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You can read the recommendations in the user guide, the technical guide or the installation guide for M-AUDIO O2. You'll find the answers to all your questions on the M-AUDIO O2 in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

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User Guide



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Manual abstract:

Class compliancy with Windows XP and Mac OS X means that you can get down to business without even installing any drivers. You can also expand on the functions of the O2 by downloading the Enigma software editor and librarian. For more information, see the Enigma Software Editor section of this manual or visit www.m-audio.com to register and download the free software. M-Audio O2 Features Ports: < MIDI OUT < USB MIDI OUT/IN Power: < USB powered < DC IN for external PSU Keyboard: < 25-note velocity-sensitive keyboard < 9 velocity curves Controls: < 8 programmable rotary dials < 1 programmable fader < 8 programmable buttons < assignable button controls for pitch bend and modulation. < MIDI-assignable foot switch MIDI Data from controllers < MIDI control number < RPN/NRPN < Program, Bank LSB, Bank MSB < pitch bend < GM/GM2/XG SysEx Messages MIDI Data from buttons: < Note on < Note on/off Toggle < MIDI CC on/off Toggle < Program, Bank LSB, Bank MSB presets < MIDI Machine Control functions < GM/GM2/XG SysEx Messages < MIDI CC increment/decrement "On the fly" features: < Program and Bank changes < Snap Shot sends current status for all controllers < Controller Mute mutes controller output to avoid parameter jumps Other features: < memory storage on your computer via SysEx < free Enigma software to edit and store memories < 5 memory locations store all settings < MIDI out from USB interface What's in the package? Your M-Audio O2 package should contain the following items: < < < < O2 keyboard Driver CD Software Bundle CD USB Cable Power and Connection Via USB You can power the keyboard via USB or an optional external power supply. Use only one method at a time. 1. Check that the on/off button on the back of the unit is set to "Off."

2. Plug in the USB cable provided with the M-Audio O2 to a free USB port on your computer. 3. Plug in the other end of the USB cable to the USB input on the M-Audio O2. The single USB cable not only powers the M-Audio O2 but also sends MIDI data to and from your computer system. You can also use a power adapter (not included) with the following specification: 9V DC output, 250-300mA, center positive. Verify that you are not powering the M-Audio O2 keyboard via USB, then simply plug in the power supply to the input labelled DC 9V and switch the power on. Note: Do not leave the adapter plugged in for long periods of time if the unit is not in use. 1 Windows XP and Mac OS X If you are using Windows XP or Mac OS X, you may simply switch the power position to "on." Because the M-Audio O2 keyboard is class compliant, it will work with out any further installation.

M-Audio O2 Features and Functions If the installation process has been completed successfully, please read through the following pages for a better understanding of the O2 and how it works. Program Mode This manual refers to "Program Mode." Program Mode defines the state of the M-Audio O2 when the ADVANCED FUNCTION button is pressed. In Program Mode, the keyboard of the M-Audio O2 is set up for selecting functions. The functions are listed above each key on the O2 keyboard. The second octave of the O2 keyboard is for numerical data entry while in Program Mode. The Preset "+" and "-" buttons can be used for increment or decrement changes in assigned value when in Program Mode. When entering numerical values in Program Mode, the LED shows the value entered. This value will update as you enter numerical data. If the M-Audio O2 is in Program Mode, a small dot will appear in the bottom right hand corner of the LED display.

Note that pressing the GLOBAL CHAN button will also engage Program Mode, since the numerical data entry keys are required to enter the new channel assignment. Also, the preset "+" and "-" buttons can be used. Exit Program Mode by pressing the ADVANCED FUNCTION button when you are finished with programming. The ENTER key must be pressed each time the numerical data entry keys are used to enter a value. Once the ENTER key has been pressed,

Program Mode will exit. Testing the M-Audio O2 with Your Software We recommend that you verify that your software application is properly communicating with the M-Audio O2 keyboard. Most software applications have a MIDI IN indicator. To confirm data is being received, press any key on the keyboard. If you encounter any issues or the software receives no data, please verify you selected the keyboard's USB driver as the MIDI Input for your software. In addition, please read the troubleshooting section at the back of this manual and please consult the manual that came with your software for proper configuration within the software application.

Recalling Presets Press the Preset "+" and "-" button to recall one of the preset memories. The LED will display the currently selected preset, preceded by a "p." Press the button again to change the preset to the next one in the series. The following is a list of the presets contained in the 5 memory locations. < < < < 01 GM Preset 02 Reason Native 03 Reason Mixer 04 Yamaha XG/Roland JV Preset 05 Undefined CC's for MIDI learn* *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 in MIDI Learn Mode, clicking on a controller and moving the dial. With such an application, it is recommended that you use controller numbers that tend not to have any function associated with them. Ableton Live is an example of an application that uses the MIDI Learn feature. Saving and Organizing Presets You may want to save and reorganize the order of Presets to suit your setup. Note that the factory presets are stored in ROM within the keyboard and can be restored at any time.

For example, let's move preset 2 ("Reason Native") to location 4 by carrying out the following procedure: 1. 2. 3. 4. 5. Recall preset 2 by pressing the Preset "+" and "-" buttons accordingly. Press the ADVANCED FUNCTION button. The keyboard will enter Program Mode. Press the STORE key on the keyboard. Type in "4" using the numerical data entry keys.

