

SONIC SOLUTIONS

SonicStudio 5

High-Density Studio

(SS-302)

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SonicStudio 5, High-Density Studio (SS-302)

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High-Density Studio

High-Density Studio allows your SonicStudio 16•24 to run at sample rates of 96 KHz or 88.2 KHz High-Density Audio and 16- to 24-bits for recording, editing, playback, and mixing. The High-Density Studio software must be used with the SonicStudio High-Density I/O, enabling you to:

- Record stereo high-density audio at 96 KHz and 88.2 KHz
- Edit your material
- Playback up to eight streams of audio simultaneously
- Mix through a special two-channel mixing desk
- Convert the signal down to 44.1 KHz for CD audio

Many features available for the standard (44.1 KHz, 48 KHz) sample rates in SonicStudio are also supported for High-Density Studio.

Two channels of digital I/O may be used with High-Density Audio.

System Requirements

The *SonicStudio Installation and Maintenance* manual lists the hardware and software requirements needed to operate the SonicStudio system. To run High-Density Studio, you will need:

- A supported Macintosh, Power Macintosh, or MacOS-compatible computer
- SonicStudio 16•24 NuBus or PCI, including hard disk
- The High-Density Studio software option
- SonicStudio High-Density I/O box (HD I/O)
- Analog-to-Digital and Digital-to-Analog converters for interfacing with the HD I/O. Compatible third-party converters can be found on the Sonic Solution web site:

www.sonic.com.

- SonicStudio version 5.2 or higher

Note – SonicStudio HD I/O uses a double-speed AES interface for digital input and output. Each connector on the back of the unit transmits or receives stereo audio, which is the same as standard AES sample rates. This double-speed signal conforms to AES specifications for normal sample rates with respect to data and audio, but the sample rate has been doubled to accommodate 96 KHz and 88.2 KHz.

As of the release of SonicStudio 5.2, there are no official interconnect specifications for 96 KHz audio, but double-speed AES is one of two interface protocols that have become leading formats for 96 KHz products. The other interface protocol is a single-channel per connector protocol that uses two AES lines to transmit stereo audio, both lines running at 48 KHz. XLR cabling consists of two conductors and one ground per cable, which allows each conductor to carry every other sample of a split 96 KHz signal.

Make sure your 96 KHz-capable A/D and D/A boxes use the double-

speed AES format for compatibility with the HD I/O box. See the SonicStudio web page at www.sonic.com for the latest information on compatible High-Density products.

Installing System Software

Installing or upgrading SonicStudio system files consists of two steps:

1. Install the system files.
2. Install a key file (this identifies the options for which your system is keyed).

Note – If you are upgrading from an earlier version of SonicStudio, remember to replace the old key file with the new key file shipped with your High-Density Studio option.

For further information on setting up SonicStudio hardware and installing the software, see the manual titled *Installation and Maintenance*.

Configuring Your System

Once you have installed your software and hardware, turned on all equipment and started SonicStudio, you are now ready to configure your software to use High-Density Studio.

