YAMAHA

AX16-AT

AUDIO EXPANSION CARD

DSP FACTORY

Owner's Manual

Mode d'emploi

Bedienungsanleitung

Manual de instrucciones

M

YAMAHA CORPORATION
Pro Audio Division, #18/3
P.O. Box 3, Hamamatsu, 430-8651, Japan

COMPLIANCE INFORMATION STATEMENT

(DECLARATION OF CONFORMITY PROCEDURE)

Responsible Party:	YAMAHA CORPORATION OF AMERICA
Address:	6600 Orangethorpe Avenue, Buena Park, Calif. 90620 U.S.A.
Telephone:	1-714-522-9011
FAX:	1-714-739-2680
Type of Equipment:	AUDIO EXPANSION CARD
Model Name:	AX16-AT

This device complies with Part 15 of the FCC Rules.
Operation is subject to the following conditions:
1) this device may not cause harmful interference, and
2) this device must accept any interference received including interference that may cause undesired operation.

FCC INFORMATION (U.S.A.)

1. IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT! This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Yamaha may void your authority, granted by the FCC, to use the product.
2. IMPORTANT: When connecting this product to accessories and/or another product use only high quality shielded cables. Cable/s supplied with this product MUST be used. Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.
3. NOTE: This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class "B" digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices. This equipment generates/uses radio frequencies and, if not installed and used according to the instructions found in the users manual, may cause interference harmful to the operation of other electronic devices. Compliance with FCC regulations does not guarantee that interference will not occur in all installations. If this product is found to be the source of interference, which can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures: Relocate either this product or the device that is being affected by the interference. Utilize power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter/s. In the case of radio or TV interference, relocate/reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to coaxial type cable. If these corrective measures do not produce satisfactory results, please contact the local retailer authorized to distribute this type of product. If you can not locate the appropriate retailer, please contact Yamaha Corporation of America, Electronic Service Division, 6600 Orangethorpe Ave, Buena Park, CA 90620

   The above statements apply ONLY to those products distributed by Yamaha Corporation of America or its subsidiaries.

Contents

Important Notices

- Do not place the AX16-AT in an area subject to excessive heat, direct sunlight, excessive humidity, or dust.
- Keep the AX16-AT inside its antistatic bag until you are ready to install it.
- To prevent handling damage, hold the AX16-AT by the edges or bracket.
- If you accidentally touch the card edge connections, remove any fingerprints using a dry tissue.
- Do not place objects on top of the AX16-AT, and do not put it down in a place where other objects are likely to be placed on top of it.
- Before removing your computer's cover, turn it off and remove the power cord.
- To prevent static electricity damage, touch a grounded metal part of your computer, such as the power supply case, before handling the AX16-AT.

Packing List

- AX16-AT Audio Expansion Card
- DS2416 20-pin connection cable x2
- ISA-bus mounting bracket
- This manual

Trademarks

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Copyright

Keep this manual safe for future reference!

Introduction

Thank you for purchasing the Yamaha AX16-AT Audio Expansion Card. The AX16-AT is an ADAT format digital interface card for the Yamaha DS2416 Digital Mixing Card. Two ADAT MultiChannel Optical Digital inputs and two outputs mean that up to 16 channels of ADAT format digital audio can be transferred simultaneously between the DS2416 and an ADAT multitrack recorder, or other ADAT-compatible device, such as a Yamaha 02R, 03D, or 01V digital mixing console with an ADAT I/O card installed.

System Requirements

- DS2416-compatible computer with a free PCI or ISA-bus slot
- Yamaha DS2416 Digital Mixing Card
- DS2416-compatible audio software

PCI or ISA?

