Horus & Hapi Release Notes

HORUS & HAPI FIRMWARE

Make sure that you are running the latest certified firmware:
http://www.merging.com/products/horus/downloads
Verify your Horus or Hapi firmware version by going to the Horus or Hapi Setup menu and open the *System info* page to verify the firmware version installed.
Refer to the Horus, Hapi or Hapi MKII respective User Manual under the Firmware Update section in order to proceed with a Firmware update.

Note: There are two types of Horus & Hapi updates possible. Either the Horus/Hapi Firmware update (frequent releases) or the Maintenance Mode update (un-frequent releases but mandatory for some firmware).
Hapi MKII does not require Maintenance Mode updates.

CURRENT LIMITATIONS (Firmware)

Current Firmware limitations:
- RS422/BiPhase/GPIO not implemented
- No VU meters in DSD (refer to User Manual)

FIRMWARE UPDATES HISTORY

Fixed in Firmware version 3.12.6b56838 – Release Date: 12.04.2023
(requires Maintenance Mode 48)
A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected

- Improvement: LAWO HOME Integration and Support
- Fixed. MDNS protection against overflow in incomplete connections
- Fixed. Home PreAmps recall

Fixed in Firmware version 3.12.5.56450 – Release Date: 10.17.2023
(requires Maintenance Mode 48)
A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected

- Improvement: LAWO HOME Integration and Support
- Fixed. Remote Web Access PreAmps typed gain value could cause a freeze
- Fixed. Ability to change NMOS port

Fixed in Firmware version 3.11.3b555319 – Release Date: 06.06.2023
(requires Maintenance Mode 48)
A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected

- Fixed. Potential Random clicks in Audio
- Fixed. NMOS instabilities
- Fixed. Peering reliability

Fixed in Firmware version 3.11.2b53376 *(requires Maintenance Mode 48)*
A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected

- Improvement latest generation of AD modules will be muted when the device is not synced
  This was implemented to avoid unwanted noise during re-sync. Impacted modules are:
    - AKDv2 - AKDG8D(S/P)
    - ADAv2- ADA8(P/S)
    - ADAv2 (run 5>) - ADA8(P/S)
- Improvement. Support odd ports for RTP input (Horus/Hapi)
- Improvement. Peering reliability, timeout free
- AKD8V2 Run 1 Modules displays unknown error in the Routing page of the Horus TFT
- Fixed. DC Offset potential issue with ADAv2 module generation
- Fixed. Hapi: ADAT/SPDIF reliability at high sampling rates
- Fixed. ADAv2 (run 5>) DSD reliability over long periods

Fixed in Firmware version 3.11.1b51894 *(requires Maintenance Mode 48)*
A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected

- New. ADA8S/P run 5 Premium support
- Improvement. Modules detection reliability
- Fixed. SAP/Dante discovery issue
- Fixed. MIDI preamps remote control for the ADA8P run5> modules (low cut disabled)
- Fixed. ADA8S & ADA8P modules thermal stabilization

Fixed in Firmware version 3.11.0b50850 *(requires Maintenance Mode 48)*
A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected

- Improvement. Validate that address and gateway are on same subnet
- Fixed. Various SAP and SDP fixes
- Fixed. Generated noise when SSRC sources has changed (e.g. reloading a preset)
- Fixed. Web app - Modules output source display can cycle source

Fixed in Firmware version 3.10.3b50198 *(requires Maintenance Mode 48)*
A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected

- New modules revision. ADA8S & ADA8P run 5 and above Support
- Improvement. NMOS reliability
- Improvement. ADA8S & ADA8P module detection reliability
- Improvement. Advanced Pages. Audio clock readings added
- Fixed. ASIO clock not updated when PTP domain has changed
- Fixed. Peering reliability and dropouts' issues

Fixed in Firmware version 3.10.2b48118 *(requires Maintenance Mode 48)*
A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected

- Improvement. Improved firmware update reliability for ADA8S/P modules
- Improvement. Peering reliability

- Fixed. Peering noise issue with modules in DSD
- Fixed. Wrong source's codec when set codec from DSD128 to PCM

Fixed in Firmware version 3.10.1b47127 *(requires Maintenance Mode 48)*
A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected

- New. Official AKDG8DS- AKDG8DP module support
- Fixed. Potential RAVENNA noise issue when mixing up streams of 8 channels and 2 channels
- Fixed. DSD128 format potential performance issue when recording multiple channels.

Fixed. PT64 issue, switching between Pro Tools ses **Fixed in Firmware version 3.10.1b47127** *(requires Maintenance Mode 48)*
A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected

- New. Official AKDG8DS- AKDG8DP module support
- Fixed. Potential RAVENNA noise issue when mixing up streams of 8 channels and 2 channels
- Fixed. DSD128 format potential performance issue when recording multiple channels.
- Fixed. PT64 issue, switching between Pro Tools sessions with adjacent sample rates crashes Pro Tools
- Fixed. Horus/Hapi virtual MIDI ports fail to load, solves PreAmps remote and MIDI Din issues.
- sions with adjacent sample rates crashes Pro Tools
- Fixed. Horus/Hapi virtual MIDI ports fail to load, solves PreAmps remote and MIDI Din issues.

