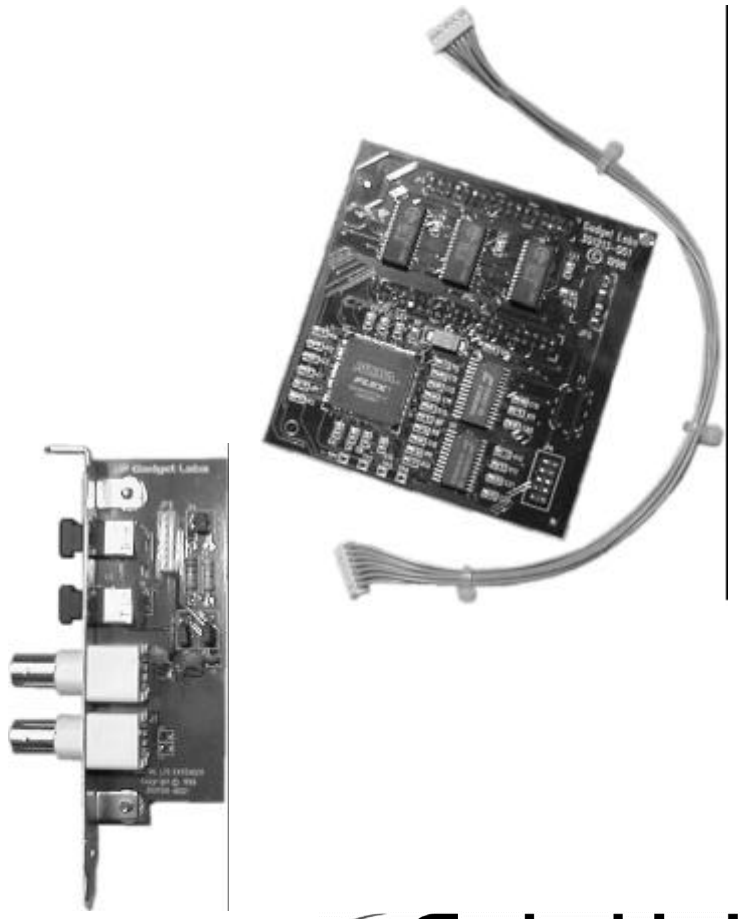
User Guide

WavePRO™

SPDIF and ADAT® Option Cards



Gadget Labs

INTRODUCTION

Thanks for purchasing gear from Gadget Labs!

The SPDIF and ADAT option cards facilitate direct digital audio data transfer to and from your PC via a WavePRO interface card. Each WavePRO PCI card has special on-board connectors that can accommodate a single option card (either SPDIF or ADAT).

The **SPDIF option card** interfaces with any equipment that supports the S/P DIF standard digital audio standard, such as DAT recorders (digital audio tape), audio processing units or music synthesizers. The S/P DIF standard includes both consumer and professional modes and the SPDIF option card supports both modes. Also, 16-bit and 24-bit data transfer is supported.

The **ADAT option card** interfaces with equipment that supports the ADAT optical, "light-pipe" standard for digital audio such as ADAT digital tape recorders, digital mixers and digital audio converters. 16-bit, 20-bit and 24-bit transfer modes are supported.

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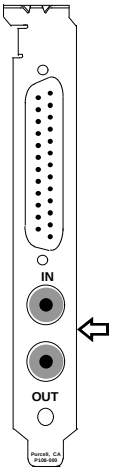
DIGITAL CONNECTIONS SUMMARY

The digital audio connections to and from a SPDIF or ADAT option card can be **electrical** (via RCA or BNC coax jacks) or **optical** (via TOSLINK-type optical connectors).

If you are installing the **SPDIF** option card onto the **Wave/824**, there are RCA jacks already on the PCI card that can be used for electrical connections. Optionally, the **Digital I/O bracket** can also be used with the **Wave/824** and the **SPDIF** option card if you need optical connections.

