MKIII HAPI

Dante®

Appendix

Revision 0.1 05 December 2024

MERGING

Contents

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 ADO8V3S/P, ADA8V3S/P, DA8V3S/P, MADI128V3, or PT64V3 (not yet available) option cards. Once the Hapi is fully loaded with option cards, it is capable of achieving 88 inputs and 90 outputs @ 1FS There are indeed 2 more output channels than input channels, including the 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 144 inputs and 146 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 Firmware Support up to 256 IO
• DANTE Firmware Support with license plans, up to 64 IO
• Hapi MKIII supports Network redundancy and Network Switch mode
• 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 In RAVENNA/AES67 (Seamless Protection Switching)
• Dante redundancy
• 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

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

RAVENNA

The Hapi has been designed so that the MADI, AES, SPDIF/ADAT, PT64 (the PT64V3 is not yet available for Hapi MKIII) 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 Wordclock directly to the Hapi unit over the same network as your audio. The RAVENNA port even provides for 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

The default firmware mode is RAVENNA which supports up to 256 IO streams.

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.

Hapi MkIII running Dante can support up to 64 x 64 IO with license plans.

The Hapi MKIII is delivered without a Dante license, the license must be purchased separately.
In order 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.

Dante Setup Guidelines

Detailed procedure on how to setup the Merging Hapi MkIII for Dante AoIP operation mode.

Important:

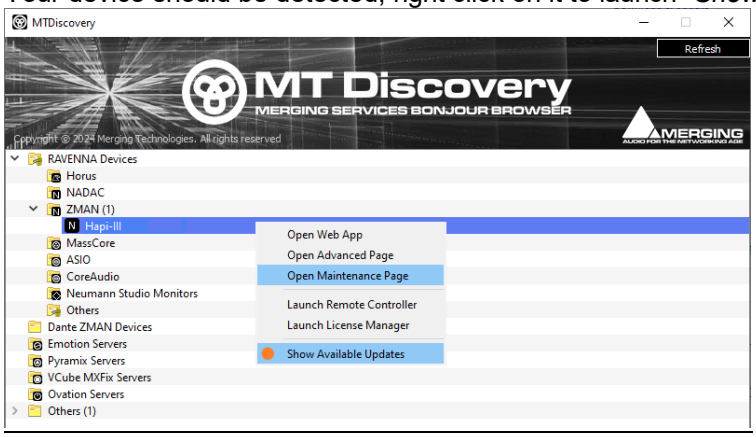
- Hapi MKIII is delivered without a Dante license; a license plan must be purchased separately.
- Hapi MKIII is delivered ex-factory with the RAVENNA/AES67 firmware running.
- In order to operate in Dante mode, it requires that the Hapi MKIII Dante firmware is updated in the unit.

Requirements:

- A Hapi MkIII
- The Hapi MkIII Dante Firmware
- Applications installed
  - MT Discovery 20.0.0 and above
  - MT Portal 1.2 and above
  - Dante Controller
- An Audinate account
- Please take note that to run Dante IO it requires a License purchasing plan.

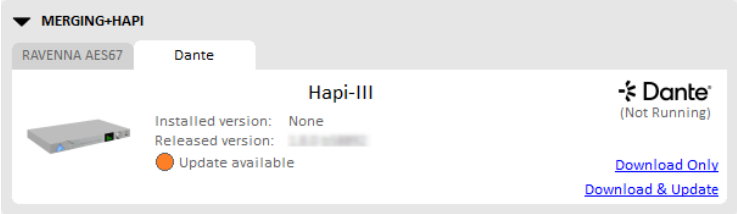
Procedure:

1. Download and Install the Merging *MT Discovery* 15.0.10 > and *MT Portal* 1.2 > applications. Those can be downloaded from the Merging website or Neumann website.
2. Connect the Hapi MkIII to your computer gigabit network interface.
3. Start the *MT Discovery* application.
   Your device should be detected, right click on it to launch "*Show Available Updates*".



   Note: If the Dante firmware for your device has been already manually downloaded, you may directly "*Open Maintenance Page*" from MT Discovery and update your device.

4. In the *MT Portal* application, select your device and select the *Dante* tab.
   The MT Portal will display the Dante firmware, please click on *Download & Update*.

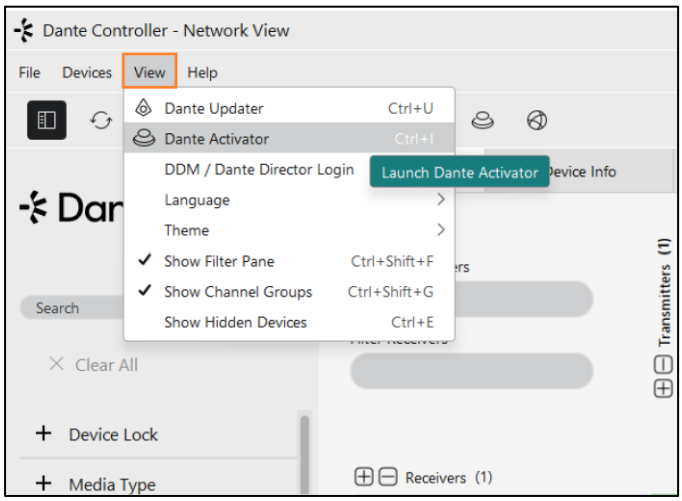


   Note: The firmware update will take more than 15min, please do not abort at any time.

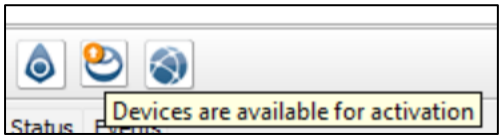
5. Once the Dante Firmware has been updated, please reboot the unit.
   Note: For Manual Firmware update refer to the procedure at the end of this manual

6. Make sure you have downloaded and installed the *Dante Controller* application from the Audinate website.
   The Dante Virtual Sound Card (ASIO/CoreAudio driver) is also recommended for operating your DAW in Dante mode (see additional information below).

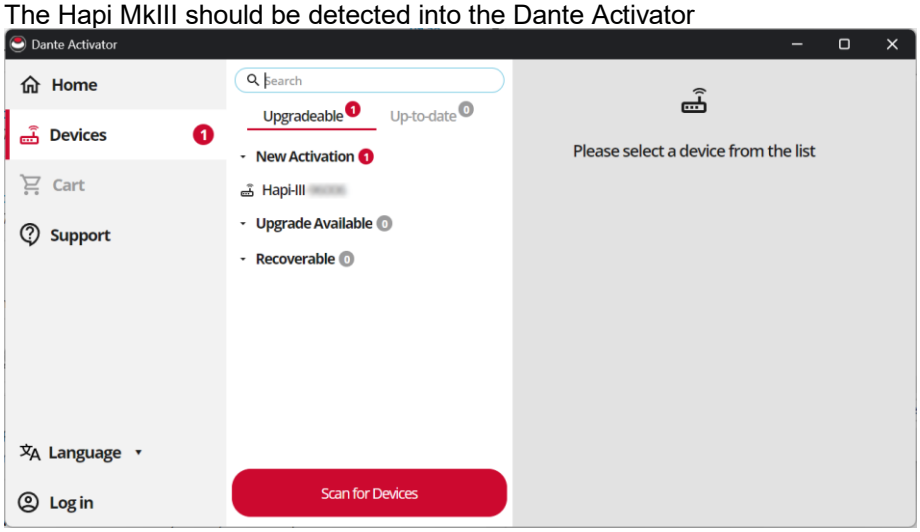
7. With the Hapi MkIII connected to the system running Dante Controller, launch the *Dante Activator* from the *View* menu.