Fixed in Firmware version 3.10.0b46507 *(requires Maintenance Mode 48)*
A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected

- New. New "Relaxed Check" option under the Advanced Pages for Sinks to accept source of less channels
- Fixed. Potential one sample offset with ADAv2 module
- Fixed. Device discovery reliability improved
- Fixed. ADA8S and ADA8P Roll-Off filter setting was inverted
- Fixed. AoIP listener parameters are now restored (start/reboot) except the routing
- Fixed. Graphic glitch with the Boost parameter on AD Modules not supporting it
- Fixed. Some ADAv2 parameters appear greyed-out in the HAPI's OLED screen
- Fixed. AKD8: on certain board, noise can appear at 384kHz when temperature rises

Fixed in Firmware version 3.9.9b44345 *(requires Maintenance Mode 48)*
A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected

- New. ADA8S and ADA8P modules support (IOM-H-ADA8S & IOM-H-ADA8P)
- New. Remote web access and Horus/Hapi now includes Pad Boost for ADA8S and ADA8P modules. The Boost parameter is not available from MIDI PreAmps. It must be operated from the device or from the remote web access PreAmps page.
- New. NMOS (IS-04 and IS-05) Support .For more details on NMOS click [here](#)
- New. SSM: use/provide source-filter SDP attribute
- Improvement. Modules detection reliability
- Improvement. Double jitter buffer for Horus and Hapi. Increase input jitter buffer for Horus and Hapi to 8192 samples for WAN support.
- Improvement. Validate subnet mask provided by user

- Improvement. Advanced Pages, Debug tab renamed System with configuration Upload/Download feature and new NMOS support
- Fixed. Device Sync change could lead in rare occasions to synchronization issue on some modules: ADA8, AD8 rev F, AKD8, ADA8v2.
- Fixed. Loading Horus/Hapi configuration Preset was breaking RAVENNA connections
- Fixed. Potential PTP sync packets corrupted on output
- Fixed. Potential hang when using ADA8 and ADA8S/P simultaneously
- Fixed. Firmware generates modules errors and flashing connections seen in ANEMAN
- Fixed. ADA8S/P: Switching sampling rate resets the output attenuation

Engineering Change. Horus/Hapi DSD, removed +6dB min gain restriction

- **Fixed in Firmware version 3.9.7b41156** *(requires Maintenance Mode 46)*
  Important: Users running the Merging RAVENNA ASIO (PC) driver or VAD (mac) must update to the latest driver version (ASIO v12.0.4 > and VAD 2.0.40585 >).
  A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected

- Fixed. PTP Sync issue causing MassCore or VAD drops
- Fixed. IGMP SSM Playout delay not saved (RAV-1008)
- Fixed. Reduce Hapi screensaver (black) from 3 to 1 minute to further preserve OLED life
- Fixed. Video sync reference issue

Fixed in Firmware version 3.9.6b40720 *(requires Maintenance Mode 46)*
Important: Users running the Merging RAVENNA ASIO (PC) driver or VAD (mac) must update to the latest driver version (ASIO v12.0.4 > and VAD 2.0.40585 >).
A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected

- Improvements. IGMP SSM support disabled by default and available as an option from the Advanced Pages
- Fixed. Auto-Unicast Sources not reconnecting after a reboot
- Fixed. Power supply related untimely false warnings at Horus StartUp
- Fixed. Simultaneously sharing Multicast and Unicast packet performance issue, which could also occur using RAVENNA ASIO and multicast streams

Known issue: When the device is PTP master, MassCore may unlock when running for several hours. This issue is under investigation and will be solved in the following firmware.

Fixed in Firmware version 3.9.4b40042 *(requires at first an update to Maintenance Mode 46)*
Important: Users running the Merging RAVENNA ASIO (PC) driver or VAD (mac) must update to the latest driver version (ASIO v12.0.2 > and VAD 2.0.40016 >).
A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected

- Ex-factory Latency framerate has been changed AES67 (48 samples), previously Low latency (64 samples)
- New. Added latencies of 6 and 12 samples (mandatory RAVENNA ASIO v12 beta2 & VAD 2.0.39648>)
- New. Added global safety playout delay in advanced pages
- Improvement. Default PTP settings is now media profile AES67 (8 sync/sec)
- Fixed. Device renaming issue
- Fixed. Wrong TTL value in source's SDP (Advanced Page). Value is no longer fixed to 15.
- Fixed. Potential timing instabilities in Firmware affecting IO & Sync and MIDI
- Fixed. Filtered out Local SAP sources form Advanced pages.
- Fixed. Inaccurate TTL value in source's SDP

Known issue: When the device is PTP master, MassCore may unlock when running for several hours.

