AnaDig 1000-1212 Encoder

Equipment Manual

Document #: 1050-1645

Revision: F

For Nielsen Audio Encoder Model: EA131

Part Number 1000-1212-00 1U Studio Encoder, Analog and Digital, RoHS Compliant

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Notices

To Ensure Proper Operation:

DO NOT expose this unit to rain or moisture. ONLY Nielsen Audio authorized service personnel shall gain access to the inside of the Encoder. DO NOT disconnect the earth ground from the power cord since this is a very important safety feature. The Encoder should be mounted securely in a rack. The sides must be free of obstructions to provide adequate airflow through the instrument.

The Encoder contains a lithium battery backup to maintain its internal clock. Specialized tools are required to replace this part. Under no circumstances should anyone other than Nielsen Audio authorized service personnel attempt to replace this part.

FAILURE TO INSTALL THE ENCODER IN ACCORDANCE WITH THE SPECIFICATION IN THIS MANUAL AND/OR FAILURE TO MAINTAIN BROADCAST SIGNALS IN ACCORDANCE WITH GENERAL INDUSTRY STANDARDS AND SPECIFICATIONS MAY RESULT IN THE ENCODER NOT OPERATING PROPERLY.

Contacts

If you need assistance or have any questions, contact or call:

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1. Introduction

The Nielsen Audio 1U Studio Encoder, Analog and Digital, RoHS Compliant, Model 1000-1212-00 is a rack-mountable networked device used in radio and television broadcast facilities to insert inaudible watermarking symbols on audio program streams. These symbols are decoded by Nielsen Audio PPM™ meters (Portable People Meter™) when they are exposed to encoded broadcasts. The data collected by PPM devices is used to provide audience credit data.

The Nielsen Audio 1000-1212 Encoder can be configured by Nielsen Audio to operate in different modes (analog or digital) to suit the individual needs of broadcast facilities where it is installed. The operating mode or "Unit Type" can be changed via the Front Panel Menu or by a configuration update file or via the Configuration Web page.

- In digital mode, the encoder can encode one AES3 stream (two channels) bearing uncompressed digital audio. In this case the encoder's unit type is said to be digital. (Throughout this manual "AES" with no qualifying number refers to AES3-compliant signals.)

- When the encoder's unit type is analog, it can encode up to two channels of analog audio signal.

The Nielsen Audio 1000-1212 Encoder provides the following features:

- Interfaces to support control and status monitoring using the HTTPS 1.0 protocol (See Sections 2.2.7 and 2.5.2 for HTTPS over Ethernet, and Sections 2.2.8 and 2.5.3 for HTTPS over Ethernet Gadget Device.) The encoder supports Transmission Control Protocol/Internet Protocol compliant with Internet Protocol Version 4 (IPv4), not IPv6. The encoder web interface has been tested with the Microsoft® Internet Explorer®, Mozilla® Firefox®, and Chrome™ browsers on the Microsoft Windows® 7 operating system (32- and 64-bit).

- An interface to support control and status monitoring using the SNMP Version 1 or Version 2c (See Section 2.5.4.)

- Interfaces to support configuration update via Web page upload, or USB mass storage device (See Sections 2.2.7, 2.2.8, 2.2.9.)

- Provision for configuration and software updates using a command file and the front-panel USB Type A connector, or a web browser and the Ethernet or USB Type B connectors (See Sections 3.7 and 3.8.)

- The ability to synchronize the internal real-time clock with external time sources to ensure accurate time stamping of encoded material (See Sections 2.2.6 and 2.5.6.)

- Provision for downloading operational logs (See Sections 3.4 and 4.6.)

- Front-panel rocker switches and LCD display providing the ability to set and monitor encoder settings (See Section 1.3.)

- Bypass mode, which causes the encoder to not alter the incoming signal (The encoder provides multiple types of bypass mode, detailed in Section 3.2.)

- Provision for Emergency Alert System (EAS) encoding detection to prevent interfering with EAS encoding when it is present on the incoming signal (See Section 6.22.)

- Support for remote bypass control and status monitoring via a third-party remote device (See Sections 2.2.5 and 2.5.5.)

- The ability to treat groups of input channels (such as members of a multi-channel audio input) as members of a "Low Level Alarm (LLA) set," for the purpose treating the member channels as a single unit when triggering a low signal level alarm (See Section 3.6.)

1.1. How to Use this Manual

Before you attempt to install or use the encoder, read all of Section 1 of this document. This section provides essential information needed to understand and use the rest of the manual, including:

- A summary of the functions the encoder provides (see above)

- A tour of the encoder's physical features (Section 1.2)

- An explanation of how to navigate the front-panel menu (Section 1.3)

Once you have read the Introduction, read Section 2 for the information you will need to install the encoder. Like Section 1, you should read this section in the order it is presented, in its entirety, before proceeding with installation.

- Section 2.1 provides information to help determine the best place for the encoder within the broadcast chain

- Section 2.2 lists the physical requirements that must be met before installing the encoder. These requirements vary depending upon which optional features of the encoder will be used.

- Section 2.3 provides step-by-step instructions to physically install the encoder.

- Section 2.4 describes how to confirm proper encoder installation.

- Section 2.5 provides information needed to set up or initialize various optional features once the encoder is physically installed. (This includes accessing the encoder via web interface.) Use the subsections addressing the features appropriate to the needs of the broadcast facility.

The remaining sections of this manual address various aspects of using the encoder once it is installed. All of these sections will be useful to most users at one time or another, but they need not be read in any particular order.

- Section 3 addresses how to perform common operational activities such as switching between bypass and encode modes, using remote monitoring and control, updating the encoder configuration and software, and downloading log files.

- Section 4 addresses how to use the web interface.

- Section 5 discusses the ways the encoder reports status and error conditions on the front-panel menu and in the web interface.

- Section 6 provides the encoder technical specifications.

- Appendix A provides detailed instructions on how to install the Nielsen Audio 1000-1212 Encoder Root Certificate Authority (CA) Certificate for HTTPS access on a PC that will be used to access the encoder via Ethernet. (See "Using the Nielsen Audio 1000-1212 Encoder Root Certificate Authority for HTTPS Access" on page 33 for more information.)

- Appendix B provides a reference list of error messages that may appear on the front-panel LCD and in the web interface.

- Appendix C provides a sample encoder log file.

- Appendix D provides the text of the encoder MIB file for setting and getting encoder parameters via the SNMP protocol. (See Sections 2.5.4 and 4.9 for more information.)

- 0 provides the text of the encoder notifications MIB, which is defines event notifications the encoder can send to SNMP manager devices. (See Sections 2.5.4 and 4.10 for more information.)

- Appendix E provides reference maps for navigating the front-panel LCD menu. (See Section 1.3 for instructions on using the LCD menu.)

1.2. Physical Features of the Nielsen Audio 1000-1212 Encoder

Throughout this manual you will find references to fixtures on the front and back panels of the encoder as shown in the figures below.

Figure 1: Front Panel of the Nielsen Audio Encoder (1000-1212)

The encoder front panel is pictured in Figure 1, and the front-panel features are described below:

1. LCD with white backlight LED (two lines of twenty characters each)

2. Two rocker switches for Menu, Select, Item, Option

3. LED for power indication

4. USB 1.1 host port type A (for USB flash memory device)

5. USB 2.0 client port type B (for Ethernet Gadget Device)

6. LED for encoding status

7. Push button switch for encode/bypass

8. Recessed reset switch
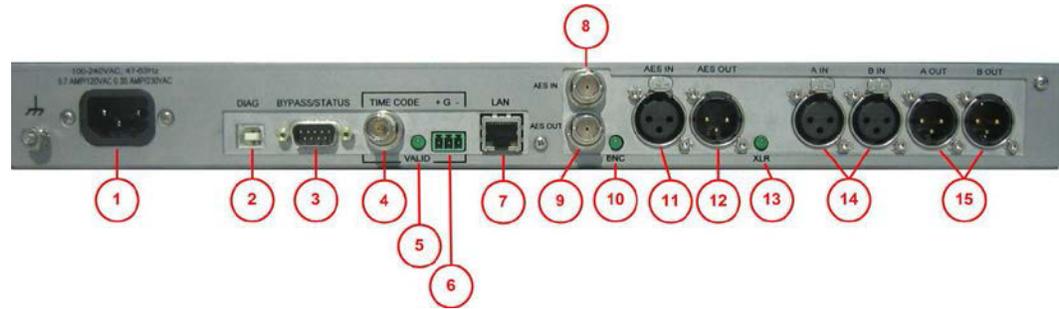
Figure 2: Rear Panel of the Nielsen Audio Encoder (1000-1212)

The encoder rear panel is pictured in Figure 2, and the rear panel features are described below:

1. Universal Power International Electrotechnical Commission (IEC) input connector

2. USB Type B connector (for Nielsen Audio diagnostic use)

3. Remote Interface for Status Monitor & Bypass Control (nine pin, male 'D' connector)

4. Time decoder input: female Bayonet Neill-Concelman (BNC) connector

5. Time input status LED

6. Modular quick-disconnect time decoder connectors

7. RJ-45 Ethernet jack with integrated transmission/reception link status LED indicators

8. Unbalanced BNC connector for digital AES3 input

9. Unbalanced BNC connector for digital AES3 output

10. BNC selection indicator LED

11. Balanced female XLR connector for digital AES3 input

12. Balanced male XLR connector for digital AES3 output

13. XLR selection indicator LED

14. Balanced XLR female connectors for analog input, channels A and B

15. Balanced XLR male connectors for analog output, channels A and B

1.3. Using the Front-Panel Menu Buttons

After installing the encoder the functions provided by the front-panel menu buttons will be needed to initialize certain features. Understanding how to navigate the front-panel menu is critical to using the encoder.

The front-panel menu buttons are rocker switches used navigate the menu hierarchies provided in Appendix E, moving the menu current pointer up, down, left or right within the hierarchy as shown in Figure 3 below:
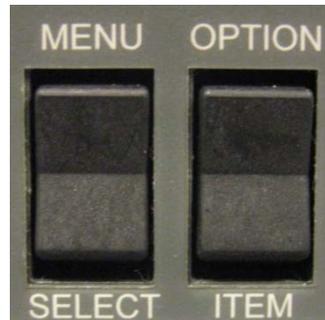
MENU = UP (exit)	OPTION = LEFT
SELECT = DOWN (enter)	ITEM = RIGHT

Figure 3: Front-Panel Rocker Switch Configuration and Functions

- MENU (upper-left rocker switch)

  When the LCD menu is not active, pressing the MENU button activates the menu. When the LCD menu is active, pressing the MENU button traverses up one level within the menu. (If the menu is active and at the top level, pressing the MENU button exits the menu.) No matter where the current pointer is within the menu structure horizontally, pressing the MENU button moves the current pointer up one level; it is not necessary to return to the point of entry for the current level before moving up.

- SELECT (lower-left rocker switch)

  When the LCD menu is not active, pressing the SELECT button does nothing. When the LCD menu is active, pressing the SELECT button produces one of two results, depending upon the current menu item displayed:

  o If the current menu item has another level of menu hierarchy branching down from it, pressing SELECT enters that level.

  o If the current menu item has no child nodes in the menu hierarchy, pressing SELECT activates that menu item.

- OPTION (upper-right rocker switch)

  o When the LCD menu is not active, pressing the OPTION button does nothing.

  o When the LCD menu is active, pressing the OPTION button scrolls to the left within the list of options available on the current level of the menu hierarchy.

o   If the current menu item has no child nodes in the menu hierarchy, pressing OPTION scrolls up through the value options for that menu item.

- ITEM (lower-right rocker switch)

  When the LCD menu is not active, pressing the ITEM button does nothing. When the LCD menu is active, pressing the ITEM button scrolls to the right within the list of options available on the current level of the menu hierarchy.

Once the front-panel menu has been activated, if the rocker switches are not used for a full 60 seconds, the LCD display exits the menu and resumes displaying the status message currently in force.

Detailed diagrams of the front-panel menu hierarchy are provided in Appendix E. For the most part, the information provided by the menu and in these diagrams is self-explanatory. Two aspects of the menu functionality bear further description: changing settings, and interpreting encoding configuration.

1.3.1.   Changing Encoder Settings from the Front-Panel Menu

Menu items marked with an asterisk in the diagrams in Appendix E indicate encoder features that can be changed from the menu, rather than only viewed. This change functionality applies to the following items on the front-panel menu:

1.3.1.1.   Parameters that Are Toggled between Two Values

- Network bypass
- Soft bypass
- LAN DHCP enablement
- Input Impedance (Analog mode only)
- Audio Word Size (Digital mode only)
- Audio Connector (Digital mode only)
- Change Unit Type

1.3.1.2.   Parameters that Require Setting Multiple Values

- LAN IP address
- LAN subnet mask
- LAN gateway address

1.3.1.3.   Parameters that Trigger Encoder Actions

- Shutdown Encoder (before removing power)
- Reboot Encoder
- Invoke B.I.S.T. (Built-In-Self-Test)

1.3.1.4. Changing Parameters that Toggle between Two Values from the Front-Panel Menu

The values for the following settings are toggle values—that is, they can be set to one of two values. Table 1 below provides the legal values for these parameters as well as the location within this document where each parameter is discussed in detail.

