WARRANTY

EGO SYStems Inc. warrants the return policy to its original purchaser as follows; All EGO SYS products, under normal use, will be free from faulty as long as the purchaser owns this product.
The terms of warranty is 15 months to EGO SYS distributors considering a 3-month temporary stock period ahead of being sold to the end user. Therefore, the actual terms of warranty is 12 months to the end user.
EGO SYS will, at its sole option, repair or replace a product, which is found to be defective. This warranty shall be null and void if, in the sole opinion of EGO SYS, a product failure is the result of misuse, abuse, modification, or misapplication. Except as expressly provided above, EGO SYS products are provided 'as is' without any kind of warranty. No claim is made for merchantability or fitness for any purpose. In no event will EGO SYS be liable for any direct, indirect, consequential, or incidental damages arising out of use of the product. The purchaser must contact EGO SYS or its regional representative to receive prior approval before returning a faulty unit. All such returns must be shipped to EGO SYS' headquarters in Seoul, Korea as being packaged in the original or equivalent protective packaging material (Rack, PCI card, Power Cables, connection cables), with freight prepaid and adequate insurance.

If the returned product is deemed to be defective, the repaired or replacement product will be back to you at no extra charge via the carrier chosen by EGO SYS.

T R A D E M A R K S
ESI, Waveterminal U24 and U24 are trademarks of EGO SYStems Inc. IBM is a registered trademark of International Business Machines Corporation. Windows is a trademark of Microsoft Corporation. Apple, Macintosh and Power Macintosh are trademarks of Apple Computer, Inc. Other product and brand names are trademarks or registered trademarks of their respective companies.

R A D I O F R E Q U E N C Y I N T E R F E R E N C E
NOTE: This equipment has been tested and found to comply with the limits for a Class A device, pursuant to Part 15 of the FCC Rules, and EN50 081-1/2:1992 of CE Test Specifications. This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instruction, it may cause interference to radio communications.

C O R R E S P O N D E N C E
For technical support inquiries, contact your nearest Waveterminal U24 dealer or contact us directly. Direct all other correspondence to:

EGO SYStems Inc.
Suite 1003, Shinhan Bldg. 45-11 Yoido-dong
Youngdungpo-gu, Seoul, Korea
Tel: +82 2 780-4451~3 Fax: +82 2 780-4454
Web Site: www.egosys.net
E-mail: webmaster@egosys.net

Second Edition July. 2002

*** All features and specifications subject to change without notice.**

C O N T E N T S

1. Overview 3
2. Features 4
3. System Requirement 5
4. Hardware Installation 6
5. External Connections 8
6. Driver Installation in PC 12
1) XP 12
2) 98SE, ME, 2000 24
3) Launching MME Control Panel 29
4) Launching ASIO2.0 Control panel 30
5) Control Panel Reference. MME & ASIO 31
7. Driver Installation in MAC 39
1) Apple Sound Manager and ASIO2.0 39
2) MAC Control Panel Reference 41
8. Using U24 in PC 49
1)Working with Applications -MME 49
2) Working with Applications -ASIO2.0 52
9. Using U24 in MAC 55
1) Working with Applications 55
SPECIFICATIONS 59

1. Overview

Thank you for choosing ESI Waveterminal U24, an USB digital audio interface.

Waveterminal U24 (U24) is an USB digital audio interface with 24-bit A/D, D/A for Apple Macintosh computers and IBM PC compatible system. U24 can be used with your digital audio recording software to record and playback simultaneously (full duplex) through stereo analog or stereo digital audio sources with exceptional audio quality.

USB stands for Universal Serial Bus, which means it connects peripherals to a computer. It is an evolved form of old serial or parallel bus.

USB makes installation of new peripherals much simpler, just plug and play. You don't have to open the PC to add a peripheral any more, just plug and turn it on. With USB-compliant computers and peripherals, there are no more worries about IRQ setting, DIP switch setting, or card installation. Even the computer turned on, it is no problem with attaching and removing devices. Just plug and play!

Practically, there is no limit on number of devices that can be linked to the computer using USB hubs.

USB even provide electrical power and supplies it, which eliminates messy power cables from working space.

If you are a professional or in need of a professional quality USB audio interface, you have made a sound investment in Waveterminal U24.

2. Features

24-bit Analog-to-Digital and Digital-to-Analog Converters

Highest quality 24-bit AD/DA converters in U24 provide unmatched sound quality with exceptionally low noise.

2-In/2-Out Analog Audio Inputs and Outputs and Headphone connector

U24 provides 1/4" phone jacks for use with –10dBV nominal level consumer audio equipment. Unlike some audio cards that deliberately boost their output levels to give you a false sense of audio quality, U24 gives you a true indication of your levels. Nothing's added or taken away unless you intend to do so. If you need to adjust levels, digital level adjustment is provided for analog inputs and outputs. You can also use Analog Out L as Headphone connector.

S/PDIF Coaxial /Optical Digital In & Out

U24 offers S/PDIF digital input and output via Optical or Coaxial ports. There's no additional conversion process for signal already recorded.

Multiple Sample Rate Support

Supports all denomination of 44.1kHz or 48kHz standard sample rates from 32kHz, 44.1kHz and 48kHz. U24 can be used in a variety of applications.

Real-time Hardware Sample Rate Conversion

Regardless of the type of sample rates, U24 automatically converts the incoming digital audio signal to the sample rate of your choice in real-time.

Functions as an independent Signal Converter

When *Digital In* Clock Source is selected, U24 can be operated as an independent signal converter. In this mode, U24 is completely disconnected with the computer, but it will send out any incoming signal to both analog and digital output ports.

ASIO2.0 and MME driver support

You can use U24 with ASIO2.0 applications such as a Cubase, Nuendo and also MME applications such as Cakewalk, Samplitude.

3. System Requirement

Most of all, your system has to have at least one available USB port to use U24.

PC

1. Intel Pentium II 400 MHz CPU or equivalent AMD CPU
2. Windows 98SE/ME/2000/XP operating system
3. 1 open USB port
4. 128MB RAM
5. Digital audio recording/playback software

MAC

1. Power Macintosh G3 or higher
2. Mac OS 9.0 to 9.2.x
3. One available USB port
4. “USB Device Extension” version 1.4.1 or later is needed
5. 128MB of RAM

(Highly depends on the system requirements of your audio software)

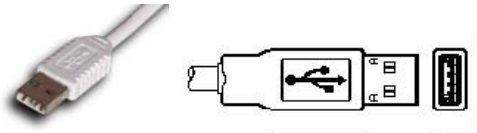
4. Hardware Installation

Before you begin, make sure you have read your computer's manual on installing USB devices. Your computer's manual should describe the precautions you should take.
Shutting down computer wouldn't need for installing an USB device to the computer. However, we will take it from the start to make sure you can follow every detail of installation.

1. Find the USB port on your computer. USB port is looked like below. You can find it by the PS/2 or serial ports on the back of desktop computer system.

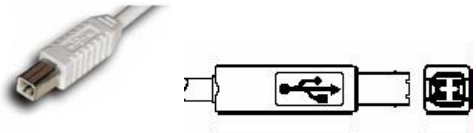
USB port on computer

2. Plug in appropriate plug of USB cable (called Series A plug) to the USB port of computer. You will notice that USB ports on computer and U24 are different.



Series A plug

3. Connect the other end of the USB cable (Series B plug) to the USB port of U24.



Series B plug

4. Turn on the computer. You will see "PWR" LED on U24 lights in red. U24 get the power from the computer via USB cable so you don't need to attach any external power supplier.

- **Series A Plug** is used for those devices on which the external cable is permanently attached like Mouse, Keyboard and USB hub etc…
- **Series B Plug** is for that requires detachable external cables and used for devices like Printers, Scanners, Modems, Stand Alone Hubs.

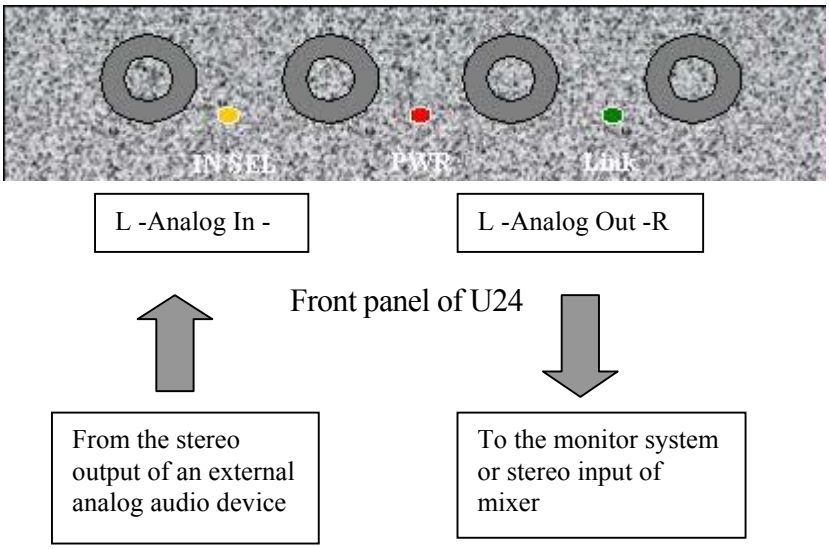
Parts of this manual are continually being updated. Please check our web site http://www.egosys.net occasionally for the most recent update information.

5. External Connections

U24 has many features that can enhance your audio production environment. If you are serious enough to about your digital audio, you may want to take time to read through this section carefully. While you may not need all of these features, and simply opt to plug in the cables to get started right away, you should at least be aware of U24's capabilities – in case you need them later on.

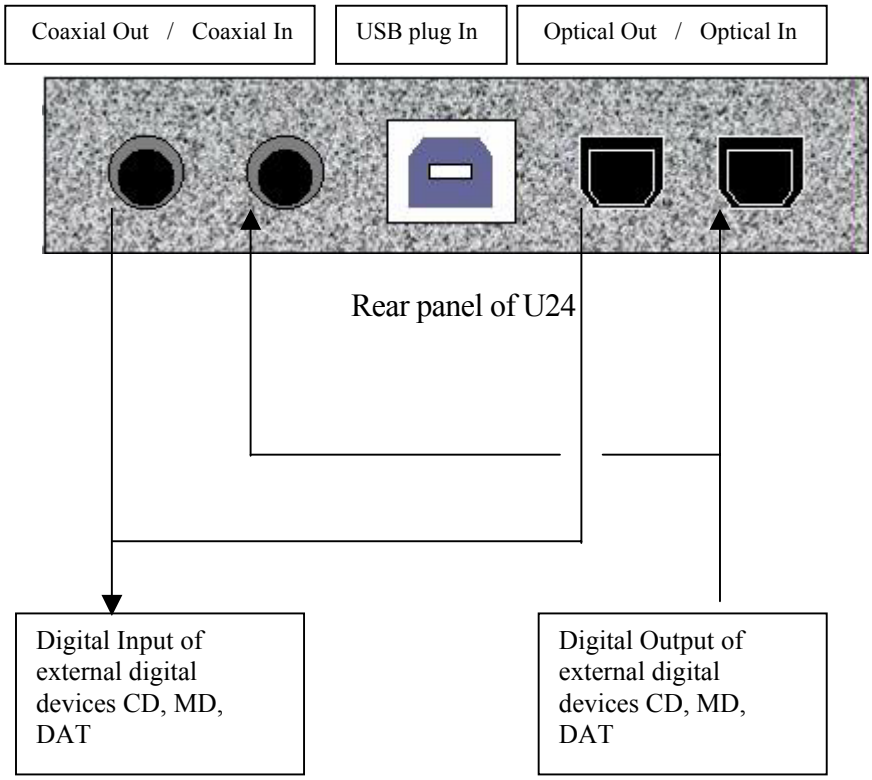
BASIC CONNECTIONS

In a typical audio production studio or workstation, where you have both digital and analog devices, this set up treats your PC or Macintosh as a stereo master recorder. In this case, monitoring of U24 will be similar to "through-the-tape" monitoring, where you monitor your input and output sources from the tape recorder's point.



If you plan to use U24 in a digital mastering environment, you may choose to connect analog outputs of U24 directly to your power amplifier's inputs instead of sending it through the console/mixer.

TIP: Analog Out L can be used as Headphone connector.

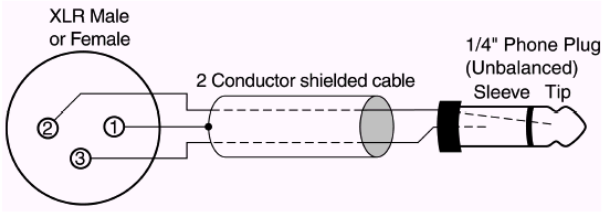


Let's talk about the cables and connectors those can be used with U24.