Suspended due to potential update issue- **Fixed in Firmware version 3.9.3b38957** *(requires at first an update to Maintenance Mode 43)*
A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected

- New. Horus and Hapi support for the MERGING+CLOCK
- New. Horus/Hapi: display GMID (Grand Master ID) in I/O & Sync page.
  Available from Web Access pages only
- New. Advanced Pages Web Access: Added a question mark icon to open the online Advanced Pages guide
- Fixed. Advanced RAVENNA Settings Pages. Session sink were not accepting source name characters

- Fixed. Advanced RAVENNA Settings Pages. Session Source: "enabled" property not restored during boot
- Fixed. Horus/Hapi Maintenance mode uses standard mode IP address and no longer reverts to Auto-IP
- Fixed. Pink front logo with Backplane revision B
- Fixed. Random potential network errors

Known issue: When the device is PTP master, MassCore may unlock when running for several hours.

Note: The advance pages new option "Get Device Engine Status » is functional for ZOEM users (only for the moment)

Fixed in Firmware version 3.9.2b38181 (requires Maintenance Mode (42) Pulled out due to issue
A complete shut down and restart of your Horus/Hapi after this firmware update is always preferred, this is in order to ensure that all your modules are properly detected
- New: Support for the latest Horus backplane revision
- New. Unicast support via RAVENNA Advanced Pages (default value remains 0)
- New. RefClk PTP traceable
  This feature can be useful if you want to connect a stream through Internet (e.g. with two PTP Masters (GPS) at each locations), it will allow the connections of devices locked to different traceable PTP Masters.
- Fixed. Hapi issue, Auto-Sampling rate on wordclock doesn't always work
- Fixed. Starting up a RAVENNA device over a network could potentially cause a small glitch (PTP domain)
- Fixed. PTP domain support other than 0. Refer to Merging RAVENNA Advanced Pages online documentation. https://confluence.merging.com

Fixed in Maintenance Mode 42
- Fixed. Maintenance mode improvement for large firmware update

Fixed in Firmware version 3.9.1b37319 (requires Maintenance Mode (42)
A complete shut down and restart of your Horus/Hapi after this firmware update is recommended, this is in order to ensure that all your modules are properly detected
- New: Support for the latest DA8 module revision Run 11
- Improvement: Hapi: Debug mode Output Mirroring
- Improvement: 48V current consumption measurement
- Fixed. Auto IP Address conflict
- Fixed. Renaming IO in advanced settings could potential freeze the interface
- Fixed. Potentially no 48V issue at start up
- Fixed. Better DA mute handling preventing potential glitches on RAVENNA slave devices
- Fixed. Added high speed support at 192kHz to be compatible with some MADI interfaces (Avid HD MADI)
- Fixed. Auto-Sampling rate detection on MADI input
- Fixed. MADI channel count issue when MADI source is set to 56 channels

Fixed in Maintenance Mode 39
- Fixed. Maintenance mode Hapi: support Hapi FPGA in failsafe

Fixed in Firmware version 3.9.0b34718 (requires Maintenance Mode 39)
- Fixed. Horus/Hapi: Starting up a slave RAVENNA device over a network can cause small glitches
- Fixed. Horus/Hapi: AES inputs noise @192k on some AES channels
- Fixed. Horus/Hapi: PTP slave improvement when the master has a big deviation
- Fixed. Routing issue of duplicated signal
- Fixed. Potential freeze of Hapi when going to the meters page
- Improvement: Custom PTP configuration from advanced settings
- Improvement: Custom network configuration (address, mask, gateway) from advanced settings
- Improvement: Timing on the RAVENNA input
- Improvement: Added "No Logo" option available from the Web Access > System page

Fixed in Firmware version 3.6.0b32391
- Improvement: Hapi screensaver optimization to preserve like time (3 min timeout)
- Fixed. AKD8D/P modules issue in DSD256 mode with Channel 5 and higher
- Fixed. PT64 reported error (AAE-1122) when using long Digilink cables

Fixed in Firmware version 3.5.0b31364
- Official support of new AKD8D/P modules
- Improvement. AKD8D/P: Removed residual clicks when performing PreAmps gain adjustments and Low Cut Filter enabling/disabling
- Improvement. AKD8DP: Headroom and Distortion at all DSD rates have been improved by several dBs when nearing Full Scale inputs
- Fixed. AKD8DP: glitch (DC jump transient) when switching back and forth between PCM/DXD and DSD considerably lowered

Fixed in Firmware version 3.5.0b31189
- Improvement: Preliminary support of new AKD8D/P modules

Fixed in Maintenance Mode 37
- Fixed. Update of binaries files < 1'500 bytes fails with new Chrome version

