Kinect/EQ Interface User Manual

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QUICKSTART

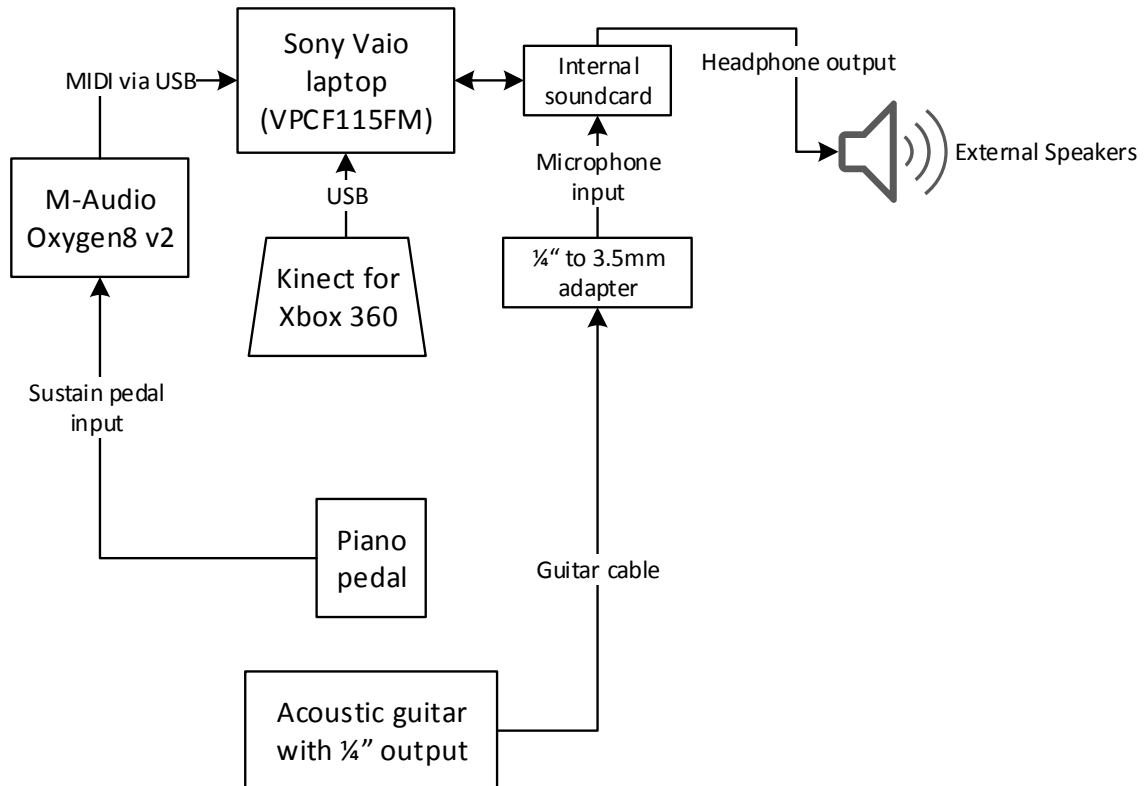1. Assemble all hardware according to the following diagram:

Figure 1. Kinect/EQ Interface signal flow

2. Launch Masters.Prototype.als, SkeletalTracking.exe, Masters.Prototype.Pedal.maxpat, and Masters.Prototype.View.maxpat, in any order.
3. Stand and face the Kinect at a practical distance away (between 4ft to 11.5ft), and ensure that your head and both shoulders can be seen by SkeletonTracking.exe while wearing the guitar.
4. Once SkeletonTracking.exe is tracking your head and shoulders, you are good to go!
    a. You can move the selected knob to adjacent knobs by **making your shoulders "touch" each other**. One way of doing this is rotating your body to the left or to the right.
    b. You can change the value of the selected knob by **pressing and holding the pedal** and then **leaning your head to the left or right**.

SYSTEM REQUIREMENTS

Minimum Hardware Requirements

- Windows-based machine (laptop recommended) with minimum:
    - Processor: 1GHz
    - RAM: 512 MB
    - Disk space: 600 MB for 32-bit and 1.5 GB for 64-bit
    - On-board internal sound card with built-in or external speakers
    - USB 2.0 port for Kinect
    - USB 2.0 port for MIDI controller (or equivalent input port for custom MIDI controller)
- Kinect for Xbox 360 with Kinect power supply and USB cable
- M-Audio Oxygen8 v2 with USB cable (or equivalent custom midi controller which converts piano pedal to MIDI and sends it to the Windows-based machine)
- Sustain piano pedal with ¼" cable, typically used for electronic keyboards
- …and your choice of guitar and corresponding hardware to send the guitar signal to the Windows-based machine. For example, if your machine contains a Mic input, a ¼" to 3.5mm adapter can be used to send it the guitar signal.

