



# Nautel Software Bulletin

April 10, 2014

## Nautel NX Series V4.2 Release Notes

NX SW 4.2 sees the introduction of Nautel Phone Home to the NX family of products. See **PhoneHomeOperation.pdf** (also available on the FTP site) for further details on activating this feature.

Other improvements with this release include:

- Resolved an issue where a "Rectifier Fan Fail" alarm would not cause a change in the color of the AUI's "STATUS" button.
- Updated the IBOC MA-1 mask as per the new NRSC-5-C standard.
- Added the ability to adjust the gain applied when EAMC is enabled.
- The AUI will no longer allow a software upgrade while RF is ON.
- Remote IO power adjustment behaviour has been modified. NX now supports both edge and level triggers, and the increment/decrement step size has been changed to 1% of TX nameplate power. NOTE: Any customers using this feature will need to double-check their remote IO power adjustment settings.

The most significant improvements with previous versions include:

### Version 4.1.1 – Released October 3, 2013

- Resolved some SNMP-related issues by more closely adhering to the SNMP spec.
- Resolved a frequency display issue with the Smith chart.
- Improved the feedback on the Power Module summary page.
- Resolved an issue where the Exciter Synchronization page would not auto-refresh after synchronization is complete.
- Resolved an issue where RF Monitor Gain was not being applied to both exciters.

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April 10, 2014

- Fixed some consistency issues with Apply button activation.

## Version 4.1 – Released August 16, 2013

- This release includes the addition of IBOC MA-3 (all-digital) mode compatibility. In the Preset screen, when IBOC is selected as the Overall Mode, it is now possible to set the "IBOC Service Mode" under the Digital Settings tab as MA-1 or MA-3. Note that IBOC MA-3 compatibility also requires an Exgine and Exporter Plus firmware update, and possibly requires capturing additional pre-correction curves. Please contact Nautel customer service if you are interested in running your NX transmitter in this mode.
- This release fixes an issue where the transmitter would overshoot its Set Point when recovering from a loss of I/Q over AES signal when running in DRM modes.
- This release includes logging of SWR protection ON/OFF changes.
- In this release, the nuisance alarm "Exciter External Changeover Fault" will no longer be displayed.
- This release resolves an issue where the Exciter's Carrier Impedance measurement possibly displayed an incorrect value when operating in DRM modes.
- This release resolves an issue where the available Control options for changing presets using the digital remote inputs were incorrect.
- This release resolves an issue where the severity of the Low Forward Power Thresholds was set to high, turning the Status button red. As this does not indicate an off-air condition, the alarm will now have severity medium, turning the Status button yellow.
- This release includes the addition of the ability to offset an incoming DRM signal by up to +/- 10 kHz before it is transmitted.

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April 10, 2014

- This release resolves an issue where the graphic meters that can be added to the right side of the home screen on the remote AUI would not scale properly when the remote AUI window was re-sized.
- This release resolves an issue where the Power Distribution Plot data would overshoot the maximum x-axis value when running high peak-to-average signals.
- This release resolves the issue of being able to change the system time, even when NTP is enabled.
- This release includes the addition of functionality that improves the pre-correction implementation for 18/20 kHz DRM and All-digital IBOC (MA-3) configurations.
- Translations are disabled in this release as they are incomplete. Translations will be re-enabled at a later date, once updated.
- This release resolves an issue where the sensitivity of the Pwr Inc/Dec buttons on the NX control PWB effectively prevented changing the transmitters power Set Point. This functionality has now been changed such that holding the button down will change the power set point in steps of 5% of the rated power of the transmitter every 0.5 second, and tapping the button will change the power set point in steps of 100W or 1 kW, depending on the transmitter type.
- This release resolves an issue where the "High Power Lockout" setting shown in the "Copy to Clipboard" version of the log is displayed as one spot lower than the actual setting (i.e. if High Power Lockout 4 was selected, High Power Lockout 3 would be shown in the text log). This cannot be fixed for SNMP due to backwards compatibility requirements.
- Users can now only modify NTP servers when NTP is NOT enabled.
- This release resolves an issue where some audio files would not appear in the playlist file list if their extensions were not lower case.

