

M-AUDIO



SESSION KEYSTUDIO 25

The Compact Make-Music-Now Keyboard Studio



English

User Guide

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Introduction

Congratulations on your purchase of Session KeyStudio 25. This complete music production package contains the KeyStudio 25-note velocity sensitive USB keyboard and powerful Session music creation software. This provides you with everything you need to compose great music on your computer.

This User Guide covers setup and features of the KeyStudio 25 USB keyboard and installation of the Session music creation software. Even if you are experienced with computer-based music production, we still recommend reading this User Guide to help you get the most out of this package.

Finally, keep in mind that the hardware contained in the bundle can also be used with third-party music software. If you are using third-party software with the KeyStudio 25 keyboard, you may want to refer to your application's User Guide to learn how the keyboard can best be used with your software.

Mac OS X Users: *Session KeyStudio 25 is a software and hardware combination designed for Windows XP and Windows Vista. However, the KeyStudio 25 USB keyboard also works well on Apple computers running Mac OS X and popular applications such as GarageBand. To assist Apple users, this guide includes KeyStudio 25 installation instructions for OS X.*

Session KeyStudio Features

KeyStudio 25 USB Keyboard:

- 25 full-sized, half-action, velocity sensitive keys
- MIDI-reassignable Pitch Bend control
- MIDI-reassignable Modulation control
- Octave up/down button
- 8 assignable knobs
- 8 assignable buttons
- 1 assignable slider
- 1 assignable pedal input
- USB bus-powered operation
- Compatible with M-Audio's Enigma librarian software
- Thin, compact design
- Class-compliant operation—no driver installation required

Session Software:

- CD-quality multi-track audio and MIDI recording software
- Built-in studio-quality effects
- Built-in virtual synthesizer with hundreds of instrument sounds
- Includes over 3.5 GB of sound content for professional music creation

What's in the Box?

Your M-Audio Session KeyStudio 25 bundle should contain the following items:

- M-Audio KeyStudio 25 USB keyboard
- M-Audio Session DVD-ROM
- USB cable
- Printed Session KeyStudio 25 Quick Start Guide

If any of the above listed items are missing, please contact the retailer where you purchased the product.

Minimum System Requirements

Windows XP (SP2) or higher*

- Pentium 4 1.6 GHz processor (CPU may be higher for laptops)
- 512MB RAM
- 4GB free hard disk space for complete Session software installation 32MB video RAM **
- 1024 x 768 video resolution (1280 x 1024 recommended)
- Built-in or third-party audio interface †
- DVD drive for Session software installation
- One native USB port

Windows Vista 32-bit

- Pentium 4 1.6 GHz processor (CPU may be higher for laptops)
- 1 GB RAM
- 4GB free hard disk space for complete Session software installation
- 128 MB video RAM**
- 1024 x 768 video resolution (1280 x 1024 recommended)
- Built-in or third-party audio interface †
- DVD drive for Session software installation
- One native USB port

Mac OS X (KeyStudio 25 hardware only)

- Macintosh G4 1GHz † †
- OS X 10.3.9 with 512 MB RAM
- OS X 10.4.9 with 512 MB RAM
- One native USB port

* Home and Professional Edition only. Windows Media Center Edition is not currently supported.

**Session does not support video cards based on any of the following chipsets: S3/VIA UniChrome, SiS EL315, Matrox. If the video card being used shares system RAM, then overall system RAM requirements may increase by the amount of system RAM shared with the video card.

† Session software will operate with any audio interface; for best performance, M-Audio recommends using an ASIO-compatible audio interface.

† † G3/G4 accelerator cards are not supported.

Installation and Setup

1. Connect the KeyStudio 25 keyboard.

The KeyStudio 25 USB keyboard is class-compliant. This means that you may simply connect the KeyStudio 25 keyboard to your Windows XP, Windows Vista or Mac OS X computer using the provided USB cable and switch the keyboard on. No additional installation or drivers are required.

NOTE: Windows users who would like to take advantage of the more advanced features of KeyStudio 25, such as using the keyboard with more than one application at the same time (multi-client), should install the optional M-Audio KeyStudio 25 drivers. These drivers can be found by going to the Support > Drivers page at www.m-audio.com.

Advanced installation instructions for Windows users (optional):

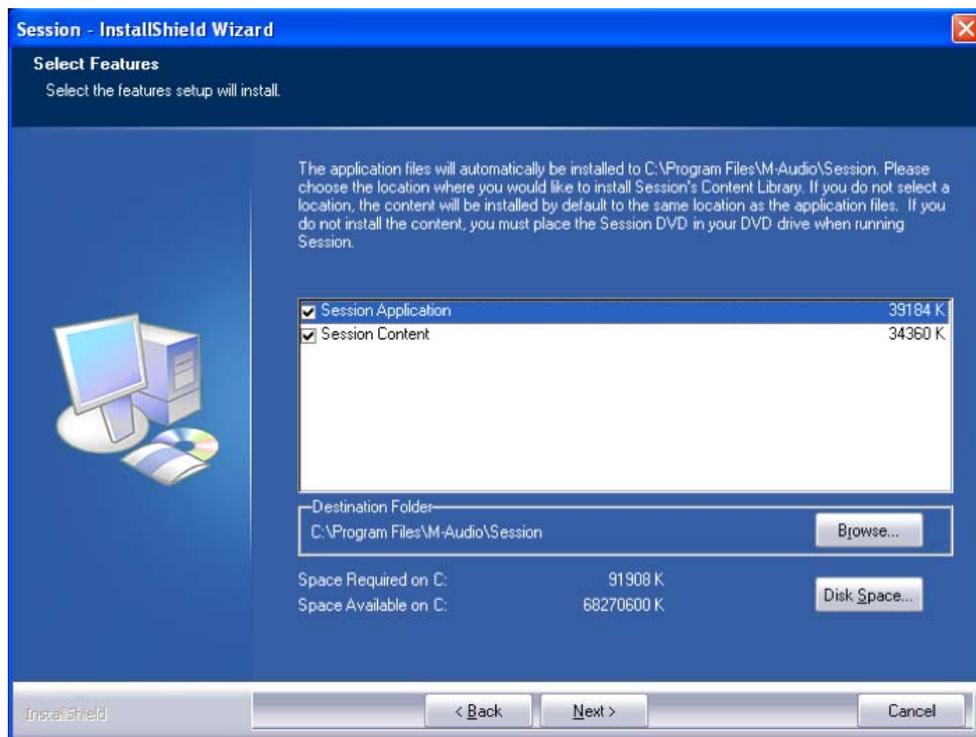
1. If you have already connected the KeyStudio 25 keyboard to your computer, disconnect it before beginning the installation.
2. Download the most recent KeyStudio 25 drivers by going to the Support > Drivers page at www.m-audio.com. This ensures that you have the newest drivers available. Double-click the file once it has finished downloading.
3. Follow the driver installer's on-screen direction prompts.
4. At various points in this installation process, you may be notified that the driver being installed has not passed Windows Logo Testing, or asked whether the program you wish to run is a trusted application. Click "Continue Anyway" or "Install" to proceed with installation.
5. Once the installer has completed, click "Finish."
6. Attach KeyStudio 25 to an available USB port using the cable provided. Make sure the power switch on the back of the keyboard is in the "on" position. If you are using Windows Vista, your KeyStudio 25 installation is now complete. If you are using Windows XP, proceed to steps 7-9.
7. Windows XP will identify the controller and will ask if you want to search the Internet for a driver. Select "No, not this time," and press "Next."
8. Windows XP will display a Found New Hardware Wizard. Choose "Install the software automatically," and click "Next."
9. Click "Finish" once the Wizard has completed the installation.

2. Install the Session Music Creation Software.

1. Insert the M-Audio Session DVD-ROM into your computer's DVD-ROM drive.
2. The computer will automatically display the install screen. If your computer fails to launch the installer, manually start it by clicking on Start > My Computer* and then double-clicking Session.
3. Follow the software installer's on-screen instructions.

NOTE: Session comes with a large library of loops and instrument samples for music creation, known as Session Content. During the installation process, you will be asked if you would like to install the Session Content on your hard drive. If you do not have 4 GB of disk space available, you may choose not to install the Session Content, but you will then have to place the Session DVD in your DVD-ROM drive whenever you run Session. Accessing Session's content via DVD-ROM results in slightly slower computer performance. If the required hard drive space is available, installing the Session Content on your computer's hard drive is recommended.

Please be aware that your Session software's Factory Content Library may take as long as 30 minutes to install. This behavior is normal. During the installation process, the installer displays helpful Session tutorial information.

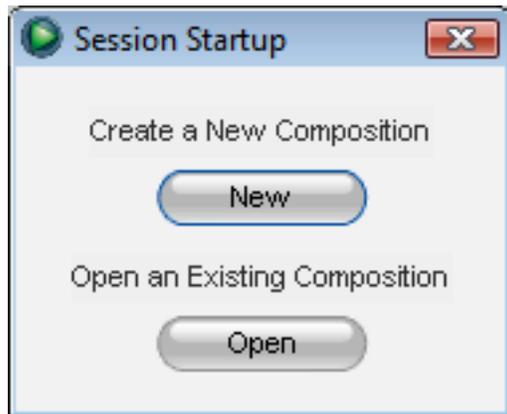


4. Click "Finish" once the installer has completed the installation.

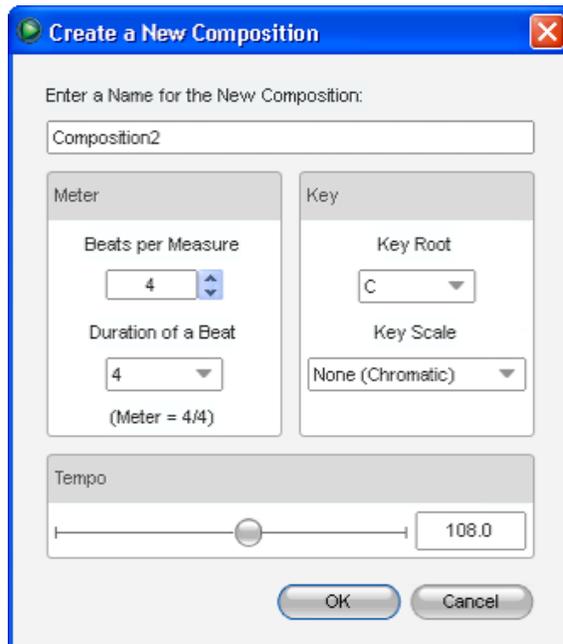
*If you are using Windows Vista, "My Computer" will be labeled "Computer" in this step.