Table 1: Encoder Parameters Toggle-able from the Front-Panel Menu

Parameter Name	Legal Values	Reference Section within this Document	Can be Changed without Interfering with Encoding
Network Bypass	asserted/deasserted	Section 3.2.1	No
Soft Bypass	asserted/deasserted	Section 3.2.2	No
LAN DHCP Enablement	enabled/disabled	See Section 2.5.2.1 Also accessible via web interface; see Section 4.5.1.	Yes
Input Impedance (Analog only) (See **NOTE** below.)	600 ohm/High (High is also known as 10K ohm or bridging.)	Also accessible via web interface; see Section 4.3.2.3.	No
Audio Word Size (Digital only)	20_BIT/ 24_BIT	Also accessible via web interface; see Section 4.3.3.3.	Yes
Audio Connector (Digital only) (See **NOTE** below.)	BNC/XLR	Also accessible via web interface; see Section4.3.3.4.	No
Change Unit Type (See **NOTE** below.)	Analog/Digital	Also accessible via web interface; see Section 4.7.	No

Note   Because changing some of these settings may cause spurious signal path disruptions downstream from the encoder, Nielsen Audio recommends that the encoder be placed into bypass mode using the front-panel RELAY BYPASS button before changing them. This applies to Input Impedance, Audio Connector, and Unit Type.

To change these settings, first navigate to the appropriate menu position (use the hierarchy maps in Appendix E) to display the current value, which will be displayed with an asterisk to indicate that it is the current value in effect. To change the value, press the Option button, and the menu will display the alternative value of the setting without an asterisk. To put the currently displayed value into effect, press the Select button, and the value will be displayed with an asterisk, indicating that it now reflects the current state of the encoder.

For example, consider an encoder with the network bypass setting currently de-asserted. Navigating to the menu entry `Network Settings Network Bypass =>` and clicking the Select button will cause the LCD to read `Network Bypass Deasserted *`. The asterisk indicates that the de-asserted condition is in force. To toggle that setting, click the Option button, causing the LCD to read `Network Bypass Asserted`. To put that displayed value into effect, click the Select button, causing the LCD to read `Network Bypass Asserted *`, and activating network bypass on the encoder.

Note	When the encoder unit type is changed (from analog to digital or vice-versa), the encoder maps the channel configuration parameters as described in Section 4.7 when switching the unit type.

1.3.1.5. Changing Parameters that Require Setting Multiple Values from the Front-Panel Menu

The values for LAN IP address, subnet mask, and gateway address are 12-digit IP addresses. These values need to be set if station personnel intend to use the encoder web interface through the rear-panel Ethernet connections, and the Local Area Network does not use DHCP. Changing these values using the front-panel menu requires using the rocker switches in a particular sequence. See Section 2.5.2.2 for detailed instructions.

If you have access to the web interface via the front-panel USB Type B Host port using USB Ethernet Gadget, you may find it easier to change these settings using the web interface as described in Section 4.5.

1.3.1.6. Setting Parameters that Trigger Encoder Actions from the Front-Panel Menu

The encoder actions listed in Table 2 below can be initiated from the front-panel menu:

Table 2: Encoder Actions Triggered from the Front Panel Menu

Action	Reference Section within this Document	Notes
Shut down Encoder	Also accessible via web interface; see Section 4.8.	Performs a clean exit of the encoding application and stops logging activity, so it is safe to remove power from the unit without risking data loss
Reboot Encoder	Also accessible via web interface; see Section 4.8.	Stops and restarts all processes on the unit
Initiate Built-In Self-Test	Accessible for the Front Panel menu only	Performs a cursory check of internal systems; reports results on the front-panel LCD and records results in the log

To select one of these actions, first navigate to the appropriate menu position (use the hierarchy maps in Appendix E) to display the prompt for the desired action. ("Shutdown Encoder?", "Reboot Encoder?" or "Perform B.I.S.T.?") The default value of NO will be displayed marked with an asterisk, in the same manner as the default value for toggle parameters described in Section 1.3.1.1. To change the value to YES, press the Option button, and the menu will display YES without an asterisk. To put the currently displayed value (YES) into effect, press the Select button, and the value will be displayed with an asterisk, indicating that it now reflects the current state of the encoder.

The encoder will then initiate the selected action and the LCD will display the appropriate status messages.

1.3.2.   Interpreting AES-Specific Information on the Front-Panel Menu

Choosing the Item button from the top-level entry of the front-panel menu on an encoder configured for AES input displays abbreviated configuration information about the encoder. This information can be interpreted as follows:

- If any channel is configured to encode, "Encoding enabled" will be displayed.

- If no channels are configured encode, "Encoding disabled" will be displayed.

Some examples illustrating how this information is presented appear in Table 3:

Table 3: Examples of AES Configuration Information on the Front-Panel LCD

LCD Display	Meaning
1212 Digital Menu Encoding Enabled =>	The encoder is configured to encode at least one of the channels in the AES input stream.
1212 Digital Menu Encoding disabled =>	The encoder is configured to not encode on any channel in the AES input stream.

As shown in Figure 102 in Appendix E, from the menu item that displays this configuration information, by pressing the Select button the user can display additional encoding configuration information about the channels pairs input to the encoder.

When processing AES input, the encoder accepts one AES3 digital audio stream on either the rear panel BNC input connector (Item 8 in Figure 2) or on the XLR female connector marked "AES IN" (Item 11 in Figure 2). The front-panel menu provides an entry indicating which channels within the AES stream the encoder is configured to encode, as well as the sample rate the encoder detects on that input. Examples illustrating how this information appears are shown in Table 4 below. (Use the front-panel Select button to display this information; see Appendix E for a chart of the front-panel menu hierarchy.)

Table 4: Examples of AES Encoding Configuration Information on the Front-Panel LCD

LCD Display	Meaning
`AES      Prof 48000` `CH1, CH2     Errors`	The encoder is configured to encode channels 1 and 2 of the AES input. The input is in Professional Block Format using a sample rate of 48 kHz. Errors indicate that there are signal errors on the AES input.
`AES      Cons 48000` `CH1`	The encoder is configured to encode channel 1 of the AES input. The input is in Consumer Block Format using a sample rate of 48 kHz.
`AES      No Lock` `CH1`	The encoder is configured to encode channel 1 of the AES input. No Lock indicates that there is no AES3 signal detected on the AES input.

2. Installation

2.1. Suggested Placement in Audio Chain

Nielsen Audio has worked closely with numerous broadcast entities in the radio, TV, satellite, and cable industries, and has developed recommendations for the encoder's optimal operation within your audio chain. Ultimately, however, decisions regarding placement of the Nielsen Audio 1000-1212 Encoder within the audio chain are the responsibility of each individual broadcast facility.

When configured for digital mode, the Nielsen Audio 1000-1212 Encoder cannot process balanced analog audio, but can process a stream of AES3 (un-compressed) digital audio. (Input channels are custom-configured by Nielsen Audio for your facility.)

In AM radio stations, Nielsen Audio recommends that the encoder be installed after the final audio processor (i.e. Orban® OPTIMOD-FM®, Telos Systems® Omnia®, or others) to take advantage of the more consistent audio leveling found at this point in the broadcast chain. In FM stations, Nielsen Audio recommends that the encoder be installed after a pre-processor and before the final audio processor. This is because the encoder cannot operate on composite audio format output typical of stereo generators. When placing the encoder after the audio processor in the signal stream, you should be aware that the signal will undergo an increase in amplitude roughly equal to 4% modulation. Figure 4 depicts an example of the encoder placed in the program audio chain.

When running in analog mode, the encoder operates optimally in an audio stream running a nominal (average) +4 dBu level. **The minimum average input signal level to the encoder is 0 dBu.** The encoder accommodates 20 dBu headroom.

The minimum average input level to the encoder in digital mode is -20 dBFS (ten percent of Full Scale).
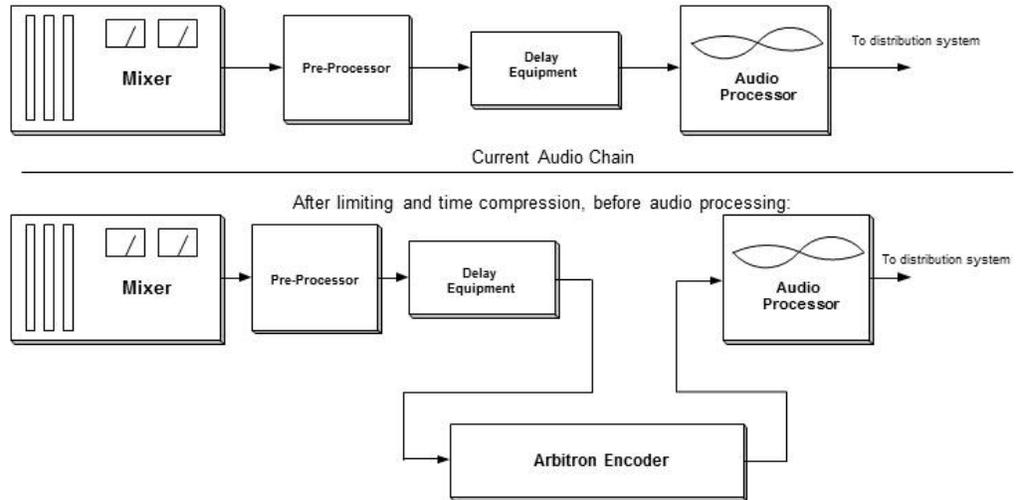
Figure 4: Suggested Placement of Encoder in Broadcast Equipment Chain

Contact Nielsen Audio for assistance and recommendations for your specific installation. See "Contacts" on page 10.

2.2. Preparing for Installation

Before installing the Nielsen Audio 1000-1212 Encoder, understand which encoder features will be used, and which physical connections must be made to support each of those features. The encoder can accept *stereo or mono* analog or digital AES3 input, depending on how it has been configured. Nielsen Audio configures encoders before delivery to suit the unique needs of each customer installation, to process the number and types of inputs required for each broadcast facility. To establish the correct audio input and output connections for the encoder, you must understand its configuration and how that configuration relates to the equipment to be used with the encoder at your facility. There is nothing to prevent users from establishing connections using both the analog and digital plugs on the back of the encoder, but the encoder ignores any connections for which it is not configured.

Important ONLY Nielsen Audio authorized service personnel shall gain access to the inside of the equipment.

Each of the sections below discusses a different feature of the encoder, what provision must be made to use it, what physical connection must be made to use it, and whether the connection must be established at the time the encoder is installed.

2.2.1. Analog Input Connection

If the encoder will be used to process stereo analog input, four XLR cables will be needed, two for signal input to the encoder and the other two for signal output from the encoder.

If the encoder will be used process mono analog input, two XLR cables will be needed, one for signal input to the encoder and the other for signal output from the encoder.

The connections must be established at installation time.

2.2.2.   Digital Input Connection

The encoder accepts digital AES input via either BNC or XLR cables. When processing digital input, the encoder will automatically detect the sample rate of the AES input. The encoder supports AES sample rates of 32 kHz, 44.1 kHz, 48 kHz, and 96 kHz.

2.2.3.   Using a BNC Connection for Digital Input

To connect the encoder to process digital signals via BNC, two BNC cables (one for input, one for output) will be needed. The connections must be established at installation time. The encoder can be configured to use these connections three ways:

- Through the front-panel menu (see Section 1.3.1.1)
- Through the web interface (see Section 4.3.3.4)
- Through a configuration update (see Section 3.8 or Section 4.12)

Because changing this setting may cause spurious signal path disruptions downstream from the encoder, Nielsen Audio recommends that the encoder be placed into bypass mode using the front-panel RELAY BYPASS button before changing the active digital connector.

2.2.4.   Using an XLR Connection for Digital Input

To connect the encoder to process digital signals via balanced XLR, one male XLR cable is required for input, and one female XLR cable is required for output. The connections must be established at installation time. The encoder can be configured to use these connections three ways:

- Through the front-panel menu (see Section 1.3.1.1)
- Through the web interface (see Section 4.3.3.4)
- Through a configuration update (see Section 3.8 or Section 4.12)

Because changing this setting may cause spurious signal path disruptions downstream from the encoder, Nielsen Audio recommends that the encoder be placed into bypass mode using the front-panel RELAY BYPASS button before changing the active digital connector.

