

audio  
cubes

percussa



Getting Started



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## **1. Welcome and Thank You !**

Years ago we were feeling ourselves increasingly restricted by the existing tools for creating electronic music, because of their user interfaces.

We felt ourselves and our creativity being controlled by technology, rather than having control over it.

We started designing a new type of electronic musical instrument, a new performance tool ... a new way for musical expression and for exploring ... called the AudioCubes.

We hope the cubes help you be creative and that they help you create great live performances.

We hope you have a lot of fun with the cubes and share your experiences online at the Percussa website ([www.percussa.com](http://www.percussa.com)).

Thanks a lot for buying the AudioCubes !

## 2. Software installation

### 2.1. Required Software

If you haven't installed the AudioCubes software yet, please refer to the enclosed "Software Installation" sheet (or `manual_installation.pdf`).

### 2.2. Recommended 3<sup>rd</sup> Party Software

For this tutorial you will need software that can play back audio files when it receives MIDI messages.

We will use Ableton Live, audio software for live performance, to demonstrate how you can use the AudioCubes.

If you are on PC we also recommend you install the LoopBe1 MIDI Loopback, which lets you send MIDI from the AudioCubes software to MIDI devices and software (such as Live).

- If you received AudioCubes software on a CD or DVD, a demo version of the software is included
- If you downloaded AudioCubes software you can download the software you need from <http://www.ableton.com/> and <http://www.nerds.de/en/loopbe1.html>

### 2.3. Upgrading from previous software versions

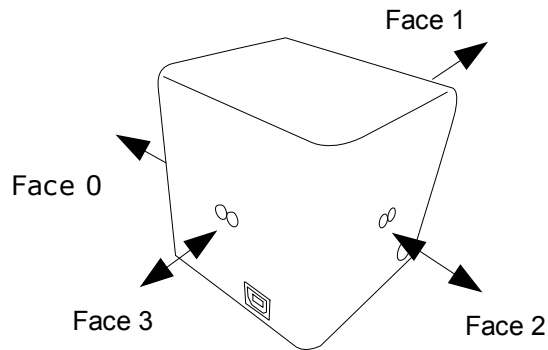
If you already have the cubes and downloaded the software from the PERCUSSA website or received an update on a CD or DVD, please first read the Upgrade Manual (`manual_upgrade.pdf`) before continuing to read this Getting Started manual.

### 3. Getting to know the cubes

Each face of the AudioCubes except the bottom and top have a communication port capable of transmitting and receiving digital or analog signals, using infrared light, to and from other cubes nearby.

The cubes also have a USB port for sending and receiving data to/from your computer, and for charging the internal battery.

Notice that the orientation of the cube can be easily recognized by the location of the USB port.



## 4. MIDI Bridge (The cubes as a MIDI Controller)

One of the easiest ways to start using the cubes is as a computer interface for existing electronic musical instruments or software.

This lets you get a first experience in a familiar environment and quickly understand the potential of the AudioCubes.

One of the applications installed on your computer in the AudioCubes folder is called the MIDI Bridge.

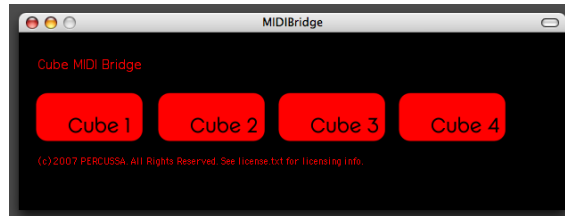
It lets the cubes generate two types of information which can be sent to any MIDI (Musical Instrument Digital Interface) compatible software or musical instrument :

- MIDI Note-On messages (used to start sounds)
- MIDI Continuous Controller messages (used to change parameters of sounds)

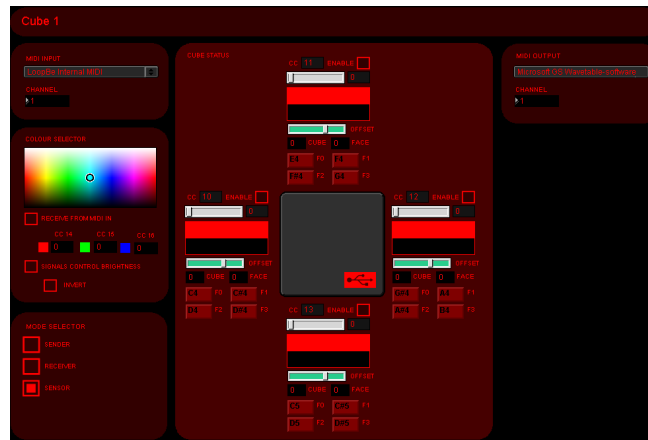
Start the MIDI Bridge application on your computer. The icon in the AudioCubes folder for the MIDI Bridge looks like this :



When the application starts a main menu is displayed :



Connect a cube to your computer using the supplied USB cable and click on the Cube 1 button. A window will appear that looks like this :



This is the window you will use to assign a colour to your cubes and to choose how you want to use them in your work.

