

M-AUDIO®

AXIOM²⁵

AXIOM⁴⁹

AXIOM⁶¹

User Guide

English

User Guide (English)

Chapter 1: Introduction

Congratulations on your purchase of an M-Audio Axiom Series MIDI Controller. Designed for both studio and stage, Axiom offers 25, 49, or 61 semi-weighted velocity-sensitive keys with aftertouch, and DirectLink. Once installed and configured, DirectLink automatically maps Axiom faders, buttons, knobs, and Transport Controls to numerous functions in qualified versions of Digital Audio Workstations (DAWs).

Axiom faders, knobs buttons, and trigger pads can be mapped to various parameters in your DAW or virtual instrument, by using the DAW's MIDI Learn function (if available), or by manual assignment as described in Chapter 5, "Advanced Programming Functions."

Refer to the documentation provided with your software for further information about its MIDI Learn capabilities and functions. For a current list of qualified recording applications, the most recent Windows drivers, and DirectLink installers and User Guides, visit www.m-audio.com.

A single USB connection not only sends MIDI data to the computer, but also provides power to the device. Axiom functions as a class-compliant device, and will be recognized by a host computer without the need for additional drivers. However, downloading and installing the latest Axiom drivers (from www.m-audio.com) is strongly recommended before installing DirectLink, controlling more than one application at the same time, or simultaneously using other class-compliant USB audio devices. Otherwise, connect Axiom to an available USB port on a computer using the included USB cable, and set the power switch to the On position.

The 5-pin MIDI connectors transmits MIDI data to and from Axiom when controlling external hardware synthesizers or sound modules. Axiom will also function as a USB MIDI interface between a host computer and external MIDI hardware while connected via USB.

For more information about installing drivers on Windows systems, as well as Axiom setup and DAW configuration for Windows and Mac OS X, see Chapter 2, "Driver Installation." Further information on installing and configuring DirectLink can be found in the appropriate DirectLink User Guide at www.m-audio.com/hypercontrol. (DirectLink is the original name of what M-Audio calls "HyperControl" today. The technology is identical—just keep in mind that it might be called "HyperControl" in newer documentation you find on our website.)

Features

- 25, 49, or 61 velocity-sensitive, semi-weighted keys with aftertouch
- 4 programmable Keyboard Zones
- Octave/Transpose buttons
- DirectLink - Automatic mapping of top panel controls to qualified DAWs
- 2 Dedicated Patch Select buttons
- 8 Trigger Pads; MIDI re-assignable
- 9 Faders (1 on Axiom 25); MIDI re-assignable
- 9 Fader buttons (Axiom 49/61 only); MIDI re-assignable
- 8 "Endless" Encoder Knobs; MIDI re-assignable
- 6 Transport buttons; MIDI re-assignable
- Pitch Bend and Modulation wheels; MIDI re-assignable
- Sustain and Expression Pedal inputs; MIDI re-assignable
- 20 user editable memory locations
- LCD Screen
- 5-pin MIDI In and MIDI Out connectors
- USB 2.0 port (backward compatible with USB 1.1)
- Powered by USB bus power or external power supply (sold separately)

Minimum System Requirements

Minimum System Requirements can be found at www.m-audio.com.

Chapter 2: Driver Installation

Windows

Axiom functions as a class-compliant device and will be recognized by a computer without additional drivers on Windows XP, Windows Vista, Windows 7, or Windows 8. Simply connect the device to a computer using the supplied USB cable, configure your recording software and start making music.

However, we recommend that Windows users download and install the latest Axiom Series drivers found on the M-Audio website to do any of the following:

- Control more than one application at the same time.
- Simultaneously use other class-compliant USB audio devices.
- Use long System Exclusive (SysEx) commands.

Installation Steps

Make sure Axiom is not connected to the computer before beginning the installation. The installer will prompt you to connect Axiom during the installation procedure.

To install the Windows drivers from a download:

Double-click the installer to begin the installation process. Follow the on-screen instructions to complete the installation.

To install the Windows drivers from the installer disk:

1. Insert the disk in your computer CD or DVD drive. The driver installer launches when the Installation disk is inserted.
If your computer fails to launch this application automatically, you can manually start it by going to the Start menu, opening My Computer (or Computer in Windows Vista, Windows 7, and Windows 8), and opening the disk that appears in your computer's CD or DVD drive.
2. Select Axiom from the Product pop-up menu and click Install.
3. Follow the on-screen instructions. At various points in the 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 (Windows XP) or Install (Windows Vista, Windows 7, and Windows 8) to proceed with the installation.
4. Once the installer has completed, click Finish.
5. Connect Axiom to an available USB port on your computer. If you are using Windows Vista, Windows 7, or Windows 8, your Axiom is now ready to use. If you are using Windows XP, proceed to the next step.
6. For Windows XP only, do the following:
 - After Windows XP identifies the keyboard and asks if you want to search the Internet for a driver, select No, not this time and click Next.
 - When the Found New Hardware Wizard appears, select Install the software automatically and click Next.
 - Once the Wizard has completed, click Finish. If you are presented with another Found New Hardware Wizard dialog, repeat step 6.
7. When the installation is complete, you will see a message stating "Your new hardware is installed and ready to use."
8. Proceed to "Configuring Music Software."

If you plan to use DirectLink so that Axiom controllers are automatically mapped to functions in your DAW, the DirectLink software must be installed separately. Refer to the separate DirectLink documentation applicable to your DAW for complete installation and configuration instructions at www.m-audio.com/hypercontrol.

Mac

The class-compliant drivers built into Mac OS X provide support for Axiom, therefore no additional drivers are necessary (or available) when using the device with Mac OS X. Simply connect it to the computer using the supplied USB cable, configure your recording software, and start making music.

If you plan to use DirectLink so that Axiom controls are automatically mapped to functions in your DAW, the DirectLink software must be installed separately. Refer to the separate DirectLink documentation applicable to your DAW at www.m-audio.com/hypercontrol for complete installation and configuration instructions.

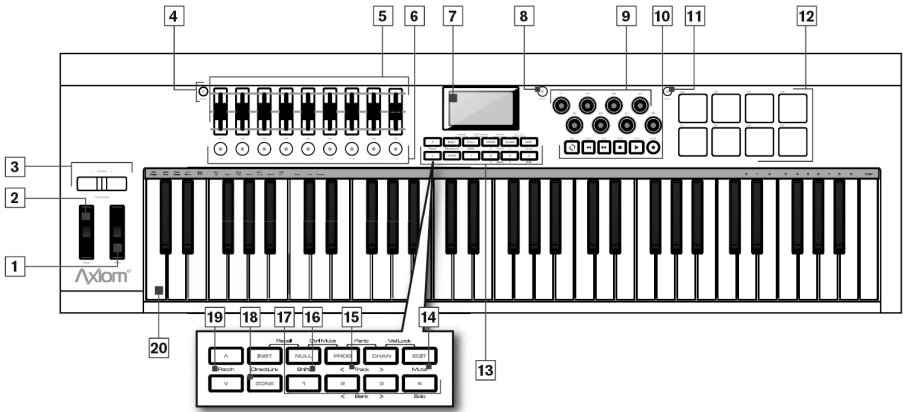
Configuring Music Software

When using Axiom with your computer, you may need to configure your music software to receive MIDI data. This process varies from one application to another, but is usually done through a "Preferences," "Setup," or "Options" menu. Refer to the documentation included with your DAW software for further information.

Because Axiom does not contain built-in sounds, pressing a key will only send MIDI data to the computer, giving instructions on when and how a note should play. A virtual instrument loaded onto a track of your DAW software then creates the sound based on the instructions received from Axiom. For more details on using virtual instruments, refer to the documentation for your DAW software.

Chapter 3: Controls and Connectors

Top Panel



Using DirectLink

Once installed and configured, DirectLink is activated by launching a qualified DAW application on the host computer. This automatically maps Axiom controls to functions in your recording software and offers the following modes of operation:

- **Mixer Mode:** This is the default mode which maps Axiom Faders, Encoder knobs, and Fader buttons to their corresponding DAW mixer functions.
- **Instrument Mode:** Pressing the Instrument Mode button (See "Function Buttons") switches DirectLink to Instrument Mode, and assigns Axiom controls to virtual instrument parameters within a selected DAW track.

Because DirectLink configuration and operation varies slightly in different DAW applications, please refer to the DirectLink documentation for your qualified DAW for further details and installation instructions at www.m-audio.com/hypercontrol.

Where applicable, this section provides an overview of these controls using DirectLink, as well as their default MIDI assignments.