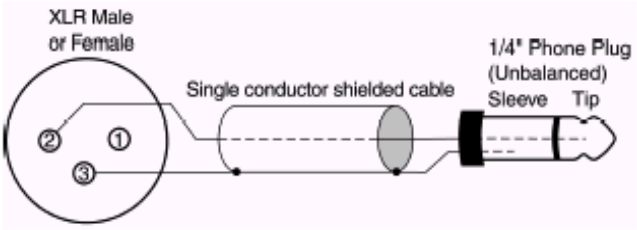
Analog connector

U24 uses 1/4" phone connectors for analog input/output connectors. The wiring method for unbalanced connections with XLR connectors to ¼" phone connectors (tip and sleeve only) using shielded twisted pair cable (2 wire + shield) is as follows:

XLR Pin 1 (GND) to cable shield with no connection on the other end
XLR Pin 2 (+) to signal wire and to the ¼" phone tip
XLR Pin 3 (-) to the other signal wire and to the ¼" phone sleeve



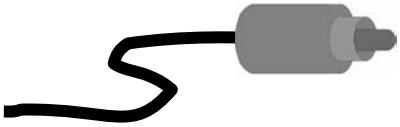
The wiring method for unbalanced connections with XLR connectors to unbalanced ¼" phone connectors (tip and sleeve only) using coaxial cable (1 wire + shield) is as follows:



Digital connector

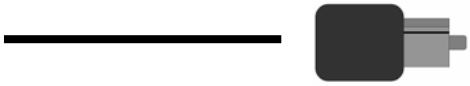
1. Coaxial connector

S/PDIF (IEC-958) uses 75ohm Coaxial cable and RCA connectors. U24 uses RCA connector that is the same cable as used in video transmission. Shown below is conventional RCA connector and you can use this for transmitting/receiving S/PDIF digital audio data from/to U24.



2. Optical connector

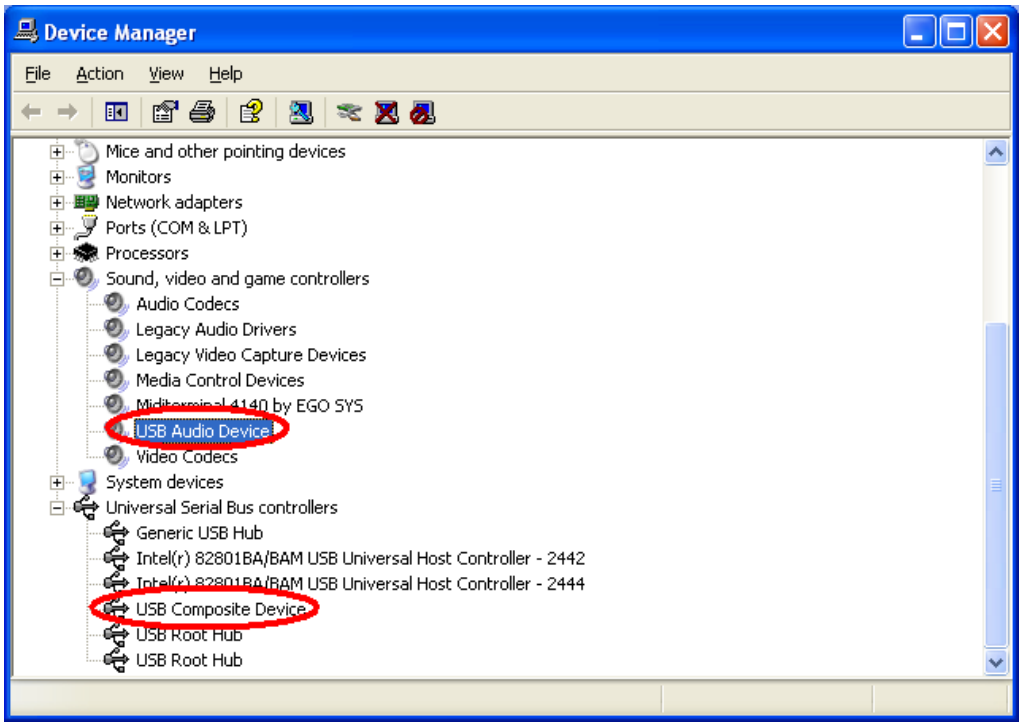
Optical version of S/PDIF interface, which is usually, called Toslink, because it uses Toslink optical components. The transmission media is 1mm plastic fiber and the signals are transmitted using visible LED light. The optical signals have exactly same format as the electrical S/PDIF signal, they are just converted to light signals.



6. Driver Installation in PC

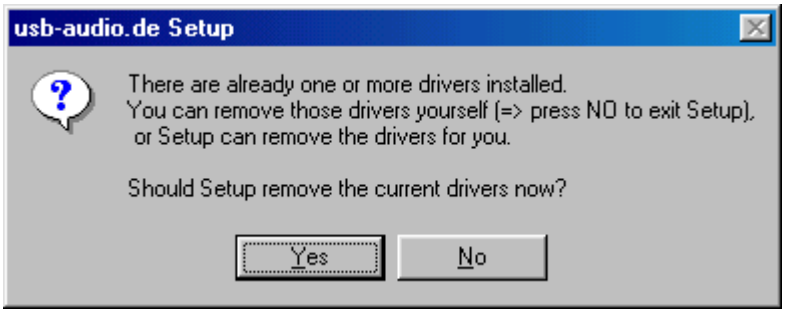
1) XP

If the hardware installation was done properly, your computer will look for the Windows native drivers need to use U24 and start to install them.

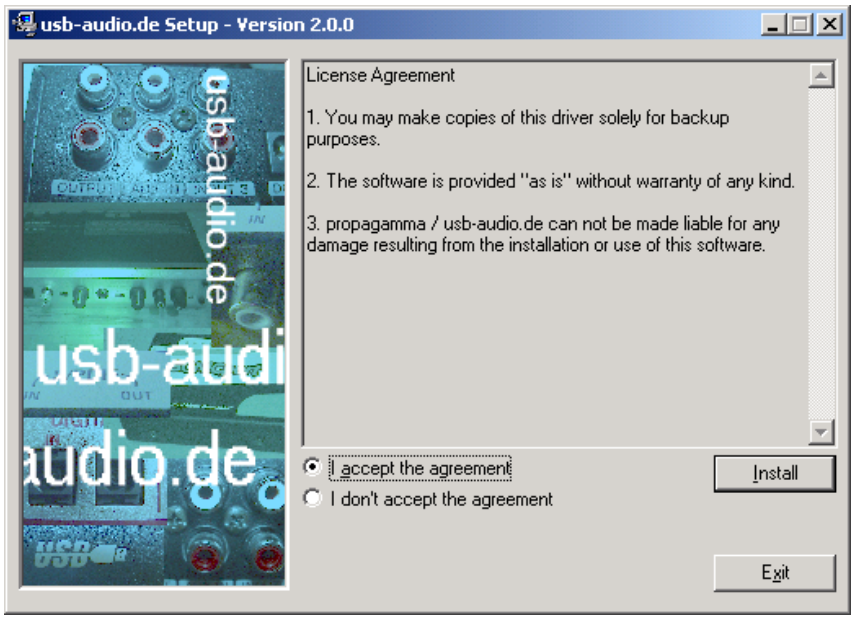


After Windows native driver was done properly, you must keep going to next exclusive U24 driver.

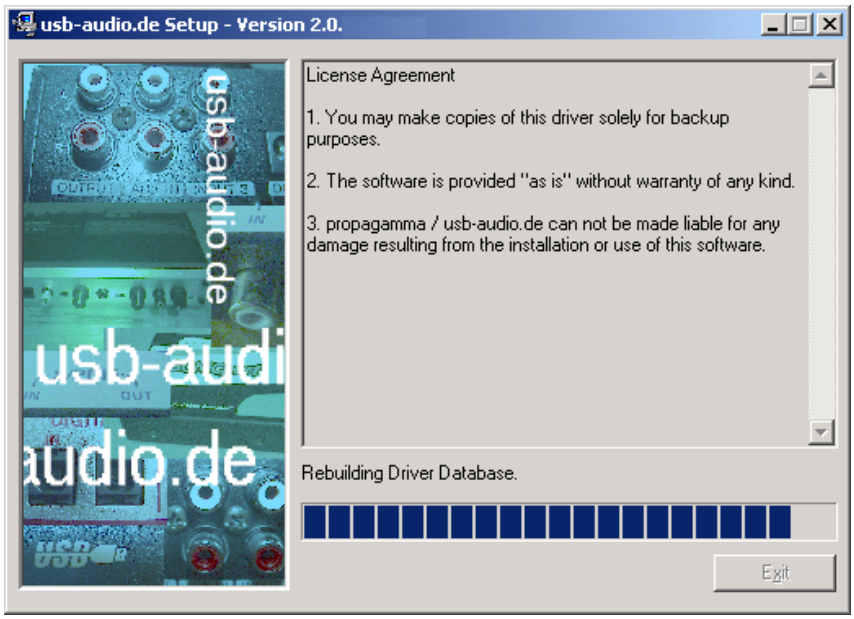
1. Insert the provided Driver CD or diskette into the CD-Rom drive or floppy disk drive and (or unzip U24 file and) copy all the files to a folder at your hard disk. Name it whatever you like. Do not move or delete any of these files, not even after the installation. Run “setup” icon. After that, if you see below message, simply click “Yes”



2. Check 'I accept the agreement' and click "Install".



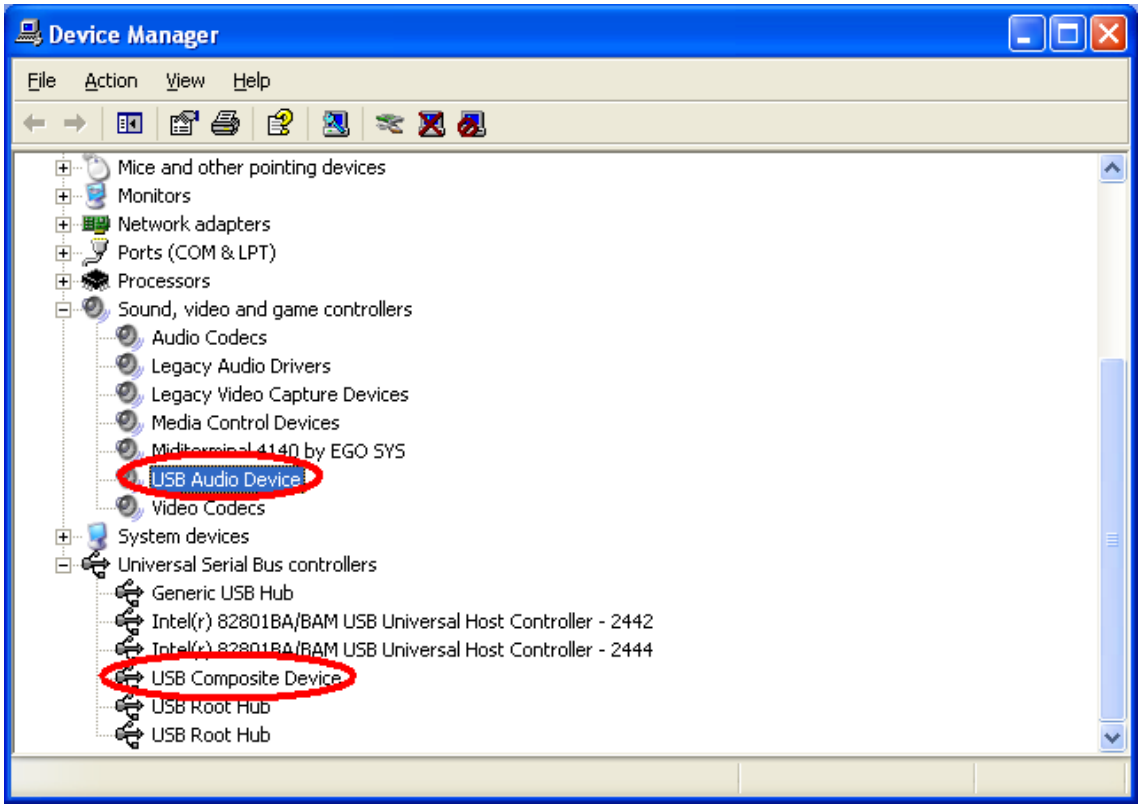
3. Exclusive U24 driver will be installed.