Alternatively, the Dante Activator will also notify that Devices are available for activation, in the Dante Controller icons.



8. The Hapi MkIII should be detected into the Dante Activator

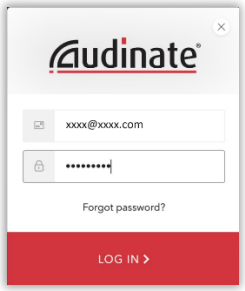


9. Select the Hapi MkIII device and choose a license plan.
   16 x 16 IO or 64 x 64 IO are available.

   Note: License plans can be upgraded later and current paid amount will be deducted from the upgrade cost.

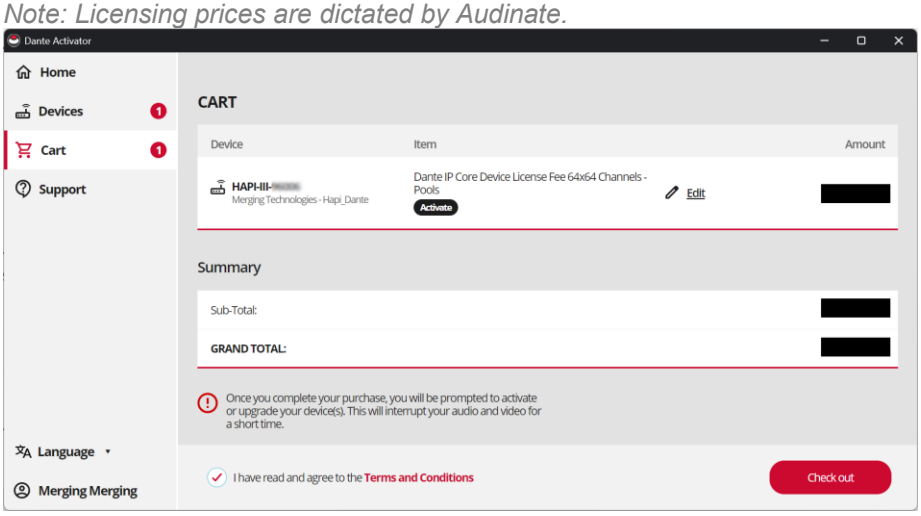
Dante Ready License Plan	44.1/48kHz	88.2/96kHz	176.4/192kHz
License plan 16 x 16 IO	16	16	16
License plan 64 x 64 IO	64	32	16

10. Go to Cart and *Check out*
    You will be asked to Login to your Audinate account, create one if you don't already have one.

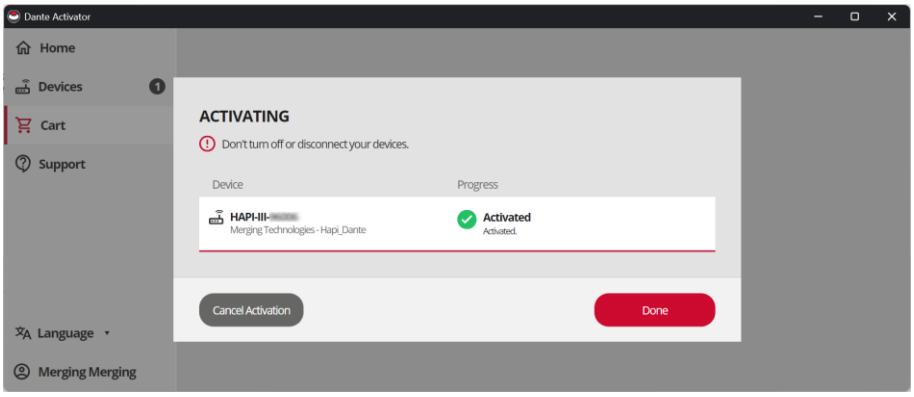


11. Activate your license plan upon entering the purchase details (e.g. credit card)

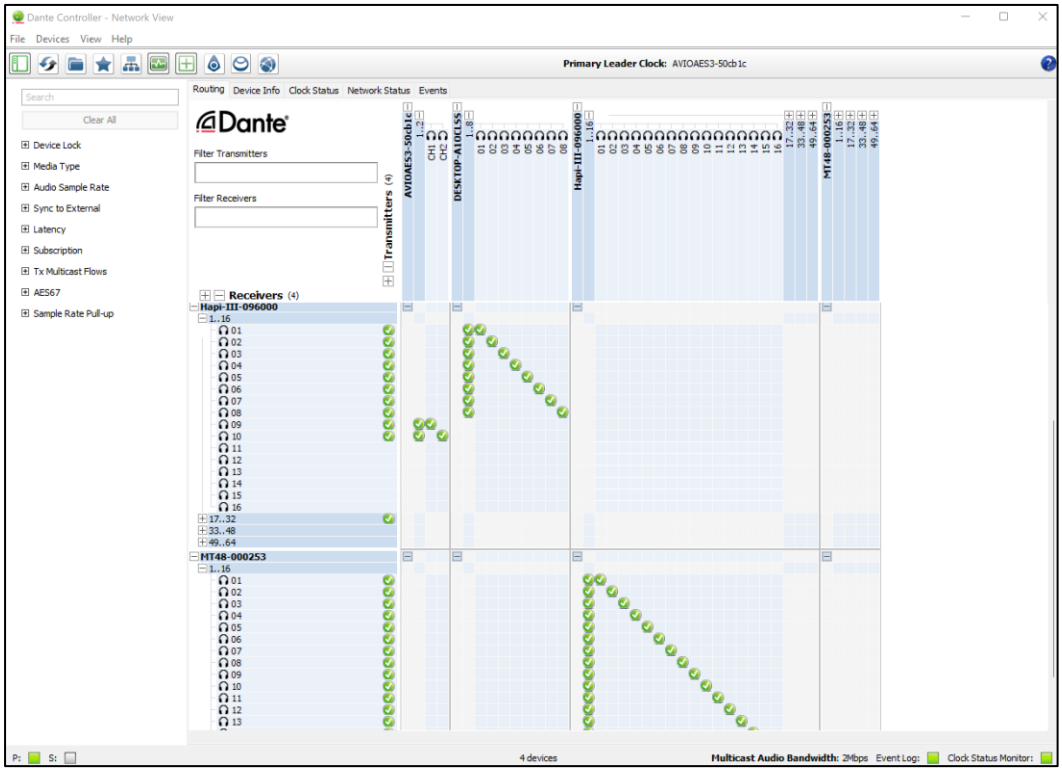
    Note: Licensing prices are dictated by Audinate.



12. Wait for the confirmation of the Activation



13. The Hapi MkIII is now ready for Dante operations.
    It will be discovered into the Dante Controller and can be used with other Dante devices or the Dante Virtual Sound Card. (Dante Virtual Sound card and/or Dante VIA must be purchased separately from Audinate)

14. 

Additional Information

- Dante Activator FAQ and Troubleshooting.
- Dante Virtual Sound card and/or Dante VIA must be purchased separately from Audinate
- The Dante Virtual Sound Card IO channel count support differs.
  Refer to Audinate DVS documentation for details.

Network speed	Max Channels @ 48kHz / 24bit	Max Channels @ 96kHz / 24bit	Max Channels @ 192kHz / 24bit
100Mbps	32x32	16x16	8x8
1000Mbps (Gigabit)	64x64	32x32	8x8

Audinate software suite

Dante Controller

Dante Controller allows for routing between all RedNet devices and also provides the provision for control of third-party Dante products. Dante Controller is installed with RedNet Control, but can also be downloaded separately from www.audinate.com

Dante Controller is developed and distributed by Audinate.

