that transforms parameters of hand motions by means of the MEMS technology in accordance with flexible algorithms and methods of the Motion Capture theory into MIDI control signals.

Wireless 3D gloves are the main component of the controller. The MIDI controller can be connected to the computer and therefore to various virtual music studios and players (Traktor 2 Pro, Ableton Live, FL Studio, VST plug-ins, Deckadance, Virtual DJ, etc.) through the USB Adapter. Tornado A1 has also a convenient multifunctional multilevel MIDI keyboard directly on the gloves. Several various MIDI commands can be sent through use of one button.

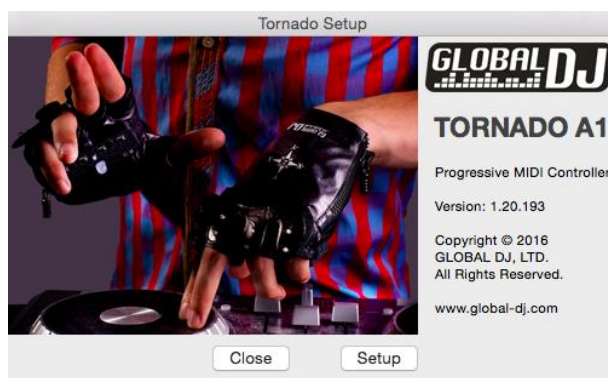
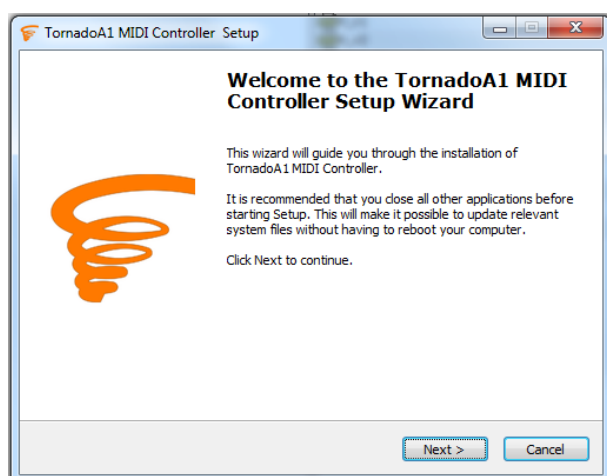
1) Installation of the driver and the software for Tornado A1.

System requirements.

- Operating Systems: Microsoft Windows 7 or later, Mac OS X.
- Computer with built-in USB port.
- Processor: 2.4 GHz or above (to ensure minimal processing delay).
- RAM: 2 GB or above.

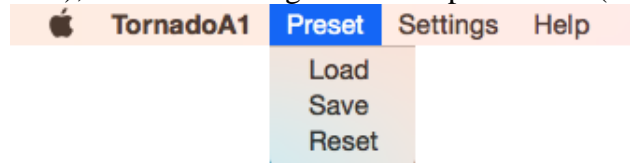
Installation of the software:

Please visit www.global-dj.com and click to Downloads section to download the driver applicable for your Operating system. Please, note that drives shall be installed on the laptop without plugged in USB Adapter Tornado. Installation program has user-friendly interface and performs standard actions. You need to restart your computer after program setup.

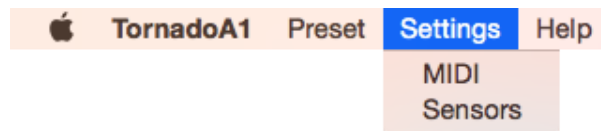


2) Menu of the program.

– **Preset**. It is used for saving presets of parameters of the Tornado A1 program shell (**Save**); for loading previously created presets (**Load**); and for resetting all current parameters (**Reset**).



– **Settings**. The **MIDI** option allows to use the alternate MIDI port (virtual or hardware) for operation. The **Sensors** option is used for setup and monitoring of glove sensors.



– **About and Help**. These items contain the program information.



– After setting up the parameters of various effect control methods, Tornado A1 can be started by the **Start** button (blue indicator on the USB Adapter is on) and stopped by the **Stop** button.

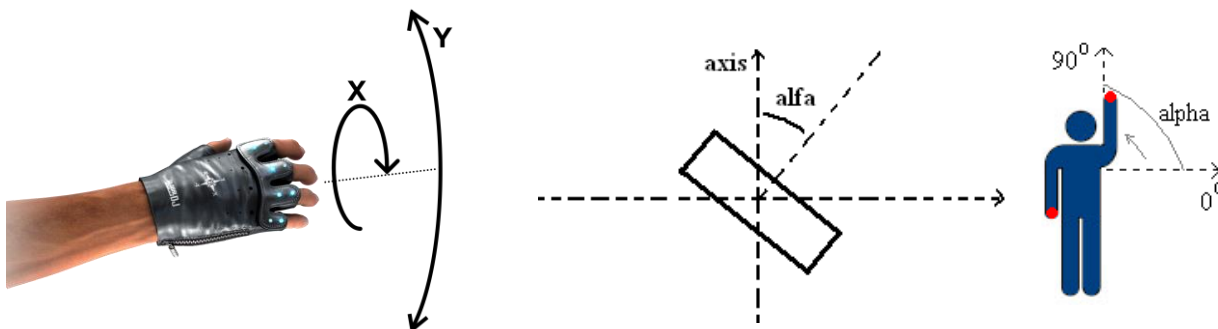
Converting movement parameters into MIDI control signals with the help of controller Tornado A1

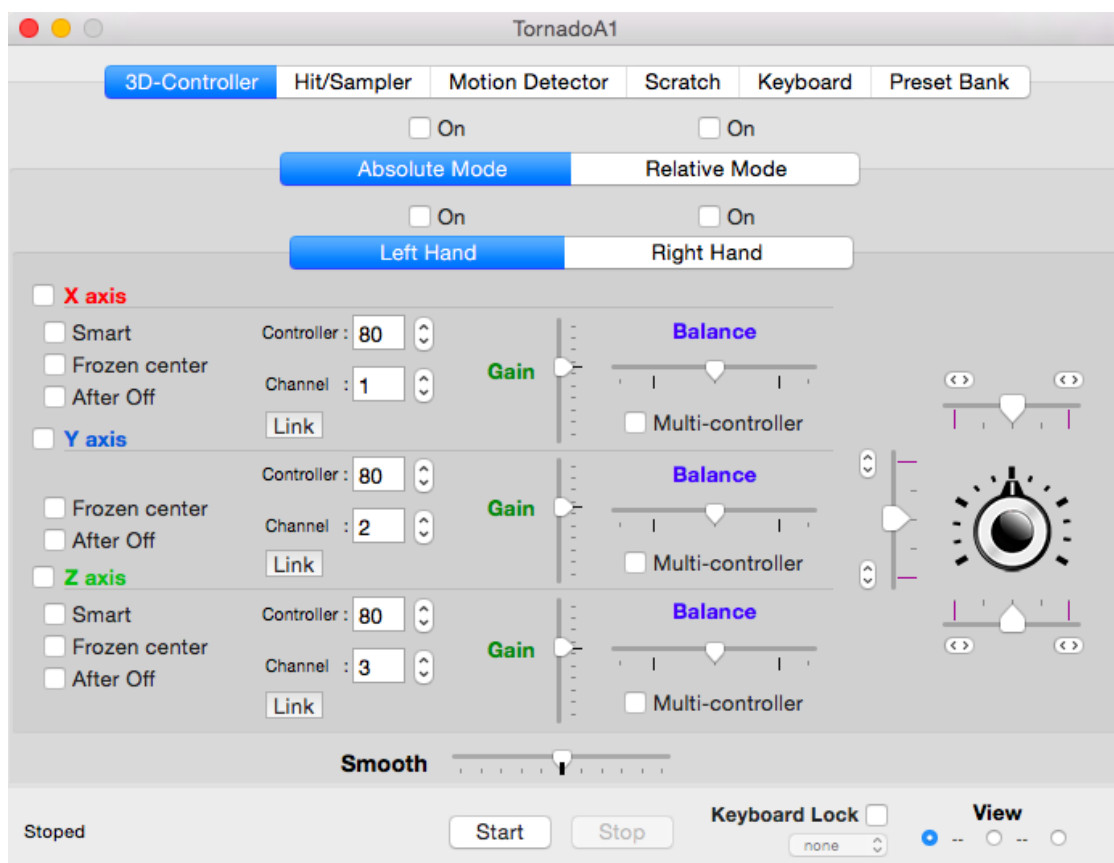
There are many methods for converting movement parameters into MIDI control signals. Consider some of them:

3) Method: 3D-Controller.

a) **Absolute Mode** – direct control of parameters of virtual music studios or VST synthesizers and effects using the MIDI channel.

Signals from 3D sensors (e.g. a gloves' angle of turn/tilt, acceleration, direction of movement, and speed) are converted into MIDI control messages for X (hand rotation), Y (tilt Up/Down), and Z (hand rotation with 90° shift relative to X axis) controllers. These controllers are used for parameter controlling of virtual regulators in musical studios. For this mode the position of a virtual regulator knob is determined definitely by angle (alpha) of rotation/tilt of the glove relative to a sensitive axis.





Thus, the separate controller is formed for each sensitive axis (X, Y, Z) (three controllers per one glove for this method). X and Y controllers are especially convenient to use, for instance, as a modulator control joystick:



Connection (X or Y or Z) of the controller for the virtual adjustment knob:

To connect the controller, define the individual number of the MIDI channel and the number of the process controller in the Tornado A1 program shell. Then activate the MIDI learn mode (Learn) for the selected virtual parameter or the adjustment knob in the virtual studio and click the **Link** button (Tornado A1 window). After the recognition of the number of the process controller deactivate the learn mode (MIDI mapping). The initial value of the virtual adjustment knob is set by the **Link** button in the same way.

Controller parameters:

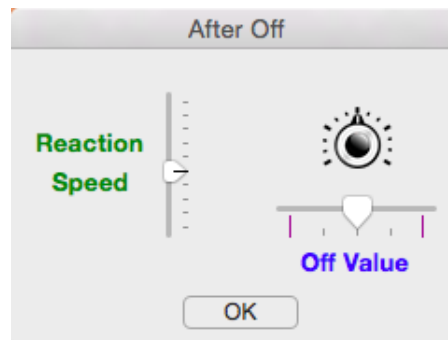
- **Balance** – balancing (or deviation) of the central position of the adjustment knob for each axis. The drift of the position occurs when batteries are low as well as due to intrinsic variation of parameters of the sensors.
- **Gain** – amplification. This parameter adjusts the factor of proportionality between the angle of rotation of the glove (for the sensitive axis) and the position of the controlled virtual adjustment knob. The higher

is Gain, the higher is the level of the virtual adjustment knob at the constant defined angle of rotation of the glove.

- **Smart** – this parameter activates the smart mode for which the axial sensitivity area is limited to ± 90 degrees. I.e. further rotation (when the angle exceeds 90 degrees) does not result in any change of the level of the adjustment knob. This mode is good for smooth hand motions.

- **Frozen center** – this option includes the capture of the central area of the adjustment knob (debouncing of the center).

- **After Off** – this parameter sets the defined value for the adjustment knob after the controller's closing switch is off (after the closing switch for the axis is off and after the selection of the glove and the method). This function also works when the controller is switched off by the keyboard.



- **Reaction Speed** – speed of stabilization of the After Off Value.

- **Off Value** – end value for setting after one controller's closing switch is off.

- **Smooth** – common parameter for both gloves. It regulates the compensation of the hand shaking. The higher is the compensation, the lower is the shaking, but the lower is the reaction speed as well.

- **Limits** for changes of the level of the virtual adjustment knob can be set by means of limit setting buttons.

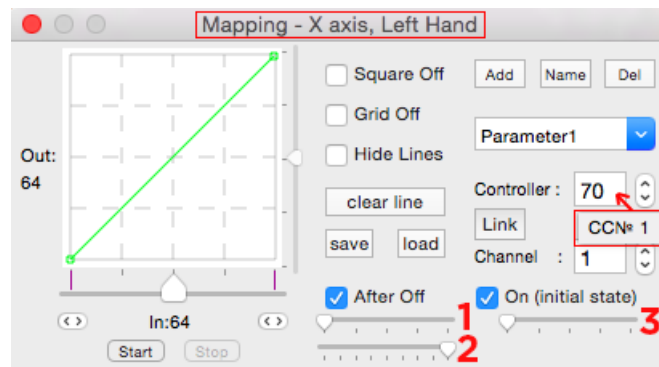


- **Multi-controller.** Tornado A1 allows you to control multiple parameters of the music studio or plug-in according to individual dependence functions (individual MIDI Maps) by one gesture. Customized for each parameter MIDI Maps are drawn in a special graphic editor. It is much easier and faster than expressing dependence by mathematical function. This versatile tool is especially useful for music studios, which have a simple basic MIDI Mapping.