Getting Started Making Music with Session

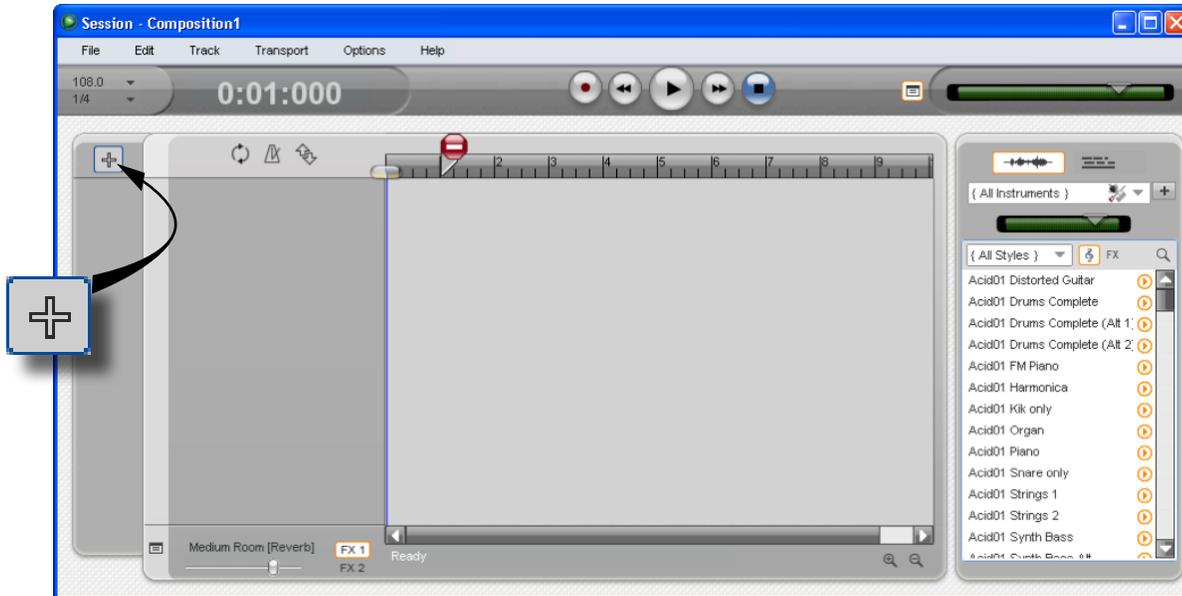
1. Connect the KeyStudio 25 keyboard to your computer using the supplied USB cable and make sure the keyboard is switched on.
2. Launch Session by clicking Start > All Programs > M-Audio > Session > Session. Alternatively, if you chose to create a desktop shortcut icon during installation, you can double-click the shortcut.
3. Click the button labeled "New" in the Session Startup window.



4. A New Composition dialog box will appear allowing you to choose a Name, Time Signature, Key Root, Key Scale, and Tempo for your composition. After these choices have been made, click OK.



5. Click the Add a Track button in the upper left corner of the Session Main Screen.



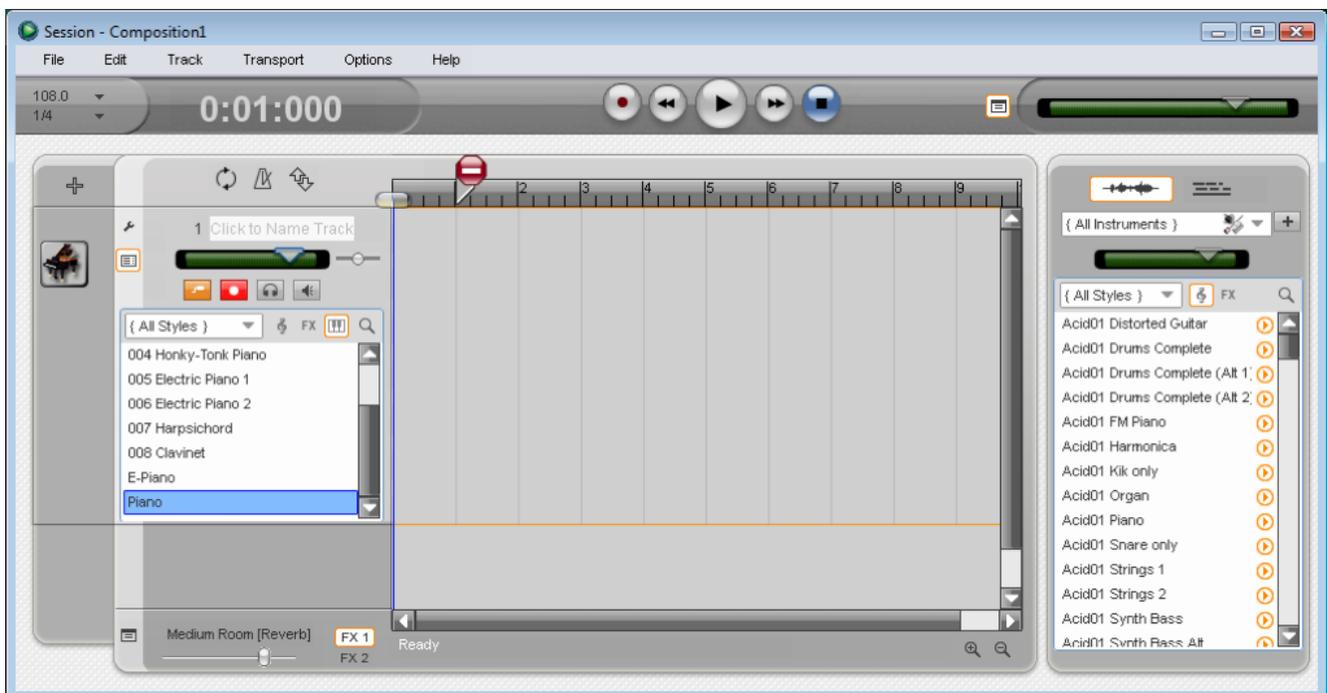
6. The "What would you like to do?" dialog box will now appear. For this example, select Play and Record with your Keyboard, and click OK.



7. In the "Select Keyboard Sound" dialog box, select the bank of sounds you would like to associate with the first track of your new song, and click OK.



8. A new track will now appear in the main Session window. You may click the specific instrument you would like to play from the instrument list appearing on the left side of the screen.



9. Try playing notes on your KeyStudio 25 keyboard. If you can hear instrument sounds, you may skip steps 10-12. If your computer does not yet generate sounds when KeyStudio 25 is played, proceed to step 10 for additional configuration instructions.
10. Go to Options > Audio Hardware and make sure the sound card you wish you use (i.e., your computer's built-in sound card or an installed ASIO compatible audio interface) is selected in the Output Device and Input Device pull-down menus. Click OK. See the following chapter, "More Information on Configuring Session," for further explanation of this.
11. Go to Options > MIDI Hardware and make sure "USB Audio Device," "USB O2," or "USB O2 In" is selected in the Input Port box. KeyStudio will appear as "USB Audio Device" in Windows XP and "USB O2" in Windows Vista if additional drivers have not been installed. If the optional drivers are installed, KeyStudio will appear as "USB O2 In." Click OK.

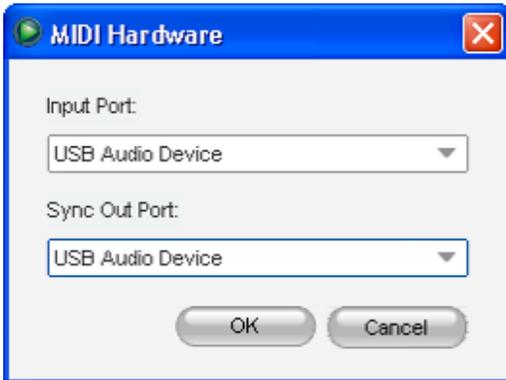


Figure A: Session MIDI Hardware dialog window without optional drivers installed in Windows XP.

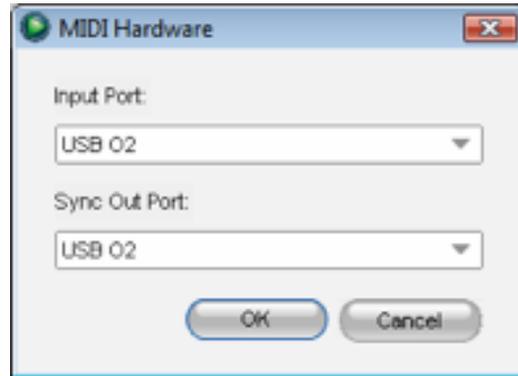


Figure B: Session MIDI Hardware dialog window without optional drivers installed in Windows Vista.

12. You should now be able to use your KeyStudio keyboard to play instruments from the Session instrument library.

More Information on Configuring Session

To play back and record audio in Session, Session must communicate with your sound card. On first launch, Session attempts to choose the first sound card containing both an audio input and audio output, effectively making this connection automatically. If Session is not able to select audio inputs and outputs automatically, it will open the Audio Hardware dialog. If the process is successful (Session does not open the Audio Hardware dialog automatically), but you cannot play back or record audio with Session, you'll need to open the Audio Hardware dialog by choosing Options>Audio Hardware.

The Audio Hardware dialog contains the following options:

ASIO/WDM Switch

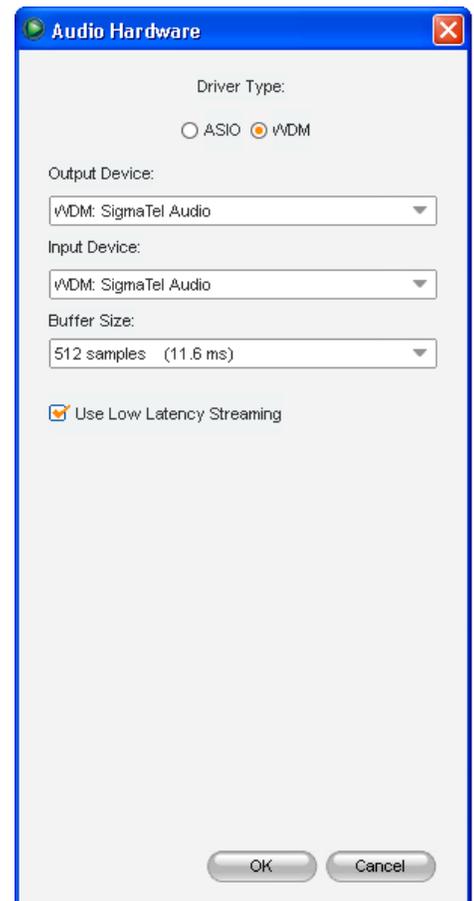
This control switches the Audio Hardware dialog of Session between ASIO and WDM mode. For best performance in Session, use ASIO mode. Consult the documentation for your sound card to determine if it supports ASIO.

Output and Input Device Selectors

These controls set the Output Device (sound card) through which Session plays audio, and the Input Device (sound card) from which Session records audio. It is recommended that you select the same sound card for audio input and output.

Buffer Size Selector

This control sets the latency of Session. See the "About Latency" section found later in this guide for additional information.



Use Low Latency Streaming Checkbox

When checked, Session attempts to open the selected audio interface in low latency mode (WDM Kernel Streaming). While most sound cards should “open” in this mode, results vary widely based on the sound card in use. See the “About Latency” section of this User Guide for further information on this.

OK Button

After making the desired settings, press the OK button to commit your changes and close the Audio Hardware dialog.

Cancel Button

Press the Cancel button to discard your changes and close the Audio Hardware dialog.

About Latency

Latency is loosely defined as the amount of time it takes for a sound made in Session to reach your speakers. For example, with a high latency (Buffer Size) setting, there will be a noticeable delay between the press of a key on KeyStudio 25, and the resultant sound. Smaller Buffer Size settings result in lower latency, but may not function well with slower systems. If you hear clicks and pops, the Buffer Size setting is too low. To adjust this setting of Session, open the Audio Hardware dialog (Options > Audio Hardware), select the desired buffer size from the Buffer Size selector, and then click the OK button.

NOTE: Deselecting the “Low-Latency Streaming” checkbox may also reduce any clicks and pops in Session audio. This setting is only available if WDM is selected as the driver type.

Upgrading your Sound Card

If you find that your sound card is incapable of producing acceptable latency times, we recommend that you upgrade your sound card. Visit www.m-audio.com for a selection of low latency ASIO audio interfaces for every purpose.

Using KeyStudio with GarageBand

The M-Audio Session software was created for use with Windows. However, the KeyStudio 25 hardware can be used with Macintosh OS X computers as well. KeyStudio 25 integrates seamlessly with the GarageBand music production software which comes pre-installed on many late-model Apple computers.

