

M-16DX 16-Channel Digital Mixer



Using the M-16DX with a DAW

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M16DXWS05

About the Workshop Booklets

The EDIROL M-16DX 16-Channel Digital Mixer delivers the power of digital mixing to musicians at an incredibly affordable price. This crystal-clear 24-bit digital mixer supports sample rates up to 96 kHz, and it's extremely flexible, with a wide range of analog and digital inputs and outputs, and effects. The M-16DX's USB connectivity makes it an ideal partner for a computer-based digital audio workstation, and features such as its pro EQ and the innovative Room Acoustic Control make it an excellent live mixer as well.

Each M-16DX Workshop Series booklet focuses on one M-16DX topic, and is intended as a companion to the *M-16DX Owner's Manual*.

The M-16DX Workshop booklets require M-16DX O.S. Version 2.00 or higher. You can download the latest O.S. for free from www.RolandUS.com/EDIROL.

About This Booklet

The M-16DX makes an excellent companion to a digital audio workstation—or “DAW”—on a personal computer. Its USB 2.0 connectivity makes it easy to get audio from the M-16DX into the DAW. Within the DAW, you can grab audio from any of the M-16DX's 16 input channels or the M-16DX's stereo main mix bus.



Every DAW deals with audio in basically the same way. This booklet discusses the universal issues and possibilities you'll find with any DAW when you're working with the M-16DX. Other Workshop booklets detail using the M-16DX with specific DAWs—you should read this booklet first, though, to make sure you're clear about the overall process.

With its Version 2.00 operating system software or higher, the M-16DX can act as a control surface, allowing you to operate DAWs directly from the M-16DX. To learn more—after reading the booklet you're reading now—see the *Using the M-16DX as a DAW Controller* Workshop booklet.

Understanding the Symbols in This Booklet

Throughout this booklet, you'll come across information that deserves special attention—that's the reason it's labeled with one of the following symbols.



A note is something that adds information about the topic at hand.



A tip offers suggestions for using the feature being discussed.



Warnings contain important information that can help you avoid possible damage to your equipment, your data, or yourself.

Hot Links

Each Workshop booklet is meant to be read in order from beginning to end. However, if we mention an upcoming section—and you see this arrow—you can click the arrow to jump there immediately.



The Basics of Working with a DAW



Using the M-16DX with a computer requires the installation of M-16DX driver software on the computer. We'll describe in detail how to obtain and install this software a bit later. If you're experienced with using audio interfaces and DAWs, you can jump to these instructions now.



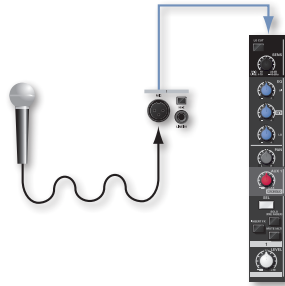
When you're using the M-16DX—or any audio interface, really—with a DAW, the two things to get a handle on are how

- 1 audio gets into a DAW
- 2 you listen to what you're doing.

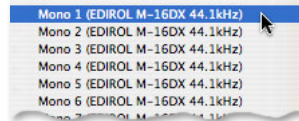
How Audio Gets Into a DAW

Once you've set everything up:

- *Audio arrives at an M-16DX input channel*—When you connect a mic, instrument, or other audio device to an M-16DX input jack, its audio is automatically routed to the corresponding M-16DX input channel.



- *You select the desired M-16DX channel or main mix bus as the audio a DAW track will record*—Each track in a DAW can record audio from any M-16DX input or its main mix bus.



Once you've recorded audio into a DAW, any changes you want to make to the recorded audio's sound get made in the DAW itself, including any effects you want to add. When you mix, you also mix inside the DAW.

How You Listen to What You're Doing

When you're working with a DAW, your listening, or "monitoring," setup depends on the kind of session you're working on:

- *In a multitrack session*—you record voices and instruments on their own tracks. You can use this technique for building an arrangement a track-at-a-time, or for doing a live recording of an entire group. Each track records audio from a single M-16DX mono or stereo input channel.
- *In a two-track session*—you capture a final musical performance by one or more musicians on a single stereo DAW track by recording from the M-16DX's main mix bus.