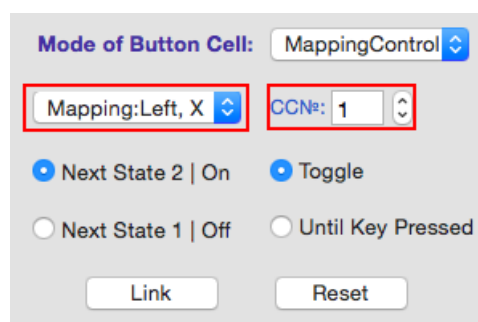
1 Gesture To Multi MIDI Maps

MIDI Mapping Management:

Window graphics editor of MIDI Maps opens with a help of corresponding “Mapping” button on the main window of the program. Each axis controllers (X, Y, Z) has its multi-controller.



- **Add** button adds a new layer, a new MIDI Map for the corresponding controller. The number of layers equals to the required number of independent parameters that must be managed. Independent parameters considered as such if their MIDI Maps are inconsistent with one another, it means that dependence functions of output MIDI messages are different.
- **Name** button defines the name of current MIDI Map.
- **Link** button. This button is designed for easy linking (connecting) controller with parameter in the music studio. This button sends MIDI message, which contains information about the selected number, channel and value of the process controller. Music studio studies according to this message.
- **Del** button deletes the current MIDI Map.
- **Square Off** option turns off the display of reference points on the line of current MIDI Map.
- **Grid Off** option turns off the display of the grid on the screen of MIDI Maps.
- **Hide Lines** option turns off the display on the current MIDI Maps.
- With the help of **ComboBox** menu (list of MIDI Maps) the current MIDI Map is selected for editing.
- There is a **special slider** that is used to control the work of Graphic MIDI Mapping under the lines of MIDI Maps. When moving this slider MIDI messages are being sent with the corresponding value for all layers.
- **On (initial state)**. This option turns on/off operation of the controller at the appropriate layer. And the slider **3** sets an initial value of the controller at the time of turning on. If we set this value equal to the initial value of the controlled parameter in the music studio, we will avoid jumps in the time of turning on. You can use the keyboard at the glove to manage the controller. For this purpose there is a special operating mode for the button – **Mapping Control**.



Parameters of Mapping Control mode:

CC№ – controller number (layer number). When the mouse's cursor is put over the controller, its number appears.

Mapping – defines glove (left or right) and a controller axis (X, Y, Z).

Next State 2 | On and Next State 1 | Off – these parameters define the next state of the switch after pressing the button (toggling the switch) on the glove keyboard.

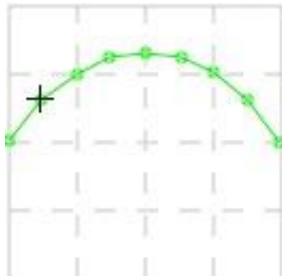
Toggle – this parameter activates the mode (for keys of the glove keyboard only) for which the closing switch of the controller each time when the glove keyboard button is pressed. The state of the switch is indicated by the LED: double blinking when the switch is on, single blinking when the switch is off.

Until Key Pressed – this parameter activates the mode (for keys of the glove keyboard only) for which the key of the glove keyboard turns on (off) the controller when being pressed and turns it off (on) when being released.

– **After Off**. If this option is enabled controller value will be established smoothly to After Off value when you turn off the controller (at the appropriate layer) by button at the glove. After Off value is determined by the slider **1**. And release time – by the slider **2**.

Drawing Lines:

The fastest and the most convenient way to draw curves is to draw them with the help of control points, which are connected with straight lines. It means that curves are approximated by lines. In conditions of low number of bits of MIDI controller value grid (integer values from 0 to 127) the difference between polylines and straight lines is not essential.



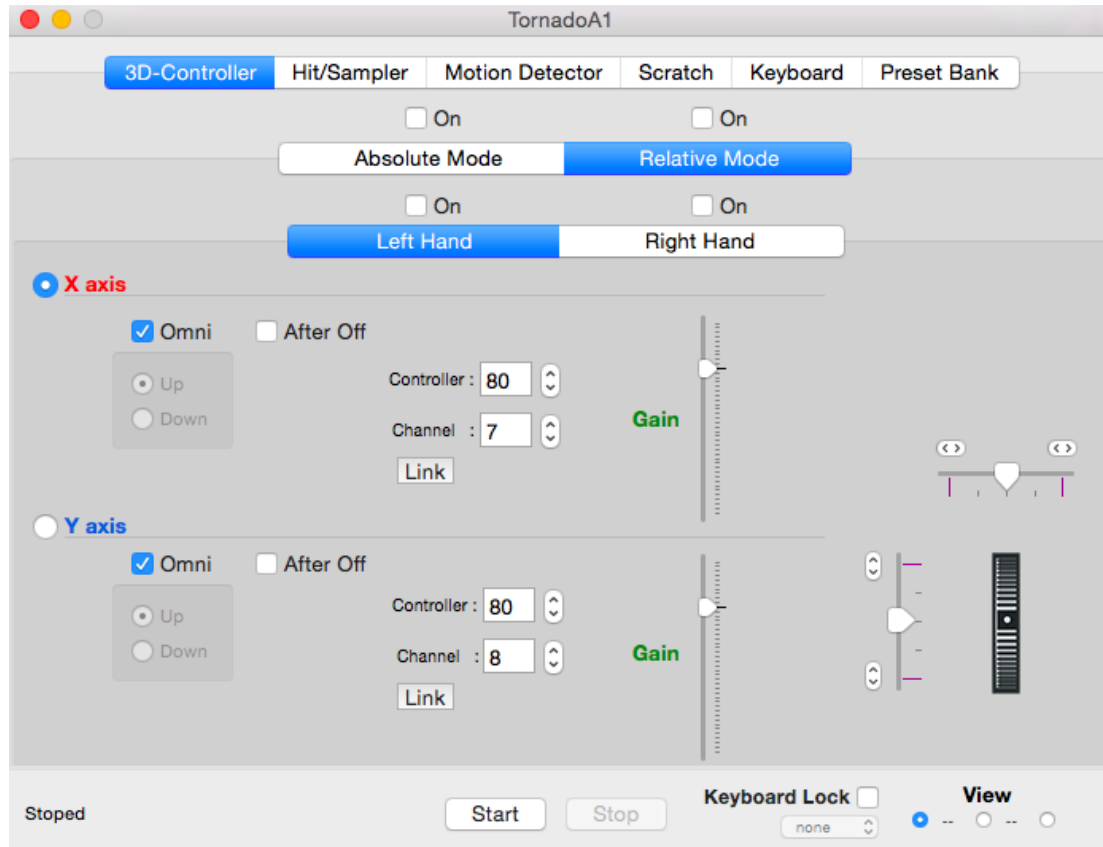
– **The reference point** is added by double-clicking with a left mouse button on the graphic screen of MIDI Maps. In such a case, there is a capture of this point with the mouse. The required coordinate of the reference point is being set by dragging the mouse. Next single click with a left mouse button fixes the reference point in the current position.

– **Deleting an existing reference point** is made by double-clicking it with a left mouse button.

– **Capturing and dragging an existing reference point** is made by single-clicking it with a left mouse button, followed by dragging.

– **The curves of MIDI Maps** can be **saved** in the file or uploaded from the file using corresponding buttons.

b) **Relative Mode** – position of the virtual adjustment knob is determined by its initial value (it is set by the Link button, after the setup of the MIDI card) and by the relative change of the angle of rotation of the appropriate glove relative to the sensitive axis X or Y.



The position of the adjustment knob does not exactly conform to the tilting angle of the glove. Clockwise rotation increases the value of the virtual adjustment knob, and counterclockwise rotation decreases this value.

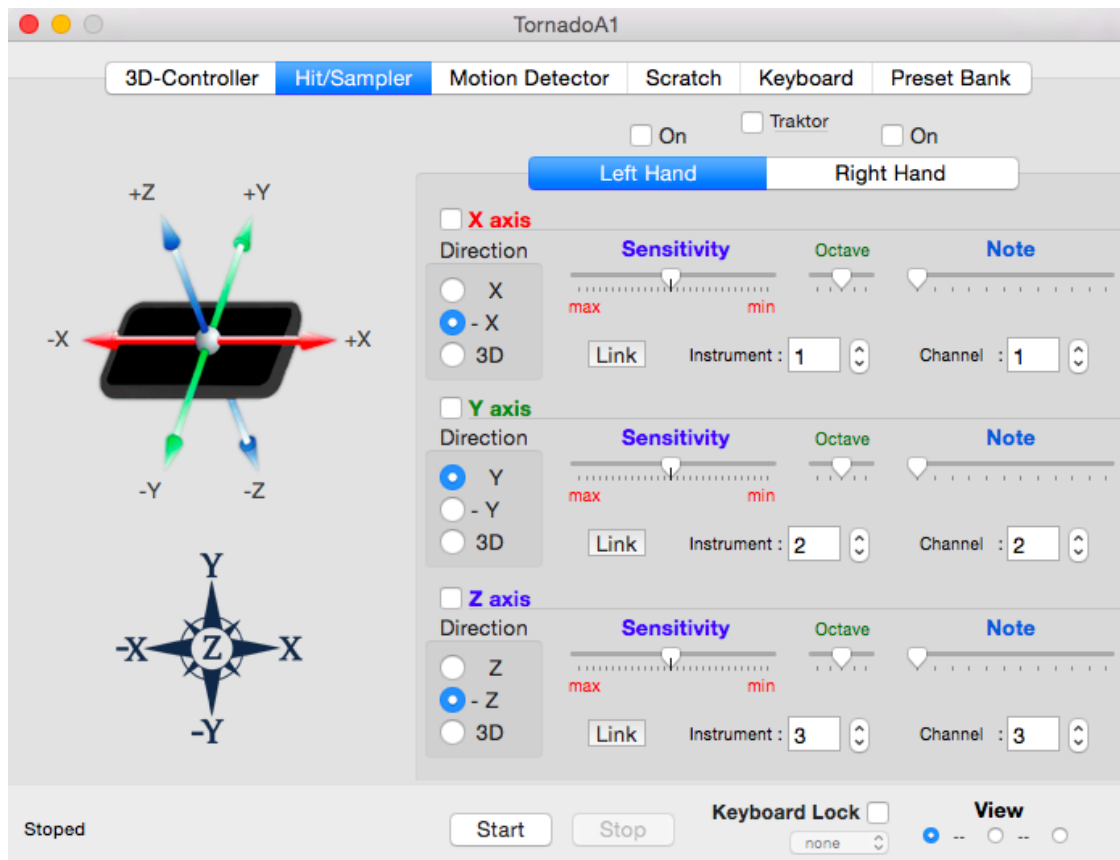
Parameters:

- **Gain** – amplification. This parameter sets proportionality between the glove rotation angle and the relative change of the virtual adjustment knob. The higher is Gain, the more substantial is the change of the position of the virtual adjustment knob at the defined relative change of the angle of rotation of the glove.
- **Omni** – this button turns on reaction of the adjustment knob in response to rotation of the glove, both clockwise and counterclockwise. When the Omni button is off, the following switches operate:
- **Up and Down** – the reaction is activated accordingly for the rotation to the right (clockwise) only, or for the rotation to the left (counterclockwise) only.
- **Limits** for changes of the level of the virtual adjustment knob can be set by limit setting buttons.



- **Connection** of the X-controller or of the Y-controller to the virtual adjustment knob is made similarly to the procedure mentioned above.

4) Method: Hit/Sampler.



This method gives the possibility to run samples using hand kick motions. The sensitive direction of a kick (for the appropriate hand) is determined by X axis, Y axis, Z axis closing switches, the positive or the negative direction is determined by **Direction** switches.

– If you select **3D option** (Direction) the signal will be supplied from **3D-Controller** to the sampler depending on the axis. Threshold (0-127) will be determined by the slider Sensitivity.

– **Sensitivity** – this switch defines sensitivity depending on the strength of the kick motion of the glove.