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April 10, 2014

Version 4.0.2 – Released February 28, 2013

## General

- In this release, the mask shown on the spectrum analyzer in 'Analog AM' transmission mode has been updated to meet the NRSC-2-B specification
- In this release, it is no longer important which AES input is used for analog or digital transmissions. For this reason, the AES inputs have been renamed as follows:
  - 'Analog AES' becomes 'AES 1'
  - 'Digital AES' becomes 'AES 2'
- This release includes the ability to use SNMP traps. A trap is an unsolicited message sent by an SNMP agent when an alarm changes state (turns on or off). The message is an SNMP packet that can be interpreted and displayed by an SNMP client application.
- This release includes the addition of summary alarms, which can be used to drive individual remote outputs on the remote I/O interface. Summary alarms are used to capture multiple alarm conditions with a single remote output. For example, the 'High Reflected Power Summary' alarm will occur when one or more of the following alarms are preset: 'SWR Shutback', 'SWR Foldback', 'Cutback'.
- This release includes the addition of remote AUI connection timeout. If a connection to the remote AUI is not used for more than 30 minutes, that user will be disconnected, which will open up a slot for another user to log in. The maximum number of logged in users is 10.
- In this release, additional permissions functionality has been added to user accounts control. It is now possible to selectively choose if a user can activate/modify presets, adjust power levels, manage power lockouts, delete

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# Nautel Software Bulletin

April 10, 2014

- logs, and turn RF on/off.
- In this release, the 'Menu' in the AUI has been reorganized into the following groups: Presets, Factory Settings, System Settings, Pre-correction Settings, User Accounts, Changeover, User Settings, Remote I/O, Scheduler and Playlist. For more information on each option, see the updated operations section of the NX manual.
  - This release includes the addition of two configurable low forward power thresholds. These thresholds are adjustable from 0 to 90% of the setpoint. When the output power is below a threshold, a corresponding alarm will be triggered.
  - As of this release, Mag Phase delay is now an offset with a default value of 0, as opposed to an absolute number. Previous modifications to the Mag Phase delay will be automatically converted.
  - Dual GPS synchronization cards are no longer supported with this release.
  - This release includes the ability to direct the transmitter to take action on audio loss, after a specified delay (similar to what is implemented in NV and VS).
  - This release includes the addition of the ability to adjust the maximum compression (in dB) when running DCC. The maximum DCC compression defines the maximum reduction in carrier power that will be seen with a given algorithm, and the DCC curve is adjusted accordingly.
  - This release resolves an issue where the transmitter would shutback on SWR events, but never enter the cutback routine. See NX manual for more information on cutback.
  - This release resolves an issue where logs would be tagged one hour in advance of the actual time due to daylight savings settings.
  - This release resolves some issues around user accounts including preventing a user from deleting the account they are logged into and allowing administrators to change their own passwords.

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April 10, 2014

- This release resolves an issue where it was not possible to copy the logs to the clipboard.
- This release includes a major overhaul of the NX scheduler. Instead of being event driven, the scheduler is now rule driven. Each rule can be created with any start/end date/time, and allows each event to be repeated on a defined interval. The maximum number of rules that can be added to the scheduler is now 144. See the updated operations section of the NX manual for more information on using the scheduler.
- This release includes the addition of support for TLS secured SMTP servers. This allows the use of a web mail service as the outgoing email server for the transmitter .
- This release includes major updates to the operating system and AUI code base, and has undergone extensive verification testing. It is expected that all software related AUI lockup issues are resolved. Please contact Nautel if any problems are experienced with this release.
- In this release, preset functionality has been completely overhauled to create consistency between product lines. New functionality is as follows:
  - The active preset is shown in the top banner. Presets are activated by choosing the desired preset from the drop-down menu in the top banner.
  - When the presets page is opened from the menu, the 'Current Settings' of the transmitter are displayed, which define the current operational state of the transmitter. 'Current Settings' can be adjusted and then immediately activated by pressing the 'Save' button.
  - To adjust a saved preset, that preset must be loaded from the Presets page. If the adjusted preset was active before it was changed, saving the preset will update the preset, but the 'Current Settings' will remain unchanged. In order to update the operation of

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# Nautel Software Bulletin

April 10, 2014

the transmitter, the preset must be re-activated through the top banner.

- An asterisk next to the preset name in the top banner indicates the 'Current Settings' have changed from the last loaded preset. 'Current Settings' are not saved through a power cycle; when recovering from an AC power loss event, the transmitter will load the preset that was last activated.
- On the presets page, an asterisk next to the preset name in the header indicates there are unsaved changes to the preset.

See the updated NX transmitter operations manual for illustrated information on operating presets.

- This release includes the ability to indicate an 'Invalid Preset' condition with a digital output on the remote I/O. This condition indicates that an unsaved change has been made to a preset, changing the current settings of the transmitter. This is the same condition that adds an asterisk to the beginning of the active preset name in the top banner of the AUI.
- This release includes improvements to preset management, where presets cannot be deleted if they are currently active, used in the scheduler, used as an audio loss fallback preset or used in the remote I/O.
- In this release, the presets page in the AUI has been divided into four tabs: 'General', 'Analog Settings', 'Digital Settings' and 'Audio Loss'. The 'Analog Settings' and 'Digital Settings' tabs are populated according to the selected transmission mode. See the updated operations section of the NX manual for a detailed description of each tab.
- This release includes the ability to copy pre-correction settings from one exciter to the other. The settings that can be copied include the AM-AM curves, AM-PM curves, equalization curves and configurations.