1. **Modulation Wheel** – This wheel changes the intensity of certain effects during performance. By default, most synthesizers assign this wheel to control vibrato (change in intonation) or tremolo (change in volume). Rolling it upward increases the modulation effect, while rolling downward reduces the effect.
When this control is moved the LCD screen will display the assigned MIDI CC number ("cc 1"), the active keyboard Zone (for example "z1"), and the values sent. If the Control Mute function is active (See "Additional Functions") the LCD will display the same information, with the addition of "MUTE." This signifies that MIDI data will not be transmitted.
The Modulation Wheel can be assigned to MIDI messages other than Modulation data (see Chapter 5, "Advanced Programming Functions"), and different assignments can be made for each of the 4 keyboard Zones. This means the type of messages sent is determined by the active Zones. See Chapter 6, "Keyboard Zones" for further details.
2. **Pitch Bend Wheel** – This wheel raises and lowers pitch during performance. Rolling the Pitch Bend wheel upward raises the pitch. Rolling it downward lowers the pitch. The upper and lower pitch bend limit is determined by settings on your hardware or software synthesizer, not by the Pitch Bend wheel on Axiom. This wheel is spring-mounted and returns to the center position when released.
When this control is moved the LCD screen will display the assigned message type (such as "P.bEND"), the active keyboard Zone (for example "z1"), and values sent. If the Control Mute function is active (See "Additional Functions") the LCD will display the same information, with the addition of "MUTE." This signifies that MIDI data will not be transmitted.
This wheel can be assigned to MIDI messages other than Pitch Bend data, and different assignments can be made for each of the 4 keyboard Zone. This means the type of messages sent is determined by the active Zones. See Chapter 6, "Keyboard Zones" for further details.
3. **Octave/Transpose Buttons** – These buttons shift the keyboard up or down in one octave increments to extend the range of playable notes. The Right button (+) shifts upward (for example, note F3 becomes F4), while the Left button (-) shifts downward (for example, note F3 becomes F2).
The Transpose function is activated by pressing the Left (-) and Right (+) buttons simultaneously. In this mode, pressing the Right button shifts the keyboard upward by one half-step (semi-tone). For example, note F3 becomes F#3. Pressing the Left button shifts the keyboard downward by one half-step (F3 becomes E3).

Global and Zone Shift Functions: As described in Chapter 6, "Keyboard Zones," keyboard Zones can have individual Octave and/or Transpose settings. The Global and Zone Octave/Transpose settings work in combination to shift the pitch of the entire keyboard while preserving relative pitch offsets between Zones. The Zone Octave and Transpose functions are useful when different Octave or Transpose shift settings are needed across multiple Zones.

4. **Group F Button (Axiom 49 & 61 only)**
 - **DirectLink Operation:** When this button is pressed, all nine Axiom Faders, and Fader buttons (F1–18) are released from their DirectLink assignments, and mapped according to the active Patch. A new Axiom Patch can be selected at any time by using the "Recall" function (see "Additional Functions"). Pressing the Group F button again, returns all controls to their DirectLink assignments. The button also illuminates confirming the group is in DirectLink mode.

- **Default Operation:** The Group F button is used to enable or disable the control group when a Patch is stored or recalled. When the button is illuminated the group is enabled for the operation. For example, when storing a Patch, the group is enabled by default. Pressing the button disables and excludes the controls from the newly stored patch. When the patch is recalled, the state of the group is remembered as being disabled, and the Group F button will not illuminate.
5. **Faders** – There are nine Faders (F1–F9) on Axiom 49 and 61, and one Fader (F1) on Axiom 25. These faders function based on the type of operation, as follows:
- **DirectLink Operation:** Refer to the separate DirectLink documentation applicable to your DAW at www.m-audio.com/hypercontrol.
 - **Default Operation:** All nine Faders (Axiom 49 & 61) send different types of standard MIDI CC messages, or advanced MIDI messages based on the parameter they are assigned to. When a fader is moved the LCD screen will display the assigned MIDI message (for example "cc 74"), its name (for example "F1"), and the values sent. If the Control Mute function (see "Additional Functions") is active the LCD will display the same information, with the addition of "MUTE." This signifies that MIDI data will not be transmitted, and the fader can be moved with affecting external software devices. All faders are fully assignable as described in Chapter 5, "Advanced Programming Functions."
6. **Fader Buttons** – Axiom 49 and 61 feature nine Fader buttons. These buttons function based on the type of operation, as follows:
- **DirectLink Operation:** Refer to the separate DirectLink documentation applicable to your DAW at www.m-audio.com/hypercontrol.
 - **Default Operation:** All nine buttons (Axiom 49 & 61) send different types of standard MIDI CC, MIDI note, or other advanced MIDI messages based on the parameter they are assigned to as described in Chapter 5, "Advanced Programming Functions." Pressing a Fader button causes the LCD screen to display the assigned MIDI message (for example "cc 74"), its name (for example "F10"), and the value sent. This will also be the case when the button is released. If the Control Mute function is active pressing one of these buttons will deactivate it.
7. **LCD Screen** – The LCD screen displays operational, programming, and status information. In DirectLink mode the data seen on the LCD screen is entirely dictated by the DAW.
8. **Group E Button**
- **DirectLink Operation:** When this button is pressed, all eight Axiom Encoder knobs (E1–E8) are released from their DirectLink assignments, and mapped according to the current active preset Patch. A new Axiom Patch can be selected at any time by using the "Recall" function (see "Additional Functions"). Pressing the Group E button again, returns all controls to their DirectLink assignments. The button also illuminates confirming the group is in DirectLink mode.
The Axiom Transport buttons are not affected by the Group E button, and they will always retain their default DirectLink assignments.
 - **Default Operation:** The Group E button is used to enable or disable the control group when a Patch is stored or recalled. When the button is illuminated the group is enabled for the operation. For example, when storing a Patch, the group is enabled by default. Pressing the button disables and excludes the controls from the newly stored patch. When the patch is recalled, the state of the group is remembered as being disabled, and the Group E button will not illuminate.
9. **Encoder Knobs** – There are eight Encoder Knobs (E1–E8) with functions based on the type of operation, as follows:
- **DirectLink Operation:** Refer to the separate DirectLink documentation applicable to your DAW at www.m-audio.com/hypercontrol.
 - **Default Operation:** These knobs send different types of standard MIDI CC messages or advanced MIDI messages based on the parameter they are assigned to, or the active preset. When a knob is moved the LCD screen will display the assigned MIDI message (for example "cc 74"), its name (for example "E1"), and the value sent. If the Control Mute function (see "Additional Functions") is active the LCD will display the same information, with the addition of "MUTE." This signifies that MIDI data will not be transmitted. All Encoder knobs are fully assignable as described in Chapter 5, "Advanced Programming Functions."
10. **Transport Buttons** – These buttons (E9–E14) function based on the type of operation, as follows:
- **DirectLink Operation:** In both Mixer and Instrument Modes, these buttons map to the Transport buttons in qualified DAW applications to control playback, record, start/stop, fast forward and rewind, as well as enabling (or disabling) the loop function.
Within in qualified versions of Pro Tools, holding the Loop button while pressing one of the other Transport Control buttons gives access to additional functions. Further information on how to access these functions can be found in the DirectLink User Guide for Pro Tools.
 - **Default Operation:** These buttons send standard MIDI CC, MIDI note, MMC (MIDI Machine Control), or other advanced MIDI messages based on the parameter they are assigned to. When a button is pressed, the LCD screen will display the assigned MIDI message (for example "cc 74"), its name (for example "E9"), and the value sent. This will also be the case when it is released. If the Control Mute function (see "Additional Functions") is active it is deactivated when on of these buttons is pressed.
All Axiom Transport buttons are fully assignable as described in Chapter 5, "Advanced Programming Functions."
11. **Group P Button**
- **DirectLink Operation:** When this button is pressed, all eight Trigger pads (P1–P8) are released from their DirectLink assignments, and mapped according to the current preset Patch. A new Axiom Patch can be selected at any time by using the "Recall" function (see "Additional Functions"). Pressing the Group P button again, returns all pads to their DirectLink assignments. The button also illuminates confirming the group is in DirectLink mode.
 - **Default Operation:** The Group P button is used to enable or disable the control group when a Patch is stored or recalled. When the button is illuminated the pad is enabled for the operation. For example, when storing a Patch, the group is enabled by default. Pressing the button disables and excludes the pads from the newly stored patch. When the patch is recalled, the state of the group is remembered as being disabled, and the Group P button will not illuminate.

- 12. Trigger Pads** – There are eight Trigger Pads (P1–P8) that send different types of standard MIDI CC, MIDI note, or other advanced MIDI messages based on the parameter they are assigned to.

Generally these pads transmit MIDI notes using MIDI Message "147." Please see Chapter 5, "Advanced Programming Functions" for more information.

When assigned to a standard MIDI CC number, the pad is pressure sensitive. In this instance, the value sent is determined by the amount of pressure applied while it is held down. The greater the pressure, the higher the value and vice versa.

Pads assigned to advanced MIDI messages operate in the same way as the Fader buttons or transport controls. When a pad is struck, or when pressure is applied to it, the LCD screen will display the assigned MIDI message (for example "cc 74"), its name (for example "P1"), and the value sent. This will also be the case when pressure has been removed.

The Trigger Pads are generally not affected by DirectLink in either Mixer or Instrument Mode. For further information about these Pads and DirectLink, refer to the DirectLink Guide for your DAW.

- 13. Function Buttons** – These buttons access the following features:

- **Instrument Mode Button (Inst):** Refer to the separate DirectLink documentation applicable to your DAW at www.m-audio.com/hypercontrol.

- **Null:** This button activates and de-activates Null Mode. By default, Null mode is always active and the Null button will illuminate when this is the case. In Null Mode, the position of Axiom Faders is stored as part of a user Patch. This is known as their Null value. If a fader is at a different position or value when the patch is recalled the LCD will display "MUTE" and a value representing how far off they are from the Null value. The fader will not transmit MIDI data until the Null Value has been reached. This prevents corresponding parameters in the software from jumping to a different value as the Axiom control is adjusted. The Axiom Fader will be "un-muted" as soon as the position matches the value stored in the user patch.

For example, in qualified versions of Pro Tools, Axiom Preset 9 can be used to control the virtual instrument called Velvet. When an instrument parameter is edited using an Axiom Fader, its new position is retained as the Null value when a new preset is selected. If the same fader is used to edit the new preset, it is likely to be in a different position when Preset 9 is recalled. Because Null Mode is active by default, the fader will not transmit MIDI data to Velvet until it has been adjusted to its Null Value. This prevents it from transmitting a MIDI CC value that will cause an unwanted parameter change in Velvet.