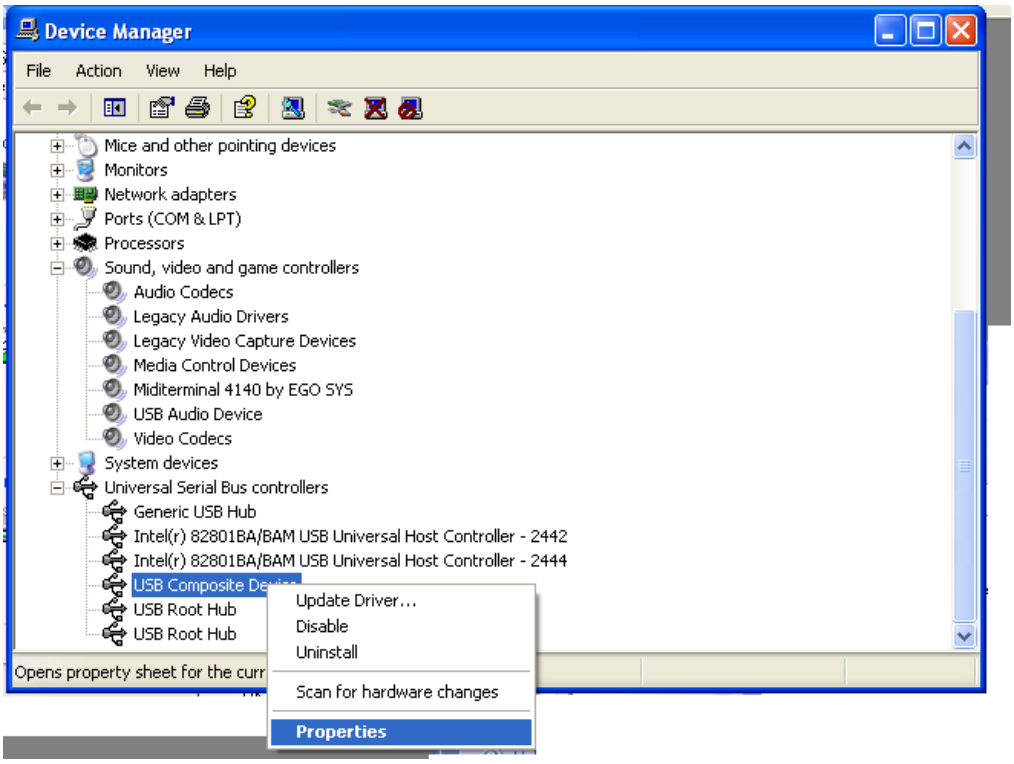
4. Click “Reboot now”

5. After install the software, Go to Device Manager again.

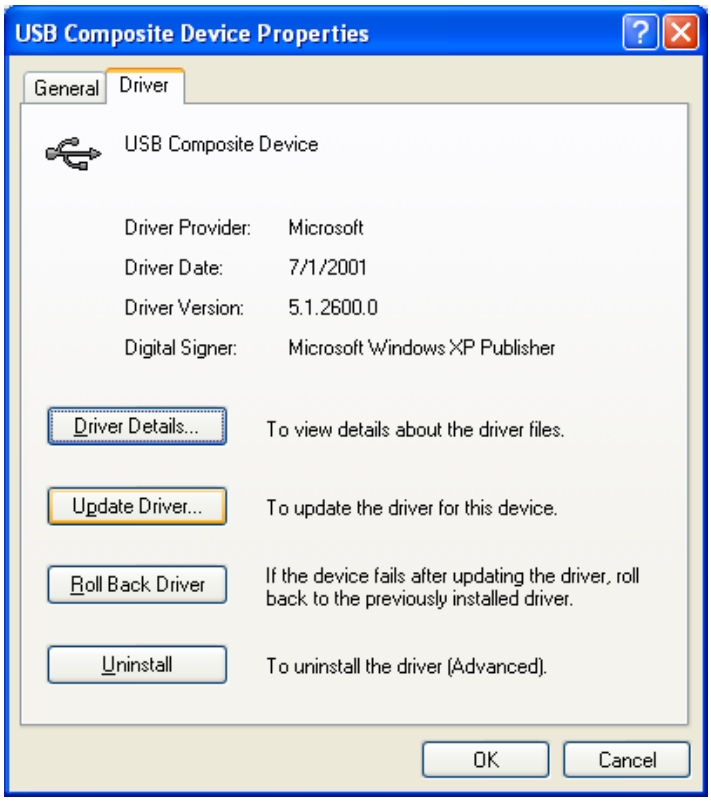
It looks nothing changed. However, your Windows now recognized U24 exclusive driver.



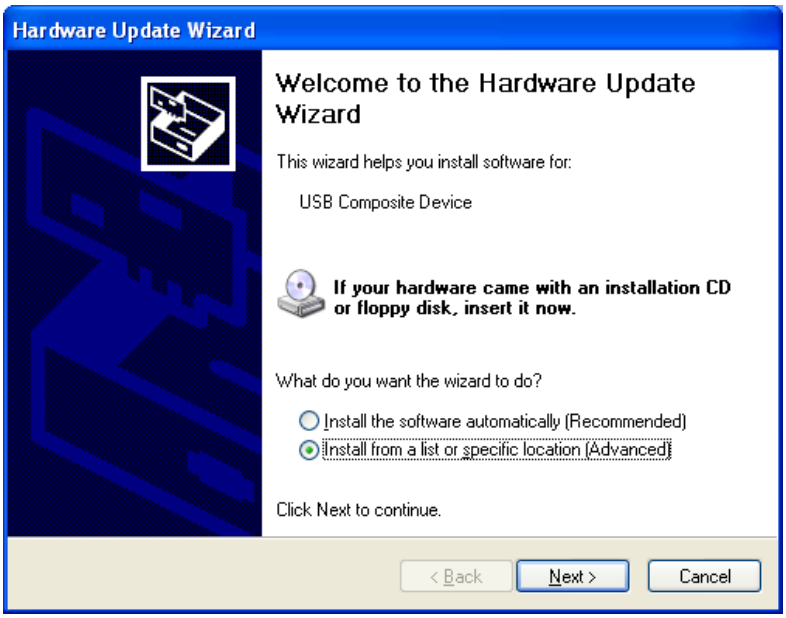
6. Right mouse click and click Properties.



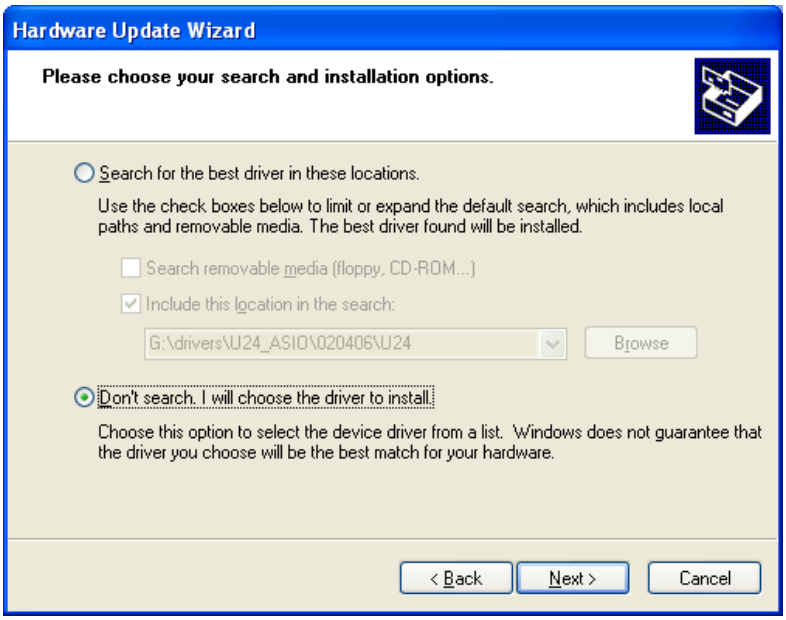
7. Click “update Driver”.



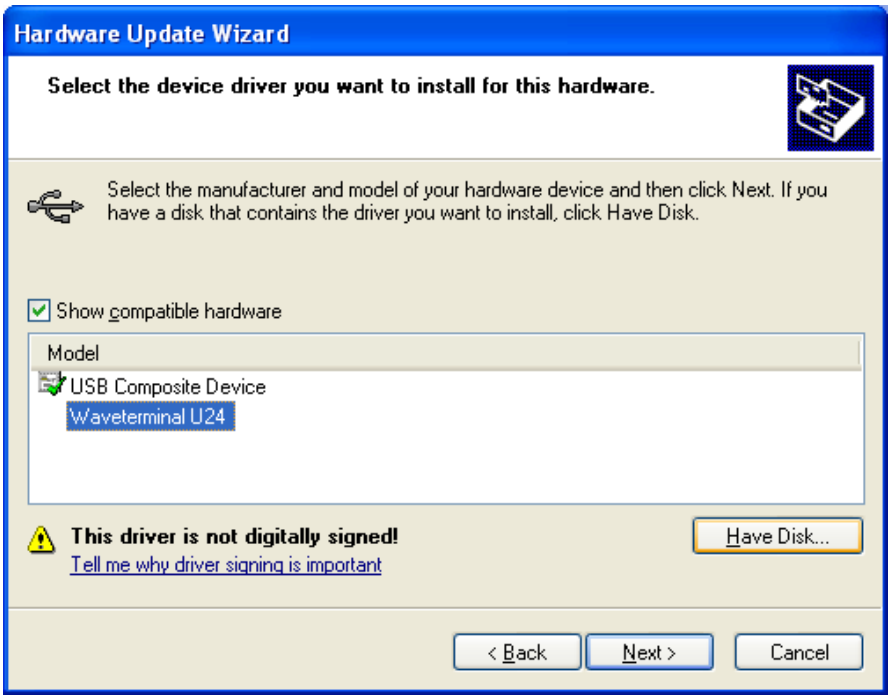
8. Choose “Install from a list or specific locations”.

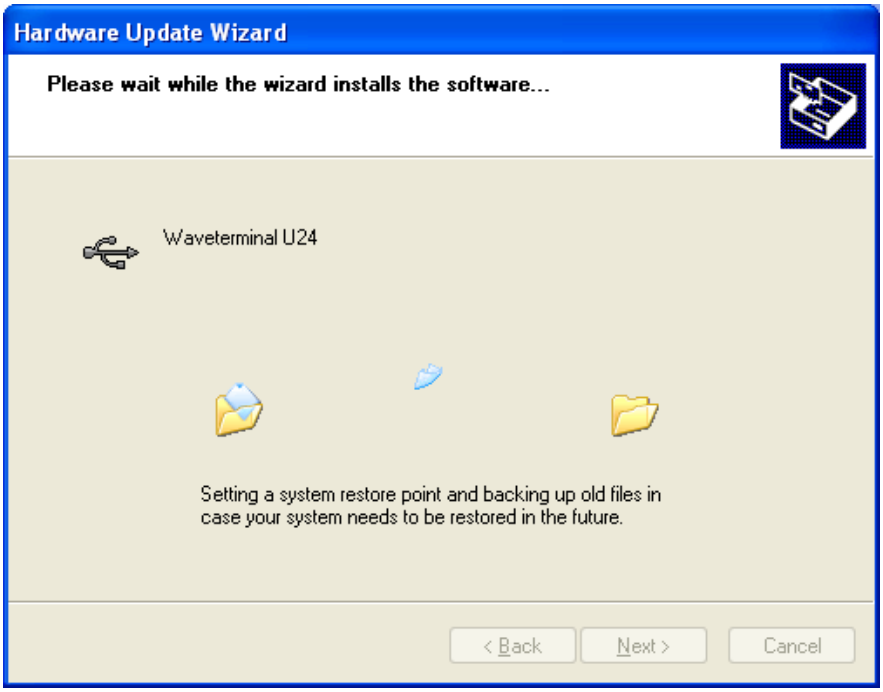


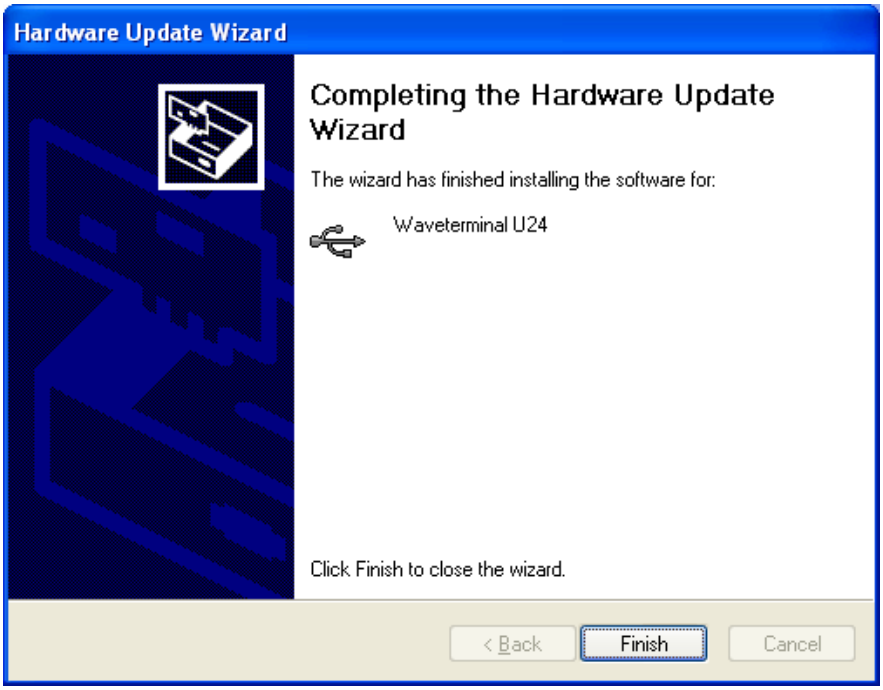
9. Choose “Don’t search. I will choose the driver to install”.



