

# Digital Sample-to-Memory



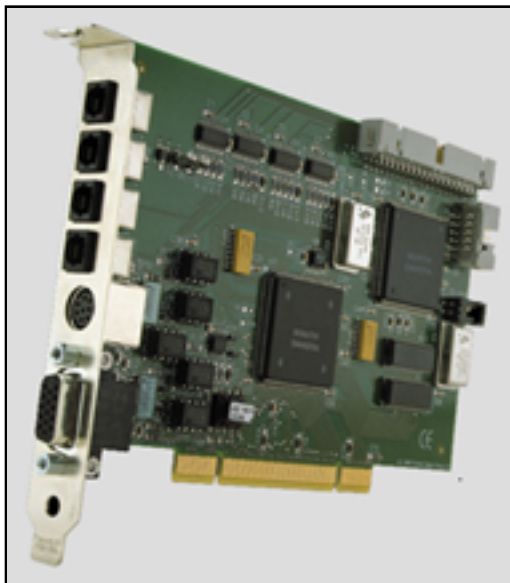
The Digital Sample-to-Memory option for Synclavier® PowerPC™ is a PCI hardware module and a collection of software drivers that let you record digital audio directly into the Sample-to-Memory Sound Editor (L-page). The Digital Sample-to-Memory option can be used in any one of several ways depending on how you work.

With the Digital STM you can

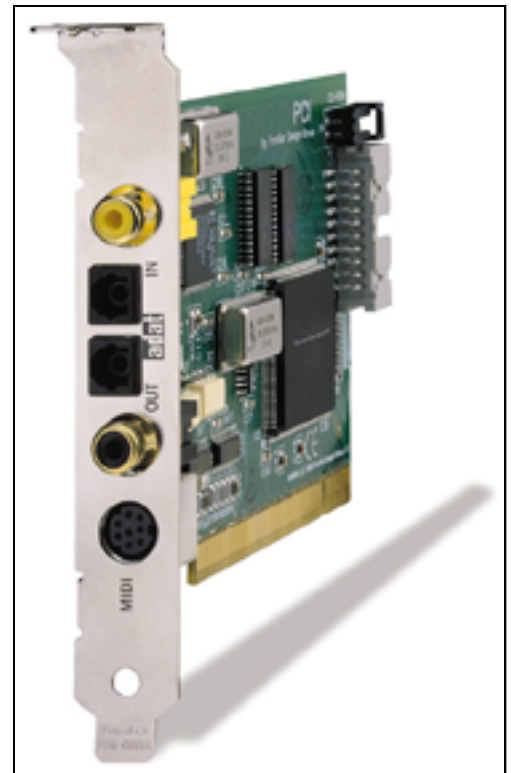
- Record digital audio from an ADAT light-pipe device, Coaxial S/PDIF or Optical S/PDIF input directly into the Sample-to-Memory Sound Editor
- Process digital audio on your Macintosh using CuBase/VST or any other ASIO-compatible digital audio application and feed the processed digital audio into the Sample-to-Memory
- Connect the output from a digital console directly to the Sample-to-Memory
- Record the playback of an ASIO-compatible hard disk recording application into the Sample-to-Memory

## Digital STM Hardware

Two hardware options are available for the Digital STM. The **10-Channel Digital STM** is a single PCI card that provides 8 channels of digital audio input and output using 2 ADAT-style optical connectors, plus two channels of digital audio input and output using S/PDIF coaxial connectors. It supports 44.1 and 48.0 khz sampling rates only (96 Khz. is planned for a later release).



The **18-Channel Digital STM** is a single PCI card that provides 16 channels of digital audio input and output using 4 ADAT-style optical connectors, plus two channels of digital audio input and output using S/PDIF coaxial connectors. All sample rates from 40.0 to 50.5 khz are supported. A later software release will support a 16-channel companion board that expands the 18-channel unit to 34-channels.