- **Program (Prog):** When this button is pressed it will illuminate and the LCD screen will show the current Program Change number (for example, "PRG 0") and the active keyboard Zone (for example, "z 1"). Pressing either of the Patch buttons ("Up" arrow or "Down" arrow) will increase or decrease this number, and the resulting program change message is sent on the active Zone channel. After 1 second, the display returns to normal and the patch buttons return to their default functionality.

Program Change messages for all active keyboard Zones are included whenever a patch is stored. For more information on Zones, please refer to Chapter 6, "Keyboard Zones."

When the Program button is held down for at least one second Axiom enters Edit Mode, which overrides both Performance and DirectLink Modes. The Program and Edit buttons will illuminate, and the LCD screen will show the current Program change and active Zone number. A direct Program change can then be sent by entering the desired program number using the numerical keys and pressing the enter key to confirm.

For more information about these parameters, see Chapter 4, "Advanced Keyboard Functions," Chapter 5, "Advanced Programming Functions," and Chapter 6, "Keyboard Zones."

- **Channel (Chan):** When this button is pressed it illuminates and the LCD screen shows the current Global MIDI Channel number (for example, "G.CHAN 1." Pressing either of the Patch buttons ("Up" arrow or "Down" arrow) will change the Channel number.

Holding the Channel button for at least one second takes Axiom into Edit Mode, which overrides both Performance and DirectLink Modes. The Channel and Edit buttons will illuminate, and the LCD screen will show the current Global Channel number. This value can be changed by entering the new Channel number using the numbered keys and Enter key on the keyboard.

- **Edit:** When this button is pressed it illuminates and activates Edit Mode. The LCD screen will read "Edit," and display the current Control Number (for example "E 1" - the first Encoder Knob). This function lets you access the extended parameters listed along the top edge of the keypad. Moving the currently selected control changes the value.

In Edit Mode, the Patch buttons increment and decrement the selected parameter value at any time.

For more information on Edit Mode, refer to Chapter 4, "Advanced Keyboard Functions," Chapter 5, "Advanced Programming Functions," and Chapter 6, "Keyboard Zones."

- **Additional Functions:** The Function buttons allow access to four additional functions as follows:
 - **Recall:** In both Performance and DirectLink Mode, simultaneously pressing the Instrument Mode and Null buttons activates Edit Mode. The Edit button illuminates and the LCD screen will show the current Patch selection (for example "PATCH 01"). This value can be changed by entering the new Patch number using the numbered keys on the keyboard, or the Patch buttons. Pressing the Enter key or Edit button will confirm the new patch number and edit mode is disabled.
 - **Control Mute (Ctrl Mute):** Simultaneously pressing the Null and Program (Prog) buttons will activate and deactivate Control Mute (Ctrl Mute mode). When this function is active, the LCD screen will read "MUTE ON." In Ctrl Mute mode, Axiom controls can be moved without transmitting MIDI Data. This function will be automatically turned off as soon as a key or button is pressed, or as soon as the Null and Program buttons are simultaneously pressed again.
 - **Panic:** Simultaneously pressing the Program (Prog) and Channel (Chan) buttons will send "All Notes Off" and "Reset All Controllers" messages on all MIDI Channels. The LCD screen will read "Panic" during this operation. This stops stuck notes that continue to play even after their keys have been released.
 - **Velocity Lock (Vel Lock):** Simultaneously pressing the Channel (Chan) and Edit buttons will activate Velocity Lock. The LCD screen will read "VLOCK ON." The note velocity sent by the Trigger Pads is restricted to the range of values specified by the Data 2 and Data 3 parameters.

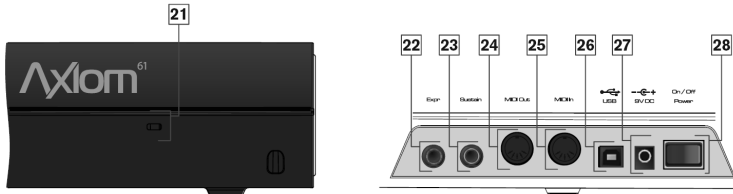
For more information on how to edit the Data 2 and Data 3 parameters, please refer to Chapter 4, "Advanced Keyboard Functions."

Pressing the buttons again will de-activate this function, returning it to the default setting. The LCD screen will read "VLOCK OFF," and the note velocity is determined by how hard the Pads are struck. By default, Velocity Lock is set to off.

The VLock setting can be stored as part of a Patch using the Store function described in Chapter 4, "Advanced Keyboard Functions."

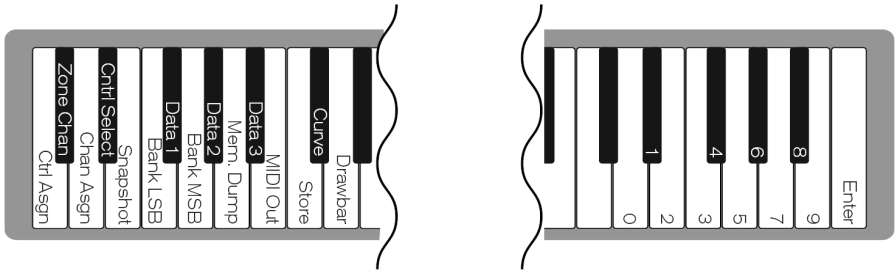
14. **Mute Button** – In DirectLink mode, this button will mute and "un-mute" the targeted track in a qualified DAW. Pressing this button while holding down the Shift button will solo the keyboard's target track. If the Zone button is active, the Mute button activates and deactivates Zone 4. For more information, see section 17 "Zone Buttons (1,2,3, & 4)" in this chapter.
15. **Track Buttons** – These buttons function based on the type of operation, as follows:
 - **DirectLink Operation:** Refer to the separate DirectLink documentation applicable to your DAW at www.m-audio.com/hypercontrol.
 - **Default Operation:** The Track buttons (< and >) are used for activating and deactivating Zones 2 (<) and 3 (>) as described below in section 17 "Zone Buttons (1,2,3, & 4)" of this chapter.
16. **Shift Button** – This button functions based on the type of operation, as follows:
 - **DirectLink (Default) Operation:** Holding down the Shift button allows you to access additional functions and mapping options performed by the Encoder knobs, Fader buttons, Track buttons, and Mute buttons, in qualified DAW applications.
 - **Default Operation:** This button is used for activating and deactivating Zone 1 as described below in Section 17, "Zone Buttons (1, 2, 3, & 4)" of this chapter.
17. **Zone Buttons (1,2,3, & 4)** – These buttons activate and de-activate keyboard Zones 1 through 4 respectively. Zone 1 is the default Zone. Activating a Zone will cause its corresponding button to illuminate, and all other Zones will be deactivated. Multiple Zones can be activated by simultaneously pressing any combination of these buttons.
18. **Zone Button** – This button is used for accessing the individual Zone buttons described above. Holding down the this button for at least one second, in both Performance and DirectLink Modes, will put Axiom into Zone Edit Mode. For more information, see Chapter 6, "Keyboard Zones."
19. **Patch Buttons** – These buttons function based on the type of operation, as follows:
 - **DirectLink Operation:** Refer to the separate DirectLink documentation applicable to your DAW at www.m-audio.com/hypercontrol.
 - **Default Operation:** These buttons allow you to scroll the 20 Axiom Patch presets. In Edit Mode, the Patch buttons are used to increment/decrement the selected parameter value.
20. **Keyboard** – The velocity-sensitive, semi-weighted keyboard is not only the primary method of sending Note On/ Off and Velocity data when performing, it is also used to access extended programming functions listed along its upper edge. For more information on the extended programming functions, refer to Chapter 4, "Advanced Keyboard Functions."
 - **Aftertouch:** Axiom features a fully assignable Aftertouch Strip under the keyboard. When additional pressure is applied to a key that has been pressed, the Aftertouch Strip will transmit MIDI data based on the assigned MIDI CC. When pressure is applied to the Strip the LCD screen will display the assigned message type ("CH AT"), the active keyboard Zone (for example "z1"), and the value sent (for example "0"). A unique MIDI CC can be assigned to the Aftertouch Strip for each active keyboard Zone, so that the messages sent are defined by the active Zones. For more information on reassigning the Strip see Chapter 5, "Advanced Programming Functions."

Rear Panel



21. **Kensington® Lock Connector** – This connector is compatible with standard laptop-style Kensington® security cables for theft protection.
22. **Expression Pedal Input** – This socket accepts both "switch type" and standard expression pedals (not included) such as M-Audio EX-P for adding expressive changes during performances. The Expression Pedal input is fully MIDI-assignable, and a unique MIDI CC can be assigned for each keyboard Zone, so that the message(s) sent are defined by the active Zone(s).
23. **Sustain Pedal Input** – This socket accepts momentary-contact foot pedals (not included). When pressed, this Pedal will sustain the notes you are playing, without having to keep your fingers pressing down the keys. The Sustain Pedal input is fully MIDI-assignable, and a unique MIDI CC can be assigned for each keyboard Zone, so that the message(s) sent are defined by the active Zone(s). *The polarity of the Sustain Pedal is determined by Axiom upon startup. When powering up, it assumes the Pedal is in the "up" (off) position. It is important that the Sustain Pedal is not pressed down during startup, otherwise its operation will be reversed.*
24. **MIDI In Port** – This standard 5-pin MIDI connector receives data from any MIDI compatible device such as a synthesizer or drum machine. This port also allows you to use Axiom as a MIDI interface to send MIDI data from external hardware to your DAW. In this instance, the 3rd USB MIDI input should be selected from those available in the DAW preferences. Please refer to the documentation provided with your DAW for further information on MIDI configuration.
25. **MIDI Out Port** – This standard 5-pin MIDI connector transmits data to any MIDI compatible device such as a synthesizer, sound module, or drum machine. In MIDI Out "From USB" Mode, data sent to the Axiom USB MIDI Output port (not the DirectLink port) will be streamed to the external MIDI Out port. Please refer to Chapter 4, "Advanced Keyboard Functions" for further information on MIDI Out from USB.
26. **USB Port** – The USB 2.0 port (backward compatible with USB 1.1) delivers power to Axiom and transmits MIDI data to and from the host computer.
27. **Power Supply Jack** – Connect an optional 9VDC power supply here when using the keyboard as a standalone MIDI controller without a USB connection to a computer. The power supply cannot be used when Axiom is connected to a computer via USB.
28. **On/Off Switch** – Use this switch to power the device on or off whether Axiom is connected via USB or using an external power supply.