To use KeyStudio 25 with GarageBand:

1. Be sure KeyStudio is connected to your Mac OS X computer via the provided USB cable (See “Connect the KeyStudio 25 Keyboard.”)
2. Launch GarageBand.
3. Create a Software Instrument track by clicking Track > New Track > Software Instrument > Create, or select a pre-existing Software Instrument track. The default instrument GarageBand selects is a Grand Piano.

When a Software Instrument is selected, clicking the  button in the lower right corner of the GarageBand window will open the Track Info screen. From this area, you can select which instrument you would like to play.

Provided your computer’s speakers are not muted or turned down, you will now hear sounds corresponding to notes you play on KeyStudio.

About MIDI and Software Synthesis

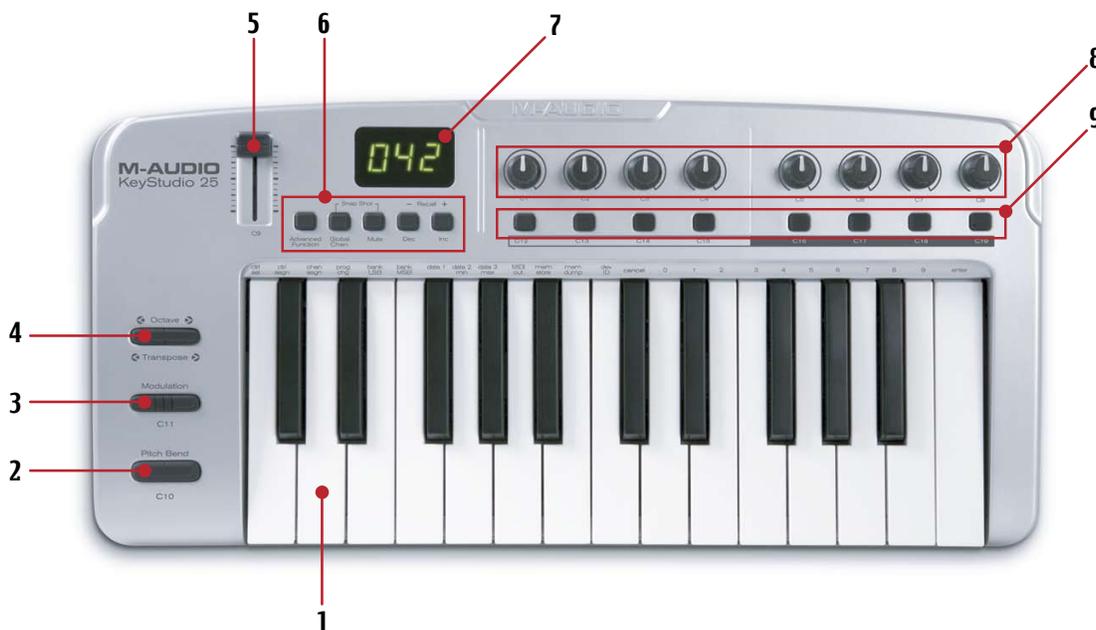
If you are new to MIDI (Musical Instrument Digital Interface), you may initially find it challenging to understand how KeyStudio interacts with the computer. However, as you use KeyStudio 25 along with Session, you'll discover the benefits of using a software-based sound source and recording system such as: access to an extremely large array of high quality sounds, a large graphic user interface, the ability to change an instrument sound after the recording has been made, and the freedom to work with many music creation applications.

A basic understanding of MIDI enables you to take advantage of its wealth of creative possibilities: MIDI data gives instructions on how a sound should play. These instructions dictate parameters such as what note to play, when to play it, how loud to play it, and which sound to use. State of the art music applications such as Session, contain "virtual instruments" that are capable of generating sound when MIDI data is sent to them. Data from the KeyStudio keyboard is transmitted to the sequencer program (e.g. Session), routed to a virtual instrument, and sent to an audio output, turning MIDI data into audible sounds. Much of this process is conveniently automated through Session software's menus and graphical user interface, letting you focus on making music. For more information on Session, such as recording audio and using loops, see the Session User Guide available from the Session Help menu.

The KeyStudio 25 Keyboard

Controls and Connectors

Top Panel



- Keyboard** – KeyStudio 25 has a two-octave, velocity sensitive keyboard. This controller features special "half-action" keys which allow KeyStudio 25 to be thinner and more portable than traditional controller keyboards.
- Pitch Bend** – This control lets you create expressive changes in your performances by raising and lowering pitch. Pressing the right side of the Pitch Bend control will raise an instrument's pitch, whereas pressing the left side will lower the pitch. Once the Pitch Bend control is released, your instrument's pitch will return to normal.

Note that the upper and lower pitch bend limit is determined by settings on your hardware or software synthesizer (such as virtual Instruments used within Session), not by the Pitch Bend control on the KeyStudio 25 keyboard. Typically, this can be either a half note or an octave up or down.

- Modulation** – This control is used to add expressivity to your performance by changing the intensity of certain effects. By default, most synthesizers assign this control to manipulate vibrato (change in intonation) or tremolo (change in volume) although it is usually possible to reassign the function of modulation through settings on the hardware or software synthesizer.

The MIDI data range of the Modulation control is 0 to 127, with 0 being the note-unchanged position. Like the Pitch Bend wheel, the amount of actual modulation that takes place depends on your instrument's settings.

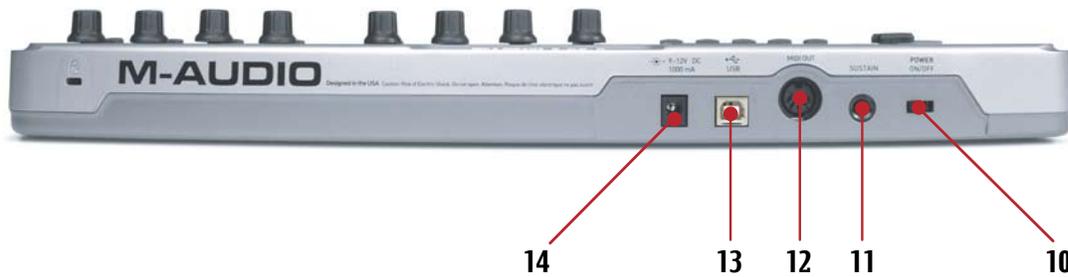
4. **Octave and Transpose Up/Down** – By default, the Octave/Transpose Up/Down control “shifts” the keyboard’s octave range in order to let you play higher or lower notes. Press the right side of the control to shift the keyboard up one octave; press the left side of the control to shift the keyboard down one octave. Note that it is possible to shift several octaves in each direction by pressing the left or right side of this control more than once.

In some cases, it may be useful to increase or decrease the transmitted pitch of KeyStudio 25 by a small number of semitones, rather than a whole octave. For example, you may be playing a song with a singer and the singer is having trouble hitting the high or low notes. In this case, you can try raising or lowering the pitch by one or more semitones. This is achieved using a function called “Transpose.”

To use the Transpose function:

1. Press Octave/Transpose + and Octave/Transpose – together.
 2. Press the Octave/Transpose + or - key for every semi tone you want to transpose up or down.
To make the Octave/Transpose control return to an Octave shift function, press the Advanced Function button, and the black key labeled CANCEL.
5. **Assignable Slider (C9)** – This slider sends out MIDI Continuous Controller (CC) data, giving you real-time control over your MIDI hardware or software instruments. By default, this slider is set to control MIDI CC number 7. This corresponds to volume on most MIDI hardware devices and software applications.
 6. **Function Buttons** – These buttons are used to access various functions and features of the keyboard. They are described in the “Using the KeyStudio 25 Keyboard” section of this guide.
 7. **LED Display** – The LED screen displays MIDI functions and data selections.
 8. **MIDI Controller Knobs (C1 – C8)** – These eight MIDI Controller knobs give you real-time control over your MIDI hardware and software through MIDI Continuous Controller (CC) messages.
 9. **MIDI Controller Buttons (C12 – C19)** – Like the MIDI Controller knobs described above, these eight MIDI Controller buttons give you real-time control over your MIDI hardware and software through MIDI Continuous Controller (CC) messages.

Rear Panel



10. **Power Switch** – This switch powers the unit on and off.
11. **Sustain Pedal Input** – Connect your sustain pedal's 1/4" connector to this jack. There is no need to worry about the polarity of the pedal—the keyboard detects the sustain pedal polarity by auto-sensing the pedal's orientation during startup.
12. **MIDI Output** – Connect this output to the input of a MIDI device using a standard 5-pin MIDI cable. By default, all MIDI data generated by KeyStudio 25 is sent out through this MIDI output as well as through the USB connection (if available). However, if KeyStudio 25 is connected to your computer via USB, it is possible to reconfigure this port so that it appears as a completely separate MIDI output port to your music software. Refer to the "Using the KeyStudio 25 Keyboard" section of this User Guide to learn how to engage "MIDI Out from USB" mode.
13. **USB Connector** – Connect a USB cable from this output to the host computer's USB port. When using the USB connection, KeyStudio 25 is powered by the host computer and a power adapter is not required.
14. **Power Jack (9V DC, 500 mA)** – Connect an optional 9V DC, 500mA external power supply to this jack. A power supply is only necessary if KeyStudio 25 is being used without a computer or if the computer is not able to provide adequate bus power to the controller.

The optional power adapter can be ordered from www.m-audio.com

IMPORTANT: *The KeyStudio 25 keyboard is "bus-powered" by your computer through the USB connection. Only use a power adapter if your computer cannot provide adequate power to the controller or if you are using KeyStudio 25 without a computer.*

Using the KeyStudio 25 Keyboard

In many cases, once KeyStudio 25 has been installed, you can simply launch your music program and begin making music right away. Many programs will be able to use KeyStudio 25 “out of the box” and require no further configuration. Certain other programs may require you to select KeyStudio 25 as a MIDI input source or to map KeyStudio’s assignable MIDI controls (buttons, knobs, sliders, etc.) to whatever on-screen functions you would like to control. These steps are described further below.

Configuring Your Software:

Once the KeyStudio 25 keyboard is installed on your computer, all MIDI capable applications on your system should recognize the controller as a new MIDI input device. However, some applications may require you to configure the software to accept MIDI data being sent from the KeyStudio 25 keyboard. This is usually done through a “Control Panel” or “Device Setup” menu in your application, but the specific process varies from program to program. Instructions on how to configure Session to accept MIDI data from KeyStudio 25 can be found in the “Getting Started Making Music with Session” section of this User Guide. Please consult your application’s documentation to learn how to select MIDI input devices.

NOTE: *In Windows XP, KeyStudio 25 will appear as “USB Audio Device” to your music software if the optional M-Audio drivers have not been installed. This is normal. If the M-Audio drivers have been installed, KeyStudio 25 will appear as “USB O2 In.”*

Assigning KeyStudio 25’s Buttons, Knobs, or the Slider to Control Your Software:

The KeyStudio 25 keyboard has a number of assignable MIDI controls (knobs, buttons, a slider, etc.) that can be used to control your music software. Each assignable control has its own unique MIDI Continuous Controller (CC) number. When you turn a knob, push a button, or move a fader, KeyStudio 25 sends out MIDI CC data that can be received and interpreted by your music software.

Many of today’s music applications (such as Ableton Live, Propellerhead Reason, Native Instruments Traktor, and others) now include a “MIDI Learn” function. This feature allows you to quickly assign the slider, buttons, or knobs of the KeyStudio 25 keyboard to control specific parameters within the software. The KeyStudio 25 keyboard can control any software that has this functionality.