Dante Virtual Soundcard (DVS)

Dante Virtual Soundcard is a simple, easy-to-use software application that turns a Windows or Mac OS X computer into a Dante-enabled device, enabling you to instantly connect to any Dante network. No special hardware or modification is required — Dante Virtual Soundcard uses your computer's Ethernet port to communicate with other Dante-enabled devices on the network.

Dante VIA

Dante Via is easy-to-use software that delivers unprecedented multi-channel routing of computer-based audio, allowing a wide range of applications and devices to be networked and interconnected, easily and inexpensively.

Dante Connect

Dante Connect delivers synchronized audio directly from on-site Dante networks to cloud services for seamless cloud production, enabling increased flexibility and more efficient usage of personnel and on-site hardware.

Dante Domain Manager

Dante Domain Manager is the essential hub for all Dante networks. Secure devices, manage users, organize rooms and functions, and run your AV seamlessly over routed networks.

HAPI MKIII Key Features

Networking
The Merging Hapi MKIII fully supports (2) RJ45 connectors, that can be configured in two different modes of operations.

1) Dante Redundancy: Can be activated from the Dante Controller or Advanced Pages. Dante offers a full-time redundancy option with permanent primary and secondary audio transmission. Redundancy requires a second network, either using a second physical switch (recommended) or via a VLAN isolating the network traffic.

   Audio data is transmitted on both the primary and secondary networks simultaneously. In the event of a failure on one network, audio will still continue to be transmitted via the other network.

2) Network Switch mode (default), 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.

Note: Support for ST2022-7 Seamless Protection Switching is only supported when running the RAVENNA/AES67 firmware.

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, 16 A/D and 16 D/A (ADA8V3S or P) will allow for 16 inputs from the live room and 16 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) 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 or DANTE stream as well. This is the function that allows the user operate with the Hapi in either a standalone (Analog to MADI/AES AD/DA) or in RAVENNA or DANTE Mode, which connects the audio a network (described below).
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/P Remote controlled Mic/Line A/D module
The ADO8V3 (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 or DANTE 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.

DA8V3S/P 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 DA8V3 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.

ADA8V3S/P Remote controlled Mic/Line A/D module with transparent Analog output
The ADA8V3S (work at sample rates up to 192 kHz) and the ADAV38P (works at sample rates up to DSD) are combining high quality Microphone pre-amplifiers and analog output module.

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.

MADI128V3 (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

PT64
64 Channels of Pro Tools HD™ support on Digilink mini connector, from 44.1 to 192 kHz sample rates
Important: The PT64V3 extension card for Hapi MkIII is not yet available and on the roadmap for 2025.

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.

DANTE IP Audio
Using DANTE 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 DANTE node can receive information from and deliver information to, any combination of DANTE devices on the network. It’s Audio technology 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.

Synchronization
Audio is not the only information that can pass down the network connection. Hapi is also able to send sync (LTC) down the same wire to and from the Hapi unit.

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

HAPI MKIII - Modules Capabilities (Dante)

	Sampling Rates	44.1/48kHz	88.2/96kHz	176.4/192kHz
MODULES	ADO8V3S Standard	√	√	√
	ADO8V3P premium	√	√	√
	DA8V3S standard	√	√	√
	DA8V3P premium	√	√	√
	ADA8S standard	√	√	√
	ADA8P premium	√	√	√
	PT64V3 (pending 2025)	√ (64 I/O)	√ (32 I/O)	√ (16 I/O)
	Headphone	√	√	√
	MADI128V3	√ (128 I/O)*	√ (64 I/O)	√ (32 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)

** 128 Channels in standalone, as Dante audio network supports a maximum of 64 IO channels*

HAPI MKIII - Modules Latencies (Dante)

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

* DA Filter setting
- Slow Roll Off Filter option = 12 Samples
- Sharp Roll Off Filter option = 39 Samples

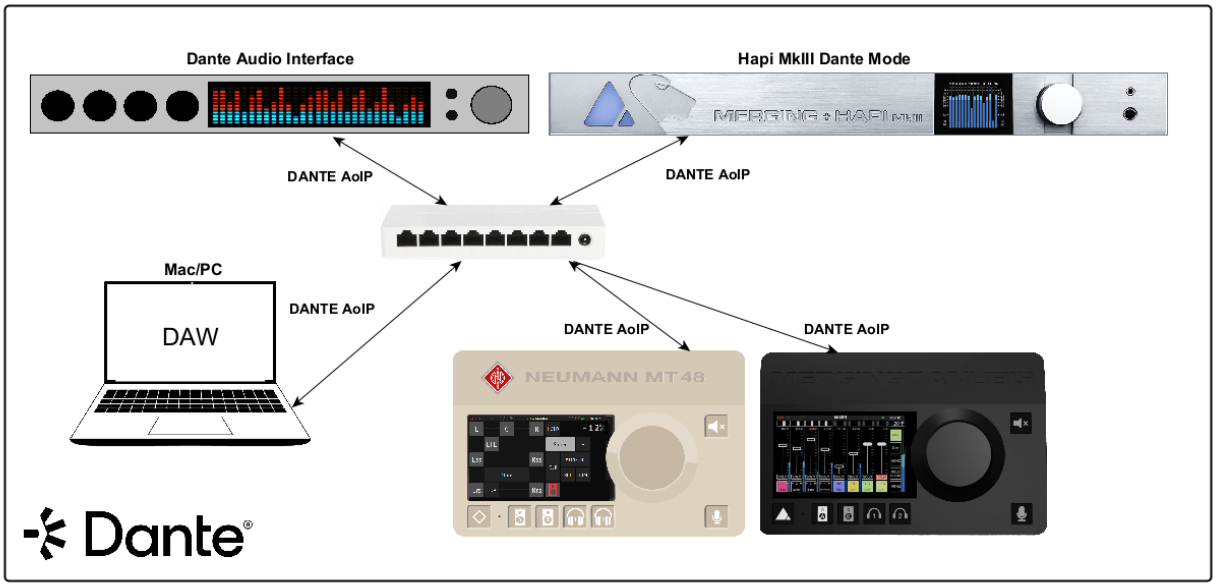
(More details available under the DA Module chapter below)