Chapter 4: Advanced Keyboard Functions



Axiom includes extended programming capabilities through secondary functions of the keys. The available parameters are listed along the top edge of the keyboard, and accessed by pressing the Edit button. The LCD screen shows the numerical value of the parameter being edited.

Control Assign (Ctrl Assign), Data 1, Data 2, Data 3

The Control Assign function (Ctrl Assign) assigns a MIDI continuous control number (MIDI CC), or other MIDI parameter to any assignable Axiom control. The Data 1, Data 2, and Data 3 keys define various related aspects of the parameter or function assigned to a control.

For example, it is possible to configure a button to send MIDI note On/Off Data by assigning it to controller number 147. The Data 1 key is used to specify the pitch (note number) of the note played by the button. The Data 2 key is used to set the Note Off velocity (Velocity Off). The Data 3 key is used to set the Note On velocity (Velocity On), determining how loud the note will sound.

For more details and step-by-step control assignment examples, refer to Chapter 5, "Advanced Programming Functions."

Zone Channel (Zone Chan)

The Zone Channel (ZONE CHAN) function specifies which MIDI Channel a Zone will use when transmitting MIDI data. Assigning each Zone to its own channel will allow you to play up to 4 different sound patches on a connected synthesizer or virtual instrument. This setting is saved as part of a user patch when stored to a Memory Location. For instructions on how to save a user patch, see the "Store" section.

Assigning an Axiom control to a Zone MIDI Channel (z1– z4) as described in the following section ("Channel Assign (Chan Assign)"), causes that control to transmit MIDI data on the same MIDI Channel as the corresponding Zone.

For more information about Keyboard Zones and their related functions and parameters, see Chapter 6, "Keyboard Zones."

To set the MIDI Channel for a Keyboard Zone:

1. Press the Zone button followed by one of the Zone selection buttons. See Chapter 6, "Keyboard Zones."
2. Press the Edit button.
3. Press the Zone CHAN key. The LCD screen will display the current function ("CHAN"), the active Zone number (for example "z1") and the current Zone Channel number.
4. Enter the new MIDI Channel number using the number keys or Patch buttons (+/-).
5. Press the Enter key.
6. Repeat steps 1 – 5 to assign set the MIDI channel for the remaining Zones.

After setting the Zone channel and exiting Edit mode, activate all desired Zones by simultaneously pressing their respective Zone buttons.

Default Zone Channels

Zone	MIDI Channel
1	0 (Global Channel)
2	1
3	2
4	3

Channel Assign (Chan Assign)

The Channel Assign function (CHAN ASGN) assigns the active Axiom control to a specific MIDI channel.

To assign a knob, fader, button or pedal jack to a MIDI channel:

1. Select the active control as described in the next section, "Control Select (Ctrl Select)".
2. Press the Edit button.
3. Press the Channel Assign key. The LCD screen will display the current parameter ("CHAN"), the currently selected control (for example "E1"), and the current MIDI channel (for example "1").
4. Enter the new MIDI channel number using the number keys.
5. Press the Enter key.

When assigned to channel "0," the control will transmit on the Global MIDI Channel.

When numbers 17 – 20 are entered the control will send MIDI data on one of the four Channels used by keyboard Zones, z1 – z4, as shown in the following table. For further instructions on assigning a MIDI channel to a Zone, see "Zone Channel (Zone Chan)".

Keyboard Entry	LCD Display	Keyboard Zone
17	z1	Zone 1
18	z2	Zone 2
19	z3	Zone 3
20	z4	Zone 4

When a control is assigned to send SysEx messages, the displayed number represents the SysEx Device ID instead of the MIDI transmit channel number.

Control Select (Ctrl Select)

The Control Select function (CTRL SEL) is used to select a MIDI control (knob, button, fader, or pedal jack) for editing. This is useful when a control needs to be selected without sending unwanted MIDI data because the control was moved or pressed.

All Axiom controls are labeled with a unique number, such as F1, P2, etc. It is not necessary (or possible) to enter the letter when following the editing examples below.

To select an Axiom control for editing:

1. Press the Edit button.
2. Press the group button that contains the control you want to select.
3. Press the Control Select key.
4. Enter the control's ID number using the number keys.

The Control is now selected for programming, and another advanced function can be selected for further programming of the control.

Alternatively, if unwanted MIDI transmission is not an issue, an Axiom control can be selected by moving or pressing it either before or after pressing the edit button.

Snapshot

This function sends the current values of all mapped Axiom knobs and faders on the external MIDI out port to a DAW or virtual instrument. This simultaneously adjusts multiple parameters. When the Edit button is pressed followed by the Snapshot key, the values are sent immediately, and the LCD screen will read "SNAP" as the MIDI data is transmitted.

When a patch is stored, the positional value of each control is saved within the patch as the 'Null' values. In other words, if you use Axiom controls to set up a virtual instrument or synth and save the settings to a patch, pressing snapshot after pressing the Edit button, will send the null values to the synth to set the sound up as programmed.

Bank LSB

The Bank LSB function sends bank change messages on the MIDI Channels for all active Zones. These messages are used to access additional banks of sound patches, if available, on virtual instruments or sound modules.

Bank LSB messages may not have any effect until they are followed by a Program Change message.

Refer to the documentation for the virtual instrument or synthesizer to confirm it will respond to these messages.

To set a Bank LSB number:

1. Press the Edit button.
2. Press the Bank LSB key. The LCD screen will display the current function ("LSB"), the current active keyboard Zone (for example "z1") and last sent Bank LSB number (for example, "0").
3. Enter the new Bank LSB number using the number keys.
4. Press the Enter key.

Bank MSB

The Bank MSB function sends bank change messages on the MIDI Channels for all active Zones. These messages are used to access additional banks of sound patches, if available, on virtual instruments or sound modules.

Bank MSB messages may not have any effect until they are followed by a Program Change message.

Refer to the documentation for the virtual instrument or synthesizer to confirm it will respond to these messages.

To set a Bank MSB Number:

1. Press the Edit button.
2. Press the Bank MSB key. The LCD screen will display the current function ("MSB"), the current active keyboard Zone (for example "z1") and last sent Bank MSB number (for example, "1").
3. Enter the new Bank MSB number using the number keys.
4. Press the Enter key.

When a patch is stored, the Bank LSB, Bank MSB, and Program values for each active Zone are saved. When the patch is recalled, this data is sent out on the active Zone channels to set up the correct instrument sound for each Zone. If this is undesirable, please ensure the Zone button ("Zone Button") is de-activated when recalling the patch.

Memory Dump (Mem Dump)

The SysEx Memory Dump function (MEM DUMP) will send the contents of all 20 Patch locations for storage in a DAW application. The SysEx data is sent as soon as the key is pressed, and Edit mode will automatically exit.

For information on how to record SysEx MIDI data, refer to the documentation provided with your DAW software.

To send a SysEx Memory Dump to your DAW:

1. Prepare a MIDI track within your DAW software to record from your Axiom.
2. Press the Edit button on your Axiom.
3. Start the MIDI recording in your DAW software.
4. Press the Memory Dump key on your Axiom. The SysEx memory dump will begin immediately, and the LCD screen will display "SYS" to indicate that data is being sent. The SysEx file will appear as a new MIDI recording in your DAW software.

In order to ensure a reliable SysEx transfer on Windows systems, please install the latest Axiom drivers available at www.m-audio.com/support.

Restoring a Memory Dump

With Axiom selected as the MIDI Out port in your DAW, play back a MIDI track that contains a previously recorded Axiom SysEx Memory Dump. The SysEx data is sent back to Axiom, and the LCD screen will display "SYS" while receiving the SysEx data. This permanently overwrites all current Axiom presets.

The restored settings will not become active until a new preset is loaded on your Axiom, or the device has been powered off and on.

MIDI Out

This parameter (also known as "MIDI Out From USB") determines the source of MIDI data sent to the external MIDI Out port. In its default setting ("OFF"), the MIDI OUT port will receive data from the Axiom keys and Controls.

When set to 'USB' the MIDI Out port receives data from the USB connection to a host computer. This allows Axiom to function as a USB MIDI interface between the computer and any external MIDI devices connected to the Axiom 5 PIN MIDI connectors.

To send MIDI data to an external MIDI device, set MIDI Out to 'USB' and select Axiom as the MIDI Out port in the DAW.

The MIDI Out setting is retained when Axiom is turned off and on.

To select a new MIDI Out:

1. Press the Edit button.
2. Press the MIDI OUT Key. The LCD screen will display "USB ->" and indicate whether the function is "OFF" or "ON."
3. Press the Patch "Up" or "Down" button to turn the function on or off. Axiom will return to Performance mode approximately one second after the final button is pressed.