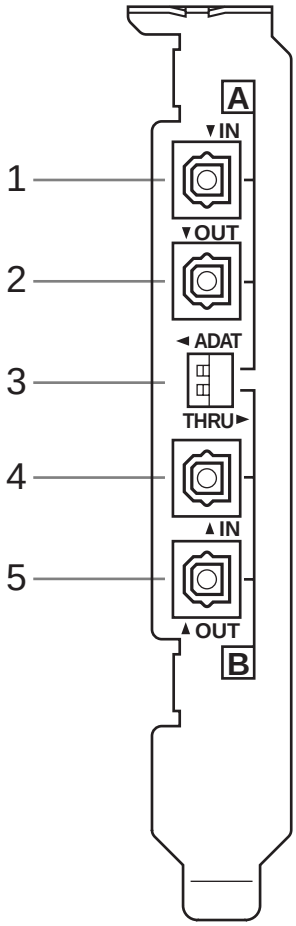
The AX16-AT is set for installation in a PCI-bus slot, but can also be installed in an ISA slot simply by swapping the supplied mounting bracket. Since DS2416-compatible Apple Power Macintosh computers do not support ISA bus, the AX16-AT must be used in a PCI slot with Power Macs. On DS2416-compatible Windows computers, however, the AX16-AT can be used in either a PCI or ISA-bus slot, which means that even if all your PCI slots are taken and the only free slots are ISA, you can still install the AX16-AT.

Important: If you are using the DS2416 and AX16-AT in a Windows 95 or Windows 98 computer, be sure to use DS2416 driver version V103 or later. The latest driver software is available for free download from the Yamaha Professional Audio Web site.
<http://www.yamaha.co.jp/product/proaudio/homeenglish/>
DS2416 driver version V102 or earlier does not support the AX16-AT ADAT/THRU switch. However, it can be made to recognize the switch by relaunching the DS2416-supporting audio software.

Important: When the DS2416's internal Vari Pitch mode is used, the word-clock, or sampling rate changes accordingly and some devices connected to the AX16-AT for use as wordclock slaves may not be able to synchronize correctly. However, they may synchronize correctly at certain settings (resultant sampling rates), but not others.

Controls & Connections

Rear



(PCI mounting)

A **A IN**

Signals arriving at this ADAT MultiChannel Optical Digital input are fed through to the IO-A connector on this card.

B **A OUT**

Signals from the IO-A outputs on the DS2416 are output via this ADAT MultiChannel Optical Digital output.

C **A & B ADAT/THRU switches**

These switches are used to select the input and output signals for the IO-A and IO-B connectors on this card. IO-A and IO-B can be set individually. In the ADAT position, the DS2416 receives and transmits signals via the A or B IN and OUT connectors on this card. In the THRU position, the DS2416 receives and transmits signals via the THRU A or B connectors on this card.

D **B IN**

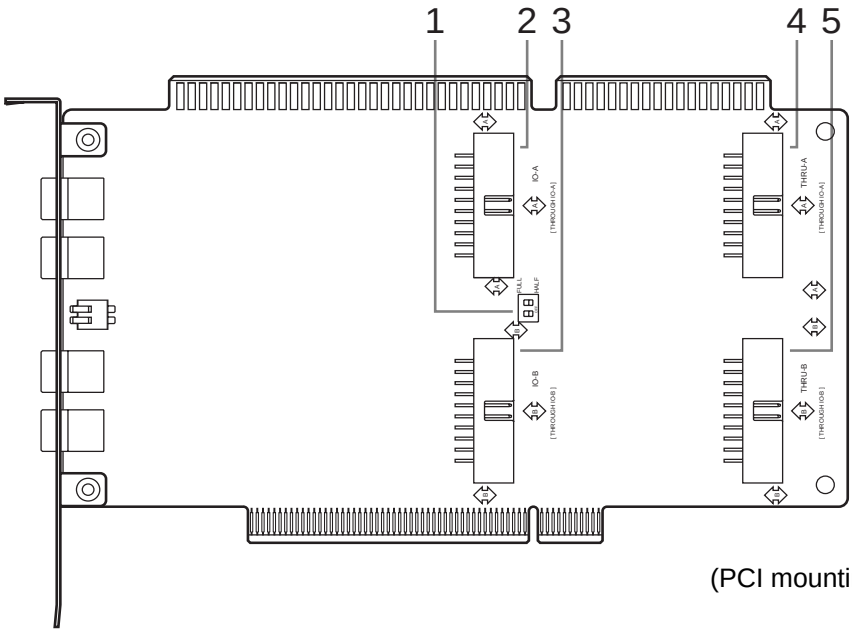
Signals arriving at this ADAT MultiChannel Optical Digital input are fed through to the IO-B connector on this card.