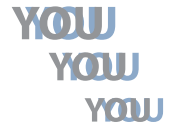
About Multitrack Session Monitoring

Latency

While modern electronic devices do things astoundingly fast, things still take a *little* time to do. It only makes sense that it takes some time for audio to travel from a voice or instrument to an audio interface, then through a cable to a computer's hardware, through that hardware to the computer's system software, from that software to a DAW's track, and then from the track to your ears. The musical ear is very sensitive to even tiny timing issues, which—of course—amount to rhythmic issues in music.

The lag in time that occurs as audio travels from a mic or instrument into and out of a DAW track is called "latency," and it's enough of a lag to make performing perfectly in time along with the DAW's metronome or already recorded tracks difficult, or even impossible with a slower computer.

This is because when you listen to yourself through a DAW while recording, latency causes the "you" that you hear to be late compared to the DAW's timing. What you'll hear is rhythmically a bit off—just how bad the latency is depends on the speed of your computer and a few other things. Even though your recorded performance may actually be in time, that's not what you'll hear as you record.



What you hear is not what you get.

Fortunately, there's a solution.

Zero-Latency Monitoring

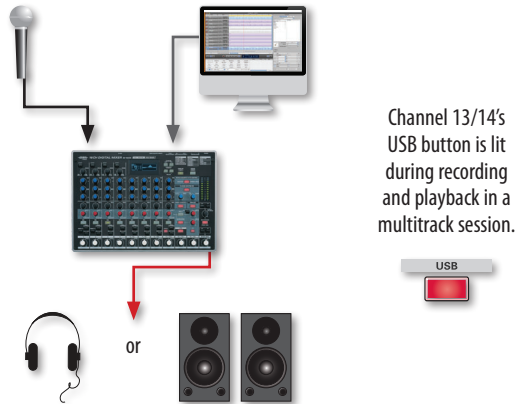
When the M-16DX is connected to a computer via USB, the audio output of the computer is returned to the M-16DX through its stereo USB channel, Channel 13/14. This allows you to monitor the DAW's output side-by-side with what you're currently recording using zero-latency monitoring.



With faster systems, latency can be more subtle, and you may choose to listen through the DAW as you record anyway so you can hear the DAW's effects. Still, since there's always some lag no matter how fast your system is, we generally recommend zero-latency monitoring.

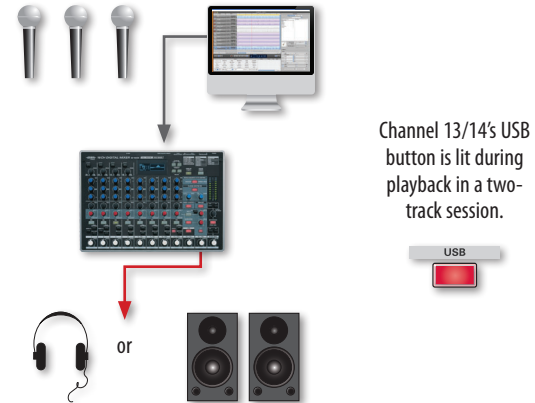
When you listen to the M-16DX stereo main mix bus with zero-latency monitoring, what you hear is

- *what you're recording*—directly through its M-16DX channel.
- *the DAW's output*—including its metronome and/or already-recorded tracks, through M-16DX Channel 13/14.



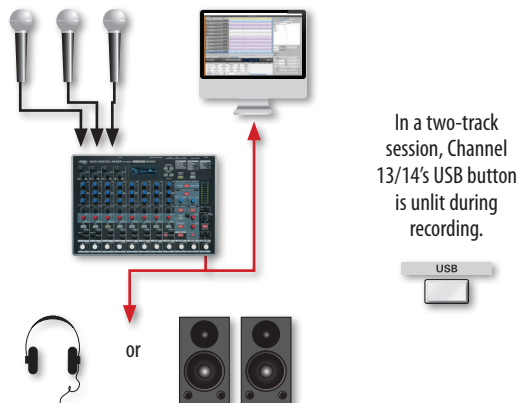
If you listen to the DAW in the M-16DX's main mix while you're recording that same mix into the DAW, the DAW's output gets sent back to itself in a feedback loop.

When you play back the recording, you turn on Channel 13/14's USB button and listen to the DAW.



About Two-Track Session Monitoring

While you're recording a performer or group live from the M-16DX's main mix bus, you turn off Channel 13/14's USB button and listen only to the M-16DX's main mix since it's what's being sent to the DAW for recording.