Minimum Software Requirements

- Operating System: Windows XP Home Edition (or later versions), 32- or 64-bit. [*Windows 7 Home Premium 64-bit is recommended.*]
- .NET Framework 4.0 client
- Ableton Live 9 Standard by Ableton
- Max 6.1 by Cycling '74
- M-Audio Oxygen8 v2 driver (or equivalent driver for custom MIDI controller)

SUBSYSTEM FEATURES

SkeletalTracking.exe

SkeletalTracking.exe tracks 3 joints – head, left shoulder, and right shoulder – via 3 colored circles. These joints are used for moving the selected knob to adjacent knobs or adjusting the value of the knobs in other subsystems.
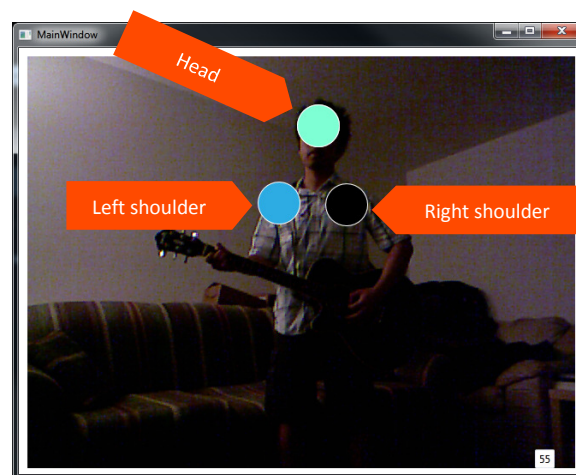

Figure 2. SkeletalTracking.exe

Debug mode

You can set SkeletalTracking.exe into Debug mode by pressing D on the keyboard while SkeletalTracking.exe is in focus. In Debug mode, each shoulder circle will flash a yellow color whenever the shoulders "touch" and then will revert to their original color when they are no longer "touching". Additionally, the head circle will light up yellow when the pedal is pressed.

Sensitivity calibration of shoulder tracking

You can set the sensitivity of shoulder tracking via the number at the lower right hand corner of SkeletalTracking.exe. This is by default set to 55. This number determines how sensitive the "are-your-shoulders-touching?" detector becomes. To put it another way, the higher this number, the less you need to turn your shoulders in order to move the selection to the adjacent knob. However, higher sensitivity values would cause the selector to move to the next knob with the slightest movement, depending on your shoulder features. Tweak this value to your preferred sensitivity.

Masters.Prototype.Pedal.maxpat

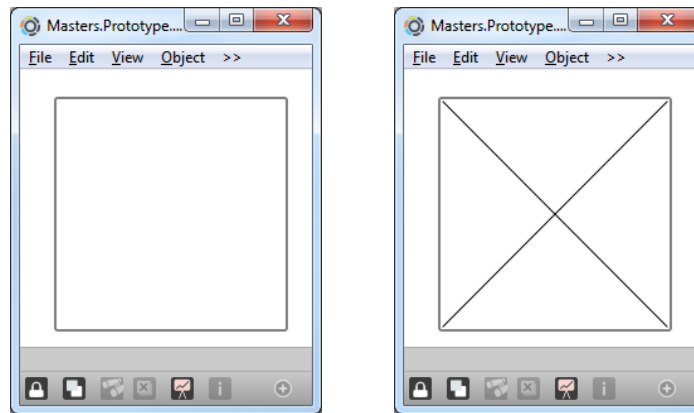Masters.Prototype.Pedal.maxpat detects whether the hardware pedal is pressed.