**10-Channel Digital STM**

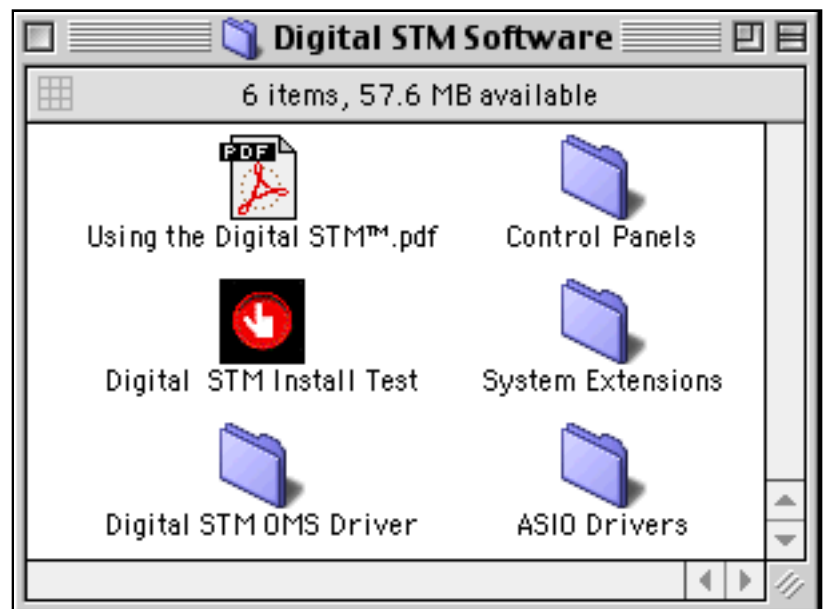
## Comparison of the 10-Channel and 18-Channel Digital STM Hardware

10-Channel Digital STM	18-Channel Digital STM
8 Channel ADAT Optical Input	2 X 8 Channel ADAT Optical Inputs
2 Channel S/PDIF Coaxial Input	2 Channel S/PDIF Coaxial Input
8 Channel ADAT Optical Output	2 X 8 Channel ADAT Optical Outputs
2 Channel S/PDIF Coaxial Output	2 Channel S/PDIF Coaxial Output
44.1 and 48.0 Khz Sampling Rates	40.0 through 50.5 Khz Sampling Rates
96 Khz added in later software	96 Khz added in later software
No channel expansion	Expandable to 4 X 8 ADAT Optical Input and Output with expansion PCI card
2 Channel MIDI	2 Channel or 8 Channel MIDI

96 Khz sampling is planned for both modules in a later software release. Both modules support 16-bit and 24-bit digital audio formats.

### Digital STM Software

The Digital STM Software includes a User Manual, an installation hardware test program, a System Extension, a Control Panel and an OMS MIDI Driver. Additionally, two ASIO drivers are included should you wish to use the Digital STM in conjunction with an ASIO-compatible application such as CuBase/VST. The System Extension ("FDGSharedLibrary.dll") and the Control Panel ("Digital STM") are automatically installed in your correct system folder during installation. If you will be using the ASIO drivers you must move them into the "ASIO Drivers" folder that goes with your ASIO-compatible application. If you wish to use the MIDI ports on the Digital STM you must install the Digital STM OMS Driver in the "OMS Folder" in your System Folder.