E **B OUT**

Signals from the IO-B outputs on the DS2416 are output via this ADAT MultiChannel Optical Digital output.

Note: Be aware that if the body of the plugs on your optical cables is too large to pass easily through the expansion-slot holes in the rear of your computer, the plugs may not plug into the ADAT jacks properly and may come lose.

Internal



(PCI mounting)

A HALF/FULL switches

These switches are used to configure wordclock operation when the DS2416 is used as a wordclock slave and receives its wordclock from the AX16-AT. IO-A and IO-B can be set individually. In the FULL position, the DS2416 derives its wordclock from the source selected using the ADAT/THRU switches.

Normally, these switches should be set to HALF, the default setting, in which case the DS2416's wordclock source is always an ADAT IN connector regardless of the ADAT/THRU switch settings. This is convenient when switching between the ADAT and THRU (AX44 or other device) connectors, because you don't have to change the wordclock settings.

When an external device connected to the A IN connector is used as the wordclock master, that device must be turned on and configured correctly for wordclock master operation. If, for some reason, the external wordclock is lost, the THRU connectors are checked for a usable wordclock, and if one is not found there either, the DS2416 stops functioning.

(To use an external device as the wordclock master, you must connect it to the A IN connector.)

B IO-A connector

This connector connects to the IO-A connector on the DS2416 using the supplied 20-pin connection cable.

C IO-B connector

This connector connects to the IO-B connector on the DS2416 using the supplied 20-pin connection cable.

D THRU-A connector

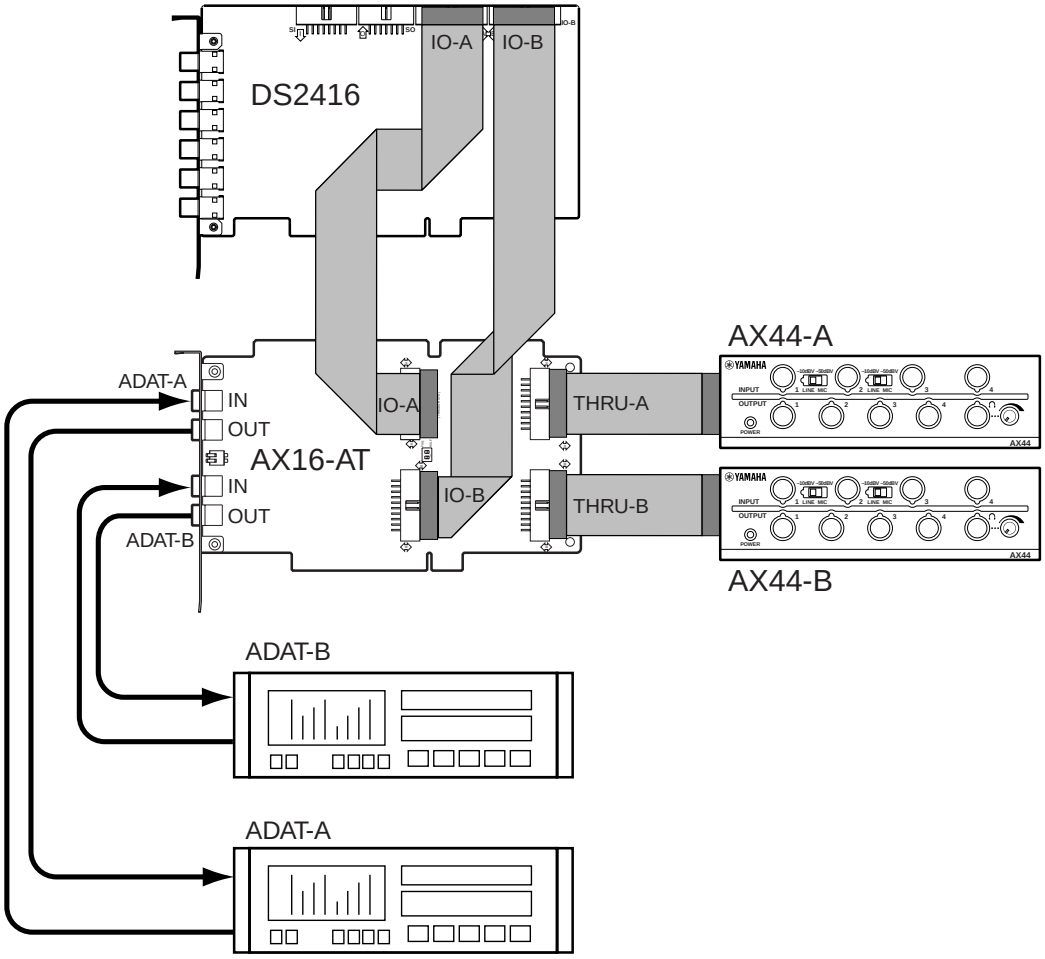
This connector connects to the first AX44 Audio Expansion Unit using the 20-pin connection cable supplied with the AX44.