Store

The Store function saves control assignment settings to one of 20 memory locations. Storing new assignment settings permanently overwrites the contents of the selected memory location.

To Restore the factory presets hold down the Patch "Up" and "Down" buttons during power up.

Groups of Axiom controls can be included or excluded from saved presets by activating or deactivating their respective Group buttons. For more information about the Group buttons, refer to Chapter 3, "Controls and Connectors."

To store an Axiom patch to a memory location:

1. Press the Edit button.
2. Press the Store key. The LCD screen will display the number of the last selected Patch memory location (for example, "1").
3. Enter the number of the memory location you want to store the new settings to, by using the number keys or the Patch "Up" or "Down" buttons.
4. Press the Enter key to save the changes and overwrite the previous settings of the memory location.

Curve

The Curve key is used for changing the touch sensitivity of the keyboard and Trigger Pads, as well as the Acceleration Curve of the Encoder Knobs. This setting lets you decide how the force with which you hit a key or Pad affects the volume at which a note plays, or how fast the knobs "sweep" through value changes.

Keyboard Sensitivity Options:

- 1 = **C1** is a sensitivity setting that generates lower velocity values for the same force. This setting is useful for playing more quietly, even if you tend to strike the keys harder.
- 2 = **C2** is the default setting, and is designed to be useful for most players with an "average" touch (people who play with an average amount of force).
- 3 = **C3** is a sensitivity setting that generates higher velocity values for the same force. This setting is useful for playing more loudly, even if you tend to strike the keys with less force.
- 4 = **C4** is a sensitivity setting that generates an equal velocity value for a given amount of force, resulting in a linear (or neutral) keyboard response.
- 5 = **F1** is a setting that effectively disables sensitivity, meaning the keyboard will generate a fixed velocity value of 64 (on a scale of 0 – 127) regardless of how hard or soft the keys are struck. This replicates velocity settings used in Organ presets.
- 6 = **F2** is a setting that effectively disables sensitivity, meaning the keyboard will generate a fixed velocity value of 100 (on a scale of 0 – 127) regardless of how hard or soft the keys are struck. This also replicates velocity settings used in Organ presets.
- 7 = **F3** is a setting that effectively disables sensitivity, meaning the keyboard will generate a fixed velocity value of 127 (on a scale of 0 – 127) regardless of how hard or soft the keys are struck. This also replicates velocity settings used in Organ presets.

To select a Keyboard Velocity Curve:

1. Press the Edit button.
2. Press the Curve key. The LCD screen will read "V Crv" and display the current velocity curve (for example, "C2").
3. Do one of the following:
 - Type the Velocity Curve number (1 through 7) using the number keys.
 - or
 - Use the Patch "Up" and "Down" buttons to scroll through the Velocity Curves (C1 through F3).
4. Press the Enter key.

Trigger Pad Sensitivity Options:

- 1 = C1** is a sensitivity setting that generates lower velocity values for the same force. This setting is useful for playing more quietly, even if you tend to strike the Pads harder.
- 2 = C2** is the default setting, and is designed to be useful for most players with an "average" touch (people who play with an average amount of force).
- 3 = C3** is a sensitivity setting that generates higher velocity values for the same force. This setting is useful for playing more loudly, even if you tend to strike the Pads with less force.
- 4 = C4** is a sensitivity setting that generates an equal velocity value for a given amount of force, resulting in a linear (or neutral) Trigger Pad response.
- 5 = F1** is a setting that effectively disables sensitivity, meaning the Pads will generate a fixed velocity value of 64 (on a scale of 0 – 127) regardless of how hard or soft they are struck.
- 6 = F2** is a setting that effectively disables sensitivity, meaning the Pads will generate a fixed velocity value of 100 (on a scale of 0 – 127) regardless of how hard or soft they are struck.
- 7 = F3** is a setting that effectively disables sensitivity, meaning the Pads will generate a fixed velocity value of 127 (on a scale of 0 – 127) regardless of how hard or soft they are struck.
- 8 = S2** is a setting where the Pads will generate a fixed velocity value of either 64 or 127 (on a scale of 0 – 127) depending on how hard or soft they are struck.
- 9 = S3** is a setting where the Pads will generate a fixed velocity value of either 64, 100 or 127 (on a scale of 0 – 127) depending on how hard or soft they are struck.
- 10 = S4** is a setting where the Pads will generate a fixed velocity value of either 32, 64, 100 or 127 (on a scale of 0 – 127) depending on how hard or soft they are struck.

To select a Trigger Pad Velocity Curve:

1. Press the Edit button.
2. Press the Curve key twice. The LCD screen will read "PdCrv" and display the current velocity curve (for example, "C2").
3. Do one of the following:
 - Type the Velocity Curve number (1 through 10) using the number keys.
 - or
 - Use the Patch "Up" and "Down" buttons to scroll through the Velocity Curves (C1 through F3).
4. Press the Enter key.

Encoder Knob Acceleration Options:

- 0 = Off** is an acceleration setting where the knob will only send a value change of one step regardless of how quickly or slowly it is turned.
- 1 = C1** is a slower acceleration curve, useful for making finer adjustments.
- 2 = C2** is the standard acceleration curve (selected by default).
- 3 = C3** is a quicker acceleration curve, useful when large parameter sweeps are required.

To select an Encoder Knob Acceleration setting:

1. Press the Edit button.
2. Press the Curve key three times. The LCD screen will read "EnCrv" and display the current velocity curve (for example, "C3").
3. Do one of the following:
 - Type the Velocity Curve number (0 through 3) using the number keys.
 - or
 - Use the Patch "Up" and "Down" buttons to scroll through the Velocity Curves (OFF through C3).
4. Press the Enter key.

Drawbar (Axiom 49 & 61)

This parameter switches all 9 Axiom Faders to Drawbar Mode. This reverses the operation of the fader, so that the maximum value is at the bottom and the minimum value is at the top. This function takes immediate effect as soon as the key is pressed, and Edit mode will automatically exit. This feature is intended for use with Organ Instruments that utilize drawbars.

To configure an Axiom Fader for Drawbar Mode:

1. Press the Edit button.
2. Press the Drawbar key. The LCD screen will momentarily read "drbAr ON."
3. Drawbar mode becomes active immediately, and Edit mode exits automatically.
4. To disable Drawbar mode, repeat steps 1 and 2. The LCD screen will momentarily read "drbAr OFF."

Number Keys

This section of the keyboard is used to type in numerical parameter values while in Edit mode.

Enter Key

The Enter key confirms changes made and exits Edit mode.

Chapter 5: Advanced Programming Functions

The MIDI CC (continuous controller) numbers from 0 to 127 are part of the General MIDI specification, and are typically used for real-time control of parameters in MIDI-compatible music equipment. For example, an Axiom knob can be assigned to MIDI CC number 10, which controls the Pan setting of a connected synthesizer or DAW software track. Many of the Axiom controls are fully programmable, and can be assigned to any standard MIDI CC. However, to simplify assignment of more complex MIDI message types such as SysEx or RPN/NRPN, M-Audio has appended additional MIDI message types to the end of the standard MIDI CC list. These additional messages can be assigned to Axiom controls, using numbers in the range from 128 to 255. This section provides examples of typical control assignment procedures for knobs, faders, buttons, and the Sustain Pedal jacks. Assigning MIDI messages that are not explicitly mentioned in this section is done by using the same basic principle shown in the examples.

Axiom never transmits values outside the range specified by the MIDI protocol (0 – 127). The controller numbers from 128 – 255 are only used internally by Axiom. This simplifies configuration of knobs, buttons, and faders when assigning advanced MIDI messages, and allows additional configuration options for the controls (such as setting the trigger or toggle operation of a button).

Setting Toggle Values (Min/Max) for Buttons or Sustain Pedals

When standard MIDI CC numbers are assigned to buttons or a Sustain Pedal, they will toggle between two values. This means that one value is sent the first time it is pressed, and another value is sent the next time it is pressed.

By default, the buttons on Axiom are already configured to operate as toggle switches. When configuring a button or a Sustain Pedal to operate in toggle mode, the following three values need to be specified:

Key	Parameter	Value
Control Assign (example)	MIDI CC number	10 (Pan)
Data 2 (example)	Second press	0 (minimum)
Data 3 (example)	First press	127 (maximum)

The following example will configure a button to "hard pan" the sound to the left speaker when it is pressed the first time, and "hard pan" to the right speaker when it is pressed a second time.

To set Toggle Values (min/max) for buttons or Sustain Pedals:

1. Select a button as described earlier.
2. Press the Edit button.
3. Press the Control Assign key. The LCD screen will read "ASIGN," and display the currently selected control (for example "F10") and the current MIDI CC assignment (for example "146").
4. Type 10 using the number keys. This assigns MIDI CC number 10 (Pan) to the button.
5. Press the Enter key.
6. Press the Edit button.
7. Press the Data 2 key. The LCD screen will read "MIN" and display the currently selected control (for example "F10"), and the current value (for example "64").
8. Type 0 using the number keys to assign the "second button press" (minimum) value.
9. Press the Enter key.
10. Press the Edit button.
11. Press the Data 3 key. The LCD screen will read "MAX" and display the currently selected control (for example "F10"), and the current value (for example "87").
12. Type 127 using the number keys to assign the "first button press" (maximum) value.
13. Press the Enter key.

If you want the button to send the same value every time it is pressed, enter the same value for both the Data2 and Data 3 parameters.

It can be useful to transmit two other specific values instead of sending minimum (zero) and maximum (127) values as in the above example. When assigning a button to control Pan (MIDI CC 10), you can, for example, configure Data 2 to send value 38, and Data 3 to send value 93, effectively causing pan to switch between the approximate "ten o'clock" and "two o'clock" positions when pressing the button repeatedly.