Setting Up

Installing M-16DX Drivers

The M-16DX works with the following computer operating (OS) systems:

- Windows XP™
- Windows XP 64-bit Edition™
- Mac OS X™
- Windows Vista 32-bit Edition™
- Windows Vista 64-bit Edition™

In the following steps we'll describe the installation of drivers for Windows XP 32-bit and Mac OS X, the two most common operating systems. (All of the M-16DX driver installers come with installation instructions in any event.)



The following instructions assume you're familiar with the operation of your computer. If you're not, consult its documentation.

Downloading Drivers

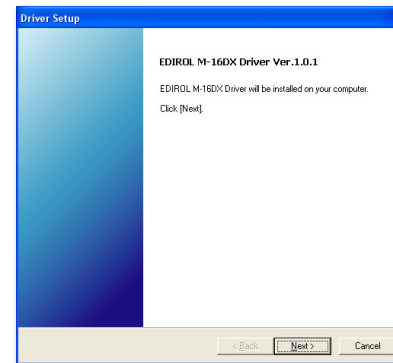


Each driver installer includes details regarding the OS system requirements for its driver, as well as a list of cautions and limitations.

- 1 Point your browser to the following URL or click the link below:
<http://www.rolandus.com/products/productdetails.aspx?ObjectId=860>
- 2 In your browser, click the Downloads tab.
- 3 Locate the desired driver, and click its name.
- 4 In the “End-User License Agreement,” click “I AGREE AND WISH TO PROCEED WITH DOWNLOAD”—the file downloads to your computer.
- 5 On a
 - PC—the downloaded file is automatically uncompressed. Locate the folder called “M-16DX_win_xp.”
 - Mac—locate and double-click the M16DXUSBDriver.tar file to create a folder called “M16DXUSBDriver.”
- 6 Inside your driver folder, you’ll find the driver installer.

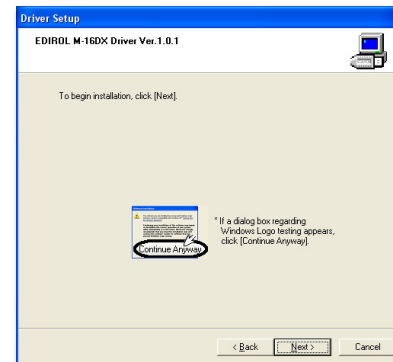
Windows XP Driver Installation

- 1 Power up your PC with all USB cables disconnected except for your keyboard and mouse.
- 2 If any applications are running, quit them.
- 3 Open up the M-16DX_win_xp folder, and double-click the Setup file inside to display the following window:



If an “Install Program as Other User” dialog appears, quit the installer, and then log in as the system administrator before installing the M-16DX driver.

- 4 Click Next to display the installation start window:

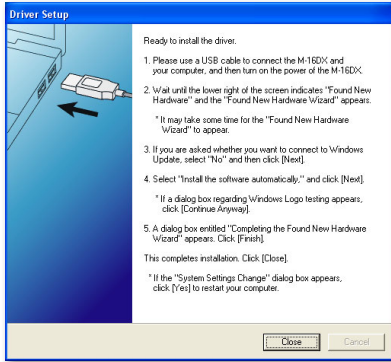




If you see the Software Installation window instead of the one shown above, click Continue Anyway. If you can't continue, see "About Driver Signing Options" later in this booklet.



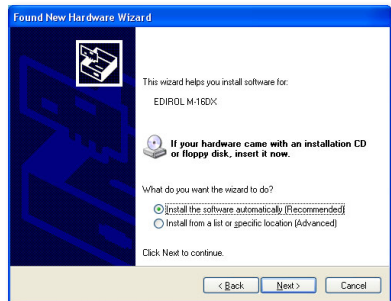
A progress bar appears for a moment, and then the following screen:



- 5 With the M-16DX's power turned off, plug one end of the included USB cable into its USB jack, and the other end into the USB jack on your computer that you want to use.
- 6 Turn on the M-16DX—after a few moments, the PC's Found New Hardware Wizard opens.

