

Nautel NVLT Series V4.3.4 Release Notes

Note: Nautel strongly recommends that users upgrade to NVLT SW 4.3.4 or higher.

• Resolved intermittent issue which could prevent an exciter from initializing properly, resulting in extended off-air time after a reboot.

The most significant improvements with previous versions include: <u>Version 4.3.3 – Released November 2, 2015</u>

- Resolves issue with 3.5kW/5kW transmitters where removal of a redundant LVPS would cause a false activation of the Low Ac Operation mode, where the transmitter output would be limited to 1/3 of nameplate for approx. 4 seconds and then recover.
- Resolves RDS issue where all letters are capitals when using ASCII over IP or ASCII over Serial data sources.
- The Mod Loss Timeout Change Preset function now changes presets as desired.
- The Mod Loss Timeout RF Inhibit function now works post an ac cycle.
- Exciter changeovers no longer falsely occur post an ac cycle.
- Improved RF On ramp up alarm masking to prevent erroneous "Exciter Fan Volts Fail" alarms from appearing, as it was too sensitive.
- Resolved issue where transmitter would repeatedly shutback and recover without any alarms logged when specific combinations of RF power modules were disabled.

Version 4.3.2 – Released June 17, 2015

• Resolved an issue where L&R audio inputs were disabled if Orban

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processor was enabled in the associated preset.

- Added an "Exciter Fan Volts Fail" alarm.
- The "Audio Processor Output Fail" alarm should now trigger and clear correctly.

Version 4.3.1 – Released April 27, 2015

 Resolved an issue where the MPX over AES function did not check to confirm it was running on a compatible hardware platform prior to activating; this caused erroneous behavior when used on incompatible versions.

Compatible with MPX over AES:

NVLT exciter A using NAPE87A (or later version) control/interface PWB;
 NVLT exciter A using NAPE83 (any version) or NAPE87 control/interface
 PWBs as long as CPLD version 10 or higher is installed;

- NVLT exciter B

Incompatible with MPX over AES: - NVLT exciter A using NAPE83 (any version) or NAPE87 control/interface PWBs with CPLD version 6 or 7

- With the update to compatibility for MPX over AES, the "Unsupported Audio Configuration" alarm will be present when trying to use MPX Over AES with an incompatible version, even though the transmitter has two exciters installed (exciter A incompatible, exciter B compatible). AES1 audio will be selected when attempting to use MPX Over AES on the incompatible exciter A; it will be used as normal if exciter B is selected for on-air operation. For single exciter systems, with incompatible exciters, if MPX over AES is selected, the preset will automatically change to use the AES1 input.
- When using the Audio Player with Exciter A (controller w/integrated exciter),

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the Digital 1 Left/Right Peak meters will now read 'N/A'. The audio level for the audio player will be displayed on the Digital 2 Left/Right Peak meters.

- Resolved an issue where the ARM processor would not boot up upon recovery from power loss and the DSP would not attempt to reset it; this would result in an "ARM Not Booted" alarm and no remote AUI accessibility until a manual ARM reset took place; however, this reset state remained volatile.
- The appearance of Pilot Level, Pilot 1 PPS Sync, Orban Processor and L/R Limiter fields in the Preset "Other Settings" tab, no longer depends upon what audio source is selected.

Version 4.3 – Released April 6, 2015

NVLT Software version 4.3 adds a number of exciting new features. These include:

- Site control, with user-definable remote inputs and outputs
- a backup audio source for presets, along with the capability to auto-return to the original source upon recovery.
- an Oscilloscope tool for the AUI.
- PS Scrolling functionality as part of RDS.

Other improvements with this release include:

- Implemented a transmitter final stage PA bias routine. Previously, a single bias value was used for all PAs for each operating mode. This new routine allows the transmitter to determine the optimal bias value for each PA, accounting for individual FET characteristic differences. For transmitters previously in the field that are upgrading to this software release, no action is required.
- The transmitter PA Bias routine will provide feedback in the Status screen for any PA that failed the routine (i.e. was not able to be biased properly).
 The routine is performed while RF is off and the alarm will remain active until

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RF is turned on, at which point the alarm will clear, but return if the PA itself is not functioning properly.