Selecting the Channel Mode

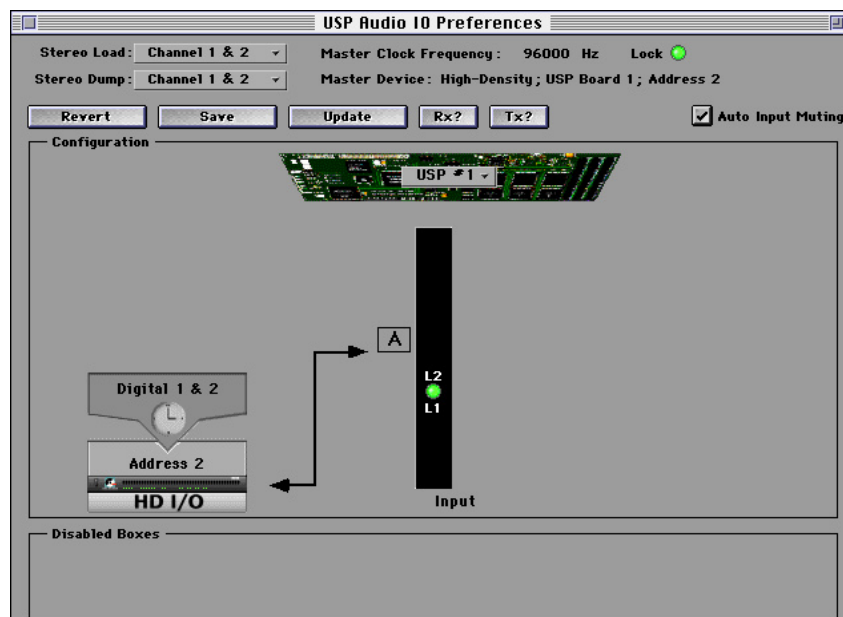
Use the Audio I/O Preferences dialog box to set the number of channels available for mixing in SonicStudio. Changing channel modes allows you to change the way you allocate SonicStudio DSP resources. High-Density Audio requires a special channel mode to run at these high sampling rates.

Upon starting, SonicStudio automatically selects the channel mode by searching the attached I/O boxes on start-up as follows:

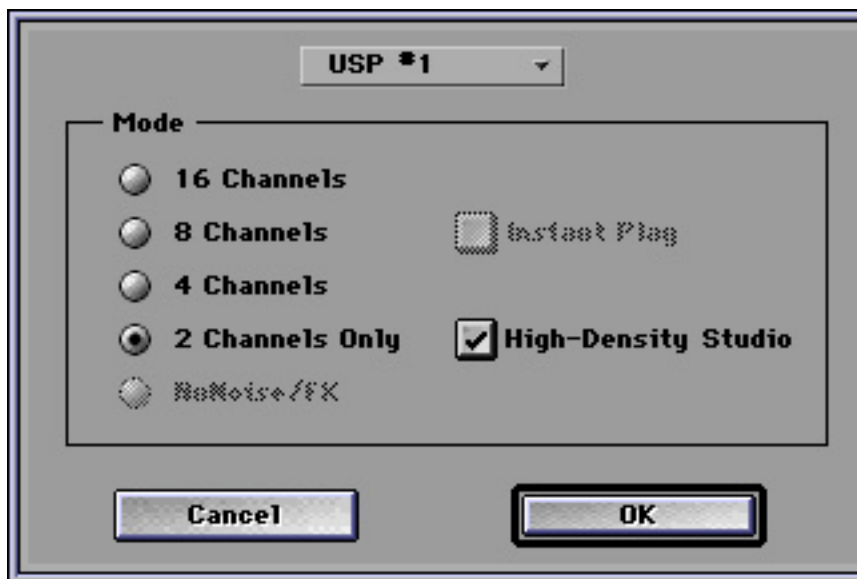
- If there is no HD I/O attached to the SonicStudio card, the system uses the default or last-saved channel mode.
- If there are both an HD I/O and other SonicStudio I/O boxes attached, the system uses the default or last-saved channel mode.
- If there is only one HD I/O attached, the system enters High-Density Audio, two-channel mode.

To manually switch to High-Density Studio mode:

1. From the File menu, select Preferences-> Audio I/O.
The Audio IO Preferences dialog box opens.



-
- Click the SonicStudio card (the green circuit board).
A dialog box opens.



- Select 2 Channels Only and High-Density Studio.

Note – If there is no HD I/O is attached to the SonicStudio card, the High-Density Studio checkbox is dimmed to show that you cannot select it.

- Click OK.
The system then resets the DSP and returns in High-Density mode.
You should see that there are only two channels available on your mixing desk. You may route any number of EDL panels to those two strips, and hear up to eight simultaneous audio playback streams from the EDL.

You have now successfully selected High-Density Audio mode.