The central panel of the window shows the connected cube, seen from above, and the status of its 4 faces (the top and bottom face of the cube is not used).



## 4.1. Setting a colour

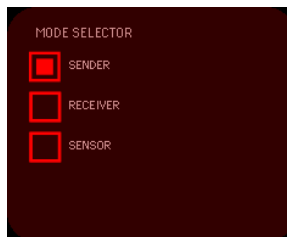
At the left of the window you can choose a colour for the cube you just connected :



Drag the black circle around over the colours and watch the cube change colour as you move the mouse.

## 4.2. Setting mode

Setting a cube mode is done through the panel located right under the colour panel :





You can tell the cube to work in any of three modes :

- Sender  
In this mode the cube sends information about itself wirelessly to other cubes nearby.
- Receiver  
In this mode the cube receives information about other cubes nearby, wirelessly.
- Sensor  
In this mode the cube senses distance to an object nearby, such as another cube or your hands.

The Sender and Receiver modes are used together to generate events when cubes detect each other.

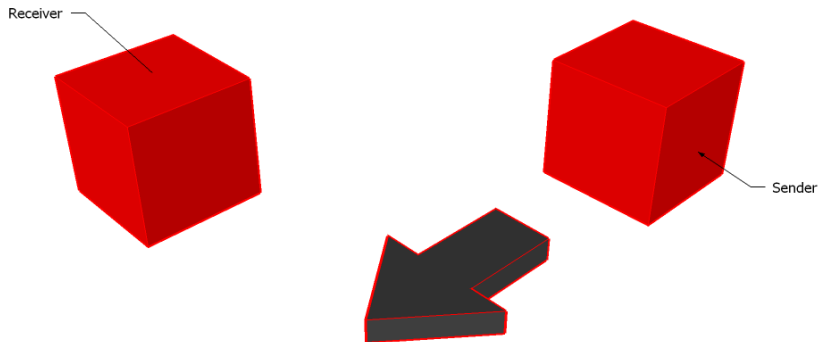
These events are automatically translated into MIDI note-on messages by the MIDI Bridge and sent to music software (e.g. Ableton Live) or MIDI devices, to start playing music or sounds.

Do the following :

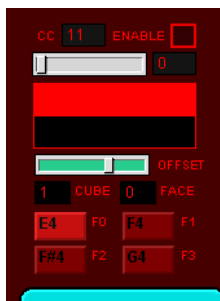
- Select the Sender mode for your cube.
- Disconnect it, and connect another cube.
- Choose a colour and set the Receiver mode, and leave this cube connected.

### 4.3. Using the cubes together

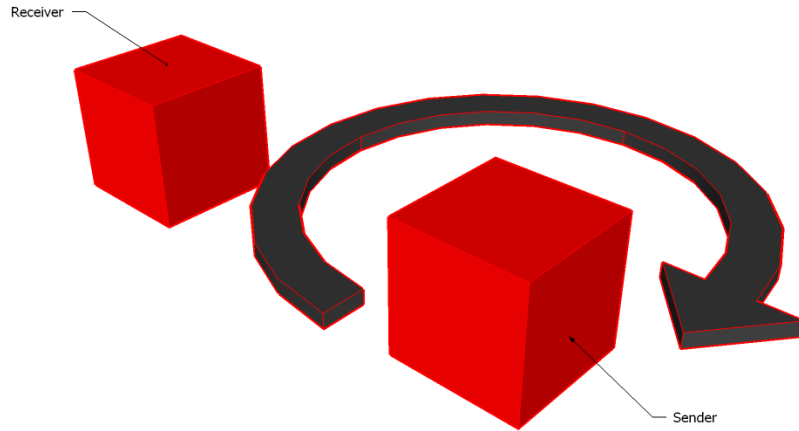
Move the Sender cube right next to the Receiver cube which is still connected to your computer and within about 10cm (4 inches). Make the faces of the cubes align.



