

MDIO-PTHDX Module

Operation Manual

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General Information

MDIO-PTHDX Module Reference Revision History

Rev	Date	Author	Comments
1.00	8 th July 2016	S.G. Penn	Initial release
1.01	7 th Sept. 2018	S.G. Penn	update to add MDIO firmware update.

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WARNING!



TO PREVENT FIRE OR SHOCK HAZARD DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

Fitting the MDIO-PTHDX module to a suitable Prism Sound Interface requires the lid to be removed. There are dangerous voltages inside and installation must be referred to qualified personnel. Anyone fitting the MDIO-PTHDX module must ensure that the mains is disconnected from the unit before removing the cover, and is not re-connected until the cover is refitted.

Statements of conformity

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against interference in a residential area. This device generates and uses radio frequency energy and, if not installed and used in accordance with the instructions, may cause interference to radio or TV reception. If this unit does cause interference to radio or TV reception, please try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiving antenna.
- Plug the equipment into an outlet on a different circuit from the receiver.
- If necessary, consult your dealer or an experienced radio or TV technician.

CAUTION: Changes or modifications to this equipment not expressly approved by the manufacturer could void the user's authority to operate this equipment.

THIS DIGITAL APPARATUS MEETS ALL CLASS B LIMITS FOR RADIO NOISE EMISSIONS AS LAID DOWN IN THE RADIO INTERFERENCE REGULATIONS OF THE CANADIAN DEPARTMENT OF COMMUNICATIONS.

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Prism Media Products Ltd hereby declares that this equipment conforms to the following standards:
EN55103-1, environment category E4
EN55103-2, environment category E4

NOTE: The use of this equipment and its host interface unit with non-shielded interface cabling is not recommended by the manufacturer and may result in non-compliance with one or more of the above directives. All coaxial connections should be made using a properly screened 75R cable with the screen connected to the outer of the connector at both ends. All analogue XLR and jack connections should use screened cable with the screen connected to pin 1 of the XLR connector, or the jack outer, at both ends.

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Introduction

The Prism Sound MDIO-PTHDX module is an option for Prism Sound interfaces that have the “MDIO” option slot. This module allows multiple units to be connected directly to an Avid | Pro Tools system utilising either a Pro Tools | HDX PCIe card, a Pro Tools | HD Native PCIe card or a Pro Tools | HD Native Thunderbolt interface with a DigiLink cable.

With this setup, Pro Tools users can enjoy the excellent sound quality of the Prism Sound Atlas and Titan A/D and D/A converters, and their equally well regarded on-board microphone preamplifiers.



Setup of the Prism Sound Atlas and Titan units with Pro Tools could hardly be simpler: up to four Prism Sound Atlas or Titan units of mixed types can be connected in a stack to each DigiLink port and will automatically configure themselves to emulate Pro Tools | HD I/O interfaces. In the maximum configuration for a single DigiLink, four Prism Sound Atlas or Titan units emulate two Pro Tools | HD I/O units, supporting up to 32 analogue input and output channels.

The first (or only) Prism Sound unit in the stack is connected to Pro Tools using the Primary connector on the Prism Sound MDIO-PTHDX module. Additional units, to a maximum stack size of four units, are added by daisy-chaining Expansion-to-Primary connections in the usual way.

Multiple stacks can be connected to multiple host DigiLink ports to build systems with larger numbers of channels.

Control of the Prism Sound Atlas or Titan units when connected to Pro Tools is easy. All of the key controls are made available within the Pro Tools GUI and can also be stored as part of the Pro Tools session, unlike some other third-party interfaces that might require separate software or hardware controls and whose settings cannot be stored in the session.

The following Pro Tools UI controls are supported:

- Sample rate and Loop Sync slave/master selection (including master sync source)
- Line input sensitivity switching, per input channel (+4/-10)
- I/O port routing (as controlled in the Pro Tools Setup\Hardware dialogue) including use of enclosure S/PDIF/AES3 I/O. Routing to Prism Sound Atlas or Titan headphone port.
- Interface 'identify' - helps to find the right unit in a stack
- Soft-clip (Prism Sound "Over-killer") switching, per input channel
- High-pass filter selection, per input channel
- Phase switching, per input channel
- Indication of mic/line/DI (instrument) input selection* (auto selecting on the Prism Sound Atlas or Titan unit, indicated in Pro Tools UI).
- Mic/instrument gain setting*
- +48V phantom power switching*
- -20dB pad switching*

* for mic/instrument preamp-equipped channels

A basic understanding of Pro Tools software and its concepts is expected of readers of this manual, the Reference section has more detailed descriptions of some aspects.

Terminology

At the time of writing, the MDIO-PTHDX module can be used with either a **Prism Sound Atlas** or **Prism Sound Titan** interface unit. For the sake of simplicity, this document will refer to “**Prism Sound Atlas**” as meaning any unit that can be fitted with an MDIO-PTHDX module, unless there are particular differences (in which case any differences between models will be noted).

Similarly in the instructions below we shall refer to the Pro Tools interface card as the “**HDX card**”, but this may be an Pro Tools | HD Native card or Pro Tools | HD Native Thunderbolt device unless otherwise detailed.

We call a group of I/O units attached in a “daisy-chain” to a single Mini-DigiLink connector a “**stack**”, and therefore two stacks may be connected to a Pro Tools | HDX or Pro Tools | HD Native card.

We call the unit that is connected by DigiLink directly to the Pro Tools | HDX card the **Top** unit, and if there are two or more units connected in a stack the final one in the DigiLink daisy-chain is referred to as the **Bottom** unit.

Pairs of Prism Sound Atlas units auto-configure as a **Main** unit and its **Sub**. The two units have different roles, and the pair will emulate a single Pro Tools | HD I/O unit. There are more discussions of Mains and Subs later in the manual.

Quick Start Guide

For the *quickest* start, if you are already familiar with Pro Tools | HD, the regime for setting up the Prism Sound Atlas units on a Pro Tools system is as follows:-

1. Check that your Prism Sound Atlas has the MDIO-PTHDX module fitted and that it has the correct firmware to work with it.

Prism Sound Atlas units that have been shipped from the factory with the MDIO-PTHDX module fitted will already be programmed to use it, and you can move straight to Quick Start step #2.

If you have received the MDIO-PTHDX module separately to be retro-fitted to an existing Prism Sound Atlas unit, then you will need to a) fit the module and b) check the firmware is at version 1.07 or higher. There are detailed instructions for fitting the module and updating the Prism Sound Atlas in [Appendix 4](#) at the end of this manual.

2. Power up the Prism Sound Atlas/Titan units individually and set each of them to MDIO-PTHDX mode by pressing and holding their Volume knob for four seconds. The Host LED goes red. Remove the power at the rear of the unit.
3. Connections – note that connections to each unit depend on how many units there are in the system – the [diagrams below](#) show a number of different configurations.
 - a. Connect the DigiLink cables in a daisy chain. Finally connect the DigiLink cable between the “top” unit’s Primary port and the HDX card.
 - b. Connect a USB cable from the host computer to the top unit.
 - c. Connect the loop sync between the BNC Wordclock connections of all “Main” units (no sync connection is required if there are just one or two Prism Sound Atlas units, and no other Pro Tools units attached to the system).
 - d. Reconnect power to all units.
4. Start Pro Tools – you should see the units in Setup / Hardware. (*Pairs of Prism Sound Atlas units will show as a single HD I/O – see the Reference section below for “[Main / Sub](#)” explanations.*)
5. Set up the Mic Pres – Pro Tools users will be familiar with this as it follows the same regime as described in the Pro Tools | PRE manual – Chapter 3 “Configuring MIDI Studio for Pro Tools | PRE”. It uses MIDI, but no extra MIDI cables are required (detailed instructions are below in [Appendix 1](#) of this document).
6. Connect up your I/O, and you’re ready to go!

Connection Diagrams

The diagrams below show connections for Prism Sound Atlas systems connected in one stack to a single DigiLink on the Pro Tools | HDX card.