Selecting the Clock Source

The clock source is the sample rate timing source for SonicStudio. As with normal sample rates and channel modes, you will need to select the clock source for High-Density Studio.

High-Density Studio must reference a clock source of 96 KHz or 88.2 KHz, (or the respective pull-down sample rates of 95.904 KHz or 88.112 KHz) in order to operate. This clock can either be generated internally or received using the digital inputs or word sync.

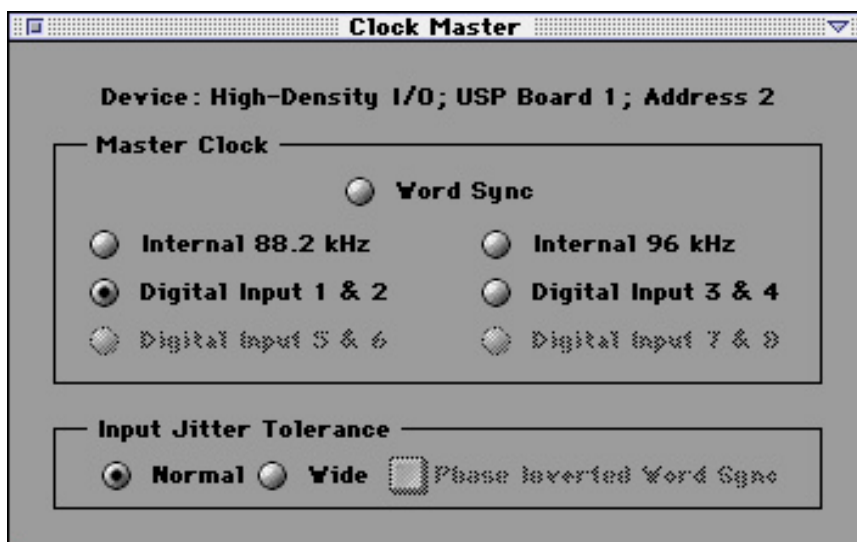
As with conventional sample rates, you must use a digital input as the SonicStudio master clock if you are planning to record audio from that input, unless both the HD I/O and the input's digital source (DAT, A/D) are locked to the same word sync signal, in which case you can use word sync as clock master.

Word sync may also be used to lock to video machines and other devices. See the sections on Digital Video or Machine Control for more information about locking to video signals.

To choose the clock source from the Clock Master dialog box:

1. From the File menu, select Preferences -> Audio I/O.
The Audio IO Preferences dialog box opens.

-
2. Click the clock above the HD I/O.
The Clock Master dialog box opens.



3. Select a clock source:
 - Word Sync - Use the 44.1 or 48 KHz word sync signal present at the word sync input as the master clock, but double the rate to 88.2 KHz or 96 KHz.
 - Internal 88.2 - Use the HD I/O's internal crystal to lock to an 88.2 KHz sample rate.
 - Internal 96 - Use the HD I/O's internal crystal to lock to a 96 KHz sample rate.
 - Digital Input 1 & 2 - Use the 96 KHz or 88.2 KHz digital signal present at inputs 1 and 2 to derive clock.
 - Digital Input 3 & 4 - Use the 96 KHz or 88.2 KHz digital signal present at inputs 3 and 4 to derive clock.

Note – Although you can lock to Digital Input 3 & 4, you cannot pass audio through them.

4. Click OK.

You have now successfully selected a clock source.

Using the Clock LEDs

The Audio I/O Preferences dialog box has LEDs and status indicators that can help you determine if your system is locked and if you are receiving a valid signal. The middle of the dialog box has a black bar with the numbers 1 and 2 in it, and an LED in between.

- If this LED is gray, then your input is Off.
- If the LED is amber, then your input is On, but there is no signal detected.
- If the LED is red with an X over it, then the signal detected is either invalid, or is not in sync with the master clock source.
- If the LED is green, then a signal is present and is locked with the master clock source.

The number next to the LED in the top right of the dialog box indicates the Master Clock Frequency. This number changes dynamically whenever you change sample rates or clock sources.