The “learn” function varies from application to application and you will need to refer to your software’s user guide to find out how to use this feature.

If your software does not have this functionality, it may still be possible to manually assign the program’s features to be controlled by the specific MIDI CC data generated by the slider, knobs, or buttons found on KeyStudio 25. Refer to your software’s user guide to see if this is possible.

If manually assigning features is possible in your software, see the appendix of this guide for a complete listing of MIDI CC information generated by the slider, knobs, and buttons of the KeyStudio 25 keyboard.

Finally, if your program does not feature “MIDI Learn” or manual assignment of MIDI CC functions, you may still be able to control your music software by changing the mapping of KeyStudio 25’s assignable controls to match the MIDI CC numbers required by your music software. To find out how to do this, refer to the section entitled “KeyStudio 25 Advanced Features” found later in this guide.

NOTE: *Syntax, the software synthesizer of Session, includes over 250 preset patches (sounds). By default, many useful parameters of each patch are mapped to the slider and knobs found on the KeyStudio 25 keyboard. This means you can modify the sound of the Syntax patches by adjusting the slider and knobs of the KeyStudio 25 keyboard.*

For a chart that describes which Syntax parameter is assigned to each KeyStudio 25 slider or knob, choose Help > Open User Manual in Session, and click the link titled “KeyStudio 25/Synth Patch Controller Assignments.”

Sending Program Changes

If your software or MIDI device supports “program change” messages, you can recall different presets (sounds) straight from the KeyStudio 25 keyboard without having to reach for the MIDI device (or computer). To send a program change message:

1. Press the ADVANCED FUNCTION button.
2. Press the PROG CHG key on the keyboard.
3. Enter the program number you wish to send, using the numerical data entry keys, or the DEC/INC buttons.
4. Press the ENTER key to confirm.

Note that program change messages are sent on the “global” MIDI channel. The global channel can be changed using the procedure described further below.

TIP: This function can also be used to set up the control parameters at the start of a song. If you set all the controller values to obtain the desired effect levels in your song, you can then record the Snap Shot to ensure the song will always play back with the correct effect levels. To do this, put your sequencer into record mode and press the Snap Shot buttons.

Sending Bank Changes

If your MIDI device or software synthesizer contains more than 128 presets (sounds), then the presets will be organized into separate “banks” of sounds. KeyStudio 25 allows you to switch between banks straight from the keyboard without having to reach for the MIDI device (or computer). To send a bank change, before sending a program change message:

1. Press the ADVANCED FUNCTION button.
2. Press the BANK LSB or BANK MSB key on the keyboard.
3. Enter the bank number you wish to send using the numerical data entry keys, or the DEC/INC buttons.
4. Press the ENTER key to confirm.
5. Press the ADVANCED FUNCTION button.
6. Press the PROG CHG key on the keyboard.
7. Enter the program number you wish to recall in your new bank, using the numerical data entry keys, or the DEC/INC buttons.
8. Press the ENTER key to confirm.

To learn more about LSB and MSB, please refer to the “MIDI Messages In-Depth” section of this User Guide.

NOTE: Bank change messages must be followed by a program change message for the bank change to take effect. Simply sending a bank change message by itself will not result in any changes in your MIDI hardware or software.

Setting the Global MIDI Channel

KeyStudio 25 can transmit on any of the standard 16 MIDI channels. If you are using a computer-based system, the software usually controls the routing of MIDI signals, and this parameter can be left in its default setting.

However, if you are using KeyStudio 25 without a computer to control a MIDI device (such as a sound module), you will need to make sure that both your M-Audio KeyStudio 25 keyboard and the MIDI device are set to the same MIDI channel. KeyStudio 25 has a “Global” MIDI channel setting that affects the keyboard, program/bank change messages, and any controllers (buttons, knobs, sliders, footswitch) that have been set to respond to the global channel.

To set the Global MIDI Channel:

1. Press the GLOBAL CHAN button. The keyboard enters Program Mode. The LED will display the currently selected Global Channel, preceded by a “c.”
2. Enter the MIDI channel number using the numeric keys or use the DEC/INC keys.
3. Press the ENTER key to accept the new channel.

MIDI Out from USB Mode

When KeyStudio 25 is connected to your computer via USB, all MIDI data generated by the keyboard is sent to your computer through the USB connection. By default, this same data is also “mirrored” and sent out through the KeyStudio 25 MIDI Output port. However, KeyStudio 25’s “MIDI Out from USB Mode” makes it possible to reconfigure the MIDI Output port so that it appears as a completely independent MIDI output to your music software. You can then use this port to control a separate MIDI device (such as a sound module or sampler) through your software (you will still be able to use KeyStudio 25 as a controller).

To activate MIDI Out from USB mode:

1. Press the ADVANCED FUNCTION button.
2. Press the MIDI OUT key.

The LED display will show “USB,” indicating that the MIDI Out port is now independent of the local KeyStudio 25 keys and MIDI controls and will output data sent to the device from your music software.

To deactivate MIDI Out from USB mode and return to normal operation, repeat the steps listed above. The LED display will show ‘Int’ indicating that the M-Audio KeyStudio 25 keyboard is once again sending mirrored data out of the USB and MIDI Output ports.

KeyStudio 25 Advanced Features

This section deals with the more advanced features found within the KeyStudio 25 keyboard. We have included this information for “power users” who want to explore and use the keyboard’s in-depth features and additional capabilities to their full extent. This information is not required reading for most users and readers who are not interested in more advanced MIDI programming concepts can feel free to skip this section.

Recalling Presets

KeyStudio 25 is capable of storing five “presets” containing all control assignments and keyboard configuration settings. Use the “DEC” and “INC” buttons to step through the five available presets. The LED will display the preset number preceded by a “P” to indicate which preset is currently loaded.

The following is a list of the five “factory default presets” that have been pre-programmed into KeyStudio 25:

- 01 GM Preset (preconfigured for use with Session)
- 02 Reason Native
- 03 Reason Mixer
- 04 Yamaha XG/Roland JV Preset
- 05 Undefined CC’s for MIDI learn*

Note that these default settings can be modified to suit your particular needs (this is described below, beginning with the “Program Mode Overview” section.)

** Some applications do not have any default settings and require you to set the MIDI controllers for the application’s parameters yourself. This normally involves placing the application into a “MIDI Learn” mode, selecting an on-screen control and moving the hardware controller you wish to assign to it. When working with such an application, it is recommended that the controller numbers used by MIDI controls on the keyboard do not already have another function associated with them – this is how preset #5 is configured.*

Storing Presets

KeyStudio 25 uses “non-volatile” memory allowing presets to be stored even after the keyboard has been switched off. All controller and channel assignments are automatically stored under the current preset number as soon as you confirm a change—there is no need to “save” the preset. Additional settings are also stored including: the program number, bank LSB and bank MSB data, global channel setting, MIDI Out from USB configuration, and last used memory preset.

Duplicating and Organizing Presets

You may want to duplicate or reorganize the order of the presets on your KeyStudio 25 controller. For example, let’s say you wanted to copy preset #2 (“Reason Native”) to location #4. This can be done through the following procedure:

1. Recall preset #2 by using the DEC/INC buttons.
2. Press the ADVANCED FUNCTION button.
3. Press the MEM STORE key on the keyboard.
4. Enter “4” using the numerical data entry keys or the DEC/INC buttons.
5. Press the ENTER key to confirm.

This will save or store the current setup to preset location #4. Note that this operation will overwrite the contents of the existing preset.

Enigma Software

Enigma is a powerful program that allows you to change the settings of any assignable slider, knob, or button on the KeyStudio 25 through an easy-to-use graphical user interface. The program also allows you to store a virtually unlimited amount of presets on your computer's hard drive—a handy tool for users who have created custom presets for each of their MIDI devices. The program is available for free download at www.m-audio.com

Refer to the Enigma User Guide to learn more about how to use the software with KeyStudio 25

Sending a Snap Shot

Snap Shot is a useful function that can be used to synchronize the receiving MIDI device with the controls on your keyboard. When you send a Snap Shot, the current value of each individual MIDI control (button, knob, slider, etc.) will be sent on the channel that the MIDI control is assigned to. This updates all of the parameters on your MIDI device with the current knob positions on KeyStudio 25. The function can also be used as a creative tool, often with interesting and surprising results.

Press the GLOBAL CHAN and MUTE buttons together to send a "Snap Shot."

TIP: This function can also be used to set up the control parameters at the start of a song. If you set all the controller values to obtain the desired effect levels in your song, you can then record the Snap Shot to ensure the song will always play back with the correct effect levels. To do this, put your sequencer into record mode and press the Snap Shot buttons.

Muting All Controllers

To temporarily mute the KeyStudio 25 fader and knobs, press the function button labeled MUTE. The LED displays "OFF" when this function is engaged.

Mute allows you to alter the position of the slider and the knobs without affecting the settings of your software. Note that this function does not affect buttons, the foot switch, pitch bend and modulation controls, or the keyboard. When one of the aforementioned controls is used, mute is disengaged and all controllers are turned back on.

Use this feature if you are switching between presets with the controllers out of position. You will be able to move the controller to a position relative to the software's controller value, without causing the software's controller value to jump.

Program Mode Overview

KeyStudio 25 has two modes of operation: Program mode and Performance mode. Most of the time, the controller stays in Performance mode so you can play regularly—Program mode is only used when you need to configure various parameters like knob assignments. Use the ADVANCED FUNCTION button to enter and exit Program mode (a small dot appears on the lower-right hand side of the display whenever you are in Program mode).

- Once you have entered Program mode, you can select different parameters to edit by pressing one of the keys on the left half of the keyboard. The function of each key is written directly above the key:



- Each of the assignable controllers on KeyStudio 25 can send MIDI CC, RPN/NRPN, GM 1&2, and predefined SysEx messages on its own individual MIDI channel.
- Certain parameters require you to enter additional information such as the MIDI channel or CC number. Use the 0-9 keys (on the right hand side of the keyboard) or the DEC/INC buttons to set these values. The LED display will indicate the current value.
- If you've entered a number, use the Enter key to confirm the entry. If you've changed your mind, press the ADVANCED FUNCTION button to exit Program mode without changing any settings.

Assigning MIDI CCs

To edit a MIDI CC mapping for a button, knob, or slider:

1. Press the ADVANCED FUNCTION button and move or push the controller that you wish to assign.
2. Press the CTRL ASGN key. The LED display will show the MIDI CC number of your selected controller.
3. Enter a new MIDI CC value using the numerical data entry keys, or the DEC/INC buttons. The LED will display your new CC number.
4. Press the ENTER key to confirm the entry and exit Program mode.

Assigning MIDI Channels

The following procedure describes how to set any of the assignable controls on KeyStudio 25 to transmit on a unique MIDI channel:

1. Press the ADVANCED FUNCTION button and move or push the controller that you wish to assign.
2. Press the CHAN ASGN key. The LED display will show the current channel assignment of the selected controller.
3. Enter the new MIDI channel number using the numerical data entry keys or the DEC/INC buttons. The LED will display the new channel number.
4. Press the ENTER key to confirm the entry and exit Program mode.

Note: *If a button, knob, or slider is assigned to channel 0, it will transmit on the Global Channel of KeyStudio 25.*

Reassigning MIDI CC for the Modulation Control

To edit a MIDI CC mapping for the Modulation control:

1. Press the ADVANCED FUNCTION button.
2. Press the CTRL SEL key.
3. Enter "10" using the numerical data entry keys or the DEC/INC buttons. This number corresponds to the Pitch control (each slider, button, or knob's control number is printed next to it on the KeyStudio 25 keyboard).
4. Press the ENTER key to confirm the selection and exit Program mode.
5. Press the ADVANCED FUNCTION button again.
6. Press the CTRL ASGN key. The LED display will show the MIDI CC number of your selected controller.
7. Enter a new MIDI CC value using the numerical data entry keys or the DEC/INC buttons. The LED display will show the new CC number.
8. Press the ENTER key to confirm the entry and exit Program mode.