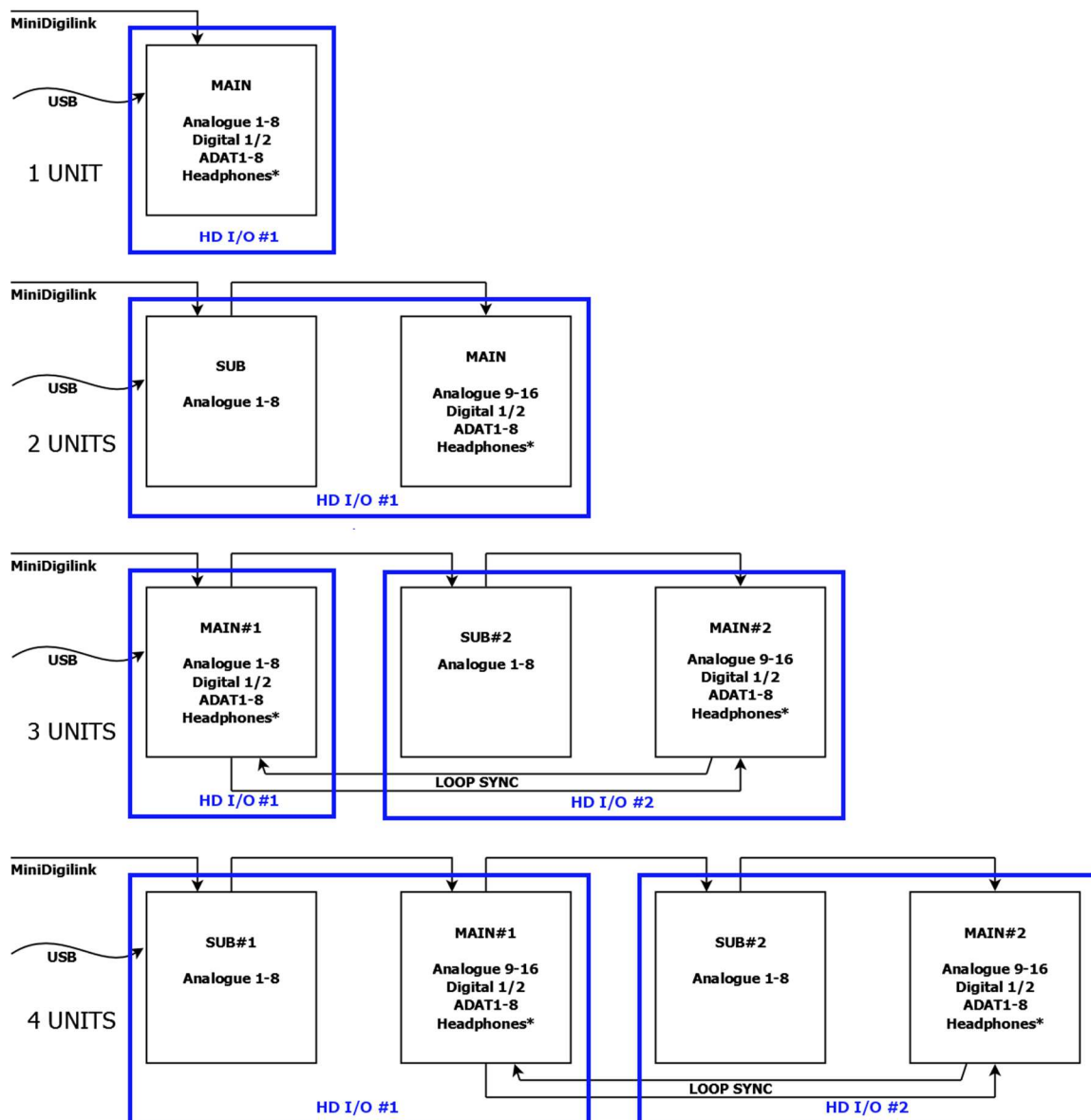
Prism Sound Atlas units will automatically configure in order to make best use of the maximum I/O counts supported by the HDX cards. **TWO Prism Sound Atlas units** (nominally named Main and Sub) **normally emulate a single Pro Tools | HD I/O unit.**

The **bottom** unit in the stack is always a **Main** unit, and its associated **Sub** is immediately above the partner Main unit.

It's very important that Loop sync connections should only be made between **Main** units (and *not* to include Subs in the Loop sync loop) and should use the Wordclock connectors on the Prism Sound Atlas units.

With an odd number of Prism Sound Atlas units in a stack, one will behave as a “lonely” Main and emulate a single HD I/O unit to optimise the channel numbers available.

ATLAS / TITAN UNITS I/O AS CONNECTED TO PRO TOOLS



For Digilink ports, the arrow marks the “Primary” port; the other port is the “Expansion” port on the MDIO-PTHDX modules.

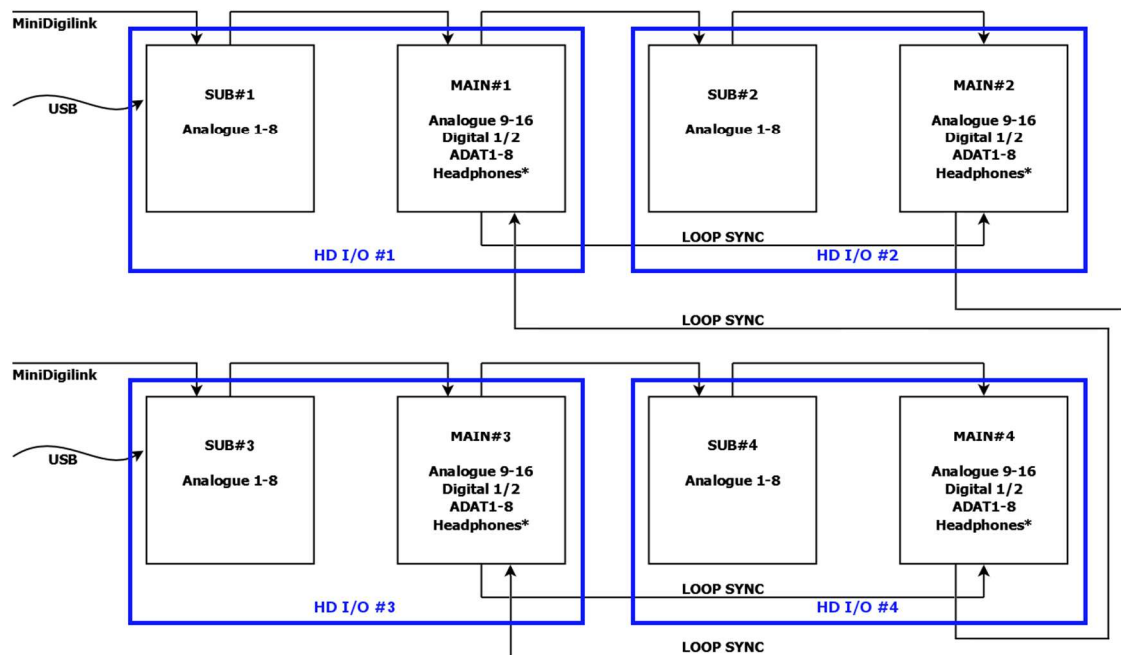
Multiple Stacks

Pro Tools software can use 16 inputs and 16 outputs from each HD I/O unit simultaneously, and can allow a maximum of two x HD I/O units on each stack. From the diagrams you can see that Prism Sound Atlas’s emulation allows for a maximum of **four units** on a single stack.

A Pro Tools | HDX card has two Digilink connectors, and thus two stacks may be connected to the HDX card. Multiple HDX cards can be used up to a maximum of three cards and thus six stacks.

The second and subsequent stacks will be connected in the same way as the first, and **Loop Sync** should be continuous in a single sync loop and connected to **all** Main units (and any Pro Tools | HD I/O units) in **all** stacks.

EIGHT ATLAS UNITS ON TWO STACKS



For Digilink ports, the arrow marks the "Primary" port; the other port is the "Expansion" port on the MDIO-PTHDX modules.

This picture shows eight Prism Sound Atlas units with the sync loop being connected from Main#1 WC Out to Main#2 WC in, Main#2 WC out to Main#3 WC In, Main#3 WC Out to Main#4 WC In and Main#4 WC Out back to Main#1 WC In.

The top Prism Sound Atlas unit of *each* stack should have a USB connection to the computer for mic pre-amp control.