- If this LED is red with an X over it, then the system is not currently locked to a valid clock source and will not operate properly.
- If the LED is green, then the system is locked at the sample rate indicated in the Master Clock Frequency.

Muting Input

Select the Auto Input Muting option in the Audio I/O Preferences dialog box to automatically mute the input when it cannot lock to the incoming signal. For example, if a signal is present at inputs 1 and 2, but your master clock source is internal 88.2 KHz, the signal is muted so you don't hear the distortion and corrupted signal that would result. For this reason, Sonic recommends that you leave this option selected.

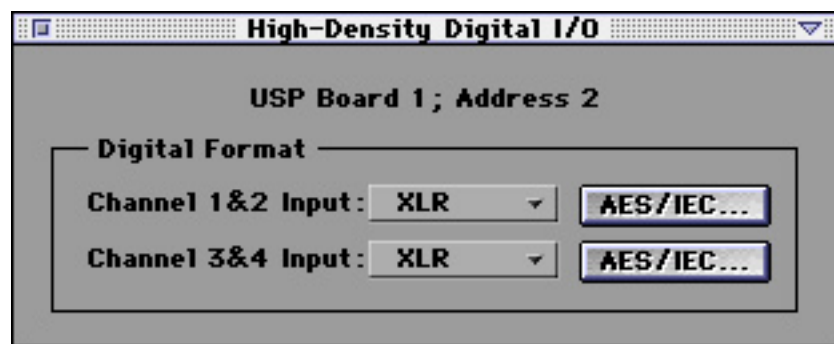
If this option is not selected, the signal is passed through the system whether it is locked or not. We recommend leaving this box checked.

Selecting the Input Source

Like other I/O boxes, you can access parameters that pertain to an interface by clicking on the icon of the box itself. When you click on the icon for HD I/O, the High-Density Digital I/O dialog box opens with options you can use to select the input sources. The only two choices for input at this time are XLR and Off.

Off turns off the input, effectively muting the signal present, if any.

XLR designates that the AES input on the HD I/O is being used as the source for audio signals.



Using High-Density Studio

Once you are in High-Density mode, most functions are identical to conventional SonicStudio operation. This section lists:

- The features of High-Density Studio that are supported by SonicStudio 5.2
- Tips and workarounds for features that are not fully supported at this time
- Tips on using special features

Supported Features

Recording

- Background recording
- 16- or 24-bit recording (specified in the Audio I/O Parameters dialog box)
- USP 24-bit mode
- Allocated recording using the record sound file dialog box
- Multiple simultaneous EDL recordings
- Eight streams of audio playback
- Four streams of audio playback and two channels or record
- Source Loads (using the Project Manager)
- DC Reject
- De-Emphasis

Editing

- Crossfades
- Marks
- All standard editing commands
- Drag-and-drop from Finder or Sonic Manager

Playback

- All standard play functions (from Play menu)
- Multiple EDL play
- Cueing from Transport Panel
- Scrubbing
- Drag-and-drop audition
- Sonic Manager audition
- Delivery Log

Mixing

- Automation
- Fader
- Pans
- In/Out routing
- Mute/Solo/EQ Bypass
- Filters (affects parameters up to 22.050 KHz; 2 filters per fader)
- Desk Setups

DSP

- Manual DeClicking (includes 96 KHz interpolation)
- Complex Filtering (affects parameters up to 22.050 KHz)
- Production DeClicking
- DeCrackle
- Gain Change
- Normalize
- Phase Invert
- Pitch Shifting
- Time Twist
- Reverse
- Frequency Analysis (now extends to 48 KHz)
- Background Sample Rate Conversion (not greater than 2 to 1 ratio)

Other

- Archiving
- Machine Control
- MIDI controllers
- OMS
- SCS-1000 Controller
- Timecode generation
- Timecode reading

Configurations

- MediaNet
- SonicStudio FX boards

Tips on Using Unsupported Features

This section offers guidelines for working with features of High-Density Studio that are not fully supported at this time.