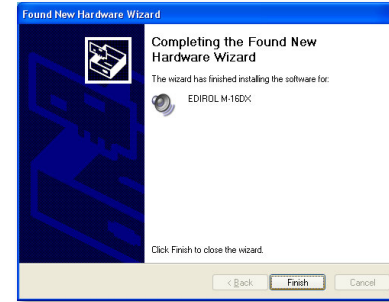


If you're asked if you want to connect to Windows Update, select No, not this time, and then click Next.



- 7 Select **Install the software automatically (Recommended)**, and then click Next.

When the driver's installed, the wizard announces the completion of the installation process.



If the "Software installation" window appears, click Continue Anyway. If you can't continue, see "About Driver Signing Options" later in this booklet.



If the "System Settings Change" window appears, click Yes to restart Windows, and jump ahead to "System Settings on Your Computer" after restarting.



- 8 Click Finish.
Windows displays "Your new hardware is ready to use."
- 9 If the Driver Setup window's still open, click its Close button.
- 10 Jump ahead to "System Settings on Your Computer"

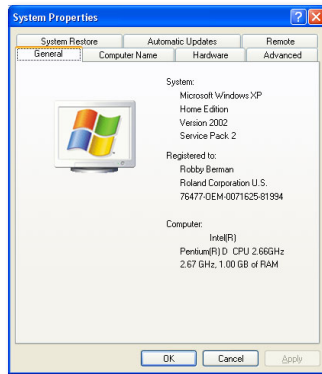


Should you ever need to remove the M-16DX driver from your system, the driver installer folder also contains an uninstaller. You can hold onto this file, or re-download the driver folder later should you need the uninstaller at some point in the future.

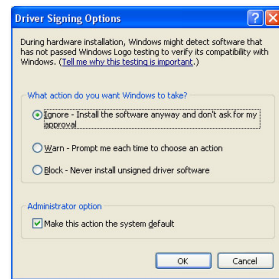
About Driver Signing Options

The Driver Signing window lets you select whether Windows should block the installation of an unknown driver, warn you about it, or just install it.

- 1 In the Start menu, select Control Panel.
- 2 If you're in
 - *Category View*—click Performance and Maintenance, and then click System.
 - *Classic View*—double-click System.



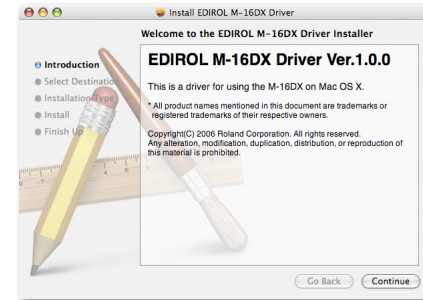
- 3 Click the Hardware tab, and then click Driver Signing.
- 4 Set "What action do you want Windows to take?" to **Ignore** or **Warn**.
- 5 Click OK to close the Driver Signing window.



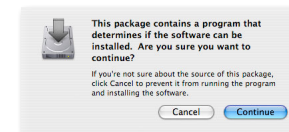
- 6 Click OK to close the System Properties window.
- 7 Return to the driver installation instructions earlier in this booklet.

Mac OS X Driver Installation

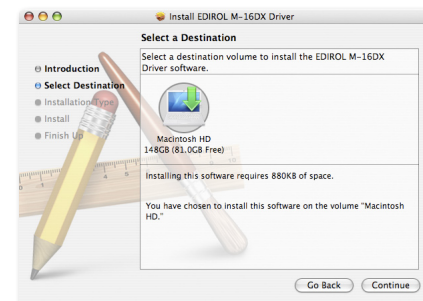
- 1 Start up your computer with all USB cables disconnected except for your keyboard and mouse.
- 2 Open up the M16DXUSBDriver folder, and double-click the M16DXUSBDriver.pkg file inside to display the following window:



If you see this dialog at any time during the installation process, click Continue.

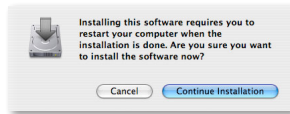


- 3 Click Continue—the installer scans your hard drives before displaying them in a new window.

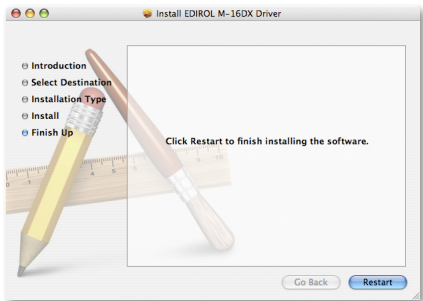


- 4 Click your bootup hard drive so that a green arrow appears on it as shown above.