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April 10, 2014

- This release includes the addition of the ability to link pre-correction settings to presets through a mechanism called 'Configurations'. A configuration is created in the Pre-correction Settings menu and includes settings for Mag-Phase delay, B+ setpoint, AM-AM curve, AM-PM curve and equalization curve. Created configurations can then be called up in a preset, and be used to adjust these settings depending on the transmission mode setting of the transmitter. These settings will normally be generated at the factory, based on the desired modes of operation, and do not require adjustment in the field. See NX transmitter operations manual for more information on configurations and presets.
- This release includes the addition of the ability to synchronize the transmitter's clock using Network Time Protocol (NTP) once directed to a NTP server.
- In this release, power modules, previously referred to as 'Cubes' in the AUI, are now referred to as 'Power Modules' or abbreviated as 'PM' when necessary.
- In this release, the maximum number of alarms that can trigger a notification has been increased from 128 to 65535
- This release adds the ability to save the list of visible meters on the main screen of the AUI. A default list can also be set, defining the meters that appear after an ac cycle. Saved meter lists are also linked to user accounts, so the default list on a given account will appear when that account is accessed.
- This release includes improvements which provide feedback as to why actions cannot be performed. Indicated restrictions include local/remote mode, user permissions and setting ranges.
- In this release, 'DCC1' mode has been properly labeled in the Dynamic Carrier Control setting in presets.
- In this release, the pre-emphasis curve has been properly identified as being that defined in the NRSC-1 standard.
- This release resolves an issue where the transmitter output power would overshoot and cause power supply transients when switching between analog and DRM modes of transmission. In this release, the transmitter will shut down and ramp up to the desired power level when switching between these modes.
- In this release, set-point precision is now limited to a level that is reasonable for the transmitter type. NX25 & NX50 set-point precision is limited to 0.1 kW. NX100+ set-point precision is limited to 1kW
- This release includes the ability to add a name(i.e. a call-sign) to the top banner. This allows the transmitter to be uniquely identified when accessing multiple transmitters via remote AUI.

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April 10, 2014

- This release includes the addition of an audio player that can be used as a backup audio source. Use of the audio player requires the purchase of a USB sound card available from Nautel. See the updated operations section of the NX manual for more information.
- In this release, when a preset is selected with a 0W setpoint, the behaviour of the transmitter has been changed to essentially be the same as if the interlock has been opened. PDM is immediately inhibited, and after 10 seconds the transmitter will shut down. Once a preset is selected with a setpoint greater than 0W, the transmitter will turn on with the normal procedure.
- This release includes the ability to change the IP address port to which the transmitter is listening, which facilitates the use of port forwarding on the firewall/router at the transmitter site. This allows the transmitter to be set to listen to a specific port that is open in the firewall if it is different from the default. This also enables connections to multiple transmitters behind a single firewall. Note that the port number for external connections to the firewall and the port number the transmitter is mapped to MUST be the same.

## IBOC Specific

- This release includes an update to the AM IBOC mask to meet the NRSC-5C specification, allowing for IBOC modes that turn off the tertiary carriers.
- This release includes the addition of the ability in IBOC mode to turn enhanced carriers on/off and change the PIDS power levels between high/low on the Exgine through the AUI.
- This release resolves an issue where erroneous Exgine alarms were being displayed.
- In this release, various Exgine alarms will now be displayed in the AUI to provide more information on the status of the Exgine. The added alarms include:
  - System Error - General fault summary alarm.
  - External 10MHZ Lost - The external 10 MHz signal is not detected by the Exgine.
  - FIFO Underflow - The Exgine waveform FIFO is overflowing, likely due to clock drift between the Exporter and Exgine.
  - FIFO Overflow - The Exgine waveform FIFO is underflowing, likely due to clock drift between the Exporter and Exgine

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- Ethernet Link Down - The Exgine is not able to communicate with the Exporter.
- Network Misconfigured - The current network settings are incorrect.
- DPLL Unlocked-The VCXO in the 10 MHz PLL is being pulled beyond it's +/- 1ppm limit.
- AM/FM Mode Mismatched - Exporter/Exgine AM/FM mode misconfiguration.
- This release resolves an issue where the progress bar which was displayed when applying settings to the Exgine would never update.
- This release resolves an issue where if the transmission mode was switched from IBOC to Analog AM, the IBOC related I/Q alarm "Serial B Missing" would not clear.
- This release includes the ability to view the constellation and take real-time MER measurements of individual sub-carrier groups in the signal seen at the output of the transmitter when running in IBOC mode.

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