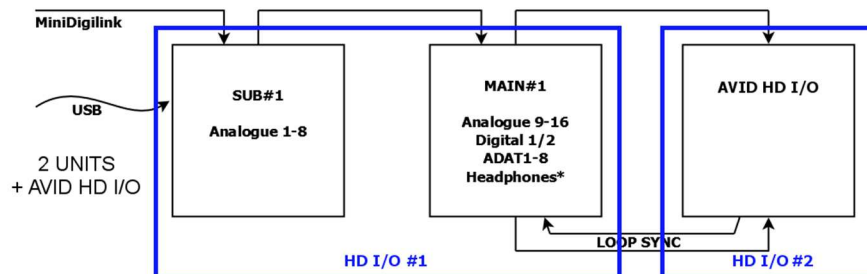
When re-configuring the stacks, you should:- remove power, make the connections and only power up the units when connections have been made.

Combining with Pro Tools | HD I/O units

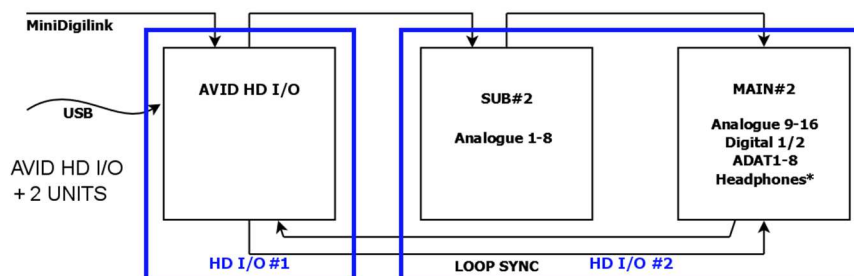
It's possible to use Pro Tools | HD I/O units alongside Prism Sound Atlas units in the same Pro Tools system, and Prism Sound Atlas, Titan and HD I/O units can be mixed on the same stack. However a Pro Tools | HD I/O unit (or any other Pro Tools compatible I/O unit) *must not be connected between two Prism Sound Atlas units*.

When connecting Loop sync, you should use the Wordclock connections on the Prism Sound Atlas units and the dedicated Loop Sync connections on any Pro Tools | HD I/O units.

ATLAS / TITAN UNITS & AVID HD I/O CONNECTED TO PRO TOOLS



OR ALTERNATIVELY....



For Digilink ports, the arrow marks the “Primary” port; the other port is the “Expansion” port on the MDIO-PTHDX modules (and the Pro Tools HD I/O units).

Software

With the MDIO-PTHDX module, the Prism Sound Atlas units are designed to emulate operation of Pro Tools | HD I/O units, and the Pro Tools software will see them as if they are HD I/O units.

They can be combined with Pro Tools | HD I/O units on the Digilink connections, and their connection and operation are much the same as the Pro Tools units. We will highlight particular differences in this manual.

There are no software controls outside of the Pro Tools software, and no separate drivers or control panels are required for operation in MDIO-PTHDX mode, however you may wish to install the standard drivers and control panel for Mac or PC to allow you to use the units in USB / UAC2 mode at different times. If there are any firmware updates at a later time, you will need to install Prism Sound Atlas’s software package to install the update.

To use the MDIO-PTHDX module requires the Prism Sound Atlas to be switched to a new mode under which it is fully dedicated to operation with Pro Tools. In MDIO-PTHDX mode the computer drivers and the Control Panel app will not see the Prism Sound Atlas as an audio device.

Reference

Switching to MDIO-PTHDX Mode

You will need to switch the units to MDIO-PTHDX mode before connecting to the Pro Tools | HDX card. With the MDIO-PTHDX module fitted, and the unit powered up, **pressing and holding the front panel volume knob for four seconds** switches mode. The unit's relays will click, the unit will restart, and the significant change on the front panel is that the **Host** LED changes :-

Host= **GREEN** is the standard USB/UAC2 mode

Host= **RED** signifies MDIO-PTHDX mode.

(A flashing Red Host LED suggests a problem – for instance USB may be connected to the wrong unit i.e. not the top unit. [Appendix 3](#) below describes the meaning of all the front panel LEDs).

Similarly pressing and holding the volume knob for four seconds will switch it back to UAC2 mode.

Main / Sub

The first major difference from a Pro Tools | HD I/O is that, depending on the number of units connected, **TWO Prism Sound Atlas units can emulate a single HD I/O unit.**

In this case each unit in a pair of Prism Sound Atlas units will be considered to be either a **MAIN** unit or a **SUB**. (This terminology will be familiar to users of our existing ADA8-XR product which has a similar Pro Tools interface module).

Mains and Subs have slightly different roles – it's crucial to remember that only the Main is used for system synchronisation (however the Sub is able to provide an auxiliary Wordclock *output*).

Prism Sound Atlas Connections

Please refer to the Connection Diagrams above.

You will need to connect the following cables:-

Mini-DigiLink – connecting the audio bus from the Pro Tools | HDX card to the I/O units. Connect a cable from the HDX or HD Native card/box to the first Unit's Primary port; then connect the first Unit's Expansion port to the next Unit's Primary port (and so on). Up to four Prism Sound units can be connected to each DigiLink, totalling 32 channels of Audio I/O per DigiLink.

USB – connect a USB cable from the computer to the closest attached Prism Sound Atlas unit. This is used for Mic Pre control.

Of course you will need to connect **power** to each unit which switches them on.

Loop Sync - BNC sync cables.

With only one or two Prism Sound Atlas units on one stack (and no other I/O units in the system), no Loop Sync connections are required.

For more than two units, sync cables must be connected so that multiple units' audio will remain in sync. Connect *only* the MAIN units in the Loop Sync – Main#1 Wordclock Out to Main#2 Wordclock In; Main#2 Wordclock Out to Main#3 Wordclock In etc. (when using units in multiple stacks, they must be connected as part of the same loop sync ring).

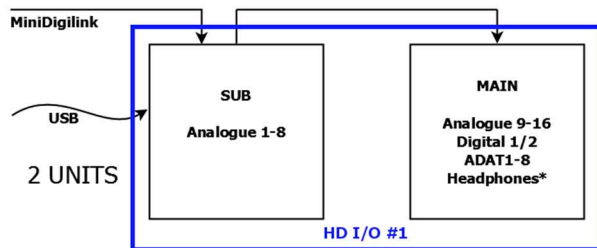
When the system is set to Internal clock or locked externally to AES, SPDIF or ADAT, connect the Wordclock out from the final Main unit back to the first Main unit's Wordclock in to complete the loop. If you're clocking the entire system externally to Wordclock, the signal from your master clock should be connected to the Wordclock input of the unit that is nominated as Loop Sync Master (and the Loop sync is broken at that point, which is necessary and acceptable).

If you are connecting any Pro Tools | HD I/O units in the stacks, you need to connect the Loop Sync to their Loop Sync connections (*not* Wordclock). On Prism Sound Atlas units there are a single set of "Wordclock" connections and these are auto-configured for Loop Sync when set to MDIO-PTHDX mode and being used in the Loop Sync loop.

The [Synchronisation](#) section below goes into more detail about Synchronisation options.

Channel Assignment

When **two units** are connected in a stack, the pair emulates a single HD I/O unit. A total of **16 channels** of input and output can be chosen from the Main unit's Analogue, ADAT or AES I/O plus the Sub's Analogues only.



One unit is nominally called “Sub”, the other “Main” and they have different roles. The “Main” unit is the final unit in the stack. The “Sub” unit is the unit closer to the Pro Tools | HDX card by DigiLink. The Main is the unit which must be used to connect to Loop Sync (in the situation where there are more than just these two units). The Digital and ADAT inputs on the Main units are available, but only the Analogue inputs on the Sub can be used.

A pair of units like this offers up to **26 possible Inputs**, with only **16 being in use at any one time**.

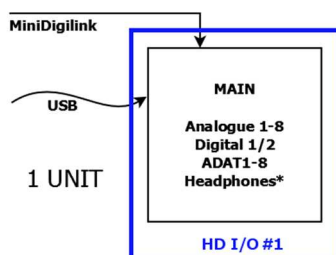
Note:- the number of available Inputs and outputs will change depending on sample rate. See the note about [ADAT](#) below.

The Pro Tools software's Setup / Hardware page has drop-down selectors to allow you to choose which 16 of the 26 available inputs are being used.