10. Choose ‘Waveterminal U24’




Hardware Update Wizard
Please wait while the wizard installs the software...
Waveterminal U24
Setting a system restore point and backing up old files in case your system needs to be restored in the future.
< Back
Next >
Cancel

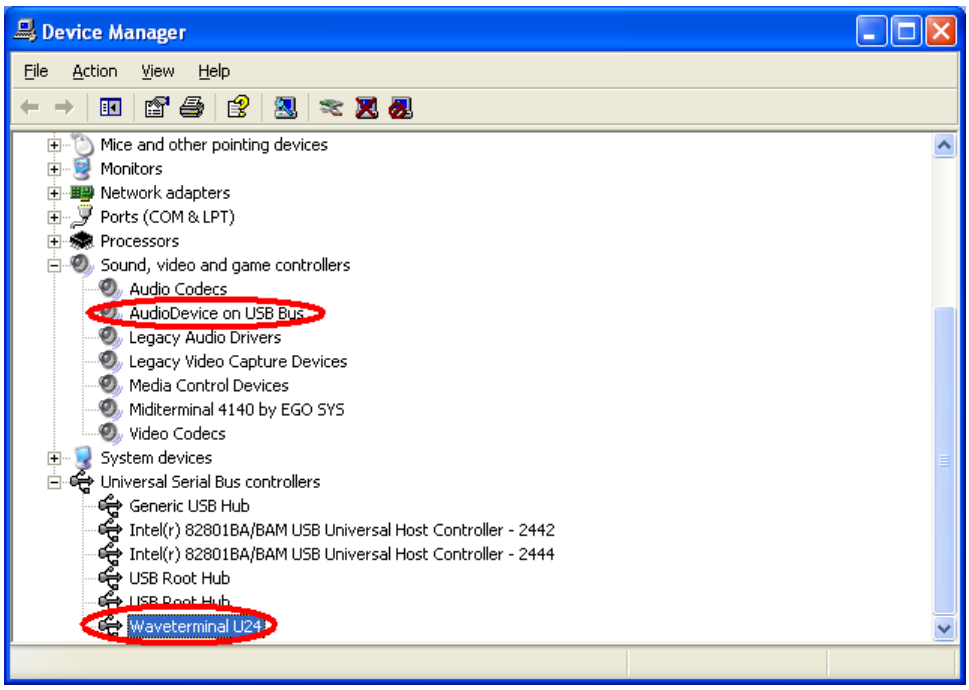

Hardware Update Wizard
Completing the Hardware Update Wizard
The wizard has finished installing the software for:
Waveterminal U24
Click Finish to close the wizard.
< Back
Finish
Cancel

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install a device driver for a hardware device.
To continue, click Next.
< Back
Next >
Cancel

Found New Hardware Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard will complete the installation for this device:
AudioDevice on USB Bus
A device driver is a software program that makes a hardware device work. Windows needs driver files for your new device. To locate driver files and complete the installation click Next.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

Found New Hardware Wizard
Completing the Found New Hardware Wizard
AudioDevice on USB Bus
Windows has finished installing the software for this device.
To close this wizard, click Finish.
< Back
Finish
Cancel

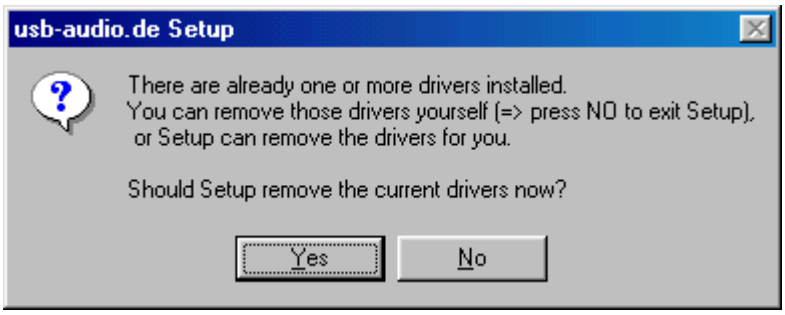
11. After rebooting your computer, open your system's Device Manager and confirms that "Waveterminal U24" is shown under "Universal Serial Bus Controllers." Now you're ready to use ASIO driver software and also MME softwares with control panel.



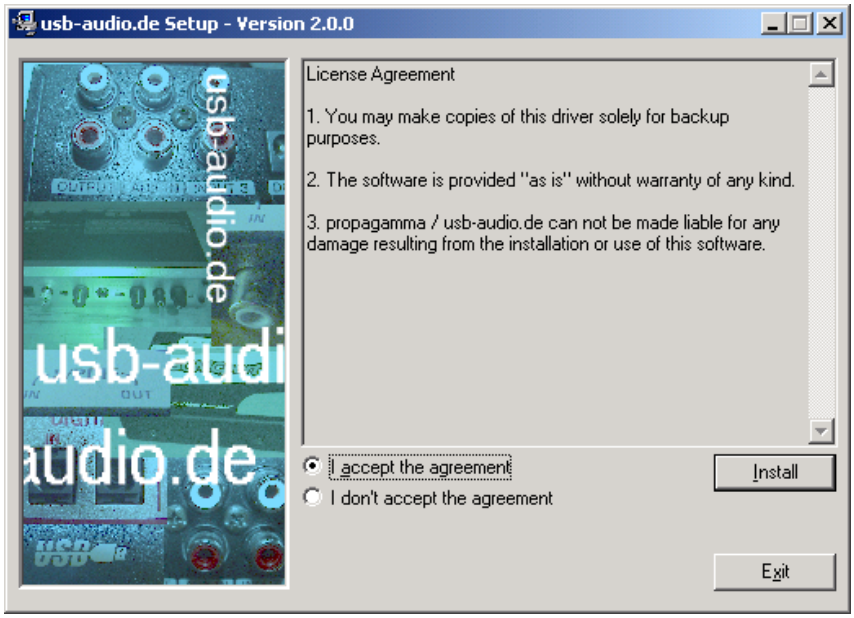
2) 98SE, ME, 2000

When you install U24 driver in next step, 'USB device' will be disappeared.

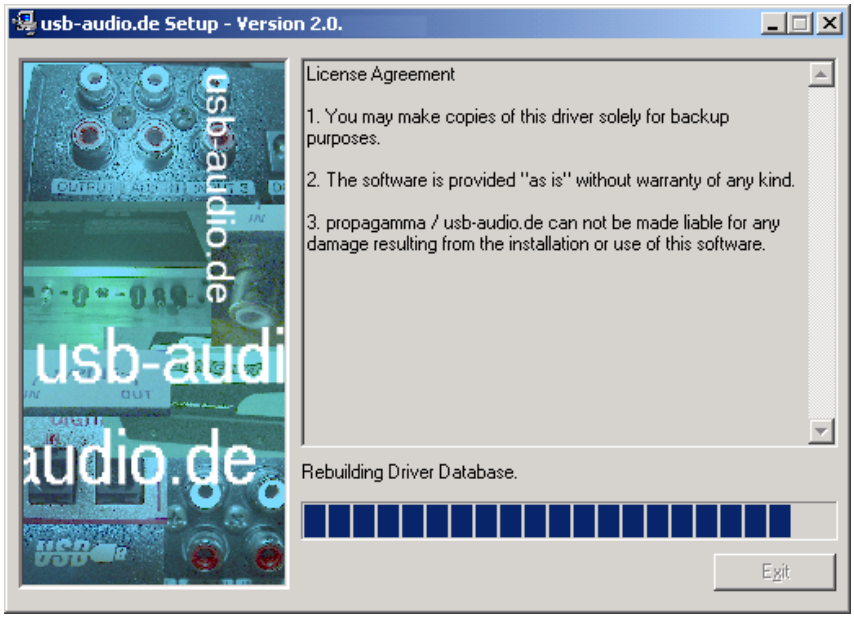
1. Insert the provided Driver CD or diskette into the CD-Rom drive or floppy disk drive and copy all the files to a folder at your hard disk. Name it whatever you like. Do not move or delete any of these files, not even after the installation. Run "setup" icon.
   After that, if you see below message, simply click "Yes"



2. Check ‘I accept the agreement’ and click “Install”.



3. Now, U24 driver will be installed.



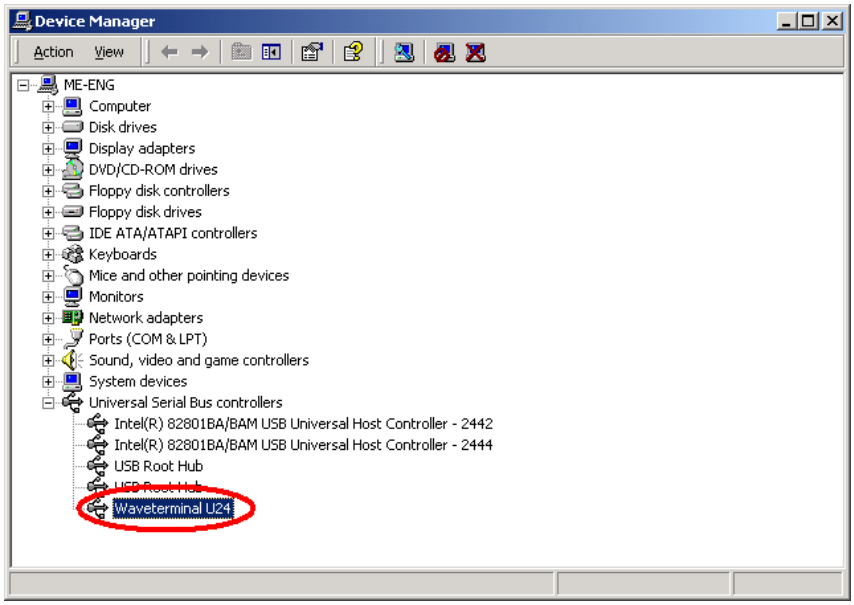
4. Click “Reboot now”

5. In order to complete the installation and reboot again.

Found New Hardware Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard will complete the installation for this device:
AudioDevice on USB Bus
A device driver is a software program that makes a hardware device work. Windows needs driver files for your new device. To locate driver files and complete the installation click Next.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

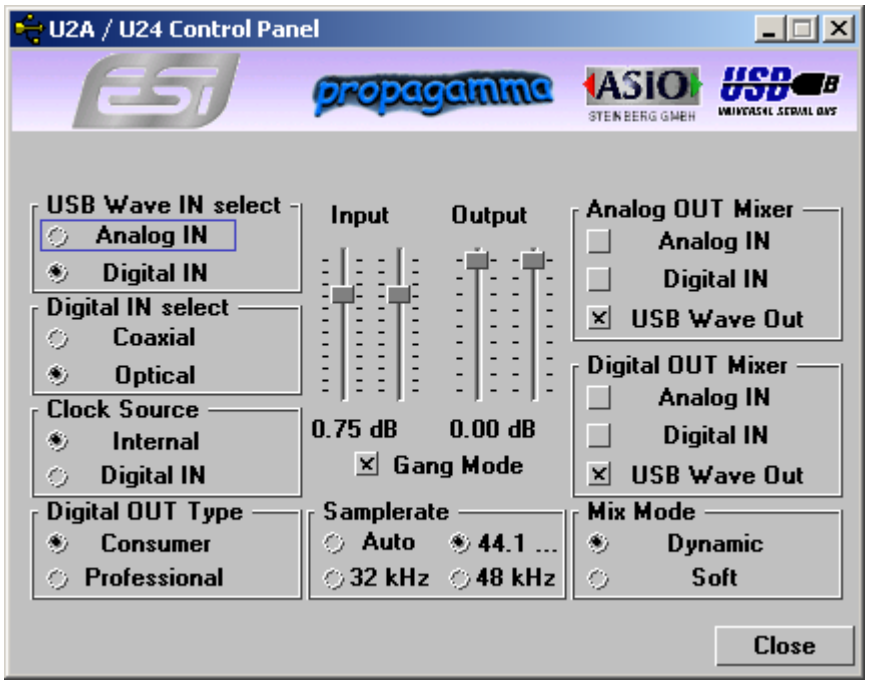
Found New Hardware Wizard
Completing the Found New Hardware Wizard
AudioDevice on USB Bus
Windows has finished installing the software for this device.
To close this wizard, click Finish.
< Back
Finish
Cancel

6. After rebooting your computer, open your system's Device Manager and confirm that "Waveterminal U24" is shown under "Universal Serial Bus Controllers".



3) Launching MME Control Panel

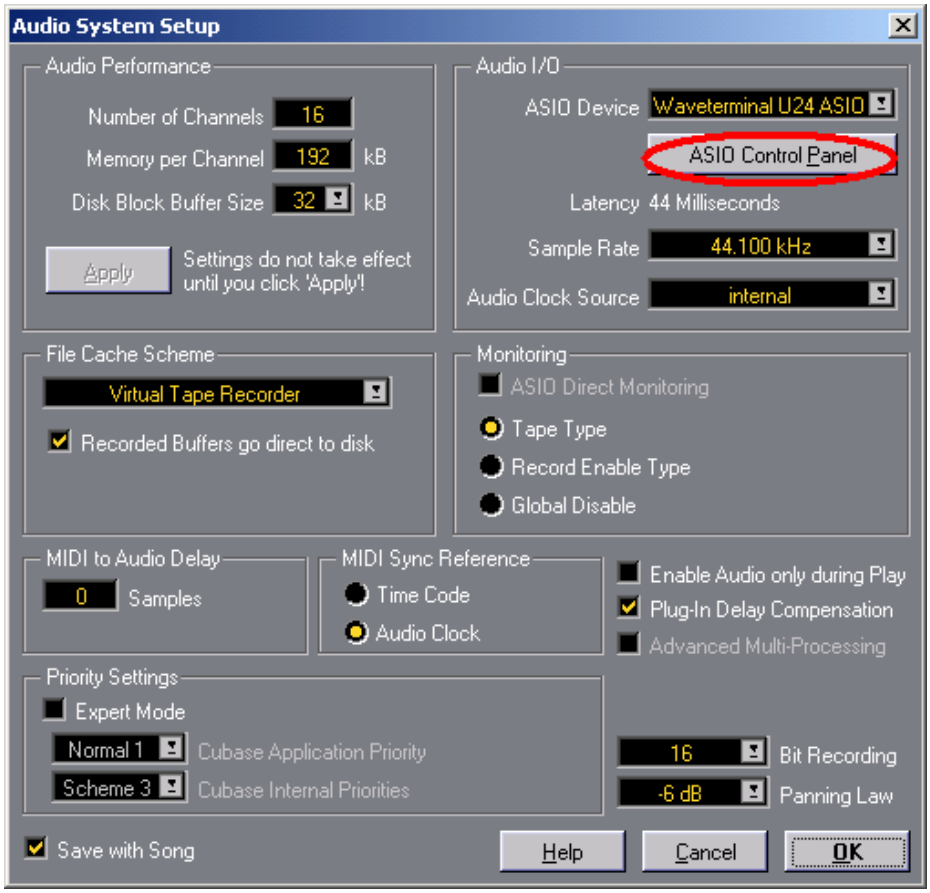
After exclusive U24 driver was done properly, click ‘U2xpanel.exe’. 'U2xpan.exe' will be appeared.