Fixed in Firmware version 3.5.0b31109
- Improvement: Unicast stream support
- Fixed. Added support of PTP master without follow up (e.g. Dolby CP850)
- Fixed. Wrong PTP domain in AES67 SDP attributes
- Fixed. AES and MADI signal status conformity check
- Fixed. Potential freeze opening Meters page
- Fixed. AES Input channels randomly muted
- Fixed: AD8 improvements on the phantom power enable/disable switch to avoid high current peaks which could cause Hapi to reboot.
- Fixed. Change the sequencing of phantom power enable to avoid high load on the regulator
- Fixed. Offset voltage compensation affected when gain change happen rapidly
- Fixed. Stabilization of offset voltage compensation
- Fixed. Potential freeze at shutdown
----- *Fixed in Firmware version 3.4.1b30443 (un-published) below* -----
- Improvement: PT64 Muted if sampling rate mismatch between Horus and ProTools
- Improvement: PT64 timing accuracy @ 4FS
- Improvement: PT64 I/O layout issue in MADI mode will be fixed
- Improvement: Reduced the Hapi screensaver time from 30 min to 10 min to preserve OLED life
- Improvement: RAVENNA network input, broadcast UDP packets are dropped and faster streams descriptor retrieving
- Fixed. MIDI input decoding issue (Support MIDI running status)
- Fixed. MIDI input and record only recognizing a few notes
- Fixed. MIDI input and Shutdown issue
- Fixed. Channel offset at RAVENNA stream closure causing potential mute
- Fixed. Potential shutdown issue if using MIDI DIN
- Fixed. Sync Lock issue with NTSC video reference
- Fixed. Headphones could be muted if Horus is fitted with 6 x DA modules

Fixed in Maintenance Mode 36
- Improvements fixed potential NAND issue causing Firmware write error.

Fixed in Firmware version 3.0.70b29299:
- Improvements on the Ethernet input stage
- Fixed. AES inputs not working properly when signals are not in phase

- Fixed. RAVENNA packets potentially dropped
- Fixed: MIDI IO support issue with Hapi

Fixed in Firmware version 3.0.70b28889:
- Fixed. RAVENNA Randomly losing connected banks of 8 channels
- Fixed. PT64 module: Half channels not working @ 2FS & 4FS

Fixed in Firmware version 3.0.6b28729:
- Fixed. AES issue with missing IO at high sampling rates
- Fixed. SPDIF/ADAT issues
- Fixed. Random potential Horus/Hapi crash

Fixed in Firmware version 3.0.5b28606:
- New. AES67 interoperability improvements
- Fixed. AES input/output not working properly, only some of the 8 channels could be available
- Fixed. No signal on DA8P output in DSD mode with Firmware 28146
- Fixed. AD8 + ADA8: reset state of Mic/Line and phantom at shutdown/reboot, to avoid a high load on the phantom power at startup which might in turn prevent the Horus/Hapi to boot.
- Fixed. Horus/Hapi: Headphone cannot route/monitor some channels of module banks above slot 1
- Fixed. I/O display issue in Pro Tools I/O Setup up page
- Fixed. PT64 module follows given sampling rate requested by Pro Tools even if clock source has not been selected
- Fixed. PT64 module banks don't appear in 'Select Source' page
- Fixed. Horus/Hapi not booting up when Phantom power is ON if too many channels with multiple Mics are connected
- Fixed. RAVENNA: improved interoperability with Directouts interface (e.g. Mic to DA)

Fixed in Firmware version 3.0.5b28146
- New. Support for HD link modules
- Fixed. MIDI Pre commands to mic preamp inaccuracies (could affect Mic/Line levels)
- Fixed. AES input: Noise can occur when device is started after the AES source or if sample rates mismatch
- Fixed. With some RAVENNA Network the Horus Ethernet input discards some audio packets causing a 'Wrong sequence error' message causing unwanted noise on audio
- Fixed. Horus/Hapi Losing banks of channels on some RAVENNA set up (part #1 & part#2).
- Fixed. Audio signal at times muted on some complex RAVENNA Network
- Fixed. PreAmps. Going from DSD to DXD confuses the Line Gain vs. Mic status
- Fixed. MADI input decoding issue (fixing potential noise)
- Fixed. Loading preset does not remove the previous connections

Fixed in Firmware version 3.0.3b27128:
- New. Support for AD8D/AD8DP run 9 and above (requires firmware 3.0.3b27128)
- Fixed. AD & ADA module Line vs. Mic status conflict at start up
- Fixed. Network: Resolved conflict when setting a fixed IP with Subnet Mask set to 255.255.255.0
- Fixed. Permanent mute when errors detected over the network
- Fixed. Web App PreAmp page +/- buttons reset gains after set sample rate
- Fixed. Web App PreAmp ungroup issue
- Fixed. Firmware update issue from MAC OS (requires Merging's latest Core Audio driver)

Maintenance Mode v32 update (v32 is optional if v31 is present)
- Improvement: No longer need to shutdown Horus/Hapi after a Firmware Update
- Improvement: Auto-Browse reconnection after Horus/Hapi reboot.
- Fixed. Maintenance mode Upload firmware text change to Update

Fixed in Firmware version 3.0.3b26178:
- Improvement: Module detection improved at Power ON