Press the ENTER key to confirm. This will save or store the current setup to preset location 4. 2 If you want to reset the M-Audio O2 to the factory defaults, hold down the Preset "+" and "-" buttons while switching the keyboard on. Note: Restoring the Factory presets will erase all setups you have programmed and stored to memory. You can also organize and store your presets on your computer using the Enigma software. This software is available as a free download at www.m-audio.com. Simply register your M-Audio product and follow the instructions from there. Sending a Snap Shot Press the GLOBAL CHAN and MUTE buttons together to send a Snap Shot of the current controller assignments and their values.



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When you send a Snap Shot, the data for an individual controller will be sent on the channel that controller has been assigned to. Snap Shot is one way of synchronizing the receiving device with the faders and rotary controllers on your keyboard. The function can also be used as a creative tool, often with interesting and surprising results. 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 Mute all rotary controllers and the fader, press the function button labelled MUTE. This feature allows you to alter the position of the rotary controllers without affecting the settings of your software. CTRL MUTE does not affect buttons, the foot switch or the keyboard. As soon as an assignable button, a function key, or the keyboard is pressed, the controllers are turned back on.

While Controller Mute is engaged, the LED displays "Off" 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, rather than causing the software's controller value to jump. Setting the Global MIDI Channel The M-Audio O2 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. If you are using a MIDI sound module or connecting to another piece of MIDI equipment, you will need to make sure that both your M-Audio O2 keyboard and the receiving unit are set to the same MIDI channel. The Global MIDI Channel affects the keyboard, Program, and Bank Changes, plus whatever controllers have been set to respond to the global setting. To set the Global MIDI Channel: Press the GLOBAL CHANNEL button. The keyboard enters Program Mode. The LED will display the currently selected Global Channel, preceded by a "c." 2.

Type in the MIDI channel number using the numeric keys or use the preset "+/-" keys. 3. Press the ENTER key to accept the new channel, and exit Program Mode. 1. Octave The keyboard can be shifted up or down to give you access to a total of 11 octaves on the M-Audio O2. 1. Press "OCTAVE +" for every octave you want to shift the keyboard up. 2. Press "OCTAVE -" for every octave you want to shift the keyboard down Transpose You can transpose the keyboard to change the key of the music you are playing without changing the key you are playing in. 1. Press "TRANPOSE" (OCTAVE + and OCTAVE together). 2. Press the OCTAVE + or - key for every semi tone you want to transpose up or down. You may have learned to play a piece of music in the key of C. To now play it in F you would need to press "TRANPOSE" followed by 5 presses on the OCTAVE + key or 7 presses on the OCTAVE - button.

Pitch Bend Control The Pitch Bend is used to bend the notes played on the keyboard up or down. This allows phrases not normally associated with keyboard playing, such as guitar riffs, to be played. Your sound source determines how far you can bend the note. It is typically set to 2 semitones but can be up to 2 octaves +/- . When you release the control, it will reset back to 0.

3 The Pitch Bend control on your M-Audio O2 keyboard is fully MIDI assignable. Please refer to the "Programming and Editing" section of this manual for more information. Modulation Control The Modulation control is used for modulation of the sound being played. This type of real-time controller was introduced on electronic keyboards to give the performer the option of adding vibrato to similar to acoustic instruments. The Modulation control on your M-Audio O2 keyboard is fully MIDI assignable. Please refer to the "Programming and Editing" section of this manual for more information. Foot Switch Any polarity foot switch (not included) can be plugged in to the foot switch input on your M-Audio O2 keyboard. The keyboard will automatically detect the correct polarity upon powering on. If you want to reverse the polarity, make sure the pedal is pressed when you switch on your keyboard. The foot switch is normally used for sustaining the sound you are playing without having to keep your hands on the keyboard.

This is also the default function on your M-Audio O2 keyboard. On the M-Audio O2, you can program the footswitch to send out MIDI notes that can trigger samples on different MIDI channels, without moving your hands from the keyboard. You can also send Program Changes any other MIDI message that can be sent from the 8 assignable MIDI buttons on your keyboard. For more detail about how to program the foot switch, please read the "Programming and Editing" section of this manual. MIDI Out On the back of the keyboard is . 4. Press the ENTER key to confirm. Move any of the rotary controllers to see the numbers in the LED display change and show the controller's current value. The MIDI controller number that is assigned to the dial last turned is shown on the LED. The last turned dial is always the one selected for editing in Program Mode.

As you create custom setups, be sure you store your changes to a memory location before recalling any other setups. 1. Selecting a Controller for Editing To assign a MIDI CC to one of the M-Audio O2's controllers, it needs to be selected for editing. 1. Press the ADVANCED FUNCTION button, then the CTRL SEL key.

The LED will display the number of the currently selected controller, preceded by a "C," or "F" if the controller is the fader. 2. Type in the number of the controller using the numerical data entry keys, or the preset +/- buttons. 3. Press the ENTER key to confirm. or 1. Move a rotary controller/fader. Simply move the controller, assignable button, or pedal to select it for editing. Assigning MIDI CCs After the controller to edit is selected, change the assigned MIDI CC number in the following way: 1. Press the ADVANCED FUNCTION button, then the CTRL ASGN key. The LED will indicate the currently assigned MIDI CC number. 2. Type in a new MIDI CC value using the numerical data entry keys, or the preset +/- buttons. 3. Press the ENTER key to confirm.