### What Is ASIO

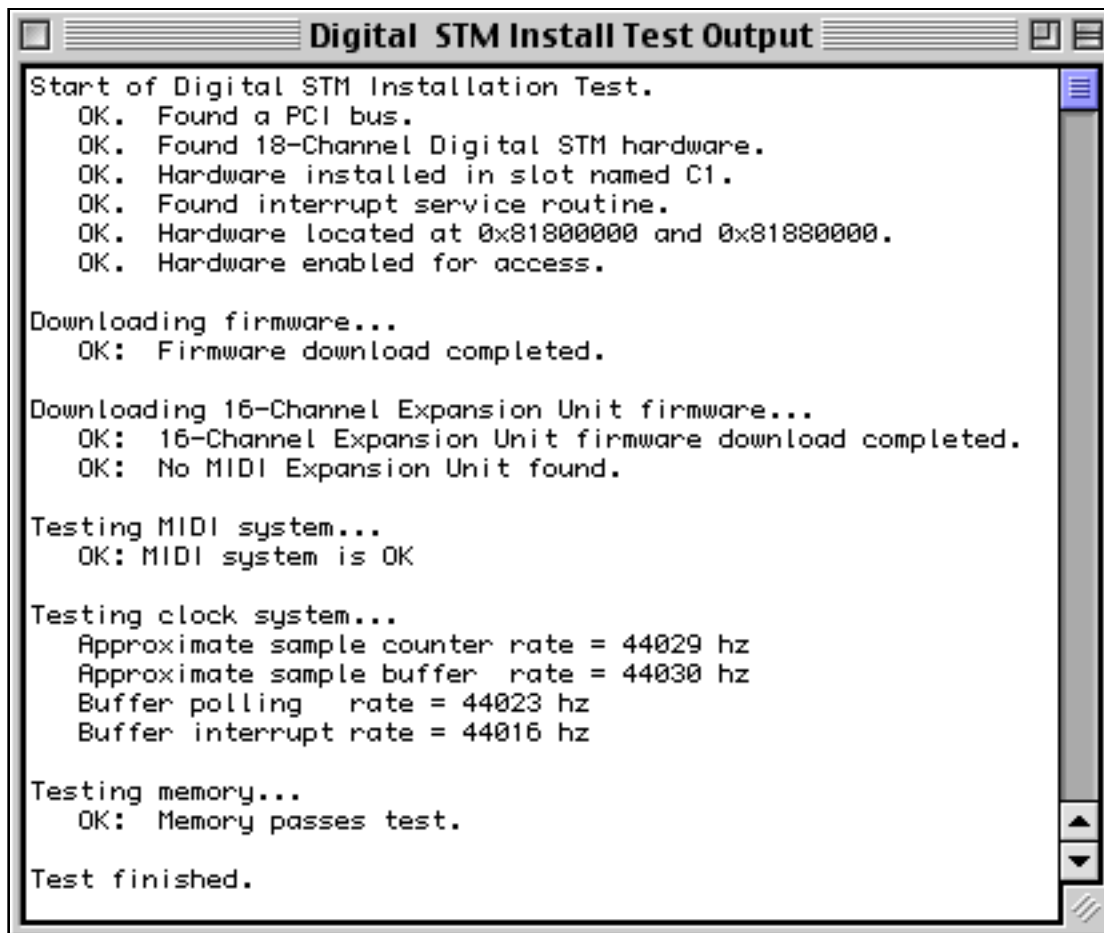
ASIO is an acronym for Audio Stream Input Output and refers to a software standard developed by Steinberg,, GmbH. The ASIO standard provides a published method for hardware and software purchased from different vendors to exchange multi-channel digital audio in real time. You do not need an ASIO-compatible application to use the Digital STM with Synclavier®

PowerPC™. However, an advanced ASIO-compatible application such CuBase/VST lets you digitally process the audio as it is being fed into the Sample-to-Memory Sound Editor and provides additional routing, metering and mixing options.

### Installing the Digital STM Hardware

The Digital STM hardware module can plug into any available PCI slot in your computer. You may use a PCI expansion chassis to add more PCI slots to your computer if you need to.

You may wish to run the Digital STM Installation Test to verify that the Digital STM hardware is installed correctly.



### Using Digital STM with OMS

The Digital STM OMS Driver allows the two midi ports on the Digital STM to be used with Opcode System's Open Music System (version 2.0 or later).

## Using the Digital STM with the Sample-to-Memory Sound Editor

Once the Digital STM hardware is installed in your computer, it is available for use by the Sample-to-Memory Sound Editor.