- Improvement: Detection accuracy on PSU count to avoid wrong Error
- Fixed: Potential Horus/Hapi crash after 5 consecutive days of power ON
- Fixed. Potential crash at 8FS with Hapi
- Fixed. Fan error when switching from Low to High speed

Fixed in Firmware version 3.0.2b25978:

Warning: this firmware as an issue that it can crash after 5 consecutive days of running. Please restart your Horus once every 5 days to avoid this. We have corrected this issue in the next upcoming Firmware v3.0.3

- Improvement: PreAmp communication improvement with external DAW (e.g. ProTools 11) large count of PreAmps remote control now supported (64)
- Fixed: ADA Mic PreAmp Pad is now functional
- Fixed: ADA Mic PreAmp remote control not working properly
- Fixed. Hapi OLED PreAmp page grayed when standard A/D @ 8FS present in Slot #1
- Fixed. Removed potential click during stream stop/start

Fixed in Firmware version 3.0.1b25577:

- New: Support for ADA8 module (requires firmware v3.0 and above)
- New: Support for DA run7 modules (requires firmware v3.0 and above)
- Improvement: Firmware version identification improved (under info page)
- Improvement. Manual override Fan OFF option on Horus to halt Fan during recordings
- Improvement. Web Access: Pre Amps and Meters pages now include VU Metering
- Improvement: Auto sampling rate option mode (under Format page)
- Fixed. CRC Error inaccurately displayed
- Fixed. FAN Hysteresis doesn't work properly
- Fixed. Hapi. After linking the two D/A, knob rotation jumped to 0dB.
- Fixed. Hapi. D/A selection uses wrong gain.
- Fixed. Hapi. Web interface doesn't reflect recent Rotary Control Volume adjustments.

Fixed in Firmware version 24821:

- Fixed. Noise in DSD Standalone internal routing
- Fixed. Hapi ADAT output muted at 192kHz

Fixed in Firmware version 24543:

No fix specific to with 24394. Refer to listing below for fix history details

Fixed in Firmware version 24394:

To upgrade to this firmware version and the ones above it is mandatory to have updated your Maintenance Mode to v30

- Improved PreAmps control in remote Midi with ProTools
  Warning: AD modules settings not recalled at project opening. We recommend within ProTools SetUp>Peripheral>PreAmps Settings that you enable the "Retain Current Settings" option
- Improvement to avoid Horus/Hapi from not starting up correctly
- Fixed: Hapi crash when an output module is routed to non-present input module

Fixed in Firmware version 24114:

To upgrade to this firmware version and the ones above it is mandatory to have updated your Maintenance Mode to v29

- Fixed: PreAmps, one channel offset in the VU meters display
- Fixed. PreAmps control in remote Midi now working again from ProTools.
  Warning: AD modules settings not recalled at project opening. We recommend within ProTools SetUp>Peripheral>PreAmps Settings that you enable the "Retain Current Settings" option
- Fixed: Web Access empty GUI if first module is not an AD
- Fixed. Muted or duplicated signal on MADI output, when routed to RAVENNA, at more than 1 FS
- Fixed. MADI output muted
- Fixed. "Product type does not match" firmware update error

Fixed in Firmware version 23877:

*To upgrade to this firmware version and the ones above it is mandatory to first update your Maintenance Mode to v29
- New: First Hapi firmware support
- Improvement: Firmware extension renamed: Horus firmware is a .horus and Hapi a .hapi file
- Improvement: LTC discontinuity when locked to external source
- Improvement. Avoid Horus blank boot TFT screen (maintenance mode 29>)
- Fixed. PTP issue with Core Audio Driver (AES67)
- Fixed. Potential Sampling Rate mismatch

Fixed in Firmware version 23165:
- Fixed. Web Access: Meters page is broken/no longer working
- Fixed. Mic Pre Amps gain control accuracy

Fixed in Firmware version 22862:
- Fixed. Horus TimeCode reading issue
- Improvement: New DA Filter option for lower latency Outputs choices between:
  - 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: 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

Fixed in Firmware version 22777:
- Improvement: Page advanced: renamed System
- Improvement: PTP lock improvements when multiple Horus are connected to a Switch
- Improvement: Horus DSD headroom set to +6dB (details in Horus User Manual)
- Improvement: The Mic/Line gain range has been increased from +0dB/+60dB to +0dB/+66dB
- Improvement: Page Setup updates:
  - Cooling mode and Terminations have been moved to System Page
  - Button Advanced -> renamed System
  - Button System Info -> renamed Info

Fixed in Firmware version 22527:
- Improvement: Screensaver Dark option
- Improvement: Horus Dim display option now applied to Horus Power Led
- Improvement: Phantom Power Safety feature
  - 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. An error message will be displayed
- Improvement: Horus RAVENNA support for different latency modes (samples)
  - Ultra Low (16 smp)
  - Extra low (32 smp)
  - (48smp) for AES67 support
  - Low (64 smp)
- Fixed. AD module small clicks in gain adjustment when Low Cut is enabled
- Fixed. Timestamp of the first sample of a frame was not correct causing a problem with the RAVENNA ASIO Driver
- Fixed. Horus MTC stream was not correct on minute changes, causing Third Party DAW (e.g. Live and Reaper) MTC chase to be inaccurate at each minute edge.
- Fixed. Horus Meters "Hot" and "Alignment" setting not applied
- Fixed. Potential "Application Failed" error at Horus launch or Ravenna reconnection