Balanced XLR pinouts for the encoder are as follows (See Figure 5):

- Pin 1: Shell or ground
- Pin 2: High
- Pin 3: Low
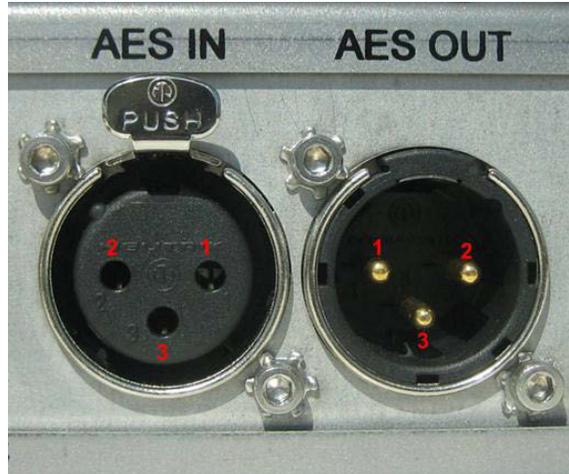
Figure 5: XLR Connection Pinouts

2.2.5. Remote Monitor and Control Connection

To use the remote bypass control and status monitoring capability via a third-party remote device, a DE-9 M cable will be needed to connect the encoder to the third-party device. Be sure the third-party device complies with the pin connection specifications found in Section 2.5.5. If pin 1 and pin 6 of the connecting cable are at the same voltage at the time of connection, making this connection will not interfere with the operation of the encoder. If the encoder rear panel will be difficult to access after installation is complete, this may be a factor in deciding when to establish this connection.

2.2.6. Connection for Synchronizing the Encoder Real Time Clock with LTC Station Time Code Source

If an LTC station time code source will be used as a reference for correcting encoder internal time clock drift, one of two types of connectors will be needed:

- A stripped wire connector will be needed if connecting with the modular quick-disconnect connectors (Item 6 in Figure 2). The encoder comes with a Phoenix Contact® printed-circuit board connector (Phoenix Contact part number 1803581).

- A BNC jack will be required if connecting with the BNC input (Item 4 in Figure 2).

The encoder can synchronize its internal clock with time input in any of the following formats: SMPTE 12M-1 (30 FPS), SMPTE 12M-1 (29.97 FPS), EBU (complying with SMPTE 12M-1 at 25 FPS), ESE TC89, ESE TC90, DQS, or IRIG-B (un-modulated). If a valid time code is not connected to the encoder, then the encoder will use its internal real-time clock, but it will not be synchronized with the station time code source.

Before establishing a time code connection, note the maximum allowable working limit voltages for the time code source signals:

- BNC input: logic 'high': minimum 1.0 Vp, maximum 5.0 Vp. logic 'low': minimum 0.0 Vp, maximum 0.4 Vp

- Quick-disconnect inputs: minimum 300 mV p-p, maximum 7 V p-p (for either differential or non-differential input signal)

Warning	The absolute maximum inputs must not exceed 11 volts peak; exceeding this level risks damage to the unit.
Note	The DQS Linear Time Code signal is polarity sensitive. If the DQS signal is connected backwards, the encoder will assert the condition "LTC_DQS_POLARITY_ERR." In that case, reverse the terminal connections for proper DQS Time Code Performance.

To ensure that the encoder will synchronize to the station clock upon boot-up, one of the supported time code sources must be properly connected to the time code input at installation time *prior to applying power to the encoder*.

See Section 2.5.6.1 for more information about using the station time code input to synchronize encoder system time.

2.2.7.   Connection for Ethernet Access

The Nielsen Audio 1000-1212 Encoder supports Transmission Control Protocol/Internet Protocol compliant with Internet Protocol version 4 (IPv4), not IPv6. An Ethernet cable is required to connect the encoder to the broadcast facility's local area network to use any of the following functionality:

- Monitoring and controlling the encoder from a PC using an HTTPS web interface (See Sections 2.5.2 and 2.5.2.3)

- Monitoring and controlling the encoder from a PC using an SNMP interface (See Section 2.5.4)

- Updating the encoder configuration via Web page upload (See Section 4.12)

- Synchronizing the encoder real-time clock using SNTP (See Section 2.5.6.2.)

The encoder has one Ethernet port on its rear panel, which provides more than sufficient capacity to support all of these means of access at once. The encoder can be used on networks both with and without DHCP (See Section 2.5.2). Connections can be established and removed from the rear-panel Ethernet port at any time without interfering with encoder functionality. However, in some facilities the encoder rear panel can be difficult to access once the unit is installed. If this is the case, consider plugging an Ethernet cable in the encoder rear panel when the encoder is installed, and leaving the other end of it somewhere easily accessible.

2.2.8.   Connection for USB Type B Client Access

Alternatively, all of the encoder features accessible via Ethernet (See Section 2.2.7) can also be accessed via the front-panel USB type B client outlet using the USB Ethernet Gadget Device CDC (Communications Device Class) protocol.

Establishing this connection requires a USB type A to type B cable.

The USB Ethernet Gadget connection is not recommended for use as a permanent connection, but is provided as an alternate means to communicate with the encoder for configuration purposes.

Using the USB Ethernet Gadget connection allows the user to configure the rear panel Ethernet network parameters easily via the appropriate Web page.

2.2.9. Connection for Front-Panel USB Type A Access

The encoder configuration and software can be updated via the front-panel USB type A outlet. This same outlet can also be used to extract the log files from the encoder.

Using this feature requires no physical connection to be established in advance; all that is needed is a USB mass storage device (containing the update materials from Nielsen Audio, or with sufficient space to accept the encoder log files) and access to the encoder front panel. This USB type A input is currently limited per USB v 1.1 so while it works fine with USB "thumb drives," it does not provide sufficient power for an external hard disk.

Note	Connecting an external hard disk that requires power from the USB type A connection greater than that specified by the USB v 1.1 specification can result in locking up the USB port. In this case the encoder will need to be rebooted to recover.

See Sections 3.7 and 3.8 for more information about updating the encoder software and configuration, and Section 3.4 for information about downloading log files via USB.

2.3. Installing the Encoder

Follow the steps below to install the encoder. **ONLY Nielsen Audio authorized service personnel shall gain access to the inside of the equipment.**

1. Place the encoder into a 19" rack in an indoor climate controlled environment. Nielsen Audio recommends allowing ½" of rack space above and below the encoder to allow for adequate ventilation and reduce the chances of overheating. DO NOT block or otherwise impede airflow through the sides of the instrument.

2. Secure the encoder using screws in each of the four front-panel corners.

3. Confirm that the Enable/Bypass push button on the front panel (Item 6 in Figure 1) is in the 'out' position to put the encoder into bypass mode.

4. If supporting analog signals, select ohm termination for connections:

   - If a 600-ohm termination is desired, be sure to select 600 ohms in the front panel menu. (Detailed diagrams of the front-panel menu hierarchy are provided in Appendix E.)

   - If a 10 k ohm input (bridging) impedance is desired, be sure to select High Impedance on the front panel menu.

5. Establish the encoder signal input and output connections as described in the sections below.

Note:	You may wish to connect cables for both analog and digital operation to the encoder at installation time and establish which connections will actually be used later. See Section 3.5 and Section 4.3.3.4 to configure the mode of operation (AKA unit type) and the operational connectors.

Analog: Stereo Installation

a. Connect the male ends of two XLR cables to the connectors marked A IN and B IN on the back of the encoder. (These are the purple cables in Figure 6.)

b. Connect the female ends of these same two cables to the output connectors on the device currently outputting the program material to be encoded.

c. Connect the female ends of two XLR cables to the connectors marked A OUT and B OUT on the back of the encoder. (These are the red cables in Figure 6.)

d. Connect the male ends of these same two cables to the input connectors on the device to receive the encoded program material.

Figure 6: Rear Panel Stereo Analog XLR Inputs and Outputs

Analog: Mono Installation

a. Connect the male end of an XLR cable to the connector marked A IN on the back of the encoder. (This is the purple cable in Figure 7.)

b. Connect the female end of this same cable to the output connector on the device currently outputting the program material to be encoded.

c. Connect the female end of an XLR cable to the connector marked A OUT on the back of the encoder. (This is the red cable in Figure 7.)

d. Connect the male end of this same cable to the input connector on the device to receive the encoded program material.

e. When using the encoder for a mono signal, **do not use an A input and a B output**—use the A input and output connectors only. **The B output will not be encoded even though the B input may have audio present.**

Figure 7: Rear Panel Mono Analog XLR Inputs and Outputs

Digital: BNC Connectors

a. Connect the male end of a BNC cable to the female BNC output connector labeled AES IN on the back of the encoder.

b. Connect the other end of the cable to the output connector of the device that is transmitting the original program material.

c. Connect the male end of a BNC cable to the female BNC output connector labeled AES OUT on the back of the encoder.

d. Connect the other end of the cable to the input connectors of the devices to receive the encoded program material. The digital BNC connections on the back of the encoder should appear as shown in Figure 8.

Figure 8: Rear Panel Digital BNC Connections

Digital: XLR Connectors

a. Connect the male end of an XLR cable to the XLR connector marked AES IN on the back of the encoder. (This is the purple cable in Figure 9.)

b. Connect the female end of the same cable to the output connector of the device that is transmitting the original program material.

c. Connect the female end of an XLR cable to the XLR connector marked AES OUT on the back of the encoder. (This is the red cable in Figure 9.)

d. Connect the male end of the same cable to the input connector of the device to receive the encoded program material.

Figure 9: Rear Panel Digital XLR Connections

6. **Optional:** To monitor and control the encoder via Ethernet interface, do the following:

    a. Read and understand the information in Section 2.2.7.

    b. Connect an Ethernet cable to the rear-panel Ethernet connection (Item 7 in Figure 2).

    c. Connect the other end of the Ethernet cable into an outlet for your Local Area Network.

    > **Note:** This connection can be established at any time without interfering with encoder operation; it does not have to be established only at installation time. The Ethernet connection on the back of the encoder should appear as shown in Figure 10.

Figure 10: Rear Panel Ethernet Connection

7. **Optional:** To allow remote control and monitoring of the encoder's bypass and encode modes, do the following:

    a. Read and understand the information in Section 2.2.5.

    b. Connect the female end of a DE-9 M cable to the male DE-9 M connector on the encoder rear panel (Item 3 in Figure 2).

    c. Connect the other end of the DE-9 M cable to a remote device that can comply with the pinout requirements as described in the following sections:

        o   Section 2.5.5.1: for remote monitoring of encoding error status)

        o   Section 2.5.5.2: for remote monitoring of encoding/bypass status)

        o   Section 2.5.3.3: for remote control of encoding/bypass mode)

    The DE-9 M connection on the back of the encoder should appear as shown in Figure 11.

    > **Note** This connection may be established after installation has been completed. However, doing so when the remote control device is asserting the remote bypass signal may interfere with encoding. See Section 2.5.5.3 for details regarding the remote bypass signal.

Figure 11: Rear Panel DE-9 M Connection

8. **Optional:** If using the station time LTC input, first read and understand the information in Section 2.2.6.

> **Note** Using the Time Decoder Input is optional, but if you choose to use it, this connection must be established at installation time *prior to applying power to the encoder* to ensure that the encoder will synchronize with the station clock on boot-up.
>
> You must respect the maximum allowable working limit voltages for the time code source signals, provided in Section 2.2.6.

> **Warning** Do **not** connect time code sources to both rear-panel inputs. Connecting to both inputs corrupts the station time that the encoder uses and may damage the encoder time code input circuit.

Establish the time input connection using the instructions appropriate to the type of connector being used:

- **For BNC connectors:** connect a single-ended BNC coaxial cable to the rear-panel BNC time input jack (Item 4 in Figure 2). The BNC time connection on the back of the encoder should appear as shown in Figure 12.

Figure 12: Rear Panel Time BNC Connection

- **For quick-disconnect connectors:** If your agreement with Nielsen Audio indicates your encoder will use a time input using this connection, the rear panel outlet (shown as Item 6 in Figure 2) will be equipped with a modular quick-disconnect connector plug. Remove the plug from the socket. (Figure 13 shows the plug in and out of the socket.)

Figure 13: Quick Disconnect Plug in Socket (Left) and out of Socket (Right)

The connection must be made using small-gauge wire (e.g., AWG 20, AWG 22, or AWG 24) inserted into the plug connectors. Before inserting the wires into the connectors, strip the wire ends bare, leaving sufficient insulation to prevent the bare wires from touching anything other than the connectors.

If the time code source is differential, insert one signal wire into the connector adjacent to the time code indicator LED. Insert another signal wire into the connector adjacent to the RJ-45 Ethernet jack labeled LAN (as shown on the left in Figure 14.) You may optionally insert a ground wire into the center connector.