E THRU-B connector

This connector connects to the second AX44 Audio Expansion Unit using the 20-pin connection cable supplied with the AX44.

System Hookup Overview

The following diagram shows how the AX16-AT connects to the DS2416 and AX44s. Also shown are two digital multitrack recorders with ADAT format inputs and outputs for up to 16 channels of digital audio transfer between them and the DS2416.



When using an ADAT, set the corresponding ADAT/THRU switch (A or B) to ADAT. To use an AX44, set the switch to THRU.

In the system shown here, the DS2416, ADAT-A, or ADAT-B could be used as the wordclock master. (Supporting software is required to set the wordclock.)

If an ADAT recorder is used as the wordclock master, turn on the ADAT first, set its wordclock, and then set the DS2416 wordclock.

Installing the AX16-AT

The AX16-AT installs into a single PCI or ISA expansion slot and requires no special jumper settings or interrupt settings. If you are installing in an ISA slot, see "Fitting the ISA-bus Mounting Bracket" on page 10 before continuing with this procedure.

See your computer's manual for full details on installing cards.

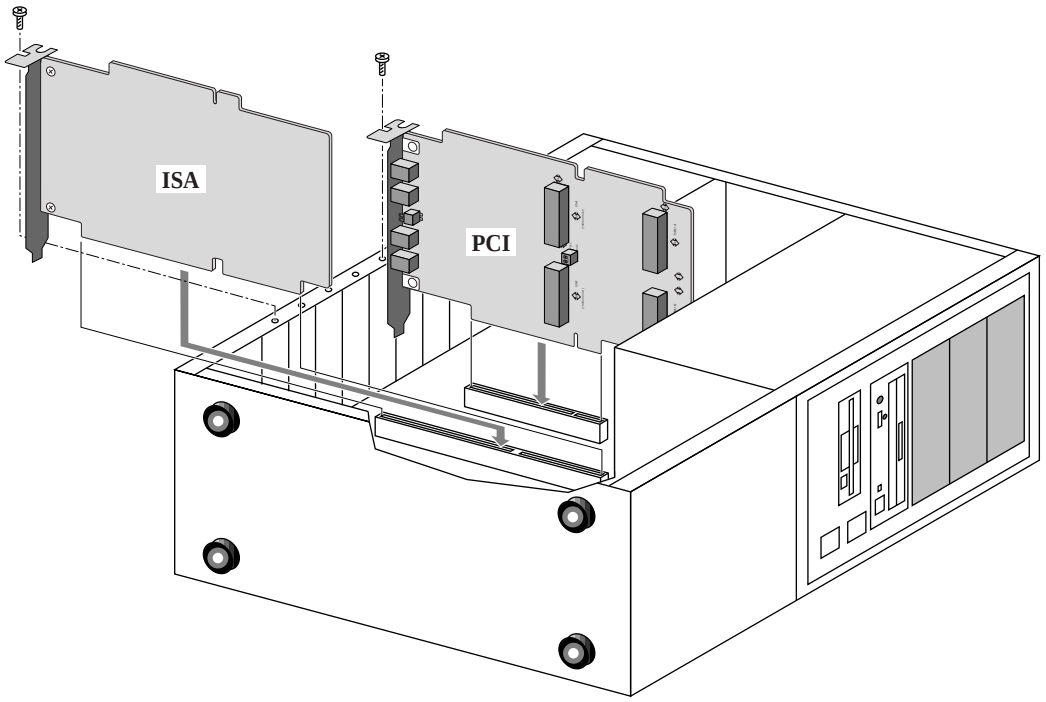
1 Turn off the computer and disconnect the power cord.

2 Remove the computer's cover.

3 Choose an empty slot for the AX16-AT, and remove the expansion-slot cover.

To prevent static electricity from damaging the AX16-AT, touch a grounded metal part of your computer, such as the power supply case, before handling it.

4 Carefully align and insert the AX16-AT into the slot.



5 If the expansion-slot cover was held in place by a screw, secure the AX16-AT using the same screw.

Important: Tighten the expansion-slot fixing screw so that the AX16-AT cannot jiggle about in the slot.

6 Connect the AX16-AT IO-A connector to the DS2416 IO-A connector using the supplied 20-pin cable (connect the end with the ferrite core to the DS2416).

7 Connect the AX16-AT IO-B connector to the DS2416 IO-B connector using the supplied 20-pin cable (connect the end with the ferrite core to the DS2416).

8 If you are using an AX44, connect the AX16-AT THRU-A connector to the first AX44 using the 20-pin cable supplied with the AX44.

9 If you are using a second AX44, connect the AX16-AT THRU-B connector to the second AX44 using the 20-pin cable supplied with the AX44.

10 Replace the computer's cover.

11 Connect your ADAT multitrack recorder, or other ADAT-compatible device, such as a Yamaha 02R, 03D, or 01V digital mixing console with an ADAT I/O card installed, to the A or B IN/OUT connectors on the rear of the AX16-AT using EIAJ fiber optical cables.

Fitting the ISA-bus Mounting Bracket

Before installing the AX16-AT into an ISA-bus slot, you must replace the PCI-bus mounting bracket with the ISA-bus mounting bracket.

To prevent static electricity from damaging the AX16-AT, touch a grounded metal part of your computer, such as the power supply case, before handling it.