Setting Trigger Values for Buttons or Sustain Pedals

It is possible to set a Trigger Value for a button or the Sustain Pedal, causing it to send one value when pressed and held down, and another value when released.

The Sustain Pedal is already configured to send trigger values by default, ensuring it activates the Sustain effect when pressed and deactivates it when the Pedal is released. Buttons can also be configured to operate this way, which requires four values to be specified. In the example of the Sustain Pedal, these four values are:

Key	Parameter	Value
Control Assign	Trigger On/Off operation	146
Data 1 (example)	MIDI CC number	64 (sustain)
Data 2 (example)	Button/Pedal Released	0 (minimum)
Data 3 (example)	Button/Pedal Pressed	127 (maximum)

When working with proprietary M-Audio parameters from the 128 – 255 range, the "Control Assign" setting is used to configure a control for this special mode of operation. This means that certain values that are usually specified through the "Control Assign" setting must instead be specified via the "Data 1" parameter such as the standard MIDI CC parameter in the example below.

The following example will configure a button to "hard pan" the sound to the right speaker when it is held down, and "hard pan" to the left speaker when it is released. This involves configuring the button to operate as a trigger, while controlling the Pan parameter (MIDI CC 10).

To set Trigger Values for buttons or Sustain Pedals:

1. Select a button as described earlier.
2. Press the Edit button.
3. Press the Control Assign key. The LCD screen will read "ASIGN" and display the currently selected control (for example "F10"), and the current MIDI CC assignment (for example "87").
4. Type 146 using the number keys. This configures the button to operate as a trigger (press/release).
5. Press the Enter key.
6. Press the Edit button.
7. Press the Data 1 key. The LCD screen will display the currently assigned function (for example "NOTE"), the selected control (for example "F10"), and the current value.
8. Type 10 using the number keys. This specifies which parameter the button will trigger and release. In this example, MIDI CC 10 (Pan).
9. Press the Enter key.
10. Press the Edit button.
11. Press the Data 2 key. The LCD screen will read "MIN" and display the currently selected control (for example "F10"), and the current value (for example "64").
12. Type 0 using the number keys. This sets the "release" value to zero, and the sound will be panned "hard left" when the button is released.
13. Press the Enter key.
14. Press the Edit button.
15. Press the Data 3 key. The LCD screen will read "MAX" and display the currently selected control (for example "F10"), and the current value (for example "87").
16. Type 127 using the number keys. This sets the "press" value to the maximum value, so that the sound is panned hard right when the button is pressed.
17. Press the Enter key.

It can be useful to transmit two other specific values instead of sending minimum (zero) and maximum (127) values as in the above example. When assigning a button to control Pan (MIDI CC 10), you can, for example, configure Data 2 to send value 38, and Data 3 to send value 93, effectively causing pan to switch between the approximate "ten o'clock" and "two o'clock" positions when pressing and releasing the button.

Assigning MMC Control to Buttons

The transport functions of some hardware recording devices and DAW applications can be controlled remotely via MMC (MIDI Machine Control) commands. MMC is a specialized transport control protocol that requires a somewhat different configuration method. The following values need to be specified:

Key	Parameter	Value
Control Assign	MMC Control	149
Channel Assign (example)	Device ID	127
Data 2 (example)	MMC Function	2 (Play)

To configure a button to send the MMC command "Play":

1. Select an assignable button as described earlier.
2. Press the Edit button.
3. Press the Control Assign key. The LCD screen will read "ASIGN" and display the currently selected control (for example "F10"), and the current MIDI CC assignment (for example "146").
4. Type 149 using the number keys. This sets the button to send MMC (MIDI Machine Control).
5. Press the Enter key.
6. Press the Edit button.
7. Press the Channel Assign key. The LCD screen will read "CHAN" and display the currently selected control (for example "F10"), and the current MIDI channel is it assigned to (for example "0").
8. Enter 127 (Poly On) using the number keys. This ensures that all receiving devices will respond to the MMC messages.
9. Press the Enter key.
10. Press the Edit button.
11. Press the Data 2 key. The LCD screen will display the current function for the Data 2 (in this case, "MMC") and the number of the current MMC command. Refer to the table below.
12. Enter a number from the table below to select the MMC command for the button. This determines which transport function will be controlled by the button. For example, enter "2" for the Play command.
13. Press the Enter key.

Number	MMC Command
01	Stop
02	Play
03	Deferred Play
04	Fast Forward
05	Rewind
06	Record Strobe (Punch In)
07	Record Exit (Punch Out)
08	Record Pause
09	Pause
10	Eject
11	Chase
12	MMC Reset

Assigning a Note to a Trigger Pad

It is possible to configure a pad to send a Note On message when it is struck or held down, and a Note Off message when it is released. This requires four values to be specified (values given are examples):

Key	Parameter	Value
Control Assign	Trigger Note On/Off	147
Data 1 (example)	Note Pitch	64 (Note E4)
Data 2 (example)	Note off velocity	0
Data 3 (example)	Note on velocity	100

Velocity Lock (Vel Lock) must be active for pads to transmit the note velocities specified by Data 2 and data 3. When Velocity Lock is off, the pads will transmit a velocity according to how hard the pad is struck. For further information, please refer to Velocity Lock under "Additional Functions".

The following example configures a pad to play MIDI note E4 while it is being held down and stop the note when released.

To configure a pad to play a MIDI note:

1. Select a pad. See "Control Select (Ctrl Select)".
2. Press the Edit button.
3. Press the Control Assign key. The LCD screen will read "ASIGN" and display the currently selected control (for example "P1"), and the current MIDI CC assignment (for example "149").
4. Enter 147 using the number keys. This sets the pad to trigger MIDI Notes.
5. Press the Enter key.
6. Press the Edit button.
7. Press the Data 1 key (Pitch/Note parameter). The LCD screen will display the currently assigned function ("NOTE"), the selected control (for example "P1"), and the current value.
8. Enter "64" using the number keys. This sets the pad to play MIDI note 64 (E4).
9. Press the Enter key.
10. Press the Edit button.
11. Press the Data 2 key (Velocity Off). The LCD screen will read "MIN" and display the currently selected control (for example as "P1"), and the current value (for example "1").
12. Enter 0 using the number keys. This sets the pad to transmit a Note Off message with a release velocity value of zero.
13. Press the Enter key.
14. Press the Edit button.
15. Press the Data 3 key (Velocity On). The LCD screen will read "MAX" and display the currently selected control (for example "P1"), and the current value (for example "127").
16. Enter 100 using the number keys. This sets the pad to transmit a Note On message with a velocity of 100 when struck.
17. Press the Enter key.

It is also possible to configure a pad or button to send a note on message when it is pressed and a note off message when it is pressed a second time. To do this, follow the configuration steps above, but enter 148 for the "Control Assign" parameter.

In most Axiom factory presets, the pads are already programmed to transmit MIDI note data. In order to change the pitch of notes sent, you need only follow steps 6 to 9.

Setting Buttons or Sustain Pedals to Send Combined Program Change, Bank LSB and Bank MSB messages

The assignable buttons and the Sustain Pedals can be configured to send a multi-part message, consisting of a Program Change, Bank LSB and Bank MSB message when pressed. This is useful for specific patch/sound selection from a specific bank of a connected synthesizer or virtual instrument. This requires four values to be specified (values given are examples):

Key	Parameter	Value
Control Assign	Program/Bank Preset select	145
Data 1 (example)	Program Change Number	42 (GM Instrument Cello)
Data 2 (example)	Bank LSB number	8
Data 3 (example)	Bank MSB number	32

The following example configures a button or Sustain Pedal to send a total of 3 MIDI messages each time it is pressed (Bank LSB, Bank MSB and Program Change), allowing you to recall any sound in any bank of a connected software or hardware synthesizer that supports this.

To configure buttons or Sustain Pedals to send combined Program Change, Bank LSB and Bank MSB Messages:

1. Select a button or Sustain Pedal as described earlier.
2. Press the Edit button.
3. Press the Control Assign key. The LCD screen will read "ASIGN" and display the currently selected control (for example "F10"), and the current MIDI CC assignment (for example "146").
4. Enter 145 using the number keys. This configures the button or Sustain Pedal to send a combined Bank Select/Program Change message.
5. Press the Enter key.
6. Press the Edit button.
7. Press the Data 1 key. The LCD screen will display the currently assigned function (for example "NOTE"), the selected control (for example "F10"), and the current value.
8. Enter a Program Change number, such as 42.
9. Press the Enter key.
10. Press the Edit button.
11. Press the Data 2 key. The LCD screen will display the current function assigned to the Data 2 key (in this case, "LSb") and the current value.
12. Enter a Bank LSB number, such as 8.
13. Press the Enter key.

14. Press the Edit button.
15. Press the Data 3 key. The LCD screen will display the currently selected control (for example "F10") and the current value.
16. Enter a Bank MSB number, such as 32.
17. Press the Enter key.

Programming a Button to Increment/Decrement a MIDI CC value

It is possible to configure a button to increase or decrease a value each time it is pressed. This is useful if you want to step through values one by one each time a button is pressed.

To configure a button to increment a MIDI CC between a minimum and maximum value, assign it to number 154. The maximum and minimum values are set using the Data 2 and Data 3 parameters respectively. This requires four values to be specified (values given are examples):

Key	Parameter	Value
Control Assign	Increment MIDI CC	154
Data 1 (example)	MIDI CC number	72 (Release Time)
Data 2 (example)	Low Limit	0
Data 3 (example)	High Limit	127

The following example configures a button to increment the release time of a sound patch on a MIDI instrument, every time it is pressed. You may have to push the button several times while playing notes to hear the difference.