- Exciter Forward Power setting can now be adjusted in 1 W increments.
- Improved reliability of Shoutcast/Icecast streaming.
- Resolved an issue where the flash port number could not be set in the Network Setup menu.
- Renamed "PS 48V A Low Line" and "PS 48V B Low Line" Rack alarms to "LVPS A Low Line" and "LVPS B Low Line" to be more consistent with the use of "LVPS" in place of "PS 48V" (which would suggest it's a fixed 48V supply, when it actually isn't).
- Allowable "VSWR Shutdown" threshold range limited to 1.5 to 3.0 instead of 1.5 to 6.0, in order to agree with the transmitter specification.
- Tapping the Nautel logo on the AUI (top left corner) will now reload the AUI.
- Increased the number of RDS Alternate Frequencies from 6 to 25.
- Resolved an issue where RDS Alternate Frequency fields could not be set.
- Various security improvements.
- Resolved erroneous exciter changeovers in FM mode at minimum power (was due to error between exciter power measurement and transmitter RF drive power measurement).
- Added Remote I/O Analog Outputs tab with improvements in user interface.
- "Remote Output Enabled" remote output control logic has been corrected to be Output Low When True (Remote Enabled) or False (Remote Disabled/Local only).
- Created new remote status outputs to indicate which audio path is active (MPX, AES 1, AES 2 and Left/Right). Left/Right applies to Stereo or Mono operation.
- Increased default "High RF Drive" threshold from 130% to 145% to account for some erroneous shutbacks during initial turn on/ramp-up of the exciter

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power. If previously installed transmitters are experience erroneous shutbacks due to high RF drive, it is acceptable to increase the threshold from 130% to 145%.

- Resolved an issue where the transmitter did not always achieve the minimum power set-point (typically in low power transmitters), due to a limit in the minimum allowable exciter output power level. That limit has now been reduced to allow further reduction in the transmitter output power level while in RF drive power control.
- Updated bash shell to address the linux Shellshocker security vulnerability.
- Changed naming of "Digital Inputs" and "Digital Outputs" tabs to "Remote Inputs" and "Remote Outputs" to be consistent with the names used within the menu.
- Incorporated a new "Turn-On Behaviour" menu within User Settings where the "Turn-On Delay" and "Ramp-Up Speed" sub-menus are available.
- Increased precision of FM Modulation meter to two decimal places. This will assist when measuring SCA/RDS injection levels.
- Resolved an issue where drop down boxes in the AUI would linger after a selection was made.
- The Audio Loss Timeout function works correctly again.
- Some usability improvements in the Playlist Manager.
- Remote Output channel option "Local/Remote" relabeled to "Remote Enabled".
- Users are no longer permitted to change Network Settings via the Remote AUI, as it could affect their ability to log in if settings are changed and not recorded/known.
- Changed 'Playlist' and 'Playlist Manger' names in the AUI to 'Audio Player'.
- The more appropriate term "Host" will now be used in various menus, functions, alarms, meters, etc... to signify the ARM processor within the Controller module, and in some cases replace the term "AUI", as the actions

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available within these menus taken against the "AUI" are actually being performed against the "Host".

- Added a "Rack Shutback" alarm to indicate a connection issue between the controller and the (rack) module control/interface PWB(s), such that the "shutback" signal is unavailable due to a hardware fault (typically, the 9-pin D-sub daisy-chain cable is disconnected). It is also likely that "Rack # Not Responding" alarms will also be present to signify a communication loss between the controller and (rack) module control/interface PWB(s); these alarms can be used to help diagnose where the break exists. See manual for more details.
- Removed erroneous Controller alarms from the available Notification list.
- · Removed erroneous Exciter alarms from the available Notifications list.
- Removed erroneous RF Module alarms from the available Notifications list.
- Removed erroneous Rack alarms from the available Notifications list.
- Resolved an issue where the Audio Low Trip Level and level at which an MPX Audio Low alarm occurred did not agree.
- Corrected the Controller RF Drive Power meter full scale values for each transmitter type to prevent meter reading (arrow) from operating "normally" in the full scale region.
- Remote Input channel option "Auto Changeover Enabled" name is now "Auto Changeover Enable/Disable" and has related Rising/Falling control logic as "Enable"/"Disable" (changed from "Turn On"/"Turn Off").
- NV20LT transmitters' 10kW Reject Load Fan 1 Speed, Reject Load Fan 2 Speed, and Splitter Fan 1 Speed meters and alarms now agree with their respective fans.
- Remote Input channel option "Main Exciter" control logic terminology changed from "Turn On/Off" to "Set to A/B" to be more intuitive.
- Remote Input channel option "Preset" related control logic terminology has been changed from "Turn On" to "Activate" to be more appropriate.
- The remote AUI will now display a progress bar on the blue page before the login screen is displayed; this will provide user feedback on AUI loading progress.
- Improved the ramp-up behaviour. Halted the RF Drive from increasing too quickly, allowing time for the power supplies to ramp up their output voltage and prevent false power supply failure alarms due to the power supplies current limiting.