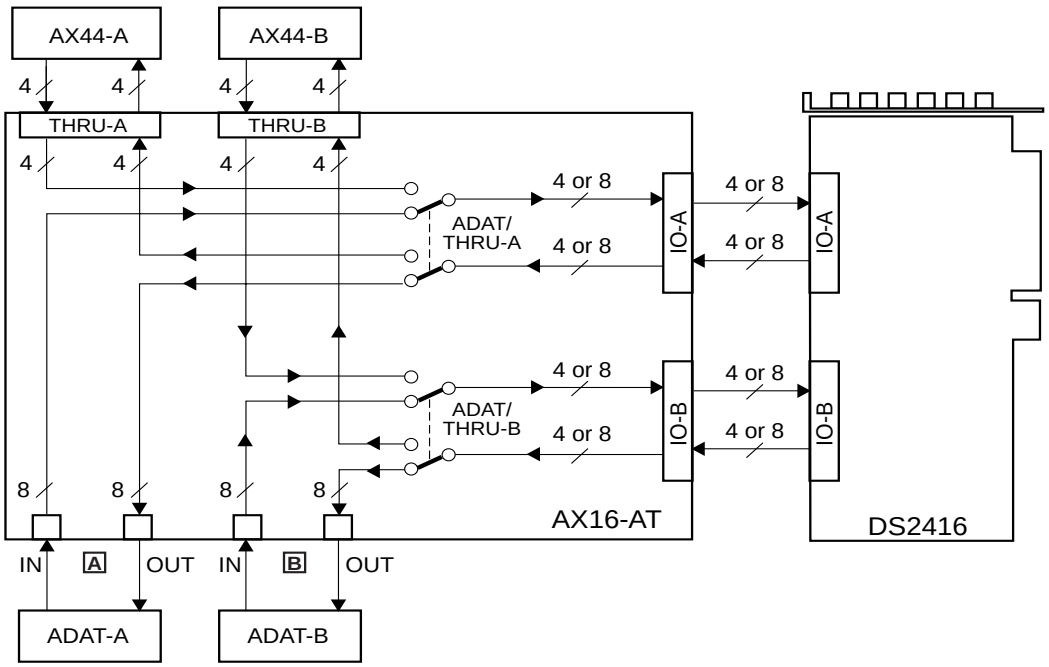
1 Remove the two fixing screws that secure the PCI-bus mounting bracket to the AX16-AT card and carefully remove the mounting bracket.

2 Carefully fit the ISA-bus mounting bracket and secure using the two screws removed previously.

Selecting the I/O Source for the DS2416

The ADAT/THRU switches select the input and output sources for the IO-A and IO-B connectors on the DS2416. In the ADAT position, the DS2416 receives and transmits signals via the ADAT IN and OUT connectors on the AX16-AT, as shown in the following diagram. In the THRU position, the DS2416 receives and transmits signals via the AX44s. IO-A and IO-B can be switched independently.