For **Outputs**, the situation is similar and you can send audio to 16 outputs, however Pro Tools allows you to “double-up” and run pairs of Outputs in parallel (by holding the CTRL key and ticking extra pairs of outputs when you open the drop-down selectors in Setup / Hardware). Using this double-up feature, for instance AES/SPDIF could be set to output the same audio in parallel with Analogue 1&2.

Pro Tools | HD I/O units don't include a headphones output and there is no specific control within the Pro Tools software for them. So there is a separate regime for assigning Prism Sound Atlas's headphones which is discussed in the [Headphones](#) section below.

If you have a **single unit** – I'll call this a “lonely” Main - it acts as a full HD I/O and **16 channels** can be chosen from Analogue, ADAT or AES.

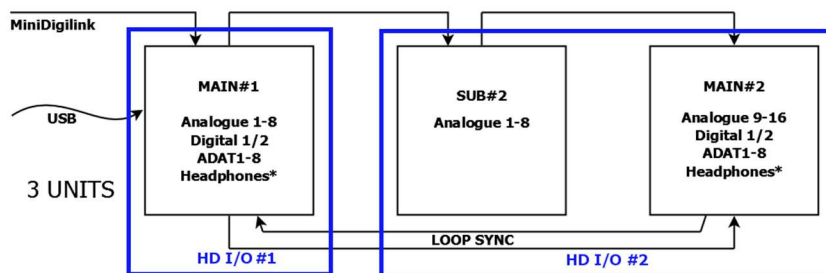


So this offers **18 possible inputs** of which, once again, the 16 in use are chosen from the Pro Tools' Hardware Setup dialogue.

If **three units** are connected in a stack they configure as two HD I/O units and appear in Hardware Setup as :

HD I/O #1
> HD I/O #2

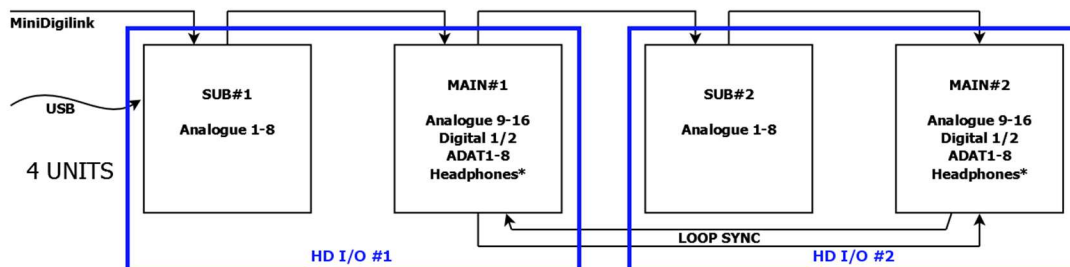
You can use **32 channels** of I/O.



The first is a “lonely” Main (offering 16 channels from 18) and the second and third are a pair (offering 16 channels from 26).

With three or more units, Loop sync connections are necessary.

And **four units** in a stack



emulate two HD I/O units (in two Main/Sub pairs) and gives a total of **32 channels** - two sets of 16 channels to be chosen from 26.

I/O order number can be customised and completely re-ordered in the Pro Tools software, but they are usually ordered as HD I/O #1 channels 1-16 followed by HD I/O#2 channels 1-16 etc. etc. It's worth noting that from a default configuration, the order of the I/O numbers is the order of the units on the chain from **top** to **bottom**.

Also note that the Main units used for loop sync are always the **bottom** unit and a unit that's two closer to the HDX card.

Note:- on **Sub** units the AES/SPDIF, ADAT OUTPUTs, and Headphone *outputs* duplicate any signal sent to the same channel on the Main unit.

However the AES/SPDIF and ADAT *Inputs* on Sub units are inactive and cannot be used.

Connecting Units on Multiple DigiLink Connectors

You will need to connect units to both Mini-DigiLink connectors on the Pro Tools | HDX/HD native card to take the I/O count above 32, and you will need multiple HDX cards to take the I/O above 64.

The configuration and the way the channels are assigned for each stack is the same as with the first stack.

Loop sync must be connected between all Main units in all stacks.

There is a special case that would allow you to connect two Prism Sound Atlas units with maximum I/O counts. When one Prism Sound Atlas is connected to each DigiLink (as opposed to a daisy-chain on one DigiLink), they both auto-configure as “lonely Mains” and will provide 16 channels of I/O *each* – i.e. **32 channels** total. (As a reminder, if the two were connected to the same DigiLink, they would act as a Main/Sub pair offering a maximum *combined* total of 16 I/O to Pro Tools).

It may depend on how many digital I/Os you want to use as to whether you would wish to do this – two units in a Sub/Main configuration provide 16 analogue I/O which may be all you require.

When units are connected to both DigiLinks, the top unit on each stack must be connected to the computer via USB in order to provide Mic Pre controls.

With two “lonely” Mains, Loop sync must be connected as they are both Mains.

Mic Pre Controls

Pro Tools has software controls for Mic-Pre level, phantom power enabling, pad, phase, filter, and display of Line/Mic/Instrument input selection. These can be displayed to the left of each track and/or in the Mixer strip. Pro Tools uses a MIDI interface to control these in the Pro Tools | PRE units.

Prism Sound Atlas’s Mic Pre controls use the same controls, and these are enabled by the method described in the Pro Tools | PRE manual.

The controls for Phase and Filter are available in Prism Sound Atlas when the analogue inputs are operating in Line mode as well as in Mic Pre mode. Therefore if you are only ever using Prism Sound Atlas’s analogue inputs in Line mode, if you wish to use these two controls, you will still need to enable the Mic Pre controls to give access to them from within the Pro Tools software.

Please refer to [Appendix 1](#) towards the end of this document for our own detailed instructions on how to set up the Mic Pre controls for Prism Sound Atlas in the Pro Tools software.

Prism Sound Over-killers

Prism Sound Atlas and Titan units incorporate the Prism Sound “Over-killer” progressive soft limiter on all analogue inputs.

These are enabled inside Pro Tools Setup / Hardware dialogue on the “Analog In” pages. There are settings for **Limiter / Soft Clip** which will enable the Over-Killers for each input. (Note that the **Curv** option will also select the Over-killer, with no change to the Over-killer behaviour).

LEDs on the Prism Sound Atlas unit’s front panel light up when the Over-killer function is actually limiting (note that they won’t light up when the function is enabled and no audio is passing) and only when the meters are set to display Input metering.

Line Input Reference Levels

There are selectors on the same Hardware Setup page for **Reference Level** which will switch the level of the Line inputs between nominal +4 and -10 settings.

Metering

By default the Prism Sound Atlas unit’s front panels display activity on the analogue and digital inputs.

Prism Sound Atlas has the ability to switch the meters to display output activity, and this is enabled by an otherwise unused control in Pro Tools : Hardware Setup – SP/DIF Format = Tascam.

When this is unticked, Input activity is displayed, when it’s ticked, Outputs are metered.

There is an individual control for each “HD I/O” unit, and therefore if it’s required to switch to output metering on all units, you will need to set the switch in every HD I/O section of the Hardware Setup page.

Headphones

Headphone outputs are not implemented on the Pro Tools | HD I/O units and so there is a **special case** to allow them to be used in Prism Sound Atlas.

Headphone outputs run in parallel with the ADAT 1/2 Out.

The Hardware Setup in Pro Tools can be configured to double up outputs by using the CTRL key when selecting, and so by remapping the ADAT 1/2 output (called “Optical 1-2” in the Pro Tools software) you can choose which outputs the Headphone is listening to.

When Optical is set as the Digital format setting in Hardware Setup (see [Digital Format Controls](#) below), ADAT becomes unavailable, and so the mapping of the Headphone outs changes to be in parallel with the Digital 1/2 Out.

Headphones can be manually remapped to duplicate Digital 1/2 (instead of ADAT, even when optical is not set) by using the otherwise unused “Ext Clock Output” setting in the Hardware Setup page – select “Word Clock = TDIF”.

The Headphone output of a Sub unit duplicates its Main unit’s headphone out.

Digital Format Controls

The Pro Tools Hardware Setup page has a control for “Digital format” which controls how the RCA and Optical I/O connections work.