### Digital STM Mono

```
5.000 V x 0.000 secs [ ]
Resolution: 5

A) Display      Time available is 54.4 seconds.
B) Modify      Mode:   Dig STM Mo Rate:   48.0 kHz
C) Store/Recall Trigger: On   Threshold: 0.015 volts
X) Modify II
```

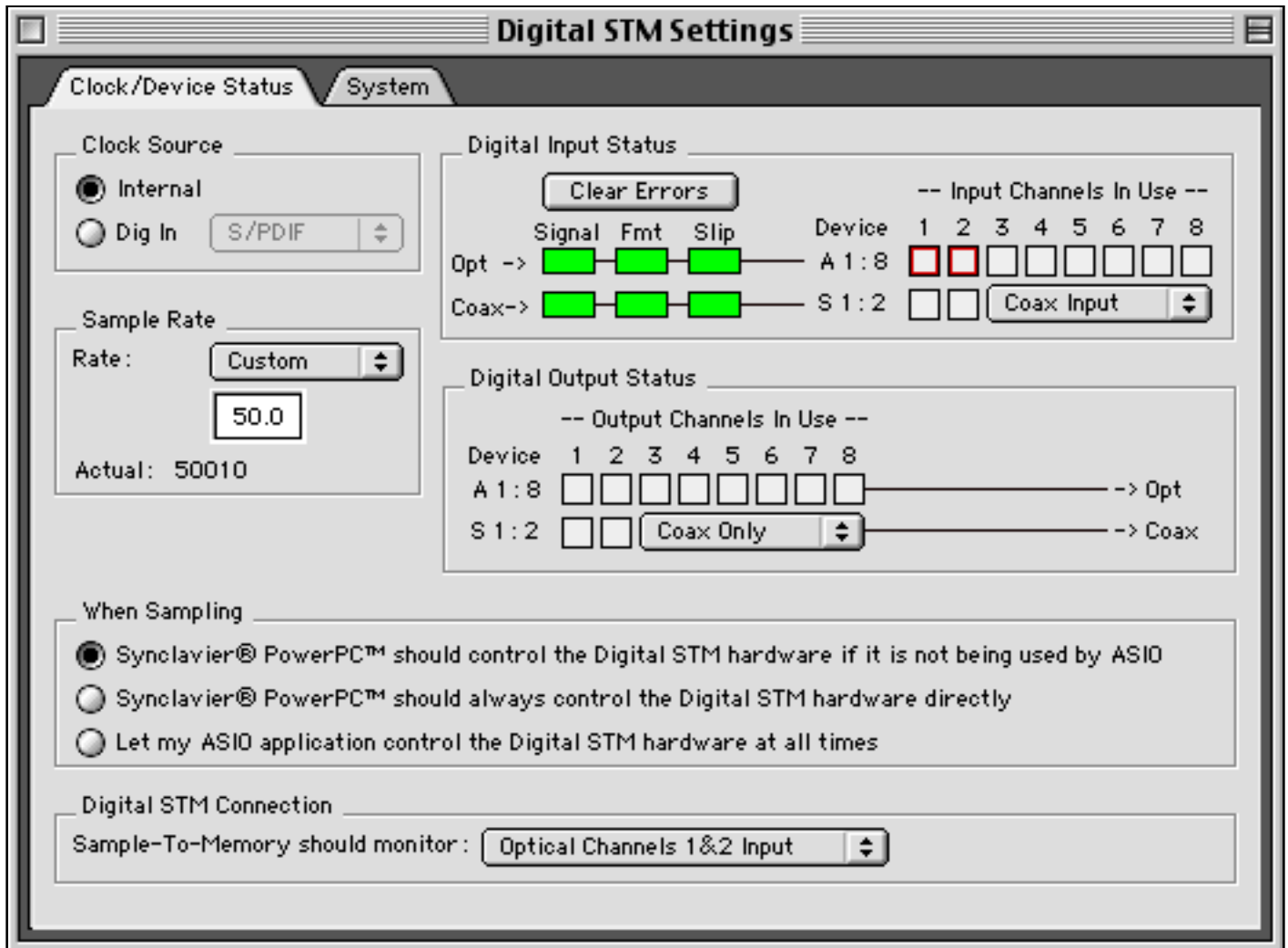
### Digital STM Stereo

```
5.000 V x 0.000 secs [ ]
Resolution: 5

A) Display      Time available is 27.2 seconds.
B) Modify      Mode:   Dig STM St Rate:   48.0 kHz
C) Store/Recall Trigger: On   Threshold: 0.015 volts
X) Modify II
```

