



3: OPERATIONS & MAINTENANCE MANUAL

GV2-5/GV2-3.5 TRANSMITTER

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RELEASE CONTROL RECORD

ISSUE	DATE	REASON
6.0	2024-05-01	Release 6 of GV2-5/GV2-3.5 (NARF71F/02). Supports software version GV2 SW 1.0.0 and later.
6.1	2025-11-01	Supports software version GV2 SW 1.2.0 (Air Chain) and later.

SECTION 3.1: DESCRIPTION

This section provides a high-level description of the transmitter's key sections. The transmitter circuitry is subdivided into four basic stages:

- [Ac-Dc Power Stage](#)
- [Control/Monitor Stage - see page 3.1.3](#)
- [RF Drive Stage - see page 3.1.4](#)
- [RF Power Stage - see page 3.1.5](#)

Refer to the functional block diagram, [Figure 3.1.1 on page 3.1.9](#).

GV2-5/GV2-3.5 Electrical Schematics

Some descriptions in this section refer to electrical schematics (SD-#s). These are located in Section 4 of the GV2-5/GV2-3.5 Troubleshooting Manual.

Ac-Dc Power Stage

See electrical schematic Figure SD-1. The ac-dc power stage provides power to operate the low voltage power supplies, which generate the 40 to 48 V dc voltage that is converted to the low level dc voltages (± 15 V and +5 V) used throughout the transmitter. This voltage is also conditioned to operate cooling fans in the RF power module and reject load assemblies. The ac-dc power stage also converts the ac power source to a positive dc voltage (PA volts) for the transmitter's RF power amplifiers and exciter(s). The transmitter accepts a wide range of ac input voltage options:

- ❖ 3-phase, 180 - 264 V ac (208 V ac nominal)
- ❖ 3-phase, 312 - 457 V ac (380 V ac nominal)
- ❖ 1-phase, 180 - 264 V ac (240 V ac nominal)

The ac-dc power stage comprises ac input terminal block TB1, power supply interface PWB (A1), low voltage power supply (LVPS) modules A (U2), B (U3), and power supply modules (U4 through U7), two for each of the two RF power modules. There are three amber LED pilot lamps (DS1 through DS3), located in the bottom, rear of the cabinet, that indicate the presence of each ac phase.

Power Supply Interface PWB

See electrical schematic Figure SD-1. The power supply (PS) interface PWB (A1):

- ❖ interfaces between the ac input on terminal block TB1 and the LVPS and power supply modules.
- ❖ distributes LVPS voltage to the RF drive (exciter) stage and the control/monitor stage.
- ❖ distributes PA voltage to the RF power stage and the control/monitor stage.
- ❖ controls, with the controller module, the LVPS output voltage.
- ❖ provides RS485 serial communication between the module control/interface PWB and the RF power module power supplies.
- ❖ allows configuration of the LVPS modules if the UPS option is installed.
- ❖ provides status and alarm outputs from the LVPS and power supply modules, consisting of Module Present, Power Fail Warning, Rectifier Fault and Overtemp Warning (provided to the module control/interface PWB over a serial bus).

LVPS Modules

See electrical schematic Figure SD-1. LVPS modules A (U2) and B (U3) convert the ac input voltage to the regulated output (40 - 48 V dc, nominally 40 V) that is applied to, and controlled by, the controller module via the module control/interface PWB. +5 V, +15 V and -15 V regulated outputs are developed from the LVPS output voltage (40 - 48 V dc) on the module control/interface PWB.

Power Supply Modules

See electrical schematic Figure SD-1. Power supply modules U4 through U7 convert the ac input voltage to a regulated dc supply (PA volts) for both RF power modules. Each switching power supply module is rated for a nominal 2725 W and provides an output voltage between 18 V and 53 V (typically 40 V). The modules regulate the output voltage based on a serial control input from the controller module (A4), applied via the module control/interface PWB. Each module has a built-in cooling fan, senses excessive temperature conditions and applies an Overtemp Warning signal (for indication purposes only) to the module control/interface PWB. The module also senses out-of-regulation on the ac input and dc output, and applies a Power Fail Warning signal to the module control/interface PWB. Both conditions cause the power supply to shut itself down, thus reducing the transmitter's RF output. All power supply module signals are applied to the controller for system level monitoring.

Control/Monitor Stage

See electrical schematic Figure SD-2. The control/monitor stage performs many critical functions for the transmitter. It:

- ❖ contains monitoring and protection circuits to prevent transmitter damage under adverse or fault conditions, including high speed SWR protection and interlock/muting.
- ❖ monitors the current value of various parameters including cooling fan tachometer outputs, transmitter output forward and reflected power, module temperature, PA current levels, and PA power supply status signals.
- ❖ measures and monitors the output voltage from the power supply modules as well as the low voltage power supplies.
- ❖ generates the signals that enable the power supply modules and control their output voltage.
- ❖ provides the status of any controller fault conditions.
- ❖ contains an integral DSP that performs all audio processing including filtering and FM baseband modulation.
- ❖ interfaces with the RF and power supply sections of the transmitter to perform control and monitoring functions.
- ❖ provides local and remote interfacing for the transmitter. Local interfacing is performed via the local AUI touch screen on the front door of the transmitter and the controller module's front panel UI - a 4 x 20 graphic LCD display - and its adjacent keypad. The AUI and controller UI each contain a menu-based series of pages that serve specific functions. The AUI is also available via remote access. The remote interface PWB (A16) allows the user a more convenient method to interface with the transmitter from a remote location using discrete wiring.

The primary components of the control/monitor stage are the single-board computer (A4A1) and controller PWB (A4A1), which are part of the controller module (A4) and the module control/interface PWB (A3).

The UI interface PWB (A4A2), also part of the controller module, provides an interface between the controller UI and the module control/interface PWB (A3). It also contains the pushbutton switches (**RF ON**, **RF OFF** and **LOCAL/REMOTE**) and associated status LEDs that protrude through the front panel, adjacent to the UI.

The remote interface PWB (A16) provides a convenient method to remotely control and monitor of the transmitter. It contains push-button switches that provide backup control for the RF on/off, local/remote, power increase/decrease and reset functions. It also contains LEDs that serve as an alternate means to monitor status (local/remote and RF on/off) and various status and alarm parameters.

RF Drive Stage

See electrical schematic Figure SD-3. The RF drive stage converts the exciter's RF output to the intermediate RF level needed to drive the RF power modules. It consists of exciter A (A5), optional exciter B (A6) and RF drive splitter/changeover assembly (A7).

Exciter(s)

Exciter A (A5) and B (A6, optional) are the RF drive sources for the transmitter. They accept the external audio program information (see the GV2-5/GV2-3.5 Pre-installation Manual for details on various program input types). For dual exciter applications, the exciters' main/standby operation is controlled using the local (or remote) AUI or the controller UI. The exciter outputs are applied to the RF drive splitter/changeover assembly (A7). The exciter provides a nominal RF drive signal of 50 W (in analog mode) at 98 MHz.

See also the Audio Path Block Diagram in [Figure 3.1.2 on page 3.1.10](#).

RF Drive Splitter/Changeover Assembly

See also electrical schematic Figure SD-33. The RF drive splitter/changeover assembly (A7) controls the routing of the main exciter and, if applicable, the standby exciter and provides the RF drive signals for the two RF power modules. The assembly is comprised of the splitter/changeover PWB (A7A1) and the 2-way RF drive splitter/attenuator PWB (A7A2).

Exciter Relay Control - Dual Exciters Only

The RF drive outputs from exciters A and B are applied to the RF drive splitter/changeover assembly at A7A1J1 and A7A1J2 respectively. The Exciter Relay Control input (A7A1J3-4) is a signal applied from the control/monitor stage that controls relay A7A1K1.

- ❖ When exciter A is selected as the main RF drive source, the Exciter Relay Control input is open circuit and relay A7A1K1 will be de-energized. Exciter A's output will be applied to 3 dB hybrid coupler A7A1U1.
- ❖ When exciter B is selected as the main RF drive source, the Exciter Relay Control input is near ground potential (0 V) and relay A7A1K1 will be energized. Exciter B's output will be applied to 3 dB hybrid coupler A7A1U1.

Exciter Drive Splitter

The splitter/changeover PWB's 3 dB hybrid coupler (A7A1U1) is connected as a splitter. The RF drive source (A or B) selected by relay A7A1K1 is applied to A7A1U1's input. The signal is split into two equal amplitude signals that are 90° out-of-phase. These split signals are applied to 2-way RF drive splitter/attenuator PWB A7A2.

2-Way RF Drive Splitter/Attenuator

The 2-way RF drive splitter/attenuator PWB (A7A2) accepts the outputs from the splitter/changeover PWB's 3 dB hybrid coupler and splits it into two equal amplitude signals, using two 3 dB couplers identical to A7A1U1. The outputs of the 3 dB couplers are applied to attenuators, as required, for application to the two RF power modules. Attenuation values are set in order to balance the RF drive output levels.

RF Power Stage

See electrical schematic Figure SD-4. The RF power stage accepts the intermediate RF drive inputs from the RF drive stage and generates the final RF output. It consists of two RF power modules, the module control/interface PWB (A3), a 10 kW combiner/filter (A12), an output power probe (A15), a 2-input reject load assembly (A13) and a 2-way fan tray assembly (A14).

RF Power Module

See electrical schematic Figure SD-34. Each of the two RF power modules provides up to 3000 W (for GV5) or 2250 W (for GV3.5) of RF output power. Each module contains four power amplifier (PA) PWBs (A1 through A4), a splitter/interface PWB (A5), combiner PWBs (A6 and A7), and six cooling fans. The intermediate RF drive outputs from the RF drive stage are applied to the RF power modules via the module control/interface PWB (A3). Within each RF power module, the RF drive signal is sampled and then split to drive the module's four PAs. The PA Volts inputs from the associated power supply modules control the RF output of the four PAs.

Module Control/Interface PWB

See also electrical schematics Figures SD-9 through SD-16. The module control/interface PWB:

- ❖ interfaces with all RF power module inputs and outputs, except for the RF output.
- ❖ interfaces between the controller module (A4) and the rest of the transmitter, distributing forward and reflected power samples, exciter control signals, and metering for reject load assemblies and the RF drive splitter/changeover assembly.
- ❖ distributes RF drive power, PA voltage and PA bias voltage to the RF power modules.
- ❖ monitors critical parameters of the RF power modules, such as RF drive sample, reject power sample, heatsink temperature and cooling fan speed. Monitoring circuits determine if a parameter is out of tolerance and generate the necessary control signal to compensate for the out of tolerance condition or to inhibit the RF power module's associated power supplies.
- ❖ applies control signals to the power supply modules from the controller and also monitors status signals and critical meters from the power supply modules and applies them to the controller. The controller can inhibit the power supply modules, as necessary (RF off, PS Temp alarm), or enable the power supply modules (RF on).
- ❖ generates a sample of the PA voltage applied to each RF power module and applies it to the control/monitor stage.
- ❖ samples the RF power module meters and generates the necessary PA bias voltages for each RF power module's PAs.

Combiner/Filter

The 5 kW combiner/filter (A12) accepts the RF outputs from two RF power modules and uses a 3 dB hybrid coupler to provide a single RF output. The 3 dB hybrid coupler accepts the outputs of two RF power modules. The equal amplitude, 90° out-of-phase (quadrature) RF signals are combined at the 3 dB hybrid coupler output and applied to a 5 kW low pass filter before being applied to the output power probe (A15).

Any amplitude or phase imbalance between the 3 dB hybrid coupler inputs causes a proportional signal to be applied to the reject load assembly's 5kW Rej Ld Pwr (1/2) via J5.

Reject Load Assembly

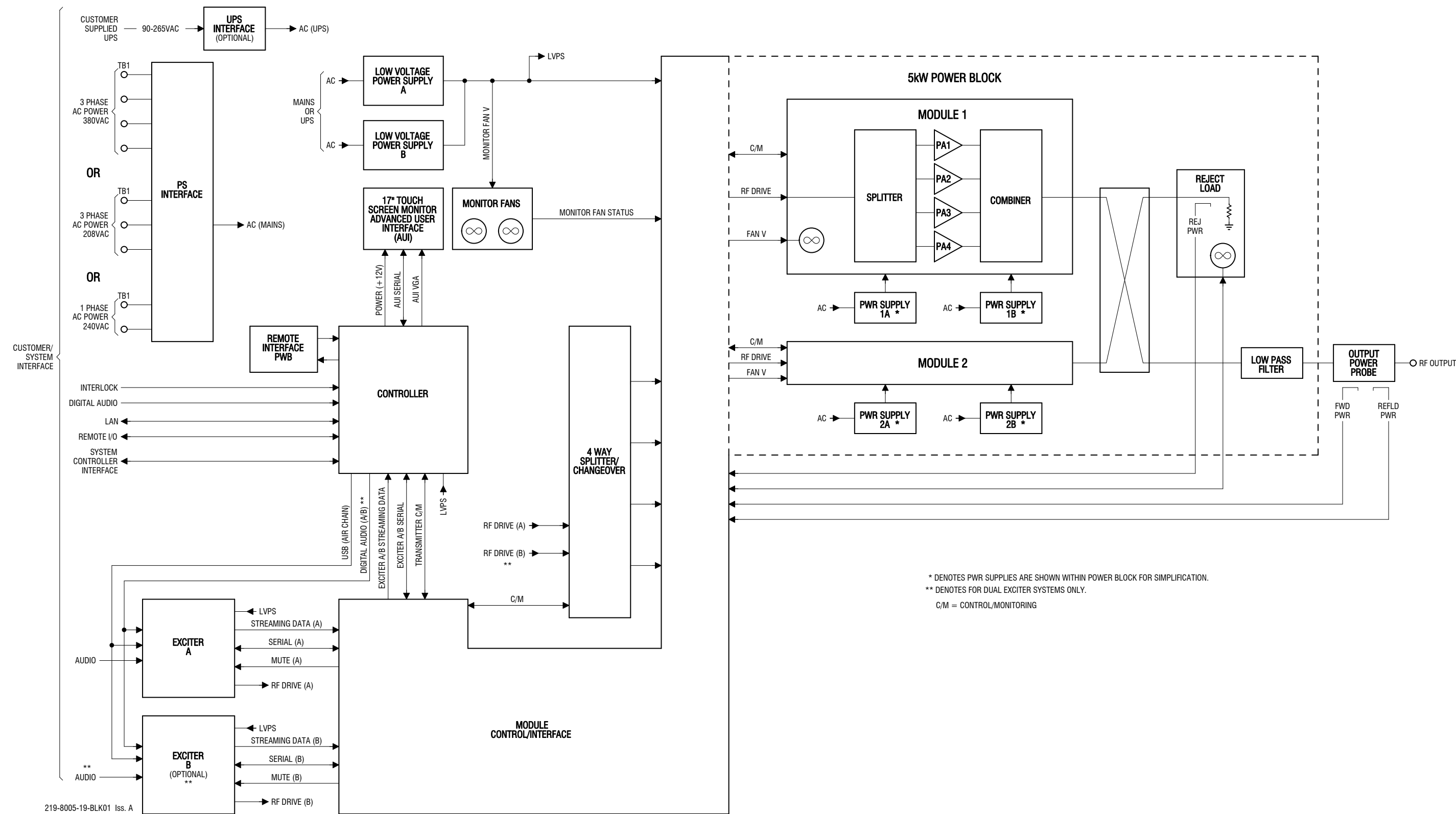
The reject load assembly (A13) provides a means to dissipate reject power from the outputs of the combiner/filter's 3 dB hybrid couplers. The reject load assembly contains power resistors to dissipate reject power. Cooling air for the reject load assembly is provided by fans in the fan tray assembly (A14). The module control/interface PWB (A3) monitors the speed of the cooling fans and regulates the voltage being applied to them accordingly.

Reject power generated by the combining stage of the combiner/filter is dissipated by resistors in the 1-input reject load assembly. Micro-strip transmission lines (on 2-input reject load PWB A13A1) in close proximity to the reject load signals induce one true RF sample voltage of the associated reject power. This sample is peak detected and applied to the control/monitor stage via the module control/interface PWB (A3). The module control/interface PWB provides an interface between the ac-dc power stage's Rej Fan Volts supply and the fan tray assembly's cooling fans. It also acts as the interface between the cooling fans' Rej Fan Tach signals and the control/monitor stage.

Output Power Probe

See electrical schematic Figure SD-36. The output power probe (A15) monitors the transmitter's forward and reflected power and generates the Fwd Pwr Sample (A1J1) and Refld Pwr Sample (A2J1) signals applied to the control/monitor stage for protection and monitoring. RF monitor PWB A3 provides a nominal 1.6 V (GV5) or 1.3 V (GV3.5) rms [at 5 kW (GV5) or 3.75 kW (GV3.5)] signal at A3J1, which is applied to the panel mount connector (W8J1) behind the front door. This can be used with a modulation monitor or spectrum analyzer. RF sample PWBs A4 and A5 provide similar samples at A4J1 and A5J1. These samples are applied to exciter B (if used) for use by the remote AUI's spectrum analyzer display.

GV3.5 / GV5 BLOCK DIAGRAM



219-8005-19-BLK01 Iss. A

Figure 3.1.1: GV2-5/GV2-3.5 Transmitter Block Diagram

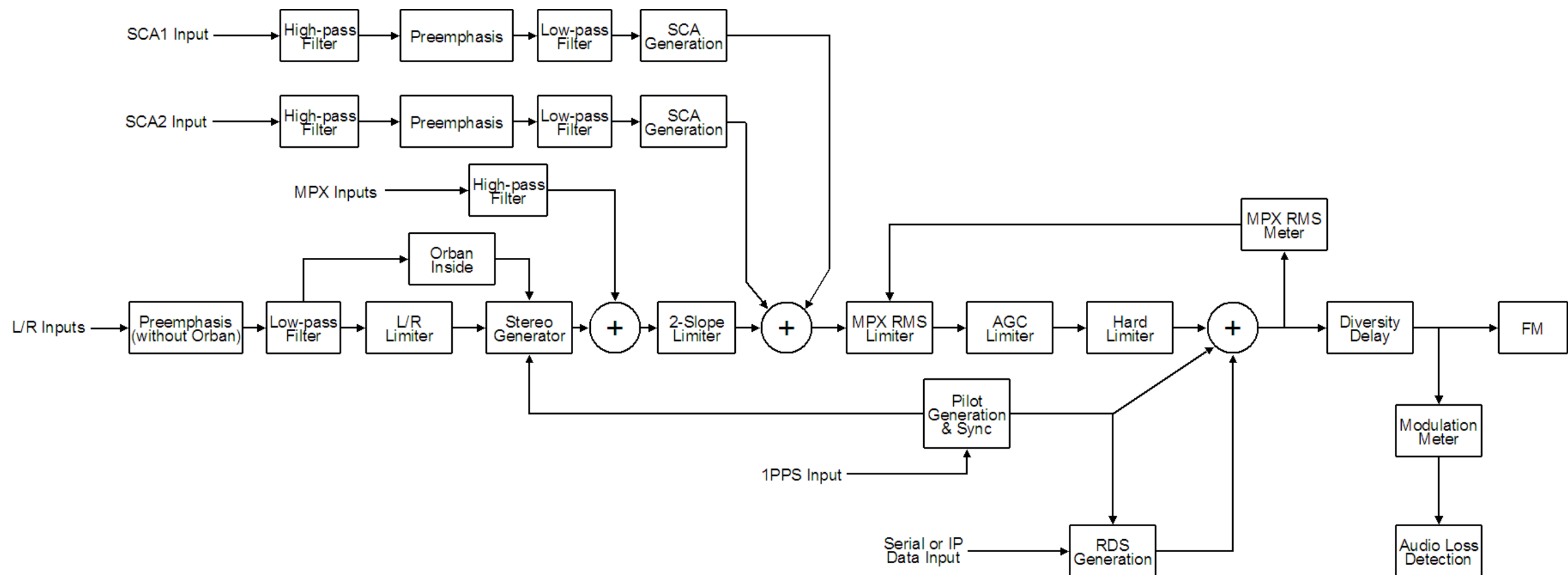


Figure 3.1.2: GV2-5/GV2-3.5 Audio Path Block Diagram

SECTION 3.2: OPERATING THE TRANSMITTER

This section provides information about operating the GV2-5/GV2-3.5 transmitter:

- [User Interface Options - see page 3.2.4](#)
- [Advanced User Interface \(AUI\) - see page 3.2.9](#)
 - ❖ [AUI Pages - see page 3.2.15](#)
- [Managing and Displaying Dashboard Panels - see page 3.2.20](#)
 - ❖ [Describing Dashboard Panel Options - see page 3.2.22](#)
 - ❖ [Alarms - see page 3.2.24](#)
 - ❖ [Audio Inputs - see page 3.2.24](#)
 - ❖ [Modulation - see page 3.2.25](#)
 - ❖ [Dashboard Meters - see page 3.2.25](#)
 - ❖ [Spectrum Analyzer - see page 3.2.27](#)
- [AUI Main Menu - see page 3.2.35](#)
 - ❖ [Alarms - see page 3.2.36](#)
 - ❖ [Meters - see page 3.2.37](#)
 - ❖ [Presets - see page 3.2.43](#)
 - ❖ [Scheduler - see page 3.2.60](#)
 - ❖ [Settings - see page 3.2.62](#)
 - ❖ [Audio Processing - see page 3.2.64](#)
 - ❖ [Exciter TCXO - see page 3.2.90](#)
 - ❖ [External 10 MHz - see page 3.2.91](#)
 - ❖ [FM Polarity - see page 3.2.92](#)
 - ❖ [Hardware Configuration - see page 3.2.93](#)
 - ❖ [HD/DRM - see page 3.2.96](#)
 - ❖ [Network - see page 3.2.101](#)
 - ❖ [Notifications - see page 3.2.103](#)
 - ❖ [Reboot Options - see page 3.2.106](#)
 - ❖ [Security Certificates - see page 3.2.107](#)

- ❖ [SNMP - see page 3.2.108](#)
- ❖ [Spectrum Mask - see page 3.2.110](#)
- ❖ [System Preferences - see page 3.2.111](#)
- ❖ [Thresholds - see page 3.2.112](#)
- ❖ [Time - see page 3.2.114](#)
- ❖ [Transmitter Info - see page 3.2.116](#)
- ❖ [Users - see page 3.2.117](#)
- ❖ [Remote I/O - see page 3.2.121](#)
- ❖ [Reports - see page 3.2.129](#)
- ❖ [Software - see page 3.2.133](#)
- ❖ [Air Chain - see page 3.2.135](#)
- ❖ [Sign Out - see page 3.2.153](#)
- [Controller Front Panel UI \(User Interface\) - see page 3.2.154](#)
 - ❖ [LCD Display \(UI\) - see page 3.2.154](#)
 - ❖ [Main Menu - see page 3.2.155](#)
- [Select Preset - see page 3.2.161](#)
- [User Settings - see page 3.2.162](#)
 - ❖ [Edit Presets - see page 3.2.163](#)
 - ❖ [Setting the Clock - see page 3.2.186](#)
 - ❖ [Network Setup - see page 3.2.186](#)
 - ❖ [Setting Pilot Sample Level - see page 3.2.189](#)
 - ❖ [Configure Test Signal Generator - see page 3.2.190](#)
 - ❖ [External 10 MHz Input - see page 3.2.192](#)
 - ❖ [Enabling the Scheduler - see page 3.2.192](#)
 - ❖ [Selecting FM Mask - see page 3.2.193](#)
 - ❖ [Setting User Thresholds - see page 3.2.194](#)
 - ❖ [Turn-On Delay Setting - see page 3.2.195](#)
 - ❖ [Ramp-Up Speed Setting - see page 3.2.196](#)

- View Status - see page 3.2.197
 - ❖ View Alarms - see page 3.2.197
 - ❖ View Meters - see page 3.2.198
 - ❖ Reset Alarms - see page 3.2.201
- Reset Alarms - see page 3.2.201
- Exciter Changeover Settings - see page 3.2.202
- System Settings - see page 3.2.204
 - ❖ Host Reboot - see page 3.2.205
 - ❖ Host Watchdog - see page 3.2.205
 - ❖ Firmware Update - see page 3.2.206
 - ❖ LCD Settings - see page 3.2.206
 - ❖ Exciter TCXO - see page 3.2.208
 - ❖ HD Optimizer - see page 3.2.209
 - ❖ HW Config - see page 3.2.211
 - ❖ FM Polarity - see page 3.2.217
 - ❖ Factory Settings - see page 3.2.218
- Remote I/O Settings - see page 3.2.223
 - ❖ Remote Inputs - see page 3.2.223
 - ❖ Remote Outputs - see page 3.2.225
 - ❖ Analog Outputs - see page 3.2.226
- Orban Audio Processor - see page 3.2.227
 - ❖ Configuring the Transmitter for the Orban Audio Processor - see page 3.2.227
 - ❖ Enabling the Orban Audio Processor for Preset Selection - see page 3.2.228
 - ❖ Selecting an Orban Audio Processor Preset - see page 3.2.231
- Using the Gen4 Remote User Interface - see page 3.2.232

User Interface Options

The user can interface with the GV2-5/GV2-3.5 using one of four methods:

- Locally, using the 17-inch front panel touch screen AUI (Advanced User Interface) (see [Advanced User Interface \(AUI\), on page 3.2.9](#)).
- Locally, using the controller module's front panel display and its navigational buttons (see [Controller Front Panel UI \(User Interface\), on page 3.2.154](#)) and the RF On, RF Off and Local/Remote control push-buttons (see [Controller Pushbuttons, on page 3.2.156](#)). This interface is considered a backup to the local AUI.
- Remotely, via a LAN connection, using the Advanced User Interface (AUI) pages (same as local AUI interface).
- Remotely, via remote input/output (I/O) wiring connected to the controller (A4) or the remote interface PWB (A16) (see the GV2-5/GV2-3.5 Pre-installation Manual for I/O details).

See the complete menu hierarchy illustrated in [Figure 3.2.1](#) (for the local/remote AUI menu) and [Figure 3.2.2](#) and [Figure 3.2.3](#) (for the controller UI menu). When a user interfacing function can be performed from both the AUI and the controller UI, both are described in this section.

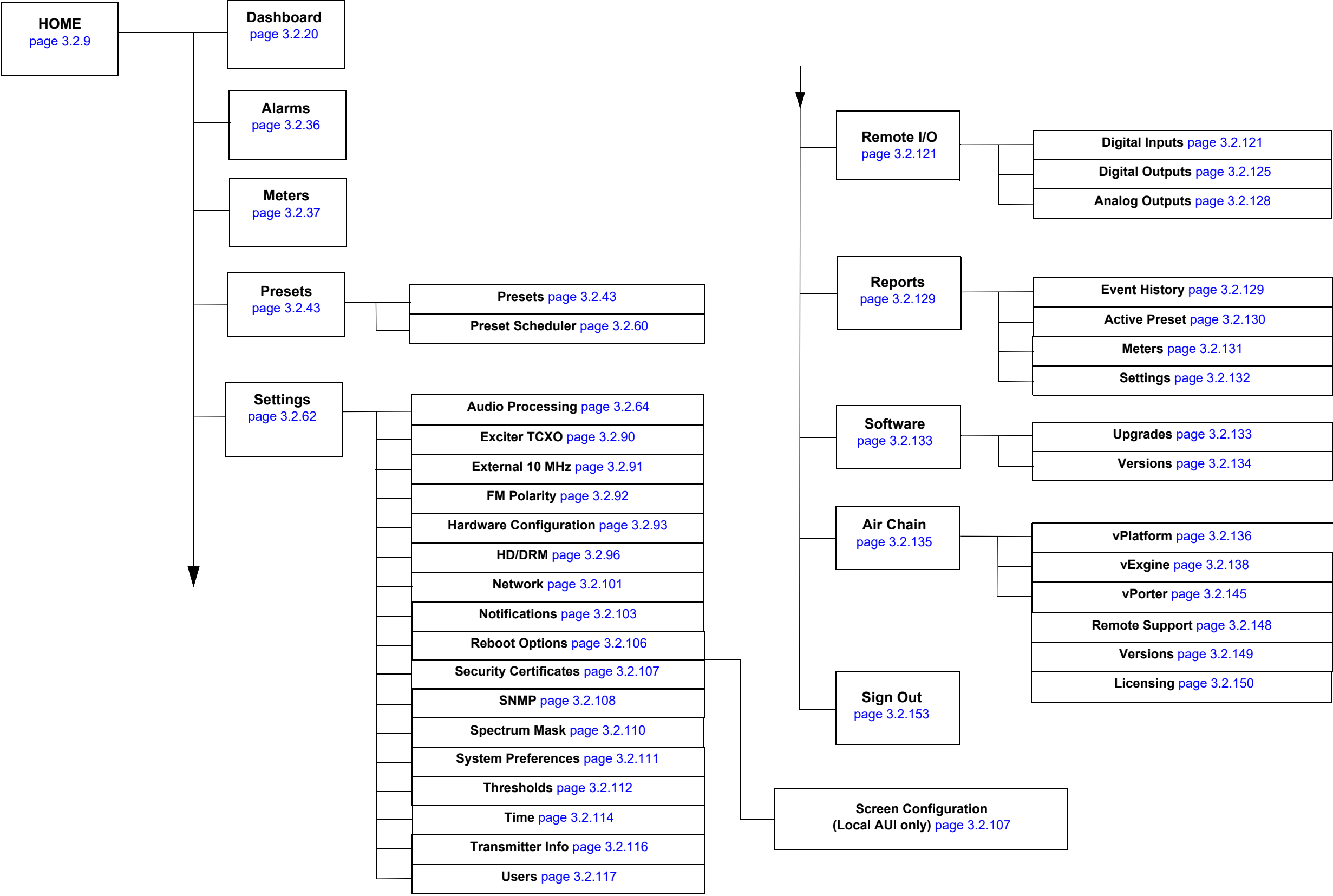
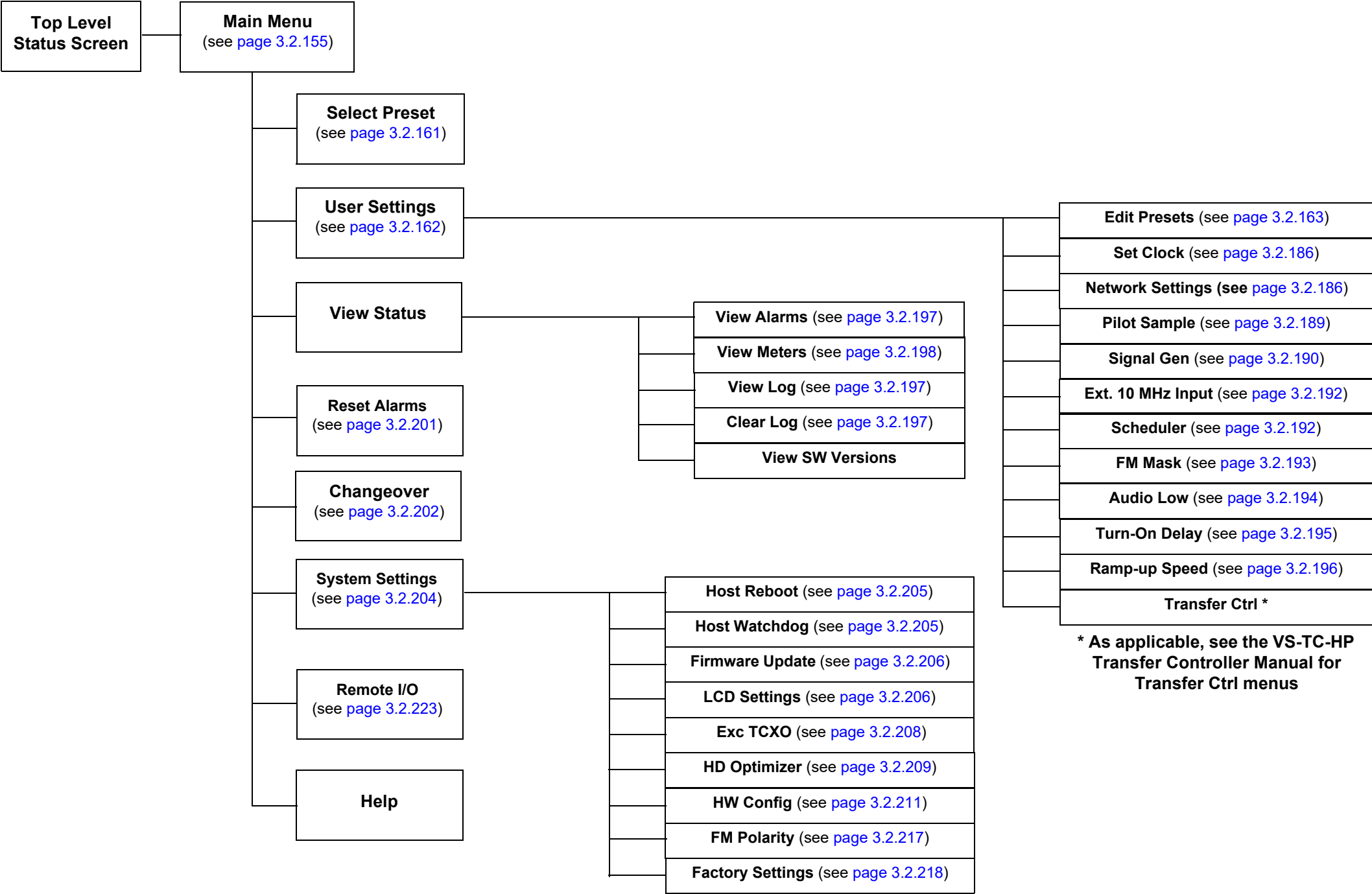


Figure 3.2.1: GV Transmitter AUI Flow Diagram

Controller UI



* As applicable, see the VS-TC-HP Transfer Controller Manual for Transfer Ctrl menus

Figure 3.2.2: GV Transmitter - Controller UI Menu Tree (Sheet 1 of 2)

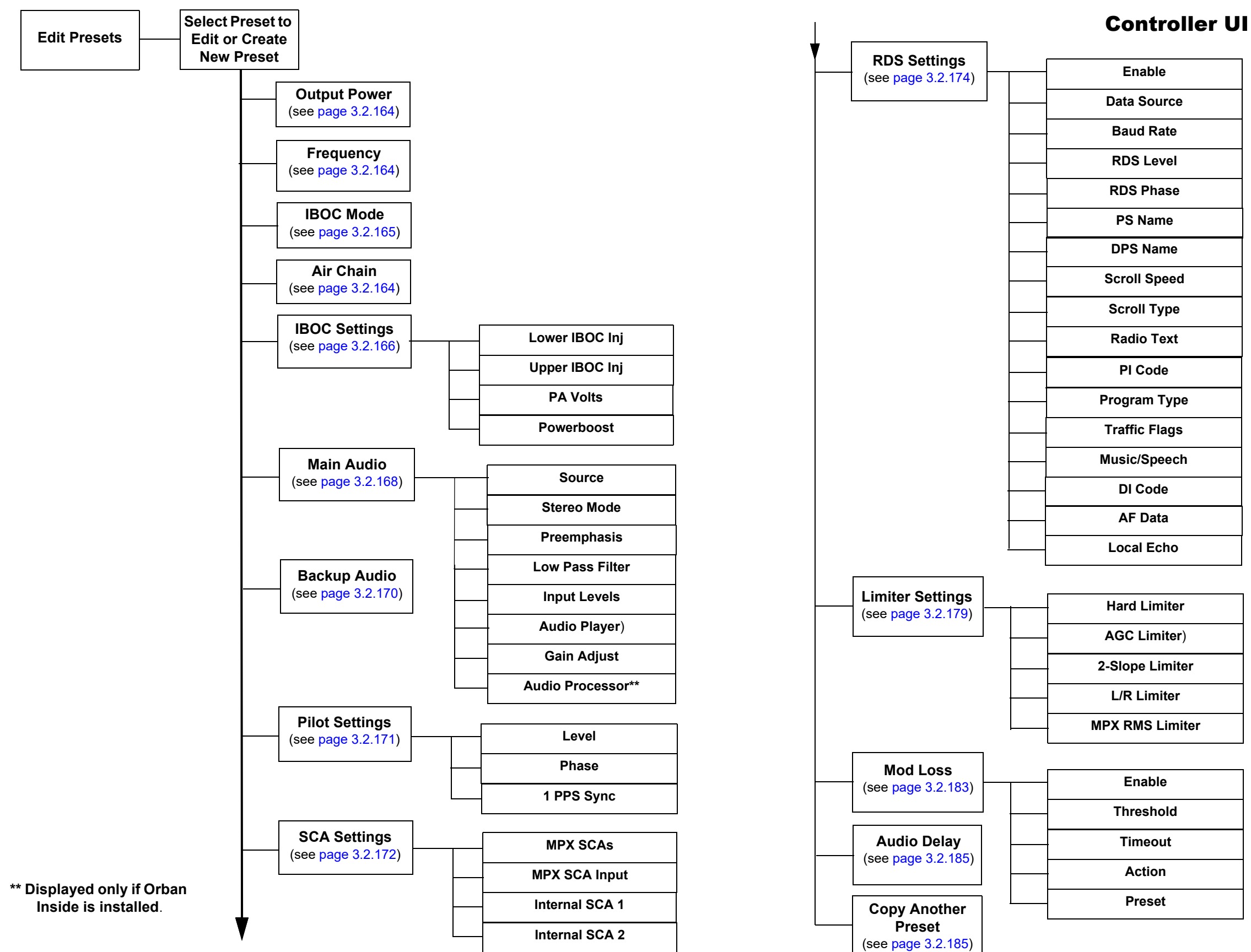


Figure 3.2.3: GV Transmitter - Controller UI Menu Tree - Edit Presets (Sheet 2 of 2)

Advanced User Interface (AUI)

The GV2-5/GV2-3.5 has an Advanced User Interface (AUI) that is displayed on a 17-inch, colour LCD screen mounted on the front of the transmitter (see [Figure 3.2.4](#)). You can access the AUI:

- locally via the touch screen, or
- remotely using a PC and a web browser, directly or through a switch or network - via the controller module's (A4) rear panel **LAN** connection or the remote interface PWB's (A16) **LAN** connection (J1), behind the front door.

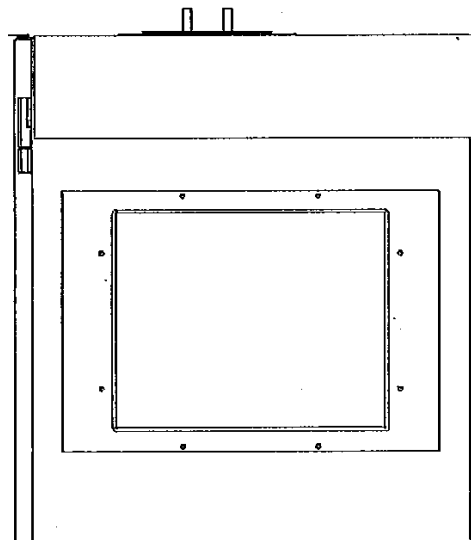
NOTE: *It is recommended the browser history be cleared before viewing the remote AUI.*

NOTE: *Overall PC performance can impact how quickly the AUI operates for specific pages. A PC with low CPU and memory usage will perform better than a PC with high CPU and memory usage.*

This section includes the following topics:

- [Logging into the AUI, on page 3.2.10](#)
- [Advanced User Interface, on page 3.2.12](#)
- [Controller Front Panel UI \(User Interface\), on page 3.2.154](#)
- [Touchscreen Calibration, on page 3.4.5](#)

Figure 3.2.4: GV2-5/GV2-3.5 AUI



Logging into the AUI

The transmitter's AUI provides a means to restrict local and remote access to transmitter control functions to authorized users only. Users can create accounts that can be pre-defined to set access restriction from view-only (no control), full control (all permissions), custom (select permissions) and administrative control.

Remote Access

To access the transmitter's AUI remotely, perform the following steps:

1. Configure your network settings (see [Network](#), on page 3.2.101).
2. On your router or firewall software, open port 80 and close (restrict access to) all other ports. If you are using RDS data, open port 7005. If you are using SNMP, open ports 161 (Agent) or 162 (Traps).
3. When properly configured as noted above, the login menu (see [Figure 3.2.5](#)) will appear in your web browser when the IP address is accessed.
4. If the login menu does not appear, then the IP address is incorrect, however, if you enter the login credentials and press submit and you get an error, then your login is incorrect. Consult the documentation for the **User Accounts** page ([Users on page 3.2.117](#)).

Figure 3.2.5: AUI Login Menu

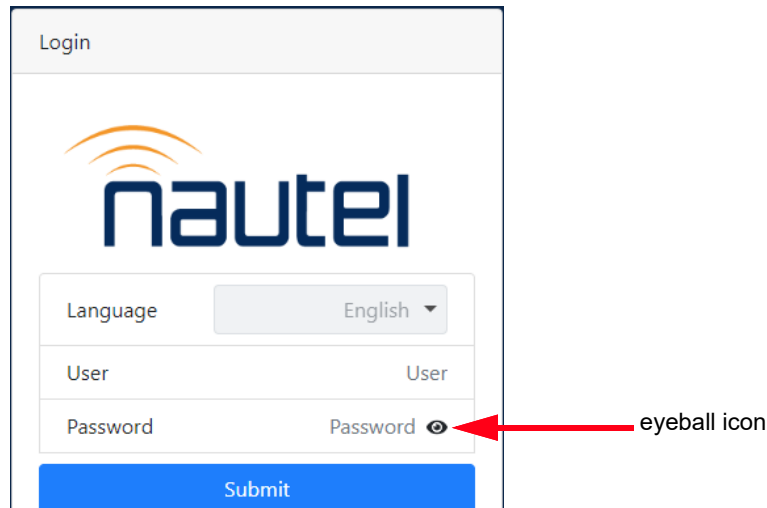


Figure 3.2.5 shows the AUI Login Menu. The form includes a 'Login' header, the Nautel logo, and three input fields: 'Language' (set to English), 'User' (set to User), and 'Password' (set to Password). An 'eyeball icon' (an eye icon) is located to the right of the Password field, indicated by a red arrow. A blue 'Submit' button is at the bottom.

5. Log in to the AUI by entering the appropriate parameters in the login window.
 - ❖ In the **Language** field (if applicable), press the down-arrow to review a drop-down menu displaying the available language options, and select one.
 - ❖ In the **User** field, there are two logins available: Admin and Viewer.
 - ❖ In the **Password** field, enter the password. If using Admin, the default password is change_me. If using Viewer, the default password is blank. Click on the eyeball icon to see the characters of the password.

NOTE: The Nautel AUI is factory configured with a default login username and password. Nautel recommends that you change the password to improve overall system security (see [Set or Change the Password](#), on page 3.2.120).

- ❖ Press **Submit** to accept your login parameters and display the AUI home page. Note: The opening screen (the **Home** page) will have the layout from the previous login session.

NOTE: If you do not have a user account, it must be set up by an existing user with proper permissions. See [Setting Permissions](#), on page 3.2.118.

NOTE: If no login attempt is made after 60 seconds, a timeout feature will be activated and the web browser will be need to be refreshed or the **Retry** button pressed (appears on AUI window after timeout) in order to attempt another login.

Local Access

When properly configured, (but without auto login selected, see [Auto Login](#)) the login menu will appear on the transmitter 17-inch LCD touchscreen. Log into the AUI by entering the appropriate parameters in the login window.

- ❖ In the **Language** field, press the down-arrow to review a drop-down menu displaying the available language options, and select one.
- ❖ In the **User** field, enter the username. Default is "Admin".
- ❖ In the **Password** field, enter the password. Default is "change_me".
- ❖ Press **Submit** to accept your login parameters and display the AUI home page ([Figure 3.2.7 on page 3.2.18](#)). Note: The opening screen (the **Home** page) will have the layout from the previous login session.
- ❖ If auto login is set (see [Auto Login](#)), the AUI will appear automatically without the required previous steps.

Auto Login. The Auto Login feature allows the AUI to automatically log in a specific user account when the local AUI (front panel touchscreen) starts up, bypassing the manual login screen. The Auto Login enable/disable toggle is only available via the local AUI, in the **Settings -> Users** menu. Only the currently logged-in user can enable Auto Login for their account and the user must have Administrator permissions.

NOTE: User accounts are **not** factory defaulted for auto-login.

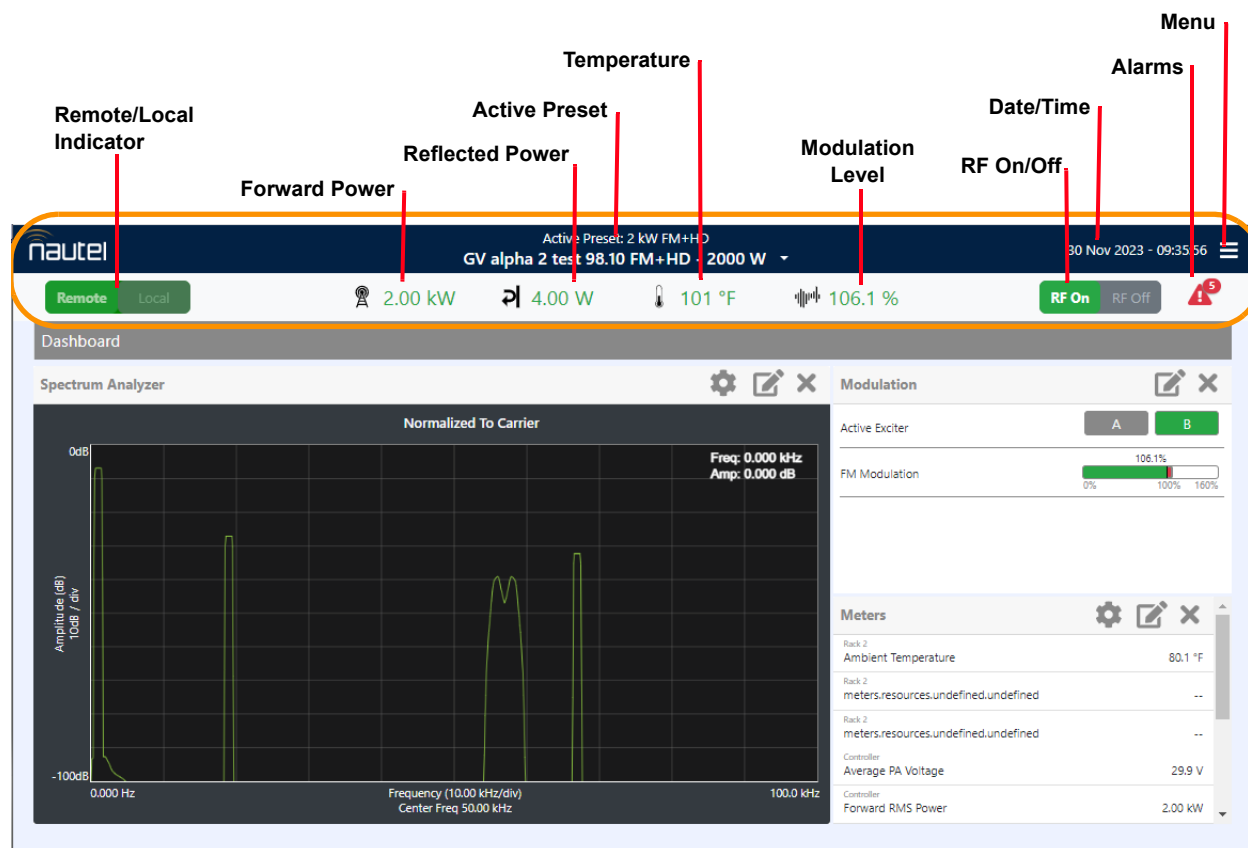
Advanced User Interface

To access the remote AUI, you need a device with an HTML5 capable web browser that is connected to the GV2-5/GV2-3.5 - directly or through a switch - via its rear panel **LAN** connection (A1J8A). The AUI has a wide range of features, including:

- ❖ Dashboard (see page [3.2.22](#))
- ❖ Alarms (see page [3.2.36](#))
- ❖ Meters (see page [3.2.37](#))
- ❖ Presets (see page [3.2.43](#))
- ❖ Settings (see page [3.2.62](#))
- ❖ Remote I/O (see page [3.2.121](#))
- ❖ Reports (see page [3.2.129](#))
- ❖ Software (see page [3.2.133](#))
- ❖ Air Chain (see page [3.2.135](#))
- ❖ Sign Out (see page [3.2.153](#))

Each AUI page provides information about a specific transmitter function. All navigation through the AUI pages begins on the main screen (or Dashboard), shown in [Figure 3.2.6 on page 3.2.13](#).

Figure 3.2.6: Using the AUI (Dashboard Page shown)



Display Area - displays user selected data and instrument panels

 - denotes status banner displayed on all AUI pages

The top banner is permanent on all AUI pages and includes:



- **Nautel Logo:** From any page, click the Nautel logo to return to the Dashboard page.
- **Remote/Local:** Buttons that determine the location of the operational control of the transmitter. The button that is highlighted green indicates the current setting. If **Local** is selected, only local control of the transmitter is possible. To change the local/remote status from the controller front panel display, see [AUI Menu page on page 3.2.18](#).

NOTE: Local changes can always be made while Remote access is enabled/disabled using the controller front panel's REMOTE button.

- **Forward Power:** Displays the current forward power level of the transmitter.
- **Reflected Power:** Displays the current reflected power level of the transmitter.
- **Active Preset:** Displays the name of the active preset (e.g., Preset 1), call sign, carrier frequency in MHz, mode (e.g., FM), and power set point. Click the down arrow to see other available presets and initiate a preset change (see [Managing Presets - Using the AUI on page 3.2.43](#)).
- **Temperature:** Displays the current temperature of the Controller's heatsink.
- **Modulation:** Displays the current modulation percentage of the transmitter.
- **RF On/Off:** Buttons that determine the on/off status of the transmitter's RF power stage. The button that is highlighted green indicates the current setting. Click **RF On** to enable the transmitter's RF power stage. Click **RF Off** to disable the transmitter's RF power stage.
- **Date & Time:** Displays day, month, year and current time. To set the time, see [Time on page 3.2.114](#).
- **Active Alarms:** Displays the critical-level alarms (red bell, with number) and maintenance-level alarms (amber warning, with number) that are currently active on the transmitter. Click on either symbol to go to the **Alarms** page (see [Alarms on page 3.2.36](#)), which provides details for current alarms as well as an option to view alarm history. When a critical-level alarm is being reported, the transmitter is in an 'off-air' state. When a maintenance-level alarm is being reported, the transmitter may still be 'on-air', but possibly at reduced power. When the transmitter is operating normally, no alarm symbols will display.
- **Menu:** Click to display further operations options, which allows navigation to various other pages (see [AUI Menu page on page 3.2.18](#)). Note: when Menu is selected, the three horizontal lines change to three vertical lines.

AUI Pages

Table 3.2.1 defines the available AUI pages.

Table 3.2.1: AUI Pages

AUI Page	Function	Page
Dashboard	Present critical data and instruments.	3.2.18
Panel Selector	Choose data and instrument panels for Dashboard.	3.2.20
Menu	Page navigation and AUI logout (see Menu options below).	3.2.35
Menu - Alarms	View active faults.	3.2.36
Menu - Meters	View Exciter and Controller meter lists.	3.2.37
Menu - Presets	Activate, create, and edit presets. Define and manage calendar-based preset schedule.	3.2.43
Menu - Settings	Manage all transmitter settings and options (see Settings options below).	3.2.62
Menu - Settings - Audio Processing	Select and modify Orban Audio Processing presets.	3.2.64
Menu - Settings - Exciter TCXO Calibration	Calibrate the 10 MHz Int-Ext Offset and set the TCXO Offset value.	3.2.90
Menu - Settings - External 10 MHz	Enable or disable the use of an external 10 MHz signal.	3.2.91
Menu - Settings - FM Polarity	Set the polarity for FM deviation; positive modulation signal yields positive frequency deviation or negative modulating signal yields positive frequency deviation.	3.2.92
Menu - Settings - Hardware Configuration	Configure the transmitter for any installed hardware that has optional variations (e.g., quantity of exciters or LVPS modules, fan speed) or is non-standard (e.g., UPS or audio processor).	3.2.93
Menu - Settings - HD/DRM	Configure HD/DRM settings.	3.2.96
Menu - Settings - Network	View network information status.	3.2.101
Menu - Settings - Notifications	Configure alarm notifications and email setup.	3.2.103
Menu - Settings - Reboot Options	Select Reboot Host, Active or Standby Exciter.	3.2.106

AUI Page	Function	Page
Menu - Settings - Screen Configuration (Local AUI only)	Select Enable Screen Saver and Timeout or perform a Touchscreen Calibration.	3.4.7
Menu - Settings - Security Certificates	Provides an option for enhanced security by uploading a security certificate.	3.2.107
Menu - Settings - SNMP	SNMP agent and traps configuration: enables notifications using a MIB browser and an alternative remote control and access.	3.2.108
Menu - Settings - Spectrum Mask	Select Spectrum mask type: FCC, ETSI or none.	3.2.110
Menu - Settings - System Preferences	Select temperature display: Celsius or Fahrenheit.	3.2.111
Menu - Settings - Thresholds	Set the main audio low and Low Forward Power trip levels.	3.2.112
Menu - Settings - Time	Select NTP, UTC, and set date, time, country and time zone.	3.2.114
Menu - Settings - Transmitter Info	View and enter transmitter name and serial number.	3.2.116
Menu - Settings - Users	Create and edit user accounts and permissions.	3.2.117
Menu - Remote I/O	Define remote inputs and outputs, monitor analog outputs.	3.2.121
Menu - Reports	View and download reports on transmitter operation: event history, active preset, meters, and settings.	3.2.129
Menu - Software - Upgrades	Select and manage installable software.	3.2.133
Menu - Software - Versions	View installed software versions and licenses.	3.2.134
Menu - Air Chain - vPlatform	Configure the DNS servers and LAN connections for vPlatform.	3.2.136
Menu - Air Chain - vExgine	Configure the DNS servers and LAN connections for vExgine, view Air Chain connections, configure signal generator settings, view other settings.	3.2.138
Menu - Air Chain - vPorter	Configure the DNS servers and LAN connections for vPorter.	3.2.145
Menu - Air Chain - Remote Support	Enable remote support.	3.2.148

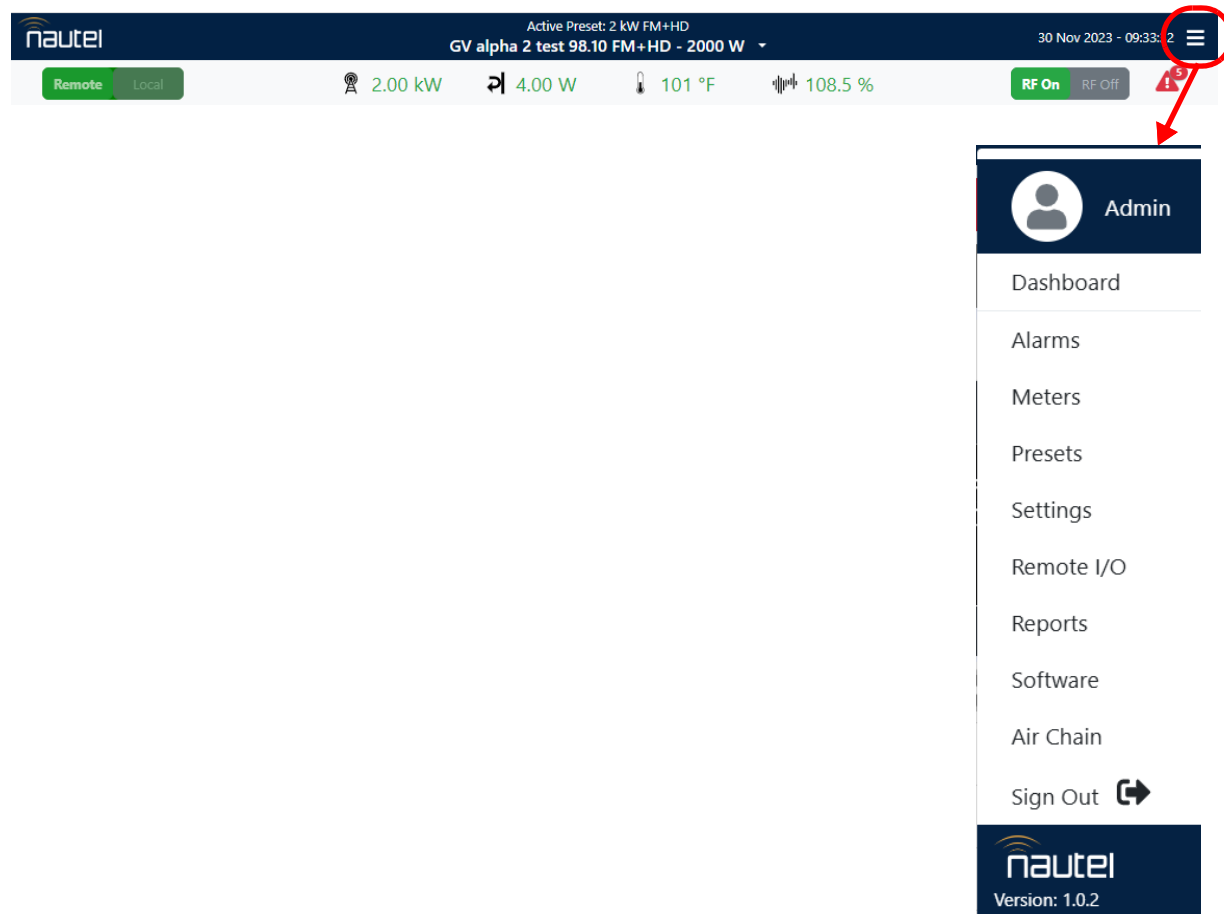
AUI Page	Function	Page
Menu - Air Chain - Versions	View installed Air Chain versions.	3.2.149
Menu - Air Chain - Licensing	View and activate licenses.	3.2.150
Menu - Sign Out	Sign out of the AUI session.	3.2.153

AUI Menu page

NOTE: Any menu item or feature in the Remote AUI that is grayed out is not available or is disabled.

From the AUI's top banner, click the **Menu** button to view the **Menu** page (see [Figure 3.2.7](#)). From this page, you can select one of the following sub-menus:

Figure 3.2.7: Main Menu Page



- ❖ Select **Alarms** to view, download or reset any current alarms (see [Alarms - see page 3.2.36](#)).
- ❖ Select **Meters** to view real time meters, selectable for Exciter (or HD Exciter), Power Module, Controller or Rack (see [Meters - see page 3.2.37](#)).
- ❖ Select **Presets** to view, load or edit available presets, create new presets, or to view, create or edit a preset schedule (see [Presets - see page 3.2.43](#)).

- ❖ Select **Settings** to access a sub-menu of settings options, including:
 - * Audio Processing (see [Audio Processing - see page 3.2.64](#))
 - Exciter TCXO (see [Exciter TCXO - see page 3.2.90](#))
 - External 10 MHz (see [External 10 MHz - see page 3.2.91](#))
 - FM Polarity (see [FM Polarity - see page 3.2.92](#))
 - Hardware Configuration (see [Hardware Configuration - see page 3.2.93](#))
 - * HD/DRM (see [HD/DRM - see page 3.2.96](#))
 - Network (see [Network - see page 3.2.101](#))
 - Notifications (see [Notifications - see page 3.2.103](#))
 - Reboot Options (see [Reboot Options - see page 3.2.106](#))
 - Screen Configuration (see [Screen Configuration \(Local AUI only\) - see page 3.2.107](#))
 - Security Certificates (see [Security Certificates - see page 3.2.107](#))
 - SNMP (see [SNMP - see page 3.2.108](#))
 - Spectrum Mask (see [Spectrum Mask - see page 3.2.110](#))
 - System Preferences (see [System Preferences - see page 3.2.111](#))
 - Thresholds (see [Thresholds - see page 3.2.112](#))
 - Time (see [Time - see page 3.2.114](#))
 - Transmitter Info (see [Transmitter Info - see page 3.2.116](#))
 - Users (see [Users - see page 3.2.117](#))

NOTE: * - If not installed on your transmitter, this option is shown greyed out and cannot be accessed.

- ❖ Select **Reports** to view or download the Alarm History (see [Reports - see page 3.2.129](#)).
- ❖ Select **Software** to view software versions or perform a software upgrade (see [Software - see page 3.2.133](#)).
- ❖ Select **Air Chain** to configure the DNS servers, LAN connections, remote support, view and enter license codes, and view software versions (see [Air Chain - see page 3.2.135](#)).
- ❖ Select **Sign Out** to log out of the AUI session and return to the login menu. See [Software Versions - see page 3.2.134](#). To log in again, use your remote PC's keyboard to enter your Username and Password, then click the **Submit** button. If you do not have a user account, see [AUI Pages - see page 3.2.15](#).

Managing and Displaying Dashboard Panels

This section includes the following topics:

- ❖ Describing Dashboard Panel Options - see page 3.2.22
- ❖ Alarms - see page 3.2.24
- ❖ Audio Inputs - see page 3.2.24
- ❖ Modulation - see page 3.2.25
- ❖ Dashboard Meters - see page 3.2.25
- ❖ Spectrum Analyzer - see page 3.2.27
- ❖ Power Distribution - see page 3.2.29
- ❖ EQ Frequency Response - see page 3.2.30
- ❖ Lissajous Plot - see page 3.2.31
- ❖ AM-AM Correction - see page 3.2.32
- ❖ AM-PM Correction - see page 3.2.33

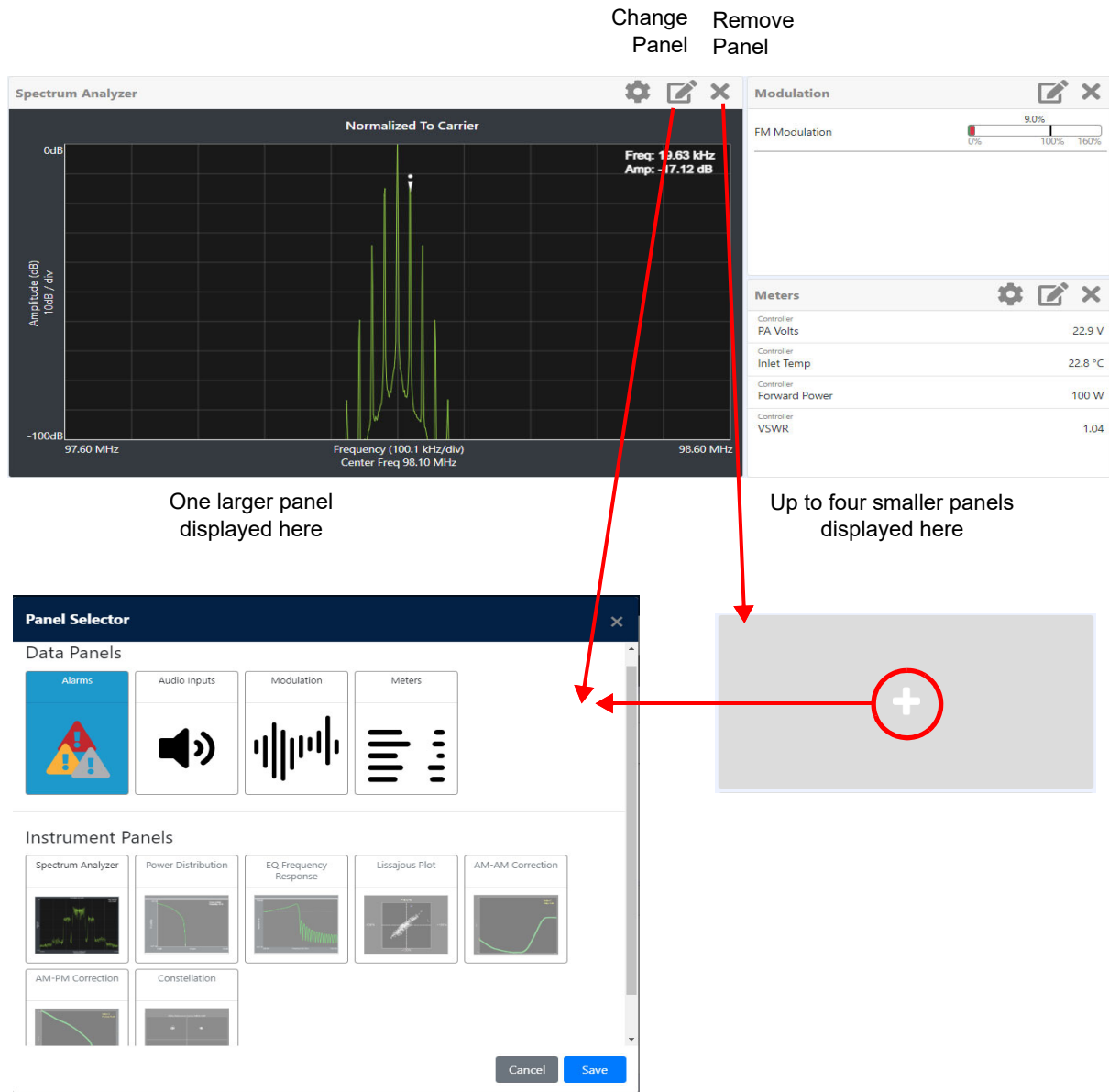
The AUI provides up to five measurement/status related tools, or panels, that you can select to display on the AUI's Dashboard (see [Figure 3.2.8 on page 3.2.21](#)).

Up to five panels can be displayed at one time, a larger panel on the left-hand side of the Dashboard and four smaller panels on the right-hand side.

To view all the panel options, select the Change Panel (edit) icon in the top, right corner of any displayed panel. You can also remove a panel by clicking the Remove Panel (X) icon in its top, right corner, then replace it by clicking the + symbol to see the panel options. See [Figure 3.2.8 on page 3.2.21](#) for a more detailed view of the panel options.

NOTE: *Dashboard panel management varies with the level of user permission. For example, a user with admin permissions can change the displayed panels on the dashboard, and those changes are saved to that user and maintained after page transition and/or logout/login. However, a user with view-only permissions cannot save or maintain changes to the displayed panels after page transition and/or logout/login. This applies to local and remote AUI operation.*

Figure 3.2.8: Panels displayed on Dashboard

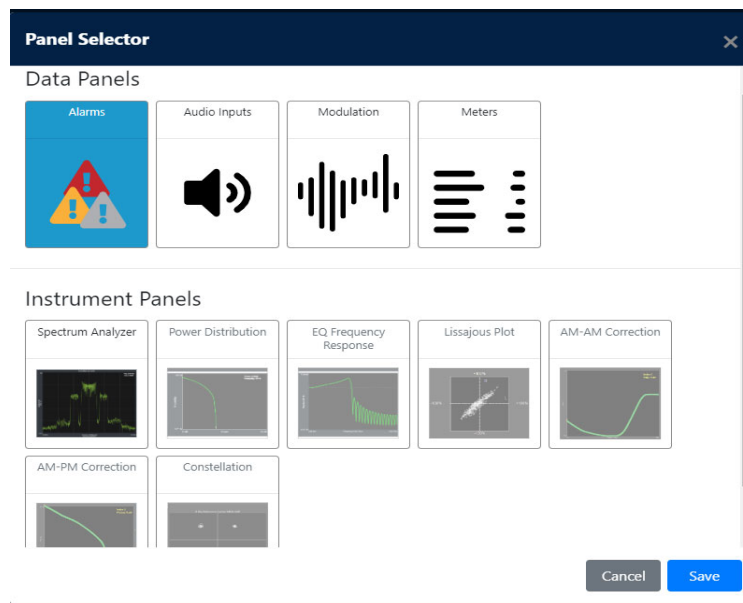


Describing Dashboard Panel Options

Click on the desired panel to display it. See [Table 3.2.2 on page 3.2.23](#) for a description of each panel, noting there are two types - Data Panels and Instrument Panels. Data Panels display read-only measurement data. Instrument Panels display graphical information with varying levels of cursor interactivity, depending on the panel. See [Figure 3.2.9](#).

The Reference column of [Table 3.2.2 on page 3.2.23](#) includes a section to find more detail for each panel.

Figure 3.2.9: Panel Options



NOTE: If HD is not enabled, the following Instrument Panels will be greyed out:

- ❖ Power Distribution
- ❖ AM-AM Correction
- ❖ AM-PM Correction

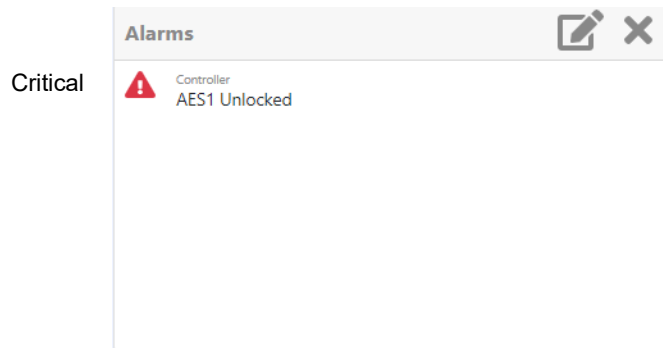
Table 3.2.2: Dashboard Panels

Panel	Description	Page
Alarms	Active transmitter alarms listing.	3.2.24
Audio Inputs	Graphic meters for audio inputs.	3.2.24
Modulation	Active exciter indicator and graphic modulation meter.	3.2.25
Meters	Customizable transmitter meter list.	3.2.25
Spectrum Analyzer	Graphical instrument that visualizes RF output.	3.2.27
Power Distribution	Graphical instrument that displays a CCDF plot that indicates the probability of exceeding a given power level, based on the average power level. Aids in determining peak power capability.	3.2.29
EQ Frequency Response	Graphical instrument that displays the frequency response of the modulator's EQ filter.	3.2.30
Lissajous Plot	Graphical instrument that displays a Lissajous figure that represents the relationship between two applicable channels (either L and R or I and Q).	3.2.31
AM-AM Correction	Graphical instrument that displays the amplitude compensation being applied to the magnitude signal.	3.2.32
AM-PM Correction	Graphical instrument that displays the phase compensation being applied to the phase signal.	3.2.33

Alarms

See [Figure 3.2.10](#). Displays active transmitter alarms, including critical alarms (red) and warning alarms (amber). A scroll bar will display, as required. The alarms listed in this panel should match the number of critical and warning alarms shown in the top banner of the AUI. Go to the **Menu - Alarms** page for alarm details (see [Alarms on page 3.2.36](#)).

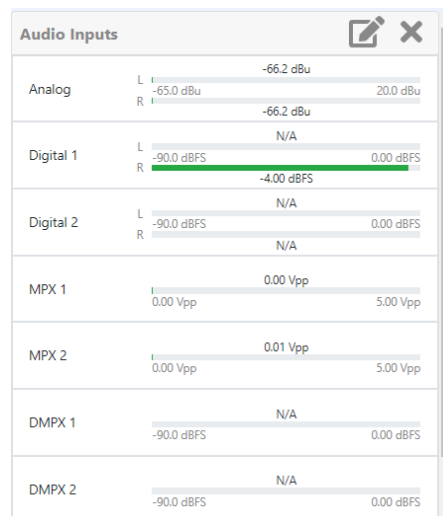
Figure 3.2.10: Alarms Panel



Audio Inputs

See [Figure 3.2.11](#). Displays preset audio inputs and monitor the levels. Each audio input has a line that displays the current level (green bar) and its full-scale value. If the input's level exceeds the full-scale value, the current level bar colour changes to red.

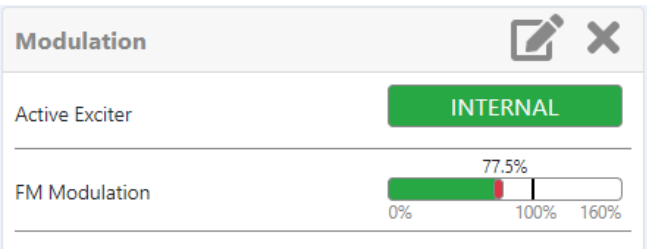
Figure 3.2.11: Audio Inputs Panel



Modulation

See [Figure 3.2.12](#). Displays the active exciter’s status (internal or external) and FM modulation level for the current preset. The current modulation level is displayed as follows: (green bar), its peak level (black line and shown numerically) and its full-scale value (typically 100%). If the input’s modulation exceeds the full-scale value, the bar colour changes to red.

Figure 3.2.12: Modulation Panel



Dashboard Meters

See [Figure 3.2.13](#). Displays a customizable list of transmitter meters, including a scroll bar. Select a meter by clicking the box adjacent to the meter parameter, a blue check mark will indicate it is selected and click Save to display the parameters on the Dashboard. See [Figure 3.2.14 on page 3.2.26](#).

Figure 3.2.13: Dashboard Meters Panel

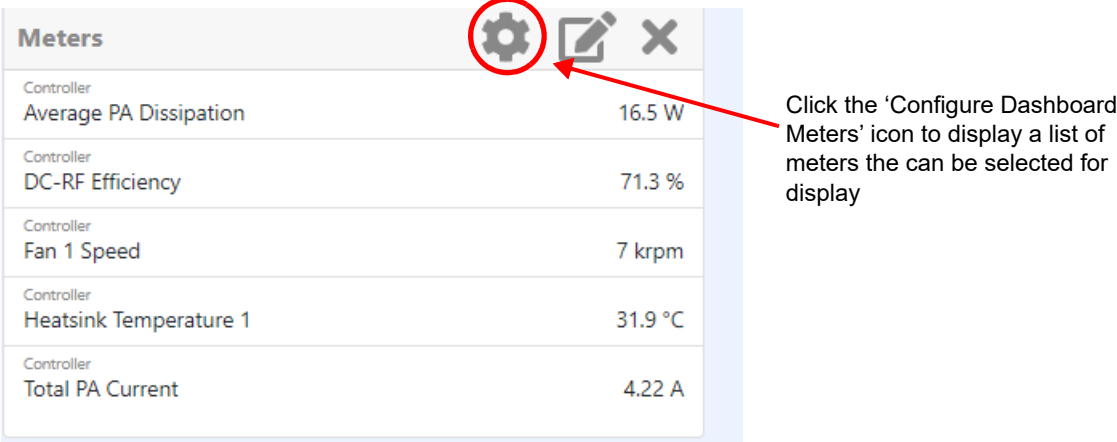
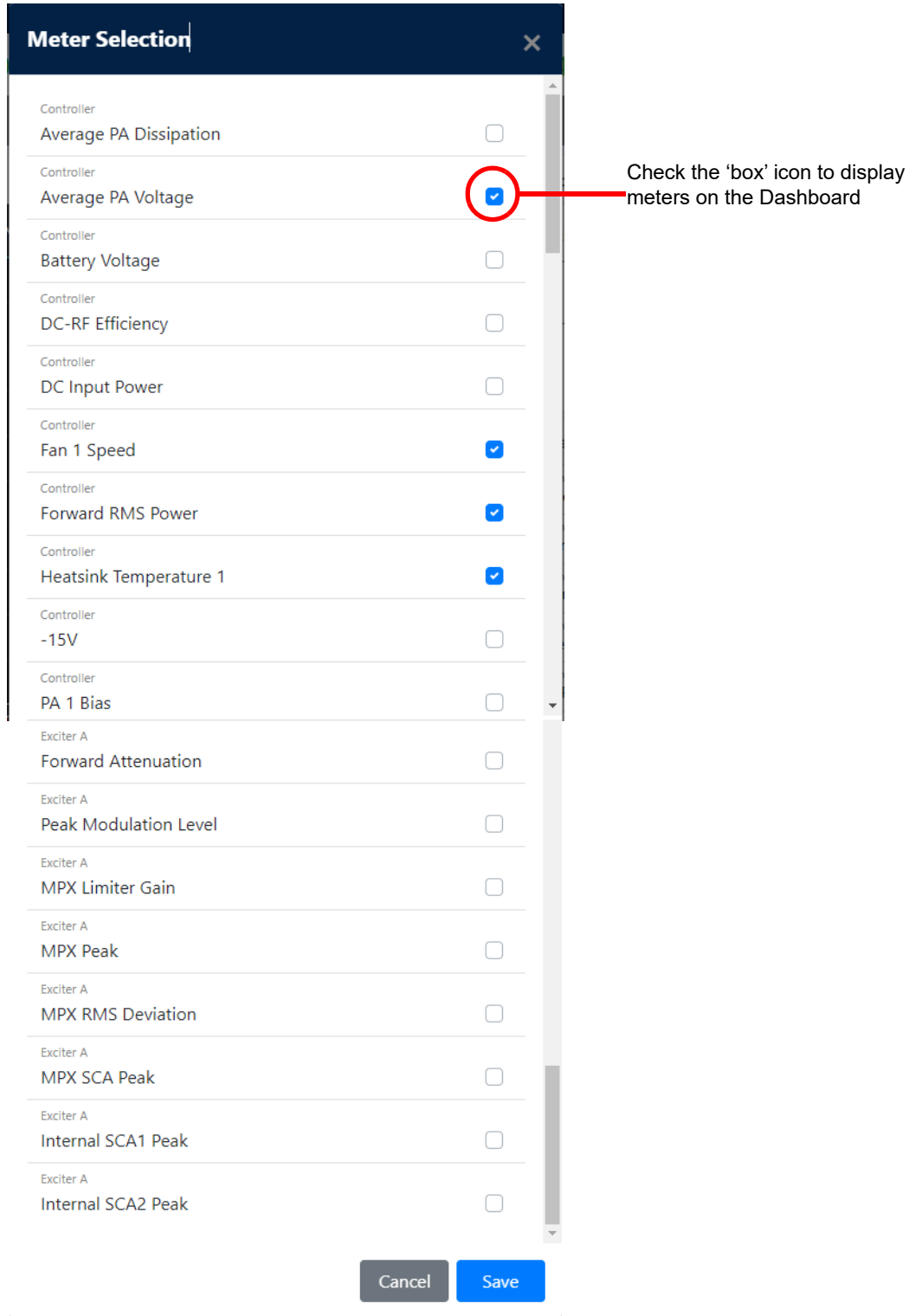


Figure 3.2.14: Dashboard Meters Selection



Meter Selection [X]

Controller	Average PA Dissipation	☐
Controller	Average PA Voltage	☒
Controller	Battery Voltage	☐
Controller	DC-RF Efficiency	☐
Controller	DC Input Power	☐
Controller	Fan 1 Speed	☒
Controller	Forward RMS Power	☒
Controller	Heatsink Temperature 1	☒
Controller	-15V	☐
Controller	PA 1 Bias	☐
Exciter A	Forward Attenuation	☐
Exciter A	Peak Modulation Level	☐
Exciter A	MPX Limiter Gain	☐
Exciter A	MPX Peak	☐
Exciter A	MPX RMS Deviation	☐
Exciter A	MPX SCA Peak	☐
Exciter A	Internal SCA1 Peak	☐
Exciter A	Internal SCA2 Peak	☐

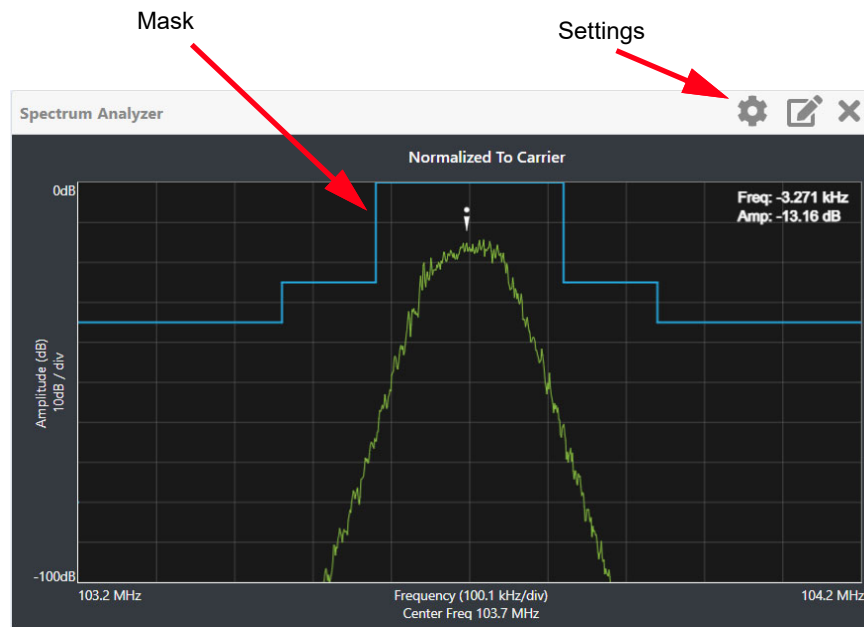
Cancel Save

Check the 'box' icon to display meters on the Dashboard

Spectrum Analyzer

See [Figure 3.2.15](#). The carrier level is normalized to its unmodulated carrier level at 0 dB. The graph center is always at the carrier frequency, as defined by the active preset's frequency.