Digital Format setting	Input	Output	ADAT
AES/EBU	RCA	AES format on RCA or XLR adaptor	Enabled for input and output
SPDIF	RCA	SPDIF format on RCA or XLR adaptor	Enabled for input and output
Optical	TOS optical	SPDIF on TOS Optical <i>and</i> on RCA or XLR adaptor*	Disabled.

*When Optical is set, the signal sent to Digital 1/2 appears on both RCA and Optical outputs in consumer SPDIF format.

(Note the special case below for Optical connections at 176.4 & 192KHz using AES/SPDIF not ADAT).

ADAT

The ADAT digital ports offer a different number of channels at different sample rates.

Inside Pro Tools at sample rates above 88.2KHz you may see some Optical ADAT I/O noted as “disabled” – the channel numbers allowed over ADAT reduce as sample rates double and quadruple.

At 44.1KHz & 48KHz, up to 8 inputs and 8 outputs may be used.

At 88.2KHz & 96KHz, up to four Inputs and four outputs may be used.

At 176.4KHz & 192KHz ADAT format is disabled, however the optical ports can be set to carry or receive AES /SPDIF digital audio under this **special case**:-

At 176.4/192KHz Pro Tools software offers a “live” ADAT input & output pair (but disallows Optical for AES or SPDIF). Prism Sound Atlas units *can* use the Optical port for AES/SPDIF but don’t support ADAT format over the optical connection at those sample rates.

Therefore only applying to 176.4 & 192KHz :-

OUTPUTs sent to the “Digital” output selected in Pro Tools Hardware Setup will appear on both electrical and optical output connectors.

INPUTs - the Pro Tools selection for Input “AES/EBU” (or SPDIF, depending on the digital format selected) selects Prism Sound Atlas’s electrical input; “Optical (ADAT S/MUX)” selects Prism Sound Atlas’s Optical input for receiving a AES/EBU or SPDIF signal (but won’t allow ADAT format).

Synchronisation

When using multiple digital audio devices, synchronisation must always be considered in order to avoid timing problems and possible glitching between the units.

In general, when you have multiple I/O units on a Pro Tools | HDX system you will need to connect “Loop Sync” between units to ensure they operate in sync. The software will display errors if a sync problem is identified and the problem will need to be resolved before operation can continue.

Prism Sound Atlas units under MDIO-PTHDX mode may operate as a Main / Sub pair to emulate a single HD I/O unit, and it’s **very important** to remember that the **Main** unit in any Main / Sub pair is the one that is used for loop synchronisation. The Sub can provide some auxiliary synchronisation *output* options (see the [External Wordclock Output](#) section below) but a **Sub must not be connected into the Loop Sync loop**.

Loop Sync connections on Pro Tools systems run at the “Baseclock” rate. Baseclock runs at 44.1KHz for sample rates of 44.1, 88.2, and 176.4KHz; or at 48KHz for samples rates of 48, 96 and 192KHz.

On Pro Tools | HD I/O units, Loop Sync BNC connectors are provided for connection. On Prism Sound units the Wordclock BNC connections are used on the units configured as “Main” (and these connections are automatically set to handle Baseclock rather than Wordclock at the full sample rate when appropriate).

(NOTE:- See the [Connection Diagrams](#) above).

To connect Loop Sync on multiple Prism Sound Atlas units, the Wordclock Output from the Main unit of the nominated Loop Sync Master is connected to the Wordclock Input of the next Main unit; its Wordclock out is then connected to the next Main unit in until all Mains in all stacks are connected.

Pro Tools I/O units must be incorporated into the Loop using their own Loop Sync connections (not Wordclock connections).

For a system running on Internal clock, the Wordclock BNC connector from the final Main unit should be connected back to the Loop Sync Master’s Wordclock In (i.e. complete the loop).

If you are running only a single Prism Sound Atlas, or just two Prism Sound Atlas units configured as Main/Sub on one DigiLink connection to the Pro Tools | HDX card, then there is no need to make any Loop Sync connections.

Synchronisation - Software Options

There are controls in Pro Tools' **Hardware Setup** (Setup Menu / Hardware) page to set the synchronisation options.

If you have multiple Main/Sub pairs or "lonely" Main units in the system they will appear in the top left of this Setup page named as "HD I/O #1", "HD I/O #2" etc.

Clock Source - each Main or HD I/O unit in the system has its own selection from the "Clock Source" option. This will define which unit is the "Loop Sync Master". A sub-selection within each unit allows you to set which connector is the sync source (or "Internal" if there is no external sync source).

i.e. at 96KHz there is a choice of:-

Internal, AES/EBU, Optical (ADAT/ S/MUX), Word Clock (48KHz) (i.e. Baseclock), Word Clock (96KHz)

When using an external sync source of Wordclock (or Baseclock), the Loop Sync Master's Wordclock input must be disconnected from the loop, and the Wordclock input will re-configure itself to accept the selected Wordclock or Baseclock rate.

External Wordclock Output

The **Ext Clock Output** selector has up to three choices:-

i.e. at 96KHz sample rate

Word Clock (48KHz), Word Clock (96KHz), Word Clock (TDIF)

The Wordclock Output on a Main unit will always run at Baseclock, in order to feed the Loop sync ring. But a Sub unit's WC Out can be used for synchronising other equipment to. The first two options define the rate at which any **Sub** unit's Wordclock output BNC connector will run.

The third option – Word Clock = TDIF - is unrelated to sync when using Prism Sound Atlas and provides a means of changing the output associated with the Headphones (see [Headphones](#) section above). If you have changed the Headphone output setting using this switch, you will be limited to using the full Wordclock sample rate on any Sub unit's Wordclock out.

Appendix 1 - Mic Pre / MIDI Setup

If you plan to never use the Mic inputs on Prism Sound Atlas, and are using Line inputs only, it's not necessary to set up the MIDI, and you could skip this step.

MIDI is used by the Pro Tools software to control the mic preamp levels on the Pro Tools | PRE units along with its switches for functions such as phantom, pad, phase, filter etc. Similarly on a Prism Sound Atlas, the controls for these from the Pro Tools software pass through a MIDI interface. In the same way as when setting up the Pro Tools | PRE, the MIDI interfaces need to be configured to accommodate this.

One Prism Sound Atlas in each stack should be attached by USB (and always the top unit that is attached closest to the Pro Tools | HDX card on the DigiLink connection). If you're using both Mini-DigiLinks on the HDX card (or more than two across multiple HDX cards), you'll need a USB cable to be attached for each of the top units on each stack – and you'll need to set up a set of MIDI ports for each stack.

The full instructions for the setup are in the Pro Tools | PRE manual – Chapter 3 “Configuring MIDI Studio for Pro Tools | PRE” – there are instructions for Mac and for PC. Setting up Prism Sound Atlas's Mic Pres follows the same routine.

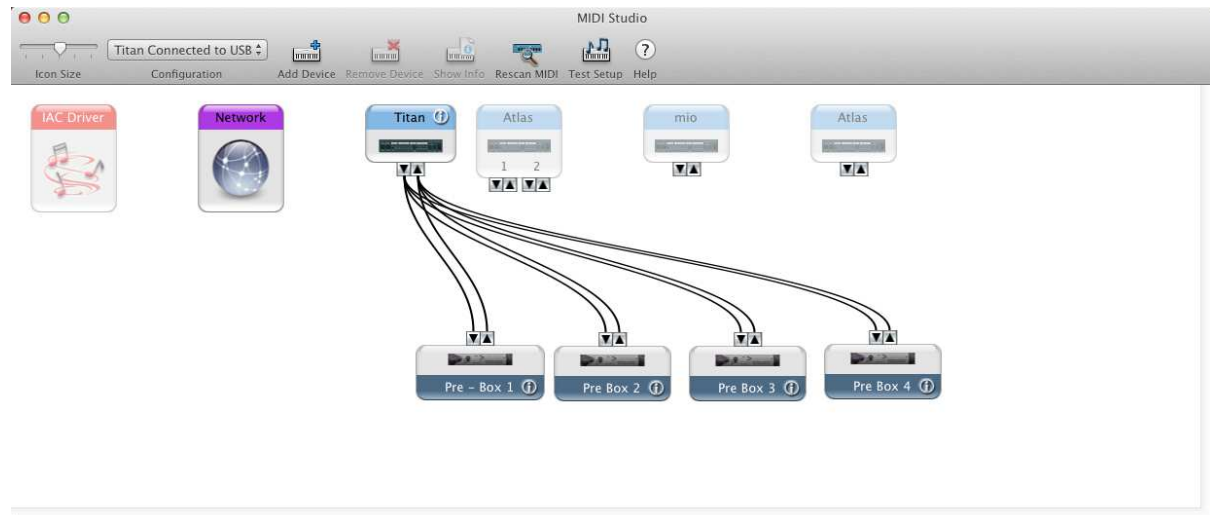
There are four stages...