- If the time code source is *not* differential, connect the ground or common wire to the middle connector, and connect the positive input to the connector adjacent to the RJ-45 Ethernet jack labeled LAN (as shown on the right in Figure 14.)
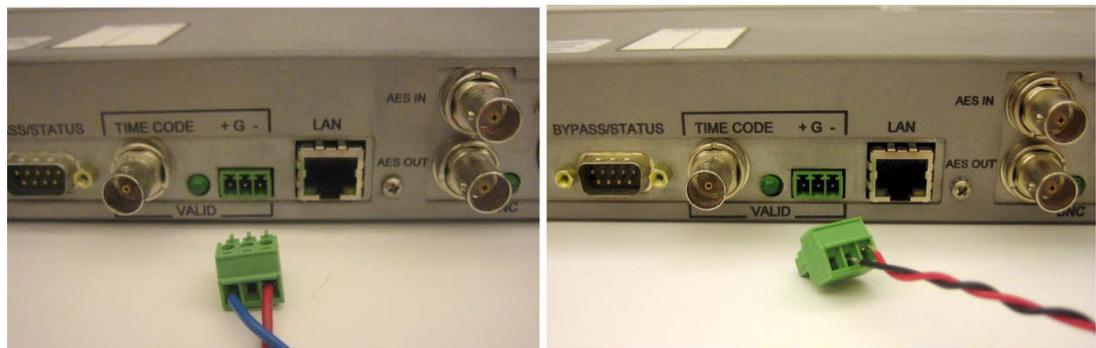
Figure 14: Connection for Differential Time Code (Left) and Non-Differential Time Code (Right)

After inserting the wires into the appropriate connectors, secure them in the plug by tightening the screws at the top of the plug using an eyeglass screwdriver, then insert the quick-disconnect plug back into the rear-panel outlet.

If using a DQS Linear Time Code: The DQS Linear Time Code signal is polarity sensitive. If the DQS signal is connected backwards, the encoder will assert the Condition "LTC_DQS_POLARITY_ERR." If this occurs, reverse the terminal connections for proper DQS Time Code Performance.

See Section 2.5.6 for more information on maintaining the encoder system time.

9. Connect the power cord to the Nielsen Audio 1000-1212 Encoder (labeled as Item 1 in Figure 2), and to the same plug strip that supplies power to the instruments that will be connected to the input and output connectors of the encoder. The power cord connection on the back of the encoder should appear as shown in Figure 15. The encoder will turn on when power is supplied via the power cord.

Figure 15: Power Cord Connected to Rear Panel

10. **Optional:** To monitor and control the encoder via USB Ethernet Gadget interface, do the following:

   a. Read and understand the information in Section 2.2.8.

   b. Connect the Type B end of a USB Type 'A' to Type 'B' cable to the front-panel USB Type B slot (Item 4 in Figure 1). The USB Type B connection on the front of the encoder should appear as shown in Figure 16.

   c. Connect the type A end of the cable into the type A slot of a personal computer or laptop.

   d. Follow the procedures described in Section 2.5.3 to initialize the USB Ethernet Gadget connection.

   Note   To operate properly, this connection must be established while power is applied to the encoder. This connection can be established at any time the encoder is powered without interfering with encoder operation; it does not have to be established only at installation time.

Figure 16: Front Panel USB Type B Connection

11. To start encoding, see the instructions in Section 3.1. If you have established physical connections to use any of the optional features (including the web interface), you will need to perform initialization functions before using those capabilities; see Section 2.5.

2.4. Immediately after Placing the Encoder On-Air

Important   Before the installation of this encoder is considered complete, Nielsen Audio requires that a quality analysis check be performed on the encoded audio. The time required per encoder is minimal. Please call your Nielsen Audio contact to arrange this test.

2.5. Initializing and Using Optional Features

The Nielsen Audio 1000-1212 Encoder provides a number of optional features to accommodate the variety of facilities where it can be used. The set-up requirements for each of these features are unique; each is addressed in this section.

2.5.1. Using the Nielsen Audio 1000-1212 Encoder Root Certificate Authority for HTTPS Access

When accessing the encoder via HTTPS (whether using Ethernet or the front-panel USB Type B port), the Nielsen Audio 1000-1212 Encoder uses Secure Sockets Layer (SSL) authentication. This means that until and unless an SSL certificate is installed on the PC connected to the encoder, any attempt to access the encoder via HTTPS will cause a warning message to display. (See Figure 21 for an example of this warning as it appears in Internet Explorer.) The message does not prevent access, but clicking through it adds another step to the login process. Nielsen Audio recommends installing the Nielsen Audio 1000-1212 Encoder Root CA certificate provided with the encoder.

The encoder root web page provides the basic information needed to install the certificate. To display this information, bring up a Web browser on the PC connected to the encoder and type in the address for the encoder root login page:

- For the front-panel Type B USB port using a USB Ethernet Gadget client, the address is `http://10.97.5.1`.

- For Ethernet the address is `http://`*`IP_Address`* where *`IP_Address`* is the address selected when the Ethernet connection is established as described in Section 2.5.3.

The message shown in Figure 17 will then appear. This message serves two purposes:

- It provides the correct address to use to access the encoder via HTTPS.

- It provides information the network administrator can use to install the Nielsen Audio 1000-1212 Encoder Root CA certificate on the PC and add an entry for the encoder to the `Hosts` file on the PC. This certificate should be installed regardless of the version of Windows or type of web browser used to access the encoder; more

detailed information for installing the certificate for Windows 7 systems using Internet Explorer is provided in Appendix A.

Nielsen Audio recommends that the network administrator of every facility install the Nielsen Audio 1000-1212 Encoder Root CA certificate on the PCs used to access the encoder. Once the certificate is installed, the warning message shown in Figure 21 will no longer appear during the login process.

> Please redirect your browser to
> **https**://*<hostname-or-ip-address>*/EncoderStatus.klx
>
> NOTE: Web access to this Encoder is intended to be performed using Secure Sockets Layer (SSL). The Server Certificate used by this Encoder's web server is issued to *.nielsenaudio.encoder.app by the Nielsen Audio Encoder Root Certification Authority (CA). The Nielsen Audio Encoder Root CA certificate is available for download from this Encoder at:
>
> http://*<hostname-or-ip-address>*/cert/NielsenAudioEncoderRootCA.cer
>
> Please download and install this Root CA certificate; refer to your browser's help on installing Root Certification Authorities.
>
> This Encoder's web server's Server Certificate is only valid for hostnames in the form of *.nielsenaudio.encoder.app. Address records will need to be created for this Encoder. Please request your Network Administrator to either:
>
> • add local DNS entries for this Encoder, or to
> • modify your local Hosts file.
>
> Once the Nielsen Audio Encoder Root CA certificate is installed, restart your browser application.

Figure 17: SSL Certificate Information on the Encoder Root Web Page

2.5.2. Setting Up to Monitor and Control the Encoder via HTTP over Ethernet

The encoder supports an HTTP interface via Ethernet (using Transmission Control Protocol/Internet Protocol compliant with Internet Protocol version 4 (IPv4), not IPv6). Once the appropriate physical connection has been established (see Step 6 of Section 2.3), perform the initialization activities described in Section 2.5.2.1 if your LAN uses DHCP, or Section 2.5.2.2 if your LAN does not use DHCP. (The encoder comes with its LAN configured to use DHCP by default.)

These initialization steps must be performed regardless of the version of Windows or type of web browser used to access the encoder.

The encoder also supports the HTTP protocol via the front-panel USB Type B client port. For information on setting up this mode of access, see Section 2.5.3. (Once access via the front-panel USB port has been established, one could configure the rear-panel Ethernet ports from the Web interface as described in Section 4.5.)

Once the HTTP connection is established and you have logged in to the web interface (as described in Section 2.5.2.3), refer to Section 4 for information about using the encoder web pages.

2.5.2.1.   Configuring the Encoder IP Address if the Local Area Network Uses DHCP

Follow these instructions to connect with the encoder using HTTP over a local area network that uses DHCP. **None of these activities will interfere with encoding.**

1. Be sure the physical connection has been established as described in Step 6 of Section 2.3.

2. Enable DHCP from the encoder front-panel menu by pressing the Item button until the Network Settings option appears. Then use the rocker switches as shown in Figure 18 below to navigate to the menu option for enabling/disabling DHCP. (A full map of the front-panel menu structure is available in Appendix E.)
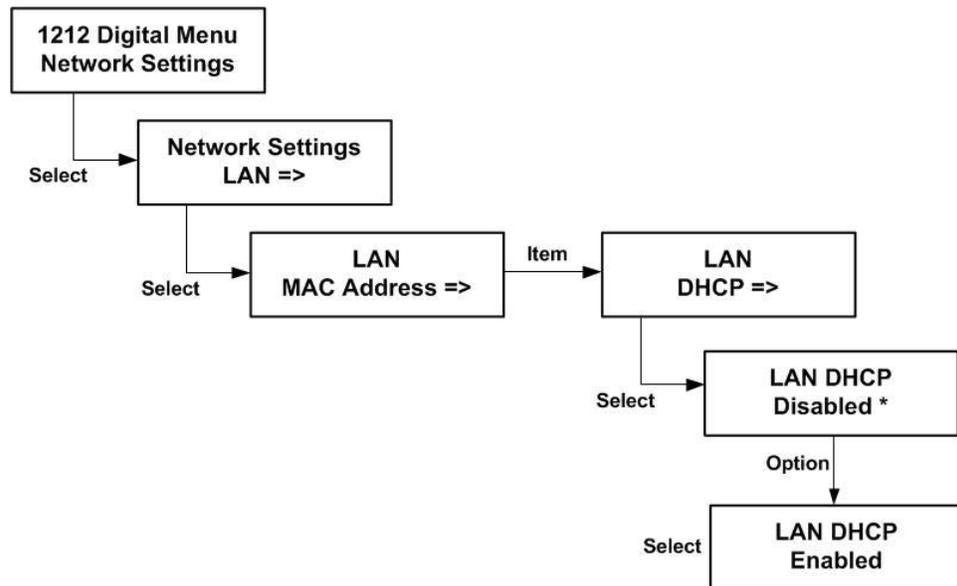
Figure 18: Enabling DHCP from the Encoder Front-Panel Menu

3. Once DHCP is enabled, the encoder will dynamically receive an IP address, which can be viewed by accessing the following front-panel menu options as shown in Figure 19 below.
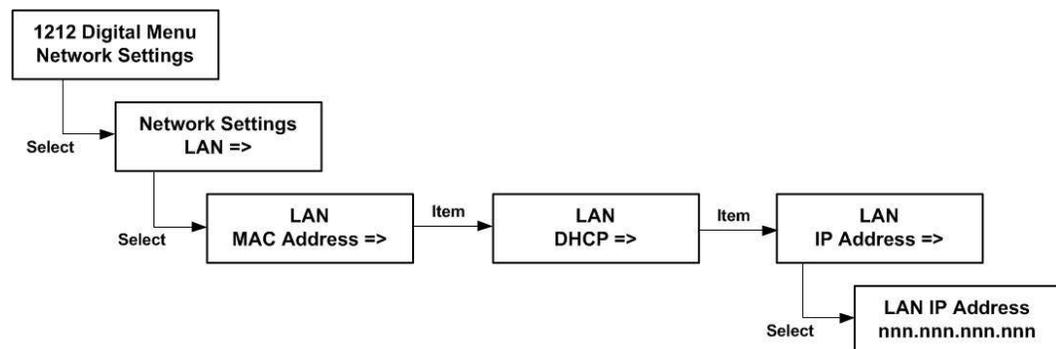
Figure 19: Viewing the IP Address for the LAN Interface

4. Log into the encoder web interface using the instructions in Section 2.5.2.3.

2.5.2.2. Configuring the Encoder IP Address if the Local Area Network Does Not Use DHCP

If the LAN does not use DHCP, to connect with the encoder using HTTP, a static IP address, gateway address and subnet mask must first be assigned to the encoder. This is accomplished via the front-panel menu. Follow the instructions below. **None of these activities will interfere with encoding.**

Any of these settings can also be modified through the web interface as described in Section 4.5.

> **Note** The settings described below cannot be altered if DHCP is enabled on the encoder LAN in question. To disable DHCP use, navigate to the DHCP enable/disable selection in the front-panel menu and toggle the setting. (See Section 1.3.1 for a detailed explanation of the front-panel menu. See Appendix E for full maps of the front-panel menu hierarchy.)
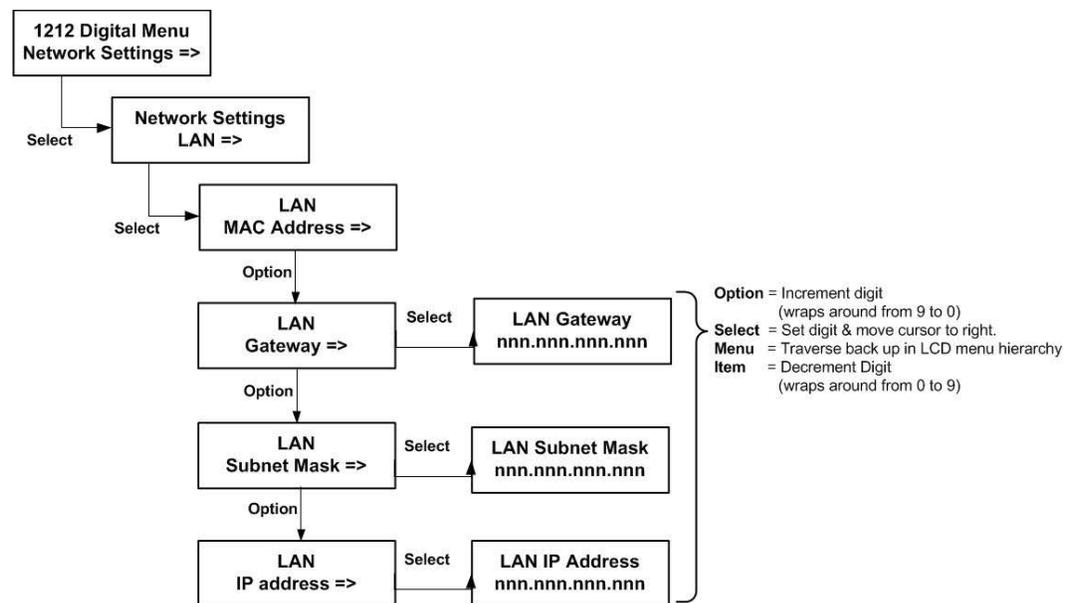
Figure 20: Setting the Encoder Gateway, Subnet Mask, and IP Address via Front-Panel Menu

1. Navigate the front-panel menu as shown in Figure 20 to access the Gateway field.

    The current accepted value displays followed by an asterisk. When you make any changes to the displayed value (as in the following steps) the asterisk will disappear to indicate the value displayed is not the one currently in force.