MIDI parameters:

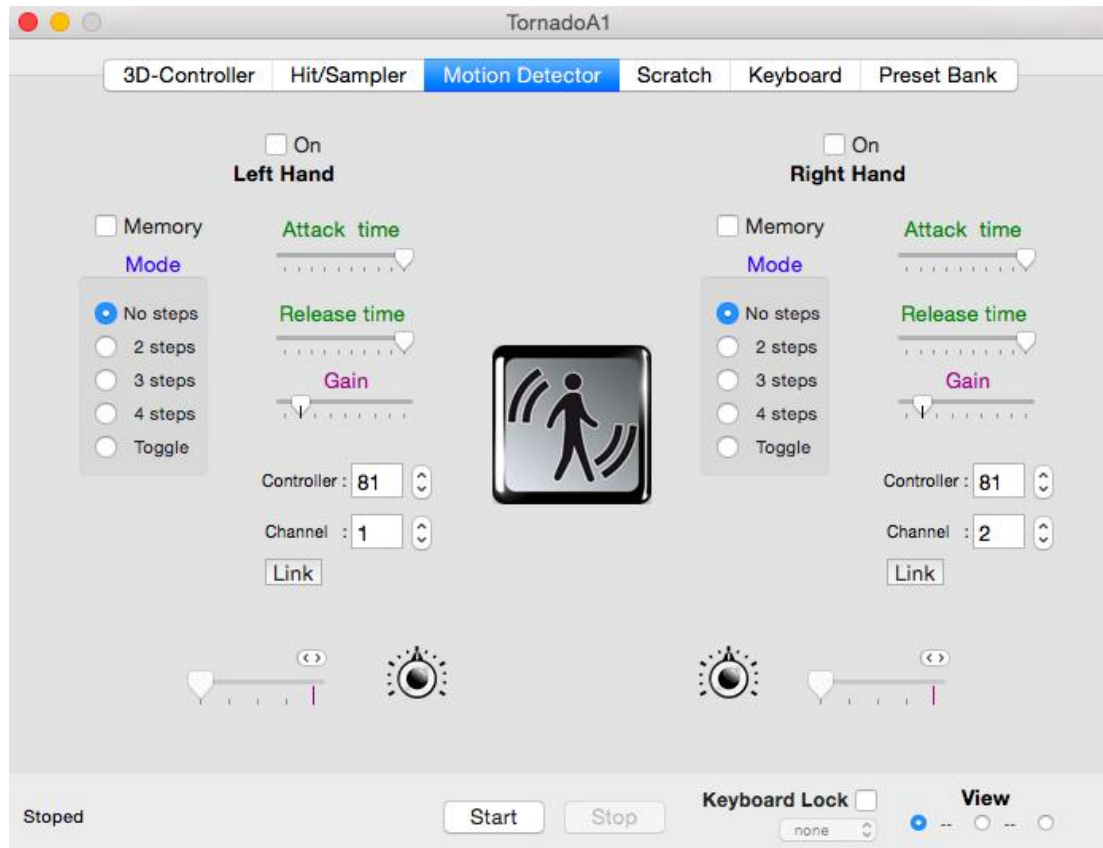
– **Note** – this parameter assigns note of the MIDI message.

– **Octave** – this parameter defines the octave of the MIDI message.

– **Instrument** – selection of instruments.

– **Channel** – this parameter assigns the channel for the message.

5) Method: Motion Detector.

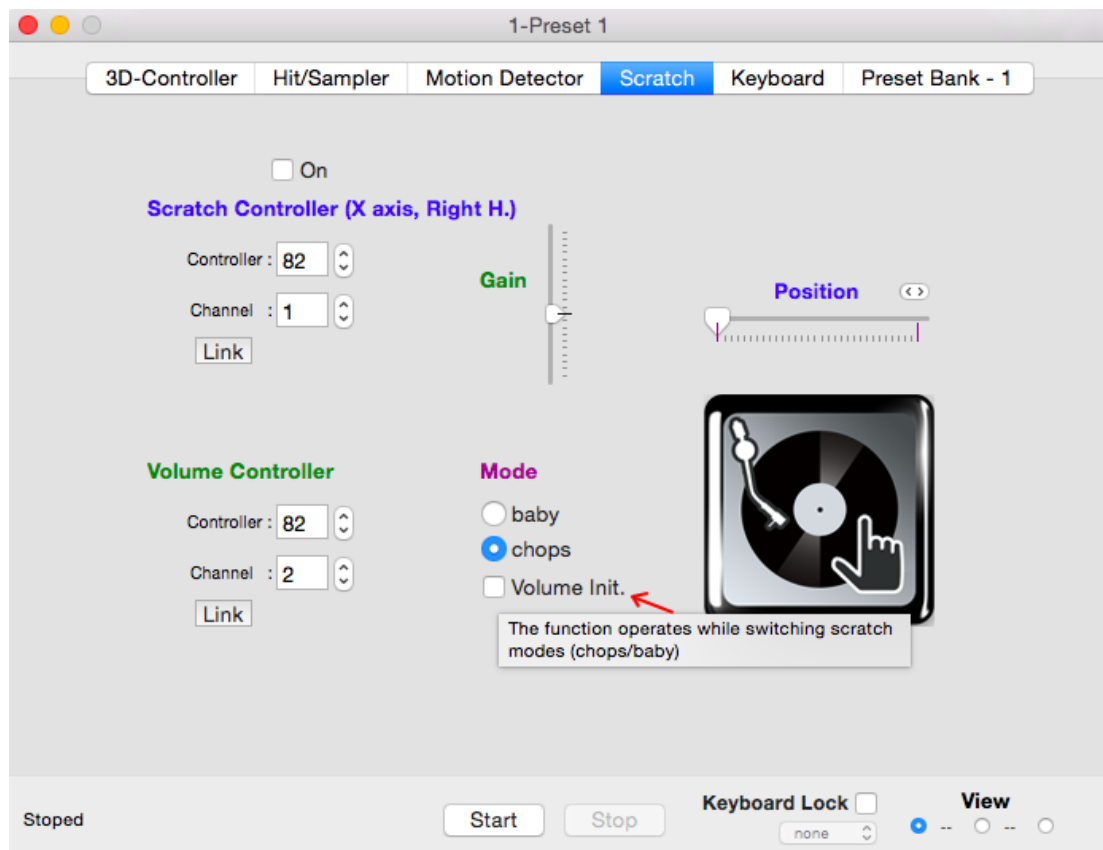


This method transforms the quantity of motion (the average acceleration) into the level of the virtual adjustment knob. The higher is the average acceleration, the higher is the level of the adjustment knob.

Parameters:

- **Attack time** – signal rise time.
- **Release time** – signal decay time.
- **Gain** – amplification. This parameter sets proportionality between the average acceleration of the appropriate glove and the level of the virtual adjustment knob.
- **Memory** – this parameter provides storing of the current level in the memory, i.e. it prohibits the decrease of the level of the adjustment knob.
- **Mode** – this parameter provides the steps of changes of the level of the adjustment knob:
 - No steps** – no level jumps of the adjustment knob, smooth changes.
 - 2 steps** – 2 available values of the adjustment knob with smooth transitions.
 - 3 steps** – 3 available values of the adjustment knob with smooth transitions.
 - 5 steps** – 5 available values of the adjustment knob with smooth transitions.
 - Toggle** – toggle mode.

6) Method: Scratch.



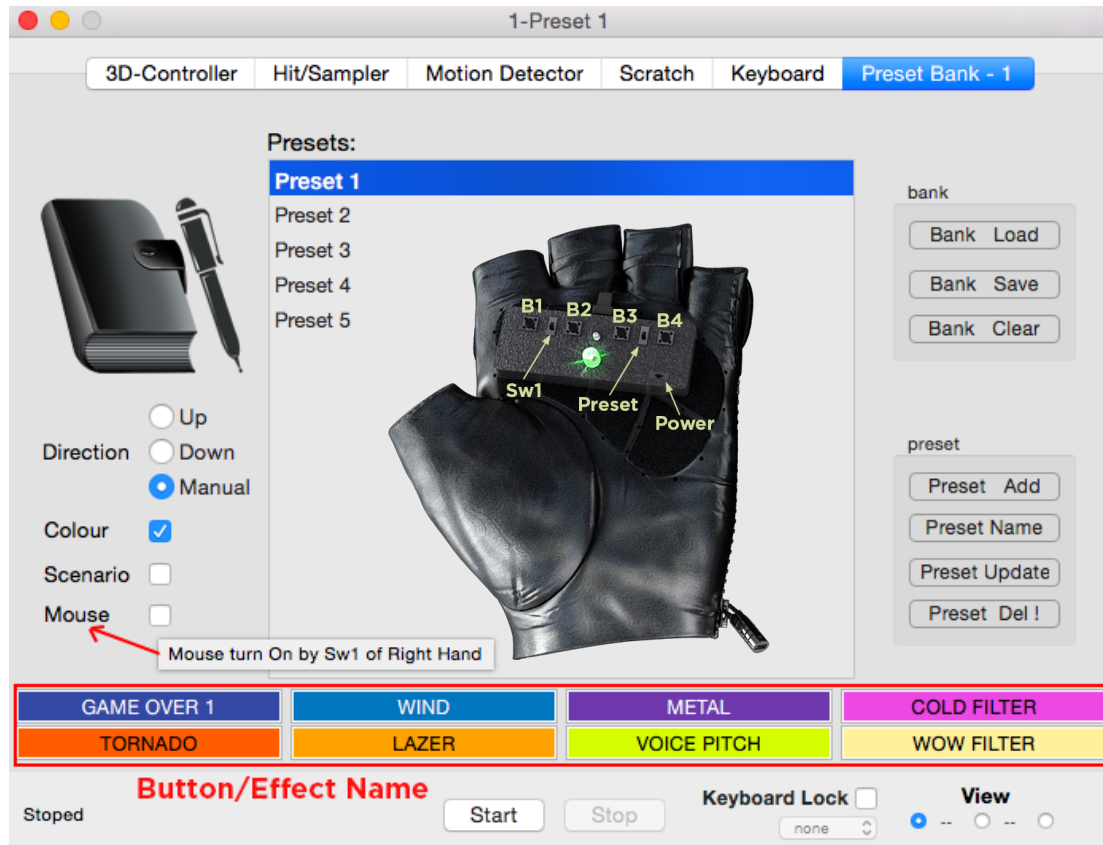
This method allows to create Scratch effects using the right glove. To do this the X-oscillatory motions are detected. Two methods are implemented: **baby** and **chops**. **Shops** method differs from a simple **baby** so that it can control the cross fader (volume). Special controller Volume Controller is designed for volume control. It automatically removes the volume on the back wave of Scratch effect.



Parameters:

- **Position** - This slider sets the initial and maximum values (positions) for Scratch Controller.
- **Gain** - gaining. It sets the proportionality between the amplitude of the X-oscillation of the right glove and the amplitude of the oscillation of Scratch Controller.
- **Volume Init.** - If this option is enabled, the value of **Volume Controller** controller automatically restored to its original state. This occurs when switching methods in order to create Scratch effects (chops / baby) using the buttons on the gloves keyboard.

7) Preset Bank.

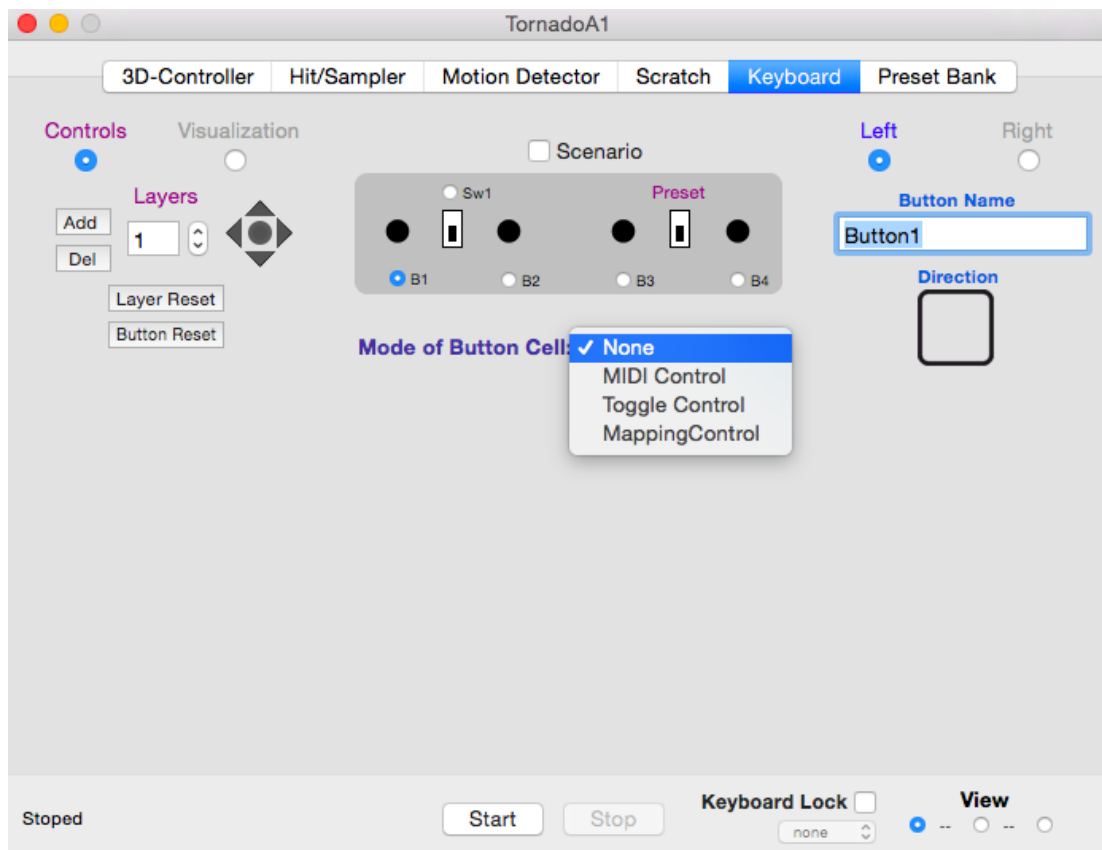


The Preset Bank contains the list of previously created presets. The sequence order of presets is formed when the selected component is dragged by the mouse (the left mouse button is used for this purpose). The double click on a preset makes it a current preset (loads its settings). **Switching of the presets is also provided by the switch (Preset) on the keyboard of the left glove**, and any preset in the list must be activated (current) in this case. When you click on the button **Stop**, Tornado A1 plug-in automatically restores state checkboxes and values (sliders) of the controllers. This occurs if the current preset is selected and there are no stars in the preset name (it means that the preset settings have been changed with the mouse).

