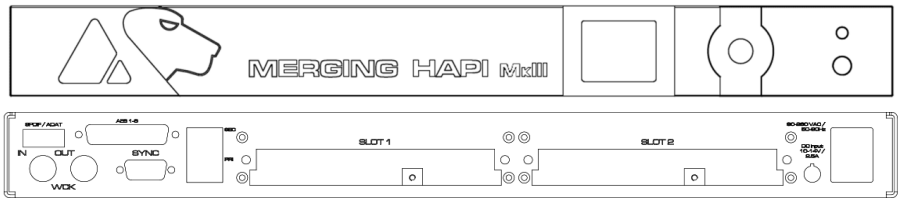

Hapi MKIII

User Manual

Revision 0.1 25 November 2024

MERGING

Contents

IMPORTANT SAFETY AND INSTALLATION INSTRUCTION SAVE THESE INSTRUCTIONS

INSTRUCTIONS PERTAINING TO RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

WARNING – when using electric products, basic precautions should be followed, including the following:

1. Read all of the safety and installations instructions and explanation of graphic symbols before using the product.

2. The product must be grounded otherwise it could malfunction or breakdown. Grounding provides a path of least resistance or electric current to reduce the risk of electric shock. This product is equipped with a power supply cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet which is properly installed and grounded in accordance with all local codes and ordinances.

DANGER – Improper connection of the equipment-grounding can result in a risk of electric shock. Do not modify the plug provided with the product – if it will not fit the outlet have a proper outlet installed by a qualified electrician. Do not use an adapter that defeats the function of the equipment-grounding conductor. If you are in doubt as to whether the product is properly grounded, check with a qualified serviceman or electrician.

3. Do not use this product near water – for example, near a bathtub, washbowl, kitchen sink, in a wet basement, or near a swimming pool, or the like.

4. This product should only be used with a stand or cart that is recommended by the manufacturer.

5. This product, either alone or in combination with an amplifier and speakers or headphones, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate at a high-volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.

6. The product should be located so that its location or position does not interfere with its proper ventilation.

7. The product should be located away from heat sources such as radiators, heat registers, or other products that produce heat.

8. The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.

9. The power-supply cord of the product should be unplugged from the outlet when left unused for a long period of time. When unplugging the power supply, do not pull on the cord, but grasp it with the plug.

10. Care should be taken so that objects do not fall, and liquids are not spilled into the enclosure through openings.

11. The product should be serviced by qualified service personnel when: A. The power supply

cord or plug has been damaged. Objects have fallen, or liquid has spilled into the product, or C. The product has been exposed to rain, or D. The product does not appear to be operating normally or exhibits a marked change in performance, or E. The product has been dropped, or the enclosure damaged.

12. Do not attempt to service the product beyond that described in the user maintenance instructions. All other services should be referred to qualified service personnel.

13. WARNING - Do not place objects on the power supply cord or place the product in a position where anyone could trip over, walk on, or roll anything over cords of any type. Do not allow the product to rest on or be installed over cords of any type. Improper installations of this type create the possibility of a fire hazard and/or personal injury.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

IMPORTANT NOTICE:
Please read the following information very carefully before attempting any installation. Failure to comply with the precise instructions may result in damage to your Merging hardware. Please read this entire section of the manual carefully before installation.

STATIC DANGER NOTICE:

Please note that the Hapi contains delicate electronic components that can be damaged or even destroyed when exposed to static electricity. Take all necessary precautions not to discharge static electricity when touching any of the Hapi connectors.

Product Regulatory Compliance

The Merging Hapi Network Converter is designed and tested to meet the standards and regulations listed in the Safety Guide provided with the unit and the Declarations of Conformity.

Electromagnetic Compatibility Notices

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two 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.
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to 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 receiver.
- Connect the equipment to an outlet on a circuit other than the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could deter the user’s authority to operate the equipment. The customer is responsible for ensuring compliance with the modified product.
Only peripherals (computer input/output devices, Ethernet switches, terminals, printers, etc.) that comply with FCC Class B limits may be attached to this computer product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception.
All cables used to connect to peripherals must be shielded and grounded. Operation with cables, connected to peripherals that are not shielded and grounded, may result in interference to radio and TV reception.

Environmental Limits

System Office Environment Parameter Limits
Operating Temperature +5 degrees C to +40 degrees C with the maximum rate of change not to exceed 10 degrees C per hour.
Storage Temperature -40 degrees C to +70 degrees C
Storage Humidity 95%, non-condensing @ 30 degrees C
Operating Shock No errors with a half sine wave shock of 2G (with 11-millisecond duration).
Package Shock Operational after a free fall, 60 cm depending on the weight.

Hapi Warranty Information

This product is warranted to be free of defects in materials and workmanship for two years from the date of purchase. Merging Technologies, Inc. extends this Limited Warranty to the original purchaser. In the event of a defect or failure to confirm this Limited warranty, Merging Technologies, Inc. will repair or replace the product without charge within sixty (60) days. To make a claim under this limited warranty, the purchaser must notify Merging Technologies, Inc. or their representative in writing, of the product failure. In this limited warranty the customer must upon Merging Technologies, Inc. request, return the product to the place of purchase, or other local designation, for the necessary repairs to be performed. If the consumer is not satisfied with the repair, Merging Technologies, Inc. will have the option to either attempt a further repair, or refund the purchase price.
This warranty does not cover: (1) Products which have been subject to misuse, abuse, accident, physical damage, neglect, exposure to fire, water or excessive changes in the climate or temperature, or operation outside maximum rating. (2) Products on which warranty stickers or product serial numbers have been removed, altered or rendered illegible. (3) The cost of installations, removal or reinstallation. (4) Damages caused to any other products. (5) Do not attempt to service the equipment. There are no user serviceable parts inside*. Please refer all servicing to an authorized Merging sales partner. Any attempt to service the equipment will expose you to the risk of electric shock and will void the manufacturer's warranty.

** Replacing or adding a AD, DA or MADI module and adjusting the DA module dip switch of legacy DA (output) is permitted under the supervision of a Merging sales partner. Any other modification will void the Hapi warranty.*

Contacting Merging Technologies

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Merging Technologies S.A.
Le Verney 4
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Switzerland

Phone: +41 21 946 0444

For all documentation inquiries or suggestions for improvement:
www.merging.com

Introduction to HAPI MKIII

Modular by Design
Hapi, the son of Horus. Born from the most flexible and sonically transparent audio interface and providing the same RAVENNA / AES67 connectivity as its father, Hapi is both the perfect primary interface for smaller systems as well as the ultimate accessory for a system using Horus where control room I/O is required. Hapi was designed to give its users an Audio I/O channels flexibility while offering an unprecedented level of quality in such a small form factor.

Providing as standard; 8 channels of AES- EBU I/O plus 8 ADAT or 2 SPDIF I/O (on TOSLINK) and 2 Network interfaces 2 slots for AD8D/AD8P, DA8/DA8P, MADI or PT64 option cards. Once the Hapi is fully loaded with option cards, it can achieve 88 inputs and 90 outputs @ 1FS. There are indeed 2 more output channels than input channels, including Stereo Headphone Monitoring.

Route Signal Anywhere
Hapi has been designed so that any input can be routed to any number of outputs as required simultaneously. With comprehensive routing pages accessible both locally on the touchscreen and by remote access using a standard web browser, Hapi is the answer to signal flow management in your studio.

Green Built
For environmentally conscious users, Hapi has been designed meticulously in order to keep power consumption at an incredible minimum. A fully loaded Hapi running all channels of phantom power will only draw about 30W, making it more affordable to run than your kitchen lights.

HAPI MKIII Key Features
• Up to 152 inputs and 154 outputs @1FS
• 8x AES/EBU + 8x ADAT or 2x SPDIF (Optical)
• Standard modules support 44.1kHz to 192kHz and Premium up to DXD/DSD256.
• Signal routing from any input to any combination of outputs
• RAVENNA/AES67 Compatible
• RAVENNA/AES67 Hapi MKIII supports Network ST2022-7 redundancy and Network Switch mode
• Dante Ready™ (requires Dante firmware & licence plan)
• Dante Network Redundancy and Switched mode support (requires Dante firmware & license plan)
• DA4:36 PM Compatible
• DA4:36 PM Redundancy Support
• Browser-based remote access using any web enabled device
• AC or DC power supply options
• Modular design for additional analog and Digital I/O
• Near-zero latency from in to out (<1ms)
• Main rotary control button
• ST2022-7 Support (Seamless Protection Switching)
• Network Switch mode support (allowing daisy chain for an extra network device)
• Additional Roll Off filters
• Per channel DA Trims level and polarity support
• Per channel Headphones Trims level and polarity support
• Routing support with per channel support
• Mastering grade Headphone Amp
• Powerful Headphone Amp suitable for ultra-low to very high impedance headphones.
• Headphones DSD volume support (DSD64, DSD128, DSD256)*
• Headphones DSD256 support*
• OLED display for local control access

** The Dante mode does not support 8FS, DXD or DSD formats.*

RAVENNA

The Hapi has been designed so that the MADI, AES, SPDIF/ADAT, PT64 and Analog modules can all feed into or take their sources from the network over RAVENNA streams, providing up to 88 channels of I/O @ 1FS over a single CAT5e or CAT6 cable to any other RAVENNA devices on the network.

The RAVENNA connection on the Hapi allows for not only audio, but also control and sync information to flow through as well. Send Timecodes and Word clock directly to the Hapi unit over the same network as your audio. The RAVENNA port even provides remote control access to the configuration and entire routing of the unit itself! Support for: LTC/Video Ref/WCK

RAVENNA is a layer 3 IP based protocol. In environments where existing networks are already in place, RAVENNA subnets can slip right into place with no additional outlay. In laymen's terms, this means that you can connect your Hapi to a properly configured network exactly as you would your PC or Mac, with no additional technology required.

RAVENNA is a "mission critical" protocol, meaning that is has been designed to ensure immensely low jitter rates and latencies (sub-millisecond) and ensures that every single sample gets to where it needs to go without fail. Hapi MKIII provides a secondary (RJ45), redundant RAVENNA connection for uninterrupted use, even when a network connection fails, it can also be used in switch mode.
Refer to the *RAVENNA User Guide* and the *MassCore-RAVENNA Configuration Guide* for more details

DANTE

Dante by Audinate is one of the leading closed AoIP ecosystems, offering a comprehensive set of software, hardware and network protocols to deliver uncompressed networked audio.

Dante is the product name for a combination of software, hardware, and network protocols that delivers uncompressed, multi-channel, low-latency digital audio over a standard Ethernet network using Layer 3 IP packets. Developed in 2006 by the Sydney-based Audinate, Dante builds on previous audio over Ethernet and audio over IP technologies.

Like most other audio over Ethernet technologies, Dante is primarily for professional, commercial applications. Most often, it is used in applications where a large number of audio channels must be transmitted over relatively long distances or to multiple locations.

Digital audio provides several advantages over traditional analog audio distribution. Audio transmitted over analog cables can be adversely affected by signal degradation due to electromagnetic interference, high-frequency attenuation, and voltage drop over long cable runs. Thanks to digital multiplexing, the cabling requirements for digital audio distribution are almost always reduced when compared to analog audio. Dante also provides specific advantages over first-generation audio over Ethernet technologies, such as CobraNet and EtherSound. Technological advancements include native gigabit support, higher channel count, lower latency, and automatic configuration.

Refer to the Hapi MkIII Dante Appendix for all details on Dante.

The Hapi MKIII is delivered without a Dante license, the license must be purchased separately.
To operate in Dante mode, it requires that the Hapi MkIII Dante firmware is updated in the unit.
Refer to the Dante Set Up guidelines for all details.

HAPI MKIII - Hardware

FRONT PANEL

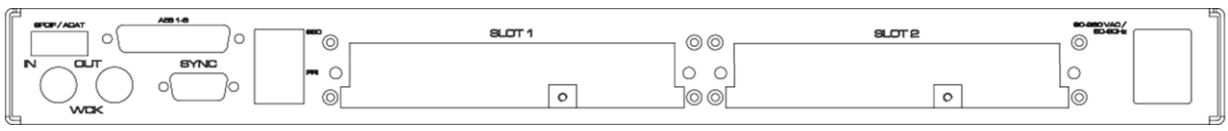
BACK PANEL

HAPI UNIT

HAPI SCHEMATIC IMAGES

Front Panel

Back Panel



HAPI BASE UNIT

IOC-HAPI Specifications

Case Material	Powder Coated Steel
Front Panel Material	Brushed Aluminum
Weight (excluding redundant PS)	4.5 kg / 10 lbs
Dimensions (1U rack mounting)	483 x 320 x 44 mm
Voltage (AC)	100V–240VAC, 50–60 Hz
Voltage (DC) (option IOC-HAPI-PSR)	10-14VDC
Power Consumption (Max)	< 30 Watts
Front Panel TFT size/resolution	OLED (160x128 px)

Headphone Monitor Jacks

Headphone Jack 1&2	6.35mm (¼") & 3.5mm TRS Female Stereo
Dynamic Range (A-weighted, typ.)	118 dB
Max output Level High / Low	15 dBu / 7.3 dBu (load 600/16 Ω)
Max output Power	2 x 200 mW (load 16 Ω)
Frequency response +0/-0.2dB @ fs = 48 kHz	6 Hz – 22 kHz
Frequency response +0/-3dB @ fs = 96 kHz	2 Hz – 44.2 kHz
Frequency response +0/-3dB @ fs = 192 kHz	2 Hz – 88.1 kHz
Output Impedance	20Ω
THD+N 1 kHz @ 0 dBFS High / Low	< -106 dB (0.0005%)
Attenuation Range (Software controlled)	- ∞ to 12 dB
Gain Step/Precision	0.5 dB / ±0.05 dB
DXD Support	Native
DSD Support	DSD 64 to DSD 256

SYNC Connectors

"Sync" Cable (LTC/Video Ref)	D-Sub 15Pin
LTC In & Out (via "Sync" Cable)	Balanced XLR
Video Reference In (via "Sync" Cable)	BNC
Word Clock Input (Switchable 75 Ω Termination)	BNC, 0.5Vp-p min
Word Clock Output (Zout = 35 Ω)	BNC, 5Vp-p
Maximum supported deviation	+/-1000ppm

Network module

Primary / Secondary (GbE)	RJ45

AES-EBU module

AES type/pinout	DB-25 / AES59 (Tascam Dig.)
AES i/o	Grounded and transformer coupled
Output Impedance	110 Ω

MADI module

MADI types (Coaxial / Optical)	BNC / SC
Output Impedance	75 Ω

ADAT/SPDIF module

ADAT/SPDIF	Optical Toslink

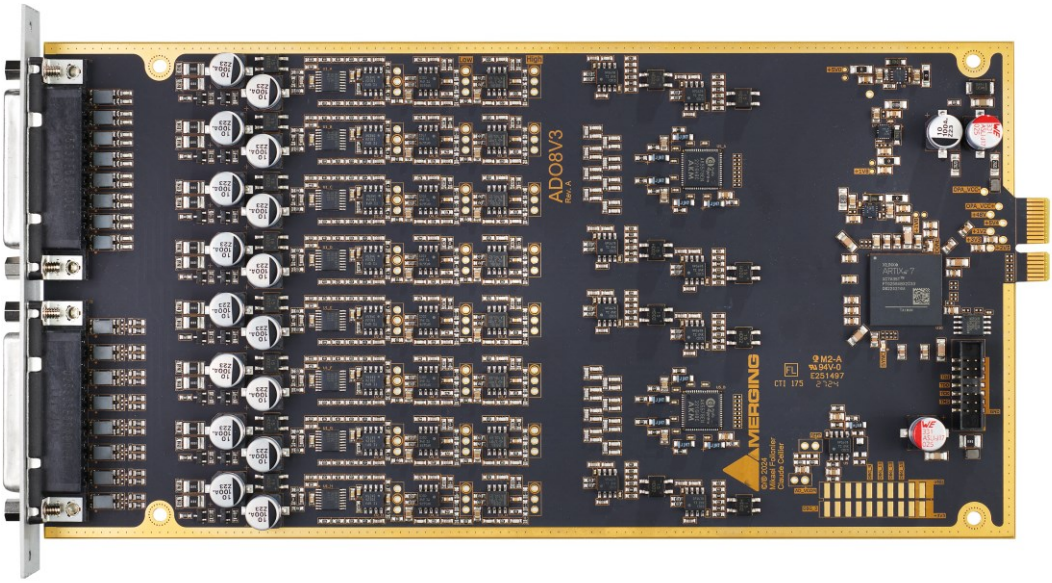
Software Specifications

RAVENNA/AES67 MassCore Driver	Pyramix v12.0 or Higher / Win10 or Win11 64bit
RAVENNA/AES67 Windows Driver/OS	ASIO 2.2 / Win11 64bit
RAVENNA/AES67 Mac Driver/OS	CoreAudio / MacOS 11.x or higher
Dante Windows Driver/OS	DVS 4.4.1.3 / Win 10 or 11 64bit
Dante Mac Driver/OS	DVS 4.4.1.3/ MacOS 10.15 or higher

HAPI - Optional Cards

ADO8V3S / ADO8V3P

These remotely controlled Mic/Line Input cards are 3rd generation Dual Gain topology designs, inspired from the Anubis outstanding Preamps, that show zero tolerance to any compromise on the audio quality.
A new benchmark in analog circuitry design, and provide additionally a Line level post Mic-pre “Direct Out” output.
Available in models that work up to 192kHz (ADO8V3S) and DXD/DSD256 (ADO8V3P)



ADO8V3S / ADO8V3P Key Features

- 8 x exceptionally transparent, Swiss designed pre-amplifiers
- Remote/Local switch to Line Level on a per channel basis
- Completely accessible remotely for all parameter changes
- Phantom Power/Polarity Invert/Low Cut/Impedance switchable per channel
- Removes the need for DI boxes
- Allows build-in Mic splitting variants
- Dynamic range of 136dB (A-weighted, typ)
- Auto-mute circuitry for “no-pop” power cycling

ADO8V3S / ADO8V3P Mic Pre-Amp + ADC

Mic Pre Max Input (Mic+Pad / Mic / Boost)	+24 dBu / +12 dBu / +0 dBu
Mic Pre Max Input (Pad On; Pad Off)	> 3 kΩ; 10.4 kΩ
Input Impedance (Zlo; ZHi)	> 3 kΩ; 10.4 kΩ
Dynamic Range (flat 20 Hz-20 kHz)	> 134 dB
Dynamic Range (A-weighted, typ)	137 dB
Gain Range (software controlled)	0 dB to +66 dB
Gain Precision	±0.2 dB
Gain Step	0.5 dB
THD+N Pre + A/D (20 Hz-20 kHz) @ -2 dBFS	-110 dB (0.00031 %)/-112 dB (0.00025 %)
Interchannel Crosstalk @ 1kHz, typ.	<-130 dB
Interchannel Crosstalk @ 20Hz – 20 kHz	< -105 dB
EIN @ >40 dB Gain (150Ω Source Impedance, A-weighted, typ)	-128 dBu
Common Mode Rejection Rate @ 20Hz – 20 kHz	> 75 dB
Phantom Power (Software Switchable Per Channel)	+48 Volts
Phase Reverse Switch (Software Switchable Per Channel)	Yes
Low Cut filter (Software Switchable Per Channel)	-12 dB/octave, 80 Hz

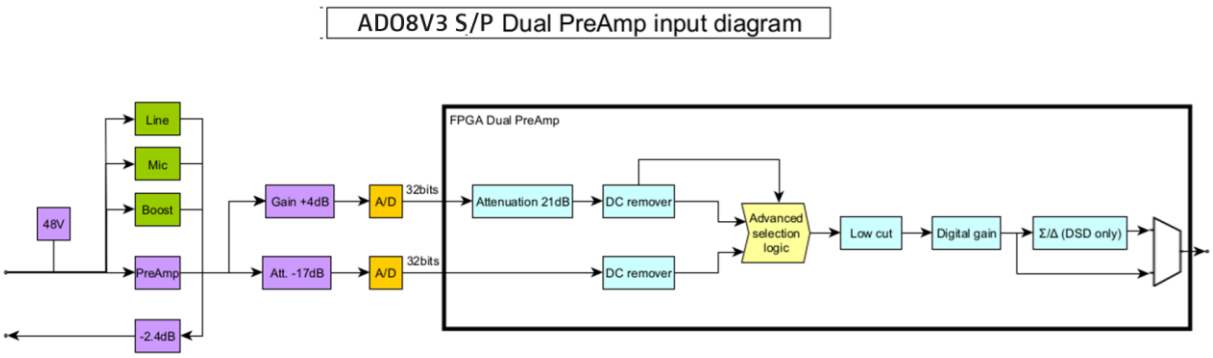
ADO8V3S / ADO8V3P Line input Section

Frequency response +0/-0.1dB @ fs = 44100 Hz	5.7 Hz - 20.5 kHz
Frequency response +0/-1.0dB @ fs = 44100 Hz	1.8 Hz - 21.0 kHz
Frequency response +0/-0.1dB @ fs = 96000 Hz	5.7 Hz - 43.9 kHz
Frequency response +0/-1.0dB @ fs = 96000 Hz	1.8 Hz - 45.4 kHz
Frequency response +0/-0.1dB @ fs = 192000 Hz	5.7 Hz - 42.1 kHz
Frequency response +0/-1.0dB @ fs = 192000 Hz	1.8 Hz - 64.7 kHz
Frequency response +0/-0.1dB @ fs = 384000 Hz	5.7 Hz – 40 kHz
Frequency response +0/-1.0dB @ fs = 384000 Hz	1.8 Hz - 75 kHz
Max Line Input for 0 dBFS	+24 dBu
Input Impedance	10.4 kΩ
Dynamic Range (flat 20 Hz-20 kHz), ref +24 dBu	>136 dB
Dynamic Range (A-weighted, typ), ref +24 dBu	139 dB
THD+N Line+A/D (1 kHz) @ -2 dBFS, Typ.	-110 dB (0.00031%)
THD+N Line+A/D (20 Hz-20 kHz) @ -2 dBFS.	< -107 dB
Interchannel Crosstalk @ 1kHz, typ.	-130 dB
Interchannel Crosstalk @ 20Hz – 20 kHz	< -105 dB
Sensitivity Range for 0 dBFS (software controlled)	-42 dBu to +24 dBu
Gain Precision	±0.2 dB
Gain Step	0.5 dB
Common Mode Rejection Rate @ 1kHz, typ.	75 dB (up to -20 dBFS)
Common Mode Rejection Rate @ 20Hz – 20 kHz	> 65 dB (up to -20 dBFS)
Group Delay (1FS)	5/fs
Group Delay (2FS)	5/fs
Group Delay (4FS) / Premium (8FS)	6/fs / 7/fs

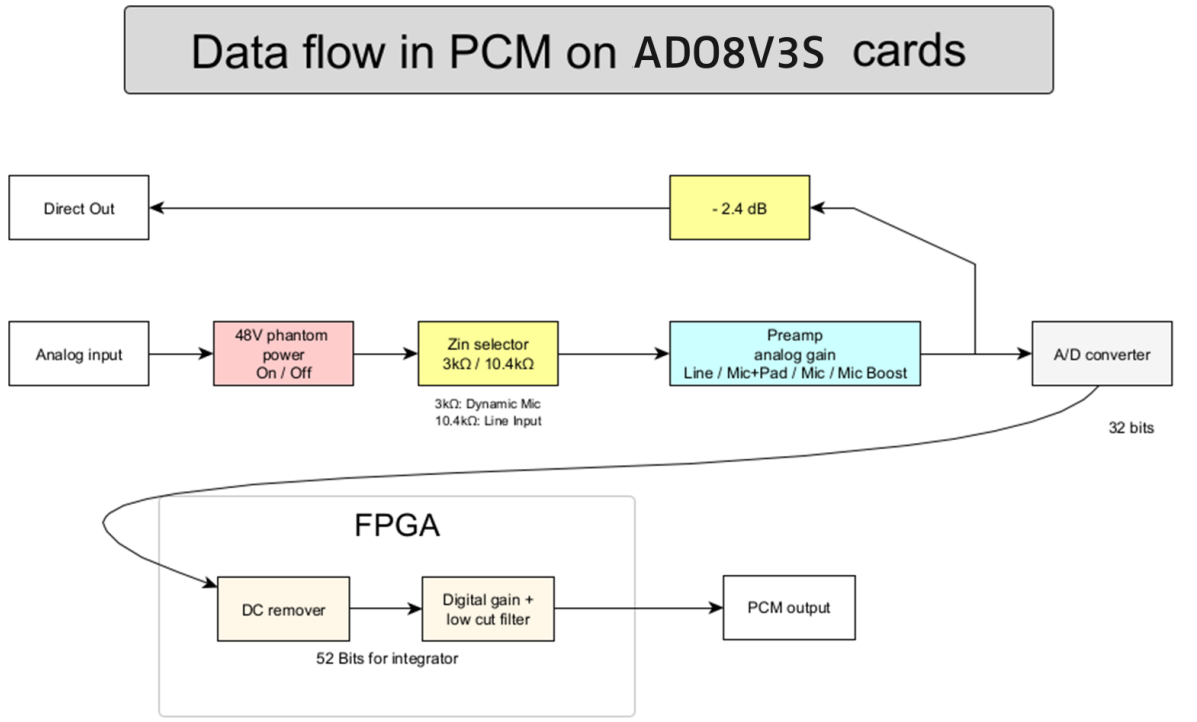
ADO8V3S / ADO8V3P Direct Out Section

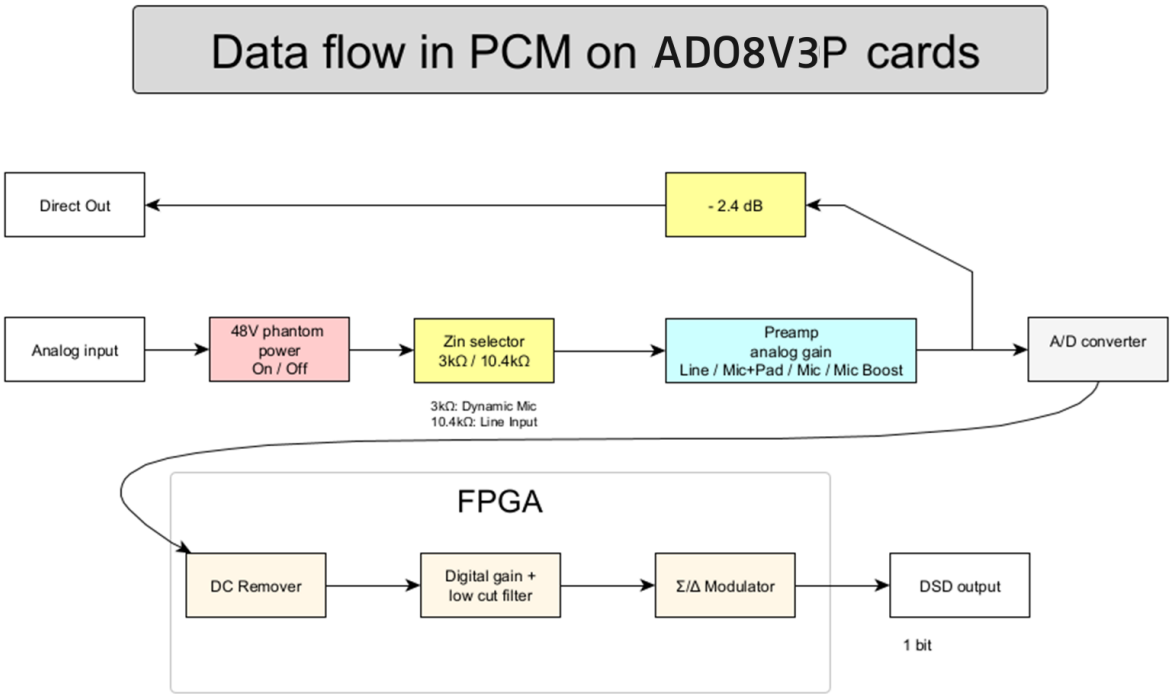
Max Direct Output level typ.	+24 dBu / +12 dBu / +0 dBu
Output Impedance (Differential)	< 100 Ω
THD+N (1 kHz) @ +10dBu	< -110 dB (0.00028 %)
Input Connector Pinout	DB-25 / AES59 (Tascam Ana.)
Direct Output Connector Pinout	DB-25 / AES59 (Tascam Ana.)