** 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

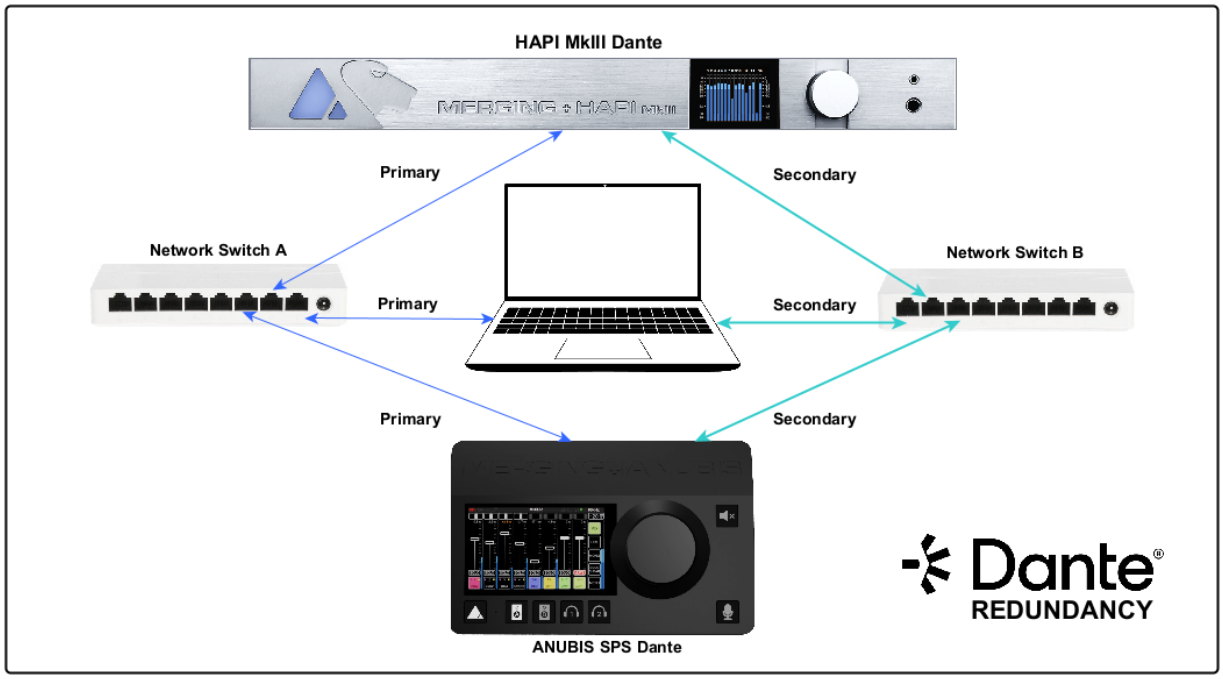
Dante Use Cases

Dante Network integration



The Merging Hapi MkIII, Anubis and NEUMANN MT 48 can fully be integrated into a Dante network once they are running the Dante firmware with a purchased Dante/Audinate license plan.
Dante Controller should be used to manage/establish connections.

Dante Redundancy



Devices set to Redundant under the Dante Controller will duplicate Dante media traffic to both Ethernet ports, allowing the implementation of a redundant network via the secondary port.
The ability of devices to be detected by Dante Controller when either the Primary or Secondary network fails depends on the network to which the computer is connected. If the computer has two network ports, it can be connected to both networks.

Network switch

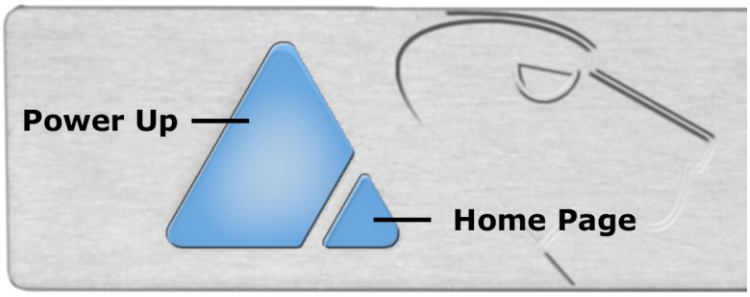
Dante systems typically require at least one network switch, and more complex systems may need multiple switches. Quality of Service (QoS) is a crucial feature for these switches and must be configured for complex setups. Managed switches are recommended for their advanced configuration and monitoring capabilities. For comprehensive information, including switch setup guides and examples, please refer to online resources.

Merging recommends the following configuration for Dante usage

https://merging.atlassian.net/wiki/spaces/PUBLICDOC/pages/4818859/Dante+devices+Multicast+Groups+configuration+-+Cisco+switches.

Hapi Power ON

1. Press the Hapi Front Panel Power Button



Note: Pressing small triangle will display the Home Page on the Hapi OLED.
The badge wil blink during the start up sequence, while the OLED will be black the first 20sec.

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.

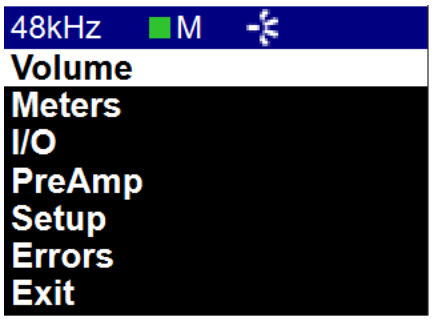
3. Wait until the Hapi is fully started and displaying the Main Home screen.

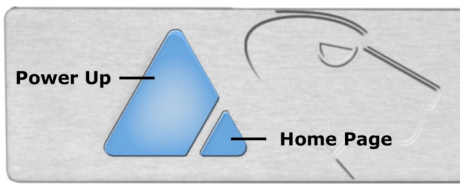
Power Button color code.

Blue: Normal operational state
Yellow: Maintenance mode
Red: Firmware Update State - Do not abort

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 at any time you want to return to the Home Screen, you can press and hold the Main Rotary Control button for a second in order 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.**

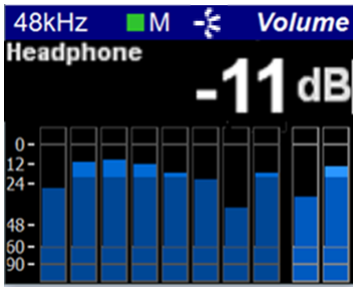




Pressing only the Home Page small pyramid button will bring the Hapi home page, this is applicable if no selection is active on the OLED

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.

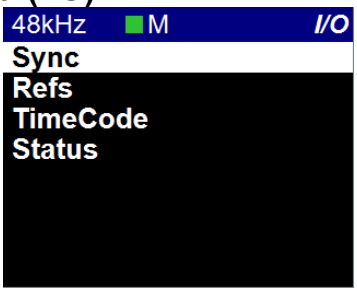


Meters Menu

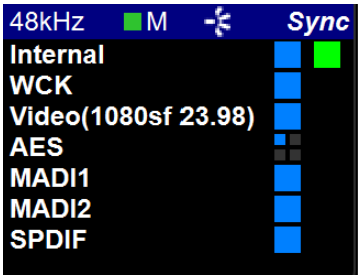
The Meters menu is where the user can view the metering of the Hapi available Input or Output modules.

For more details refer to the Hapi MkIII User Manual

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.



Internal Clock: Dante

All Dante-enabled devices use the IEEE 1588 Precision Time Protocol (PTP) across the network to synchronize their local clocks to a leader clock, providing sample-accurate time alignment throughout the network. One Dante device will be elected as the PTP Leader Clock for the network; all other Dante devices act as a PTP Follower Clocks to the elected leader clock. Although many Dante devices may be capable of becoming PTP
Leader Clock, only one device will win the election. Devices with clock inputs (e.g. Word Clock or AES3) will be preferred in the election process. A gigabit connected device is preferred over a device connected via 100Mbps. A tie-breaker rule of the lowest MAC address is used if several equivalent candidate leader clocks are available. The election process may be overridden by manually setting 'Preferred Leader' on a device.

Dante Clock Types

Each Dante hardware device can derive its clock from either its high-quality onboard clock circuit, or an externally connected word clock. In the case of Dante Virtual Soundcard, the computer's clock will be used.

Reference navigation

Selecting a Reference with multiple choices (such as Sync or 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

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.