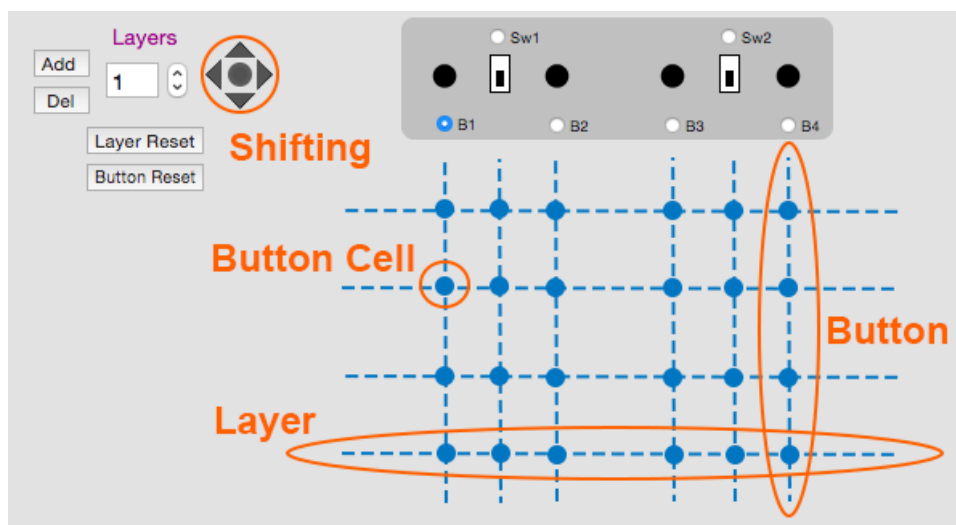
Parameters and buttons:

- **Up** – when the presets are switched by means of the switch on the keyboard, the preset which is one step higher will be the next preset.
 - **Down** – the preset which is one step lower will be the next preset.
 - **Manual** – preset is selected using the buttons B1-B4 when Preset button is on. At the time of switch off Preset button the selected preset is loading. Switching between windows of Tornado plug-in (Keyboard / Preset Bank) is proceeding automatically.
 - **Preset Add** – this button adds the preset to the list.
 - **Preset Del** – this button deletes the preset from the list.
 - **Bank Clear** – this button clears the Preset Bank.
 - **Bank Save** – this button saves the Preset Bank to the file.
 - **Bank Load** – this button loads the Preset Bank from the file.
 - **Preset Update** – this button uploads new settings for the current preset to the Preset Bank.
 - **Preset Name** – this button changes the preset name in the list of the Preset Bank.
- The special **Preset-> Save** menu must be used for saving the current preset; the **Preset->Load** menu (or a double click of the mouse on the preset in the list) is used for loading the preset. **Preset->Reset** – resets all settings of the Tornado A1 plug-in and loads the clear preset.
- **Colour** – for display purposes the effects names can be lighted up differently.
 - **Mouse** – turns on "3D Mouse" operating mode by Sw1 of right glove.

8) Keyboard.

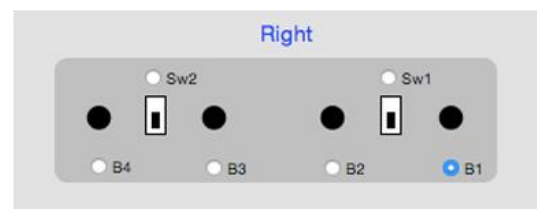
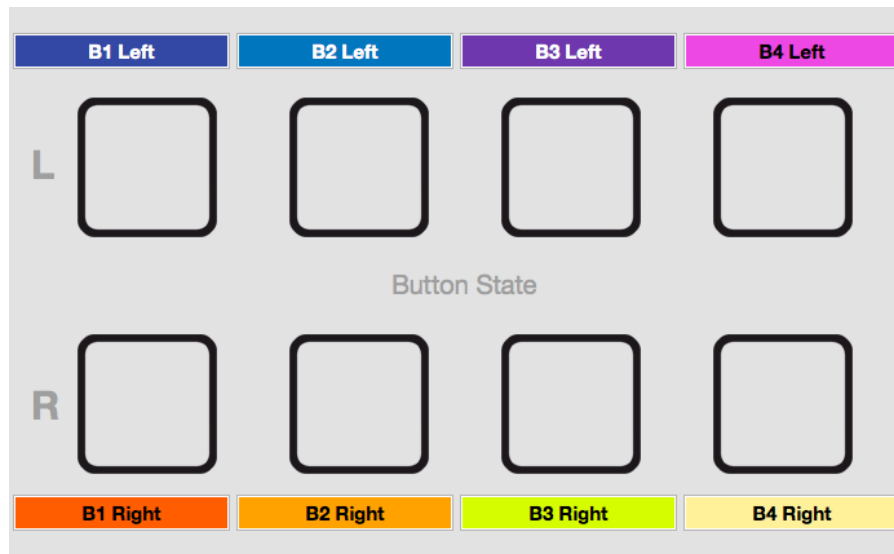


The Multifunctional Keyboard can simultaneously control the parameters of the virtual music studio via MIDI, control the parameters of the Tornado A1 utility and switch LED visualization modes. The advantage of the keyboard is its multi-layered - the ability to send multiple MIDI messages and other commands with one button. Layer (Layer) consists of cells (Button Cell) of all the buttons and switches on the horizontal. The set of cells (Button Cell) all layers of the vertical form is a button (Button). The multilayer structure of the keyboard:



Lower cell (Button Cell) of the button (Button) has a higher priority than the top, its command is executed first. However, the display on the information diode of the gloves is determined from the last cell command.

The correspondence between the buttons at the gloves and the buttons at the Tornado A1 plugin:



Managing layers and cells buttons:

- **Add** – add new Layer.
- **Del** – delete current Layer.
- **↑** – select current Layer.
- **Layer Reset** – clear current Layer.
- **Button Reset** – clear Button.
- **◀** – moves Button to the left.
- **▶** – moves Button to the right.
- **▲** – moves Button Cell layer on top.
- **▼** – moves Button Cell on a layer of down.
- **Link** – save settings of Button Cell.
- **Reset** – reset settings of Button Cell.

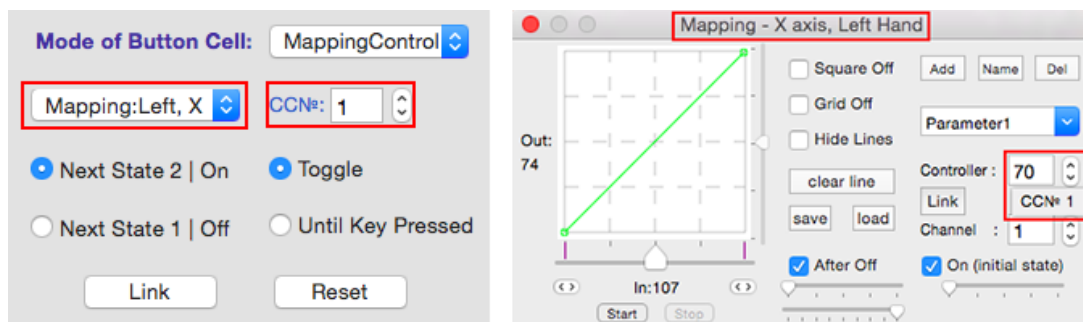
Button Name:

- **Button Name** - This field contains the name of a button, it may indicate an effect name managed by it.

- **Keyboard Lock** – keyboard lock option. If the mode is selected the lock is activated by switch (**Sw1**) at the left-hand glove.

Modes of button cells (Mode of Button Cell).

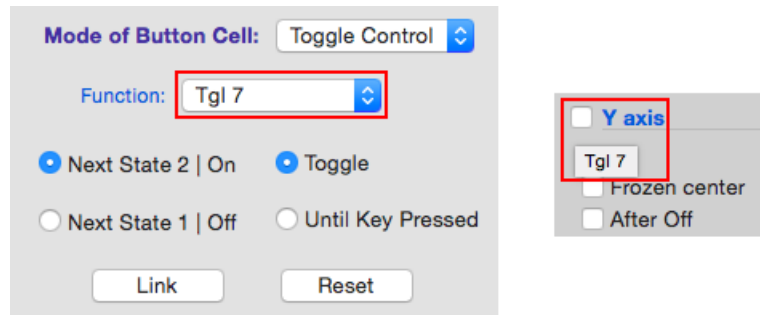
- **Mapping Control Mode** – This mode is used to control MIDI controllers of graphical mapping (layers of multi-controller). This command enables / disables operation of the controller on the appropriate layer.



Mode Options:

- **CCN** – controller number (layer number). When the mouse's cursor is put over the controller, its number appears.
- **Mapping** – defines glove (left or right) and a controller axis (X, Y, Z).
- **Next State 2 | On** and **Next State 1 | Off** – these parameters define the next state of the switch after pressing the button (toggling the switch) on the glove keyboard.
- **Toggle** – this parameter activates the mode (for buttons of the glove keyboard only) for which the closing switch of the controller each time when the glove keyboard button is pressed. The state of the switch is indicated by the LED: double blinking when the switch is on, single blinking when the switch is off.
- **Until Key Pressed** – this parameter activates the mode (for buttons of the glove keyboard only) for which the key of the glove keyboard turns on (off) the controller when being pressed and turns it off (on) when being released.

Toggle Control Mode – Switch Tornado A1 plug-in parameters. Options (switches) are selected from the list by number. When you move the mouse cursor to switch his number appears (Tgl).



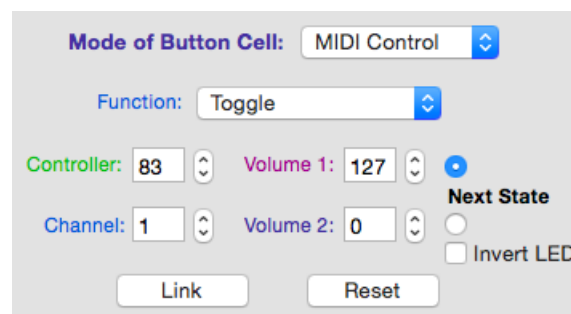
Mode Options:

- **Next State 2 | On** and **Next State 1 | Off** – these parameters define the next state of the switch after pressing the button (toggling the switch) on the glove keyboard.
- **Toggle** – this parameter activates the mode (for buttons of the glove keyboard only) for which the closing switch of the Tornado A1 plug-in toggles each time when the glove keyboard button is pressed. The state of the switch is indicated by the LED: double blinking when the switch is on, single blinking when the switch is off.
- **Until Key Pressed** – this parameter activates the mode (for buttons of the glove keyboard only) for which the key of the glove keyboard turns on (off) the switch in the Tornado A1 plug-in when being pressed and turns it off (on) when being released.

MIDI Control Mode – used for sending MIDI messages.

MIDI Control Mode functions:

Toggle – MIDI switch.



This sets the controller number, channel number, **Volume 1** and **Volume 2**, given the subsequent state of the switch (Next State). Switch Status is displayed on the LED indicator: when it sets to 1, LED flashes 2 times, when setting value is 2 - 1 times (possibly to turn on an inversion display). If you set the controller **Volume** = 200, when switching to a state of MIDI message will not be sent to a music studio!

Button | Sampler 1 – MIDI button. Also, it can run samples.

The screenshot shows the 'Mode of Button Cell' set to 'MIDI Control'. The 'Function' dropdown is set to 'Button | Sampler1'. The 'Controller' is set to 83, 'Channel' to 2, 'Volume On' to 127, and 'Volume Off' to 0. There are 'Link' and 'Reset' buttons at the bottom.

Set the controller number, channel number, the value when button is pressed (Volume On) and the value after switching off (Volume Off). If you set the controller **Volume** = 200, when switching to a state of **MIDI message will not be sent** to a music studio!

Note | Sampler 2 – sends a MIDI note to the music studio. Also, this mode can run the samples.

The screenshot shows the 'Mode of Button Cell' set to 'MIDI Control'. The 'Function' dropdown is set to 'Note | Sampler2'. There are sliders for 'Note' and 'Octave'. The 'Instrument' is set to 1, 'Channel' to 1, and 'Volume' to 127. There are radio buttons for 'Toggle' and 'Until Key Pressed' (which is selected). There are 'Link' and 'Reset' buttons at the bottom.

The settings are: the number of MIDI channel, the serial number of the instrument, the note and its octave, volume. In the mode **Until Key Pressed** the button works similarly to the button on the classic MIDI keyboard, in this mode you can also run samples. In **Toggle** mode button toggles the state of the note - on / off.