ADO8V3S / ADO8V3P Dual preamp block diagram



ADO8V3S / ADO8V3P block diagram

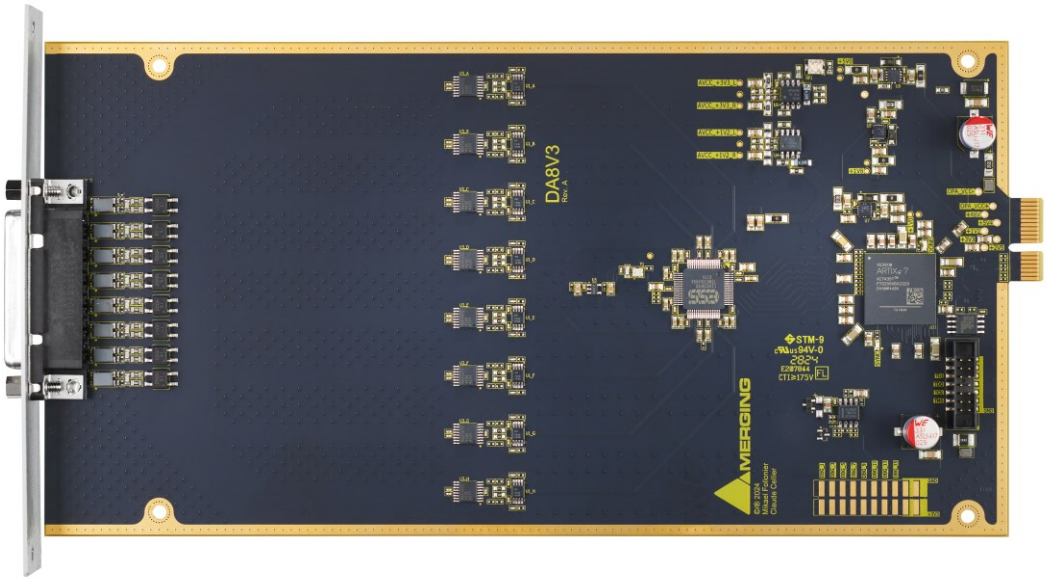




Note: The ADO8V3S/P cards do not reflect on their Direct Outs the Digital Gain values which are only applied to the local signal paths. They offer a fixed level output and do reflect the Line/Mic/Boost respective Analog front-end gains. Which are 0 dB for Line (and Mic with PAD), 12 dB for Mic and 24 dB for Boost settings.

DA8V3S/DA8V3P

The DA8 (up to 192kHz) and the DA8P (up to DSD) have been shown in testing to be consistently the quietest multichannel D/A conversion modules available anywhere.



DA8V3S/DA8V3P Key Features
• Auto-mute circuitry for “no-pop” power cycling
• Digitally controlled trims for line up procedures
• Dynamic range of 127dB (typ.)
• Local low phase noise oscillator circuitry

DA8V3S/DA8V3P Specifications

Max Line Output @ 0 dBFS (settings on +24 dBu)	24 dBu +0/-0.5 dB
Max Line Output @ 0 dBFS (settings on +18 dBu)	18 dBu +0/-0.5 dB
Frequency response +0/-0.3dB @ fs = 48000 Hz	0 Hz – 20 kHz
Frequency response +0/-0.3dB @ fs = 2.8224 MHz (DSD)	NA / 0 Hz – 20 kHz
Frequency response +0/-3.0dB @ fs = 2.8224 MHz (DSD)	NA / 0 Hz – 50 kHz
Line Output Impedance (Differential)	90 Ω
Dynamic Range (flat 20 Hz-20 kHz)	125 dB
Dynamic Range (A-weighted, typ)	128 dB
THD+N D/A (1 kHz) @ 0 dBFS (DA8V3S)	< -115 dB (0.00017 %)
THD+N D/A (1 kHz) @ 0 dBFS (DA8V3P)	< -116 dB (0.00015 %)
Interchannel Crosstalk @ 1kHz, typ.	-140 dB
Connector Pinout	DB-25 / AES59 (Tascam Ana.)

Line Output Level calibration

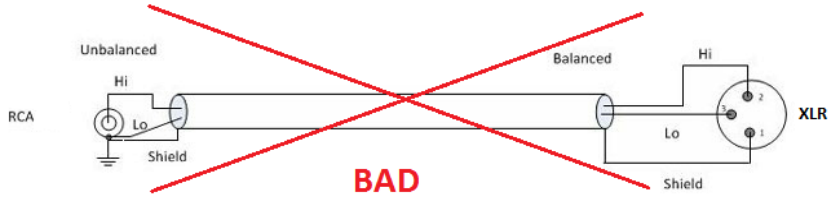
On the DA8 and DA8P cards, the output level setting for all channels is done via software through the option “max output level” in each DA’s setting page, allowing either + 24 dBu or 18 dBu max level.

For a more precise trimming of the output level, the output attenuation can be set on the same page

The Hapi software Output Attenuation range is from -60dB to 0dB

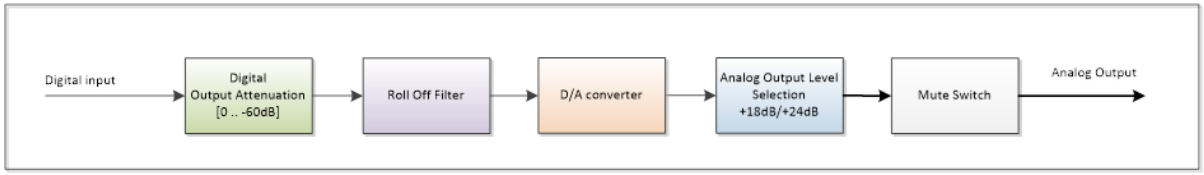
How to connect the symmetrical line out to an unbalanced input

Never attempt to short pin 3 (or pin 2) to Ground on Horus DA's output, since the Horus Line Out driving circuitry is symmetrical but not floating.



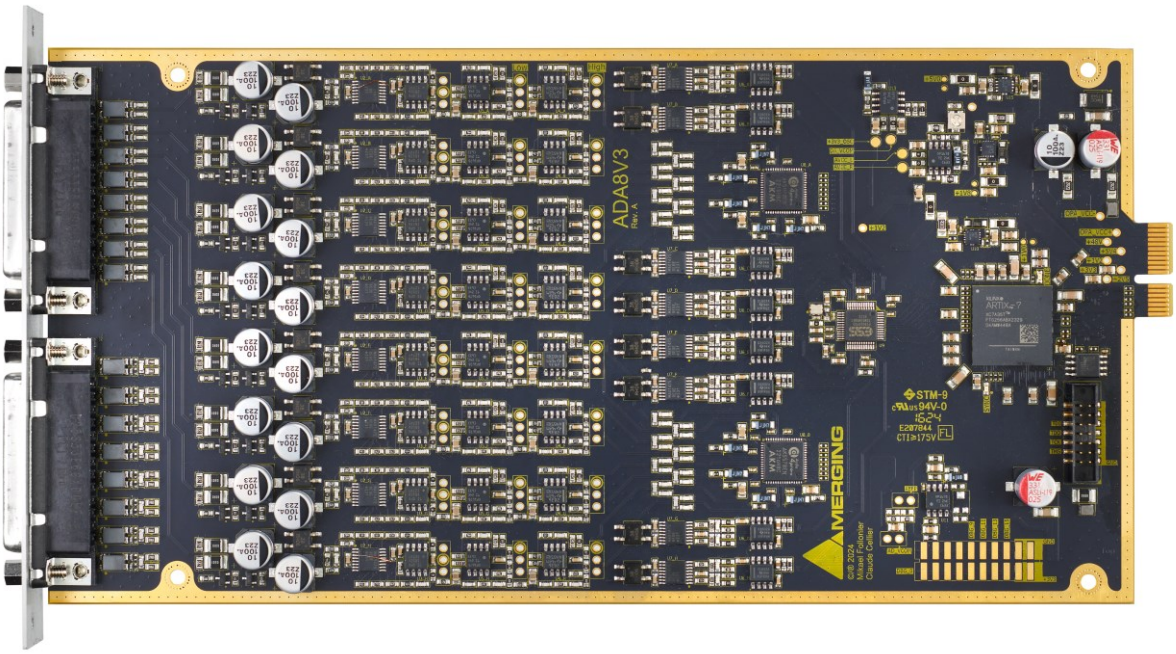
Furthermore, as Unbalanced Inputs are traditionally more sensitive than Balanced Inputs, the - 6dB Analog level achieved by using only one of the Horus symmetrical outputs, will offer better signal level adaptation with less risks of overdriving the Unbalanced Inputs connected to the Horus.

DA8V3S/DA8V3P Block diagram



ADA8V3S/ADAV38P

These remotely controlled Mic/Line Input and Output cards are 3rd generation Dual Gain topology designs, inspired from the Anubis outstanding Preamps, that show zero tolerance to any compromise on the audio quality.
Available in models that work up to 192kHz (**ADA8V3S**) and DXD/DSD256 (**ADA8V3P**)
Using those combined 8 channel Mic/Line In and Line Out cards allow the Hapi to be configured with up to 16 channels of Analog In/Out.



ADA8V3S/ADA8V3P Key Features

- 8 x exceptionally transparent, Swiss designed pre-amplifiers
- Remote/Local switch to Line Level on a per channel basis
- Completely accessible remotely for all parameter changes
- Phantom Power/Polarity Invert/Low Cut/Impedance switchable per channel
- Dynamic range of 139dB (A-weighted, typ) on the Line inputs
- Auto-mute circuitry for “no-pop” power cycling
- Digitally controlled output trims for line up procedures
- Dynamic range of 124dB (A-weighted, typ.) on the Line outputs

ADA8V3S/ADA8V3P Specifications

ADA8V3S/ADA8V3P Mic-Pre + ADC Section

Mic Pre Max Input (Mic+Pad / Mic / Boost)	+24 dBu / +12 dBu / +0 dBu
Input Impedance (Differential, Software Switchable Per Channel)	3 kΩ / 10.4 kΩ
Input Impedance (Zlo; ZHi)	3 kΩ / 10.4 kΩ
Frequency response +0/-0.3dB @ fs = 48 kHz	9 Hz – 22 kHz
Frequency response +0/-3dB @ fs = 96 kHz	9 Hz – 46 kHz
Frequency response +0/-3dB @ fs = 192 kHz	11 Hz – 94 kHz
Dynamic Range Mic (A-weighted, typ.), ref +12 dBu	137 dB
Dynamic Range Mic Boost (A-weighted, typ.), ref 0 dBu	128 dB
Gain Range (software controlled)	0 dB to +66 dB
THD+N Pre + A/D (20 Hz - 20 kHz) @ -2 dBFS	< -111 dB (0.00028 %)
Interchannel Crosstalk @ 1kHz	< -130 dB
EIN @ >40 dB Gain (150Ω Source Impedance, A-weighted)	< -127 dB
Common Mode Rejection Rate (20 Hz – 20 kHz)	> 75 dB
Phantom Power (Software Switchable Per Channel)	+48V
Polarity Invert (Software Switchable Per Channel)	YES
Low Cut filter (Software Switchable Per Channel)	-12 dB/octave, 80 Hz

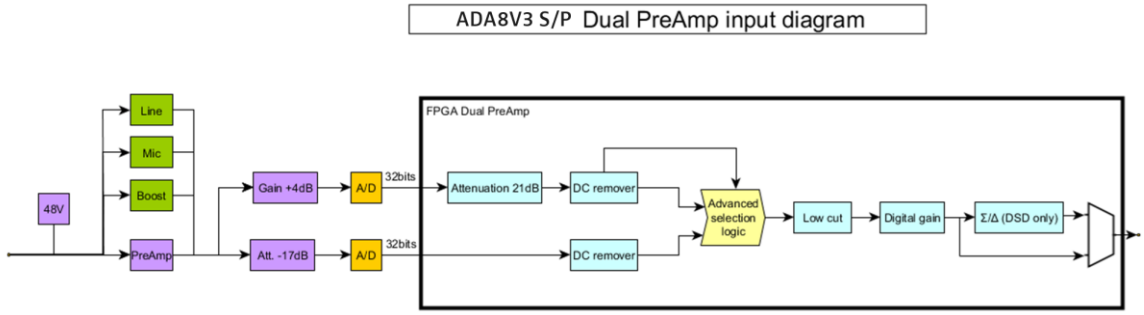
ADA8V3S/ADA8V3P Line input Section

Max Line Input for 0 dBFS	+24 dBu
Input Impedance (Differential)	10.4 kΩ
Dynamic Range (A-weighted, typ.), ref +24 dBu	139 dB
THD+N Line+A/D (20 Hz - 20 kHz) @ -2 dBFS	< -111 dB (0.00028 %)
Interchannel Crosstalk @ 1kHz	< -135 dB
Sensitivity Range for 0 dBFS (software controlled)	-42 dBu to +24 dBu
Gain Step	0.5 dB
Common Mode Rejection Rate (20 Hz – 20 kHz)	> 75 dB
Connector Pinout	DB-25 / AES59 (Tascam Ana.)

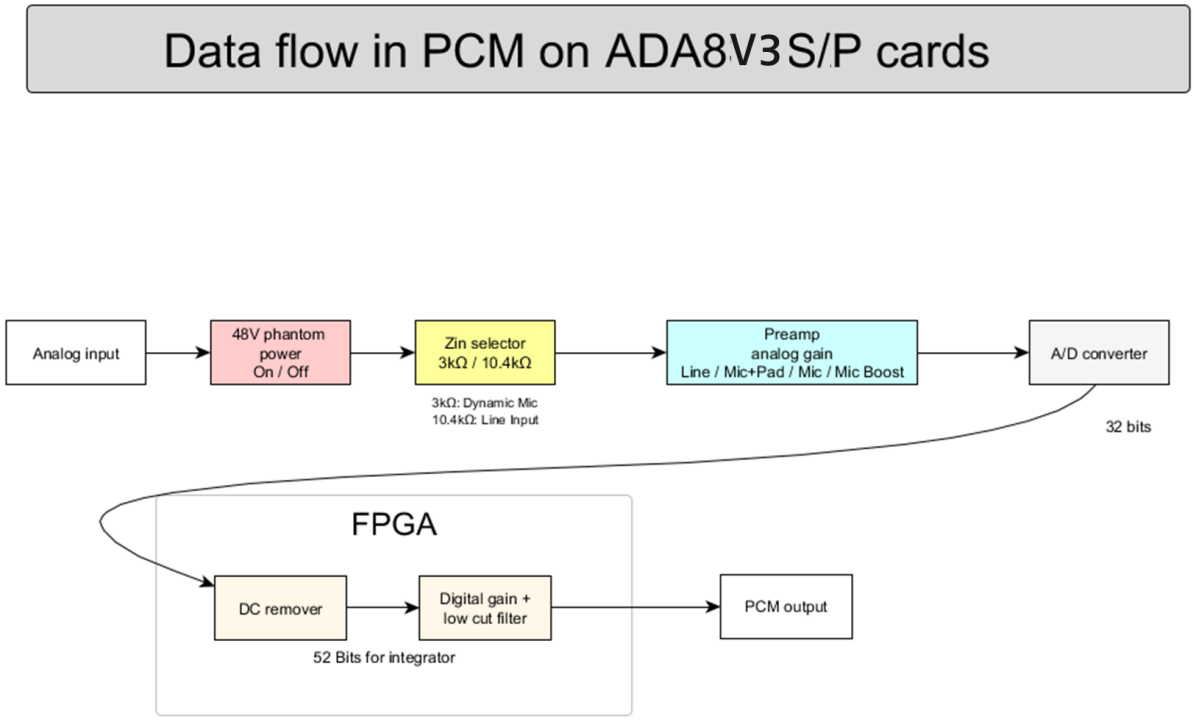
ADA8V3S/ADA8V3P Line Out Section

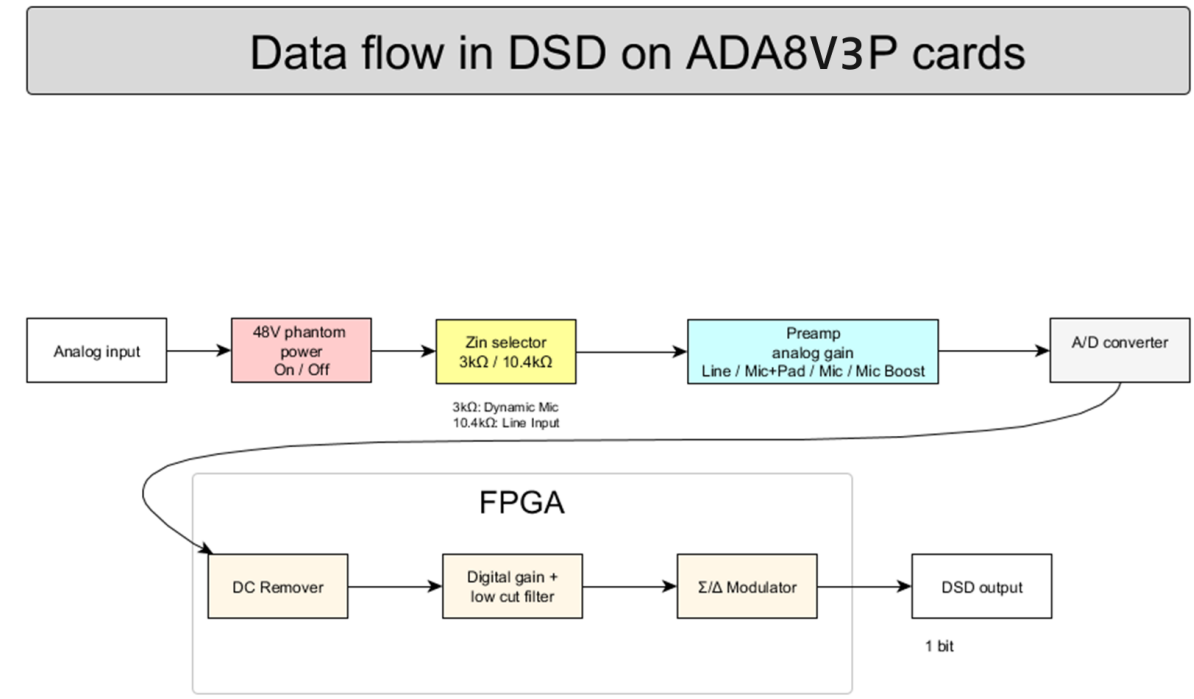
Max Output level software switchable for 0 dBFS	+24 dBu / +18 dBu +0/-0.5 dB
Frequency response +0/-0.3dB @ fs = 48 kHz	0 Hz – 22 kHz
Frequency response +0/-3dB @ fs = 96 kHz	0 Hz – 46 kHz
Frequency response +0/-3dB @ fs = 192 kHz	0 Hz – 92 kHz
Output Impedance (Differential)	< 80 Ω
Dynamic Range (A-weighted, typ.)	125 dB / 126 dB
THD+N (1 kHz) @ 0dBFS	< -117 dB (0.00014 %)
Interchannel Crosstalk @ 1kHz	< -139 dB
Connector Pinout	DB-25 / AES59 (Tascam Ana.)

ADA8V3S/ADA8V3P Dual preamp block diagram



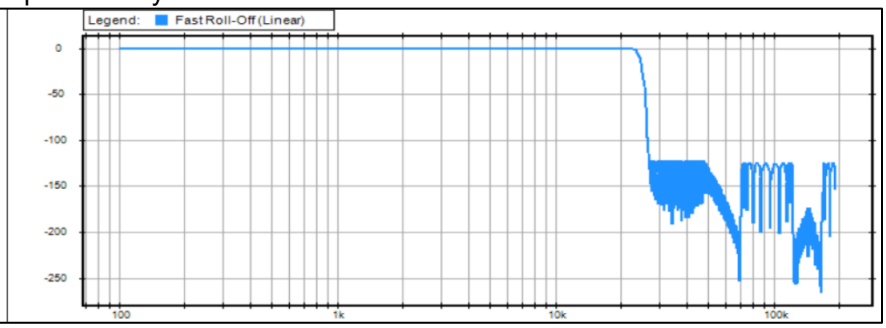
ADA8V3S/ADA8V3P block diagram



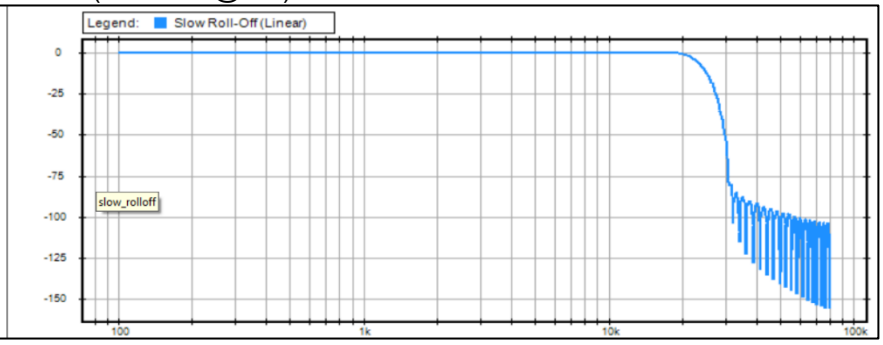


ADA8V3S and ADA8V3P Roll Off Filters:

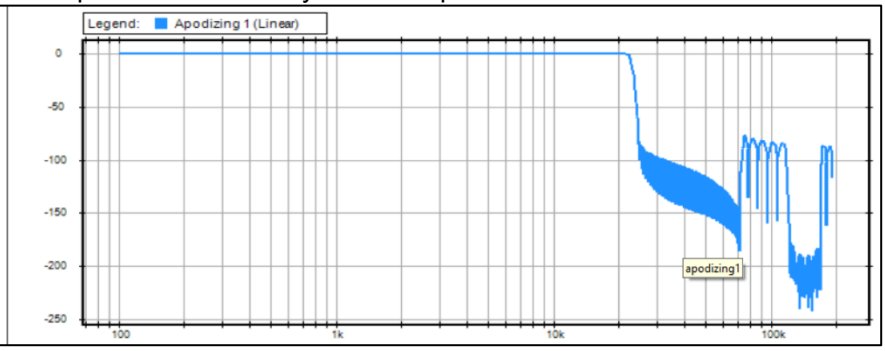
Sharp: Offers a flat frequency response with an attenuation of 3 dB at 0.484 x FS (23.2 kHz @48k), which has the trade-off of 35 samples latency.

Fast Roll-Off, Linear Phase Filter (dB)	

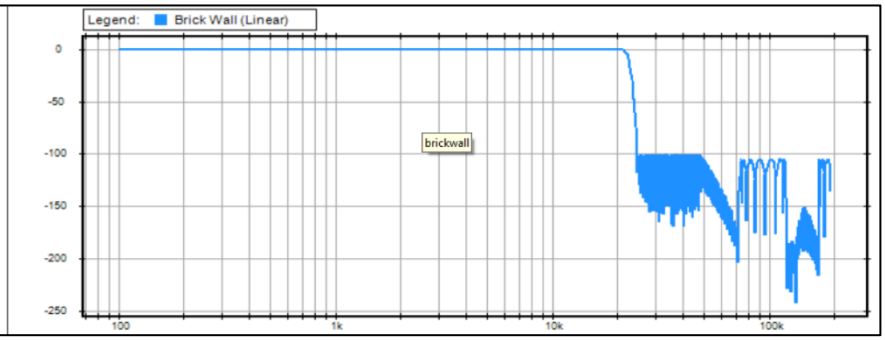
Slow (default): Offers the lowest latency of 9 samples, with the trade-off of a gentle frequency response attenuation reaching -3dB at 0.45 x FS (21.6 kHz @48k)

Slow Roll-Off, Linear Phase Filter (dB)	

Apodizing: Fast Roll-Off filter, Linear phase filter. Latency of 35 samples

Apodizing, Fast Roll-Off, Linear Phase Filter (dB)	

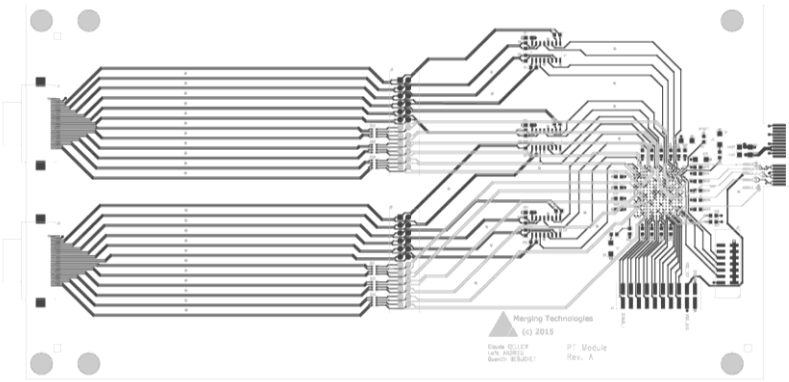
Brickwall: Ensures rejection of more than -100dB at Nyquist (0.50 x FS, 24 kHz @48k). Latency of 35 samples

Brickwall Filter (dB)	

PT64V3

Not yet available, in our roadmap for 2025.

This module allows you to connect your Hapi directly to a Pro Tools HD or Pro Tools HDX system through its two Digilink Mini connectors. You can plug up to two modules in a device, meaning you can record up to 128 Channels at a time.



PT64V3 Key Features

- Up to 64 Channels @48kHz per module (32 ch. @ 96kHz, 16 ch. @192kHz)
- Up to two PT64V3 modules in one Horus/Hapi
- Automatic Delay Compensation
- Three hardware emulation modes (Digidesign 192I/O, HDIO and HDMADI)
- Two Digilink mini connectors

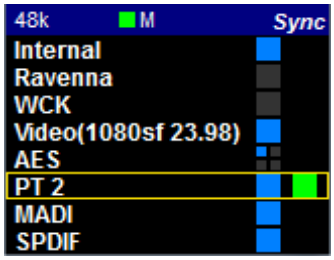
Ports usage

There are two connectors on the PT64V3 module called Port 1 and Port 2.
Working at 44.1/48kHz, both Ports are enabled. Channels I/O 1-32 are carried through Port 1 and channels I/O 33-64 through Port 2. If only 32 channels are needed, it is possible to use only Port 1 or *only one of Port 1 or Port 2 in HD I/O or 192 I/O modes only*.
With a Sample Rate of 88.2/96kHz, only Port 1 is enabled. All 32 I/O channels will be carried through this Port.
If the Sample Rate is set to 176.4/192kHz, then all 16 I/O channels will be carried through Port 1 as well.
Port 1 of your PT64V3 should always be connected to Port 1 on the AVID interface and Port 2 should always be connected to Port 2 even if just one Port is used.