Master: indicates that the current Hapi is the PTP Master

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 (available only in 2025 for Hapi MkIII)
7. Internal

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:

LTC IN: Corresponds to the incoming LTC frame rate

Hapi PTP status: MASTER or SLAVE

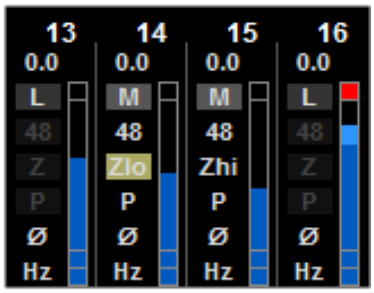
Video Format Detected:
Supported Formats:
PAL – NTSC
720p23.98– 720p24 – 720p25 – 720p29.97 – 720p30
720p50 – 720p59.94 – 720p60 (not recommended video formats)
1080i25 – 1080i29.97 – 1080i30
1080sf25 – 1080sf29.97 – 1080sf30
1080p23.98 – 1080p24 – 1080p25 – 1080p29.97 – 1080p30

PTP Master note: The GMID (Grand Master ID) is available from Web Access page under IO & Sync, and in the Advanced pages – PTP tab.

Word Clock Inputs Allows synchronization of the Dante network to house word clock.

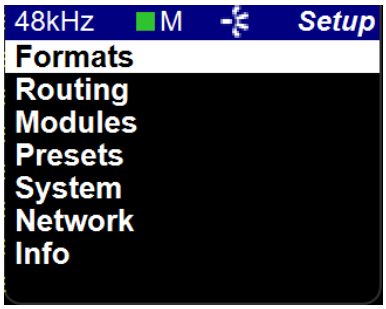
PreAmp Menu

The PREAMP (A/D) menu becomes active if you have 1 or more ADA or ADO modules installed in the Hapi unit, giving full access to the Input controls.

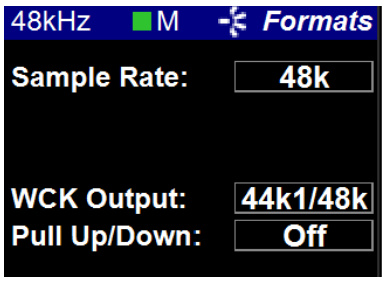


Setup Menu

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 are available when running in Dante.

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.

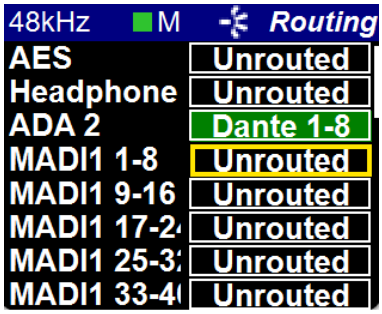
Follow SR: When enabled the WordClock Ouput will follow the Sampling Rate selected.

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 on the advanced routing refer to:
The RAVENNA Advanced Pages online guide
The Dante Advanced Pages online guide



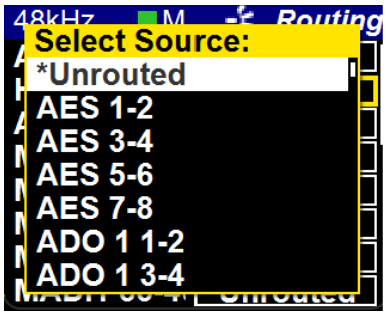
Here the AD8 module is routed to the Dante 1-8 routing

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 (availability 2025):	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!
Dante:	Takes you to the Dante Routing page (refer below)
Loopback:	Takes you to the Loopback module (present only in debug mode)

Warning: Two inputs can't be routed to the same output, as we are routing channels and not mixing.

Routing: Source Configuration

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



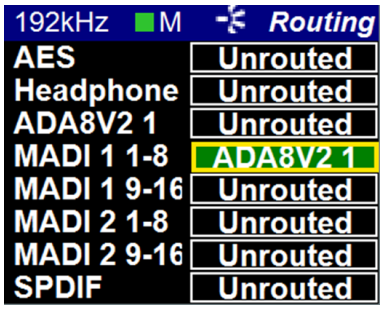
For all of the output modules (ADAT/SPDIF,AES, D/A N, PT64, MADI & Headphone Jack) the user can set where the signal feeding it comes from. Any combination is possible using the Output source page linked to any of the output modules.
* All routing in the Hapi is currently achieved using banks of 8 channels.

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:	Available in 2025. 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
DANTE:	Sets the module being configured to receive signal from the Dante channels
Loopback:	Should only be used for test purposes.

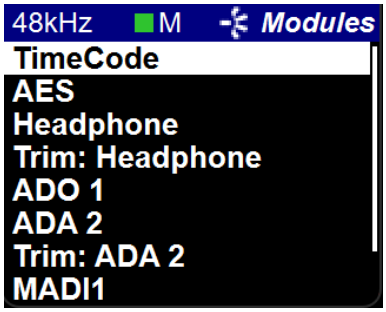
Routing Example:

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



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.

A/D N / AKD N
The A/D buttons, which become active if you have 1 or more AD8(P) 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 ADA8 or ADAv2 modules installed in the Hapi unit, give access to the Input controls.

PT N
The PT buttons become active when an IOC-H-PT64 module is installed.
The PT64V3 extension card for Hapi MkIII will be available in 2025.

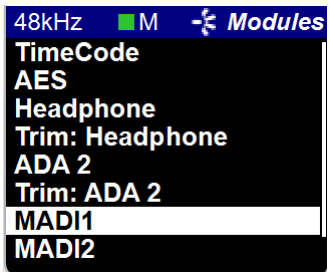
MADI
MADI module is optional with each Hapi. Only one MADI module can be fitted per Hapi.

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

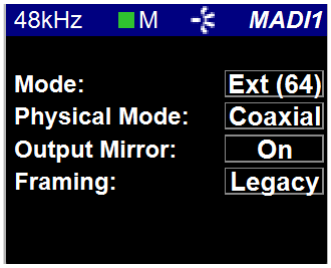
ADAT/SPDIF
ADAT/SPDIF module is included as standard with each Hapi.

Modules: MADI

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.

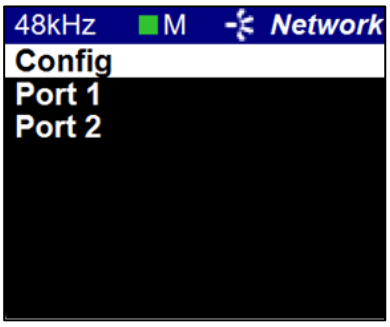


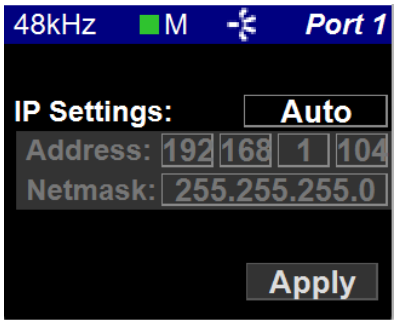
The Hapi MkII supports 128 channels of MADI IO, those are repartitioned in MADI1(1-64) and MADI2 (65-128)



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

Network Menu (Setup)





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)
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) Dante Redundancy: Can be activated from the Dante Controller or Advanced Pages. Dante offers a full-time redundancy option with permanent primary and secondary audio transmission. Redundancy requires a second network, either using a second physical switch (recommended) or via a VLAN isolating the network traffic.

   Audio data is transmitted on both the primary and secondary networks simultaneously. In the event of a failure on one network, audio will still continue to be transmitted via the other network.