Assigning an Individual MIDI Channel 1. Select the controller you wish to edit. 2. Press the ADVANCED FUNCTION button, then the CHAN ASGN key. The LED will show the current channel assignment of the selected controller, preceded by a "c." 3. Type the MIDI channel number the controller is to send on (0-16) using the numerical data entry keys or the preset +/- buttons. 4. Press the ENTER key to confirm. If the controller is assigned to channel 0, it will transmit on the Global Channel.

Limiting the Range of the Controls Normally, the range of a MIDI controller is 0 to 127.



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It is possible to limit the maximum and minimum in this range. 1. 2. 3.

4. 5. 6. Press the **ADVANCED FUNCTION** button, followed by the **DATA 2 (MIN)** key. The LED will display the current Minimum limit of the controller. Type in the Minimum desired value using the numerical data entry keys or the **Preset +/-** buttons. Press the **ENTER** key to confirm. Program Mode will exit and the controller's CC assignment will be displayed on the LED. Press the **ADVANCED FUNCTION** button, followed by the **DATA 3 (MAX)** key. The LED will display the current Maximum limit of the controller. Type in the Maximum value using the numerical data entry keys or the **Preset +/-** buttons. Press the **ENTER** key to confirm. It is possible to limit the range of any rotary dial, the fader, or the Pitch bend and modulation controls. Buttons and the pedal can be set to decrement or increment between two limits. To do this: 1.

2. 3. 4. 5. 6. 7. Press the **ADVANCED FUNCTION** button, followed by the **CTRL ASGN** key. Enter '153' for decrement or '154' for increment. Press the **ENTER** key to confirm. Press the **ADVANCED FUNCTION** button, followed by the **DATA 1** key.

Enter the value of the MIDI CC you want the button to send out. Press the **ENTER** key to confirm. Enter the limits as described above. 6 Setting Toggle Values for the Buttons The 8 assignable buttons and the pedal can each be assigned to toggle between two values. This is how: 1.

2. 3. 4. 5. 6.

Press the **ADVANCED FUNCTION** button, followed by the **DATA 2 (MIN)** key. Type in the Minimum desired toggle number using the numerical data entry keys or the **Preset +/-** buttons. Press the **ENTER** key to confirm. Press the **ADVANCED FUNCTION** button, followed by the **DATA 3 (MAX)** key. Type in Maximum desired toggle number using the numerical data entry keys or the **Preset +/-** buttons. Press the **ENTER** key to confirm. If you want the button to send the same value every time, type in the same value both times. The above method will toggle the button each time you press it. It is also possible to set the button to send one value when you press it, and another value when you release it. To do this: 1.

Press the **ADVANCED FUNCTION** button, followed by the **DATA 1** key. 2. Type in 146 using the numerical data entry keys. This sets the button up for MIDI CC (On/Off) mode, as shown in Appendix B. 3. Press **ENTER** to confirm. 4. Assign the two toggle values for press (**DATA 3**) and release (**DATA 2**) as described above. Program Changes Send out a program change message to the sound card, sound module, instrument or other MIDI device that will receive this standard MIDI message. The program change will be sent on the global MIDI channel.

1. 2. 3. 4. 5.

Press the **ADVANCED FUNCTION** button. The keyboard will enter Program Mode. Press the **PROGRAM** key on the keyboard. @@@@1. 2.

3. 4. Press the **ADVANCED FUNCTION** button. The keyboard will enter Program Mode. Press the **BANK LSB** or **BANK MSB** key on the keyboard. @@@@ Select the button you want to control the MMC message. 2. Press the **ADVANCED FUNCTION** button, then the **CTRL ASGN** key. 3. Type in "149" using the numerical data entry keys.

@@4. Press the **ADVANCED FUNCTION** button, then the **CHAN** key. 5. Type in "127" using the numerical keypad. This ensures that the message is sent to all device ID numbers. @@6. Press the **ADVANCED FUNCTION** button, then the **DATA 2** key. 7. @@1. Select the controller to assign as described earlier.

2. Press the **ADVANCED FUNCTION** button, then the **CTRL ASGN** key. @@3. Press Enter to confirm the number entered. 4.

Press the **ADVANCED FUNCTION** button, then the **DATA 3** key. This assigns the number for the **RPN/NRPN MSB**. 5. Press the **ADVANCED FUNCTION** button, then the **DATA 2** key. This assigns the number for the **RPN/NRPN LSB**.

6. Finally, set the channel that the message should be sent on. @@@@ Press the **Dec** button to convert it to a decimal value. @@1. Press the **ADVANCED FUNCTION** button, then the **CTRL ASGN** key. 2. @@3. Press the **ENTER** key to confirm. @@4. Press the **ADVANCED FUNCTION** button, then the **DATA 3** key.