## Using the Digital STM Control Panel

The Digital STM Control Panel is activated from the Control Panels folder via the Apple menu.



## Basic Settings

Clock Source - Select Internal to synchronize to an internal crystal time base. Select Digital Input to synchronize the Digital STM clock circuitry to the incoming digital signal. To use a Custom sample rate, you will typically use Internal synchronization, and use the generated Optical or S/PDIF output signal to provide clocking to your Analog-to-Digital converter.

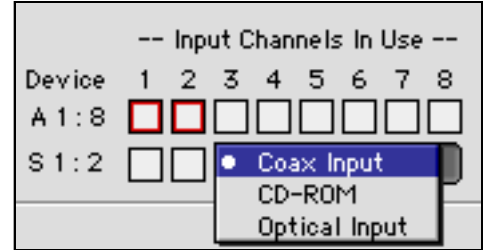
S/PDIF as an acronym for "Sony/Phillips Digital Interface Format". It is a common industry-standard format for the real-time exchange of digital audio

Sample Rate - 44.1, 48.0 or a Custom rate may be entered. The Custom rate is only available with the 18-Channel Digital STM; it is not available with the 10-Channel Digital STM.

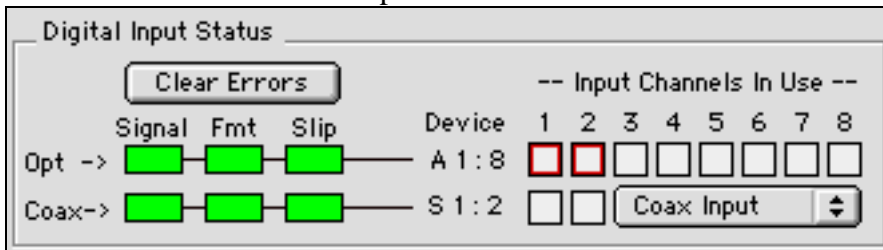
## Selecting the S/PDIF input source

The S/PDIF input signal can be received from the coaxial connector, directly from certain CD-ROM drives, or using an S/PDIF Optical signal connected to the Optical Input connector.

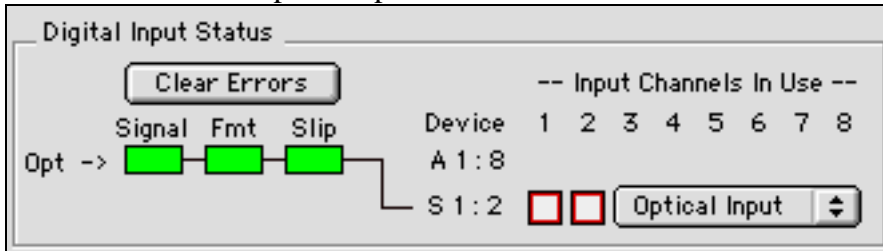
When the Optical Connector is being used for an S/PDIF signal the ADAT channels are not available.



## S/PDIF received at Coaxial input



## S/PDIF received at Optical input

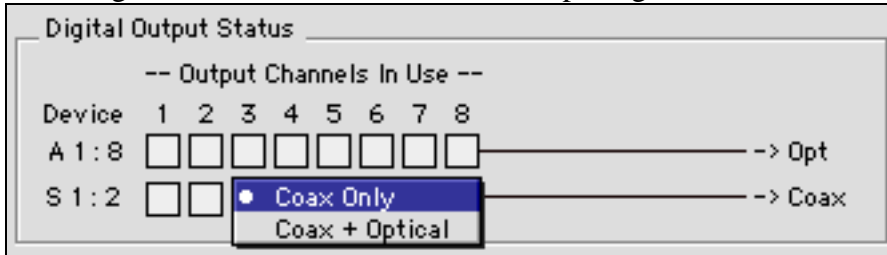


AES/EBU - An AES/EBU format digital signal can be converted to an S/PDIF signal using an inexpensive converter cable or box.