Figure 3. Masters.Prototype.Pedal.maxpat when user is not pressing or pressing on the pedal, respectively

Masters.Prototype.View.maxpat

Masters.Prototype.View.maxpat is a larger view of the knobs in Masters.Prototype.als. This is a view-only application and was provided so that you can see the knobs' values from a distance. The currently-selected knob is the one knob whose colors aren't greyed out. And when the pedal is pressed, the borders turn green:
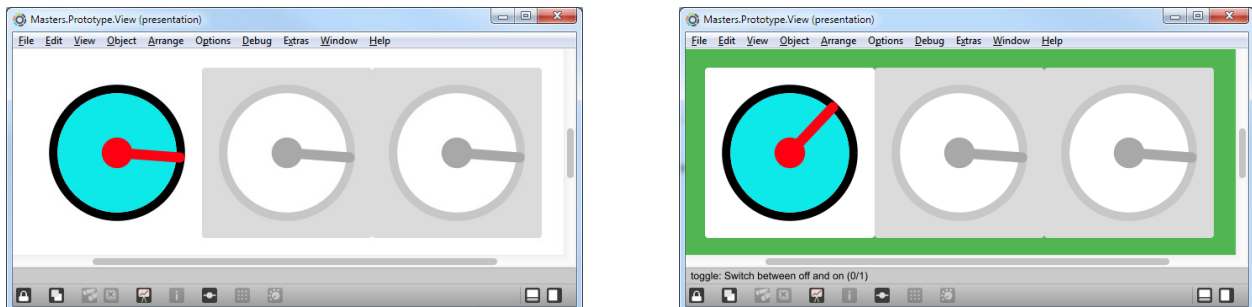

Figure 4. Masters.Prototype.View.maxpat when user is not pressing or pressing on the pedal, respectively

Masters.Prototype.als

Masters.Prototype.als alters the audio signal from the guitar according to the values of the 3 knobs in Max Kinect Dial 1, 2 and 3, which are respectively mapped to GainLow, GainMid, and GainHi of the EQ Three audio effect. The out-of-the-box ranges of the EQ Three audio effect in Ableton Live were not altered:
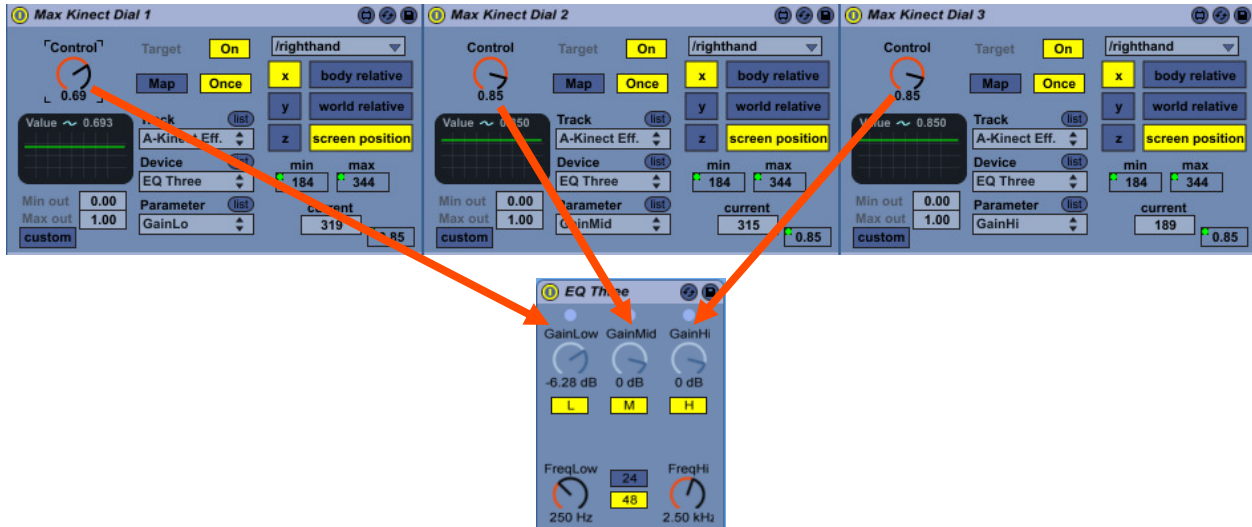

Figure 5. Max Kinect Dial 1, 2 and 3 custom Max For Live patchers mapped to EQ Three in Masters.Prototype.als