5. Enter "100" using the numerical data entry keys or the **Preset +/-** buttons. 6. Press the **ENTER** key to confirm. When a button is pressed, a Note On message is sent out with a velocity of 100. 7. Press the **ADVANCED FUNCTION** button, then the **DATA 2** key. 8. Enter "0" using the numerical data entry keys or the **Preset +/-** buttons. 9.

Press the **ENTER** KEY to confirm. When a button is released, a Note Off message will be sent out. 10. Press the **ADVANCED FUNCTION** button, then the **DATA 1** key. 11.

Enter "64" using the numerical data entry keys or the **Preset +/-** buttons. 12. Press the **ENTER** key to confirm. These assignments will send out MIDI Note 64 or E4 each time the button is pressed. The MIDI Note numbers are given in Appendix D.

Note: When you press the button in Note Mode, the LED display will briefly show the note velocity. About SysEx Messages and Device ID When transmitting SysEx messages, the individual control channel number does not define a transmit channel, but a Device ID. When the **CHAN** key is pressed, the "c" is NOT displayed in the LED screen. Device IDs range between 00127. In most cases, the Device ID should be set at 127. This means that the SysEx message will be received by all devices. The Device ID for a SysEx message assigned to a controller cannot be changed using the **DEV ID** key. This key is used for varying the global Device ID of the M-Audio O2. For more information please reference the "SysEx Messages" and "Device ID" sections later in the manual. Non-Volatile Memory The M-Audio O2 uses non-volatile memory, allowing the memory to save after powering down and restarting.

The current controller and channel assignments are stored whether you have stored the setup to a memory location or not. The Program, Bank LSB and Bank MSB data, global channel setting, MIDI Out from USB setting and last used memory preset are also stored. Memory Dump Press the **ADVANCED FUNCTION**, then **MEM DUMP** key to send out a number of SysEx data packets that represent the 5 memories set up in the M-Audio O2. This can be used for storing or backing up the contents of the memory presets externally. It is possible to record the complete Memory Dump to a standard sequencer. Recall the Memory Dump by playing the MIDI track containing the recorded Memory Dump, making sure that the M-Audio O2's drivers are selected as output for that particular track. The current controller assignments are not affected by a Memory Dump, or a memory send to the keyboard. Recall a preset to access the new memory settings after a memory dump has been sent to the keyboard. Assigning the Device ID Press the **ADVANCED FUNCTION**, then **DEV ID** key to assign a Device ID to the M-Audio O2. The default Device ID is 127 when a memory dump is performed; that dump can be received by the same keyboard model regardless of the Device ID setting.

If a Device ID is assigned to any number other than 127, the Memory Dump performed will be specific to the M-Audio O2, with the same device ID. If the Device ID of the M-Audio O2 differs from the one recorded with the Memory Dump, the data will be ignored.



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The Device ID is a way of differentiating between multiple keyboards. It is recommended to keep the Device ID setting as 127. When the DEV ID key is pressed, the LED display represents the assigned Device ID.

It is possible to enter a new device ID using the numerical data entry keys, or the Preset +/- buttons. Press the ENTER key to confirm. For more information on Sys Ex messages and device ID, please reference the "MIDI Messages Explained" section of this manual. 9 MIDI Out from USB Mode MIDI Out from USB Mode allows use of the M-Audio O2 as a USB-to-MIDI interface. When MIDI Out from USB Mode is engaged, data transmitted from the MIDI Out port of the O2 is received at the USB port.

If MIDI Out from USB is active and the M-Audio O2 is selected as the USB output device in your software, all data from the software is passed to the MIDI Out port of the O2. 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 set to transmit data from the USB port. Program Mode will automatically cancel. When MIDI Out from USB Mode is NOT active, the MIDI Out port will mirror the data that is sent via USB from the M-Audio O2 controller. To disengage MIDI Out from USB Mode: 1. Press the ADVANCED FUNCTION button.

2. Press the MIDI OUT key. The LED display will show 'Int'. This indicates that the M-Audio O2 keyboard is transmitting data from the keys and controllers of the M-Audio O2. Resetting to the Factory Default Setting To reset the M-Audio O2 back to the factory defaults, switch off the O2. Then, with the unit off, hold down the Preset +/- buttons and turn the unit on. Note: Restoring the factory presets will erase all setups you have stored to memory. MIDI Messages Explained Program and Bank Changes Explained The original GM MIDI specification allowed for only 128 voices, numbered from 0-127. It is possible to access a different voice by sending a Program Change. In order to expand on the GM set of voices, Bank Changes were devised.

Each bank contains 128 patches that can be accessed using a Program Change. There are 16,384 available banks that can be accessed by sending a 14-bit Bank Change message. The first 7 bits of this message are sent in a single byte known as the Bank LSB. The last 7 bits are specified by another byte known as the Bank MSB. The BANK LSB is the most commonly used.

This allows for 128 Bank Changes, and often there is no need to send a Bank MSB. Almost all MIDI devices respond to the Program Change, but some that do not conform to the GM set of voices use the Program Change message for other purposes. Many VST instruments have adopted this approach, allowing the use of a Program Change to change the instrument patch. (The FM7 by Native Instruments is an example of this.) Bank Changes are used more rarely.