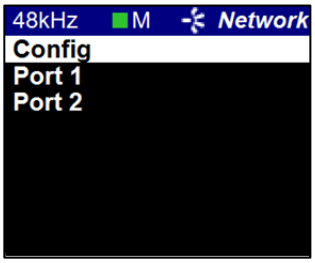
   Note: Support for ST2022-7 Seamless Protection Switching is only supported when running the RAVENNA/AES67 firmware.

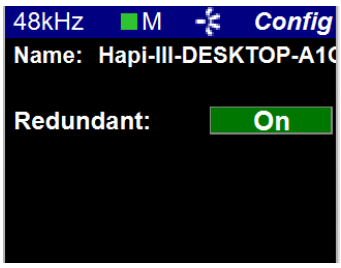
2) Network Switch mode (default), allowing the daisy changing of one extra network interface connected directly to one of the Hapi MKIII RJ45 port. When Redundant mode is Off the interface falls back in switch mode.

   Note: A properly configured Network switch is recommended in order to daisy chain more than one additional hardware audio interface.

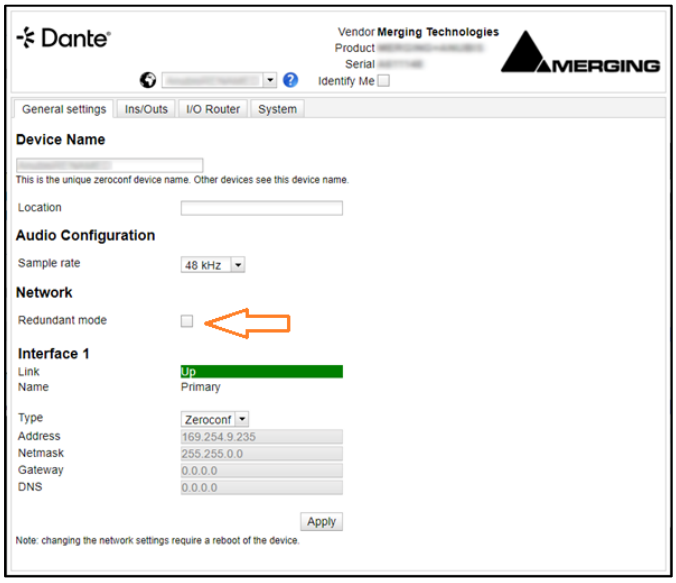
Dante Redundancy Activation

From Network page, select the Config entry and then set the Redundant to ON. Configure you network Port 1 and 2 afterwards. Reboot once the configuration is established.



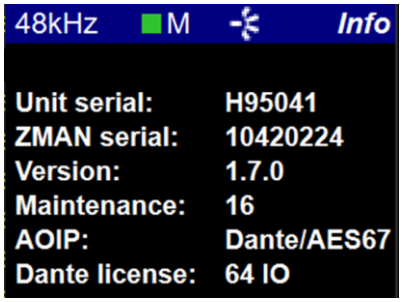


Otherwise from the Advanced Dante Page enable the Dante Redundant mode.



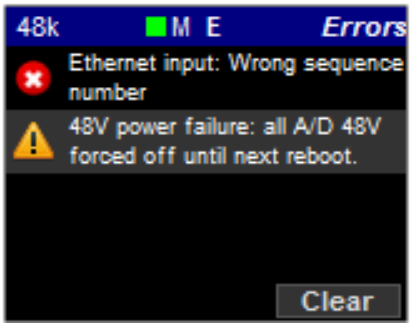
Info (Setup):

In this sub menu you will find details about the Hapi internals; serial number and the firmware version currently installed along with the running firmware (Dante/AES67) and the Dante License IO plan.

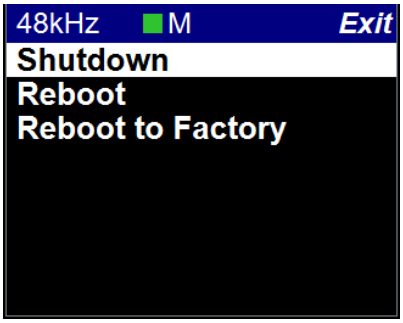


ERROR Menu

List the errors detected by the Hapi. Refer to the Hapi MkIII Main User Manual for troubleshooting 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 Hapi remotely

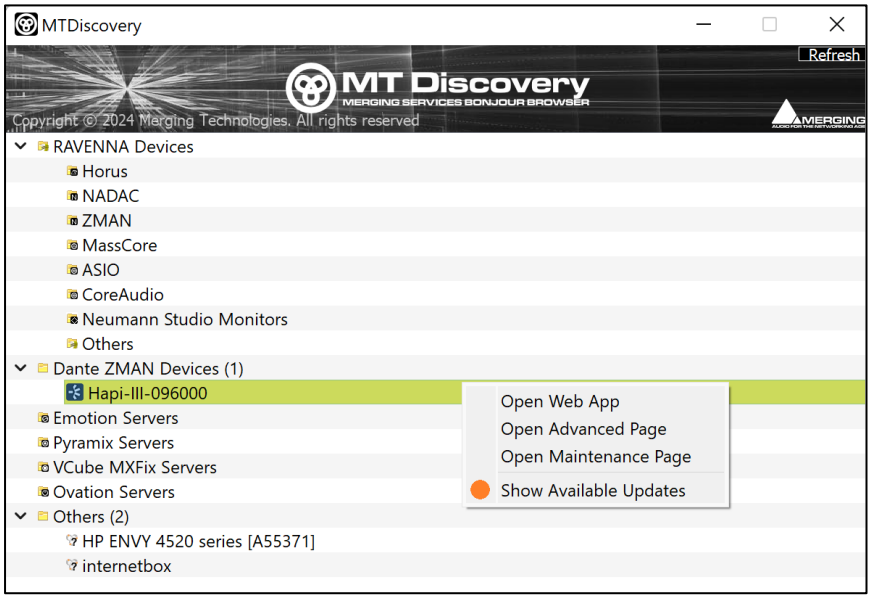
To control and view your Hapi remotely with a web browser make sure that you are using one of the Internet browsers below: Google Chrome (Highly Recommended), Mozilla Firefox, Opera, Apple Safari, Microsoft Edge. * Microsoft Internet Explorer is not supported *

Then take the following steps:

1) Download MT Discovery
   https://www.merging.com/products/interfaces/downloads
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 the MT Discovery
4) Any Hapi devices on the network will be discovered by the MT Discovery tool and will appear under the “Dante Devices”
5) A mouse double-click on the Hapi Device entry will open the Hapi Web Interface in your default web browser

Note: 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



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.

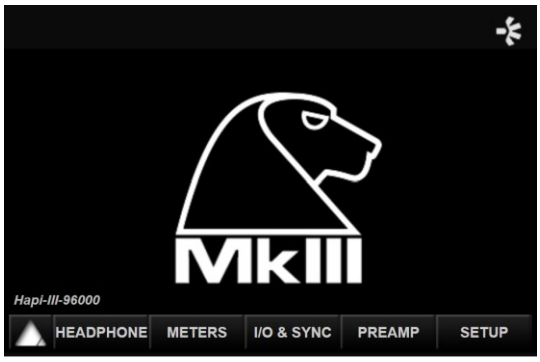
HAPI MKII Web Access

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.

Important: MT Discovery 15.0.10 and above is recommended for Dante users to open the Web Access page, Advanced Dante Pages or for manual Firmware updates via the Maintenance Mode.