If you are installing the **ADAT option card**, the **Digital I/O bracket** is included. If you are installing the **SPDIF** option card on the **Wave/424 or Wave/496**, the Digital I/O bracket is included.

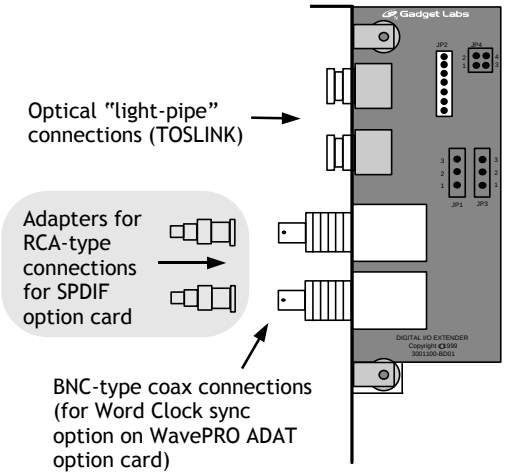
connection	**ADAT** (all cards)	**SPDIF** Wave/424 Wave/496	**SPDIF** Wave/824	**Word Clock sync** (included with ADAT card)
RCA jacks on Wave/824 card			✓	
RCA jacks via adapters on Digital I/O bracket		✓	✓	
Optical TOSLINK jacks on Digital I/O bracket	✓	✓	✓	
BNC coax jacks on Digital I/O bracket				✓



Wave/824 PCI card

RCA-type jacks for SPDIF option card

Digital I/O bracket



Optical "light-pipe" connections (TOSLINK)

Adapters for RCA-type connections for SPDIF option card

BNC-type coax connections (for Word Clock sync option on WavePRO ADAT option card)

INSTALLING THE SPDIF OR ADAT OPTION CARD & SOFTWARE DRIVERS

STEP ❶ Shut down and turn off your PC

Before you begin installing an option card, please note:

Static electricity can damage electronic components!

Take the following precaution before you install the option card:

Shut down and turn off the PC *but leave it plugged in*. Touch the metal chassis of the PC to drain the static from your bod ☺ ***before*** you touch the WavePRO PCI card or the option card.

Next, unplug the PC's power cable. Follow the steps in your PC's user manual and remove the PC chassis cover.

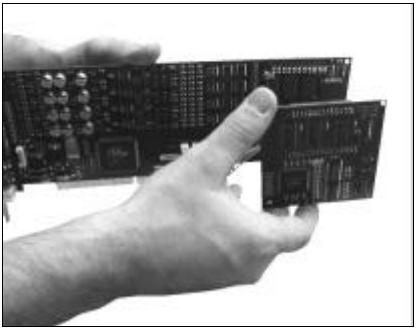
STEP ❷ Disconnect all cables from your WavePRO PCI card and remove the PCI card from your PC.

For the Wave/824 or Wave/496, disconnect the Patch Box cable from the WavePRO PCI card. For the Wave/424, disconnect and audio cables from the card.

STEP ❸ Connect the gray signal cable that came with the option card to the back of the SPDIF or ADAT card.

Don't worry -- the connectors are keyed & there's no way to plug in the signal cable incorrectly.

STEP ❹ Connect the SPDIF or ADAT option card to the PCI card at the multi-pin connections.



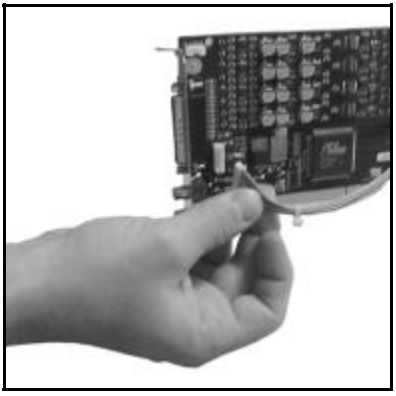
STEP ❺ CAUTION

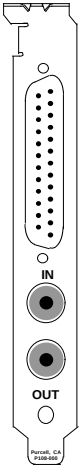
MAKE SURE that that the pins are lined up properly!