1. Setting up the MIDI devices and connections in MIDI Studio
2. Declaring the Mic Pres in Pro Tools
3. Enabling the Mic Pres in Pro Tools
4. Displaying and adjusting Mic Pre controls

Setting Up MIDI Devices on a Mac

1. Open Audio MIDI Setup, and from its “Window” menu, select “Show MIDI Studio”.
2. With the Prism Sound Atlas attached in MDIO-PTHDX mode, the Prism Sound Atlas's (or Prism Sound Titan's) **MIDI Interface** will appear in MIDI Studio.
3. You need to set up a new **“PRE” device** for each Prism Sound Atlas or Titan in the stack (up to four devices per stack; you must include the first Prism Sound device in the chain, and if you have three units, you must create four PRE devices as per the note below):-
 - 3.1. Press Add Device. The device appears, double-click on it.
 - 3.2. Name the Device i.e. “Atlas Pre 1” with a name that will help you identify which unit it's for.
 - 3.3. As with the Pro Tools | PRE units set the Manufacturer to “Digidesign”, and the Model to “PRE”.
 - 3.4. Set both Transmit and Receive channel to 1 (for the first unit; channel 2 for the next one on the stack, and so on for channel 3 & channel 4 if four units are present).
Note that you can delete multiple MIDI channels easily in that setup dialogue by scratching the mouse across the channel numbers.
 - 3.5. Press Apply

- 3.6. Repeat the process for “Pre 2” / MIDI Channel 2, “Pre 3” / ch 3, “Pre 4” / ch4.
4. In the MIDI Studio window, connect the “Pre” devices you’ve just made to the Prism Sound Atlas device, by clicking with the mouse on their arrows and connecting each of them directly to the Prism Sound Atlas device in both directions (down arrow to down arrow; up arrow to up arrow).



Four “PRE” Devices connected to a Prism Sound Atlas MIDI Interface

IMPORTANT NOTE :- Prism Sound Atlas has TWO MIDI interfaces – its physical MIDI port and the “virtual” one used for Mic Pre control. Of the two ports shown in MIDI Studio **you should connect the Pre devices to the second port if it’s an Atlas**. Prism Sound Titan has only a single virtual port.

Setting Up MIDI Devices on Windows

1. In Pro Tools, select Setup / MIDI / MIDI Studio.
2. You need to set up a new “PRE” device for each Prism Sound Atlas or Titan in the stack (up to four devices per stack, you must include the first Prism Sound device in the chain, and if you have three units, you must create four PRE devices as per the note below):-
 - 2.1. Click on “Create”.
 - 2.2. Name the Device i.e. “Atlas Pre 1” with a name that will help you identify which unit it’s for.
 - 2.3. As with the Pro Tools | PRE set the Manufacturer to “Digidesign”, and the Model to “PRE”
 - 2.4. From the Input port selector, choose “Prism Titan (unit ser no)” (or “MIDIIN2 (Prism Atlas ser no)” if it’s a Prism Sound Atlas as per the note above in the Mac section).
 - 2.5. From the Output port selector choose “Prism Titan (unit ser no)” (or “MIDIOUT2 (Prism Atlas ser no)” if it’s a Prism Sound Atlas as per the note above in the Mac section).
 - 2.6. Set both Transmit and Receive channel to 1 (for the first unit; channel 2 for the next one on the stack, and so on for channel 3 & channel 4 if four units are present).
 - 2.7. Repeat the process for “Pre 2” / MIDI Channel 2, “Pre 3” / ch 3, “Pre 4” / ch4.

Declaring the Mic Pres

Open Pro Tools.

In the Pro Tools software:-

1. Go to **Setup / Peripherals**, and click the “Mic Preamps” tab.
2. Select PRE from the “Type” drop-down list for the first line.
3. Use the “Receive From” and “Send To” selectors to choose the MIDI device that you set up for the first unit.
4. This unit will be referred to in the next stage as “Pre#1”
5. Repeat for Pre#2, Pre#3, Pre#4 (or more) if necessary - the other devices/units whose Mic Preamps you plan to use.

Enabling the Mic Pres

In Pro Tools you will need to map the Mic Pres to the inputs that they are using.

1. Go to **Setup / I/O** and click the “Mic Preamps” tab.
2. For the Pre#1 line click in the grid to specify the I/O unit and channels that the pre-amps are associated with. Clicking in the box 1 will insert eight Mic Pre’s.
3. Repeat for Pre#2, #Pre#3, Pre#4 if necessary – i.e. Pre#2 would map to HDI/O ch9-16, Pre#3 to HDI/O ch1-8 and Pre#4 HD I/O ch9-16

You can click on boxes and drag to move them; you can select multiple boxes by shift-clicking them or drawing a rectangle around them; you can delete boxes by selecting them in blue and pressing the backspace key (If you are setting up Mic Pre’s for a Prism Sound Titan you should delete channels 5-8 as only ch1-4 on a Titan have Mic Pre’s).

Displaying Mic Pre controls

You may wish to view the Mic Pre-amp controls in either the Mix or Edit window (or both).

They may appear automatically, or if not, you can enable them by...

1. Go to the View menu and choose Edit Window Views and tick “Mic Preamps”.
2. Repeat for View / Mix Window Views.

Mic pre controls appear at the side of Edit window / top of the mixer.

You’re now ready to use the units with the Pro Tools system.

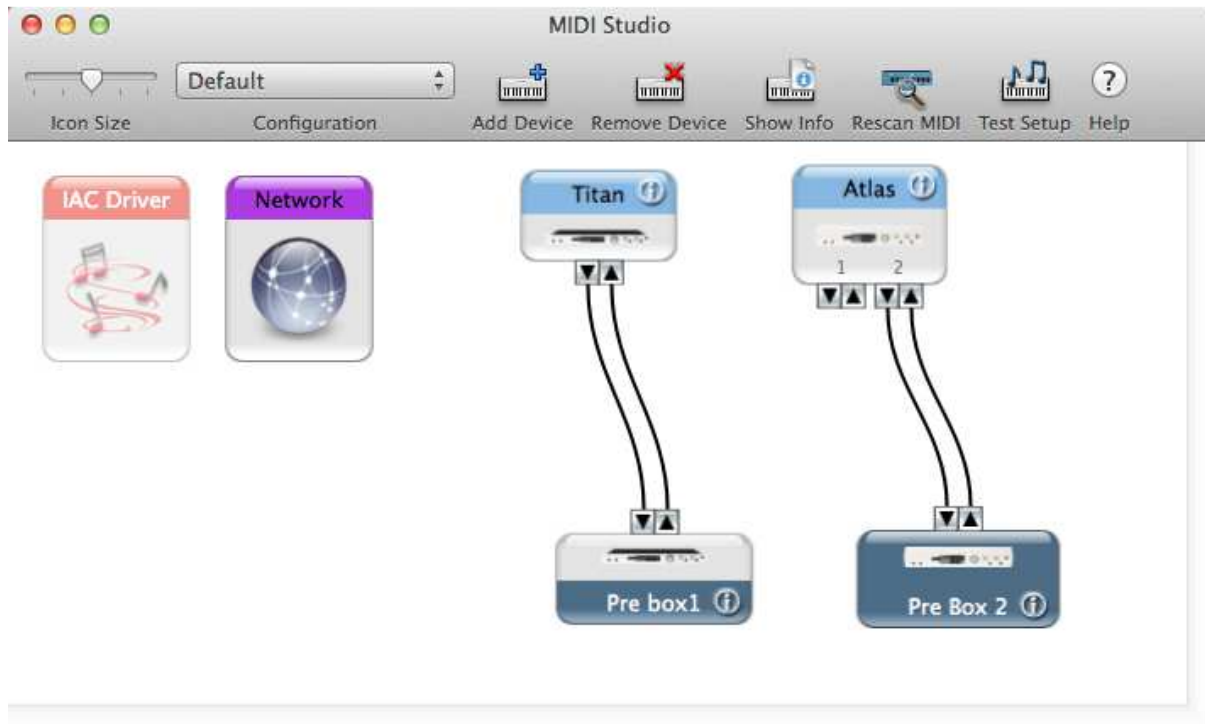
(Tip – when an input is set to “Mic” the P or PAD buttons cause a relay click in the Prism Sound Atlas boxes, and so provide a simple way to check the Mic Pre controls are working in an otherwise “blind” setup.)