Figure 3.2.15: Spectrum Analyzer Panel



Masks are shown based on transmission mode and are defined by the latest versions of the following standards:

- IBOC: NRSC-5
- European Standard: ETSI EN 302 018-2
- FCC CFR 47, Part 73.317 and IC BETS-6e

Refer [Spectrum Mask, on page 3.2.110](#) to set the mask type.

NOTE: While very accurate, the spectrum analyzer may display artifacts (spurs) as some operating carrier frequencies that are a function of the analyzer and are not actually present on the output of the transmitter. If these spurious emissions are observed on the spectrum analyzer, Nautel recommends that a calibrated, external spectrum analyzer be used to verify the presence of spurs.

Click the panel to display a cursor on the nearest peak on the spectrum. The cursor position (frequency and amplitude) is noted in the upper, right-hand corner of the panel.

Click and hold the left mouse button and move the cursor to make fine adjustments.

Click the “Settings” button to gain access to spectrum settings (see [Figure 3.2.16](#)) such as:

- ❖ **Resolution Bandwidth:** determines the FFT bin size or the smallest frequency that can be resolved. Allowable range is 75 - 10,000 Hz. Default setting is 1000 Hz.
- ❖ **Averages:** determines the number of averages that the analyzer performs per sweep. Press the **Clear Averaging** button to restart the averaging process. Allowable range is 0 - 100 kHz. Default setting is 19.
- ❖ **Span:** determines the start and stop frequencies of the analyzer with the carrier frequency always at the center. Allowable range is 10 - 1200 kHz. Default setting is 1000 kHz.
- ❖ **Measurement Options:** determines the source of the spectrum plot that is being displayed. Selecting **Internal (FM)** uses the exciter’s RF signal, before being equalized (if applicable). **FM spectrum analyzer bandwidth is defaulted to 1 MHz, but can be increased to 1.2 MHz.** Selecting **MPX** bandwidth displays the entire composite baseband signal (100 kHz wide). For **VS-HD systems**, selecting **Internal (Hybrid)** displays the signal that will be produced by the exciter and selecting **TX Output/External** displays the exciter’s RF sample feedback to display the transmitter’s RF output spectrum.

Figure 3.2.16: Spectrum Settings

Spectrum Settings		×
Resolution Bandwidth	1090 Hz	
Averages	10	🗑️
Span	1000.972 kHz	🗑️
Measurement Options	Internal FM	🗑️
Close		

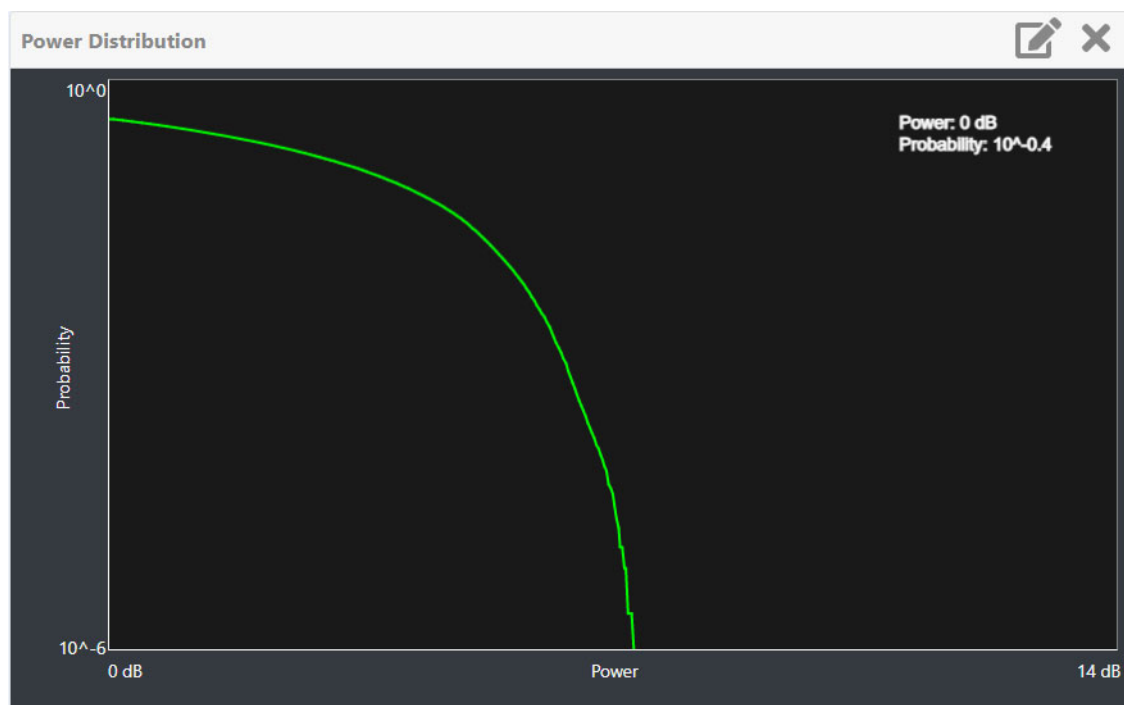
NOTE: The FM spectrum analyzer displays the ideal spectrum generated by the DSP. It is not necessarily the same as the spectrum seen at the RF output.

Power Distribution

See [Figure 3.2.17](#). The exciter measures the relative power levels of the signal and determines the probability of exceeding a given power level, relative to the average power. The data is plotted in the **Power Distribution Plot** as a CCDF (complementary cumulative distribution function). The x-axis displays the relative power level in dB, with the reference representing the average power. The average power is 0 dB. The y-axis displays the probability of exceeding that power level. This plot can be used to assess the distribution of a given signal, and provides an indication of the amount of peak power capability required from the transmitter in order to prevent peak clipping/distortion of the output signal.

Click on the panel to display a cursor in the approximate area. The cursor position (Power and Probability) is noted in the upper, right-hand corner of the panel. Select other areas of the panel to provide a coarse adjustment of the cursor position.

Figure 3.2.17: Power Distribution Panel



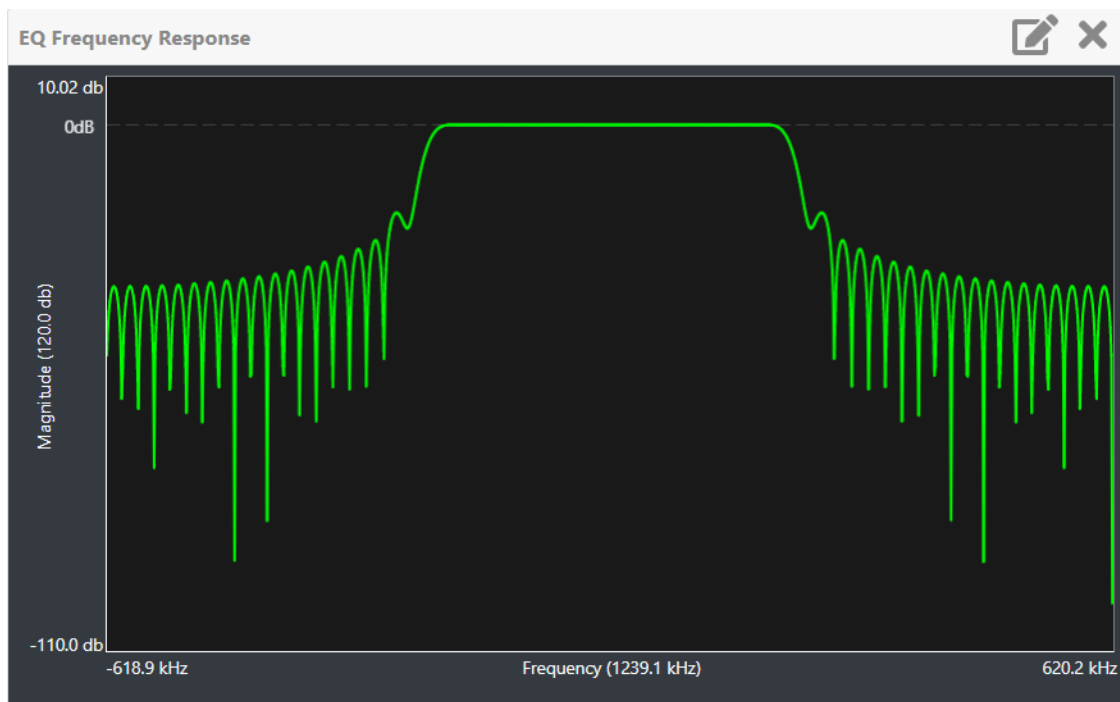
EQ Frequency Response

See [Figure 3.2.18](#). This panel displays the frequency response of the exciter's EQ filter. The panel displays the gain of the filter with respect to the magnitude and frequency of the modulating signal. A dashed line is displayed at the 0 dB level.

This tool is useful for installations featuring filter coefficients loaded to compensate for a channel combiner response.

Click on the panel to display a cursor in the approximate area. The cursor position (Frequency and Magnitude) is noted in the upper, right-hand corner of the panel. Select other areas of the panel to provide a coarse adjustment of the cursor position.

Figure 3.2.18: EQ Frequency Response Panel

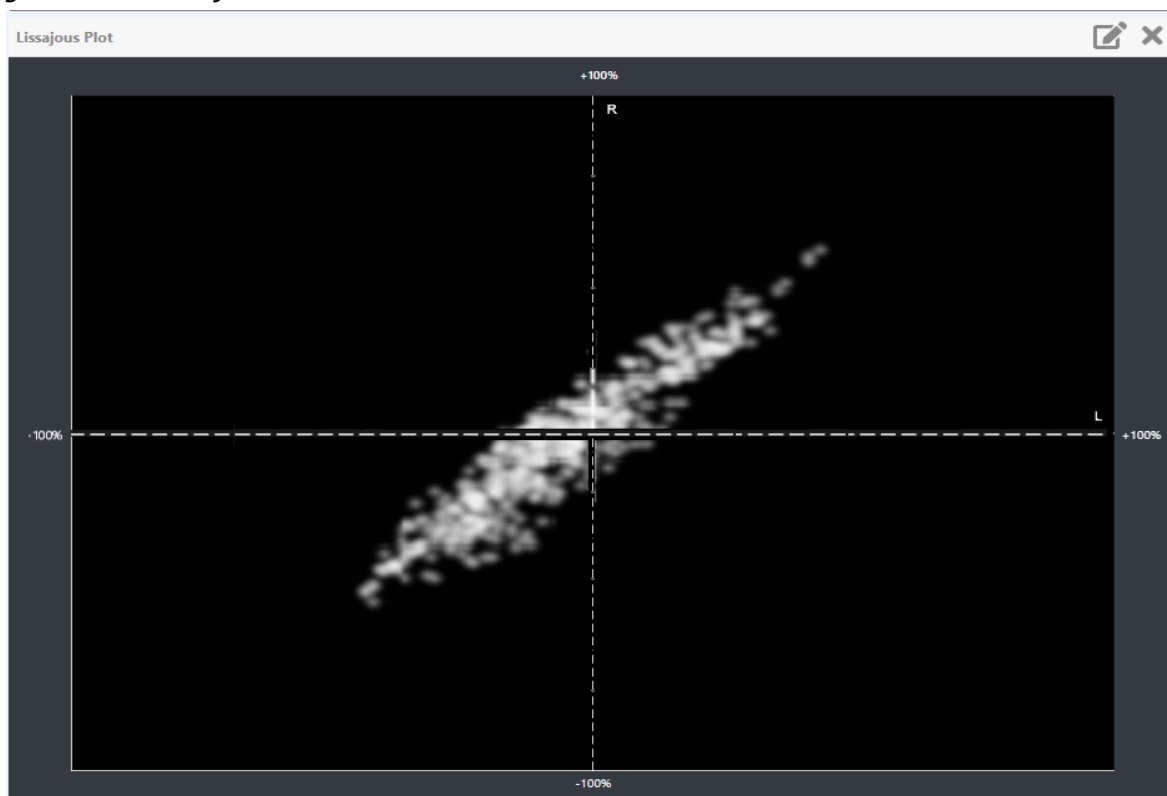


Lissajous Plot

See [Figure 3.2.19](#). This panel displays a Lissajous plot that represents either left and right audio content or a representation of the FM modulated signal (I and Q). I and Q will be automatically selected when using MPX as the main audio source. Left and right audio content is displayed for all other audio sources.

The plot consists of a group of sequential samples to allow signal analysis. In L and R mode, the L+R portion of the signal tends to dominate the plot, resulting in the majority of samples appearing in the lower, left and upper, right quadrants. In I and Q mode, signals that are of equal frequency and 90 degrees out-of-phase result in a circular display.

Figure 3.2.19: Lissajous Plot Panel



L & R mode shown for reference

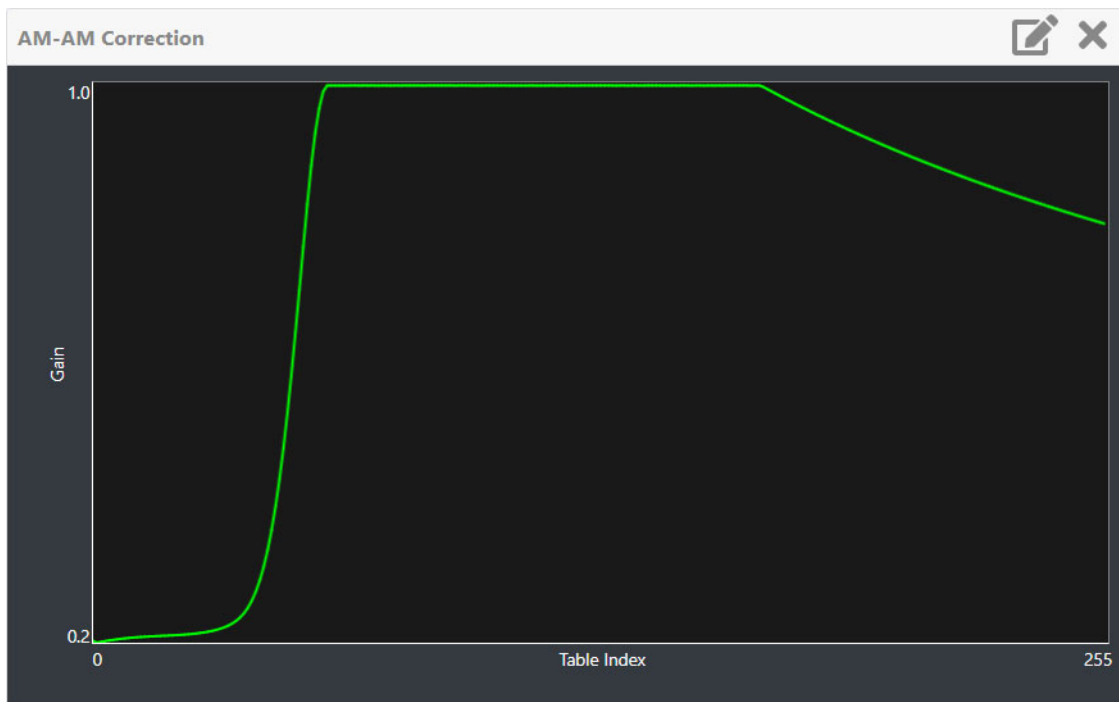
AM-AM Correction

See [Figure 3.2.20](#). This panel displays the amplitude correction being applied to the RF drive signal in order to compensate for the transmitter amplitude (gain) response, which is non-linear. The x-axis represents the signal amplitude and the y-axis represents the gain correction applied for a given amplitude value. A look up table (LUT) index value of 0 represents low transmitter output power (RF drive). A LUT index value of 255 represents the maximum transmitter output power (RF drive).

The LUT curve can show that at low transmitter output power, more RF drive power is required to correct for low final stage amplifier gain - the curve sharply increases as it drops to 0 table value. (This low gain can also be overcome using additional bias, however pre-correction is more efficient.) Equally, the curve could also increase sharply at the top end of the table, suggesting that high RF drive power (gain) is required to connect for low gain at final stage amplifiers (PA compression peak limiting). It is technically the inverse of the transmitter's power amplifier gain response. Click or

Click on the panel to display a cursor in the approximate area. The cursor position (Index and Gain) is noted in the upper, right-hand corner of the panel. Select other areas of the panel to provide a coarse adjustment of the cursor position.

Figure 3.2.20: AM-AM Correction Panel

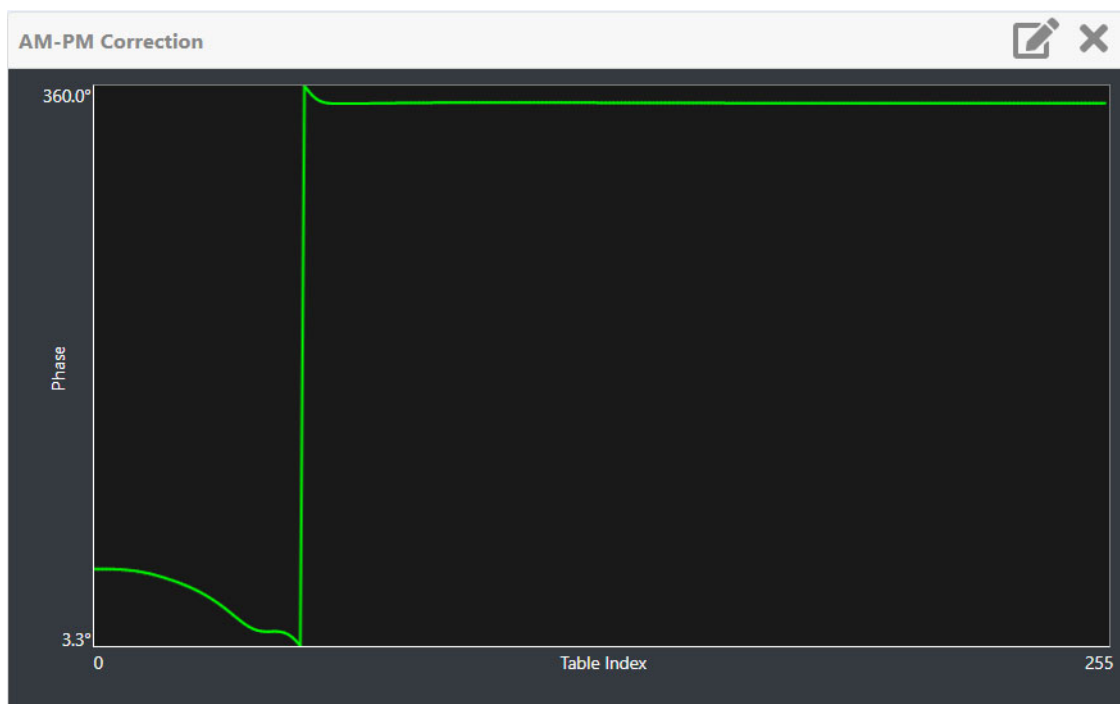


AM-PM Correction

This panel displays the phase correction being applied to the RF drive signal in order to compensate for the transmitter's (exciter +PA stage) phase non-linearity versus the output power. For example, in [Figure 3.2.21](#), the transmitter output power is low, so the curve in the plot shows positive phase correction. Inversely, a negative phase correction will be displayed in the plot given high output power levels. This correction is represented on the plot via the x-axis (table index value of between 0-255). The y-axis represents the phase shift correction applied for a given amplitude value.

Click on the panel to display a cursor in the approximate area. The cursor position (Index and Phase) is noted in the upper, right-hand corner of the panel. Select other areas of the panel to provide a coarse adjustment of the cursor position.

Figure 3.2.21: AM-PM Correction Panel



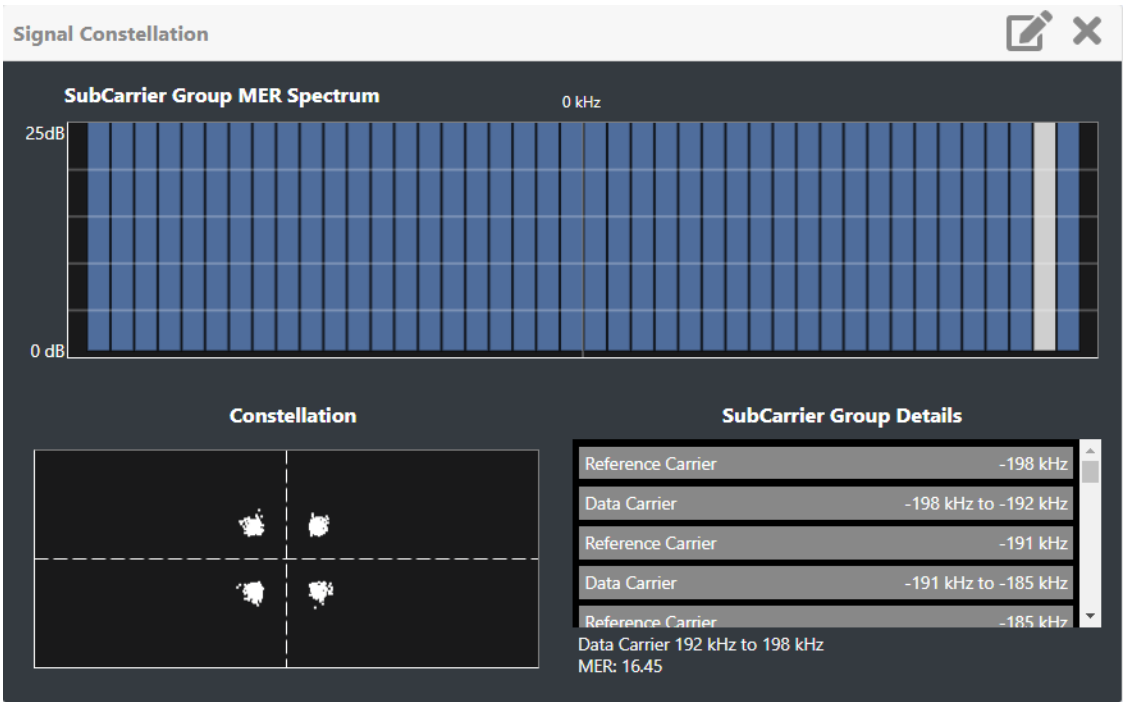
Constellation

See [Figure 3.2.22](#). The exciter constantly measures the transmitter signal and performs basic demodulation of the digital carriers. The **Constellation** panel displays the phase and amplitude of the symbols being modulated within an OFDM sub-carrier as dots on a Cartesian graph. There are separate screens for each sub-carrier. Typically, the dots will be grouped together around the ideal data points. When the transmitter is on, the signal constellation display is representative of the transmitter output. When the transmitter is off, the display is representative of the forward path that will be transmitted.

Sub-carrier group details is shown in the lower, right section of the screen. Displayed information includes the sub-carrier group name, the bandwidth that the selected carrier group occupies and the modulation error ratio (MER) for the selected carrier group. MER quantifies the performance of the transmitted digital signal as the ratio between the RMS power of the ideal signal and the RMS power of the received signal's error vector. A higher MER value is characteristic of a smaller error, and therefore a higher quality signal. There is a NRSC minimum requirement of a MER value of no less than 14 dB.

Use the scroll bar to select a higher or lower sub-carrier for viewing. Some sub-carriers are for timing and synchronization. Others are modulated with data/content. Use the maximize or minimize buttons as required.

Figure 3.2.22: Constellation Panel

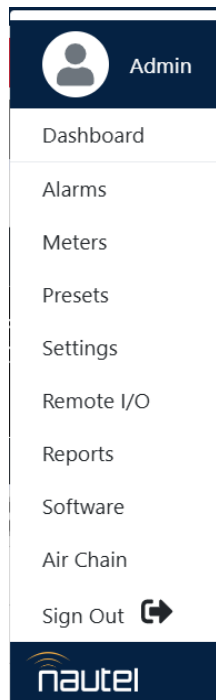


AUI Main Menu

The Main Menu contains the following features (see [Figure 3.2.23](#)):

- Dashboard
- Alarms (see [3.2.36](#))
- Meters (see [3.2.37](#))
- Presets (see [3.2.43](#))
- Settings (see [3.2.62](#))
- Remote I/O (see [3.2.121](#))
- Reports (see [3.2.129](#))
- Software (see [3.2.133](#))
- Air Chain (see [3.2.135](#))
- Sign Out (see [3.2.153](#))

Figure 3.2.23: Main Menu

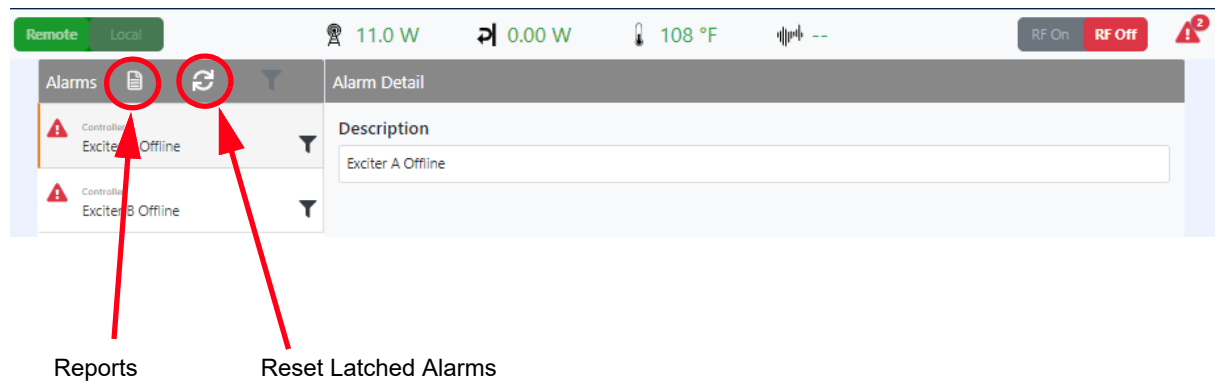


Alarms

You can view the GV2-5/GV2-3.5's operational status using the AUI's Alarm page. This page shows current active alarms to aid in fault diagnosis. To view, click the **Alarms** button in the AUI's main menu. See [Figure 3.2.24](#).

You can also use the controller front panel UI to view active alarms (see [View Status on page 3.2.197](#)).

Figure 3.2.24: Alarms page



The **Alarms** page displays all active transmitter alarms. Alarms are listed by their host device (Controller Exciter A, Rack, etc.), alarm name and severity level [an orange ! indicates low severity/maintenance required (RF output not affected); a red ! indicates critical severity (RF output is reduced/inhibited)]. Refer to the GV2-5/GV2-3.5 Troubleshooting Manual for detailed information on alarm details such as root cause and troubleshooting tips.

Click the **Reset Latched Alarms** icon at the top, left of the Alarms screen to attempt to clear any latching alarms that are holding the transmitter in an "off-air" state. If the offending alarm has cleared, the transmitter should resume operation.

Click the **Reports** button at the top, left of the Alarms screen to go to the Reports screen where the user can see or download the event history. See [Reports on page 3.2.129](#).

Meters

The meters displayed in the AUI represents the active meters selected for the associated sub-sections and displays a real-time value.

Select the Meters page and select one of the following transmitter sub-sections:

- ❖ Controller - see [Figure 3.2.25 on page 3.2.38](#) and [Figure 3.2.26 on page 3.2.39](#)
- ❖ HD Exciter - see [Figure 3.2.27 on page 3.2.39](#) and [Figure 3.2.28 on page 3.2.40](#)
- ❖ Power Module - see [Figure 3.2.29 on page 3.2.41](#) and [Figure 3.2.30 on page 3.2.42](#)
- ❖ Rack - see [Figure 3.2.31 on page 3.2.42](#)

NOTE: *The Power Module page has five selectable meter groups: PA Voltage/Current, PA Bias/Drive & Reject Power, PA Temperature, PS Voltage/Current, and PS Temperature & Run Time.*

Meters can also be added to the Dashboard as a display panel. See [Dashboard Meters on page 3.2.25](#).

You can also view meters using the controller front panel UI (see [View Meters on page 3.2.198](#)).

NOTE: *Meter values get updated typically every one or two seconds.*

Figure 3.2.25: Meters - Controller Page (1 of 2)

Meter Detail		
Meter Name	Controller	
+1.2 V (V)	1.19	NOTE: Meter list items vary with the GV2 transmitter model and may not be exactly as shown.
+1.8 V (V)	1.83	
+3.3 VDC (V)	3.34	
+5 VDC (V)	4.91	
+12 V A (V)	12.2	
+12 V B (V)	11.9	
+15 V (V)	15.0	
5kW Reject 1-2 Power (W)	8.00	
5kW Reject 3-4 Power (W)	11.0	
5kW Reject 5-6 Power (W)	5.00	
5kW Reject 7-8 Power (W)	12.0	
5kW Reject Fan 1 Speed (rpm)	0.00	
5kW Reject Fan 2 Speed (rpm)	0.00	
5kW Reject Fan 3 Speed (rpm)	0.00	
10kW Reject 1-4 Power (W)	11.0	
10kW Reject 5-8 Power (W)	7.00	
10kW Reject Fan 1 Speed (rpm)	0.00	
10kW Reject Fan 2 Speed (rpm)	0.00	
20kW Reject 1-8 Power (W)	1.00	
Analog Forward Power (kW)	19.9	
Average Active PA Power (W)	684	
Average PA Dissipation (W)	48.0	
Average PA Voltage (V)	38.3	
Battery Voltage (V)	3.24	
DC Input Power (kW)	23.4	
DC-RF Efficiency (%)	85.0	
Digital Forward Power (kW)	0.00	
Fan 1 Speed (rpm)	0	
Final Reject Fan 1 Speed (rpm)	0.00	
Final Reject Fan 2 Speed (rpm)	0.00	
Final Stage Reject Power (W)	253	

Figure 3.2.26: Meters - Controller Page (2 of 2)

Forward RMS Power (W)	19912	NOTE: Meter list items vary with the GV2 transmitter model and may not be exactly as shown.
LVPS Input Voltage (V)	39.3	
PWB Temperature (°C)	42.0	
Reflected Power (W)	35.0	
RF Drive (W)	286	
RF Output Return Loss (dB)	27.6	
Splitter Fan 1 Speed (rpm)	0.00	
Total Forward RMS Power (kW)	19.9	
Total PA Current (A)	611	
VSWR	1.09	

Figure 3.2.27: Meters - HD Exciter Page (1 of 2)

Meter Detail	
Meter Name	HD Exciter A
-15 V (V)	-15.3
+1.2 V (V)	1.19
+1.8V (V)	1.82
+3.3 V (V)	3.26
+5 V A (V)	4.84
+5 V B (V)	5.02
+15 V (V)	14.9
10 MHz Delta (ppm)	N/A
AGC Limiter Gain (%)	100
Analog Left Peak (dBu)	-85.7
Analog Right Peak (dBu)	-84.5
Battery Voltage (V)	N/A
Current Filter Tilt (dB/MHz)	0.45
DAC Gain (%)	91.1
Data MER LSB (dB)	N/A
Data MER USB (dB)	N/A

Figure 3.2.28: Meters - HD Exciter Page (2 of 2)

MPX Limiter Gain (%)	100
MPX Peak (Vpp)	0.00
MPX RMS Deviation (%)	7.66
MPX SCA PEAK (Vpp)	N/A
PA Bias Voltage (V)	3.11
PA Dissipation (W)	164
PA Temp (°C)	39.0
PA Volts (V)	38.6
Pre-Amp Bias Voltage (V)	3.09
Pre-Amp Current (mA)	122
PWB Temperature (°C)	55.9
Reference MER LSB (dB)	N/A
Reference MER USB (dB)	N/A
Reflected Power (W)	5.51
Reverse Attenuation (dB)	7.00
Total Forward RMS Power (kW)	18.7
Total PA Current (A)	10.8
VSWR	1.34

Figure 3.2.29: Meters - Power Module Pages (1 of 2)

Meter Detail				
PA Voltage/Current PA Bias/Drive & Reject Power PA Temperature PS Voltage/Current PS Temperature & Run Time				
Meter Name	PM1	PM2	PM3	PM4
PA 1 Current (A)	6.30	6.00	6.30	6.70
PA 2 Current (A)	6.50	6.40	6.70	6.40
PA 3 Current (A)	5.90	6.80	6.20	6.20
PA 4 Current (A)	6.40	7.10	6.50	6.40
PA Voltage A (V)	52.8	52.6	53.0	52.8
PA Voltage B (V)	52.7	52.6	52.8	52.6

PA Voltage/Current PA Bias/Drive & Reject Power PA Temperature PS Voltage/Current PS Temperature & Run Time				
Meter Name	PM1	PM2	PM3	PM4
Bias Voltage 1 (V)	3.07	3.01	3.03	3.04
Bias Voltage 2 (V)	2.99	2.97	2.97	2.99
Bias Voltage 3 (V)	3.04	3.03	2.93	2.99
Bias Voltage 4 (V)	3.03	2.99	3.01	3.04
Final Stage Reject Power (W)	4.00	1.00	1.00	0.00
RF Drive Power (W)	0.90	0.90	0.90	0.80

PA Voltage/Current PA Bias/Drive & Reject Power PA Temperature PS Voltage/Current PS Temperature & Run Time				
Meter Name	PM1	PM2	PM3	PM4
Fan 1 Speed (rpm)	4830	4770	4890	4800
Fan 2 Speed (rpm)	4860	4530	4650	4680
Fan 3 Speed (rpm)	4650	4620	4470	4530
Fan 4 Speed (rpm)	4740	4530	4710	4530
Fan 5 Speed (rpm)	4590	4710	4650	4590
Fan 6 Speed (rpm)	5070	4800	4620	4740
Fan Voltage (V)	31.1	31.0	31.3	31.1
Heatsink Temperature (°C)	43.4	43.5	43.4	42.3

NOTE: The number of PM columns varies with the GV2 transmitter model and may not be exactly as shown.

Figure 3.2.30: Meters - Power Module Pages (2 of 2)

PA Voltage/Current PA Bias/Drive & Reject Power PA Temperature PS Voltage/Current PS Temperature & Run Time				
Meter Name	PM1	PM2	PM3	PM4
PS A Current (A)	12.2	13.0	12.4	12.2
PS A Input Current (A)	3.16	3.38	3.09	3.29
PS A Output Voltage (V)	53.0	53.0	53.0	53.0
PS A Voltage (V)	53.0	53.0	53.0	53.0
PS B Current (A)	12.7	13.0	13.0	12.1
PS B Input Current (A)	3.40	3.39	3.27	3.44
PS B Output Voltage (V)	53.0	53.0	53.0	53.0
PS B Voltage (V)	53.0	53.0	53.0	52.9

PA Voltage/Current PA Bias/Drive & Reject Power PA Temperature PS Voltage/Current PS Temperature & Run Time				
Meter Name	PM1	PM2	PM3	PM4
PS A Fan Speed (rpm)	4200	4128	2704	4816
PS A Runtime (h)	4368	4116	4128	4137
PS A Temperature (°C)	64.0	64.0	64.0	65.0
PS B Fan Speed (rpm)	3952	5000	2984	4352
PS B Runtime (h)	4123	4122	4543	4128
PS B Temperature (°C)	64.0	65.0	64.0	64.0

NOTE: The number of PM columns varies with the GV2 transmitter model and may not be exactly as shown.

Figure 3.2.31: Meters - Rack Page

Meter Detail		
Meter Name	Rack 1	Rack 2
+3.3 V (V)	3.28	3.37
+5 V (V)	4.97	5.02
+15 V (V)	15.0	14.9
Ambient Temperature (°C)	28.6	29.5
LVPS Input Voltage (V)	39.1	39.2
Reject Fan Voltage (V)	0.70	0.70

NOTE: Number of racks varies with transmitter model and may not be exactly as shown.

Presets

This section includes the following subjects:

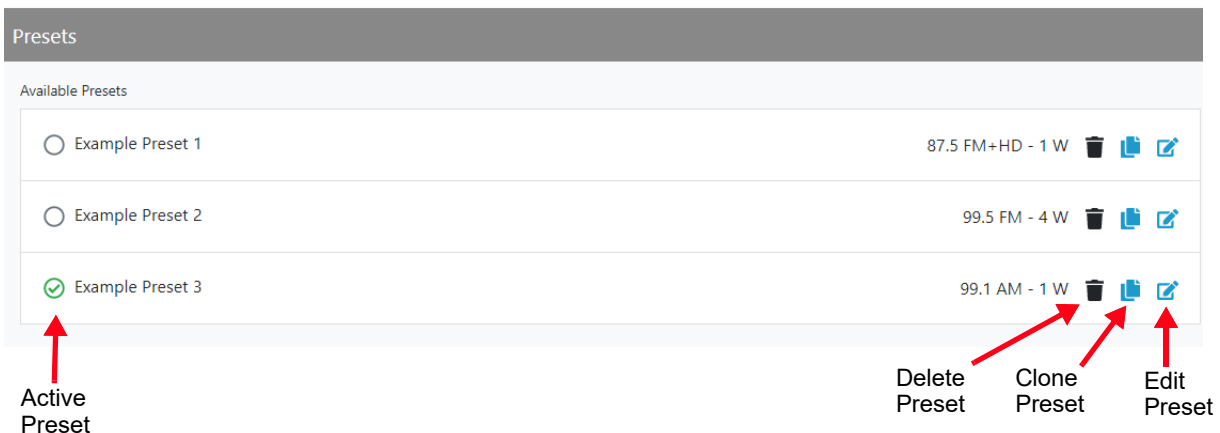
- ❖ [Managing Presets - Using the AUI](#)
- ❖ [Activating Presets using the AUI - see page 3.2.43](#)
- ❖ [Editing or Creating Presets Using the AUI - see page 3.2.44](#)
- ❖ [Scheduler - see page 3.2.60](#)

Presets contain operational data (power, frequency, mode, program inputs) for the transmitter. You can create and manage presets using the remote AUI (see [Managing Presets - Using the AUI](#)).

Managing Presets - Using the AUI

The **Presets** page (see [Figure 3.2.32](#)) allows you to create up to 62 operating presets or edit existing presets. To view the **Presets** page, select **Presets** from the Dashboard menu or click on the Active Preset in the top banner. Many preset settings available on the remote AUI are also available on the controller front panel UI. In this case, if you change a preset setting on the remote AUI, it will also be reflected on the controller front panel UI, and vice versa.

Figure 3.2.32: Presets page



Activating Presets using the AUI

There are two ways to activate a preset using the AUI:

- ❖ Click the **Active Preset** section in the top banner of any AUI page
- ❖ Enter the **Presets** page from the Dashboard.

Both methods will indicate the current active preset, by a green check mark next to its radio button (e.g., Example Preset 3, see [Figure 3.2.32 on page 3.2.43](#)). If the current preset is not the desired one, click the radio button of the desired preset in the Available Presets list, or create a new preset or clicking the Clone Preset button and edit the preset.

If you select an alternate active preset, a confirmation prompt will appear. Select **Cancel** to cancel or **Yes** to activate the selected preset. Press the **Delete** button to delete the selected preset. Users cannot delete the current "active" (operational) preset or any preset that is referenced in the **Remote I/O** menu as either a remote input or output. Those links in the **Remote I/O** menu must be deleted before the associated preset can be deleted. Press **Cancel** to return to the **Presets** page.

Editing or Creating Presets Using the AUI

When a presets page is opened from the main menu, the operational settings of the transmitter are displayed. They define the current operational state of the transmitter. Operational settings can be edited and then immediately activated by pressing the **Save** button.

To edit a saved preset, you must load that preset from the **Presets** page (see [Figure 3.2.32 on page 3.2.43](#)). If the edited preset was active before it was edited, saving the preset will update the preset, but the operational settings will not change. To update the operation of the transmitter, re-activate the preset through the top banner or Presets menu.

NOTE: *When editing saved User presets, the best practice is to load a preset that is close to the desired configuration and then adjust its settings for the exact configuration.*

In the **Presets** screen or top banner (see [Figure 3.2.32 on page 3.2.43](#)), a green checkmark appears next to the preset name to indicate which is the active preset.

When changes are complete, press the **Save** button. If you are creating a new preset, you can also enter a new name (e.g., Preset 4 - IBOC) in the preset window before clicking the **Save** button.

Parameters that can be edited are discussed in detail below.

To remove a preset, press the **Delete** (trash can icon) button. A confirmation screen will appear. Click **Yes** to confirm.

NOTE: *If the delete icon is greyed out, the preset cannot be deleted as it is either used by another preset, the scheduler, or Remote I/O. A preset can also not be deleted if it is the only preset. A preset can also not be deleted if it is designated as a Mod Loss Preset (in the Presets -> Other Settings tab). For example: if Preset 2 has Mod Loss Timeout enabled, and its Mod Loss Preset is set to Preset 3, you cannot delete Preset 3.*

To ignore any changes, press **Cancel** to return to the **Presets** screen.

General

See [Figure 3.2.33](#).

Figure 3.2.33: General page

Update Preset	
General Audio SCA RDS Other Settings	
Preset Name	Air Chain
Preset ID	3
Output Power	11000 W
Frequency	106.70 MHz
Mode	FM+HD
HD PA Voltage	53.0 V
HD Power Boost Priority	Efficiency
HD Injection (Lower)	-20.0 dB
HD Injection (Upper)	-20.0 dB
Air Chain	Enabled
Cancel Save	

Tabs shown for an Air Chain enabled preset. In this case, SCA and RDS tabs are not available.

- ❖ **Preset Name:** This field identifies the name of the current preset. Users must load a preset to directly edit this field.
- ❖ **Preset ID:** This field identifies the ID or number of the preset (e.g., 3).
- ❖ **Output Power:** Sets the output power level (in W). Use the up and down arrows to adjust the power level. Output power limits are a function of the transmitter mode of operation (see the *Pre-Installation Manual* for RF output power ratings for this transmitter).
- ❖ **Frequency:** Set value. Valid frequencies are between 87.00 and 108.00 MHz.
- ❖ **Mode:** Set the overall transmission mode. Available options are:
 - FM: an analog only mode, transmits a carrier, frequency modulated with audio.
 - HD: all digital mode; this mode transmits the upper and lower digital sidebands of OFDM IBOC carriers. HD transmitter is typically high-level combined (coupler or spatial) with a paired FM only transmitter. This mode requires additional hardware and is not available for Air Chain operation (as of software version GV2 SW 1.2.0).
 - FM+HD: also known as hybrid/simulcast or low-level combined, this mode transmits the analog carrier (FM modulated) and the upper and lower digital sidebands of OFDM IBOC carriers. This mode requires additional hardware or Air Chain.
 - DRM+: transmits a DRM OFDM signal using the I/Q stream from a DRM modulator connected to the desired AES input. This mode requires additional hardware.
- ❖ **Air Chain:** Set Air Chain to Enabled (for use with Air Chain presets) or Disabled, as applicable.

NOTE: Settings on the Presets tabs are shown/hidden based on the chosen settings. Not all settings are available in all modes.

Mode - Additional Calibration Settings:

- HD PA Voltage: for FM+HD, HD and DRM+ modes, use the up and down arrows to adjust the level, in V, between -30.0 and 53.0 V dc (default value is 53.0 V). This sets the nominal dc supply voltage for the HD power amplifier for this preset.
- HD Power Boost Priority: for FM+HD mode only. Select either MER (modulation error ratio or signal quality; default setting) or Efficiency.
 - ❖ Selecting Efficiency maximizes the aggressiveness of Nautel's HD PowerBoost process, an advanced peak-to-average power ratio reduction algorithm that prioritizes efficiency and power capability when reducing the peak-to-average power ratio, while ensuring that the MER of the transmitted HD signal meets transmission requirements.
 - ❖ Selecting MER minimizes the aggressiveness of the HD PowerBoost function and makes maximizing MER the priority. Transmitter efficiency and power capability will be reduced as a result.
- HD Injection (Lower): for FM+HD and HD modes, enter value, in dB, between -20 and -10 dB for the HD injection level of the lower sideband of digital carriers. This value determines the relationship between the digital carriers power and the analog carrier power. Example: -20 dB indicates that the total RMS power of the digital carriers will be 1/100 of the total RMS power of the analog carrier. -10 dB indicates that the total RMS power of the digital carriers will be 1/10 of the total RMS power of the analog carrier.
- HD Injection (Upper): for FM+HD and HD modes, enter value, in dB, between -20 and -10 dB for the HD injection level of the lower sideband of digital carriers. This value determines the relationship between the digital carriers power and the analog carrier power. Example: -20 dB indicates that the total RMS power of the digital carriers will be 1/100 of the total RMS power of the analog carrier. -10 dB indicates that the total RMS power of the digital carriers will be 1/10 of the total RMS power of the analog carrier.

NOTE: The actual digital sideband power is 3 dB less than that indicated in the upper or lower IBOC Injection fields; i.e. if -20 dBc is entered in the upper and lower IBOC Injection fields, the upper and lower digital sideband power levels are actually -23 dBc; this way, when added, the resultant total digital power level is -20 dBc.

For symmetrical sideband transmission: if -14 dBc IBOC Injection level is desired (total digital power of upper + lower sidebands is 4% of analog carrier power), set the upper and lower IBOC Injection levels to -14 dBc.

For asymmetrical sideband transmission, consider that the actual sideband power level is 3 dB less than that shown. For example, if the upper digital sideband IBOC Injection level is entered as -14 dBc, the actual power level will be -17 dBc. This is equally true for the lower digital sideband.

NOTE: The preferred option to maximize IBOC performance is by using the HD Optimizer feature (see [Spectrum Efficiency Optimizer, on page 3.2.100](#)). In this case, leave the HD PA Voltage setting at its default value (53.0 V).

Main Audio

See [Figure 3.2.34](#).

Figure 3.2.34: Main Audio page

Update Preset

General **Audio** SCA RDS Other Settings

Main Audio

Audio Source	Analog L/R
Analog Level	0.0 dBu
Audio Mode	Stereo
15 kHz Low-Pass	Disabled
Pre-emphasis	0 μs
Gain Adjust	0.0 dB
Backup Audio	Disabled
Backup MPX Level	1.0 Vpp

Cancel Save

NOTE: only Air Chain Digital MPX Level is displayed for Air Chain presets.

- **Audio Source:** Select from Analog L/R, MPX, AES 1, AES 2, or MPX over AES.
- **Analog Level:** applies to Analog Left/Right source only; enter value between -12 and +12 dBu, which represents the input voltage level that yields 100% modulation (default setting is 0.0 dBu).
- **MPX Level:** applies to MPX source only. Set this parameter level in Vpp (default setting is 3.5 Vpp - 100% modulation value). The allowable range for this setting is between 1-5 Vpp.
- **Digital Level:** applies to MPX Over AES and AES/EBU 1 sources only; enter value between -25.5 and 0 dBFS, with a typical setting of -4 dBFS (100% modulation value).
- **Air Chain Digital MPX Level:** applies to Air Chain presets only; enter value between -25.5 and 0 dBFS; default setting of -4 dBFS (100% modulation value).
- **Audio Mode:** applies to Analog L/R, AES 1 and AES 2 audio sources only; select Mono L, Mono R, Mono L+R or Stereo (selecting Stereo applies a 19 kHz pilot).
- **Gain Adjust:** applies to Analog L/R, AES 1 and AES 2 audio sources only; allowable range is -20 to 10 dB. This configuration setting will increase the incoming signal level and yield a proportional increase in % modulation.

-
- **Pre-emphasis:** applies to Analog L/R, AES 1 and AES 2 audio sources only; select 0 us, 25 us, 50 us or 75 us.
 - **15 kHz Low-Pass:** applies to Analog L/R, AES 1 and AES 2 audio sources only; select Enabled (applies 15 kHz low-pass filter to audio input) or Disabled.
 - **Backup Audio:** When you set **Backup Audio** to **Enabled**, you can select a backup **Audio Source** and edit various parameters for the backup audio similarly to the main audio described above. The backup audio source, if enabled and present, will replace the main audio source if the main audio level is less than its user-determined trip threshold (see [Presets, on page 3.2.43](#)). The main audio source will be restored as the active source if it returns and is present for at least one second.

NOTE: AES 2 may not be used as a backup source for AES 1 when the internal exciter is used.

SCA

See [Figure 3.2.35](#). The AUI's SCA menu is not available for Air Chain presets.

Figure 3.2.35: SCA page

The screenshot shows the 'Update Preset' screen with the 'SCA' tab selected. The settings are as follows:

Setting	Value
MPX SCA	Disabled
SCA Reduction	0 %
Internal SCA1	Disabled
Internal SCA2	Disabled

Buttons: Cancel, Save

NOTE: Check your local broadcast regulatory body's guidelines for allowable modulation depth with SCAs or RDS enabled.

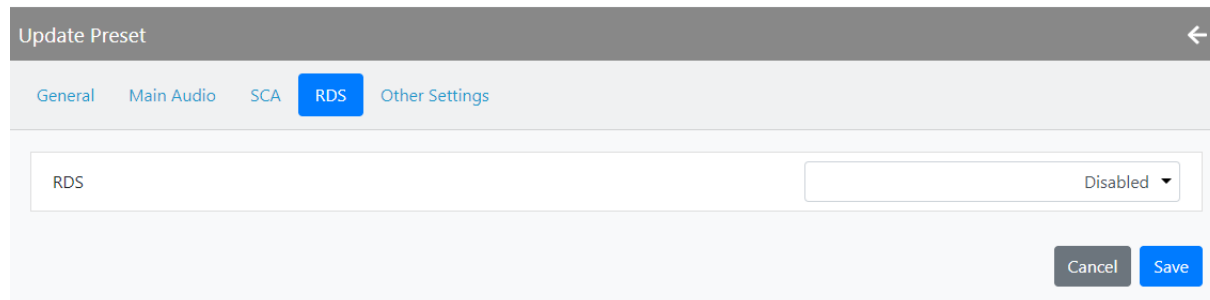
- **MPX SCA:** Connector (J7:A for SCA1, J7:B for SCA2) for use with an externally generated SCA; select **Enabled** or **Disabled**. When enabled, all the selections listed below are active.
 - ❖ **Input Level:** signal level that represents 10% modulation. Enter a value between 1 and 5 V p-p (default 3.50 Vpp).
- **SCA Reduction:** Attenuation applied to the SCA input; set between 0 and 20% (used to reduce the modulation level of the main audio when SCAs are enabled; typically, for every 2% of SCA modulation, the main audio modulation must be reduced by 1%).
- **Internal SCA1/2:** Enable or disable the appropriate internal SCA (SCA1 or SCA2). When enabled, the settings listed below are active for the associated SCA signal (1 or 2).
 - ❖ **SCA1 or SCA2 Mode:** select FM (frequency modulated sub-carrier, default) or DSB-SC (double side band suppressed carrier).
 - ❖ **SCA1 or SCA 2 Input Level:** enter value between -12 and +12 dBu, which represents the input voltage level that yields 10% modulation (default 0.0 dBu).
 - ❖ **SCA1 or SCA2 Injection Level:** enter value between 0 and 20% (default 10%); this level is added to the composite baseband signal.
 - ❖ **SCA1 or SCA2 Frequency:** enter value between 20 and 100 kHz (default set to 67 kHz or 92 kHz).
 - ❖ **SCA1 or SCA2 Preemphasis:** select 0 us, 50 us, 75 us or 150 us.
 - ❖ **SCA1 or SCA2 Lowpass Filter:** select Enabled (applies 7.5 kHz low-pass filter to audio input) or Disabled.

RDS

For RDS operation, an external unit or software can send data to the exciter, serially or over IP. The exciter generates the RBDS/RDS carrier and injects the data; externally generated, or alternatively, the **Presets** page offer a means to configure internally generated data. See [Figure 3.2.36](#).

NOTE: The AUI's RDS menu is not available for Air Chain presets. For Air Chain users, RDS is configured through the Omnia for Nautel audio processor (see [RDS Configuration, on page 3.2.85](#)).

Figure 3.2.36: RDS page (shown disabled)



Refer to [RDS Remote Protocol, on page 3.2.53](#) for information on using the ASCII protocol to remotely configure RDS settings and to observe the strings supported by Nautel.

NOTE: The UECP protocol is fully supported.

NOTE: The differences between RDS (European) and RBDS (North American) are not part of this manual. Presets created using the GV2 series transmitters are compatible with either type.

- RDS: Select Enabled or Disabled (default is Disabled). When enabled, all of the selections below are active.

NOTE: When using the internal data source, you must correctly enter all RDS fields - specifically PI Code or PS Name - to ensure proper reception of RDS information.

- Data Source: Select UECP over Serial, Internal RDS, ASCII over Serial, ASCII over IP, or UECP over IP.

NOTE: For ASCII over IP data or UECP over IP data, send RDS information to the IP address of the GV5/GV3.5, port 7005.

- Radio Text: Most RDS radios can receive short messages that may include information about the presenter, station or program you are listening to (e.g., a web address for the station). You can enter radio text up to 64 characters in length. Information is displayed on the receiver based on the receiver configuration and capability (e.g., maximum number of characters on the screen). Default is blank.

- Traffic Info: Select None, TA (Traffic Announcement), TP (Traffic Programme) or TA+TP. The receiver can often be set to pay special attention to this flag and, for example, stop the tape/pause the CD or re-tune to receive a traffic bulletin. The TP flag is used (set to 1) to allow the user to find only those stations that regularly broadcast traffic bulletins whereas the TA flag is used (set to 1) to signal an actual traffic bulletin in progress. These flags are set to 0 if they are not being used for traffic information. Default is None.
- Baud Rate: (displayed only when **Data Source** is ASCII over Serial or UECF over Serial): Select 150, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115,200 bps (default is 19200). Does not apply to the Internal data source.
- Stereo: (bit 0 of DI, see NOTE below): select Stereo or Mono. This selection is a decoder identification operating mode flag. Default is Mono.

NOTE: Artificial Head, Compression Flag, Dynamic PTY and Stereo are part of the DI (Decoder Information) data (see UI editing screens on [Figure 3.2.131 on page 3.2.175](#)). RDS Data is provided as a single-digit hex input between 0 and F, that encodes the flags for the four settings as a 4-bit code. For example: hex number 3 is bit-represented by 0011, from bit 3 on the left to bit 0 on the right. This number is decoded to mean Stereo = Yes/Stereo (bit 0 = 1), Artificial Head = Yes/Enabled (bit 1 = 1), Compression = No/Disabled (bit 2 = 0) and Dynamic PTY = No/Static (bit 3 = 0).

- Scrolling Type: Select the type of scrolling to be used by the receiver - Word or Character. Word scrolling displays and transitions a maximum of 8 characters of the **Scrolling PS Name** at a time. Character scrolling still displays a maximum of 8 characters; however, transitions by one character of the **Scrolling PS Name** at a time. In both cases, transitions occur at the speed defined by the **Scrolling Enable/Speed** selection (Slow or Fast). The default selection is Word.
- Scrolling Enable/Speed: Determines the scrolling speed of the **Scrolling PS Name**. Select Off (disabled), Slow (transitions every 10 s) or Fast (transitions every 3 s). Default is Off.
- Scrolling PS Name: If used, enter up to 64 characters for the PS name that will scroll (if enabled) at the speed selected in the **Scrolling Enable/Speed** field. Information is displayed on the receiver based on transmitter configuration; however, is limited to 8 characters maximum. Default is blank.

NOTE: Words are defined by the spaces in the Scrolling PS Name. Words that exceed 8 characters will scroll each character until the entire word is displayed, then continue with the next word.

- Injection Level: Enter value between 0 and 10% (default is 5%). This level is added to the composite baseband signal.
- Alternate Frequencies: Select None or 1 through 25. This allows a receiver to re-tune to a different frequency providing the same station information (i.e., using translators or repeaters) when the first signal becomes too weak. This is often utilized in car stereo systems. Default is None.
- Phase: enter value in degrees between 0 and 360 (default is 0.0 degrees).

- Artificial Head (bit 1 of DI, see NOTE below): select Enabled or Disabled. This selection is a decoder identification operating mode flag. Default is Disabled.
- Compression Flag (bit 2 of DI, see NOTE below): Select Enabled or Disabled. This selection is a decoder identification operating mode flag. Default is Disabled.
- RDS Local Echo (displayed only when **Data Source** is ASCII over Serial). Select Enabled or Disabled (default is Disabled). When Enabled, the exciter RDS port transceiver will echo all inputs and controls received back to the terminal.
- PTY: this coding of up to 32 (0 to 31) pre-defined programme types allows users to find similar programming by genre. Default is 0: NONE/NONE.
- PTYN (programme type name): This field can be used for detailed description of the PTY by 8 digits. Example: if the PTY is 4 (Sport) a PTYN like "Football" could be transmitted. The PTYN is intended for displaying additional information only cannot be used for automatic station tuning like the PTY. The PTYN is optional. Default is blank.
- Dynamic PTY (bit 3 of DI, see NOTE below): Select Dynamic or Static. This selection is a decoder identification operating mode flag. Default is Static.

NOTE: Artificial Head, Compression Flag, Dynamic PTY and Stereo are part of the DI (Decoder Information) data (see UI editing screens on [Figure 3.2.131](#) on [page 3.2.175](#)). RDS Data is provided as a single-digit hex input between 0 and F, that encodes the flags for the four settings as a 4-bit code. For example: hex number 3 is bit-represented by 0011, from bit 3 on the left to bit 0 on the right. This number is decoded to mean Stereo = Yes/Stereo (bit 0 = 1), Artificial Head = Yes/Enabled (bit 1 = 1), Compression = No/Disabled (bit 2 = 0) and Dynamic PTY = No/Static (bit 3 = 0).

- PI Code (hex) (Program Identification code): Enter four hex digits that represent the station call sign (e.g., PI=1AE5); this unique code is used to identify a broadcast station. Each station gets assigned a specific code with a country identifying prefix. In the USA the code is determined by applying a formula to the station's call sign (see www.nrsstandards.org). In Canada the code is determined using the Spectrum Management and Telecommunications tool found at www.ic.gc.ca. Contact your local broadcast regulatory body for details on determining your unique PI Code.
- PS Name (programme service name): This is simply a maximum 8-character "tagline" static display that represents the call letters or station identity name. Most RDS capable receivers display this information and, if the station is stored in the receiver's presets, will cache this information with the frequency and other details associated with that preset. Default is blank.
- Music/Speech: Select Music or Speech. Default is Speech.

RDS Remote Protocol. The following information is intended to assist users with remote RDS settings using the ASCII protocol. ASCII over IP does not provide exciter responses.

Assigning Settings: To assign a value to a setting, send the setting name, the equal sign (=) and the desired value. If the setting is valid, the exciter responds "OK". If the setting is invalid, the exciter responds "NO".

```
Examples: PI=1248    //set the PI code to 0x1248
          OK         // exciter responds with OK
          TA=2       // set the traffic announcement to 2 (bad command; only values 0 or 1 allowed)
          NO         // exciter responds with NO
```

Querying Settings: To determine the current value of a setting, type the setting name with a question mark (?) instead of an equal sign (=).

```
Examples: PI?        //query the current PI code
          1248       // exciter responds with "1248", the current PI code
```

Other Considerations:

Initial Values and Preset Changes

On startup, or when the RDS settings in the active preset differ from the last ones loaded, the preset's initial RDS settings (PS, PI, PTY, PTYN, RT, AF, etc.) will be loaded. If there is an active data source (UECP or ASCII via serial or IP), these settings may be updated externally.

The RDS settings from the preset will only be loaded again if they change, otherwise the working set from the external data source will continue to be used. This allows unrelated preset changes to adjust other settings without affecting RDS functionality.

Real Time Clock

The exciter/control PWB has a battery-backed real-time clock that keeps track of the time and date. It is possible the exciter's RDS generator could broadcast the incorrect time and date if this is not set correctly, so the broadcast of time must be enabled via ASCII or UECP each time the system is powered up. Until it is enabled, the time will not be broadcast again after a power failure.

TCP Usage

Use TCP port 7005. This is not user configurable.

List of Settings: [Table 3.2.3](#) lists the RDS settings supported by Nautel, including descriptions and examples.

NOTE: Remote setting of the RDS baud rate is not supported.

Table 3.2.3: Supported ASCII Settings for RDS

Setting	Name	Description/Example
PI=	Program Identification	Four hex digits representing the station call sign. Consult the RDS/RBDS specification for more information. Example: PI=1AE5
PS=	Program Service	Maximum 8-character ASCII “tagline” string describing the radio station. Example: PS=Q104-FM
PTY=	Program TYPe	Number, from 0 to 31, describing the station format. Example: PTY=24
PTYN=	Program TYPe Name	8-character ASCII string, also describing the station format. Example: PTYN=JAZZ24-7
TP=	Traffic Program	Set to 1 if the current program sometimes carries traffic information, otherwise set to 0. Example: TP=1
TA=	Traffic Announcement	Set to 1 if the current program is currently broadcasting a traffic announcement, otherwise set to 0. Example: TA=0 NOTE: Timeout of the TA flag is not implemented, so the RDS data source should ensure this flag is properly cleared.
AF1= ... AF25=	Alternative Frequency	If the station broadcasts on more than one frequency using translators or repeaters, these are typically set to each of the frequencies used in the broadcast network. Sample calculation for 98.5 MHz: $(98.5-87.8) \times 10 = 107$ Example: AF1=107 NOTE: there is no method to disable AFs in this protocol.

Setting	Name	Description/Example
DI=	Decoder Information	Single hex digit, range 0-9 and A-F (case insensitive) that encodes the flags Stereo(1)/Mono(0) - bit 0; Artificial Head (Yes=1, No=0) - Bit 1; Compression (Yes=1, No=0) - Bit 2; and Dynamic (Yes=1, No=0) - Bit 3 Example: DI=3 (Stereo, Artificial Head=Yes, Compression=No, Dynamic=No)
MS=	Music/Speech	Typically set to 1 if the station broadcasts music, otherwise set to 0. Example: MS=1
TEXT=	Radio Text	Accepts a 1 through 64 character ASCII string, displayed on receivers that support RDS radio text. Example: TEXT=Tears for Fears - Shout (1985)
ECHO=	Echo on/off	If set to 1, the RDS encoder will echo back characters that are sent to it. If set to 0, the encoder will only send responses. Example: ECHO=1
DATE=	Current UTC date	Format is strictly YYYY-MM-DD. Sets the current UTC date for 4A date/time broadcasts. This is a non-volatile setting. Example: DATE=2016-04-04
TIME=	Current UTC time	Format is strictly HH:MM:SS, 24-hour format. Sets the current UTC time for 4A date/time broadcasts. This is a non-volatile setting. Example: TIME=17:23:05
UTC=	UTC time zone offset	Range is 0 to 24, 32 to 56. Sets the current time zone. To calculate this value, multiply the time offset by 2 and add 32 if the time offset is negative. For Newfoundland (UTC-3.5), $3.5 \times 2 = 7$, and add 32 (since the time zone is negative) to yield 39. This is a non-volatile setting. Example: UTC=39
CT=	4A date/time enable	If set to 1, the exciter will broadcast a 4A RDS packet on the edge of every minute with the currently set UTC time/date. This is a volatile setting. Example: CT=1
DPS=	Dynamic Program Service (scrolling command)	64-character ASCII string typically describing the radio station. Example: DPS=Q104-FM The Home of Rock N Roll

Setting	Name	Description/Example
DSPTE XT=	Dynamic Program Service (scrolling command) and Radio Text (RT)	Allows sending to both the DSP field and RadioText (RT) field in a single operation. 64-character ASCII string typically describing the radio station. Example: DPS=Q104-FM The Home of Rock N Roll
DPSR=	Dynamic Program Service Rate (scrolling command)	Number, from 0 to 2, describing the scrolling rate. 0 is off (default); the PS= command is displayed when DPSR=0 is used. 1 is slow; the DPS string will scroll at a rate of approximately 10 s. 2 is fast; the DPS string will scroll at a rate of approximately 3 s. Example: DPSR=2
DPSM=	Dynamic Program Service Mode (scrolling command)	Number, 0 or 1, describing the scrolling mode. 0 is word-scrolling; the DPS string will scroll word by word, or multiple words when they fit. 1 is character-scrolling; the DPS string will scroll character by character. Example: DPSM=0
REV not available for ASCII over IP	Software Version (special command)	Typing this command (no = or ?) returns the current RDS encoder software version. Example: REV // issue version command Nautel NVE RDS Encoder V1.0 // exciter response

Other Settings

See [Figure 3.2.37](#).

Figure 3.2.37: Other Settings page

Update Preset

General

Audio

SCA

RDS

Other Settings

Pilot Level	9.0	%
Pilot 1 PPS Sync	Disabled	
Sample Output	Pilot	
Audio Delay	Disabled	
Mod Loss Timeout	Disabled	
Hard Limiter	Disabled	
AGC Limiter	Disabled	
Two Slope Limiter	Disabled	
Orban Processor	Disabled	
L/R Limiter	Disabled	
MPX Power Limiter	Disabled	

Cancel

Save

NOTE: only Mod Loss Timeout is displayed for Air Chain presets.

- Pilot Level: enter value between 6 and 12% (default 9%); this level is added to the composite baseband
- Pilot 1 PPS Sync: select Enabled or Disabled. If Enabled, enter:
 - Pilot Sync Phase: (enter value between 0 and 360 degrees; default 0 degrees)

- Audio Delay: Used to time align the receiver output of decoded analog and digital audio signals. Select Enabled or Disabled. If Enabled, enter:
 - Audio Delay Value: enter value between 0 and 12,000 ms (default is 0)
- Mod (Modulation) Loss Timeout: select Enabled or Disabled. If Enabled, enter:
 - Action: Alarm Only (alarm only, no resulting action), RF Inhibit (inhibits the RF output and fans until the audio returns) or Change Preset (changes the active preset).
 - Mod Loss Preset: displayed only if Action is set to Change Preset. Select the preset from the drop down list that will activate upon the loss of a modulating signal, post the timeout period.
 - Mod Loss Timeout Minutes: sets the delay, in minutes, between modulation loss detection and the resulting action. Enter a value in the allowable range of 0 and 255 minutes.
 - Mod Loss Timeout Seconds: sets the delay, in seconds, between modulation loss detection and the resulting action. Enter a value in the allowable range of 0 and 59.9 seconds.
 - Mod Loss Threshold: sets the threshold for modulation loss detection. Enter a value in the allowable range of 0 and 100% (default is 0%).
- Hard Limiter: If enabled, the modulation level will be limited (audio signal clipped or distorted) if it exceeds the hard limit threshold. Select Enabled or Disabled. If Enabled, enter:
 - Hard Limit Value: enter value between 0 and 160% (default is 160%)
- AGC Limiter: If Enabled, when the modulation level exceeds the AGC Limit, the gain of the audio input will instantly decrease in order to reduce the modulation level below the AGC limit threshold. Recovery from this audio gain reduction is dependent on the Time Constant delay (fast attack, slow recovery). The input signal is briefly distorted by the audio gain reduction when the threshold is exceeded. Select Enabled or Disabled. If Enabled, enter:
 - AGC Limit: enter value between 0 and 160% (default is 120%)
 - AGC Time Constant: enter value between 0 and 1000 ms (default is 300 ms)

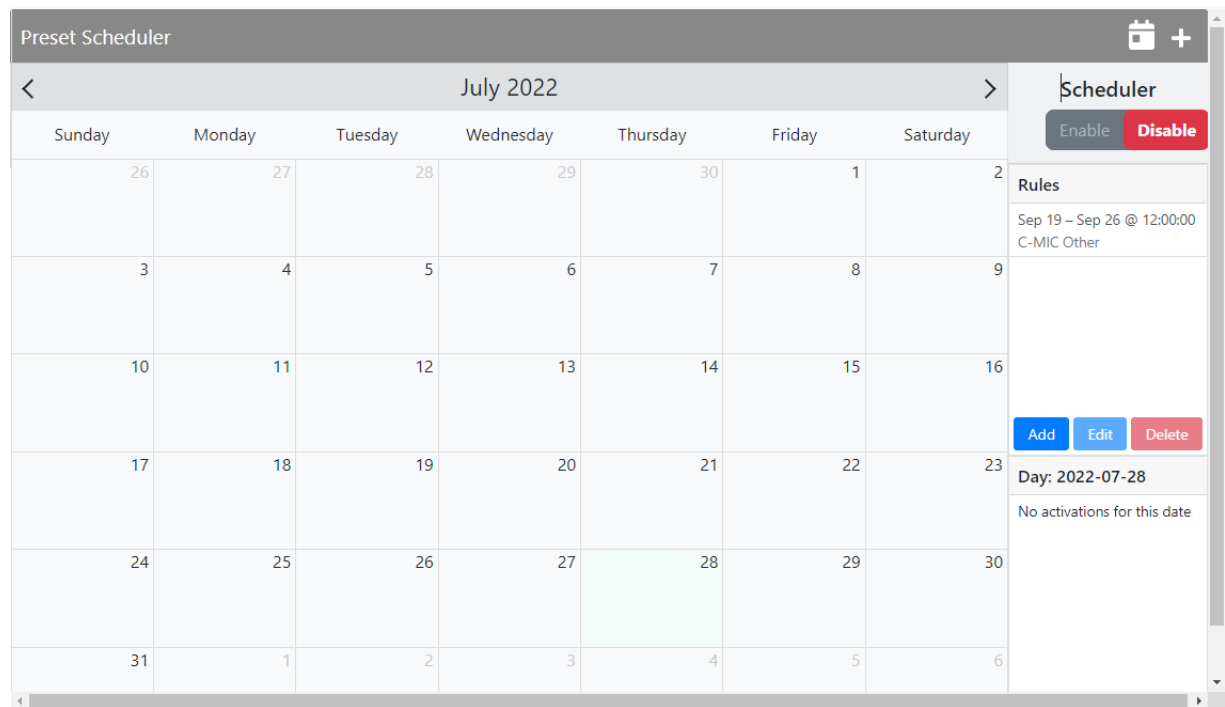
-
- Two Slope Limiter: If **Enabled**, when the modulation level exceeds the **Threshold**, the gain of the audio input will instantly change according to the gain percentage setting (percentage of the initial gain, which is below the threshold). The input signal is distorted by the audio gain change.
 - Two Slope Threshold: enter value between 0 and 160% (default is 160%)
 - Gain: enter value between 0 and 100% (default is 50%)
 - Orban Processor: select Enabled or Disabled. If Enabled, enter:
 - Orban Preset: select one of the 27 Orban presets from the drop-down menu.
 - L/R Limiter: This look-ahead limiter can be applied to the signal immediately before the stereo generator in the exciter. It has a fixed attack-time (and corresponding delay) of approximately 1 s. It can be configured to reduce the signal, if the gain setting is 0 dB or less, or can be used to perform an AGC function and boost quiet sections of the audio if a positive gain setting is used. If **Enabled**, enter the following parameters:
 - L/R Hold Time: enter value between 0 and 60 s (default is 5 s)
 - L/R Decay Time: enter value between 0 and 60 s (default is 5 s)
 - L/R Max Gain: enter value between -30 and 30 dB (default is 12 dB)
 - MPX Power Limiter: If **Enabled**, enter **MPX RMS Limit**. This limit allows the broadcast signal to remain in compliance with the MPX power limits as suggested in ITU-R BS.412-9. While the limiter will keep the transmitter in compliance, it is recommended that adjustment to the processing be made in such a way to minimize the reductions performed by the limiter. Otherwise the signal will not take advantage of the peak modulation capability available.
 - MPX RMS Limit: enter value between -12 and 12 dBr (default is 0 dBr)

NOTE: *MPX RMS is displayed as a percentage (%) on the meters screen. The percentage (%) equivalent for the dBr range shown above are 4.5% (-12 dBr) to 71.3% (12 dBr); default is 17.9% (0 dBr).*

Scheduler

You can program a preset schedule for the transmitter. Select **Preset Scheduler** from the **Settings** page in the Dashboard menu (see [Figure 3.2.38](#)) to set the dates and times at which presets take effect. You can define up to 63 different schedule rules. The Scheduler can also be set using the controller front panel UI (see [Enabling the Scheduler on page 3.2.192](#)).

Figure 3.2.38: Scheduler page



The **Scheduler** page displays a monthly calendar (e.g., September 2020). Use the < and > buttons to navigate between months.

By clicking on a specific date in the monthly calendar displays the **Edit Rule** page which contains the Timeframe, Days of the Week, and Time parameters, as applicable, for that day.

When in the Edit Rule list, you have the option to edit or delete an existing rule, or to create a new rule. Click the **New** or **Edit** button to display the **Rule Explorer** window (see [Figure 3.2.39 on page 3.2.61](#)). Click **Delete** to remove a rule from the list.

Use the **Edit Rule** window as follows:

- ❖ Use the drop-down menu to select the preset (e.g., Current Settings) for the rule. The preset's power, mode and frequency are displayed below the preset.
- ❖ In the **Timeframe** section, set the start (From:) and end (To:) dates for the rule. Start to end dates must be less than one year apart.
- ❖ In the **Days of the Week** section, select the days of the week on which the rule will apply.
- ❖ In the **Time** section, set the start (From:) and end (To:) times (hours and minutes) for the rule. Use the Repeat: field to establish a repeating cycle for the rule (e.g., every 24 hours).
- ❖ Unless you edit other rules first, you cannot select a date that occurs before the start of the previous rule or after the start of the following rule.
- ❖ Click the **Save** button to store the rule in the scheduler, the **Cancel** button to return to the **Scheduler** page or the **Delete** button to delete the rule.

When **Scheduler: OFF** appears, the transmitter will stop following the schedule and the active preset will be the preset that was operating when the scheduler was disabled.

Figure 3.2.39: Edit Rule page

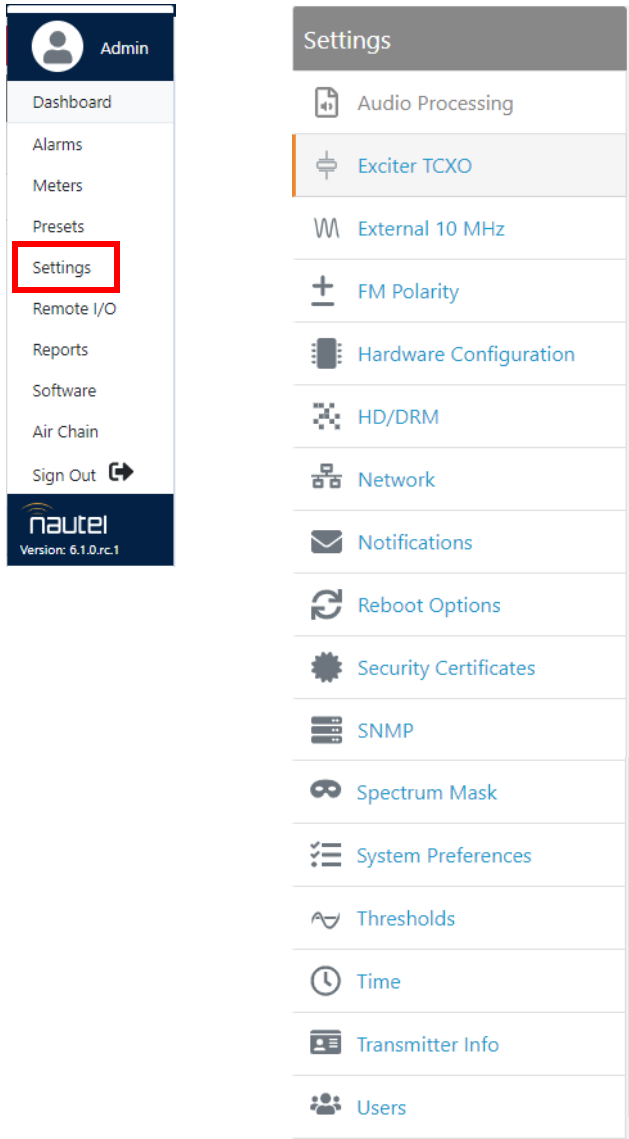
The screenshot displays the 'Edit Rule' interface. On the left, there are several sections: 'Presets' with a dropdown menu showing 'Example Preset 1'; 'Timeframe' with 'From' and 'To' date pickers set to January 1 and November 1; 'Days of Week' with checkboxes for Sunday through Saturday, where Monday, Wednesday, and Friday are selected; 'Time' with 'From' and 'To' time pickers set to 06:00 and 16:00; 'Repeat Every' with a text input set to '02:00'; and a 'Self Delete' checkbox. At the bottom left are 'Delete', 'Save', and 'Cancel' buttons. On the right, a 'Preview' section shows a vertical timeline from 00:00 to 24:00 in 2-hour increments. Orange horizontal lines indicate the active schedule periods: from 06:00 to 16:00 on the selected days.

Settings

The Settings menu (see [Figure 3.2.40 on page 3.2.63](#)) contains the following features:

- Audio Processing (see [Audio Processing - see page 3.2.64](#))
- Exciter TCXO (see [Exciter TCXO - see page 3.2.90](#))
- External 10 MHz (see [External 10 MHz - see page 3.2.91](#))
- FM Polarity (see [FM Polarity - see page 3.2.92](#))
- Hardware Configuration (see [Hardware Configuration - see page 3.2.93](#))
- HD/DRM (see [HD/DRM - see page 3.2.96](#))
- Network (see [Network - see page 3.2.101](#))
- Notifications (see [Notifications - see page 3.2.103](#))
- Reboot Options (see [Reboot Options - see page 3.2.106](#))
- Screen Configuration (Local AUI only) (see [Screen Configuration \(Local AUI only\) - see page 3.2.107](#))
- Security Certificates (see [Security Certificates - see page 3.2.107](#))
- SNMP (see [SNMP - see page 3.2.108](#))
- Spectrum Mask (see [Spectrum Mask - see page 3.2.110](#))
- System Preferences (see [System Preferences - see page 3.2.111](#))
- Thresholds (see [Thresholds - see page 3.2.112](#))
- Time (see [Time - see page 3.2.114](#))
- Transmitter Info (see [Transmitter Info - see page 3.2.116](#))
- Users (see [Users - see page 3.2.117](#))

Figure 3.2.40: Main Menu - Settings



NOTE: For consistency, the Settings menu is the same for all transmitter series. If a transmitter does not have a feature installed or enabled, such as Audio Processing, that menu option is greyed out in the Settings list.

Audio Processing

This section describes how to configure and operate the audio processor in your transmitter. There are two options supported by Nautel, depending on your transmitters type of program input.

- For transmitters not operating with Air Chain, a physical Orban audio processor is available for your transmitter. See [Orban Audio Processor](#) for operational details.
- For transmitters operating with virtual Air Chain program, the Omnia for Nautel software must be used to configure and operate the audio processor. See [Omnia for Nautel Audio Processor, on page 3.2.67](#) for operational details.

Orban Audio Processor

If your transmitter is configured with an Orban audio processor, there are 29 different Orban presets available. You can interface with audio processor functionality locally, using the controller front panel UI or the remote AUI. The extent of the features available depends on which interface is used.

Select an Orban audio processor preset using either the remote AUI (see [Orban Enabling - Using the Remote AUI](#)) or the controller front panel UI (see [Orban Audio Processor on page 3.2.227](#)).