*** Caution: Even Two U24 control panel looks different, they have same functions and its same name. See page 33 for MME control panel functions.**

4) Launching ASIO2.0 Control panel

After launching Cubase, Go to 'Option' -> 'Audio Setup' -> System. Select ''Waveterminal U2A/U24 ASIO driver' for the ASIO Device.



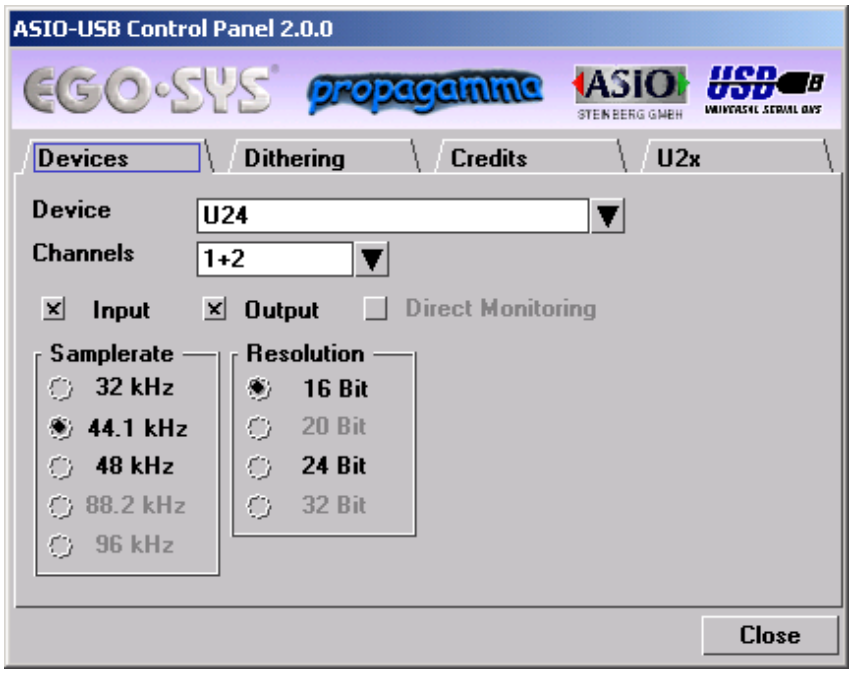
5) Control Panel Reference. MME & ASIO

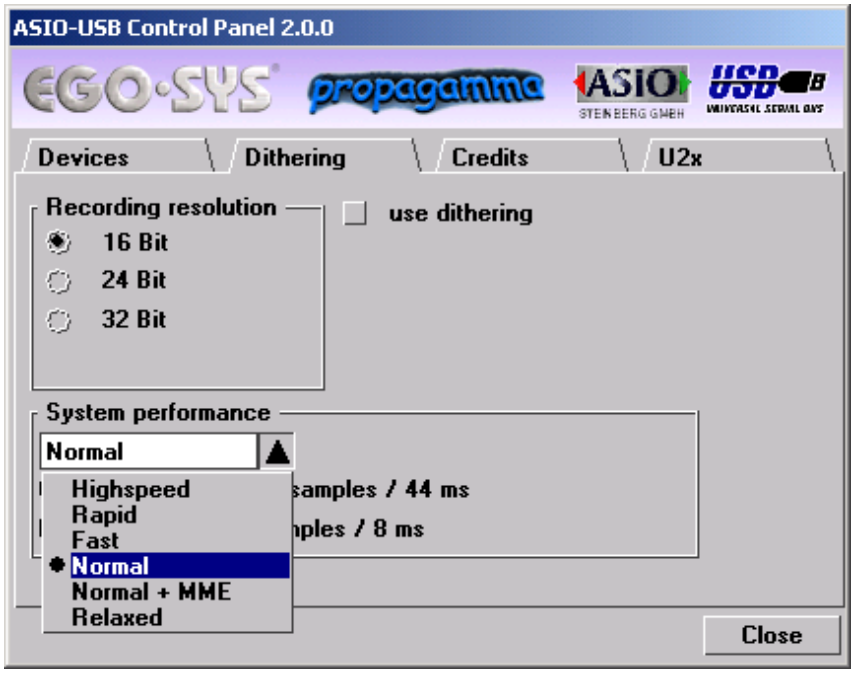
This control panel is pretty simple.
However you should be careful with 'System performance' in Dithering menu.

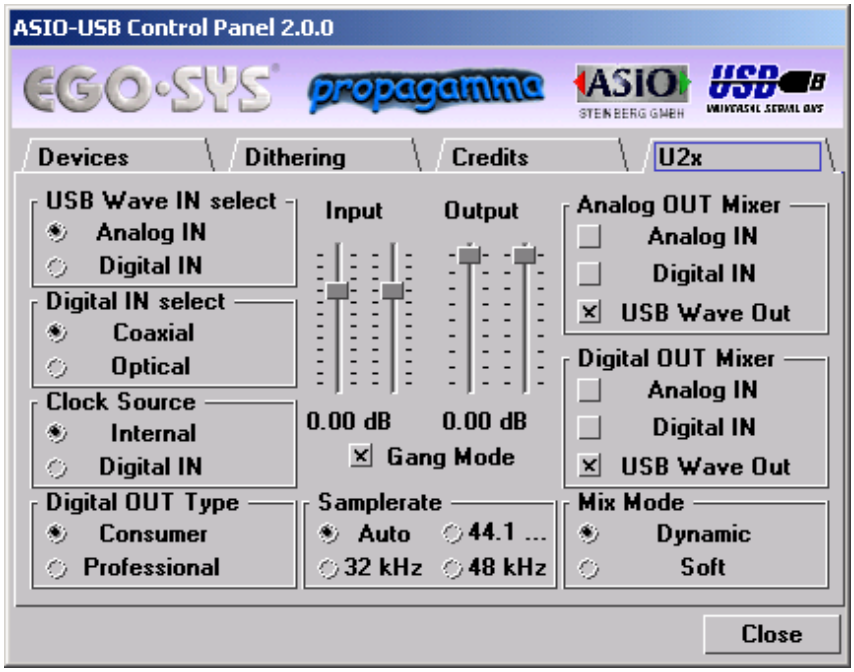
In the case of U24, You have to choose the bit-rate of your recordings in 'Recording resolution'.
If your music file is 24bit recording and you're going to play it back via U24's 16bit, you can use dithering to increase quality.

Also, you can choose different system performance depends on your computer's efficiency.

Choosing 'Highspeed' and 'Faster' will bring fast processing.
But if your computer has low efficiency and you select 'Highspeed', it cause noise problem. We generally recommend to you to select 'Normal +MME' or 'normal'.




ASIO-USB Control Panel 2.0.0
EGO·SYS
propagamma
ASIO
STEINBERG GMBH
USB
Devices
Dithering
Credits
U2x
Recording resolution
16 Bit
24 Bit
32 Bit
use dithering
System performance
Normal
Highspeed
Rapid
Fast
Normal
Normal + MME
Relaxed
samples / 44 ms
nples / 8 ms
Close


ASIO-USB Control Panel 2.0.0
EGO·SYS
propagamma
ASIO
STEINBERG GMBH
USB
Devices
Dithering
Credits
U2x
USB Wave IN select
Analog IN
Digital IN
Digital IN select
Coaxial
Optical
Clock Source
Internal
Digital IN
Digital OUT Type
Consumer
Professional
Input
Output
0.00 dB
0.00 dB
Gang Mode
Samplerate
Auto
44.1 ...
32 kHz
48 kHz
Analog OUT Mixer
Analog IN
Digital IN
USB Wave Out
Digital OUT Mixer
Analog IN
Digital IN
USB Wave Out
Mix Mode
Dynamic
Soft
Close

Caution: Even Two U24 control panel looks different, they have same functions and its same name.

INPUT/OUTPUT LEVEL FADERS

1. Level Faders

Click and drag to change the input and output levels. U24 is fixed to use –10dBV input/output reference level. Check the manuals of the audio equipment you want to connect to U24's inputs. It should be –10dBV device. The numbers on the bottom show the relative levels in dB. When you place mouse cursor over the level fader, fader will light in blue and mouse cursor changed to cross arrow figure. You can use wheel mouse or click the fader and drag to adjust the value of I/O level.

2. GANG MODE

Links the L-R faders for stereo operation. Un-select the Gang Mode if you need to control the left and right levels independently.

USB WAVE IN SELECT

Select the input source type for audio recording.

1. ANALOG IN

Selects the analog input port (-10dBV unbalanced) on the U24 as the USB wave input source.

2. DIGITAL IN

Selects the digital input port (SPDI/F Coaxial or Optical) on the U24 as the USB wave input source.

DIGITAL IN SELECT

Select the input connector type for your digital audio input.

1. COAXIAL

Selects the Coaxial input port (RCA type S/PDIF format) on the U24 as the digital input source.

2. OPTICAL

Selects the Optical input port (Tos-link, S/PDIF format) on the U24 as the digital input source.

CLOCK SOURCE

Clock Source determines that U24 will reference to. Clock Source is the time reference that determines precisely where each digital audio sample begins and ends. Also, Clock Source in U24 control panel gives unique function to the unit by selecting between two different sources.

1. INTERNAL

Selects U24's on-board clock source as the reference. This is the default mode for recording analog/digital audio through U24. Use this mode if you are recording audio signal, playing back audio file or using Real-time Sampling Rate Converter.

2. DIGITAL IN

Selects the digital audio input's data as the clock source. Selecting this mode causes U24 functions as an independent operation status from computer. As you can see below, *USB WAVE IN SELECT* section is disappeared and *USB WAVE OUT* of *ANALOG/DIGITAL OUT MIXER* section is disabled.

In this mode, you can operate U24 as a signal converter, but U24 is now completely separate from the computer. That means you cannot record any input source to the computer and play any audio source from the computer. However, any incoming audio signal (either analog or digital) can be sent out through three different output ports. Analog audio signal can be converted to digital audio data, digital audio data would be converted to analog audio signal and even digital audio data can be transferred to different connector type.

ANALOG OUT MIXER

This is where you select the source that is routed to the Analog Output jacks of U24. You can select either Analog In or Digital In for input monitoring. USB WAVE OUT can be selected simultaneously with one of the input source monitoring.

1. ANALOG IN

Signal connected to Analog Input ports of U24 is routed to the Analog Output ports for input monitoring.

2. DIGITAL IN

Signal connected to Digital Input port of U24 is routed to the Analog Output ports for input monitoring.

3. USB WAVE OUT

Output of wave device selected to *USB Audio Device* is routed to the Analog Output ports for monitoring.

DIGITAL OUT MIXER

This is where you select the source that is routed to the Digital Output jacks (Coaxial and Optical) of U24.

1. ANALOG IN

Signal connected to Analog Input ports of U24 is routed to the Digital Output ports for input monitoring.

2. DIGITAL IN

Signal connected to Digital Input port of U24 is routed to the Digital Output port for input monitoring.

3. USB WAVE OUT

Output of wave device selected to *USB Audio Device* is routed to the Digital Output port for monitoring.

MIX MODE

When more than one output source is selected to be played back simultaneously in the *Analog* or *Digital Out Mixer*, you are actually combining the data of two digital audio signals together, resulting in an overall gain of about 6dB/bit for each signal combined. This can cause the output circuit to overload and create a noticeable click or distortions as the combined level can exceed 0 dB peak level. Mix Mode gives you the choice as to how such excessive levels are handled by U24.

1. DYNAMIC

The combined signal levels are not adjusted by U24. In this mode clipping signals are audible, but left untouched. If you want to adjust the levels, you can do so by adjusting the levels from the audio software or by manually reducing the output level faders of U24.

2. SOFT

The combined signal levels are reduced automatically by U24, depending on the number of signal sources combined. For two combined signals, the output signal is reduced by –6 dB.

If output-monitoring sources don't contain peak level (0 dB peak) programs, combining them probably would not cause any clipping or distortion. In such cases, you may opt for the Dynamic mode, as it will allow you to add the signals for a much 'hotter' output. On the other hand, if your sources already contain peak level programs, you may need to select the Soft mode or manually adjust the levels of each output source you have selected.

SAMPLE RATE

Sample rate determines the number of samples per second that is used to convert analog audio to digital audio.