Notice how the face number changes and how one of the note triggers flashes when the Receiver detects the Sender :



Rotate the Sender cube 90 degrees and notice how the face number changes again, and how a different MIDI note is selected. The panel cycles through notes F0 to F3 as you rotate the Sender cube.



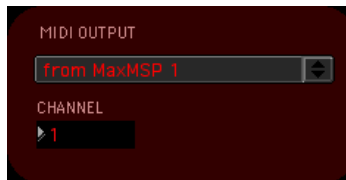
## 4.4. Sending MIDI to other Software

When the MIDI Bridge is started, a default MIDI port is selected where all events created by the cubes are sent.

If you want to send these events to audio software running on your computer, you need to use a MIDI Loopback.

This is a virtual “pipe” between two MIDI compatible programs running on your computer (e.g. the MIDI Bridge and Ableton Live).

To the right side of the window, you will find a panel to choose a MIDI output port and channel.

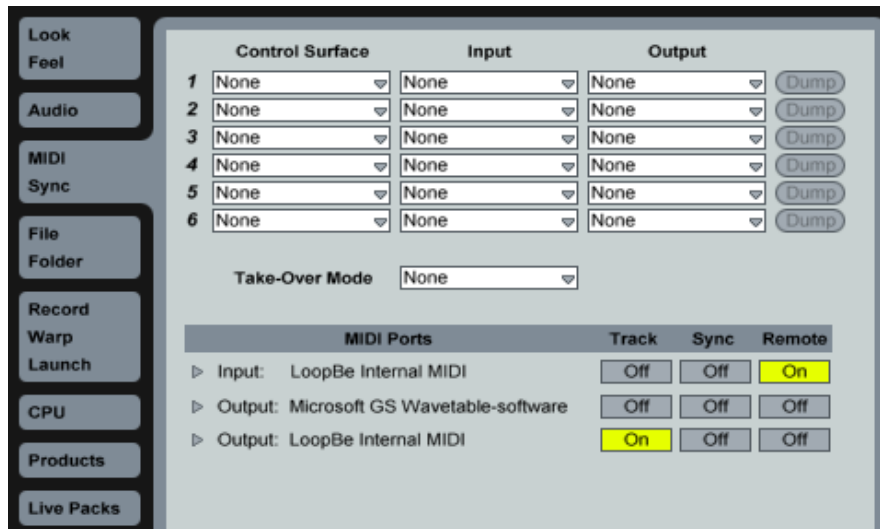


If you are on Mac, select “from MaxMSP 1”. If you are on PC, select “LoopBe1 Internal MIDI”. Make sure to select channel 14 (click and drag the number box to change the channel), used by the examples in this tutorial.

## 4.5. Configuring Live to communicate with the MIDI Bridge

Start Ableton Live on your computer and keep the MIDI Bridge open.

- On Mac, go to the Live menu and select Preferences.
- On PC, go to Options > Preferences.



A menu will appear similar to the screenshot above. Select the MIDI tab on the left hand side of the window to display the MIDI options.

Next, set the Track and Remote buttons as shown for the LoopBe Internal MIDI Input and Output ports (PC) or for the from/to Max/MSP 1 and 2 ports (Mac).

## 4.6. Loading and playing the example Live set

- On Mac, go to the AudioCubes folder in Applications on your computer, and click on the sounds folder to open it.
- On PC, go to Start > Programs > Percussa > AudioCubes and click on the sounds folder to open it.

Go into the live 6 demo folder and double click the Dance Grooves file to open it in Ableton Live.



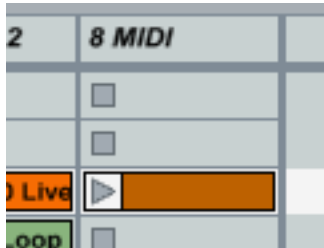
The Live set we created contains 4 audio tracks each with 4 clips in it. Each of the 16 combinations of the faces of the Sender – Receiver cube pair corresponds to one of the audio clips.

Try moving the Sender cube around the Receiver cube and try various combinations of faces. You will notice how the location of the Sender cube and its orientation determine which sound is being played.