NOTE: This section contains frequent reference to Orban's Optimod-FM 5500 Digital Audio Processor Operating Manual (see the link below). The equipment covered in the 5500 manual uses the same Orban audio processor as in your transmitter. The 5500 manual provides detailed information on the audio processor's functionality. If a discrepancy exists between the operational instructions in the Orban manual and this document, the latter shall prevail as this document is specific to operation with an GV5/GV3.5 transmitter. View the Orban Optimod-FM 5500 Digital Audio Processor Operating Manual online at:

http://www.orban-europe.com/downloads/5500/Documentation/5500_1.2_Operating_Manual.pdf

(the version number referenced in this URL is controlled by a third party and is subject to change)

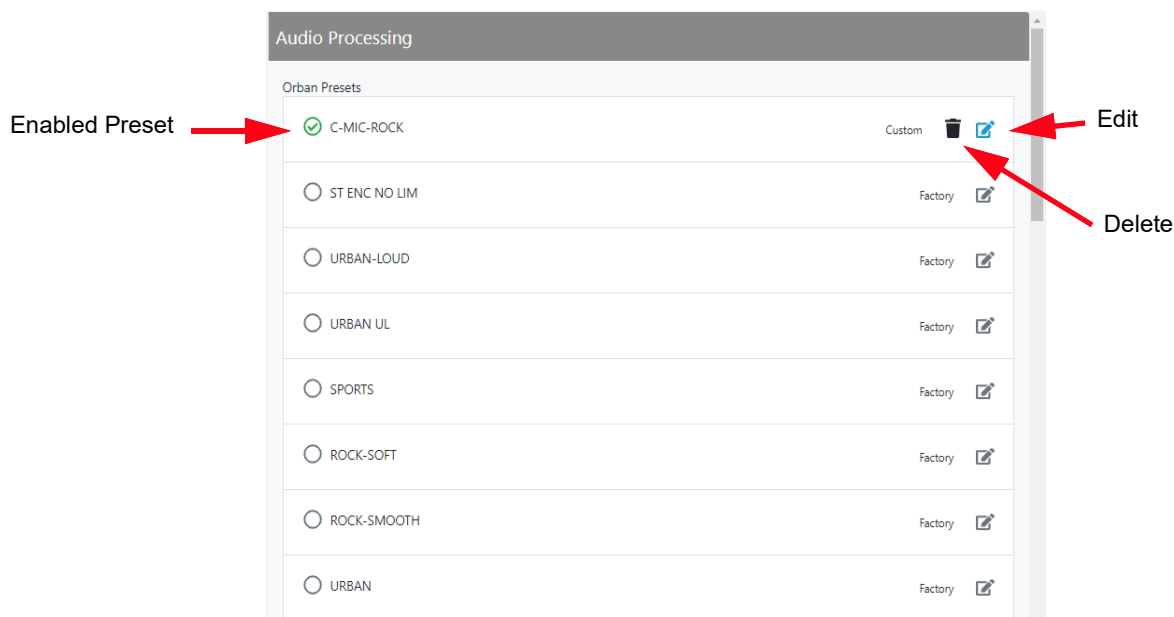
Orban Enabling - Using the Remote AUI.

In the **Settings -> Audio Processing** page, select the desired Orban Preset by clicking the circle to the left of the preset name, a green checkmark will indicate that the preset is enabled. See [Figure 3.2.41 on page 3.2.65](#)).

There are two types of Orban audio processor presets: Factory presets and Custom presets. Factory presets cannot be modified. When a factory preset control is changed, a new preset is automatically created. This preset's default name will be the same as the Orban preset with an asterisk (*) prefix (e.g., * EXTREME). Modified presets should be saved to a new name, otherwise they will be overwritten by any edits made to subsequent presets. A saved preset will display as a Custom preset in the **Load** or **Save** screens. Custom presets can be modified.

NOTE: When creating a name for a custom preset, the ' _ ' is an invalid character.

Figure 3.2.41: Settings - Audio Processing



By clicking the **Edit** button, you can change the various settings for the active preset. See [Figure 3.2.42 on page 3.2.66](#).

The Audio Processing selections include:

Less More, Stereo Enhancer, AGC, EQ, Final Clipping, 2Band, 2Band Distortion, Multiband, Compressors, Bandmix, Multiband Distortion, and UL Distortion. Refer to the Operation section of the Orban Optimod 5500 manual for detailed information on these meters.

To activate any changes in the **Audio Processor** page, the following options apply:

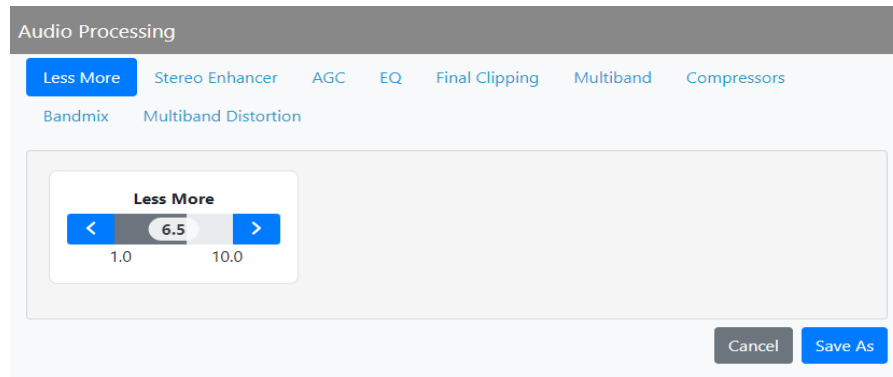
- for Factory presets - **Save As** or **Cancel**
- for Custom presets - **Save**, **Save As** and **Cancel**

When creating a new preset, you must enter a new name in the **Save Preset** window before clicking the **Save As** button. Click **Cancel** to discard changes and return to the Audio Processor page.

NOTE: Selecting an Orban preset locally will cause the remote AUI to also reflect the change. The same occurs on the controller front panel UI when remotely selecting a preset. To create a new Orban Audio Processor Preset, see [Selecting an Orban Audio Processor Preset on page 3.2.231](#).

NOTE: The Audio Processor page contains nine tabbed sections that allow managing of Orban presets. These tabbed pages (see [Figure 3.2.42](#)) illustrate the many parameters associated with an Orban preset. Detailed descriptions are not included in this document. Refer to the Orban Optimod 5500 manual for more information on setting these parameters.

Figure 3.2.42: Audio Processing - Edit



WARNING!

When you open the Audio Processor page while the transmitter is on and Orban is enabled, the active preset in the Orban audio processor is loaded by default. Loading another Orban preset causes that preset to become active. Make sure you understand the impact that a preset change will have on your broadcast.

Omnia for Nautel Audio Processor

This section describes how to access and use the Omnia for Nautel software. Omnia for Nautel provides high-quality software audio processing, using Audio over IP (Livewire, Shoutcast, Icecast, etc.), eliminating the need for external hardware processors (see also [Air Chain, on page 3.2.135](#)). Omnia for Nautel software is part of the overall Air Chain platform, allowing users to interact with it alongside other Gen4 and vPorter modules, load and save configurations, and manage presets, using a web interface.

The following topics are included in this section:

- [General Network Requirements - see page 3.2.68](#)
- [Installing and Using NfRemote - see page 3.2.68](#)
- [Using Omnia for Nautel Software - see page 3.2.70](#)

NOTE: *Telos provides an online help page that includes details not included in this manual. Click the following link to find more information on the Omnia for Nautel audio processor:*

<https://docs.telosalliance.com/docs/omnia-enterprise-9s-user-manual-v33110>

General Network Requirements. The following requirements must be observed:

- Switches that are approved and configured for AoIP use including QoS and IGMP snooping.
- A PTP or Livewire master clock must be present on the AoIP network(s).
 - ❖ A single facility master clock for all timing and clock signals is preferred.
 - ❖ The AoIP network must be configured for the proper distribution of a PTP clock according to the requirements outlined in both the current IEEE 1588 standard (IEEE 1588-2019 at the time this was written) and the SMPTE 2059-2 standard.
- Server hardware and network adapters for the AoIP network must be chosen and configured to handle the required number of AES67 / SMPTE ST 2110-30 and -31 Profile A audio streams.

Observe the following typical bandwidth requirements for a network using Air Chain content:

- Livewire: bandwidth ranges from 2.8 Mbps (standard stereo) to 6.53 Mbps (live mode) per HD Radio channel. Due to the high bandwidth requirement of Livewire's Live mode, you should use standard stereo mode wherever possible. A live audio signal is not required, considering the large on-air delays of the HD Radio signal.
- Streaming: depends on the bandwidth configured in the Shoutcast/Icecast server. If it serves a 64 kbps AAC stream, the bandwidth requirement is slightly more than 64 kbps.

Depending upon the installation, one or two networks may be required.

NOTE: Telos provides an online help page that includes details not included in this manual. Click the following link to find more information on the Omnia for Nautel audio processor:

<https://docs.telosalliance.com/docs/omnia-enterprise-9s-user-manual-v33110>

Installing and Using NfRemote. The NfRemote application allows access to the Omnia for Nautel audio processor.

The installation procedure for the NfRemote application is provided in the Air Chain section of the 'Planning Program Inputs' chapter of the *Pre-Installation Manual*. If you have not installed NfRemote on your laptop or PC, see the *Pre-Installation Manual* for instructions.

Logging into the Omnia for Nautel software from the NfRemote application is described in the 'Commissioning' chapter of the *Installation Manual*, but high level instructions are also included in this section.

NOTE: The NfRemote application on your laptop or PC provides access to your transmitter via vPorter, and allows you to perform various functions, including licensing, audio processor settings, and Nielsen setup (if desired).

1. With the transmitter turned on, navigate to the local or remote AUI's **Air Chain -> vPorter -> IP Network** page. Note the LAN2 IP Address for the vPorter.
2. Open the NfRemote application on your PC or laptop. Enter the vPorter's LAN2 IP address into the IP address field (see [Figure 3.2.43](#)).
3. Click the **Connect** button to open the Omnia for Nautel audio processor interface for the transmitter (see [Figure 3.2.44](#)) for an example of a page that might be displayed.
4. See [Using Omnia for Nautel Software, on page 3.2.70](#) for further details on Omnia for Nautel interface menus.

Figure 3.2.43: NfRemote Menu

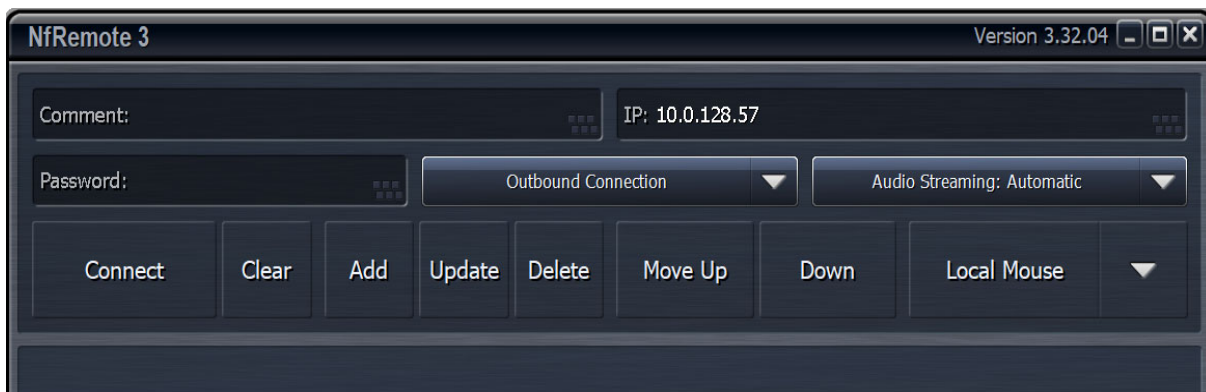
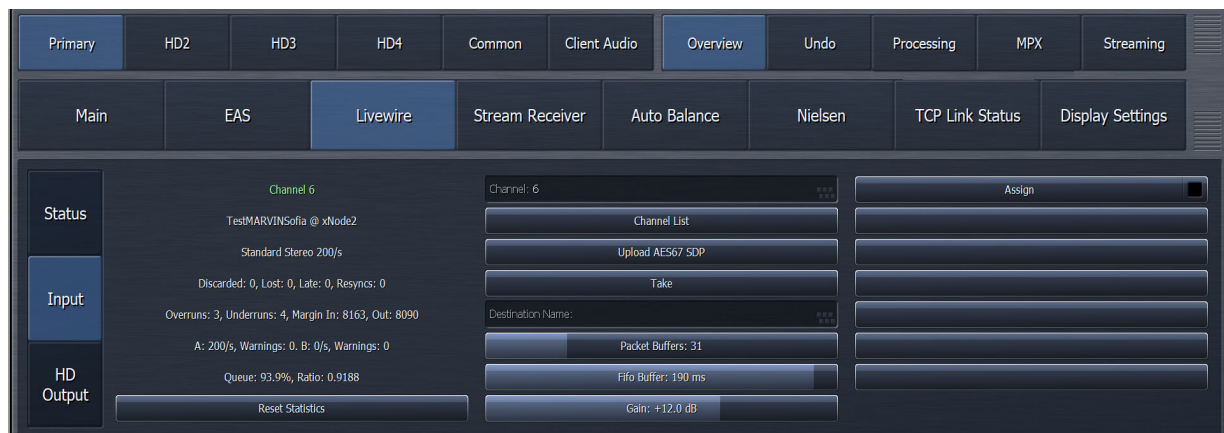


Figure 3.2.44: Omnia for Nautel User Interface (example screen)



Using Omnia for Nautel Software.

The Omnia for Nautel audio processor software is highly customizable and configurable and is able to display an abundance of meters, instrumentation, menus, and controls. This section is designed to provide an overview of the Omnia for Nautel interface and describe the behavior of various control types, not to provide full details on individual controls.

NOTE: *Telos provides an online help page that includes details not included in this manual. Click the following link to find more information on the Omnia for Nautel audio processor:*

<https://docs.telosalliance.com/docs/omnia-enterprise-9s-user-manual-v33110>

NOTE: *Screenshots of the user interface are used throughout this manual to identify the location of various menus and controls. Because of the responsive nature of Omnia for Nautel, the actual displayed screen may not exactly match the screenshot in the manual. The menus and controls may be arranged differently.*

Features and operations described in this manual are:

- [Navigation Types: - see page 3.2.71](#)
- [Display Windows: - see page 3.2.73](#)
- [Licensing for Primary and Sub-Channels: - see page 3.2.75](#)
- [Licensing for Nielsen Ratings: - see page 3.2.77](#)
- [Livewire or Stream Receiver Network Configuration - see page 3.2.78](#)
- [Audio Processing Basics - see page 3.2.81](#)
- [Choosing a Preset: - see page 3.2.82](#)
- [MPX Stereo Generator Menu - see page 3.2.83](#)
- [RDS Configuration - see page 3.2.85](#)
- [Client Audio Feature - see page 3.2.88](#)
- [Undo Feature - see page 3.2.89](#)

Navigation Types:

Omnia for Nautel offers two ways to view and navigate displays and menus, Tree Navigation and Tabbed Navigation, which are selectable from the **Menu** button at the top of the display (see [Figure 3.2.45 on page 3.2.72](#)).

- Tree Navigation (see [Figure 3.2.45 on page 3.2.72](#)): Tree Navigation is a graphical representation of a typical menu "path". It divides the screen into two sections:
 - ❖ Displays are located in the top section.
 - ❖ Controls are located in the bottom section.
 - ❖ The navigation bar in between shows your location within the menus and offers buttons to take you directly back to a menu layer along with navigation arrows which function as "previous" and "next" buttons.
 - ❖ The resize handle allows you to make the top and bottom sections smaller or larger in relation to one another.

Tree navigation provides a less cluttered look on-screen and is especially suitable for smaller displays. The trade-off is that more navigation is required since not all available menus and controls are displayed at once.

- Tabbed Navigation (see [Figure 3.2.46 on page 3.2.72](#)): Tabbed Navigation displays all available menus, sub-menus, and controls at all times. It divides the screen into the following sections:
 - ❖ Displays are located in the top section.
 - ❖ The top-level menu, first sub-menu, and second sub-menu are in the middle section.
 - ❖ Controls are located in the bottom section.
 - ❖ Two resize handles allow you to adjust the relative size of the top, middle, and bottom sections.

Tabbed navigation generally makes navigation easier because all controls and menus are displayed at once. It is the style used in screenshots throughout this document. It can, however, be a bit visually overwhelming for some users and, depending upon how many display windows are employed, can result in menus and controls becoming unusably small, particularly on smaller displays.

Figure 3.2.45: Tree Navigation

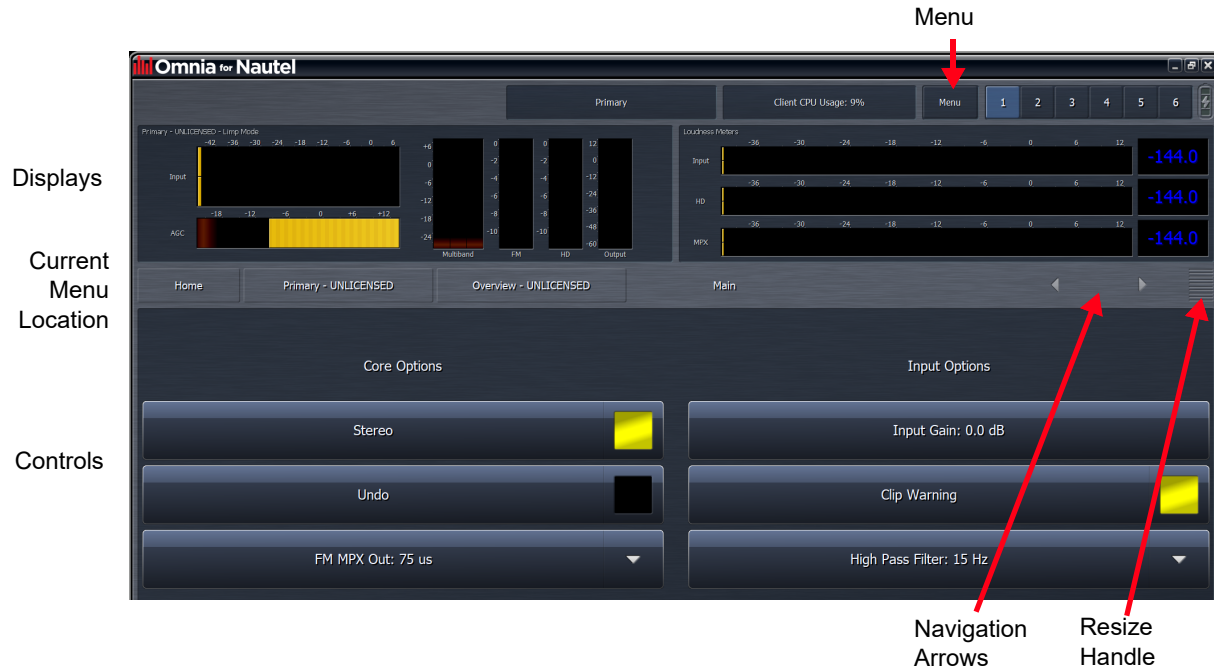
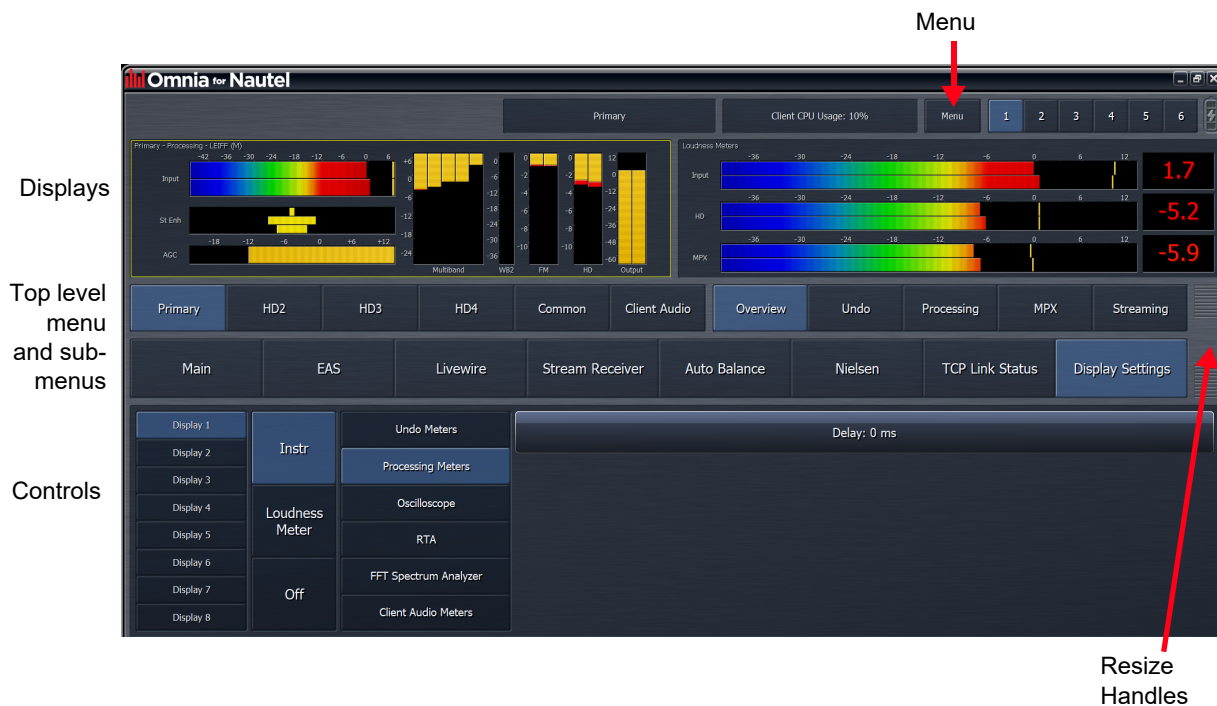


Figure 3.2.46: Tabbed Navigation



Display Windows:

The top section of the Omnia for Nautel screen can be customized to show up to eight individual display windows. See [Figure 3.2.47](#).

Adding more displays makes each existing window smaller, so depending upon the size of your monitor, having more than three or four active windows at a time may not be practical. However, six **Display Presets** are provided and each can be individually configured to display whatever combination of information suits your needs.

NOTE: The .ini file that holds the information for the display configuration is stored on the PC or laptop running NfRemote to allow each user to set up their own personalized displays. When running the app instead of the service, the file is stored on the server itself.

Figure 3.2.47: Display Windows



Clicking the **Display Settings** button will open the display menu in the bottom section for the selected Display Preset.

Clicking within any of the display windows will do the same and outline the active window in yellow. Clicking one of the **Display** buttons reveals the various options for each window. Options include:

■ Main Meters

- ❖ Undo Meters - Show the activity of the multi-band expanders and de-clipper.
- ❖ Processing Meters - Show the activity of the various processing stages.

■ Loudness Meter

- ❖ Loudness Meters - Shows the LKFS/LUFS loudness of all available inputs and outputs.
- ❖ Loudness Graph - Shows a graph of LKFS/LUFS loudness for the selected patch point over time.

■ Instrumentation (Instr)

- ❖ Oscilloscope - Provides a digital oscilloscope (oversampled if desired) for the selected patch point.
- ❖ RTA - Shows the frequency spectrum of the selected patch point.
- ❖ FFT - Shows a spectrum analysis of the selected patch point.

■ Off - Turns off the selected display.

Licensing for Primary and Sub-Channels: This section describes how to use the Licensing related pages of the Omnia for Nautel menu.

NOTE: *Licensing the Omnia for Nautel is described in the 'Commissioning' chapter of the Installation Manual, but high level instructions are also included in this section. If the Omnia for Nautel software is not licensed, it will enter 'Limp mode' (displayed on user interface). Audio will be 10 dB quieter.*

Click the **Common** -> **Licensing** -> **Overview** buttons to view a screen similar to [Figure 3.2.48 on page 3.2.76](#). This example shows an existing single license that includes:

- ❖ Base: 1 for the primary channel
- ❖ SLA: service level agreement license with Telos care
- ❖ Subs: number of licensed sub-channels (e.g., 3 indicates licenses for HD2, HD3 and HD4)
- ❖ Nielsen: 1 indicates a Nielsen license is active; 0 indicate no active Nielsen license (see [Licensing for Nielsen Ratings](#), on page 3.2.77 for details on activating a Nielsen license).

If there is no license, or one needs to be added, or a license requires renewal, obtain the license key, enter it in the License field, and click **Add License**. When there is no active license, the **Primary** and **HD#** buttons will indicate 'UNLICENSED'.

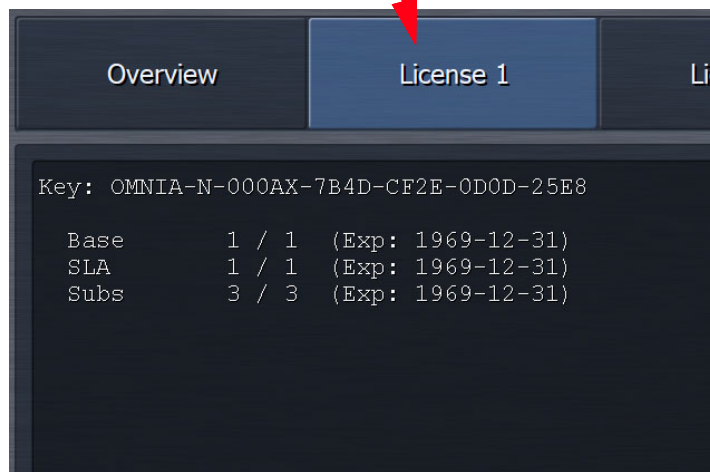
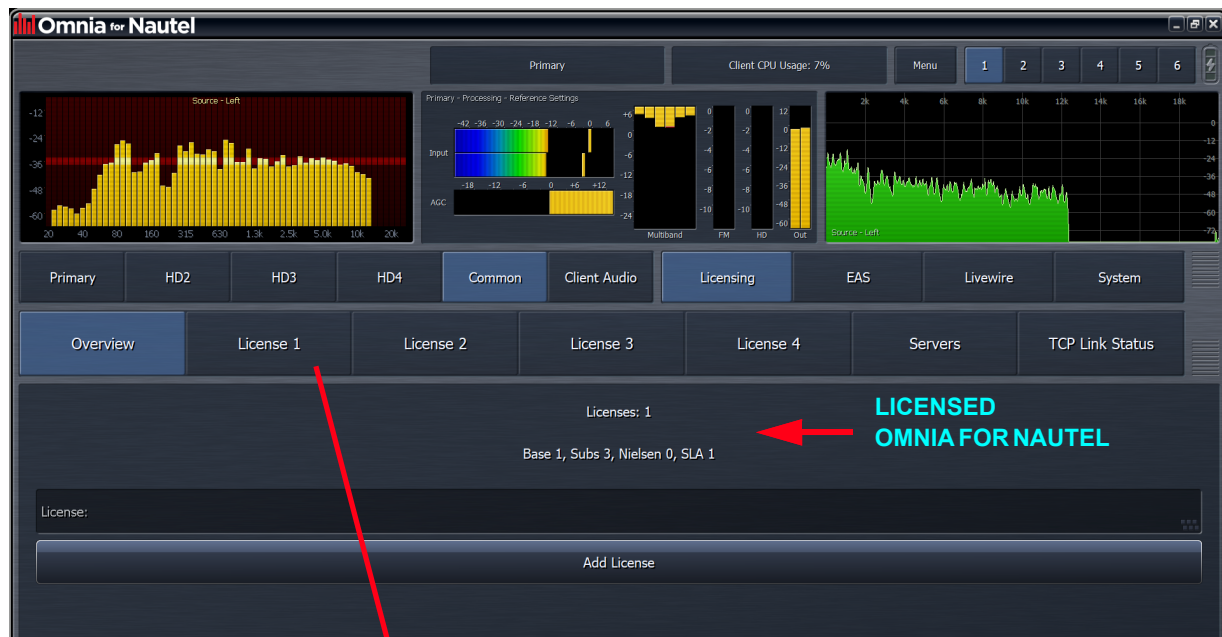
NOTE: *Nautel provides the Omnia for Nautel license code on the 'Software License Certificate' sheet provided in the shipped transmitter documentation. If you need a new license key, contact Nautel.*

Click the **License 1** button to view the details of the active license, if applicable (see [Figure 3.2.48 on page 3.2.76](#)). If there are multiple licenses, click the appropriate **License 2** through **License 4** buttons to view their details. Up to four license keys can be entered and displayed. License details include:

- ❖ Key: the license key for the Omnia for Nautel software
- ❖ Details on the specific licenses (Base, SLA, Subs, Nielsen, as applicable), with their license expiry date.

NOTE: *There is no electronic notification when a license is about to expire. It is the user's responsibility to maintain licensing for the Omnia for Nautel software. Contact Nautel for re-licensing at least two weeks prior to the license expiration date to avoid delays and expired licensing.*

Figure 3.2.48: Omnia for Nautel - Licensing Overview screen



Base is the Primary channel license
SLA is the Telos care (Nautel care) license
Subs indicate the number of licensed sub-carrier channels (e.g., 3 indicates HD2, HD3, HD4)
Nielsen license is available but not shown

NOTE: license expiry date may not be accurate; this is expected behavior.

Licensing for Nielsen Ratings: This section describes how to use the Nielsen license related pages of the Omnia for Nautel menu.

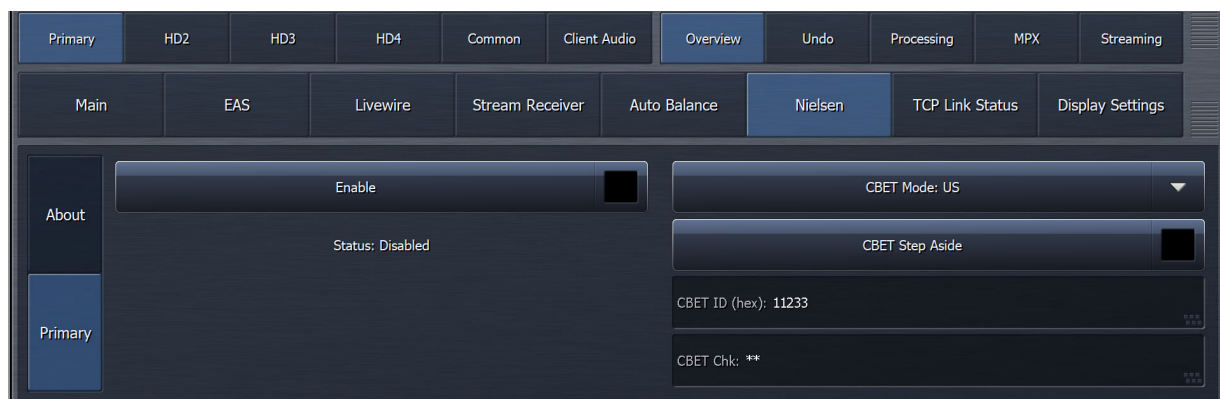
NOTE: *Licensing the Omnia for Nautel is described in the 'Commissioning' chapter of the Installation Manual, but high level instructions are also included in this section.*

Click the **Primary** -> **Overview** -> **Nielsen** buttons to view a screen similar to [Figure 3.2.49 on page 3.2.77](#). The Status section shows the Nielsen ratings feature disabled. To acquire and enable a Nielsen rating license:

- ❖ Contact Nielsen to obtain a CBET ID.
- ❖ Enter the ID in the CBET ID (hex) field.
- ❖ Click the right-hand side of the **Enable** button to enable Nielsen ratings

You should now see evidence of a Nielsen license in the **Common** -> **Licensing** -> **Overview** screen (see [Figure 3.2.48 on page 3.2.76](#)).

Figure 3.2.49: Omnia for Nautel - Nielsen Licensing screen



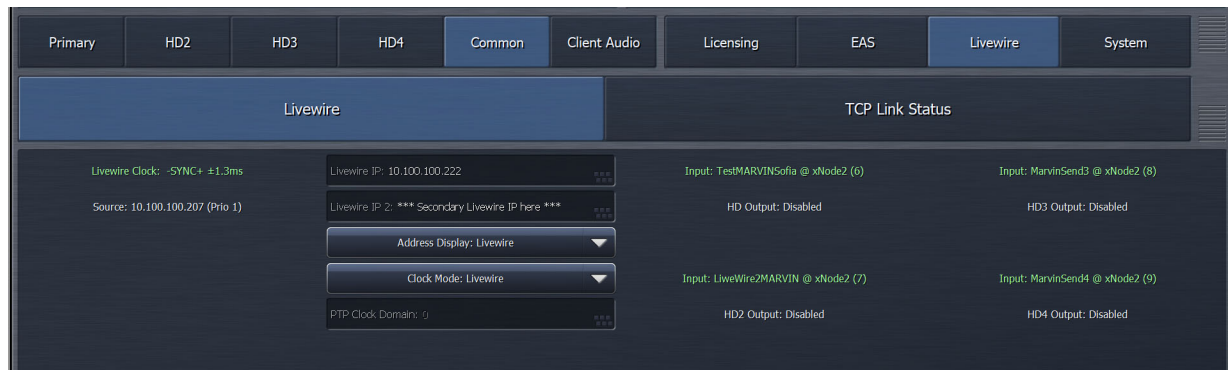
Livewire or Stream Receiver Network Configuration. This section describes how to configure the audio over IP feed (Livewire, Icecast, Shoutcast, etc.) in the Omnia for Nautel menu.

NOTE: *Configuring the audio over IP feed network (e.g., Livewire or Stream Receiver) is described in the 'Commissioning' chapter of the Installation Manual, but instructions are also included in this section.*

Livewire Source Setup

Livewire is considered the 'professional' audio feed. If you are using Livewire, click the **Common** -> **Livewire** buttons to view the Livewire setup screen (see [Figure 3.2.50](#)).

Figure 3.2.50: Livewire Setup screen



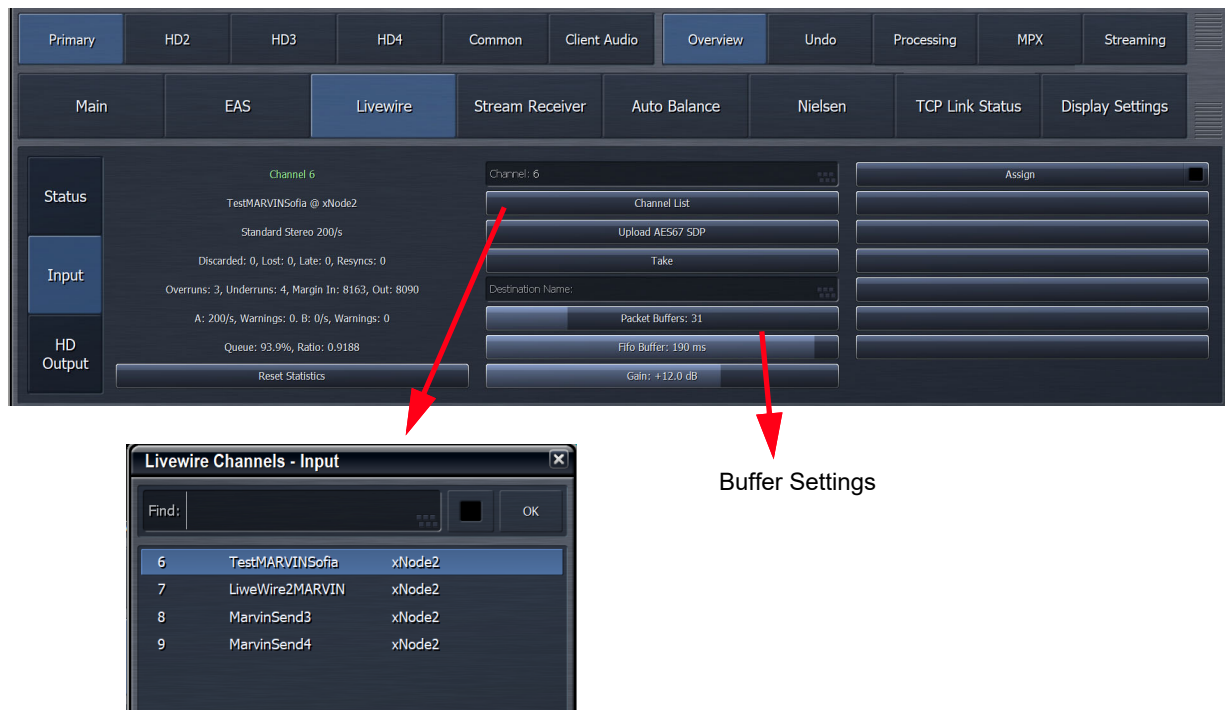
- ❖ For a single AoIP network, enter the Livewire IP field with the vPorter IP address for the interface on which you expect to receive Livewire. Nautel recommends that this corresponds with your LAN 1 connection (see [Figure 3.2.101 on page 3.2.145](#)).
- ❖ Use the Livewire IP 2 field to enter a second address for dual-network applications.
- ❖ Select the Address Display drop-down to show either Livewire or AES67 style channel IDs. Livewire displays I/O entries as Livewire channel numbers. AES67 displays I/O entries as multicast addresses
- ❖ Select the Clock Mode drop-down to Livewire or AES67 (PTP), as desired. **IMPORTANT!: You must be receiving a Livewire clock** (e.g., from a Telos xNode2 device, etc.) to receive an audio over IP signal.
 - Livewire Clock - Used for Axia installations
 - PTP Clock - Used for AES67/SMPTE 2110 installations
 - The AES67 standard recommends a PTP clock domain of 0
 - The SMPTE 2110-30 standard recommends a clock domain of 127
 - Check with your network administrator as your network may use a different domain
- ❖ The Livewire Clock's sync status will be displayed on the left-hand side of the menu. When the sync status is shown in green, the clock is synchronized. When the sync status is shown in yellow, the clock is not ideally synchronized, but will still function.

Livewire Channel Setup

Set up your Livewire channel for all desired stations (Primary, HD2, HD3 and HD4, as applicable) as follows:

Click the desired station button (Primary, HD2, HD3, HD4), plus the Overview -> Livewire -> Input buttons (see [Figure 3.2.51](#)).

Figure 3.2.51: Livewire - Channel Input Setup screen



- ❖ Click Channel List and select the desired Livewire input, click OK, then click the **Take** button.
- ❖ Verify or set the Packet Buffers value to 32 (click and slide the value to set).
- ❖ Verify or set the Fifo Buffer value to 190 ms (click and slide the value to set).
- ❖ You can use the HD Output button to direct an input channel as an output that can be acquired as an input by another channel.

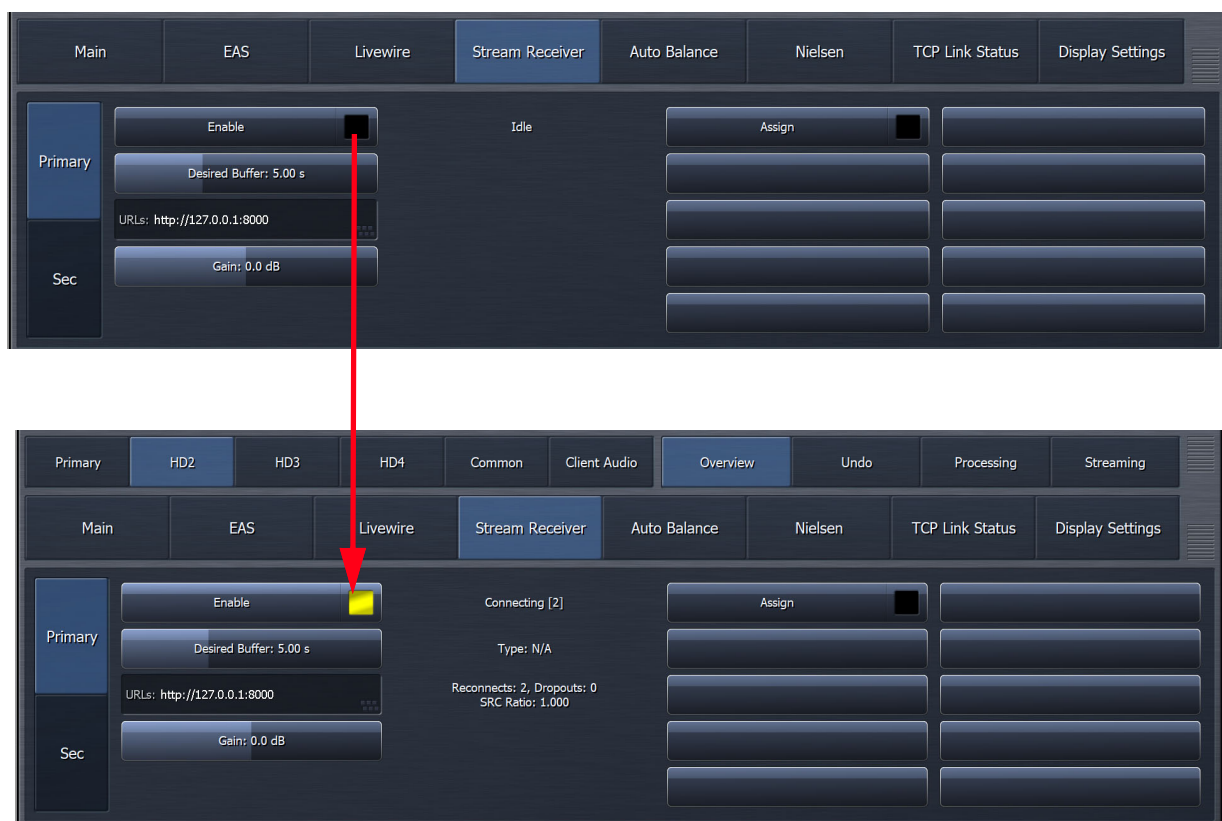
Stream Receiver Source Setup (as required)

If you are using Shoutcast or IceCast, you can use the **Stream Receiver** tab (see [Figure 3.2.52](#)) to enable the stream receiver for an input channel and enter the appropriate URL for the audio feed.

Nautel supports:

- ❖ Shoutcast/Icecast using MP3, MP2, AAC, Ogg Vorbis, Windows Media Audio.
- ❖ Playlists can be PLS or M3U formatted.
- ❖ Bit rates from 16 to 320 kbps.

Figure 3.2.52: Stream Receiver Setup screen



Click the **Enable** button [Figure 3.2.52](#) to enable the stream receiver for an input channel and enter the appropriate URL for the audio feed.

NOTE: An enabled stream receiver input will supersede a Livewire input.

You can create presets under the **Assign** button.

Audio Processing Basics.

Processing Overview and Signal Path:

Omnia for Nautel uses the same dynamics processing engine found in the Omnia.9 hardware processor.

Starting at the unprocessed input audio and working forward through the path, the audio processing include:

- ❖ Phase Processing
- ❖ Downward Expanders
- ❖ Input AGC
- ❖ Wideband AGC 1
- ❖ Solar Plexus
- ❖ Parametric EQ
- ❖ Stereo Enhancer
- ❖ Multiband AGCs and Limiters
- ❖ Multiband Compression
- ❖ Dry Voice Detector
- ❖ Wideband AGC 2
- ❖ Wideband AGC 3
- ❖ Band Mix
- ❖ Bass Clipper
- ❖ FM Clipper/HD Limiter

Each Station has its own set of processing controls. These controls are, for the most part, shared among all available output paths (FM, HD, and streaming) though there are some settings unique to each path. For instance, the FM output can have pre-emphasis limiting applied if desired and the HD output has its own signal limiter and treble control to help match the spectral characteristics of the corresponding FM signal.

Detailed information for audio processing settings is beyond the scope of this manual. See the Omnia 9s manual for more details.

<https://docs.telosalliance.com/docs/omnia-enterprise-9s-user-manual-v33110>

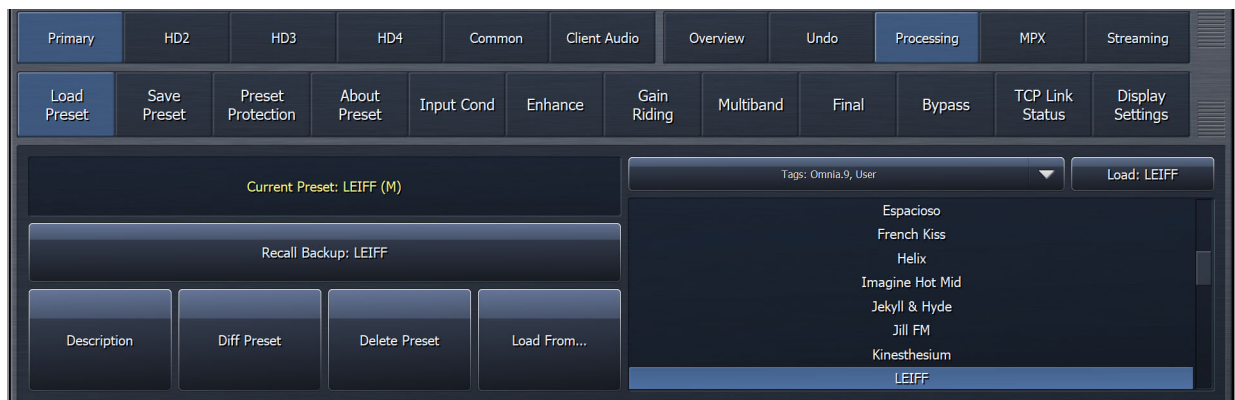
Choosing a Preset:

Omnia for Nautel includes a wide variety of factory presets that can either be used as-is or act as a starting point for user customization. Each was created with a different end goal in mind in terms of loudness, density, and spectral balance.

Each station (Primary, HD2, HD3 and HD4, as applicable, has its own preset setting).

There is no “one size fits all” preset as personal preferences, content type, music genre, and market-specific conditions (including loudness) will all factor in. Likewise, there is no shortcut to choosing the right starting preset or ultimately making adjustments to fine-tune the processing. Setting up a processor requires extensive listening and cooperation between engineering, programming, and any other parties with a vested interest and a voice in the decision-making process.

Figure 3.2.53: Selecting Presets



See [Figure 3.2.53](#). Select the desired channel (Primary, HD2, etc.), click the **Processing** button, then click the **Load Preset** button. The preset currently on-air is shown in the **Current Preset** window. To load a different preset, highlight the preset name in the **Preset** list then click the **Recall Backup** button. The new preset will immediately become the **Current Preset** and the former current preset will move to the **Backup** position. You can also double-click the preset name to immediately place the highlighted preset on the air. The **Recall Backup** button acts as a toggle so that you can easily do an A/B comparison between the current and backup presets.

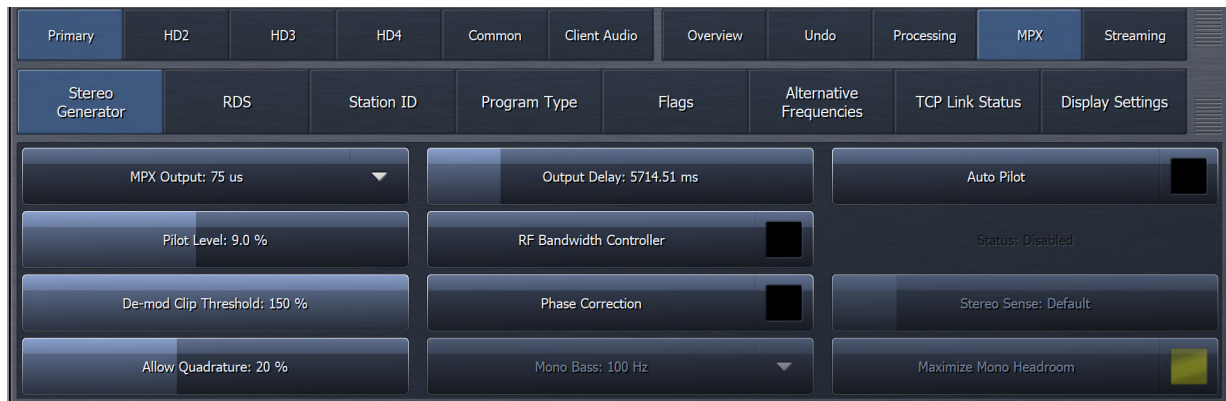
Describing the sound of a preset is not always easy, but clicking the **Description** button will open a pop-up window that gives a brief description of the preset's overall character and in some cases a few technical details as to how the sound was achieved.

NOTE: You can load and save presets to your local PC or laptop.

MPX Stereo Generator Menu. The Stereo Generator menu has a variety of features to configure the MPX signal.

Click the desired station (e.g., Primary, HD2, etc.) and the **MPX -> Stereo Generator** buttons to view the screen in [Figure 3.2.54](#).

Figure 3.2.54: MPX Stereo Generator Menu



You can adjust various MPX parameters including MPX Output pre-emphasis, Pilot Level, De-mod Clip Threshold and Output Delay.

NOTE: Telos provides an online help page that includes details not included in this manual. Click the following link to find more information on the Omnia for Nautel audio processor:

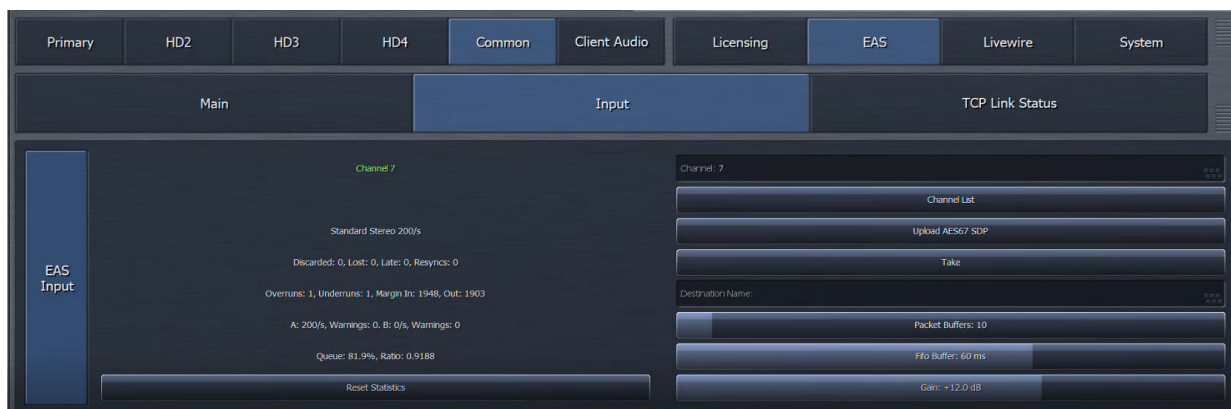
<https://docs.telosalliance.com/docs/omnia-enterprise-9s-user-manual-v33110>

EAS Configuration. This section describes how to configure an Emergency Alert System (EAS) input. You can choose one Livewire channel to act as the EAS audio, which can be configured to override the audio on any station (e.g., Primary, HD2 etc.), provided there is an audio level registering on the selected input.

NOTE: The terms 'station' and 'channel' are used interchangeably when describing Primary, HD2, HD3 and HD4.

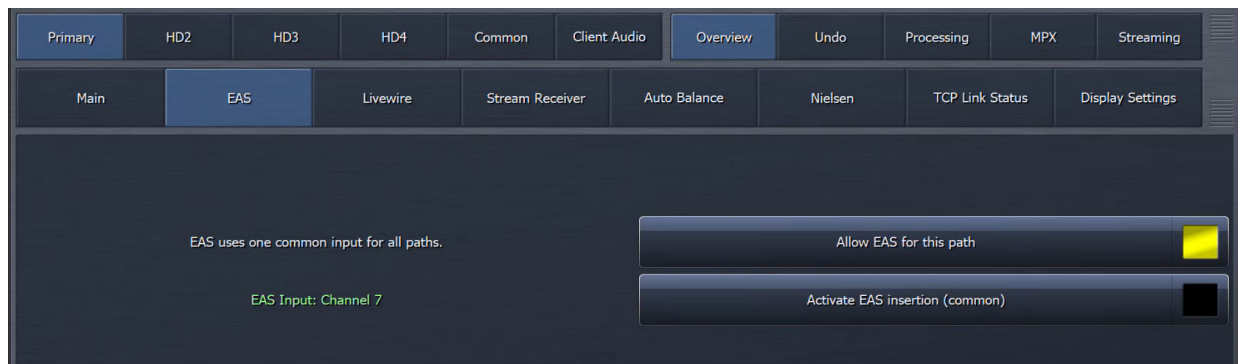
Click the **Common** -> **EAS** -> **Input** buttons to view the screen in [Figure 3.2.55](#). Enter a Channel or select a channel from the Channel List (Channel 7 shown) that will act as the EAS input. EAS uses one common input for all paths. Click the **Take** button to save the selection. The selected channel will display in green on the left side of the menu.

Figure 3.2.55: EAS Common Input Selection



To enable the EAS input on desired stations (e.g., Primary, HD2, etc.), click the desired station button, plus **Overview** -> **EAS** buttons to view the screen in [Figure 3.2.56](#). Click the **Allow EAS for this path** enable button (highlighted is enabled). Repeat this for all stations where you want an EAS input. When enabled, and an audio level is present, the EAS input will override what is normally configured on the associated station.

Figure 3.2.56: Enabling EAS for Desired Stations

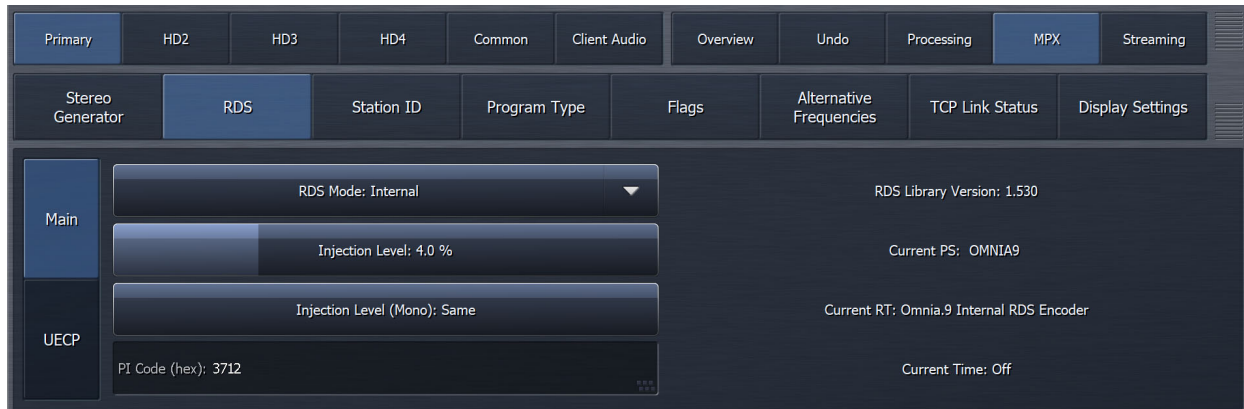


RDS Configuration. This section describes how to configure RDS settings. RDS settings apply to FM only.

NOTE: *Air Chain users can only configure RDS through the Omnia for Nautel menu. The transmitter AUI's RDS menu is not available for Air Chain presets.*

Click the desired station button (e.g., Primary, HD2, etc.) plus **MPX** -> **RDS** buttons to view the screen in [Figure 3.2.57](#).

Figure 3.2.57: RDS Configuration Menu



The **Main** tab allows RDS mode selection for the internal RDS, which allows the use of the other configuration buttons (**Station ID**, **Program Type**, **Flags**, **Alternative Frequencies**). Samples of these menus are shown in [Figure 3.2.58](#) on [page 3.2.86](#).

Setting RDS Mode to Off disables RDS carriers.

Repeat RDS configuration for each desired station (e.g., Primary, HD2, etc.).

NOTE: *The RDS settings described for the AUI and controller UI are similar to the settings used in the Omnia for Nautel interface. Refer to [RDS](#), on [page 3.2.50](#) or [RDS Settings](#), on [page 3.2.174](#) for further information contained in this manual.*

You can also refer to the Telos Help page for details on any Omnia for Nautel interface function.:

<https://docs.telosalliance.com/docs/omnia-enterprise-9s-user-manual-v33110>

You can also configure to use an external RDS feed, with an RDS encoder, using the UECP tab (see [Figure 3.2.59](#) on [page 3.2.87](#)). There are four supported modes: TCP, UDP, TCP (ASCII) and UPDP (ASCII).

Figure 3.2.58: Other Internal RDS Menus

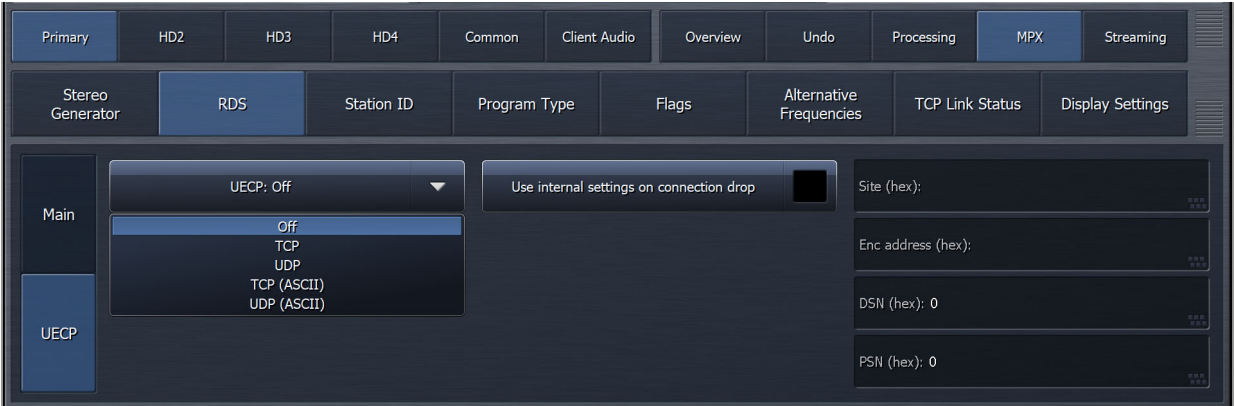
Stereo Generator	RDS	Station ID	Program Type	Flags	Alternative Frequencies	TCP Link Status	Display Settings
Current PS: OMNIA9 Current RT: www.omniaaudio.com Message Age: 00:17							
PS: OMNIA9		RT: 20s:Now Playing: Milli Vanilli - Girl You Know It's True/10s		PS/RT Time-out: None			
PS Source: Edit Box		RT Source: Fetch from URL		Default PS:			
Location: c:\audio\radio\yds_psm1		Location: http://127.0.0.1:7380/nowplaying_generator?stream=		Default RT:			
Template: 20s:Now Playing\ %title%/10s:Omnia.9 Internal RD							

Stereo Generator	RDS	Station ID	Program Type	Flags	Alternative Frequencies	TCP Link Status	Display Settings
RDS/RBDS Mode: RBDS (USA) Dynamic PTY Enable PTYN							
PTY Code: None PTYN:							

Stereo Generator	RDS	Station ID	Program Type	Flags	Alternative Frequencies	TCP Link Status	Display Settings
RadioText Traffic Program Music							
Time Code Traffic Announcement Artificial Head							
Compressed TA Time-out: 5 minutes							
Stereo							

Stereo Generator	RDS	Station ID	Program Type	Flags	Alternative Frequencies	TCP Link Status	Display Settings
A AF 0: Off AF 5: Off AF 10: Off AF 15: Off AF 20: Off							
AF 1: Off AF 6: Off AF 11: Off AF 16: Off AF 21: Off							
AF 2: Off AF 7: Off AF 12: Off AF 17: Off AF 22: Off							
B AF 3: Off AF 8: Off AF 13: Off AF 18: Off AF 23: Off							
AF 4: Off AF 9: Off AF 14: Off AF 19: Off AF 24: Off							

Figure 3.2.59: UECP Tab for External RDS



Client Audio Feature. The Client Audio Patch Point menu allows streaming audio from the audio processor in the transmitter to a remote PC or laptop on the same network for monitoring purposes. Users can select the output audio device, turn client audio on or off, adjust volume, enable sample rate conversion for smoother playback, and buffer incoming audio to manage network bandwidth. The client audio feature also includes a patch point menu to select the specific audio to monitor. This setup requires sufficient network bandwidth and a robust connection for optimal performance.

Click the **Client Audio -> Client Audio Output -> Patch Point** buttons to view the screen in [Figure 3.2.60](#).

Figure 3.2.60: Client Audio -> Patch Point Menu



From the menu, you can enable a 'conference monitor' feature that allows you to play audio on a selected patch point.

To enable, click the 'power' button.

You can select the desired station (e.g., Primary, HD2, etc.), select the audio at various points of the processor (Source, HD Output, MPX Output, Client Mic Input), and play it on the speakers of the device running NfRemote. Use the Default Device drop-down to select the monitor. Use the Client Volume adjustment to change the audio volume.

There are various other features of this menu that are not described in this manual.

NOTE: You can also refer to the *Telos Help* page for details on any Omnia for Nautel interface function:

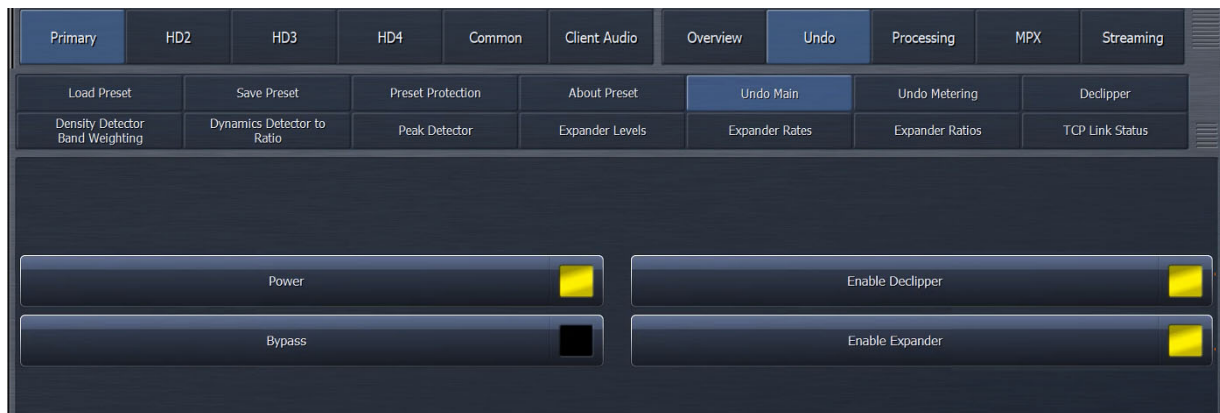
<https://docs.telosalliance.com/docs/omnia-enterprise-9s-user-manual-v33110>

Undo Feature. The Undo feature allows removal of any previous audio processing, if detected. This may allow for more pristine audio before applying further processing.

Each channel in a given Omnia for Nautel installation has one instance of Undo that can be applied to its input audio source. The output of the Undo process is common to all processed output paths (FM, HD, and Streaming) in that channel.

Enable the Undo feature by clicking the **Undo** button for the desired channel (Primary, HD2, etc.), then clicking the **Undo Main** button. The screen in [Figure 3.2.61](#) will appear.

Figure 3.2.61: Undo Feature screen



The **Power** button is the main on/off control for Undo. Turning the power off completely removes both the declipper and multiband expanders from the input audio path and eliminates the option to display any of the multiband expander meters in the user interface or observe the effects of Undo using the oscilloscope. Turning the power off lessens overall CPU usage and reduces latency.

The **Bypass** button simultaneously turns off both the declipper and multiband expander, but the input audio is still routed through the Undo circuit. In contrast to the **Power** button, overall CPU usage and latency are not reduced, and the activity of the multiband expanders - if they were enabled - can still be viewed in the user interface.

The declipper can be independently enabled and disabled with the **Enable Declipper** button.

Likewise, the multiband expanders can be independently enabled and disabled with the **Enable Expander** button.

NOTE: *If it is necessary to use the Undo Power button while on the air, be advised that the change in latency will have an audible effect. Turning Undo off will cause the audio to skip ahead slightly, resulting in an audible "jump", while turning Undo on will introduce a short but audible gap. Using the Undo Bypass button avoids this and is recommended for instances that are currently on the air.*

See <https://docs.telosalliance.com/docs/understanding-undo> for more details.

Exciter TCXO

You can calibrate the internal clock reference to an external 10 MHz clock (e.g. GPS synchronized 10 MHz clock) or manually enter an offset value using the remote AUI.

NOTE: You can also adjust the exciter TCXO offset value and run a TCXO calibration from the controller UI (see [Exciter TCXO](#), on page 3.2.208).

NOTE: During calibration, the external 10 MHz clock should be connected to the EXT 10 MHz IN (A1J4B) BNC connector on the rear of the transmitter or to the 10 MHz IN (W2J1) BNC connector on the rear of the optional exciter.

To view the AUI's Exciter TCXO screen (see [Figure 3.2.62](#)), select **Exciter TCXO** from the Settings menu.

Figure 3.2.62: Settings - Exciter TCXO Calibration

Exciter TCXO		
HD Exciter A (Active) HD Exciter B		
10 MHz Int-Ext Offset	1.000	ppm
TCXO Offset Value	Value Not Set	ppm

Start Save

Once this external 10 MHz clock reference is connected, the 10 MHz Int-Ext Offset field will display the difference between the internal and external frequencies (in ppm). Users can press the Start button to automatically calibrate the internal TCXO to the external reference source; equally, they can manually enter the measured internal-external offset value into the TCXO Offset Value field and press Save.

If no external high precision 10 MHz clock reference is connected, but the actual transmitter carrier frequency is being measured with a calibrated external frequency counter, operators can manually offset the internal TCXO by entering the appropriate ppm difference in the TCXO Offset field. For example, if the frequency of the transmitter is 1 ppm too high, then a positive 1 ppm should be entered in the TCXO Offset Value field in order to compensate. Similarly, if the transmitter frequency is too low, enter a negative ppm value. After an adjustment is made, press Start.

To calibrate another exciter, switch to that exciter and repeat the calibration.

External 10 MHz

You can configure the GV2-5/GV2-3.5 to accept an external 10 MHz input using the AUI or using the controller UI (see [External 10 MHz Input, on page 3.2.192](#)).

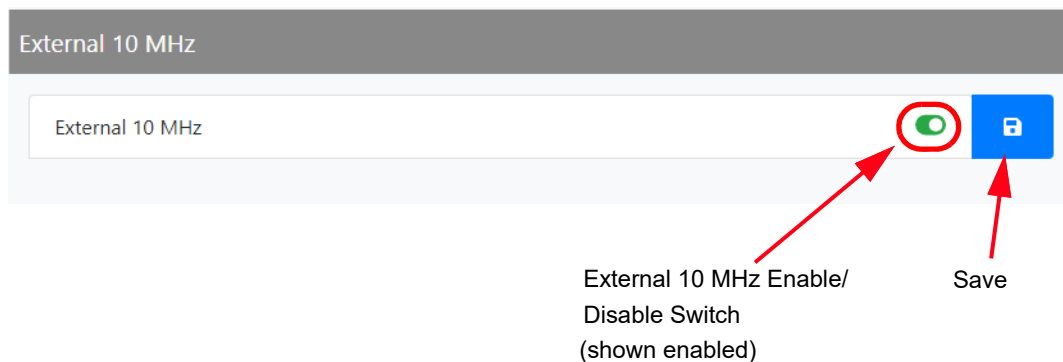
NOTE: You can also adjust the exciter TCXO offset value and run a TCXO calibration from the controller UI (see [Exciter TCXO, on page 3.2.208](#)).

This setting allows the user to mask the associated 10 MHz alarm from appearing in the Event History page if it is not being used. If an external 10 MHz source is being used, an alarm will be activated on the Event History page should the external signal be lost.

NOTE: The exciter will automatically use an external 10 MHz reference signal if connected, no matter the state of this parameter.

To enable the External 10 MHz input on the AUI's **External 10 MHz** page (see [Figure 3.2.63](#)), slide the External 10 MHz Enable/Disable switch to the right and click Save.

Figure 3.2.63: Settings - External 10 MHz

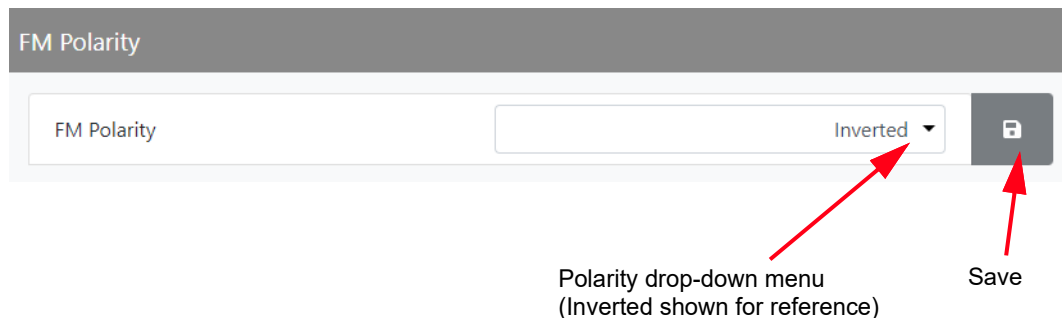


NOTE: Nautel recommends using the internal 10 MHz source for Air Chain operation. Refer to the 'Planning Program Inputs' chapter of the Pre-Installation Manual for more information.

FM Polarity

The FM Polarity page (see [Figure 3.2.64](#)) allows the user to invert the polarity of the frequency modulation (i.e., positive going modulation signal yields positive deviation; or positive going modulation yields negative deviation). Options are Normal or Inverted. Select from the drop-down menu and click the Save button to enable the changes.

Figure 3.2.64: Settings - FM Polarity



NOTE: *FM Polarity does not apply for Air Chain operation.*

Hardware Configuration

The Hardware Configuration page allows the user to configure the transmitter for any installed hardware that has optional variations (e.g., quantity of exciters or LVPS modules, fan speed) or is non-standard (e.g., UPS or audio processor). See [Figure 3.2.65](#).

NOTE: These settings are established at the factory based on the configuration that existed at time of shipping. Changes to these setting are only necessary if hardware is added or removed by the user.

Figure 3.2.65: Settings - Hardware Configuration

Hardware Configuration				
Exciter Changeover	Main Exciter: A	Auto Changeover: Disabled	Delay: 1 s	
Installed Exciter(s)	Dual (A/B)			
LVPS Hardware	Single LVPS: 1A			
LVPS Voltage	40	V		
Fan Speed	100	%		
UPS Installed				
Audio Processor	Orban Inside			

Save

This menu has seven sub-menu options:

- ❖ [Exciter Changeover](#) - see page 3.2.94
- ❖ [Installed Exciter\(s\)](#) - see page 3.2.94
- ❖ [LVPS Hardware](#) - see page 3.2.94
- ❖ [LVPS Voltage](#) - see page 3.2.94
- ❖ [Fan Speed](#) - see page 3.2.95
- ❖ [UPS Installed](#) - see page 3.2.95
- ❖ [Audio Processor](#) - see page 3.2.95

Exciter Changeover

When dual exciters are installed and configured, the user can set the changeover parameters. The parameters are:

- Main Exciter (A or B)
- Auto Changeover (enabled or disabled)
- Delay (in seconds)

Installed Exciter(s)

You can configure the transmitter for the number of installed exciters. If you have upgraded your transmitter to dual exciters, you may have already been prompted to change this configuration. Use the drop-down menu to select the appropriate exciter configuration - Exciter (A) or Dual Exciter (A/B). Press the Save button to save the change.

LVPS Hardware

You can configure the transmitter for the number of installed LVPS modules. If you have upgraded your transmitter to dual LVPS modules, you may have already been prompted to change this configuration.

Use the drop-down menu to select the appropriate LVPS configuration - **Single LVPS: A** or **Dual LVPS: A/B**. Press the Save button to save the change.

LVPS Voltage

You can set the default LVPS voltage. The user can set the LVPS voltage to any value between 40 and 53 V, in 0.01 V steps) during normal operation. Under fault conditions, if the LVPS voltage requires an increase, the control system automatically increases the LVPS voltage, then decreases it back to the set value when the fault condition clears. This setting should not require adjustment.

Use the up and down buttons to select a voltage between 40 and 53 V (in 0.01 V steps). The default setting is 48 V. Press the Save button to save the change.

Fan Speed

The transmitter control function automatically adjusts fan speed to ensure adequate cooling based on all operating conditions. As a result this setting should not require adjustment. Increasing the fan speed will allow for cooler transmitter operation, but will also decrease efficiency and increase acoustic noise levels.

You can set the default speed of the transmitter's cooling fans. Under fault conditions, the control system determines if an increase or decrease in fan speed is required and automatically adjusts the fan speed.

Use the up and down buttons to select a value between 63 and 100%. The default setting is 100%, which corresponds to approximately 48 V for the related fan voltage. Press the Save button to save the change.

CAUTION! *Reducing Fan Speed will increase operating temperatures for critical components, reducing life expectancy.*

NOTE: *A 20% reduction in fan speed can yield up to 5 dB improvement in acoustic noise from the transmitter, as well as decrease power consumption (i.e., utility costs) and extend the operating life of the cooling fans.*

UPS Installed

You can configure the transmitter for the installation of the UPS interface kit, which allows operation with an external, user-provided UPS. If you have upgraded your transmitter with the UPS interface, you may have already been prompted to change this configuration.

Slide the toggle switch to the right (will turn green) to enable the UPS. Press the Save button to save the change.

Audio Processor

If an Orban Audio Processor is installed, the transmitter must be configured to recognize it.

NOTE: *Configuring the Orban audio processor locally will cause the AUI to display an Orban Inside setting. The same occurs on the controller UI when configuring via the AUI.*

Use the drop-down menu to select the appropriate configuration - None or Orban Inside. Press the Save button to save the change. Reboot the transmitter by switching the ac power off and then on. This will ensure the transmitter properly detects the Orban Inside card upon recovery.

NOTE: *The Orban Inside card is an option for non-Air Chain configured exciters only. Transmitters with Air Chain configured exciters rely on audio processor software, called Omnia for Nautel (see [Omnia for Nautel Audio Processor](#), on page 3.2.67).*

HD/DRM

NOTE: *If HD/DRM is not enabled, it will be greyed out in the Settings menu.*

The HD/DRM Settings page allows the user to configure the transmitter for HD operation. The HD/DRM Settings page is divided up into three sub-sections, which are:

- Exgine Settings (see [Exgine Settings](#))
- HD Settings (see [HD Settings on page 3.2.98](#))
- Spectrum Efficiency Optimizer (see [Spectrum Efficiency Optimizer on page 3.2.100](#))

Exgine Settings

The **Exgine Settings** page allows users to configure the Exgine for HD operation. See [Figure 3.2.66 on page 3.2.97](#). Configure the Exgine Settings as follows:

NOTE: *The Exgine Settings tab is not displayed if you have an Air Chain enabled exciter. See [vExgine on page 3.2.138](#) for vExgine settings.*

1. Enable Digital Carriers by sliding the Icon to the right (turns green) and click Save.
2. Select the protocol to be used from the drop-down menu, either UDP or TCP and click the Save. Match this setting to the Exporter configuration.
3. Enter the Exgine IP address and click Save. If no Gateway is used or assigned, enter 0.0.0.0
4. Enter the Exporter IP address and click Save. This is the address of the interface where the data stream is originating. It is used to filter E2X traffic in case multiple Exporters are used in broadcast mode on a single LAN. 0.0.0.0 is also a valid configuration.
5. Enter the Netmask IP address and click Save.
6. Enter the Gateway IP address and click Save.
7. Enter the E2X Port address and click Save. The Exgine expects E2X on port 9000, some non-Nautel users utilize port 11000.
8. Mac Address - displays a number that serves as a unique network adapter identifier. This is set by the manufacturer and is displayed for informational purposes only. It may be necessary to use this number to allow the AUI to access your network.

Figure 3.2.66: Settings - HD/DRM - Engine Settings

HD/DRM

Engine SettingsHD SettingsSpectrum Efficiency Optimizer

HD Exciter A

Digital Carriers	☒	
Protocol	UDP	
Engine IP	10.10.10.100	
Exporter IP	10.10.10.101	
Netmask	255.255.255.0	
Gateway	10.10.10.254	
E2X Port	9000	
MAC Address	40:D8:55:01:93:80	

NOTE: Engine Settings tab not displayed if you have an Air Chain enabled exciter.

HD Settings

The HD Settings page allows users to establish Forward Tap Delay, FM+HD Low Inj Gain, FM+HD High Inj Gain and HD Gain levels. It also allows for an HD Power Calibration. Changes applied to the active exciter (A or B) only. To calibrate the other exciter, switch to the other exciter and repeat the change. See [Figure 3.2.67 on page 3.2.99](#).

Configure the HD Settings as follows:

- **Forward Tap Delay** - Displays the time delay (in unit taps) between the forward path signal from the exciter and the reverse path signal into the exciter, fed back from the output of the transmitter. This value is factory set (to synchronize the phase of the forward and reverse signals so that pre-correction can operate properly) and should not require any adjustment in the field. Select the number using the arrow keys and press the Save button.
- **Auto-Find Gain** - Press the Start button to automatically find the optimized gain while the transmitter is RF On and in the applicable preset mode/injection level. Press the Start button to initiate. Run **Auto-Find Gain** any time you are setting up an HD-related preset (i.e., changing injection level, etc.).
- **FM+HD Low Inj Gain** - Applicable for FM+HD mode only (at -20 dBc to -15.1 dBc injection levels) and represents the starting/default gain applied to the forward path signal within the exciter at initial turn on/ramp-up. Select the gain using the arrow keys and press the Save button.
- **FM+HD High Inj Gain** - Applicable for FM+HD mode only (at -15 dBc to -10 dBc injection level) and represents the starting/default gain applied to the forward path signal within the exciter at initial turn on/ramp-up. Select the gain using the arrow keys and press the Save button.
- **HD Gain** - Applicable for HD mode only and represents the starting/default gain applied to the forward path signal within the exciter at initial turn on/ramp-up. Select the gain using the arrow keys and press the Save button.
- **HD Power Calibration** - This calibration occurs at the factory and should not require any adjustment in the field. This calibration is performed in FM mode. Press the Save button to initiate.

Figure 3.2.67: Settings - HD/DRM - HD Settings

HD/DRM

Engine SettingsHD SettingsSpectrum Efficiency Optimizer

HD Exciter A

Forward Tap Delay125

Auto-Find Gain

Start

FM+HD Low Inj Gain0.2427

FM+HD High Inj Gain0.5091

HD Gain1.4145

HD Power Calibration4.106014

Start

Spectrum Efficiency Optimizer

The Spectrum Efficiency Optimizer page allows the user to optimize the transmitter's spectrum and/or efficiency. See [Figure 3.2.68](#). To optimize the HD operation, adjust the following parameters:

NOTE: The Spectrum Efficiency Optimizer page is displayed when Air Chain operation is enabled, but the spectrum efficiency optimizer function is disabled.

- **Optimization Enabled** - Slide the icon to the right and click Save. Enabling allows the optimizer to adjust the PA voltage setting to maximize efficiency based on the transmitter output spectrum. Depending on other settings in this section, it may require other actions to maintain the transmitter's compliance.
- **Desired Mask Delta** - Set the desired clearance (between -10 dB and 0 dB) from the spectral mask and click the Save button. The default setting is -1 dB, which will maintain a 1 dB clearance from the mask for maximum efficiency. This setting will not cause any reduction in output power.
- **Required Mask Delta** - Sets the value (between -10 db and 10 dB) that is considered to be absolutely required. Click the Save button. If this level is exceeded, the digital power from the transmitter will be reduced if the PA voltage is at maximum. If the spectral mask still cannot be met and the setting for it is enabled, the transmitter power set-point will be reduced.
- **Reduce Digital Power If Required**: Slide the icon to the right and click Save. Enabling allows a reduction in injection level (digital power) if the spectrum mask requires it.
- **Reduce Power Set-Point If Required**: Slide the icon to the right and click Save. Enabling allows a reduction in the transmitter power set-point if the spectrum mask requires it.

Figure 3.2.68: Settings - HD/DRM - Spectrum Efficiency Optimizer

HD/DRM		
Engine Settings HD Settings Spectrum Efficiency Optimizer		
Optimization Enabled	☒	
Desired Mask Delta	-1 db	
Required Mask Delta	0 db	
Reduce Digital Power If Required	☒	
Reduce Power Set-Point If Required	☐	

Network

CAUTION!

When connecting to a Nautel transmitter, note that both HTTP and HTTPS protocols are supported. If using HTTP, the data traffic is not encrypted, meaning your username/password could be compromised. For security reasons, Nautel recommends using HTTPS whenever possible.