Fixed in Firmware version 21673:
For Horus DXD & DSD support in RAVENNA. The Pyramix users must upgrade to Pyramix v8.1
- Improvement: AD8D clarified 4FS limitation

- Improvement: Fixed digital wrap near fullscale in DSD64

Fixed in Firmware version 21289:
- Fixed: RAVENNA ASIO, current sample rate report accuracy issue
- Improvement: New AD8D module support (with Direct Outs)
- Fixed: AD parameters accuracy with Pyramix Mixer and Web Access page
- Fixed: Potential DA glitch at RAVENNA start up in DSD
- Fixed: Potential glitch/mute in network configuration.
- Fixed: Further reduced clicks on AD PreAmp gain adjustment

Fixed in Firmware version 20622:
- Fixed: LTC output potential missing frame
- Fixed: Remove Error messages (Fifo and Buffering)
- Fixed: inaccurate power Supply error message when connected to secondary only
- Fixed. Horus not working with certain Hirschipsmann switches (MAR1140) due to too severe Ethernet preamble check

Fixed in Firmware version 20417:
- Improvement: AD Premium Mic pre-amp DSD gain range of 0dB to +60dB
- Improvement: Format page: DSD/DXD GUI clarification
- Improvement : Limiter added to avoid noise when overloading input in DSD
- Fixed. Horus monitor jack provides the same channel on both outputs (8FS only)
- Fixed. Phase invert now working in DSD

Fixed in Firmware version 20084:
- Improvement: DSD256 noise floor improvement
- Improvement: DSD256 removed DC offset
- Improvement: DSD64 and DSD128 support
- Improvement: Added support for 720p 23.98 video format
- Improvement: Display Audio Data Format in I/O & Sync page (A/D, D/A, Monitor Jack)
- Fixed. Remove inadequate warning about SSRC mismatch
- Fixed. Remove Inadequate warning about Power Supply redundancy
- Fixed. RAVENNA ALC i/o rename would make Horus crash
- Fixed. DSD / DXD indication discrepancy in "Format" page
- Fixed. Horus Web access: Not updating Pyramix PreAmps changes correctly

Fixed in Firmware version 19802:
- Improvement: 384kHz and DXD support
- Improvement: Horus Error report (on Horus TFT)
- Improvement: Pull Up / Pull Down support when locked to video reference
- Improvement: AD module Mic alignment selector
- Improvement: Horus Monitor module: Stereo channels routing selector (1-2/3-4/5-6/7-8)
- Improvement: Fan, cooling mode set to low at start up only (to avoid noise)
- Improvement: WebApp: At the browser opening we automatically open the latest page chosen by the user
- Fixed. Clicking noise on some AES input channels with long cabling at 96kHz
- Fixed. Horus: MADI input sync color display was not correct on the Web access page

Fixed in Firmware version 19243:
- Improvement: Added MADI "96k Frame" Option (High Speed) for MADI output. This option is only available at 88.2/96kHz sampling rate.
- Fixed. Web Access, MADI extension 2 not visible in routing

Fixed in Firmware version 18935:
- Fixed. Module serial number not readable from Horus TFT
- Fixed. RAVENNA i/o could end up muted due to video sync reference changes
- Fixed. Horus Web Access I/O & Sync page was showing a quick red led, misleading status

- Fixed. Horus: LTC out mute on stop, wrong last LTC decoded when stopping
- Fixed. Horus: Monitor Jack clicks when the sample rate is changed
- Fixed. Horus: Web Access faders optimization to the grouped PreAmps
- Fixed. Horus: DA8/DA8P modules clicks when the sample rate is changed

Fixed in Firmware version 18725:

Warning: Users updating from a firmware < 18491 (RC1) will need to perform a second Shutdown of the Horus after the Firmware update (in order to initialize correctly the AD and DA modules)

- Improvement: Metering support on the Web Access Page (see Horus user manual for details)
- Improvement: The Horus TFT Meter page will gray out all inactive MADI leds
- Improvement: WordClock output now supported at all sampling rates
- Improvement: Lock mechanism improved in case of high deviation
- Improvement: Discovery of connected Horus improved
- Improvement/Limitation: Support of "High speed mode" on MADI output was removed
- Fixed. AES and MADI input and lock accuracy at high sampling rates
- Fixed. WordClock input sync glitch
- Fixed. Horus potential audible clicks with a very large count of RAVENNA I/Os enabled
- Fixed. Prevent the Horus to stay stuck on 'Starting application' at start up
- Fixed: RAVENNA MADI i/o connections bug if toggling between Standard(56) & Extended (64)
- Fixed: Presets can now be recalled without muting signal

Note: the Visible to RAVENNA module entries were removed to avoid confusion.