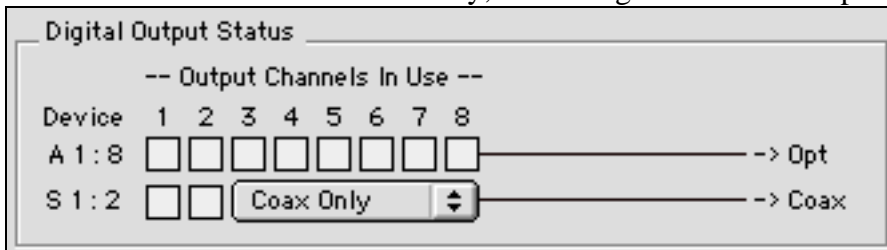
## Selecting the S/PDIF output destination

The Digital STM creates an S/PDIF output signal which can be directed to the coaxial output connector, and optionally to the optical output connector. This S/PDIF output signal may be used to clock your Analog-to-Digital converter, and it also may contain digital audio data from an ASIO-compatible application (described later).

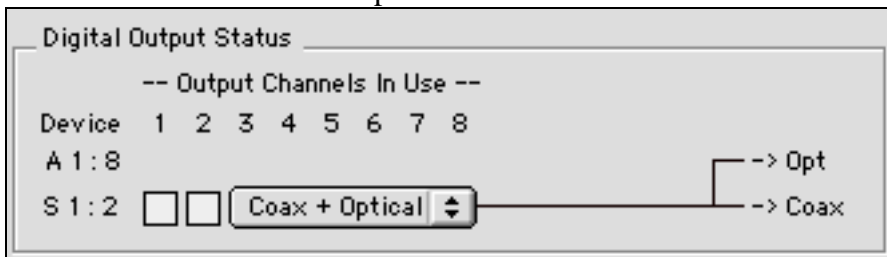
## Choosing the destination for the S/PDIF output signal



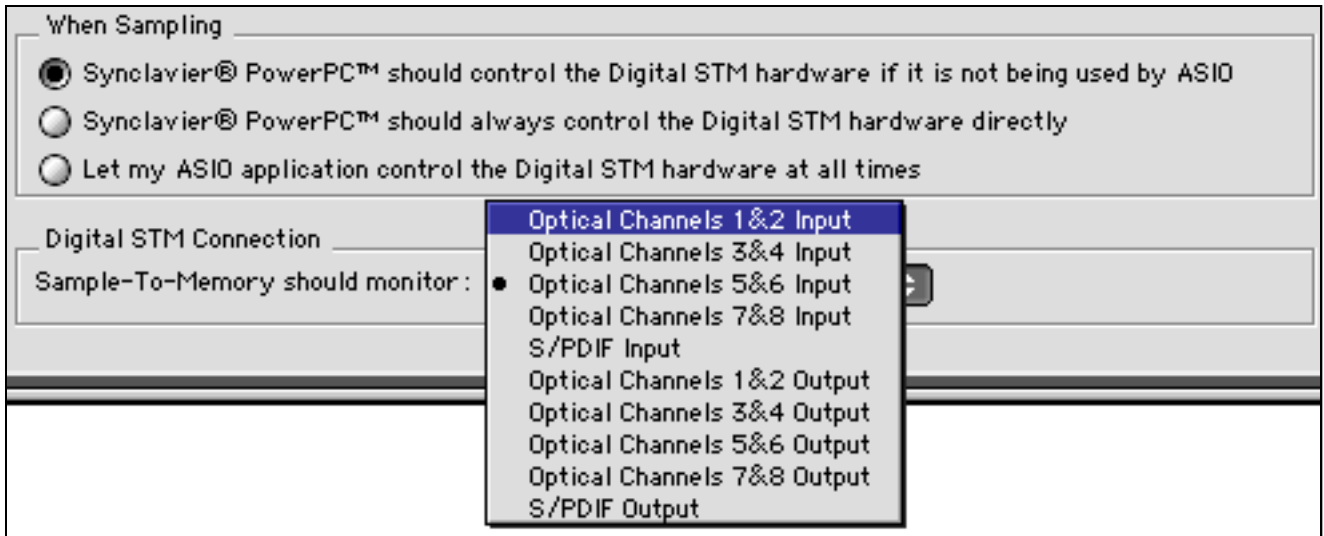
S/PDIF sent to coaxial connector only; ADAT signals sent to the optical connector.