You can configure network settings using the remote AUI (see [Figure 3.2.69](#)). If you change a network setting on the controller UI, it will also be reflected on the remote AUI, and vice versa.

NOTE: *Nautel recommends that network settings be entered/vetted by a qualified Network Administrator. If parameters are changed and the AUI is reset, record the new values (or see the local controller UI) to ensure you can log in after changes are made.*

Figure 3.2.69: Settings - Network

Network	
General	
Mac Address	70:B3:D5:87:C2:FB
DHCP	☒
IP Address*	192.168.0.99
Subnet Mask*	255.255.255.0
Gateway*	192.168.0.1
Status	Running
DNS Servers	
DNS 1*	24.222.0.94
DNS 2*	24.222.0.95

Cancel Save

All IP addresses shown are for reference purposes only

Determining DHCP Setting

One of the main decisions in configuring the network connection on your GV2-5/GV2-3.5 transmitter is whether you set DHCP to **ON** or **OFF**. If you are connecting to a network, consult with a network administrator before connecting the transmitter to your network to determine whether to enable (turn **ON**) or disable (turn **OFF**) the DHCP setting.

NOTE: *DHCP can only be set from on/off from the controller front panel UI.*

When DHCP is set to **ON** (default from factory), IP addresses are assigned automatically by the network server. In order for this feature to function properly, you must have a network-viewable DHCP server on your network.

If a DHCP server is not present, you (or your network administrator) must provide static addresses for IP, netmask, gateway and nameservers (gateway and nameservers are optional). You must enter them manually using the transmitter's controller front panel. In this case, DHCP should be set to **OFF**.

NOTE: *A nameserver: (also called a DNS) translates a host name (e.g., mail.nautel.com) to an IP address such as in configuring email (see [Network on page 3.2.101](#) and [Email Server on page 3.2.105](#)).*

Network Setup - Using the AUI

NOTE: *The following settings should be entered/vetted by a qualified Network Administrator.*

By entering the GV2-5/GV2-3.5's established IP address into an Internet browser's address bar, and then logging into the AUI, you can view and edit the network parameters (see [Figure 3.2.69 on page 3.2.101](#)). You must have remote control enabled to edit network settings using the remote AUI. The **MAC Address** and **Status** fields are read-only; they cannot be edited. You must disable DHCP (as shown in [Figure 3.2.69 on page 3.2.101](#)) to be able to edit the **IP Address**, **Subnet Mask** and **Gateway** fields. If DHCP is enabled, these fields will be assigned automatically. The **DNS1** and **DNS2** nameserver fields can be edited regardless of the DHCP setting.

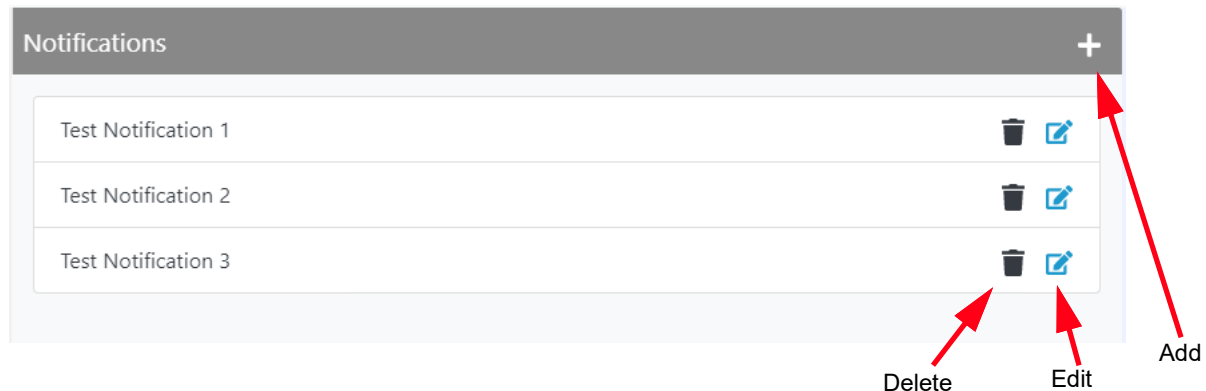
The **Status** field identifies the status of the network.

- ❖ **RUNNING:** transmitter is connected to a network and is functioning properly.
- ❖ **NOT RUNNING:** transmitter is not connected or is not functioning properly. When in this state, remote AUI access is not possible.

Notifications

The **Notifications** feature (see [Figure 3.2.70](#)) provides a means for the transmitter to issue emails or texts (SMS messages) triggered by user defined alarm events. If you use this feature, you must also configure an email (see [Email Server on page 3.2.105](#)).

Figure 3.2.70: Settings - Notifications



To configure the notifications feature, perform the following steps:

1. Pre-existing notifications are displayed in the Notifications list (e.g., "Audio Loss"). Click **Add** to create a new item for notification, click **Edit** (after highlighting an existing item) to edit an existing item or click **Delete** to erase an item.
2. When you click **Add** or **Edit**, the screen in [Figure 3.2.71 on page 3.2.104](#) will appear. This screen allows you to add or edit a **Notification Name**, **Recipient Email(s)** (use a semi-colon to separate multiple email addresses, as applicable), and define the alarm list by **Device** type. Add or remove alarms by moving them (using the > and < arrow buttons) from the Available Alarms list to the Selected Alarms list. An email is issued when any alarm in the Selected Alarms list is active.

Text (SMS) Messaging: In the **Recipient Email** field, you can enter a standard email address to initiate an email or you can enter a mobile phone number and SMS gateway to initiate a text (SMS message). The email-to-SMS text format is mobilenumber@ mobile_gateway (e.g., 5551234567@txt.bell.ca). Check with your mobile carrier to determine the proper gateway address for your area.

3. When complete click the **Send Test Notification** button to send a test email to the associated email address. Click **Save** to accept changes or the **Cancel** button to discard changes and return to the **Notifications** page.

Figure 3.2.71: Notifications/Email Server Configuration Page

Notifications

External Interlock

Email Server Configuration

General

Host*	smtp.gmail.com
Port*	465
Transmitter Name*	VS300
Sender Email*	
Authentication	☒
Username*	
Password*	

Show Password ☐

Cancel

Save

Send Test Email

Recipient

Enter Email

Send Test Email

Authentication enabled for reference purposes only

All IP addresses shown are for reference purposes only

Email Server

Email Server (see [Figure 3.2.71 on page 3.2.104](#)) allows you to configure email parameters (e.g., email server and port number), and is required if the notification feature is used.

NOTE: *Nautel recommends that the following settings be entered/vetted by a qualified Network Administrator.*

From the Notifications menu, the Email Server fields must be completed to configure the email feature. Perform the following steps (see [Figure 3.2.71 on page 3.2.104](#)):

Enter the following five parameter fields:

- ❖ **Host:** In order to enter a server name (e.g., mail.nautel.com), at least one nameserver IP address must be entered.
- ❖ **Port Number:** This logical connection end point uses a number to identify the type of process to which an internet or other network message is to be forwarded to when it arrives at a server. Typically, this is set to 25 for unencrypted SMTP systems and 843 for encrypted email.
- ❖ **Transmitter Name:** Set to a name that associates to the transmitter such as station identification (e.g., VS_WXYZ). This name will be included in notification emails.
- ❖ **Sender Email Address:** Enter as a standard email address (e.g., a@b.com). This will be the sender address that notification email recipients will see. Free web based email service accounts (Gmail, Hotmail, Yahoo mail etc.) are acceptable here.
- ❖ **Authentication:** If your email server requires authentication to send emails, click the check box and enter the appropriate **Username** and **Password** to allow this. If the check box is not selected, the **Username** and **Password** fields do not appear.

NOTE: *The transmitter will automatically handle encryption if the associated mail server requires it.*

When complete click **Save** to store these settings. Enter a recipient email address in the Send Test Email section and click the **Send Test Email** button to test your settings. Click the **Save** button to run the test or the **Cancel** button to return to the **Notifications** page.

Reboot Options

The Reboot Options page allows users to select the reboot various devices throughout the transmitter. See [Figure 3.2.72](#).

There are three reboot options to choose from:

- ❖ Reboot Host (SBC)
- ❖ Reboot Active Exciter
- ❖ Reboot Standby Exciter

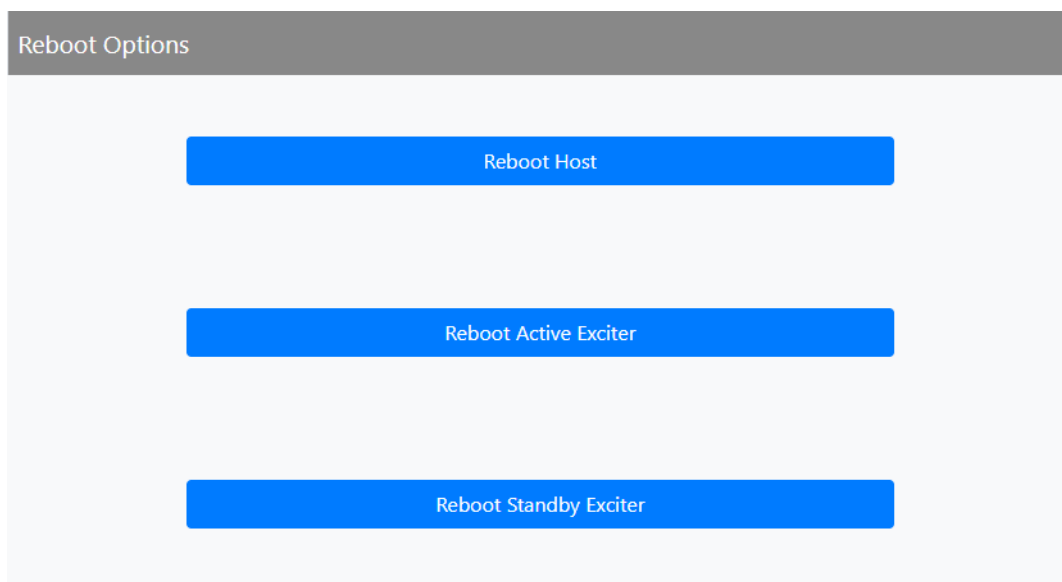
Click the desired option to initiate a reboot of that device.

A Reboot Host allows the user to force a host (SBC) reset to the AUI.

Rebooting the Active Exciter will cause a brief interruption in transmitter operation. Rebooting the Standby Exciter is only applicable for dual exciter systems.

NOTE: For a Host Reset, all users that are remotely connected (logged in) will be disconnected (logged out).

Figure 3.2.72: Settings - Reboot Options



Screen Configuration (Local AUI only)

The Screen Configuration page allows users to enable a Screen Saver for the front panel display and perform a touchscreen calibration.

Refer to [Non-Standard Maintenance - see page 3.4.1](#) for detailed information on these features.

Security Certificates

The AUI supports HTTPS connections and to take advantage of this, the user must either use a free or purchased Security Certificate.

Security uses public and private keys to ensure that the site is verified that is what it purports to be and therefore safe.

For most users there is no need to add a Security Certificate, as the connection to the transmitter is controlled by the customer's network architecture, however, it is available for organizations that wish to take extra precautions.

Security Certificates are uploaded to the transmitter via the Settings > Security Certificates menu.

Purchased certificates are provided by Certificate Authorities:

https://en.wikipedia.org/wiki/Certificate_authority

Click the Browse button to search for the certificate and press Upload to activate. See [Figure 3.2.73](#).

Figure 3.2.73: Settings - Security Certificates

Certificates

Select certificate file(s), may be two separated certificate and private key or one combined file. To select multiple files in the upload dialog, click on one of the files then hold the <CTRL> while selecting the other, then click <Open>.

SNMP

The **SNMP** configuration page provides a user with a means to configure the **SNMP** agent and the associated traps (see [Figure 3.2.74](#)).

Figure 3.2.74: Settings - SNMP

The image shows a web-based configuration interface for SNMP. The title bar at the top is labeled "SNMP". Below it, the "General" tab is selected. The "SNMP Version" is set to "v2C". The "Agent Port*" is set to "161". There are two sections for community strings: "Read Community String" and "Write Community String". Each section has a text input field for "New String", a confirmation field "New String (Confirm)", and a "Show String" checkbox. Below each section is an "Add" button and a password strength indicator. The "Enable Traps" toggle is turned on. The "Available Trap Settings" section shows "SNMP Trap Settings" with a dropdown arrow and "No SNMP Trap Settings". The "Selected Trap Settings" section shows "SNMP Trap Settings" with a dropdown arrow and "TRAP to 127.0.0.1:162". Between the two sections are icons for adding, removing, and editing settings. At the bottom, a message states "Traps enabled for reference purposes only". There are "Cancel" and "Save" buttons at the bottom right.

SNMP

General

SNMP Version v2C

Agent Port* 161

Read Community String

New String

New String (Confirm)

Show String ☐

Add

Write Community String

New String

New String (Confirm)

Show String ☐

Add

Enable Traps ☒

Available Trap Settings

SNMP Trap Settings

No SNMP Trap Settings

Selected Trap Settings

SNMP Trap Settings

TRAP to 127.0.0.1:162

Traps enabled for reference purposes only

Cancel Save

Configure the **SNMP** agent as follows:

1. Enter the first five fields, noting the following:
 - ❖ **Agent Port:** Enter the UDP port where the SNMP agent checks for requests. The default setting is 161. If your transmitter is behind a firewall, you must open this port to use SNMP.
 - ❖ **Read Community String:** Enter the password for the SNMP client application to allow acquisition of channel values. Provide confirmation of this password by re-entering it in the **Confirm** field.
 - ❖ **Write Community String:** Enter the password for the SNMP client application to allow changing of channel values. Provide confirmation of this password by re-entering it in the **Confirm** field.
2. Select **Enable Traps** to allow the SNMP agent to send trap notifications, and to display two additional fields associated with traps. Enter the two additional fields as follows:
 - ❖ **Trap Receiver IP:** Enter the IP address of the computer to which the SNMP agent will send trap notifications. The computer must be running an SNMP application that is configured to receive traps. The SNMP agent will send trap notifications to only one recipient.
 - ❖ **Trap Receiver Port:** Enter the UDP port where the SNMP agent will send traps. The default setting is 162.
3. When complete press **Save** or press the **Cancel** to restore the previous settings.

NOTE: Check the *Read Community* and *Write Community* passwords after a software upgrade. Some upgrades will clear passwords and require them to be reset.

Spectrum Mask

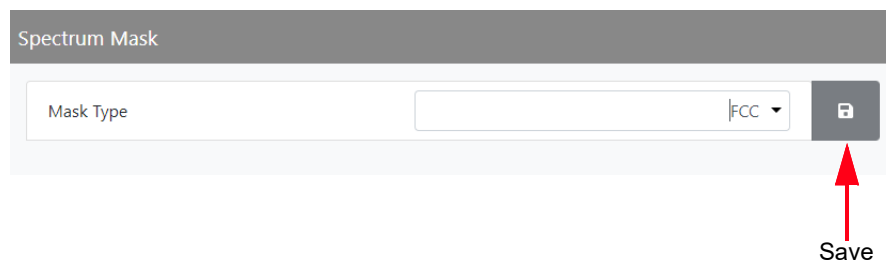
The **Spectrum Mask** page allows users to select the appropriate FM mask standard being used by the Dashboard spectrum analyzer. See [Figure 3.2.75](#). Use the Mask Type drop-down menu to select the desired mask (factory setting is FCC). Press the Save button to enable the mask.

There are three mask options to choose from:

- ❖ FCC
- ❖ ETSI
- ❖ None

NOTE: *Selecting the spectrum mask standard applies only to FM mode of operation. For other modes of operation (e.g., FM+HD, HD, DRM), the spectrum mask is automatically applied.*

Figure 3.2.75: Settings - Spectrum Mask

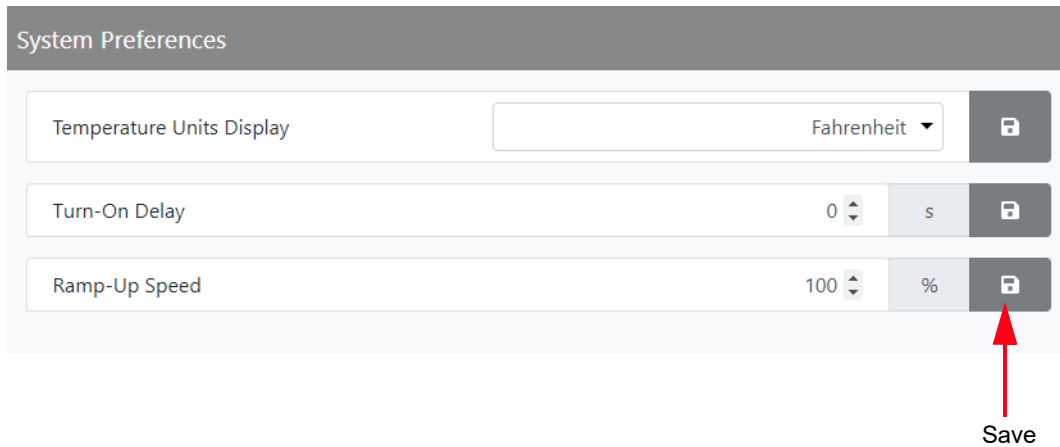


System Preferences

The System Preferences page allows the user to display the Temperature units in either Celsius or Fahrenheit. See [Figure 3.2.76](#).

Select from the drop-down menu and click the Save icon to save the changes.

Figure 3.2.76: Settings - System Preferences



The screenshot displays the 'System Preferences' interface. It features a title bar at the top. Below it, there are three rows of settings. The first row is 'Temperature Units Display' with a dropdown menu currently showing 'Fahrenheit' and a Save icon. The second row is 'Turn-On Delay' with a numeric input set to '0', a unit selector set to 's', and a Save icon. The third row is 'Ramp-Up Speed' with a numeric input set to '100', a unit selector set to '%', and a Save icon. A red arrow points to the Save icon for the Ramp-Up Speed setting, and the word 'Save' is written below the arrow.

NOTE: Temperature units selection (e.g. Celsius or Fahrenheit) will be the same for all login sessions or multiple users. If the units are changed in one login session, they will be changed for all open sessions and all users.

Thresholds

You can set thresholds for the main audio and SCA sources (trip level and timeout) using the remote AUI. These thresholds determine the limit for an associated low audio power alarm to be activated.

If you change a setting on the remote AUI, it will also change on the controller front panel UI, and vice versa.

Audio Low Thresholds

The AUI's **Audio Low Thresholds** page (see [Figure 3.2.77](#)) displays a screen that allows for setting of the low trip level and timeout delay for the main audio and SCA audio low thresholds.

If the applicable audio source (main or SCA) level falls below the **Trip Level** setting (default is -22.5 dB) for longer than the **Timeout** setting (default is 20 s), an alarm will activate in the Alarms page.

When the audio source level increases above the **Trip Level**, the alarm will clear. To disable the low audio alarm, set the associated **Trip Level** to -100 dB. Press **Save** button to save the change.

Use the up and down arrows to change the **Trip Level** or **Timeout** and click the **Save** button.

Figure 3.2.77: Settings - Thresholds - Audio Low

Thresholds			
Audio Low Low Forward Power			
Main Audio Low Timeout	23	s	Save
Main Audio Low Trip Level	-21	dB	Save
SCA Audio Low Timeout	20	s	Save
SCA Audio Low Trip Level	-22.5	dB	Save

Low Forward Power Thresholds

Use the up and down buttons to move the cursor to the desired line item and click the Save icon to save the changes. Select a threshold between 0 and 100% (in 0.5% increments), that corresponds to a percentage of rated power. See [Figure 3.2.78](#).

The default setting for Low Forward Power is 50% (equivalent to 3 dB power reduction).

The default setting for Very Low Forward Power is 12.5% (equivalent to 9 dB power reduction).

Figure 3.2.78: Settings - Thresholds - Low Forward Power

Thresholds

Audio Low

Low Forward Power

Low Forward Power	50	%	
Very Low Forward Power	12.5	%	

Time

The GV2-5/GV2-3.5's internal clock uses a backup battery, and therefore maintains an accurate date and time, even during power outages.

For non-Air Chain transmitters, the date and time needs to be set when the transmitter is first installed, or after a power outage if the backup battery has failed.

If the NTP feature is enabled (see [Figure 3.2.79](#)), the clock will set automatically and cannot be manually adjusted. Transmitters operating with Air Chain are configured with the NTP server enabled; only the time zone setting is required.

NOTE: Enabling the NTP server is mandatory for Air Chain operation. It may be set during factory testing.

If necessary, you can set the date and time using the remote AUI (see [Setting the Clock - Using the AUI](#)). If you change the clock setting on the controller front panel UI, it will also be reflected on the remote AUI, and vice versa.

Setting the Clock - Using the AUI

You can remotely set the GV2-5/GV2-3.5's time and date by selecting **Time** from the **Settings** menu. See [Figure 3.2.79](#)).

Figure 3.2.79: Settings - Time

Time

NTP

NTP Enable/Disable Switch (shown enabled) ☒

NTP Server* ntp.ubuntu.com

Time Settings

UTC ☐

Current Timezone America/Halifax

Country* Canada

Timezone* America/Halifax Atlantic - NS (most areas); F

Cancel Save

The **Time** option allows users to set the exact time and date information as well as regional and timezone settings for a transmitter location.

Procedure to set up the time and date:

1. Select the **Time** option from the **Settings** page.
2. Enter the following location parameters:
 - ❖ **Country** - select the appropriate country from the drop-down menu.
 - ❖ **Timezone** - select the appropriate timezone based on **Country** selection.
3. Enter **Time** and **Date** parameters and press **Save**. Press **Cancel** to discard changes. Please note that **Time** and **Date** cannot be set via this menu if NTP is enabled (see [Figure 3.2.79 on page 3.2.114](#)).
 - ❖ **Date** - select values from the calendar icon for **Day**, **Month**, and **Year**.
 - ❖ **Time** - select values from the clock icon for hours (24-hour clock) and minutes (up to 60). You can click **Now** to set the clock to the current time.

NOTE: *Changes cannot be made via this menu if NTP is enabled. Disable NTP, make the required changes in the Time menu, then re-enable NTP.*

NOTE: *Ensure the proper Timezone is selected to observe Daylight Savings time (DST).*

NTP Servers

You can configure an NTP (Network Time Protocol) server to allow clock synchronization with all computers on the same network as the transmitter.

NOTE: *The accuracy of the NTP synchronization is related to the distance to the server, therefore Nautel recommends you choose servers in the same country as the equipment. If this is not possible, attempt to connect to servers from the same continent.*

NOTE: *The NTP clock synchronization polling interval varies between 64 and 1024 seconds. To minimize network traffic, the interval will change depending on how much error is accumulated between polling events and will be increased if the remote NTP server becomes unreachable. The polling interval is also randomized slightly to avoid the situation where a large number of requests are always arriving at the NTP server at the same time.*

Enabling NTP

Enable the NTP function by moving the **NTP** toggle switch to the right (displays green). Disable by moving the **NTP** toggle switch to the left. When NTP is disabled, the Current Timezone fields (Country and Zone, as applicable) are also displayed (see [Setting the Clock - Using the AUI](#)). Click the **Save** button to activate any change.

Transmitter Info

NOTE: Nautel recommends adding a Transmitter Name and Serial Number to the Transmitter Info section. This will provide easy transmitter identification when using the remote AUI.

The **Transmitter Info** page allows the user with a means to name the transmitter as a simple identifier. See [Figure 3.2.80](#). Enter the information to be used as follows (Transmitter Name, Serial Number).

Click the Transmitter Name or Serial Number bar to enter a new name or serial number or edit a previous one and press the Save button to save the changes.

Figure 3.2.80: Settings - Transmitter Info

Transmitter Info	
Transmitter Model	GV2-10
MAC Address	BC:24:11:18:7A:13
Transmitter Unique ID (GUID)	
Transmitter Name/Call Sign	
Serial Number	

Save

Users

The **Users** menu (see [Figure 3.2.81](#)) allows a user with the proper permissions to create accounts to allow certain users to access and control features of the AUI, and receive notifications when critical-level or maintenance-level alarms occur. To view this menu, select **Users** from the **Settings** menu.

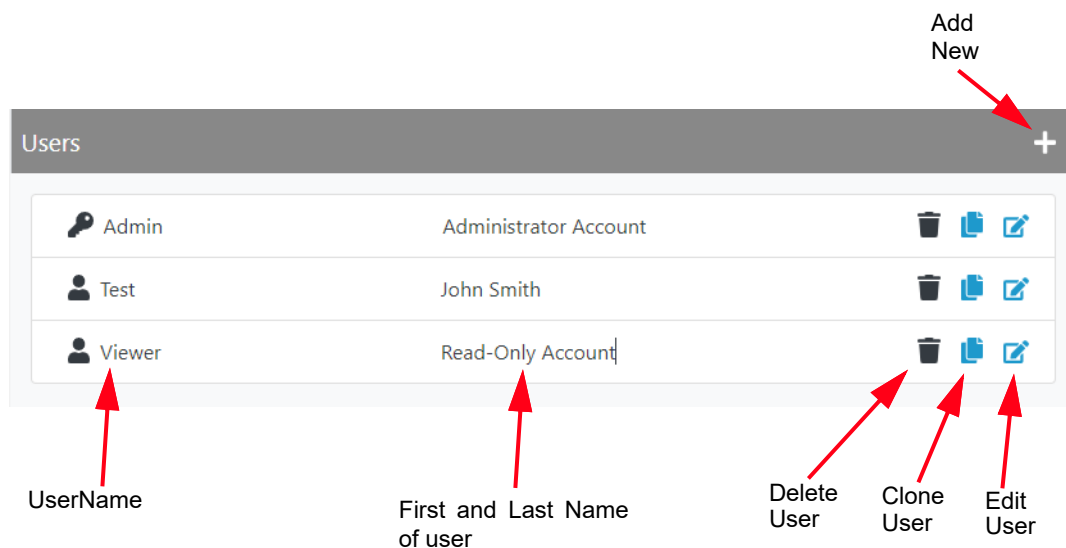
NOTE: Depending on the permission level assigned to a given user, some features shown in [Figure 3.2.82](#) on page 3.2.119 may not be displayed or available.

The GV2-5/GV2-3.5 contains two default user accounts when it leaves the factory. (Administrator and Viewer). See [AUI Pages on page 3.2.15](#)).

The Administrator default Username is "Admin" and password is "change_me". The Viewer default Username is "Viewer" and the password is blank (i.e., no password).

The Administrator account is able to perform all user functions, whereas the Viewer account only has visibility of the user functions.

Figure 3.2.81: Settings - Users



Setting Permissions

There are three user permissions, each with their own specific functionality. See [Figure 3.2.82 on page 3.2.119](#). All users have permission to change their own name, email, language and password, after their account has been created, but are otherwise limited to the following functions:

- **Edit Presets:** Pre-defined user type. Allows the user to modify presets and change active preset. No administrative functions.
- **RF Control:** Pre-defined user type. Allows the user to turn the RF output on and off. No administrative functions.
- **Administrator:** Pre-defined user type. Can perform all functions. Administrator is the only permission level that allows addition, deletion or editing of users.

Click **Save** to activate the changes.

Adding/Editing Account Information

If the Permission user role is **Administrator**, you have permissions to edit any user account. Other roles are limited.

Add an Account

To add a user account, click the + symbol in [Figure 3.2.81 on page 3.2.117](#). Enter the User Form (see [Figure 3.2.82 on page 3.2.119](#)) with user account information, including First Name, Last Name, Email, Language and Permissions. Click **Save** to accept. See also [Set or Change the Password on page 3.2.120](#).

Edit an Account

To edit an existing user account, click the Edit User icon of the desired user in the Users list (see [Figure 3.2.82 on page 3.2.119](#)). The User Form for that user will be displayed. You can edit the Name, Email, Language, Permissions and Password (see [Set or Change the Password on page 3.2.120](#)). Click **Save** to accept.

Figure 3.2.82: User Form Page

User

Information

User Name	Admin
First Name	Administrator
Last Name	Account
Email	
Language	English

Permissions

Edit Presets	
RF Control	
Administrator	

Change Password

Cancel

Save

Remote AUI

User

Information

User Name	Admin
First Name	Administrator
Last Name	Account
Email	
Language	English
Auto Login (Local AUI Only)	
Remote Auto Logout Enabled	

Permissions

Administrator	
Edit Presets	
RF Control	

Change Password

Cancel

Save

Local AUI

Auto Login enable/
disable toggle switch

Set or Change the Password

To set or change your password, click **Change Password** at the bottom, left of the User Form screen. A menu appears (see [Figure 3.2.83](#)) that prompts you to enter the old password (as applicable), new password and confirmation of the new password. Click the **OK** button to accept changes or the **Cancel** button to discard changes and exit this menu.

Figure 3.2.83: Changing Password



Delete an Account

To delete a user account, click the Delete User icon of the desired user in the Users list (see [Figure 3.2.81 on page 3.2.117](#)). Click **Continue** in the confirmation window to delete the user account or click **Close** to keep the user account and return to the Users list.

Auto Login

The local AUI has an Auto Login enable/disable toggle, which allows the AUI to automatically log in a specific user account when the local AUI (front panel touchscreen) starts up, bypassing the manual login screen. The Auto Login enable/disable toggle is only available via the local AUI. Only the currently logged-in user can enable Auto Login for their account and the user must have Administrator permissions.

Remote I/O

The Remote I/O page allows the user to configure the remote input/output interface for the transmitter. Refer also to the GV2-5/GV2-3.5 Installation Manual for information on remote inputs and outputs and their factory default settings.

- Digital Inputs (see [Digital Inputs](#))
- Digital Outputs (see [Digital Outputs on page 3.2.125](#))
- Analog Outputs (see [Remote I/O Settings on page 3.2.223](#))

Digital Inputs

Using the **Digital Inputs** page (see [Figure 3.2.84](#)), you can configure up to ten inputs that allow you to remotely control various operational characteristics of the transmitter. Unless otherwise noted, these inputs are only accepted by the transmitter if remote control has been enabled. That setting can only be made by a local user using the controller front panel UI's REMOTE button (its LED is green when remote is enabled). Nautel sets remote input defaults prior to shipping. See the Pre-Installation Manual for details.

Figure 3.2.84: Remote I/O - Digital Inputs Page

Digital Inputs					
#	Name	Channel	Control	Level	
1	Input 1	Controller: RF On/Off	Rising Edge, Activate	1	 Edit
2	Input 2	Controller: RF On/Off	Rising Edge, Deactivate	1	
3	Input 3	Preset: Preset 1	Rising Edge, Set	1	
4	Input 4	Unassigned	Unassigned	1	
5	Input 5	Inc/Dec RF Power	Rising Edge, Increase	1	
6	Input 6	Inc/Dec RF Power	Rising Edge, Decrease	1	
7	Input 7	Alarm Reset	Rising Edge, Reset	1	
8	Input 8	Force Host Reboot	Falling Edge, Reset	1	
9	Input 9	Controller: Main Exciter	Rising Edge, Set to A	1	
10	Input 10	Controller: Main Exciter	Falling Edge, Set to B	1	

The current settings for Input 1 through Input 10 are displayed, including the **Channel** and **Control** settings, as well as the current logic Level (1 or 0). You can edit **Channel** and **Control** settings by clicking the edit icon for the desired input. This displays the menu in [Figure 3.2.85 on page 3.2.122](#).

Figure 3.2.85: Input Editing Menu

Digital Input 1	
Channel	Controller: RF On/Off
Control	Rising Edge, Activate
Level	1
Cancel Save	

Select Input Channel

From the editing screen for remote input 1 through 10, you can configure the input for one of a variety of channel inputs. Click the Channel field's up/down arrows to display the following options:

- ❖ **Unassigned.** No effect on transmitter operation, regardless of logic level.
- ❖ **RF On/Off.** Same as pressing the **RF On** (telling the system to provide RF power, if possible) or the **RF Off** button on the FPUI. There are two inputs configured by default; one for **Falling Edge, Activate** and one for **Falling Edge, Deactivate**.
- ❖ **Preset 1 to 6:** Selects the associated preset as active.
- ❖ **Inc/Decr RF Power.** Activating these inputs will increment/decrement the current preset power level by 1% of the rated power. Holding the selection will increment/decrement the power level by 1% every 1/2 second. There are two inputs configured by default; one for **Falling Edge, Increase** and one for **Falling Edge, Decrease**. **NOTE:** If multiple power increase or decrease inputs are active, the lower number input takes precedence.
- ❖ **Alarm Reset.** Initiates an reset for latched alarms. Same as initiating an Alarms Reset from the controller front panel's main menu.
- ❖ **Force Host Reboot:** Allows the user to force a host (SBC) reset to the AUI, thus rebooting the AUI via a hardware parallel remote input (controlled by a third party remote control unit).
- ❖ **Main Exciter:** Selects the main exciter to operate the transmitter. There are two inputs configured by default; one for **Falling Edge, Set to A** and one for **Falling Edge, Set to B**.
- ❖ **Auto Changeover:** Sets the exciter changeover function to operate automatically. There is only one input configured by default; each subsequent activation of the input will toggle the state (enabled/disabled) e.g. **Falling Edge, Toggle**.

Click **Save** to activate changes. Click **Cancel** to cancel changes and return to the Remote Inputs screen. If you save a change to a remote input via the AUI, it will also be displayed on the controller front panel UI.

Configure Input Control Logic

From the editing screen for remote input 1 through 10, you can configure the input's active/inactive control logic. Click the Control field's up/down arrows to display the following options, noting the options differs for each Channel input:

Channel	Control Options	Description
Unassigned	Unassigned	No logic setting.
RF On/Off	Rising Edge, Activate	Logic '1' (high or rising edge) activates the input.
	Falling Edge, Activate	Logic '0' (low or trailing edge) activates the input.
	Rising Edge, Deactivate	Logic '1' (high or rising edge) de-activates the input.
	Falling Edge, Deactivate	Logic '0' (low or trailing edge) de-activates the input.
	Rising Edge, Toggle	Logic '1' (high or rising edge) activates the input; next logic '1' (high or rising edge) de-activates the input.
	Falling Edge, Toggle	Logic '0' (low or trailing edge) de-activates the input; next logic '0' (low or trailing edge) activates the input.
	Active High, Turn On. Active Low, Turn Off.	Logic '1' (high) causes an RF on. Logic '0' (low) causes an RF off.
	Active High, Turn Off. Active Low, Turn On.	Logic '1' (high) causes an RF off. Logic '0' (low) causes an RF on.
Preset 1-6	Rising Edge, Set	Logic '1' (high or rising edge) selects the preset.
	Falling Edge, Set	Logic '0' (low or trailing edge) selects the preset.
	Active High, Activate	Logic '1' (high) activates the preset.
	Active Low, Activate	Logic '0' (low) activates the preset.
Inc/Dec RF Power	Rising Edge, Increase	Logic '1' (high or rising edge) causes a power increase.
	Falling Edge, Increase	Logic '0' (low or trailing edge) causes a power increase.
	Rising Edge, Decrease	Logic '1' (high or rising edge) causes a power decrease.
	Falling Edge, Decrease	Logic '0' (low or trailing edge) causes a power decrease.
	Active High, Increase	Logic '1' (high) causes a power increase.
	Active Low, Increase	Logic '0' (low) causes a power increase.
	Active High, Decrease	Logic '1' (high) causes a power decrease.
	Active Low, Decrease	Logic '0' (low) causes a power decrease.
Alarm Reset	Rising Edge, Reset	Logic '1' (high or rising edge) causes a reset.
	Falling Edge, Reset	Logic '0' (low or trailing edge) causes a reset.

Channel	Control Options	Description
Force Host Reboot	Rising Edge, Reset	Logic '1' (high or rising edge) causes a reset.
	Falling Edge, Reset	Logic '0' (low or trailing edge) causes a reset.
Main Exciter	Rising Edge, Set to B	Logic '1' (high or rising edge) causes a transfer to exciter B.
	Falling Edge, Set to B	Logic '0' (low or trailing edge) causes a transfer to exciter B.
	Rising Edge, Set to A	Logic '1' (high or rising edge) causes a transfer to exciter A.
	Falling Edge, Set to A	Logic '0' (low or trailing edge) causes a transfer to exciter A.
	Rising Edge, Toggle	Logic '1' (high or rising edge) causes an exciter transfer.
	Falling Edge, Toggle	Logic '0' (low or trailing edge) causes an exciter transfer.
	Level	Logic '1' (high or rising edge) remains the same exciter; Logic '0' (low or trailing edge) causes an exciter transfer.
	Inverted Level	Logic '1' (high or rising edge) causes an exciter transfer; Logic '0' (low or trailing edge) remains the same exciter.
Auto Changeover	Rising Edge, Set	Logic '1' (high or rising edge) enables auto changeover mode.
	Falling Edge, Set	Logic '0' (low or trailing edge) enables auto changeover mode.
	Rising Edge, Clear	Logic '1' (high or rising edge) disables auto changeover mode.
	Falling Edge, Clear	Logic '0' (low or trailing edge) disables auto changeover mode.
	Rising Edge, Toggle	Logic '1' (high or rising edge) causes a change to the auto changeover state.
	Falling Edge, Toggle	Logic '0' (low or trailing edge) causes a change to the auto changeover state.
	Level	Logic '1' (high or rising edge) enables auto changeover mode; Logic '0' (low or trailing edge) disables auto changeover mode.
	Inverted Level	Logic '1' (high or rising edge) disables auto changeover mode; Logic '0' (low or trailing edge) enables auto changeover mode.

Click **Save** to activate changes. Click **Cancel** to cancel changes and return to the Remote Inputs screen.

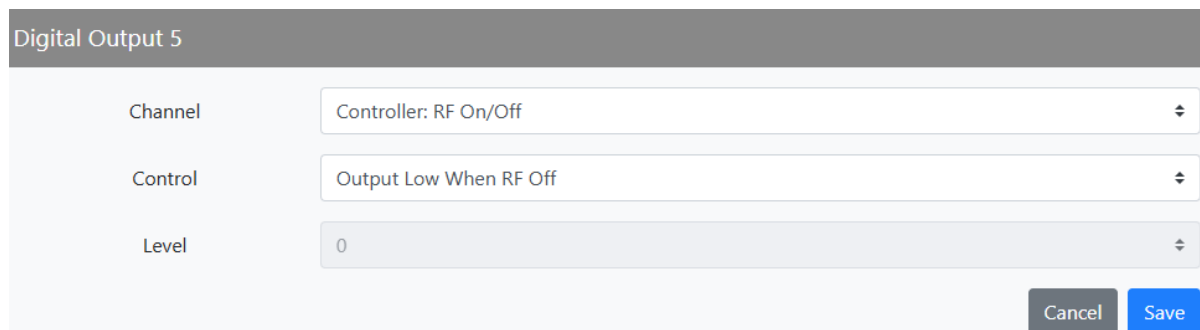
Digital Outputs

Using the **Digital Outputs** page (see [Figure 3.2.86](#)), you can configure up to 16 outputs that indicate either the presence of various alarms or the status of operator controlled circuits. Nautel sets remote output defaults prior to shipping. See the Pre-Installation Manual for details.

Figure 3.2.86: Remote I/O - Digital Outputs Page

Digital Outputs					
#	Name	Channel	Control	Level	Edit
1	Output 1	Unassigned	Unassigned	1	
2	Output 2	Controller: External Interlock Open	Active Low	0	
3	Output 3	Controller: High Temperature Latch	Active Low	1	
4	Output 4	Controller: External Summary	Active Low	0	
5	Output 5	Controller: RF On/Off	Output Low When RF Off	0	
6	Output 6	Controller: Remote Status	Output Low When True	0	
7	Output 7	Controller: Forward Power Low	Active Low	1	
8	Output 8	Controller: High Reflected Summary	Active Low	1	
9	Output 9	Controller: Power Amplifier Summary	Active Low	1	
10	Output 10	Controller: Power Supply Summary	Active Low	1	

The current settings for Output 1 through Output 16 are displayed, including the **Channel** and **Control** settings, as well as the current logic Level (1 or 0). You can edit **Channel** and **Control** settings by clicking the edit icon for the desired output. This displays the menu in [Figure 3.2.87](#) on [page 3.2.126](#).

Figure 3.2.87: Output Editing Menu

Digital Output 5

Channel	Controller: RF On/Off
Control	Output Low When RF Off
Level	0

Cancel Save

Select Output Channel

From the editing screen for remote output 1 through 16, you can configure the output for one of a variety of channel outputs. Click the Channel field's up/down arrows to display the following example options:

- ❖ **Unassigned.** No alarm or status parameter is monitored.
- ❖ **Remote Status.** The active logic level indicates remote control is enabled (i.e. local plus remote). The inactive logic level indicates remote control is disabled.
- ❖ **RF On/Off.** The active logic level indicates the transmitter's RF power stage is on (enabled). The inactive logic level indicates the transmitter's RF power stage is off.
- ❖ **Preset 1-6 status.** The active preset's output will be indicated by a logic low. The remaining, non-active preset outputs will be open collector.
- ❖ **Active Exciter.** The active exciter's output will be indicated by a logic low. The other, nonactive exciter output (as applicable), will be open collector.
- ❖ **Auto Changeover.** The output will be a logic low or high when auto changeover is enabled or disabled, as defined by the control logic.
- ❖ **Overall Summary Alarm.** The active logic level indicates that an alarm is occurring. Any transmitter alarm can be selected as a remote output. Refer to the Troubleshooting Manual for a description of each alarm.
- ❖ **Audio Active:** The selected output (MPX, AES 1, AES 2 or L/R) will be a logic low or high when the associated audio path is active, as defined by the control logic.

Click **Save** to activate changes. Click **Cancel** to cancel changes and return to the Remote Outputs screen. If you save a change to a remote output via the AUI, it will also be displayed on the FPUI.

Configure Output Logic

You can configure the active/inactive logic for each of the 16 remote outputs. Click the Control field's up/down arrows to display the applicable drop-down menu options. Some remote output default examples:

If the selected channel is RF On/Off, the drop-down options are:

- ❖ **Output Low When RF On.** Logic '0' (low) indicates the output is true (e.g., RF is on); Logic '1' (high) indicates the output is false (e.g., RF is off).
- ❖ **Output Low When RF Off.** Logic '0' (low) indicates the output is true (e.g., RF is off); Logic '1' (high) indicates the output is false (e.g., RF is on).

If the selected channel is Remote Status, the drop-down options are:

- ❖ **Output Low When True.** Logic '0' (low) indicates the remote access is enabled; Logic '1' (high) indicates the remote access is disabled.
- ❖ **Output Low When False.** Logic '0' (low) indicates the remote access is disabled; Logic '1' (high) indicates the remote access is enabled.

If the selected channel is Active Exciter, the drop-down options are:

- ❖ **Output Low When A.** Logic '0' (low) indicates the output is true (A); Logic '1' (high) indicates the output is false (B).
- ❖ **Output Low When B.** Logic '0' (low) indicates the output is true (B); Logic '1' (high) indicates the output is false (A).

If the selected channel is Preset, the drop-down options are:

- ❖ **Output Low When Active.** Logic '0' (low) indicates the output is true (Active); Logic '1' (high) indicates the output is false (Inactive).
- ❖ **Output Low When Inactive.** Logic '0' (low) indicates the output is true (Inactive); Logic '1' (high) indicates the output is false (Active).

Click **Save** to activate changes. Click **Cancel** to cancel changes and return to the Remote Outputs screen.

Analog Outputs

There are four analog outputs - forward power, reflected power, Average PA Voltage and Total PA Current - that can be remotely monitored. These outputs are factory defined parameters and cannot be changed to other parameters, however their scaling can be configured, using the **Analog Outputs** page (see [Figure 3.2.88](#)), to reflect the output voltage that yields a full-scale deflection.

Figure 3.2.88: Remote I/O - Analog Outputs Page

Analog Outputs

#	Name	Sample Full Scale	Meter Full Scale	Sample Voltage	Meter Value
1	Forward Power	5 V	24000 W	0.000 V	11 W
2	Reflected Power	6 V	2400 W	0.000 V	0 W
3	Average PA Voltage	6 V	60 V	0.196 V	1.98 V
4	Total PA Current	6 V	96 A	0.000 V	0 A

Save

The values associated with each of these fixed meters are of a linear nature so that changes made to the **Sample Full Scale** field (allowable range is 1- 10 V, defaulted to 5 V) will be reflected in the other fields according to the following equation:

(Meter Value/Meter Full Scale) x Sample Full Scale = Sample Voltage

NOTE: The Sample Voltage reading reflects the value that can be measured at the associated remote analog output pin for the given Meter Value. See the Installation Manual for actual remote analog output pin assignments.

Set the **Sample Full Scale** field, as desired, and Click the associated save button to activate the change.

Reports

The Reports page allows the user to view and download transmitter events by the following criteria:

- [Event History](#)
- [Active Preset](#) - see page 3.2.130
- [Meters](#) - see page 3.2.131
- [Settings](#) - see page 3.2.132

Event History

In the Event History report (see [Figure 3.2.89](#)), the user can select the following criteria from the drop-down menu:

- ❖ Preset Change
- ❖ Power Change
- ❖ Freq Change
- ❖ Local Remote Change
- ❖ Alarm
- ❖ RF State Change

Press Refresh Events to provide a current list of alarms. Press Download Report to save an Excel Spreadsheet copy of the Event History to the computer/laptop connected.

Figure 3.2.89: Reports - Event History

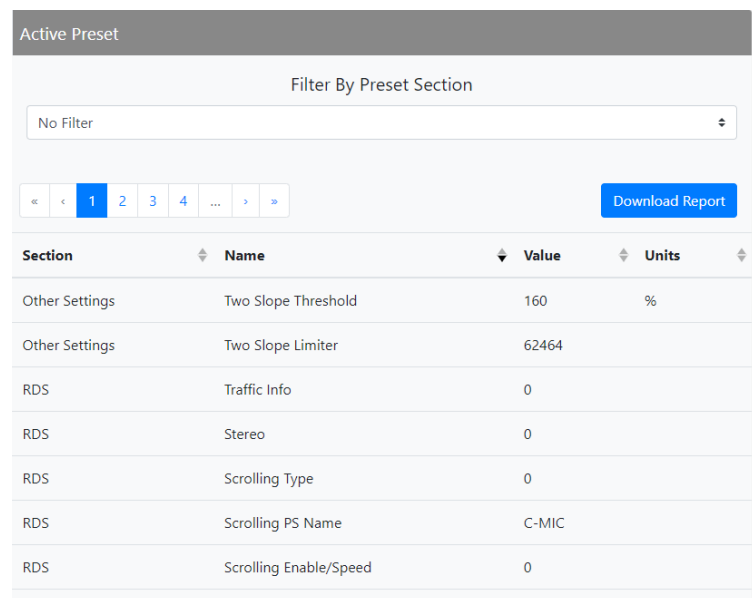
Value	Device	Name	Alarm Severity	Time	Type
Off	HD Exciter A	No External 10 MHz	Maintenance	12/19/2023, 1:40:10 PM	Alarm
On	HD Exciter A	No Engine 10 MHz	Reduced Power	12/19/2023, 1:40:10 PM	Alarm
On	HD Exciter A	No HD Data	Critical	12/19/2023, 1:40:10 PM	Alarm
On	HD Exciter A	External Mute	Maintenance	12/19/2023, 1:39:42 PM	Alarm
Off	Controller	RF On/Off		12/19/2023, 1:39:42 PM	RF State

Active Preset

In the Active Preset report (see [Figure 3.2.90](#)), the user can select the following criteria from the drop-down menu:

- ❖ No Filter
- ❖ RDS
- ❖ SCA
- ❖ Main Audio
- ❖ Other Settings
- ❖ General

Figure 3.2.90: Reports - Active Preset



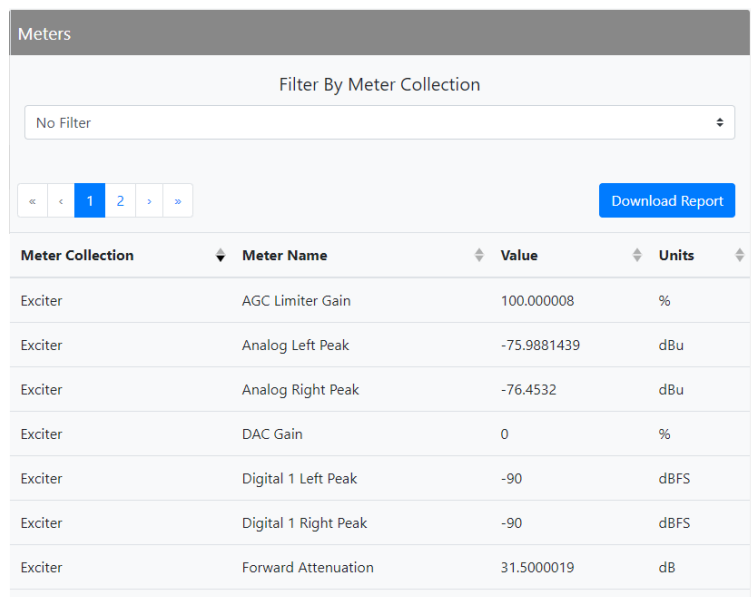
Active Preset			
Filter By Preset Section			
No Filter			
« < 1 2 3 4 ... > » Download Report			
Section	Name	Value	Units
Other Settings	Two Slope Threshold	160	%
Other Settings	Two Slope Limiter	62464	
RDS	Traffic Info	0	
RDS	Stereo	0	
RDS	Scrolling Type	0	
RDS	Scrolling PS Name	C-MIC	
RDS	Scrolling Enable/Speed	0	

Meters

In the Meters report (see [Figure 3.2.91](#)), the user can select the following criteria from the drop-down menu:

- ❖ No Filter
- ❖ Summary
- ❖ Transmitter
- ❖ Controller
- ❖ Exciter
- ❖ HD Exciter

Figure 3.2.91: Reports - Meters



The screenshot shows a web interface titled "Meters". Below the title is a section "Filter By Meter Collection" with a dropdown menu currently set to "No Filter". Below the filter is a pagination bar with buttons for navigation: "<<", "<", "1" (highlighted), "2", ">", and ">>". To the right of the pagination is a blue button labeled "Download Report". Below these elements is a table with the following data:

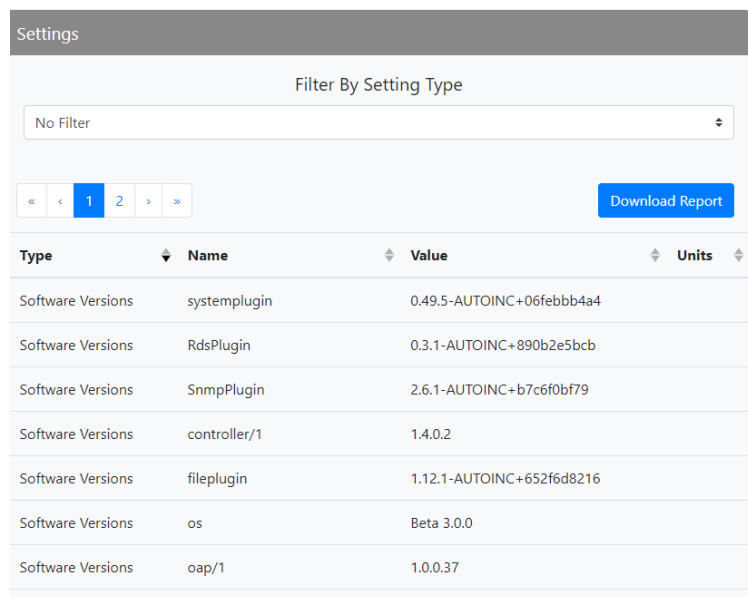
Meter Collection	Meter Name	Value	Units
Exciter	AGC Limiter Gain	100.000008	%
Exciter	Analog Left Peak	-75.9881439	dBu
Exciter	Analog Right Peak	-76.4532	dBu
Exciter	DAC Gain	0	%
Exciter	Digital 1 Left Peak	-90	dBFS
Exciter	Digital 1 Right Peak	-90	dBFS
Exciter	Forward Attenuation	31.5000019	dB

Settings

In the Settings report (see [Figure 3.2.92](#)), the user can select the following criteria from the drop-down menu:

- ❖ No Filter
- ❖ Active Preset
- ❖ Controller
- ❖ Exciter Thresholds
- ❖ Scalings
- ❖ Spectrum/Eff. Optimizer
- ❖ Exciter A/B
- ❖ Network
- ❖ Software Versions

Figure 3.2.92: Reports - Settings



Type	Name	Value	Units
Software Versions	systemplugin	0.49.5-AUTOINC+06febb4a4	
Software Versions	RdsPlugin	0.3.1-AUTOINC+890b2e5bcb	
Software Versions	SnmpPlugin	2.6.1-AUTOINC+b7c6f0bf79	
Software Versions	controller/1	1.4.0.2	
Software Versions	fileplugin	1.12.1-AUTOINC+652fd8216	
Software Versions	os	Beta 3.0.0	
Software Versions	oap/1	1.0.0.37	

Software

The Software menu contains the following sub-menus:

- Software Upgrades (see [Software Upgrades](#))
- Software Versions (see [Software Versions on page 3.2.134](#))

Software Upgrades

NOTE: Nautel provides a transmitter update mechanism by connecting a USB drive to the rear USB ports of the GV2 controller. Nautel will provide instructions on how to create a USB drive and complete the update or provide preprogrammed USB drives with instructions.

The AUI's **Software Upgrades** page (see [Figure 3.2.93](#)) in the **Settings** menu allows the user to manage the transmitter's software files (.tgz files) via remote connection. Navigate the page as described below. The display area shows all available software files.

The page consists of the following sections and buttons.

- ❖ **Browse:** allows the user to search for software files to upload.
- ❖ **Upload:** uploads the chosen file to the display area.
- ❖ **Refresh List:** refreshes all the available software files in the display area.
- ❖ **Start Upgrade:** initiates the software file selected to upgrade.
- ❖ **Delete Upgrade file:** deletes the selected software file from the display area.

Figure 3.2.93: Software Upgrades

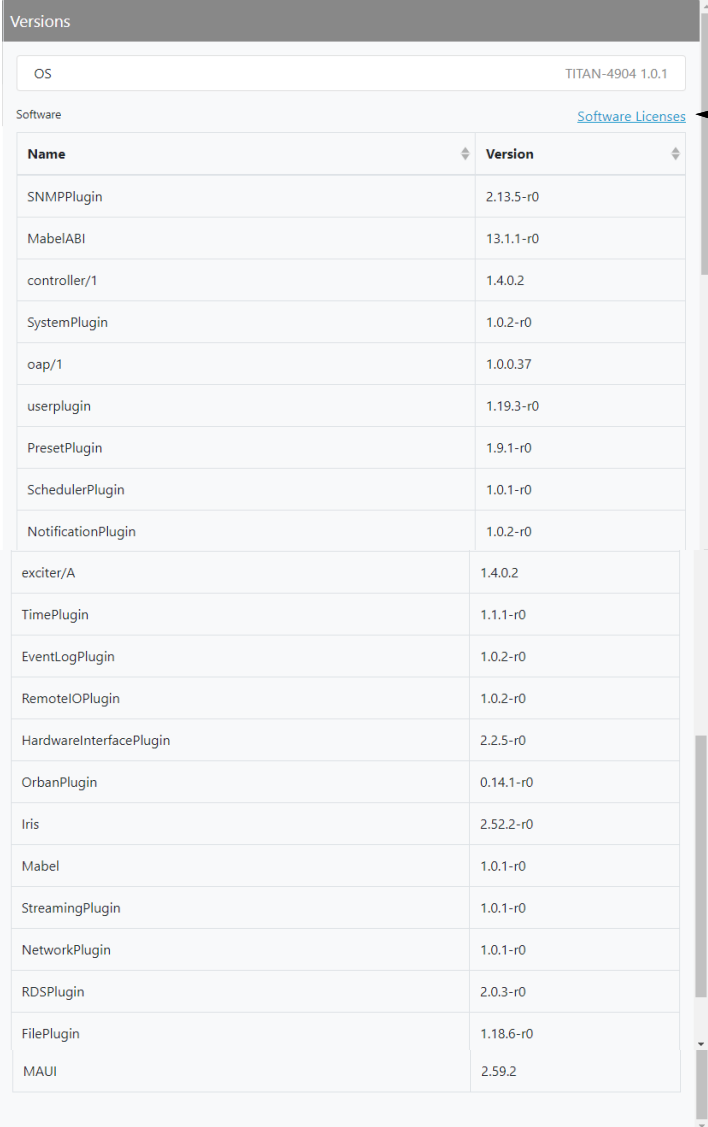
The screenshot displays the 'Upgrades' interface. At the top, a header bar shows 'Current Version' as 'TITAN-4904 1.0.1'. Below this is the 'Add Upgrade' section, which includes a 'From' field with a 'Browse' button and a 'To' dropdown menu set to 'Onboard Filesystem' with an 'Upload' button. The main section is 'Select upgrade for installation', which lists three files: 'vs.titan.4.0.0.30.tgz', 'vs.titan.5.0.0.30.tgz', and 'firmware.tgz'. To the right of these files is a 'Source' column with 'USI' listed for each. At the bottom, there are three buttons: 'Refresh List' (blue), 'Start Upgrade' (green), and 'Delete Upgrade File' (red).

Software Versions

The AUI's **Software Versions** page (see [Figure 3.2.94](#)) in the **Settings** menu displays the Operating version and all it's associated plug-ins.

Plug-ins are referenced by Name and Version. By clicking the [Software Licenses](#) hyperlink, the user is directed to Nautel's support website which provides a list of open source Nautel Software Licenses used by this product.

Figure 3.2.94: Software Versions



The screenshot shows the 'Versions' page with a table of software components. The table has two columns: 'Name' and 'Version'. The components listed are:

Name	Version
SNMPPlugin	2.13.5-r0
MabelABI	13.1.1-r0
controller/1	1.4.0.2
SystemPlugin	1.0.2-r0
oap/1	1.0.0.37
userplugin	1.19.3-r0
PresetPlugin	1.9.1-r0
SchedulerPlugin	1.0.1-r0
NotificationPlugin	1.0.2-r0
exciter/A	1.4.0.2
TimePlugin	1.1.1-r0
EventLogPlugin	1.0.2-r0
RemotelOPlugin	1.0.2-r0
HardwareInterfacePlugin	2.2.5-r0
OrbanPlugin	0.14.1-r0
Iris	2.52.2-r0
Mabel	1.0.1-r0
StreamingPlugin	1.0.1-r0
NetworkPlugin	1.0.1-r0
RDSPlugin	2.0.3-r0
FilePlugin	1.18.6-r0
MAUI	2.59.2

A red arrow points to the [Software Licenses](#) hyperlink located in the top right corner of the table area.

See also [Versions, on page 3.2.149](#) for a page that displays Air Chain related software versions, as applicable.

Air Chain

NOTE: *Air Chain operation is only available for software version GV2 SW 1.2.0 and newer.*

The Air Chain menu contains the following six sub-menus:

- vPlatform (see [vPlatform on page 3.2.136](#))
- vEngine (see [vEngine on page 3.2.138](#))
- vPorter (see [vPorter on page 3.2.145](#))
- Remote Support (see [Remote Support on page 3.2.148](#))
- Versions (see [Versions on page 3.2.149](#))
- Licensing (see [Licensing on page 3.2.150](#))

NOTE: *To operate with Air Chain, you need compatible hardware and software (GV2, vEngine, vPlatform), valid HD Radio licensing, up-to-date software, proper network setup, and must follow instructions in Nautel's Pre-installation and Installation Manuals for configuration and installation.*

The use of Air Chain requires access to other web-based interfaces in addition to the transmitter's AUI:

- For information on how to use the Gen4 Xperi webpage, refer to [Using the Gen4 Remote User Interface, on page 3.2.232](#).
- For information on how to use the Air Chain audio processor, refer to [Omnia for Nautel Audio Processor, on page 3.2.67](#).

vPlatform

vPlatform represents the virtualization platform, Proxmox, that is integrated into the GV2-5/GV2-3.5 and supports virtual applications such as the vAUI, vExgine, and vPorter. The vPlatform - IP Network page (see [Figure 3.2.95](#)) allows the user to configure and view network settings for the vPlatform.

NOTE: The vAUI refers to the standard AUI running on the GV2 transmitter platform as a virtual machine instance. It operates the same as the AUI executing directly on the processor in a standard GV2 transmitter. As the functionality is identical, AUI and vAUI have identical versioning.

Figure 3.2.95: Virtual Platform Page

vPlatform	
IP Network	
DNS Servers	
DNS 1*	10.0.1.200
DNS 2*	10.0.1.222
Routing	
Routing*	ANY LAN
LAN1	
Mode	DHCP
MAC Address	00:18:7D:E3:9E:B1
IP Address*	0.0.0.0
Subnet Mask*	0.0.0.0
Gateway*	10.0.128.254
Status	Not Running
LAN2	
Mode	DHCP
MAC Address	00:18:7D:E3:9E:B2
IP Address*	10.0.128.20
Subnet Mask*	255.255.255.0
Gateway*	10.0.128.254
Status	Running

- DNS Servers: enter or view the IP addresses for DNS1 and DNS2; use your own or use public DNS servers such as Google's 8.8.8.8 or 8.8.4.4.

- Routing: the transmitter has two physical network interfaces - LAN1, intended for content, and LAN2, intended for control. Both physical interfaces are offered to vPlatform and only LAN2 is offered to the vAUI. Select from the drop-down list which interface (LAN1 or LAN2) to use to reach the wide area network (WAN/Internet). Typically this is relevant only to the control network but may sometimes be desired to be on the content network.
 - ❖ LAN1 - Routes through the LAN1 interface always. Only available when both interfaces are set to static IP. A gateway address on the selected interface must be provided.
 - ❖ LAN2 - Routes through the LAN2 interface always. Only available when both interfaces are set to static IP. A gateway address on the selected interface must be provided.
 - ❖ ANY LAN - The WAN/Internet can be reached over any one or both network interfaces. This option is intended to be used with DHCP on one or both interfaces, where DHCP provides the necessary gateway. There is no guarantee which network interface will be used to reach the WAN/Internet.
 - ❖ NONE - The component will not route through either interface making the component only accessible on the IP network directly connected to the transmitter. This component, therefore, cannot reach out to the WAN/Internet, nor can it be reached from the WAN/Internet.

NOTE: *Nautel recommends to set up and connect the LAN2 interface, while keeping LAN1 off. This allows enabling remote support for Nautel Customer Service and for Nautel Customer Service to access the vPlatform user interface.*

- LAN1 and LAN2: enter or view parameters for LAN1 and LAN2
 - ❖ Mode: drop-down menus have three selection options: Off (default), DHCP, Static
 - ❖ MAC Address: for viewing only
 - ❖ IP Address
 - ❖ Subnet Mask
 - ❖ Gateway
 - ❖ Status (of connection): for viewing only

NOTE: *If an address field is not set, it displays as 0.0.0.0.*

NOTE: *The two LAN connections have specific uses in transmitting Air Chain information. The LAN1 network connection is used for the content to be broadcast while the LAN2 network connection is used for controlling the vPlatform. Content can also be routed on LAN2, but best recommended practice is to separate content and control.*

Click Save to store changes. Click Cancel to discard changes.

vEngine

The vEngine page (see [Figure 3.2.96](#)) allows the user to configure the vEngine using the following sub-menus:

- ❖ IP Network (see [IP Network](#));
- ❖ Air Chain Selector (see [Air Chain Selector](#);, on page 3.2.140)
- ❖ Signal Generator (see [Signal Generator](#);, on page 3.2.142
- ❖ Settings (see [Settings](#), on page 3.2.144)

IP Network: The IP Network page (see [Figure 3.2.96](#)) allows the user to configure and view network settings for the vEngine.

NOTE: *The page is only available if the vEngine is present and communicating; otherwise, it is greyed out or hidden.*

Figure 3.2.96: vEngine Page (IP Network sub-menu shown)

IP Network

Air Chain Selector

Signal Generator

Settings

DNS Servers

DNS 1*	10.0.1.200
DNS 2*	10.0.1.222

Routing

Routing*	ANY LAN ▾
----------	-----------

LAN1

Mode	DHCP ▾
MAC Address	BC:24:11:9F:BD:8C
IP Address*	10.0.128.44
Subnet Mask*	255.255.255.0
Gateway*	10.0.128.254
Status	Running

LAN2

Mode	DHCP ▾
MAC Address	BC:24:11:52:55:B6
IP Address*	10.0.128.39
Subnet Mask*	255.255.255.0
Gateway*	10.0.128.254
Status	Running

Cancel

Save

- DNS Servers: enter or view the IP addresses for DNS1 and DNS2; use your own or use public DNS servers such as Google's 8.8.8.8 or 8.8.4.4.
- Routing: the transmitter has two physical network interfaces - LAN1, intended for content, and LAN2, intended for control. Both physical interfaces are offered to vEngine and only LAN2 is offered to the vAUI. Select from the drop-down list which interface (LAN1 or LAN2) to use to reach the wide area network (WAN/Internet). Typically this is relevant only to the control network but may sometimes be desired to be on the content network.
 - ❖ LAN1 - Routes through the LAN1 interface always. Only available when both interfaces are set to static IP. A gateway address on the selected interface must be provided.
 - ❖ LAN2 - Routes through the LAN2 interface always. Only available when both interfaces are set to static IP. A gateway address on the selected interface must be provided.
 - ❖ ANY LAN - The WAN/Internet can be reached over any one or both network interfaces. This option is intended to be used with DHCP on one or both interfaces, where DHCP provides the necessary gateway. There is no guarantee which network interface will be used to reach the WAN/Internet.
 - ❖ NONE - The component will not route through either interface making the component only accessible on the IP network directly connected to the transmitter. This component, therefore, cannot reach out to the WAN/Internet, nor can it be reached from the WAN/Internet.

NOTE: Nautel recommends you set up and connect the LAN2 interface, while keeping LAN1 off. This allows enabling remote support for Nautel Customer Service and for Nautel Customer Service to access the vEngine user interface.

- LAN1 and LAN2: enter or view parameters for LAN1 and LAN2
 - ❖ Mode: drop-down menus have three selection options: Off (default), DHCP, Static; NOTE: setting LAN2's mode to Off will set its IP Address and Subnet Mask to 0.0.0.0.

NOTE: When the vPorter is hosted internally to the GV2-5/GV2-3.5, LAN1 and LAN2 do not require configuration and can be set to Off since all traffic will be routed inside the transmitter.

- ❖ MAC Address: for viewing only
- ❖ IP Address
- ❖ Subnet Mask
- ❖ Gateway
- ❖ Status (of connection): for viewing only

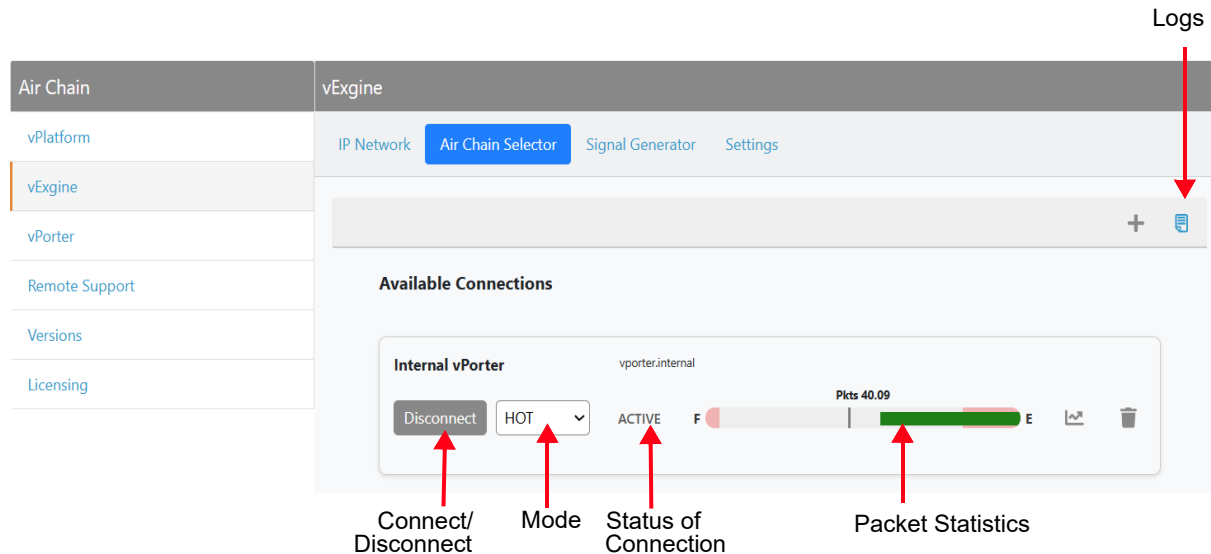
NOTE: If an address field is not set, it displays as 0.0.0.0.

NOTE: The two LAN connections have specific uses in transmitting Air Chain information. The LAN1 network connection is used for the content to be broadcast while the LAN2 network connection is used for controlling the vEngine. Content can also be routed on LAN2, but best recommended practice is to separate content and control.

Click Save to store changes. Click Cancel to discard changes.

Air Chain Selector: The Air Chain Selector page (see [Figure 3.2.97](#)) is the main interface for managing and monitoring Air Chain connections to the vExgine.

Figure 3.2.97: Air Chain Selector Page



Available Connections: The Available Connections section displays all Air Chain connections (e.g., vporter.internal) configured for the vExgine, including those created via the AUI or manually. Connections cannot be added or deleted in software version GV2 SW 1.2.0.

- ❖ For each Air Chain connection, there are three connection mode options (MANUAL, HOT, and COLD). These options allow you to tailor each Air Chain connection's behavior to your operational needs, balancing control, redundancy, and response time.
 - **MANUAL:** The connection is only established or activated when the user explicitly clicks the **Connect** button in the AUI. This mode is typically used for testing, troubleshooting, or when you want full control over when a connection is live.
 - **HOT (hot standby):** The connection is kept ready and can take over immediately if the primary connection fails. In this mode, the system automatically manages the connection state to ensure rapid failover. No manual connect/disconnect is required; the system handles activation.
 - **COLD (cold standby):** The connection is configured but not actively maintained. If needed, the system will establish the connection, but it may take longer to become active compared to HOT mode. Used for backup scenarios where immediate switchover is not critical.
- ❖ The currently active Air Chain connection displays as 'ACTIVE'.

NOTE: The internal vPorter (vporter.internal) is the only available connection for software version GV2 SW 1.2.0.

Connect/Disconnect: Each connection can be connected or disconnected via a button. The connection status updates through states like 'Ready', 'Filling', 'Connecting', and 'Active'.

Delete Connection: Click the delete button to delete an Air Chain connection from the list.

NOTE: The add (+) and delete buttons are not available for software version GV2 SW 1.2.0.

Packet Tracking: Displays real-time packet statistics for each available Air Chain connection. The Pkts value is the current number of packets in the receive buffer for that Air Chain connection. The green bar is the current averaged receive buffer level. The light grey vertical line represent the target buffer level. The 'F' at the left side indicates the 'full buffer' end (high buffer level). The 'E' at the right side indicates the 'empty buffer' end (low buffer level). When the green level bar is near the grey line, the connection is buffering as intended. Statistics are updated at least once per second. This allows you to monitor the health and activity of each Air Chain connection, including packet flow and buffer status.

Logs: Click the Logs button to view the Air Chain Logs report (see Figure 3.2.98). Click **Download Logs** to view logs or download the report. Click **Close** to return to the Air Chain Selector page.

Figure 3.2.98: Air Chain Selector - Logs

Air Chain	Air Chain Logs	Download Logs	Close
vPlatform	2025-06-19@20:52:31: (vPorter) ACTIVE_LOW_BUF=>CONNECTED 2025-06-19@20:52:31: No ACTIVE found. Activating good vPorter		
vEngine	2025-06-19@20:52:31: (vPorter) CONNECTED=>ACTIVE 2025-06-19@20:52:31: (vPorter) ACTIVE=>ACTIVE_LOW_BUF 2025-06-19@20:52:31: (vPorter) ACTIVE_LOW_BUF=>CONNECTED		
vPorter	2025-06-19@20:52:31: (vPorter) ACTIVE_LOW_BUF=>CONNECTED 2025-06-19@20:52:31: No ACTIVE found. Activating good vPorter 2025-06-19@20:52:31: (vPorter) CONNECTED=>ACTIVE		
Remote Support	2025-06-19@20:52:31: (vPorter) ACTIVE=>ACTIVE_LOW_BUF 2025-06-19@20:52:31: (vPorter) ACTIVE_LOW_BUF=>CONNECTED		
Versions	2025-06-19@20:52:31: No ACTIVE found. Activating good vPorter 2025-06-19@20:52:31: (vPorter) CONNECTED=>ACTIVE		
Air Chain Licensing	2025-06-19@20:52:31: (vPorter) ACTIVE=>ACTIVE_LOW_BUF 2025-06-19@20:52:31: (vPorter) ACTIVE_LOW_BUF=>CONNECTED 2025-06-19@20:52:31: (vPorter) ACTIVE_LOW_BUF=>CONNECTED 2025-06-19@20:52:31: No ACTIVE found. Activating good vPorter 2025-06-19@20:52:31: (vPorter) CONNECTED=>ACTIVE 2025-06-19@20:52:31: (vPorter) ACTIVE=>ACTIVE_LOW_BUF 2025-06-19@20:52:31: (vPorter) ACTIVE_LOW_BUF=>CONNECTED 2025-06-19@20:52:31: (vPorter) ACTIVE_LOW_BUF=>CONNECTED 2025-06-19@20:52:31: No ACTIVE found. Activating good vPorter 2025-06-19@20:52:31: (vPorter) CONNECTED=>ACTIVE 2025-06-19@20:52:31: (vPorter) ACTIVE=>ACTIVE_LOW_BUF 2025-06-19@20:52:31: (vPorter) ACTIVE_LOW_BUF=>CONNECTED 2025-06-19@20:52:31: No ACTIVE found. Activating good vPorter 2025-06-19@20:52:31: (vPorter) CONNECTED=>ACTIVE 2025-06-19@20:52:31: (vPorter) ACTIVE=>ACTIVE_LOW_BUF 2025-06-19@20:52:31: (vPorter) ACTIVE_LOW_BUF=>CONNECTED 2025-06-19@20:52:31: No ACTIVE found. Activating good vPorter 2025-06-19@20:52:31: (vPorter) CONNECTED=>ACTIVE 2025-06-19@20:52:31: (vPorter) ACTIVE=>ACTIVE_LOW_BUF		

Signal Generator: The Signal Generator page (see [Figure 3.2.99](#)) allows the user to inject test signals directly into the FM audio chain, replacing user audio with internally generated tones or noise for testing and calibration purposes.

Figure 3.2.99: Signal Generator page

The figure displays four sequential screenshots of the vEngine Signal Generator page, illustrating different operational modes. Each screenshot shows the 'vEngine' header, navigation tabs ('IP Network', 'Air Chain Selector', 'Signal Generator', 'Settings'), and the 'Signal Generator' configuration area. The 'Mode' dropdown menu is highlighted in each case, with corresponding 'Cancel' and 'Save' buttons at the bottom right.

- Mode set to Disabled:** The 'Mode' dropdown is set to 'Disabled'. The 'Frequency*' and 'Level*' fields are not visible.
- Mode set to Sine Wave:** The 'Mode' dropdown is set to 'Sine Wave'. The 'Frequency*' field is set to 1000 Hz, and the 'Level*' field is set to 100 %.
- Mode set to Bandlimited Noise:** The 'Mode' dropdown is set to 'Bandlimited Noise'. The 'Level*' field is set to 100 %.
- Mode set to Silence:** The 'Mode' dropdown is set to 'Silence'. The 'Frequency*' and 'Level*' fields are not visible.

From the Mode drop-down menu you can select one of the following four options. Select **Save** to store the change. Select **Cancel** to return to the previous menu. Note that different selection options will appear depending on the selection.

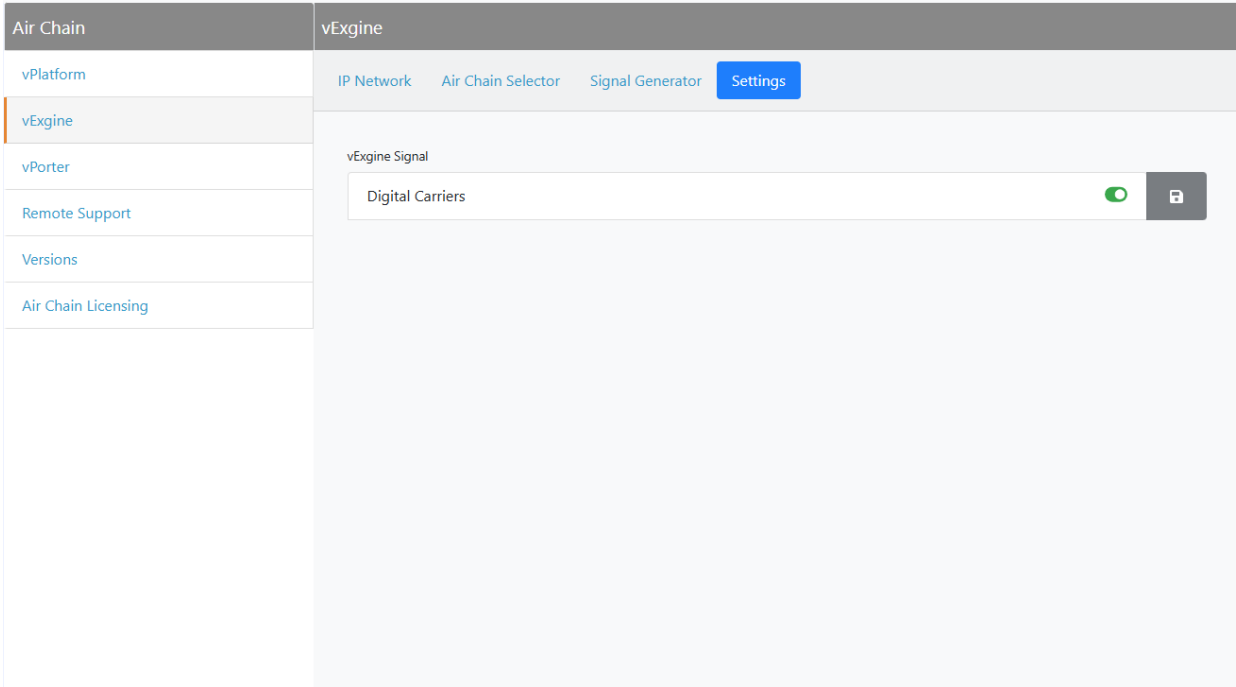
- ❖ Disabled: no test signal is injected
- ❖ Sine Wave: generates a pure tone at a selectable frequency
 - set the frequency between 1 and 75,000 Hz (default is 1000 Hz)
 - set the level between 0 and 100% (default is 100%)
- ❖ Bandlimited Noise: injects noise for system testing
 - set the level between 0 and 100% (default is 100%) (setting is displayed, but will not actually change the Bandlimited Noise level. At present, the level can only be changed using the Air Chain Digital MPX Level in the presets)
- ❖ Silence: provides an unmodulated carrier (useful for baseline measurements)

NOTE: *The signal generator is managed entirely within the vExgine and AUI. When enabled, the test signal is inserted into the FM audio chain and can be observed on a radio at the transmitter frequency. This is especially useful for production testing, calibration, and troubleshooting.*

When a test signal is enabled, an alarm is triggered to indicate it has been enabled.

Settings. The Settings page (see [Figure 3.2.100](#)) allows the user to enable or disable digital carriers for the vExgine signal.

Figure 3.2.100: Settings page



Slide the toggle switch to the right (will turn green) to enable Digital Carriers.

Slide the toggle switch to the left (will turn grey) to disable Digital Carriers. If digital carriers are disabled, a “vExgine Digital Carriers Disabled” alarm is triggered and displayed in the AUI and other relevant system components. This helps with troubleshooting and ensures all parts of the system are aware of the carrier status.

Press the save icon button to save the change.