Fixed in Firmware version 18491:

- Improvement: Metering support (refer to Horus user manual for all details)
- Improvement: Web Access offline status detection in browser
- Fixed. AES module noise at 4FS/2FS
- Fixed. Screensaver setting not properly reloaded
- Fixed. LTC output improved accuracy
- Fixed. Auto IP addressing issue (3rd byte of IP address now below 128)
- Fixed. Channel routing issue on MADI (muted banks)
- Fixed. Timecode missing half-bit on the first frame
- Fixed. DA module Output Attenuation range now (-12dB to 0dB)

Fixed in Firmware version 18308:

* For Horus LTC support in RAVENNA. The Pyramix users must upgrade to Pyramix v8 BETA 6 in order to have the LTC support.

- Improvement: LTC support
- Improvement: Video clock robustness
- Fixed. Noise on first channel of MADI output when in standard mode (56 channels)
- Fixed. 4FS small noise introduced on random channels

Fixed in Firmware version 17903:

* Pyramix RAVENNA users must upgrade to Pyramix v8 BETA 5 in order to be compatible with this firmware 17903.

- Improvement: Video sync now supported for all formats
- Improvement: PreAmps Low Cut filter now supported
- Improvement: Support for RAVENNA ASIO (refer to ASIO driver for download)
- Improvement: Less clicks in AD gain adjustment
- Fixed. Preset: save to disk does not work, leads to a 404 browser page
- Fixed. Mixup in internal routing, some banks assignment did not work
- Fixed. Horus channel output duplication in routing (RAVENNA>MADI)
- Fixed. 2 samples delay on AD modules between first channel and subsequent channels

Fixed in Firmware version 17648:

Note: New firmware versioning to be able to track firmware and Pyramix versions

- Improvement: PreAmps grouping is now saved
- Improvement: PreAmps remote web access page support of 8 groups
- Improvement: PreAmps remote web access faders interaction improved
- Improvement: PreAmps remote web access added PAD button
- Improvement: PreAmps remote web access added channel Naming and Gain typing

- Fixed. Horus Ethernet connection, detection robustness
- Fixed. Larger Wordclock range of deviation allowing some highly deviating clock sources (more than 100 ppm) to lock correctly
- Fixed. RAVENNA small mute on random streams
- Fixed. Some Horus were always rebooting in Maintenance Mode or hanging on "starting application" screen
- Fixed. Limit preamp fader moves to the group min and max for all members of the group
- Fixed. Horus being muted at times (needing extra reboot).

Fixed in Firmware version 433*:
- *To upgrade to this firmware version and the ones above it is mandatory to first update your Maintenance Mode to v23
  Note: Users will have to manually shutdown their Horus after the maintenance mode successful install, as Horus will most probably not shutdown by itself that time only.
- Improvement:: Added Sample Rate in I/O&Sync page (both TFT and WebApp)
- Improvement: Better communication with analog modules
- Improvement: Added preset page (support for 5 presets Save/Load)
- Improvement: New Auto-Save configuration option in Preset Page
- Improvements on RAVENNA audio streams (clicks removed)
- Improvements on external synchronization (devices with large deviation are supported i.e. RME and TC Electronics).
- Fixed: Screensaver disable touch can no longer affect the TFT button in the behind display
- Fixed: TFT + and – buttons now have pressing highlight state.
- Fixed. Horus: PreAmps, first gain increment can increase by +5dB instead of +0.5dB
- Fixed. PTP Slave sync locking robustness
- Fixed: Negative delta reference potential freeze
- Fixed. Missing UI update in TFT I/O&Sync page setting change
- Fixed: DA module, no more clicks when changing sampling rate
- Fixed: Web Access added confirmation pop up for reboot or shutdown confirmation
- Fixed: Module missing after firmware update.
- Fixed: Fan stopping issue at sampling rate change
- Fixed: RAVENNA stream address conflicts

Fixed in Firmware version 323*:
- *To upgrade to this version and the ones above it is mandatory to first update your Maintenance Mode to v10
  Note: In such case a message *"Wrong maintenance version, must be >= 10"* will be displayed
  Once the Maintenance mode updated you will be able to install firmware's >= v323
- Fixed: Bug on the Legacy mode the MADI input
- Fixed: Bug on the DA page web access
- Fixed: Mute correctly done when no signal on the input
- Fixed: Improved connections in RAVENNA mode when multiple connections are active
- Fixed: Improved MTDiscovery Horus entry display and detection
- Fixed: Horus Web Access : D/A Page visible to RAVENNA selection not working from Web access

Fixed in Firmware version 296:
- Improvements: WordClock and AES input sync support
- Fixed. Horus: PreAmps trim dB value not updated if clicking next to slider to increase the gain
- Fixed: MADI I/O now compatible with RME devices that apparently do not conform entirely to MADI standard (AES10-2008, section 4.3.2) and were rejecting Horus output due to some RME's own restrictions.
- Fixed: Improvements on Wordclock lock (at multiples of FS)
- Fixed. Correction on the AES input at 176.4 kHz
- Fixed. MADI auto switch to Extended mode when nFS is > 1