S/PDIF send to coaxial and optical connectors.



## Sending data to the Sample-to-Memory Sound Editor



1.

Synclavier® PowerPC™ should control the Digital STM hardware if it is not being used by ASIO

This setting directs Synclavier® PowerPC™ to take control of the Digital STM hardware when you switch to the Sample-to-Memory Sound Editor recording screen *if the unit is not being used by an ASIO-compatible application at that time*. If the Digital STM hardware *is* being used by an ASIO application, the Sample-to-Memory Sound Editor connects to the desired audio channel but leaves the Digital STM hardware under the control of your ASIO-compatible application.

2.

Synclavier® PowerPC™ should always control the Digital STM hardware directly

This setting directs Synclavier® PowerPC™ to always take control of the Digital STM Hardware whenever you switch to the Sample-to-Memory Sound Editor recording screen. Synclavier® PowerPC™ will display an error message if the Digital STM hardware is being used by ASIO when you try to record into the Sample-to-Memory.

3.

Let my ASIO application control the Digital STM hardware at all times

This setting directs Synclavier® PowerPC™ to always leave your Digital STM hardware under the control of your ASIO-compatible application. Use this setting if you always plan to record into the Digital STM under the control of an application such as CuBase/VST. If you select this setting you will be able to launch Synclavier® PowerPC™ and your ASIO-compatible application in either order without generating a "device busy" error.

Hint: If you don't own and never plan to use an ASIO-compatible application, select option 2. If you plan to use an ASIO-compatible application every time you record using the Digital STM, select option 3. Otherwise leave the setting at 1 and be sure to launch your ASIO-compatible application before you go to the Sample-to-Memory record screen if you want to process digital audio while recording.

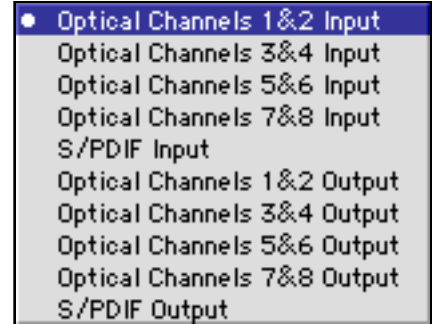
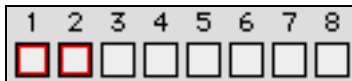


## Choosing the Sample-to-Memory Data Connection

The Sample-to-Memory Sound Editor can receive data from the 8 optical input channels or the S/PDIF input channel. Additionally, if you are using an ASIO-compatible application to control the Digital STM hardware, you can route data going to any of the Digital STM outputs into the Sample-to-Memory Sound Editor.

When you are doing stereo recording, the channels are paired as shown. When you are doing mono recording, only the left channel of the stereo pair may be recorded (that is, channels 1, 3, 5, 7 or the left S/PDIF input channel).