USER SCENARIOS

How to select a knob via body rotation

You can move the selected knob to adjacent knobs by making your shoulders "touch" each other. One way of doing this is rotating your body to the left or to the right. (In Debug mode, the corresponding shoulder circle will flash yellow when they "touch".)
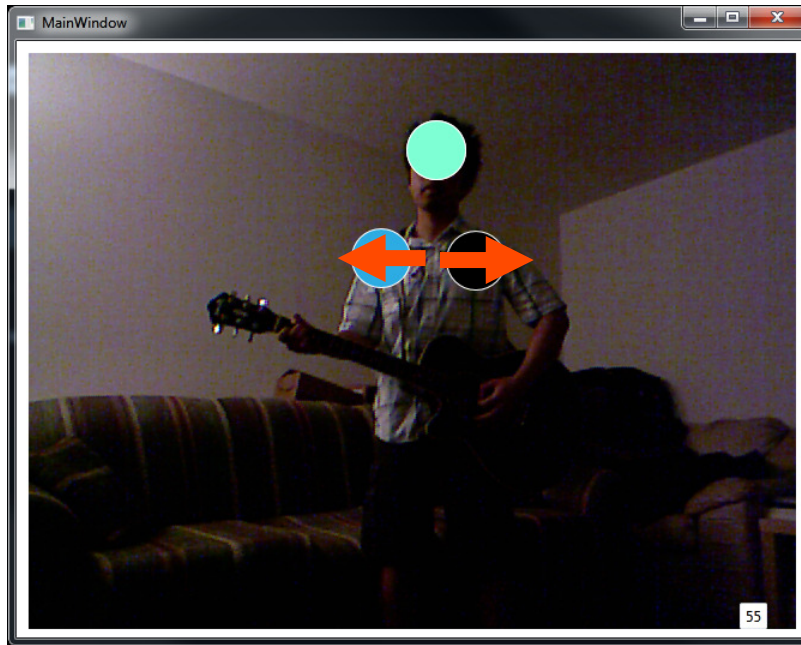
Figure 6. SkeletalTracking.exe body rotation movement

This will move the selected knob to the adjacent knob in Masters.Prototype.View.maxpat. The directions of adjacent selections in Masters.Prototype.View.maxpat are shown in the following:
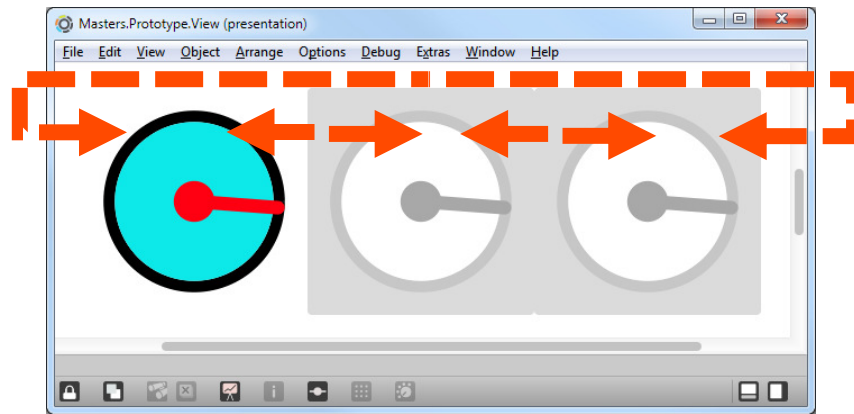

Figure 7. Masters.Prototype.View.maxpat's corresponding direction of selection due to body rotation

This will also move the selected knob to the adjacent knob in Masters.Prototype.als in a similar fashion:
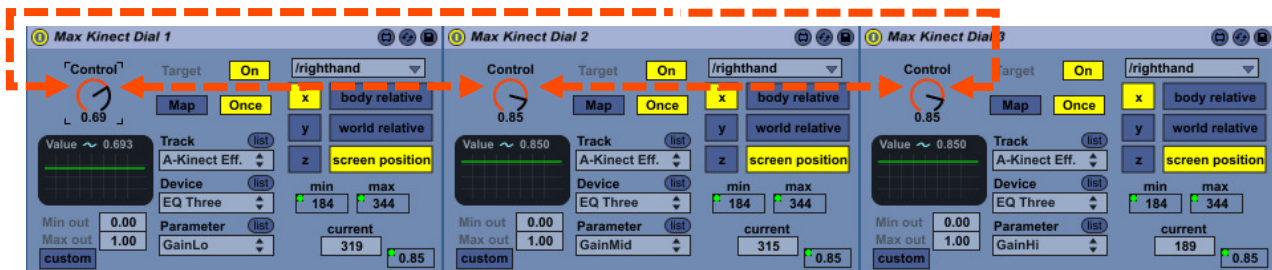

Figure 8. Masters.Prototype.als's corresponding direction of selection due to body rotation