To configure a button to increment/decrement a MIDI CC value:

1. Select a button as described earlier.
2. Press the Edit button.
3. Press the Control Assign key. The LCD screen will read "ASIGN" and display the currently selected control (for example "F10"), and the current MIDI CC assignment (for example "146").
4. Enter 154 using the number keys. This sets the button to increment the MIDI CC value.
5. Press the Enter key.
6. Press the Edit button.
7. Press the Data 1 key. The LCD screen will display the currently assigned function (for example "NOTE"), the selected control (for example "F10"), and the current value.
8. Enter "72" using the number keys. This specifies the MIDI CC for the parameter or function that will be affected.
9. Press the Enter key.
10. Press the Edit button.
11. Press the Data 2 key. The LCD screen will read "MIN" and display the currently selected control (for example "F10"), and the current value (for example "64").
12. Enter 0 using the number keys. This specifies the minimum value.
13. Press the Enter key.
14. Press the Edit button.
15. Press the Data 3 key.
16. Enter 127 using the number keys. This specifies the maximum value.
17. Press the Enter key.

To configure a button to decrement (decrease) a MIDI CC value, assign it to number 153. The minimum and maximum value (range) for each button is set using the Data 2 and Data 3 parameters respectively.

Each button will only increment or decrement its own parameter value, and this value is independent of any other button. In other words, assigning one button to increment a parameter and another to decrement the same parameter will cause the first button to send values such as 1, 2, 3, etc. Pressing the second button will send values such as 127, 126, 125, etc, and will not decrement from where the first button left off (for example 2, 1, 0).

Programming a Button to Increment/Decrement a Program Change

It is possible to configure a button to send an Increment (increase) or Decrement (decrease) Program Change message each time it is pressed.

To configure a button to increment a Program Change between a minimum and maximum value, assign it to number 156. The minimum and maximum values are set using the Data 2 and Data 3 parameters respectively. This requires three values to be specified (values given are examples):

Key	Parameter	Value
Control Assign	Program Increment	156
Data 2 (example)	Program Number (minimum)	0
Data 3 (example)	Program Number (maximum)	127

To configure a button to increment/decrement a Program Change:

1. Select a button as described earlier.
2. Press the Edit button.
3. Press the Control Assign key. The LCD screen will read "ASIGN" and display the currently selected control (for example "F10"), and the current MIDI CC assignment (for example "154").
4. Enter 156 using the number keys. This configures the button to increment the Program number
5. Press the Enter key.
6. Press the Edit button.
7. Press the Data 2 key. The LCD screen will read "MIN" and display the currently selected control (for example "F10"), and the current value (for example "64").
8. Enter 0 using the number keys. This specifies the lowest Program number.
9. Press the Enter key.
10. Press the Edit button.
11. Press the Data 3 key. The LCD screen will read "MAX" and display the currently selected control (for example "F10"), and the current value (for example "87").

12. Enter 127 using the number keys. This specifies the highest Program number.
13. Press the Enter key.

To configure a button to decrement a Program Change between a maximum and minimum value, assign it to number 155. The minimum and maximum values are set using the Data 2 and Data 3 parameters respectively.

When one button is configured to increment through sound patches (such as, 1, 2, 3, etc.), and another to decrement through them (such as, 127, 126, 125, etc.), the second button will not decrement from where the first button left off (for example, 2, 1, 0).

Reversing the Operation of Knobs or Faders

Most MIDI parameters that are assignable to knobs or faders can be configured to reverse the controls operation. Once a control is assigned to a MIDI parameter, by default the Data 2 parameter defines a minimum value (such as, zero) while the Data 3 parameter defines a maximum value to be transmitted (such as 127). Reversing the operation of knobs or faders is achieved by entering a higher value for the Data 2 parameter (usually minimum) and a lower value for the Data 3 parameter (usually maximum).

This is useful when a single fader needs to be configured to work as a drawbar, or if a knob needs to be configured in reverse when controlling a particular parameter. In the case of a fader, this is an alternative to using the Drawbar function detailed in Chapter 4, "Advanced Keyboard Functions," because it allows the configuration of different minimum and maximum values.

This requires two values to be specified (values given are examples):

Key	Parameter	Value
Data 2 (example)	Minimum value	127
Data 3 (example)	Maximum value	0

To configure a knob or fader to reverse its operation:

1. Select a knob or fader as described earlier.
2. Press the Edit button.
3. Press the Data 2 key. The LCD screen will read "MIN" and display the currently selected control (for example "F1"), and the current value (for example "0").
4. Enter 127 using the number keys. This configures the control to reach its maximum value when it is all the way down.
5. Press the Enter key.
6. Press the Edit button.
7. Press the Data 3 key. The LCD screen will read "MAX" and display the currently selected control (for example "F1"), and the current value (for example "127").
8. Enter 0 using the number keys. This configures the control to reach its minimum value when it is all the way up.
9. Press the Enter Key.

The knob or fader now operates in reverse. What was originally the maximum position is now the minimum position, and vice versa.

Limiting the Range of a Knob or Fader

The effective range of values transmitted by knobs and faders can be limited by entering values other than 0 and 127 (the default minimum and maximum values) for the Data 2 and Data 3 parameters.

For example, with the Data 2 parameter set to 38 and Data 3 set to 93, if a knob is set fully counter-clockwise, the minimum value transmitted is 38. If the knob is turned fully clockwise, the maximum value transmitted is 93. This can be useful in a variety of scenarios, like keeping a knob within the "sweet spot" of a synthesizer parameter (such as, filter cutoff), or to quickly recall a specific minimum or maximum volume setting for a track.

Key	Parameter	Value
Control Assign	MIDI CC number	07 (Volume)
Data 2 (example)	Minimum value	38
Data 3 (example)	Maximum value	93

The operation of knobs and faders can also be reversed, even if the range of operation is limited. This is achieved by entering a higher value for the Data 2 parameter and a lower value for the Data 3 parameter.

To configure a knob or fader to operate within a limited range:

1. Select a knob or fader as described earlier.
2. Press the Edit button.
3. Press the Control Assign key. The LCD screen will read "ASIGN" and display the currently selected control (for example "F1"), and the current MIDI CC assignment (for example "10").
4. Type 7 using the number keys. This assigns MIDI CC number 7 (Volume) to the control.
5. Press the Enter key.
6. Press the Edit button.
7. Press the Data 2 key. The LCD screen will read "MIN" and display the currently selected control (for example "F1"), and the current value (for example "0").
8. Type 38 using the number keys.
9. Press the Enter key.
10. Press the Edit button.
11. Press the Data 3 key. The LCD screen will read "MAX" and display the currently selected control (for example "F1"), and the current value (for example "127").
12. Type 93 using the number keys.
13. Press the Enter key.

Assigning RPN/NRPN Messages to a Knob, Fader, Button, or Pedal

Axiom transmits all three necessary MIDI CC messages for RPNs and NRPNs when a knob or fader is moved, or the Sustain Pedal or a button is pressed.

The "Control Assign" setting allows assignment for control of the RPN Coarse (132) and RPN Fine (133), as well as NRPN Coarse (134) and NRPN Fine (135) parameters.

The Data 1 setting lets you specify which MIDI CC number is sent to alter values (usually: Coarse = CC 6; Fine = CC 38). The Data 2 setting defines what value is sent for LSB (RPN: CC 100, NRPN: CC 98) while the Data 3 setting defines which value is sent for MSB (RPN: CC 101, NRPN: CC 99). Together, the LSB and MSB values specify the RPN/NRPN parameter to be edited.

Assigning a knob to control an RPN/NRPN on a connected hardware or software device requires four values to be specified as shown in the following table:

Key	Parameter	Value
Control Assign	NRPN Coarse	134
Data 1 (example)	CC for Value Change	6
Data 2 (example)	CC 98 / LSB	51
Data 3 (example)	CC 99 / MSB	3

To assign a manufacturer specific NRPN Coarse message to an Axiom control:

1. Select a control as described earlier, such as Encoder Knob E1.
2. Press the Edit button.
3. Press the Control Assign key. The LCD screen will read "ASIGN" and display the currently selected control (for example "E1"), and the current MIDI CC assignment (for example "146").
4. Enter 134 (NRPN Coarse) using the number keys.
5. Press the Enter key.
6. Press the Edit button.
7. Press the Data 1 key (for buttons, pads, and pedals only). The LCD screen will read "CC," the selected control (for example "E1"), and the current value.
8. Enter 6 using the number keys (or the MIDI CC number for value changes as required by your device).
9. Press the Enter key.
10. Press the Edit button.
11. Press the Data 2 key. The LCD screen will read "LSb" and display the currently selected control (for example "E1"), and the current value (for example "64").
12. Enter the value to be transmitted via MIDI CC 98 (LSB) using the number keys.
13. Press the Enter key.
14. Press the Edit button.
15. Press the Data 3 key. The LCD screen will read "MSb" and display the currently selected control (for example "E1"), and the current value (for example "87").
16. Enter the value to be transmitted via MIDI CC 99 (MSB) using the number keys.
17. Press the Enter key.

Axiom factory preset 16 is already configured with NRPN controls for Yamaha XG and Roland GS synthesizers.

SysEx Messages and Device ID

When transmitting SysEx messages, the individual control channel number does not define a transmit channel, but a Device ID. This being the case, when the Channel Assign key is pressed, the LCD screen will display the Device ID. Device IDs range between 0 – 127. In most cases, the Device ID should be set to 127 so that all devices will receive the SysEx message. The Device ID for a SysEx message assigned to a control cannot be changed using the Device ID key. This key is used for changing the global Device ID of Axiom.