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- The RDS Baud Rate options are now the same between the AUI and controller UI.
- The Audio Delay range is now the same between the AUI and controller UI.
- The Mod Loss Timeout range is now the same between the AUI and controller UI.
- The L/R Limiter Max Gain range is now the same between the AUI and controller UI.
- Implemented a discharge bias voltage increase (to a limit) on PAs if PA voltage is not discharging fast enough.
- Added support for the NV30LTN (12 RF Module) transmitter.
- MPX over AES is now supported in NAPE83B and NAPE87 based controller/exciter modules (NAE106 and NAE106A, respectively). It was previously only supported in NAPE87A (or later) versions (NAE106B or later).
- The Remote I/O Power Increase / Decrease now properly adjusts power by 1% of nameplate power on all transmitters.
- Added a new alarm in the Controller which indicates that the Rack(s) data for scale factors or transmitter type is(are) out of sync with the Controller data. When this alarm is present, it is recommended that the customer perform a calibration synchronization routine to ensure this data is the same between both devices.
- 'Audio Player -> AES1' and 'Audio Player -> AES2' now show up as available sources in the AUI preset menus.
- Phone Home Apply and Cancel buttons are now only enabled after changes have been made.
- Greatly improved Phone Home's alarm reconciliation feature and data integrity.
- Improved appearance and function of various AUI pages.
- User, System and Factory Settings menus on the controller UI have been updated to be easier to navigate and be more consistent with other products.
- The Tool Menu has been reorganized to be more consistent with other products.
- Corrected labeling of various alarms in the Notification menu.
- Resolved an issue where some active alarms were appearing in the event Log, but not in the Status screen.
- Power Supply (PS) Current Limit alarms are now available on the Notification list.

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- The Main Menu has been re-organized for more logical flow and consistency with other products.
- Email notifications are now working RF Module Switch Inhibit and related PS Missing alarms.
- Resolved an issue where Rack alarms were not displaying properly in the Logs page.
- Included support for NAE107A (and later) exciters.

Version 4.2.3 – Released August 18, 2014

- Implemented a transmitter final stage PA bias routine. Previously, a single bias value was used for all PAs for each operating mode. This allows the transmitter to determine the proper bias value for each PA, accounting for individual FET characteristic differences.
- Resolved an issue where the minimum power set-point is undershot while in RF-drive control (low power in FM mode).
- Implemented a discharge bias voltage increase (to a limit) on PAs if PA voltage is not discharging fast enough.

Version 4.2.2 - Released May 26, 2014

• Resolved an internal DSP/DMA engine issue whereby if operating with "MPX over AES" as the main audio source, the exciter PWB output would produce wideband noise that translated to the transmitter RF output spectrum (having the potential to fail power amplifiers and would sound un-listenable).

Version 4.2.1 - Released May 14, 2014

• This release resolved a connection issues with the Phone Home service.

Version 4.2 – Released January 31, 2014

NVLT SW 4.2 sees the introduction of Nautel Phone Home to the NVLT family of products. See manual for further details on activating this feature.

Other improvements with this release include:

- Greatly increased communication reliability with the power supplies.
- Cleaned up some errant duplicate SNMP MIB entries.

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 Remote IO power adjustment behaviour has been modified. NVLT now supports both edge and level triggers, and the increment/decrement step size has been adjusted from 100W to 1% of TX nameplate power. NOTE: Any customers using this feature will need to double-check their remote IO power adjustment settings.