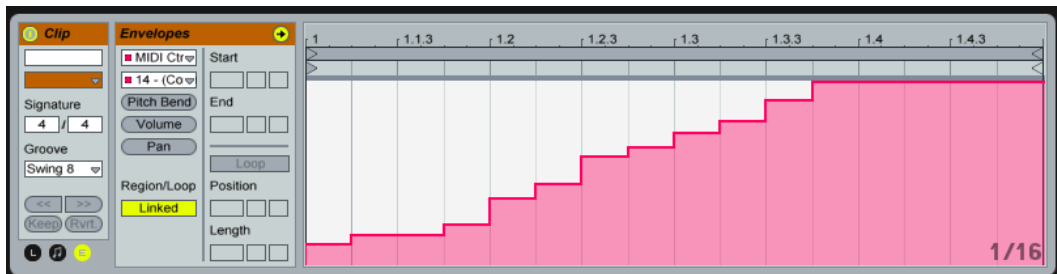
## 4.7. Controlling cube colour from Live

Besides choosing a fixed colour for the cube connected to your PC, you can also control the colours from any MIDI application or controller that can send continuous MIDI controllers.

In Ableton Live, Double click the MIDI clip in the example Live set to display it :



An editing window will open at the bottom of the screen showing the data in the MIDI clip, similar to this :



This represents a change in intensity in time of the red light source inside the connected cube.



Notice the controller number on the left side of the editing window (14) :

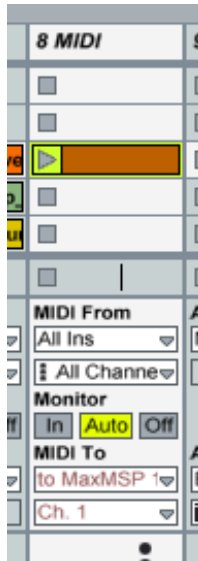


The cubes use three light sources internally. One light is red, one is green and the last one is blue. Mixing those 3 fundamental colours in various intensities creates many combinations (up to 4096). Controller number 14 is used for Red, 15 for Green and 16 for Blue.

When you click the play button on the MIDI clip, you will notice that it starts playing at the same tempo as the audio clips in the Live set.

When we send the data in the MIDI clip to the MIDI Bridge application, the colour of the cube will change.

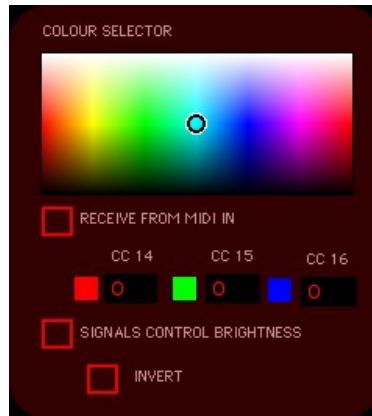
To do this, first select the to Max/MSP 1 (on Mac) or LoopBe MIDI Out (on PC) on the track of the MIDI clip under the "MIDI To" heading :



Next, go to the MIDI Bridge and select the same MIDI port as you just selected on the left side of the panel :



Notice that the number displays under the colour picker (CC 14 / 15 / 16) will start changing.

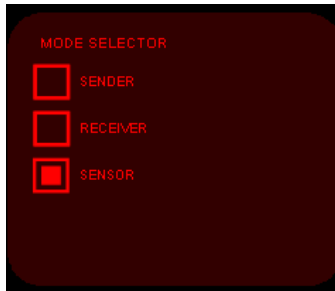


When you now click "Receive from MIDI In", you will notice that the cube will fade from dark red to bright red, according to the MIDI clip in Ableton Live.

## 4.8. Control effects in Live with sensor cubes

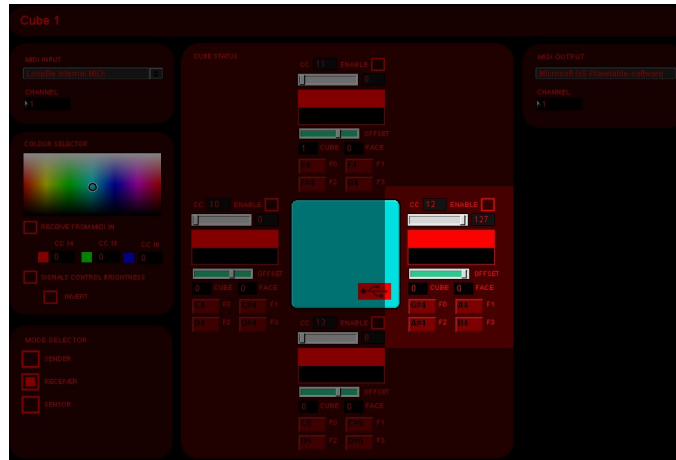
Apart from using the cube connected to your computer to detect other cubes which are wireless, you can also let the cube measure the distance to other objects, such as your hands, or other cubes, and use that to apply effects to the sound.