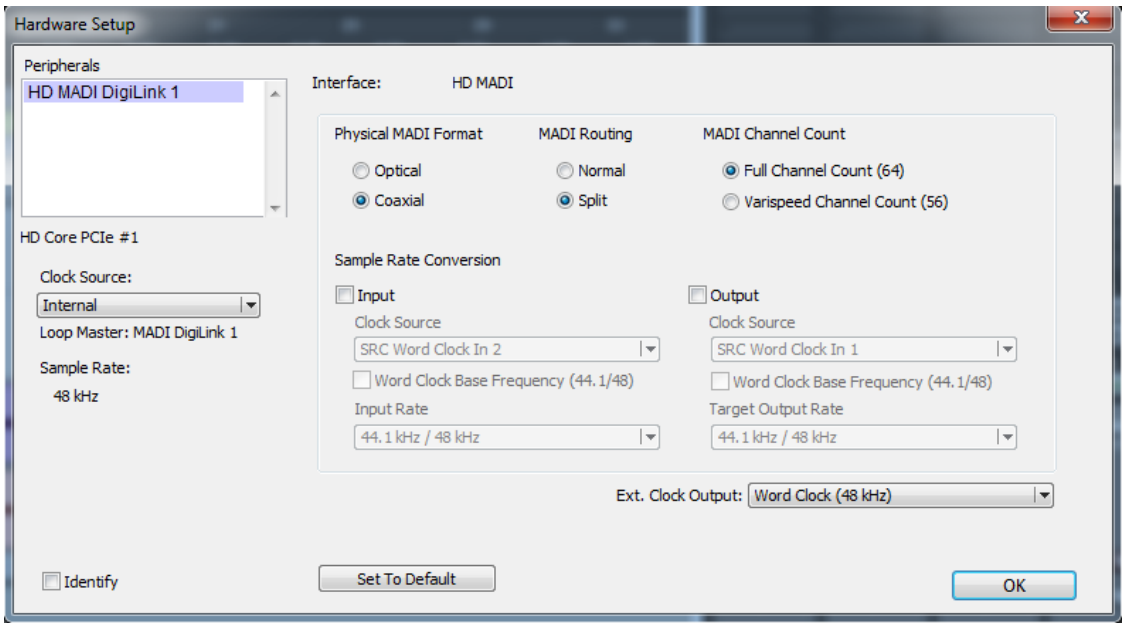
***Note**: Cables of same length must be used when both ports are connected.*
***Note**: When using 2* x PT64V3 cards in a single device in order to benefit from 64 channels at 88k2/96k, you can connect Port 1 of the first card to HDX/HD Native Port1 and Port 1 of the second card to HDX/HD Native Port2.

Synchronization and Word Clock

When properly configured, Hapi is able to automatically change its internal clock to match a Pro Tools project's Sample Rate. The proper PT64V3 module must be selected in the I/O & Sync menu (PT 1 or PT 2 if module is in Slot 1 or 2). The Auto-follow option must be enabled in Setup -> Format menu, and Hapi will change its Internal Sample Rate automatically.



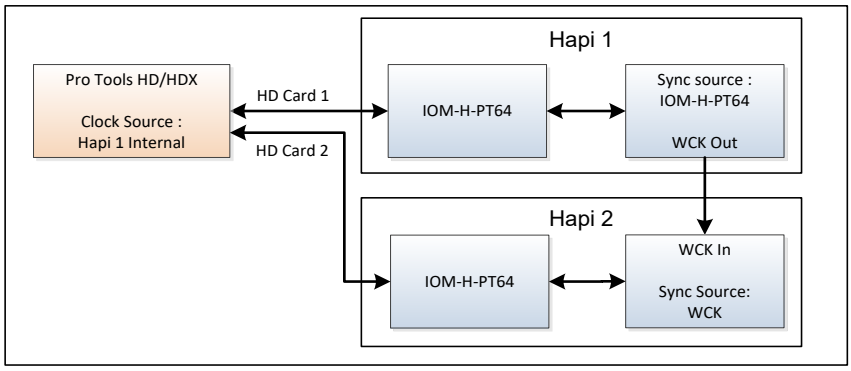
In Pro Tools, the Clock source should be set to Internal for the device emulated by the PT64V3 module (HD MADI in the following example).



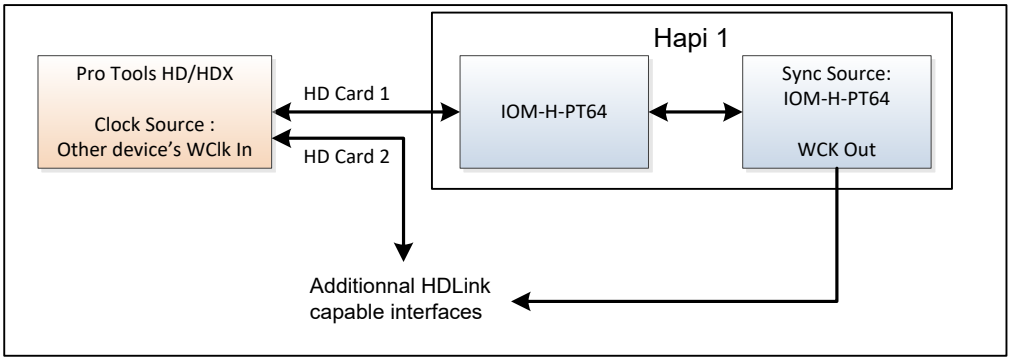
Sampling Rate mismatch protection
Audio from Pro Tools to Hapi and from Hapi to Pro Tools is muted when the Sampling Rate asked by PT is not met by Horus to avoid recording when Sampling Rates mismatch.
Enable the Auto-follow SR option and Synchronize on PT module to avoid any SR mismatch.

Setups with multiple devices
If your setup is made of several Pro Tools Hardware interfaces that need to be synchronized, our recommendation is to select Internal Clock Source of your PT64V3 module as the Master Clock. The other devices present in the setup can be synchronized several different ways.

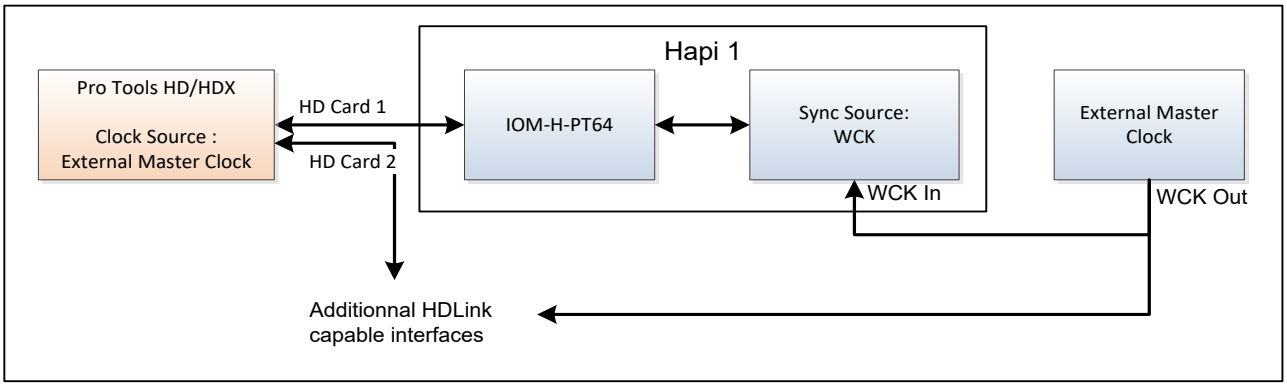
If two Hapi interfaces are used in a setup, they can be synchronized through the Word Clock connectors. To send the actual Sample Rate, the *Follow SR* option in *Setup -> Format* must be enabled.



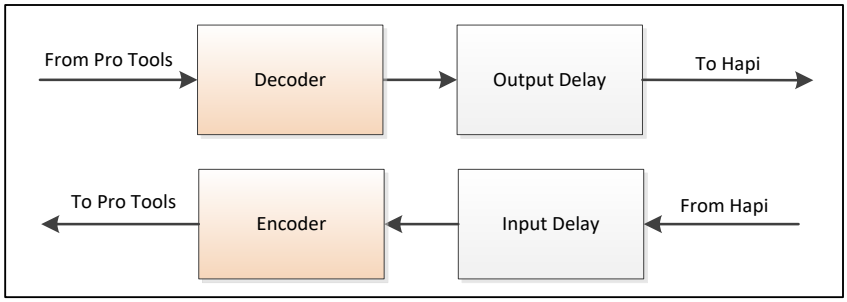
The next setup is using Hapi as the Master clock for all devices. In this case, the Clock Source must be set to the other device's Word Clock. The *Follow SR* option in *Setup -> Format* must be enabled.



In the following setup, an external Master Clock is used for all devices. In this case, the external Master Clock controls the Hapi Sample Rate. Hence, the external Master Clock must be set accordingly to the Pro Tools project Sample Rate.



PT64V3 block diagram



Delay compensation
Input and Output delay are strongly dependent on the Hardware. This implies that if one records a single source with two different devices at the same time, one will get two slightly out-of-phase tracks. This is explained by the fact that every device has its own circuitry and different components.
To minimize this issue, Pro Tools implemented an Auto Delay Compensation feature which will automatically shift the recording depending on the Hardware used.
The PT64V3 module was made to emulate three different Digidesign interfaces and match every interface's actual input/output latency (within a margin of maximum 3 samples). This chart shows what latency to expect for different setups. Analog/Digital modules latencies are already included in these measures.

Emulation Mode		Routing	44k1/48k	88k2/96k	176k4/192k
None	Input	-	2* smpl.	2* smpl.	2* smpl.
	Output	-	2* smpl.	2* smpl.	2* smpl.
192IO	Input	From AD8D	65 smpl.	65 smpl.	65 smpl.
	Output	To DA8	24 smpl.	14 smpl.	15 smpl.
HDIO	Input	From AD8D	16 smpl.	12 smpl.	11 smpl.
	Output	To DA8	56 smpl.	21 smpl.	21 smpl.
HD MADI	Input	From MADI	6 smpl.	6 smpl.	7 smpl.
	Output	To MADI	5 smpl.	5 smpl.	7 smpl.

***** Added to the other modules used

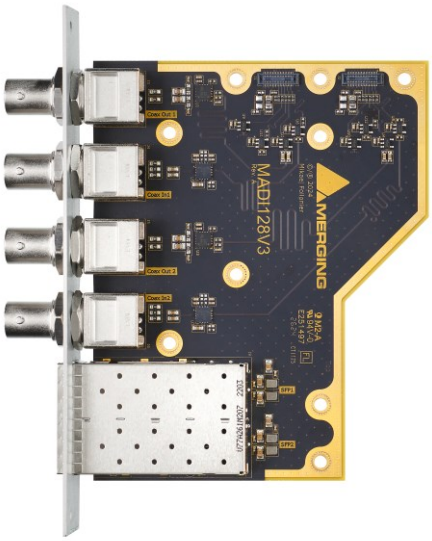
For the delay compensation to be working, it must be enabled in the ProTools software (*Options -> Delay Compensation*).

Emulation Mode
Configures which Digidesign interface the PT64V3 module will emulate in Pro Tools. This option does not affect the Hapi routing or preamps, it will just set the Input/Output Delays as seen above.
When set to None, Pro Tools will see the module as an HD MADI, but Hapi will use the minimum latency. Therefore, Delay Compensation will not be accurate on Pro Tools in this mode.

Error AAE -6116
When Hapi is configured to follow the Sample Rate asked by Pro Tools, an AAE -6116 error might happen when opening a project with a new Sample Rate. If it happens, click OK to close the error information. Then, when trying to play the file, the error might show again. After clicking OK, the error should not appear again.
If this issue is too frequent, a way to avoid it is to disable the Auto-Follow option in *Setup -> Formats* and change the Sample Rate on Hapi by hand. This should reduce the probability of getting such an error.

MADI128V3

The MADI optional Module card provides a channel count of 128 inputs and 128 outputs @1FS



Module	Connection
MADI128V3	Expansion Slot #1
BNC IO (pair 1)	Coaxial BNC input/output 75 oHm
BNC IO (pair 2)	Coaxial BNC input/output 75 oHm
SFP IO	SFP cage (transceivers not included*)

**For recommended SFP transceivers click here*

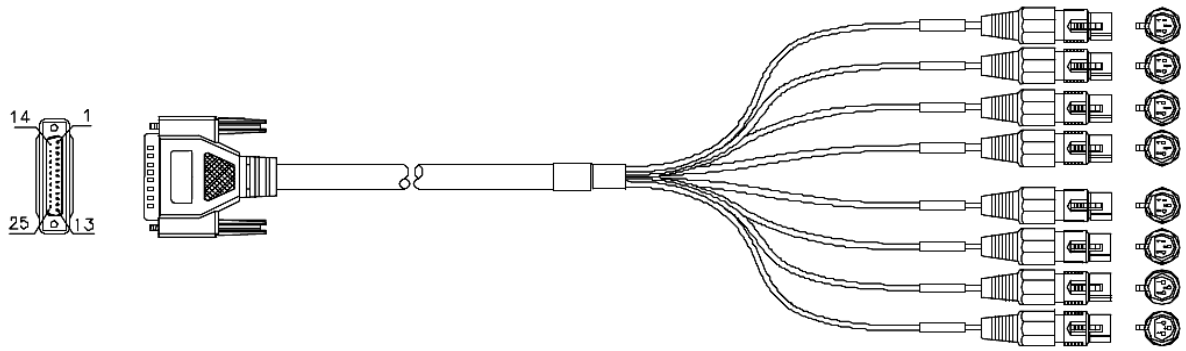
MADI128V3 Features

- 2 pairs of MADI Coaxial inputs and outputs
- 128 discrete channels of digital input and output (extended mode) at 1FS
- Up to 384 kHz sampling rate
- 24-bit resolution
- Fully compliant MADI (AES 10-1991)
- 4 BNC
- 1 SFP Cage

HAPI - Cables

Connecting the analog audio Input cables to the ADO8V3S/P - ADA8V3S/P modules

The ADO8V3S/P or ADA8V3S/P modules connect the Mic/Line Inputs using DB25 D-SUB connections. Please ensure that the cables you have chosen to use, or have had made, conform to this specification before you attempt to connect them.



Specifications

- Part: CON-D25-XLRF
- Cable Color: black
- Numbered XLR fan-out
- Cable Ø: 12 mm
- Cable Length: 1,5 m
- Cable Weight: 500 gr

In 1	In 2	In 3	In 4	In 5	In 6	In 7	In 8
Pin 24= (+) Pin 12 = (-)	Pin 10= (+) Pin 23 = (-)	Pin 21= (+) Pin 9 = (-)	Pin 7= (+) Pin 20 = (-)	Pin 18= (+) Pin 6 = (-)	Pin 4= (+) Pin 17 = (-)	Pin 15= (+) Pin 3 = (-)	Pin 1= (+) Pin 14 = (-)
GND is connected to Pins: 2, 5, 8, 11, 16, 19, 22, 25. Pin 13 is not connected							

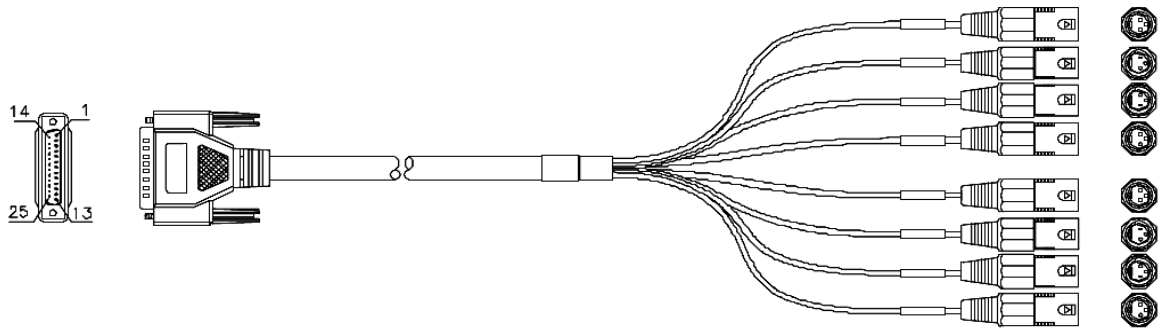
To connect the DSUB connection to the module, align the Male cable connector with the female DSUB port on the module. Then, with slight pressure, guide the connector into place. If your DSUB connector has retention screws on either side, then fasten them finger-tight once the connector has been pushed into place.

Note: The pinout of the DB-25 is as per AES59 (Tascam Analog).

** THESE CONNECTIONS ARE NOT MEANT TO SUPPORT ANY SIGNIFICANT WEIGHT.**
Ensure that there is no strain from the connected cable as any significant pressure on the module's DSUB connector could damage the Hapi unit.

Connecting the analogue outputs cables to the DA8V3S DA8V3P modules

The DA8V3 S/P modules connect the line outputs using DB25 D-SUB connections.
Please ensure that the cables you have chosen to use, or have had made, conform to this specification before you attempt to connect them.



Specifications
▪ Part: CON-D25-XLRM
▪ Cable Color: black
▪ Numbered XLR fan-out
▪ Cable Ø: 12 mm
▪ Cable Length: 1,5 m
▪ Cable Weight: 500 gr

Out 1	Out 2	Out 3	Out 4	Out 5	Out 6	Out 7	Out 8
Pin 24= (+) Pin 12 = (-)	Pin 10= (+) Pin 23 = (-)	Pin 21= (+) Pin 9 = (-)	Pin 7= (+) Pin 20 = (-)	Pin 18= (+) Pin 6 = (-)	Pin 4= (+) Pin 17 = (-)	Pin 15= (+) Pin 3 = (-)	Pin 1= (+) Pin 14 = (-)
GND is connected to Pins: 2, 5, 8, 11, 16, 19, 22, 25. Pin 13 is not connected							

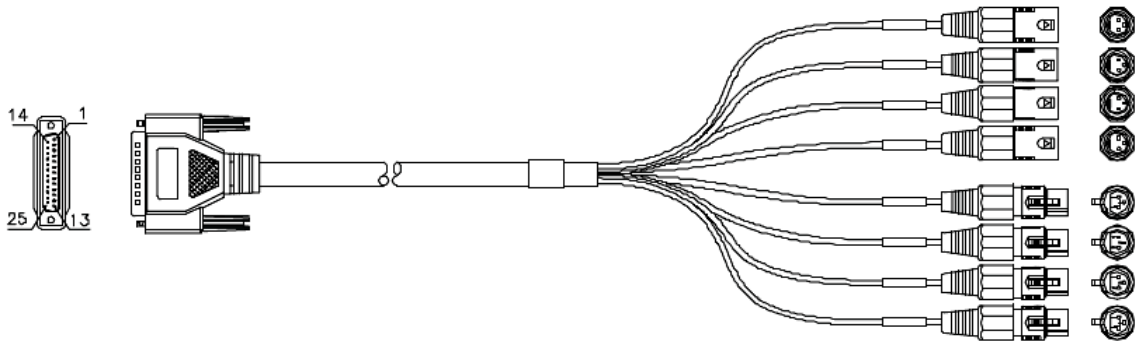
To connect the DSUB connection to the IOC-DA8(P), align the Male cable connector with the female DSUB port on the module. Then, with slight pressure, guide the connector into place. If your DSUB connector has mounting screws on either side, then fasten them finger-tight once the connector has been pushed into place.

Note: The pinout of the DB-25 is as per AES59 (Tascam Analog).

** THESE CONNECTIONS ARE NOT MEANT TO SUPPORT ANY SIGNIFICANT WEIGHT.**
Ensure that there is no strain from the connected cable as any significant pressure on the module's DSUB connector could damage the Hapi unit.

Connecting the AES-EBU cable

The AES ports connect to the AES-EBU I/O using DB25 D-SUB connections.
Please ensure that the cables you have chosen to use, or have had made, conform to this specification before you attempt to connect them.



Specifications

- Part: CON-D25-XLRD
- 192 kHz ready
- Cable Color: black
- Impedance: 110 Ohm
- Numbered XLR fan-out
- Cable Ø: 12 mm
- Cable Length: 1,5 m
- Cable Weight: 500 gr

AES In 1 (1/2)	AES In 2 (3/4)	AES In 3 (5/6)	AES In 4 (7/8)	AES Out (1/2)	AES Out (3/4)	AES Out (5/6)	AES Out (7/8)
Pin 24= (+) Pin 12 = (-)	Pin 10= (+) Pin 23 = (-)	Pin 21= (+) Pin 9 = (-)	Pin 7= (+) Pin 20 = (-)	Pin 18= (+) Pin 6 = (-)	Pin 4= (+) Pin 17 = (-)	Pin 15= (+) Pin 3 = (-)	Pin 1= (+) Pin 14 = (-)
GND is connected to Pins: 2, 5, 8, 11, 16, 19, 22, 25. Pin 13 is not connected							

To connect the DSUB connection to the AES port, align the Male connector with the female DSUB port on the module. Then, with slight pressure, guide the connector into place. If your DSUB connector has mounting screws on either side, then fasten them finger-tightn once the cable has been pushed into place.

Note #1: The pinout of the DB-25 is as per AES59 (Tascam Digital).
Note #2: Users that have Mykerinos AES or Dual cables cannot use those with their Horus or Hapi as the pin out is not compatible.
Note #3: DB25 TDIF cables are not compatible with Horus/Hapi AES

** THESE CONNECTIONS ARE NOT MEANT TO SUPPORT ANY SIGNIFICANT WEIGHT.**
Ensure that there is no strain from the connected cable as any significant pressure to the module's DSUB connector could damage the Hapi unit.

Connecting the MADI cable

The MADI port (optional MADI Module) can be connected using either Optical or coaxial cabling.

When using the coaxial cable a 75 Ohm BNC-HDSDI cable must be used.

How to make a Coaxial connection. Slowly bring the Male cable up to the female port, ensuring that the pin in the centre of the male cable lines up with the receptacle in the female port. Push the connector firmly into place and twist the sleeve clockwise until it clicks into its locked position.
Maximum recommended cable length is 100 meters

The MADI128V3 is equipped with a two slots Small Form-factor Pluggable (SFP) cage, suitable SFP modules can be fitted. One of our recommended SFP Transceiver is a MADI Optical module (Multimode or Singlemode).
If Optical cabling, first ensure that you have a clean work area, as dust and debris can affect the connection if any obstruction is present. Remove the cap on both the cable and the port and slowly / firmly push the cable into the receiving port on the Hapi unit until it clicks into place.

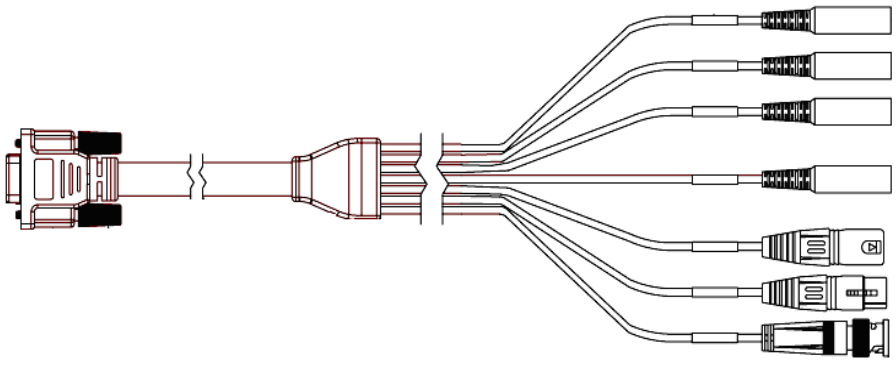
For more recommended SFP transceivers click here

Connecting the Wordclock input/output

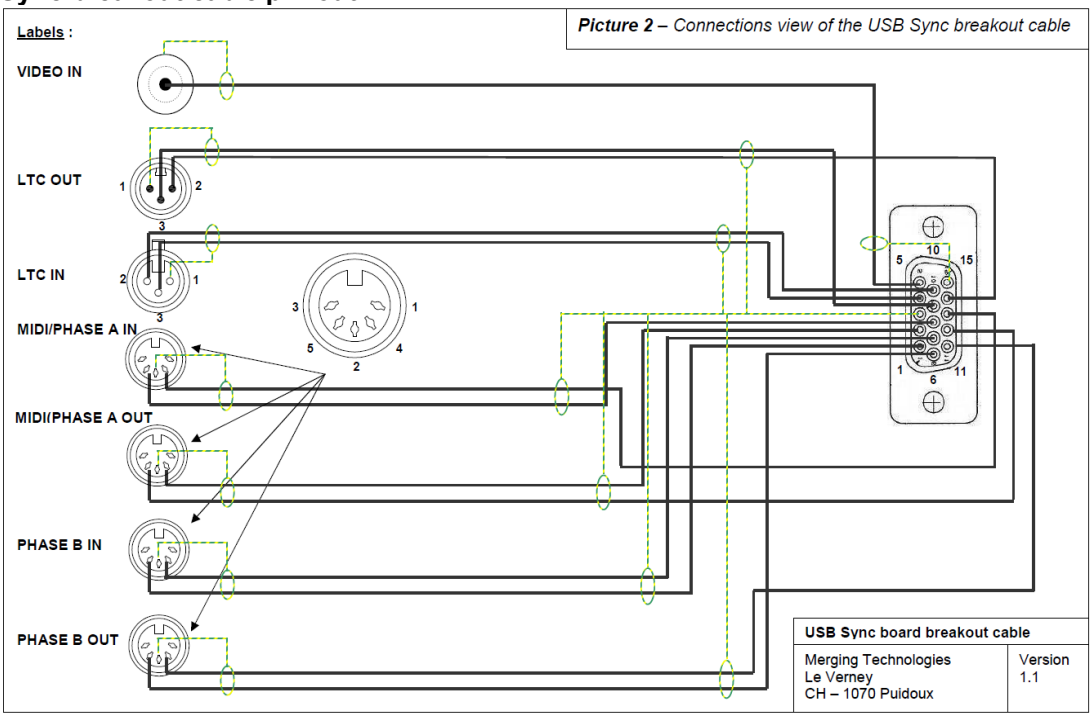
The Wordclock connections on the rear of the Hapi unit are coaxial BNC's. To connect a Wordclock source from an external device slowly bring the Male cable up to the female port, ensuring that the pin in the center of the male cable lines up with the receptacle in the female port. Push the connector firmly into place and twist the sleeve clockwise until it clicks into its locked position.