Alternate method for selecting controls

To edit a controller, you must first select the control you wish to reassign. The simplest way of doing this is to turn or push whatever knob, button, or slider you wish to edit. This method is already mentioned throughout the various sections of this chapter. However, there is an alternate method of selecting a control for editing using the "CTRL SEL" (Control Select) key. This method is as follows:

1. Press the ADVANCED FUNCTION button, then the CTRL SEL key.
2. The LED will display the number of the currently selected controller, preceded by a "C."
3. Enter the number of the controller using the numerical data entry keys, or the DEC/INC buttons.
4. Press the ENTER key to confirm.

This control is now selected for editing.

Reassigning MIDI CC for the Pitch Control

To edit a MIDI CC mapping for the Pitch Bend control:

1. Press the ADVANCED FUNCTION button.
2. Press the CTRL SEL key.
3. Enter "10" using the numerical data entry keys or the DEC/INC buttons. This number corresponds to the Modulation control (each slider, button, or knob's control number is printed next to it on the KeyStudio 25 keyboard).
4. Press the ENTER key to confirm the selection and exit Program mode.
5. Press the ADVANCED FUNCTION button again.
6. Press the CTRL ASGN key. The LED display will show the MIDI CC number of your selected controller.
7. Enter a new MIDI CC value using the numerical data entry keys or the DEC/INC buttons. The LED will display your new CC number.
8. Press the ENTER key to confirm the entry and exit Program mode.

Reassigning MIDI CC for the Sustain Pedal input

To edit a MIDI CC mapping for the Sustain footswitch:

1. Press the ADVANCED FUNCTION.
2. Press the CTRL SEL key.
3. Enter "20" using the numerical data entry keys or the DEC/INC buttons. This number corresponds to the Sustain Pedal input (each slider, button, or knob's control number is printed next to it on the KeyStudio 25 keyboard).
4. Press the ENTER key to confirm the selection and exit Program mode.
5. Press the ADVANCED FUNCTION button again.
6. Press the CTRL ASGN key. The LED display will show the MIDI CC number of your selected controller.
7. Enter a new MIDI CC value using the numerical data entry keys, or the DEC/INC buttons. The LED display will show the new CC number.
8. Press the ENTER key to confirm the entry and exit Program mode.

Limiting the Range of the Controls

Normally, the range of a MIDI controller is 0 to 127. In some cases, you may wish to restrict the minimum or maximum limits of this range. A minimum restriction can be placed on knobs, faders, Pitch bend, or Modulation controls by doing the following:

1. Press the ADVANCED FUNCTION button and move or push the controller that you wish to limit.
2. Press the DATA 2 (MIN) key. The LED will display the current Minimum limit of the controller.
3. Enter the desired minimum value using the numerical data entry keys or the DEC/INC buttons.
4. Press the ENTER key to confirm the entry and exit Program mode.

If you would like to place a maximum limit:

1. Press the ADVANCED FUNCTION button and move or push the controller that you wish to limit.
2. Press the DATA 3 (MAX) key. The LED will display the current maximum limit of the controller.
3. Enter the desired maximum value using the numerical data entry keys or the DEC/INC buttons.
4. Press the ENTER key to confirm the entry and exit Program mode.

TIP: If your DATA 2 (MIN) value is greater than the DATA 3 (MAX) value, your control will work in "reverse." In other words, turning the control clockwise will cause the MIDI CC output data to decrease while turning counter-clockwise will cause the CC output to increase. This is useful in certain situations such as when you wish to use a slider like a drawbar on an organ. For standard operation, make sure your DATA 3 (MAX) value is higher than DATA 2 (MIN).

Using Controls to Increment or Decrement Values

Buttons and the pedal can be set to decrement or increment MIDI data values within a defined range and one by one. This is useful if you need precise control over MIDI CC or you would like to use buttons to step forward or backward through programs (using a program change message). To do this:

1. Press the ADVANCED FUNCTION button and push the footswitch or button you wish to modify.
2. Press the CTRL ASGN key.
3. Enter '153' if you'd like to use the control to decrease a value (enter '154' if you'd like to use the control to increase a value).
4. Press the ENTER key to confirm.
5. Press the ADVANCED FUNCTION button again, followed by the DATA 1 key.
6. Enter the number of the MIDI CC you want the button to send out.
7. Press the ENTER key to confirm.
8. To define the range minimum, press the ADVANCED FUNCTION button, followed by the DATA 2 (MIN) key.
9. Enter the desired minimum value using the numerical data entry keys or the DEC/INC buttons (e.g. 0).
10. Press the ENTER key to confirm.
11. To define the range maximum, press the ADVANCED FUNCTION button, followed by the DATA 3 (MAX) key.
12. Enter the desired maximum value using the numerical data entry keys or the DEC/INC buttons (e.g. 127).
13. Press the ENTER key to confirm.

Setting Toggle Values for the Buttons

The 8 assignable buttons and the pedal can each be assigned to toggle between two values by doing the following:

1. Press the ADVANCED FUNCTION button and push the footswitch or button you wish to modify.
2. Press the DATA 2 (MIN) key. The LED will display the current "low" value of the controller.
3. Enter your new low value using the numerical data entry keys or the DEC/INC buttons.
4. Press the ENTER key to confirm.
5. Press the ADVANCED FUNCTION button again, followed by the DATA 3 (MAX) key.
6. Enter the new "high" value using the numerical data entry keys or the DEC/INC buttons.
7. Press the ENTER key to confirm.

The procedure described above will toggle the value each time you press the button or footswitch. It is also possible to configure the control so that it sends one value when it is pressed, and another value when released. To do this:

1. Press the ADVANCED FUNCTION button and push the footswitch or button you wish to modify.
2. Press the CTRL ASGN key.
3. Enter 146 using the numerical data entry keys or DEC/INC buttons. This sets the control for MIDI CC (On/Off) mode.
4. Press ENTER to confirm.
5. Press the ADVANCED FUNCTION button again, followed by the DATA 1 key.
6. Enter the number of the MIDI CC you want the button to send out.
7. Press the ENTER key to confirm.
8. Assign the two toggle values for "control press" (DATA 3) and "control release" (DATA 2) using the procedure described above.

Assigning MIDI Machine Control (MMC) Commands to a Button

1. Press the ADVANCED FUNCTION button and push the button you wish to modify.
2. Press the CTRL ASGN key.
3. Enter "149" using the numerical data entry keys to indicate that you would like to assign an MMC command to your selected button (see Appendix B for a complete list of MIDI CC numbers and their corresponding commands).
4. Press the ENTER key to confirm
5. Press the ADVANCED FUNCTION button, then the CHAN ASGN key.
6. Enter "127" using the numerical keypad. This ensures that the message is sent to all device ID numbers.
7. Press the ENTER key to confirm.
8. Press the ADVANCED FUNCTION button, then the DATA 2 key.
9. Enter a number from the chart on the right to assign the corresponding MMC message to your selected button.

Number	MMC Command
01	STOP
02	PLAY
03	DEFERRED PLAY
04	FAST FORWARD
05	REWIND
06	RECORD STROBE
07	RECORD EXIT
08	RECORD PAUSE
09	PAUSE
10	EJECT
11	CHASE
12	COMMAND ERROR RESET
13	MMC RESET

Assigning a Note to a Button

The following shows the procedure for setting a button to transmit a MIDI Note On message when pressed, and a MIDI Note Off message when released.

1. Press the ADVANCED FUNCTION button and push the button you wish to modify.
2. Press the CTRL ASGN key.
3. Enter "147" using the numerical data entry keys or the DEC/INC buttons. This is the MIDI CC number that corresponds to Note On/Off mode (see Appendix B for all MIDI CC numbers).
4. Press the ENTER key to confirm.
5. Press the ADVANCED FUNCTION button followed by the DATA 3 key.
6. Enter "100" using the numerical data entry keys or the DEC/INC buttons. This will result in a "Note On" message with a velocity of 100 when your selected button is pressed. If you would like a different velocity, enter that velocity instead of "100."
7. Press the ENTER key to confirm.
8. Press the ADVANCED FUNCTION button followed by the DATA 2 key.
9. Enter "0" using the numerical data entry keys or the DEC/INC buttons. This will result in a "Note Off" command being sent out when your selected button is released.
10. Press the ENTER key to confirm.
11. Press the ADVANCED FUNCTION button followed by the DATA 1 key.
12. Enter "64" using the numerical data entry keys or the DEC/INC buttons. This results in MIDI Note 64 or E4 each time the button is pressed. To play a different note, enter a different value here (MIDI Note numbers are listed in Appendix E).
13. Press the ENTER key to confirm.

Assigning RPN/NRPN to a Fader or Knob

Non-registered parameter numbers (NRPN's) are device-specific messages that enable you to control synthesizers and sound modules via MIDI. The MIDI specification defines open parameter numbers to allow manufacturers to specify their own controllers. Some of the more common messages are now registered by the MIDI Manufacturer's Association and are part of the MIDI specification (hence the term Registered Parameter Numbers – RPN's).

Each NRPN/RPN has an associated 2-byte number. The two bytes allow for 128 values each. (An RPN or NRPN message is made up of two parts: the MSB and the LSB message. Both of these messages together constitute an RPN or NRPN command.) This allows for 16,384 values in total.

MIDI controllers 98 and 99 represent the NRPN LSB and MSB respectively, while 100 and 101 represent the RPN LSB and MSB messages (see the MIDI controllers list in Appendix B). To transmit an NRPN/RPN message, these LSB and MSB controller messages are sent along with their user-specified values. A further controller message and value needs to be sent to specify the (coarse or fine) value adjustment. This is specified by controller number 6 (data entry) for coarse adjustments or number 38 for fine adjustments.

A list of NRPN's is usually given in the user's manual of any device that receives NRPN messages. It is always necessary that the NRPN MSB and LSB be sent together. Both will be specified in the device's manual.

To assign an RPN/NRPN message to a fader or knob:

1. Press the ADVANCED FUNCTION button and move the fader or knob you wish to assign.
2. Press the CTRL ASGN key and enter "132" for RPN Coarse, "133" for RPN Fine, "134" for NRPN Coarse, or "135" for NRPN Fine using the numerical data entry keys or DEC/INC buttons.
3. Press ENTER key to confirm your selection.
4. Press the ADVANCED FUNCTION button, then the DATA 3 key.

5. Enter your RPN/NRPN MSB value and press the ENTER key to confirm.
6. Press the ADVANCED FUNCTION button, then the DATA 2 key. This assigns the number for the RPN/NRPN LSB.
7. Enter your RPN/NRPN LSB value and press the ENTER key to confirm.
8. Finally, press the ADVANCED FUNCTION button, then the CHAN ASGN key.
9. Enter the channel that the message should be sent on.
10. Press the ENTER key to confirm your selection.

Note: Many specification sheets for synthesizers and other MIDI devices make use of NRPN messages and will give the MSB and LSB values that should be entered for DATA 3 and DATA 2 (See Appendix G). Some sheets may only list the values in hexadecimal format, but the M-Audio KeyStudio 25 requires each value to be entered as a decimal. Use Appendix C at the end of this User Guide to convert hexadecimal values into decimal.