As most of you may know, sample rate for CD-DA is 44.1kHz and professional digital audio masters are usually recorded at 48kHz sample rate. U24 may be used to sample analog audio at 48kHz, but at some point in time it must be converted down to 44.1kHz for it to be used in a viable consumer format, such as CD-DA. Once you convert (dither) the data down to a lower sample rate format, you will experience some losses in frequency response. However, analog audio recorded with higher sample rate and bit resolution will sound cleaner and retain more accurate frequency response when they are dithered down to lower bit rate or converted to lower sample rate.

1. AUTO

Sample rate is automatically set by the selection you make in your digital audio recording software during analog audio recording or by the encoded signal format during digital audio recording.

2. SAMPLE RATE

There are three different sample rates available – 32kHz, 44.1kHz and 48kHz. If you want to convert sample rate in real time, you can select desired sampling rate among them.

REAL-TIME SAMPLE RATE CONVERTER

U24 can function as a real-time sample rate converter. This is U24's unique function that you cannot find from any other digital audio interface. You can change the incoming digital signal to a different sample rate by choosing *Internal* word clock and selecting a desired sample rate. The maximum conversion ratio is 3:1, so if your input signal's sample rate is 96kHz, you can convert it down to 32kHz (96/3) or convert 11kHz signal up to 32kHz (11x 3). Real Time Sample Rate Converting functions <u>only for incoming digital signal</u>. Connect digital source to Coaxial/Optical Input port and choose desired sampling rate. Now the sampling rate of the signal you can get from digital output port is converted.

However, you cannot change the sampling rate of .wav file that playback through the application. If you try to convert it, it only sounds like sampling up (faster speed than normal) or sampling down (slower than normal).

DIGITAL OUT (IEC 958) TYPE

Digital Out Type selector determines the type of data format to be used on the digital output jack of U24.

1. CONSUMER (IEC 958 Type II)

Generally known as S/PDIF (Sony Phillips Digital Interface), select this mode if you are sending digital audio output from U24 to a S/PDIF equipped audio device.

2. PROFESSIONAL (IEC 958 Type I)

Generally known as AES/EBU, select this mode if you are sending digital audio output from U24 to an AES/EBU audio device.

Important Notice: Since the adaptation of IEC958 no longer distinguishes between S/PDIF and AES/EBU, some of the older AES/EBU audio equipment requires a higher signal level than U24's digital output levels (which conform to IEC 958 standards).

7. Driver Installation in MAC

1) Apple Sound Manager and ASIO2.0

U24 works best when using it with ASIO compatible audio software. However, you can also use it as a default Sound Manager device instead of built-in device in your Macintosh computer.

There are different driver installation procedures for these two cases.

APPLE SOUND MANAGER DEVICE

For the system sound monitoring, CD monitoring, and running ASIO-incompatible application, you don't need to install or add any special driver or file. The moment you connect the U24 to the USB port on the MAC, you can use U24 instantly. However, as we mentioned in system requirements part, you must have "USB Device Extension" version 1.4.1 or later to use U24.

Only thing you have to do is to make a copy of the "U24 Control Panel" in a convenient place (such as Apple Menu) in your hard disk. You will use this to change the settings of U24.

ASIO DRIVER

To use ASIO driver with U24, you need to do two things as follows:

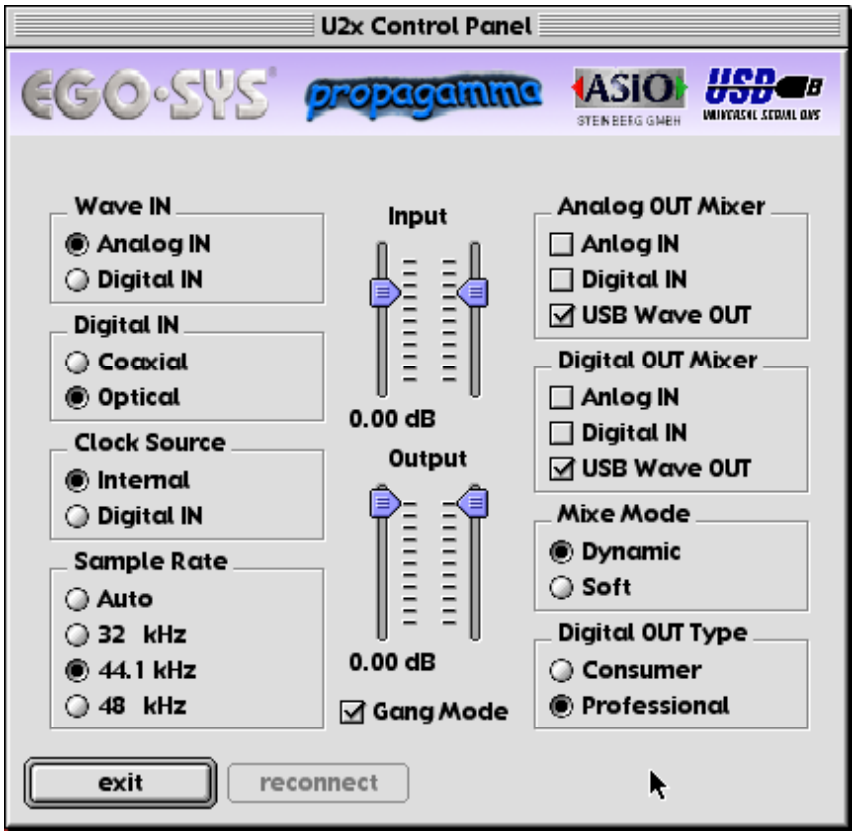
1. Locate the "U24" file in the CD-ROM, and drag it into the "Extensions" folder in the System Folder in your startup disk. Or

simply you can drag it into the System Folder, and the system will puts the file into the right place for you. You need to restart your Macintosh.

2. Locate the “EgoSys Waveterminal U24” file in the CD-ROM, and drag it into the “ASIO Drivers” folder of your desired application (PEAK, Logic Audio, for example).

2) MAC Control Panel Reference

If you use U24 as a Sound Manager device, you should use “U24 Control Panel” to modify the settings.



If you use U24 as an ASIO compatible device, you should use the control panel, which can be accessed from audio applications. The exact procedure for this depends on the application you are using.

This control panel is pretty simple.
However you should be careful with ‘System performance’ in Dithering menu.

You have to choose the bit-rate of your recordings in ‘Recording resolution’.
If your music file is 24bit recording and you're going to play it back via U24's 16bit, you can use dithering to increase quality.

Also, you can choose four different system performance depends on your computer’s efficiency.

Choosing ‘Highspeed’ and ‘Faster’ will bring fast processing.
But if your computer has low efficiency and you select ‘Highspeed’, it cause noise problem. We generally recommend to you to select ‘Fast’ or ‘normal’.

*** Caution: Even Two U24 control panel looks different, they have same functions and its same name.**

INPUT/OUTPUT LEVEL FADERS

1. Level Faders

Click and drag to change the input and output levels. U24 is fixed to use –10dBV input/output reference level. Check the manuals of the audio equipment you want to connect to U24’s inputs. It should be –10dBV device. The numbers on the bottom show the relative levels in dB.

2. GANG MODE

Links the L-R faders for stereo operation. Un-select the Gang Mode if you need to control the left and right levels independently.

USB WAVE IN SELECT

Select the input source type for audio recording.

1. ANALOG IN

Selects the analog input port (-10dBV unbalanced) on the U24 as the USB wave input source.

2. DIGITAL IN

Selects the digital input port (SPDI/F Coaxial or Optical) on the U24 as the USB wave input source.

DIGITAL IN SELECT

Select the input connector type for your digital audio input.

1. COAXIAL

Selects the Coaxial input port (RCA type S/PDIF format) on the U24 as the digital input source.

2. OPTICAL

Selects the Optical input port (Tos-link, S/PDIF format) on the U24 as the digital input source.

CLOCK SOURCE

Clock Source determines that U24 will reference to. Clock Source is the time reference that determines precisely where each digital audio sample begins and ends. Also, Clock Source in U24 control panel gives unique function to the unit by selecting between two different sources.

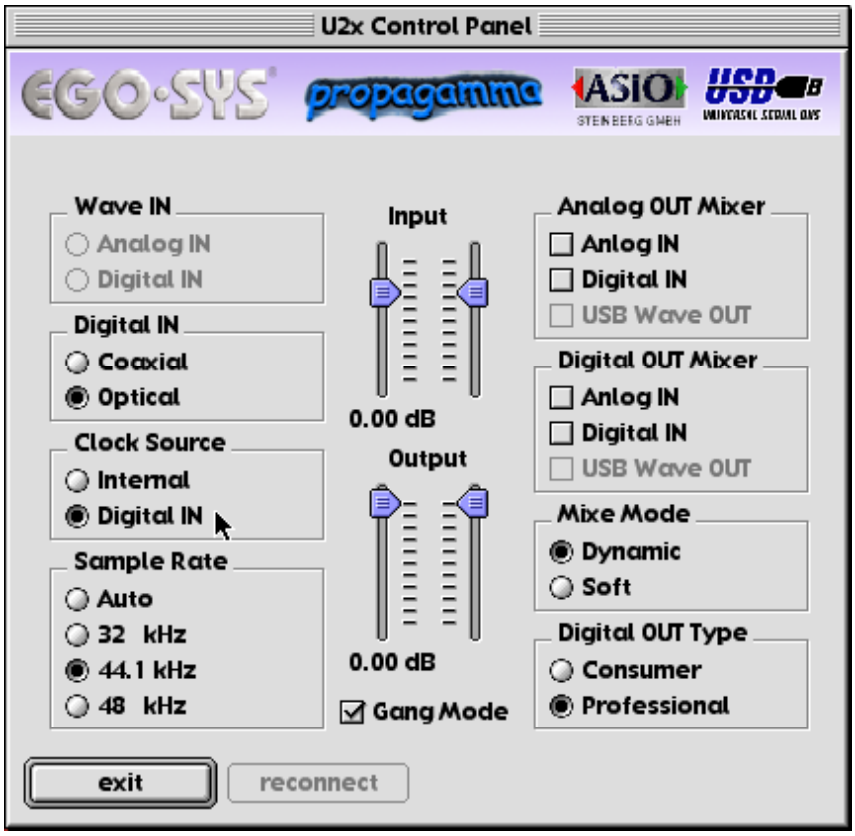
1. INTERNAL

Selects U24's on-board clock source as the reference. This is the default mode for recording analog/digital audio through U24. Use

this mode if you are recording audio signal, playing back audio file or using Real-time Sampling Rate Converter.

2. DIGITAL IN

Selects the digital audio input's data as the clock source. Selecting this mode causes U24 functions as an independent operation status from computer. As you can see below, *USB WAVE IN SELECT* section is disappeared and *USB WAVE OUT* of *ANALOG/DIGITAL OUT MIXER* section is disabled.



In this mode, you can operate U24 as a signal converter, but U24 is now completely separate from the computer. That means you cannot record any input source to the computer and play any audio source from the computer. However, any incoming audio signal (either analog or digital) can be sent out through three different

output ports. Analog audio signal can be converted to digital audio data, digital audio data would be converted to analog audio signal and even digital audio data can be transferred to different connector type.

ANALOG OUT MIXER

This is where you select the source that is routed to the Analog Output jacks of U24. You can select either Analog In or Digital In for input monitoring. USB WAVE OUT can be selected simultaneously with one of the input source monitoring.

1. ANALOG IN

Signal connected to Analog Input ports of U24 is routed to the Analog Output ports for input monitoring.

7. DIGITAL IN

Signal connected to Digital Input port of U24 is routed to the Analog Output ports for input monitoring.

8. USB WAVE OUT

Output of wave device selected to *USB Audio Device* is routed to the Analog Output ports for monitoring.

DIGITAL OUT MIXER

This is where you select the source that is routed to the Digital Output jacks (Coaxial and Optical) of U24.

1. ANALOG IN

Signal connected to Analog Input ports of U24 is routed to the Digital Output ports for input monitoring.

2. DIGITAL IN

Signal connected to Digital Input port of U24 is routed to the Digital Output port for input monitoring.

3.USB WAVE OUT

Output of wave device selected to *USB Audio Device* is routed to the Digital Output port for monitoring.

MIX MODE

When more than one output source is selected to be played back simultaneously in the *Analog* or *Digital Out Mixer*, you are actually combining the data of two digital audio signals together, resulting in an overall gain of about 6dB/bit for each signal combined. This can cause the output circuit to overload and create a noticeable click or distortions as the combined level can exceed 0 dB peak level. Mix Mode gives you the choice as to how such excessive levels are handled by U24.

1. DYNAMIC

The combined signal levels are not adjusted by U24. In this mode clipping signals are audible, but left untouched. If you want to adjust the levels, you can do so by adjusting the levels from the audio software or by manually reducing the output level faders of U24.

2.SOFT

The combined signal levels are reduced automatically by U24, depending on the number of signal sources combined. For two combined signals, the output signal is reduced by –6 dB.

If output-monitoring sources don't contain peak level (0 dB peak) programs, combining them probably would not cause any clipping or distortion. In such cases, you may opt for the Dynamic mode, as it will allow you to add the signals for a much 'hotter' output. On the other hand, if your sources already contain peak level programs, you may need to

select the Soft mode or manually adjust the levels of each output source you have selected.