Connecting the Sync Cable

The Sync Cable (optional with each Hapi unit) is a DB15 cable that connects to the "SYNC" port on the rear of the Hapi unit. The SYNC cable provides connectivity for LTC and Video Reference Input and Output for the Hapi unit. To attach this cable to the Hapi unit, align the male connector with the female DSUB port on the module. Then, with slight pressure, guide the connector into place. Once the cable has been pushed into place, fasten the mounting screws on either side finger tightly.
Note: The Hapi provides Video Reference I/O Synchronization but is not a Video reference Generator.

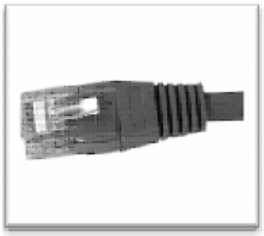


Sync breakout cable pin-out



Picture 2 – Connections view of the USB Sync breakout cable

Connecting the Network Ethernet cables



The Network ports (Primary and Secondary) are RJ45 female receptacles. Simply line up the RJ45 cable with the slot on the rear of the Hapi unit and slide it into place until it clicks into its locked position.
(Category 5E or 6)
Note: Use the primary (PRI) port. Secondary port behavior depends on the ST2022-7/Redundant mode, set in the Hapi Advanced pages (default mode: network switch mode). See Network menu – Network operations modes for details.

Similar applied to DANTE support, refer to the Hapi MkIII Dante Appendix for all details.

HAPI MKIII Key Features

Networking
The Merging Hapi MKIII fully supports (2) RJ45 connectors, that can be configured in two different modes.
1) ST2022-7 Seamless Protection Switching when running the RAVENNA/AES67 firmware or Dante Redundancy mode when running the Dante firmware
2) Network Switch mode, allowing the daisy-chaining of one additional network device without the need for an external network switch.

Modular analog interfacing
Hapi allows the user to choose between Analog inputs and Analog outputs and MADI I/O required for each unit. Hapi provides a total of 2 universal I/O slots which can accept a combination of Mic/Line modules and or Line output cards and or a MADI module. Configure Hapi with any combination.
For instance, in a studio environment, 8 A/D (1X IOC-AD8/P) and 8 D/A (IOC-AD8/P) will allow for 8 inputs from the live room and 8 outputs to feed studio monitoring and foldback to the artist.

Modular Device connectivity
Any of the modules listed below (A/D, D/A, MADI, AES, ADAT/SPDIF, RAVENNA) can be interconnected in any way the user chooses. Simple and easy routing pages enable the user to source signal from any module and send it to any other combination of modules. An A/D Module could feed 8 Channels of AES Outputs. At the same time, it could feed to 8 MADI channels, or even the RAVENNA stream as well. This is the function that allows the user to operate with the Hapi in either a standalone (Analog to MADI/AES AD/DA) or in RAVENNA or Dante Mode, which connects the audio to a RAVENNA or Dante networks.
With such a wealth of different outputs, it made sense to apply a “route to” instead of a “route from” philosophy in the way Hapi presents its routing pages. After an initial learning period, you will understand that this is a much more efficient way to present so many routing options in an easy to unfold process. So always ask yourself first which output is being considered and then decide what input signal will feed that output, and you will be offered all logical and valid choices at every step. It also made sense to limit the granularity of routing options to blocks of 8 channels, as a good compromise between flexibility and complexity.

ADO8V3S / ADO8V3P Remote controlled Mic/Line A/D module
The ADO8V3S (works up to 192 kHz) and the ADO8V3P (works up to DXD/DSD256) are remote controllable, extremely high-quality Microphone pre-amplifiers with a switch on each channel to route the signal through dedicated line level circuitry instead. The remote control is achieved over Ethernet, via the RAVENNA Port at the back of the chassis. With all standard analogue controls also available via remote (Phantom power on a “per channel” basis, polarity invert, HPF) and a Gain stage reaching from -10dB all the way up to +60dB, these modules are not only easy to use, but completely transparent to listen to as well.

ADA8V3S and ADA8V3P Remote controlled Mic/Line A/D module with transparent Analog output
The ADA8V3S (work at sample rates up to 192 kHz) and the ADA8V3P (works at sample rates up to DSD) are combining high quality Microphone pre-amplifiers and analog output module.

DA8V3S / DA8V3P Safety Conscious Analogue Line Output Modules
The DA8V3S (works at sample rates up to 192 kHz) and DA8V3P (works at sample rates up to DSD) are specifically designed with the user’s speakers in mind. Incorporating analogue mute circuitry, the DA8/P modules provide protection against spurious transients that may occur during Sample rate changes and power cycling “clicks” and “pops” which can damage not only speakers, but also the listener’s ears. When you add to that a noise floor of less than -125dB, these are the ultimate analog outputs for any monitoring system.

HD Link with Pro Tools HD
The PT Module allows the Horus to communicate with a Pro Tools HD card. With two modules in one interface, up to 128 channels can be recorded simultaneously.
Warning: The PT64V3 extension card will be available in 2025

MADI (Module)
A MADI module is available and can be fitted in one of the Hapi slots. It provides users with up to 128 channels of MADI I/O for use with the system. The signal sent to the MADI Outputs are configurable in blocks of 8 channels and can be sourced from any other module in the Hapi.
Note: Only one MADI module can be fitted per Hapi, please refer to the MADI module section above.
The Hapi MKIII MADI modules comes with as well an SFP case. Refer to recommended SFP modules on the Merging Knowledge Database site (link available at the end of the manual)

AES-EBU
1 x D-SUB25 connectors providing 8 channels (4 AES pairs) of AES-EBU I/O are Included as standard. The AES-EBU signal is transmitted as single wire at all supported sampling rates.

ADAT/SPDIF
8 ADAT I/O or 2 SPDIF I/O (on TOSLINK) are Included as standard. This module is supported up to 4FS (192 kHz).
Note: It is recommended to use 3 Meters and less cable length for proper transparency

PT64V3
Not available, in our roadmap for 2025
64 Channels of Pro Tools HD™ support on Digilink mini connector, from 44.1 to 192 kHz sample rates

Signal routing paradigm
Hapi is quite possibly the most flexible audio interface ever designed. Users can literally route any input signal to any output module. Better yet, it can route any input signal to any combination of output modules. Routable in blocks of 8 channels, a user can send 8 Mic Inputs to 8 AES outputs. At the same time these 8 mic inputs can also be sent via the MADI outputs and included in the RAVENNA stream.

RAVENNA IP Audio
Using RAVENNA IP audio, Hapi can connect to a standard network, using off the shelf switches and other IT technology to become a node on a LAN. From that point, any other RAVENNA node can receive information from and deliver information to, any combination of RAVENNA devices on the network. It is a revolution in Audio technology and will soon mean the end to costly audio routers and matrices and allow any facility an immense amount of flexibility. From Broadcast and TV/Film post-production, to music, live events, theatres, cruise ships and many more applications, the RAVENNA Enabled Hapi interface will reinvent how systems come together.

The Hapi MKIII with its dual network interface provides supports for two different modes of operations.
- ST2022-7 Seamless Protection Switching. For full network redundancy.
- Network Switch mode, allowing the daisy changing of one extra network interface connected directly to one of the Hapi MKIII RJ45 port.

  Notice: We do not support multiple daisy chained devices from the Hapi second ethernet port in switch port. A properly configured Network switch is recommended in order to daisy chain more than one additional hardware audio interface.

Hapi MKIII is NMOS compliant
- NMOS IS-04 (Discovery & Registration)
- NMOS IS-05 (Device Connection Management)

Dante Support
The Hapi MkIII can also run in Dante mode its dual network interface can be used as Primary and Secondary ports with Dante Redundancy support. Refer to the Hapi MkIII Dante Appendix for all details.

Synchronization
Audio is not the only information that can be passed down the RAVENNA connection. Hapi is also able to send sync (LTC) down the same wire to and from the Hapi unit. For more details refer to the RAVENNA network guide available on www.merging.com

Key Specifications
Please see the sections below for the measurement performed on the circuitry inside the Hapi unit.

HAPI MKIII - Modules Capabilities

	Sampling Rates	44.1/48kHz	88.2/96kHz	176.4/192kHz	DXD/384kHz	DSD64	DSD128	DSD256
MODULES	ADO8V3S Standard	√	√	√				
	ADO8V3P premium	√	√	√	√	√	√	√
	DA8V3S standard	√	√	√				
	DA8V3P premium	√	√	√	√	√	√	√
	ADA8V3S standard	√	√	√				
	ADA8V3P premium	√	√	√	√	√	√	√
	PT64V3 (Pending 2025)	√ (64 I/O)	√ (32 I/O)	√ (16 I/O)				
	Headphone (stereo)	√	√	√	√	√	√	√
	MADI1/MADI2	√ (128 I/O)	√ (64 I/O)	√ (32 I/O)	√ (16 I/O)			
	AES	√ (8 I/O)	√ (4 I/O)	√ (2 I/O)				
	ADAT	√ (8 I/O)	√ (4 I/O)	√ (2 I/O)				
	SPDIF	√ (2 I/O)	√ (2 I/O)	√ (2 I/O)				

HAPI MKIII - Modules Latencies

	Sampling Rates	44.1 / 48kHz	88.2 / 96kHz	176.4 / 192kHz	DXD / 384kHz
MODULES	DA8V3 standard premium	12 smpl. *	12 smpl. *	12 smpl. *	12 smpl. *
	AD08V3 standard premium	9 smpl.	9 smpl.	9 smpl.	9 smpl.
	ADA8V3S/P Input standard premium	9 smpl.	9 smpl.	9 smpl.	11 smpl.
	ADA8V3S/P Output standard premium	9 smpl. **	9 smpl. **	9 smpl. **	9 smpl. **
	PT64V3 (Pending 2025)	2 smpl.	2 smpl.	2 smpl.	N/A
	Headphones	15 smpl.	8 smpl.	8 smpl.	8 smpl.
	MADI128V3	3 smpl.	3 smpl.	3 smpl.	3 smpl.
	AES	3 smpl.	3 smpl.	3 smpl.	N/A

* DA Filter setting
- Slow Roll Off Filter option = 12 Samples
- Sharp Roll Off Filter option = 39 Samples
(More details available under the DA Module chapter below)
** ADA Filter setting
- Slow Roll Off Filter option = 9 Samples
- Sharp Roll Off Filter option = 38 Samples
Note: Internal router of the Hapi MKIII may add up to 1 sample of latency

Installing an additional Hapi I/O Module

Installing additional Hapi I/O Cards (ADO8V3S/P - AD8V3S/P or DA8V3S/P)

Before you start

- Place the Hapi unit on a hard, dry surface or mount it onto a 19” rack and leave plenty of room for air convection.
- In order to meet the EMC requirements of directives 89/336/EEC and 93/68/EEC, and in order to obtain the high performance possible for the Hapi unit, you must use correctly shielded cables of good quality for all external connections when installing the Hapi unit. For the power connection, a normal unshielded power cable with a proper ground can be used.
- Make sure that your sound system is at a safe volume level.

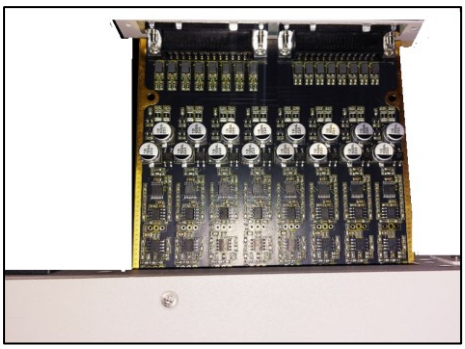
Hardware Installation

This section will take you through installation of your Hapi unit. We will describe how to mount the I/O modules and the power, audio and digital cable connections that can be accessed on the rear panel.

PLEASE ENSURE THAT YOUR HAPI UNIT IS SWITCHED OFF BEFORE ATTEMPTING TO CONNECT ANY CABLES TO THE UNIT.

If you need to mount an I/O module at a later stage, the following procedure is used.

1. Place the shutdown Hapi unit on a dry steady horizontal surface. Remove all cables (including the power cable).
2. On the back of the Hapi unit there are 2 slots for mounting the Analog I/O cards or a MADI card.
3. To remove blind plates from I/O module slots, remove the 2 screws on either side of the plate. Use a Phillips (cruciform) screwdriver tool size 2
4. Only remove the number of blind plates necessary to fit the I/O module(s). If only one I/O slot is installed, remove only 1 blind plate. If 2 I/O slots are installed, remove 2 blind plates.
5. It is very important to insert the I/O card horizontally and carefully into the Hapi unit. There are 6 set of guides inside the Hapi unit to guide the I/O cards correctly into place. Do not use force in any way to insert the I/O card. This may damage the card. Slide card slowly as picture below shows.



6. When the cover plate of the I/O card covers the hole created by removing the blind plate, the 2 screws from the blind plate are mounted in the sides of the I/O card. Tighten the screws carefully and be careful not to damage the threads.
7. After inserting the I/O module, the Hapi unit might need to be initialized. If this is the case, please follow the instructions received with the I/O module.

Hapi MkIII MADI128V3 Module Installation

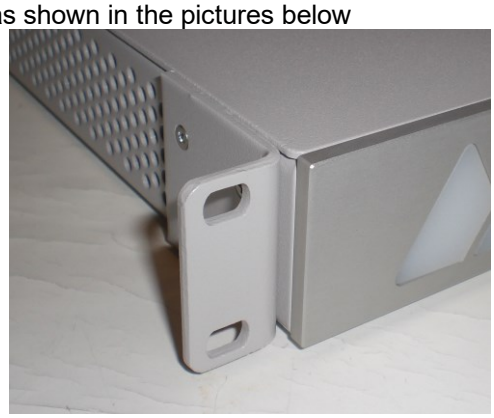
The MADI128V3 Module installation must be done by your servicing center.

Assembling the Rack Mount ears

Hapi is delivered with two rack mount ears for easy installation into a 19” rack.
The ears can be mounted either on the front or the rear of the device.

Installing the rack mount ears on the front panel

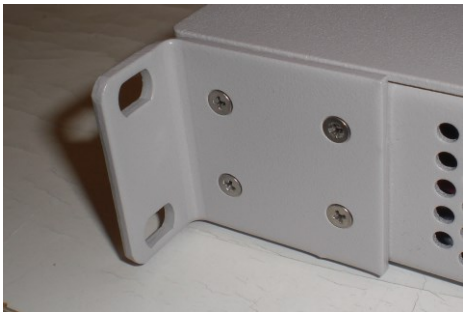
1. Turn off and unplug your Hapi
2. Unscrew the eight (8) M3x5 screws located on the side of the device (4 screws per side)
3. Place the rack mount ears on the side of Hapi, as shown in the pictures below

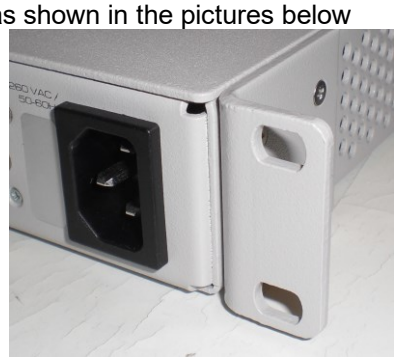


4. Fix the ears with the four (4) M3x8 screws delivered with the ears

Installing the rack mount ears on the rear panel

1. Turn off and unplug your Hapi
2. Place the rack mount ears on the side of Hapi, as shown in the pictures below





3. Fix the ears with the four (4) M3x8 screws delivered with the ears

Hapi recommended placement in Rack

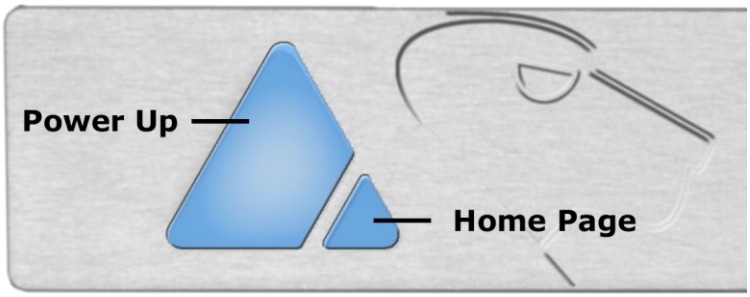
Due to confined space in a rack furniture, adequate spacing (and ordering) between multiple Hapi or Horus units will play a significant role on the units temperature. Although Merging has spent considerable time in optimizing the Hapi power consumption in every aspect possible, the units are still drawing an average of 30W. The dissipation of the related heat produced by this consumption is therefore highly dependent on the airflow and natural air convection around those units.

With highly loaded Horus units (more than 3 I/O Analog modules per unit) or Hapi units (2 I/O Analog modules per unit), Merging recommends a free space of 1U above each unit to ensure adequate cooling of the devices, if no other heating elements are present.

HAPI MK III - Power ON

Connecting the Power Cable
The Hapi unit runs on 100-240V, 50-60 Hz AC voltage. Excessive voltages can seriously damage the Hapi unit, so make sure that your AC power matches the voltage of your Hapi unit. When you connect the power, use the cable you received with your Hapi unit and plug it into a grounded outlet.
For safety and EMC reasons, and to prevent audio hum, the system must be properly grounded. If your power source does not have a standard three-prong socket, the system must be grounded in another appropriate manner.

Turn ON your Hapi
1. Press the Hapi Front Panel Power Button
   During the power up process the Hapi badge will blink in blue until fully initialized and started. The OLED will start black initially for the first 20 seconds.



Note: Pressing small triangle will display the Home Page on the Hapi OLED.

2. The Hapi front panel button will turn on. If the panel button light isn't steady but appears to flicker, this may indicate a fault condition and requires immediate shut down.

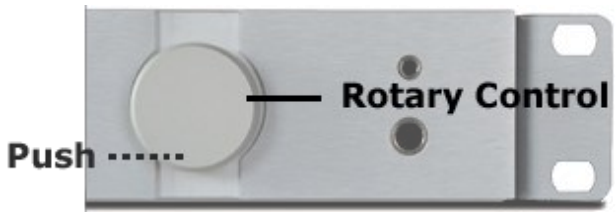
3. Wait until the Hapi is fully started and displaying the Main Home screen.

Power Button color code.
Blue: Normal operational state
Yellow: Maintenance mode
Red: Firmware Update State - Do not abort

HAPI MKIII - OLED screen interface

Screen Navigation

The Main Rotary Control gives the user control over the Hapi OLED screen navigation



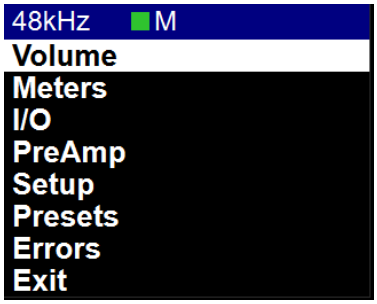
The Rotary Control: The Rotary Control wheel when turned from right to left navigates through the available menu, to confirm a Menu entry Push the Rotary Control button. This will either open a sub-menu or confirm an entered value.
The Main Rotary Control also gives the user control on the volume level of the monitoring (Headphone or DA) or the gain level of a selected Mic PreAmp channel.

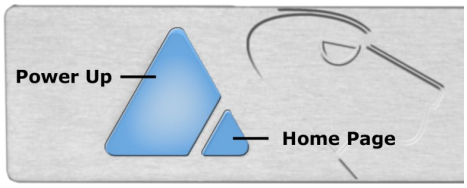
Push: Pushing the Rotary button will confirm the menu entry selection or confirm an entered value.

Long Push: In order to return to the previous screen keep the Rotary Control pushed for 1 sec. Press hold a few times to return to the Home page.

Home Screen

This is the screen which you will see after the Hapi completes its boot sequence. From here you can navigate to all the other menus for the setup and use of Hapi. If you want to return to the Home Screen, you can press and hold the Main Rotary Control button for a second to return to the Home Screen. The screen also has access to the 8 main sections of the Hapi menu: **Volume, Meters, I/O, PreAmp, Setup, Presets, Errors** and **Exit.**

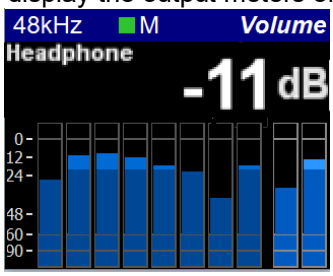




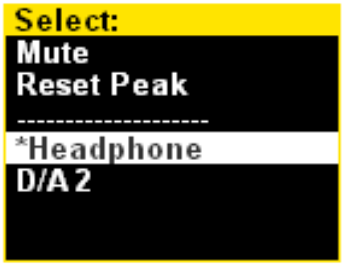
Pressing only the Home Page small pyramid button will bring the Hapi home page, this is applicable if no selection is active on the OLED

Volume Menu

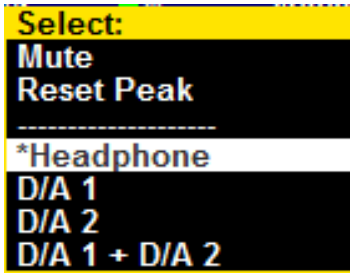
The Volume menu is where the user can determine the analog output module which will be controlled by the Hapi Rotary Control. It will also display the output meters of the selected module.



Pressing the Hapi Rotary Control button allows user to select the which analog Module will be volume controllable

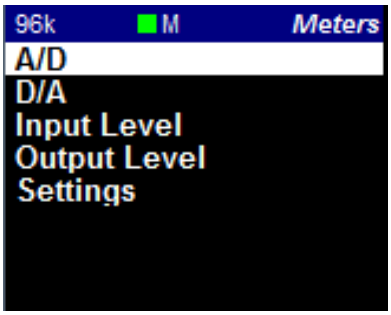


If you have multiple DA and would like to have both of them controlled by the Volume button simply select the DA1 + DA2 entry



Meters Menu

The Meters menu is where the user can view the metering of the Hapi available Input or Output modules.

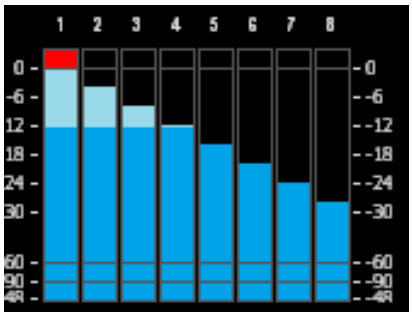


A/D Meters Sub-Menu (Meters)

The A/D meters page displays a VU meter for each A/D Input available. If you have 1 x A/D module you will see 8 VU meters and with 2 x A/D modules you will see 16 VU meters, one for each physical input.

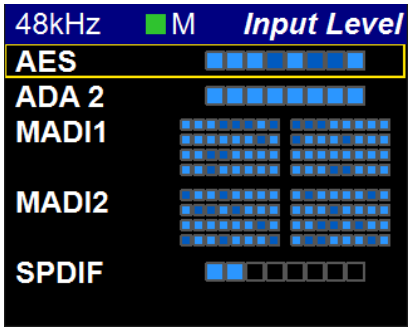
D/A Meters Sub-Menu (Meters)

The D/A meters page will display a VU meter for each D/A output available. If you have 1 x D/A module you will see 8 VU meters, if you have 2 x D/A modules you will see 16 VU meters, so one for each physical output.



Input Levels Sub-Menu (Meters)

The Input Meters page will display the input metering of the modules present in the Hapi. A metering view of one Led per input channel is represented in this page.



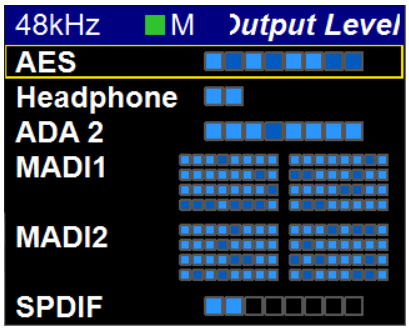
LED indications:

- Peak indication
- Alignment range
- Signal indicator

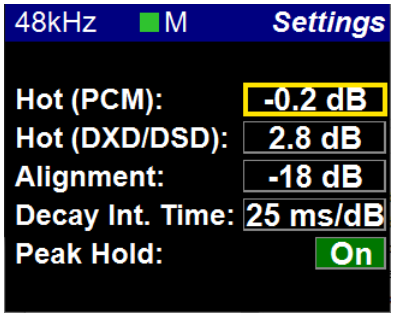
The LEDs indicate the inputs levels of the AD1 inputs 1 to 8
Note: You can reset a module Peak by pressing the Rotary Control. In the example above pressing A/D 1(8ch) will reset the peak displayed on the input 1 This led view ledged also applies to the DA view.

Output Levels Sub-Menu (Meters)

The Output Meters page will display the Output metering of the modules present in the Hapi. A metering view of one Led per output channel is represented in this page.



Meters Settings Menu



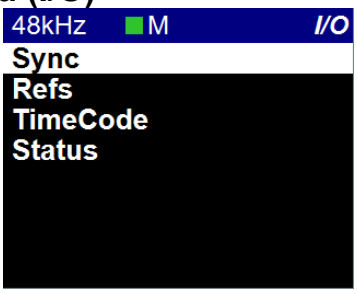
Hot : Sets the level above which the meter display will be red. If set to 0dB this will mean clipping. Range -2dBFS to 0dBFS (PCM)
-2dB to 6dB SACD (DXD/DSD). Reminder: DSD users benefit from a +6dB headroom in DSD with distortion starting slightly and progressively from +3.1dB upwards and clipping once reaching +6dB SACD

Alignment: Sets metering level alignment range (yellow leds). Range -24dBFS to 0dB

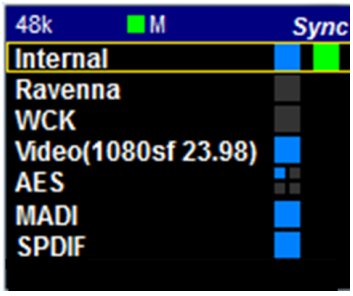
Decay integration time: Sets the rate at which the level meter display decays after the level falls below the most recent Peak.

Peak Hold: If ON it will keep the red Peak Hold Overload in display

I/O Menu & Sync Sub-Menu (I/O)



The IO and Synchronization menu is where the user can select the source of the Hapi reference clock. It is essential that these settings are configured correctly in order to ensure a clean audio signal through the Hapi unit.



Reference Source: Choose the desired sync source by selecting a Reference source. Available Reference Sources are: RAVENNA, WordClock, Video, MADI, AES or SPDIF.

Reference navigation: Selecting a Reference with multiple choices (such as AES) will enable the source navigation. The navigation is performed from top to bottom and will cycle through in this order at each consecutive press. The selection of another Reference Source will re-select the top entry in the list by default.

PTP Clock (RAVENNA): The Precision Time Protocol (PTP) is a protocol used to synchronize clocks throughout a computer network. Also known as IEEE 1588, it is a protocol designed to synchronize real-time clocks in the nodes of a distributed system that communicates using a network. RAVENNA is based on and uses

V2 of this IEEE standardized protocol. PTP Clocks allow for time resolution to the Nanosecond.