Home Page Web Access

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



PreAmp Web Access

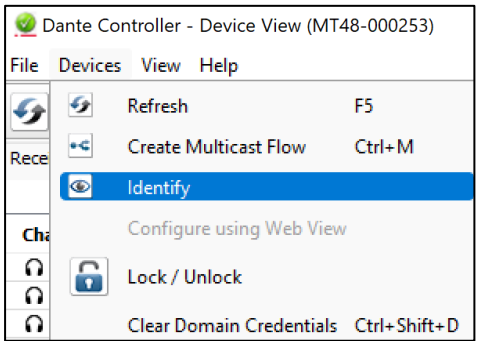
- Allows the creation of up to 8 groups
- Naming of channels (can be saved in Hapi presets)
- VU meters

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

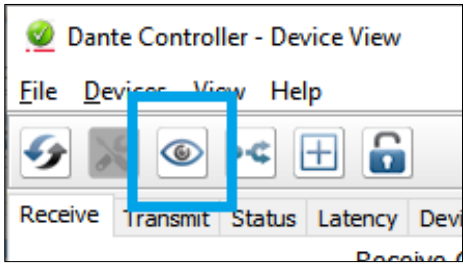
Identify Device

Dante Controller incorporates support for device identification. Double click any device in the Network View to open the Device View, the click on the “Identify” button or click on the Toolbar Eye icon.

This will make the Hapi MkIII front pyramid badge blink, as well as the network port LEDs at the back of the unit.



Dante Controller Eye icon

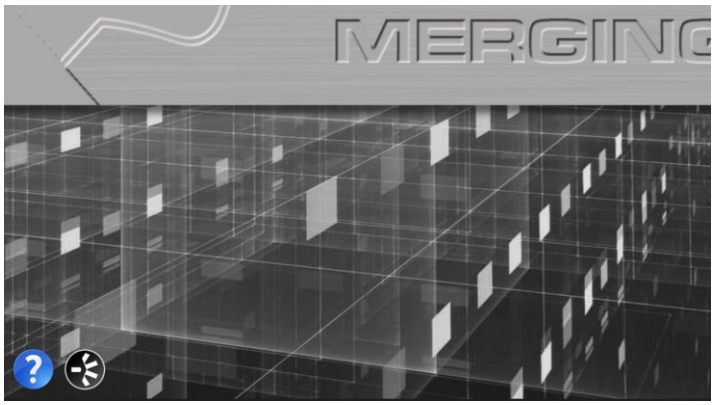


Embedded User Manual & Dante Appendix

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.

By selecting the Dante logo you will open the Dante Appendix manual.

HAPI MKIII Embedded User Manual and Dante Appendix



Disconnection Warning - Web Access

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

Hapi Web Access Disconnected

HAPI MKIII - Firmware Update Procedure

PREREQUISITES

- MT Discovery v15 and above or the MT Portal. Download from https://www.merging.com/anubis/download
- An internet connection to download the latest Hapi MkIII Dante 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*

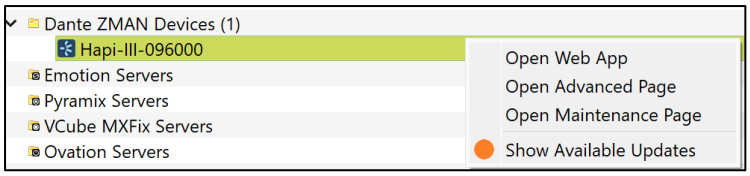
UPDATE PROCEDURE

Auto-Firmware Update with MT Portal

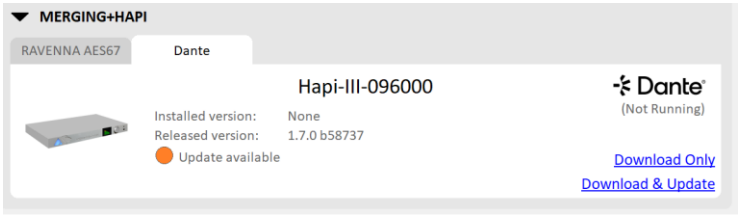
1. Install MT Discovery 15.0.10 and above with the MT Portal 1.2 and above

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

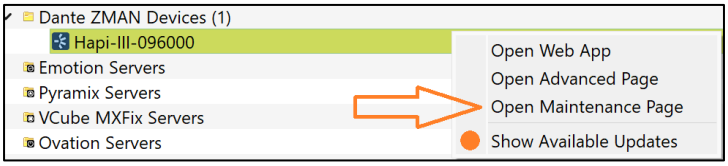
Firmware Update Manual Mode

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

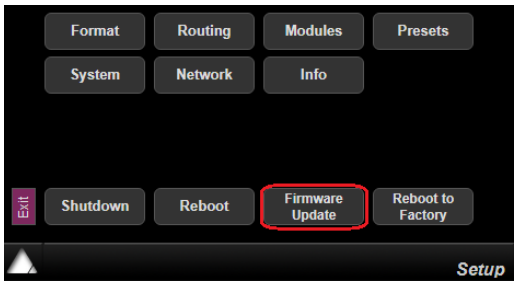
2. Connect your Hapi MKII network port to the system where you have downloaded the latest firmware

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

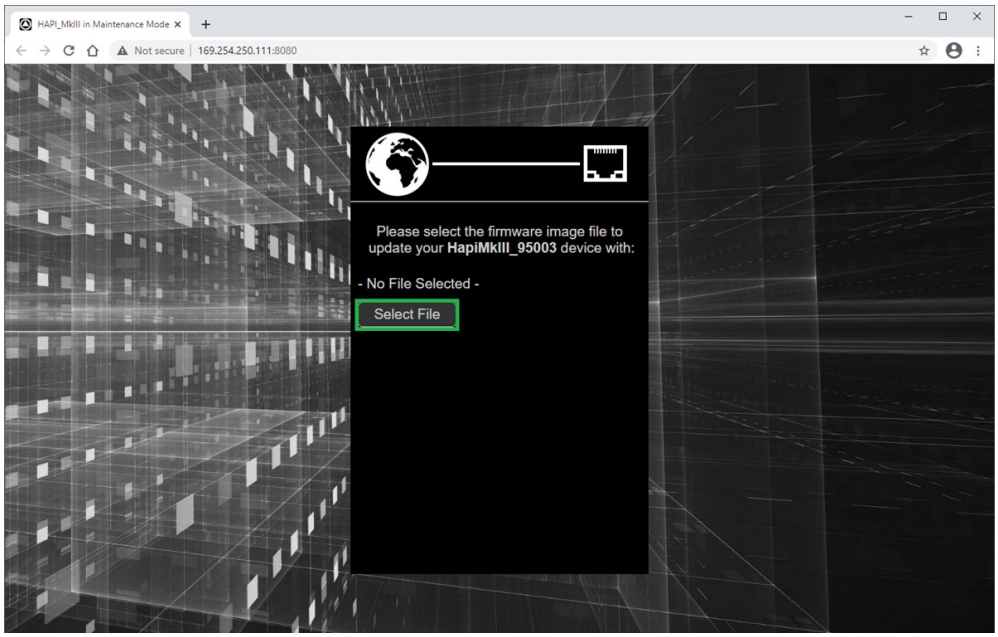
4. Once discovered perform a Mouse + Right Click on Hapi MkIII and Open Maintenance Page