Fixed in Firmware version 287:
- Fixed: MADI signal level too high
- Fixed: Connection issue with RAVENNA

Fixed in Firmware version 280:
- Fixed: Corrupted noise in RAVENNA at 2FS and higher
- Fixed: WordClock support with phase alignment
- Fixed: The D/A Small fade in apply on source is now removed
- Fixed: TFT splashscreen option (Setup>Advanced)
- Fixed: Web Control access: PreAmps Metering range for Mics and Line
- Fixed: Web Control access: PreAmps Mic Pading range indication
- Fixed: Web Control access: PreAmps Mic/Line Coherency and relative group Gains support
- Fixed: Web Control access: Horus User Manual embedded (now working with Chrome)

Fixed in Firmware version 262:
- Fixed: Sampling rate changes instability
- Fixed: Added D/A output level calibration slider
- Fixed: Parameters reset to default
- Fixed: Mutes smalls audible clicks on the D/A and Headphones at initialization
- Fixed: Fan and Temperature issue (0)
- Fixed: Web Control access: Network page apply & reboot
- Fixed: Web Control access: PreAmps Grouping (4 groups now supported)
- Fixed: Web Control access: PreAmps page multiple bug fixes
- Fixed: Web Control access: Horus User Manual via the **?** icon (not yet working with Chrome)
- Fixed: Auto disable +48V in Line mode
- Fixed: Horus will fall to inactive mode if the initialization failed (with a message on TFT)

Please refer to the Horus User Manual Firmware update section to proceed with update

HORUS & HAPI TROUBLESHOOTING

Merging Knowledge Database:
https://confluence.merging.com/display/PUBLICDOC/Merging+RAVENNA+devices

If you cannot remotely open your Horus or Hapi web access page please follow the workaround here
https://confluence.merging.com/pages/viewpage.action?pageId=29557332

Pyramix versions & Firmware:
- Merging recommend users on Pyramix v8.1 to remain on firmware v23165 due to a Gain control issue (limited to 3dB Gain steps)
  http://www.merging.com/uploads/assets/Installers/Horus/HorusFirmware_2.0.6_23165.bin
- Pyramix v9.1 and above users should be on firmware 3.0.3b26178 and above.
- **Firmware 3.4.1 and above** are no longer compatible with Pyramix v9.1 for remote Preamps control (this doesn't apply to Pyramix v10 users)
  Workaround:
  - Use Merging Pyramix v9.1 patch
    https://confluence.merging.com/display/PUBLICDOC/Firmware+3.5.0b31109+Preamp+remote+with+Pyramix+9.1
    Or
  - Use the Web Access page for PreAmps remote control

Rollback Firmware
Users that need to rollback to a previous firmware version can do so.

Firmware v23783 and above goes with Maintenance Mode v29 and above and does not support Maintenance Mode v23.
Firmware v23165 and below go with Maintenance Mode v23 or Maintenance Mode v29

Note: What might occur if your Firmware version is not in front of the Maintenance Mode version is that the Horus might always start up in Maintenance mode.
Also we recommend that if you rollback the Maintenance Mode that you also re-install the desired firmware version, as the version numbering indicated under the Horus system info page might be misleading.

Cannot access Horus or Hapi remotely in Maintenance mode for Firmware update
Procedure:
1. First launch MTDiscovery and open the Horus Maintenance Mode entry
2. If such entry does not show up, reboot your system and retry
3. If it still does not work, make sure that your Network card is set to Automatic IP addressing (see Horus User Manual)

In case none of the above works try to access the Horus directly from your Chrome browser
4. First make sure that the Horus if well connected to your system via Ethernet, be aware that the Port or Switch must be Gigabit.
5. Verify that you are using Ethernet cable category 5E or 6
6. On the Horus Maintenance TFT screen take note of the written IP Address
7. Type this address in your Chrome browser followed by :8080
   Example: 169.254.182.31**:8080**

You should now have access to the Horus remote Maintenance page and be able to update your Horus firmware.

Firewall and Antivirus:
Windows Firewall:
The Windows Firewall can block communication between MassCore and Horus/Hapi. We recommend users to disable the Public Network Firewall
Procedure:
1. Go in Windows Control Panel > Windows Firewall.
2. Click on "Turn Windows Firewall on or off"

3. Go to the Public Network section and select "Turn Off Windows Firewall"

Disable Antivirus:
Merging also recommends users to disable their Antivirus, some Antivirus as Avast and Sophos have been known to block the Horus & Hapi discovery and RAVENNA I/O Connections

RAVENNA
MassCore/RAVENNA NET-MSC-GBEX1 PCIe Ethernet card users might have to wait a little after their system startup/login before the Horus shows up online and in MT Discovery