Known issues:

- The remote IO power adjustment increments for NVLT 3.5, 7.5, 15, and 30 are incorrectly 50W, 100W, 200W and 400W, respectively.
- On the Software Upgrade page, the "Last Update" date always shows the year of the user's computer. The Software Upgrade History shows the correct date.

Version 4.1 – Released August 29, 2013

NVLT SW 4.1 includes the following improvements:

- As of this release, NVLT supports MPX over AES (Omnia Direct) with appropriate Omnia 11 (or later) processor and necessary version of transmitter related hardware which includes: Controller module (with integrated exciter) using PWB NAPE87A or later (e.g. NAE106B) and/or Exciter module NAE107 or later.
- SNMP Summary Alarm support; see new MIB file.
- Resolved issue where "Controller RF Drive Splitter Temperature" meter did not appear on AUI for NV3.5LT thru NV10LT.
- Resolves an issue in the System Settings -> LVPS Hardware menu where "Dual LVPS A/B" was not an available option. For those customers who have dual LVPS A and B installed and were running NVLT SW 4.0 and are now upgrading to NVLT SW 4.1, it is recommended that this configuration be changed from "Single LVPS A" (a temporary factory setting to work around this bug) to "Dual LVPS A/B". This configuration change will now show "LVPS B Missing" alarms when and if the B LVPS is removed; otherwise it is masked off for a setting of "Single LVPS A". Note that even with "Single LVPS A" as the setting while LVPS A and B are installed, both LVPS A and B alarms would be visible if a related fault occurred.

Version 4.0 – Released July 29, 2013

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Upgrading to NVLT SW 4.x from version 3.3 is a two-stage process; first is an OS upgrade, and second is an upgrade using a .tgz file. Please see the appropriate upgrade Information Sheet for further details.

It is **strongly recommended** that customers upgrade to NVLT SW 3.3 before upgrading to NVLT SW 4.x; version 3.3 contains a new second stage bootloader that greatly increases the success rate of the OS fallback procedure.

NVLT software version 4.0 supports high power NVLT systems, as well as fixing a number of issues:

- This release implements a new OS and a new first stage bootloader.
- Implements "Cutback" function which reduces the transmitter's target output power level to the shutback point power level less 15%, in the event an SWR Shutback occurs repeatedly (more than 3 times in 60 seconds for the 1st time, and then each time there after) due to an issue with the output RF feedline/antenna (e.g. fault in the feedline that has a finite air gap between the output conductor and the inner conductor, such that at a specific power level, the air breaks down and an arc occurs causing repeated SWR shutback events each time the transmitter recovers and the power level reaches that breakdown point). The transmitter will automatically try and increase the target power level back to the set-point after a predetermined amount of time (approx. 3min). If the fault condition has been cleared, the transmitter will recover to the original desired set-point; if not, it will continue cycling indefinitely. This also applies to the Reject Shutback function.
- Exciter "Reverse Path Gain" meter replaced by "Reverse Attenuation"; value only applies to NAE107 Exciter module.
- Some device meter ranges were updated to account for corrected typical values and alarm thresholds.
- Additional meters were added to each device and the sorting was rearranged accordingly.
- Added new Lineage PS meters: Ac Input Voltage (V), Ac Input Current (A), Run Time (hrs) and Fan Speed (RPM).
- When using UG92A power supplies the transmitter is now capable of operating from 90-265Vac vs. 175-265Vac; a "Low Ac Operation" alarm will become active when in this condition (incoming ac voltage drops below 170Vac) and clear when the voltage exceeds 175Vac.
- "Call Sign/ID" text is now shown as a header in the Critical Parameters.