Sample rate conversion on input

It is possible to convert the audio at a 2 to 1 ratio (96 to 48 KHz or 88.2 to 44.1 KHz) while recording High-Density Audio, but the sound files created are corrupted and show no waveform.

Reverse

Reverse for sound files greater than 16 bits is not yet functional. 16-bit sound files are processed correctly.

DeNoise

Both DeNoise and Realtime DeNoise are not yet functional for High-Density Studio.

Autoconform

While it is possible to do source log loads using the project manager, there is no field in an exported CMX list for a 96 KHz EDL. This feature is not yet supported.

Dither

Dither has not yet been activated for High-Density Studio.

Filtering

While both the mixing desk and complex filtering are supported, the EQ is not yet capable of affecting frequencies above 22.050 KHz, which is the current limit on the filters for normal sample rates.

Double-speed playback

It is not possible to playback 96 KHz audio at double-speed.

Digital Video

The Sonic Digital Video Playback Option is not supported at this time. The supported video cards such as Media 100 may exist in the computer, but you will not be able to run digital video in High-Density mode.

Multi-board configurations

SonicStudio FX boards are supported. Therefore background DSP processing can take place. However, using additional boards as Audio I/O boards is not yet supported. You cannot have two SonicStudio 16•24 cards, attach an HD I/O to each of them, and expect to get four channels of 96 KHz.

Dump to CD/DDP/PCM-9000/Image File

It is not possible to dump 96 KHz audio to any of these devices, so this feature is not supported in 96 KHz. Use normal channel modes for dumping to SCSI devices.

PQ Read/Rewrite/Verify

These feature are intended for use after writing a DDP tape, and therefore are only supported in normal channel modes.

CD Play Panel

This feature, which is for playing back 44.1 DDP tapes, will not work in High-Density Mode.

SCSI Copy

This feature is not supported in High-Density mode.

Tips on Using Special Features

FFT Frequency analysis

The SonicStudio Frequency Analysis, found in the DSP menu, now supports FFT up to 48 KHz, as opposed to the previous 22.1 KHz, which is appropriate for normal sample rates.

Sample Rate Conversion

The Sample Rate Conversion DSP is not capable of greater than 2 to 1 ratios of conversion, meaning that audio recorded at 96 KHz cannot be converted to 44.1 KHz in a single pass.

If you wish your final format to be 44.1 KHz, do one of the following:

- Record at 88.2 KHz, then convert to 44.1 KHz

-or-

- Make two SRC passes: the first from 96 KHz to 48 KHz, then again to 44.1 KHz.

In addition, if you are working with 24-bit material, it is desirable to do your sample rate conversion before you reduce to bit rate to 16-bit. Processing dithered material is generally not a recommended process. You will need to switch to a normal channel mode to do the bit reduction on the down-sampled file, as dither is not supported in 96 KHz mode.

Scrubbing

You may notice that the scrubbing is much richer than at normal sample rates. Since you have twice as many samples to scrub per unit of time, you have much more audio information to work with. As a result, the scrubbing sounds much more like true analog scrubbing than any standard sample rate could produce.

EDL and Sound File Flags

The EDL sample rate and sound files now have flags for 96000 Hz and 88200 Hz. The EDL preferences dialog box now includes sample rate selections (under the General category) for 96000, 88200, and the sample

rates (to match film to video transfers) of 95904 and 88112. When the EDL sample rate is set to Auto, SonicStudio will choose the closest sample rate that matches the Master Clock Frequency for any new EDL.

Sound files also have 96000 and 88200 flags, which are evident in the Info dialog box for any sound file. The Info (?) button is in the upper left of the Sonic Manager and displays information about any sound files selected in Sonic Manager.

For more information about using Sonic Studio or any of these features, see the Sonic Studio manual titled *Reference* and the *5.2 Release Notes*.

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