Bank Changes are useful in manufacturer's extensions to the MIDI specification, such as Roland's GS specification and Yamaha's XG specification. Both of these require the specification of a Bank Change in order to access the extra voices and effects that these specifications provide. Sending Program, Bank LSB and Bank MSB data is done via the M-Audio O2. Simply press the ADVANCED FUNCTION button followed by the PROGRAM, DATA LSB or DATA MSB key, then enter the Program or Bank Change desired. RPN/NRPNs Explained Non-registered parameter numbers (NRPN's) are device-specific messages that enable the control of synths via MIDI. The MIDI specification defines parameter numbers to allow room for manufacturers to specify their own controllers. The more common of these have been registered by the MIDI Manufacturer's Association and are part of the MIDI specification (hence the term Registered Parameter Numbers RPN's). (See Appendix F for additional information.) MIDI controllers 98 and 99 represent the NRPN LSB and MSB respectively, while 100 and 101 represent the RPN LSB and MSB. This can be seen in the MIDI controllers list in Appendix D.

To transmit an NRPN/RPN, these two controller messages are sent along with their user-specified values. An additional 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. Devices that receive NRPN messages will list NRPNs in the User Manual. It is essential that the NRPN MSB and LSB messages are sent together. Both will be specified in the device's manual, but oftentimes only in Hexadecimal format. If this is the case, you may refer to Appendix C for help translating the value to Decimal. The M-Audio O2 keyboard greatly simplifies the process of transmitting NRPNs. Enter the appropriate NRPN LSB by pressing the LSB/DATA button twice, enter the NRPN MSB by pressing the MSB/DATA button twice, and as the controller is moved, an appropriate NRPN message will be sent out. Assign NRPN Coarse to make big sweeps, or NRPN Fine to make slight adjustments.

10 SysEx Explained System Exclusive (SysEx) messages were defined in the MIDI specification to allow individual devices to have individual control via MIDI. The format of SysEx messages allows for virtually any function to be performed via MIDI--so long as the receiving device is able to translate the message and act accordingly. This allows devices to send audio sample memory data, memory dumps, controller settings, and much more. It also allows the controllers of one device to be controlled by another. It is not possible to program your own specified SysEx message into the M-Audio O2.

However, several useful Sys Ex messages are preprogrammed into the keyboard. They can be accessed by assigning the appropriate MIDI CC to a controller (see Appendix B). It should be noted that a SysEx message is not transmitted on any specified channel. All SysEx messages contain a Device ID, which is used to single out devices to respond to the SysEx message. All other devices are ignored.

If you are using a SysEx message on the M-Audio O2, the Global Channel is ignored. When you press the CHAN key, instead of entering a channel for the controller, you will enter a Device ID instead. This is indicated by the fact that the LED displays a 3-digit number, not a 2-digit number preceded by a "c." Device ID's run from 00 to 127. 127 is the default device number setting on the M-Audio O2. This setting transmits the SysEx message to all devices. Although it is not possible to program the controllers of the M-Audio O2 with your own SysEx messages, there are software applications that can receive a MIDI input signal and transmit a different, user-specified message. You can program your SysEx messages into the translator software, and then translate the incoming data from the keyboard to your SysEx, depending on the controller you are using. General Trouble-Shooting Here are answers to common questions you may have, using your M-Audio O2 keyboard: Problem 1: My keyboard suddenly stopped working after having performed fine since installation.



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Solution 1: Switch off the unit and let it sit for 10 seconds.

Then restart your computer and try again. If the problem persists you may have to reinstall drivers for the unit. Problem 2: I have plugged a sustain pedal into my keyboard, but it works the wrong way around. Solution 2: The polarity of the sustain pedal is calculated by the keyboard when it is powered up. On power up, the sustain pedal is assumed to be in the OFF position. So if you want the sustain pedal to be off when it is not depressed, make sure the pedal is not depressed when you power up. Problem 3: When I press a key, there is a delay before I hear any sound. Solution 3: This delay is known as latency. @MIDI data is simply control data. The MIDI data is read by your software.

@@@5795 Martin Road, Irwindale, CA 91706-6211, U.S.A. Sales Information: Sales Information (email): Tech Support: Tech Support Fax: Internet Home Page: 626-633-9050 info@m-audio.com 626-633-9055 (email): techsupt@m-audio.com 626-633-9060 http://www.m-audio.com M-AUDIO Deutschland (Germany) Kuhallmand 34, D-74613 Ohringen, Germany Sales Information: Sales Information (email): Technical Support: Technical Support (email): Fax: Internet Home Page: 49 7941 98 7000 info@m-audio.de 49 7941 98 70030 support@m-audio.de 0 7941 98 70070 http://www.m-audio.de M-AUDIO U.K. Unit 5, Saracen Industrial Estate, Mark Road, Hemel Hempstead, Herts HP2 7BJ, England Sales Information (phone): Sales Information (fax): Sales Information (email): Technical Support (PC): Technical Support (Mac): Technical Support (email): Internet Home Page: 44 (0) 1442 416590 44 (0) 1442 246832 info@maudio.co.uk 44 (0) 1309 671301 44 (0) 1765 650072 support@maudio.co.uk http://www.maudio.co.