    A flashing cursor appears under the active digit.

2. Set the active digit to the desired value. Use the Option button to increment the active digit. (Incrementing the digit from 9 wraps around to 0.) Use the Item button to decrement the active digit. (Decrementing the digit from 0 wraps around to 9.)

3. Press Select to accept the displayed value for the active digit and proceed to the next digit in sequence.

4. Repeat Steps 2 and 3 until all digits have been set to their correct values.

   When the cursor is flashing under the final digit, pressing Select sets the entire value displayed. The asterisk reappears and the cursor wraps back to the first digit.

   Pressing Menu at any point when the asterisk is not displayed traverses back up the LCD menu hierarchy one level without putting any changes into effect. Press the Menu button to backtrack within the menu tree and use the Option button to select the Subnet Mask field.

6. Set the appropriate Subnet Mask value using the same process as described for the Gateway field in Step 1.

7. Press the Menu button to backtrack within the menu tree and use the Option button to select the IP Address field.

8. Set the appropriate IP address value using the same process as described for the Gateway field in Step 1.

9. Log into the encoder web interface using the instructions in Section 2.5.2.3.

2.5.2.3.   Logging In to the Encoder Web Interface through Ethernet

Once an encoder IP address has been configured through the front-panel menu (as described in Section 2.5.2.1 or 2.5.2.2) or through the front-panel USB Type B client port using USB Ethernet Gadget (as described in Section 4.5), anytime that PC is connected to an encoder via Ethernet (as described in Step 6 of Section 2.3), users can log in to the encoder web interface via the Ethernet connection using the procedure outlined in this section.

> **Note**   The following instructions present screen shots using Windows 7 and Internet Explorer.

1. Bring up a web browser (Microsoft Internet Explorer®; Firefox® or Chrome™) on the computer connected to the encoder and enter the following in the address window:

   https://IP-address**/EncoderStatus.klx**

   Where:

   IP_Address is the address selected when the Ethernet connection is configured as described in Section 2.5.2.1 or 2.5.2.2

   > **Note**   If an SSL certificate for the encoder has been installed on the PC, the URL to access the encoder will be different. See "Using the Nielsen Audio 1000-1212 Encoder Root Certificate Authority for HTTPS Access" on page 33 and Appendix A for instructions on installing the certificate and creating the URL for encoder access when using the certificate.If the Nielsen

   Audio 1000-1212 Encoder Root CA certificate has not been installed on the PC, a warning message will display as shown in Figure 21 (The figure shows the warning as it appears in Internet Explorer running on Windows 7; in other browsers this message may appear different.)
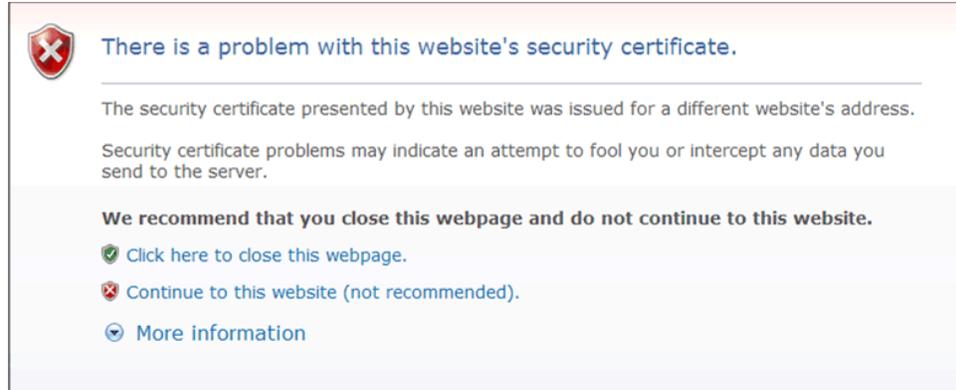
Figure 21: SSL Certificate Warning for Internet Explorer on Windows 7

This message is normal, and does not prevent access to the encoder web interface. However, to prevent this message from appearing during future logins, the Nielsen Audio 1000-1212 Encoder Root CA certificate should be installed on the PC.

3. Click "Continue to this website." The login window shown in Figure 22 below appears.

Figure 22: Encoder Web Interface Login Window for Windows 7

4. Enter the user name `Station`, and the password `Maintenance` (this is case-sensitive), and click OK.

5. If the login is successful, the Encoder Status page appropriate to the current mode of operation (analog or digital) appears. (See Figure 55 through Figure 58 in Section 4.2.) For details on using the web interface, see Section 4.

2.5.3. Setting Up to Monitor and Control the Encoder via HTTP using USB Ethernet Gadget

The encoder can support an HTTP interface using USB Ethernet Gadget via the front panel type B USB port. The web interface is identical to that supported via HTTP over Ethernet and can be used to access the encoder using a PC when the Ethernet network is unavailable, or in facilities where there is no LAN. For USB Ethernet Gadget access, the address of the Encoder USB Type B device is fixed at `10.97.5.1`.

Note	The encoder front-panel USB Type B interface allows only ONE connection at a time. This means you can connect only one computer at a time to the Nielsen Audio 1000-1212 Encoder using the USB Type B connection.

The PC accesses the front-panel Type B Client USB on the Nielsen Audio 1000-1212 Encoder using Windows device drivers. Some Windows PCs require a driver information file supplied by Nielsen Audio to associate the proper device drivers with this device. This driver information file is `AnaDig1212_USB.inf`.

Before attempting to access the encoder via USB Ethernet Gadget on a Windows PC, obtain the driver information file from Nielsen Audio and copy it to any location on the PC or laptop to be connected with the encoder. Contact Nielsen Audio if you need help installing the USB Ethernet Gadget driver.

Most Windows 7 PCs do not need the driver information file and will find the appropriate drivers automatically. If your Windows 7 PC fails to install the driver on its own, you will need to use the `AnaDig1212_USB.inf` file.

Note	On some Windows systems the driver installation results in an error "Driver did not start (code 10). The work around for this known issue is to place a USB Hub (USB 2.0-compliant) between the Windows PC and the encoder USB Client connector to establish the USB Ethernet Gadget connection.

The first time a Windows 7 PC is connected to the encoder via the front-panel USB Type B port, the Found New Hardware wizard appears on the PC. Use the instructions in Section 2.5.3.1 to install the appropriate driver, and then use the instructions in Section 2.5.3.2 to set Ethernet parameters to use the driver.

The Nielsen Audio 1000-1212 Encoder uses Secure Sockets Layer (SSL) authentication. This means that accessing the encoder through USB Ethernet Gadget is best done with the appropriate SSL certificate installed on the PC connected to the encoder. See Section 2.5.1 for more information. (As noted in Section 2.5.1, the encoder can be accessed without installing the certificate, but the login process is cleaner if the certificate is installed. Nielsen Audio recommends installing the Nielsen Audio 1000-1212 Encoder Root CA certificate provided with the encoder.)

Once the USB Ethernet Gadget driver and Root CA certificate are installed, whenever the PC is connected to the encoder front-panel Type B USB port, use the instructions in Section 2.5.3.3 to log in to the encoder via USB Ethernet Gadget.

2.5.3.1. Installing the USB Client Driver on a PC using Windows 7

This section provides instructions for installing the USB Ethernet Gadget driver on Windows 7 systems.

When a Windows 7 PC is connected to the encoder via the front-panel Type B USB port for the first time, the PC will attempt to find the correct driver and install it. If this process is successful, the PC will display a success message as shown in Figure 23 below.
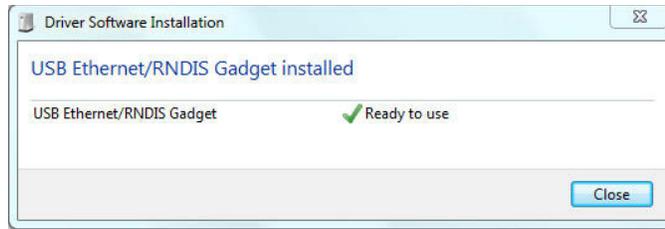
Figure 23: Driver Installation Success Message

- If the screen shown in Figure 23 appears, complete the installation process as described in Section 2.5.3.2. (Skip the remainder of this section.)

- If the Windows 7 PC fails to install the driver, it will display a pop-up as shown in Figure 24 below:
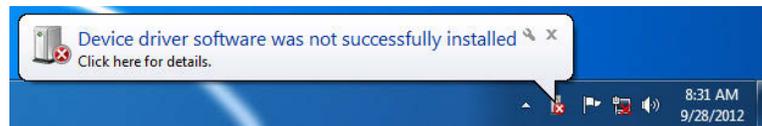
Figure 24: Driver Installation Failed Pop-Up

Click the pop-up to display more information as shown in Figure 25 below:
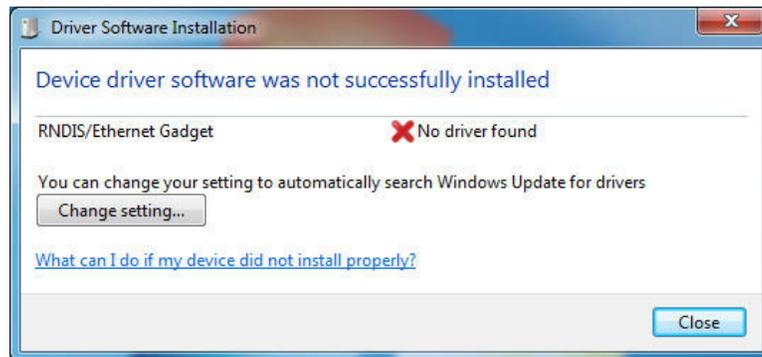
Figure 25: Driver Installation Failure Information Box

If the screens shown in Figure 24 and Figure 25 appear, to install the USB Ethernet Gadget driver, use the `AnaDig1212_USB.inf` file obtained from Nielsen Audio and follow the instructions below:

> **Note**   The following instructions present screen shots using Windows 7 and Internet Explorer.