- 5 Click Continue, and then click Install, or Upgrade if you've previously installed an earlier version of the M-16DX driver.
- 6 If the computer asks you to enter your computer's administrator password, type it in and click OK.
- 7 When the computer tells you you'll need to restart the computer after the installation, click Continue Installation.



- 8 After the driver's been installed, you'll see this screen.



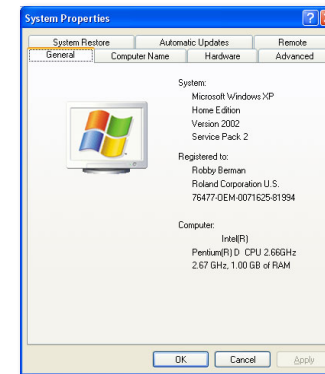
- 9 Click Restart.
- 10 After the computer restarts, with the M-16DX turned off, plug one end of the included USB cable into its USB jack, the other end into a USB jack on your computer, and then turn on the M-16DX.
- 11 Read "System Settings on Your Computer" in the next column.

System Settings for Your Computer

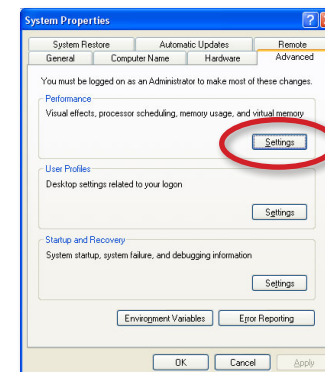
Optimizing Your Windows PC for Audio

To optimize Windows XP for DAW audio operations

- 1 In the Start menu, select Control Panel.
- 2 If you're in
 - *Category View*—click Performance and Maintenance, and then click System.
 - *Classic View*—double-click System.

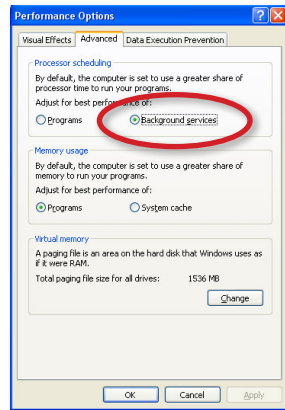


- 3 Click the Advanced tab, and then click the Performance Settings button.



Should you ever need to remove the M-16DX driver from your system, the driver installer folder also contains an uninstaller. You can hold onto this file, or re-download the driver folder later on should you need the uninstaller at some point in the future.

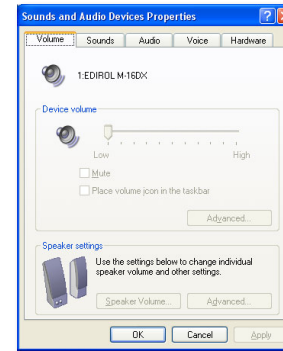
- 4 In the Performance Options window, click the Advanced tab.
- 5 Select **Background Services** as shown here.



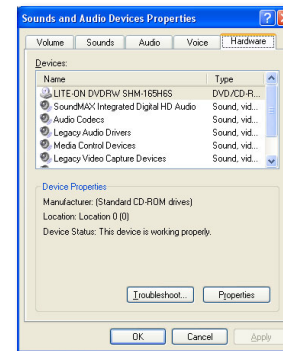
- 6 Click OK to close the Performance Options window, and then click OK to close the System Properties window.

Sending Windows XP System Sounds to the M-16DX

- 1 In the Start menu, select Control Panel.
- 2 If you're in
 - *Category View*—click Sounds, Speech, and Audio Devices, and then click Sounds and Audio Devices.
 - *Classic View*—double-click Sounds and Audio Devices.



- 3 Click the Hardware tab to display a list of devices.



You'll find more tips on tweaking Windows XP for recording and playback at MusicXP.net, http://musicxp.net/tuning_tips.php.