STEP ❻ Wave/824 + SPDIF step

If you are installing the SPDIF option card onto the Wave/824, there are RCA jacks on the card that can be used to connect external digital audio equipment to the card.

To use these SPDIF RCA jacks, plug the gray signal cable from the SPDIF card onto the Wave/824 PCI card at location JP2 (as shown)





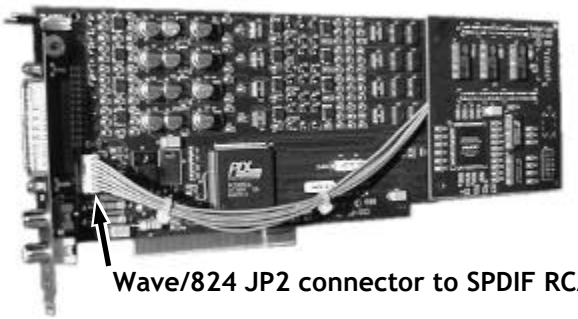
Wave/824 PCI card connections

25-pin connector for cable to Patch box

IN

OUT

RCA-type jacks for SPDIF option card



Wave/824 JP2 connector to SPDIF RCA Jacks

For the Wave/824 card with SPDIF-via-RCA jacks, here's how the finished connections should look.

STEP ❼ CONFIGURING THE DIGITAL I/O BRACKET

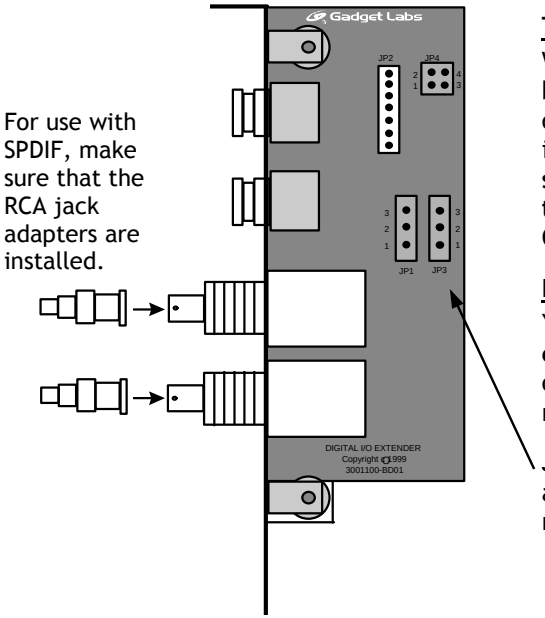
Note: if you have a Wave/824 with a SPDIF option card and you are not using the Digital I/O bracket, skip to Step 9

The Digital I/O bracket is required for the ADAT option card. It is also required when using the SPDIF option card with either the Wave/424 or the Wave/496. It can also be used as an option with the Wave/824 (to facilitate optical connections).

The Digital I/O bracket includes a small circuit board and this circuit board is connected to the SPDIF or ADAT option card via a gray signal cable.

Before you install the Digital I/O bracket, you'll need to check the jumper strapping. The jumper strapping consists of jumper blocks that are connected across pins to create a circuit connection.

SPDIF JUMPER STRAPPING



For use with SPDIF, make sure that the RCA jack adapters are installed.

Transmitting digital audio

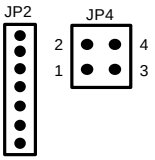
When using the Digital I/O bracket with the SPDIF option card, digital audio is transmitted **simultaneously on both the RCA jacks and the Optical TOSlink jacks.**

Receiving digital audio

You will need to **select either** the RCA jacks or the optical jacks as the receive connection.