CC Volume Setup – sends the value (**Volume**) to MIDI controller (virtual regulator).

The screenshot shows the 'Mode of Button Cell' set to 'MIDI Control'. The 'Function' dropdown is set to 'CC Volume Setup'. The 'Controller' is set to 83, 'Channel' to 4, and 'Volume' to 127. There are 'Link' and 'Reset' buttons at the bottom.

Increment and Decrement – modes for groups of the buttons (4 groups consisting of 4 buttons each can be formed) for which one button increases the value of the MIDI controller by **Delta**, and the other one decreases it in the same way.

The top screenshot shows the 'Mode of Button Cell' set to 'MIDI Control' and the 'Function' set to 'Increment'. Parameters include 'Controller for Group' (83), 'Initial' (127), '5:Channel' (5), 'Group' (1), and 'Delta' (12). There are 'Link' and 'Reset' buttons.

The bottom screenshot shows the 'Mode of Button Cell' set to 'MIDI Control' and the 'Function' set to 'Decrement'. Parameters include 'Group' (1) and 'Delta' (12). There are 'Link' and 'Reset' buttons.

Parameters which are common for the group are assigned in the settings of the **Increment** function. Therefore the assignment of group parameters begins from the settings of the **Increment** function.

Tornado CC Setup – when you press the button the new number and channel for MIDI controller of Tornado A1 plug-in are assigned. The sequence number of the control of the controller appears when you hover on the mouse pointer.

The left screenshot shows the 'Mode of Button Cell' set to 'MIDI Control' and the 'Function' set to 'Tornado CC Setup'. Parameters include 'Controller' (80), 'CC Nbr' (CC1), and 'Channel' (1). There are 'Link' and 'Reset' buttons.

The right screenshot shows the 'X axis' settings. Parameters include 'Controller' (80), 'Channel' (1), and 'CC1' highlighted. There are 'Link' and 'Reset' buttons.

Hit Channel Setup – when you press the button a new channel for conversion algorithm Hit/Sampler is assigned. This takes into account options: sensitive axis direction and the type of glove (left / right).

The left screenshot shows the 'Mode of Button Cell' set to 'MIDI Control' and the 'Function' set to 'Hit Channel Setup'. Parameters include 'Left, X' and 'Channel' (1). There are 'Link' and 'Reset' buttons.

The right screenshot shows the 'Hit/Sampler' settings. Parameters include 'X axis', 'Direction' (- X), 'Sensitivity', 'Octave', 'Note', 'Instrument' (1), and 'Channel' (1).

Start, Stop, Continue – modes for buttons that start, stop or continue operation of the step sequencer of a virtual studio accordingly (e.g. FL Studio).

9) LED Visualization. Operating Modes.

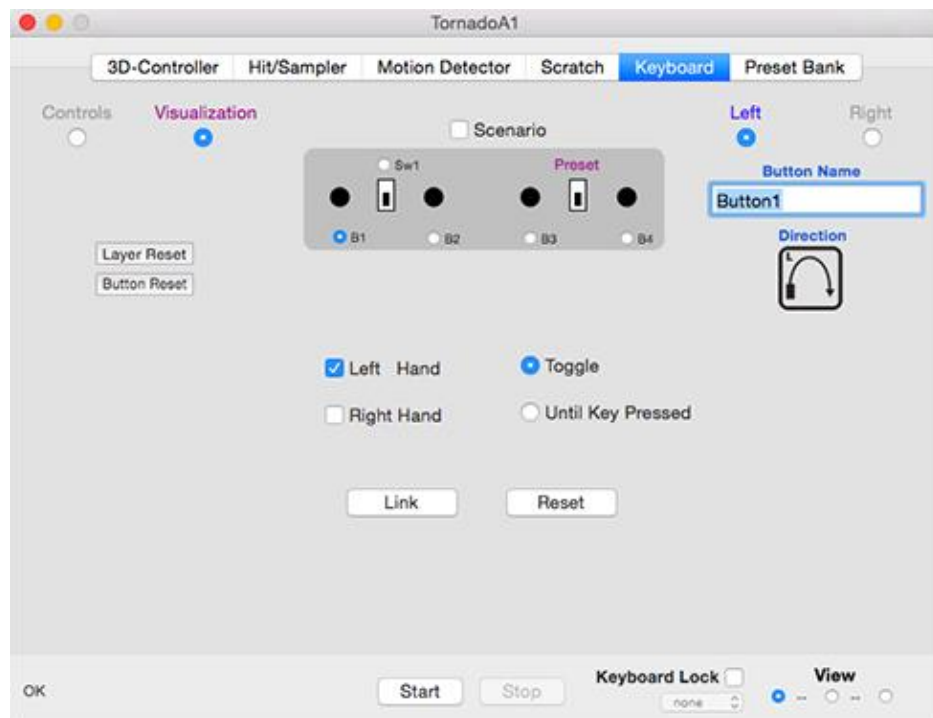
You can use the LED visualization to attract the public's attention at a right time. It activates automatically when creating musical effects. LEDs on both hands are independent.

To enable automatic visualization for the corresponding button you can click on the **Link** button on the Keyboard page in the display settings mode (**Visualization option**).

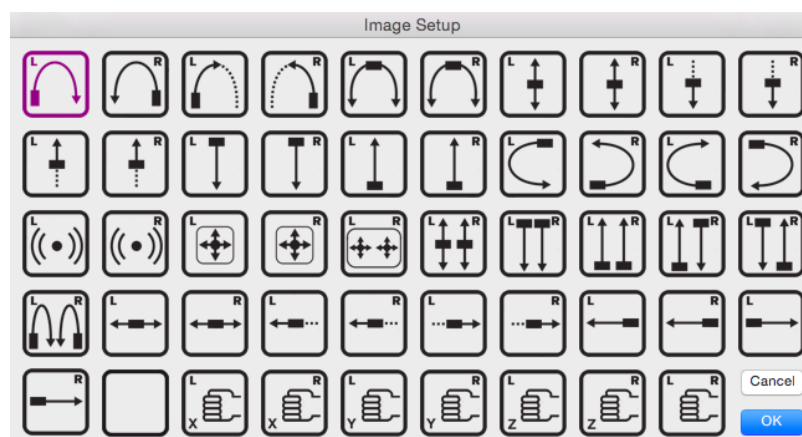
Each button can enable visualization of the left and / or right gloves.

Visualization can be adjusted to different operating modes:

- **Toggle** – Each press of the button switches the imaging condition.
- **Until Key Pressed** – visualization is enabled only when the button is held down.



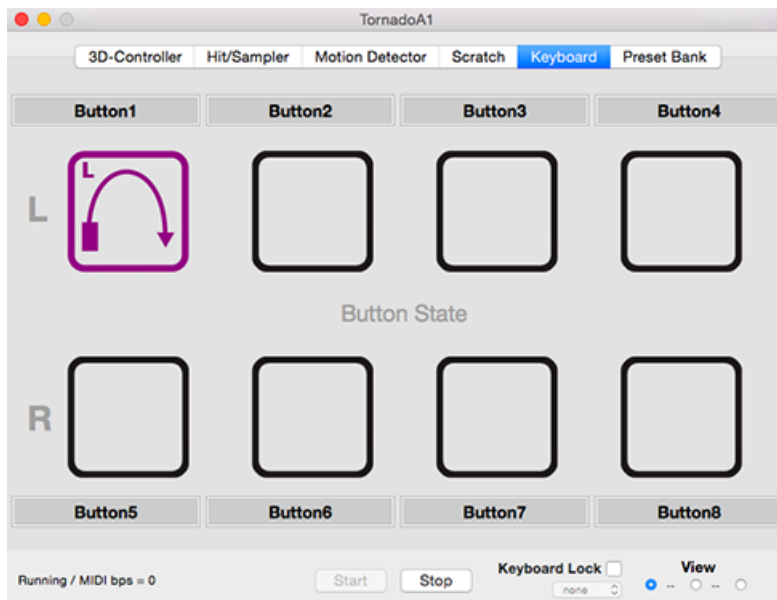
For the selected motion control you can choose hint picture in **Direction** option.



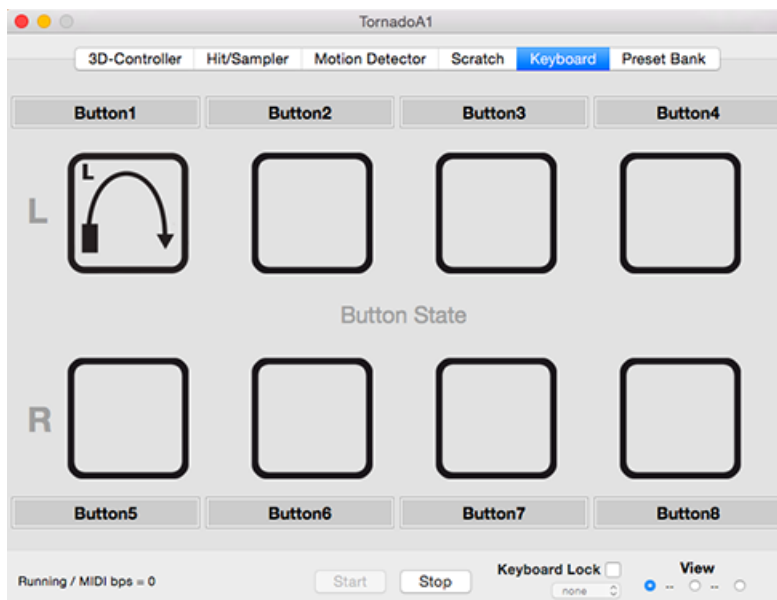
When you click on **Start** (start of MIDI Gloves Tornado) on the keyboard tab the hint images are shown for control gestures, LED status and name of effects.

Example:

First button is ON (effect control is enables) and left hand visualization is ON.

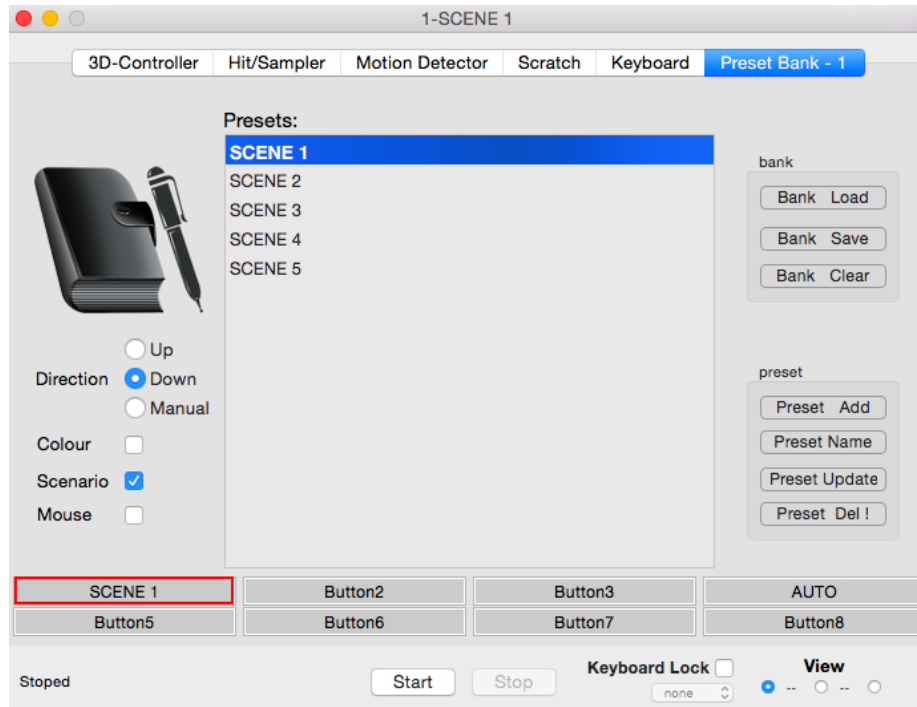


Visualization off.



9) Scenario Keyboard Mode.