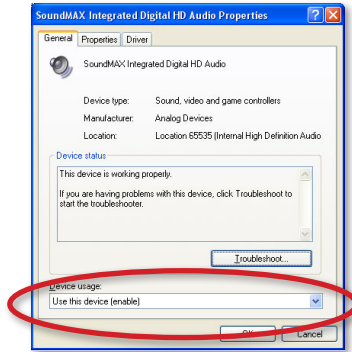
Using the M-16DX for System Sounds

In addition to using the M-16DX with a DAW, you can use it for all of your computer's operating system sounds if you like. The following sections explain how to set this up.



It's a good idea to turn off your system sounds while you're actually working with your DAW for a couple of reasons. First, they may provide an extra burden for your computer's processor when it's busy recording and playing tracks in your DAW. Second, if you're recording the M-16DX's main mix bus into your DAW in a two-track session, the system sounds will be included in the recording.

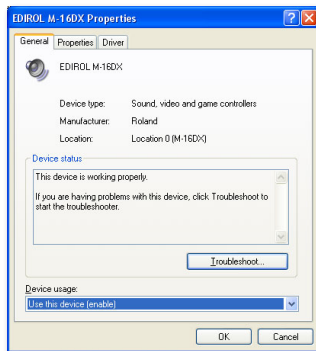
- 4 Double-click your current sound card in the list.



- 5 You'll need to disable the sound card so it doesn't conflict with the M-16DX. If you want to disable the card
- for the current user of the PC—set Device usage to **Do not use this device in the current hardware profile (disable)**.
 - for all users of the PC— set Device usage to **Do not use this device in any hardware profile (disable)**.

- 6 Click OK.

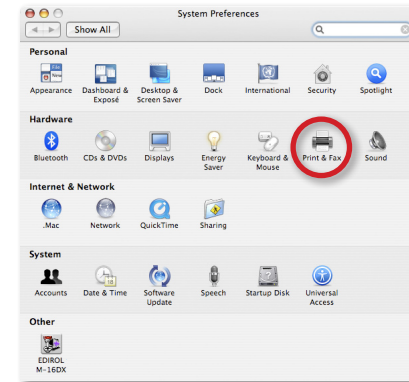
- 7 In the list, double-click EDIROL M-16DX.



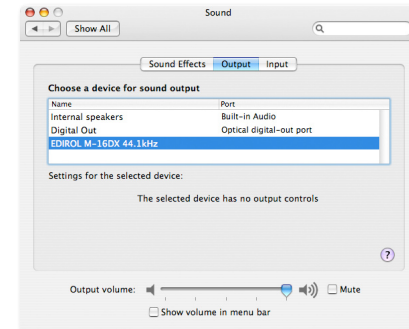
- 8 Set Device usage to **Use this device (enable)**, and then click OK.

Sending Mac OS X System Sounds to the M-16DX

- 1 Open your System Preferences window.

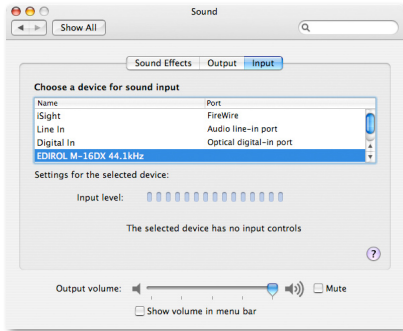


- 2 Click Sound—circled above—to open the Sound control panel.
- 3 Click the Output tab, and select EDIROL M-16DX.



In the Sound control panel, you'll see the M-16DX's current sample rate after "EDIROL M-16DX." We'll discuss sample rates in a bit.

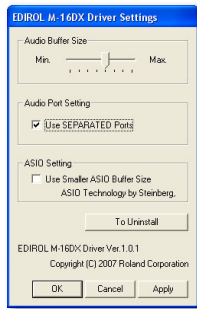
- Click the Input tab, and select EDIROL M-16DX.



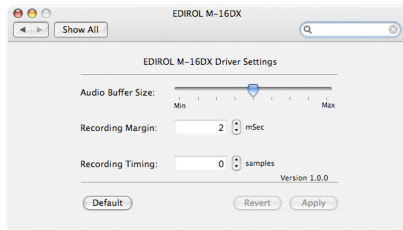
- Close the Preferences window.

The M-16DX Driver Settings

The M-16DX driver installer adds an M-16DX control panel to Windows, and a Preferences pane to Mac OS X. In these windows, you'll find controls you may need as you set up and work with your DAW.