M Master: indicates that the current Hapi is the PTP Master

S Slave: The Hapi is slave to another PTP Master

The Hapi will always try to be the PTP Master. If multiple Hapi' or Horus' are used in a network environment, the Hapi set in this order will have the PTP Master priority, using the Best Master Clock Algorithm (BMCA):

1. Video sync
2. Word Clock
3. AES
4. ADAT/SPDIF
5. MADI
6. PT64 (not available yet)
7. Internal
8. RAVENNA (always slave unless there is no PTP master available)

Sync Color table:

Dark Blue:	Signal present	Red:	Unlocked
Light Blue:	Signal valid	Yellow:	Locking
Black:	No Signal	Green:	Locked

Note: When two or more Hapi are connected together through an Ethernet network, one of them will always be automatically selected as master, the other Hapi' will be forced into slave state and therefore will not be synchronized to wordclock or audio input. However, this is not a problem since all Hapi' will be synchronized.

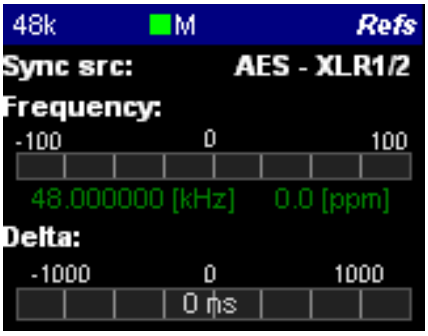
Status: Hapi PTP status: MASTER or SLAVE

Video Format Detected:
Supported Formats:
PAL – NTSC
720p23.98– 720p24 – 720p25 – 720p29.97 – 720p30
720p50 – 720p59.94 – 720p60 (not recommended video formats)
1080i25 – 1080i29.97 – 1080i30
1080sf25 – 1080sf29.97 – 1080sf30
1080p23.98 – 1080p24 – 1080p25 – 1080p29.97 – 1080p30

PTP Master note: The GMID (Grand Master ID) is available from Web Access page under IO & Sync, and in the Advanced pages – PTP tab.
Note: The RAVENNA sync is not available in Dante mode. Refer to the Hapi MkIII Dante Appendix

Refs Sub-Menu (I/O)

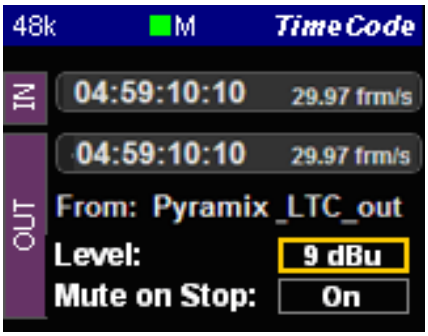
This Sub Page menu is where you can view the Deviation and Jitter of the External Reference, as measured by the Hapi synchronization circuitry (RAVENNA/AES67 Only)



Frequency: The long-term measured Frequency (in Hz) and deviation in ppm (parts per million) between the signal the unit is locked on to and the internal reference.

Delta: The short-term (instantaneous) time offset between the reference signal and the internal (considered as ideal) reference, measured in nanoseconds (ns). In other words, the delta indicator over a RAVENNA network will report the delta in ns between the master and the slave.

Timecode Sub-Menu (I/O)



IN Timecode: Will display the current incoming LTC/Timecode

OUT Timecode: Will display outcoming LTC/Timecode

Frame Rate: The current LTC/Timecode Frame Rate is indicated next to the Timecode IN & OUT display

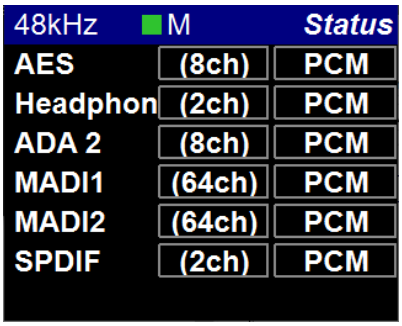
From: Indicates the Timecode provider (in example above the Pyramix DAW)

Timecode Level: Shows the current LTC output level in dBu. The selector offers a choice of output level from -18dBu to +9dBu in 3dBu increments, or can be switched off

Mute on Stop: If OFF the LTC output will not be active (default)
If ON the LTC output is generated constantly

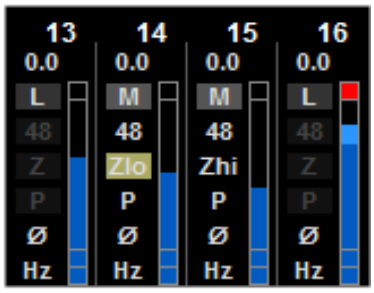
Status Sub-Menu (I/O)

Lists the status of each Module. Channel count (I/O) and each module Mode (PCM or DSD modes)



PreAmp Menu

The PREAMP (A/D) menu becomes active if you have 1 or more AD8(P) modules installed in the Hapi unit, giving full access to the Input controls. Please see below for a description of the buttons available.



All

Active: Will select all 8 input channels for function and level grouping
Inactive: Adjustments to the input settings and level affect only the selected channel only
Note the All button will group all inputs of the same type (Mic or Line)

Gain slider

The Rotary Control will give the user control over the Gain level with increments/decrements in 0.5 dB steps
The Gain range goes from 0 dB to +66.0 dB from left to right

In Mic mode (M): Sets the Mic Preamplifier's Gain

In Line mode (L): Sets the Line Input Sensitivity
A value of 0dB corresponds to an input sensitivity of +24dBu for 0dBFS. This corresponds to a calibration level of +4dBu for -20dBFS.
A value of +20.0 dB corresponds to an input sensitivity of +4dBu for 0dBFS
A value of +66.0 dB corresponds to an input sensitivity of -42.0dBu for 0dBFS

Example: Assuming you want to interconnect to an analog console and your standard studio alignment level is +4dBu for -18dBFS. In this case set the gain slider to +2dB. Similarly, on the DA analog output side, set the attenuation to -2dB, refer to section Line Output Level calibration on page 22, provided the max output level is set to +24dBu.

Mic (M) or Line (L)

Switches the Input from the Mic-Pre amplifier to the Line level circuitry. The button will show the current input signal path it is set for (Mic or Line).
The Line input sensitivity can be adjusted by setting the line gain for each input of the AD module.
Line Fader of 0 dB, means 0 dBFS for +24 dBu Analog signal level present at the Line input
Line Fader of + 6 dB, means 0 dBFS for +18 dBu Analog signal level present at the Line input
Line Fader of + 20 dB, means 0 dBFS for +4 dBu Analog signal level present at the Line input
Line Fader of + 66 dB, means 0 dBFS for -42 dBu Analog signal level present at the Line input

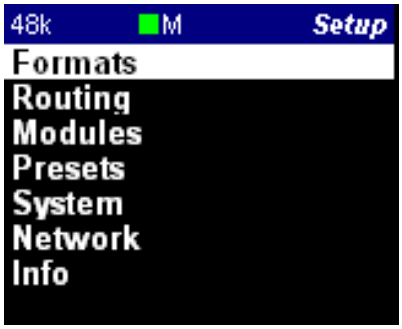
Note #1: the MIC and Line inputs are stored as independent parameters, meaning that switching from Mic to Line and vice versa will load its own gain (sensitivity) value

Note #2: The Premium AD converters have been designed in order to be able to benefit from the +3.1 dB SA-CD headroom offered by DSD, as per the scarlet book standard. The gain range goes from +0dB to +66dB in both PCM and DSD mode. In DSD mode it is possible to set a gain of up to +6dB on a full-scale signal to benefit from the SACD headroom.

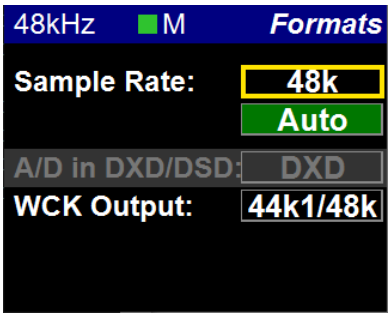
48V	This button will turn on 48V phantom power for the channel. If it is lit, it means that Phantom power is active. Only active on channels set to Mic. The total current drawn on the phantom power by all the microphones should never exceed 48mA for the whole device If a MAJOR (by MAJOR, we mean that the threshold of short-circuit detection requires at least 10 Preamp inputs to be shorted simultaneously) 48V Phantom Power Supply short circuit is detected, 48V is forced off on all A/D channels and the following error message is displayed. “48V power failure: all A/D 48V forced off until next reboot”
Zlo – Zhi	Mic input impedance (only available with certain extensions AD cards) For the different mic input impedance values, please refer to the card specifications.
PAD (P - B)	A -10 dB Pad can be applied in the Mic Preamp circuitry. B- Boost**:** Increases the mic input signal level by 12 dB > Max input level 0dBu *Note: The Boost is only available for the modules ADA8S and ADA8P Recommended for Ribbon Microphones that have low output.*
Ø	Polarity invert button. When lit, it inverts the polarity of the selected input signal.
80 Hz (Hz)	Low cut filter 80 Hz. Second order, 12 dB/octave.
Meters dB scaling	The Meters scaling is displaying from -90 dBFS to 0 dBFS.
Meters color range	Refer to the Meters Page Settings, in order to adjust the Level meter color range (Peak, Alignment and Decay time).
Rst	Stands for Reset Peaks Hold Meters. The top Red led of the PreAmp metering will indicate that a Peak has occurred. In order to clear the Peak display, simply press the RST button on the remote web access. To reset the peaks on the OLED you must refresh the PreAmps Page by going to previous one and back. Enabled the Peak Hold option under the Meters menu Settings
Navigation	Use the left << and right >> arrows in order to navigate through the banks of 8 inputs. Will be active if more than one AD8(P) module is present in the unit.

Setup Menu

The Setup menu's primary page contains function buttons described below as well as sub-menu links listed in the sub-sections; **Formats, Routing, Modules, Presets, System, Network and Info**



Formats Menu (Setup)



Sample Rate: Select the Hapi Sampling Rate
44.1 kHz - 48 kHz - 88.2 kHz - 176.4 kHz - 192 kHz - 384 kHz – DXD/DSD
Note: The available Sampling Rates depend on the Hapi Analog module cards. Only Premium Analog modules offer support beyond 192 kHz.
Note: Dante mode supports sampling rates up to 192 kHz.

Auto: Auto Sampling Rate mode. Hapi will automatically follow the sampling rate given by a RAVENNA source provided by; ASIO / Virtual Audio Device (Formerly Core Audio Driver), MassCore or another Horus/Hapi) or external Input Sync source. (RAVENNA/AES67 only)

Example 1: User using an external player (such as jRiver) can enable the Auto mode so that Hapi automatically changes its sampling rate according to the media file being played back.
Provided at least one RAVENNA ASIO or Virtual Audio Device (formerly Core Audio) stream is connected to an Output of the Horus/Hapi

Example 2: This Auto setting can apply to user running the RAVENNA ASIO or Virtual Audio Device (formerly Core Audio) so that Hapi adapts its sampling rate automatically.
Provided at least one RAVENNA ASIO or Virtual Audio Device (formerly Core Audio) stream is connected to an Output of the Horus/Hapi

Example 3: Another usage of this « Auto » sample rate button is to enable the Horus/Hapi locked (e.g. WordClock) to automatically follow the sample rate of the WordClock generator (same applies to AES/MADI/ADAT sync).
Provided at least one RAVENNA ASIO or Virtual Audio Device (formerly Core Audio) stream is connected to an Output of the Horus/Hapi

Warning: The Auto sampling Rate option must be disabled if locking the Horus/Hapi devices to reference (e.g. 44.1kHz WordClock) which would be different than the working Sampling Rate Format (E.g. 88.2kHz,,192kHz, DXD.) For MADI, the Auto sampling rate option depends on the MADI framing (48 or 96k frame). Therefore it is recommended to disable the option at sampling rates higher than 48 kHz.

Note: If using ANEMAN with a Sampling Rate Zone the device on the Crown will decide the Master sampling rate of all the devices present in the Zone. In such a case it is recommended to disable the Hapi MkIII Auto Sampling Rate mode to avoid fights over the sampling rate of the non-Crowned devices at a given moment, since those could potentially cause sampling rate flickering.

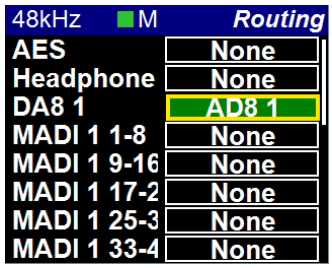
A/D Mode in DXD/DSD: This format setup only applies to the AD module which can be set to either DXD - DSD64 - DSD128 - DSD256
Note: The Hapi can be configured in DXD/DSD and in this mode the Hapi can receive any audio data format stream and can generate DXD or DSD(64, 128 or 256) stream depending on the A/D audio data format chosen.
(RAVENNA/AES67 only)

WordClock Output: 44k1 / 48k: When enabled the Wordclock Output will be at either 44.1kHz or 48kHz
Example:
Sampling Rate: 44k1/88k2/176k4 the WordClock Output will be 44.1kHz
Sampling Rate: 44k/96k/192k the WordClock Output will be 48kHz.

Follow SR: When enabled the WordClock Ouput will follow the Sampling Rate selected.
Example:
If the selected Sampling Rate is 48k the WordClock output will be at 48kHz
If the selected Sampling Rate is 176k4 the WordClock output will be 176.4kHz

Routing Menu (Setup)

Module routing menu describes where the signal for each module in the Hapi is coming from. Each button leads to a sub-menu that allows the user to change the source of the signal to that specific module. For instance, the Headphone in the Routing menu will allow the user to change the routing of the Headphone.
Choices are made in blocks of 8 channels from the OLED (except for the Monitor, which is a Stereo signal). As of the Hapi MKIII single channel routing is supported but has to be performed via the Advanced pages. For more information refer to the RAVENNA Advanced Pages online guide.



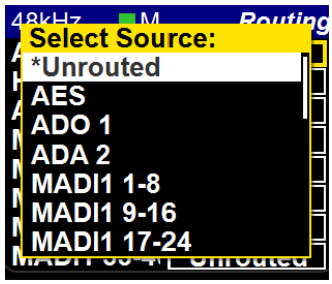
Here the AD8 module is routed to the DA8 module and it will remain available for RAVENNA routing

ADAT:	Takes you to the ADAT Routing configuration page (refer below)
AES:	Takes you to the AES Routing configuration page (refer below)
D/A:	Takes you to the D/A Routing configuration page (refer below)
PT64 (not available):	Takes you to the PT64 Routing configuration page (refer below)
MADI:	Takes you to the MADI Routing configuration page (refer below)
HEADPHONE:	Takes you to the Headphone Routing configuration page (refer below)
SPDIF:	Takes you to the SPDIF Routing configuration page (refer below)
A/D:	Disabled as one cannot route TO an Input!
Loopback:	Takes you to the Loopback module (present only in debug mode)
Dante*:	Takes you to the Dante Routing configuration page **Only available in Dante mode*

Warning: Two inputs can't be routed to the same output, the channels are routed but not mixed.

Routing: Source Configuration

ADAT – AES - D/A - MADI – SPDIF Routing Output Source (similar)



For all of the output modules (ADAT/SPDIF, AES, D/A N, PT64, MADI & Headphone Jack) the user can set where the signal feeding it comes from. Any combination is possible using the Output source page linked to any of the output modules.
* All routing in the Hapi is currently achieved using banks of 8 channels.

Unrouted:	No internal routing has been performed, the module remains available for RAVENNA and/or internal routing

ADAT/SPDIF: Sets the module being configured to receive signal from the ADAT/SPDIF

AES: Sets the module being configured to receive signal from a bank of AES-EBU inputs.

MADI: Enables the module being configured to receive signal from any 8-channel bank in either of the MADI streams

PT N (not available yet): Enables the module being configured to receive signal from any 8-channel bank in either of the PT64 modules.

A/D N: Sends the signal coming in from the Mic or Line input modules to the output module being configured

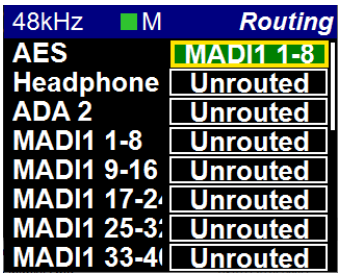
Loopback: Should only be used for test purposes.

Dante*: Sets the module being configured to receive signal from the Dante channels
**Only available in Dante mode*

Routing Example:

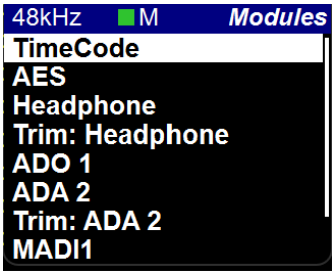
MADI Routing Output: Users can route literally any input signal to any output module. Users can also route any input signal to any combination of output modules. Signals are routable in blocks of 8 channels from the unit OLED.

The example picture below shows the MADI output 1-8 routing being selected from the Routing page on the ADA8 module channels 1-8



Hapi MKIII single channel routing is supported but has to be performed via the RAVENNA Advanced pages. For more information refer to the Advanced Pages online guide.
https://merging.atlassian.net/wiki/spaces/PUBLICDOC/pages/4819571/Merging+RAVENNA+Advanced+Pages+User+Guide.

Modules Menu (Setup)



Selecting one of the Modules described below will open the Module I/O configuration menu

AES
Included as standard. The AES buttons are active since this module is included as standard. Connectivity is over 1 D-SUB25 connectors providing 8 channels (4 AES pairs) of AES-EBU I/O.

Headphone
Shortcut to the Headphone monitor page described above.

D/A N
The D/A buttons become active when 1 or more IOC-DA8(P) modules are installed in the Hapi unit.

Trim : Headphone / DA N / ADA N
Hapi MKIII provides single channel trim support.

ADO N
The A/D buttons, which become active if you have 1 or more ADO8V3 modules installed in the Hapi unit, give access to the Input controls. N being a number incrementing from 1 to 2. Please see below for a description of the buttons available.

ADA N
The ADA buttons, which become active if you have 1 or more ADA8V3 modules installed in the Hapi unit, give access to the Input controls.

PT N (not available yet)
The PT buttons become active when an IOC-H-PT64 module is installed.

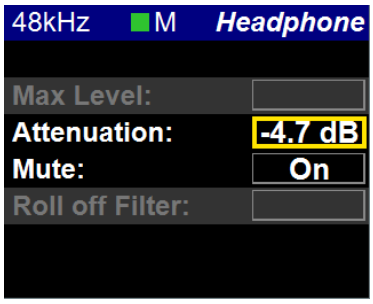
MADI
MADI module is optional with each Hapi. Only one MADI module can be fitted per Hapi.
MADI1 = 1 to 64 Channels
MADI2 = 65 to 128 Channels

TimeCode
Included as standard. The TimeCode button is active since this module is included as standard and will bring you to the TimeCode page.

ADAT/SPDIF
ADAT/SPDIF module is included as standard with each Hapi.

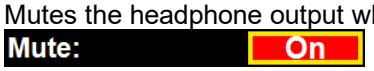
Headphone Menu

The Headphone menu refers to the Hapi front panel Headphone Monitor jacks. The Headphone jacks 1 & 2 (6.3 mm and 3.5 mm) output the same source and level.



Attenuation: Sets the attenuation of the Headphone output. By selecting (Rotary Push) the Attenuation entry and using the Hapi Rotary Control (Left= less gain / Right= more attenuation) to set the attenuation to the desired level
Headphone level range: -60 dB to +12 dB with 0.1dB precision.

Headphone Mute: Mutes the headphone output when ON is enabled



Roll off Filter:

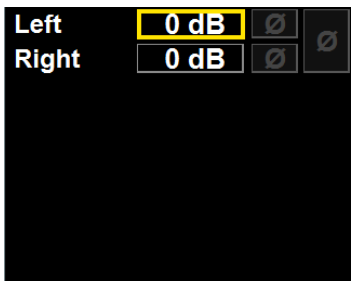
Slow (default): Offers the lowest latency of 9 samples, with the tradeoff of a gentle frequency response attenuation reaching -3dB at 0.45 x FS (21.6 kHz @48k)

Sharp: Offers a flat frequency response with an attenuation of 3 dB at 0.484 x FS (23.2 kHz @48k), which has the tradeoff of 35 samples latency.

Apodizing: Fast Roll-Off filter, Linear phase filter. Latency of 35 samples

Brickwall: Ensures rejection of more than -100dB at Nyquist (0.50 x FS, 24 kHz @48k). Latency of 35 samples

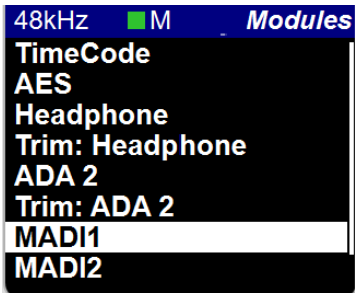
TRIM: Headphones



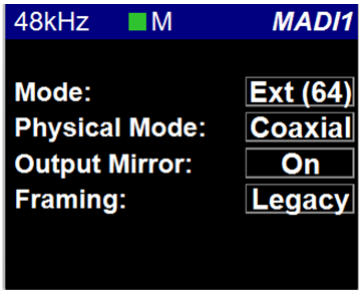
Open the Trim Headphone page in order to have trim level per channel support. The headphone module offers 2 channel trims (left and Right) on a .1 dB step scale. With a per channel polarity parameter and a two channels one.

Modules: MADI Sub-Menu

The MADI128V3 extension module is optional with each Hapi. A single MADI128V3 module is supported with Hapi MkIII and this one is supported in Slot 1 only.

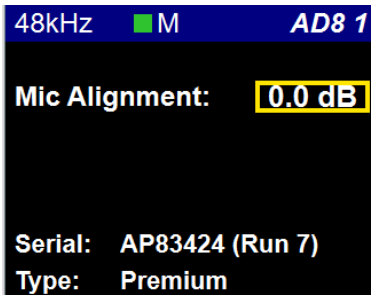


The Hapi MkII supports 128 channels of MADI IO, those are repartitioned in MADI1(1-64) and MADI2 (65-128)



Mode:	Sets the MADI mode to either “Standard” (56 audio channels) or “Extended” (64 channels). To determine which setting(s) you are able to use, please consult the user manual of the device you are connecting the Hapi to in order to see which (if not both) formats it complies with. *Note: MADI Standard (56) can only be enabled at 1FS (44.1kHz/48kHz) above 1FS we will automatically revert to MADI Extended (64).*
Physical Mode:	Choose the input signal to be derived from the Coaxial or SFP mode. Note: The small form-factor pluggable (SFP) is a compact, hot-pluggable network interface module used for both telecommunication and data communication applications. Refer to the Merging knowledge Database for our recommended SFP modules. https://merging.atlassian.net/wiki/spaces/PUBLICDOC/pages/551682065/Hapi+MkIII+recommended+SFP+modules
Output Mirror	Choose if the output MIDI signal goes out from the Coaxial and SFP Transceivers at the same time, thus is mirrored.
Legacy/High Speed:	Choose between using Legacy (48k Frame) or High-speed (96K to 192K Frame). This option is only available for MADI output at 88.2/96kHz sampling rate and176.4/192kHz sampling rate and is dependent of the device used in conjunction with the Hapi

Modules: A/D Sub-Menu



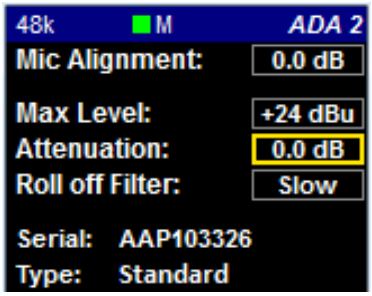
Mic Alignment: User can offset the Mic Gain Alignment scaling from a Range of 0dB to +12dB.

Example: Setting a gain alignment of +10dB will make the Hapi, Web Access or the Pyramix PreAmps control to be offset by a scaling of +10 dB.

Serial Number: This is the place you can access all your Modules serial numbers without having to unslot them or open the box

Type: Module Type description (Example : Premium Direct Out)

Modules: ADA Sub-Menu



Mic Alignment: User can offset the Mic Gain Alignment scaling from a Range of 0dB to +12dB.

Example: Setting a gain alignment of +10dB will make the Hapi, Web Access or the Pyramix PreAmps control to be offset by a scaling of +10 dB.

Max Level Maximum Output Level: +18 dBu or +24 dBu

Output attenuation: Calibration of the D/A output (Range -60.0 dB to 0 dB with 0.1 dB precision). Refer to the Hardware section for the D/A onboard output level calibration.

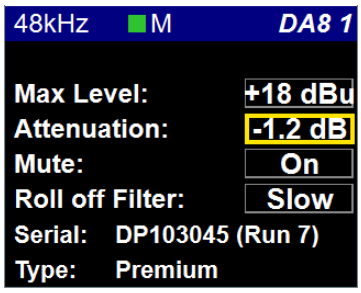
Roll Off Filter: Recent ADA8S/P modules offers 4 roll off filters: Slow, Sharp, Apodizing and Brickwall. Refer to the ADA8S/P Module section at page 31 for more details

Previous ADA module offer 2 Roll Off filters. Sharp or Slow.
Sharp roll-off filter: Offers a flat frequency response up to 22kHz, within 0.2dB, which has the tradeoff of 36 samples latency.
Slow roll-off filter: Offers a low latency of 9 samples, with the tradeoff of a gentle frequency response attenuation starting around 16kHz and reaching -2.5dB at 22kHz. This mode is the default one.

Serial Number: This is the place you can access all your Modules serial numbers without having to unslot them or open the box

Type: Module Type description

Modules: D/A Sub-Menu



Max Level: On the DA8V3S and DA8V3P cards, the output level setting for all channels is done via software through the option “max output level” in each DA’s setting page, allowing either + 24 dBu or 18 dBu max level.

For a more precise trimming of the output level, the output attenuation can be set on the same page

Output attenuation: Calibration of the D/A output. Range -60.0 dB to 0 dB with 0.1 dB precision steps
Refer to the Hardware section for the D/A onboard output level calibration.

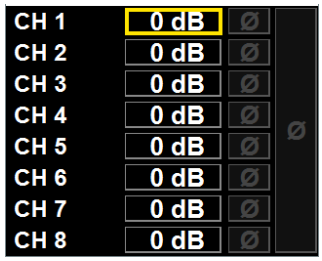
Mute: Mutes all the DA output channels when ON is enabled

Roll Off Filter: Sharp roll-off filter: Offers a flat frequency response up to 22kHz, within 0.2dB, which has the tradeoff of 36 samples latency. This mode was and still is the default one.
Slow roll-off filter (default): Offers a low latency of 9 samples, with the tradeoff of a gentle frequency response attenuation starting around 16kHz and reaching -2.5dB at 22kHz

Serial Number: Module serial numbers

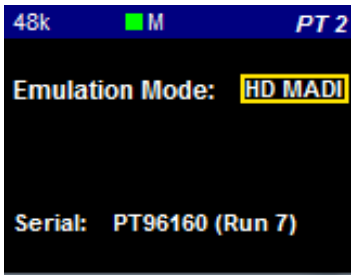
Type: Module Type description

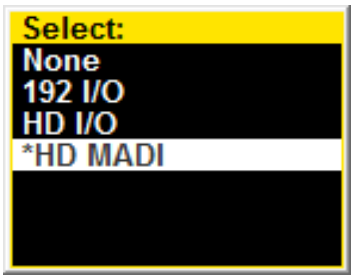
TRIM: DA



Open the Trim DA page in order to have trim level per channel support. The DA module offers 8 channel trims, from channel 1 to channel 8 on a .1 dB step scale. With a per channel polarity parameter.