SAMPLE RATE

Sample rate determines the number of samples per second that is used to convert analog audio to digital audio.

As most of you may know, sample rate for CD-DA is 44.1kHz and professional digital audio masters are usually recorded at 48kHz sample rate. U24 may be used to sample analog audio at 48kHz, but at some point in time it must be converted down to 44.1kHz for it to be used in a viable consumer format, such as CD-DA. Once you convert (dither) the data down to a lower sample rate format, you will experience some losses in frequency response. However, analog audio recorded with higher sample rate and bit resolution will sound cleaner and retain more accurate frequency response when they are dithered down to lower bit rate or converted to lower sample rate.

1. AUTO

Sample rate is automatically set by the selection you make in your digital audio recording software during analog audio recording or by the encoded signal format during digital audio recording.

2. SAMPLE RATE

There are three different sample rates available – 32kHz, 44.1kHz and 48kHz. If you want to convert sample rate in real time, you can select desired sampling rate among them.

REAL-TIME SAMPLE RATE CONVERTER

U24 can function as a real-time sample rate converter. This is U24's unique function that you cannot find from any other digital audio interface. You can change the incoming digital signal to a different sample rate by choosing *Internal* word clock and selecting a desired sample rate. The maximum conversion ratio is 3:1, so if your input signal's sample rate is 96kHz, you can convert it down to 32kHz (96/3) or convert 11kHz signal

up to 32kHz (11x 3). Real Time Sample Rate Converting functions only for incoming digital signal. Connect digital source to Coaxial/Optical Input port and choose desired sampling rate. Now the sampling rate of the signal you can get from digital output port is converted.

However, you cannot change the sampling rate of .wav file that playback through the application. If you try to convert it, it only sounds like sampling up (faster speed than normal) or sampling down (slower than normal).

DIGITAL OUT (IEC 958) TYPE

Digital Out Type selector determines the type of data format to be used on the digital output jack of U24.

1. CONSUMER (IEC 958 Type II)

Generally known as S/PDIF (Sony Phillips Digital Interface), select this mode if you are sending digital audio output from U24 to a S/PDIF equipped audio device.

2. PROFESSIONAL (IEC 958 Type I)

Generally known as AES/EBU, select this mode if you are sending digital audio output from U24 to an AES/EBU audio device.

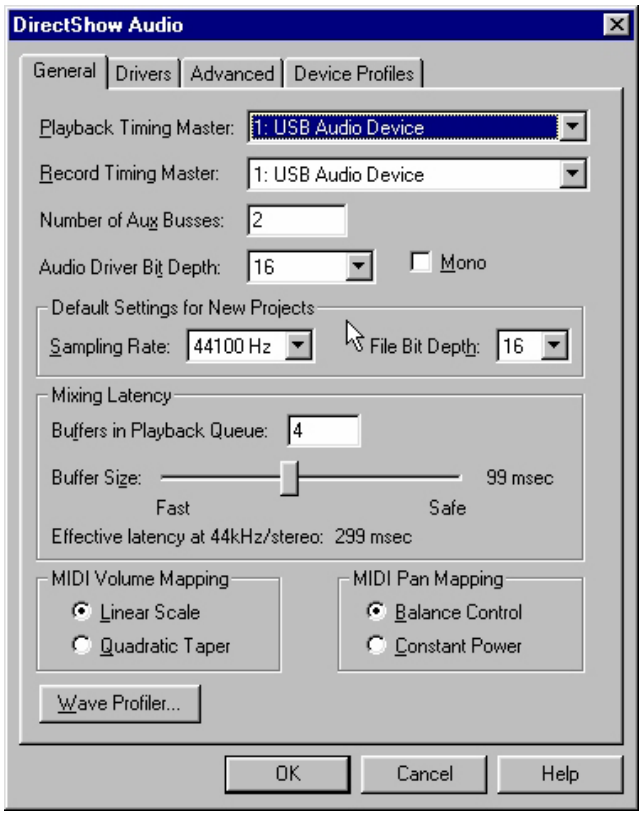
Important Notice: Since the adaptation of IEC958 no longer distinguishes between S/PDIF and AES/EBU, some of the older AES/EBU audio equipment requires a higher signal level than U24's digital output levels (which conform to IEC 958 standards).

8. Using U24 in PC

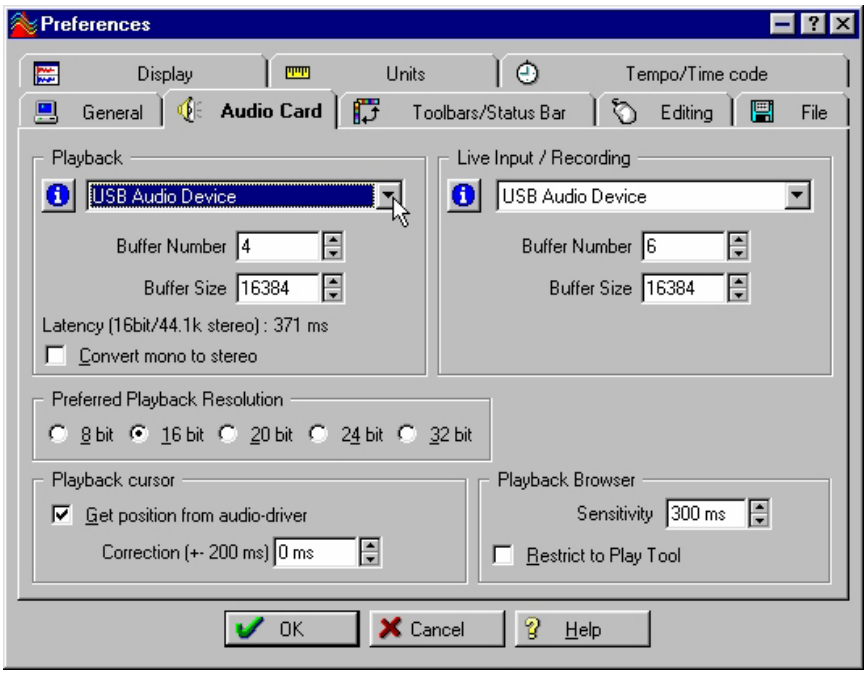
1)Working with Applications -MME

S O N A R / C A K E W A L K

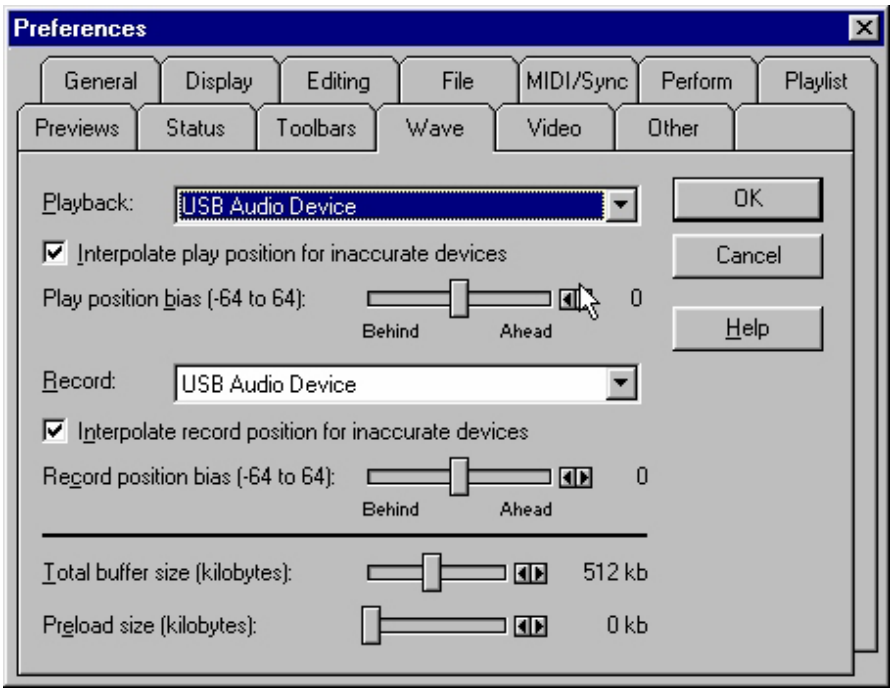
Running Cake Walk for the first time after hardware and drivers of U24 are installed correctly, initiate "Wave Profiler" to adjust proper buffer size for the new audio device. If this procedure is not done automatically, select Options>Audio… from the menu. *DirectShow Audio* window will open and click "Wave Profiler…" on the bottom to run it. Don't forget to select "USB Audio Device" for Playback Timing Master and Record Timing Master.



Start Wave Lab and open the Preferences window under Options menu. Tab the “Audio Card” and you will find the Playback/Recording device set up section. Choose “USB Audio Device” to use U24 with Wave Lab.



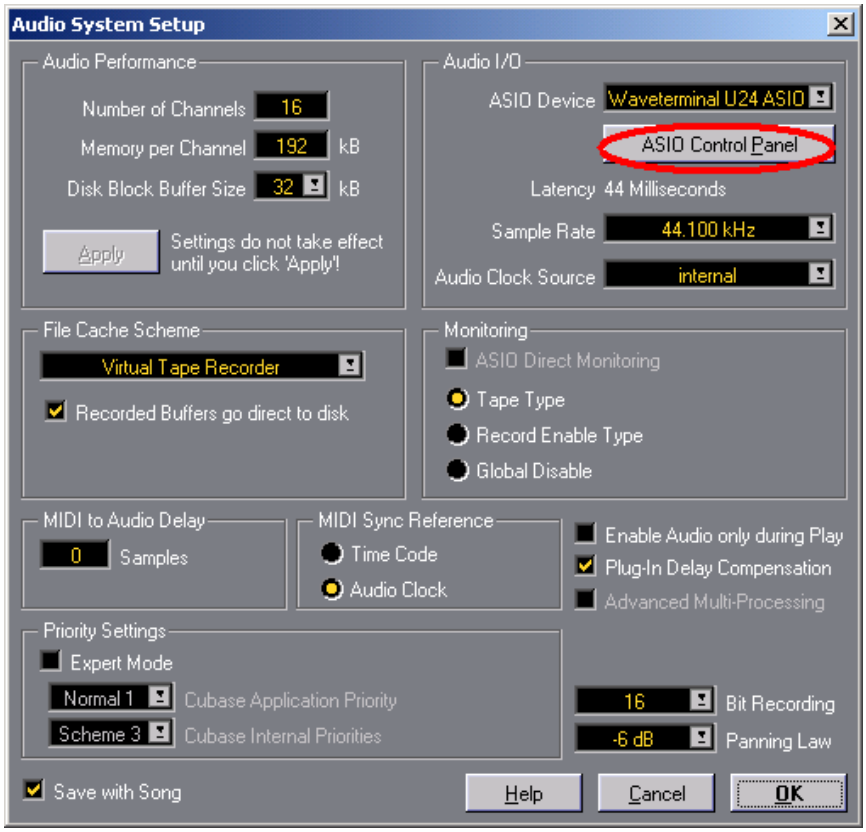
Open Preferences window under Options menu. You can find I/O device set up section by clicking “Wave” tab. Choose “USB Audio Device” for both Playback and Record section.



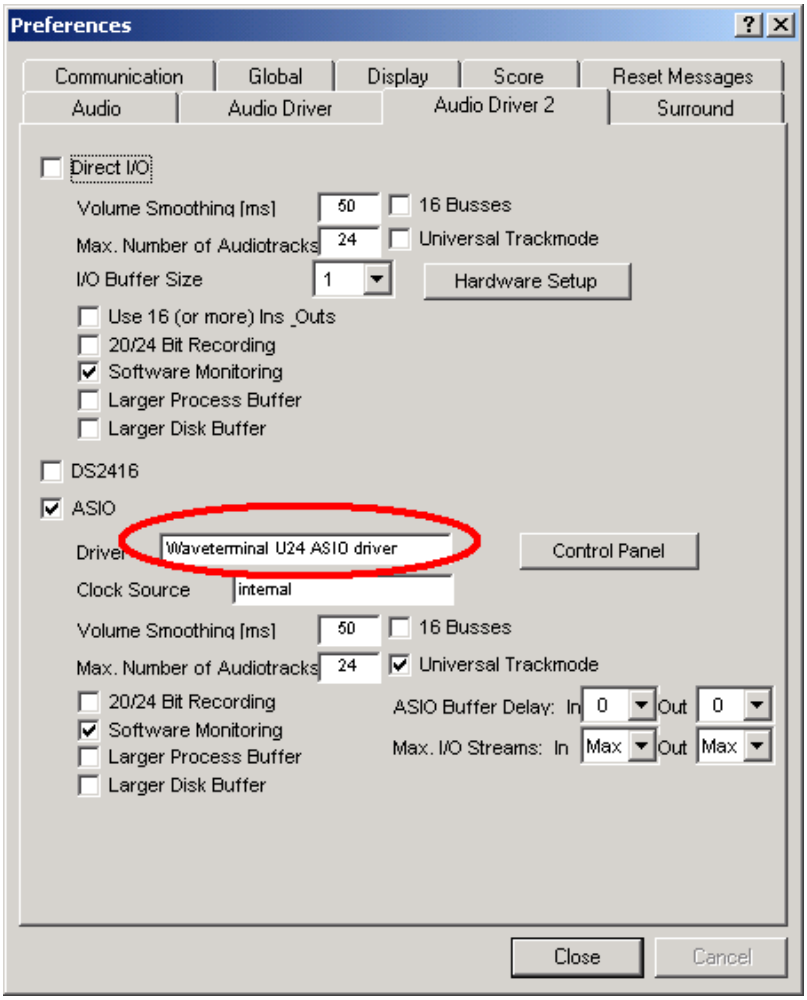
2) Working with Applications -ASIO2.0

If you have properly installed U24 ASIO driver software, you can find U24 control panel in your applications' audio setup menu.
Just click 'ASIO Control Panel' or 'Control Panel' in your application.
U24 ASIO control panel will be appearing.