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Added new Combiner Match related alarms that indicate the reason the Combiner Match alarm occurred: these include:

- "Power Discrepancy" (control system has determined that there is unaccounted for amount of RF power somewhere in the transmitter likely in an arc);
- "Low Efficiency" (control system has determined that the system efficiency is much lower than expected; input power >> output power because some of the RF power is going to sustain an arc and not making it out of the transmitter);
- "Current Imbalance" (RF module current ratios on either side of the internal hybrid combiner have exceeded an acceptable threshold, typically caused by severe SWR; symptoms of an intermediate combiner stage arc).
- Added support for Level Triggered Remote Inputs (e.g. Presets).
- Updated function so that the external RDS Encoder "must" enable time packets and issue the time to the exciter before time packets will be sent by the exciter (NAE107).
- "Low Forward Power" and "Very Low Forward Power" thresholds now exist in the "User Settings" menu (still remain as duplicate in the "System Settings"); this allows the user to adjust these thresholds without having to enter the System Settings menu.
- The maximum number of remote AUI users has been increased to 8. Performance (update speed) may degrade as the number of users increase.
- NVLT SW 4.0 requires a new OS v4.0 update; for that reason, any saved Playlists will be deleted. It will be up to the user to ensure their playlist content can be restored post the upgrade.
- Changeover menu updated slightly to improve readability.
- Critical Parameters "Settings" reorganized to improve readability.
- Resolved issue where the standby NAE106 controller was not enabling the internal fan when Standby Test was active.
- UI Main/Active Exciter within Changeover menu now references Exciter B in place of Exciter 2(B); and Ctrl/Exc A in place of Ctrl/Exc 1(A)
- Controller Reject #-# Power meters now reference "5kW", "10kW", "20kW" or "40kW" prefixes based on their application (makes it easier to identify their purpose).
- Resolved issue where Exciter B (NAE107*) version number was not being shown in the Software

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Upgrade details.

- Updated UI meter sorting to match sequence on AUI meter view.
- Updates Controller Total RF Drive Power meter to reflect necessary ranges for NV40LT (highest RF Drive Power requirements).
- Exciter Forward Power meter range/limits increased to account for higher power application when used in NVLT HP.
- Updates "Exciter PA Current" meter to reflect NV40LT exciter current requirements; higher nominal levels.
- Standby Exciter is limited to 100W RF output when "Standby Test" is ON.
- Incorporates new alarm "RF Module # Fan Voltage Fault" to inform the user that the associated RF Module fan power supply is not producing the expected output voltage.
- New "Exciter VSWR" meter added.
- Changeover menu "Auto Delay" range is now 2-120 seconds with the default as 2 seconds (min was 1 second).
- Improvements made to prevent Controller/Exciter DAC Gain from reaching the upper limit (100%) before
 the Forward Attenuation was updated; now the Forward Attenuation is allowed to change further to
 prevent this behaviour. Symptoms were that the exciter forward power set-point could not be achieved,
 as the DAC would hit 100%; this typically had a negative impact on output power capability due to the
 reduced RF drive; however, it was worked around by running the "Exc Att Routine" (Exciter Attenuation
 Routine) this should no longer be necessary.
- Resolves issue where local RF OFF button would only turn the transmitter off if the local UI was functioning; hardwired control line wasn't being listened to by the rack controller; now, if the UI fails, the local RF OFF button will turn off the transmitter.
- Incorporates a new alarm "Module Extraction Shutback" to inform the user that they have extracted an RF module without first disabling it and this is the cause of the transmitter shutback. RF modules should first be disabled using their front panel switch and only removed once the STATUS LED is red.
- Fan Speed range changed from 60-100% to 63-100% with 63% as the default.
- Changed syntax for "Sync Cal" menu to use the term "Racks" in place of "Tx" for consistency/accuracy.
- Several menus have removed the numerical references to exciters (1 & 2).

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- Resolves issue where "Exciter High SWR" and "Exciter SWR Foldback" alarms were not being displayed properly when the controller/exciter was in that condition. Alarms inform the user that the exciter is not achieving the desired output power due to a high SWR at its output.
- Resolved intermittent controller temperature reading issue (meter read normal then dropped out to less than 0C, then normal again). It now reads the correct temperature and is stable.
- Resolved issue where Controller Average PA Voltage meter was reading 0V (was actually correct, but the meter read incorrectly) when the Forward Power was less than 5% of the transmitters rated power.
- Resolved a few issues with Exciter Changeover function where Exciter High SWR (pulled RF drive cable) would not cause changeover to the standby exciter.
- RF Module "RF Drive Loss" alarms now function.
- "Avg PS Curr" (Average Power Supply Current) meter added to the UI Controller meter list to aid in troubleshooting only (not available in AUI).

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