This is done by setting the cube in sensor mode, using the mode select panel at the left hand side of the MIDI Bridge :

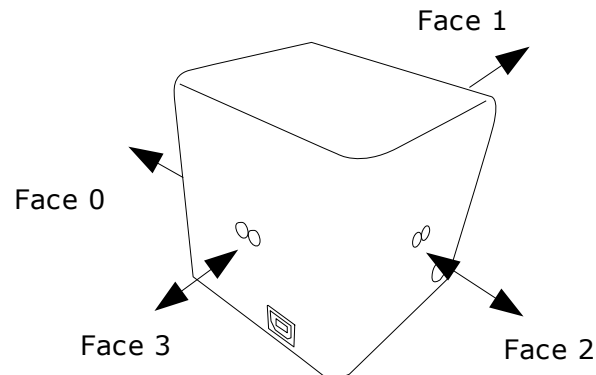


Click on the "Sensor" button to switch the cube into sensor mode. Next, go to the panel in the middle where the cube is shown and the status of its faces.

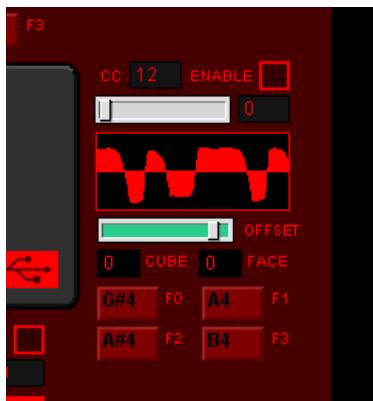
Let's choose one of the faces to change a parameter of a sound effect in Ableton Live. For example, the face on the right (Controller number 12) :



Move your fingers closer and further away of the sensor on the right side of the cube. This is Face 2 in the following drawing :



While moving your fingers in front of the sensor, move the green slider (Offset) to the right until you have a sensor range you are happy with (ideally the full range of the sensor display) :



Next, go back to Ableton Live and click on the Master channel in the Live set we opened earlier. Notice the effect icon at the bottom-right of the screen indicating that there is an effect through which all the sound passes.



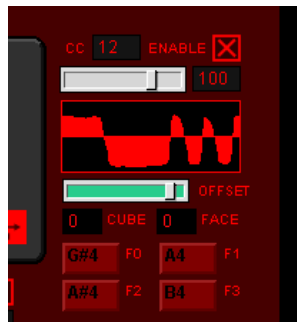
Click on this effect icon to display the effect :



This effect will filter out certain frequencies of the sound while we are playing it back. Let's say we want to change the frequency above which the sound is attenuated (lowered in volume), called the cutoff frequency.

In the example Live set, the cutoff frequency has already been assigned to the distance measured by the sensor on the right side of the cube, such that we don't need to do this manually.

Go back to the MIDI Bridge, and click the enable button above the sensor display for which you just made the adjustment of the Offset :



Next, set the MIDI output channel to 2 :



Now, go back to Live, and move your fingers in front of the sensor on the right side of the cube.

You should now be able to see the cutoff frequency change and the graph move, as you move your fingers closer and further away of the sensor.

You can of course use one cube pair to generate MIDI triggers (Receiver connected to your computer with USB) and another cube at the same time as a sensor (also connected using USB), to send continuous controllers. Up to 4 cubes can be directly connected via USB to your computer, and edited through the panels Cube 1..4.



## 5. Conclusion

This is the end of the Getting Started manual. We recommend you read through the reference manual to get the most out of your cubes, and to learn more about the advanced features and uses such as :

- assigning MIDI notes to clips
- assigning MIDI controllers to sensors
- using the cubes as a lo-fi sound generator / processor
- using the cubes with Max/MSP and integrating them in your own patches

The Percussa website is a great source for information about the cubes. Be sure to register with your email address to receive the latest updates about the software, news about artists using the cubes, and participate in our user's forum.

We hope you have fun with the cubes and that you will explore their creative potential.