MIDI for Multiple Stacks

As mentioned above when using multiple stacks you'll need each top unit of each stack to be connected via MIDI, and you'll need to set up two sets of MIDI ports.

Each stack has its own MIDI interface, and each "PRE" unit in the stack is set to an individual MIDI channel – 1,2,3, or 4.

There's an example picture below of a MIDI setup for two "lonely" Main units.



Special case for three units in a stack

When you have three units in a stack, it's necessary to set up *four* PRE units – set up four PRE units in MIDI Studio, Declare all four in Setup/Peripherals, and Enable them in Setup/I/O.

Only PRE 1,3 & 4 will actually work (and i.e. the "dummy" pre-amp controls declared for PRE2 for the digital inputs 9-16 will not display), but this will ensure that all channels with Mic pre-amps can display the controls.

Appendix 2 - Pro Tools Software Controls

The following is a list of controls in the Pro Tools software which will control settings in the Prism Sound Atlas units:-

Setup ... Hardware

Sample Rate (this tends to be set per project).

Loop Sync Master (which is set by the Clock Source control).

Clock Source - AES/ADAT/ Baseclock / Wordclock for each unit – the unit selected will choose the Loop Sync Master.

Identify - LEDs flash on the selected unit(s).

Ext Clock Output – Baseclock / Wordclock / TDIF.

(the synchronisation options are described above).

I/O port routing – drop-down selectors to select from available I/O.

Line Input sensitivity switching – on the Input tabs of the Hardware Setup page, there are individual +4/-10 settings for each Line Input connection.

Note that outputs are fixed at +4 – there's no setting for this within Pro Tools.

Limiter / Soft Clip (or Curv) – this enables Prism Sound Atlas's Over-killer feature on individual inputs.

Setup.. I/O

Shows a matrix for remapping the I/O on Input and Output tabs.

The Mic Preamp tab allows you to set and change the mapping of the Mic Pre controls.

When the Inputs are re-ordered in Hardware Setup in the Pro Tools software, it leaves the Mic Pre controls behind (i.e. Mic pre #1 software controls still control ch #1's Mic Pre even though it may now be coming through input number 7). This behaviour is identical for Prism Sound units and the Pro Tools | PRE. You could remap the Mic Pre controls using the I/O setup page's Mic preamp tab to account for this if necessary. However if you change the input routing using the I/O setup page's Input matrix, then the Mic Pre controls follow as expected.

Mic/Line controls

Having chosen to view the Mic Pre controls in either the Edit or Mix window (or both – there are Edit Window and Mix Window Views options in the View menu) you will be able to control the following:-

Mic / Line / DI indication – The selection of the input type is automatic depending on which connector is plugged into the Prism Sound Atlas or Titan input. DI shows when the front panel Instrument jack is used.

High-pass filter selection, per input channel

Phase switching, per input channel

Mic/instrument **gain** setting (not available on Line inputs)

+48V phantom power switching (available on Mic inputs)

-20dB pad switching (available on Mic inputs)

Appendix 3 - Front Panel LEDs

The front panel of both Prism Sound Atlas and Titan units have LED displays to show some key information. Because Atlas has a bigger case, there's space for a bigger screen and more LEDs.



44.1, 48, X2, X4	Sample Rate and multiplier (i.e. 48 and x2 lit means the current sample rate is 96KHz. <i>(Atlas only)</i>)
HOST	<p>Host= GREEN is standard USB/UAC2 mode.</p> <p>Host= UNLIT is standard USB/UAC2 mode but no USB is connected.</p> <p>Host= RED signifies MDIO-PTHDX mode.</p> <p>Host= RED FLASHING the LED may flash several times then pause and the number of flashes indicates what type of error is occurring.</p> <p>One red flash then pause etc., suggests an error on the MDIO-PTHDX module, and that it may need to be reprogrammed.</p> <p>Two red flashes then pause etc. , signifies MDIO-PTHDX mode is selected but that USB is connected to the wrong unit in the stack (it should be the unit which is attached directly to the HDX card).</p> <p>Three red flashes then pause etc. , signifies a problem with the stack connections – power down, and check all the connections.</p>
MASTER	<p>Sync status of the unit. In MDIO-PTHDX mode this is lit in GREEN to signify that this unit is the Sync Master (it will light on the Main unit of a pair). The Master LED will be unlit on other units.</p> <p>On the Sync Master Main unit, the LED will be lit when set to local (Internal) sample clock, or in the case where clock is set to an external source within the Pro Tools software, it will light continuously when the system is locked.</p> <p>Flashing GREEN on the Main unit of the clock master pair signifies an</p>

	error on the chosen clock source (when the unit is Sync Master and set to lock to an external source). The Pro Tools software will also display sync error messages until this condition is corrected. Flashing GREEN on any other unit signifies a clock error. On a Main unit that is not the Sync Master it would mean that the loop sync is not connected correctly.
IP	The meters are set to display activity on <i>inputs</i> .
OP	The meters are set to display activity on <i>outputs</i> . (The control to toggle IP & OP meters is in Hardware Setup... SPDIF format=Tascam)
ANALOGUE	Eight meters to display activity on analogue inputs (or outputs depending on setting)
DIGITAL	Two meters to display activity on the digital AES/SPDIF or TOS input (or outputs depending on setting)
UNL	When UNL is lit it signifies the digital input is unlocked - not synchronous to the system clock. UNL will be lit when nothing is connected.
SRC	<i>(SRC is not active in MDIO-PTHDX mode)</i>
OVER-KILLER	These light when the Over-killer function is active and limiting (i.e. they won't light up when the function is enabled and no audio is passing).
PRE	These light in PINK when an XLR is connected to an analogue input to show that the Mic Pre-amp is selected on that channel. They light in BLUE when a ¼" jack is connected the front panel Instrument jack. The Pre light is lit in PINK when no connection is made.
LINE	These light in GREEN when a TRS jack is connected to an analogue input to show that Line mode is selected on that channel. (The associated PRE LED will be unlit).

Appendix 4 - Installing the MDIO-PTHDX module

WARNING!



TO PREVENT FIRE OR SHOCK HAZARD DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

Fitting the MDIO-PTHDX module to a suitable Prism Sound Interface requires the lid to be removed. There are dangerous voltages inside and installation must be referred to qualified personnel. Anyone fitting the MDIO-PTHDX module must ensure that the mains is disconnected from the unit before removing the cover, and is not re-connected until the cover is refitted.

To fit the MDIO-PTHDX module, you will need to remove the lid of the unit, and a little dexterity is required in fitting the module. If you are in doubt about fitting an MDIO module to an existing Prism Sound Atlas or Titan unit, we recommend that you speak to your dealer who will be able to arrange to fit it.

You will need some tools – a standard No1 posi-drive cross-head screwdriver, and a 2mm hex head screwdriver (a suitable Allen key is provided with the MDIO kit).

In addition, you will need to check the current firmware version of the Prism Sound Atlas or Titan unit, and update the firmware if necessary. The MDIO-PTHDX module requires the Prism Sound Atlas or Titan to have firmware version 1.07 or higher loaded.

Hardware Installation

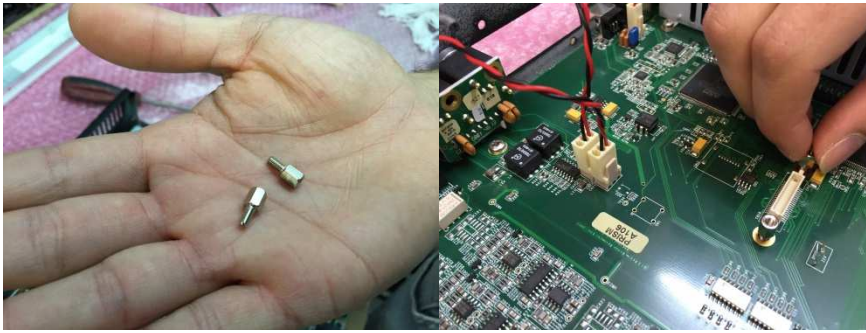
1. Remove the lid of the unit. Prism Sound Atlas has six hex-head screws on each side; Titan has five on each side; both units have another three screws along the top edge at the rear. Keep those screws safe while you fit the module.
2. Also remove the MDIO blanking cover plate which uses another four hex-head screws.