About SysEx Messages and Device ID

MIDI SysEx messages (memory dump, all notes off, master tune, etc.) are global MIDI messages that are not MIDI channel-specific. This means SysEx messages are not transmitted on specific MIDI channels. Instead, SysEx transmits a Device ID number along with any SysEx message. This ID is used to uniquely address a particular destination device within your MIDI setup. Device IDs range between 00–127. To send a SysEx message to a particular device in your MIDI setup, find out which Device ID it responds to, then assign the same Device ID to KeyStudio 25 before starting the transmission.

For most devices, the Device ID is pre-configured at 127 at the factory. Device ID 127 plays a special role, as it can be read by all connected devices, regardless of their individual Device ID setting.

As an example, a device with device ID 50 will not only accept messages that are using Device ID 50, but also messages with Device ID 127. SysEx messages with any other Device ID are ignored.

The Device ID for a SysEx message assigned to a controller can be changed using the DEV ID key. This key is used for varying the global Device ID of the M-Audio KeyStudio 25.

Assigning the Device ID

Press the ADVANCED FUNCTION button, then the DEV ID key to assign a Device ID to the M-Audio KeyStudio 25. When the DEV ID key is pressed, the LED display indicates the assigned Device ID. It is possible to enter a new device ID using the numerical data entry keys, or the +/- buttons. Press the ENTER key to confirm.

If a SysEx message is sent from a device with a Device ID of 127, that message can be read by all attached MIDI receiving hardware regardless of their Device ID settings. If a SysEx message is created by a device with a Device ID other than 127, the SysEx message will only be processed by devices with an identical Device ID. The sent SysEx message will be ignored by devices with a Device ID that doesn't match that of the sending device.

Memory Dump

Press the ADVANCED FUNCTION button followed by the MEM DUMP key to send out a number of SysEx data packets that represent the 5 user-defined or factory-set presets of the M-Audio KeyStudio 25. This can be used for storing or backing up the contents of the memory presets externally.

It is possible to record a Memory Dump to a standard MIDI sequencer track, much like how you would record notes on a MIDI sequencer track. You can recall the Memory Dump you recorded by playing back the MIDI track containing the recorded Memory Dump, making sure that the M-Audio KeyStudio 25 is selected as the MIDI output for that particular track.

The current controller assignments are not immediately affected by a Memory Dump, or a memory location that is sent to the keyboard. You first need to recall a preset to access the uploaded new settings after a memory dump has been sent to the keyboard.

MIDI Messages In-Depth

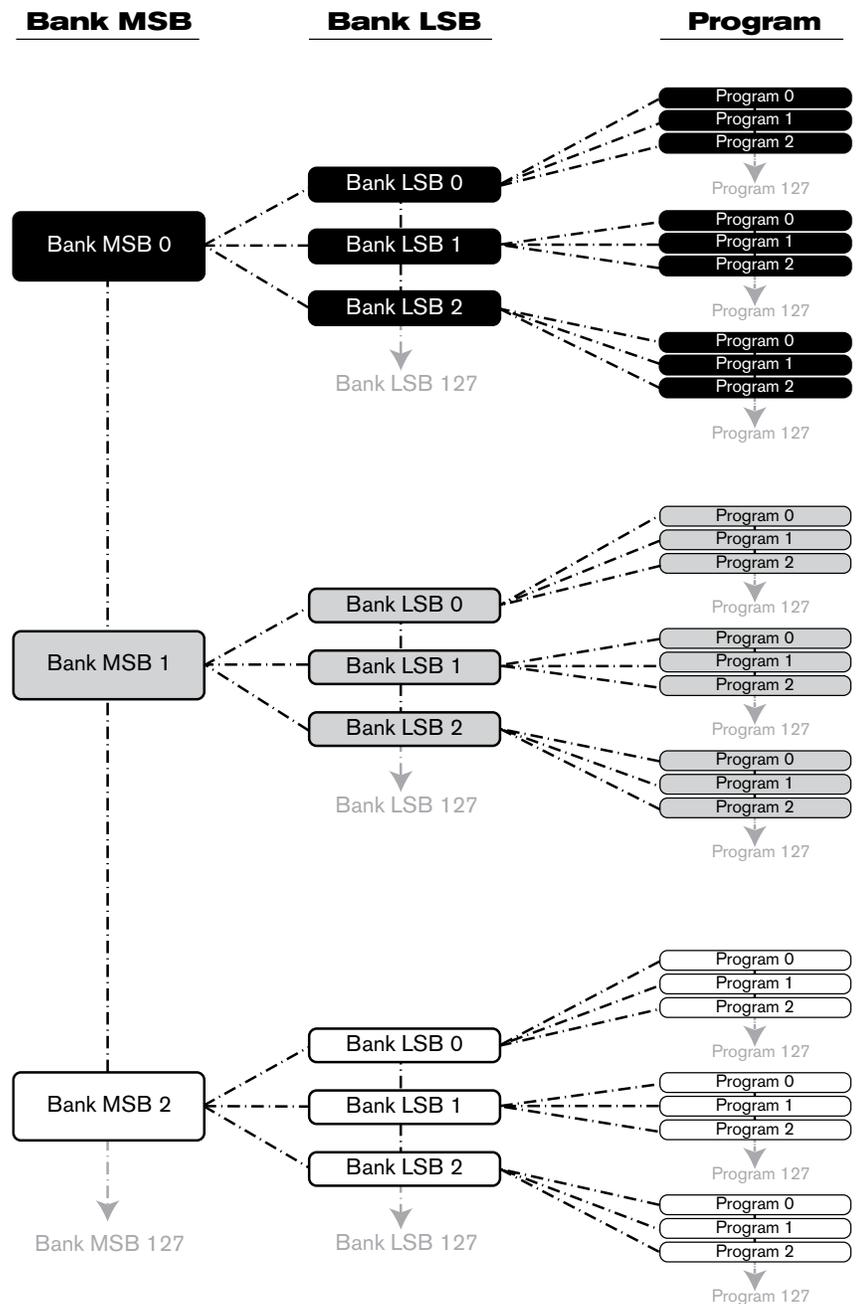
Program & Bank Changes

When the MIDI standard was first established, it enabled the user to access only 128 different sounds using program change messages (0-127). As MIDI devices grew to be more sophisticated and contain more sounds, bank change messages were included in an updated MIDI specification to allow for more than 128 sounds to be accessed.

The language MIDI uses to communicate between musical instruments only allows for program change commands 0-127, for a total of 128 possible programs (127 programs + program "0" = 128 programs total). Because of inherent limitations of the MIDI communication protocol, the number of directly accessible programs (using program change messages) cannot easily be expanded beyond 128. Thus, a system of banks, with 128 sounds in each, has been created that enables manufacturers to overcome the 128-sound MIDI limit.

128 Banks with 128 sounds in each bank is the basic principle used to expand the number of accessible sounds. However, to avoid reaching the new limit of the resulting 16,384 possible sounds (128 banks x 128 programs) accessible using a bank change combined with a program change, another layer of banks was added. The result is a system of 128 banks that can contain 128 sub-banks in each of them, which, in turn, can contain 128 sounds (programs) within them. Bank change messages are useful when calling up sounds from a large library that may exist in a particular sound module or software synth. For example devices that are built with Roland's GS specification or Yamaha's XG specification require you to specify a bank change in order to access the extra voices and effects that these devices provide.

MIDI CC 0 is the bank select MSB (Most Significant Byte) message. This MIDI message is 7-bit in size and can be used to select any of 128 banks. This message can be used in conjunction with MIDI CC 32 which is bank select LSB (Least Significant Byte): a separate 7-bit message allowing additional selection of any of another 128 sub-banks. The combination of Bank MSB and LSB messages gives a 14-bit message that can select any of a possible 16,384 banks. Each bank can in turn contain 128 possible sounds selected via a separate program change MIDI message. This enables a user to theoretically recall over two million programs directly, using only MIDI commands. However, most devices only use a few different banks, and allow you to access them with either a Bank LSB message or a Bank MSB message. Please consult your synthesizer's or software's documentation for more information on which type of bank change messages they can process."



You will find many MIDI devices respond to program change commands and many are organized according to the GM listing. In General MIDI devices, different sounds are organized in the same way from device to device. Piano sounds are in their particular place, string sounds are in their place, drum sounds are in their place, and so on. All GM devices (both hardware and software sound modules) are clearly labeled as such, so you know that their sounds are organized in the General MIDI structure. When a GM device receives a MIDI program change, it calls up a type of sound that you expect from the GM sound set. All non-GM MIDI sound modules call up unique sounds from their memory upon receiving MIDI program changes. Since the sounds in a non-GM device are not arranged in a particular order, you need to take a look at the device itself to see which sound you want and at which location in the memory it resides. Many VST instruments such as Native Instruments' FM7 or the synth modules in Propellerhead Reason are non-GM devices.

You can send program change, bank LSB and bank MSB messages directly from the KeyStudio keyboard. Please consult the "Advanced KeyStudio 25 Features in Edit Mode" section of this User Guide for further details.

Troubleshooting

The KeyStudio 25 keyboard has been tested under a wide variety of conditions. Despite our thorough testing, the controller can be used in virtually limitless situations and certain scenarios may result in unexpected performance. This section will highlight some of the most common difficulties users may experience and provide tips to remedy these problems. If you have read this section and still cannot resolve an issue you are experiencing, please feel free to contact M-Audio technical support for further assistance.

Problem 1: My KeyStudio 25 suddenly stopped working after having performed fine since installation.

Close any music applications you are using, switch the KeyStudio 25 off, and restart your computer. Once your computer has restarted, switch the KeyStudio 25 back on and try again.

Problem 2: I have connected a sustain pedal to my M-Audio keyboard, but its operation is reversed.

The KeyStudio 25 keyboard determines the polarity of a sustain pedal when the controller is switched on. The sustain pedal is assumed to be in the OFF position (i.e., not pressed) when the keyboard is turned on. To ensure proper operation, make sure the pedal is not pressed during start up.

Problem 3: The keyboard does not trigger sounds in my music software.

See if your music software features a "MIDI input" or "MIDI activity" indicator. Most programs have a MIDI activity indicator that can be used to confirm whether MIDI data from the keyboard is reaching the software. If the software is not receiving any MIDI data, be sure the controller is properly installed and is selected as a MIDI input device within your software. Refer to your software's documentation to learn how to configure and select MIDI input devices.

If the MIDI activity display indicates that MIDI data is reaching your software, then you may not be hearing sounds because the MIDI data is not being routed correctly through the software itself. Refer your software's documentation to learn how to route MIDI data properly.

Problem 4: The controller is connected to my computer through USB but it does not seem to turn on.

Make sure the power switch is in the "On" position. If this does not remedy the problem, the keyboard may not be receiving adequate power from your computer. Try plugging the controller into a different USB port or powered USB hub. Alternatively, you may try connecting a 9V DC, 500mA external power supply to the Power jack on the rear of the keyboard.

Problem 5: My music software (or hardware) always recalls the preset next to the program number that I have sent to it from the KeyStudio 25. For example, if I send a program change with the number 40 (Violin), my software loads sound number 41 (Viola).

Some General MIDI modules count their sound patches from 1 – 128 instead of 0-127. Both methods are common. As a result, there may be an offset of +/-1 between the sent program change number and the recalled sound patch.

Problem 6: I have modified my KeyStudio 25 settings but would like to go back to its "factory default" settings.

To reset KeyStudio 25 to its "factory default" settings, first switch the keyboard off. Next (while the controller is still off), press and hold both Preset +/- buttons and turn the unit on. Note that restoring the factory presets will erase all setups you have stored to memory.

Problem 7: When I press a key, or attempt to monitor my microphone or instrument input, there is a noticeable delay before I hear any sound.