uk M-AUDIO Canada 1400 St-Jean Baptiste Ave. #150, Quebec City, QC G2E 5B7, Canada Tel: Fax: Email: Internet Home Page: 418-872-0444 418-872-0034 midimancanada@m-audio.com http://www.m-audio.ca M-AUDIO France Unit 5, Saracen Industrial Estate, Mark Road, Hemel Hempstead, Herts HP2 7BJ, England Informations Commerciales: Informations Commerciales (email): Assistance Technique: Assistance Technique (email): Fax: Site Internet: 0810 001 105 info@m-audio.fr 0820 000 731 (PC) ou 0820 391 191 (Mac at général) support@m-audio.fr.com ou mac@m-audio.fr +44 (0) 144 224 6832 http://www.m-audio.

fr M-AUDIO Japan Annex Buliding 6F, 2-18-10 Marunouchi, Naka-Ku, Nagoya 460-0002, Japan Tel: Fax: Technical Support: Email: Internet Home Page: 81 52 218 3375 81 52 218 0875 08 200 0731 info@m-audio.co.jp http://www.m-audio.co.

jp Warranty Terms & Registration Warranty Terms M-Audio warrants products to be free from defects in materials and workmanship, under normal use and provided that the product is owned by the original, registered user. Visit www.m-audio.com/warranty for terms and limitations applying to your specific product. Warranty Registration Thank you for registering your new M-Audio product.

Doing so immediately both entitles you to full warranty coverage and helps M-Audio develop and manufacture the finest quality products available. Register online at www.m-audio.com/register to receive FREE product updates and for the chance to win FREE M-Audio gear. 12 Technical Info Modifications not authorized by the manufacturer may void users authority to operate this device. Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: . . . Reorient or relocate the receiving antenna.

*Increase the separation between the equipment and receiver. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. Consult the dealer or an experienced radio/TV technician for help. VST is a trademark of Steinberg Soft und Hardware GmbH ASIO is a trademark of Steinberg Soft und Hardware GmbH DirectX is copyright 2002 Microsoft Sound Studio II, PictureBoard and Music Teacher are copyright 2003 Evolution Electronics Ltd All rights reserved ESD and Fast Transient may cause the unit to temporarily malfunction. Switch off and on again to restore normal operation. 13 Appendices Appendix A - MIDI IMPLEMENTATION CHART Function Basic :Default Channel: Changed :Default Mode :Messages :Altered Note Number: True Voice Velocity: Note ON : Note OFF After Touch : Keys :Ch's Transmitted 1-16 1-16 -----X ***** 0-127 ***** 0 X X 0 0 0-119 X Received Remarks X X X X X Pitch Bend Control Change 120-127 Program Change: True Number System Exclusive 0 0 0-127 ***** GM, GM2, MMC X X X X X Memory Dump Song Position Common: Song Select X System :Clock Exclusive: Commands Aux Messages :Local ON/OFF :All Notes OFF :Active Sense :Reset Notes: X X 0 0 0 0 = YES X X X=NO 14 Appendix B - Assignable MIDI CC's on the M-Audio O2 B1 - The Fader and rotary Controllers: MIDI CC 0-119 120-127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 255 Description Standard MIDI CC's Channel Mode Messages Pitch Bend Sensitivity Channel Fine Tune Channel Coarse Tune Channel Pressure RPN Coarse RPN Fine NRPN Coarse NRPN Fine Master Volume GM* Master Pan GM* Master Coarse Tune GM* Master Fine Tune GM* Chorus Mod Rate GM2* Chorus Mod Depth GM2* Feedback GM2* Send to Reverb GM2* Pitch Bend Controller Off*** - Data Lsb (Press Twice) - Data Msb (Press Twice) RPN LSB RPN LSB NRPN LSB NRPN LSB Volume LSB Pan LSB Tuning LSB Tuning LSB Mod rate Mod depth Feedback level Reverb send level Pitch shift LSB - RPN MSB RPN MSB NRPN MSB NRPN MSB Volume MSB Pan MSB Tuning MSB Tuning MSB Pitch shift MSB - * Sys Ex messages ** MMC Sys Ex messages *** This value cannot be typed in using the numerical keypad. Type in 144 and then press the Preset + button to set this value. 15 The Buttons and Pedal: Program (Press Twice) Value Value Value Value Program MIDI CC Note Note MIDI CC MIDI CC - MIDI CC 0-119 120-127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 255 Description Standard MIDI CC's Channel Mode Messages Pitch Bend Range Channel Fine Tune Channel Coarse Tune Channel Pressure RPN Coarse RPN Fine NRPN Coarse NRPN Fine Master Volume GM* Master Pan GM* Master Coarse Tune GM* Master Fine Tune GM* Chorus Mod Rate GM2* Chorus Mod Depth GM2* Feedback GM2* Send to Reverb GM2* Pitch Bend Program/Bank Preset MIDI CC (on/off) Note (on/off) Note (on/off toggle) MMC Command** Reverb Type GM2 * Reverb Time GM2 * Chorus Type GM2* MIDI CC Decrement MIDI CC Increment Controller Off*** Data Lsb (Press Twice) Toggle value 2 Toggle value 2 Sensitivity value Tuning amount Tuning amount Pressure amount RPN LSB RPN LSB NRPN LSB NRPN LSB Volume LSB Pan LSB Tuning LSB Tuning LSB Mod rate Mod depth Feedback level Reverb send level Pitch shift LSB Bank LSB Button press value Velocity off Velocity off Command select.*



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Type Time Type Start value Start value - Data Msb (Press Twice) Toggle value 1 Toggle value 1 RPN MSB RPN MSB NRPN MSB NRPN MSB Volume MSB
Pan MSB Tuning MSB Pitch shift MSB Bank MSB Button release value Velocity on Velocity on End value End value - * Sys Ex messages **
MMC Sys Ex messages *** This value cannot be typed in using the numerical keypad. Type in 144 and then press the Preset + button to set this value.