NOTE: The digital carriers setting is typically toggled for operational reasons such as power calibration or to address interference complaints. In normal HD operation, carriers are ON, but they may be turned OFF for FM-only operation or testing.

vPorter

The vPorter page (see [Figure 3.2.101](#)) allows the user to configure and view settings for the vPorter using the following sub-menus:

- ❖ IP Network (see [IP Network:](#))
- ❖ Settings (see [Settings;](#) on [page 3.2.147](#))

IP Network: The IP Network page (see [Figure 3.2.101](#)) allows the user to configure and view network settings for the vPorter.

Figure 3.2.101: vPorter IP Network Page

Air Chain	vPorter
vPlatform	IP Network Settings
vEngine	DNS Servers
vPorter	DNS 1*
Remote Support	DNS 2*
Versions	Routing
Licensing	Routing* ANY LAN
	LAN1
	Mode DHCP
	MAC Address BC:24:11:CE:FF:F4
	IP Address* 0.0.0.0
	Subnet Mask* 0.0.0.0
	Gateway* 0.0.0.0
	Status Running
	LAN2
	Mode DHCP
	MAC Address BC:24:11:4B:C1:50
	IP Address* 10.0.128.57
	Subnet Mask* 255.255.255.0
	Gateway* 10.0.128.254
	Status Running
	Cancel Save

- DNS Servers: enter or view the IP addresses for DNS1 and DNS2; use your own or use public DNS servers such as Google’s 8.8.8.8 or 8.8.4.4.

- Routing: the transmitter has two physical network interfaces - LAN1, intended for content, and LAN2, intended for control. Both physical interfaces are offered to vPorter and only LAN2 is offered to the vAUI. Select from the drop-down list which interface (LAN1 or LAN2) to use to reach the wide area network (WAN/Internet). Typically this is relevant only to the control network but may sometimes be desired to be on the content network.
 - ❖ LAN1 - Routes through the LAN1 interface always. Only available when both interfaces are set to static IP. A gateway address on the selected interface must be provided. Typically the Livewire network set in Omnia for Nautel's Common -> Livewire screen.
 - ❖ LAN2 - Routes through the LAN2 interface always. Only available when both interfaces are set to static IP. A gateway address on the selected interface must be provided.
 - ❖ ANY LAN - The WAN/Internet can be reached over any one or both network interfaces. This option is intended to be used with DHCP on one or both interfaces, where DHCP provides the necessary gateway. There is no guarantee which network interface will be used to reach the WAN/Internet.
 - ❖ NONE - The component will not route through either interface making the component only accessible on the IP network directly connected to the transmitter. This component, therefore, cannot reach out to the WAN/Internet, nor can it be reached from the WAN/Internet.
- LAN1 and LAN2: enter or view parameters for LAN1 and LAN2
 - ❖ Mode: drop-down menus have three selection options: Off (default), DHCP, Static; NOTE: setting LAN1 or LAN2's mode to Off will set its IP Address and Subnet Mask to 0.0.0.0.
 - ❖ MAC Address: for viewing only
 - ❖ IP Address
 - ❖ Subnet Mask
 - ❖ Gateway
 - ❖ Status (of connection): for viewing only

NOTE: *The two LAN connections have specific uses in transmitting Air Chain information. The LAN1 network connection is intended for Livewire+/AES67 while the LAN2 network connection is used for controlling the vPorter. Content can also be routed on LAN2, but best recommended practice is to separate content and control.*

NOTE: *If an address field is not set, it displays as 0.0.0.0.*

Click Save to store changes. Click Cancel to discard changes.

Settings: The Settings page (see [Figure 3.2.102](#)) allows configuration of the VNC (virtual network client) server for the vPorter.

Figure 3.2.102: vPorter Settings page

The figure consists of two screenshots of the vPorter Settings page. Both screenshots show the 'vPorter' header and two tabs: 'IP Network' and 'Settings'. The 'Settings' tab is selected.

Top Screenshot (VNC Server Disabled): The 'VNC Server' section contains a single field labeled 'Enable Server' with a toggle switch on the right, currently in the 'off' position. Below this field are 'Cancel' and 'Save' buttons.

Bottom Screenshot (VNC Server Enabled): The 'VNC Server' section contains two fields: 'Enable Server' with a toggle switch on the right, currently in the 'on' position, and 'VNC Server Enable Duration' with a value of '15' and a unit of 'min'. Below these fields is the 'VNC Server Status' section, which contains three input fields: 'Start Time', 'End Time', and 'Remaining Time'. 'Cancel' and 'Save' buttons are at the bottom right.

- Set the Enable Server switch to right position to enable, left to disable (default setting).
- When VNC is enabled:
 - ❖ you can set the VNC Server Enable Duration (in minutes) that the VNC server remains active. Duration can be set between 1 and 180 minutes, with a default setting of 15 minutes.
 - ❖ the VNC Server Status display will indicate Start Time, End Time, and Remaining Time.

Press the Save button to save changes or Cancel to return to the previous settings.

NOTE: You can change the enable duration while the server is running, without disconnecting existing sessions. Saving changes sends commands to the vPorter system to start or stop the VNC server accordingly. Canceling changes will revert to the last saved values.

NOTE: Using a VNC remote desktop viewer (Nautel recommends TightVNC), you can access the vPorter Windows desktop to perform various functions. See [Accessing the vPorter Desktop, on page 3.4.13](#) for details.

Remote Support

The Remote Support page (see [Figure 3.2.103](#)) offers an optional feature that allows Nautel Customer Service to remotely assist customers with their Air Chain systems using a secure, flexible, and customer-controlled method. Use this screen as directed by Nautel Customer Service.

Figure 3.2.103: Remote Support page

Remote Support

Enable Support ⏻ Shown Disabled (default)

Cancel Save

Remote Support

Enable Support ⏻ Shown Enabled

Connection ID* 30000

URL remotesupport.nautel.com

Port* 2222

Enable Support Duration* 60 Min

Cancel Save

When remote support is required:

1. Slide the Enable Support icon to the right to enable Remote Support (will turn green when enabled).
2. Contact Nautel Customer Service (support@nautel.com). Nautel Customer Service will assign a unique Connection ID and provide further instructions.
3. Enter the Connection ID, support server URL, Port number, desired Enable Support Duration, and click the Save button. The system creates a temporary SSH tunnel to the Nautel support server. This tunnel forwards several internal ports, allowing Nautel Customer Service to access:
 - ❖ Proxmox Web UI (system management)
 - ❖ AUI (advanced user interface)
 - ❖ NfRemote App (audio processing control)
 - ❖ Gen4 Web UI (HD Radio control)

NOTE: The connection stays open only for the configured duration (e.g., 60 minutes) and then automatically closes. The system does not retry or keep the connection open after the support window expires, ensuring customer control, privacy, and enhanced security.

Versions

The Versions page (see [Figure 3.2.104](#)) display the current versions of key software and platform components used in the Air Chain system. This information is critical for troubleshooting, upgrade planning, and ensuring compatibility across the system.

Figure 3.2.104: Versions page

Versions	
Name	Version
vPlatform	1.2.0
vPorter	1.0.0
vPorter OS	1.0.0
SPD Driver	2.5.6
Proxmox	8.1.4
vExgine App	1.0.0.1
vExgine OS	1.0.0.0

The following components and their current versions are displayed on the Versions page:

- vPlatform: The virtualization platform version running on the Proxmox host.
- vPorter: The version of vPorter in use.
- vPorter OS: The operating system version for the vPorter Gen4 Importer.
- SPD Driver: The version of the SPD driver in use.
- Proxmox: The version of the Proxmox virtualization environment.
- vExgine App: The version of vExgine application software running on the virtualized broadcast platform.
- vExgine OS: The operating system version for the vExgine modulator.

Licensing

The Licensing page (see [Figure 3.2.105](#)) allows the user to view active licensed features and enter an activation code to activate a new feature. The AUI displays all available features and their license status for each exciter. Users can determine which Air Chain licenses are required based on the features they want to enable and the transmitter configuration.

NOTE: *There are separate tabs for HD Exciter A, HD Exciter B (if present), and vPorter.*

If a required feature is not licensed, the AUI will indicate this, and show the device ID needed for code generation. Attempting to enable unlicensed features will result in clear alarms and/or disabled functionality, guiding the user to the missing license.

HD Exciter A/B: The HD Exciter A or B (if applicable) tab (see [Figure 3.2.105](#)) allows licensing for the HD exciter(s).

Figure 3.2.105: Air Chain Licensing page - HD Exciter A tab

Name	Status	Details
Exciter Basic Operation	✓	Permanent
HD Power Boost Operation	✓	Permanent
Basic Air Chain Operation	✓	Permanent
vExgine FM+HD Permanent Operation	✓	Permanent

Each HD Exciter tab displays:

- Device ID: Reports the unique exciter device ID (read-only)
- Activation Code: Enter the license activation code; entering a valid activation code for feature updates its status to 'Licensed'.
- Add button: Submits the activation code

- A list of existing features showing:
 - ❖ Name of feature
 - ❖ Status of license, with indicators as follows:
 - Not licensed: grey circle with minus, named 'Not Licensed'
 - Permanently activated: green circle with checkmark, named 'Permanent'
 - Timed license activated: green circle with checkmark, named 'Expires [date]'
 - Timed license expired: red circle with X, named 'Expired [date]'
 - Timed license, inactive (NTP missing): yellow circle with minus, named 'NTP not detected'
 - ❖ Details of license (e.g., Permanent, Timed, etc.)

Four main licenses are managed: Exciter Basic Operation, HD Power Boost Operation, Basic Air Chain Operation and vEngine FM+HD Permanent Operation.

- If Basic Air Chain Operation is licensed, Air Chain can be enabled without alarms.
- If Basic Air Chain Operation is not licensed, attempting to enable Air Chain will mute the RF output and trigger an 'Air Chain not Licensed' alarm.
- If vEngine FM+HD Permanent Operation is not licensed, FM+HD mode cannot be enabled, triggering a specific alarm.

User operation:

1. Select the appropriate exciter tab (A or B).
2. View the device ID and current feature status.
3. Enter the activation code for the desired feature.
4. Click Add to activate the feature.
5. The Features list should indicate a Status update for the new license state.

NOTE: All license changes are reflected immediately in the AUI. The Basic Air Chain Operation and vEngine FM+HD Permanent Operation features are not activated before the transmitter ships. The user must activate these two features using codes provided by Nautel on the 'GV2 Airchain Licenses' sheet provided in the shipped transmitter documentation.

Contact Nautel Customer Service to confirm the exact requirements for your configuration.

vPorter: The vPorter tab (see [Figure 3.2.106](#)) allows licensing for the vPorter.

NOTE: Nautel factory configures the Windows 11 license for the vPorter and applies the label to the rear of the controller module. The label contains the activation key that has been entered in the Activation Key field.

Figure 3.2.106: Air Chain Licensing page - vPorter tab

The screenshot shows a web interface for licensing. At the top is a grey header with the word 'Licensing'. Below it are two tabs: 'HD Exciter A' and 'vPorter'. The 'vPorter' tab is selected and highlighted in blue. Under the tabs, there is a 'License Status' field on the left and 'Not Licensed' on the right. Below this is a label 'Enter Windows 11 Activation Key' and an 'Activation Key' input field. The input field has a placeholder text 'XXXXX-XXXXX-XXXXX-XXXXX-XXXXX'. At the bottom right of the form is a blue 'Submit' button.

The vPorter tab displays:

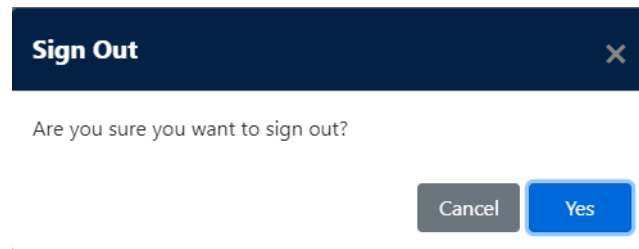
- License Status field: Reports the vPorter license status (read-only)
- Activation Key field: Enter the Windows 11 license activation key; entering a valid activation key updates the license status to 'Licensed'.
- Submit button: Submits the activation key

Sign Out

The Sign Out dialog (see [Figure 3.2.107](#)) allows the user to sign out of the AUI session.

Click OK to sign out or Cancel to return to the active session.

Figure 3.2.107: Sign out



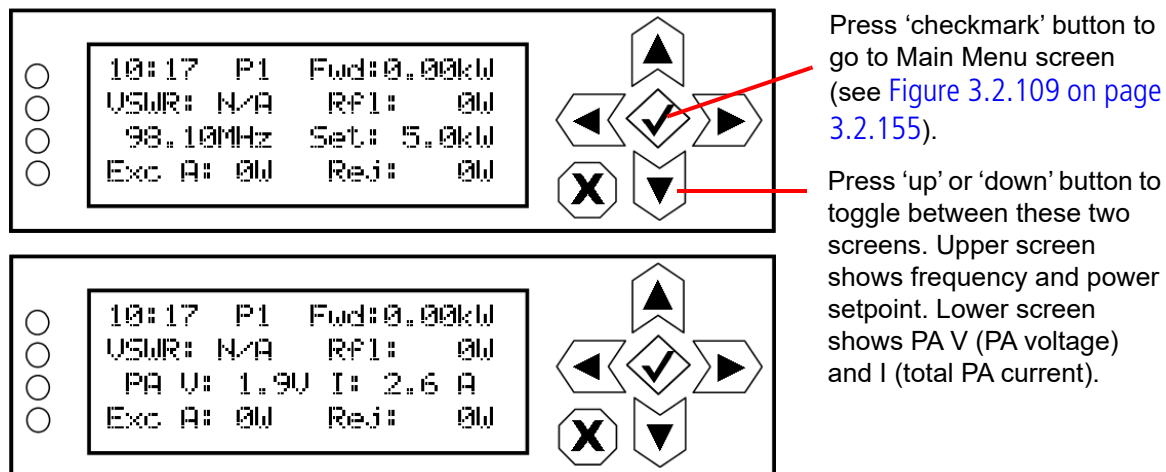
Controller Front Panel UI (User Interface)

The controller's front panel has a user interface (UI) featuring a 4 x 20 character graphic LCD display (see [Figure 3.2.109 on page 3.2.155](#)). The UI can be controlled by its adjacent keypad. The UI contains a menu-based series of pages that serve specific functions. Similar interfacing, as well as more advanced functionality, is available on the AUI (see [Advanced User Interface \(AUI\), on page 3.2.9](#)). The controller front panel also has push-button switches that allow RF on, RF off and local/remote selection (see [Navigational Buttons, on page 3.2.155](#)).

LCD Display (UI)

This display shows all the UI screens. The display's top level screen, used for viewing purposes only, is shown in [Figure 3.2.108](#).

Figure 3.2.108: Top Level Screens



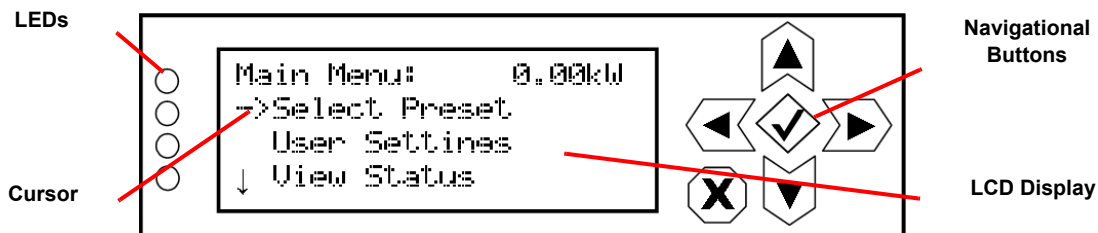
The top level screen displays the following information:

- ❖ Line 1: current time, active preset (e.g., P1) and the transmitter's actual forward power.
- ❖ Line 2: VSWR ratio and the transmitter's reflected power level.
- ❖ Line 3: operating frequency and the desired power setpoint (or PA voltage and total PA current).
- ❖ Line 4: active exciter's forward power level and the total system reject power.

Main Menu

This main menu is the starting point for navigating through the UI screens. See [Table 3.2.4 on page 3.2.157](#) for a list of screens and their basic functions.

Figure 3.2.109: Main Menu



Navigational Buttons

There are six push-buttons on the right-hand side of the LCD display that allow navigation through the UI pages, as well as modifying selected settings.

- ❖ Up and down - on menu and list screens, moves cursor up and down through the associated page; on edit screens, increases and decreases the value of a parameter being modified.
- ❖ Left - on menu and list screens, exits to the next higher level screen; on edit screens, moves the editing cursor left, as applicable.
- ❖ Right - on menu and list screens, goes to the next lower level screen; on edit screens, moves the editing cursor right, as applicable.
- ❖ Checkmark - on menu screens, goes to the next lower level screen; on edit screens, acts as an "accept" or "save" function; in some cases the display will prompt its use.
- ❖ X - on menu and list screens, exits to the next higher level screen; on edit screens, acts as a "cancel" function; in some cases the display will prompt its use.

Saving Settings

Many of the UI screens allow for modifying a selected setting. Use the checkmark button to save a change. Use the X button to cancel a change and revert back to the previously stored value.

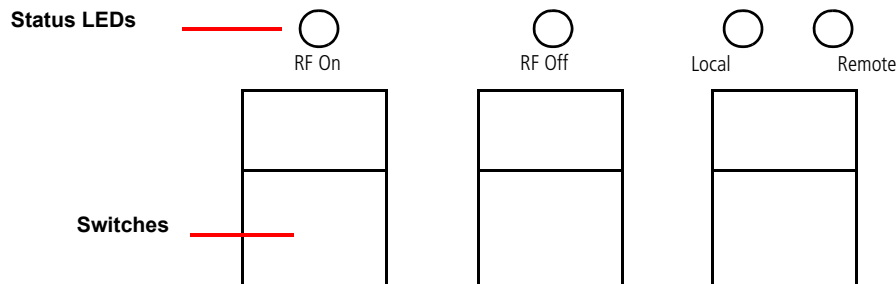
LEDs

There are four LEDs on the left-hand side of the LCD display that provide the operational status of various sections of the transmitter - **Exciter**, **Power Amplifier**, **Output Network** and **Power Supply** (see [Figure 3.2.109 on page 3.2.155](#)). The LEDs can glow green, amber or red. Typically, green indicates normal operation, amber indicates a warning, and red indicates a fault or error. Refer to the Troubleshooting section for more detailed information on LED status.

Controller Pushbuttons

The controller front panel contains three pushbutton switches that provide local control of the transmitter's RF on/off status and the local/remote operational control status (see [Figure 3.2.110](#)).

Figure 3.2.110: Front Panel Pushbutton Switches



- ❖ **RF On** - In local mode, press the pushbutton switch to turn on the RF power stage and cooling fans. The **RF On** LED will be on (amber) when the RF power stage is on and the external interlock circuit is intact. The transmitter will operate at the level stored in the selected preset.
- ❖ **RF Off** - Regardless of the remote enable/disable status, press the pushbutton switch to turn off the RF power stage. The **RF Off** LED will be on (amber) when the RF power stage is off.

NOTE: The **RF On** and **RF Off** LEDs may blink if there are alarms occurring that prevent the transmitter from enabling the RF power stage (e.g., interlock open, combiner matching, etc.)

- ❖ **Local/Remote** - Press the switch to toggle between "remote enabled" (**Remote** amber LED on; local and remote control) and "remote disabled" (**Remote** LED off; local control only). The transmitter's local controls are always enabled. In **Local** mode (Local amber LED on), all of the remote controls (except the external interlock) are disabled. In **Remote** mode, control of transmitter functions is also provided to the remote (web-accessed) AUI or remote input/output control via the remote interface PWB or the rear of the controller module. The bottom of the remote AUI home page will display the control status. When remote control is enabled, only the **Remote** button is green. When remote control is disabled, only the **Local** button is green.

Controller UI Screens

Table 3.2.4 defines the available UI display screens on the controller module.

Table 3.2.4: Controller UI Screens

Controller UI Screen	Function	See Page
Main Menu	Choose options and navigate to other screens.	3.2.155
Select Preset	Select and activate a user-defined preset.	3.2.161
User Settings	Edit various transmitter user settings (see other User Settings options in this table).	3.2.162
User Settings - Edit Presets	Edit various parameters for a user-defined preset (see the following rows for all Edit Presets options).	3.2.163
User Settings - Edit Presets - Output Power	Edit the selected preset's output power.	3.2.164
User Settings - Edit Presets - Frequency	Edit the selected preset's operating frequency.	3.2.164
User Settings - Edit Presets - IBOC Mode	Edit the selected preset's mode of operation (FM, FM+HD, HD or DRM+).	3.2.165
User Settings - Edit Presets - Air Chain	Enables or disabled Air Chain presets.	3.2.166
User Settings - Edit Presets - IBOC Settings	Edit the selected preset's settings for IBOC (digital) operation.	3.2.166
User Settings - Edit Presets - Main Audio	Edit the selected preset's main audio characteristics such as source, stereo mode, pre-emphasis and low pass filtering.	3.2.168
User Settings - Edit Presets - Backup Audio	Enable and edit the selected preset's backup audio characteristics such as source, stereo mode, pre-emphasis and low pass filtering.	3.2.168
User Settings - Edit Presets - Pilot Settings	Edit the selected preset's pilot settings such as level, phase and 1 PPS synchronization.	3.2.171
User Settings - Edit Presets - SCA Settings	Edit the selected preset's SCA settings such as SCA reduction, MPX SCAs, MPX SCA input and internal SCA (1 and 2) generator characteristics.	3.2.172
User Settings - Edit Presets - RDS Settings	Edit the selected preset's RDS settings such as enable/disable, data source, baud rate, level, phase, program type, alternate frequency data, etc.	3.2.174
User Settings - Edit Presets - Limiter Settings	Edit the selected preset's limiter settings. Limiter types include hard limiter, AGC limiter, 2-slope limiter, L/R limiter and MPX RMS limiter.	3.2.179

Controller UI Screen	Function	See Page
User Settings - Edit Presets - Mod Loss	Edit the selected preset's modulation loss functionality, such as enable/disable, setting threshold, setting timeout period, setting resulting action and selecting a backup preset.	3.2.183
User Settings - Edit Presets - Audio Delay	Edit the selected preset's audio delay.	3.2.185
User Settings - Edit Presets - Copy Another Preset	Copy the selected preset's settings to another preset.	3.2.185
User Settings - Set Clock	Set precise time and date.	3.2.186
User Settings - Network Settings	View and/or set network information such as MAC address (view only), DHCP on/off status, IP address, netmask and gateway.	3.2.186
User Settings - Pilot Sample	Set the pilot sample level for the controller's rear panel BNC connector.	3.2.189
User Settings - Signal Gen	Enable/disable and setup the internal signal generator.	3.2.190
User Settings - Ext. 10 MHz Inp	Enable/disable the use of an external 10 MHz signal.	3.2.192
User Settings - Scheduler	Enable/disable the scheduler.	3.2.192
User Settings - FM Mask	Select the FM mask - FCC, ETSI or None (turns off mask).	3.2.193
User Settings - Audio Low	Set the low audio thresholds and associated timeout delays.	3.2.194
User Settings - Turn-On Delay	Set the transmitter turn-on delay period.	3.2.195
User Settings - Ramp-Up Speed	Set the transmitter's ramp-up delay period.	3.2.196
User Settings - Transfer Ctrl (if applicable)	Control the on/off status of transmitters by controlling RF mute circuits	See VS-TC-HP manual
View Status	View various transmitter parameters (see other View Status options in this table).	3.2.197
View Status - View Alarms	View all active transmitter alarms.	3.2.197
View Status - View Meters	View the levels of various transmitter parameters, including forward power, reflected power, PA voltage, PA current and low level dc supply voltages.	3.2.198
View Status - View Log	View the transmitter's events log, including alarms, commands, etc.	3.2.198
View Status - Clear Log	Clear the transmitter's events log.	
View Status - View SW Versions	View the versions of software installed on the transmitter.	-

Controller UI Screen	Function	See Page
Reset Alarms	Initiate an attempt to reset all alarms controlled by latched protection circuits.	3.2.201
Changeover	For dual exciters, controls the auto exciter transfer function. You can also enable the standby exciter test function (local control only).	3.2.202
System Settings	Edit various transmitter system settings (see other System Settings options in this table).	3.2.204
System Settings - Host Reset	Initiate a reset of the host (SBC).	3.2.205
System Settings - Host Watchdog	Enable, disable or force a reset of the host watchdog feature.	3.2.205
System Settings - Firmware Update	Perform a software upgrade on the transmitter.	3.2.206
System Settings - LCD Settings	Set the front panel display's contrast, backlight and timeout.	3.2.206
System Settings - Exciter TCXO	Calibrate the internal clock to a user supplied external high precision 10 MHz clock reference	3.2.208
System Settings - HD Optimizer	Set parameters for the HD Optimizer feature, which can be used to maximize the efficiency of the transmitter's RF spectrum.	3.2.209
System Settings - HW Config	Configure various system hardware parameters (see other System Settings - HW Config options in this table).	3.2.211
System Settings - HW Config - Installed Exc	Configures the transmitter for single or dual exciter installation.	3.2.212
System Settings - HW Config - Exciter A Modulator	Configures the type of modulator in Exciter A (none, NAPE74 Exgine or NAPI205 USB IQ)	3.2.212
System Settings - HW Config - GV Family	Configures the transmitter family type to match with the installed exciters.	3.2.213
System Settings - HW Config - Power Probe	Configures the type of RF Power Probe version used.	3.2.214
System Settings - HW Config - Enable Door Alarm	Enables the Door Open Alarm.	3.2.214
System Settings - HW Config - LVPS Hardware	Configures the transmitter for single or redundant LVPS installation.	3.2.215
System Settings - HW Config - LVPS Voltage	Set the normal-state level of the low voltage power supply.	3.2.215

Controller UI Screen	Function	See Page
System Settings - HW Config - Fan Speed	Set the normal-state speed of the transmitter's cooling fans.	3.2.216
System Settings - HW Config - UPS Installed	Set the transmitter for UPS operation.	3.2.217
System Settings - HW Config - Audio Processor	Set audio processor to none or Orban Inside.	-
System Settings - FM Polarity	Set the polarity for FM deviation; positive modulation signal yields positive frequency deviation or negative modulating signal yields positive frequency deviation.	3.2.217
System Settings - Factory Settings	Sets critical thresholds, calibration values and operating values for key transmitter parameters. These settings are established at the factory and do not normally require user adjustment (see other System Settings - Factory Settings options in this table).	3.2.218
System Settings - Factory Settings - Thresholds	Set protection thresholds for various parameters (e.g., SWR shutback, high/low exciter PA power, low/very low forward power, etc.).	3.2.219
System Settings - Factory Settings - Calibration	Set calibration values or run calibration routines for various parameters (e.g., forward/reflected power, program input levels, etc.).	3.2.220
System Settings - Factory Settings - Exciter PA Power	Set the normal operating power level for the active exciter, in FM mode.	3.2.222
System Settings - Factory Settings - Exciter HD PA V	Set the HD exciter's PA voltage.	3.2.222
Remote I/O	Configure the remote inputs, remote outputs and analog outputs for the transmitter.	3.2.223
Orban Audio Processor	Configure, enable and operate the optional Orban audio processor after it is installed in your transmitter.	3.2.227
Configuring the Transmitter for the Orban Audio Processor	Configures the transmitter for use with the Orban Audio Processor.	3.2.227
Enabling the Orban Audio Processor for Preset Selection	Enable the Orban audio processor to allow preset selection using either the controller UI or the AUI.	3.2.228
Selecting an Orban Audio Processor Preset	Select an Orban audio processor preset using either the AUI or the controller UI.	3.2.231

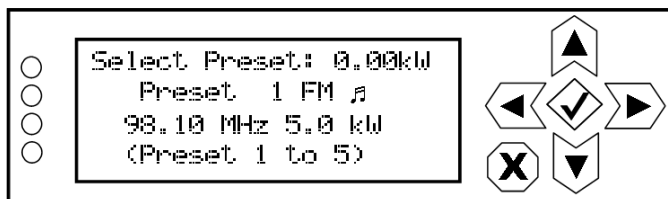
Select Preset

The **Presets** page allows users with the appropriate permissions to view operational data (power level, frequency, mode, program input characteristics), plus create and control preset settings. Users can create up to 62 presets or edit existing presets. To view the **Presets** page, select **Presets** in the **Menu** page.

Selecting the Active Preset

When you choose **Select Preset** from the **Main Menu** (see [Figure 3.2.111](#)) you can select the active preset for transmitter operation.

Figure 3.2.111: Select Preset screen



Use the up and down buttons to scroll through the existing presets. Press the accept (checkmark) button to enable the preset as the transmitter's active preset. Press the cancel (X) button to return to the previous menu.

User Settings

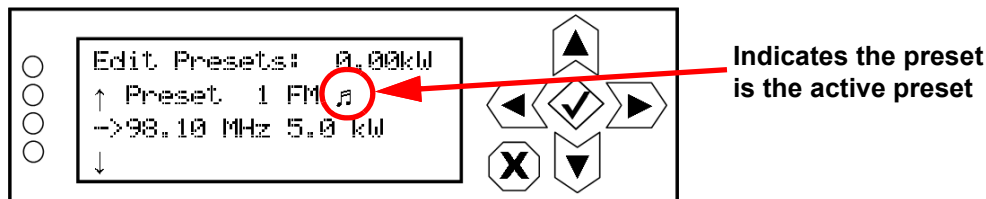
You can establish various user settings for the GV2-5/GV2-3.5 using the controller's UI. Several User Settings were described previously in this section (e.g., Edit Presets, Set Clock, Network Settings, etc.). The following additional options are available:

- Edit Presets: see [Edit Presets, on page 3.2.163](#)
- Set Clock: see [Setting the Clock, on page 3.2.186](#)
- Network Settings: see [Network Setup, on page 3.2.186](#)
- Pilot Sample: see [Setting Pilot Sample Level, on page 3.2.189](#)
- Signal Gen: [Configure Test Signal Generator, on page 3.2.190](#)
- Ext. 10 MHz Input: see [External 10 MHz Input, on page 3.2.192](#)
- Scheduler: see [Enabling the Scheduler, on page 3.2.192](#)
- FM Mask: [Selecting FM Mask, on page 3.2.193](#)
- Audio Low: see [Setting User Thresholds, on page 3.2.194](#)
- Turn-on Delay: [Turn-On Delay Setting, on page 3.2.195](#)
- Ramp-up Speed: [Ramp-Up Speed Setting, on page 3.2.196](#)

Edit Presets

When you select **User Settings -> Edit Presets** from the **Main Menu** (see [Figure 3.2.112](#)) you can create up to 63 operating presets or edit existing presets.

Figure 3.2.112: Edit Preset screen



Use the up and down buttons to scroll through the existing presets, or scroll to the bottom of the list to **Create New Preset** (see [Figure 3.2.113](#)). Press the accept (checkmark) button to enter the editing menu for that preset (see [Figure 3.2.114](#)). Press the cancel (X) button to return to the previous menu. When you create a new preset, the next available preset number is assigned (e.g., Preset 5).

Figure 3.2.113: Create New Preset screen

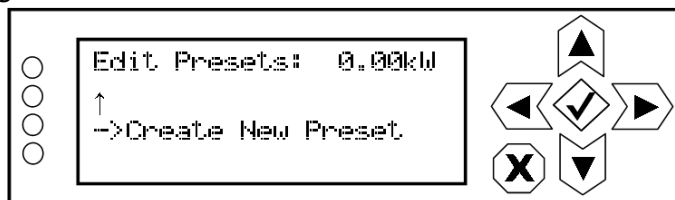
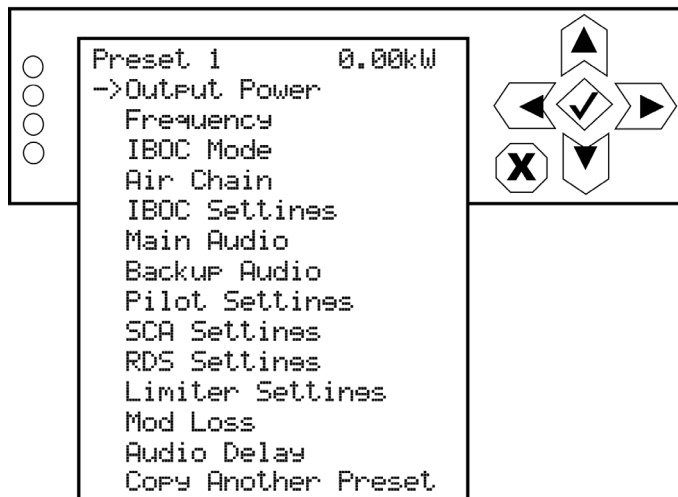


Figure 3.2.114: Preset Editing menu



Within the Preset Editing menu, use the up and down buttons to scroll through the options and press the accept (checkmark) button to enter the selected editing menu/screen. Press the cancel (X) button to return to the previous menu. Parameters that can be edited are:

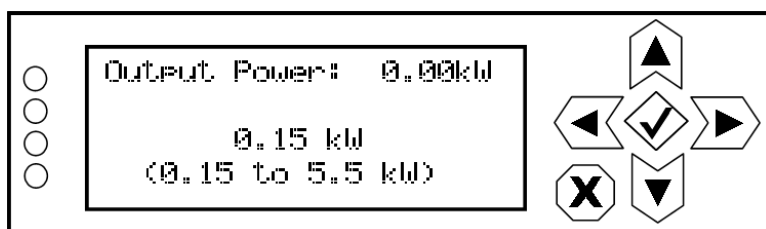
Output Power

Output power limits are a function of the transmitter mode of operation. See Table 1-1 of the Pre-Installation Manual for RF output power ratings. The following exceptions apply:

- For hybrid (FM+HD) mode, the maximum power setpoint is 5% (1.05 times) higher than the rated value shown for "Analog Power MP3" in Table 1-1 of the Pre-Installation Manual for a specific injection level. For example, when operating in FM+HD mode with a -20 dB injection level, you can set to a maximum power level of 5.25 kW (for GV5) or 3.94 kW (for GV3.5).

See [Figure 3.2.115](#). Use the up and down buttons to edit the output power (in 50 W increments, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.

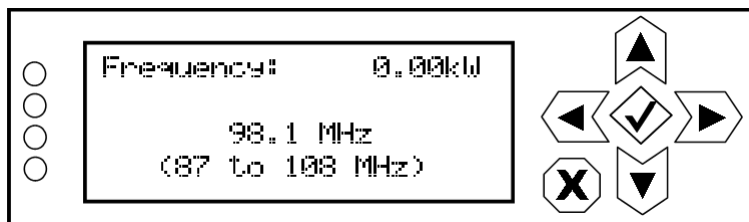
Figure 3.2.115: Output Power screen



Frequency

See [Figure 3.2.116](#). Use the up and down buttons to edit the carrier frequency (in 0.01 MHz increments, then press the accept (checkmark) button to save the change. Press the cancel (X) button to return to the previous menu.

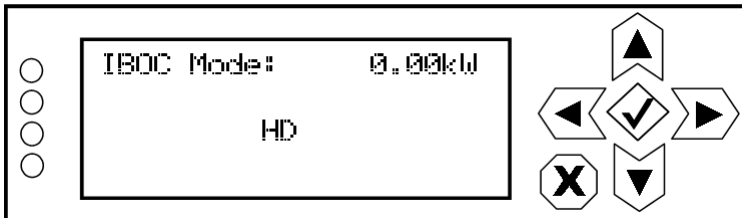
Figure 3.2.116: Frequency screen



IBOC Mode

See [Figure 3.2.117](#). Use the up and down buttons to select the overall transmission mode, noting the options below, then press the accept (checkmark) button to save the change. Press the cancel (X) button to return to the previous menu.

Figure 3.2.117: IBOC Mode screen



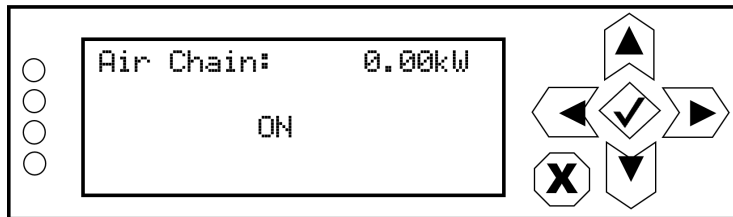
IBOC mode options include:

- ❖ FM: an analogue only mode, transmits a carrier, frequency modulated with audio.
- ❖ HD: all digital mode; this mode transmits the upper and lower digital sidebands of OFDM IBOC carriers. HD transmitter is typically high-level combined (coupler or spatial) with a paired FM only transmitter. See [IBOC Settings, on page 3.2.166](#) for additional calibration settings. This mode requires additional hardware.
- ❖ FM+HD: also known as hybrid/simulcast or low-level combined, this mode transmits the analog carrier (FM modulated) and the upper and lower digital sidebands of OFDM IBOC carriers. See [IBOC Settings, on page 3.2.166](#) for additional calibration settings. This mode requires additional hardware.
- ❖ DRM+: transmits a DRM OFDM signal using the I/Q stream from a DRM modulator connected to the desired AES input. See [IBOC Settings, on page 3.2.166](#) for additional calibration settings. This mode requires additional hardware.

Air Chain

See [Figure 3.2.118](#). Use the up or down arrow to toggle between **ON** (enable the preset for Air Chain) and **OFF** (disables the preset Air Chain), then press the accept (checkmark) button to save the change. Press cancel (X) to discard changes and return to the previous menu. This menu is consistent with the behavior of the AUI's General page's setting for Air Chain.

Figure 3.2.118: Air Chain menu



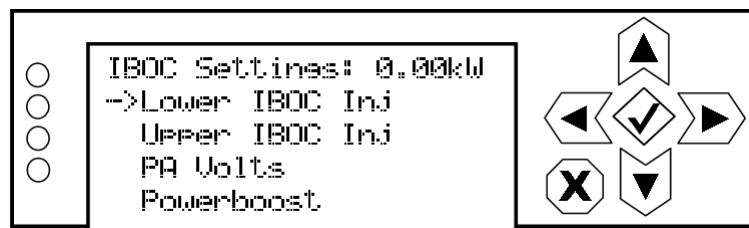
When enabled (ON), the controller and exciter treat the preset as an Air Chain preset and use the vEngine/vPorter path for HD content. A number of unrelated preset fields are hidden/ignored (both in the AUI and controller UI) to avoid confusion.

When disabled (OFF), the preset has no Air Chain options and behaves with all legacy preset controls visible.

IBOC Settings

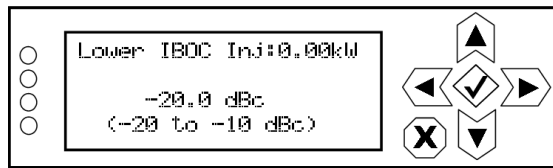
See [Figure 3.2.119](#). When you select **IBOC Settings** from the **Preset** editing options screen, you can edit various IBOC parameters

Figure 3.2.119: IBOC Settings menu

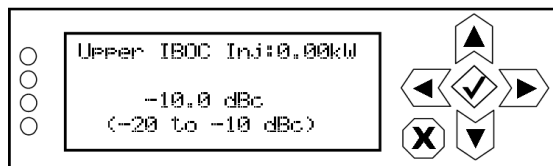


Use the up and down buttons to scroll through the IBOC settings options, then press the accept (checkmark) or right arrow button to enter the selected editing screen. [Figure 3.2.120 on page 3.2.167](#) shows the editing screens for the **IBOC Settings** menu. Press the cancel (X) button to discard changes and return to the previous menu.

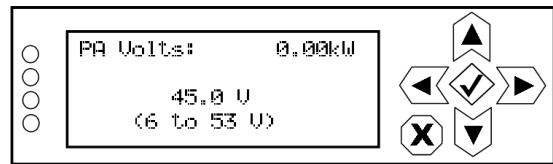
Figure 3.2.120: IBOC Settings editing screens



For FM+HD and HD modes, use the up and down buttons to select a value between -20 and -10 dB for the IBOC injection level of the lower sideband of digital carriers. This value determines the relationship between the digital carriers power and the analog carrier power. Example: -20 dBc indicates that the total RMS power of the digital carriers will be 1% of the total RMS power of the analog carrier. -10 dB indicates that the total RMS power of the digital carriers will be 10% of the total RMS power of the analog carrier.

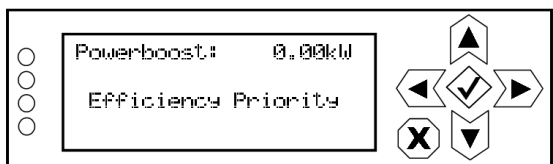


For FM+HD and HD modes, use the up and down buttons to select a value between -20 and -10 dB for the IBOC injection level of the upper sideband of digital carriers. This value determines the relationship between the digital carriers power and the analog carrier power. Example: -20 dBc indicates that the total RMS power of the digital carriers will be 1% of the total RMS power of the analog carrier. -10 dB indicates that the total RMS power of the digital carriers will be 10% of the total RMS power of the analog carrier.



NOTE: The preferred option to maximize IBOC performance is by using the HD Optimizer feature (see [HD Optimizer, on page 3.2.209](#)). In this case, leave PA Volts setting at its default value (53.0 V).

For FM+HD, HD and DRM+ modes, use the up and down buttons to enter a value between 30.0 V and 53.0 V. This value sets the drain voltage applied to the PAs in the RF power modules, from their associated power supplies. This value affects IBOC/DRM+ performance. Larger values result in an improved spectrum, but decreased efficiency. Conversely, smaller values result in improved efficiency, but degrade the spectrum. Typical values are between 35 V and 50 V, and depend on many variables such as power level, frequency and injection level.



For FM+HD mode only. Use the up and down buttons to toggle between Efficiency Priority (default setting) and MAX MER Priority. Selecting Efficiency Priority instructs the PowerBoost function to make efficiency and power capability the priority when reducing the peak-to-average power ratio, while ensuring that the MER (modulation error ratio) of the transmitted HD signal meets transmission requirements.

Selecting MAX MER Priority instructs the PowerBoost function to make maximum MER the priority. Transmitter efficiency and power capability will be reduced as a result.

PowerBoost is only available in transmitters with the appropriate exciter configuration.

Main Audio

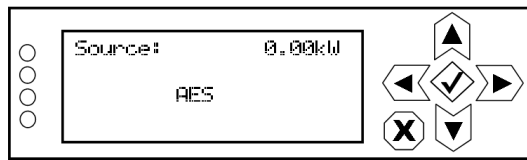
When you select **Main Audio** from the **Preset** editing options screen, you can edit various main audio parameters (see [Figure 3.2.121](#)).

Figure 3.2.121: Main Audio menu

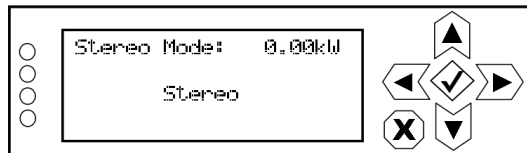


Use the up and down buttons to scroll through the main audio menu options, then press the accept (checkmark) or right arrow button to enter the selected editing screen. [Figure 3.2.122 on page 3.2.169](#) shows the editing screens for the **Main Audio** menu. Press the cancel (X) button to discard changes and return to the previous menu.

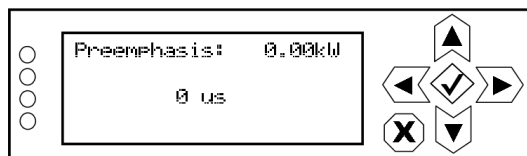
Figure 3.2.122: Main Audio editing screens



Use the up and down buttons to locate the desired audio source - **MPX, Analog L/R, MPX Over AES, Audio Player -> AES 2, Audio Player -> AES 1, AES 2 or AES 1**, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.



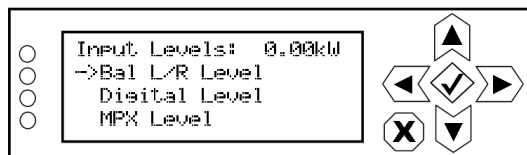
Use the up and down buttons to locate the desired stereo mode - **Stereo, Right Mono, Left Mono or L+R Mono** then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.



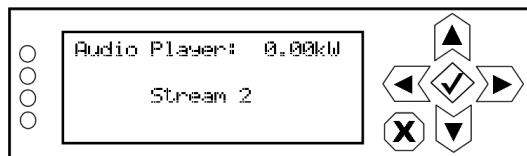
Use the up and down buttons to locate the desired preemphasis characteristic - **0 us, 25 us, 50 us or 75 us**, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.



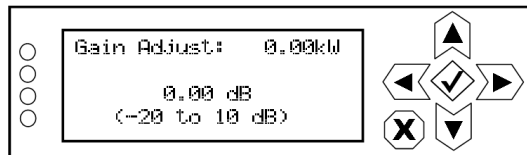
Use the up and down buttons to toggle between **ON or OFF**, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default setting is OFF.



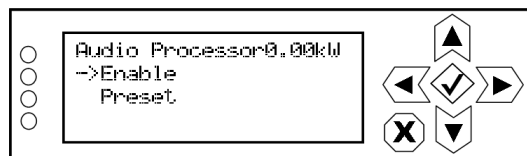
Use the up and down buttons to move the cursor to the desired audio input and then press the right button to enable editing of the parameter. [Figure 3.2.123 on page 3.2.170](#) shows all the editing screens for the **Input Levels** sub-menu. Within any of the editing screens, use the up and down buttons to edit a parameter value, noting the minimum and maximum limitations indicated at the bottom of the display. When complete, press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.



Use the up and down buttons to select **File Playlist or Stream 1 through Stream 255**, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.

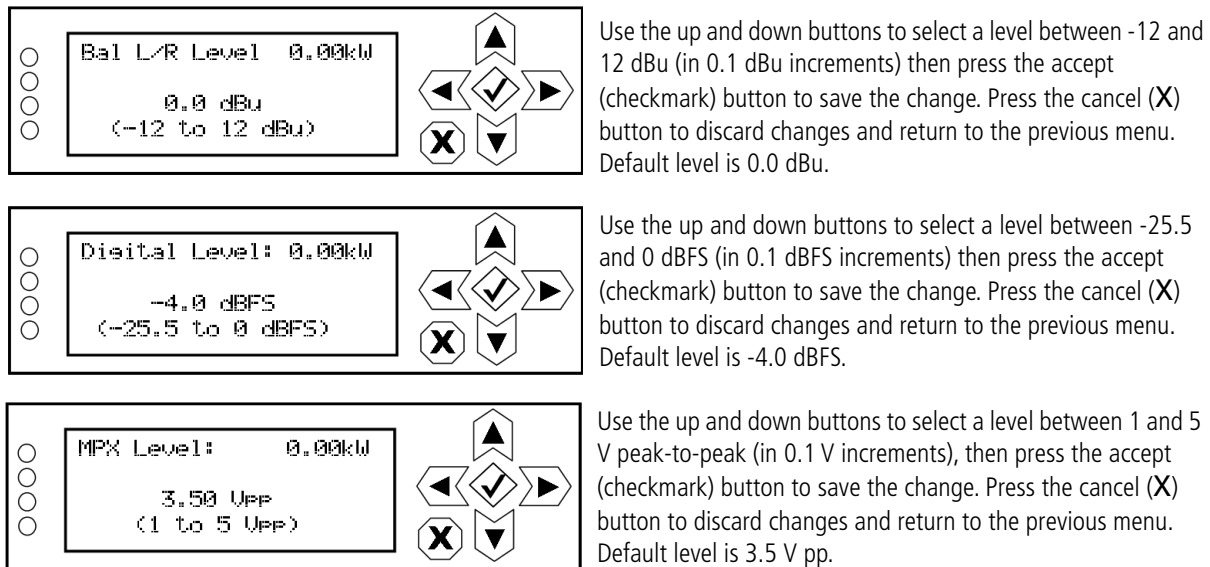


Use the up and down buttons to select again adjust level between -20 and 10 dB (in 0.01 dB increments), then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.



Use the up and down buttons to move the cursor to the desired sub-menu (Enable or Preset) and then press the right button to enable editing within the sub-menu. See [Urban Audio Processor, on page 3.2.227](#) for more details. Press the cancel (X) button to discard changes and return to the previous menu.

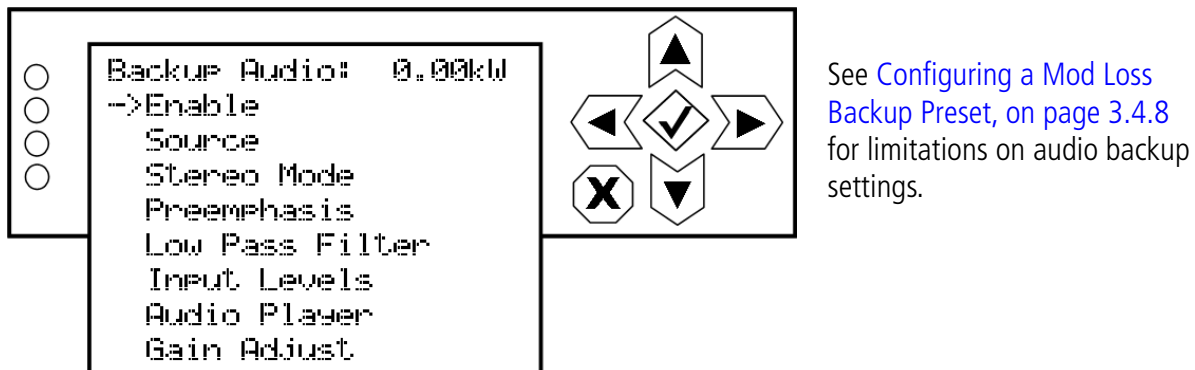
Figure 3.2.123: Input Levels editing screens



Backup Audio

When you select **Backup Audio** from the **Preset** editing options screen, you can enable a backup audio source and edit various backup audio parameters (see [Figure 3.2.124](#)).

Figure 3.2.124: Backup Audio menu

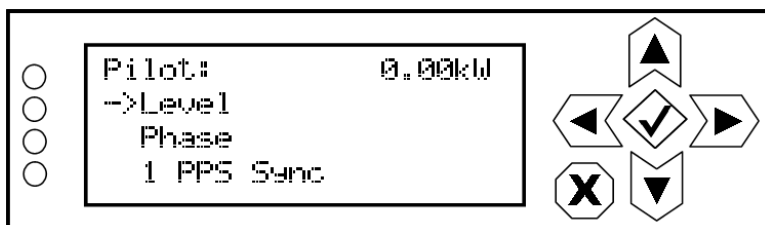


Use the up and down buttons to scroll through the backup audio menu options, then press the accept (checkmark) or right arrow button to enter the selected editing screen. With the exception of the **Enable** screen (select ON to enable, OFF to disable), the editing screens for the **Backup Audio** menu are the same as the **Main Audio** menu (see [Figure 3.2.122 on page 3.2.169](#)). Press the cancel (X) button to discard changes and return to the previous menu.

Pilot Settings

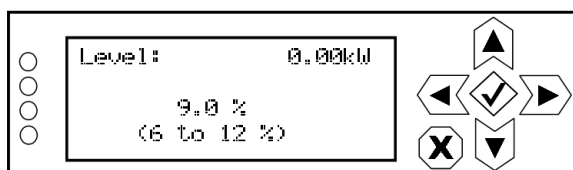
When you select **Pilot Settings** from the **Preset** editing options screen, you can edit the settings of the pilot signal (see [Figure 3.2.125](#)).

Figure 3.2.125: Pilot Settings menu

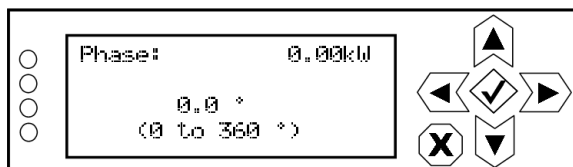


Use the up and down buttons to move the cursor to the desired pilot setting and then press the right button to enable editing of the parameter. [Figure 3.2.126](#) shows all the editing screens for the **Pilot Settings** menu. Within any of the editing screens, use the up and down buttons to edit or toggle a parameter value, noting the minimum and maximum limitations indicated at the bottom of the display. When complete, press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.

Figure 3.2.126: Pilot Settings editing screens



Use the up and down buttons to select a level between 6 and 12% (in 0.1% increments), then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default level is 9%.



Use the up and down buttons to select a phase angle between 0 and 360 degrees (in 0.1 degree increments), then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default level is 0.0 degrees.

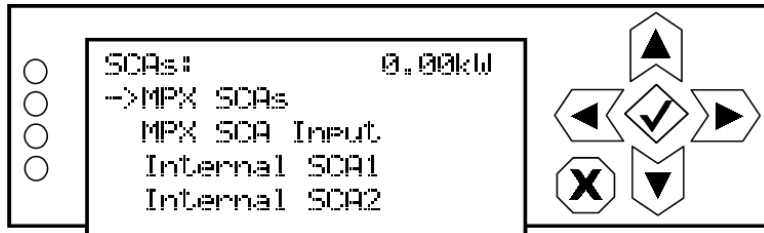


Use the up and down buttons to select ON or OFF, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default setting is OFF.

SCA Settings

When you select **SCA Settings** from the **Preset** editing options screen, you can edit various SCA parameters (see [Figure 3.2.127](#)). The SCA menu is not available for Air Chain presets.

Figure 3.2.127: SCA Settings menu



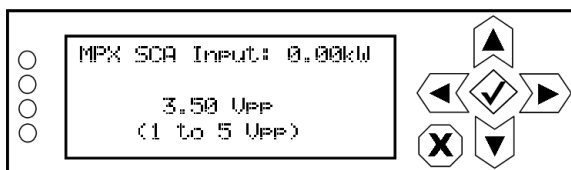
Use the up and down buttons to move the cursor to the desired SCA setting and then press the right button to enable editing of the parameter. [Figure 3.2.128](#) shows the editing screens for the **SCA Settings** menu. Within any of the editing screens, use the up and down buttons to edit or toggle a parameter value, noting the minimum and maximum limitations indicated at the bottom of the display. When complete, press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.

If you select Internal SCA1 or Internal SCA2, there is a sub-menu that contains additional SCA settings (see [Figure 3.2.129 on page 3.2.173](#)).

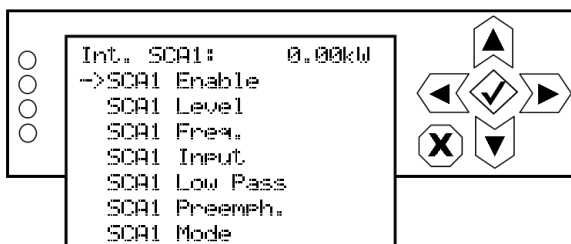
Figure 3.2.128: SCA Settings editing screens



Use the up and down buttons to select ON or OFF, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default setting is OFF.



Use the up and down buttons to select a level between 1 and 5 V peak-to-peak (in 0.01 V increments), then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.



Use the up and down buttons to select the desired parameter for editing. See [Figure 3.2.129 on page 3.2.173](#) for more details. Press the accept (checkmark) button to enter the sub-menu for that parameter. Press the cancel (X) button to return to the previous menu.

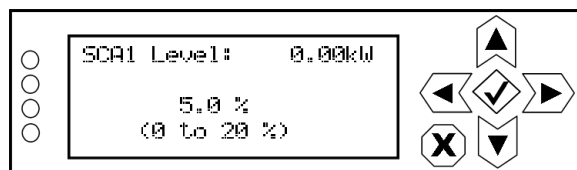
Figure 3.2.129: Internal SCA1 and SCA2 editing screens



SCA1 Enable: 0.00kW
OFF

Navigation buttons: Up, Down, Left, Right, Checkmark, Cancel (X).

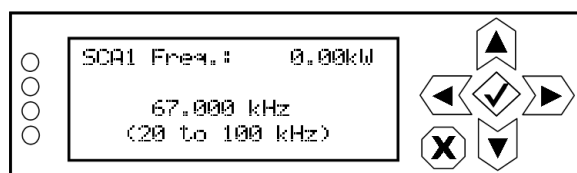
Use the up and down buttons to select ON or OFF, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default setting is OFF.



SCA1 Level: 0.00kW
5.0 %
(0 to 20 %)

Navigation buttons: Up, Down, Left, Right, Checkmark, Cancel (X).

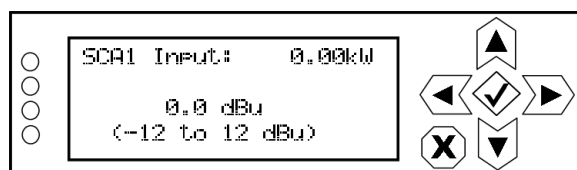
Use the up and down buttons to select a level between 0 and 20%, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default level is 5.0%.



SCA1 Freq.: 0.00kW
67.000 kHz
(20 to 100 kHz)

Navigation buttons: Up, Down, Left, Right, Checkmark, Cancel (X).

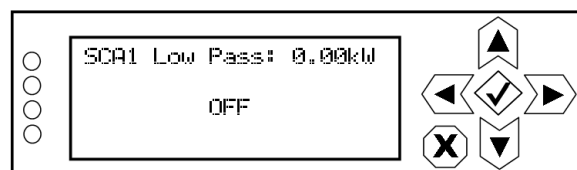
Use the up and down buttons to select a frequency between 20 and 100 kHz, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default level is 67 kHz; typical



SCA1 Input: 0.00kW
0.0 dBu
(-12 to 12 dBu)

Navigation buttons: Up, Down, Left, Right, Checkmark, Cancel (X).

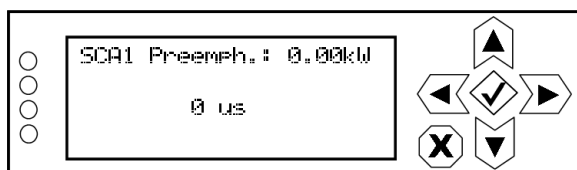
Use the up and down buttons to select a level between -12 and 12 dBu, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default level is 0 dBu.



SCA1 Low Pass: 0.00kW
OFF

Navigation buttons: Up, Down, Left, Right, Checkmark, Cancel (X).

Use the up and down buttons to select ON or OFF, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default setting is OFF.



SCA1 Preemph.: 0.00kW
0 us

Navigation buttons: Up, Down, Left, Right, Checkmark, Cancel (X).

Use the up and down buttons to select a pre-emphasis of 0 us, 50 us, 75 us or 150 us, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default level



SCA1 Mode: 0.00kW
FM

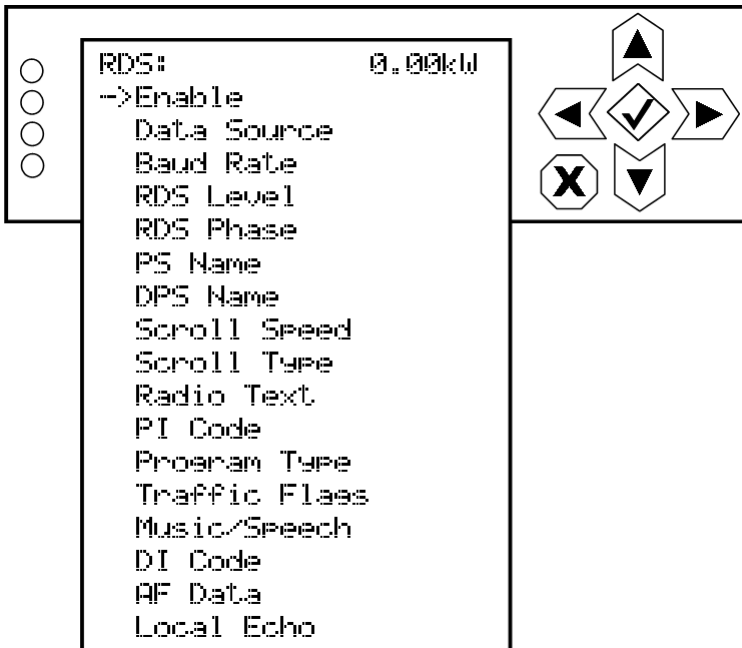
Navigation buttons: Up, Down, Left, Right, Checkmark, Cancel (X).

Use the up and down buttons to select FM or DSB-SC, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default setting is FM.

RDS Settings

When you select **RDS Settings** from the **Preset** editing options screen, you can edit various RDS parameters (see [Figure 3.2.130](#)). The RDS menu is not available for Air Chain presets.

Figure 3.2.130: RDS Settings menu



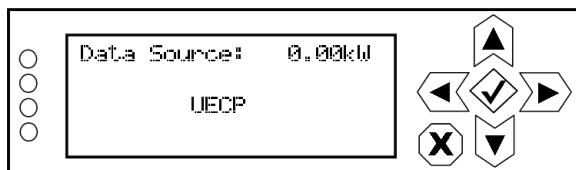
Use the up and down buttons to move the cursor to the desired RDS setting and then press the right button to enable editing of the parameter. [Figure 3.2.131 on page 3.2.175](#) and [Figure 3.2.132 on page 3.2.176](#) show all the editing screens for the **RDS Settings** menu. Within any of the editing screens, use the arrow buttons to edit or toggle a parameter value, noting the minimum and maximum limitations indicated at the bottom of the display (as applicable). When complete, press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.

If you select **DI Code** (see [Figure 3.2.133 on page 3.2.177](#)) or **AF Data** (see [Figure 3.2.135 on page 3.2.178](#)), there are associated sub-menus that contain additional setting options.

Figure 3.2.131: RDS Settings editing screens (1 of 3)



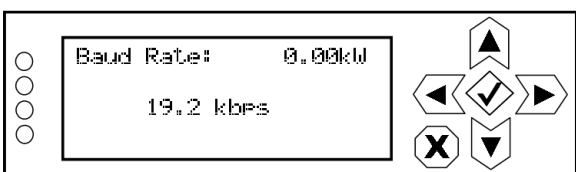
Use the up and down buttons to select ON or OFF, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default setting is OFF.



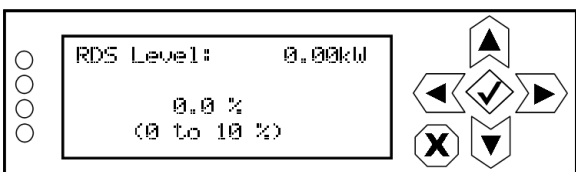
Use the up and down buttons to select Select Internal, ASCII, Ext. UECP, ASCII Over IP, or UECP Over IP, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default setting is UECP.

NOTE: For an ASCII Over IP data source, RDS information should be sent to the IP address of the GV2-5/GV2-3.5, port 7005.

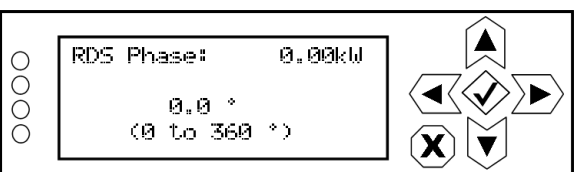
NOTE: For title/artist functionality, the GV2-5/GV2-3.5 supports the radiotext (RT) data type, using the UECP or Ext. ASCII data source.



Use the up and down buttons to select Select 150 bps, 300 bps, 600 bps, 1.2 kbps, 2.4 kbps, 4.8 kbps, 9.6 kbps, 19.2 kbps, 38.4 kbps, 57.6 kbps or 115.2 kbps, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default baud rate is 19.2 kbps.



Use the up and down buttons to select a level between 0 and 10% (in 0.1% increments), then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default level is 0.0%.



Use the up and down buttons to select a phase angle between 0 and 360 degrees (in 0.1 degree increments), then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default level is 0.0 degrees.

Figure 3.2.132: RDS Settings editing screens (2 of 3)

Enter an 8-character name. Use the right and left arrows to move the cursor to the desired character. Use the up and down arrows to edit the character, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.

Enter a name. Use the right and left arrows to move the cursor to the desired character. Use the up and down arrows to edit the character, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.

Use the up and down arrows to select Off, Fast or Slow, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. The default selection is Off.

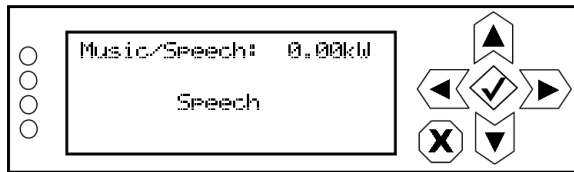
Use the up and down arrows to select Word or Character, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. The default selection is Word.

Enter a name. Use the right and left arrows to move the cursor to the desired character. Use the up and down arrows to edit the character, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.

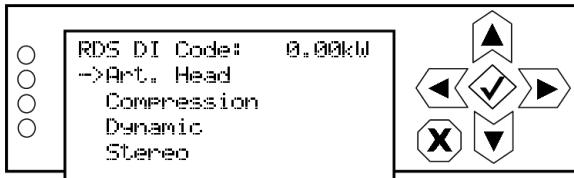
Use the up and down arrows to select a hex value between 0x0000 and 0xFFFF, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. The default hex value is 0x0000.

Use the up and down arrows to select the program type from the various options, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. The default selection is NONE.

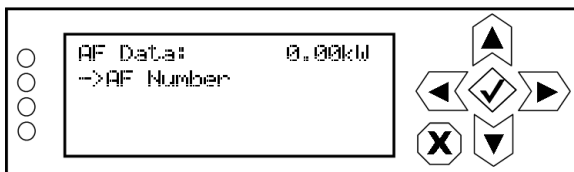
Use the up and down arrows to select None, TA/TP, TP or TA, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. The default selection is NONE.

Figure 3.2.133: RDS Settings editing screens (3 of 3)

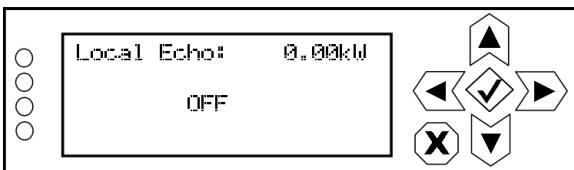
Use the up and down arrows to select Music or Speech, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. The default selection is Speech.



Use the up and down buttons to select the desired parameter for editing. See [Figure 3.2.133 on page 3.2.177](#) for more details. Press the accept (checkmark) button to enter the sub-menu for that parameter. Press the cancel (X) button to return to the previous menu.

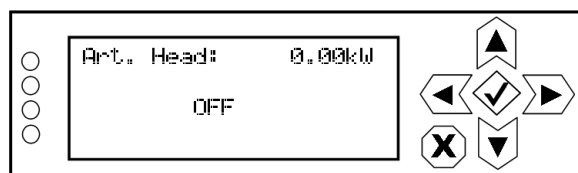


Use the up and down buttons to select AF Number for editing. See [Figure 3.2.135 on page 3.2.178](#) for more details. Press the accept (checkmark) button to enter the sub-menu for that parameter. Press the cancel (X) button to return to the previous menu.



Use the up and down arrows to select ON or OFF, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. The default selection is OFF.

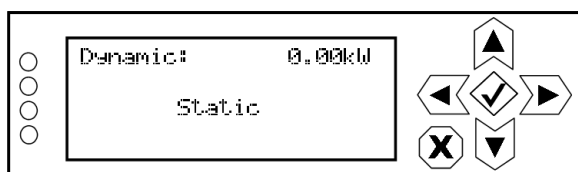
Figure 3.2.134: DI Code editing screens



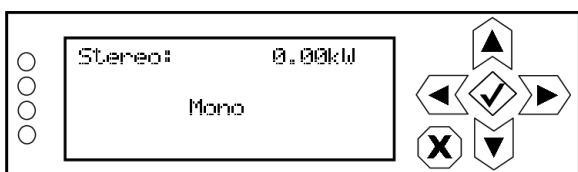
Use the up and down arrows to select ON or OFF, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. The default selection is OFF.



Use the up and down arrows to select ON or OFF, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. The default selection is OFF.

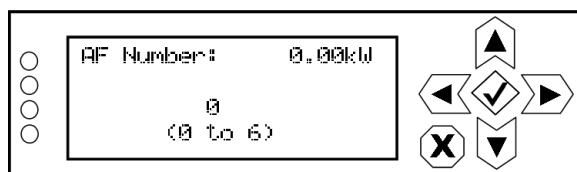


Use the up and down arrows to select Dynamic or Static, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. The default selection is Static.



Use the up and down arrows to select Stereo or Mono, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. The default selection is Mono.

Figure 3.2.135: AF Data editing screen

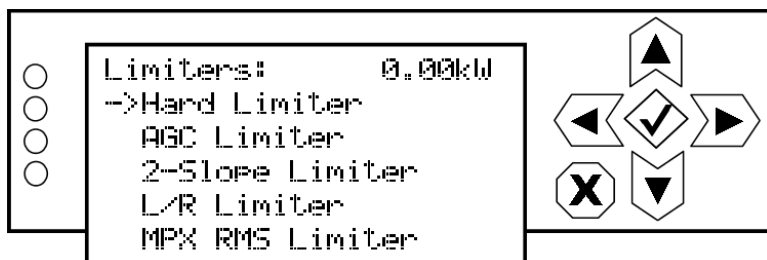


Use the up and down arrows to select the number of alternate frequencies (between 0 and 6), then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. The default number is 0.

Limiter Settings

When you select **Limiter Settings** from the **Preset** editing options screen, you can edit various limiter parameters (see [Figure 3.2.136](#)).

Figure 3.2.136: Limiter Settings menu



Use the up and down buttons to move the cursor to the desired limiter and then press the right button to enter the associated sub-menu for:

- ❖ **Hard Limiter** (see [Figure 3.2.137 on page 3.2.180](#))
- ❖ **AGC Limiter** (see [Figure 3.2.138 on page 3.2.180](#))
- ❖ **2-Slope Limiter** (see [Figure 3.2.139 on page 3.2.181](#))
- ❖ **L/R Limiter** (see [Figure 3.2.140 on page 3.2.182](#))
- ❖ **MPX RMS Limiter** (see [Figure 3.2.141 on page 3.2.183](#))

Within a sub-menu, use the up and down buttons to move the cursor to the desired limiter setting and then press the right button to enter the associated editing screen. Within any of the editing screens, use the arrow buttons to edit or toggle a parameter value, noting the minimum and maximum limitations indicated at the bottom of the display (as applicable). When complete, press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.

Figure 3.2.137: Hard Limiter sub-menu and editing screens

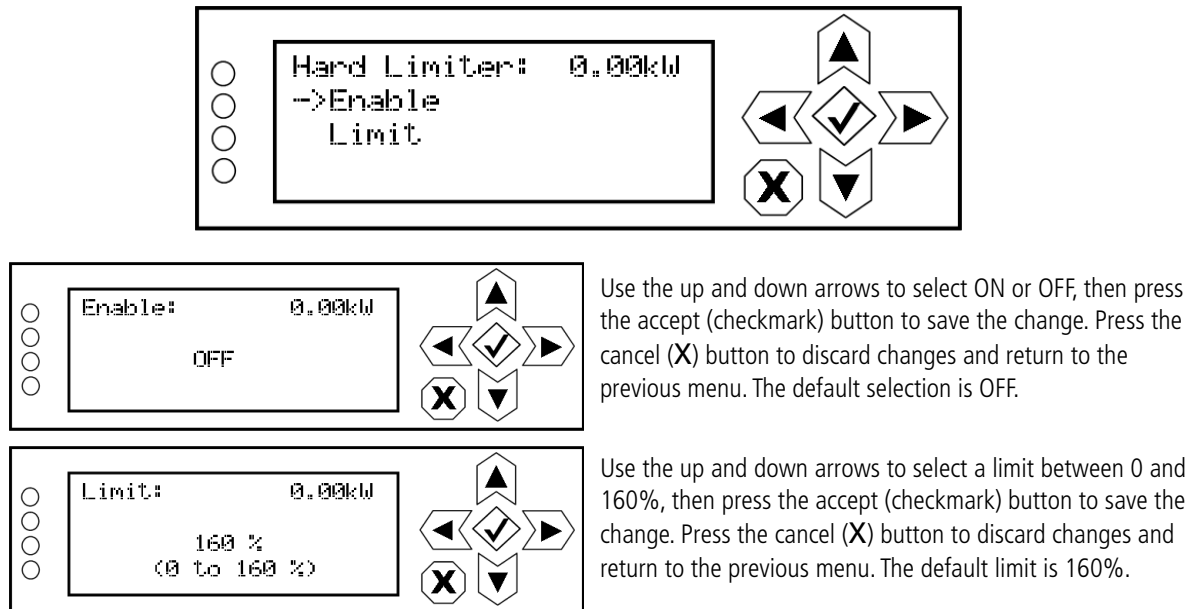


Figure 3.2.138: AGC Limiter sub-menu and editing screens

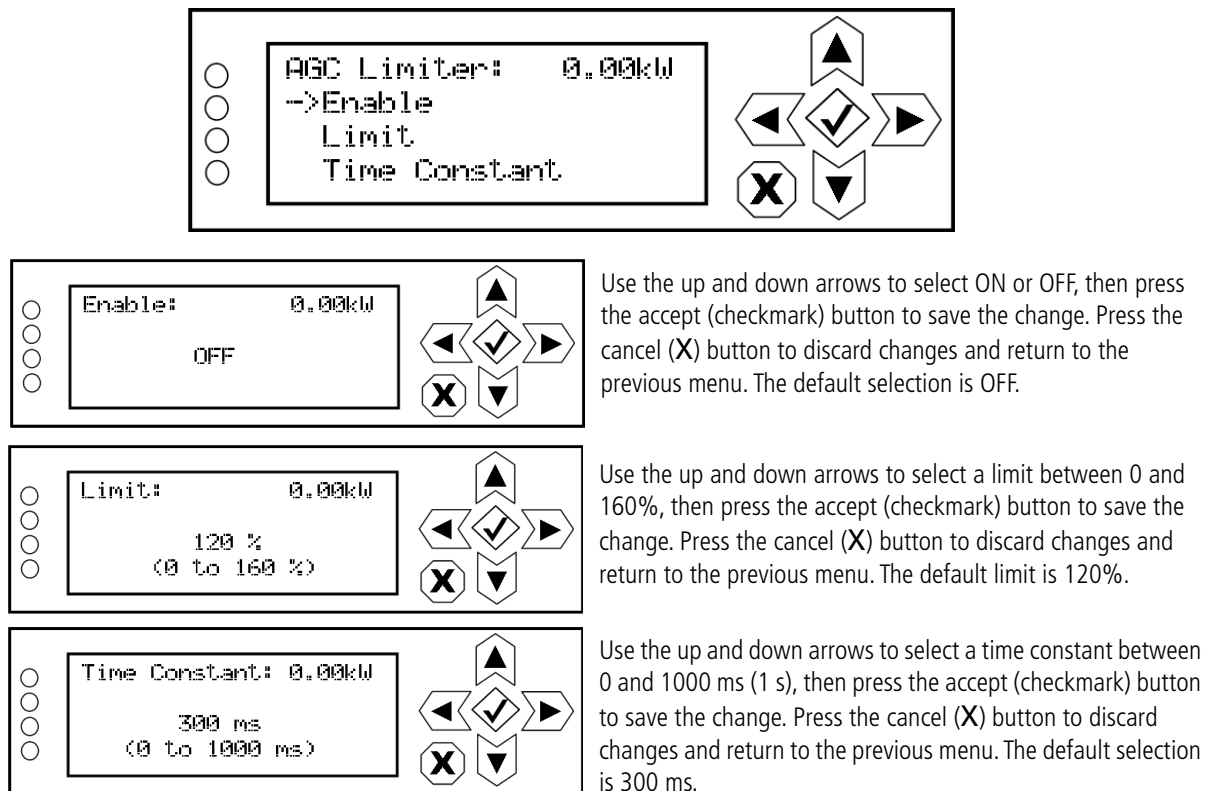


Figure 3.2.139: 2-Slope Limiter sub-menu and editing screens

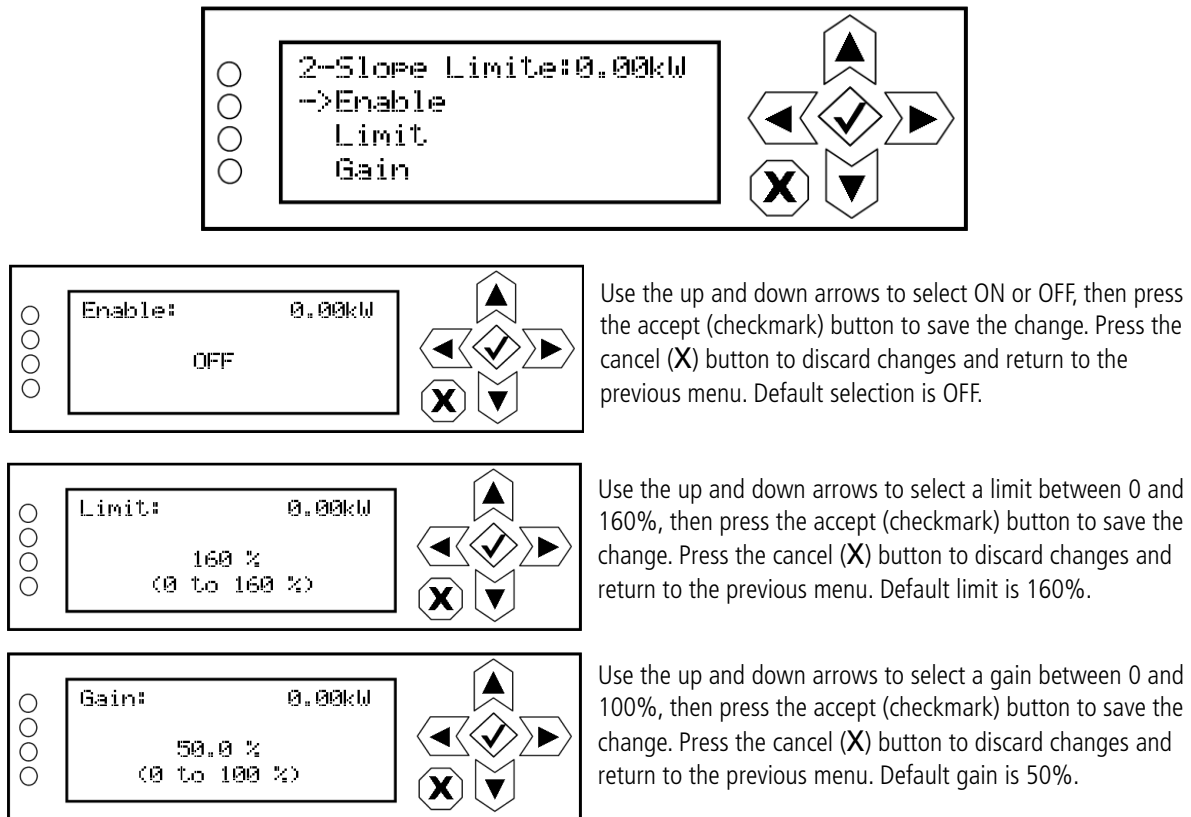


Figure 3.2.140: L/R Limiter sub-menu and editing screens

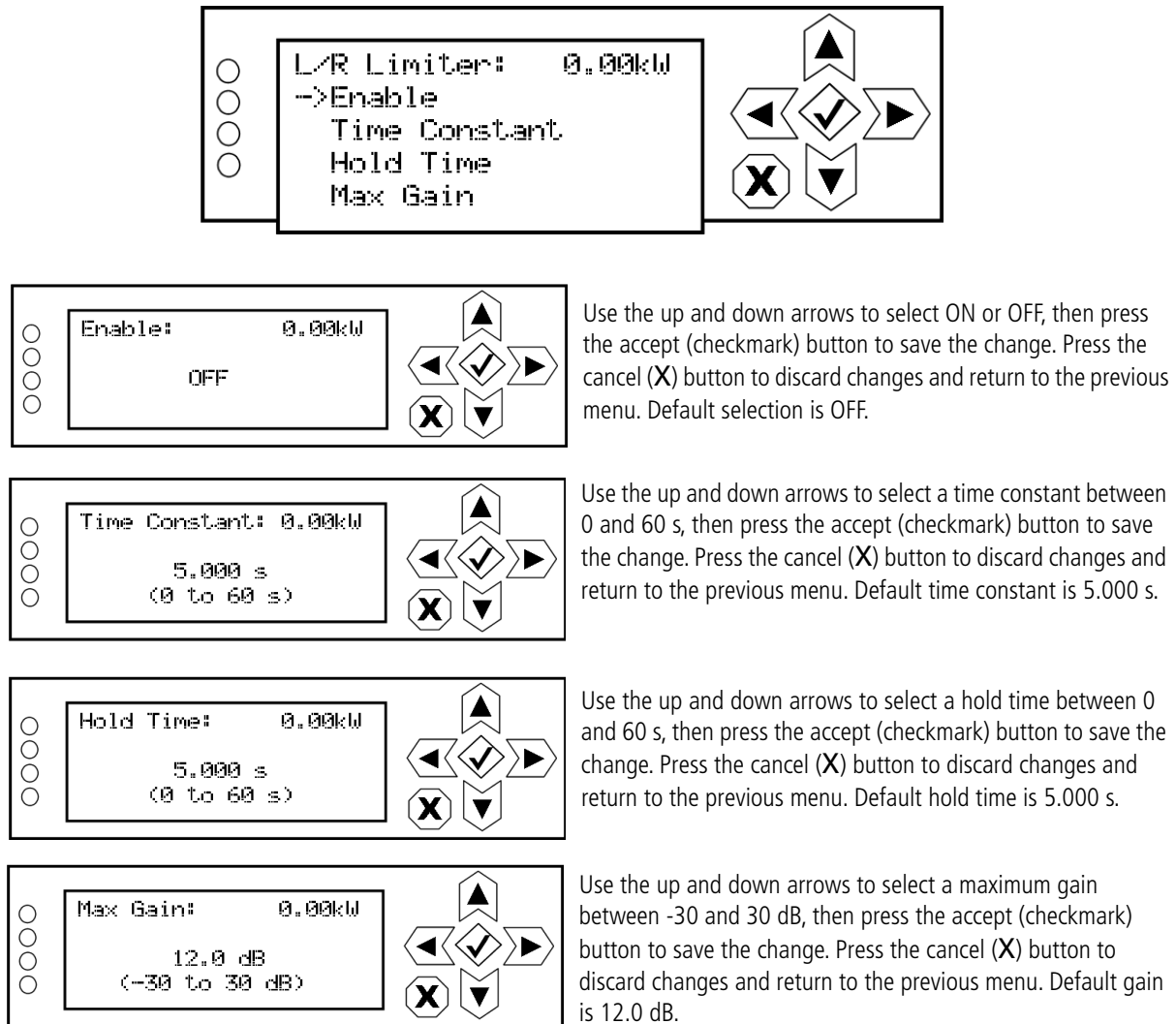
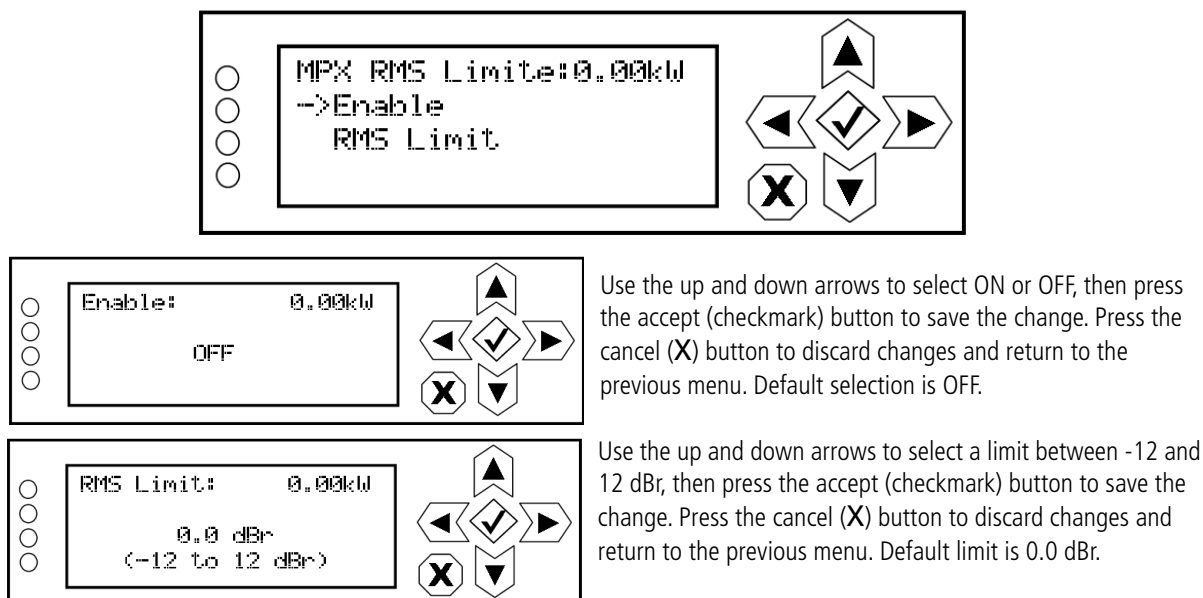


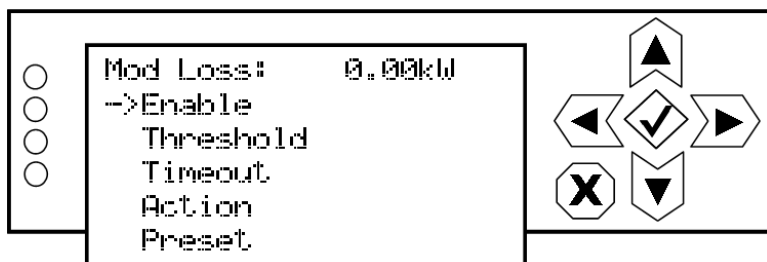
Figure 3.2.141: MPX RMS Limiter sub-menu and editing screens



Mod Loss

When you select **Mod Loss** (modulation loss) from the **Preset** editing options screen, you can edit the parameters related to a loss of modulation (see [Figure 3.2.142](#)).