Non-Volatile Memory

Axiom features non-volatile memory, which automatically saves the current state of operation when the device is powering down. The current control and channel assignments are stored even if the Save function has not been used. The Program, Bank LSB and Bank MSB data, Global Channel settings, MIDI Out from USB, Velocity Lock, and the last Axiom preset used are also stored and recalled the next time Axiom is powered up.

Restoring the Factory Settings

Factory default settings can be restored by holding down the Patch "Up" and "Down" buttons during power-up. At this point all previously saved data will be erased.

Chapter 6: Keyboard Zones

The Zone feature allows you to layer or split sounds on a hardware or virtual instrument, by dividing the keyboard into a maximum of four programmable non-overlapping or overlapping sections. When active, each Zone will transmit MIDI notes on a separate MIDI channel. This makes it possible to play up to 4 different instrument sounds on a connected multi-timbral synthesizer, by playing notes in different sections (Zones) of the keyboard. If any of the Zones are configured to overlap partially or completely, multiple instrument sounds will be layered, and played simultaneously in those areas of the keyboard.

Zone Selection & Activation

Pressing the Zone button (Zone) changes the function of the Shift, Track Select and Mute buttons to Zone buttons one through four as indicated on each button. The Zone button will illuminate to indicate that Axiom is in "Zone Mode." At this point pressing any of the four Zone buttons will activate the corresponding keyboard Zone, and all other Zones will be deactivated. To activate multiple Zones, simultaneously press their respective Zone buttons. In either case, each button will illuminate indicating that its corresponding Zone is active.

Editing Zones

Holding down the Zone button (Zone) for at least one second will put Axiom into Zone Edit Mode. The Zone button and buttons for all active Zones will flash.

Parameters such as Zone Range and Octave/Transpose shift can be edited for each Zone. The information on the LCD screen will also display values for lowest Zone number. These settings are saved as part of a user patch when stored to a Memory Location.

When more than one Zone is active, all changes will be applied to all selected Zone numbers.

Zone Range

This function sets the range of notes used by a Zone. By default, all Zones span the entire length of the keyboard. On Axiom 61 this default Range is from note C1 on the far left to C6 on the far right. However it is from C1 to C5 on Axiom 49, and C2 to C4 on Axiom 25.

If two or more active Zones are configured to overlap partially or completely, multiple instrument sounds will play simultaneously (layered) if a key is pressed in that area.

To set the Zone range:

1. Select a Zone as described earlier.
2. Hold down the Zone button (Zone) for at least one second. The LCD screen will display the current range of notes used in the Zone.
3. Press the lowest note to be included in the Zone. The LCD screen will display the note value.
4. Press the highest note to be included in the Zone. The LCD screen will display the note value.
5. Repeat steps 1 – 5 to set the range of notes for all remaining Zones.

Simultaneously holding down multiple Zone buttons and then setting the range as described above, will apply the same Zone Range to all active Zones. This will layer all sound patches that are played. After setting the Range, activate all desired Zones by simultaneously pressing their respective Zone buttons.

Zone Octave

The Zone Octave parameter lowers or raises the pitch of a Zone, in one octave increments, to a maximum of 10 Octaves.

Zone Octave shift settings work in combination with the Global Octave shift setting (see Chapter 3, Octave / Transpose buttons). This can be useful when working with different Octave or Transpose shift settings across multiple Zones. The Global Octave function shifts the entire keyboard up or down, while preserving relative pitch settings between Zones. For example, if a Zone is configured for an Octave shift of +1, and a Global Octave shift setting of +2 is applied, the effective Octave shift for that Zone is +3.

To set the Zone octave value:

1. Select a Zone as described earlier.
2. Hold down the Zone button (Zone) for at least one second. The LCD screen will display the current range of notes used in the Zone.
3. Repeatedly press the Octave "-" or "+" button to lower or raise the Octave shift value. The LCD screen will display the current value. Axiom will return to Performance one second after the "last button press."
4. Repeat steps 1 – 3 to set the Octave shift for the remaining Zones.

After setting the Octave shift value and exiting Edit mode, activate all desired Zones by simultaneously pressing their respective Zone buttons.

Zone Transpose

The Zone Transpose parameter lowers or raises the pitch of a Zone in one semi-tone (half-step) increments, to a maximum of 12 semi-tones.

Zone Transpose shift settings work in combination with the Global Transpose shift setting. This can be useful when working with different Transpose or Octave shift settings across multiple Zones. The Global Transpose function shifts the entire keyboard up or down, while preserving relative pitch settings between Zones.

For example, if a Zone is configured for a Transpose shift of +5, and a Global Transpose shift setting of +2 is applied, the effective Transpose shift for that Zone is +7.

To set the Zone Transposition value:

1. Select a Zone as described earlier.
2. Hold down the Zone button (Zone) for at least one second. The LCD screen will display the current range of notes used in the Zone.
3. Simultaneously press the Octave "-" and "+" buttons. The LCD screen will display the current value.

4. Repeatedly press the Octave "-" or "+" button to lower or raise the pitch. Axiom will return to Performance one second after the last button press.
5. Repeat steps 1 – 4 to set the Transpose value for the remaining Zones.

After setting the Transpose value and exiting Edit mode, activate all desired Zones by simultaneously pressing their respective Zone buttons.

Zone Channel

The Zone Channel parameter specifies which MIDI Channel a Zone will use when transmitting MIDI data. Assigning each Zone to its own channel will allow you to play up to 4 different sound patches on a connected synthesizer. This setting is saved as part of a user patch when stored to a Memory Location.

To set the Zone Channel:

1. Select a Zone as described earlier.
2. Press the Edit button.
3. Press the Zone Channel key (Zone Chan). The LCD screen will display the current function ("CHAN"), the active Zone number, and Zone MIDI Channel number.
4. Enter the new MIDI Channel number using the number keys, or by repeatedly pressing the Patch "Up" or "Down" buttons.
5. Press the Enter key.
6. Repeat steps 1 – 5 to assign set the MIDI channel for the remaining Zones.

After setting the Zone channel and exiting Edit mode, activate all desired Zones by simultaneously pressing their respective Zone buttons.

Default Zone Channels

Zone	MIDI Channel
1	0 (Global Channel)
2	1
3	2
4	3

Zone Program

Program change messages are sent on active Zone channels, defining the instrument sound for each Zone. This information is included in a stored Axiom preset, ensuring that the correct sound is accessed for each active Zone whenever the preset is recalled.

To set the Zone Program Change number:

1. Select a Zone as described earlier.
2. Press the Program button (Prog). The LCD screen will display the current value and the active Zone number.
3. Enter the new program number using the number keys, or by repeatedly pressing the Patch "Up" or "Down" buttons.
4. Press the Enter key. A program change message will be transmitted immediately.
5. Repeat steps 1 – 4 to assign new program numbers for the remaining Zones.

After configuring the program numbers and exiting Edit mode, activate all desired Zones by simultaneously pressing their respective Zone buttons.

Zone LSB

Bank LSB messages are sent on active Zone channels, defining the instrument sound for each Zone. This information is included in a stored Axiom preset, ensuring that the correct sound is accessed for each active Zone whenever the preset is recalled.

To set the Zone LSB value:

1. Select a Zone as described earlier.
2. Press the Edit button.
3. Press the Bank LSB key. The LCD screen will display the current Bank LSB value and active Zone number.
4. Enter the new Bank LSB value using the number keys.
5. Press the Enter key. The assigned Bank LSB value will be transmitted immediately.
6. Repeat steps 1 – 5 to assign new Bank LSB value for the remaining Zones.

After setting the Bank LSB values and exiting Edit mode, activate all desired Zones by simultaneously pressing their respective Zone buttons.

Zone MSB

Bank MSB messages are sent on active Zone channels, defining the instrument sound for each Zone. This information is included in a stored Axiom preset, ensuring that the correct sound is accessed for each active Zone whenever the preset is recalled.

To set the Zone MSB value:

1. Select a Zone as described earlier.
2. Press the Edit button.
3. Press the Bank MSB key. The LCD screen will display the current Bank MSB value and active Zone number.
4. Enter the new Bank MSB value using the number keys.
5. Press the Enter key. The assigned Bank MSB value will be transmitted immediately.
6. Repeat steps 1 – 5 to assign new Bank MSB value for the remaining Zones.

After setting the Bank MSB values and exiting Edit mode, activate all desired Zones by simultaneously pressing their respective Zone buttons.

When a patch is stored, the Bank LSB, Bank MSB, and Program values for each active Zone are saved. When the patch is recalled, this data is sent out on the active Zone channels to set up the correct instrument sound for each Zone. If this is undesirable, please ensure the Zone button ("Zone Button") is de-activated when recalling the patch.

Appendix**Technical Specifications**

Display:	Custom, backlit LCD
Power:	USB bus-powered or external 9V DC power supply
Keyboard:	Semi-weighted piano-style keys Velocity-sensitive and aftertouch-sensitive (channel pressure)
Assignable Controls:	8 encoders (360°) 9 faders (40 mm) (Axiom 49, Axiom 61); 1 fader (40 mm) (Axiom 25) 9 fader buttons (Axiom 49, Axiom 61) 6 transport buttons 8 assignable trigger pads Pitch bend wheel Modulation wheel
Connections:	1 MIDI input (5-pin DIN) 1 MIDI output (5-pin DIN) 1 expression pedal input 1 sustain pedal input 1 USB port 1 power supply input

* Specifications are subject to change without notice.

m-audio.com