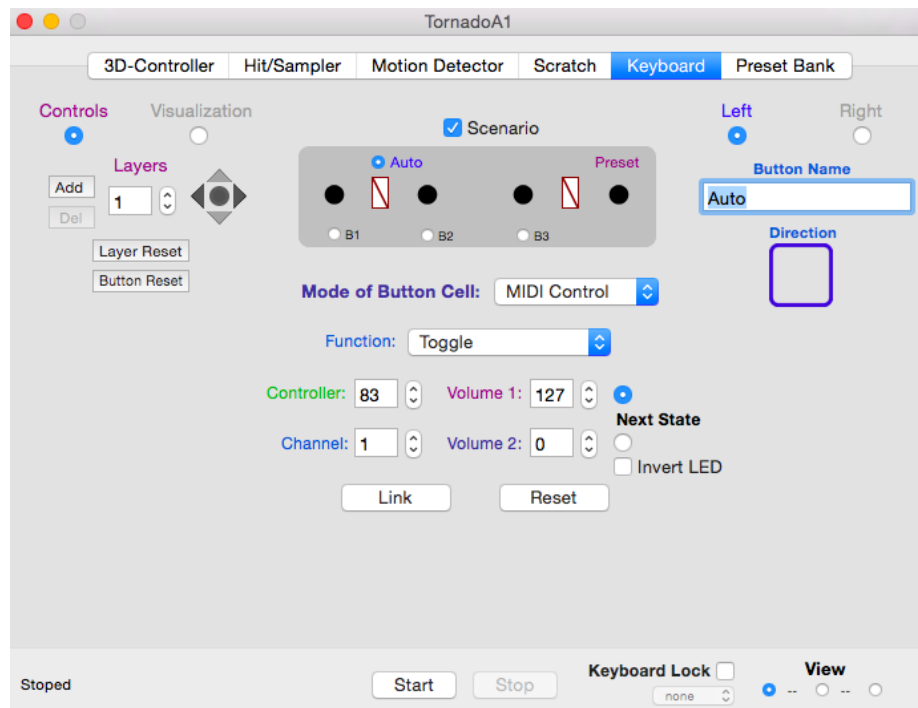
In this mode, MIDI gloves allow you to create complex, dynamic sound effects simply and effectively for the public. This is achieved by dividing the sequence of musical effects to the scripts. These scripts are easy to remember and easy to perform. The script is the preset which operates a separate stage in the cascade of complex effect.



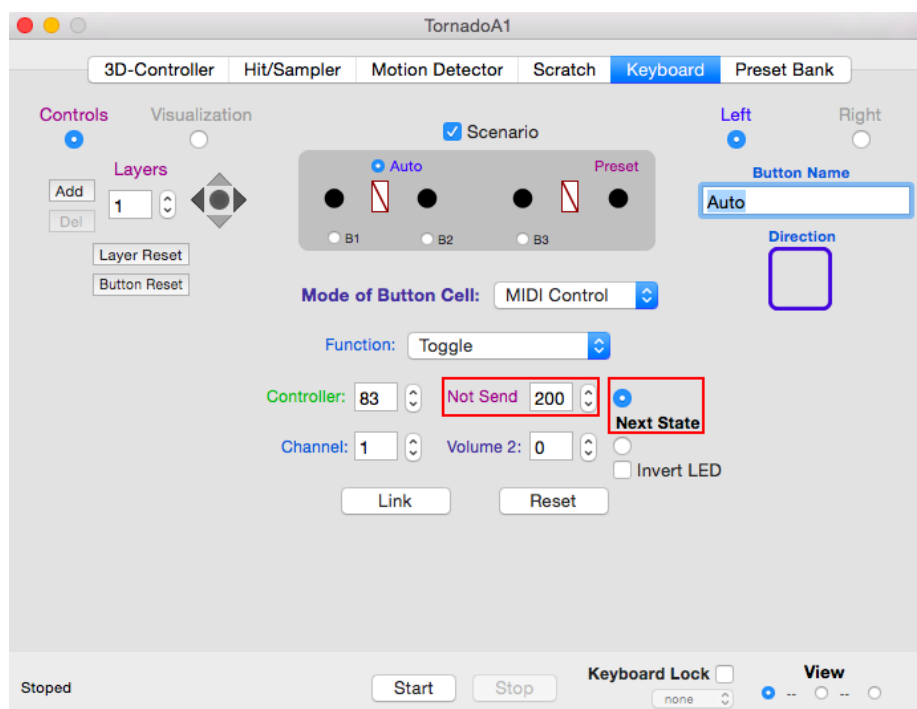
In this mode the presets (scenes) are switched with a single click of the left hand button B4, switching delay is minimal. If you select **Up** option for the **Direction**, the following will be preset, located above the list of presets. If the **Down** or **Manual**, then the next preset will be lower on the list.



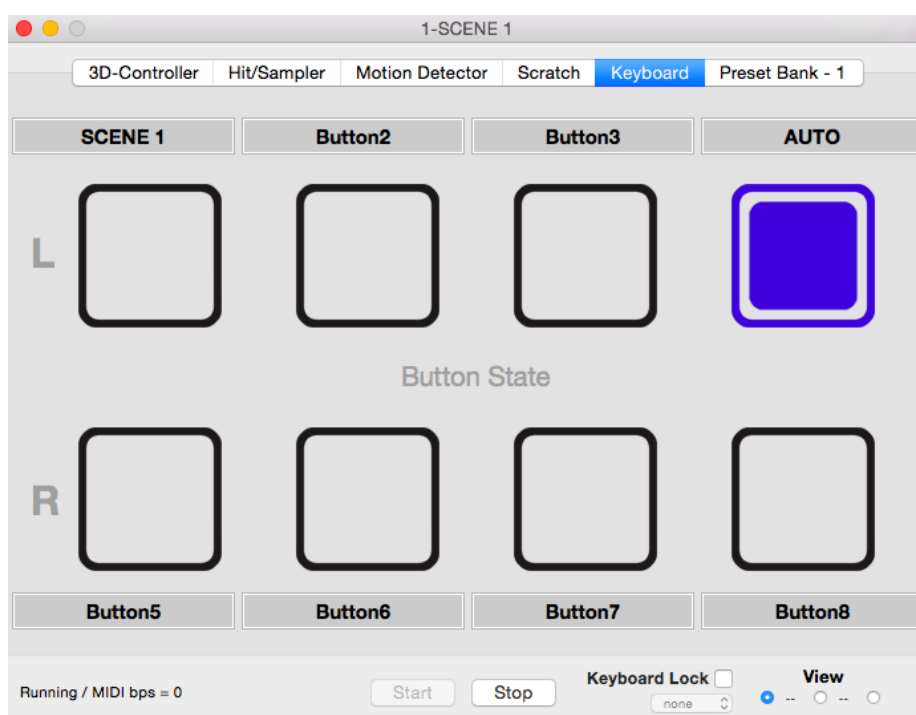
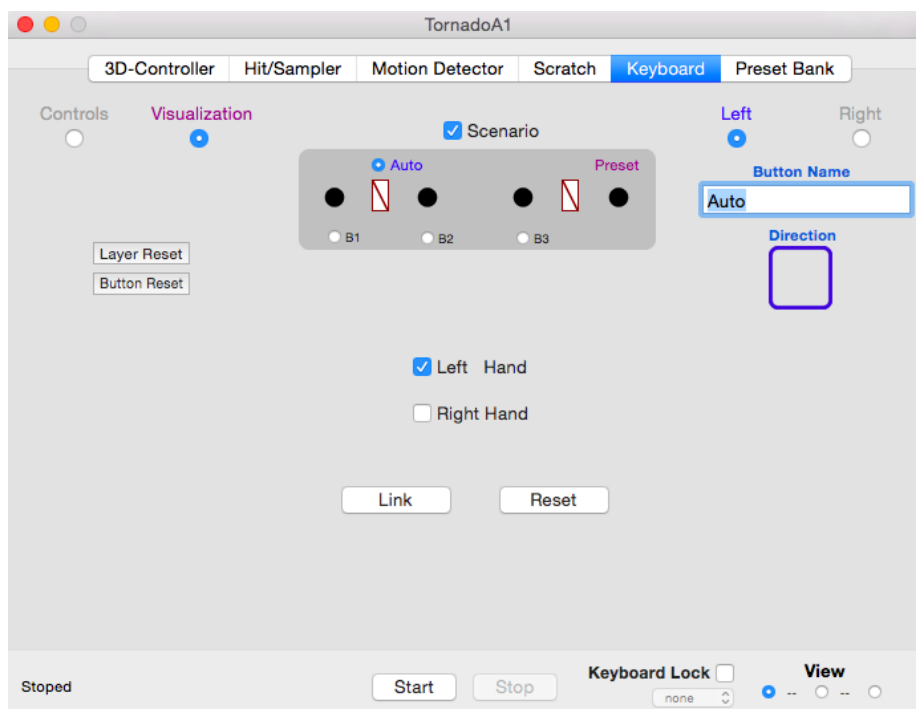
An important element in **Scenario** mode is the automatic button, it is activated automatically when you switch presets. Automatic button has 2 modes: the first is triggered when a preset is turned on, and the second when turned off. Thus, it is possible to create automatic control of technical parameters of the music studio and the DJ cannot be distracted by them, he need to control the main effect or action. In the transition from scene to scene, switching between parameters of the music studio is made automatically. In Scenario mode **Sw1** switch (left glove) is converted into an automatic Auto button. Toggle function is available for it. The first state is triggered at the time of turning on, and the second at the time of turning preset off.



If you want to skip the operation when switching on or off a preset, it is possible to set the value for the respective states is Volume = 200. For example:

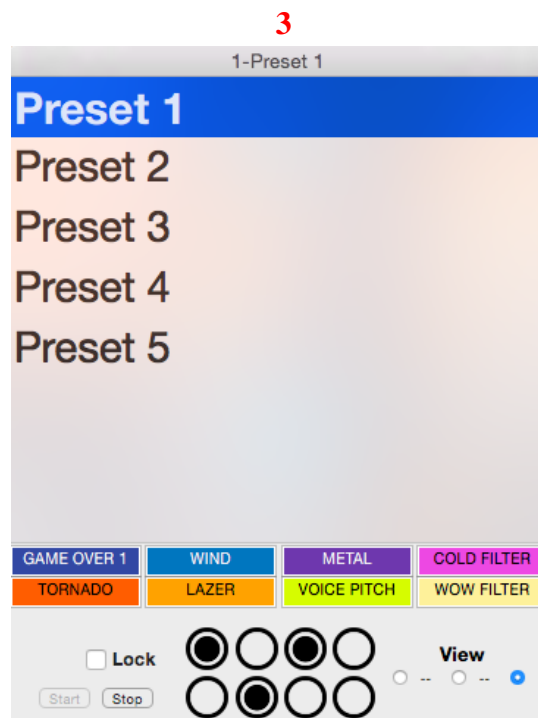


It is possible to adjust visualization for automatic button, so that when you turn on a certain preset the LED visualization is flashing on a given glove.



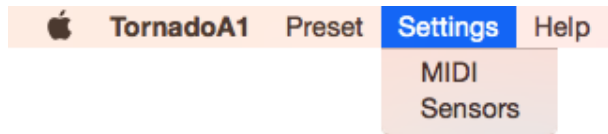
11) How to display Tornado A1 plug-in window.

In a normal mode Tornado A1 plug-in window displays full details: algorithms and their settings, effects titles, pictures of control gestures, etc. There are other visual display windows, such as the **Mini** and **Scenario**. Visual display of the window is determined by switch **View**. Window to **Mini** mode is useful if you do not want to display detailed information. Showing **Scenario** is more suitable for using with Tornado A1 plug-in, if you use Scenario mode to operate with keyboard.

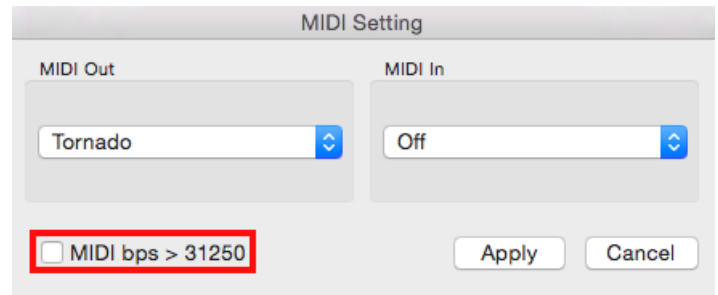


12) MIDI Ports Setup.

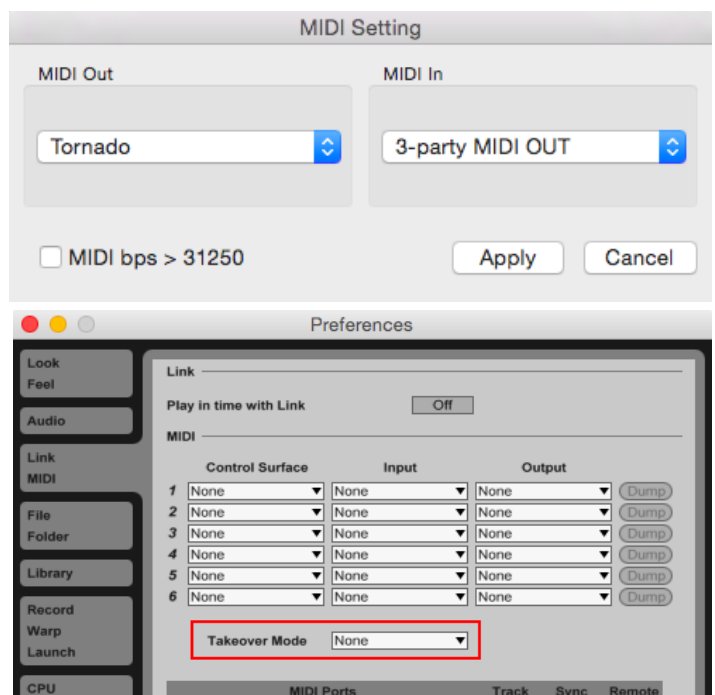
MIDI option allows to use alternative MIDI port (virtual or hardware). This can simplify the connection of Tornado A1 to virtual studio, which does not connect via third-party MIDI ports.