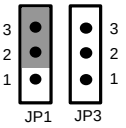
Jumpers J1, J3, and J4 are used to select the SPDIF receive mode

Receive SPDIF via Optical TOSLINK



J1 use a jumper block (included) to connect pins 2 and 3

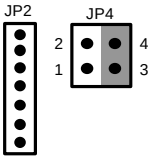
J2 this connector is used to connect the gray signal cable to the SPDIF option card.



J3 no jumper blocks required

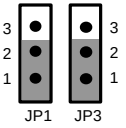
J4 no jumper blocks required.

Receive SPDIF via RCA jacks



J1 use a jumper block (included) to **connect pins 1 and 2**

J2 this connector is used to connect the gray signal cable to the SPDIF option card.

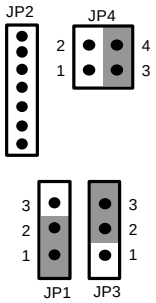


J3 use a jumper block to **connect pins 1 and 2**

J4 use a jumper block to **connect pins 3 and 4**

ADAT JUMPER STRAPPING

For the ADAT option card, the Digital I/O bracket is configured as shown below. Check this strapping before installation.



J1 use a jumper block (included) to **connect pins 1 and 2**

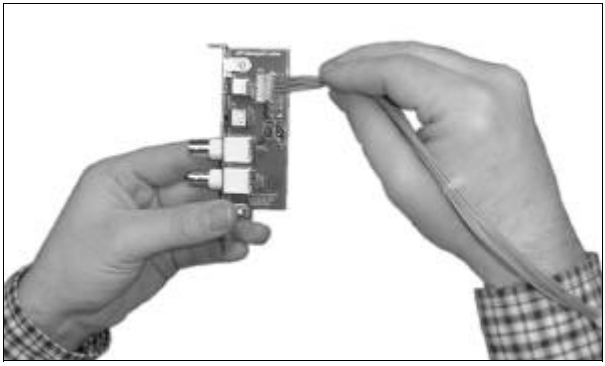
J2 this connector is used to connect the gray signal cable to the SPDIF option card.

J3 use a jumper block to **connect pins 2 and 3**

J4 use a jumper block to **connect pins 3 and 4**

STEP ❽ CONNECT THE GRAY SIGNAL CABLE TO THE DIGITAL I/O BRACKET

Don't worry -- the connectors are keyed & there's no way to plug in the signal cable incorrectly.



STEP ❾ After the previous steps are completed:

- Plug the PCI card back into the computer
- If you are using the Digital I/O bracket, plug it into the computer
- reconnect the cable between the PCI card and the Patch box
- reconnect the PC's power cord & turn on the PC.

STEP ❿ UPDATING THE WINDOWS SOFTWARE DRIVER

The SPDIF or ADAT option cards require WavePRO driver version 4.0 or higher. If you are using an earlier version, you MUST update the driver. Use the driver diskette that's included with this SPDIF package.

PRINT OUT AND FOLLOW THE INSTRUCTIONS IN THE **README FILE** ON THE DRIVER DISKETTE TO INSTALL THE NEW DRIVER.

USING THE SPDIF or ADAT OPTION CARD

The SPDIF and ADAT option cards add additional channels to the WavePRO interface.

After adding the SPDIF option, for the Wave/824 you will have 10 audio inputs and 10 outputs that can be used independently. For the Wave/424 and Wave/496, you'll have 6 audio inputs and 6 outputs.

After adding the ADAT option, for the Wave/824 you will have 16 audio inputs and 16 outputs that can be used independently. For the Wave/424 and Wave/496, you'll have 12 audio inputs and 12 outputs.

Here's a step-by-step guide to using an Option Card.

1. Connect the digital I/O jacks from the WavePRO interface to your audio equipment.

   If you are using the RCA jacks, make sure you have the proper cable. For optimal results and to avoid drop-outs, you should not use standard audio cables to carry the SPDIF data. We recommend using a a 75-ohm video cable (these cables are available at most any electronics retailer).