Modules: PT64V3 Sub-Menu (not yet available for Hapi MkIII)



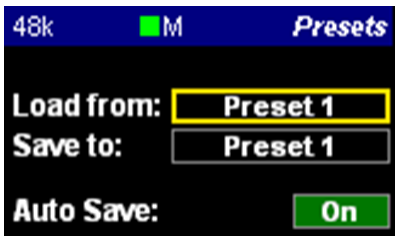


Emulation mode:	Selection of the Hardware emulated in Pro Tools. Latency is adapted to the mode chosen, see detailed table in PT64V3 section. *None* mode is seen as an HD MADI in Pro Tools, but has the lowest latency.
Serial Number:	Module Serial Number and Run
Output Source:	Selection of the output source sent to Pro Tools for each of the 8 groups. Any of the digital or analog inputs can be routed to Pro Tools as well as RAVENNA signals.

Modules: Loopback (hidden menu, available only for debug use)

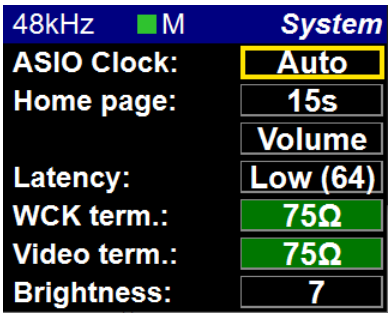
Transparency Check:	This is a Debug Utility tool that verifies the bit transparency of the audio path On: Transparency check enabled Off: Loopback mode enabled
Word Length:	Word length of the digital audio data signal (16 bits or 24 bits)
Status:	Green: Path transparency valid Black: Path is not transparent Numbering: indicates the number of discontinuities measured
Latency:	Output to Input delay in samples

Presets Menu (Setup)



Load:	5 presets banks of different Hapi configurations can be loaded (one at a time)
Save:	5 presets banks are available to store different Hapi configurations
Auto Save:	If enabled the save configuration will happen at every 2 minutes. *Note: Since the flash memory which is at the heart of the Hapi storage has a huge (but not infinite) amount of write cycles, we limit the auto-save of all configuration and PreAmps settings to once every two minutes if (and only if) a change has occurred meanwhile.* *Furthermore, both Shutdown and Reboot buttons (in Setup page) do also entirely save the current configuration of the Hapi prior to power down.*

System (Setup):



ASIO Clock:

If set to Auto enabled: The ASIO clock will be generated by the Hapi which will be PTP Master.
If Auto is disabled: The ASIO clock will always be generated by this Hapi.
Note: Do not disable unless you are sure that no Hapi will be PTP Master.
(RAVENNA/AES67 only)

Home Page:

Users can decide what will be their Hapi OLED Home Page. You can return to the Home Page by performing consecutive 1 sec push hold or by pressing and releasing the Hapi front panel Home Page button (small Pyramid). Users can also set a Home page display delay option of; 15 seconds, 30 seconds, 1 minute or set it to Never (disabled).

A/D Metering: The screensaver redirects you to the AD Meters Page.
D/A Metering: The screensaver redirects you to the DA Meters Page.
In Levels: The screensaver redirects you to the Input Level Page.
Out Levels: The screensaver redirects you to the Output Level Page.
Volume: The screensaver redirects you to the Volume Page.

Long push the Rotary Control to exit those pages.

Screensaver: The Hapi screen will turn black after a 1min delay wihout user interaction. This is in order to preserve the life span of the Hapi OLED display. To exit the Screensaver press the Rotary Control Button.

Latency:

The Hapi has 4 Latency Settings (in samples) that will determine the device latency over a RAVENNA network. When multiple RAVENNA devices (e.g. Horus & Hapi) are connected over a network, they adjust themselves to the lowest latency that can globally be achieved. (RAVENNA/AES67 only)

- Ultra Low (16 smp)
- Extra Low (32 smp)
- AES 67 (48 smp)
- Low (64 smp)

Terminations:

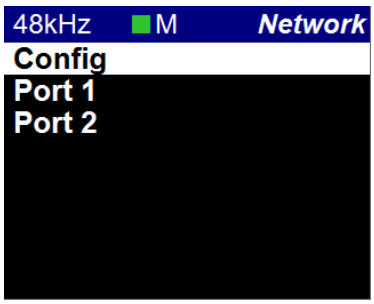
75Ω for WCK: Sets 75Ω termination for the Wordclock Input.
75Ω for Video: Sets 75Ω termination for the Video reference Input. Unless the Video Reference signal provided to the Hapi is daisy-chained to other equipment, you should always terminate your Video signal for most reliable operation.

Brightness:

Users can set the Hapi Power Button and OLED display luminosity.
This may save some power and hence some internally generated heat.

Note: during the adjustments the OLED will flicker black and update the brightness value.

Network Menu (Setup)



Config: Network Configuration sub-menu

Port: Network Port IP Configuration sub-menu. Number of port available depends on the network configuration

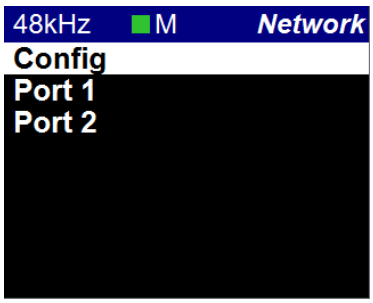
Network Config Sub-Menu

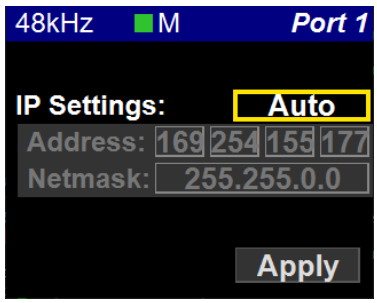
Device Name: Name of the Hapi unit. This name will be broadcast across the network and will be seen in applications such as the MT Discovery tool or ANEMAN. The Hapi unit name can be changed from the Web control access Network page (see section below for all details)

ST2022-7: Network mode configuration. Toggles between Switched mode (default) and ST2022-7. A reboot is required for the change to apply.

Network Port Sub-Menu

The Hapi MkIII has two network interfaces, listed as Port1 and Port 2. Each one can be configured by selecting their entry line. Please reboot after configuration





IP Settings: *Manual*: Type IP address using box selection and the - or + buttons
Auto: The IP address will be automatically attributed using ZeroConf/Auto-IP mechanism (address range 169.254.xx.xx if no DHCP server is present)

Address: Set the IP Address for the Hapi unit by using box selection and the - or + buttons (Available only with IP Settings = Manual)

Netmask: Set the Subnet Mask for the Hapi unit by using box selection and the < or > buttons (Available only with IP Settings = Manual)

Apply & Reboot: Once changes have been made to this section, you must press this button to save the settings and power cycle the Hapi unit

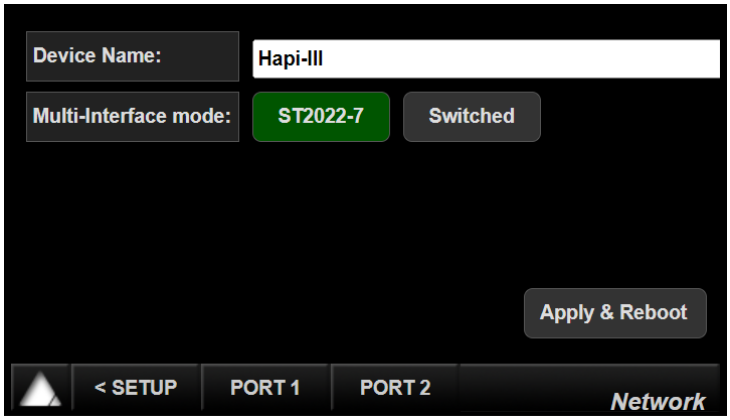
Note:
Hapi has no DHCP-server capability neither does the Merging PCIe Ethernet Controller Card NET-MSC-GBEX1.
By default the Hapi IP setting is set to "Auto" configuration mode which gives an address in the range 169.254.xxx.xxx if no DHCP server is present on the network. Users are free to put a DHCP server in their RAVENNA network with a customized address range and the Hapi would get an IP address from this server. Note that our recommended RAVENNA switches are configured with DHCP disabled.

Merging recommend the Hapi to be configured in "Auto" mode and the Merging PCIe Ethernet Controller Card NET-MSC-GBEX1 to also be configured with "Internet Protocol Version 4" with "Obtain an IP automatically".

HAPI MKIII NETWORK OPERATION MODES

The Hapi MKIII RAVENNA provides two network operation modes.

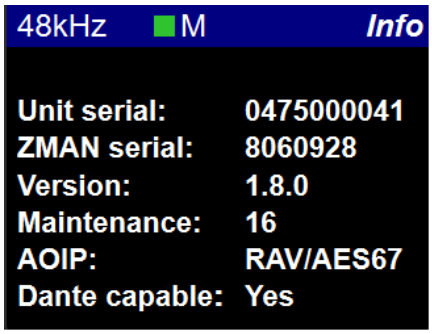
1- ST2022-7 Seamless Protection Switching
2- Network Switch mode (default). Allowing daisy chain for an extra network device
Those modes of operation are available for selection from the RAVENNA Advanced Pages.
Find more details here.
https://merging.atlassian.net/wiki/spaces/PUBLICDOC/pages/4819571/Merging+RAVENNA+Advanced+Pages+User+Guide.



For Dante Redundant mode support refer to the Hapi MkIII Dante Appendix.

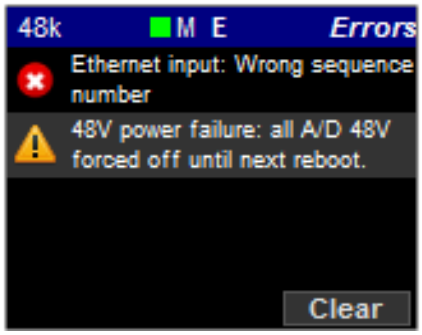
Info (Setup):

In this sub menu you will find details about the Hapi internals; Serial number, firmware version currently installed, the AOIP mode and Dante compatibility of the device.

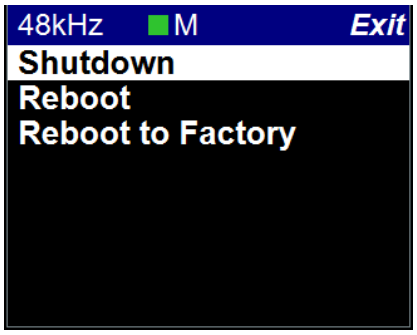


ERROR Menu

List the errors detected by the Hapi. Refer to the troubleshooting section below for details of each errors. The Clear entry will delete the listed errors.



EXIT Menu



Shutdown: Initiates a proper shutdown of the Hapi unit, including a save of the current configuration. Do not attempt to shutdown the Hapi unit in other ways (such as using the power switch on the back of the device).

Reboot: Power cycles the Hapi unit (shutdown>Boot up)

Reboot to Factory: If selected we will reboot the Hapi to the default factory configuration. The Current configuration will be lost but all the saved presets will be kept and can be reloaded.

HAPI MKIII - Web Control Access

Installing and accessing the Hapi Control interface remotely

To control and view your Hapi remotely with a web browser make sure that you are using one of the Internet browsers below: Google Chrome (Highly Recommended), Mozilla Firefox, Opera, Apple Safari, Microsoft Edge. * Microsoft Internet Explorer is not supported *

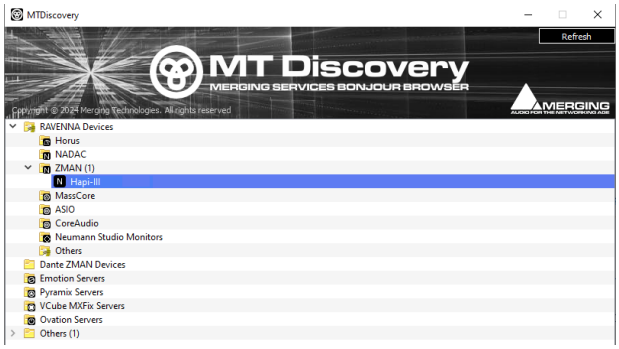
Then take the following steps:

1) Download and install MTDiscovery v15.0.10 and above on your system (PC or MAC) https://www.merging.com/support/downloads#accessory-installers-3
   ANEMAN 1.7.0 and above can also be used in RAVENNA/AES67 mode.
2) Make sure your Hapi is connected to the same network as your system, and is configured with the correct IP settings (See “Setting up the Hapi IP Address”)
3) Launch MT Discovery (MTDiscovery.exe) or ANEMAN (Aneman.exe)

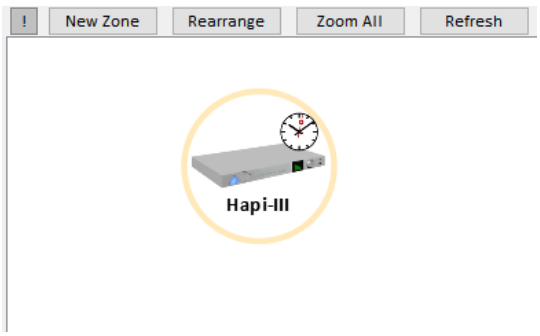
Any Hapi devices on the network will be discovered by the MT Discovery tool or ANEMAN and will appear under the “RAVENNA Devices”

- A mouse double-click on the Hapi Device entry will open the Hapi Web Interface in your default web browser
- Only Devices on the same network (same color in display) can have their I/O interconnected
- *Microsoft Internet Explorer is not recommended for this*

MT Discovery Window



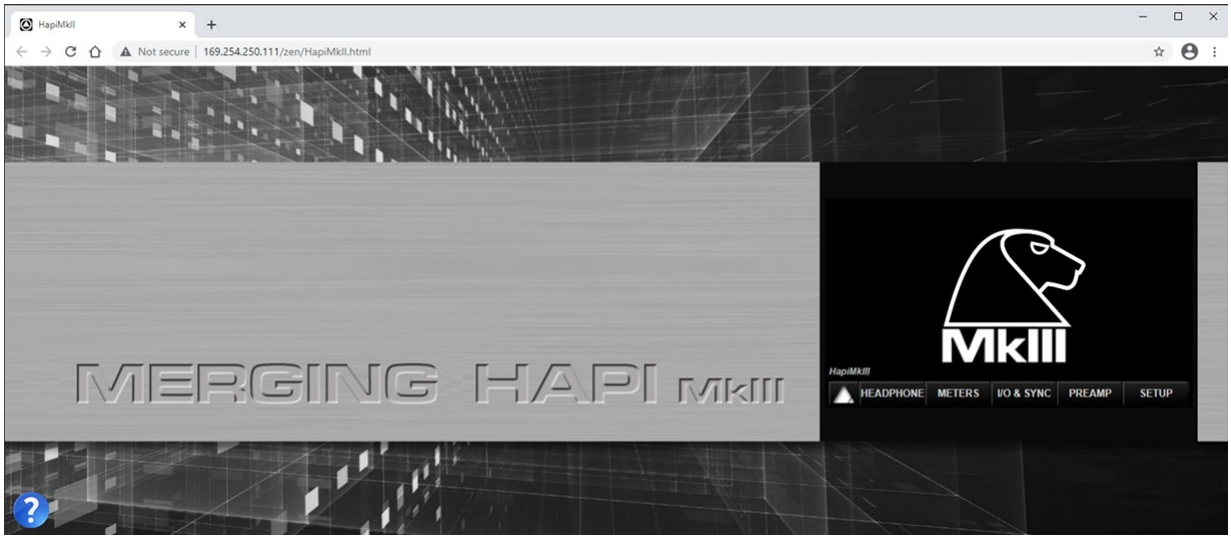
ANEMAN



Using the Webpage, you can browse the Menus and change parameters in exactly the same manner as on the front panel TFT of the Hapi unit in question.

Warning: It is mandatory that you connect the Hapi to a Gigabit Ethernet Port or Switch for remote access.

HAPI MKIII Web Access



The Web access Hapi MkIII menu pages are based on the Horus layout and differ from the Hapi MkIII OLED screen. For precise description of each parameter refer to the Hapi MkIII OLED description of the parameter as the Web Access is remote controlling the same parameters that are available on the Hap MKIII OLED display.

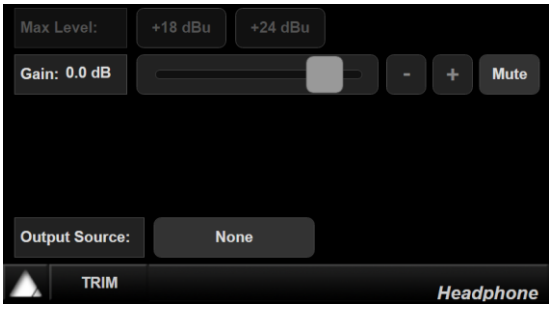
Open the Web Access from ANEMAN, MT Discovery, VAD or MAD by selecting the Open Web App entry from the Hapi-III context menu.

Home Page Web Access

The Hapi remote Home page is the default web access page displayed at opening and is different from the Hapi OLED home page display.

HOME PAGE LAYOUT ENTRIES

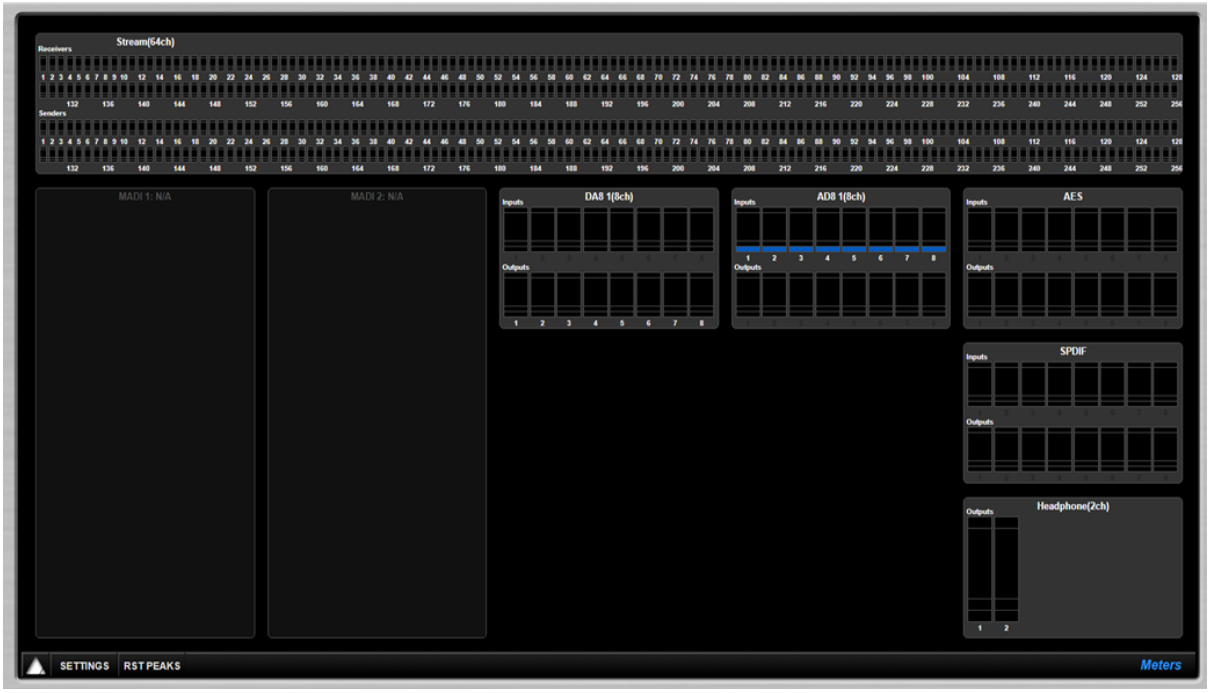
HEADPHONE
Direct access to the Headphones pages



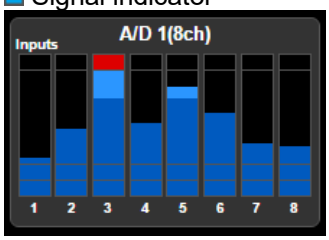
METERS
The Meters web menu will display the input and output metering of the modules present in the Hapi.

At the top of the Meters Web Access page is the Stream Metering section which provides metering of your AoIP streams, this section is divided in two.
Receivers (Channel 1 to 256)
Senders (Channel 1 to 256)

Note: this section is useful to identify if audio is being streamed, if you see metering and cannot monitor your signal, the problem is mostly probably a routing one.

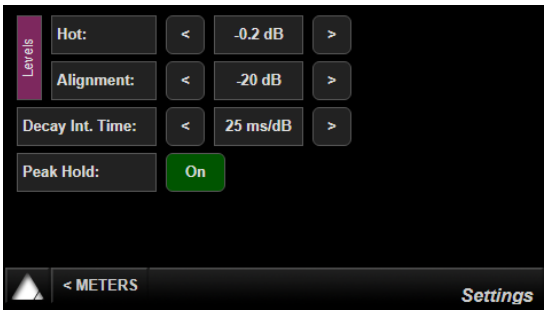


Led indications:
Peak indication
Alignment range
Signal indicator



The leds indicate the inputs levels of the AD1 inputs 1 to 8
Note: You can reset a module Peak by doing Mouse + Click on the Module display section. In the example above pressing A/D 1(8ch) will reset the peak displayed on the input 1.

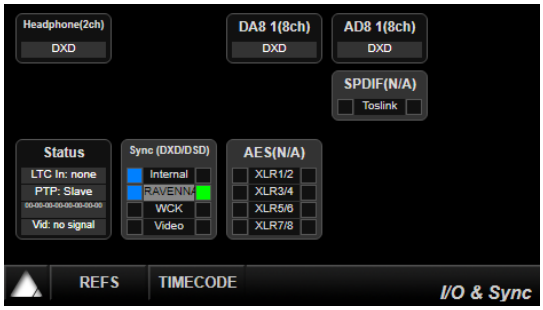
Meters web Settings:



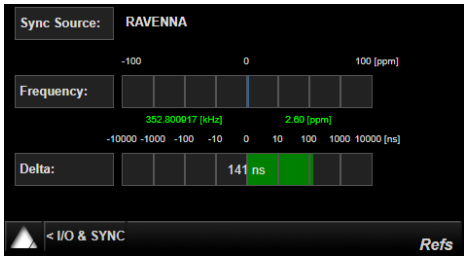
Hot:	Sets the level above which the meter display will be red. If set to 0dB this will mean clipping. Range -2dBFS to 0dBFS
Alignment:	Sets metering level alignment range (yellow leds). Range -24dBFS to 0dB
Decay integration time:	Sets the rate at which the level meter display decays after the level falls below the most recent Peak.
Peak Hold:	If ON it will keep the red Peak Hold Overload in display

IO & SYNC Web Access

The IO and Synchronization menu is where the user can select the source of the Hapi reference clock. It is essential that these settings are configured correctly in order to ensure a clean audio signal through the Hapi unit. Refer to the OLED IO & Sync description for more details.
Options may differ if the device is running in RAVENNA/AES67 or Dante mode.

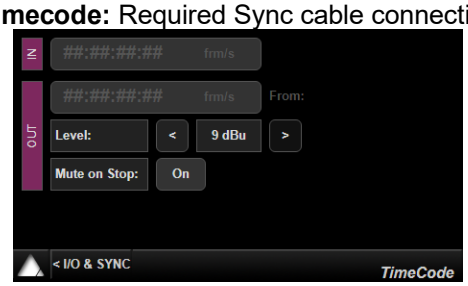


REFS



Not available in Dante mode.

Timecode: Required Sync cable connectivity



PreAmp Web Access

- Allows the creation of up to 8 groups
- Naming of channels (can be saved in Hapi presets)
- VU meters

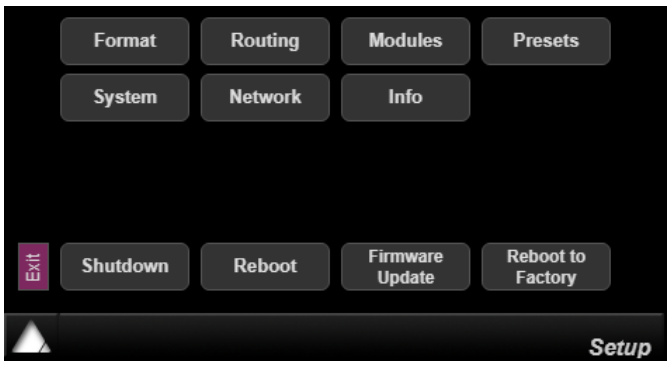
For other parameters, please refer to the PreAmps module description (above)
Note: The Boost PreAmps option available only for latest generation of ADA8S and ADA8P modules

Preamp web menu

ALL GRP	Will include all faders into the selected group
RMN GRP	Will include the remaining faders into the selected group
RST GRP	Will reset the selected group
RST ALL GRP	Will reset all groups, all grouping will be reset to default

SETUP Web Access

The Setup page once opens will bring you additional sub parameters pages and controls

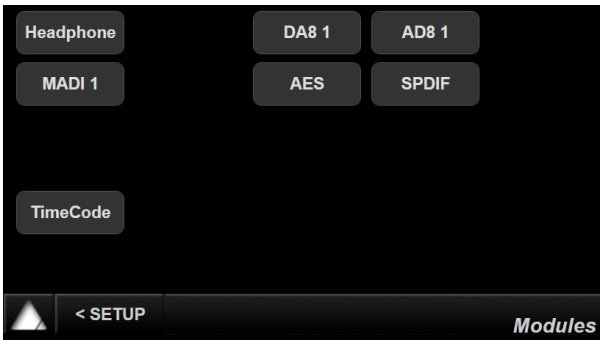


Format

Sampling rate selection, Auto sampling rate and more. Refer to the OLED Format description
Options may differ if the device is running in RAVENNA/AES67 or Dante mode.

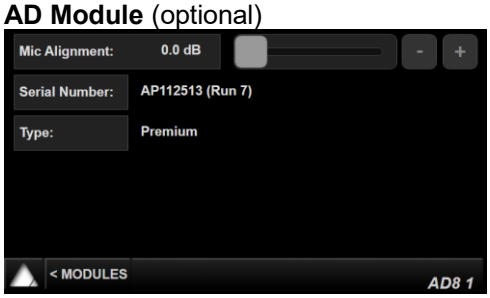
Routing
Remote routing access page, where available modules will be displayed for selection. Refer to the OLED Routing description

Modules

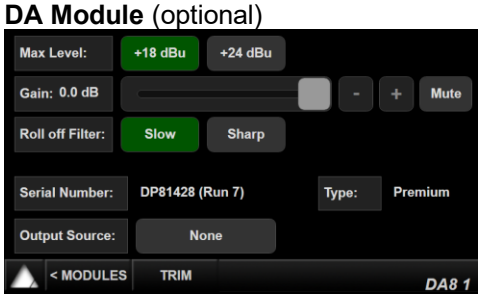


Module menu will show the available Hapi Modules that your Hapi has in its configuration. Each module type has its own set of parameters.