16 Appendix C - Hexadecimal Conversion Chart Hexadecimal to Decimal Conversion Chart Hexadecimal Value 0 1 2 3 4 5 6 7 8 9 0A 0B 0C 0D 0E 0F 10 11
12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F 20 21 22 23 24 25 26 27 28 29 2A Decimal Value 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 Hexadecimal Value 2B 2C 2D 2E 2F 30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F 40 41 42
43 44 45 46 47 48 49 4A 4B 4C 4D 4E 4F 50 51 52 53 54 55 Decimal Value 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68
69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 Hexadecimal Value 56 57 58 59 5A 5B 5C 5D 5E 5F 60 61 62 63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F
70 71 72 73 74 75 76 77 78 79 7A 7B 7C 7D 7E 7F Decimal Value 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110
111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 17 Appendix D - Useful MIDI data General MIDI Instruments Piano 0 Acoustic
Grand Piano 1 Bright Acoustic Piano 2 Electric grand Piano 3 Honky Tonk Piano 4 Electric Piano 1 5 Electric Piano 2 6 Harpsichord 7 Clavinet Chromatic
Percussion 8 Celesta 9 Glockenspiel 10 Music Box 11 Vibraphone 12 Marimba 13 Xylophone 14 Tubular bells 15 Dulcimer Organ 16 Drawbar Organ 17
Percussive Organ 18 Rock Organ 19 Church Organ 20 Reed Organ 21 Accordion 22 Harmonica 23 Tango Accordion Bass 32 Acoustic Bass 33 Fingering
Bass 34 Electric Picked Bass 35 Fretless Bass 36 Slap Bass 1 37 Slap Bass 2 38 Syn Bass 1 39 Syn Bass 2 Strings/Orchestra 40 Violin 41 Viola 42 Cello 43
Contrabass 44 Tremolo Strings 45 Pizzicato Strings 46 Orchestral Harp 47 Timpani Ensemble 48 String Ensemble 1 49 String Ensemble 2 50 Syn Strings 1
51 Syn Strings 2 52 Choir Aahs 53 Voice Oohs 54 Syn Choir 55 Orchestral Hit 72 Piccolo 73 Flute 74 Recorder 65 Alto Sax Reed 64 Soprano Sax 66 Tenor
Sax 67 Baritone Sax 68 Oboe 69 English Horn 70 Bassoon 71 Clarinet Pipe Synth Effects 96 SFX Rain 97 SFX Soundtrack 98 SFX Crystal 99 SFX
Atmosphere 100 SFX Brightness 101 SFX Goblins 102 SFX Echoes 103 SFX Sci-Fi Ethnic 104 Sitar 105 Banjo 106 Shamisen 107 Koto 108 Kalimba 109 Bag
Pipe 110 Fiddle 111 Shanai Percussive 112 Tinkle Bell 113 Agogo 114 Steel Drums 115 Woodblock 116 Taiko Drum 117 Melodic Tom 118 Syn Drum 119
Reverse Cymbal 75 Pan Flute 76 Bottle Blow 77 Shakuhachi 78 Whistle 79 Ocarina Synth Lead 80 Syn Square Wave 81 Syn Sawtooth Wave 82 Syn Calliope
83 Syn Chiff 84 Syn Charang 85 Syn Voice 86 Syn Sawtooth Wave 87 Syn Brass & Lead Guitar 24 Nylon Acoustic 25 Steel Acoustic 26 Jazz Electric 27 Clean
Electric 28 Muted Electric 29 Overdrive 30 Distorted 31 Harmonics 56 Trumpet Brass 57 Trombone 58 Tuba 59 Muted Trumpet 60 French Horn 61 Brass
Section 61 Syn Brass 1 62 Syn Brass 2 Synth Pad 88 New Age Syn Pad 89 Warm Syn Pad 90 Polysynth Syn Pad 91 Choir Syn Pad 92 Bowed Syn Pad 93
Metal Syn Pad 94 Halo Syn Pad 95 Sweep Syn Pad Sound Effects 120 Guitar Fret Noise 121 Breath Noise 122 Seashore 123 Bird Tweet 124 Telephone Ring
125 Helicopter 126 Applause 127 Gun Shot MIDI Note Numbers Octave (n) Cn -1 0 1 2 3 4 5 6 7 8 9 0 12 24 36 48 60 72 84 96 108 120 C#n 1 13 25 37 49
61 73 85 97 109 121 Dn 2 14 26 38 50 62 74 86 98 110 122 D#n 3 15 27 39 51 63 75 87 99 111 123 En 4 16 28 40 52 64 76 88 100 112 124 Note Numbers
Fn 5 17 29 41 53 65 77 89 101 113 125 F#n 6 18 30 42 54 66 78 90 102 114 126 Gn 7 19 31 43 55 67 79 91 103 115 127 G#n 8 20 32 44 56 68 80 92 104
116 An 9 21 33 45 57 69 81 93 105 117 A#n 10 22 34 46 58 70 82 94 106 118 Bn 11 23 35 47 59 71 83 95 107 119 18 Appendix E - Standard MIDI
Controller numbers (MIDI CC's) 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
40 41 42 43 44 45 Bank Select Modulation Breath Control Controller 3 Foot Control Porta Time Data Entry Channel Volume Balance Controller 9 Pan
Expression Effects Controller 1 Effects Controller 2 Controller 14 Controller 15 Gen Purpose 1 Gen Purpose 2 Gen Purpose 3 Gen Purpose 4 Controller 20
Controller 21 Controller 22 Controller 23 Controller 24 Controller 25 Controller 26 Controller 27 Controller 28 Controller 29 Controller 30 Controller 31
Bank Select LSB Modulation LSB Breath Control LSB Controller 35 Foot Control LSB Porta Time LSB Data Entry LSB Channel Volume LSB Balance LSB
Controller 41 Pan LSB Expression LSB Controller 44 Controller 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74
75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 Controller 46 Controller 47 Gen Purpose 1 LSB Gen Purpose 2 LSB Gen Purpose 3 LSB Gen Purpose 4
LSB Controller 52 Controller 53 Controller 54 Controller 55 Controller 56 Controller 57 Controller 58 Controller 59 Controller 60 Controller 61 Controller
62 Controller 63 Sustain Pedal Portamento Sostenuto Soft Pedal Legato Pedal Hold 2 Sound Variation Resonance Release Time Attack Time Cut-off
Frequency Controller 75 Controller 76 Controller 77 Controller 78 Controller 79 Gen Purpose 5 Gen Purpose 6 Gen Purpose 7 Gen Purpose 8 Portamento
Control Controller 85 Controller 86 Controller 87 Controller 88 Controller 89 Controller 90 Reverb Depth Extra RPN Messages 128 129 130 131 Pitch
Bend sensitivity Fine Tune Coarse Tune Channel Pressure 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116
117 118 119 Tremelo Depth Chorus Depth Celeste (De-tune) Phaser Depth Data Increment Data Decrement Non-Reg Param LSB Non-Reg Param MSB Reg
Param LSB Reg Param MSB Controller 102 Controller 103 Controller 104 Controller 105 Controller 106 Controller 107 Controller 108 Controller 109
Controller 110 Controller 111 Controller 112 Controller 113 Controller 114 Controller 115 Controller 116 Controller 117 Controller 118 Controller 119
Channel Mode Messages 120 121 122 123 124 125 126 127 All Sound off Reset all Controllers Local Control All Notes Off Omni Off Omni On Mono On
(Poly Off) Poly On (Mono Off) 19 Appendix F - Roland GS and Yamaha XG NRPN Support to Roland JV/XP NRPN MSB CC99 01 01 01 01 01 01 01 01 *14
*15 *16 *17 18 *19 1A 1C 1D 1E %1F NRPN LSB CC98 08 09 0A 20 21 63 64 66 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F
Data MSB CC06 00-7F
CC38 n/a (-64 - 0 - +63) Vibrato Rate (relative change) n/a (-64 - 0 - +63) Vibrato Depth (relative change) n/a (-64 - 0 - +63) Vibrato Delay (relative
change) n/a (-64 - 0 - +63) Filter Cutoff Freq.