2. Setup you application software to utilize the extra channels.

   For SPDIF, the extra channels are identified to your software application as "Channel 9/10 SPDIF WavePRO" on the Wave/824 and as "Channel 5/6 SPDIF WavePRO" on the Wave/424 and Wave/496.

   For ADAT with the Wave/824 the channels are identified as:

   Channel 9/10 ADAT WavePRO
   Channel 11/12 ADAT WavePRO
   Channel 13/14 ADAT WavePRO
   Channel 15/16 ADAT WavePRO

   When using the ADAT option card with the Wave/424 and Wave/496, the ADAT channels are numbered starting at channel 5.

   The channels are accessed and opened by the application in the same fashion as all the other channels on the WavePRO interface. Please refer to the WavePRO User Guide for specific application instructions.

3. Set the audio sample rate in the application to match the rate that's supported by your audio equipment. The SPDIF option

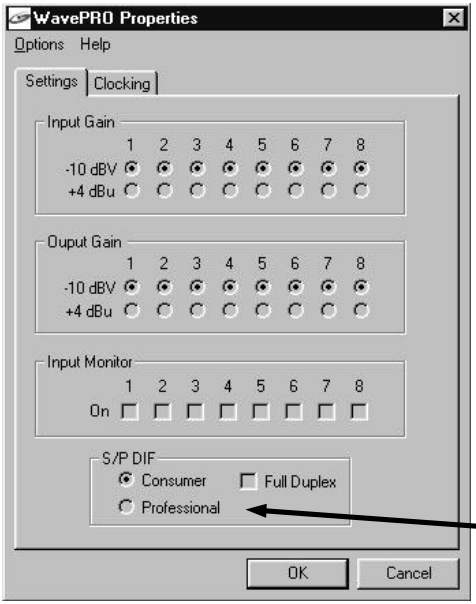
supports rates of 32 kHz, 44.1 kHz or 48 kHz. The ADAT option card supports rates of 44.1 kHz or 48 kHz.

NOTE: All channels on the WavePRO interface must operate at the same sample rate. For example, if you are trying to record a track using the SPDIF input and the application is not setup to record at the same sample rate as your equipment, an error message saying, "invalid sample rate" will be displayed.

4. Set the bit-depth in the application to match the bit-depth of the connected audio equipment. If the equipment is 16-bit, the application should be set up to record and play 16-bit samples.

   If the audio equipment is 18, 20 or 24-bits, set the software application to record and play 24-bits.

5. **For SPDIF**, make sure that the SPDIF mode is set correctly. This setting is found in the WavePRO applet for the Windows Control Panel.



When you add the SPDIF option, another setting will automatically appear in the WavePRO control panel applet. The setting allows you to choose professional or consumer mode and is dependent on the mode of the connected equipment. Most SPDIF equipment operates in consumer mode (the default).

6. Record or play audio using the same application functions that are used for recording and playing audio with the other WavePRO interface channels.

■

TIPS

- If you receive an "invalid sample rate" error message, check the connections between the WavePRO interface and the audio equipment. Also, make sure the sample rates all match up.
- If you experience audio drop-outs and you are using the RCA jacks for SPDIF, make sure that the cable you're using is 75-ohm cable (video quality) and *not* standard audio cable that's used in home stereos.

Word Clock and external clocking

The "heartbeat" of digital audio gear is determined by an electronic clock. Due to design and manufacturing tolerances, the internal clocks within different pieces of digital audio gear will vary by small percentages.