1. Right-click "My Computer" (found either on the Start Menu or on the Desktop) and click Properties as shown in Figure 26.
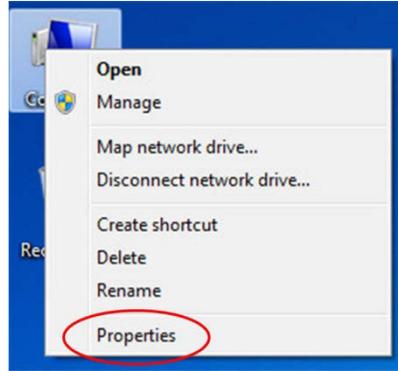
Figure 26: My Computer Properties

The Properties window appears as shown in Figure 27 below.
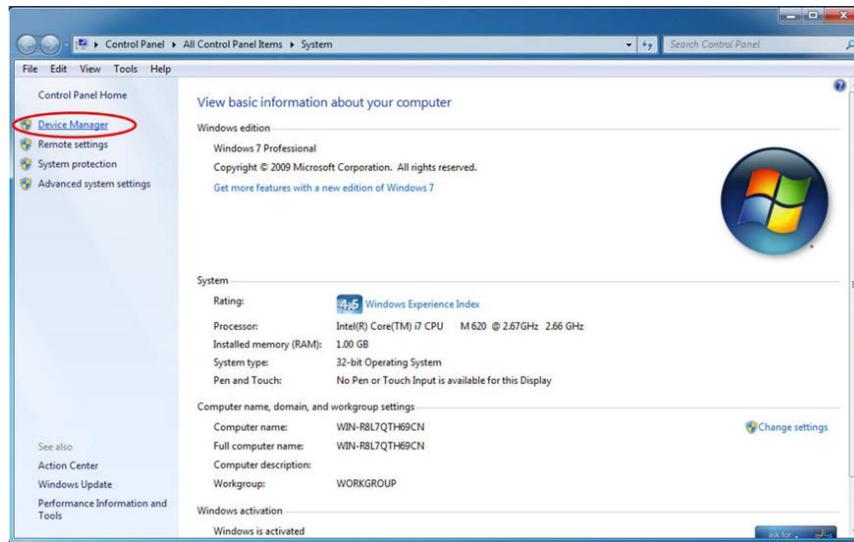
Figure 27: Computer Properties Device Manager Link

2. Click the Device Manager link (circled in red in Figure 27) to open the Device Manager, shown in Figure 28.
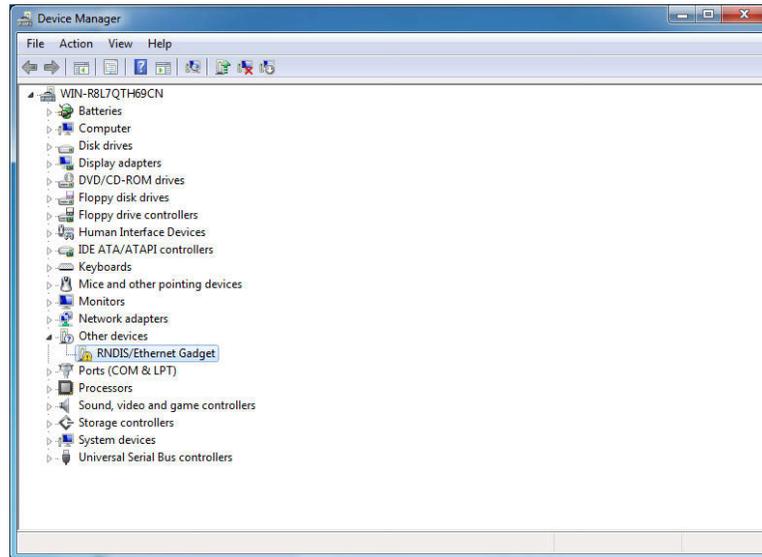
Figure 28: Device Manager Displaying Warning Icon

3. In the Device Manager window, observe that the entry for the "RNDIS/Ethernet Gadget" (highlighted in Figure 28) appears with a warning icon. To display the menu shown in Figure 29, right-click the "RNDIS/Ethernet Gadget" entry and select the menu option "Update Driver Software."
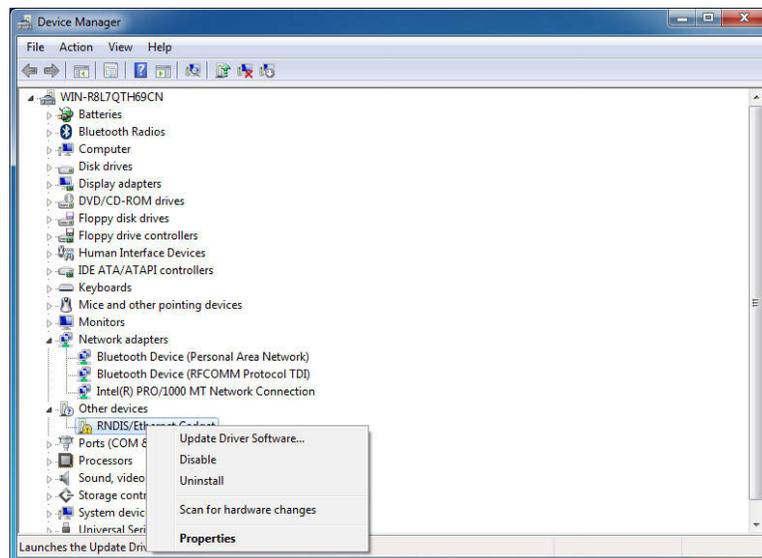
Figure 29: Select Update Driver Software

4. The Update Driver Software dialog box appears as shown in Figure 30. Select the option "Browse my computer for driver software."
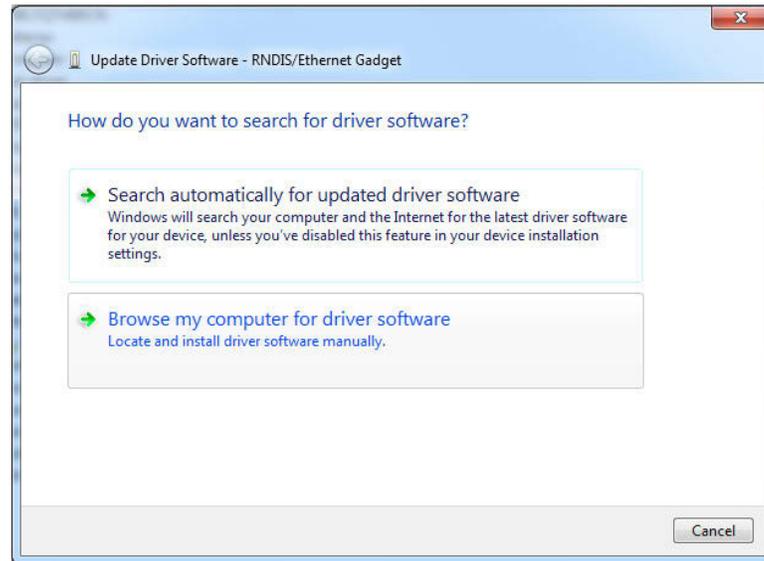
Figure 30: Update Driver Software Dialog Box

5. In the Update Driver Software window, click Browse (Figure 31) and select the folder where the `AnaDig1212_USB.inf` file resides (in this example `C:\AnaDig1212USB`).

6. Click OK.
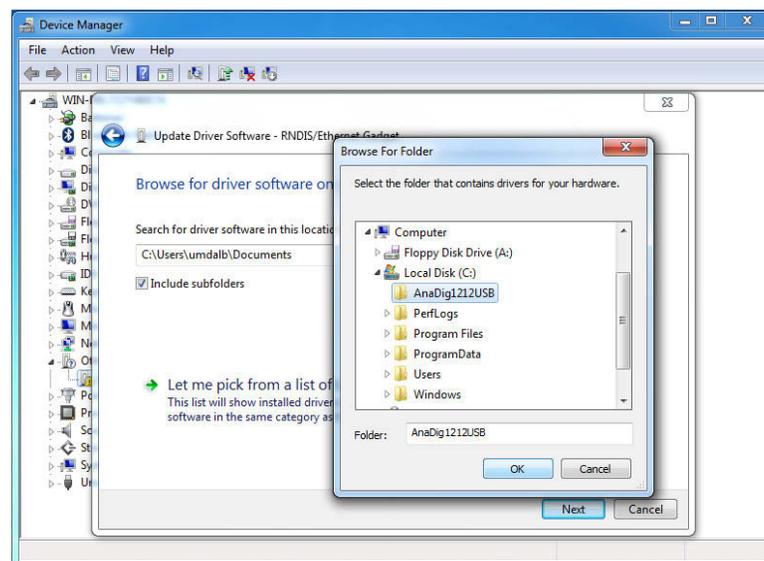
Figure 31: Select the Driver Information File Directory

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7. Verify that the Update Driver Software window displays the folder you selected, and click Next (see Figure 32 below.)
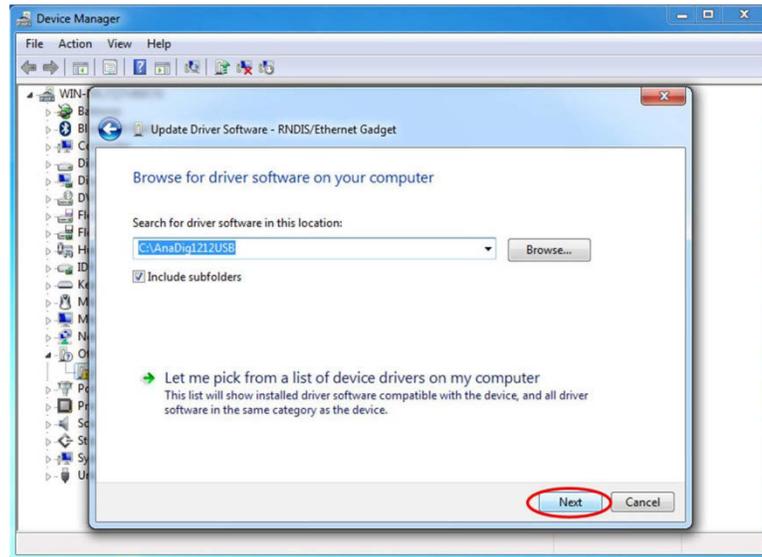
Figure 32: Update Folder Selected

8. A Security warning like that shown in Figure 33 appears. Click "Install this driver software anyway."
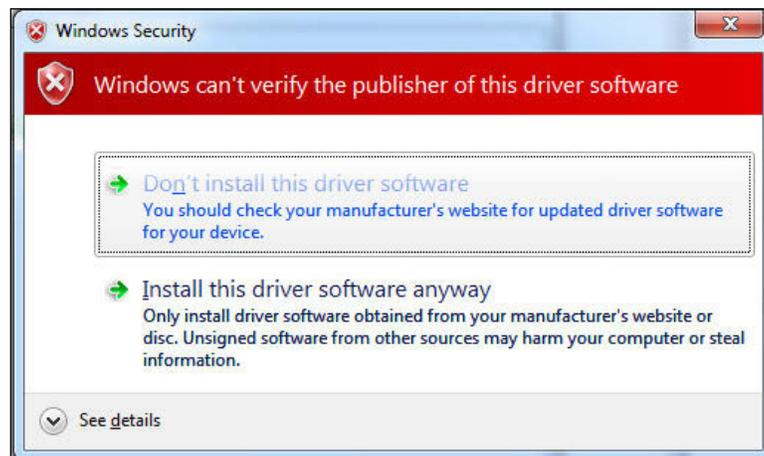
Figure 33: Driver Installation Warning

9.   Windows displays a success message as shown in Figure 34 below. In the lower right corner of the dialog, click Close.
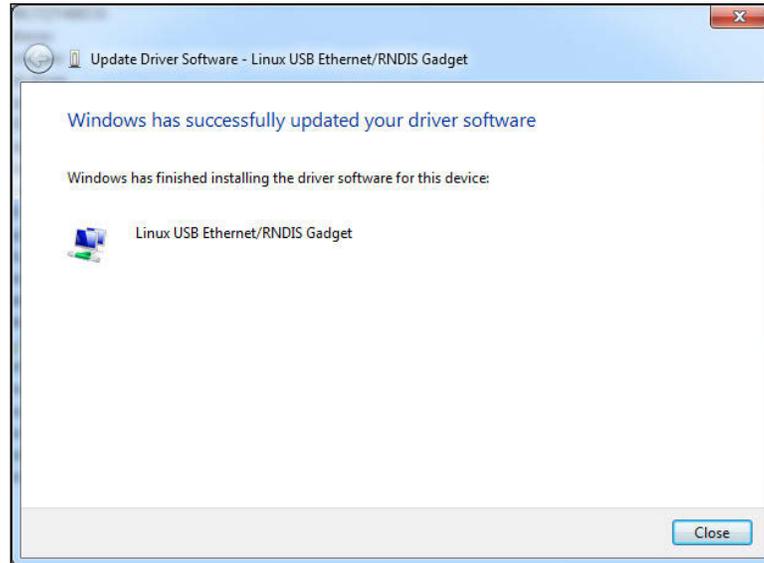
Figure 34: Driver Installation Success

10.   As shown in Figure 35, the Device Manager window is updated with the `Linux USB Ethernet/RNDIS Gadget` added to the list of Network adapters.
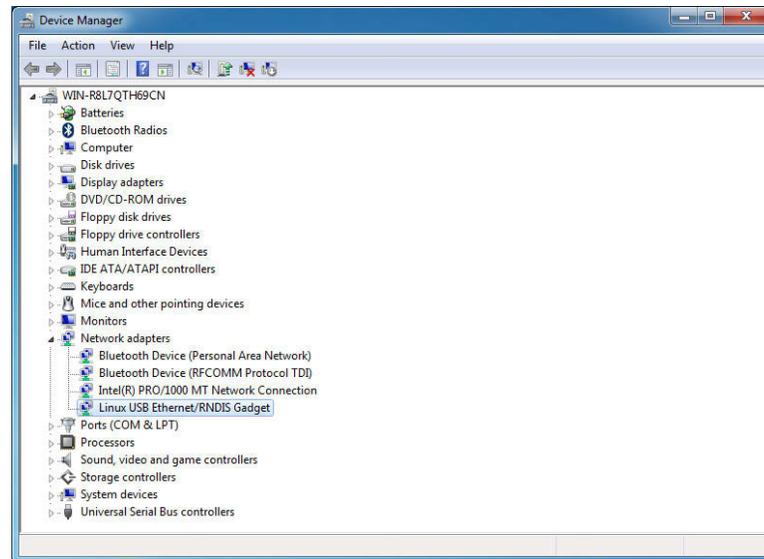
Figure 35: Driver Update Complete

11.   Proceed with the instructions in Section 2.5.3.2 configure the encoder Ethernet parameters to use the USB Ethernet Gadget Driver.