This phenomenon is known as latency. On certain audio interfaces, latency may be adjusted by changing the buffer size setting in the audio interface's control panel. Consult your audio interface's documentation to learn if it is possible to reduce latency on your system.

The goal is to set the buffer size as low as possible without experiencing artifacts in the audio. Faster computers generally allow for smaller buffer size settings, and thus less latency. If there is a large delay between what you play on the keyboard, and what you hear from your virtual instrument in Session, you can try to lower the audio buffer size within Session.

If your audio interface supports ASIO, click Options > Audio Hardware. Make sure the ASIO radio button is selected, then click "ASIO Settings" to open the control panel for your ASIO interface. The control panel features that are available depend on the make and model of your audio interface. Locate the buffer size and/or latency control and lower the buffer size and/or latency time.

If your audio interface does not support ASIO, click Options > Audio Hardware. Select the WDM radio button, then choose a lower value from the "Buffer Size" menu.

Some WDM compatible sound cards deliver improved latency when activating the "Use Low Latency Streaming" check box. However, not every audio interface is compatible with this mode.

M-Audio builds a variety of low latency ASIO-compatible devices that can help resolve latency issues you may be experiencing. If you are on a budget, the inexpensive M-Audio Micro interface will provide low latency performance at an extraordinarily low price point to help you make better music with Session and other applications.

Problem 8: I am unable to input monitor through Session.

Click the Input Monitor button, enabling the Input Monitor feature. This allows you to play or sing through Session, known as input monitoring. Depending on the proximity of your microphone or guitar to your speakers, and the volume setting of your speakers, there is potential for feedback (a loud, screeching noise). Be sure to turn your speaker volume down before pressing the Input Monitor button. After pressing the Input Monitor button, gradually increase your speaker volume to a safe level. Optionally, Session can press the Input Monitor button automatically for the selected Track. This option is disabled by default to protect your ears and speakers. To turn this option on, select Auto Input Monitor Selected Audio Track from the Track menu, located at the top of the Session window.

Alternatively, if you are using a professional or semi-professional audio interface, your device may feature "hardware monitoring" allowing an input to be sent directly to the audio outputs. This method bypasses your audio software (and buffers) and allows you to hear the inputs with virtually no latency. Consult your audio interface's documentation to learn how to use this feature.

Problem 9: I hear a loud screeching sound after creating or selecting an audio track.

If you are using speakers, and your microphone is too close to the speakers, you may experience feedback. To solve this issue,

- Lower your speaker's volume.
- Disable Auto Input Monitor Selected Audio Track from the Track menu in the Menu bar. If you choose this option, make sure to press this button when you need to monitor through the track.

In general, it is good practice to turn your speakers off while recording, and listen with headphones.

Problem 10: I hear crackles, clicks, or pops when playing or recording audio.

Make sure that Session's Master Volume control does not indicate clipping. This control indicates clipping by drawing two red dots at the far right edge of the volume meter. If you see clipping, move the Master Volume control slider to the left. If you hear crackles, clicks, pops, or other artifacts while recording or input monitoring through a track, lower your microphone or guitar signal until the track stops clipping. Crackles, clicks, pops, or other artifacts also occur when your computer cannot keep up with the current task. To solve this problem in Session, click Options > Audio Hardware > ASIO Settings > Latency, and drag the slider upwards. Repeat this process if this problem continues.

Problem 11: The KeyStudio does not trigger sounds in Session.

Go To Options > MIDI Hardware and make sure "USB Audio Device" or "USB O2 In" is selected in the Input Port box. Also make sure a track for keyboard playback and recording is selected.

Problem 12: Synth Patches and MultiFX Presets do not load.

It is likely that you moved the Factory and/or User Content Folders. If you moved the Factory Content Folder, you can point Session to it by choosing Locate Factory Content Folder from the Options Menu. If you moved the User Content Folder, you can point Session to it by choosing Set User Content Folder from the Options Menu.

Problem 13: After adding more sample content, the new content does not display in the Track Browsers.

When manually adding new content to Session (copying new files into Session's Content Folders), you must re-scan the Content Library by choosing Re-Scan Content Categories from the Category Manager.

Problem 14: The Composition sounds distorted.

If your Composition sounds distorted, you may need to lower the overall volume of the Composition by adjusting the Master Volume control, located at the top right of the Session window. If the level is loud enough to cause distortion, you will see two red dots at the far right end of the Master Volume control.

Problem 15: The Session software operates very slowly, and is very system-resource intensive.

This problem may be solved by downloading and installing a more current driver from your specific graphics card manufacturer's website.

Appendices - Useful MIDI Data

Appendix A: MIDI Implementation Chart

Function		Transmitted	Received	Remarks
Basic	Default	1-16		
Channel	Changed	1-16	X	
Mode	Default	-----		
	Messages	X	X	
	Altered	*****		
Note		0-127		
Number	True Voice	*****	X	
Velocity	Note ON	0		
	Note OFF	X	X	
After	Keys	X		
Touch	Ch's	0	X	
Pitch Bend		0	X	
Control	0-119	0	X	
Change	120-127	0	X	
Program		0-127		
Change	True Number	*****	X	
System		GM, GM2, MMC	Memory Dump	
Exclusive				
System	Song Position	X		
Common	Song Select	X	X	
System	Clock	X		
Exclusive	Commands	X	X	
Aux	Local ON/ OFF	0		
Messages	All Notes OFF	0	X	
	Active Sense	0		
	Reset	0		
Notes		0 = YES	X=NO	

Appendix B: Assignable MIDI CC's on KeyStudio 25

Table B1: Knobs and fader assignments

MIDI CC	Description	Data LSB	Data MSB
0-119	Standard MIDI CC's	-	-
120-127	Channel Mode Messages	-	-
128	Pitch Bend Sensitivity	-	-
129	Channel Fine Tune	-	-
130	Channel Coarse Tune	-	-
131	Channel Pressure	-	-
132	RPN Coarse	RPN LSB	RPN MSB
133	RPN Fine	RPN LSB	RPN MSB
134	NRPN Coarse	NRPN LSB	NRPN MSB
135	NRPN Fine	NRPN LSB	NRPN MSB
136	Master Volume GM*	Volume LSB	Volume MSB
137	Master Pan GM*	Pan LSB	Pan MSB
138	Master Coarse Tune GM*	Tuning LSB	Tuning MSB
139	Master Fine Tune GM*	Tuning LSB	Tuning MSB
140	Chorus Mod Rate GM2*	Mod rate	-
141	Chorus Mod Depth GM2*	Mod depth	-
142	Feedback GM2*	Feedback level	-
143	Send to Reverb GM2*	Reverb send level	-
144	Pitch Bend	Pitch shift LSB	Pitch shift MSB
255	Controller Off	-	-

* *SysEx messages*

Table B2: Buttons and Sustain Pedal Assignments

MIDI CC	Description	Program	Data LSB	Data MSB
0-119	Standard MIDI CC's	-	Toggle value 2	Toggle value 1
120-127	Channel Mode Messages	-	Toggle value 2	Toggle value 1
128	Pitch Bend Range	-	Sensitivity value	-
129	Channel Fine Tune	-	Tuning amount	-
130	Channel Coarse Tune	-	Tuning amount	-
131	Channel Pressure	-	Pressure amount	-
132	RPN Coarse	Value	RPN LSB	RPN MSB
133	RPN Fine	Value	RPN LSB	RPN MSB
134	NRPN Coarse	Value	NRPN LSB	NRPN MSB
135	NRPN Fine	Value	NRPN LSB	NRPN MSB
136	Master Volume GM*	-	Volume LSB	Volume MSB
137	Master Pan GM*	-	Pan LSB	Pan MSB
138	Master Coarse Tune GM*	-	Tuning LSB	Tuning MSB
139	Master Fine Tune GM*	-	Tuning LSB	Tuning MSB
140	Chorus Mod Rate GM2*	-	Mod rate	-
141	Chorus Mod Depth GM2*	-	Mod depth	-
142	Feedback GM2*	-	Feedback level	-
143	Send to Reverb GM2*	-	Reverb send level	-
144	Pitch Bend	-	Pitch shift LSB	Pitch shift MSB
145	Program/Bank Preset	Program	Bank LSB	Bank MSB
146	MIDI CC (on/off)	MIDI CC	Button press value	Button release value
147	Note (on/off)	Note	Velocity off	Velocity on
148	Note (on/off toggle)	Note	Velocity off	Velocity on
149	MMC Command**	-	Command select.	-
150	Reverb Type GM2 *	-	Type	-
151	Reverb Time GM2 *	-	Time	-
152	Chorus Type GM2*	-	Type	-
153	MIDI CC Decrement	MIDI CC	Start value	End value
154	MIDI CC Increment	MIDI CC	Start value	End value
255	Controller Off	-	-	-

*SysEx messages

**MMC SysEx messages

Table B3: MMC Command Numbers

Number	MMC Command	Number	MMC Command
01	STOP	08	RECORD PAUSE
02	PLAY	09	PAUSE
03	DEFERRED PLAY	10	EJECT
04	FAST FORWARD	11	CHASE
05	REWIND	12	COMMAND ERROR RESET
06	RECORD STROBE	13	MMC RESET
07	RECORD EXIT		

Appendix C: Hexadecimal Conversion Chart

Hexadecimal Value	Decimal Value	Hexadecimal Value	Decimal Value	Hexadecimal Value	Decimal Value
0	0	2B	43	56	86
1	1	2C	44	57	87
2	2	2D	45	58	88
3	3	2E	46	59	89
4	4	2F	47	5A	90
5	5	30	48	5B	91
6	6	31	49	5C	92
7	7	32	50	5D	93
8	8	33	51	5E	94
9	9	34	52	5F	95
0A	10	35	53	60	96
0B	11	36	54	61	97
0C	12	37	55	62	98
0D	13	38	56	63	99
0E	14	39	57	64	100
0F	15	3A	58	65	101
10	16	3B	59	66	102
11	17	3C	60	67	103
12	18	3D	61	68	104
13	19	3E	62	69	105
14	20	3F	63	6A	106
15	21	40	64	6B	107
16	22	41	65	6C	108
17	23	42	66	6D	109
18	24	43	67	6E	110
19	25	44	68	6F	111
1A	26	45	69	70	112
1B	27	46	70	71	113
1C	28	47	71	72	114
1D	29	48	72	73	115
1E	30	49	73	74	116
1F	31	4A	74	75	117
20	32	4B	75	76	118
21	33	4C	76	77	119
22	34	4D	77	78	120
23	35	4E	78	79	121
24	36	4F	79	7A	122
25	37	50	80	7B	123
26	38	51	81	7C	124
27	39	52	82	7D	125
28	40	53	83	7E	126
29	41	54	84	7F	127
2A	42	55	85		