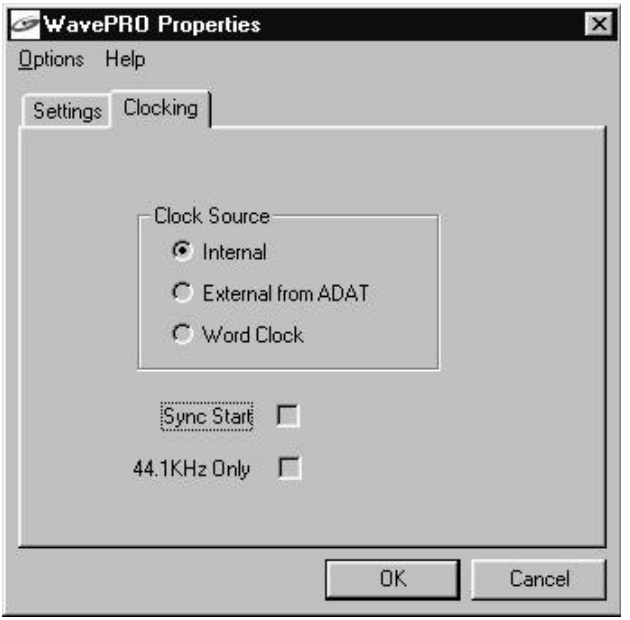
To provide flawless data exchange and to prevent timing drift between tracks, it's necessary that the digital audio gear share the same clock. In other words, a piece of equipment is designated as the "**master**" and it uses its own **internal clock**. The other pieces of gear are then set to be the "**slave(s)",** using an **external clock.**

When a SPDIF or ADAT option card is added to a WavePRO interface, the interface is enhanced to support external clocking.

The clock can be transmitted between the gear by the digital audio interface cable (SPDIF or ADAT). In other words, the clock is embedded in the digital audio signal.

Additionally, a Word Clock feature is included with the WavePro ADAT option card. Word Clock is shared between digital audio gear via a coaxial cable connected to the Word Clock input and output BNC jacks.

> ***NOTE:*** *When you are using a WavePRO interface to receive (record) digital audio data from another piece of gear, it's necessary that the WavePRO interface be set to use* ***external clocking****. The WavePRO card will act as a "****slave****" to the other digital audio equipment.*



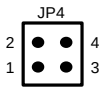
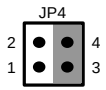
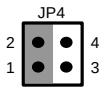
The Control Panel applet for the WavePRO interface has a **Clock Source** setting. Set the Clock Source to **External** to receive digital audio data correctly.

TIP for using Word Clock

If you are experiencing difficulty using the Word Clock feature, you may need to adjust the electrical signal termination value on the WavePRO Word Clock input jack.

Check the manual for the other digital audio gear to determine the optimal signal termination value for the WavePRO interface.

Use a jumper block on J4 to change the Word Clock signal termination value.

No Word Clock termination	75 Ω Word Clock termination (default setting)	110 Ω Word Clock termination
		
No jumper block	jumper block Pins 3 & 4	jumper block Pins 1 & 2

WARRANTY

The SPDIF and ADAT option cards are warranted against defects in materials and workmanship for a period of ***five years*** from the date of delivery. We will repair or replace products which prove to be defective during the warranty period provided they are returned to us.

All parts or components contained in this product are covered by Gadget Labs' limited warranty for this product; the product may contain fully tested, recycled parts, warranted as if new.

If you experience difficulties with your SPDIF or ADAT option card, please follow these steps:

- Verify that the SPDIF or ADAT option card was installed and configured according to the information in this guide.
- Review the "Using the SPDIF option card" section or the "Using the ADAT option card" section of this Guide to see if you can find a solution.
- If you purchased the card from a dealer, contact the dealer for additional help. If the dealer is unable to resolve the issue with you, contact us (see our technical support contact information, above). Please, don't return the card to Gadget Labs without authorization.
- If you must return the card for warranty repair or replacement, you must first obtain a return authorization number (RMA) from Gadget Labs. Please pack the card in its original box.

CONTACT DETAILS

Gadget Labs, Inc.
333 SW 5th Avenue, Suite 202
Portland, Oregon 97204

Tel: 503-827-7371
FAX: 503-295-0119
E-mail: hotline@gadgetlabs.com
World Wide Web: www.gadgetlabs.com

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