The lines from the DS2416 are labeled "4 or 8" because they carry four audio channel when set to THRU (i.e., AX44) and eight channels when set to ADAT.



Specifications

General

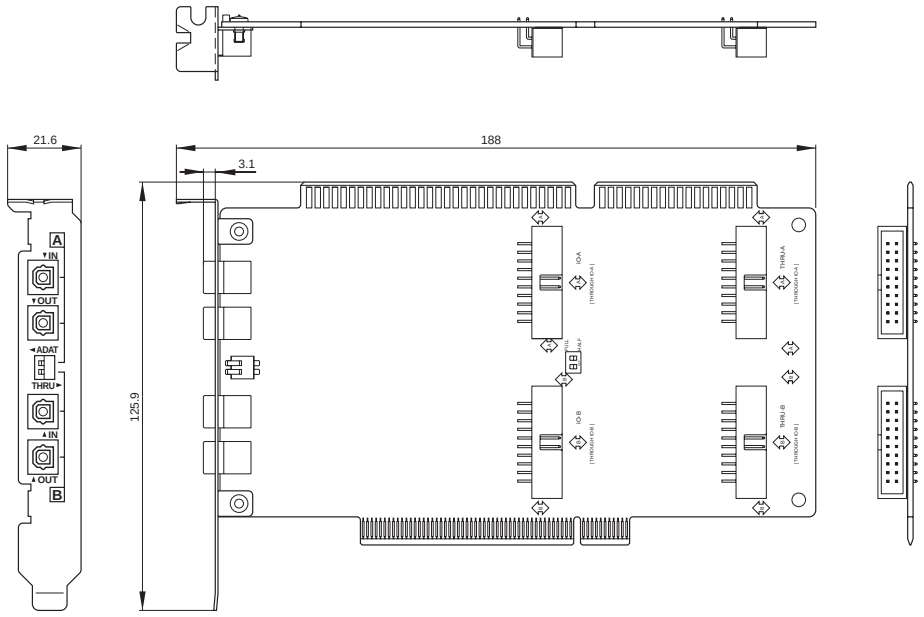
Sampling rate	**External**	40.013 kHz to 50.880 kHz
ADAT/THRU switches		DS2416 I/O source selection
WORDCLOCK HALF/FULL switches		Wordclock source select
PCI-bus (for power supply only)		PCI Raw Variable Height Short Card (5 V, 32-bit)
ISA-bus (for power supply only)		ISA card (5 V, 8-bit)
Power supply		+5 V (250 mA max)
Maximum power consumption		1.25 W
Temperature	**Operating**	+10˚C to +35˚C
	Storage	–20˚C to +60˚C
Dimensions (H x L x D)		125.9 (ISA 127.7) x 188 x 21.6 mm (4.95 x 7.4 x 0.85 inch)
Weight		120 g (4.2 oz)
Supplied accessories		20-pin cable x2
		ISA-bus mounting bracket