Figure 3.2.142: Mod Loss menu



Use the up and down buttons to move the cursor to the desired mod (modulation) loss menu item and then press the right button to enable editing of the item. [Figure 3.2.143 on page 3.2.184](#) shows all the editing screens for the **Mod Loss** menu. Within any of the editing screens, use the up and down buttons to edit a parameter value, noting the minimum and maximum limitations indicated at the bottom of the display (as applicable). When complete, press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.

See [Configuring a Mod Loss Backup Preset, on page 3.4.8](#) for detailed instructions.

Figure 3.2.143: Mod Loss editing screens

Determines whether the audio loss feature is used. Use the up and down arrows to select ON (enable) or OFF (disable), then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default selection is OFF.

Sets the modulation threshold below which the transmitter will take action. Use the up and down arrows to select a threshold between 0 and 100% (adjustable in 1% steps), then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default threshold is 0%.

Sets the time period of low modulation (based on the threshold setting) after which the transmitter will take action. Use the up and down arrows to select a value between 0 and 14400 seconds (240 minutes) (in 0.05 s increments), then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default timeout is 0 s.

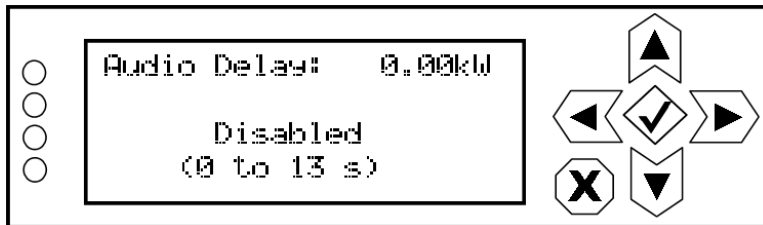
Determines the action taken by the transmitter when the modulation has been below the threshold for the timeout period. Use the up and down arrows to select Alarm Only, Switch Preset or RF Inhibit, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default setting is Alarm Only.

Determines the preset that becomes active after a modulation loss if the mod loss action is set to Switch Preset. Use the up and down arrows to select None Selected or Preset 1 to 62, then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu. Default setting is None Selected.

Audio Delay

When you select **Audio Delay** from the **Preset** editing options screen, you can edit or disable the audio delay period (see [Figure 3.2.144](#)).

Figure 3.2.144: Audio Delay menu

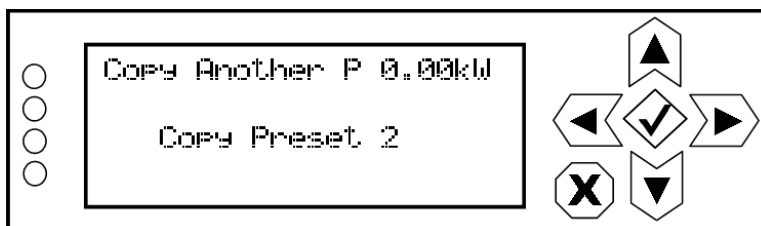


Use the up and down buttons to change the audio delay setting between disabled (= 0 s) and any time period to a maximum of 13 seconds (in 1 us steps), then press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.

Copy Another Preset

When you select **Copy Another Preset** from the **Preset** editing options screen, you can copy the settings from another preset into the preset that is being edited (see [Figure 3.2.145](#)).

Figure 3.2.145: Copy Another Preset Screen

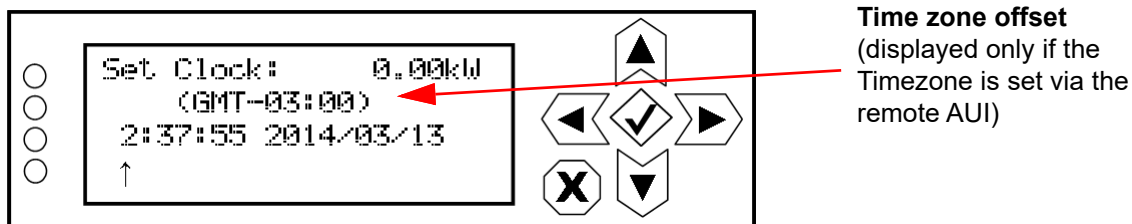


Use the up and down buttons to select the preset that you wish to copy to the selected preset for editing (e.g., Copy Active Preset, Copy Preset 2, etc.) or select Cancel. Press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.

Setting the Clock

When you select **User Settings -> Set Clock** from the **Main Menu** (see [Figure 3.2.146](#)) you can set the current time and date. The time appears on the top line of the top level screen (see [Figure 3.2.108 on page 3.2.154](#)).

Figure 3.2.146: Set Clock screen



To change the time or date, use the right and left arrow buttons to move the cursor to the desired field (hours, minutes, seconds, year, month, day), and use the up and down arrow buttons to increase or decrease the value of the selected field as desired. When complete, press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.

The time zone offset line (e.g., GMT-03:00) appears only if the **Timezone** has been established in the remote AUI's **Time Setup** page.

Network Setup

From the controller's UI, in local mode, you can set or change network settings. To view the **Network Settings** screen, select **User Settings -> Network Settings** from the **Main Menu**. See [Figure 3.2.147 on page 3.2.187](#) for details on setting each parameter.

Use the up and down buttons to move the cursor to the desired parameter and then press the right button to enable editing of the setting. Within any of the editing screens, use the left and right buttons to select a character for editing and then use the up and down buttons to edit a setting. Press the accept (checkmark) button to save the change. Press the cancel (X) button to discard changes and return to the previous menu.

NOTE: A *nameserver* (also called a *DNS*) translates a *host name* (e.g., *mail.nautel.com*) to an *IP address* such as in configuring email (see [Email Server, on page 3.2.105](#)).

If you are using a laptop to connect to the GV2-5/GV2-3.5, see [Connecting a Laptop Directly to the Transmitter, on page 3.2.188](#).

Figure 3.2.147: Network Settings screens

○ ○ ○ ○ Network Settings: 0.00kW
→ MAC Address
DHCP
↓ IP Address

○ ○ ○ ○ MAC Address: 0.00kW
00:50:C2:59:44:1B

○ ○ ○ ○ DHCP: 0.00kW
ON

○ ○ ○ ○ IP Address: 0.00kW
10. 0.128. 21
↑

○ ○ ○ ○ Netmask: 0.00kW
255.255.255. 0
↑

○ ○ ○ ○ Gateway: 0.00kW
10. 0.128.254
↑

○ ○ ○ ○ Nameserver 1: 0.00kW
0. 0. 0. 0
↑

○ ○ ○ ○ Server Port: 0.00kW
Changes will reboot
3501
(1024 to 65535)

○ ○ ○ ○ NTP Sync: 0.00kW
OFF

All addresses shown are for reference purposes only

Displays a number that serves as unique network adapter identifier. This is set by the manufacturer and is displayed for informational purposes only (cannot be user set). It may be necessary to use this number to allow the AUI to access your network.

Set to ON to automatically assign the IP Address, Netmask, Gateway, Nameserver 1 and Nameserver 2 by the access point (i.e., a router) or set to OFF to manually assign. In either case, the access point must be configured with the correct settings, which match the settings on the AUI in order for the AUI to access the network.

Displays a unique numerical network identifier for the transmitter. If DHCP was set to OFF, specify the IP address. Consult with your network administrator.

Masks an IP address, and divides the IP address into network address and host address. If DHCP was set to OFF, specify netmask. Typical netmask address shown. Consult with your network administrator.

Defines the address of the network access point. If DHCP was set to OFF, specify the gateway address. Consult with your network administrator.

Address that identifies the DNS host. The DNS (Domain Name System) translates internet domain and host names to IP addresses. DNS automatically converts the name typed into a web browser address bar to the IP addresses of web servers hosting those sites. If DHCP is set to OFF, specify the address.

Used to identify the senders and receivers of messages. Also supports port forwarding (remapping) which allows the AUI of multiple transmitters to be accessed on the same network. See your network router documentation for additional remapping information and instructions. NOTE: Changes to this port are reset to 3501 after a software upgrade; reconfigured the port, as required, after an upgrade.

NTP = Network Time Protocol.

Set to ON to allow the network to synchronize to the transmitter time. Set to OFF to use the transmitter's internal time reference.

Connecting a Laptop Directly to the Transmitter

If connecting to the GV2-5/GV2-3.5 directly with a laptop, you must set a static IP address on the GV2-5/GV2-3.5 and your laptop.

1. From the controller UI's **Main Menu**, go to **User Settings -> Network Settings** and set the IP address as follows:
 - ❖ DHCP: OFF
 - ❖ IP Address: 10.10.10.2
 - ❖ Netmask: 255.255.255.0

2. Set the transmitter for **Remote** control.

NOTE: *The following steps assume the operating system is Windows XP. Adapt as required for computers with different operating systems.*

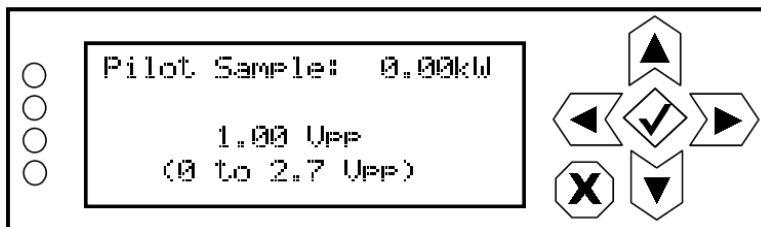
3. On the laptop, go to **Start Menu/Control Panel/Network Connections/Local Area Network**.
4. In the Local Area Network Status, open the **General** tab and choose **Properties**. Scroll down and highlight **Internet Protocol (TCP/IP)**. Choose **Properties**.
5. In the Internet Protocol (TCP/IP) Properties window, select **Use the following IP address**.
6. Enter the following settings:
 - ❖ IP Address: 10.10.10.1
 - ❖ Subnet Mask: 255.255.255.0
 - ❖ Default Gateway: 192.168.1.2
7. In the Internet Protocol (TCP/IP) Properties window, select **OK**.
8. In the Local Area Connection Properties window, select **OK**.
9. In the Local Area Connection Status window, select **Close**.
10. Close the Network Connections window.
11. Enter the IP address (10.10.10.2) into a web browser's address bar to connect to the transmitter's remote AUI.

Setting Pilot Sample Level

NOTE: Setting the pilot sample is only available using the controller UI.

From the controller front panel UI, you can set the level of the pilot sample that is applied to the PILOT SAMPLE OUT (A1J4A) BNC connector on the rear of the controller (A4). To view the Pilot Sample screen, select User Settings -> Pilot Sample from the Main Menu (see [Figure 3.2.148](#)).

Figure 3.2.148: Pilot Sample Screen



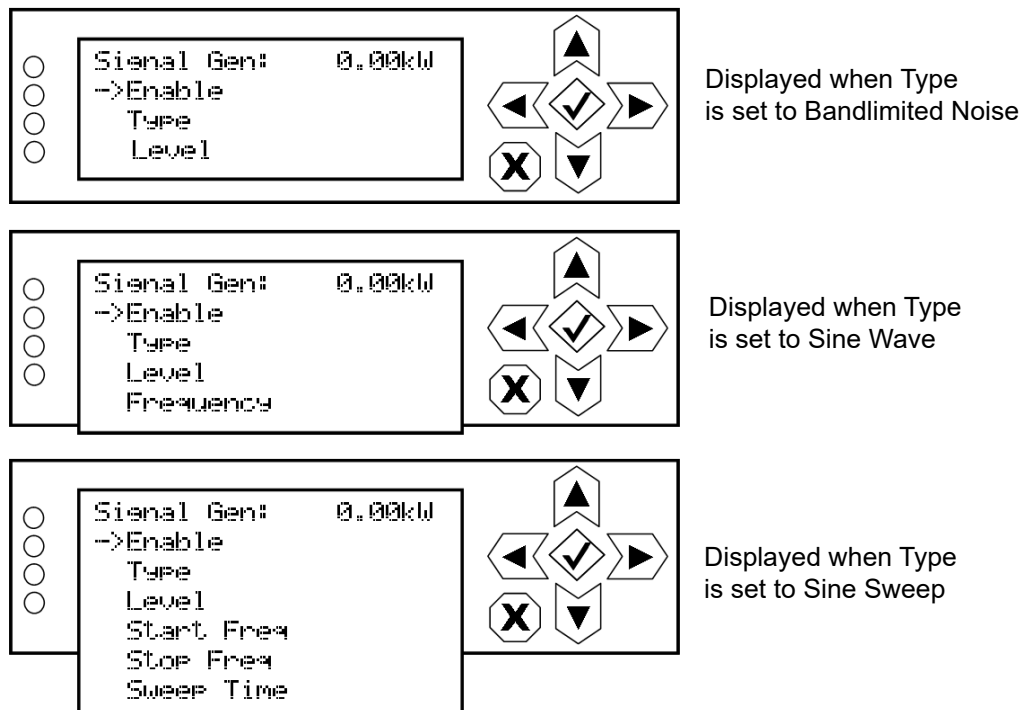
Use the up and down buttons to edit the pilot sample level between 0 and 2.70 V peak-to-peak (in 0.01 V increments). Press the accept (checkmark) button to save the change. Press cancel (X) to discard changes and return to the previous menu.

Configure Test Signal Generator

NOTE: The test signal generator function is only available using the controller UI.

From the controller UI, you can configure the test signal generator output of the GV2-5/GV2-3.5. Note that a different menu will appear depending on the currently configured test signal type. To view the **Signal Gen** screen, select **User Settings -> Signal Gen** from the **Main Menu** (see [Figure 3.2.149](#)).

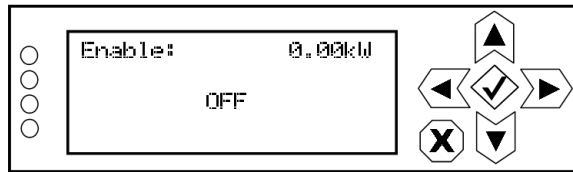
Figure 3.2.149: Signal Generator Menus



Use the up and down buttons to move the cursor to the desired line item and then press the right button to enable editing.

[Figure 3.2.150 on page 3.2.191](#) shows all possible editing screens for the **Signal Gen** menu. Within any of the editing screens, use the up and down buttons to edit the setting. Press the accept (checkmark) button to save the change. Press cancel (X) to discard changes and return to the previous menu.

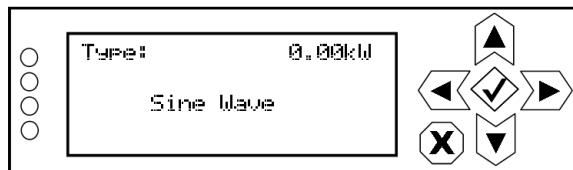
Figure 3.2.150: Signal Generator Editing Screens



Enable: 0.00kW
OFF

Navigation buttons: Up, Down, Left, Right, Checkmark, Cancel (X)

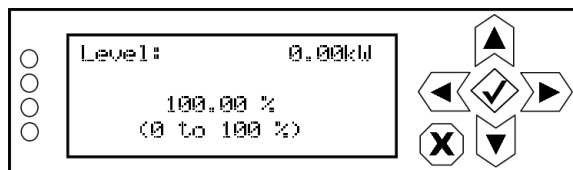
Select ON (enabled) or OFF (disabled). Press the cancel (X) button to discard changes and return to the previous menu. Default is OFF.



Type: 0.00kW
Sine Wave

Navigation buttons: Up, Down, Left, Right, Checkmark, Cancel (X)

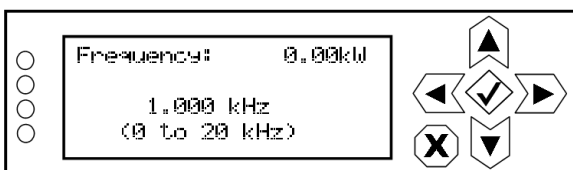
Select a type - None, Sine Wave, Sine Sweep or Bandlimited Noise. Press the cancel (X) button to discard changes and return to the previous menu.



Level: 0.00kW
100.00 %
(0 to 100 %)

Navigation buttons: Up, Down, Left, Right, Checkmark, Cancel (X)

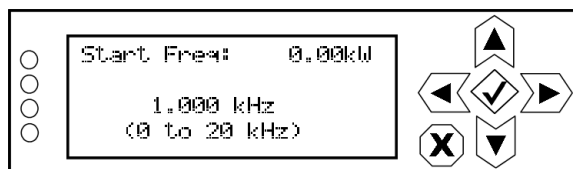
Select a level between 0 and 100%. Press the cancel (X) button to discard changes and return to the previous menu. Default is 100%.



Frequency: 0.00kW
1.000 kHz
(0 to 20 kHz)

Navigation buttons: Up, Down, Left, Right, Checkmark, Cancel (X)

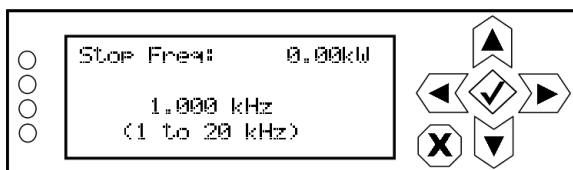
When **Type** is set to Sine Wave, select a frequency between 0 and 20 kHz. Press the cancel (X) button to discard changes and return to the previous menu. Default is 1 kHz.



Start Freq: 0.00kW
1.000 kHz
(0 to 20 kHz)

Navigation buttons: Up, Down, Left, Right, Checkmark, Cancel (X)

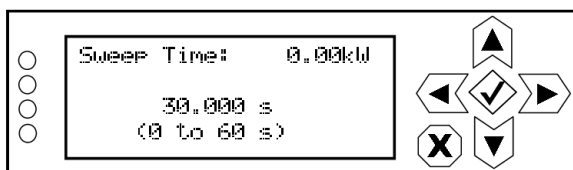
When **Type** is set to Sine Sweep, select a start frequency between 0 and 20 kHz. Press the cancel (X) button to discard changes and return to the previous menu. Default is 1 kHz.



Stop Freq: 0.00kW
1.000 kHz
(1 to 20 kHz)

Navigation buttons: Up, Down, Left, Right, Checkmark, Cancel (X)

When **Type** is set to Sine Sweep, select a stop frequency between 1 and 20 kHz. Press the cancel (X) button to discard changes and return to the previous menu. Default is 1 kHz.



Sweep Time: 0.00kW
30.000 s
(0 to 60 s)

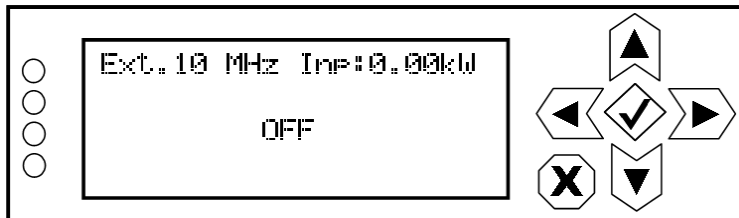
Navigation buttons: Up, Down, Left, Right, Checkmark, Cancel (X)

When **Type** is set to Sine Sweep, select a time between 0 and 60 s. Press the cancel (X) button to discard changes and return to the previous menu. Default is 30 s.

External 10 MHz Input

To view the enable/disable screen for the external 10 MHz input (see [Figure 3.2.151](#)), select User Settings -> Ext. 10 MHz Inp from the Main Menu.

Figure 3.2.151: Front Panel - External 10 MHz Input screen

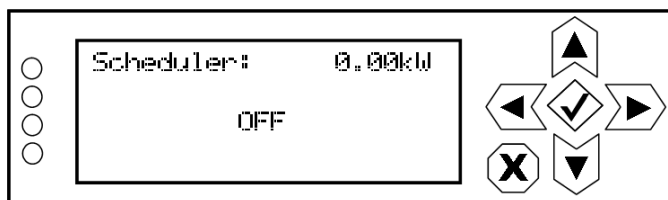


Use the up or down arrow to toggle between **ON** (using external 10 MHz input) and **OFF** (not using external 10 MHz input), then press the accept (checkmark) button to save the change. Press cancel (X) to discard changes and return to the previous menu.

Enabling the Scheduler

To view the Scheduler enable/disable screen (see [Figure 3.2.152](#)) on the controller front panel display, select User Settings -> Scheduler from the Main Menu.

Figure 3.2.152: Enabling/disabling the scheduler - Front Panel



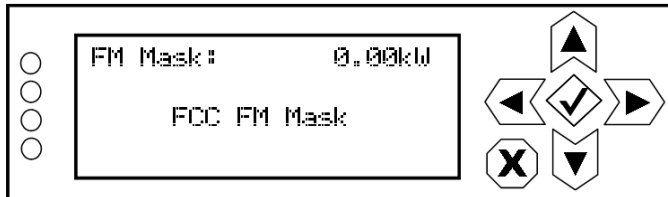
Use the up and down buttons to select **ON** (enable) or **OFF** (disable). The default setting is **OFF**. Press cancel (X) to return to the previous menu.

Selecting FM Mask

NOTE: FM Mask selection is only available using the controller UI.

From the controller UI, you can select the appropriate FM mask standard (FCC, ETSI or None) being used by the analyzer on the AUI. The selection affects the mask lines on the AUI's Spectrum Analyzer instrument. To view the **FM Mask** screen, select **User Settings** -> **FM Mask** from the **Main Menu** (see [Figure 3.2.153](#)).

Figure 3.2.153: FM Mask Screen

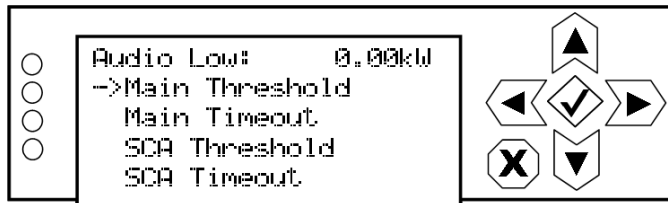


Use the up and down buttons to toggle between **FCC FM Mask**, **ETSI FM Mask** and **No FM Mask**. The factory setting is **FCC FM Mask**. Press the accept (checkmark) button to save the change. Press cancel (X) to discard changes and return to the previous menu.

Setting User Thresholds

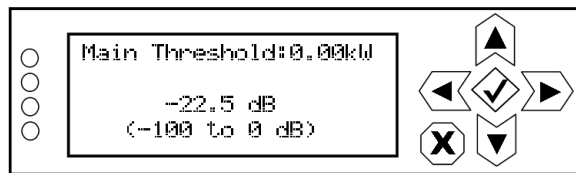
From the controller UI, you can establish the low audio thresholds and timeout delays for the main audio and SCAs. To view the **Audio Low** screen, select **User Settings** -> **Audio Low** from the **Main Menu** (see [Figure 3.2.154](#)).

Figure 3.2.154: Audio Low Menu

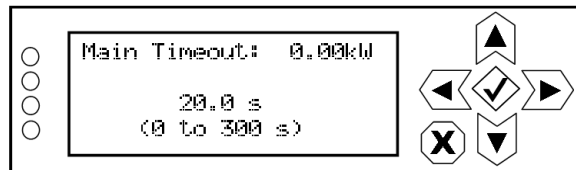


Use the up and down buttons to move the cursor to the desired line item and then press the right button to enable editing. [Figure 3.2.155](#) shows all possible editing screens for the **Audio Low** menu. Within any of the editing screens, use the up and down buttons to edit the setting. Press the accept (checkmark) button to save the change. Press cancel (X) to discard changes and return to the previous menu.

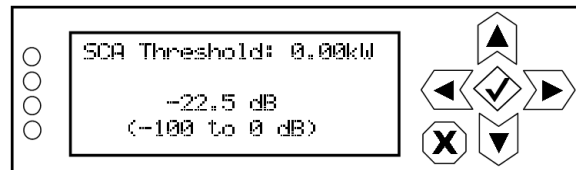
Figure 3.2.155: Audio Low Editing Screens



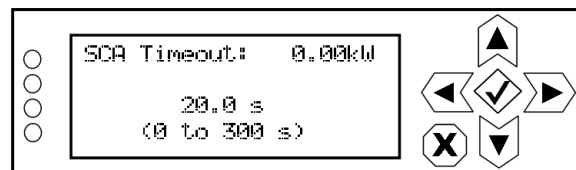
Select a level between -100 and 0 dB (in 0.5 dB increments). Press the cancel (X) button to discard changes and return to the previous menu. Default setting is -22.5 dB.



Select a timeout between 0 and 300 s (5 minutes) (in 0.5 s increments). Press the cancel (X) button to discard changes and return to the previous menu. Default setting is 20 s.



Select a level between -100 and 0 dB (in 0.5 dB increments). Press the cancel (X) button to discard changes and return to the previous menu. Default setting is -22.5 dB.



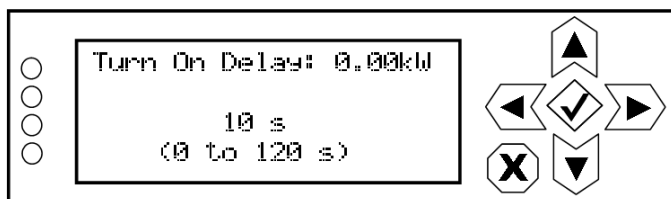
Select a timeout between 0 and 300 s (5 minutes) (in 0.5 s increments). Press the cancel (X) button to discard changes and return to the previous menu. Default setting is 20 s.

Turn-On Delay Setting

NOTE: The turn-on delay setting is only available using the controller UI.

From the controller UI, you can set the transmitter's turn-on delay. This setting determines the time delay for the transmitter to recover from an ac power loss. This is typically used in sites with multiple transmitters on a common generator. By staggering the turn-on delay periods of each transmitter, you can reduce the overall load on the generator. To view the **Turn On Delay** screen, select **User Settings -> Turn On Delay** from the **Main Menu** (see [Figure 3.2.156](#)).

Figure 3.2.156: Turn On Delay Screen



Use the up and down buttons to select a delay between 0 and 120 s (in 1 s increments). The default setting is 0 s (disabled). Press the accept (checkmark) button to save the change. Press X to abort the reset and return to the previous menu.

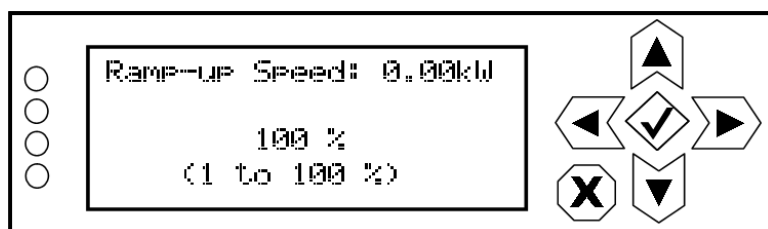
Ramp-Up Speed Setting

NOTE: The ramp-up speed setting is only available using the controller UI.

From the controller UI, you can set the transmitter's ramp-up speed. This setting establishes the time it takes the transmitter to ramp up from 0 W to full power. At 100%, ramp-up speed is approximately seven seconds. For a setting of 50%, ramp-up would be approximately 14 seconds. For a setting of 25%, ramp-up would be approximately 28 seconds. In multi-transmitter systems that are on a common generator or power grid, adjusting the ramp-up speed can be used to reduce the transient load on the source during an ac power recovery (i.e., after a power failure or changeover to a generator).

To view the **Ramp-up Speed** screen, select **User Settings -> Ramp-up Speed** from the **Main Menu** (see [Figure 3.2.157](#)).

Figure 3.2.157: Ramp-up Speed Screen



Use the up and down buttons to select a ramp-up speed between 1 and 100% (in 1% increments), noting 100% represents approximately seven seconds (0 W to full power). The default setting is 100% (approximately Press the accept (checkmark) button to save the change. Press X to abort the reset and return to the previous menu.

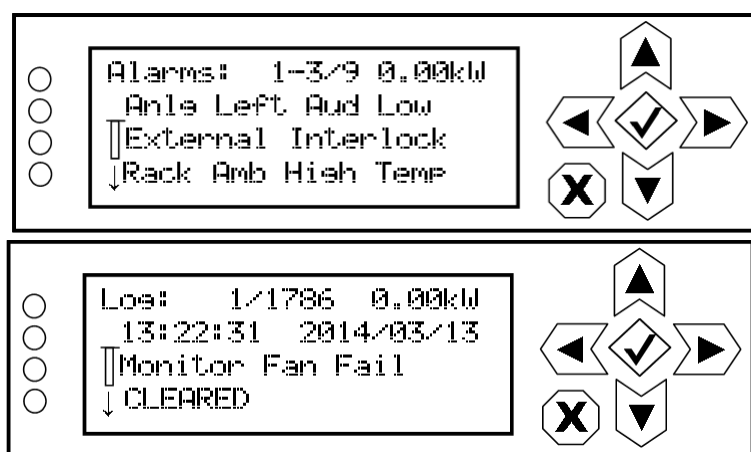
View Status

View Alarms

When you select **View Status -> View Alarms** or **View Status -> View Log** from the **Main Menu** (see [Figure 3.2.158](#)), you can view various active or logged events, respectively, of the GV2-5/GV2-3.5. These parameters are likely displayed on multiple pages and require that you scroll to view all of them.

NOTE: This screen is for viewing purposes only and does not offer the same level of analytical features as the AUI's **Logs** page (see [View Status on page 3.2.197](#)).

Figure 3.2.158: View Alarms and View Logs Screens



The **View Alarms** screen displays only alarms that are currently active. Older alarms that have cleared may still be present in the **View Log** screen.

Use the up and down buttons to scroll through the list of alarms or logged events.

Refer to the GV2-5/GV2-3.5 Troubleshooting Manual to cross-reference the alarm name to possible causes and troubleshooting tips.

When you select **Clear Log** from the **View Status** menu, you will delete all logged events.

NOTE: Clearing the controller front panel UI's logs does not clear the logs displayed in the remote AUI.

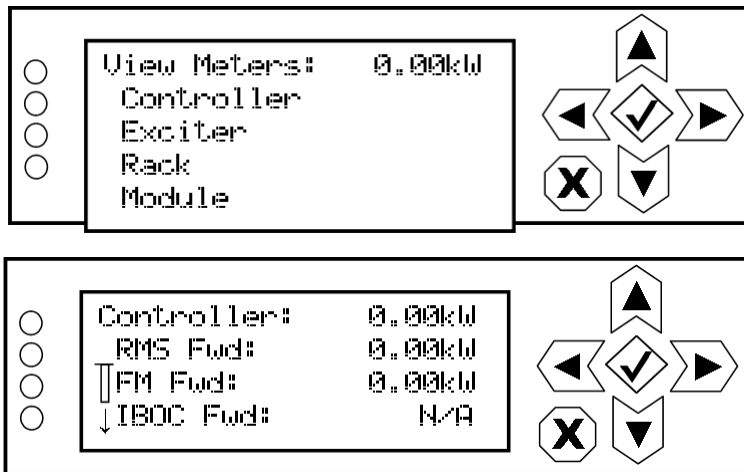
Use the **Reset Alarms** command in the controller front panel UI's **Main Menu -> Reset Alarms** screen to attempt to clear any latching alarms that are holding the transmitter in an "off-air" state. If the offending alarm has cleared, the transmitter should resume operation. See [Setting Pilot Sample Level, on page 3.2.189](#).

View Meters

When you select **View Status -> View Meters** from the **Main Menu** (see [Figure 3.2.159](#)) you can view various metered parameters of the GV2-5/GV2-3.5. These parameters are divided into sections. When you select a particular section, the applicable meters are displayed as a list on the appropriate screen.

NOTE: The View Meters screens are for viewing purposes only and do not offer the same level of analytical features as the GUI's Meter List View page (see [Meters on page 3.2.37](#)).

Figure 3.2.159: View Meters Screens



Controller screen shown,

See the tables on the following pages for full list of meters available for Controller, Exciter, Rack and RF Module sections.

Use the up and down buttons to scroll through the meter sections. Press the accept (checkmark) button to enter the meters screen for that section (see Controller example in [Controller: on page 3.2.199](#)). Use the up and down buttons to scroll through the list of metered parameters one at a time and use the right arrow to 'page down' through the list of metered parameters, noting that the parameters in the following tables are available for viewing.

NOTE: In the RF Module meter screen, pressing the checkmark button will change the sorting of the PM meters. For example: normally the meters are displayed for PM1, then PM2, etc. When you press checkmark, the meters sort by parameter (e.g., PM1 PA Voltage A, PM2 PA Voltage A, etc.) to allow easier viewing of a specific parameter for all RF modules.

Controller:

RMS Forward Power	Reject 3-4 Power	Reject 17-32 Power, as applicable
FM Forward Power	Reject 5-6 Power, as applicable	Reject 1-24 Power, as applicable
IBOC Forward Power	Reject 7-8 Power, as applicable	Reject 1-32 Power, as applicable
Reflected Power	Reject 9-10 Power, as applicable	Splitter Fan 1 Speed
VSWR	Reject 11-12 Power, as applicable	Splitter Fan 2 Speed
RF Output Return Loss	Reject 13-14 Power, as applicable	Splitter Fan 3 Speed, as applicable
DC Power In	Reject 15-16 Power, as applicable	Splitter Fan 4 Speed, as applicable
DC-RF Efficiency	Reject 17-18 Power, as applicable	Reject 5kW Fan1 Speed
RF Power Per PA	Reject 19-20 Power, as applicable	Reject 5kW Fan2 Speed
Avg. PA Volts	Reject 21-22 Power, as applicable	Reject 5kW Fan3 Speed
Avg PS Current	Reject 23-24 Power, as applicable	Reject 5kW Fan4 Speed
Total PA Current	Reject 25-26 Power, as applicable	Reject 5kW Fan5 Speed
Avg. PA Dissipated Power	Reject 27-28 Power, as applicable	Reject 5kW Fan6 Speed
PWB Temperature	Reject 29-30 Power, as applicable	Reject 5kW Fan7 Speed, as applicable
Fan Speed	Reject 31-32 Power, as applicable	Reject 5kW Fan8 Speed, as applicable
LVPS Voltage	Reject 1-4 Power	Reject 5kW Fan9 Speed, as applicable
Battery Voltage	Reject 5-8 Power, as applicable	Reject 5kW Fan10 Speed, as applicable
+15V	Reject 9-12 Power, as applicable	Reject 5kW Fan11 Speed, as applicable
+12V A	Reject 13-16 Power, as applicable	Reject 5kW Fan12 Speed, as applicable
+12 V B	Reject 17-20 Power, as applicable	Reject 10kW Fan1 Speed
+5V	Reject 21-24 Power, as applicable	Reject 10kW Fan2 Speed
+3.3V	Reject 25-28 Power, as applicable	Reject 10kW Fan3 Speed
+1.8V	Reject 29-32 Power, as applicable	Reject 10kW Fan4 Speed, as applicable
+1.2V	Reject 1-8 Power, as applicable	Reject 10kW Fan5 Speed, as applicable
RF Drive Power	Reject 9-16 Power, as applicable	Reject 10kW Fan6 Speed, as applicable
RF Drive 1-12 Power, as applicable	Reject 13-20 Power, as applicable	Reject Final Fan1 Speed
RF Drive 13-24 Power, as applicable	Reject 17-24 Power, as applicable	Reject Final Fan2 Speed
RF Drive 17-24 Power, as applicable	Reject 25-32 Power, as applicable	Reject Final Fan3 Speed
RF Drive 25-32 Power, as applicable	Reject 1-12 Power, as applicable	Reject Final Fan4 Speed, as applicable
Total Reject Power	Reject 13-24 Power, as applicable	Reject Final Fan5 Speed, as applicable
Reject 1-2 Power	Reject 1-16 Power, as applicable	Reject Final Fan6 Speed, as applicable

Exciter (A/B, as applicable):

Exc Fwd Power	Exc -15V	Dig 2 R Level
Exc Refl Power	Exc +5V_A	MPX SCA Level
Exc PA VSWR	Exc +5V_B	MPX RMS %
Exc PA Voltage	Exc +3.3V	AGC Limit %
Exc PA Current	Exc +1.8V	MPX Limit %
Exc PA Bias Voltage	Exc +1.2V	Delta 10 MHz
Exc PA Dissipation	Exc Battery Voltage	DAC Gain %
Exc Preamp Voltage	Exc Peak Mod %	Forward Attenuation
Exc Preamp I (current)	Bal L Level	Reverse Attenuation
Exc Preamp Bias Voltage	Bal R Level	Reverse Gain
Exc Fan Voltage	MPX Level	Mask Delta
Exc Fan Speed	Int SCA1 Level	Exc Tilt
Exc PA Temp	Int SCA2 Level	Exc Data MER
Exc PWB Temperature	Dig 1 L Level	Exc Ref MER
Exc LVPS	Dig 1 R Level	Exc 10 MHz Delta (ppm)
Exc +15V	Dig 2 L Level	

Rack # (1 through 8, as applicable):

Rk +15V	Rk LVPS
Rk +5V	Rk Ambient Temperature
Rk +3.3V	Rk Reject Fan Voltage

RF Module (PM1, repeat for PM2):

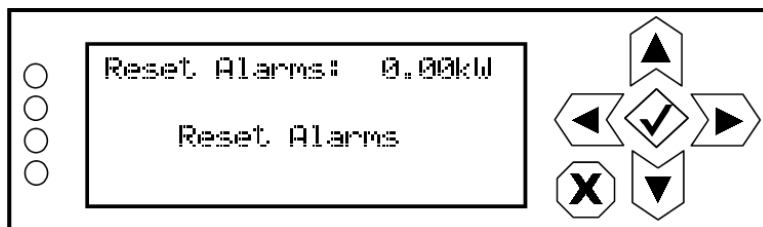
PM1 Drive Power	PM1 PS A Input Voltage	PM1 Temperature
PM1 PA Voltage A	PM1 PS B Input Voltage	PM1 PS A Voltage
PM1 PA Voltage B	PM1 PS A Input Current	PM1 PS B Voltage
PM1 PA 1 Curr	PM1 PS B Input Current	PM1 PS A Current
PM1 PA 2 Curr	PM1 Fan Voltage	PM1 PS B Current
PM1 PA 3 Curr	PM1 Fan 1 Speed	PM1 PS A Fan Speed
PM1 PA 4 Curr	PM1 Fan 2 Speed	PM1 PS B Fan Speed
PM1 Bias 1 Voltage	PM1 Fan 3 Speed	PM1 PS A Temperature
PM1 Bias 2 Voltage	PM1 Fan 4 Speed	PM1 PS B Temperature
PM1 Bias 3 Voltage	PM1 Fan 5 Speed	PM1 PS A Run Time
PM1 Bias 4 Voltage	PM1 Fan 6 Speed	PM1 PS B Run Time
PM1 Reject Power	PM	

Reset Alarms

You can attempt to reset any latching transmitter alarms that are holding the transmitter in an “off-air” state using the remote AUI’s **Reset** button (see [Reset Alarms, on page 3.2.201](#)) or using the controller’s UI display.

When you select **Reset Alarms** from the **Main Menu**, you can attempt to reset latched protection circuits in the GV2-5/GV2-3.5 (see [Figure 3.2.160](#)). If the alarm condition has been cleared, the alarm indication on the **View Alarms** screen should disappear.

Figure 3.2.160: Reset Alarms Screen



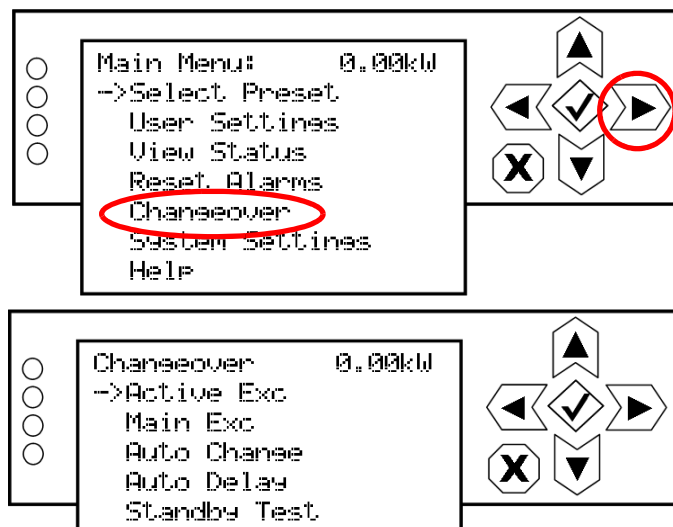
Use the up and down buttons to toggle between **Reset Alarms** and **Cancel**. Press the accept (checkmark) button to save the change. Press the cancel (X) button to return to the previous menu.

Exciter Changeover Settings

From the controller UI, you can set the active exciter, main exciter, auto changeover status, changeover delay and exciter configuration. To view the **Changeover** screen, select **System Settings -> Changeover** from the **Main Menu** (see [Figure 3.2.161](#)).

NOTE: In order to edit any changeover settings, the transmitter must be configured for Dual Exciter (A/B) in the controller front panel UI's **Installed Exc** screen (see [Installed Exciter](#), on page 3.2.212).

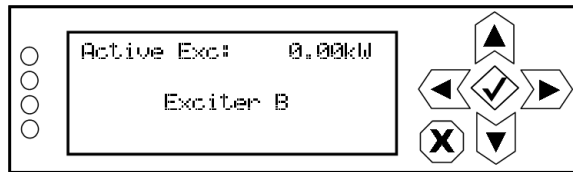
Figure 3.2.161: Changeover Menu



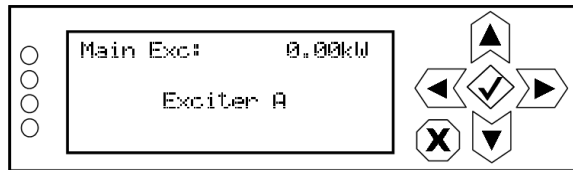
This menu has five sub-menu options. Use the up and down buttons to move the cursor to the desired display setting and then press the right button to enable editing of the setting. [Figure 3.2.162 on page 3.2.203](#) shows the editing screens for the **Changeover** menu. Within any of the editing screens, use the up and down buttons to edit a setting. Press the accept (checkmark) button to save the change. Press cancel (X) to discard changes and return to the previous menu.

WARNING! Before using the Standby Test function, make sure that the standby exciter's RF output is being applied to a suitably rated test load.

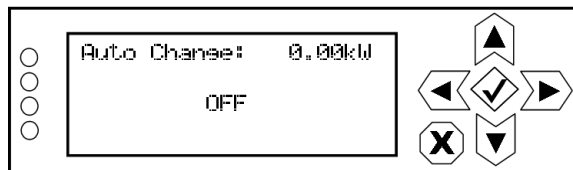
Figure 3.2.162: Changeover Editing Screens



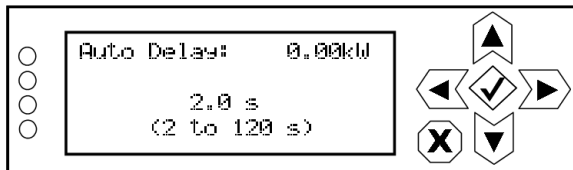
For display only. Indicates the active exciter - Exciter A or Exciter B. Press the cancel (X) button to return to the previous menu.



Allows user to set the transmitter's main exciter to Exciter A or Exciter B. Typically, the main exciter is the exciter that operates until an automatic changeover occurs. The default setting is Exciter A. Press the cancel (X) button to discard changes and return to the previous menu.



Configures the transmitter to enable (ON) or disable (OFF) automatic exciter changeover. Changeover to the standby exciter occurs if the current/active exciter experiences a fault that inhibits its operation. Press the cancel (X) button to discard changes and return to the previous menu.



Sets the delay period after which an automatic changeover will occur to a value between 2 and 120 seconds (in 0.1 s increments). Default value is 2 s. Press the cancel (X) button to discard changes and return to the previous menu.



Configures the transmitter to enable (ON) or disable (OFF) the standby exciter's RF power stage to allow testing into a user provided dummy load. When enabled (ON), the exciter will operate at 100 W (ensure the test load is suitably rated). While enabled, auto exciter changeover is disabled (regardless of configuration status). Press the cancel (X) button to discard changes and return to the previous menu.

System Settings

WARNING! System settings are established at Nautel and should not require any adjustment. Making changes to these settings may void your warranty. Contact Nautel before making changes.

You can perform the following functions using the **System Settings** menu of the controller UI:

- [Host Reboot - see page 3.2.205](#)
- [Host Watchdog - see page 3.2.205](#)
- [Firmware Update - see page 3.2.206](#)
- [LCD Settings - see page 3.2.206](#)
- [Exciter TCXO - see page 3.2.208](#)
- [HD Optimizer - see page 3.2.209](#)
- [HW Config - see page 3.2.211](#)
- [FM Polarity - see page 3.2.217](#)
- [Factory Settings - see page 3.2.218](#)

NOTE: Changing values in the System Settings -> Factory Settings is not normally required, and should only be performed by trained personnel. Information on some of these sub-menus is not included in the manual. Contact Nautel for assistance.

Host Reboot

NOTE: A host reboot is available using the controller UI. Once the host is rebooted, all users that were remotely connected (logged in) will be logged out.

From the controller UI, you can reset the host. To view the **Host Reboot** screen, select **System Settings** -> **Host Reboot** from the **Main Menu** (see [Figure 3.2.163](#)).

Figure 3.2.163: Host Reboot Screen



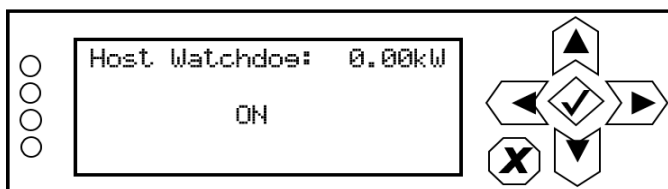
Use the up and down buttons to toggle between **Force Host Reboot** and **Cancel**. Press the accept (checkmark) button to save the change. If a reset is selected, it will occur immediately. Select **Cancel** or press **X** to abort the reset and return to the previous menu.

Host Watchdog

NOTE: Host watchdog configuration is only available using the controller UI.

From the controller UI, you can enable or disable the host watchdog feature. This feature, when enabled, monitors communication between the host (SBC) and the DSP processor on the exciter/control PWB within the controller module. If communication is lost for more than 30 seconds, the transmitter will initiate an alarm and reboot the host. To view the **Host Watchdog** screen, select **System Settings** -> **Host Watchdog** from the **Main Menu** (see [Figure 3.2.164](#)).

Figure 3.2.164: Host Watchdog Screen



Use the up and down buttons to toggle between **ON** (enabled) and **OFF** (disabled). Press the accept (checkmark) button to save the change. Press cancel (**X**) to discard changes and return to the previous menu.

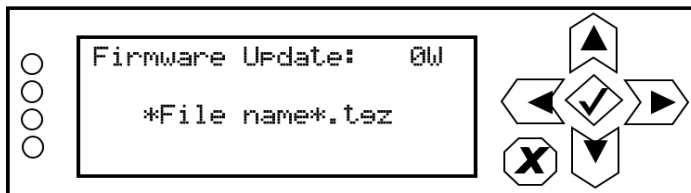
NOTE: Host watchdog must be set to **OFF** (disabled) before opening the controller and installing or replacing a solid-state drive (SSD) with Proxmox installed.

Firmware Update

NOTE: A firmware update is available using the controller UI. It can also be performed from the AUI, using the Upgrade Software page in the System Settings menu (see [Software Upgrades, on page 3.2.133](#)). Once the host (SBC) is reset, all users that were remotely connected (logged in) will be logged out.

From the controller UI, you can update firmware used in the transmitter. To perform a firmware update, select **System Settings** -> **Firmware Update** from the **Main Menu** (see [Figure 3.2.165](#)).

Figure 3.2.165: Firmware Update Screen

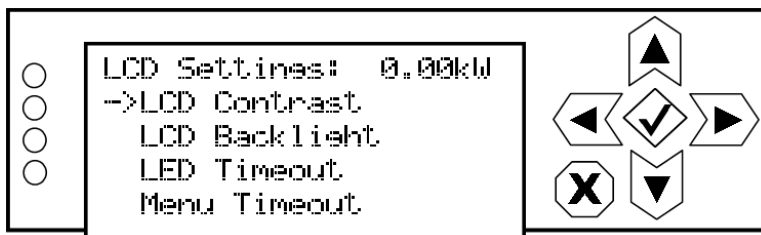


LCD Settings

NOTE: Controller UI display settings are only available using the controller UI.

From the controller's UI, you can configure the LCD display's contrast, brightness and backlight settings. To view the LCD Settings screen, select **User Settings** -> **LCD Settings** from the **Main Menu** (see [Figure 3.2.166](#)).

Figure 3.2.166: LCD Settings Menu

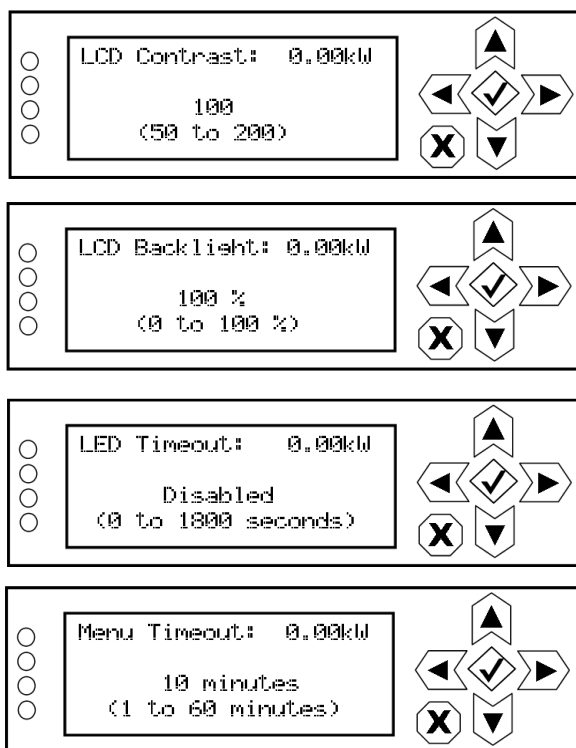


This menu has four sub-menu options:

- ❖ **LCD Contrast** - sets the display contrast.
- ❖ **LCD Backlight** - sets the brightness of the display's backlight during normal use.
- ❖ **LED Timeout** - sets a time delay, after a period of non-use, that the brightness of the display's backlight will dim. This feature can also be disabled.
- ❖ **Menu Timeout** - sets a time delay, after a period of non-use, that the controller front panel screen will revert back to the main menu.

Use the up and down buttons to move the cursor to the desired display setting and then press the right button to enable editing of the setting. [Figure 3.2.167 on page 3.2.207](#) shows the editing screens for the **LCD Settings** menu. Within any of the editing screens, use the up and down buttons to edit a setting. Press the accept (checkmark) button to save the change. Press cancel (X) to discard changes and return to the previous menu.

Figure 3.2.167: LCD Settings Editing Screens



Select a value between 50 (lighter contrast) and 200 (darker contrast) (in increments of 5). Press the cancel (X) button to discard changes and return to the previous menu. Default setting is 100.

Select a value between 0 and 100% (in 5% increments). Press the cancel (X) button to discard changes and return to the previous menu. Default setting is 100%.

Select disabled (i.e., no timeout) or select a time period between 0 and 1800 seconds (30 minutes) (in 5 s increments). Press the cancel (X) button to discard changes and return to the previous menu. Default setting is 900 s (15 minutes).

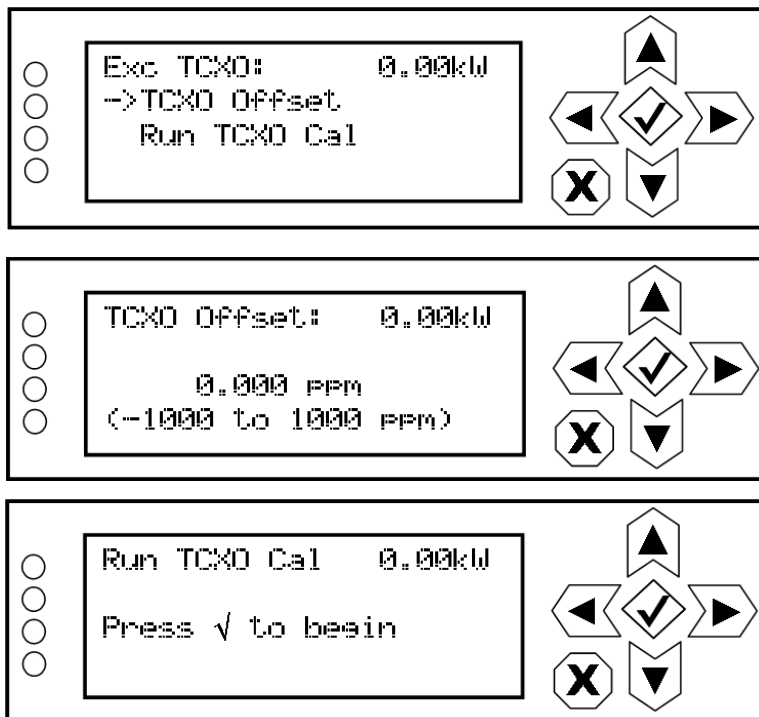
Select a time period between 1 and 60 minutes (in 1 minute increments). Press the cancel (X) button to discard changes and return to the previous menu. Default setting is 10 minutes.

Exciter TCXO

NOTE: You can also adjust the exciter TCXO offset value using the AUI (see [Exciter TCXO](#), on page 3.2.90).

To view the controller UI's Exc TCXO screens (see [Figure 3.2.168](#)), select **System Settings** -> **Calibration** from the **Main Menu**.

Figure 3.2.168: Exc TCXO screens



Use the up or down arrow to place the cursor next to TCXO Offset, then press the accept (checkmark) button to enter the **TCXO Offset** screen. Use the up and down arrows to set the TCXO offset value (in ppm) for the external 10 MHz source. When complete, press the accept (checkmark) button to save the change. Press cancel (X) to discard changes and return to the previous menu.

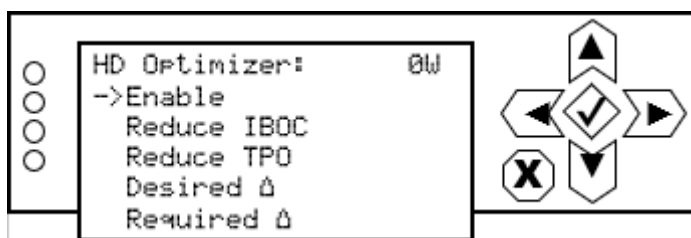
From the **Exc TXCO** menu, press the down arrow to place the cursor next to Run TCXO Cal, then press the accept (checkmark) button to enter the **Run TCXO Cal** screen. The calibration routine will begin when the external 10 MHz source is connected.

HD Optimizer

NOTE: You can also optimize the digital signal (spectrum mask) using the AUI (see [Spectrum Efficiency Optimizer](#), on page 3.2.100).

From the controller's UI, you can enable and configure various HD signal parameters (e.g., injection level, TPO, etc.) in an attempt to optimize the digital signal's overall efficiency. To view the **HD Optimizer** screen, select **User Settings** -> **HD Optimizer** from the **Main Menu** (see [Figure 3.2.169](#)).

Figure 3.2.169: HD Optimizer Menu



This menu has five sub-menu options:

- ❖ Enable
- ❖ Reduce IBOC
- ❖ Reduce TPO
- ❖ Desired Delta
- ❖ Required Delta

Use the up and down buttons to move the cursor to the desired setting and then press the right button to enable editing of the setting. [Figure 3.2.170 on page 3.2.210](#) shows the editing screens for the **HD Optimizer** menu. Within any of the editing screens, use the up and down buttons to edit a setting. Press the accept (checkmark) button to save the change. Press cancel (X) to discard changes and return to the previous menu.

Figure 3.2.170: HD Optimizer Screens

Select ON to allow the optimizer to adjust the PA voltage setting to maximize efficiency based on the transmitter output spectrum. Depending on other settings in this section, it may require other actions to maintain the transmitter's compliance. Select OFF to disable. When disabled, other HD Optimizer settings will have no effect.

Select ON to enable a reduction in IBOC injection (digital power) if the spectrum mask requires it. Select OFF to disable this setting.

Select ON to enable a reduction in the power set-point if the spectrum mask requires it. Select OFF to disable this setting.

Set the desired clearance (between -10 dB and 0 dB) from the spectral mask. The default setting is -1 dB, which will maintain a 1 dB clearance from the mask for maximum efficiency. This settings will not cause any reduction in output power.

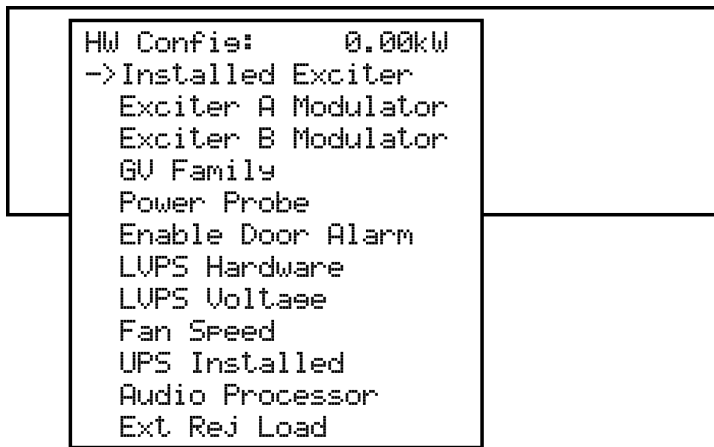
Sets the value (between -10 dB and 10 dB) that is considered to be absolutely required. If this level is exceeded, the digital power from the transmitter will be reduced if the PA voltage is at maximum. If the spectral mask still cannot be met and the setting for it is enabled, the transmitter power set-point will be reduced. Default setting is 0.0 dB.

HW Config

From the controller's UI, you can configure the transmitter for any installed hardware that has optional variations (e.g., quantity of exciters or LVPS modules, fan speed) or is non-standard (e.g., UPS or Audio Processor). To view the **HW Config** screen, select **User Settings** -> **HW Config** from the **Main Menu** (see [Figure 3.2.171](#)).

NOTE: These settings are established at the factory based on the configuration that existed at time of shipping. Changes to these setting are only necessary if hardware is added or removed by the user.

Figure 3.2.171: HW Config Menu



This menu has nine sub-menu options:

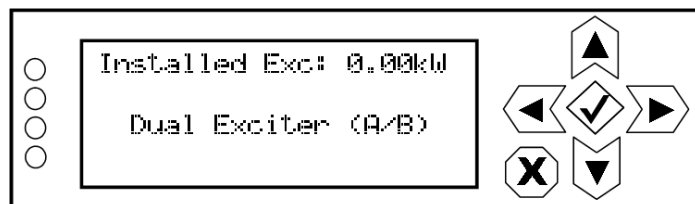
- ❖ [Installed Exciter - see page 3.2.212](#)
- ❖ [Exciter A Modulator - see page 3.2.212](#)
- ❖ [Exciter B Modulator - see page 3.2.213](#)
- ❖ [GV Family - see page 3.2.213](#)
- ❖ [Power Probe - see page 3.2.214](#)
- ❖ [Enable Door Alarm - see page 3.2.214](#)
- ❖ [LVPS Hardware - see page 3.2.215](#)
- ❖ [LVPS Voltage - see page 3.2.215](#)
- ❖ [Fan Speed - see page 3.2.216](#)
- ❖ [UPS Installed - see page 3.2.217](#)
- ❖ [Orban Audio Processor, on page 3.2.227](#)

NOTE: If running in HD mode, set the GV Family to either GV or GV2 Air Chain prior to enabling the Exciter A/B Modulator configuration.

Installed Exciter

From the controller UI, you can configure the transmitter for the number of installed exciters. If you have upgraded your transmitter to dual exciters, you may have already been prompted to change this configuration. To view the **Installed Exc** screen, select **System Settings -> HW Config -> Installed Exc** from the **Main Menu** (see [Figure 3.2.172](#)).

Figure 3.2.172: Installed Exciter Screen

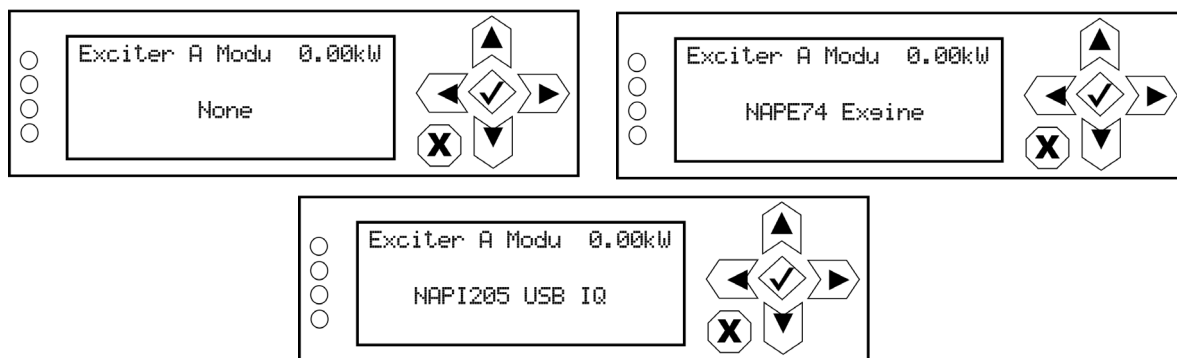


Use the up and down buttons to select the appropriate exciter configuration - Exciter (A) or Dual Exciter (A/B). Press the accept (checkmark) button to save the change. Press X to abort the change and return to the previous menu.

Exciter A Modulator

From the controller UI, you can configure the type of modulator in the exciter. To view the **Exciter A** options, select **System Settings -> HW Config -> Exciter A Modu** from the **Main Menu** (see [Figure 3.2.173](#)).

Figure 3.2.173: Exciter A Modulator



Use the up and down buttons to select the appropriate exciter configuration - None, NAPE74 Exsine or NAPI205 USB IQ. Press the accept (checkmark) button to save the change. Press X to abort the change and return to the previous menu.

NOTE: The NAPI205 USB IQ option is only visible when GV Family is set to GV2 Air Chain.

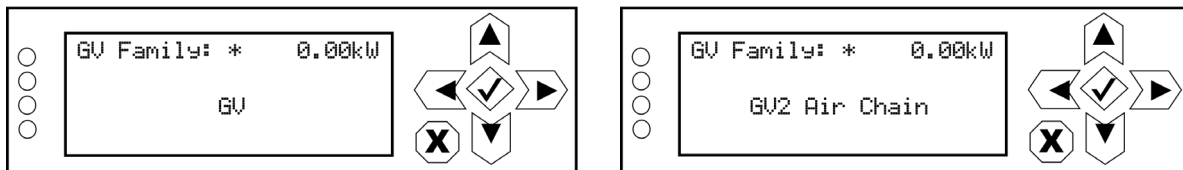
Exciter B Modulator

Exciter B Modulator is only visible in dual exciter configurations. The options are the same as Exciter A Modulator, see [Exciter A Modulator on page 3.2.212](#) for details.

GV Family

From the controller UI, you can configure the transmitter family type to match with the installed exciters. To view the options for the **GV Family** screen, select **System Settings -> HW Config -> GV Family** from the **Main Menu** (see [Figure 3.2.174](#)).

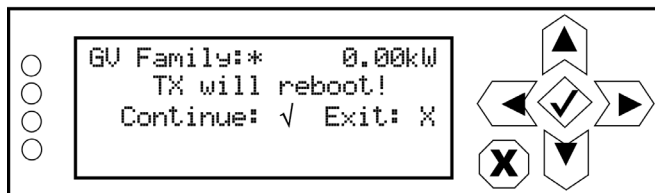
Figure 3.2.174: GV Family



Use the up and down buttons to select the appropriate configuration - GV or GV2 Air Chain. Press the accept (checkmark) button to save the change. Press X to abort the change and return to the previous menu.

Any changes will trigger a warning screen that the Controller will require a reboot. See [Figure 3.2.175](#). Press the accept (checkmark) button to initiate a reboot or press X to exit.

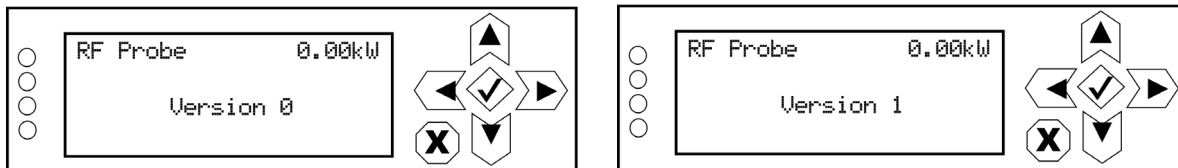
Figure 3.2.175: GV Family Reboot



Power Probe

From the controller UI, you can configure which version of power probe is installed in the transmitter. type to match with the installed exciters. Select **System Settings -> HW Config -> Power Probe** from the **Main Menu** and select Version 0 or Version 1, based on the power probe's nomenclature. Press the accept (checkmark) button to save the change or press X to exit (see [Figure 3.2.176](#)).

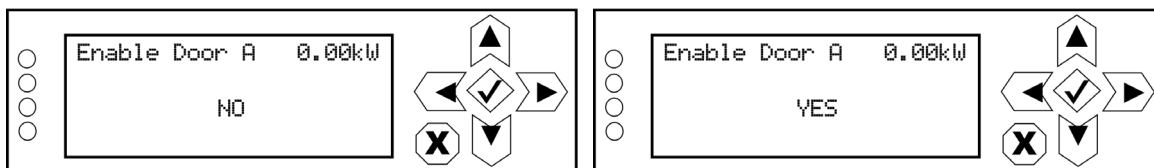
Figure 3.2.176: Power Probe



Enable Door Alarm

From the controller UI, you can enable or disable the door open alarm to eliminate unwanted alarms. Select **System Settings -> HW Config -> Enable Door Alarm** from the **Main Menu** and select Yes/No. Press the accept (checkmark) button to save the change or press X to exit (see [Figure 3.2.177](#)).

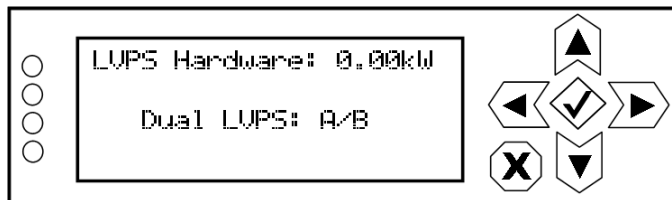
Figure 3.2.177: Enable Door Alarm



LVPS Hardware

From the controller UI, you can configure the transmitter for the number of installed LVPS modules. If you have upgraded your transmitter to dual LVPS modules, you may have already been prompted to change this configuration. To view the **LVPS Hardware** screen, select **System Settings** -> **HW Config** -> **LVPS Hardware** from the **Main Menu** (see [Figure 3.2.178](#)).

Figure 3.2.178: LVPS Hardware Screen



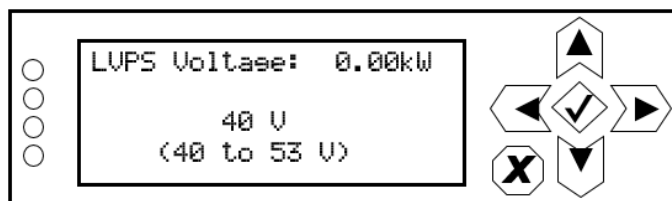
Use the up and down buttons to select the appropriate LVPS configuration - **Single LVPS: A** or **Dual LVPS: A/B**. Press the accept (checkmark) button to save the change. Press X to abort the change and return to the previous menu.

LVPS Voltage

From the controller UI, you can set the default LVPS voltage. The transmitter will set the LVPS voltage to this value (between 40 and 53 V, in 1 V steps) during normal operation. Under fault conditions, if the LVPS voltage requires an increase, the control system automatically increases the LVPS voltage, then decreases it back to the set value when the fault condition clears. This setting should not require adjustment.

To view the **LVPS Voltage** screen, select **System Settings** -> **HW Config** -> **LVPS Voltage** from the **Main Menu** (see [Figure 3.2.179](#)).

Figure 3.2.179: LVPS Voltage Screen



Use the up and down buttons to select a voltage between 40 and 53 V (in 1 V steps). The default setting is 40 V. Press the accept (checkmark) button to save the change. If a reset is selected, it will occur immediately. Press X to abort the change and return to the previous menu.

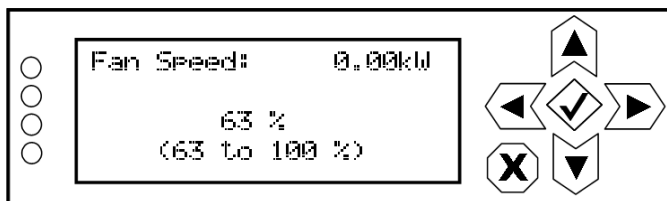
Fan Speed

The transmitter control function automatically adjusts fan speed to ensure adequate cooling based on all operating conditions. As a result this setting should not require adjustment. Increasing the fan speed will allow for cooler transmitter operation, but will also decrease efficiency and increase acoustic noise levels.

From the controller UI, you can set the default speed of the transmitter's cooling fans. The transmitter will set the fan speed to a percentage (between 63 and 100%) of the maximum speed during normal operation. Under fault conditions, the control system determines if an increase or decrease in fan speed is required and automatically adjusts the fan speed.

To view the **Fan Speed** screen, select **System Settings** -> **HW Config** -> **Fan Speed** from the **Main Menu** (see [Figure 3.2.180](#)).

Figure 3.2.180: Fan Speed Screen



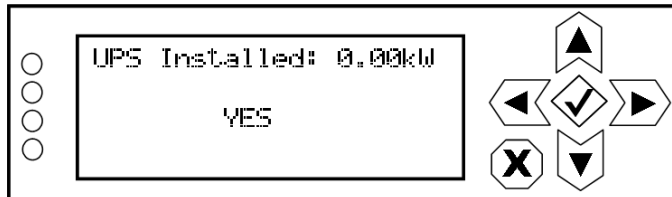
Use the up and down buttons to select a value between 63 and 100%. The default setting is 63%, which corresponds to approximately 31 V for the related fan voltage. A setting of 100% corresponds to approximately 48 V for the related fan voltage. Press the accept (checkmark) button to save the change. Press X to abort the change and return to the previous menu.

NOTE: A 20% reduction in fan speed can yield up to 5 dB improvement in acoustic noise from the transmitter, as well as decrease power consumption (i.e., utility costs) and extend the operating life of the cooling fans.

UPS Installed

From the controller UI, you can configure the transmitter for the installation of the UPS interface kit, which allows operation with an external, user-provided UPS. If you have upgraded your transmitter with the UPS interface, you may have already been prompted to change this configuration. To view the **UPS Installed** screen, select **System Settings** -> **HW Config** -> **UPS Installed** from the **Main Menu** (see [Figure 3.2.181](#)).

Figure 3.2.181: UPS Installed Screen



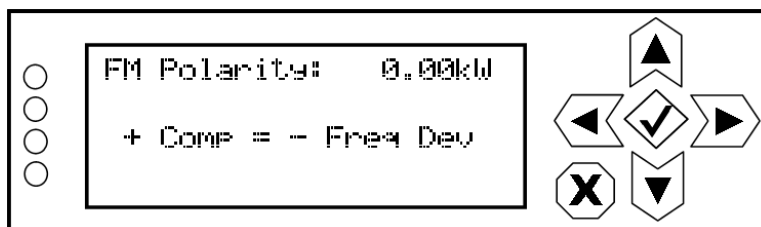
Use the up and down buttons to toggle between **NO** (no UPS interface installed) and **YES** (UPS interface is installed). Press the accept (checkmark) button to save the change. Press **X** to abort the change and return to the previous menu.

FM Polarity

NOTE: Adjusting FM polarity is used to synchronize transmitters for a single-frequency network. It determines whether positive audio input results in positive or negative modulation.

From the controller front panel UI, you can set the FM polarity. To view the **FM Polarity** screen, select **System Settings** -> **FM Polarity** from the **Main Menu** (see [Figure 3.2.182](#)).

Figure 3.2.182: FM Polarity Screen



Use the up and down buttons to toggle between **+ Comp = - Freq Dev** and **+ Comp = + Freq Dev**. The default setting is **+ Comp = - Freq Dev**. Press the accept (checkmark) button to save the change. Press **X** to abort the change and return to the previous menu.

NOTE: FM Polarity does not apply for Air Chain operation.

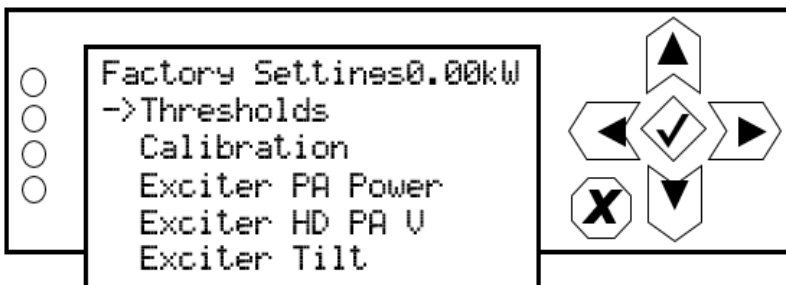
Factory Settings

NOTE: *Factory Settings are only available using the controller UI.*

CAUTION! *Changing values in the System Settings -> Factory Settings menu is not normally required, and should only be performed by trained personnel. Information on some of these sub-menus is not included in the manual. Contact Nautel for assistance.*

From the controller's UI, you can adjust various factory settings such as critical parameter thresholds, calibration values, exciter PA power level, etc. To view the **Factory Settings** menu (see [Figure 3.2.183](#)), select **System Settings-> Factory Settings** from the **Main Menu**.