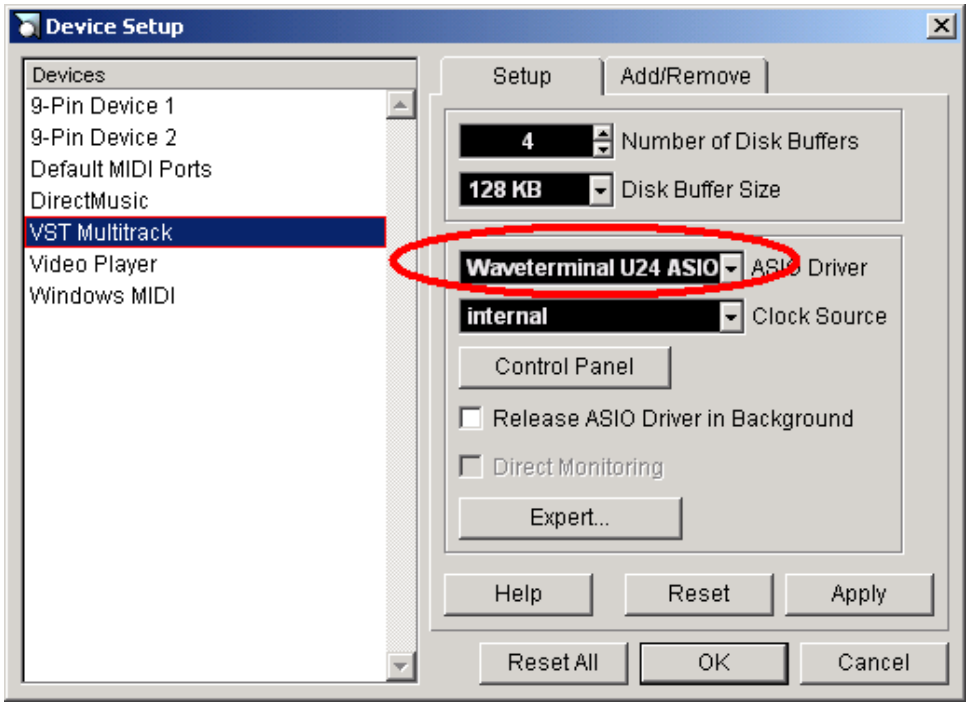
-Cubase



- Logic


Preferences
Communication
Global
Display
Score
Reset Messages
Audio
Audio Driver
Audio Driver 2
Surround
Direct I/O
Volume Smoothing [ms]
50
16 Busses
Max. Number of Audiotracks
24
Universal Trackmode
I/O Buffer Size
1
Hardware Setup
Use 16 (or more) Ins _Outs
20/24 Bit Recording
Software Monitoring
Larger Process Buffer
Larger Disk Buffer
DS2416
ASIO
Driver
Waveterminal U24 ASIO driver
Control Panel
Clock Source
internal
Volume Smoothing [ms]
50
16 Busses
Max. Number of Audiotracks
24
Universal Trackmode
20/24 Bit Recording
Software Monitoring
Larger Process Buffer
Larger Disk Buffer
ASIO Buffer Delay: In
0
Out
0
Max. I/O Streams: In
Max
Out
Max
Close
Cancel

-Nuendo


Device Setup
Devices
9-Pin Device 1
9-Pin Device 2
Default MIDI Ports
DirectMusic
VST Multitrack
Video Player
Windows MIDI
Setup
Add/Remove
4
Number of Disk Buffers
128 KB
Disk Buffer Size
Waveterminal U24 ASIO
ASIO Driver
internal
Clock Source
Control Panel
Release ASIO Driver in Background
Direct Monitoring
Expert...
Help
Reset
Apply
Reset All
OK
Cancel

9. Using U24 in MAC

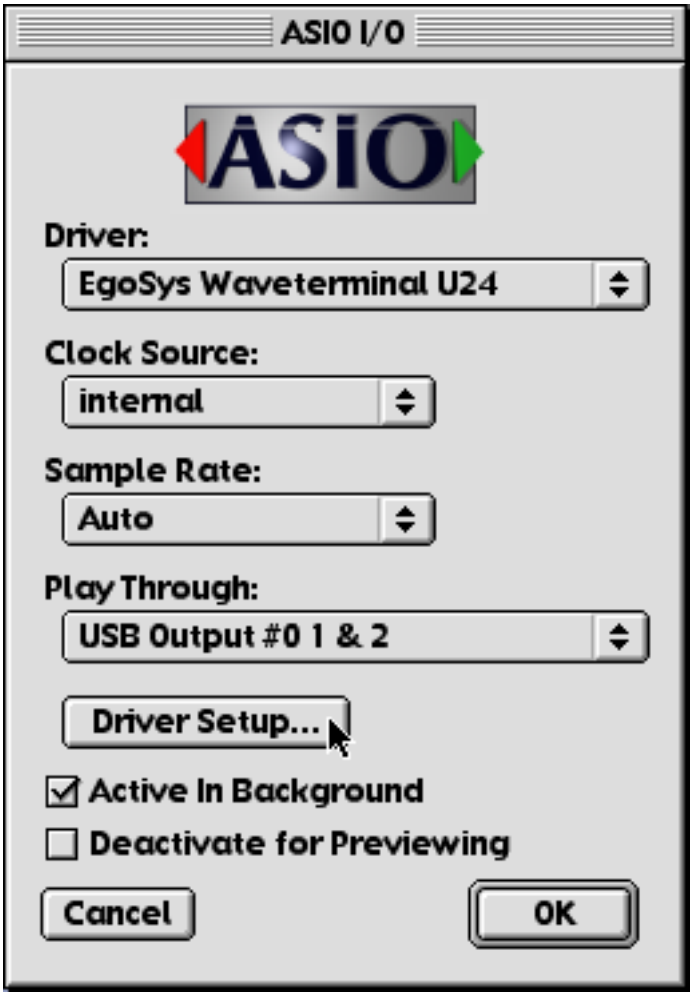
1) Working with Applications

Today, most digital audio applications support ASIO, and U24 works with them once it has been installed properly. It's just a matter of selecting the sample rate and the bit depth of your preference from thereon. You should refer to the specific application's manual on how to setup the hardware and optimize the audio recording and playback capabilities. If you have problems or questions with setting up U24 on your application please contact our technical support.

Here are some examples how you make a proper ASIO setup for the application to use with U24:

PEAK 2.X

1. Choose the menu Audio > Sound Out > ASIO.
2. Choose "EgoSys Waveterminal U24" from "Driver" popup menu.
3. The clock source should be "internal" unless you need digital sync.
4. Choose the right playback sample rate and channels (refer to the Peak manual).
5. Click the "Driver Setup…" button to open the U24 ASIO control panel. Choose the proper settings.


ASIO I/O
ASIO
Driver:
EgoSys Waveterminal U24
Clock Source:
internal
Sample Rate:
Auto
Play Through:
USB Output #0 1 & 2
Driver Setup...
Active In Background
Deactivate for Previewing
Cancel
OK

1. Choose “Audio Hardware & Drivers” from Audio menu.

2. Turn off “Mac AV” if needed.

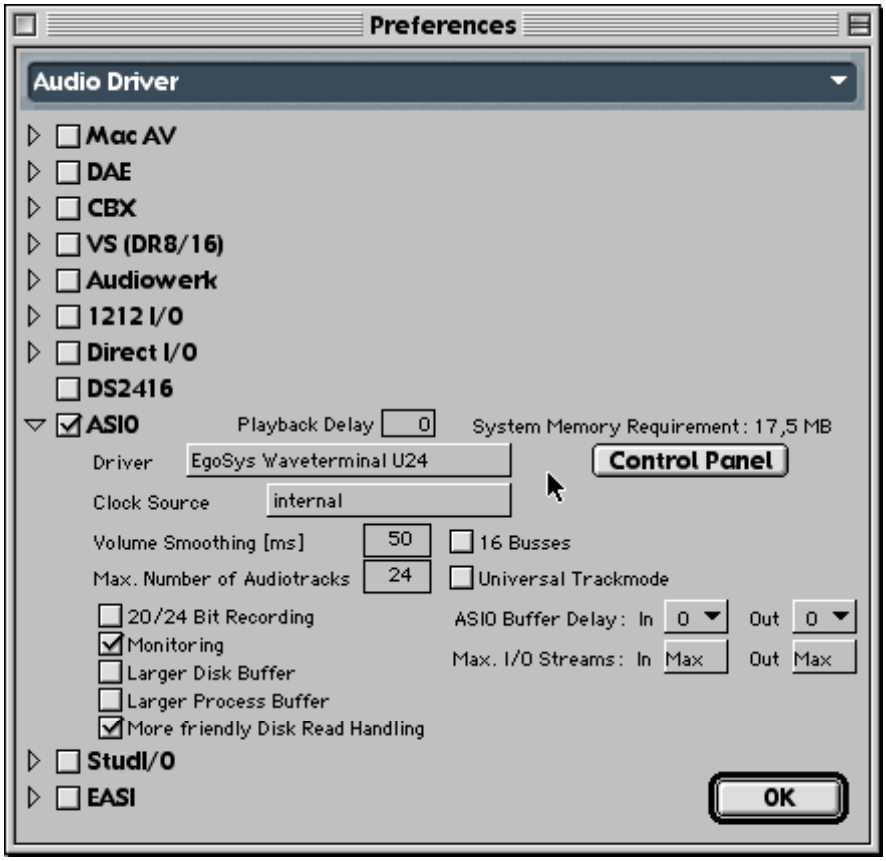
3. Click the triangle button of “ASIO” to see the options. (Do not turn on “ASIO” yet.)

4. Choose “EgoSys Waveterminal U24” from “Driver” popup.

5. Turn on “ASIO” by clicking the check box. When Logic asks to reboot Logic Audio, click “Try (Re)Launch” button.

6. Click “Control Panel” button to open the U24 ASIO control panel. Choose the proper settings.

7. Please refer to the Logic manual for the other options.


Preferences
Audio Driver
Mac AV
DAE
CBX
VS (DR8/16)
Audiowerk
1212 I/O
Direct I/O
DS2416
ASIO
Playback Delay
0
System Memory Requirement: 17,5 MB
Driver
EgoSys Waveterminal U24
Control Panel
Clock Source
internal
Volume Smoothing [ms]
50
16 Busses
Max. Number of Audiotracks
24
Universal Trackmode
20/24 Bit Recording
Monitoring
Larger Disk Buffer
Larger Process Buffer
More friendly Disk Read Handling
ASIO Buffer Delay: In 0 Out 0
Max. I/O Streams: In Max Out Max
Studi/O
EASI
OK

SPECIFICATIONS

1. Input LEVEL - -10dBV Unbalance : -10dBV Nominal, +6.5dBV Max

2. Output LEVEL - -10dBV Unbalance : -10dBV Nominal, +3.0dBV Max

3. Input Impedance - Unbalanced Mode 10K

4. Output Impedance - Unbalanced Mode 100

5. Analog Input Gain/Attenuation - Analog 0dB ~ 18dB, 0.5dB Step Size
Digital -72dB ~ 0dB, About 0.5dB Step Size

6. Analog Output Gain/Attenuation - Digital -72dB ~ 0dB, About 0.5dB Step Size

7. Sample Rate - 32KHz,44.1KHz,48KHz

8. A/D Spec
1) Type - AKM Semiconductor, 24Bit, 64xOversampling
2) Dynamic Range - 100dB A-Weighted, AT -60dBFS measurement method
3) Signal-to-Noise Ratio - 100dB A-Weighted
4) S/(N+D) Ratio - 90dB, AT -0.5dBFS measurement method
5) Inter channel Gain Mismatch - Typical:0.2dB, Max:0.5dB
6) Frequency response - 0 ~ 20KHz (FS=44.1KHz)

9. D/A Spec
1) Type - AKM Semiconductor, 24Bit, 128x Oversampling
2) Dynamic Range - 110dB A-Weighted AT -60dBFS measurement method
3) Signal-to-Noise Ratio - 110dB A-Weighted
4) S/(N+D) Ratio - 94dB, AT -0.5dBFS measurement method
5) Inter channel Gain Mismatch - Typical:0.2dB, Max:0.5dB
6) Frequency response - 0 ~ 20KHz (FS=44.1KHz)

10. Digital I/O Spec
1) Type - Crystal Semiconductor
24Bit Digital Audio I/O with Sample rate Converter
2) Format - IEC60958,AES3,S/PDIF
3) Sample Rate - 32KHz, 44.1KHz, 48KHz
4) Resolution - 24Bits
5) Sample Rate Converter - 128dB Dynamic Range
1:3 & 3:1 Maximum input to output sample rate ratio