3. Approximately half way back from the MDIO slot there is a white multi-pin connector labelled “CN19”, and either side are two cross-head screws. Unscrew the two cross head screws.

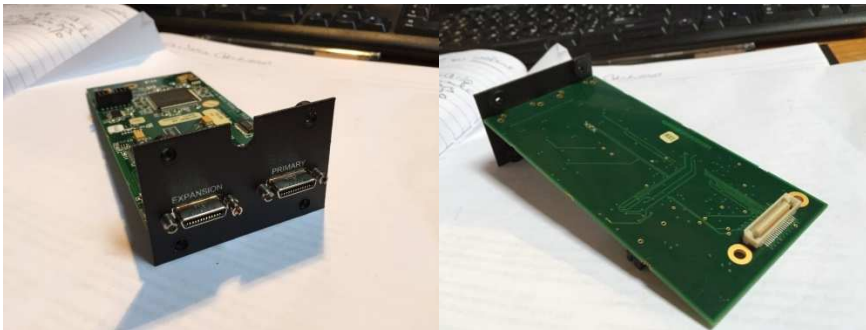
(Some units may be supplied with Hex spacers already fitted in place of the cross-head screws; in this case, you can skip step 4).

- Two M3 x 6mm threaded Hex spacers are provided.

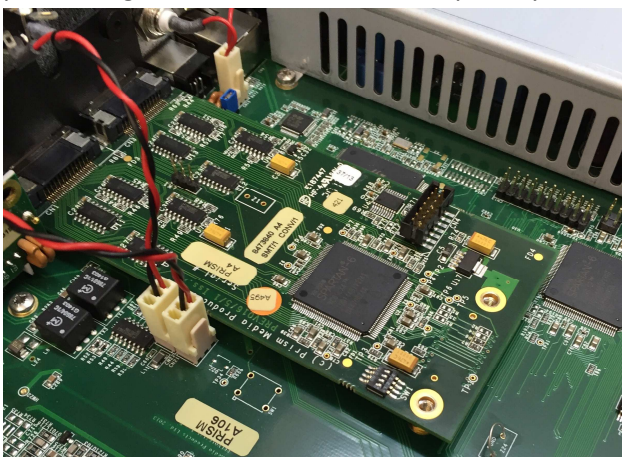


Insert these in place of the cross head screws you have just removed. These can be screwed down finger-tight. If using a tool, such as pliers, or (the correct tool) a 5mm nut-spinner, make sure not to over-tighten these.

- Taking anti-static precautions, remove the MDIO-PTHDX module from its anti-static bag.



- Offer up the MDIO-PTHDX module to its connector. Position the face plate end against the rear panel first – should be flush against the inside of the Prism Sound Atlas/ Titan rear panel. Then lay the MDIO PCB so that the screws line up with the screw holes. It should not require much force to mate the connectors – when it's in the correct position the board should gently push down. Don't force anything if it does not seem to fit – adjust the positioning until the connector lines up easily.



- Once in position, you can screw the two 6mm x M3 screws through the board into the hex spacers.



8. Some new hex head M3 screws are provided to fix the rear plate of the MDIO-PTHDX module to the rear panel of Prism Sound Atlas/Titan. The short pair should be used for the lower pair of holes closest to the bottom of the box.
9. Refit the lid and replace the screws.

Firmware Checking and Installing

To check which firmware is currently installed in the Prism Sound Atlas unit, you will need the Control App. The existing version that you have already installed for USB/UAC2 mode is sufficient for checking the version. If required, the Control App and/or driver installer for the standard USB mode can be downloaded from our website...

http://www.prismsound.com/music_recording/support_subs/support_downloads.php

With the Prism Sound Atlas or Titan connected in standard USB/UAC2 mode, open the Control app, and hover the mouse over the serial number towards the top of the control panel (just above "Sync Source") for a second or so and it will reveal the firmware version...



Prism Sound Atlas and Titan firmware versions of 1.07.xxxx or higher will support the MDIO-PTHDX module.

If your firmware version is below 1.07, then you must update the firmware.

This can also be downloaded from our download page linked above. If you're updating the firmware, it makes good sense to update the Control App first (and the software package will include a driver if you're running on Windows). Run the installers in the usual way to update the software.

The instructions for updating the firmware are in our "Firmware Loading Guide for Atlas, Titan and Lyra" document....

http://resources.prismsound.com/rp/USBAudio_FirmwareLoading_A4.pdf

Note that settings are reset after a firmware load, so you may wish to save your USB mode settings before updating the firmware (and reload after). If you're using the volume control for speaker level control in USB mode, then the reset will disable this (and will revert the output level to full level - if your Prism Sound Atlas is attached directly to active speakers, playback may be very loud) so take special care of levels and reset this control before playing anything. Note also that the volume control is not active in MDIO-PTHDX mode.

You can now return to the [Quick Start Guide](#) at the top of this manual and proceed to connect the Prism Sound Atlas units to your Pro Tools system.

Appendix 5 – Updating the MDIO module's firmware

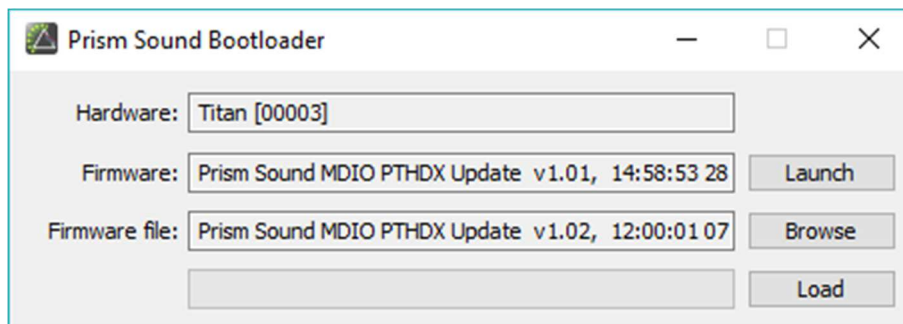
NOTE:- the Titan and Atlas units have firmware which may be updated. **Also** the MDIO modules themselves have separate firmware which may be updated from time to time. The main unit firmware and MDIO module firmware are in different files and are uploaded separately.

The procedure for updating the MDIO module's firmware is similar to updating the main unit's firmware.

The document here explains the process:-

http://resources.prismsound.com/rp/USBAudio_FirmwareLoading_A4.pdf

The only difference being that when you **Browse** and select a Firmware File that is recognised as being for the MDIO module, the **Firmware:** line switches to report the firmware version currently **in the MDIO PTHDX module** where previously it was showing the firmware version of the Atlas or Titan unit.



Pressing **Load** will start the MDIO firmware update, and then when the progress bar completes the **Launch** button becomes available again and pressing it will restart the unit.

MDIO update history as of August 2018

	Version	Date	Changes
MDIO PTHDX v1.00	1.00	July 2016	First release.
MDIO_PTHDX_1P01.FIRMWARE	1.01	9 th Dec 2016	Update to change latencies to bring Titan into line with HD I/O round-trip latencies. Also fixes for possible glitches at 192K.
MDIO_PTHDX_UPDA TE_1P02.FIRMWARE	1.02	7 th Aug 2018	Update to prevent glitching on startup and closing ProTools software.

You will need the MDIO firmware file and the correct version of the Prism Sound USB Audio software. On a PC you need the software version 1.15 (December 2016) or higher. On a Mac it needs to be software version 1.24 (August 2018) or higher.

Atlas and Titan units shipped before January 2017 may not be capable of accepting a MDIO firmware upload over USB, even with the most up to date software. They may require the hardware to be re-programmed at the factory or at one of our distributors. If the MDIO firmware update fails, please contact tech.support@prismsound.com including details of the serial numbers of your units and the software versions being used.