Figure 3.2.183: Factory Settings Menu



This menu has five sub-menu options:

- ❖ [Thresholds](#) - see page 3.2.219
- ❖ [Calibration](#) - see page 3.2.220 (see IMPORTANT note below)
- ❖ [Exciter Tilt](#) - see page 3.2.221
- ❖ [Exciter PA Power](#) - see page 3.2.222
- ❖ [Exc HD PA V](#) - see page 3.2.222

IMPORTANT! *The Calibration menu (see [Calibration](#), on page 3.2.220) contains a X_{mtr} PA Bias routine that must be initiated after any of the following events:*

- ❖ A new RF power module has been installed in the transmitter
- ❖ RF power modules have swapped positions
- ❖ A new controller module has been installed in the transmitter

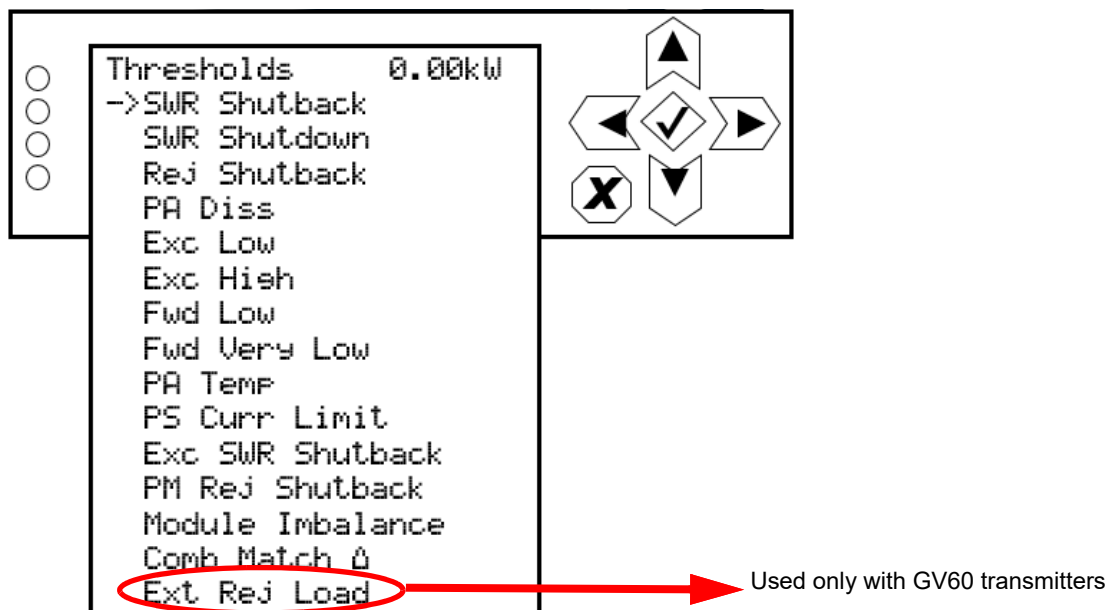
Thresholds

NOTE: Threshold settings are only available using the controller UI.

WARNING! Threshold settings are established at the factory and should not require any adjustment. These settings affect critical system protection circuits. Making changes to these settings may void your warranty. Contact Nautel before making changes.

From the controller's UI, you can set alarm thresholds for critical parameters. To view the **Thresholds** menu (see [Figure 3.2.184](#)), select **System Settings -> Factory Settings -> Thresholds** from the **Main Menu**.

Figure 3.2.184: Thresholds Menu

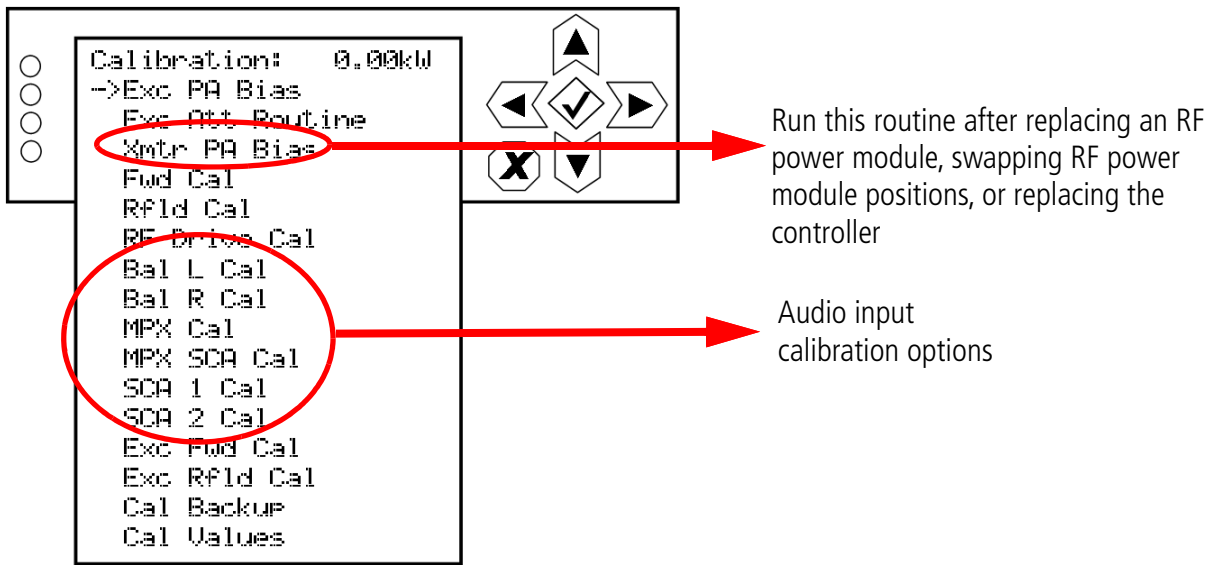


Calibration

NOTE: Most of the Calibration settings are only available using the controller UI.

From the controller's UI, you can calibrate various parameters. To view the Calibration menu (see [Figure 3.2.185](#)), select **System Settings -> Factory Settings -> Calibration** from the **Main Menu**.

Figure 3.2.185: Calibration Menu



Running the Xmtr PA Bias Routine

You must run the transmitter's PA bias routine immediately after one of the following events:

- ❖ installation of a new RF power module
- ❖ swapping of existing RF power modules
- ❖ installation of a new controller module

NOTE: Make sure that the RF stage is disabled (RF Off) and the interlock circuit is closed before running the PA bias routine. If not, a message will appear on the display prompting you to do so.

Use the up or down arrow to place the cursor next to **Xmtr PA Bias**, then press the accept (checkmark) button to enter the sub-menu. Within the sub-menu, press the accept (checkmark) button to start the routine. A line will display to indicate the percentage of completion. When it is complete, the display will again read "Press ✓ to begin". Press X to return to the previous menu.

Calibrating Audio Inputs

Use the up or down arrow to place the cursor next to the desired audio input calibration item (Bal L Cal, Bal R Cal, MPX Cal, MPX SCA Cal, SCA 1 Cal or SCA 2 Cal), then press the accept (checkmark) button to enter the selected audio input. With the appropriate calibrated audio source(s) applied, use the up and down arrows to set the new calibration value for the selected audio input. When complete, press the accept (checkmark) button to save the change. Press cancel (X) to discard changes and return to the previous menu.

NOTE: Forward power (Fwd Cal), reflected power (Refld Cal), RF Drive, exciter forward (Exc Fwd) and exciter reflected (Exc Rfld) calibrations are performed at the factory and should not require user adjustment. Contact Nautel for assistance, if necessary.

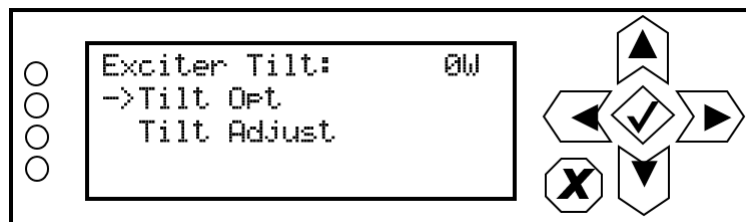
Exciter Tilt

From the controller front panel UI, you can set the exciter tilt settings. To view the **Exciter Tilt** screen, select **System Settings -> Factory Settings -> Exciter Tilt** from the **Main Menu** (see [Figure 3.2.186](#)).

NOTE: Exciter tilt settings are only available using the controller front panel UI.

WARNING! Exciter tilt settings are established at the factory and should not require any adjustment. Making changes to these settings may void your warranty. Contact Nautel before making changes.

Figure 3.2.186: Exciter Tilt Screen



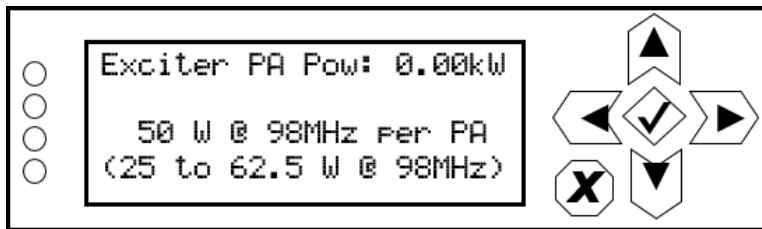
Use the up or down arrow to place the cursor next to **Tilt Opt** or **Tilt Adjust**, then press the accept (checkmark) button to enter the sub-menu. Within the sub-menus, select the desired option or setting and press the accept (checkmark) button to save the setting. Press X to return to the previous menu.

Exciter PA Power

NOTE: The exciter PA power setting is only available using the controller UI.

From the controller UI, you can set the exciter's PA power level at 98 MHz. To view the **Exciter PA Power** screen, select **System Settings** -> **Factory Settings** -> **Exciter PA Power** from the **Main Menu** (see [Figure 3.2.187](#)). The transmitter automatically compensates the actual exciter PA power level based on the operating frequency so there should be no need to adjust this value.

Figure 3.2.187: Exciter PA Power Screen



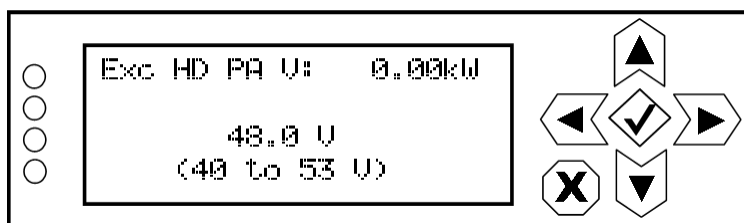
Use the up and down buttons to select a power level between 25 and 62.5 W (in 5 W increments). Press the accept (checkmark) button to save the change. Press X to abort the change and return to the previous menu.

Exc HD PA V

NOTE: The exciter PA power setting is only available using the controller UI.

From the controller UI, you can set the exciter's HD PA voltage. To view the **Exc HD PA V** screen, select **System Settings** -> **Factory Settings** -> **Exc HD PA V** from the **Main Menu** (see [Figure 3.2.188](#)).

Figure 3.2.188: Exc HD PA V Screen

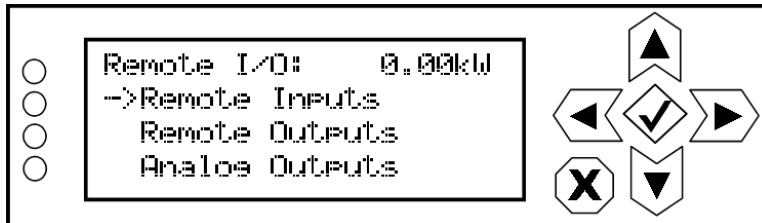


Use the up and down buttons to select a voltage between 40 and 53 V (in 0.5 V increments). Default setting is 48.0 V. Press the accept (checkmark) button to save the change. Press X to abort the change and return to the previous menu.

Remote I/O Settings

To view the Remote I/O screen (see [Figure 3.2.189](#)) on the controller UI, select **Remote I/O** from the Main Menu.

Figure 3.2.189: Remote I/O screen



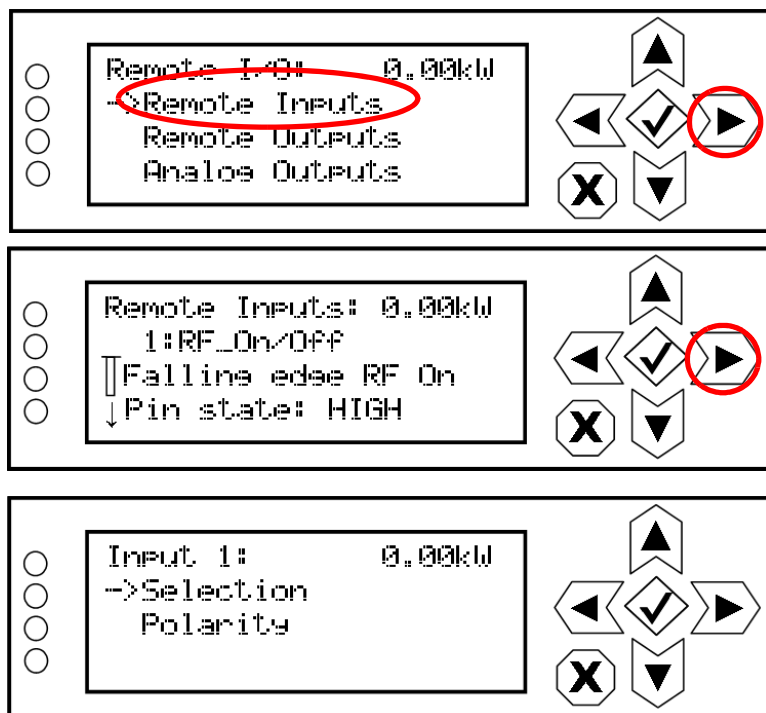
Use the up and down buttons to select **Remote Inputs** (see [Remote Inputs](#)), **Remote Outputs** (see [Remote Outputs, on page 3.2.225](#)) or **Analog Outputs** (see [Analog Outputs, on page 3.2.226](#)) to view or edit detail on the selected inputs or outputs.

Remote Inputs

Using the **Remote Inputs** screens (see [Figure 3.2.190 on page 3.2.224](#)), you can configure up to 10 remote inputs that allow you to remotely control various operational characteristics of the transmitter. Unless otherwise noted, these inputs are only accepted by the transmitter if remote control is enabled. That setting can only be made by a local user using the front panel AUI.

Nautel sets remote input defaults prior to shipping. See the GV2-5/GV2-3.5 Pre-installation Manual for details.

Figure 3.2.190: Remote Inputs Screens (Input 1 shown)



Use the up and down buttons to select the desired remote input (1 through 10) from the list. Each screen shows the current remote input parameter (e.g., RF On/Off), as well as the polarity (e.g., Falling edge RF On) and current state (e.g., high, low) of the corresponding input pin. Use the right-arrow button to enter the **Selection/Polarity** screen for the selected input to allow editing of the selection or the polarity. Press cancel (X) to return to the previous menu.

If you save a change to a remote input via the controller UI, it will also be displayed on the AUI page.

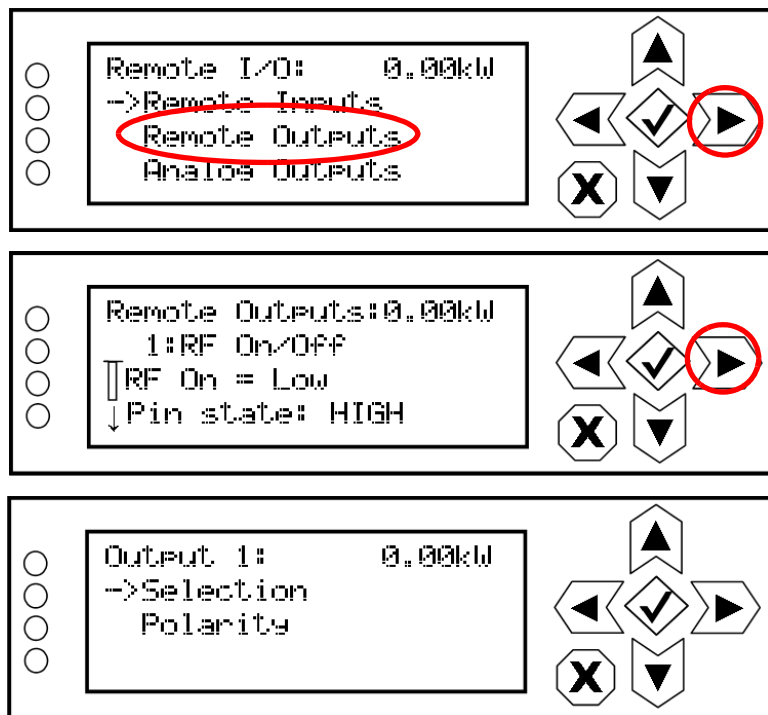
NOTE: The selection and polarity options for remote inputs are the same as described in [Select Input Channel](#), on page 3.2.122 and [Configure Input Control Logic](#), on page 3.2.123.

Remote Outputs

Using the Remote Outputs screens (see [Figure 3.2.191](#)), you can configure up to 16 remote outputs that indicate either the presence of various alarms or the status of operator controlled circuits.

Nautel sets remote output defaults prior to shipping. See the GV2-5/GV2-3.5 Pre-installation Manual for details.

Figure 3.2.191: Remote Outputs Screens (Output 1 shown)



Use the up and down buttons to select the desired remote output (1 through 16) from the list. Each screen shows the current remote output parameter (e.g., RF On/Off), as well as the polarity (e.g., RF On = Low) and current state (e.g., high, low) of the corresponding output pin. Use the right-arrow button to enter the **Selection/Polarity** screen for the selected output to allow editing of the selection or the polarity. Press cancel (X) to return to the previous menu.

If you save a change to a remote output via the controller UI, it will also be displayed on the AUI page.

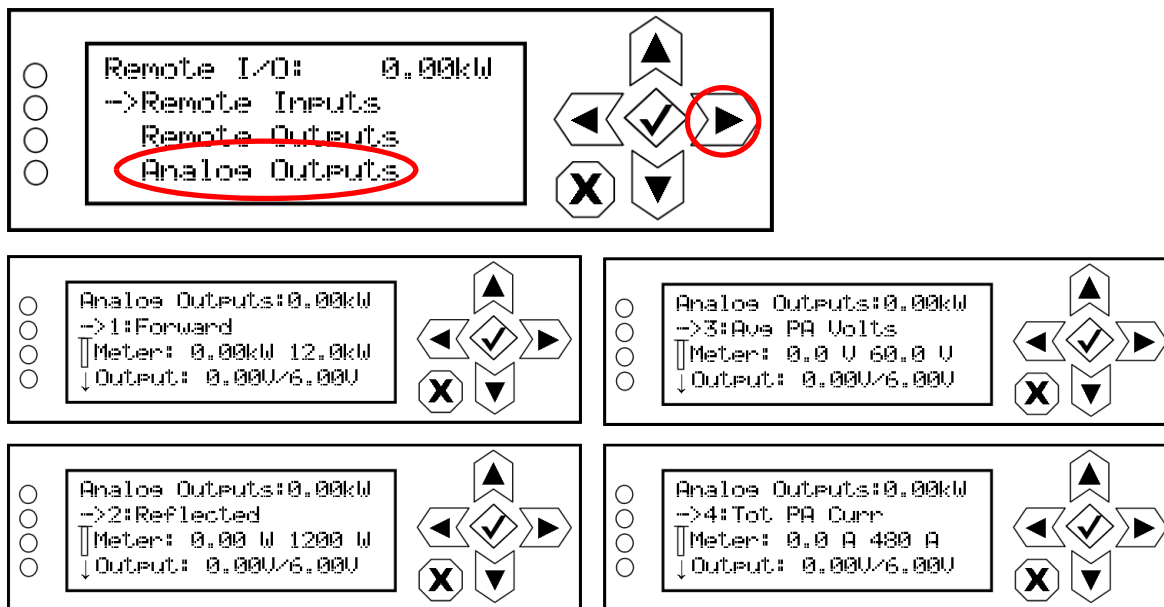
NOTE: The selection and polarity options for remote outputs are the same as described in [Select Output Channel](#), on page 3.2.126 and [Configure Output Logic](#), on page 3.2.127.

Analog Outputs

Using the **Analog Outputs** screens (see [Figure 3.2.192](#)), you can view the levels of four pre-defined analog outputs that are representative of critical transmitter parameters.

Nautel sets analog output defaults prior to shipping. There are no configuration options. They are for monitoring purposes only. See the GV2-5/GV2-3.5 Pre-installation Manual for details.

Figure 3.2.192: Analog Outputs Screens



Use the up and down buttons to select the desired analog output (1 through 4) from the list. Each screen shows the analog output parameter (e.g., Forward Power, Reflected Power, Avg PA Volts or Total PA Current), as well as the meter reading (actual and full-scale) and the output pin voltage (actual and full-scale). Press cancel (X) to return to the previous menu.

NOTE: The analog output's Output voltage reading reflects the value that can be measured at the associated remote analog output pin for the given Meter value. See the Pre-installation Manual for actual remote analog output pin assignments.

Orban Audio Processor

This section describes how to configure, enable and operate the optional Orban audio processor after it is installed in your transmitter. You can interface with audio processor functionality using the transmitter's local (or remote) AUI or controller UI. The extent of the features available depends on which interface is used.

- [Configuring the Transmitter for the Orban Audio Processor - see page 3.2.227](#)
- [Enabling the Orban Audio Processor for Preset Selection - see page 3.2.228](#)
- [Selecting an Orban Audio Processor Preset - see page 3.2.231](#)

NOTE: *Using the Orban Inside option requires the installation of an Orban audio processor card in your transmitter. If you had a pre-existing transmitter when you received your Orban Inside kit, verify that the Orban card has been installed in the transmitter according to the Orban Inside Quick Guide (QG12001), provided with the Orban Inside kit. Refer to the Pre-installation and Installation Manuals for information on purchasing and installing this option.*

NOTE: *This section contains frequent reference to Orban's Optimod-FM 5500 Digital Audio Processor Operating Manual (see the link below). The equipment covered in the 5500 manual uses the same Orban audio processor as in your transmitter. The 5500 manual provides detailed information on the audio processor's functionality. If a discrepancy exists between the operational instructions in the Orban manual and this document, the latter shall prevail as this document is specific to operation with an GV2-5/GV2-3.5 transmitter. View the Orban Optimod-FM 5500 Digital Audio Processor Operating Manual online at:*

http://www.orban-europe.com/downloads/5500/Documentation/5500_1.2_Operating_Manual.pdf

(the version number referenced in this link is controlled by a third party and is subject to change without notice)

Configuring the Transmitter for the Orban Audio Processor

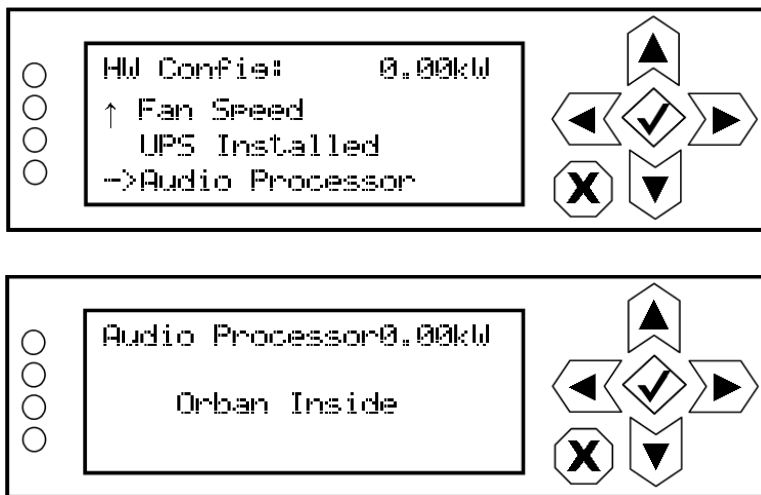
Configure the GV2-5/GV2-3.5 to recognize the presence of the Orban card using the controller UI (see [Orban Enabling](#)) or the AUI (see [Orban Enabling - Using the Remote AUI - see page 3.2.64](#)) as follows:

NOTE: *Configuring the Orban audio processor locally will cause the AUI to display an Orban Inside setting. The same occurs on the controller UI when configuring via the AUI.*

Orban Hardware Configuration

1. With the transmitter turned on and in local mode of operation, navigate to the controller UI's **Main Menu** -> **System Settings** -> **HW Config** menu. Scroll down through this menu and select **Audio Processor** (see [Figure 3.2.193](#)).
2. In the **Audio Processor** screen (see [Figure 3.2.193](#)), use the up and down buttons to toggle between **None** and **Orban Inside** (default factory setting is **None**). Select **Orban Inside** to enable the Orban audio processor for use (selecting **None** disables it). Press the accept (checkmark) button to save the change. Press cancel (X) to discard changes and return to the previous menu.
3. Reboot the transmitter by switching the ac power off and then on. This will ensure the transmitter properly detects the Orban Inside card upon recovery.

Figure 3.2.193: Configuring the Transmitter - Controller UI HW Config and Audio Processor screens



Enabling the Orban Audio Processor for Preset Selection

Enable the Orban audio processor to allow preset selection using either the controller UI (see [Orban Enabling](#)) or the AUI (see [Orban Enabling - Using the Remote AUI - see page 3.2.64](#)) as follows:

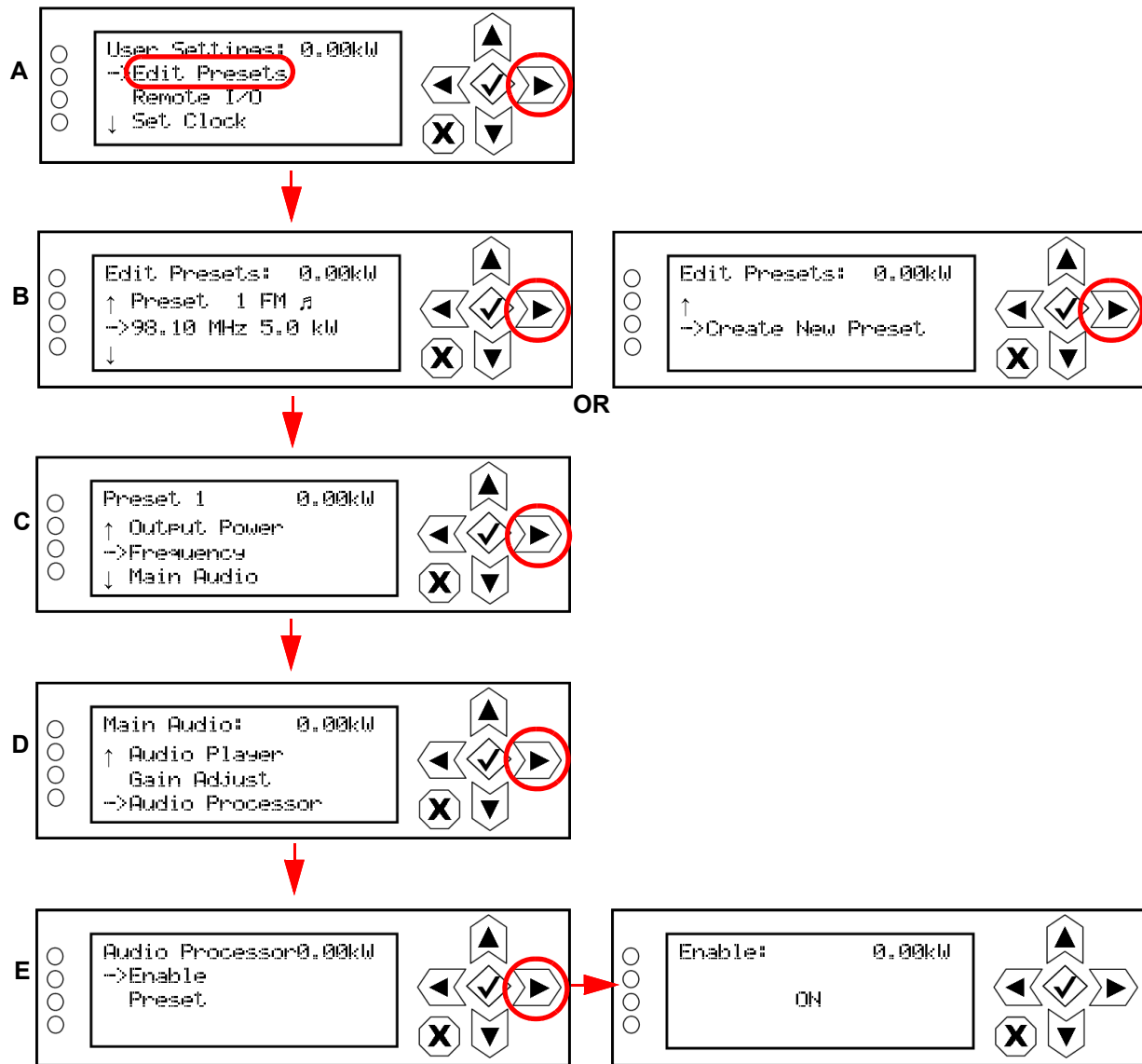
NOTE: Enabling the Orban audio processor locally will cause the AUI to display an enabled setting. The same occurs on the controller UI when enabling via the AUI.

Orban Enabling

1. With the transmitter turned on and in local mode of operation, navigate to the controller UI's **Main Menu** -> **User Settings** menu. Select **Edit Presets** (see A in [Figure 3.2.194 on page 3.2.230](#)).
2. In the **Edit Presets** screen (see B in [Figure 3.2.194 on page 3.2.230](#)), select from the list the desired preset for use with the Orban audio processor or create a new preset.
3. Within the selected preset's screen (see C in [Figure 3.2.194 on page 3.2.230](#)), scroll down and select **Main Audio**.
4. Within the **Main Audio** screen (see D in [Figure 3.2.194 on page 3.2.230](#)), scroll down and select **Audio Processor**. This option appears only when the transmitter has been configured for Orban Inside.
5. Within the **Audio Processor** screen (see E in [Figure 3.2.194 on page 3.2.230](#)), select **Enable**. From the **Enable** screen, select **ON** to enable the audio processor (selecting **OFF** disables the audio processor)

NOTE: *The Orban Inside card processes only the main audio; however it is possible for the composite SCA inputs to result in excessive modulation. The L/R limiter is automatically disabled when the Orban Inside card is selected; however the other limiters (hard limiter, AGC limiter, 2-slope limiter) remain active. Nautel recommends that you set the thresholds for these other limiters high enough to ensure the signal is unaffected. These other limiters remain as a last resort to prevent over-modulation.*

Figure 3.2.194: Enabling the Orban Audio Processor - Controller UI



Selecting an Orban Audio Processor Preset

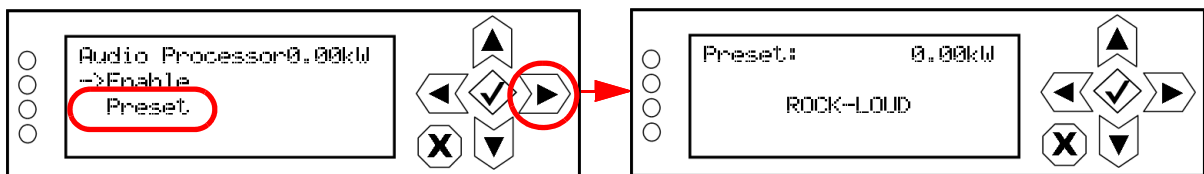
Select an Orban audio processor preset using either the AUI (see [Orban Enabling - Using the Remote AUI - see page 3.2.64](#)) or the controller UI (see [Selecting an Orban Preset](#)) as follows:

NOTE: Selecting an Orban preset via the AUI will cause the controller UI to also reflect the change, and vice versa.

Selecting an Orban Preset

1. From the User Settings -> Edit Presets -> (Select desired preset to edit) -> Main Audio -> Audio Processor menu (see [Figure 3.2.195](#)), select Preset.
2. Use the up and down arrows to scroll through the list of available Orban presets (e.g., ROCK-LOUD, etc). Select the desired preset and press the 'accept' (checkmark) button to activate. Refer to the Orban Optimod 5500 manual for detailed information on the factory programmed presets available.

Figure 3.2.195: Selecting an Orban Preset - Front Panel UI



Using the Gen4 Remote User Interface

The Gen4 web interface for Air Chain operation serves as a centralized, web-based user interface that enables configuration, control, and monitoring of the Gen4 Importer (vPorter) and related Air Chain components within Nautel's GV integrated HD Radio Air Chain system.

This section provides information about the Gen4 user interface's software menu structure and provides brief functional descriptions. The Gen4 user interface can be monitored remotely with a standard web browser.

Login

Perform the following steps to log in remotely to the Gen4 user interface. See [Figure 3.2.196](#).

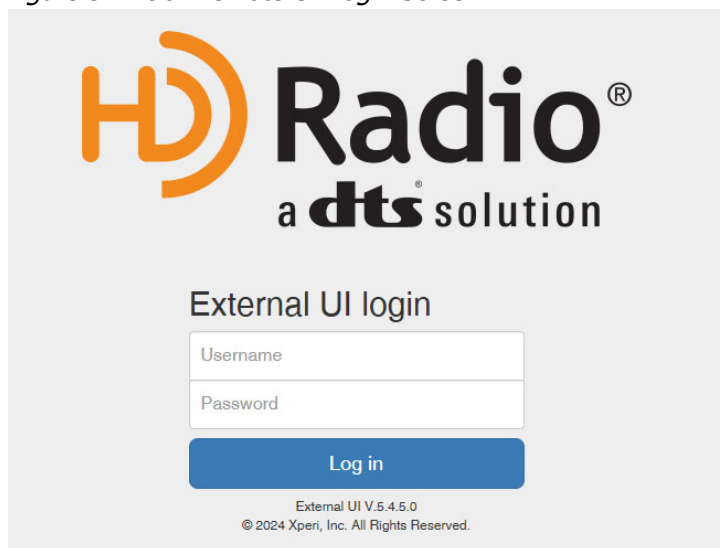
- Enter the IP Address of the GV2-5/GV2-3.5 vPorter, Port 3000, in the address bar of the web browser (e.g., 192.168.1.2:3000).

NOTE: During factory testing Nautel randomizes and assigns a password for the Gen4 login. This information is recorded as 'Gen4 Control Panel Web Page login password' on the 'GV2 OS Password' sheet provided in the shipped transmitter documentation.

- ❖ Enter the Username: **controller**
- ❖ Enter the Password: **see NOTE above**

NOTE: The user can change the Gen4 login password, if desired, by enabling VNC. See the Non-Standard Maintenance section of the Operations and Maintenance Manual for the procedure to change the password.

Figure 3.2.196: Remote UI Login Screen



Gen4 Remote UI Menus

The Gen4 remote UI includes all of the pages necessary to set up and run the virtual Importer and Exporter applications of the GV2-5/GV2-3.5, including:

- SysApp section
 - ❖ [SysCfg Page - see page 3.2.234](#)
 - ❖ [Comm Page - see page 3.2.235](#)
 - ❖ DLMX Link Status Page - Not Used
 - ❖ [License Page - see page 3.2.236](#)
 - ❖ [CfgUtility Page - see page 3.2.237](#)
 - ❖ [Restart Commands - see page 3.2.238](#)
- Exporter section
 - ❖ [EmbExp Page - see page 3.2.239](#)
 - ❖ [MPS Digital Audio Config Page - see page 3.2.241](#)
 - ❖ [PSD Page - see page 3.2.242](#)
 - ❖ [TSM Page - see page 3.2.243](#)
 - ❖ [Analog Audio Config Page - see page 3.2.243](#)
- NodeServ section
 - ❖ [NodeConfig Page - see page 3.2.244](#)
- AudioClients section
 - ❖ [HD2 to HD4 AudioClients Pages - see page 3.2.245](#)
- MSAC Clients section
 - ❖ [MSAC 1 to 4 Clients Pages - see page 3.2.247](#)

The left side of each page displays a list of sections and links to available pages within each section. Each page includes user entry fields. If necessary, click the orange **Help** or **Component Help** button on a particular page for helpful details.

See applicable **notes** below the pages in [Figure 3.2.197](#) through [Figure 3.2.208](#) for special information or configuration settings that determine the page's availability.

NOTE: *Not all Gen4 menus and screens are required for Air Chain operation. This section describes the functionality of the required menus and settings only.*

SysCfg Page

Figure 3.2.197: SysApp - SysCfg page

InfoLog out

SysCfgHelp

SysAppComponent Help

opMode

IMP_EXP_FULL_OP_MODE

autoRun

true

lumbEnabled

false

GetSaved

Refresh

Save

Audio/MSAC Client Auto-Load & Client IP Addr (IP Addr relative to Ext Server Location)Component Help

HD2 load true	HD2 clientIP 127.0.0.1	HD3 load true	HD3 clientIP 127.0.0.1
HD4 load true	HD4 clientIP 127.0.0.1	HD5 load false	HD5 clientIP 127.0.0.1
HD6 load false	HD6 clientIP 127.0.0.1	HD7 load false	HD7 clientIP 127.0.0.1
HD8 load false	HD8 clientIP 127.0.0.1	Num AudioClients Allowed To Load 3	
MSAC1 load true	MSAC1 clientIP 127.0.0.1	MSAC2 load false	MSAC2 clientIP 127.0.0.1
MSAC3 load false	MSAC3 clientIP 127.0.0.1	MSAC4 load false	MSAC4 clientIP 127.0.0.1

GetSavedRefreshSave

The system may be set to run in the configuration mode (CFG) or the fully operational mode (FULL). Certain functions, such as licensing, must be done only while in configuration (CFG) mode. In order to run the system, it must be in Operational (OP) mode.

Air Chain typically operates in IMP_EXP_FULL_OP_MODE

The system can also be configured to automatically start running when the Control Panel is run by setting the autoRun parameter to true.

Comm Page

The Comm page (see [Figure 3.2.198](#)) allows inputting several important items. The system must be in Operational mode to access this menu. Functions which are controlled from here include:

- ❖ Active Configuration Selection (choose defined configuration of service mode and audio channel bandwidths)
- ❖ Sync (Importer<-> Exporter bandwidth synchronization)
- ❖ Run (system is producing and sending E2X data)

The AutoRun parameter is also available in this dialog. When the Control Panel software is started and AutoRun is selected, the system will immediately begin sending the E2X data.

Figure 3.2.198: SysApp - Comm page

The screenshot shows the 'Comm' page of the SysApp. At the top right is a 'Help' button. The main area is divided into two columns. The left column contains: 'Exline IP' (10.0.128.168) and 'E2X UDP Port' (9000) with 'Get Saved', 'Refresh', and 'Save' buttons; 'Syno State' with a 'SYNCHRONIZED' status indicator (three circles, the right one is green); 'Active Config.' with a dropdown menu showing 'FM_MP11_4HD_AE-P1' and a 'SetActiveConfig' button; and 'Active Services' with a dropdown menu showing 'HD1' and an 'Update' button. The right column contains: 'Run State' with a 'STARTED' status indicator (three circles, the right one is green); 'Stop' and 'Run' buttons; and a 'Refresh' button at the bottom right.

NOTE: The Active Config field shows the active configuration (e.g., FM-MP11, etc.) for the system. To change the active configuration, click Stop to stop vPorter, then select from the drop-down list and click SetActiveConfig.

This page is not available when the OpMode field is set to a CFG mode in the SysApp -> SysCfg page (see [Figure 3.2.197](#) on page 3.2.234).

NOTE: Stopping the vPorter requires a restart of the Gen4 system.

License Page

The Air Chain transmitter must have a valid license issued by Xperi in order to operate.

Figure 3.2.199: SysApp - License page

License

Active Key Status

LICENSE_INVALID View Active Key Info

Request Key

4e6104dcd-0602-3292-827e-f83012da6b83 Refresh Clear

License Key

LICENSE-KEY-IS-INVALID-AND-MUST-BE-UPDATED-FOR-FULL-IMPORTER-USE

Refresh Clear Invalidate key Set License

View license key info (from textbox)

Gen4 System ERROR Messages

The Air Chain transmitter system will not function without a valid license key issued by Xperi. The following steps describe how to check and renew your license key.

1. View the license status in the License Key dialog (see [Figure 3.2.199](#)).
2. Check the Active Key Status field.
 - ❖ If it indicates LICENSE_VALID, the license is still active. Click the View Active Key Info button to obtain details on the license, including the expiry date. If your license is about to expire, proceed to [Step 3](#). If there are sufficient days remaining in your active license, no further licensing action is required at this time.
 - ❖ If it indicates LICENSE_INVALID, the license has either expired (for existing systems) or not yet obtained (for new systems). Proceed to [Step 3](#).
3. See "Licensing Requirements" in the "Planning Program Inputs" section of the *Pre-Installation Manual* for instruction to request a new license key.
4. When you receive a new license key, enter it in the License Key field and click the Set License button. The license status in the License Key dialog should indicate a valid license.

CfgUtility Page

The CfgUtility will allow you to save a copy of the system's configuration. The configuration will consist of a zip file which includes a number of .CFG files. This is saved on the vPorter windows file system; can be transferred via VNC.

Figure 3.2.200: SysApp - CfgUtility page

The screenshot displays the CfgUtility web interface. On the left, the 'Backup' section contains input fields for 'Backup directory' and 'Backup filename', a checkbox for 'Include logFile', and a 'Backup' button. On the right, the 'Restore (enabled in CFG opModes only)' section includes a 'Restore filename' input field, explanatory text about file formats, a list of supported input file formats, a 'Restore' button, and a 'Restore Default Cfg Files' button.

CfgUtility Help

Backup

Backup directory

Backup filename

- Directory/Filename fields are optional (default names used otherwise)
- Filename extension can be blank or the default '.zip'

☐ Include logFile

Backup

Restore (enabled in CFG opModes only)

Restore filename

Expecting Importer 4.4*.xml OR Gen4 *.zip formats

Supports 2 input file formats:

1. *.xml - Importer4.4 User Config xml file from DB Admin Tool
 - o Merge will occur into Gen4 Importer DEFAULT Admin Cfg
 - o User changes to Admin Cfg will not be included
2. *.zip - Gen4 Importer CfgUtility Backup zip file
 - o Restores all cfg files
 - o Zip files from other Versions of Gen4 will attempted to be merged (Admin and Sys)

Requires full path to file, for example:

- ../backup/backupFile.zip (may use relative path if file located in install dir)
- C:/Program Files (x86)/ImporterGen4-v5.3.1/backup/backupFile.zip (or absolute path)
- Use "/" separator for compatibility with all OS's

Restore Restore Default Cfg Files

Backup your Configuration. Once your system is setup and ready to run, you should back up your configuration. This is useful to have on hand in the event of a failure.

NOTE: The backup will be stored on the virtual machine and can be transferred to another device using a VNC-compatible remote desktop software such as TightVNC.

See [Backup Gen4 Importer Configuration, on page 3.4.19](#) for instructions to back up your configuration.

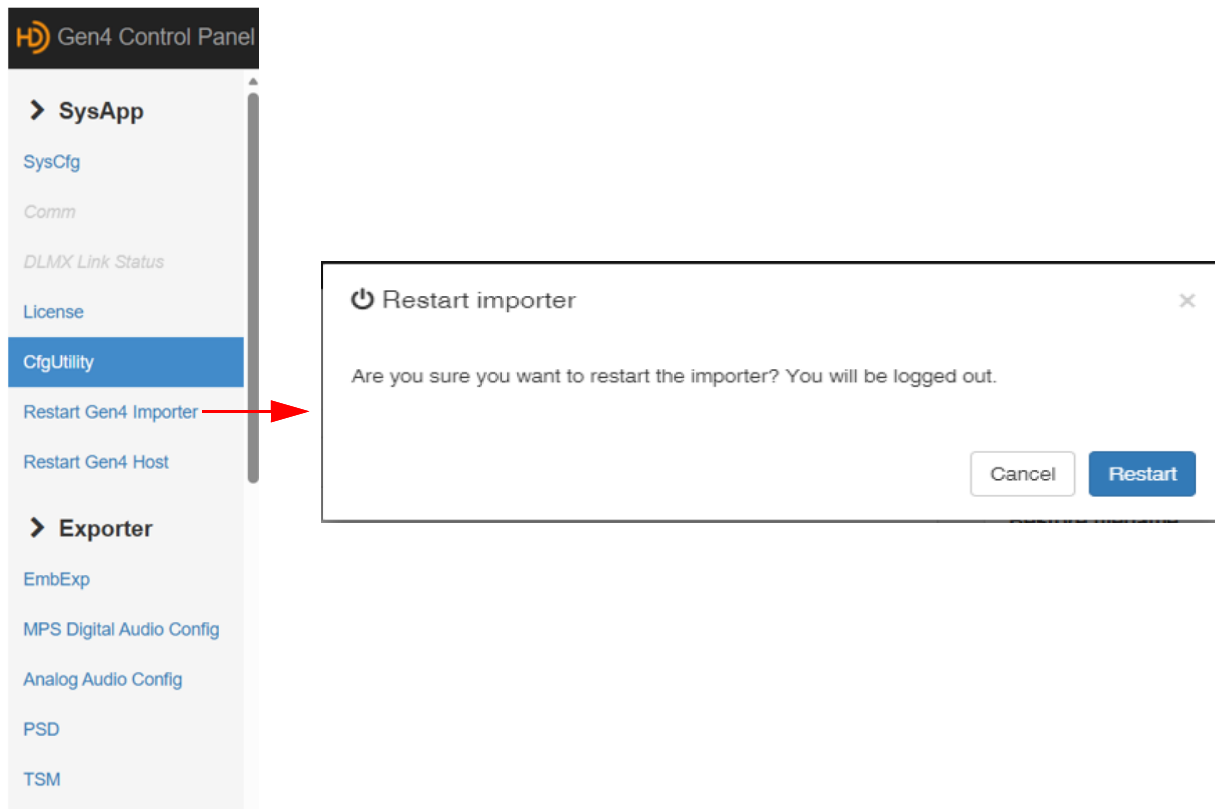
Restore your Configuration. Use the same page if you must restore from your backup.

Restart Commands

This section describes the two **Restart** options on the left side of the Gen4 UI menu (see [Figure 3.2.201](#)). Both options will trigger a 'No Active Air Chain' alarm if this is the only configured and active vPorter.

Restart Gen4 Importer. If changes are made to the system configurations while the system is operational, they may be saved, but not applied until the system is restarted. Clicking **Restart Gen4 Importer** restarts only the Gen4 Importer/Exporter service.

Figure 3.2.201: SysApp - Restart system commands



Restart Gen4 Host. This restart option performs a full reboot of the Windows host running the Gen4 system.

NOTE: Nautel recommends always trying the *Restart Gen4 Importer* first. Use *Restart Gen4 Host* when the application restart does not recover the system.

EmbExp Page

The EmbExp (Embedded Exporter) page (see [Figure 3.2.202 on page 3.2.240](#)) includes the Station information settings (SIS) section. Station information is transmitted along with the program material. Depending on the type of receiver, some of this information is displayed.

As a minimum, enter the following station information in the SIS section of the EmbExp page:

- Country Code and FCC ID: this is required for the auto stage to function correctly.
- Call Sign: in the 'Station name' section, correctly enter the station call sign in the 'Short Name' field.

Click the Save button to store changes.

Figure 3.2.202: Exporter - EmbExp page

Gen4 Control Panel Info Log out

Exporter

- EmbExp
- MPS
- PSD
- TSM
- ADD

NodeServ

- NodeConfig

AudioClients

- HD2 Audio Client
- HD3 Audio Client
- HD4 Audio Client
- HD5 Audio Client
- HD6 Audio Client
- HD7 Audio Client
- HD8 Audio Client

MSAC Clients

- MSAC 1 Client

EmbExp Importer Active Help

Core

Primary Carrier Cfg (PCC)
FM_HYBRID_MP1_MP11_DYNAMIC_BASE

SMX

Bandwidth	MPS size	AAS size
P1	6065	12183
P2	0	0
P3	0	571
P4	0	0

Importer to Exporter Delay
6

MPS

☐ Decode Digital Enable

Service Program Type
Non_Specific

Sound Experience
None

Core Channel Mode
STEREO

SIS

Country Code
US

FCC ID
21

Station name

☒ Short Name ☐ Append ~FM*

At least 2 non-blank characters and at most 4 characters. Each of the characters must be in the set [A-Z, ' ', '-', '_', '.', '\$']

☐ UnvShort Name ☐ Append ~FM*

At least 2 non-blank characters and at most 12 characters

Encode

Slogan

Name Encode

Message

Info Encode

☐ High priority

Refresh Save

MPS Digital Audio Config Page

The MPS (Main Program Service) Digital Audio Config page (see [Figure 3.2.203](#)) is used to assign the Audio Input capture device for the primary audio channel - essentially the main FM analog audio program that is also simulcast digitally on HD1.

HD2, and further sub-channels, carry additional digital-only content.

Figure 3.2.203: Exporter - MPS Digital Audio Config page

The screenshot shows the 'MPS Digital Audio Config' interface. It includes a 'Help' button in the top right corner. The configuration area contains the following elements:

- Audio Input Device:** A dropdown menu showing 'Omnia 9: HD1+MPX'.
- Audio Output Device:** A dropdown menu showing 'None'.
- Digital Phase Inversion:** An unchecked checkbox.
- Blend Control:** A dropdown menu showing 'BLEND_CTRL_ENABLE'.
- Volume Adjust:** A text input field containing '0'.
- Num prefill samples:** A text input field containing '16384'.
- Buttons:** 'Refresh' and 'Save' buttons at the bottom right of the configuration area.

- The Audio Input Device is pre-configured in Air Chain mode and should not be changed.
- Blend Control is pre-configured for 'enabled' and should not be changed.
- Volume Adjust cannot be changed. Volume can be adjusted using the Omnia for Nautel audio processor software.

PSD Page

The PSD page (see [Figure 3.2.204](#)) provides an interface for manually inputting and sending Program Service Data (PSD). Song Title, Artist, Album and Genre can be transmitted by filling in the appropriate entry boxes and clicking Send. Comments can also be sent.

The default HD1 PSD port is 11000 and is not user configurable.

Figure 3.2.204: Exporter - PSD page

The screenshot displays the 'PSD' page interface. At the top right is a 'Help' button. The main form area contains several sections:

- Encode:** A dropdown menu set to 'ISO_8859_1'.
- Checkboxes:** 'Send Default PSD at Start' and 'Core Enable' are checked. 'Comment Enable' and 'Commercial Enable' are unchecked.
- Text Fields:** 'Title' (HD1), 'Artist' (HD1), 'Album' (HD1), and 'Genre' (empty).
- Comment Section:** 'Comment title' and 'Comment description' (both empty).
- Commercial Section:** 'Commercial Price (currency)' (USD), 'Commercial Price (amount)' (10.00), 'Commercial Contact URL' (www.HD-Radio.com), 'Commercial Valid Until' (11/24/2017), 'Commercial Receive As' (Other), 'Commercial Seller Name' (empty), and 'Commercial Seller Description' (empty).

At the bottom right are three buttons: 'Refresh', 'Send', and 'Save'. Below the form is a section labeled 'PSD MESSAGES'.

TSM Page

The TSM (Time Space Management) page (see [Figure 3.2.205](#)) is primarily informational. The location and altitude of the antenna can be input in the Position dialog. The Time dialog allows for the setting of the UTC offset and the Daylight Savings time schedule. The system uses Windows OS time, which is set up separately in the Operating System.

Figure 3.2.205: Exporter - TSM page

TSM Help

GPS Version **Antenna Delay**

☐ Time Sync Control

Position

	Hemisphere	Degrees	Minutes
Latitude	N	0	0
Longitude	W	0	0

Altitude

Time

UTC Offset **DST Schedule**

☐ Enable DST Regionally ☐ Enable DST Locally

Refresh Save

NOTE: The TSM page is not applicable to Air Chain and should not be changed.

Analog Audio Config Page

The Analog Audio Config page is not supported for Air Chain operation.

NodeConfig Page

The NodeConfig page (see [Figure 3.2.206](#)) allows configuration of the IP addresses and ports for the Gen4 system and the various HD and MSAC clients.

NOTE: No user changes should be required in the NodeConfig page.

Figure 3.2.206: NodeServ - NodeConfig page

External UI - Node Server Configuration Panel

NodeServer Login Name:

Client	IP Address	Port	Enabled
Gen4 System	127.0.0.1	8022	☐
HD2 Client	127.0.0.1	12010	☐
HD3 Client	127.0.0.1	12011	☐
HD4 Client	127.0.0.1	12012	☐
HD5 Client	127.0.0.1	12013	☐
HD6 Client	127.0.0.1	12014	☐
HD8 Client	127.0.0.1	12016	☐
MSAC_1 Client	127.0.0.1	13001	☐
MSAC_2 Client	127.0.0.1	13002	☐
MSAC_3 Client	127.0.0.1	13003	☐
MSAC_4 Client	127.0.0.1	13004	☐

HTTP Listen Port
 Client Polling Interval (1-10 sec)
 Config Utility Timeout (30-300 sec)
 Browser Client Limit (0 - 10)

☒ Dimx/Imp-Exp Polling Enable
 Dimx/Imp-Exp Polling Interval (1-300 sec)
☒ AutoReconnect Enable
 AutoReconnect Interval (1-100 sec)

Sync Timeout (4-300 sec)
 Login Timeout (4-300 sec)
 Msg Rsp Timeout (4-300 sec)

HD2 to HD4 AudioClients Pages

The Audio which will be transmitted on the secondary audio channels, HD2, HD3 and HD4, is captured by the Audio Clients. The HD2 to HD4 Audio Clients pages (see [Figure 3.2.207 on page 3.2.246](#)) allows configuration of the IP addresses and ports for the Gen4 system and the various HD and MSAC clients.

NOTE: *This page is not available when the OpMode field is set to a CFG mode in the SysApp - SysCfg page (see [Figure 3.2.197 on page 3.2.234](#)).*

NOTE: *Make sure that the active Audio Clients match the desired HD channels.*

- Client IP Addr: and Connection Controls/Default PSD sections:
 - ❖ Importer IP: IP Address of the Importer. This will be 127.0.0.1 if the client is being operated on the same computer as the Importer core.
- Connection Control section:
 - ❖ Connect: creates a connection between the Importer software and the Audio Client.
 - ❖ Send: starts the process of capturing audio and sending it to the Importer for broadcast. The secondary channel will be enabled.
 - ❖ Stop: stops the secondary channel.
 - ❖ Close: closes the Audio Client window.
 - ❖ AutoStart: ticking the AutoStart box will bypass the requirement of clicking the Connect and Send buttons. The Audio Client will immediately begin capturing audio and sending it to the Importer core; defaulted to on (selected).
 - ❖ AutoReStart: the client will continually attempt to connect to the Importer core until it is successful; defaulted to on (selected).
 - ❖ to change the AutoStart or AutoReStart selections, change the setting and click Stop for that AudioClient
 - ❖ Auto Rate Convert (± 30 Hz): the Auto Rate Convert function provides a software rate conversion to align signals up to 30 Hz off frequency (44.1 kHz). This function is unnecessary (set to off) for Air Chain as the audio is synchronized by the Omnia for Nautel audio processor software.
- Audio Control section:
 - ❖ Stereo Mode: by default, the Audio Client mode is set to produce stereo if the secondary channel bandwidth is approximately 24 kbps. If a secondary channel has been allocated a low bandwidth, it may only be possible to broadcast that channel in Mono or Parametric Stereo. High bandwidth channels can also be forced to Mono or Parametric Stereo, if desired.
- Audio I/O Control section:
 - ❖ Audio Input Device: should always be set to 'Omnia 9'. Do not change.
 - ❖ Audio Output Device: should always be set to 'None'. Do not change.

- Default PSD section. This allows for manual entry and sending of Title, Artist and Album information.
- VU Meters section: The level of the incoming audio is indicated by the VU meters.
 - ❖ Clicking the **L+R Audio Phase OK** button will auto-detect if either the left or right audio input on this channel has been incorrectly wired such that either the left or right audio phase is inverted. Check the audio connection at the input all the way back to the source.
- Audio Buffer Levels section: this is a indicator of the amount of audio samples currently in the buffer. It should reach a level of approximately 50% and remain there.
- Audio Client System Messages section: Current status of the Audio Client will be indicated in this window.

Figure 3.2.207: AudioClients - HD2 - HD4 page

The screenshot displays the 'Audio Client Name: HD2 Audio Client' configuration page in the Gen4 Control Panel. The interface is divided into several sections:

- Client Control:** Includes buttons for 'Connect', 'Send', 'Stop', and 'Close'. It also features checkboxes for 'AutoStart', 'AutoRestart', and 'AutoRateConvert (±30 Hz)'.
- Audio Control:** Contains dropdown menus for 'Stereo Mode' (set to 'PARAMETRIC_STEREO') and 'Audio Gain' (set to 'AG_0'). It also has a dropdown for 'API Compatibility Mode' (set to 'DEFAULT') and input fields for 'Buffering Duration' (set to 'ONE_FR_1486') and 'Phase Inv Det Integ Time (sec)' (set to '25').
- Default PSD Control:** Includes radio buttons for 'Blank PSD After', 'Use Default PSD After', and 'Do Nothing After'. It also has a dropdown for 'Blank PSD Timeout' (set to 'TO_30').
- Audio I/O Control:** Includes dropdown menus for 'Audio Input Device' (set to 'Omnia 9: HD2') and 'Audio Output Device' (set to 'None').
- Client Status:** Displays 'VU METERS' with 'dB' and 'dB' scales, and 'AUDIO BUFFER LEVELS' with 'Current' and 'Average' scales. It also includes a green button labeled 'L-R Audio Phase OK'.
- Connection Controls/Default PSD:** Includes input fields for 'Importer IP' (set to '127.0.0.1'), 'Imp Port' (set to '8020'), 'PSD UDP Port' (set to '10010'), and 'ExtUI Port' (set to '12010'). It also has input fields for 'ExtUI Sleep Timeout (msec)' (set to '500') and 'ExtUI Sleep To Mult' (set to '20').
- Default PSD:** Includes input fields for 'Song Title' (set to 'HD2'), 'Artist' (set to 'HD2'), and 'Album' (set to 'HD2'). It also has a button labeled 'PSD SEND' and a checkbox for 'Send Default PSD at Start'.
- Audio Client System Messages:** A log showing system messages, including 'HD2 Audio Client Sending a Blank PSD' and 'HD2 Audio Client Sending a Blank PSD'.
- PSD Messages:** A log showing PSD messages, including 'NEW PSD: TITLE:HD2 ARTIST:HD2 ALBUM:HD2'.

MSAC 1 to 4 Clients Pages

The Gen4 menu includes integrated MSAC clients to allow for Station Logo broadcasting. If you are using an MSAC client it must be used in conjunction with an Active_Configuration that includes an "AE" suffix. MSAC clients are accessed by selecting the MSACClients menu on the main Gen4 System Control Panel and selecting the appropriate MSAC 1 to 4 Clients pages (see [Figure 3.2.208 on page 3.2.248](#)). These pages allow configuration of the IP addresses and ports for the Gen4 system and the various HD and MSAC clients.

NOTE: This page is only enabled when the OpMode field is set to an AE (Artist Experience) mode in the SysApp - SysCfg page (e.g., FM-MP11_4HD_AE-P1, see [Figure 3.2.197 on page 3.2.234](#)).

NOTE: Typically, only client MSAC1 should be used. It is pre-configured for the default Artist Experience services and is capable of supporting Station Logo for HD1, HD2, HD3 and HD4.

- Client IP Addr: and Importer Connection Controls sections:
 - ❖ Importer IP: IP Address of the Importer. This will be 127.0.0.1 if the client is being operated on the same computer as the Importer core.
- Client Run State Control section:
 - ❖ Start: MSAC Client will connect to the Importer, if it is operational, and begin running.
 - ❖ Stop: stops the MSAC Client.
 - ❖ AutoStart: when selected, MSAC Client will attempt to connect to the Importer once without user intervention; defaulted to on (selected)
 - ❖ AutoReStart: when selected, MSAC Client will attempt to connect to the Importer continuously until successful; defaulted to on (selected)
 - ❖ to change the AutoStart or AutoReStart selections, change the setting and click Stop
 - ❖ Default Station Logo Sender: used to manually load Station Logo images for HD1, HD2, HD3 and HD4; see also [Update Default Station Logo, on page 3.4.21](#).
- Client Connection Controls section:
 - ❖ Nautel recommends leaving default settings (e.g., TCP Listen Port = 7777) as is.
- Login Controls section: login info (for MSAC1): Username = aahd1; Password = aahd1
- Client Data Service Statistics section: displays the Station Logos being transmitted and their average bandwidth usage.

Figure 3.2.208: MSAC Clients - MSAC Clients 1 - 4 pages

The screenshot displays the 'MSAC Client Name:' configuration page for 'MSAC 1 Client - Artist Experience' within the 'Gen4 Control Panel'. The interface includes a sidebar with navigation options: TSM, ADD, NodeServ, NodeConfig, AudioClients (selected), and MSAC Clients (with sub-items MSAC 1 Client, MSAC 2 Client, MSAC 3 Client, and MSAC 4 Client). The main content area is divided into several sections:

- Client IP Addr:** A text field containing '127.0.0.1' with a 'Refresh' button and a 'Save' button.
- Client Run State Control:** Includes 'Stop' and 'Start' buttons, checkboxes for 'AutoStart' and 'AutoRestart', and a 'Default Station Logo Sender' button.
- Importer Connection Controls:** Includes 'Importer IP' (127.0.0.1), 'Imp Port' (8020), 'Sec To Retry Connect' (60), and a checked 'ImpTcpKeepAlive' checkbox.
- Client Connection Controls:** Includes 'Connection Type' (TCP), 'TCP Listen Port' (7777), 'TCP Listen Port Timeout' (1), 'UDP Input Port' (15000), 'UDP Output Port' (15001), and 'Last LOT ID' (62026).
- External UI Controls:** Includes 'ExtUI Serv Port' (13001), 'Sleep Timeout (msec)' (500), and 'Sleep TO Mult' (20).
- Remote File Settings:** Includes 'Remote Expir. In Days' (5), 'Remote File Dir' (../data/remote/), and a checked 'File Overwrite Enable' checkbox.
- Artist Experience - Album Art Controls:** Includes 'Frac Of Song Duration (%)' (60), 'Num Repeat Duty Cycle (%)' (40), and 'Max Num Repeats' (20).
- Login Controls:** Includes 'Login UN' (aahd1), 'Login PWD' (*****), and 'Client Assoc File' (../cfg/mpClient.xml/).
- MSAC Client System Messages:** A log area showing messages such as 'Stopping MSAC Client', 'MSAC Client stopped', and 'Starting the Client'.
- Client Data Service Statistics:** A section at the bottom for monitoring client data.

SECTION 3.3: ROUTINE MAINTENANCE

This section provides instructions for performing routine maintenance on the GV2-5/GV2-3.5 transmitter. This section includes the following topics:

- [Scheduled Maintenance](#)
 - ❖ [Cleaning](#)
 - ❖ [Checking Hardware - see page 3.3.2](#)
 - ❖ [Battery Replacement - see page 3.3.2](#)
- [Replacing an Air Filter - see page 3.3.3](#)
- [Performing On-Air Checks - see page 3.3.6](#)
- [Replacing the Controller Module's Battery - see page 3.3.7](#)
- [Inspecting Lightning Protection Systems - see page 3.3.9](#)
- [Performing a vPorter Windows Update \(Air Chain only\) - see page 3.3.10](#)

Scheduled Maintenance

Scheduled maintenance consists of performing a visual inspection of the GV2-5/GV2-3.5 at scheduled intervals. The recommended minimum time between scheduled maintenance visits is three months. Local operating and environmental conditions may dictate more frequent visits, while in remote sites less frequent visits may be acceptable. Experience and system reliability will determine the most practical schedule for a specific installation.

Cleaning

At a minimum, follow the cleaning procedures listed below.

NOTE: *A site located in a dirty area using open-air cooling requires more extensive cleaning than a site located in a clean area using closed-air cooling.*

1. Check the air filters, noting there is one in the front door of the transmitter and one in the back of the transmitter. Remove each air filter, inspect it, then re-install the air filter if it is clean. If an air filter is dirty or damaged, replace it as soon as possible. See [Replacing an Air Filter, on page 3.3.3](#).
2. Clean the GV2-5/GV2-3.5 using a vacuum cleaner and a soft-bristle brush to remove loose dirt. Clean, damp rags should be used to remove dirt that cannot be removed with a vacuum cleaner. Never use compressed air to clean the GV2-5/GV2-3.5.

Checking Hardware

All hardware must be checked at least once a year. Thermal cycling from turning the GV2-5/GV2-3.5 on and off will require more frequent checks.

- To prevent damaging the hardware, ensure that the proper sized tools are used. In most cases, hardware is metric.
- A mounting surface or terminal that has changed colour indicates a loose hardware connection.
- Check and, if necessary, retorque the ac input cables on terminal block TB1. See ["Connecting Ac Power" on page 2.5.1.](#) of the GV2-5/GV2-3.5 Installation Manual to determine specific torque values.

Battery Replacement

The controller assembly contains a battery backup circuit that provides a memory of the transmitter time setting during ac power failure. See [Replacing the Controller Module's Battery, on page 3.3.7.](#)

Replacing an Air Filter

The transmitter contains one cotton air filter in the front door of the transmitter (see [Figure 3.3.1 on page 3.3.4](#)) and one in the upper, rear panel of the transmitter (see [Figure 3.3.2 on page 3.3.5](#)). If an air filter becomes dirty or damaged, replace it as follows:

Interval

As required.

Parts and tools

- Replacement air filter

Procedure

Take the following steps to replace an GV2-5/GV2-3.5 air filter:

1. Order a new filter or filters, as necessary. You can order a standard sized filter from Nautel (Nautel Part # HR196) or from the manufacturer (standard size 18" x 24" x 2" American Air Filter PerfectPleat SC M8 MERV 8 or equivalent; actual size 17.5" x 23.5" x 1.75") or obtain one from any local supplier of HVAC supplies.
2. Unpack the new filter and inspect it for damage.
3. Remove the old or damaged filter as follows:
 - ❖ For a front air filter (see [Figure 3.3.1 on page 3.3.4](#)), open the front door. On the back side of the door, loosen the two quarter-turn fasteners securing the filter bracket to the door. Lift out the filter bracket. Remove (slide out) the air filter from the door.
 - ❖ For a rear panel filter (see [Figure 3.3.2 on page 3.3.5](#)), loosen only the four quarter-turn fasteners securing the filter bracket to the panel (removal of the entire rear panel is not necessary). Remove the filter bracket. Remove (slide out) the air filter from the panel.
4. Insert the new air filter into the bracket, noting the air flow direction in [Figure 3.3.1 on page 3.3.4](#) or [Figure 3.3.2 on page 3.3.5](#). Reinstall the filter bracket on the front door or rear panel, as applicable. Tighten the quarter-turn fasteners to secure the filter bracket to the front door (two fasteners) or rear panel (four fasteners).
5. Dispose of the dirty or damaged air filter.

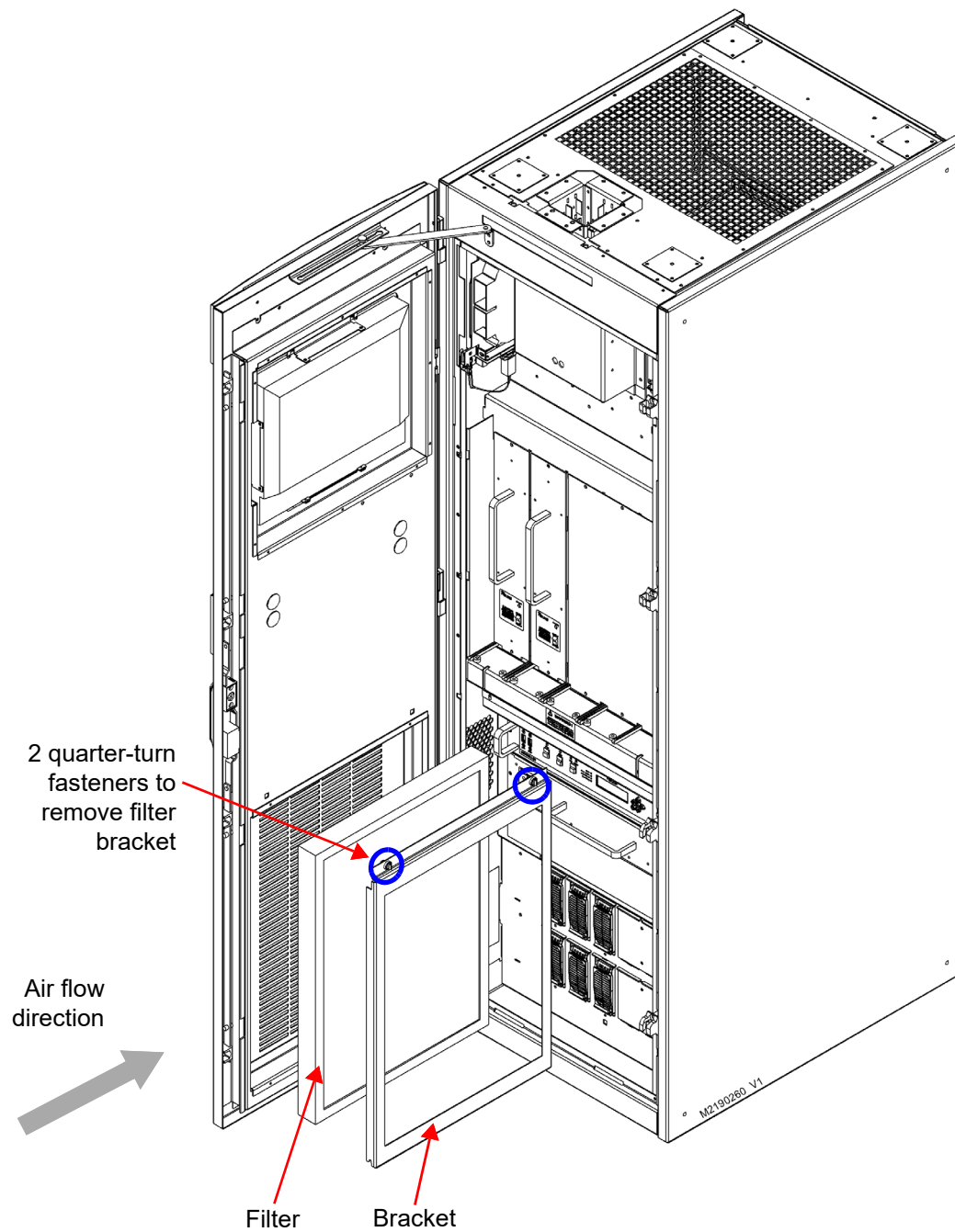
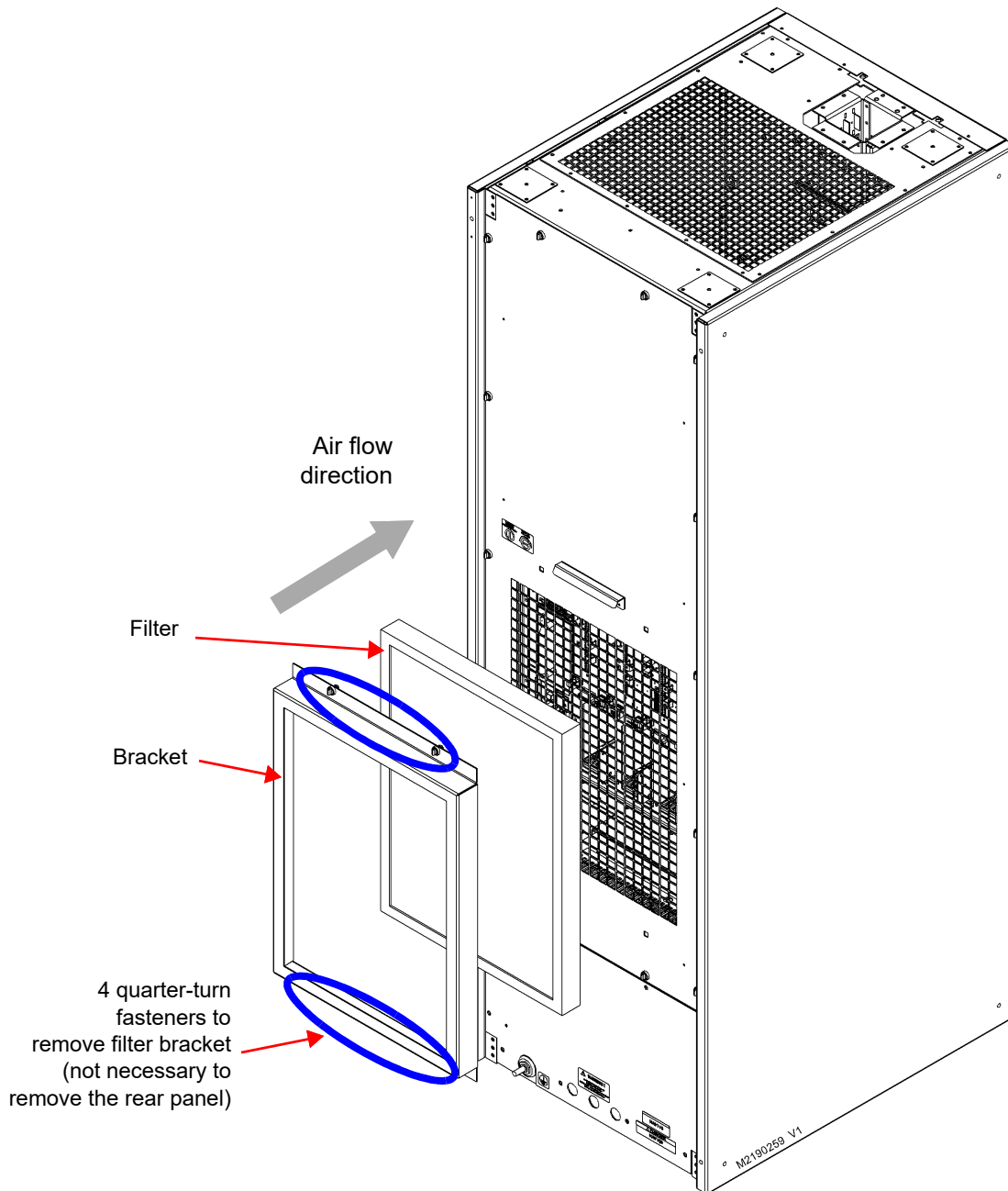
Figure 3.3.1: Replacing Front Air Filters

Figure 3.3.2: Replacing Rear Air Filters

Performing On-Air Checks

You should check the on-air quality of the transmitter's signal periodically. This check can be done locally at the transmitter site, or remotely from another location in the transmitter's coverage area.

Interval

Every 12 months, or as required by law.

Parts and Tools

- High-quality receiver compatible with the modulation scheme used on the transmitter.

Procedure

1. Monitor the transmitter signal to identify any problems:
 - ❖ Use a high quality receiver to monitor audio quality.
 - ❖ Check the spectral output of the transmitter. You can use the local or remote AUI's spectrum analyzer to accurately assess the transmitter's spectral output.
 - ❖ Take a portable receiver to different locations in your coverage areas to identify any problems with the antenna pattern or areas of localized interference.
2. Obtain the Critical Parameters sheet that was completed during factory testing and provided with the transmitter. Use the transmitter's AUI to compare current transmitter settings with those on the Critical Parameters sheet.

NOTE: *Nautel completes the Critical Parameters sheet with the transmitter terminated into a precision 50 ohm load. Measurements made on site into a dummy load or station antenna may not yield the same readings. Slight variances are acceptable. The data is provided as a troubleshooting aid.*

Replacing the Controller Module's Battery

Replace the battery on the controller module's controller PWB (A4A2) once a year, or whenever the **Controller - Low Battery** alarm appears (on the AUI, controller UI or via remote digital output). Chemical leakage from an old battery can cause damage.

Interval

Every 12 months.

Parts and Tools

Replacement battery: 3 V lithium coin cell, 20 mm (Panasonic # CR2032 or equivalent).

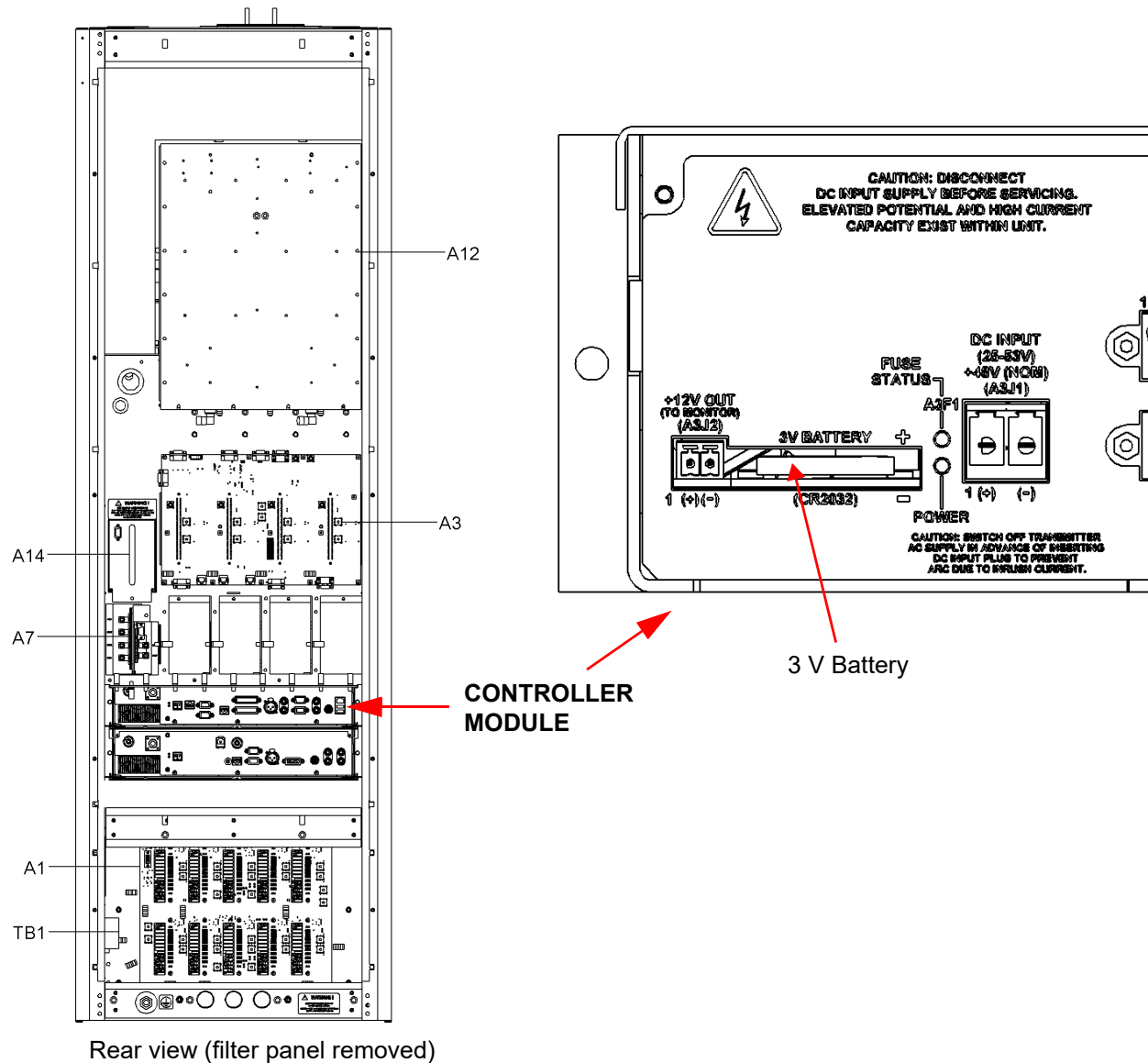
Procedure

Perform the following steps to replace the battery:

1. Remove the upper, rear filter panel by loosening the 12 quarter-turn fasteners securing the panel to the transmitter.
2. Replace the battery in the **3V BATTERY** holder on the rear of the controller assembly (see [Figure 3.3.3 on page 3.3.8](#)).
3. Re-install the upper, rear filter panel removed in [Step 1](#).
4. Check for any alarms on the AUI (local or remote) or controller UI (see [View Status, on page 3.2.197](#)). Battery related alarms should clear.
5. Reset the system clock via the AUI (local or remote) or controller UI (see [Setting the Clock, on page 3.2.186](#)).

NOTE: *If the NTP server feature has been enabled, your clock setting will automatically reset within approximately five minutes. See [NTP Servers, on page 3.2.115](#) for more information.*

Figure 3.3.3: Replacing Controller Battery



Inspecting Lightning Protection Systems

You should inspect the lightning protection systems that are connected to your GV2-5/GV2-3.5 transmitter, ac power, RF feedline, antenna and tower periodically to ensure that your site, equipment and personnel are fully protected.