Appendix D: General MIDI Preset Specification

Piano	Bass	Reed	Synth Effects
0 Acoustic Grand Piano	32 Acoustic Bass	64 Soprano Sax	96 SFX Rain
1 Bright Acoustic Piano	33 Fingered Bass	65 Alto Sax	97 SFX Soundtrack
2 Electric grand Piano	34 Electric Picked Bass	66 Tenor Sax	98 SFX Crystal
3 Honky Tonk Piano	35 Fretless Bass	67 Baritone Sax	99 SFX Atmosphere
4 Electric Piano 1	36 Slap Bass 1	68 Oboe	100 SFX Brightness
5 Electric Piano 2	37 Slap Bass 2	69 English Horn	101 SFX Goblins
6 Harpsichord	38 Syn Bass 1	70 Bassoon	102 SFX Echoes
7 Clavinet	39 Syn Bass 2	71 Clarinet	103 SFX Sci-Fi
Chromatic Percussion	Strings/Orchestra	Pipe	Ethnic
8 Celesta	40 Violin	72 Piccolo	104 Sitar
9 Glockenspiel	41 Viola	73 Flute	105 Banjo
10 Music Box	42 Cello	74 Recorder	106 Shamisen
11 Vibraphone	43 Contrabass	75 Pan Flute	107 Koto
12 Marimba	44 Tremolo Strings	76 Bottle Blow	108 Kalimba
13 Xylophone	45 Pizzicato Strings	77 Shakuhachi	109 Bag Pipe
14 Tubular bells	46 Orchestral Harp	78 Whistle	110 Fiddle
15 Dulcimer	47 Timpani	79 Ocarina	111 Shanai
Organ	Ensemble	Synth Lead	Percussive
16 Drawbar Organ	48 String Ensemble 1	80 Syn Square Wave	112 Tinkle Bell
17 Percussive Organ	49 String Ensemble 2	81 Syn Sawtooth Wave	113 Agogo
18 Rock Organ	50 Syn Strings 1	82 Syn Calliope	114 Steel Drums
19 Church Organ	51 Syn Strings 2	83 Syn Chiff	115 Woodblock
20 Reed Organ	52 Choir Aahs	84 Syn Charang	116 Taiko Drum
21 Accordion	53 Voice Oohs	85 Syn Voice	117 Melodic Tom
22 Harmonica	54 Syn Choir	86 Syn Sawtooth Wave	118 Syn Drum
23 Tango Accordion	55 Orchestral Hit	87 Syn Brass & Lead	119 Reverse Cymbal
Guitar	Brass	Synth Pad	Sound Effects
24 Nylon Acoustic	56 Trumpet	88 New Age Syn Pad	120 Guitar Fret Noise
25 Steel Acoustic	57 Trombone	89 Warm Syn Pad	121 Breath Noise
26 Jazz Electric	58 Tuba	90 Polysynth Syn Pad	122 Seashore
27 Clean Electric	59 Muted Trumpet	91 Choir Syn Pad	123 Bird Tweet
28 Muted Electric	60 French Horn	92 Bowed Syn Pad	124 Telephone Ring
29 Overdrive	61 Brass Section	93 Metal Syn Pad	125 Helicopter
30 Distorted	61 Syn Brass 1	94 Halo Syn Pad	126 Applause
31 Harmonics	62 Syn Brass 2	95 Sweep Syn Pad	127 Gun Shot

Appendix E: MIDI Note Numbers

Octave (n)	Note Numbers											
	Cn	C#n	Dn	D#n	En	Fn	F#n	Gn	G#n	An	A#n	Bn
-1	0	1	2	3	4	5	6	7	8	9	10	11
0	12	13	14	15	16	17	18	19	20	21	22	23
1	24	25	26	27	28	29	30	31	32	33	34	35
2	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59
4	60	61	62	63	64	65	66	67	68	69	70	71
5	72	73	74	75	76	77	78	79	80	81	82	83
6	84	85	86	87	88	89	90	91	92	93	94	95
7	96	97	98	99	100	101	102	103	104	105	106	107
8	108	109	110	111	112	113	114	115	116	117	118	119
9	120	121	122	123	124	125	126	127				

Appendix F: Standard MIDI Controller Numbers (MIDI CC's)

00	Bank Select	34	Breath Control LSB	68	Legato Pedal	102	Controller 102
01	Modulation	35	Controller 35	69	Hold 2	103	Controller 103
02	Breath Control	36	Foot Control LSB	70	Sound Variation	104	Controller 104
03	Controller 3	37	Porta Time LSB	71	Resonance	105	Controller 105
04	Foot Control	38	Data Entry LSB	72	Release Time	106	Controller 106
05	Porta Time	39	Channel Volume LSB	73	Attack Time	107	Controller 107
06	Data Entry	40	Balance LSB	74	Cut-off Frequency	108	Controller 108
07	Channel Volume	41	Controller 41	75	Controller 75	109	Controller 109
08	Balance	42	Pan LSB	76	Controller 76	110	Controller 110
09	Controller 9	43	Expression LSB	77	Controller 77	111	Controller 111
10	Pan	44	Controller 44	78	Controller 78	112	Controller 112
11	Expression	45	Controller 45	79	Controller 79	113	Controller 113
12	Effects Controller 1	46	Controller 46	80	Gen Purpose 5	114	Controller 114
13	Effects Controller 2	47	Controller 47	81	Gen Purpose 6	115	Controller 115
14	Controller 14	48	Gen Purpose 1 LSB	82	Gen Purpose 7	116	Controller 116
15	Controller 15	49	Gen Purpose 2 LSB	83	Gen Purpose 8	117	Controller 117
16	Gen Purpose 1	50	Gen Purpose 3 LSB	84	Portamento Control	118	Controller 118
17	Gen Purpose 2	51	Gen Purpose 4 LSB	85	Controller 85	119	Controller 119
18	Gen Purpose 3	52	Controller 52	86	Controller 86		Channel Mode Messages
19	Gen Purpose 4	53	Controller 53	87	Controller 87	120	All Sound off
20	Controller 20	54	Controller 54	88	Controller 88	121	Reset all Controllers
21	Controller 21	55	Controller 55	89	Controller 89	122	Local Control
22	Controller 22	56	Controller 56	90	Controller 90	123	All Notes Off
23	Controller 23	57	Controller 57	91	Reverb Depth	124	Omni Off
24	Controller 24	58	Controller 58	92	Tremelo Depth	125	Omni On
25	Controller 25	59	Controller 59	93	Chorus Depth	126	Mono On (Poly Off)
26	Controller 26	60	Controller 60	94	Celeste (De-tune)	127	Poly On (Mono Off)
27	Controller 27	61	Controller 61	95	Phaser Depth		
28	Controller 28	62	Controller 62	96	Data Increment		
29	Controller 29	63	Controller 63	97	Data Decrement		
30	Controller 30	64	Sustain Pedal	98	Non-Reg Param LSB		
31	Controller 31	65	Portamento	99	Non-Reg Param MSB		
32	Bank Select LSB	66	Sostenuto	100	Reg Param LSB		
33	Modulation LSB	67	Soft Pedal	101	Reg Param MSB		

Appendix G: Roland GS and Yamaha XG NRPN Support

NRPN	NRPN	Data	Data
MSB	LSB	MSB	LSB
CC99	CC98	CC06	CC38
01	08	00-7F	n/a (-64 - 0 - +63) Vibrato Rate (relative change)
01	09	00-7F	n/a (-64 - 0 - +63) Vibrato Depth (relative change)
01	0A	00-7F	n/a (-64 - 0 - +63) Vibrato Delay (relative change)
01	20	00-7F	n/a (-64 - 0 - +63) Filter Cutoff Freq. (relative change)
01	21	00-7F	n/a (-64 - 0 - +63) Filter Resonance (relative change)
01	63	00-7F	n/a (-64 - 0 - +63) EG (TVF&TVA) Attack Time (relative change)
01	64	00-7F	n/a (-64 - 0 - +63) EG (TVF&TVA) Decay Time (relative change)
01	66	00-7F	n/a (-64 - 0 - +63) EG (TVF&TVA) Release Time (relative change)
*14	00-7F	00-7F	n/a (-64 - 0 - +63) Drum Filter Cutoff Freq. (relative change)
*15	00-7F	00-7F	n/a (-64 - 0 - +63) Drum Filter Resonance (relative change)
*16	00-7F	00-7F	n/a (-64 - 0 - +63) Drum EG Attack Rate (relative change)
*17	00-7F	00-7F	n/a (-64 - 0 - +63) Drum EG Decay Rate (relative change)
18	00-7F	00-7F	n/a (-64 - 0 - +63) Drum Instrument Pitch Coarse (relative change)
*19	00-7F	00-7F	n/a (-64 - 0 - +63) Drum Instrument Pitch Fine (relative change)
1A	00-7F	00-7F	n/a (0 to Max) Drum Instrument Level (absolute change)
1C	00-7F	00-7F	n/a (Random, L>C>R) Drum Instrument Panpot (absolute change)
1D	00-7F	00-7F	n/a (0 to Max) Drum Instrument Reverb Send Level (absolute change)
1E	00-7F	00-7F	n/a (0 to Max) Drum Instrument Chorus Send Level (absolute change)
%1F	00-7F	00-7F	n/a (0 to Max) Drum Instrument Variation Send Level (absolute change)

* added by Yamaha XG; % changed from Delay to Variation by Yamaha XG

Appendix H: General MIDI Reverb and Chorus Types

Reverb Types

- 0: Small Room
- 1: Medium Room
- 2: Large Room
- 3: Medium Hall
- 4: Large Hall
- 8: Plate

Chorus Types

- 0: Chorus 1
- 1: Chorus 2
- 2: Chorus 3
- 3: Chorus 4
- 4: FB Chorus
- 5: Flanger

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M-Audio USA

5795 Martin Rd., Irwindale, CA 91706

Technical Support

web www.m-audio.com/tech
tel (pro products) (626) 633-9055
tel (consumer products) (626) 633-9066
fax (shipping) (626) 633-9032

Sales

e-mail sales@m-audio.com
tel 1(866) 657-6434
fax (626) 633-9070

Web www.m-audio.com

M-Audio U.K.

Floor 6, Gresham House, 53 Clarendon Road, Watford
WD17 1LA, United Kingdom

Technical Support

e-mail support@maudio.co.uk
tel (Mac and PC support) +44 (0)1753 658630

Sales

tel +44 (0)1923 204010
tel +44 (0)1923 204039

Web www.maudio.co.uk

Benelux

Technical Support

Belgium tel +32 22 54 88 93
Holland tel +31 35 625 0097

M-Audio France

Floor 6, Gresham House, 53 Clarendon Road, Watford
WD17 1LA, United Kingdom

Renseignements Commerciaux

tel 0 810 001 105
email info@m-audio.fr

Assistance Technique

PC 0 820 000 731
Mac 0 820 391 191
e-mail (PC) support@m-audio.fr
email (Mac) mac@m-audio.fr
fax +33 (0)1 72 72 90 52

Web www.m-audio.com

M-Audio Germany

Kuhallmand 34, D-74613 Ohringen, Germany

Technical Support

email support@m-audio.de
tel +49 (0)7941 - 9870030
tel +49 (0)7941 - 98 70070

Sales

e-mail info@m-audio.de
tel +49 (0)7941 98 7000
fax +49 (0)7941 98 70070

Web www.m-audio.de

M-Audio Canada

1400 St-Jean Baptiste Ave. #150, Quebec City,
Quebec G2E 5B7, Canada

Technical Support

e-mail techcanada@m-audio.com
tel (418) 872-0444
fax (418) 872-0034

Sales

e-mail infocanada@m-audio.com
tel (866) 872-0444
fax (418) 872-0034

Web www.m-audio.ca

M-Audio Japan

アビッドテクノロジー株式会社|エムオーディオ事業部:〒460-0002 愛知県名古屋市中区丸の内2-18-10
Avid Technology K.K.:2-18-10 Marunouchi, Naka-Ku, Nagoya, Japan
460-0002

カスタマーサポート(Technical Support)

e-mail win-support@m-audio.jp
e-mail (Macintosh 環境専用) mac-support@m-audio.jp
tel 052-218-0859(10:00~12:00/13:00~17:00)

セールスに関するお問い合わせ(Sales)

e-mail info@m-audio.jp
tel 052-218-3375
fax 052-218-0875

Web www.m-audio.jp