Windows XP



Mac OS X

To gain access to your individual M-16DX channels within your DAW in Windows XP, checkmark the Use Separated Ports Audio Port parameter.

The Audio Buffer size parameter can be helpful if you're having trouble successfully record or playing back. Larger buffer settings can get rid of clicks and pops, though they also increase latency in the DAW.

Matching Sample Rates



In digital audio, the number of times per second that a sample—essentially a snapshot—is taken of your audio is called the “sample rate.” CDs use a sampling rate of 44.1 kHz, or 44,100 samples per second.

The M-16DX can operate at 44.1 kHz, 48 kHz, and 90 kHz sampling rates, and you can select any one with which your DAW is also compatible. Use

- **44.1 kHz**—if you're recording music strictly for CD. Since 44.1 kHz is the sampling rate CDs use, you'll avoid having to apply sample-rate conversion later on.
- **48 kHz**—for slightly better audio quality than 44.1 kHz if your destination media isn't a CD. If it is, you can still use 48 kHz, but the sample-rate conversion process you'll need to get the recording onto a CD will probably take away any benefits the higher sample rate's gotten you.
- **96 kHz**—for very high-quality audio. Again this is mostly for recordings not destined for CD, for the same reasons as 48 kHz.

You set the sample rate for the M-16DX in its UTILITY screen, by setting the Sample Freq parameter as described in the *Using the M-16DX with a DAW Workshop* booklet.



After you change the M-16DX's sample rate while it's connected to a computer via USB, you've got to either power the off and back for the sample rate change to take effect, or disconnect and reconnect either end of the USB cable connecting the M-16DX and the computer.

The sample rate of the M-16DX and your DAW has to be the same to ensure the successful passing of audio back and forth via USB. In the case of

- **system sounds**—your computer will automatically change its sample rate to match when the M-16DX's sample rate is changed.
- **your DAW**—it's a good idea to quit and re-launch your DAW after changing the M-16DX's sample rate. Also, make sure the sample rate of any new project you create matches the M-16DX's sample rate. If you're working on a pre-existing project, set the M-16DX's sample rate to match the project's.

Getting to Work with the M-16DX and a DAW

Configuring Your DAW

The rest of the setting-up you need to do takes place in your DAW. We'll give specific instructions on how to do these things in the individual DAW-specific Workshop booklets.

Keeping Audio Clean

Getting a clean audio signal when you're recording electric or electronic instruments is pretty simple—use good-quality cables. When you're using mics, however, a little thought is required.

If you're recording yourself through mics, it's a good idea to listen through headphones connected to the M-16DX's PHONES jack, whose level is controlled by the PHONES/CTRL ROOM knob. If you work on speakers, your mic will pick up the M-16DX's main mix and that'll get recorded behind your audio—not usually a good thing.

If you're recording someone else who's in your studio while you're in the control room

- *you listen to the M-16DX main mix in your control room*—by connecting the CONTROL ROOM L and R jacks to your control room speaker amp or to powered speakers. Adjust your listening volume using the PHONES/CTRL ROOM knob.
- *your performer listens to Aux Bus 1 through headphones*—connected to a headphone amp plugged into the M-16DX's AUX SEND 1 jack. Locate the USB to AUX1 parameter in the M-16DX's UTILITY menu and turn the parameter on so the DAW's signal goes to AUX 1. Press the AUX 1 button so it lights, and then use your input channel's AUX 1 knob to balance the performer's live signal against the audio coming from the DAW.



If you're recording a group of musicians together, they should listen through headphones connected to a multi-output headphone amp plugged into the M-16DX's AUX SEND 1 jack.

Session Monitoring Procedures

Listening in a Multitrack Session

On the LEVEL

When you select an M-16DX mono channel—or pair of channels—to be recorded on a track in a DAW, the track grabs the audio from the channel before it reaches its LEVEL knob. This means the LEVEL knob has no effect on the volume of the audio as it's recorded on the DAW track. The LEVEL knob only controls the volume of the channel's signal as it goes into the M-16DX's main mix, which is what you listen to as you record into the DAW.

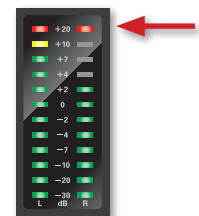


While a channel's LEVEL-knob setting has no effect on the volume of its signal when it goes to the DAW, the channel's EQ controls above the knob *do* shape the tone of the audio the DAW records.