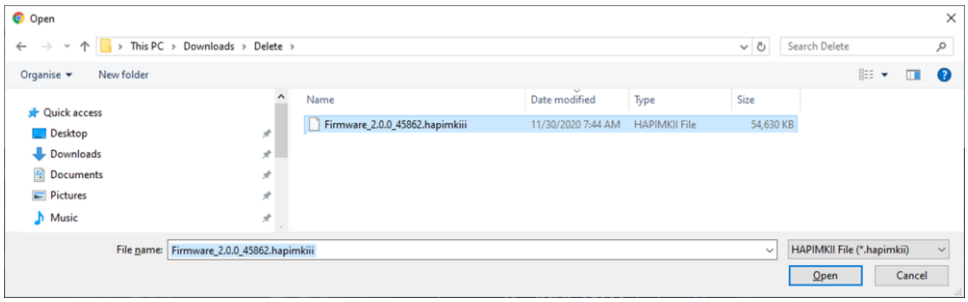
Note: It is also feasible to access the Firmware Update from the Web Access > SetUp page



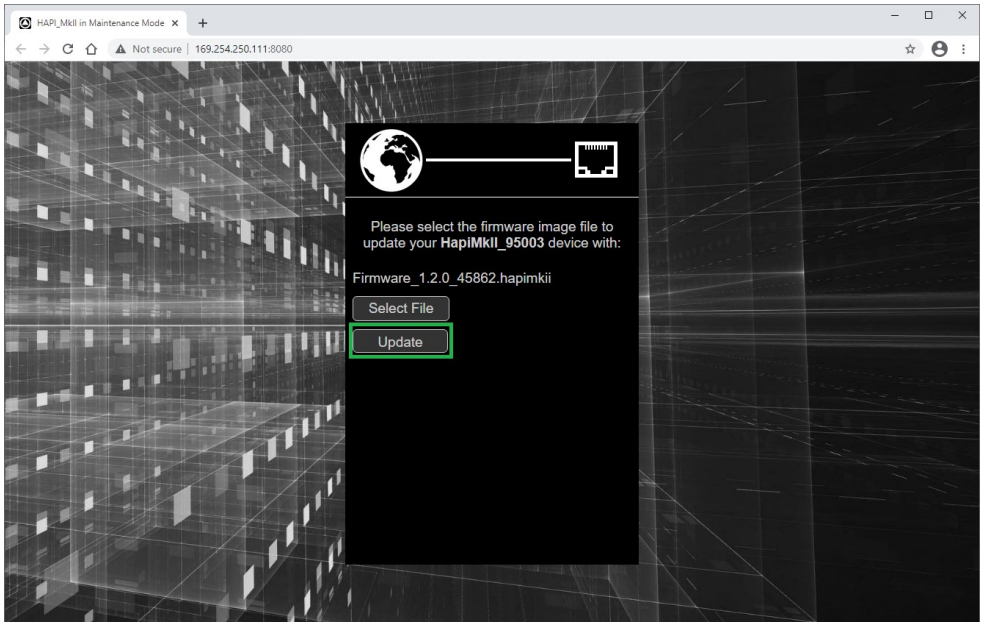
5. This will open a browser page from which you will be able to select the **.hapimkiii** firmware file



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

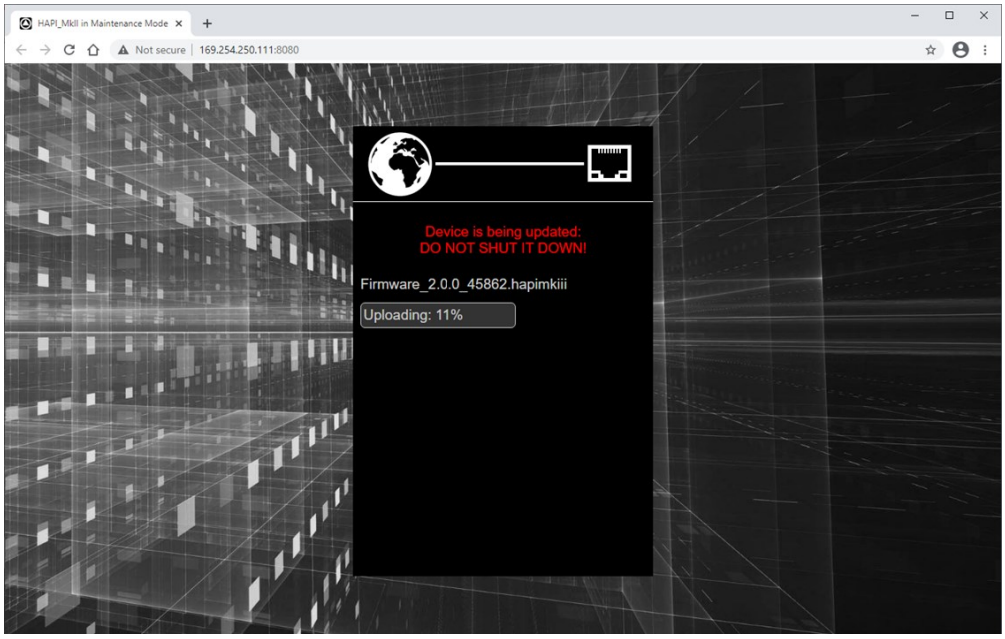


8. Once the firmware is selected press the Update button

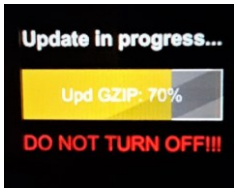


9. Wait for the upload and update to complete.

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

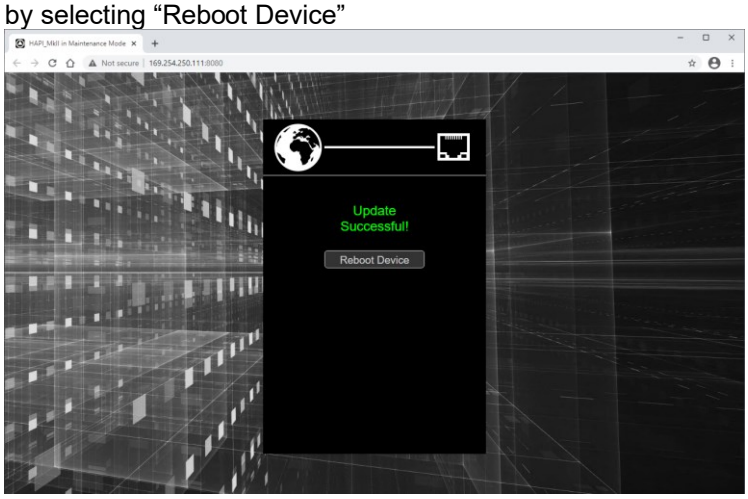


Notice that your Hapi MKII OLED will also display the progression of the update.

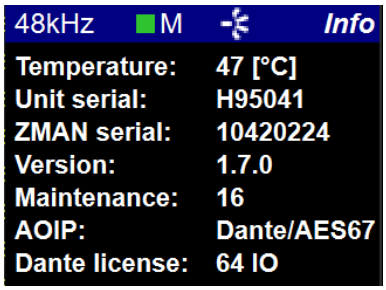


.⚠*Warning: We do not recommend that you refresh the browser page or restart the Hapi while a firmware update is in progress.*

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



You should now be on the latest Firmware. You can verify the Firmware version of your Hapi MK 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 MKII and Network Interface card).

Type the Hapi MKII 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 MkII in Maintenance Mode by pressing the power button and simultaneously pressing the Rotary encoder for a few seconds.
The Hapi MkII will then start in Maintenance Mode and will be ready for a firmware update.

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 HAPI MkIII FAQ
https://merging.atlassian.net/wiki/spaces/PUBLICDOC/pages/579502081/Hapi+MkIII+FAQ

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

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

MERGING SUPPORT
support@merging.com

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