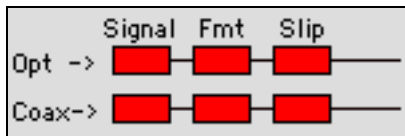
The channel pair you have selected for recording is highlighted in red:



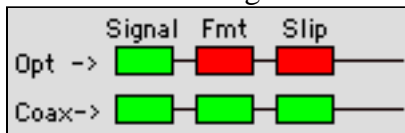
## Data Error Indications

The Digital STM Control Panel provides visual indication that a valid digital input is connected and that no data errors are occurring.

No signal connected

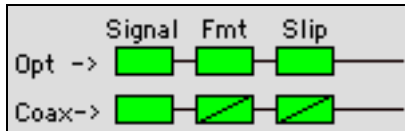


Signal connected but wrong format

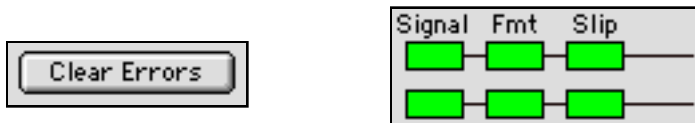


Note it is normal for errors to occur when you change sampling rates, plug or unplug signals, and so forth. Persistent "Slip" errors indicate that the Digital STM is not synced to the digital input signal correctly, or perhaps the Optical and S/PDIF inputs are coming from devices that are not being clocked from a common clock source.

Signal errors have occurred since Clear Errors was pressed



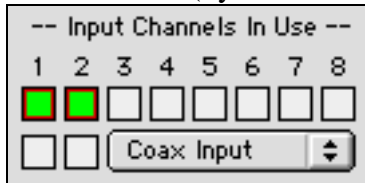
Click in Clear Errors to clear all the error indications. You should see solid green



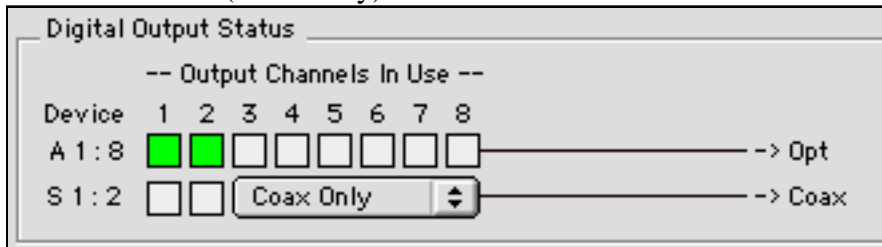
## Channel-in-Use indicator

The Digital STM Control Panel provides a visual indication (green) when a digital input or output channel is actively being used by either Synclavier® PowerPC™ or an ASIO-compatible application. This indicator is not a signal level indicator; digital silence will still show green.

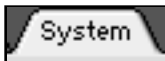
### Input Channel In Use (Synclavier® PowerPC™ or ASIO)



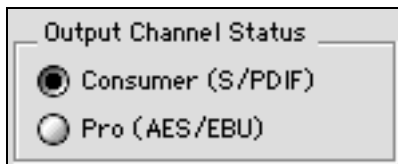
### Output Channels in Use (ASIO only)



### System Tab



The Output Channel Status control lets you specify consumer (S/PDIF) or professional (AES/EBU) format for the S/PDIF output signal:



The ASIO Buffer Size control lets you specify the input and output buffer sizes that are used by ASIO. Smaller buffers provide smaller input-to-output delays but require more processor bandwidth.



## Using the Digital STM with an ASIO-Compatible Application

To use the Digital STM with an ASIO-compatible application such as CuBase/VST, you must move the files "ASIO Digital STM 16-bit" and "ASIO Digital STM 24-bit" into the "ASIO Drivers" folder that is specified for your ASIO Compatible application. This folder is usually adjacent to the ASIO application itself.

Here's how CuBase/VST selects the Digital STM ASIO Driver:



Using an application such as CuBase/VST as a front end for the Sample-to-Memory provides powerful digital signal processing capabilities while creating samples. EQ and other effects as well as multi-channel mixing and level control can all be accomplished with 24-bit accuracy before the signal is fed into the Sample-to-Memory Sound Editor.