2.5.3.2. Setting Ethernet Parameters to Use the USB Ethernet Gadget Driver on a PC using Windows 7

This section provides instructions for setting the Ethernet parameters for using the USB Ethernet Gadget drive on Windows 7 systems.

Once the USB Ethernet Gadget driver has been installed as described in Section 2.5.3.1, the network connection settings *must be configured for **each** USB port* on the PC that will be used for connecting with the encoder via the front-panel USB Type B port. Use the instructions below.

Note   The following instructions use screen shots using Windows 7 and Internet Explorer.

1. Ensure that the PC is connected to the encoder via the front-panel USB Type B port.

2. Bring up the Control Panel from the Start menu and click on Network and Internet, highlighted in Figure 36 below.
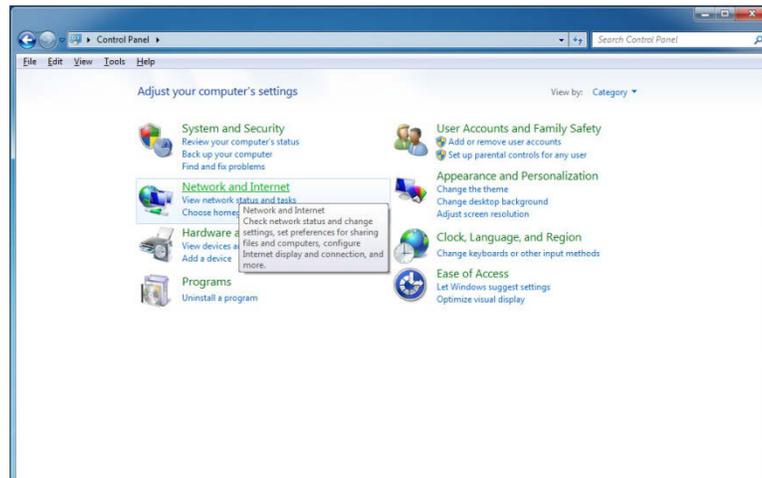
Figure 36: Windows 7 Control Panel

3. The Network and Internet window appears as shown in Figure 37 below. Click "Network and Sharing Center" to bring up the Network and Sharing window, shown in Figure 38.
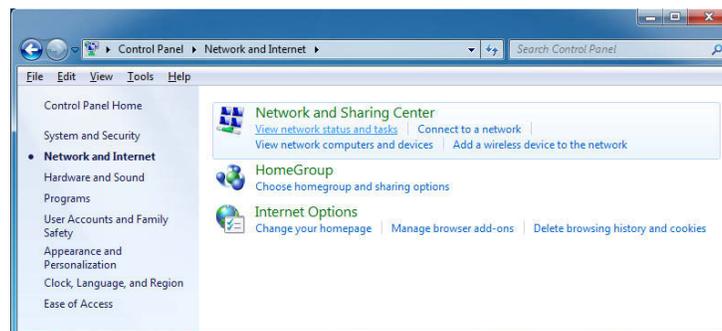
Figure 37: Network and Internet Window

4. In the Network and Sharing Center window, click the link for the new Local Area Internet Connection. (In Figure 38, this is Local Area Connection 2; however, the name may be different on your system.) The Connection Status window for that connection appears.
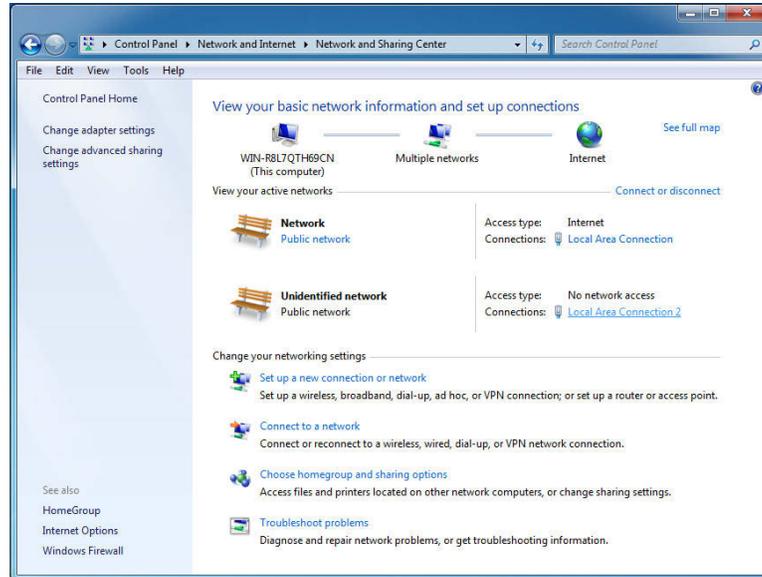
Figure 38: Network and Sharing Window

5. Figure 39 shows an example Connection Status window (for Local area Connection 2, seen in Figure 38). Click Properties, circled in red below.
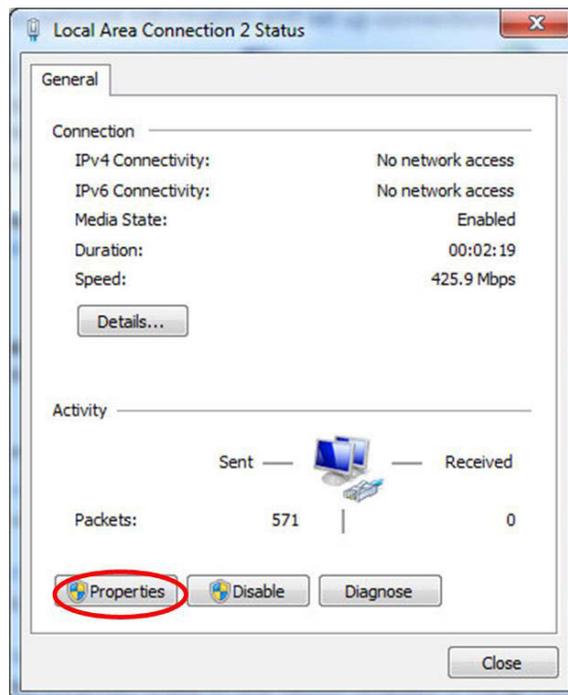
Figure 39: Connection Status Window for Local Area Connection 2

6. The Properties window appears; Figure 40 shows an example for Local Area Connection 2. Double-click the entry for Internet Protocol Version 4 (TCP/IPv4), shown in Figure 40.
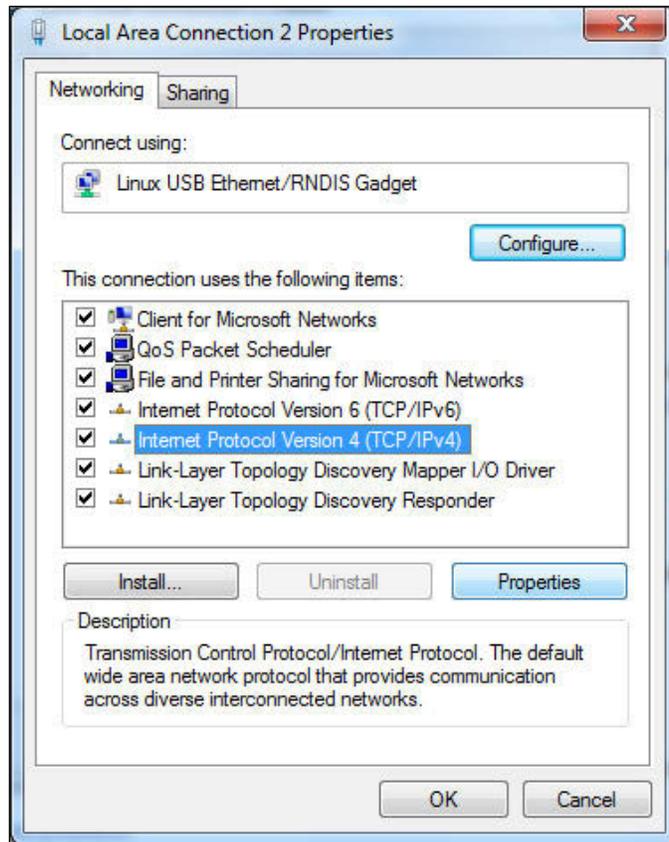
Figure 40: Connection Properties Window for Local Area Connection 2

7. The Internet Protocol Version 4 (TCP/IPv4) Properties window appears. Select "Use the following IP address:" as shown in Figure 41.
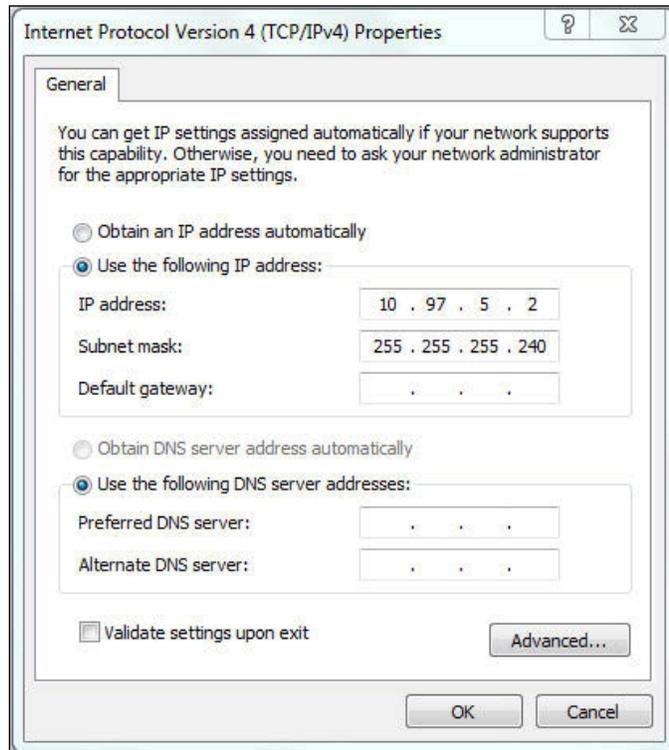
Figure 41: Internet Protocol Version 4 (TCP/IPv4) Properties Window

The Nielsen Audio 1000-1212 Encoder is set to use IP address `10.97.5.1`. The computer must be set to a different address within the subnet mask. Enter the IP address and subnet mask values shown in Figure 41.

Note: When setting up subsequent USB Type B ports on the computer, use IP address `10.97.5.3`, `10.97.5.4`, etc. (the USB Ethernet Gadget protocol connection with the encoder only works using USB Type B ports on your computer that have been configured in this manner.)

8. To display the Advanced TCP/IP Settings window, click the Advanced… button. Select the WINS tab, as shown in Figure 42.
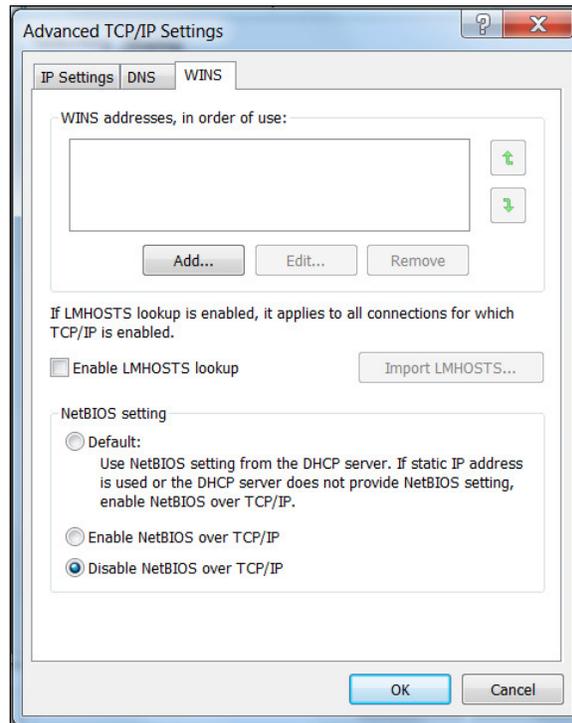
Figure 42: Advanced TCP/IP Settings Window

9. As shown in Figure 42, do the following:

    •   Select the radio button labeled Disable NetBIOS over TCP/IP.

    •   Uncheck the box labeled Enable LMHOSTS lookup.

    •   Remove all entries from the WINS address list.

10. Close all the windows used thus far:

    •   Click OK on each of the following windows to dismiss them:

        o   The Advanced TCP/IP Settings window (Figure 42)

        o   The Internet Protocol Version 4 (TCP/IPv4) Properties window (Figure 41)

        o   The Connection Properties window (Figure 40)

    •   Click Close on the Connection Status window (Figure 39) to close it.

    •   Dismiss the Network and Sharing window (Figure 38).