MIDI Out – MIDI port that will be used by the Tornado A1 plug-in for sending MIDI messages to the music studio. By default the own **Tornado** port for Mac OS X and **01.Internal MIDI** for Windows OS is used.

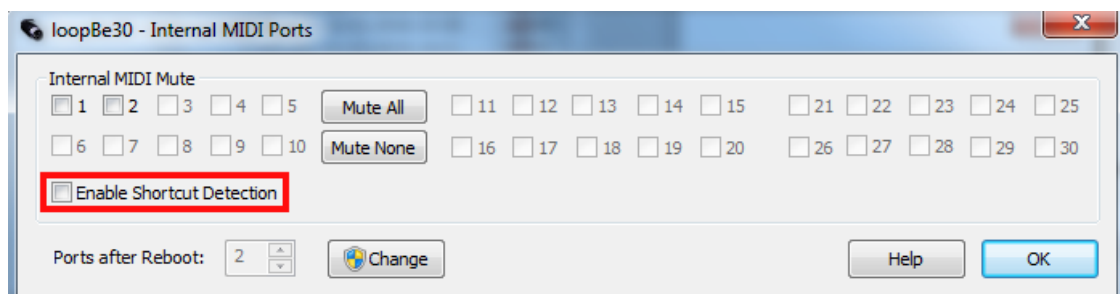


MIDI In – select MIDI input port for Tornado A1 plug-in. This function was designed to operate with Ableton Live 8, if Takeover Mode option is set in Pickup. The function allows you to get the initial value of the controller in Ableton Live and set the value to the corresponding controller in Tornado A1 plug-in. In Ableton Live 9 controls do not send their values in case of mismatch with the value of the master controller. Therefore, MIDI In option must be switched off (leaving the default - Off) while operating Ableton Live 9, Takeover Mode option must be set to None.



Message speed limit through MIDI Out port.

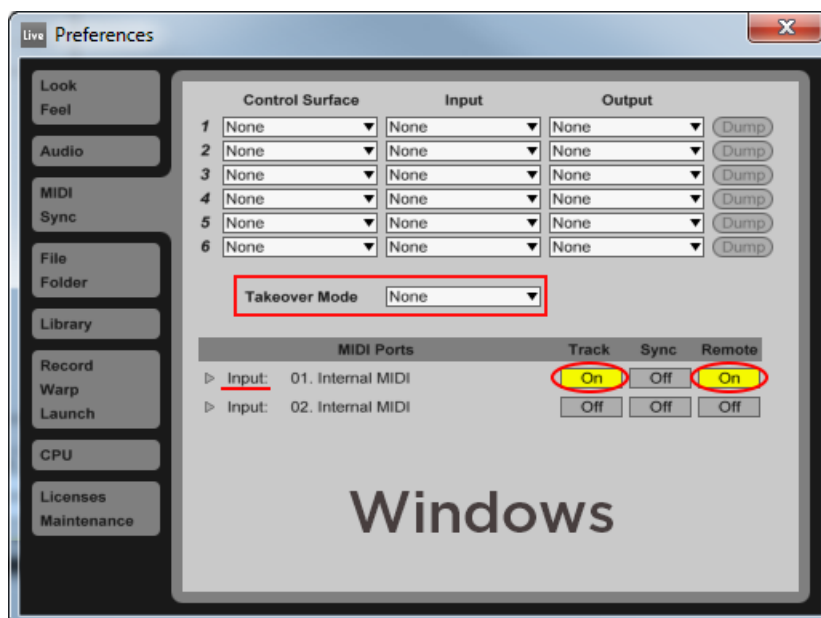
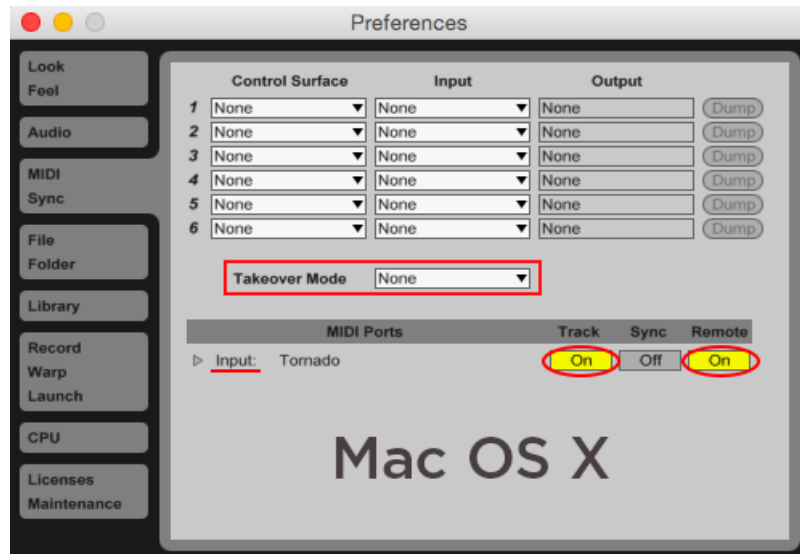
There is a special option for Tornado A1 plug-in with music programs or devices for which it is important that MIDI channel transmission rate must not exceed 31,250 bps. If this option is enabled, the plugin will stop Tornado A1 in excess of 31250 bps. The current transmission rate of the MIDI Out port is shown in the plugin status bar. Running / MIDI bps = 1008 For Windows the Tornado A1 uses LoopBe30 virtual MIDI port (<http://www.nerds.de/en/loopbe30.html>). By default the speed limit is enabled. To disable this limit is recommended to turn off **Enable Shortcut Detection** option, as shown in the figure.



13) Connection of the operating controller to the virtual parameter.

Ableton Live. Corresponding virtual MIDI ports will appear in the operating system after setting software for controller. For Windows – **01. Internal MIDI** and **02. Internal MIDI**. For Mac OS X – **Tornado**. For operating system Mac OS X you need to start Tornado plug-in, so that virtual MIDI port will be displayed in the menu of music program.

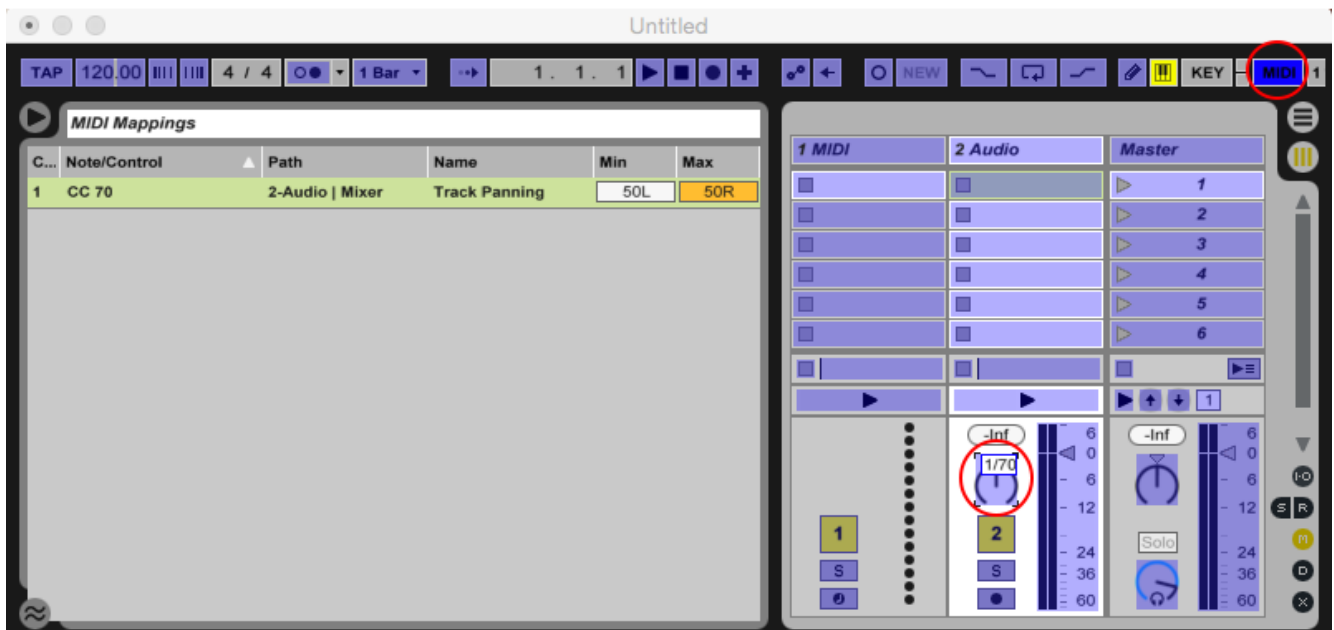
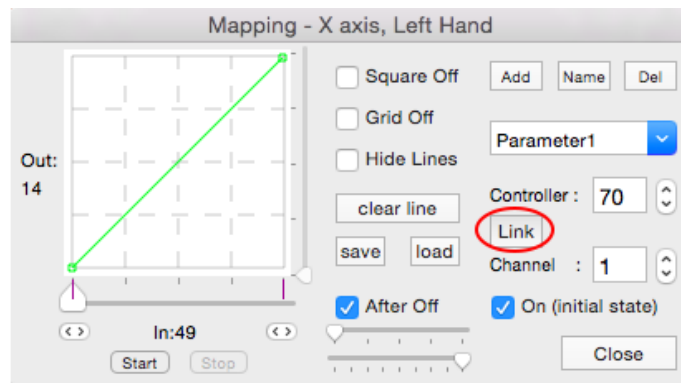
Let's open Ableton Live settings and connect all the necessary MIDI ports. We should turn on Track switch so that we could send notes from the keyboard of MIDI-Gloves. We recommend **Takeover Mode** option set to **None** to ensure that would MIDI messages from Tornado A1 plug-in always perceived musical studio Ableton Live.



Binding of MIDI CC controller to the parameter of virtual studio:

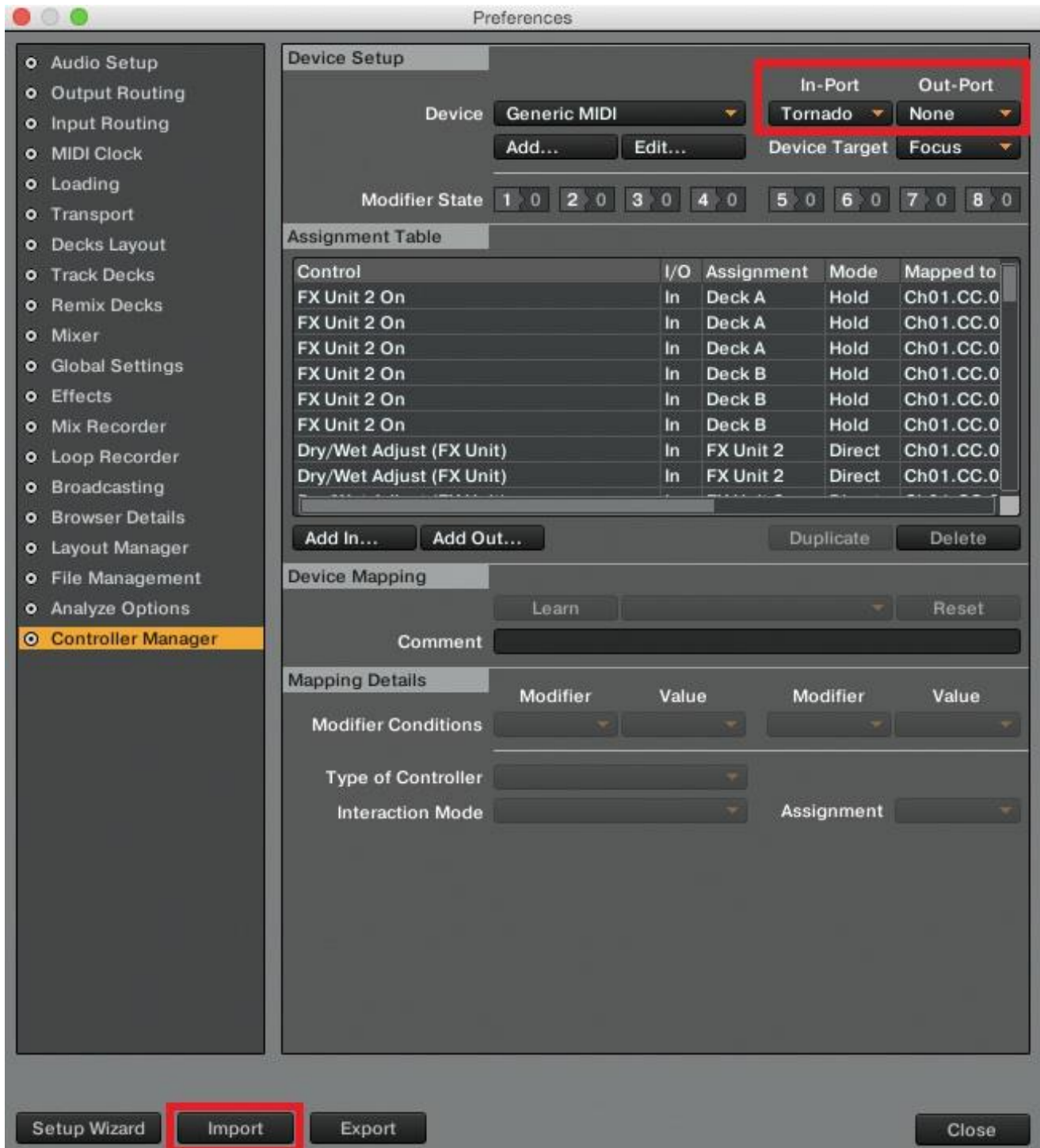
MIDI Mapping in Ableton Live program is performed very easy and handy. All you need to do is activate MIDI switch in Ableton Live, press the **Link** button in Tornado plug-in and send MIDI CC message.