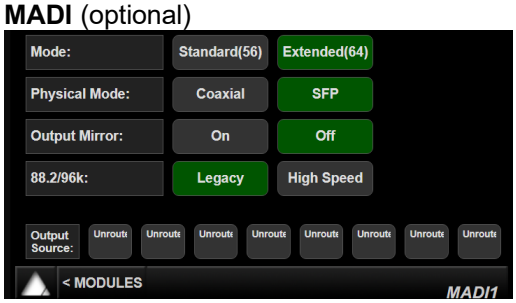
AD Module (optional)



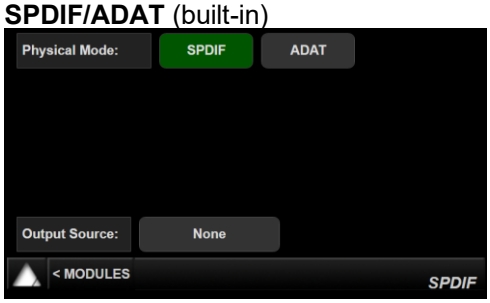
DA Module (optional)



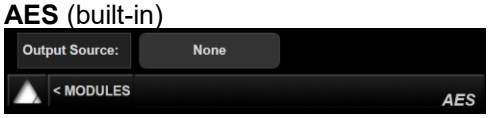
MADI (optional)



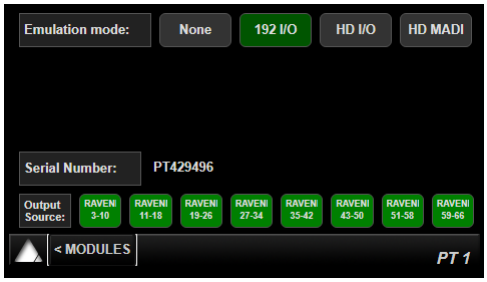
SPDIF/ADAT (built-in)



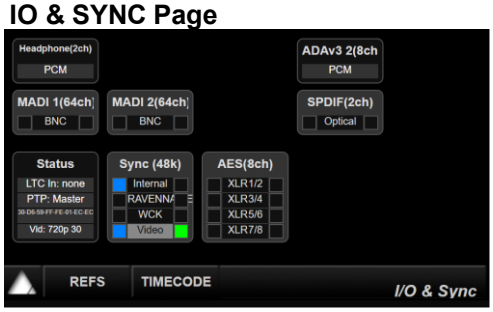
AES (built-in)



PT64 (optional, not available yet)



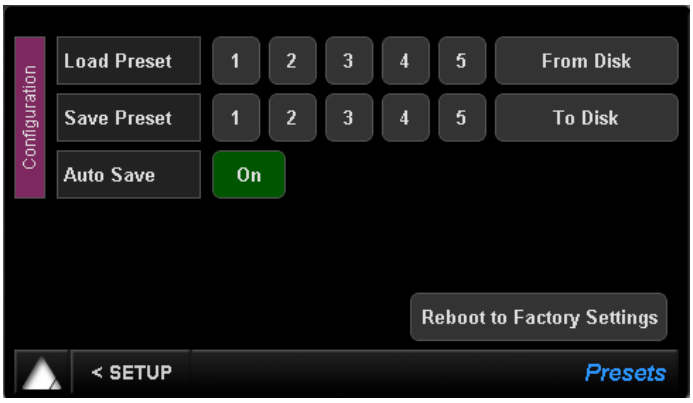
IO & SYNC Page



Options may differ if the device is running in RAVENNA/AES67 or Dante mode.

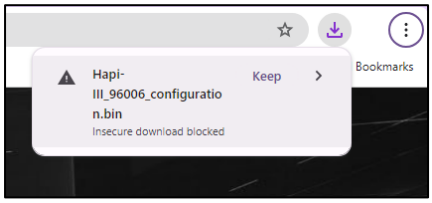
PRESET Web Access

Disk Presets can be stored and loaded on your local system where Hapi is connected to.



Save Presets	Up to 5 presets can be saved and stored in the Hapi
Load Presets	Up to 5 presets can be loaded from the Hapi
From Disk	Users can load some presets that were stored on your local Hard Drive
To Disk	Users can save some presets to your local Hard Drive
Reboot to Factory	Will reset all the Hapi parameters to the default factory settings

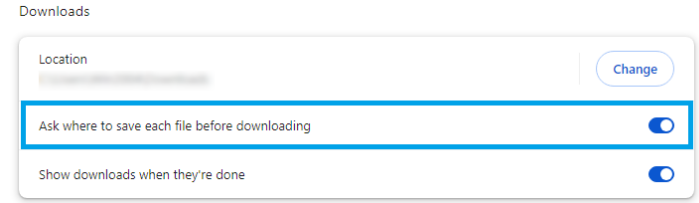
Note: The Chrome browser may prevent the preset file download. In such case, please verify the Chrome Downloads / Downloads history and Keep the downloaded Preset file.



Note: Stored Hapi preset have a .bin file extension. In order to be able to rename the Hapi preset file at save the Chrome browser users will need to adjust this Setting.

1. Go into Chrome Settings
2. Select Downloads on the left-hand pane
3. Activate « Ask where to save each file before downloading »

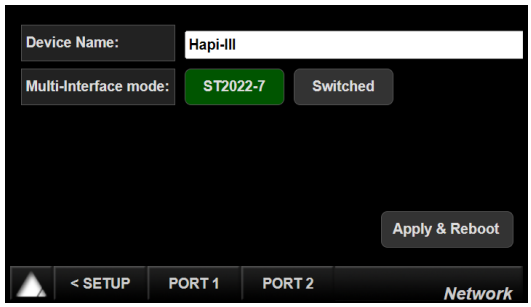
Now when clicking on « to Disk » a window pops up that allows you to change the name of the preset (.bin) file prior to saving it.



Note: When saving presets to Disk with the Chrome Brower it is possible that the save windows dialog does not show up. It such case it is due to the browser Pop-Up blocker configuration. Make sure that you allow pop-ups from your Hapi.

NETWORK Web Access

Hapi network configuration page

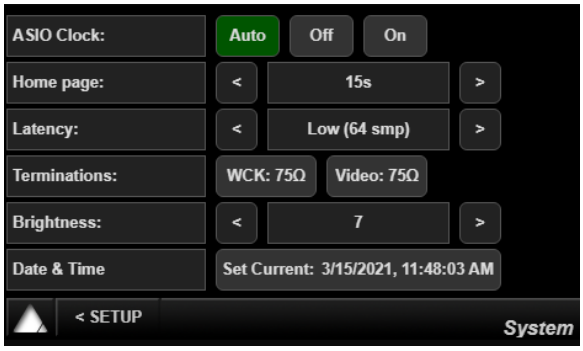


The Hapi MkIII RAVENNA provides two network operation modes
1- ST2022-7 for Seamless Protection Switching
2- Network Switch mode, allowing daisy chain for an extra network device
Those modes of operation are available from the RAVENNA Advanced Pages. Find more details here.
https://merging.atlassian.net/wiki/spaces/PUBLICDOC/pages/4819571/Merging+RAVENNA+Advanced+Pages+User+Guide.

For Dante usage refer to the Hapi MkIII Dante Appendix

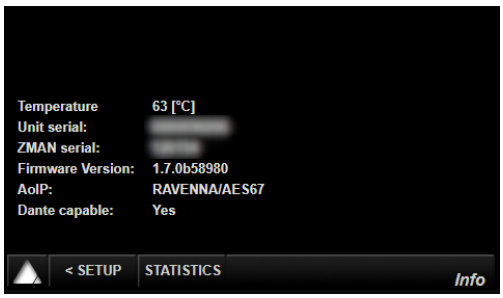
SYSTEM Web Access

Refer to the OLED System description.



INFO Web Access

In this sub menu you will find details about the Hapi internals; temperature, serial number and the firmware version currently installed



EXIT Web Access

Shutdown: Initiates a proper shutdown of the Hapi unit, including a save of the current configuration. Do not attempt to shutdown the Hapi unit in other ways (such as using the power switch on the back of the device).

Reboot: Power cycles the Hapi unit (shutdown>Boot up)

Firmware Update: Will open the Firmware update browser page. Refer to the Firmware update procedure for more details

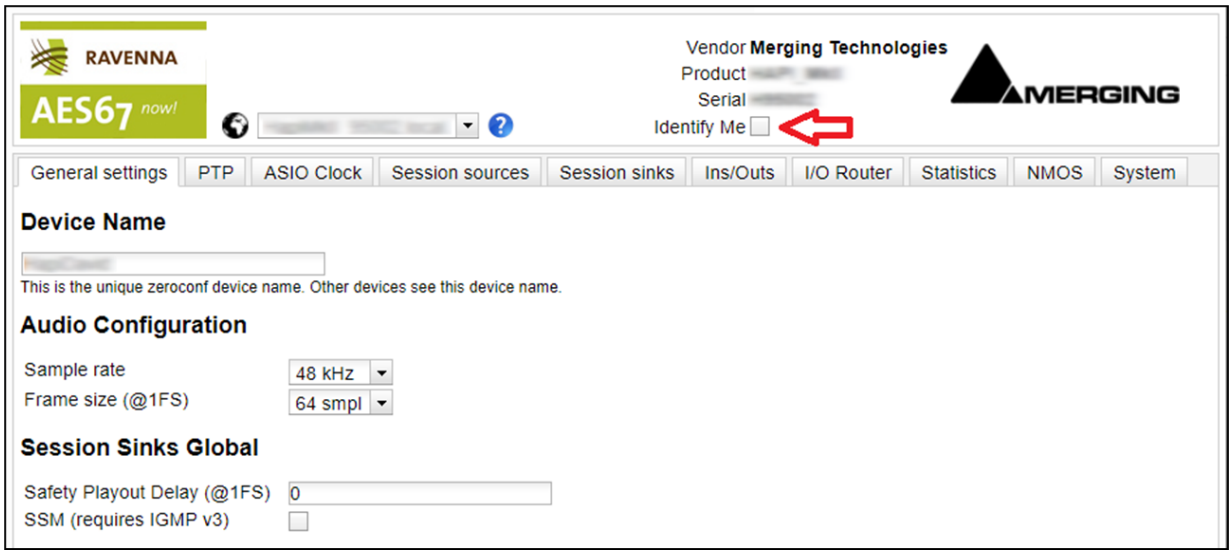
Reboot to Factory: If selected we will reboot the Hapi to the default factory configuration upon confirmation. The Current configuration will be lost but all the saved presets will be kept and can be reloaded.

Identify Me – Device Location

The Identify me feature is available to locate a device over a network. If you have multiple network Interfaces over a network you might at some point identify one of them.
The identified device will then blink so that you can locate it.

Procedure

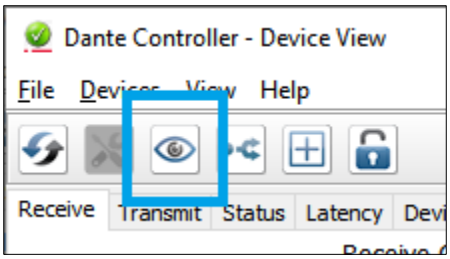
1. Open the Hapi MkIII advanced pages.
This can be done from MTDiscovery (or the Driver MAD or VAD panel) by Mouse+Right clicking on the Hapi icon and open the Advanced Pages.
2. Once the Advanced pages are open go to the top right of the page
3. Check the Identify Me box



4. This will identify the Hapi MkIII (or Anubis) and make the Hapi MkIII Power button blink and as well the network port LEDs at the back of the unit.

You have now identified your device over the network

Note: In Dante mode, you can also go in the Dante Controller and access the Device View of your Hapi. Click on the Identify – Eye icon to make the Hapi MkIII Power button blink and as well the network port LEDs at the back of the unit.



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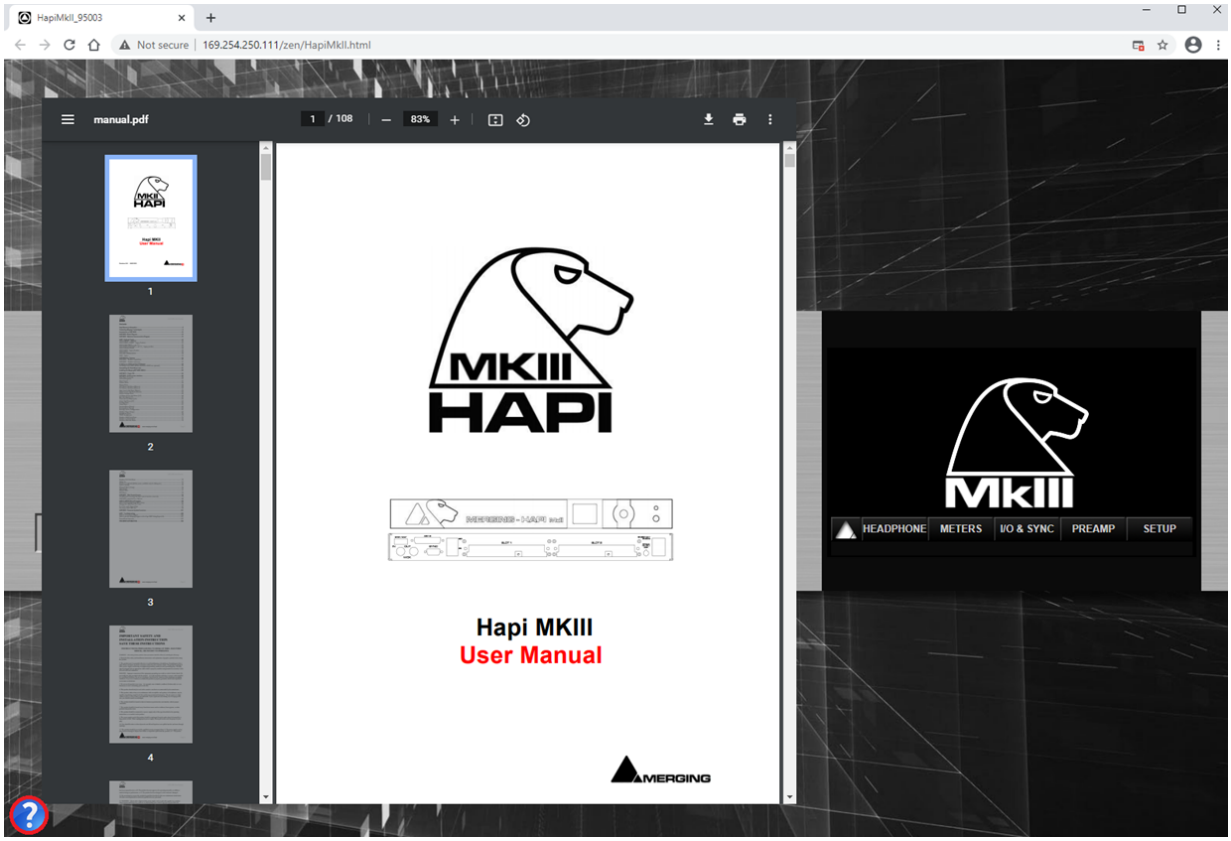
HAPI MKIII embedded User Manual

The Hapi embedded User Manual can be opened by clicking on the question mark sign at the bottom left of your browser. This will overlay the Hapi User Manual on your Web control access page.

Figure5 HAPI MKIII Embedded User Manual



Disconnection Warning - Web Access

User will be warned it the remote web access to the Hapi become offline/disconnected.

Hapi Web Access Disconnected

PT64V3 (Not yet available) & Digidesign HDIO Setup

This document explains how to setup Pro Tools and the devices to use a Hapi with an PT64V3 module alongside a Digidesign HDIO with just one HD Native interface. HDIO can obviously be replaced with any Digidesign Interface.

Hardware setup:

- Connect Port 1 of HD Native interface to Port 1 of PT64 on Hapi
- Connect Port 2 of HD Native interface to Primary Port of Digidesign HDIO
- Connect Hapi WCK Out to HDIO WCK In with coaxial cable
- Connect Hapi to computer with Ethernet cable
- See Block Diagram at the end of the Document

In Hapi:

- In *I/O & Sync*, select Sync: PT2
- In *Setup -> Format*, enable Auto-Follow
- In *Setup -> Format*, choose WCK Output wanted (usage explained further)
- In *Setup -> Modules -> PT2*, select Emulation mode: HDIO
- In *Setup -> Routing*, route signals wanted to/from PT (*NOTE:* with only Port 1 connected, only PT2 (1-32) are used @ 1FS)

In Pro Tools:

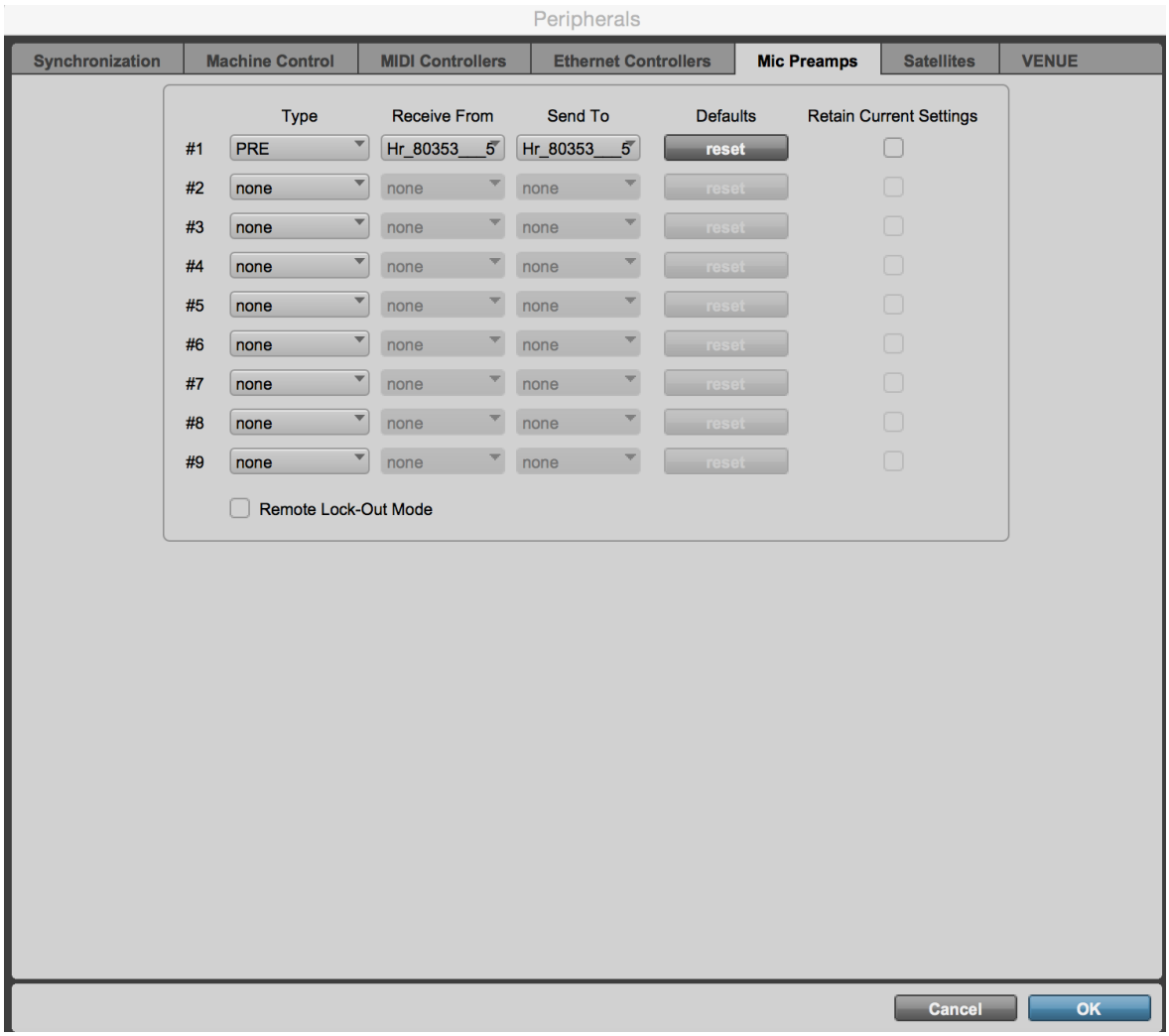
- Select Clock Source : HDIO#3 WCK
    - Select 44k1/48kHz if WCK Output option is set to 44k1/48kHz
    - Select Sample Rate if WCK Output option is set to Follow SR

With this configuration, you are now able to record/read Analog or Digital Signals with Pro Tools.

Manage Mic PREs from Pro Tools

To be able to manage the Hapi Mic PREs from Pro Tools, the latest Merging RAVENNA CoreAudio Driver must be installed on the Mac OS.

1. The Hapi must then be linked to the Mac OS directly with an Ethernet cable.
2. The Hapi is accessible from Pro Tools once it is seen in the *System Preferences -> Merging RAVENNA* settings window.
3. In Pro Tools *Setup -> MIDI -> Input Devices* window, select Hapi_90xxx_midi_pre_in.
   In *Setup -> Peripherals -> Mic Preamps*, select Type as PRE, and select channel number corresponding with the Slot your A/D module is seated in.
4. Enable *View -> Mix Window Views -> Mic Preamps*:
   You are now able to manage the Hapi Mic Preamps options from Pro Tools.

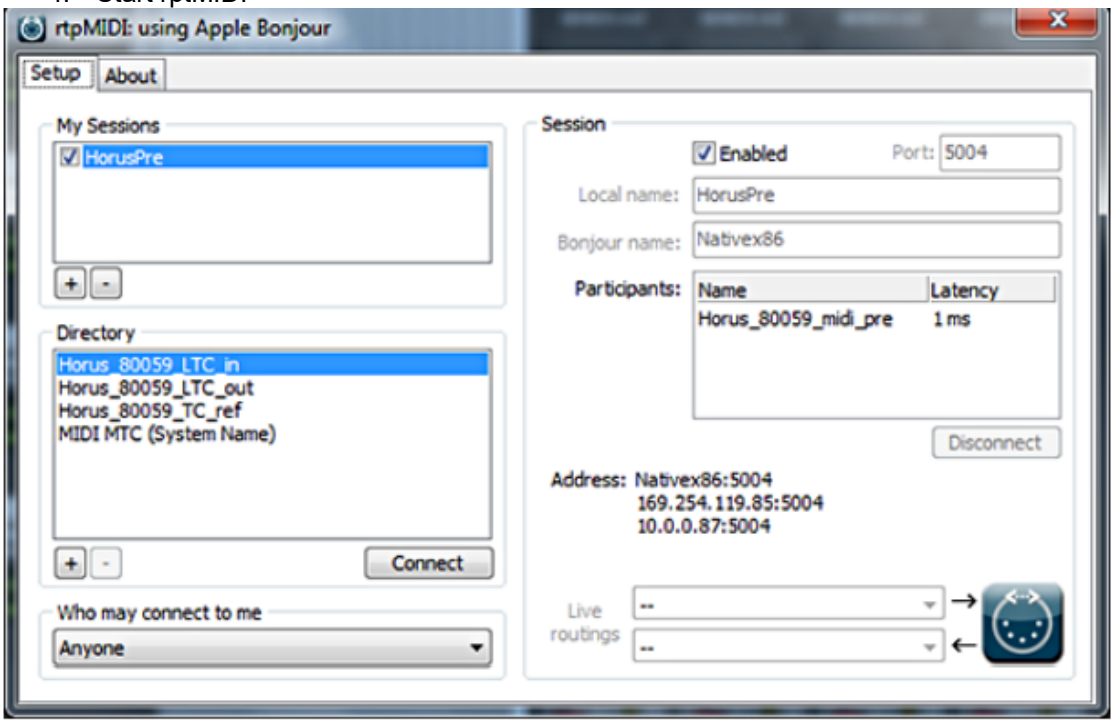


All details are available in the Virtual Audio Device (formerly Core Audio) Guide:
http://www.merging.com/products/networked-audio/downloads

Pro Tools on PC **Horus/Hapi** (PT64V3 available in 2025)

Analog preamps can be controlled directly from within Avid Pro Tools running on a PC. In order to set Pro Tools up for Horus/Hapi preamp control follow this procedure:

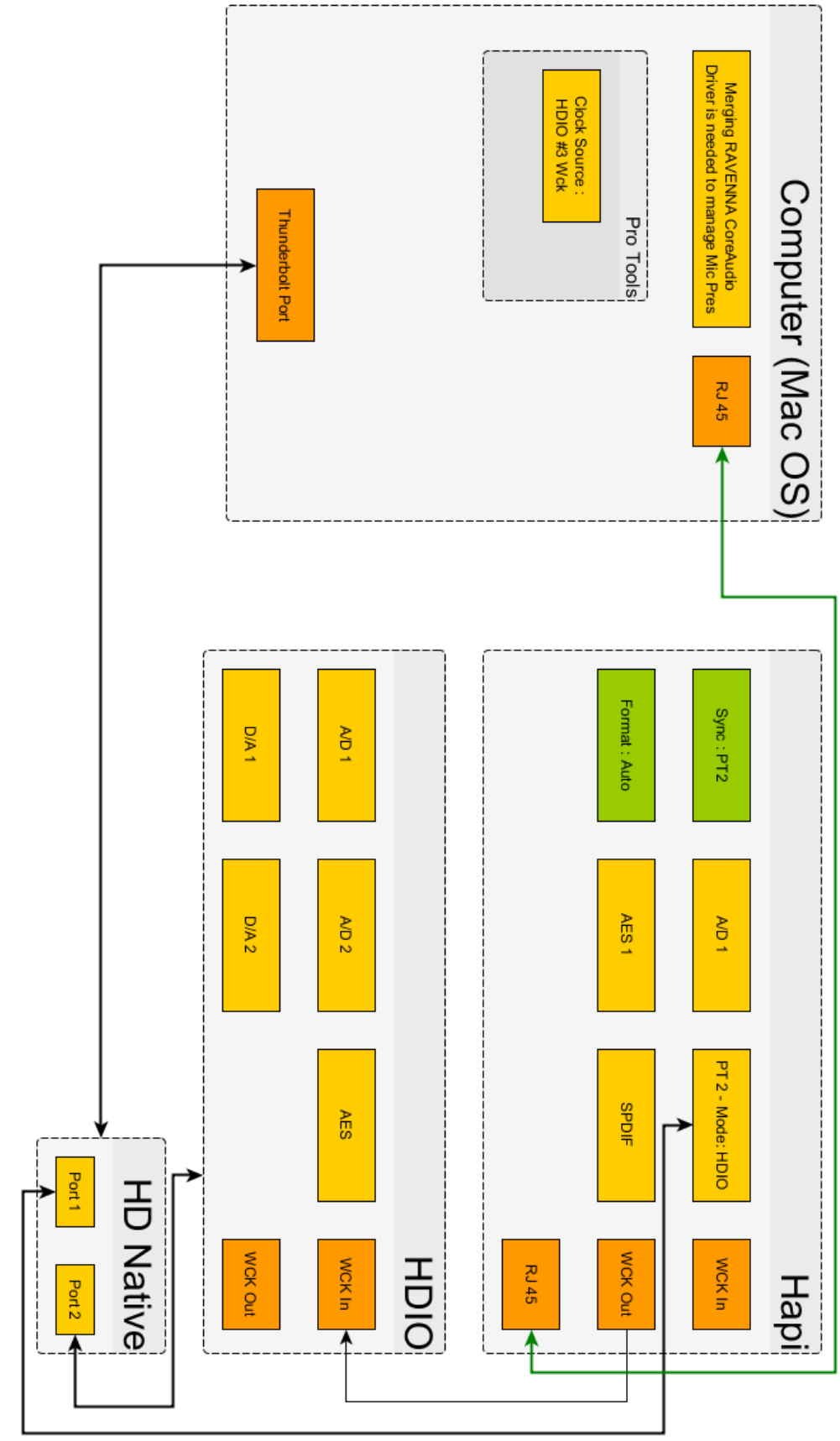
1. Check the Horus/Hapi firmware version and update if necessary, to v19734 or above.
2. Connect Horus/Hapi to the system running Pro Tools through the Ethernet. port.
3. Download rptMIDI from here:
   http://www.tobias-erichsen.de/wp-content/uploads/2020/01/rtpMIDISetup_1_1_14_247.zip
   Install rptMIDI
4. Start rptMIDI



rptMIDI control panel

5. In the My Sessions section (top left) click on the + button to add a new entry.
6. In the Session section (right) rename the entry in the Local name: field to HorusPre/HapiPre.
7. In the Directory section (bottom left) select the Horus_80xxx_midi_pre module entry to add it to the Participants list.
8. At the top of the Session section check the Enabled box to enable the session.
9. Close the rptMIDI control panel.
10. Open the MTDiscovery or ANEMAN application and check that the Horus is connected.
11. Please see: Within Pro Tools on page 38 and follow step 10 and complete the subsequent steps in Pro Tools followed by restarting Pro Tools

Block Diagram



Use Horus-HAPI MIDI din

To be able to use Horus and Hapi MIDI din.