Interval

Every 6 months.

Parts and Tools

Depends on your site, but may include a digital multimeter, ladder, binoculars, and continuity tester.

Procedure

Perform the following steps to test the lightning protection systems:

1. Test the continuity between ground available at your lightning arrestor and ground available on various pieces of equipment connected to the transmitter. Ensure that there is no resistance (near 0 ohms, accounting for multimeter test lead resistance).
2. Physically inspect the lightning arrestor to ensure that all connections are tight. Also look for any sign of scoring or burning (indications of possible damage from earlier lightning strikes).
3. Using binoculars, visually inspect the hardware on the tower. Look for charred, broken or frayed connections and corrosion.

Performing a vPorter Windows Update (Air Chain only)

Perform a Windows update, when available or as dictated by station policies, as follows:

NOTE: The GV2 transmitter ships from factory with Windows 11 IoT Enterprise 2024. This version is stable, does not receive feature updates, and minimizes feature changes over time. Refer to Nautel's web page <https://support.nautel.com/latest-software/> for supported Windows updates.

NOTE: Windows updates may cause undesirable behavior. Proceed with updates at your own risk. A Windows update may cause the vPorter to restart, which will take the transmitter 'off air'. Nautel recommends turning off the transmitter (i.e., RF off) before performing a Windows update. Do not install additional applications, virus protection.

NOTE: Windows updates should always be disabled by default. Security definition updates are enabled and occur periodically

Interval

As required. This procedure should be performed with the transmitter in an 'RF off' state. A Windows update can take up to 60 minutes to complete.

Parts and Tools

None.

Procedure

1. Set the transmitter to RF off.
2. Access the vPorter Windows desktop as described in the [Accessing the vPorter Desktop, on page 3.4.13](#).
3. From the Start menu, search for 'windows updates' (see [Figure 3.3.4 on page 3.3.11](#)), then go to Windows Update settings page (see [Figure 3.3.5 on page 3.3.11](#)).
4. Click the 'Check for updates' button. If an update is available, apply it by clicking the 'Download & install all' button (see [Figure 3.3.6 on page 3.3.12](#)). The update may take up to 60 minutes to complete.
5. After an update, you might be required to restart Windows. Click the 'Restart now' button.
6. A restart will cause a loss of VNC connection. Disable and re-enable VNC after the restart.
7. Use the Windows Update settings page to verify the update was successful.
8. Set the transmitter to RF on.

Figure 3.3.4: Start Menu - Search for Windows Updates

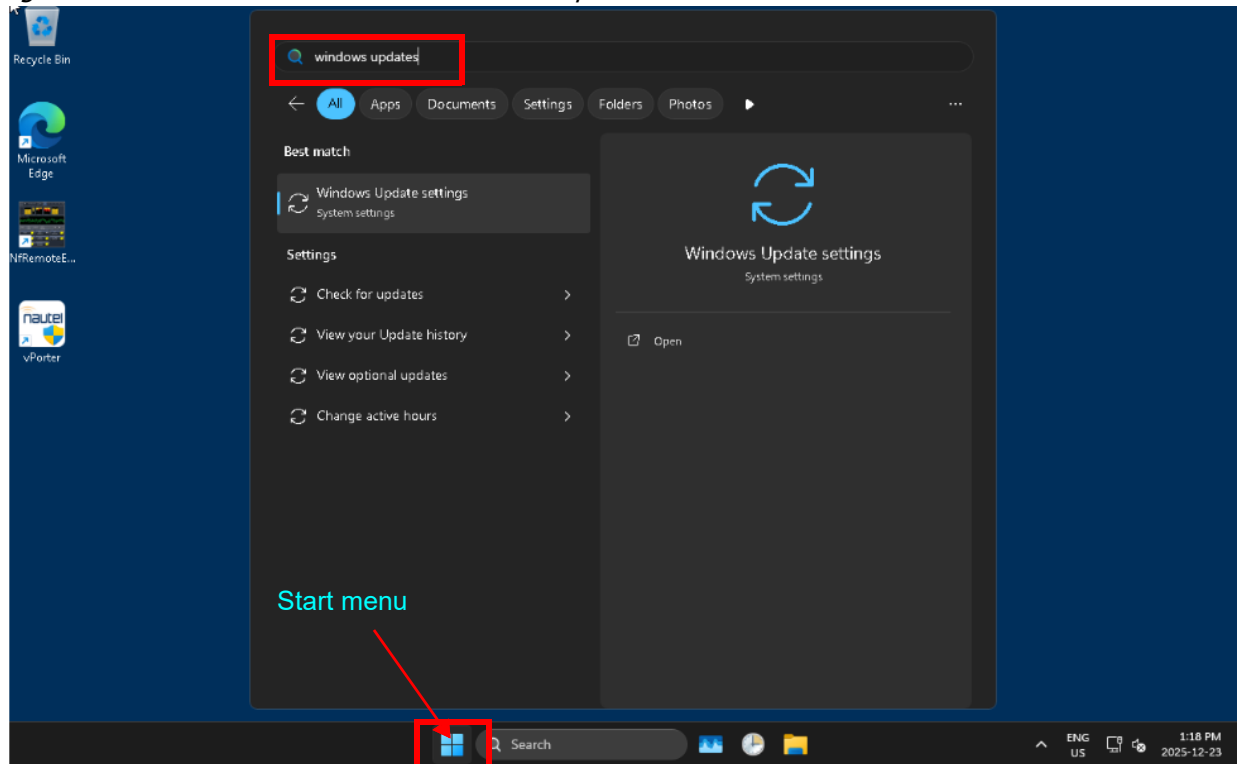


Figure 3.3.5: Windows Update settings page



Figure 3.3.6: Downloading a Windows Update

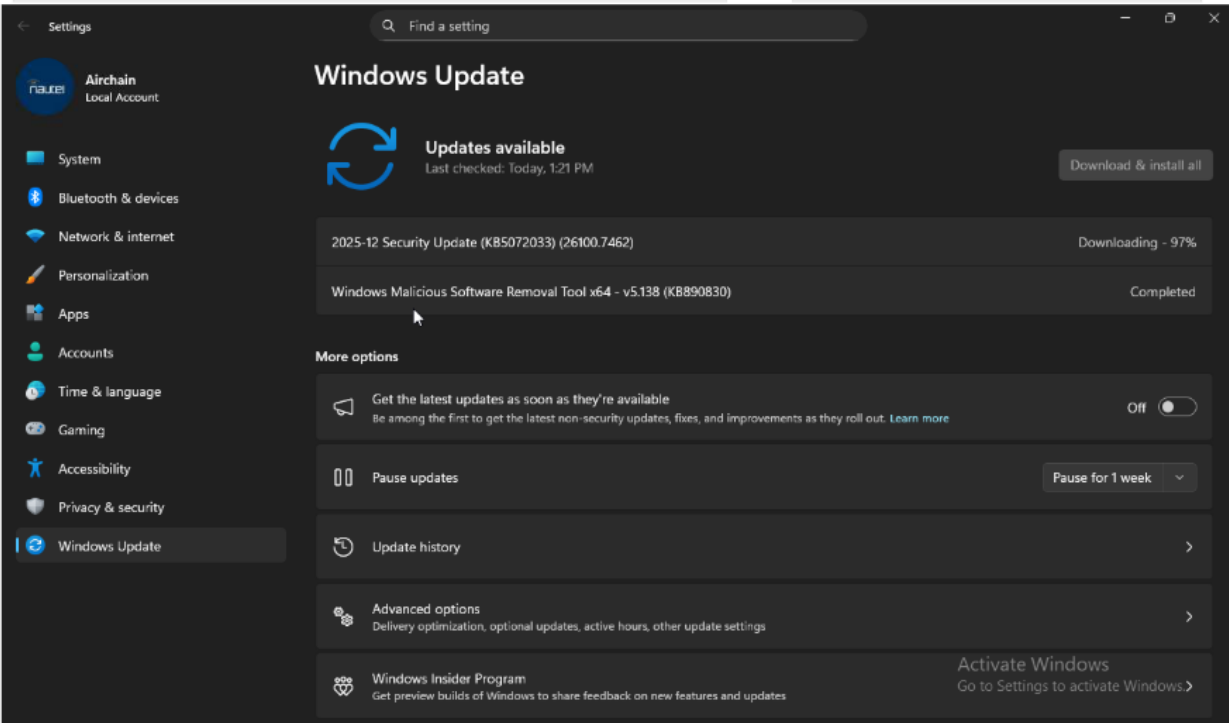
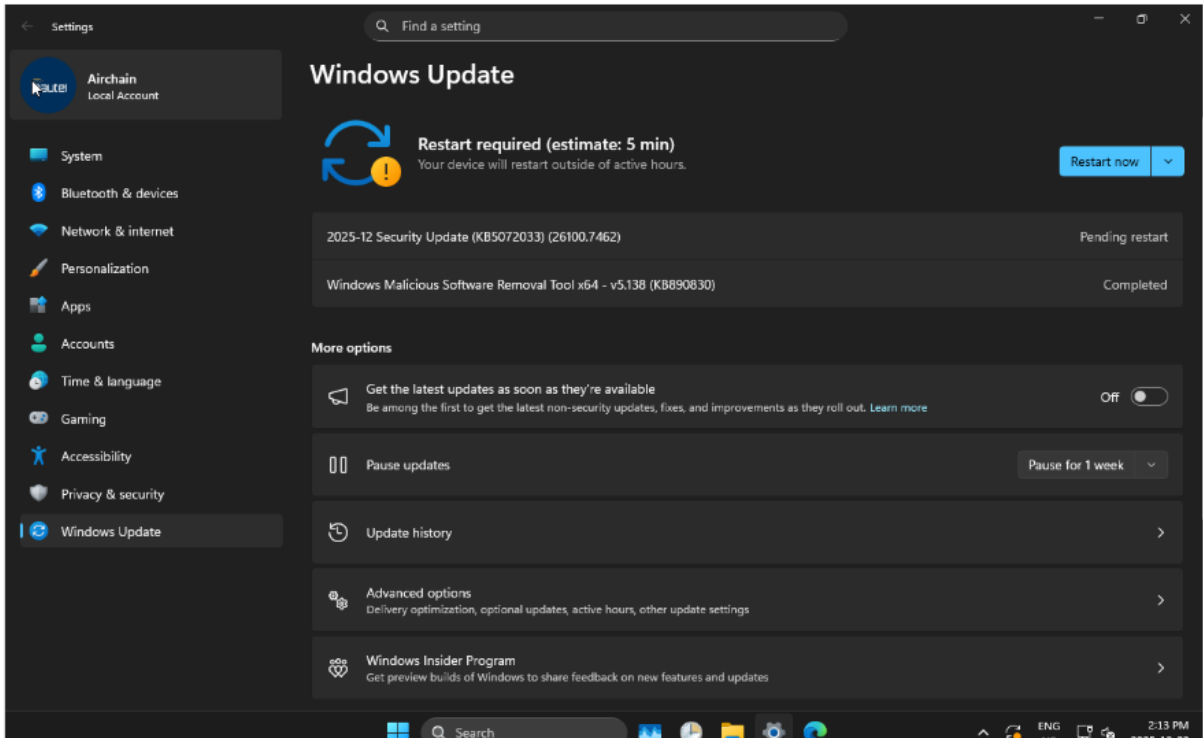


Figure 3.3.7: Restart required indication



SECTION 3.4: NON-STANDARD MAINTENANCE

This section provides instructions for performing non-standard maintenance on the GV2-5/GV2-3.5 transmitter. This section includes the following topics:

- [Upgrading Software](#)
- [Screen Configuration - see page 3.4.7](#)
 - [Touchscreen Calibration - see page 3.4.8](#)
- [Changing the OS Password - see page 3.4.8](#)
- [Configuring a Mod Loss Backup Preset - see page 3.4.9](#)
- [Using the vPorter Desktop \(Air Chain users only\) - see page 3.4.12](#)

Upgrading Software

Periodically, enhancements or improvements to the operating system are identified and made available. Perform a software upgrade, as required, as follows:

NOTE: *Nautel recommends you perform a software upgrade at the transmitter site.*

NOTE: *Nautel provides a transmitter update mechanism by connecting a USB drive to the rear USB ports of the GV2 controller. Nautel will provide instructions on how to create a USB drive and complete the update or provide preprogrammed USB drives with instructions.*

NOTE: *For port-forwarded transmitters, uploading of the .tgz file must occur locally or on the transmitter side of the router.*

Parts and Tools

- Laptop (i.e., local computer for direct connection) or network computer with Windows and Web browser
- Cat5e Ethernet cable
- Upgrade software (*.tgz file), provided via email or web download

Preliminary Checks

1. Determine the current software revision installed via the advanced user interface (AUI). Select **Menu/Software/Upgrades** to view the current version.
2. Contact Nautel for the most recent software revision and download *.tgz file to a laptop or network location.
3. Maximize the SBC's disk space by deleting the old .tgz files. You can Browse, Upload, Refresh, Delete and Start Upgrade form this screen. See [Figure 3.4.1 on page 3.4.2](#).

Software Upgrade via Remote AUI

The Upgrades page (see [Figure 3.4.1](#)) in the Software menu allows for uploading a suite of software upgrade files (.tgz files) via remote connection. Navigate the page as described below to complete an upgrade.

Figure 3.4.1: Software - Upgrades

The screenshot displays the 'Upgrades' page. At the top, a grey header bar contains the word 'Upgrades'. Below this, a white box shows 'Current Version' as 'TITAN-4904 1.0.1'. Underneath is the 'Add Upgrade' section, which includes a 'From' field with a text input 'Select upgrade file to upload' and a 'Browse' button, and a 'To' field with a dropdown menu set to 'Onboard Filesystem' and an 'Upload' button. Below the 'Add Upgrade' section is a table titled 'Select upgrade for installation' with a 'Source' column. The table lists three files: 'vs.titan.4.0.0.30.tgz', 'vs.titan.5.0.0.30.tgz', and 'firmware.tgz', all with 'USI' in the source column. At the bottom of the page are three buttons: 'Refresh List' (blue), 'Start Upgrade' (green), and 'Delete Upgrade File' (red).

Select upgrade for installation		Source
vs.titan.4.0.0.30.tgz		USI
vs.titan.5.0.0.30.tgz		USI
firmware.tgz		USI

Select Browse to locate a .tgz file to upload to the transmitter and click Upload to save the file in the Select upgrade for installation field. A status bar will be displayed showing the percentage completed. See [Figure 3.4.2 on page 3.4.3](#).

Figure 3.4.2: File Upload in Progress

The screenshot shows a web interface titled "Upgrades". At the top, there is a field for "Current Version" with the value "6.0.0". Below this is a section labeled "Add Upgrade". Inside this section, there is a "From" field containing "vx-upgrade-6.0.0.tgz" and a "Browse" button. Below that is a "To" field containing "Onboard Filesystem" and a "Cancel" button. A green progress bar is shown with the text "Uploading 100.00 %". Below the progress bar is a section labeled "Select upgrade for installation" with a large empty list box. At the bottom of the interface are three buttons: "Refresh List" (blue), "Start Upgrade" (green), and "Delete Upgrade File" (red).

.tgz file shown for reference, software
upgrade file name will differ

When the file is fully uploaded, the file will be displayed in the Select upgrade for installation field. See [Figure 3.4.3 on page 3.4.4](#).

Figure 3.4.3: File Upload field Populated

The screenshot shows a web interface titled "Upgrades". At the top, there is a "Current Version" field displaying "Beta 1.1.0 v1". Below this is a section labeled "Add Upgrade". It contains two rows: "From" with a text input field containing "Select upgrade file to upload" and a "Browse" button; and "To" with a dropdown menu showing "Onboard Filesystem" and an "Upload" button. Below the "Add Upgrade" section is a list titled "Select upgrade for installation" containing a single item: "upgrade-beta-1-v2.tgz". At the bottom of the interface are three buttons: "Refresh List" (blue), "Start Upgrade" (green), and "Delete Upgrade File" (red).

Select the upgrade file from the list and click Start Upgrade to initiate the software upgrade process. A warning will be displayed, indicating that the upgrade can take up to fifteen (15) minutes to complete and cannot be stopped once started. Also, the transmitter can remain in an on-air state during the upgrade. Press Yes to start the upgrade process or Cancel to not proceed with an upgrade. See [Figure 3.4.4](#).

Figure 3.4.4: Upgrade Warning

The screenshot shows a modal dialog box titled "Are you sure?" with a close button (X) in the top right corner. The dialog contains a "NOTE" stating: "Upgrading can take up to 15 minutes to complete and cannot be stopped once started. If unsuccessful, the system will be the same as before the upgrade attempt. The transmitter can remain on-air during the upgrade process." At the bottom of the dialog are two buttons: "Cancel" (gray) and "Yes" (blue).

A status bar will be displayed showing the percentage completed. See [Figure 3.4.5 on page 3.4.5](#).

Figure 3.4.5: File Upgrade in Progress

Upgrades

Current Version6.0.0

Add Upgrade

Fromvx-upgrade-6.0.0.tgzBrowse

ToOnboard FilesystemCancel

Uploading 100.00 %

Select upgrade for installation

Refresh List

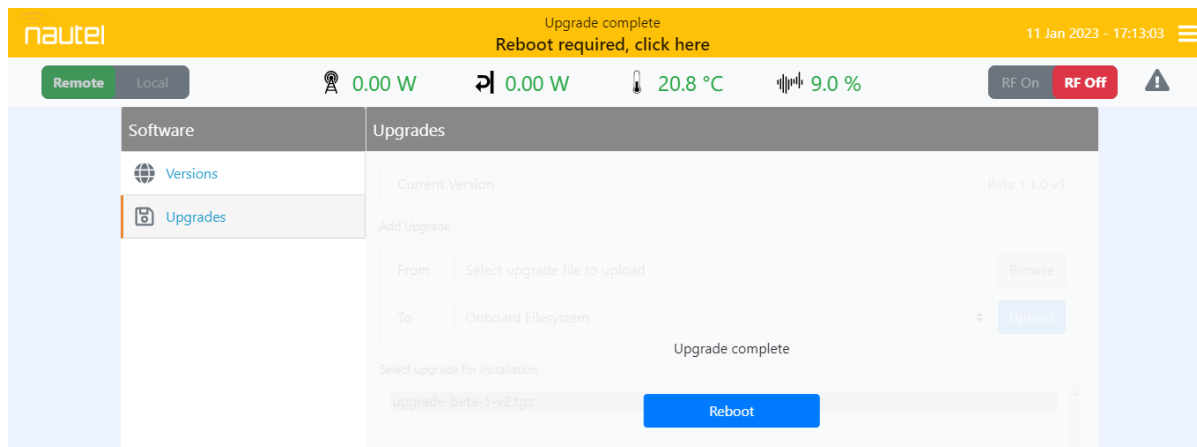
Start Upgrade

Delete Upgrade File

A notification will be displayed if the upgrade was successful or has failed.

If the upgrade was successfully completed, the transmitter will require a reboot. Click the Reboot button or the link in the top banner to start the reboot process. See [Figure 3.4.6 on page 3.4.6](#).

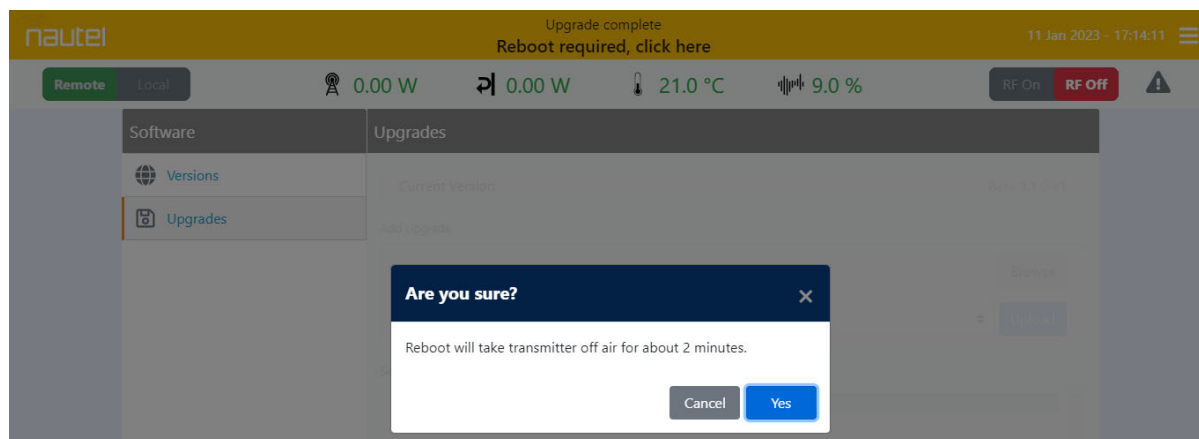
Figure 3.4.6: File Upgrade Complete/Reboot



A warning will be displayed, indicating that the transmitter will be off-air for up to two (2) minutes during a reboot. Press Yes to reboot that transmitter or Cancel to revert to the previous software. See [Figure 3.4.7](#).

NOTE: If a firmware update is included in the update, RF off time may be extended depending on the transmitter model (larger models taking longer). Please **do not** AC cycle the transmitter until the internal SBC has rebooted and the AUI is accessible.

Figure 3.4.7: Reboot Warning



If the upgrade failed, the Operating System will remain unchanged and a pop-up screen will be displayed for the user to acknowledge the failed attempt.

Clicking on Refresh List will show the user all upgrade files currently available. To delete an upgrade file from the list, select the desired file and click Delete Upgrade File. See [Figure 3.4.1 on page 3.4.2](#).

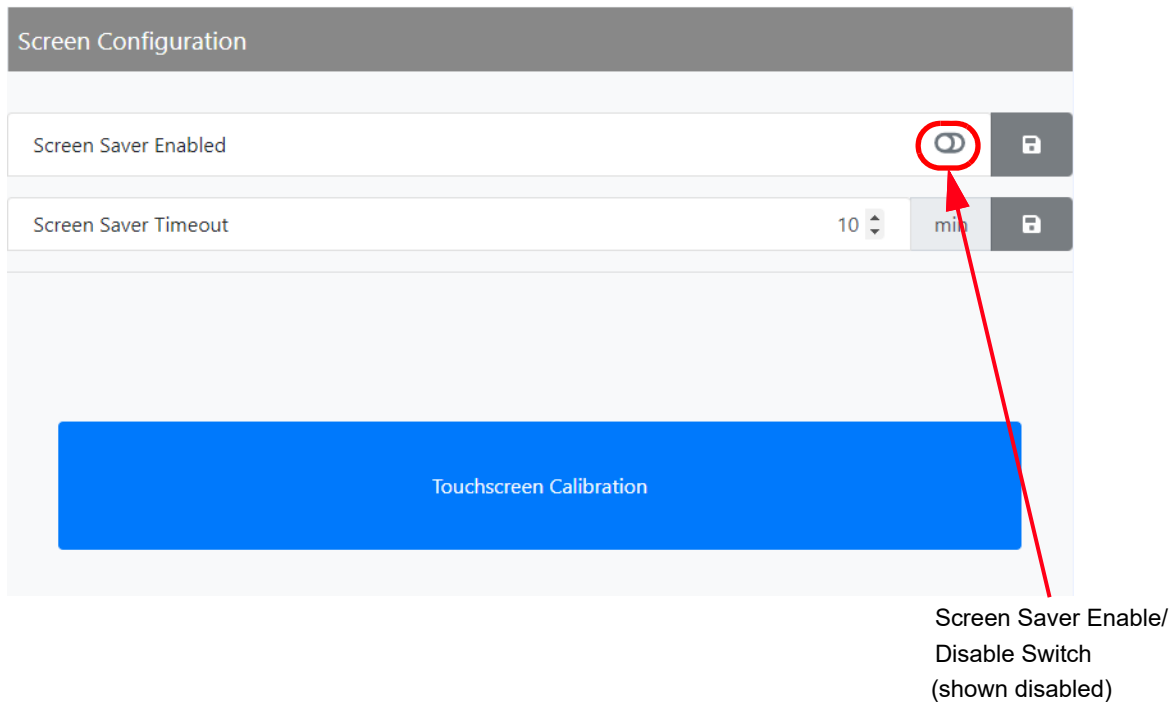
Once rebooted, you will have to log back into the transmitter, using your Username and Password. Refer to [Logging into the AUI - see page 3.2.10](#).

Screen Configuration

NOTE: The Screen Configuration menu is only visible in Local mode.

The Screen Configuration page allows users to enable a Screen Saver and set the Screen Saver Timeout for the front panel display or perform a touchscreen calibration. See [Figure 3.4.8](#).

Figure 3.4.8: Screen Configuration Screen



Enable the Screen Saver by sliding the Icon to the right (turns green) and click the Save button.

Use the up and down arrows to change the Screen Saver Timeout and click the Save button. The range is between 10 and 180 minutes.

Touchscreen Calibration

A touchscreen calibration will be required if the AUI or the controller's internal solid-state drive (SSD) has been replaced. To perform a touchscreen calibration, perform the following steps:

- plug a USB mouse into Single Board Computer (SBC).
- put the transmitter in local mode.
- using the mouse, select "Settings" then "Screen Configuration" from the main menu screen.
- select "Touchscreen Calibration".
- follow the on-screen prompts to calibrate the touchscreen by pressing on the X's where instructed to do so.

Changing the OS Password

The OS (operating system) password is a unique, factory set password that is recorded in the OS Password document provided with the transmitter. It should not be necessary to change this password unless there has been a network security breach and access to the transmitter is compromised.

To change the OS Password, you will need to remotely connect to a Linux computer using SSH. PuTTY is a common utility for Windows users (available at <http://www3.nautel.com/pub/Utilities/putty/putty.exe>; if unable to open this link, use a search engine to find new URL), while Linux users can use 'ssh' from the command line. Change the OS password as follows:

1. Connect to the transmitter IP address using your selected SSH client.
2. Login with username root and the OS Password provided with your transmitter on the OS Password document.
3. At the prompt, type the command `passwd`. This is the Linux command to change your password.
4. Enter and confirm your new password.
5. Record your new password on the OS Password document provided with the transmitter. If you would like Nautel to track your password for support purposes, please email support@nautel.com with your new information.
6. Close the console window.

Configuring a Mod Loss Backup Preset

The GV2-5/GV2-3.5 contains an audio level detection circuit that can be used, when enabled, to allow switching to a secondary (backup) audio input source upon the loss of the primary source. Configure the desired transmitter preset to perform this function as follows (refer also to Section 2 of this manual for operating instructions of the AUI (local or remote) and controller UI (local) interfaces:

NOTE: *You must configure a minimum of two presets to allow this feature to operate. One preset will act as the primary, or normal operating preset. The second preset will act as the secondary, or backup audio preset. Configure the backup audio preset first.*

Configuring the Backup Audio Preset

1. Consider the following limitations when selecting a backup preset:
 - ❖ If the exciter has an Orban Inside installed and enabled, then only one AES source can be used for either the primary or backup source.
 - ❖ If MPX over AES is used for either the primary or backup, the other source cannot be AES (either primary or secondary).
 - ❖ If MPX SCAs are enabled, then audio backup cannot be used with MPX as either the main or backup source.
2. From the transmitter AUI, go to **Presets/Other Settings** and enable Mod Loss Timeout. See [Figure 3.4.9 on page 3.4.10](#). When enabled, other parameters have to set. They are as follows (refer to [Other Settings on page 3.2.57](#)):
 - Mod Loss Action (Alarm Only, RF Inhibit and Change Preset)
 - Mod Loss Preset
 - Mod Loss Timeout (Minutes and Seconds)
 - Mod Loss Threshold (typically 10%)
3. Select a suitable preset to use as the backup audio preset.
4. Click the Save button.

Figure 3.4.9: Presets/Other Settings - Mod Loss Enabled

Update Preset		
General Audio SCA RDS Other Settings		
Pilot Level	10.0	%
Pilot 1 PPS Sync	Disabled	
Audio Delay	Disabled	
Mod Loss Timeout	Enabled	
Mod Loss Action	Change Preset	
Mod Loss Preset	Preset 6	
Mod Loss Timeout Minutes	0	min
Mod Loss Timeout Seconds	5.0	s
Mod Loss Threshold	0	%

5. From the transmitter AUI, go to **Presets/Audio** and enable Backup Audio. See [Figure 3.4.10 on page 3.4.11](#). When enabled, other parameters have to set. They are as follows (refer to [Main Audio, on page 3.2.47](#)):

- Backup Audio Source (Analog L/R, MPX, AES/EBU, Audio Player to AES2 and MPX over AES)
- Backup Analog Level
- Backup Audio Mode (Mono L+R, Mono L, Mono R and Stereo)
- Backup Pre-emphasis (enabled or disabled)
- Backup Audio Gain Adjust

NOTE: SCA, RDS and Pilot modulation levels are additive and contribute the audio level. If their combined levels exceed the audio loss threshold level, a preset change will not occur. Stations with audio content containing extended nulls or silent periods (e.g., classical music) should consider reducing the audio loss threshold or increasing the timeout period.

6. Click the Save button.

Figure 3.4.10: Backup Preset Main Audio Screen

Update Preset

General

Audio

SCA

RDS

Other Settings

Main Audio

Audio Source

AES/EBU

Digital Level

0.0

dBFS

Audio Mode

Stereo

15 kHz Low-Pass

Disabled

Pre-emphasis

0

µs

Gain Adjust

0.0

dB

Backup Audio

Enabled

Backup Audio Source

Analog L/R

Backup Analog Level

0.0

dBu

Backup Audio Mode

Mono L+R

Backup Audio 15 kHz Low-Pass

Disabled

Backup Pre-emphasis

0

µs

Backup Audio Gain Adjust

0.0

dB

Cancel

Save

Using the vPorter Desktop (Air Chain users only)

For Air Chain users, standard vPorter operation is controlled via the vPorter web interface ([Using the Gen4 Remote User Interface, on page 3.2.232](#)) and the Omnia NfRemote interface ([Omnia for Nautel Audio Processor, on page 3.2.67](#)). Access to the vPorter desktop is only expected in the following limited scenarios, or as directed by Nautel Customer Service:

- [Accessing the vPorter Desktop - see page 3.4.13](#)
- [Setting the VNC Password - see page 3.4.16](#)
- [Transferring Files Between vPorter and PC - see page 3.4.17](#)
- [Backup Gen4 Importer Configuration - see page 3.4.19](#)
- [Update Default Station Logo - see page 3.4.21](#)
- [Changing the Gen4 User Interface Login Password - see page 3.4.29](#)
- [Updating vPorter Software - see page 3.4.30](#)

Accessing the vPorter Desktop

The Windows desktop of the vPorter can be accessed using a Virtual Network Client (VNC) remote desktop viewer. Nautel recommends using TightVNC. This software is available on the Nautel website (<http://www3.nautel.com/pub/Utilities/TightVNC/>) or from:

<https://www.tightvnc.com/download.php>

For enhanced security, the VNC access is disabled by default, and can only be enabled for a maximum of three (3) hour duration. To enable the VNC server on the vPorter, go to the remote AUJ's **Air Chain -> vPorter -> Settings** (see [Figure 3.4.11](#)).

Figure 3.4.11: Enabling vPorter VNC Server

The screenshot shows the vPorter Settings interface. At the top, there are two tabs: 'IP Network' and 'Settings', with 'Settings' being the active tab. Below the tabs, the 'VNC Server' section is visible. It contains a toggle switch for 'Enable Server' which is currently turned on (green). Below this is a field for 'VNC Server Enable Duration' set to '15 min'. The 'VNC Server Status' section below shows three fields: 'Start Time', 'End Time', and 'Remaining Time', all of which are currently empty. At the bottom right of the settings area, there are 'Cancel' and 'Save' buttons.

1. In the VNC Server section, set the Enable Server toggle to on (green).
2. When VNC is enabled you can set the VNC Server Enable Duration (in minutes) for the desired duration (between 1 and 180).
3. Click Save to start the enable period. Remaining time will be indicated on the screen. The time will only be updated on refreshing or navigating to this screen.
4. Obtain either the LAN1 or LAN2 IP address of the vPorter from the **Air Chain -> vPorter -> IP Network** page.

5. Open the TightVNC viewer and enter the vPorter IP address (e.g., 10.0.128.57), followed by ":47786" in the tightVNC connection screen's Remote Host field and click **Connect** (see [Figure 3.4.12](#)). The Vnc Authentication screen will display (see [Figure 3.4.13](#)).

Figure 3.4.12: TightVNC Connection screen

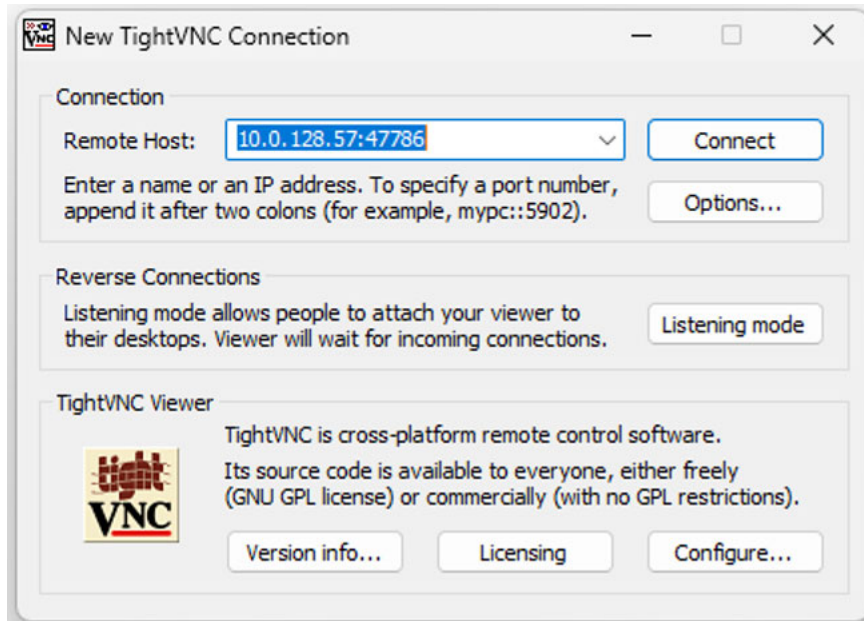
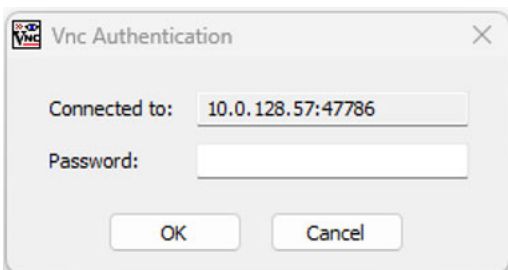
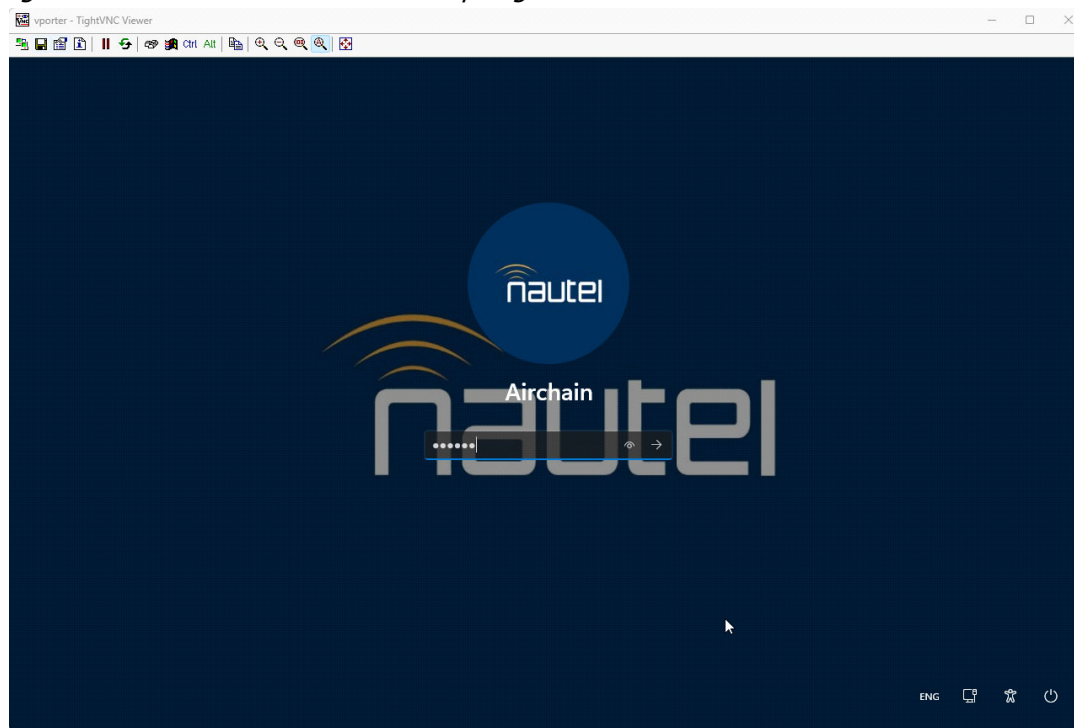
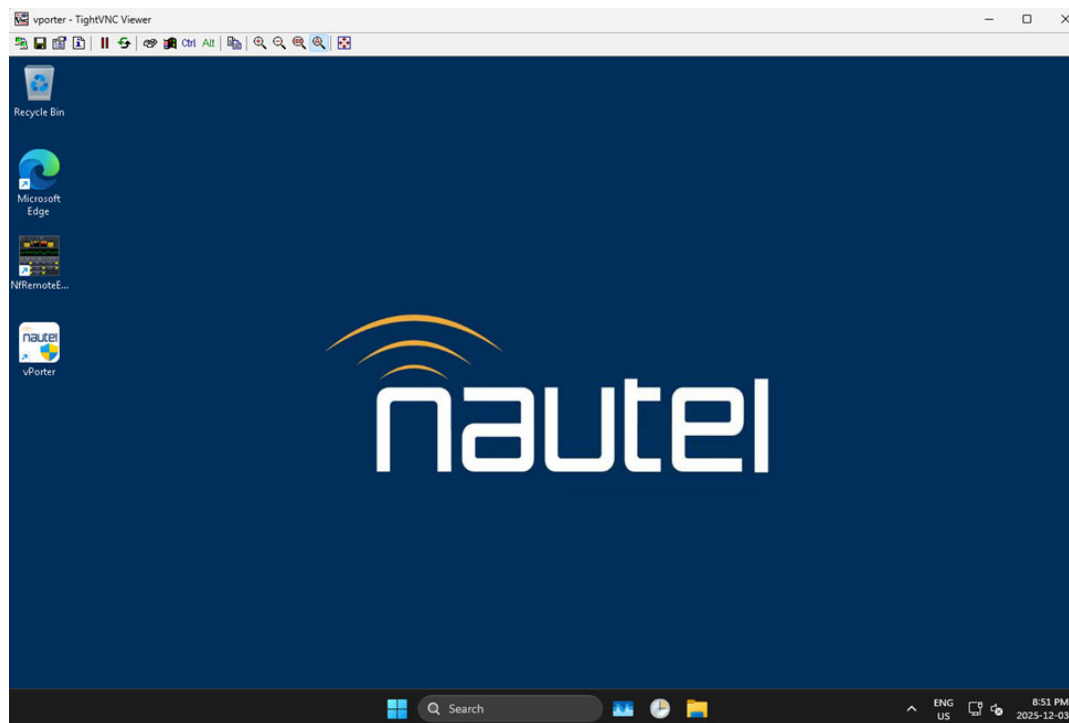


Figure 3.4.13: VNC Authentication screen



6. Enter the Password field with the randomized VNC password recorded as '*TightVNC login password*' on the '*GV2 OS Password*' sheet provided in the shipped transmitter documentation, or use the latest configured password. The vPorter Windows desktop login screen will display (see [Figure 3.4.14 on page 3.4.15](#)).
7. Log in to the windows desktop using the randomized password recorded as '*vPorter Windows login password*' on the '*GV2 OS Password*' sheet provided in the shipped transmitter documentation, or use the latest configured password. See [Figure 3.4.15 on page 3.4.15](#). You are now on the windows desktop and can start performing the required maintenance task.

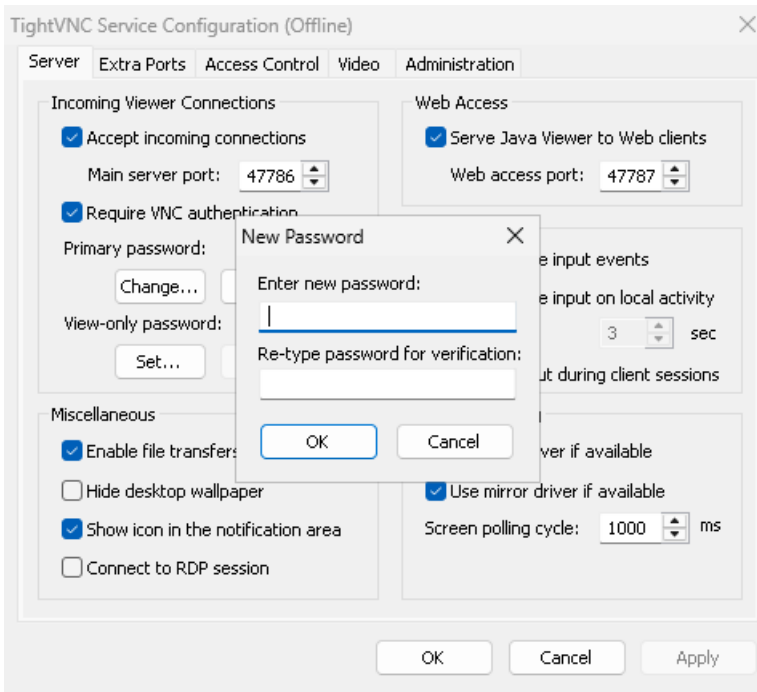
NOTE: Limit interaction with the Windows desktop as excessive CPU usage can impact the on-air signal.

Figure 3.4.14: vPorter Windows Desktop Login*Figure 3.4.15: vPorter Windows Desktop*

Setting the VNC Password

1. From the vPorter Windows start menu (see [Accessing the vPorter Desktop, on page 3.4.13](#) to access, if necessary), search for 'TightVNC Service - Offline Configuration' and open the application (see [Figure 3.4.16](#)).

Figure 3.4.16: TightVNC Service Configuration - Primary password screen



2. Click the Server tab, then click the Primary password: **Change...** button.
3. In the New Password window, enter the new password, retype the password, then click OK.
4. Click OK in the main window of the TightVNC Service - Offline Configuration screen. Click OK on the pop-up message that appears.

Transferring Files Between vPorter and PC

From the vPorter Windows desktop, double-click the file transfer icon (see [Figure 3.4.17](#)). The file transfer screen in [Figure 3.4.18](#) will display.

Figure 3.4.17: TightVNC File Icon on vPorter desktop

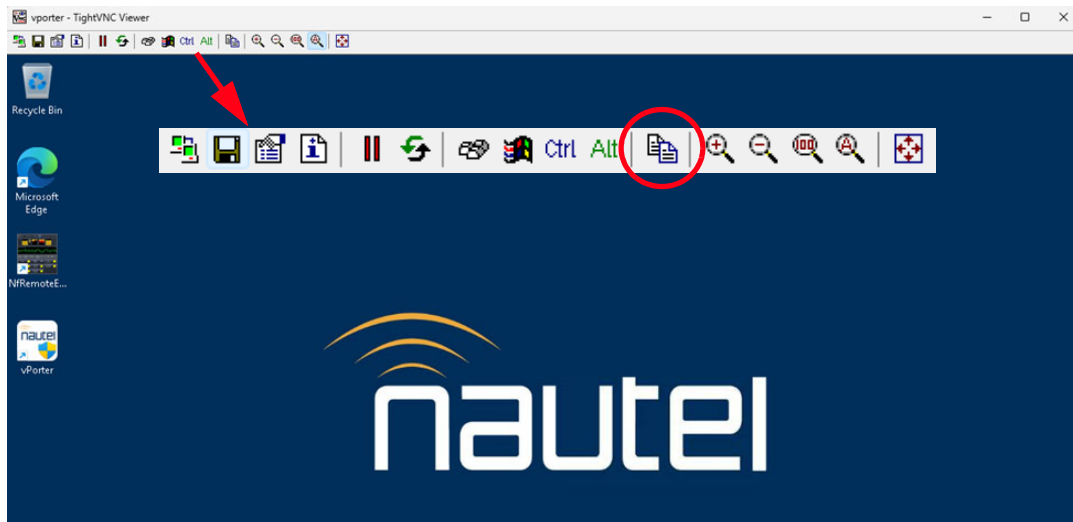
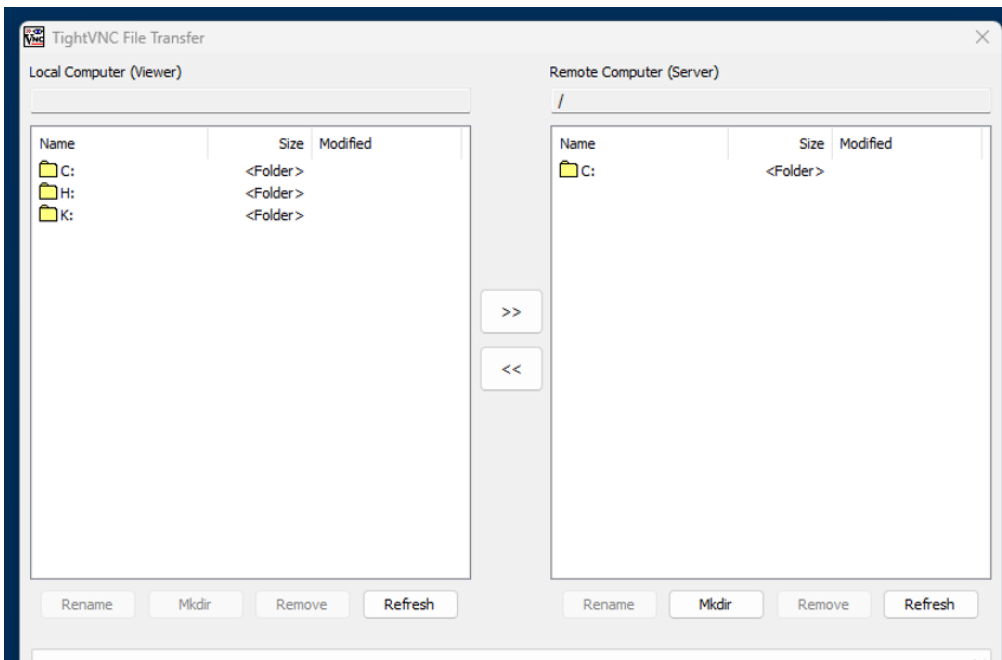


Figure 3.4.18: TightVNC File Transfer screen



The file transfer window is configured with left and right panes. The left-hand side is the Local Computer (Viewer) and the right-hand side is the Remote Computer (vPorter server).

Pulling Files to the PC

- ❖ On the remote side, navigate to where you placed the files (e.g., C:\Users\airchain\Documents\).
- ❖ On the local side, choose your destination folder (e.g. C:\Users\<you>\Downloads\TF-513_vPorter_Logs\).
- ❖ Select the files on the remote side and click the left (transfer) arrow button to copy them to the local side's destination folder. You now have the vPorter files on your PC, ready to rename as per your testing or FM convention.

Pushing Files to vPorter

- ❖ On the local side, browse to your files (e.g., vPorterSetup.msi, a batch, or log parser)
- ❖ On the remote side, choose a user folder (e.g., C:\Users\airchain\Documents\).
- ❖ Select the files on the local side and click the right (transfer) arrow button to upload. Once done, you can run or move the file on the vPorter desktop as needed.

Backup Gen4 Importer Configuration

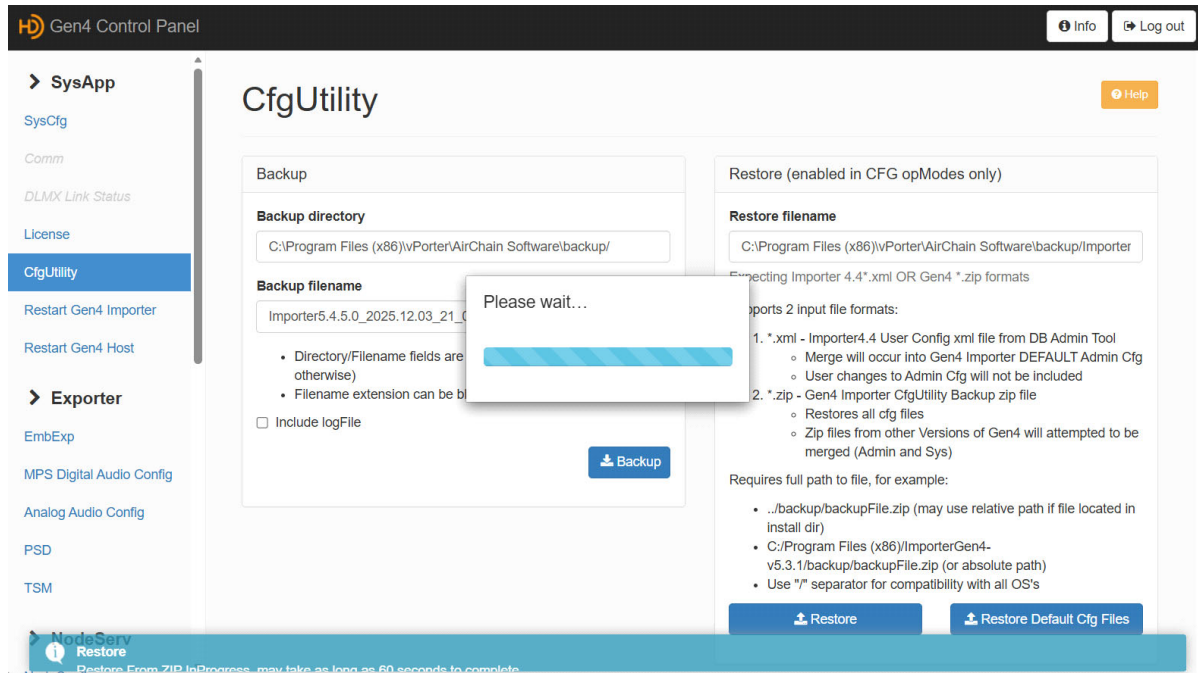
1. Log in to the Gen4 web interface (see [Using the Gen4 Remote User Interface - see page 3.2.232](#)) and go the SysApp -> CfgUtility page ([Figure 3.4.19](#)).

Figure 3.4.19: Gen4 UI ConfigUtility screen

The screenshot displays the Gen4 Control Panel's CfgUtility interface. On the left, a sidebar lists various system components, with 'CfgUtility' currently selected. The main area is divided into two sections: 'Backup' and 'Restore'. The 'Backup' section includes input fields for the backup directory and filename, along with a 'Backup' button. The 'Restore' section provides instructions on file formats and a 'Restore' button. A 'Help' button is located in the top right corner of the main area.

2. Click the **Backup** button. The backup file is located on the vPorter as the **Backup filename** in the **Backup directory** shown.
3. Copy the backup file to your local PC as described in [Pulling Files to the PC, on page 3.4.18](#).
4. To restore a backup configuration, upload the backup file to the vPorter as described in [Pushing Files to vPorter, on page 3.4.18](#).
5. In the Gen4 CfgUtility page, enter the **Backup filename** field with the file name to be restored and click the **Restore** button (see [Figure 3.4.20 on page 3.4.20](#)). The filename must include the entire path and filename.
6. After the restore operation completes, restart the Gen4 system from the left hand panel.

Figure 3.4.20: CfgUtility backup progress screen



Update Default Station Logo

If the station automation system does not provide updated station logos, update it using the Gen4 interface as follows:

1. In the SysApp -> Comm page (see [Figure 3.4.21](#)), ensure the service mode configuration ends in '_AE' (e.g., FM_MP3_4HD-EVEN_AE). This is required for station logos.

Figure 3.4.21: SysApp -> Comm page - Set or Verify the Active Configuration

The screenshot shows the SysApp Comm page. On the left, the 'Sync State' section displays a green light and the word 'SYNCHRONIZED'. Below this, the 'Active Config.' dropdown is set to 'FM_MP3_4HD_HD-EVEN_AE', which is circled in red. The 'Active Services' dropdown is set to 'HD1'. On the right, the 'Run State' section displays a green light and the word 'STARTED'. A 'Stop' button is visible below the Run State indicator.

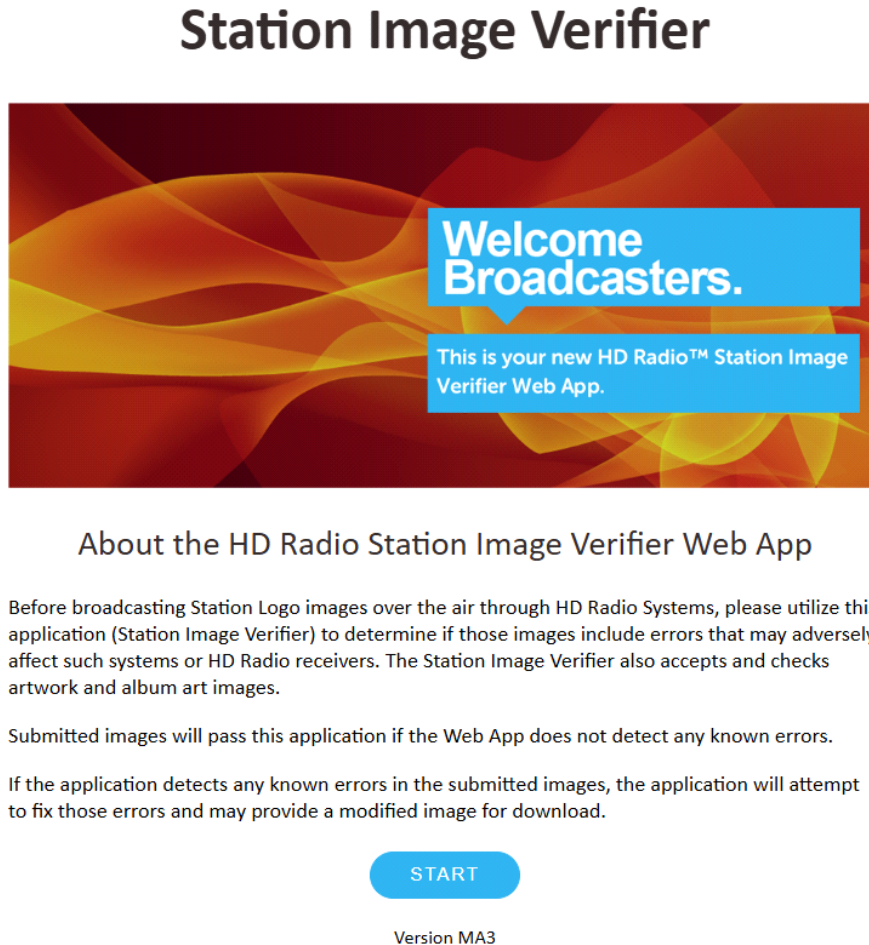
2. In the SysApp -> SysCfg page (see [Figure 3.4.22](#)), set MSAC1 load to true.

Figure 3.4.22: SysApp -> SysCfg Page - Setting MSAC1 load

The screenshot shows the SysApp SysCfg page. On the left, the 'SysApp' section has a 'Component Help' button and several configuration options: 'opMode' (IMP_EXP_FULL_OP_MODE), 'autoRun' (true), and 'lumbEnabled' (false). Below these are 'GetSaved', 'Refresh', and 'Save' buttons. On the right, the 'Audio/MSAC Client Auto-Load & Client IP Addr (IP Addr relative to Ext Server Location)' section contains a table of settings. The 'MSAC1 load' dropdown is circled in red and set to 'true'. Other settings include HD2, HD4, HD6, HD8, HD3, HD5, HD7, MSAC2, MSAC3, and MSAC4 loads and client IPs. A 'Num AudioClients Allowed To Load' field is set to 3. At the bottom right are 'GetSaved', 'Refresh', and 'Save' buttons.

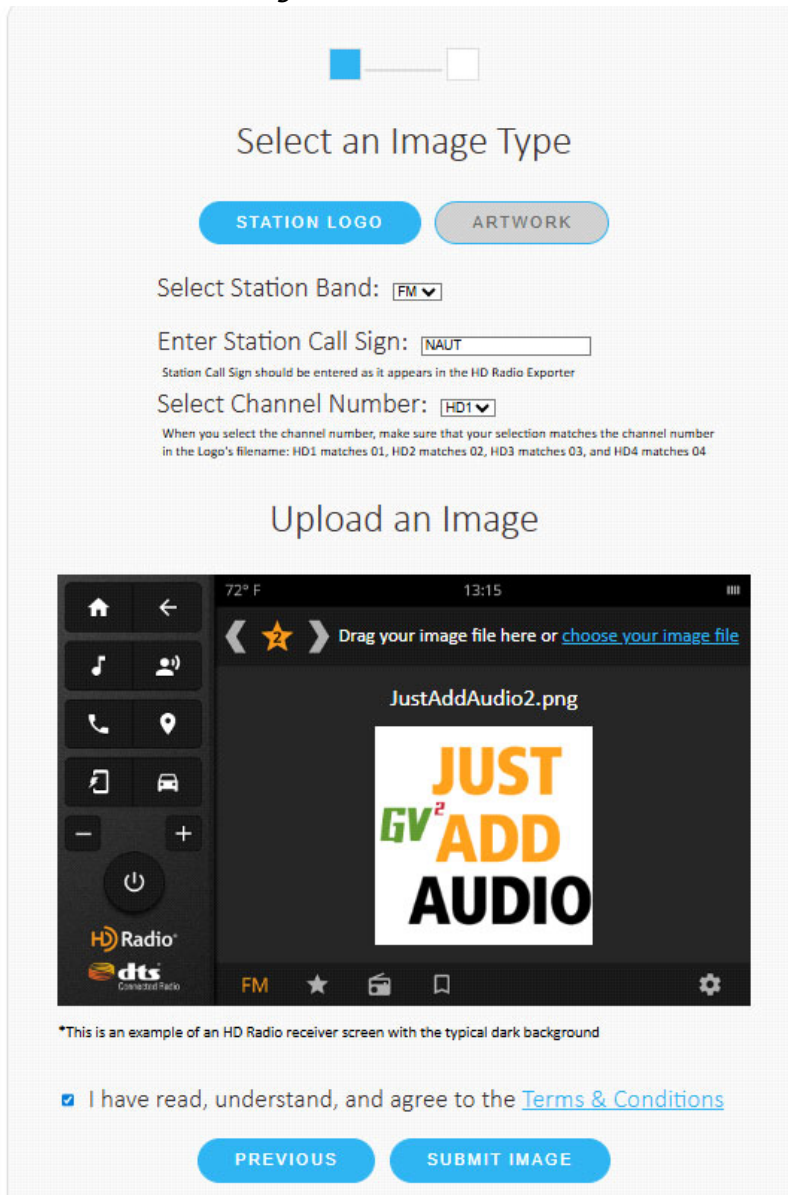
3. In a web browser, open the Station Image Verifier site (<https://hdlogoverify.com/>) (see Figure 3.4.23) and click **START**.

Figure 3.4.23: Station Image Verifier home page



4. Complete the Station Image Verifier form (see Figure 3.4.24 on page 3.4.23) as follows:
 - ❖ Click the **STATION LOGO** button
 - ❖ Select Station Band (FM)
 - ❖ Enter Station Call Sign
 - ❖ Select Channel Number (HD1, HD2, HD3, or HD4)
 - ❖ Upload your station logo image
 - ❖ Read and agree to the Terms and Conditions; click checkbox
 - ❖ Click the **SUBMIT IMAGE** button

Figure 3.4.24: Station Image Verifier Submission Form



The form is titled "Station Image Verifier Submission Form" and is designed for submitting station logos or artwork. It features a progress indicator at the top with a blue square and a white square. The main heading is "Select an Image Type", followed by two buttons: "STATION LOGO" (highlighted in blue) and "ARTWORK" (greyed out). Below this, there are three input fields: "Select Station Band:" with a dropdown menu showing "FM", "Enter Station Call Sign:" with a text box containing "NAUT", and "Select Channel Number:" with a dropdown menu showing "HD1". A small note below the channel number field states: "When you select the channel number, make sure that your selection matches the channel number in the Logo's filename: HD1 matches 01, HD2 matches 02, HD3 matches 03, and HD4 matches 04". The next section is titled "Upload an Image" and displays a preview of an HD Radio receiver screen. The screen shows a dark background with a sidebar of icons (home, back, music, people, phone, location, document, car, volume, power) and a main area with a star icon and the text "Drag your image file here or [choose your image file](#)". Below this, the filename "JustAddAudio2.png" is shown above a logo that reads "JUST GV² ADD AUDIO". The bottom of the screen shows "FM", a star, a folder icon, a bookmark icon, and a settings gear. A note below the preview states: "*This is an example of an HD Radio receiver screen with the typical dark background". At the bottom of the form, there is a checkbox labeled "I have read, understand, and agree to the [Terms & Conditions](#)" which is checked. Finally, there are two buttons: "PREVIOUS" (greyed out) and "SUBMIT IMAGE" (highlighted in blue).

Select an Image Type

STATION LOGO ARTWORK

Select Station Band: FM

Enter Station Call Sign: NAUT

Station Call Sign should be entered as it appears in the HD Radio Exporter

Select Channel Number: HD1

When you select the channel number, make sure that your selection matches the channel number in the Logo's filename: HD1 matches 01, HD2 matches 02, HD3 matches 03, and HD4 matches 04

Upload an Image

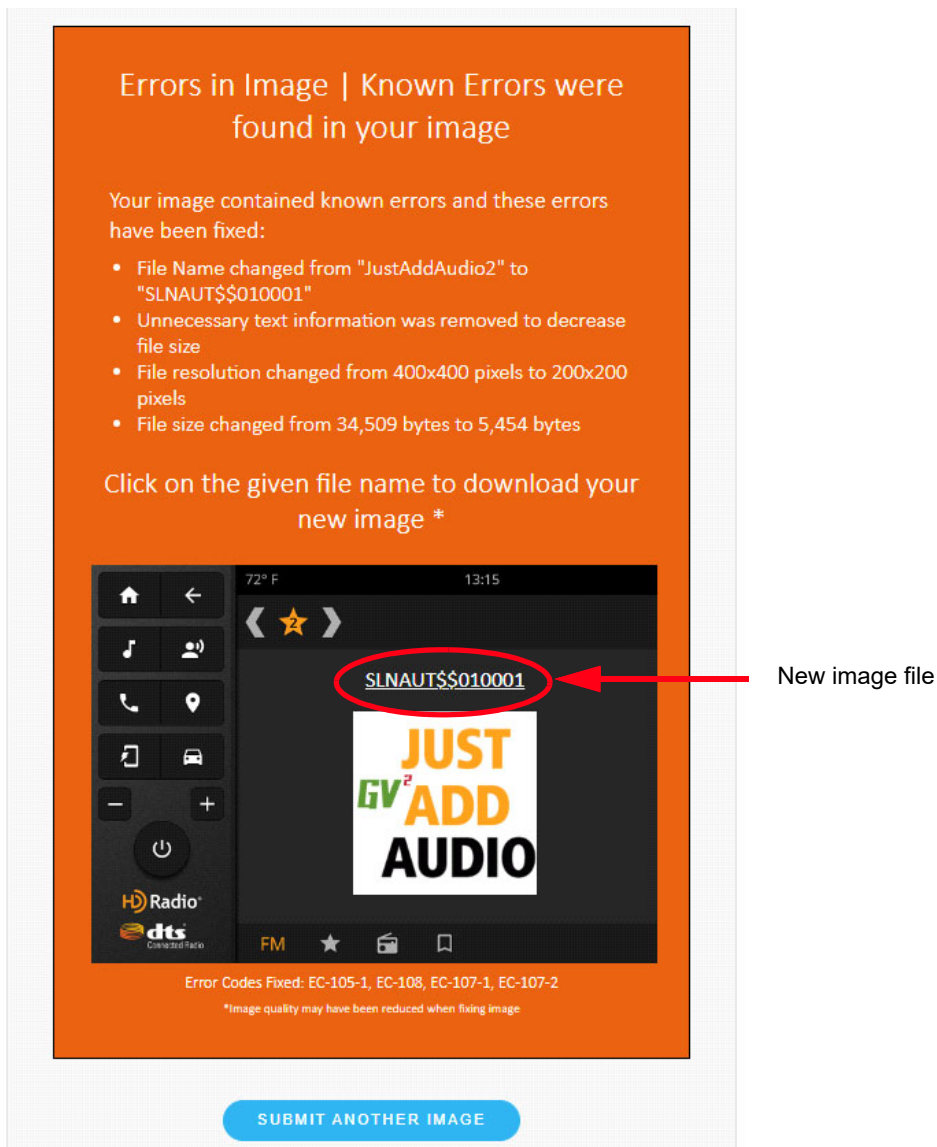
*This is an example of an HD Radio receiver screen with the typical dark background

☒ I have read, understand, and agree to the [Terms & Conditions](#)

PREVIOUS SUBMIT IMAGE

5. The image verification program will verify the station logo, fix errors (text, file size, resolution, etc., if necessary), and provide an updated file to download (see Figure 3.4.25).

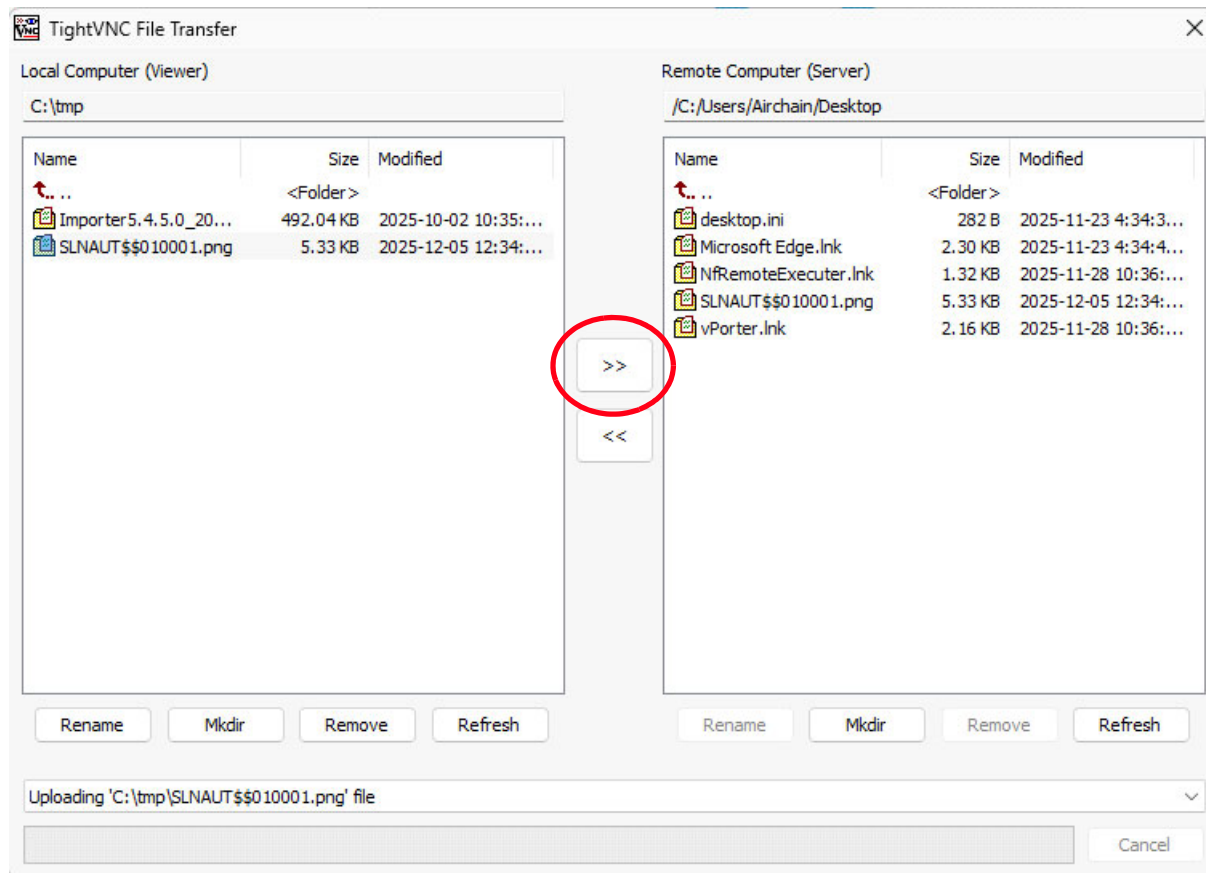
Figure 3.4.25: Station Image Error Correction and New File Provision



NOTE: An orange-background screen indicates that your submitted image contained known errors that were fixed. A red-background screen indicates that your submitted image contained errors that could not be fixed. In this case, you will need to submit another image.

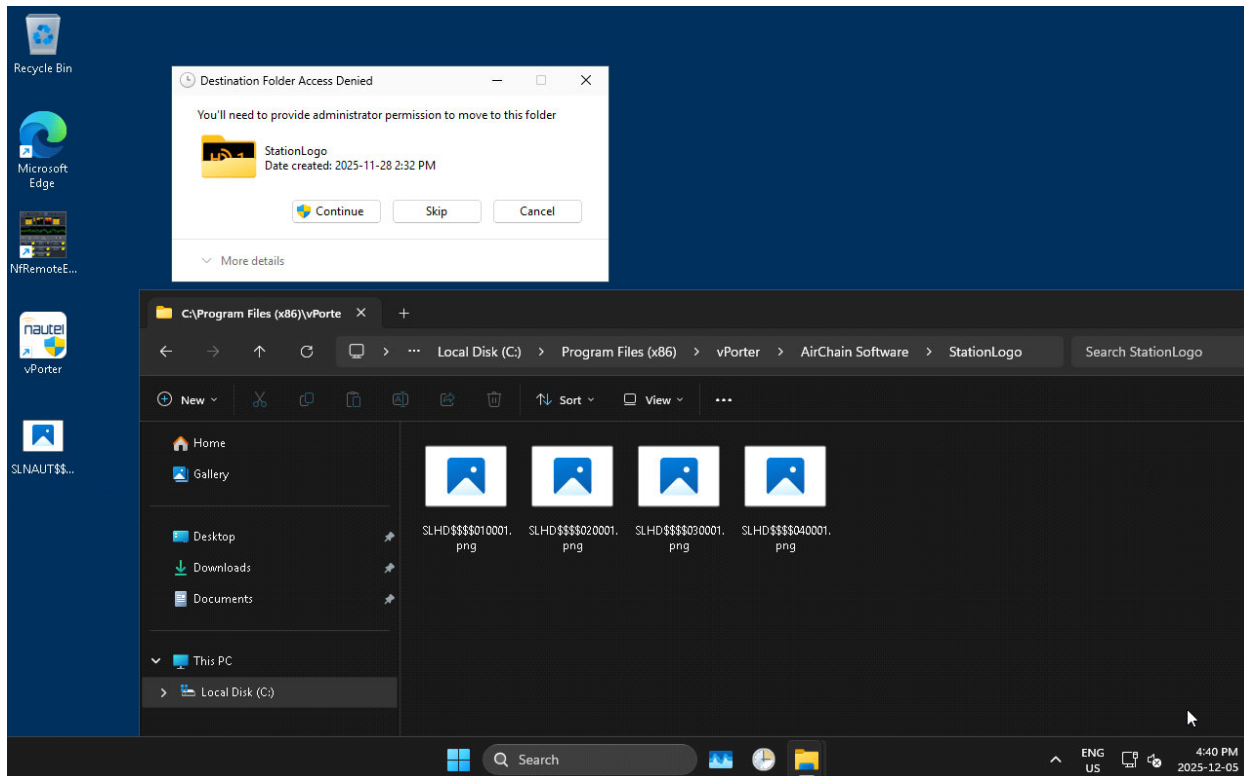
6. Download to a location on the laptop or PC and then transfer the file to C:/Users/AirChain/Desktop on vPorter as described in [Pushing Files to vPorter, on page 3.4.18](#) (see also [Figure 3.4.26](#)).

Figure 3.4.26: Transfer Station Logo Image File from PC to vPorter



7. On the vPorter desktop, drag the file to folder to C:\Program Files(x86)\vPorter\AirChain Software\StationLogo (see [Figure 3.4.27](#)). Click **Continue** when prompted.

Figure 3.4.27: Drag File to c:\Program Files location



- On the Gen4 web interface, go to the **MSAC Clients -> MSAC #1** page and click the **Default Station Logo Sender** button to open the Default Station Logo Filler/Sender window (see [Figure 3.4.28](#)). Note: MSAC1 can handle all configured stations (HD1 through HD4).

Figure 3.4.28: Default Station Logo Filler/Sender window

Default Station Logo Filler/Sender

Client Name:

☒ Auto Send Logos at Start

StationLogoFile HD1:

StationLogoFile HD2:

StationLogoFile HD3:

StationLogoFile HD4:

StationLogoFile HD5:

StationLogoFile HD6:

StationLogoFile HD7:

StationLogoFile HD8:

- Manually enter the file path and filename exactly as uploaded (e.g., SLNAUT\$\$010001.png). Click **Save**, then click **Close**.

10. Scroll down on the **MSAC Clients** -> **MSAC #1** page to the Client Data Service Statistics section (see [Figure 3.4.29](#)). Verify it is sending, reset statistics and observe data increasing (Num Ave value) on all configured channels.

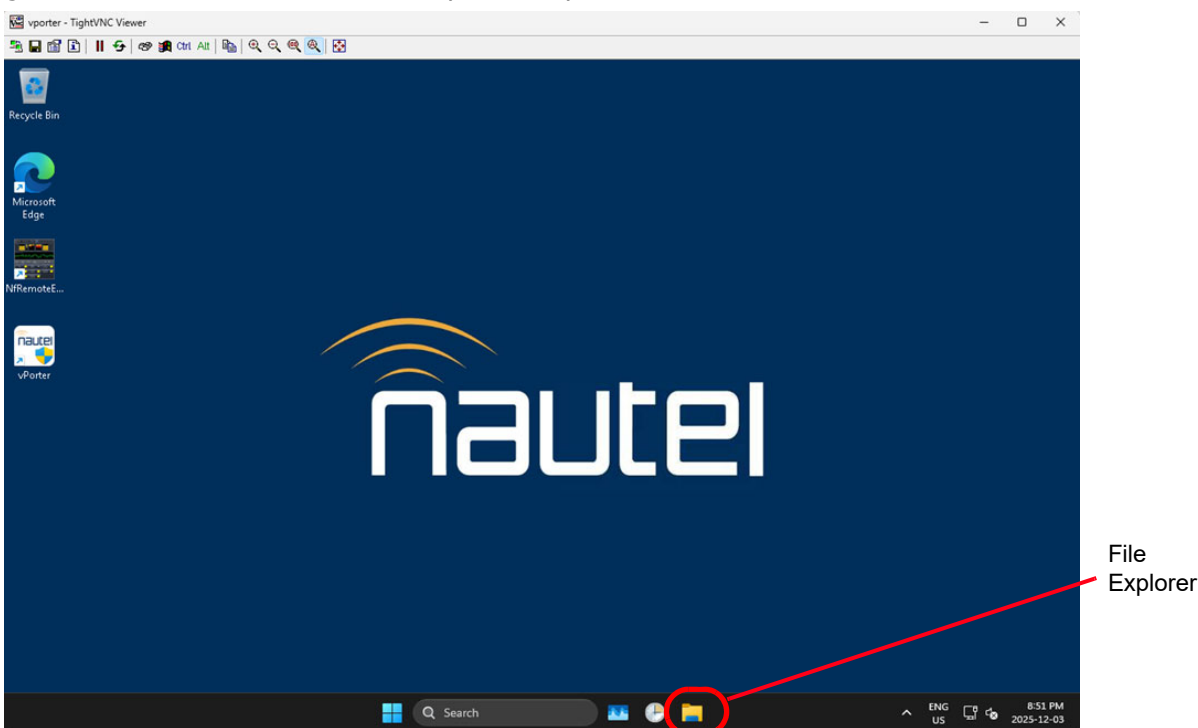
Figure 3.4.29: Verify Client Data Service Statistics

Client Data Service Statistics		
Data Svc Name	Bit Per Sec (bps)	Num Ave
SLHD1	2073.353	1
SLHD2	2099.877	1
SLHD3	2157.972	1
SLHD4	2184.027	1
Total-Bitrate	8515.2295	1
Reset Averages Num Averages NUM_AVE_20		

Changing the Gen4 User Interface Login Password

1. From the vPorter Windows start menu (see [Accessing the vPorter Desktop, on page 3.4.13](#), to access, if necessary), open File Explorer (see [Figure 3.4.30](#)) and go to the C:\Program Files (x86)\vPorter\AirChain Software\cfg folder.

Figure 3.4.30: vPorter Windows Desktop - File Explorer icon location



2. Copy the 'Syscfg' file and paste it on the vPorter desktop.
3. From the vPorter desktop, right-click on the 'Syscfg' file and open the file using Notepad.

NOTE: Follow the file editing instructions carefully and accurately. Failure to do so could result in degraded system performance.

4. Search for (Ctrl-f) **remotePwd=**.
5. Carefully replace the random password text after **remotePwd=** and within the " " marks with the desired password. Save the file.
6. Cut the updated 'Syscfg' file from the vPorter desktop and paste it into the C:\Program Files (x86)\vPorter\AirChain Software\cfg folder. This should prompt an overwrite of the previous file. Click Continue if necessary.
7. The password to log in to the Gen4 user interface is successfully changed.

Updating vPorter Software

NOTE: *The vPorter software is not included in the GV2 software distribution to update the AUI. For a transmitter with an initial install of the GV2 vPorter software that also includes the Windows installation, subsequent updates of the vPorter software are updated using a standard windows installer MSI file.*

This procedure is not available in this issue of the manual. It will be included in a future release.

SECTION 3.5: LIST OF TERMS

This section defines some of the terms that are used in Nautel documentation.

AES/EBU. Audio Engineering Society/European Broadcasting Union (AES/EBU) is the name of a digital audio transfer standard. The AES/EBU digital interface is usually implemented using 3-pin XLR connectors (the same type connector used in professional micros). One cable carries both left-channel and right-channel audio data to the receiving device.

AoIP. Audio over IP.

AUI. The Advanced User Interface is the local touch screen on the front door and the advanced remote control/monitoring feature that allows for extensive remote control and monitoring of the transmitter.

Cutback. A reduction in RF output power, caused by the occurrence of multiple shutbacks within a pre-defined period.

DHCP. Dynamic Host Carrier Protocol.

DSP. Digital Signal Processing.

EEPROM. Electrically Erasable Programmable Read-Only Memory.

Foldback. A reduction in RF output power, caused by adverse load conditions (high VSWR). No shutbacks or cutbacks have occurred.

LED. Light Emitting Diode (also referred to as lamp).

LVPS. Low Voltage Power Supply. A module or modules used in the ac-dc power stage that generates the low level dc supply voltage for the transmitter.

Preset. A setting that controls power level, frequency and audio parameters. The GV2-5/GV2-3.5 allows you to pre-program multiple presets.

PWB. Printed Wiring Board.

Shutback. A complete, but temporary loss of RF output power, caused by any one of a variety of faults, including high VSWR, high reject load power, RF drive failure, or an open external interlock.

Shutdown. A complete and permanent loss of RF output power. Typically follows repeated cutback, foldback or shutback events.

Surge protection panel. An electrical panel that protects equipment from electrical surges in the ac power supply, antenna or site ground caused by lightning strikes.

UI. The User Interface is the controller module's front panel LCD screen that allows for extensive local control and monitoring of the transmitter.

VSWR. Voltage standing wave ratio. This is an expression of the ratio of reverse voltage to forward voltage on the feedline and antenna system. An ideal VSWR of 1:1 provides maximum transmitter-antenna efficiency.

GV2-5/GV2-3.5 OPERATIONS & MAINTENANCE MANUAL

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