Every controller of MIDI-Gloves has its own **Link** button. This way you can bind any operating controller to the necessary parameter of music studio.

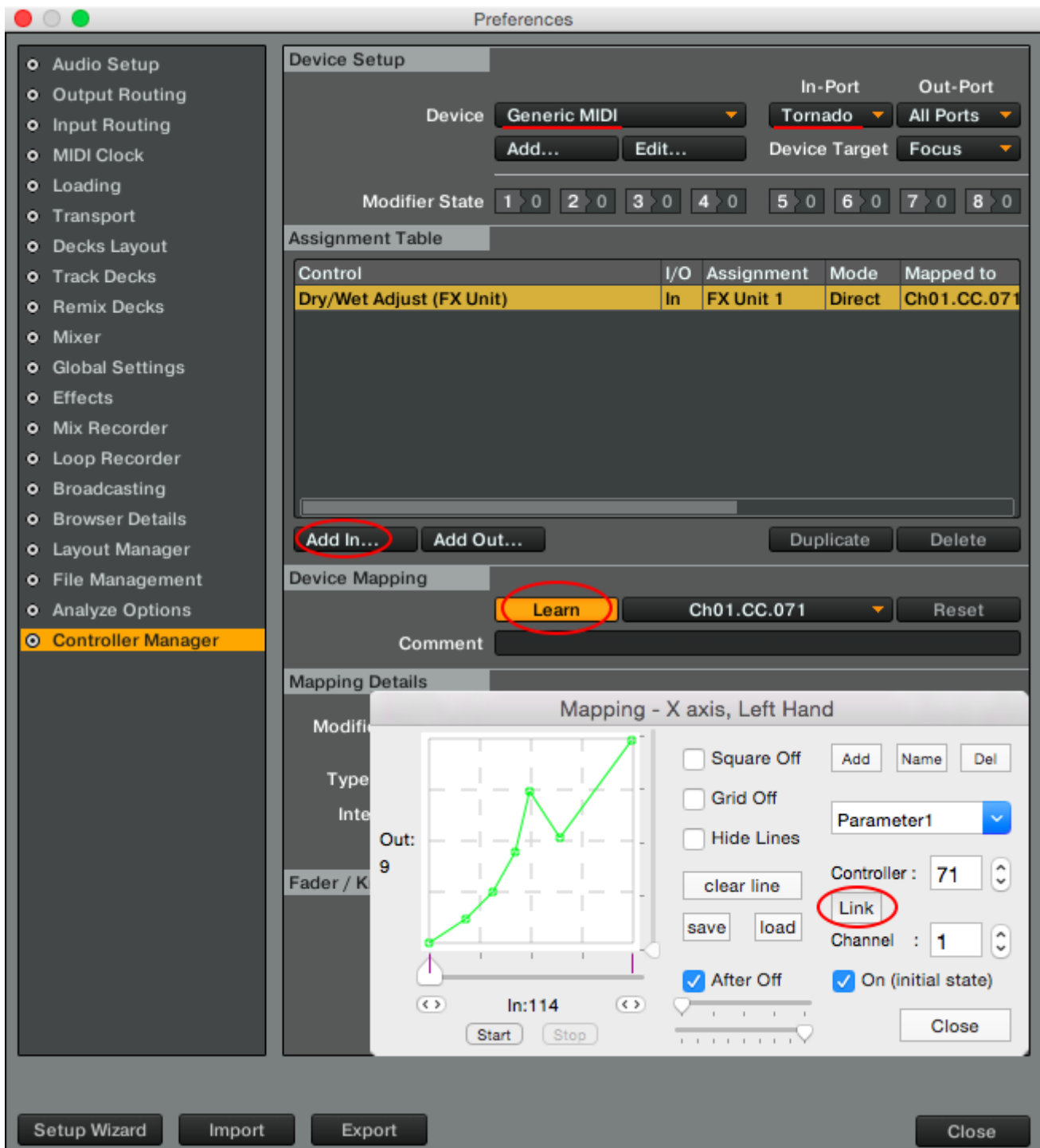


Traktor Pro. Special configuration file **TornadoA1.tsi**. was created for connecting MIDI controller Tornado A1 to DJ program Traktor Pro. It comes in set with Tornado plug-in presets for Traktor Pro effects. Presets can be downloaded from the website www.global-dj.com from section DOWNLOADS. You should add (or import) TornadoA1.tsi file, as shown in the picture.

Next, you need to adjust MIDI port properly. You should select **Tornado** port in the In-Port option for Mac OS X operating system. Choose **01. Internal MIDI** for Windows operating system.



Individual MIDI Mapping: If you need to adjust control of built-in effects in Traktor Pro for other gestures and movements (for other management MIDI controllers), you need to create new individual MIDI Mapping. For this just go to the settings menu **Controller Manager**, add the parameter you want to control (button **Add In ...**), and then click the **Learn** button. Next you need to send a training signal using the **Link** button of the corresponding MIDI controller of Tornado plug-in.



14) Setup and maintenance of glove sensors.

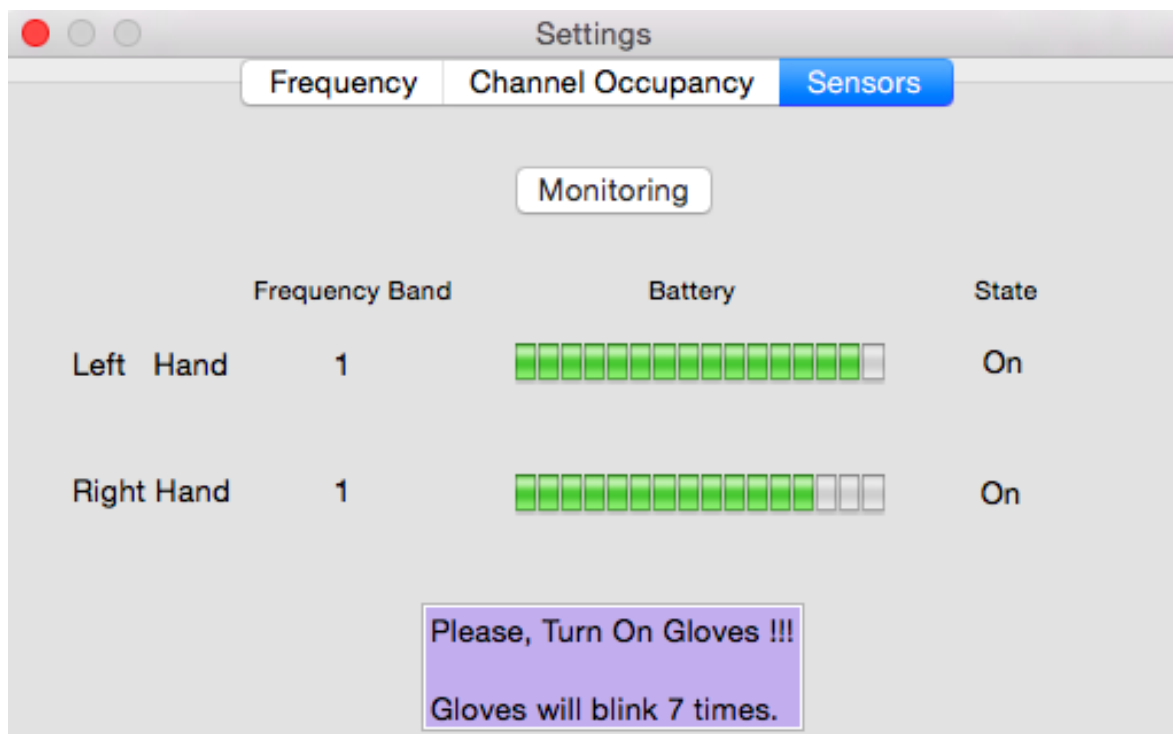
Charging of glove accumulators. Gloves batteries are charged, while the sensor is connected to the Laptop by a USB cable. When the green indicator on the Sensor is On, this indicates 90% charge level. 100% charge level is reached within 20-30 minutes after the green indicator is On. The operation time of the gloves at 90% charge is around 5-6 hours.

If you do not press the Start button on the Tornado A1 plug-in after 15 minute idle time, the sensors enter sleep mode; switch off and then switch on power supply for their activation.

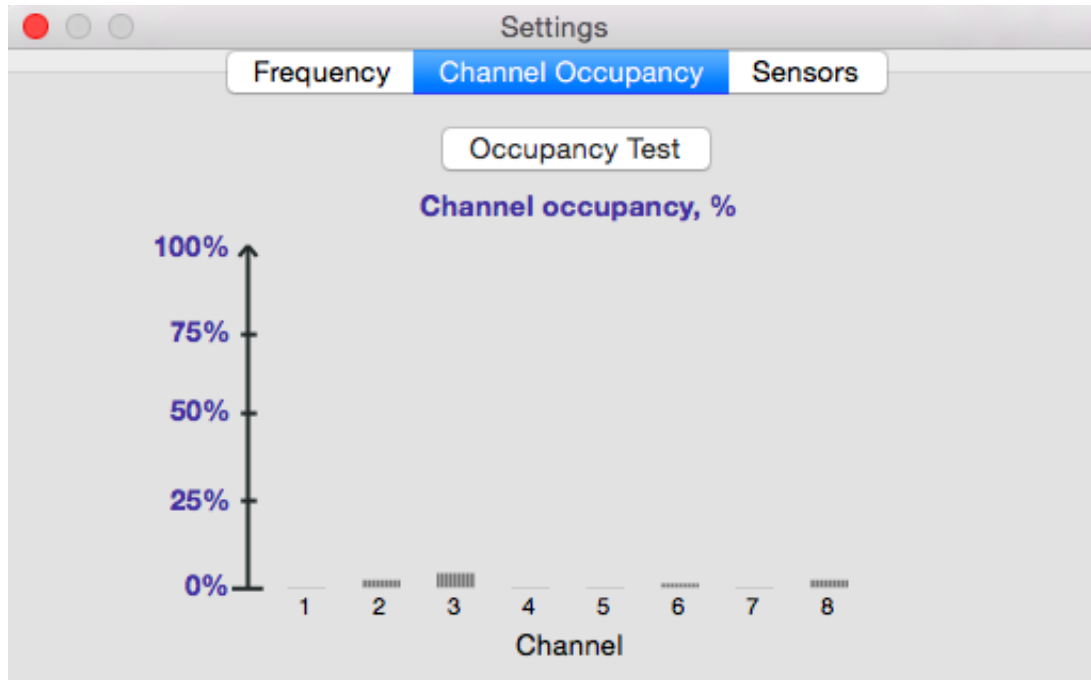
During the idle time, the indication LED blinks once in 5 seconds. If the battery is discharged, the indicator blinks slowly within one minute, and then the sensor enters sleep mode. When you prepare sensors for long-term storage, always switch off their power supply.



Sensor state monitoring. The option **Settings->Sensors->Monitoring** gives the possibility to check the percentage of the residual charge of built-in batteries and the number of the used frequency band. To get this information, switch on both gloves (or the desirable one) and click the **Monitoring** button. The gloves must be in close proximity to the USB Adapter. In case of the successful response, sensor indicators will rapidly blink 7 times (confirmation of execution of the command). The Adapter will blink 7 times as well.



Channel occupancy monitoring can be tested using the relevant option **Settings->Sensors Occupancy->Occupancy Test**. If all channels are occupied, the blue indicator (operation indicator) on the USB Adapter in the Running mode will blink or will be off many times. **To improve the reliability of radio communications**, the USB Adapter must be located at the level of DJ's mixer or higher, with no metal shields, screens and other obstacles.



Setting the frequency range.

Each region has its own frequency allocation specifics. If you need to change the operating frequency, this can be done with the option **Settings-> Frequency-> Set Frequency Band**, choosing a range for the region from a list. Both gloves should be turn on. Fast blinking (7 times) indicator indicates the command was successful. If the operation is not successful then installation of the range to be repeated.