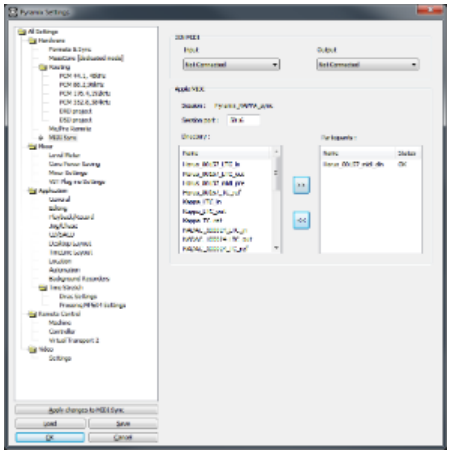
Prerequisite:

- Plug the Sync break out cable (CON-D15-VTC) at the back of your unit (SYNC connector)

On Windows :

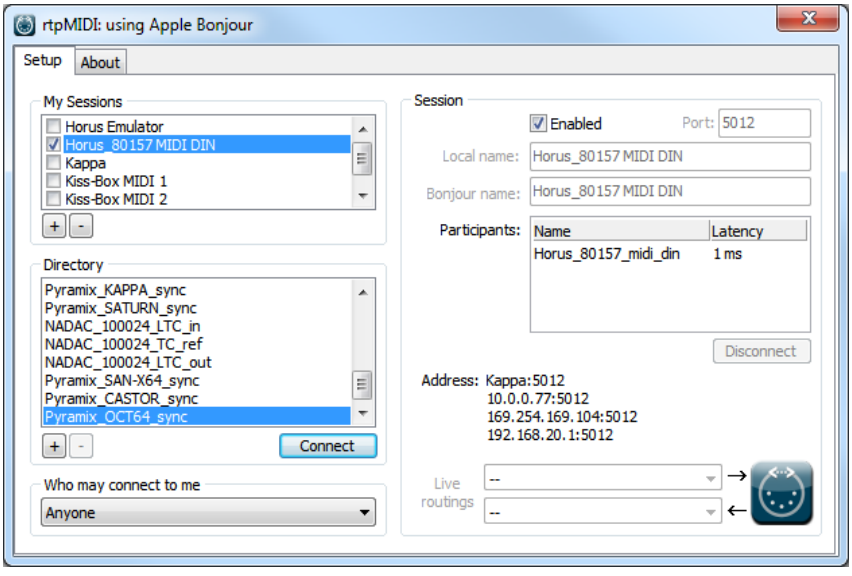
Pyramix v12 > users:

Under the Pyramix Settings>Hardware>MIDI Sync page
In the Directory list, choose an Apple MIDI service suffixed by "...midi_din". This nomenclature correspond to the Physical MIDI DIN port of a Horus/Hapi product.



ASIO users :

1. Make sure your Horus / HAPI is detected in MT Discovery or ANEMAN
2. Download ans install RTPMidi http://www.tobias-erichsen.de/software/rtpmidi.html
3. Start RTP MIDI
4. In My Sessions section, click on the + sign to create a new session, and name it.
5. Once the Session has been created, select the device_name_midi_din in the available streams and click on Connect.



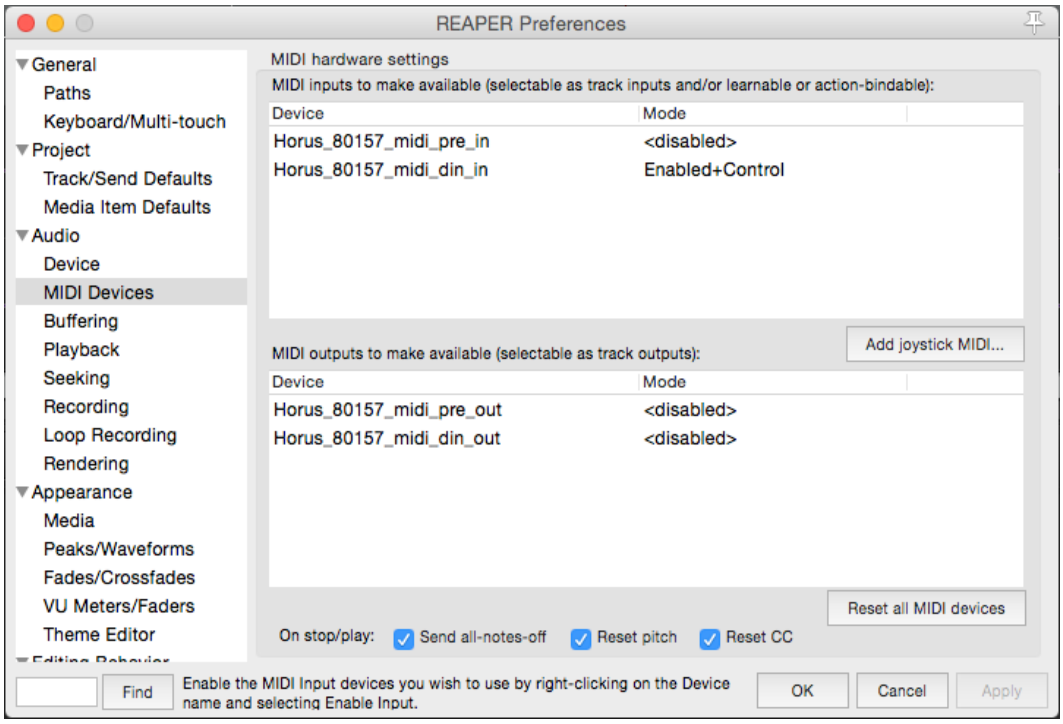
6. The midi_din stream will be passed in the Participants section, you can now use it in your favorite application.

RTPMIDI do not properly always refresh, if you need to change your settings in RTPMIDI, you will have to restart the computer for the changes to apply.

On MacOS:

Horus / Hapi MIDI DIN port can be used directly from within any DAW running on a Mac.
(RAVENNA Core Audio driver v2.0.28855 and above recommended).
In order to use a Horus / Hapi MIDI port in MacOS follow this procedure:

1. Check the Horus / Hapi firmware version and update if necessary to the latest version. (v28855 or above)
2. Connect Horus / Hapi to the system running the DAW through the Ethernet port. (v28855 or above)
3. Make sure your Horus / HAPI is detected in MT Discovery or ANEMAN
4. All available MIDI DIN port available on the network will appear as a usual MIDI port. I.e. Reaper



HAPI MKIII - Firmware Update Procedure

PREREQUISITES

- ANEMAN v1.7.0 and above or MT Discovery v15.0 and above. Download from https://www.merging.com/anubis/download
- An internet connection to download the latest Hapi MkIII Firmware https://www.merging.com/support/downloads#current-hapi-downloads
- Connecting the ethernet interface of the Anubis to a Mac or PC system for the update procedure
- Google Chrome is the recommended browser

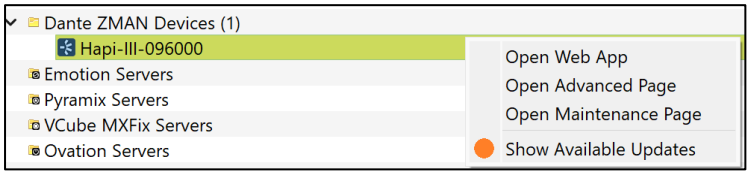
  ⚠ *Warning. Safari is known to cause update slowdown or update button might not appear. Use Chrome*

Auto-Firmware Update with MT Portal

1. Install MT Discovery and the MT Portal

2. Launching MT Discovery

3. Mouse Right+Click on the Hapi-III entry, it should propose new updates for the Hapi MkIII under “Show Available Update”, select this line.



4. This will open the MT Portal from which you can update the RAVENNA/AES67 firmware or the Dante Firmware.

5. Select Download & Update to update now, or download only to Manually install later.

6. Reboot the Hapi MkIII when the update is successful

Firmware Update Manual Mode

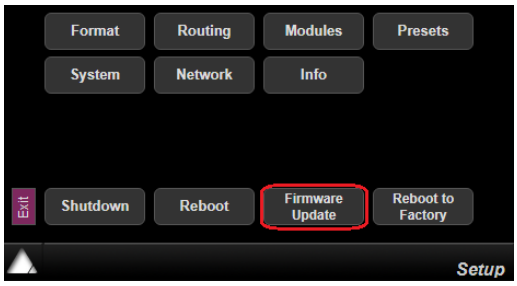
1. Download the latest HAPI MKIII Firmware
https://www.merging.com/support/downloads#current-hapi-downloads

2. Connect your Hapi MKII network port to the system where you have downloaded the latest firmware

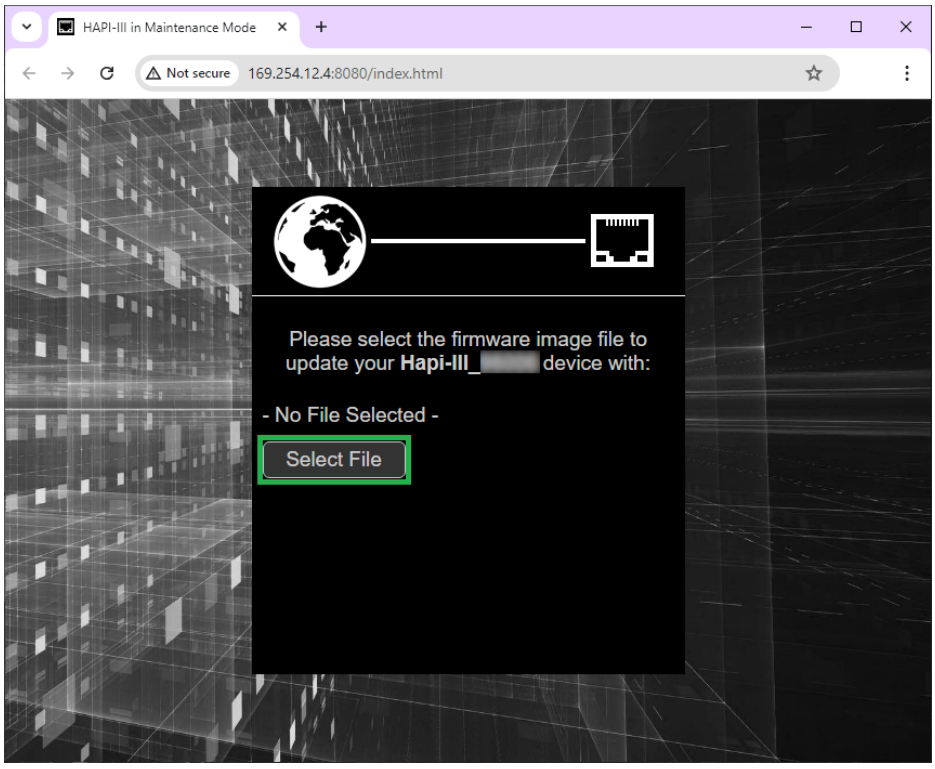
3. Launching MT Discovery or ANEMAN and it will discover your Hapi MKIII within seconds.

4. Once discovered perform a Mouse + Right Click on Hapi MkIII and Open Maintenance Page

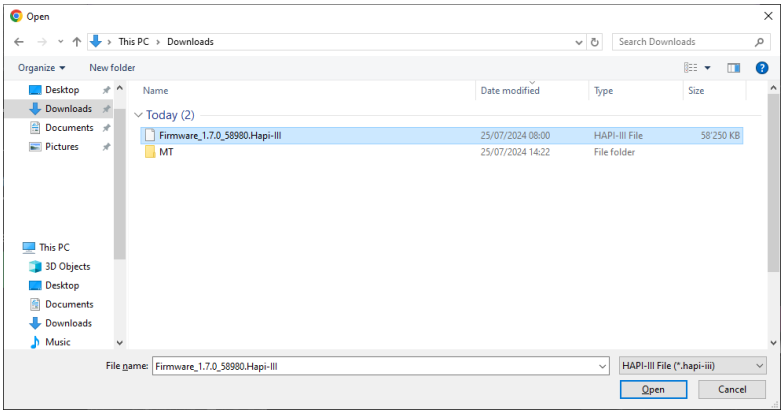
Note: It is also possible to access the Firmware Update from the Web Access > SetUp page



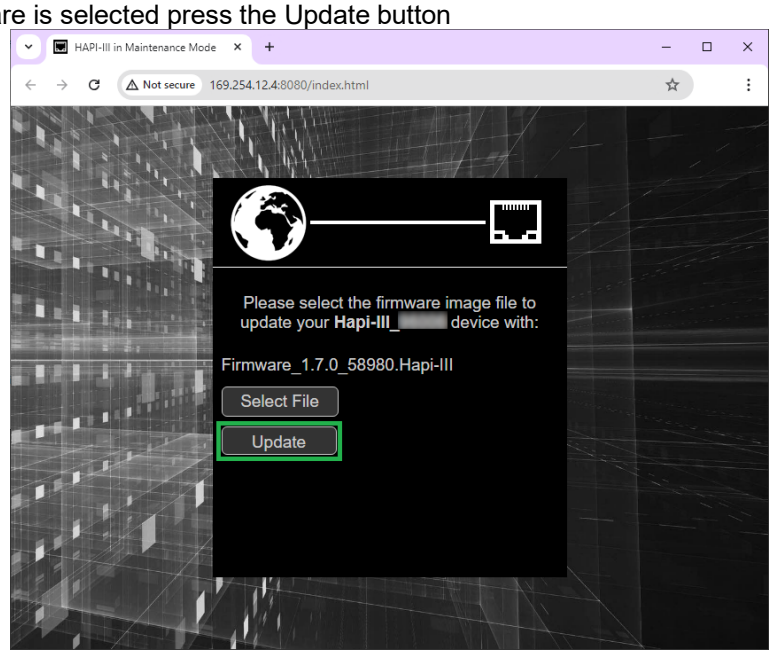
5. This will open a browser page from which you will be able to select the **.Hapi-III** firmware file



6. Use the “Select File” button to select your firmware
7. This will open the explorer form where you can load the Hapi MKIII Firmware

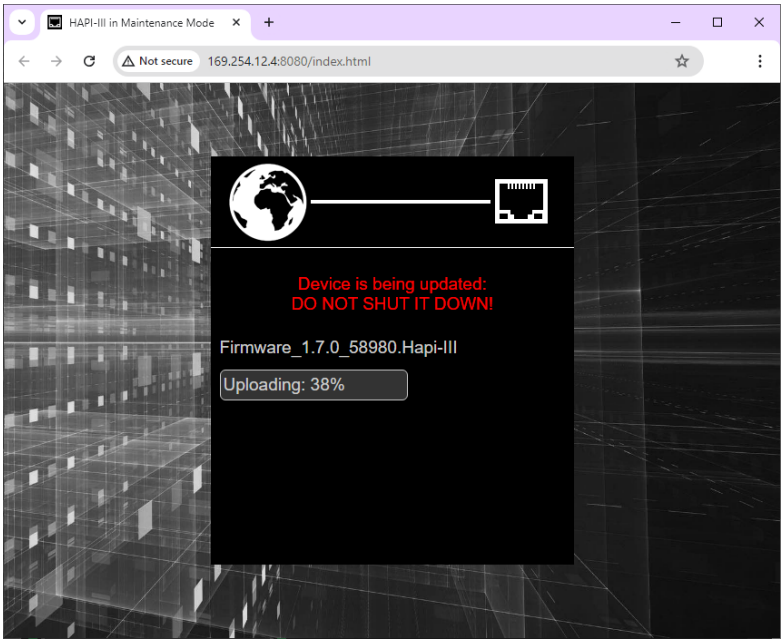


8. Once the firmware is selected press the Update button

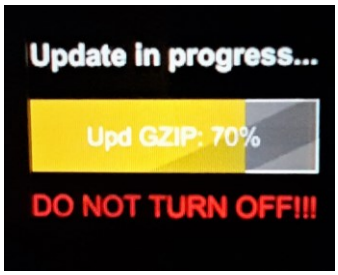


9. Wait for the upload and update to complete.

⚠ *Warning. Never abort the Firmware when it is updating, this could damage the HAPI configuration.*

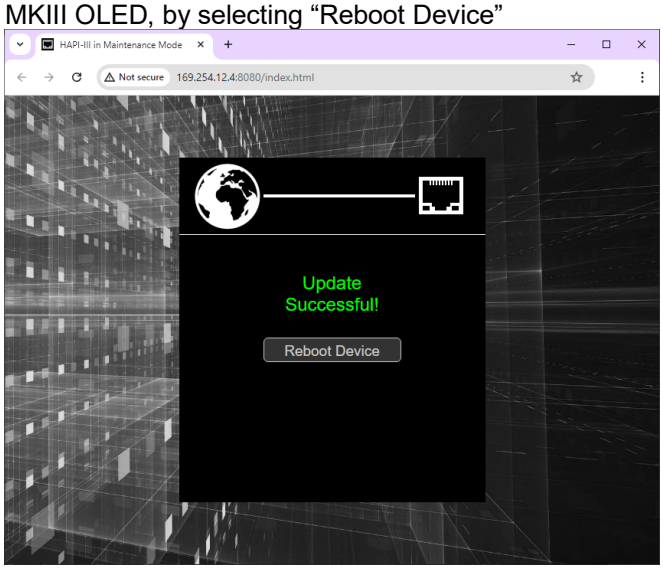


Notice that your Hapi MKIII OLED will also display the progression of the update.

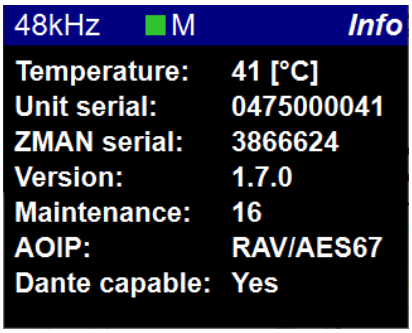


.⚠*Warning: We do not recommend that you refresh the browser page or restart the Hapi while a firmware update is in progress.*

10. Once the Firmware update is completed please reboot your Hapi MKIII. You can do this from either the browser or the Hapi MKIII OLED, by selecting “Reboot Device”



You should now be on the latest Firmware. You can verify the Firmware version of your Hapi by opening the Info page under Setup>Settings>Info



In case you cannot access the Hapi MKIII Maintenance mode.

Make sure that Hapi MkIII is well connected to your system, it is mandatory that the Ethernet port or Switch is a Gigabit one.

Under the Setup>Settings>Info page take note of the written IP Address (ideally be set to Auto IP on both your Hapi MKIII and Network Interface card).

Type the Hapi MKIII address in your Chrome browser followed by :8080 Example: 169.254.250.11:8080

You could also just open the Hapi web access page and add the :8080 at the end of the IP address, follow by pressing enter.
You should now have access to the Hapi Maintenance page and be able to update your Hapi firmware

Start Up in Maintenance Mode (Rescue)

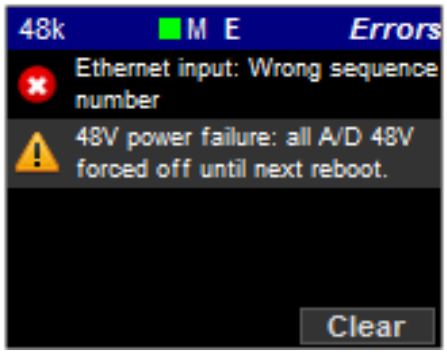
In case of problems updating the firmware or not being able to see the Hapi for update. You can start up the Hapi MkIII in Maintenance Mode by pressing the power button and simultaneously pressing the Rotary encoder for a few seconds.
The Hapi MkIII will then start in Maintenance Mode and will be ready for a firmware update.

HAPI - Troubleshooting

Hapi on screen Error Report

Your Hapi can display on the OLED screen some detected errors. In case of an error report the Hapi will display the message on its screen. Refer to the error list below as a reference. Once the issue is sorted Press the “clear” button to remove reported error. If the message reappears it indicates that the error is still present.

Hapi Error report example:



Potential reported errors:

"Primary Power Supply Failure";
"Secondary Power Supply Failure";
One of your Power supply is down, it is recommended that you eventually shutdown the Hapi and verify your power cord connections

"Hapi Application failure, please reboot"
The Hapi internal application has failed. Will require a reboot, make sure that you are using the latest Hapi firmware available. If the problem persists contact support@merging.com

"Ethernet input: GP fifo overrun";
"Ethernet input: GP descriptors fifo overrun";
The Ethernet communication is overloaded. The bandwidth is too small. Verify your set up, take note that a RAVENNA Network configuration must be running on a dedicated and certified Merging Switch. If problem persists contact our support team.

"Ethernet input: Audio packet still pending";
"Ethernet input: Audio pipeline too small";
"Ethernet input: Wrong sequence number";
"Ethernet input: CRC error";
"Ethernet input: Queue mux error";
"Ethernet input: Audio buffer too small";
"Ethernet input: SSRC mismatch"
Error on the incoming RAVENNA streams. There might be click on the physical output of the Hapi. Such a click could have occurred on one of the RAVENNA bank of 8 channels. Verify your set up, mainly on the network side and afterwards clear the error. If the problem persists contact our support team.

"Ethernet input: Unknown error";
"FPGA memory: Timeout";
"FPGA memory: Unknown error";
Contact Merging Support

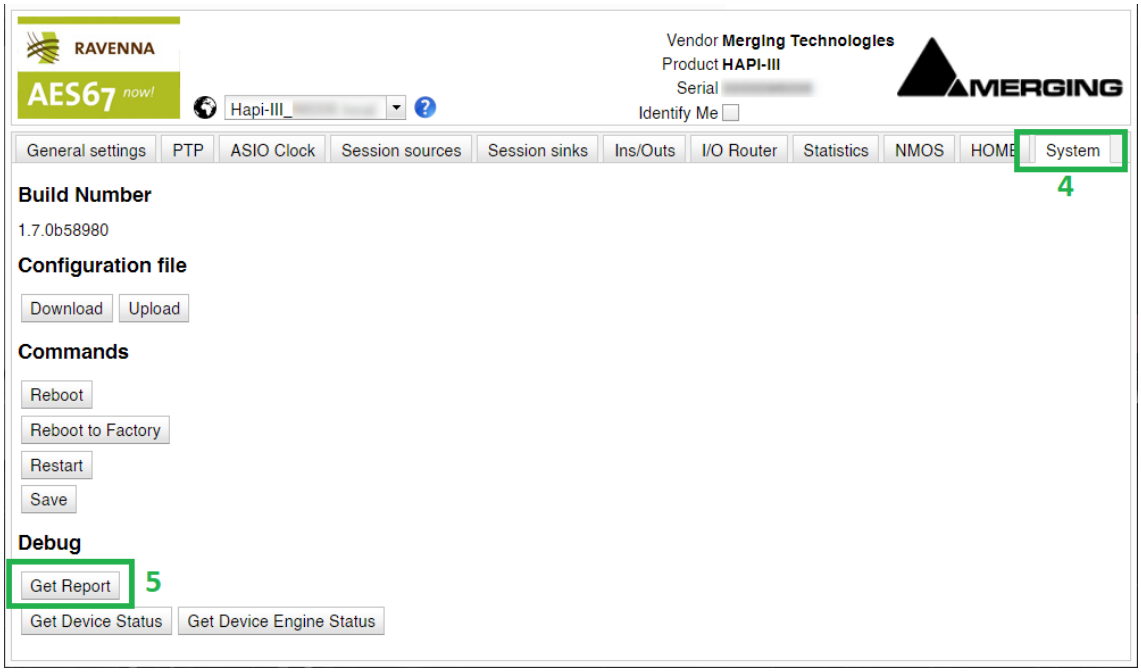
“48V power failure: all A/D 48V forced off until next reboot”
The attached error message is displayed when:

1. 48V is malfunctioning
2. If there is a short circuit on 48V

If a MAJOR (by MAJOR, we mean that the threshold of short-circuit detection requires at least 10 Preamp inputs to be shorted simultaneously) 48V Phantom Power Supply short circuit is detected, 48V is forced off on all A/D channels and the following error message is displayed.
Note: 48V will be forced off until reboot.
Note: the user 48V settings are not affected i.e. the UI still shows the 48V as configured by the user.

How to provide Merging Support with a Hapi MKIII Debug Report file

1. Connect your Hapi MKIII to your system via Ethernet.
2. Open MT Discovery and Mouse+Right Click on the Hapi MKIII entry to select Advanced Page
3. This will open the Advanced page in your web browser (e.g. Google Chrome)
4. Select the System Tab
5. Click Get Report button and save **HapiMkiii_9xxxx_report.**bin file.
6. Send the .bin file report to Merging



Firewall and Antivirus

Windows Firewall:
The Windows Firewall can block communication between MassCore and Hapi.
By default, the built-in Windows Firewall should be automatically configured by the installer, but in some special cases, the user might have to configure it manually.
Antivirus: Merging also recommends users to configure their Antivirus, some Antivirus as Avast or Sophos have been known to block the Hapi discovery and/or I/O Connections
Please see the details on
https://merging.atlassian.net/wiki/spaces/PUBLICDOC/pages/4820536/Antivirus+and+Merging+Technologies+Softwares

FOR MORE INFORMATION

MERGING HAPI Website
https://www.merging.com/products/interfaces/hapi

MERGING HAPI Downloads
https://www.merging.com/support/downloads#current-hapi-downloads

MERGING Knowledge Database, FAQs and Tutorials
https://merging.atlassian.net/wiki/spaces/PUBLICDOC/overview

MERGING Dante FAQ
https://merging.atlassian.net/wiki/spaces/PUBLICDOC/pages/364576772/Merging+Dante+FAQ

MERGING SUPPORT
support@merging.com

MERGING YouTube CHANNEL
https://www.youtube.com/channel/UCR5q_dlb9dYnXTrVDWMshgw