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(relative change) n/a (-64 - 0 - +63) Filter Resonance (relative change) n/a (-64 - 0 - +63) EG (TVF&TVA) Attack Time (relative change) n/a (-64 - 0 - +63) EG (TVF&TVA) Decay Time (relative change) n/a (-64 - 0 - +63) EG (TVF&TVA) Release Time (relative change) n/a (-64 - 0 - +63) Drum Filter Cutoff Freq. (relative change) n/a (-64 - 0 - +63) Drum Filter Resonance (relative change) n/a (-64 - 0 - +63) Drum EG Attack Rate (relative change) n/a (-64 - 0 - +63) Drum EG Decay Rate (relative change) n/a (-64 - 0 - +63) Drum Instrument Pitch Coarse (relative change) n/a (-64 - 0 - +63) Drum Instrument Pitch Fine (relative change) n/a (0 to Max) Drum Instrument Level (absolute change) n/a (Random, L>C>R) Drum Instrument Panpot (absolute change) n/a (0 to Max) Drum Instrument Reverb Send Level (absolute change) n/a (0 to Max) Drum Instrument Chorus Send Level (absolute change) 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 G - General MIDI Reverb and Chorus Types Reverb Types 0: 1: 2: 3: 4: 8: Small Room Medium Room Large Room Medium Hall Large Hall Plate Chorus Types 0: 1: 2: 3: 4: 5: Chorus 1 Chorus 2 Chorus 3 Chorus 4 FB Chorus Flanger 20.



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