Digital I/O

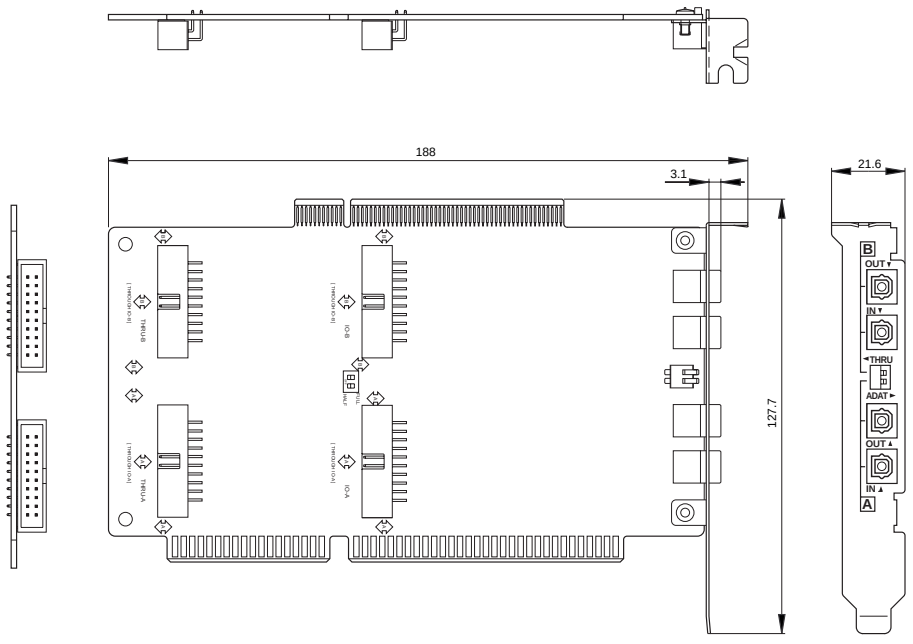
Connection	I/O	Format	Level	Connector
A IN B IN	I	ADAT MultiChannel Optical Digital Interface	—	EIAJ fiber optical jack
A OUT B OUT	O	ADAT MultiChannel Optical Digital Interface	—	EIAJ fiber optical jack
IO-A IO-B THRU-A THRU-B	I/O	4CH or 8CH digital audio inputs (2CH or 4CH line, MSB first x2) 4CH or 8CH digital audio outputs (2CH or 4CH line, MSB first x2) 32-bit max/channel DS2416 compatible format	5 V CMOS	20-pin connector

Dimensions

PCI



ISA



Unit: mm

Specifications and external appearance are subject to change without notice.