How to control a knob via head tracking

You can change the value of the selected knob by pressing and holding the pedal and then leaning your head to the left or right. (In Debug mode, the corresponding head circle will light up yellow when the pedal is pressed.)
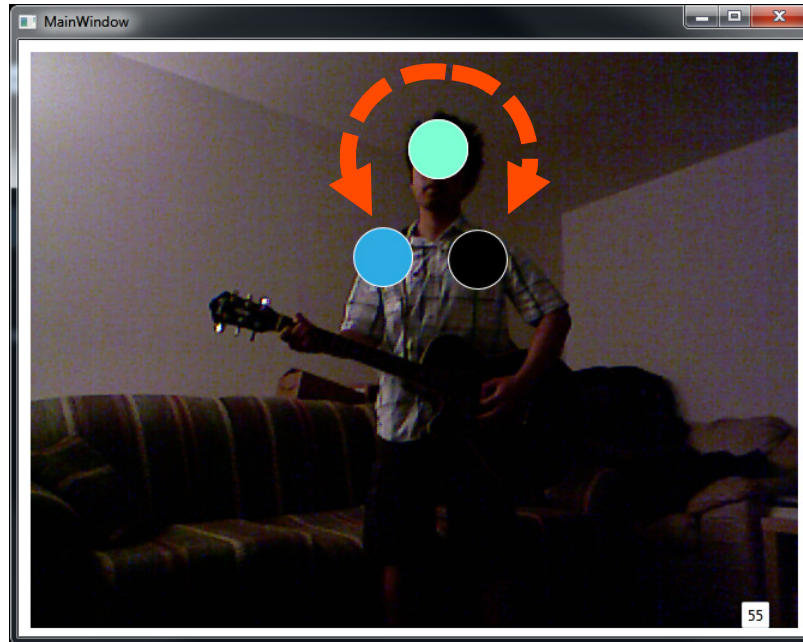

Figure 9. SkeletalTracking.exe head tracking movement

This will change the value of the selected knob in Masters.Prototype.View.maxpat. The range of the values are shown in the following:
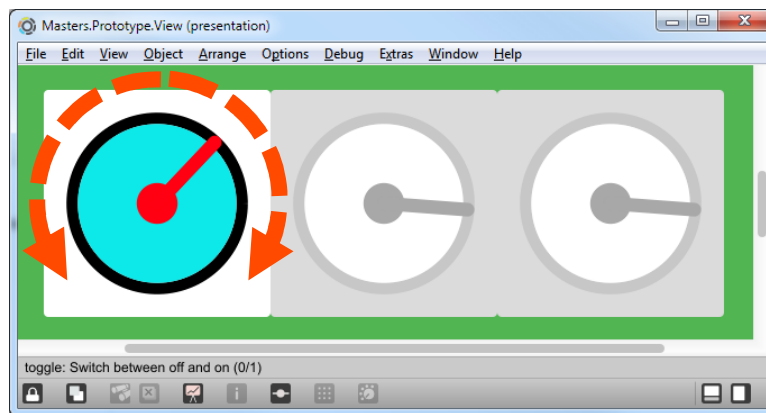

Figure 10. Masters.Prototype.View.maxpat's corresponding direction of selection due to head tracking

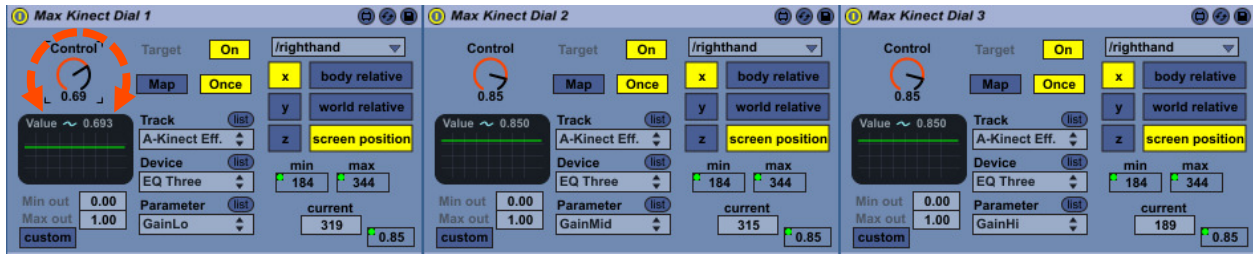This will also will change the value of the selected knob in Masters.Prototype.als in a similar fashion:

Figure 91. Masters.Prototype.als's corresponding direction of selection due to head tracking

THANK YOU

Congratulations and a special, personal thank you for choosing the Kinect/EQ Interface in your music setup! It is my hope that this application would inspire you to experiment, encourage creativity, and enable you to do more in your live performance/recording sessions while your hands are already occupied.