Balancing Your Monitoring Mix

As you record, you'll set up your monitor mix by

- *setting the desired listening volume of the audio you're now recording using its channel's LEVEL knob.*
- *turning on the USB button and setting the desired listening volume of the DAW using the Channel 13/14 LEVEL knob.*
- *setting the overall volume of the main mix using the MAIN MIX LEVEL knob as loud as you can without lighting the red indicators in the M-16DX's main meters.*
- *adjusting the volume of your headphones or speakers using the PHONES/CTRL knob.*



Using Effects in Your Monitoring Mix

The M-16DX's loop effect—the one produced by its FX processor—adds an effected copy of a channel's signal to the M-16DX's main mix. Since you're not recording the main mix, this effected copy isn't recorded in the DAW.



While loop effects aren't recorded in a DAW when you're recording input channels, Channel 1's and Channel 2's insert effects are.

This means you can use an M-16DX loop effect just to make things sound better during recording. For example, some singers find it easier to get a good performance when they hear reverb on their voice. Use as much reverb or delay as you want in the main mix, since it won't be going into the DAW.



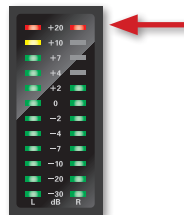
For an introduction to loop and insert effects, see the *Getting Started with the M-16DX* Workshop booklet. To learn more about the M-16DX's effects, see the Workshop booklet *The M-16DX Effects*.

Two-Track Session Monitoring

What You Hear Is Exactly What You Get

In a two-track session, the M-16DX main mix you hear is what you'll be recording, so make sure that the volume balance between your channels is exactly how you want it. Use their LEVEL knobs to set this balance. Also, any effects you hear will be recorded, so make sure you're happy with them.

Your main mix level is of critical importance in a two-track session since it sets the main mix's recording level in the DAW. Make the mix as loud as you can without lighting the M-16DX's main meters or overloading the DAW track's input.

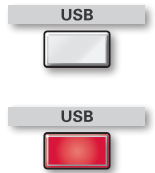


You may want to use the M-16DX's Finalize feature to tighten up your mix before recording—see the *M-16DX Owner's Manual* for details. Your DAW may also offer similar functionality you can apply after recording if you prefer.

The Role of the USB Button in Two-Track Recording

Since the USB button switches the feed of the DAW into the main mix on or off, its setting is important. During

- *recording*—turn off the USB button to avoid sending the DAW's output, including your new recording, into the main mix and back to the DAW, over and over.
- *playback*—turn on the USB button so it's lit to hear your recorded DAW tracks play back after recording.



Recording Setup Procedures

Here's a general description of the steps you'll take to set up a DAW track you want to record—you'll find specific instructions in the Workshop booklet detailing the M-16DX's use with your DAW.

Select the Audio You Want to Record

Once the DAW has been configured properly, you'll typically be able to select the desired M-16DX input, pair of inputs, or main mix for a track using a pop-up menu associated with the track.

Turn Off Monitoring Through the DAW

For zero-latency monitoring, you'll want to begin by making sure you're not listening to incoming audio through your DAW. Each DAW has its way of handling this. In some DAWs:

- *you can turn off the monitoring of incoming audio globally, for all tracks at once.*
- *you turn the monitoring of incoming audio off for each individual track.*



Since you won't be listening to your live audio through the DAW, you won't hear any DAW effects on the audio until you play it back.

Arm and Record Your Track

Consult your DAW's documentation to learn how to arm a track for recording, and how to begin recording.

Playing Back Your Recording

Your DAW's documentation will tell you how to disarm a track, and how to play it back.

In the M-16DX, you listen to the main mix, which includes the DAW's output coming through Channel 13/14. (Make sure the channel's USB button is lit.)

Overdubbing

If you're doing a multitrack session, you can add more tracks to your DAW project by assigning the desired M-16DX input channels to them and then recording the channels' audio while listening to the live audio side-by-side with your already-recorded tracks, as we discussed in "Zero-Latency Monitoring" on Page 3.

The End

We hope you've found this workshop helpful. You'll find other M-16DX Workshop booklets available for downloading at www.RolandUS.com/EDIROL.

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