11.   Right-click the Computer icon on the desktop, and from the pop-up menu, select Manage, as shown in Figure 43.
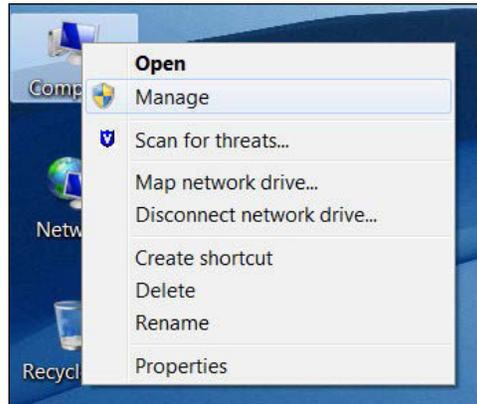
Figure 43: Manage Computer Menu Selection

12.   The Computer Management appears as shown in Figure 44. Double-click the Services item, shown highlighted in Figure 44.
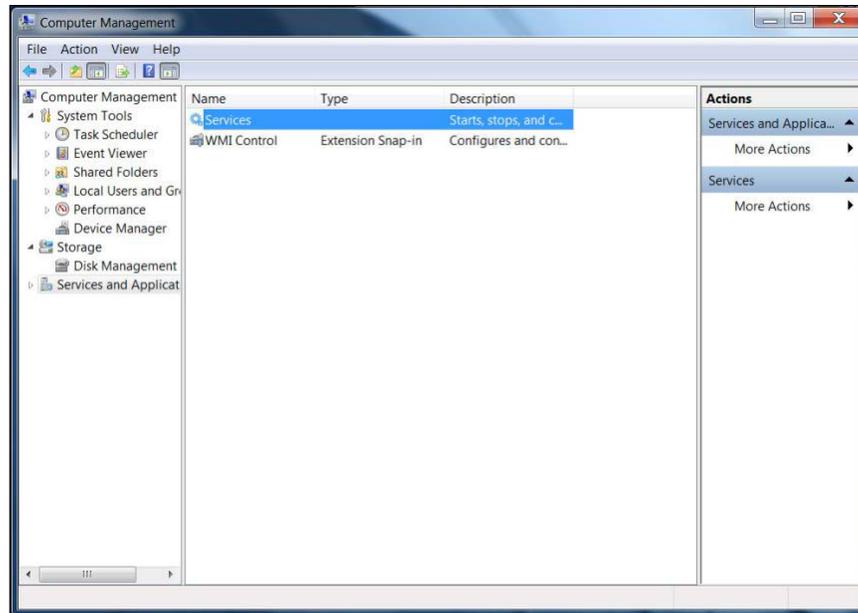
Figure 44: Computer Management Window with Services Item Selected

13. The list of computer services appears as shown in Figure 45. Double-click the SSDP Discovery service, shown highlighted in Figure 45.
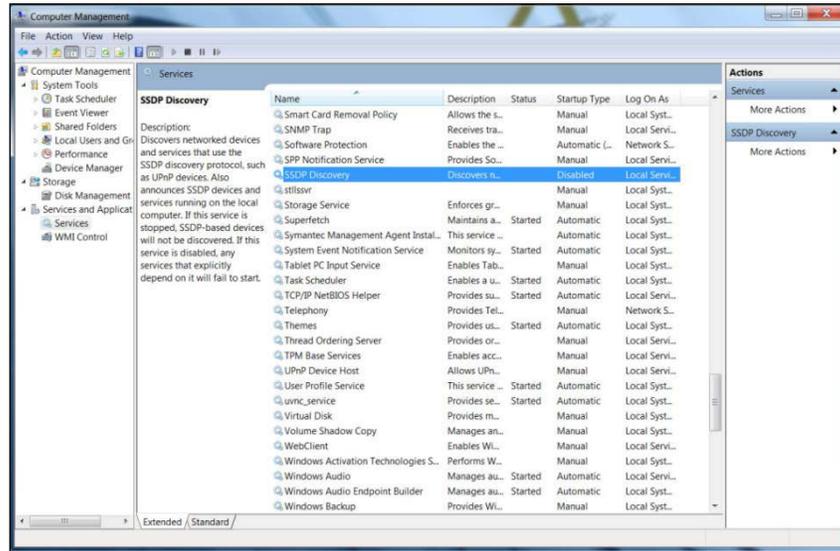
Figure 45: Computer Services with SSDP Discovery Highlighted

14. The Properties window for the SSDP Discovery service appears. (Shown in Figure 46.)
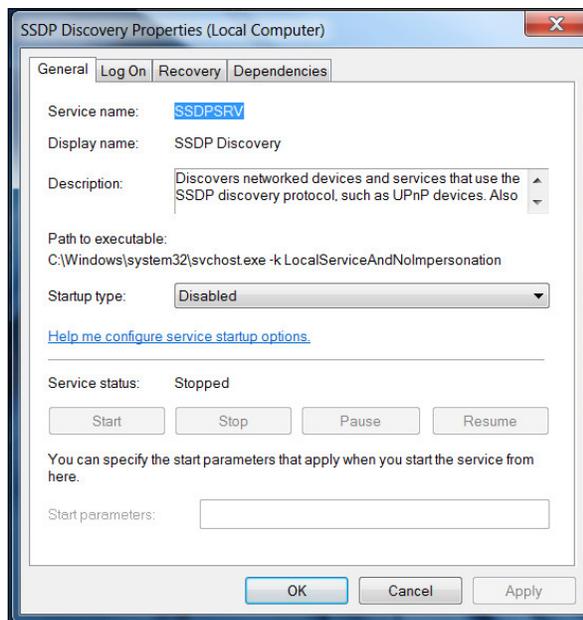
Figure 46: Properties Window for SSDP Discovery Service

15. Click Stop to stop the SSDP Discovery service.

16. Change the Startup type to Disabled.

17. The SSDP Discovery Properties window should appear as shown in Figure 46; click OK to dismiss the window.

18. To verify the physical and protocol connection, open a command prompt window. (Start→All Programs→Accessories→Command Prompt.)

19. Enter the `ping` command as shown in Figure 47 and confirm that the encoder sends one or more successful replies.
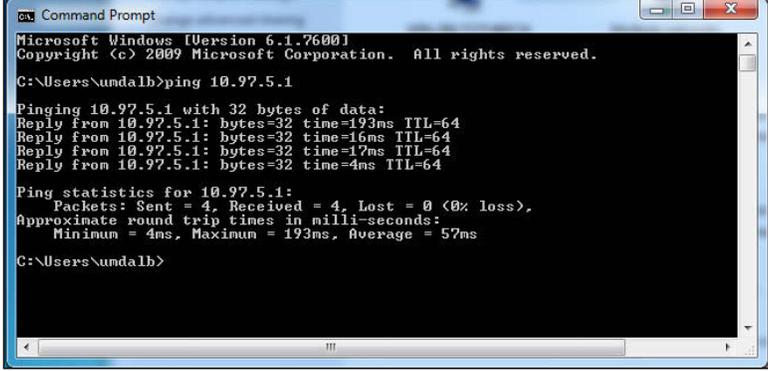
Figure 47: Ping Test

Before logging into the encoder web interface using USB Ethernet Gadget, Nielsen Audio recommends installing the Nielsen Audio 1000-1212 Encoder Root CA certificate on the PC. This makes the login process smoother.

Instructions for logging in to the encoder web interface (with or without the Nielsen Audio 1000-1212 Encoder Root CA certificate installed) are provided in Section 2.5.3.3.

2.5.3.3. Logging into the Encoder Web Interface through USB Ethernet Gadget

Once the USB Ethernet Gadget driver has been installed on a PC (as described in Section 2.5.3.1), anytime that PC is physically connected to an encoder front-panel USB Type B slot (as described in Step 10 of Section 2.3), users can log in to the encoder web interface via USB Ethernet Gadget connection using the procedure outlined in this section.

See "Using the Nielsen Audio 1000-1212 Encoder Root Certificate Authority for HTTPS Access" on page 33 and Appendix A for instructions on installing the certificate and creating the URL for encoder access when using the certificate.

1. Open a web browser on the computer connected to the encoder and enter the following in the address window:

    https://10.97.5.1/EncoderStatus.klx

    One of the following occurs:

- If an SSL certificate for the encoder has been installed on the PC, the URL to access the encoder is different from when the certificate has not been installed.

- If the Nielsen Audio 1000-1212 Encoder Root CA certificate has not been installed on the PC, a warning message appears as shown in Figure 21. (See Section 2.5.2.3.) The figure shows the warning as it appears in Internet Explorer; in other browsers this message may appear different.)

  This message is normal, and does not prevent access to the encoder web interface. However, to prevent this message from appearing during future logins, install the Nielsen Audio 1000-1212 Encoder Root CA certificate on the PC.

2. Click "Continue to this website." The login window shown in Figure 48 below appears:
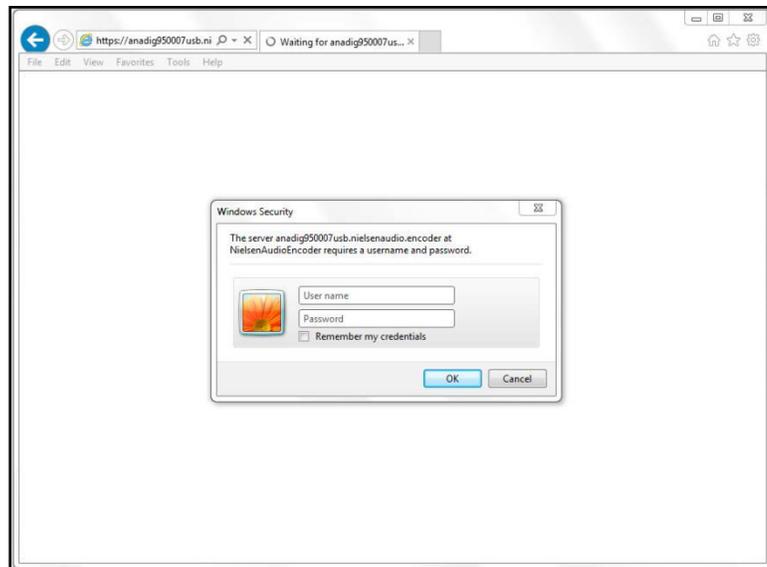
Figure 48: Nielsen Audio 1000-1212 Encoder Web Interface Login Prompt

3. Enter the user name `Station`, and the password `Maintenance` (this is case-sensitive), and click the OK button.

   If the login is successful, the Encoder Status page appropriate to the current mode of operation (analog or digital) appears. (See Figure 55 through Figure 58 in Section 4.2.) For details on using the web interface, see Section 4.

2.5.4. Setting Up to Monitor and Control the Encoder via SNMP

Simple Network Management Protocol (SNMP) is a network monitoring application that uses User Datagram Protocol/Internet Protocol (UDP/IP) to set and get parameters specific to a network device (in this case, the Nielsen Audio 1000-1212 Encoder). The parameters are grouped into a Management Information Base (MIB), and comprise definitions of management information used to remotely monitor, configure, and control networked systems.

This document provides encoder-specific information needed by network engineers who already know how to use SNMP and a MIB browser application. The encoder supports SNMP Version 1 or Version 2c.

The encoder is provided with two different MIBs:

- NIELSEN-1212-ENCODER_MIB

  This MIB provides the ability to monitor and control the encoder remotely via SNMP. Load this MIB definition into an MIB browser to enable setting and getting encoder information. The Nielsen Audio 1000-1212 Encoder is able to accept SNMP Version 1 or Version 2c commands. The encoder recognizes one read/write SNMP community, named `nielsen1212encoder`. See Section 4.9 for more information.

- NIELSEN-1212-ENCODER-NOTIFICATIONS-MIB

  This MIB establishes event notifications for one or more SNMP manager servers to receive from the encoder via SNMP traps. If you plan to use the same MIB browser to accept trap notifications from the encoder, set the notifications community to be the same as the SNMP community, which is `nielsen1212encoder`, because the encoder SNMP interface uses port 161 for both MIB browsing and for trap notifications. See Section 4.10 for more information.

2.5.5. Remote Control/Monitor Pin-Outs

To monitor and control the encoder remotely via a third-party device, you must connect the device to the encoder rear-panel DE-9 M port as described in Step 7 of Section 2.3. (This connection can be established at any time without interfering with encoder operation; it does not have to be established at installation time.) This connection provides access to the following features:

- The ability to remotely monitor the encoder encoding/bypass status

- The ability to remotely monitor the encoder error status

- The ability to remotely switch the encoder between bypass and enable mode

The DE-9 M pinout configurations for each of these features are described in the following three subsections. To use these features the remote device must comply with these pinout specifications.

2.5.5.1. Pinouts for Remote Monitor of Encoder Error Status

To allow remote monitoring of the encoder error status, the following connections are provided in the DE-9 M plug at the rear of the encoder (as shown in Figure 49):

- Pin 8 – Error Status Common connection

- Pin 5 – Error active (pins 8+5 shorted, 8+9 open)

- Pin 9 - Normal mode (pins 8+9 shorted, 8+5 open)

Table 5: DE-9 M Pin Connections for Remote Error Status Monitoring

Pin	Status = NORMAL	Status = ERROR
Pin 5	Open to pin 8	Shorted to pin 8
Pin 9	Shorted to pin 8	Open to pin 8
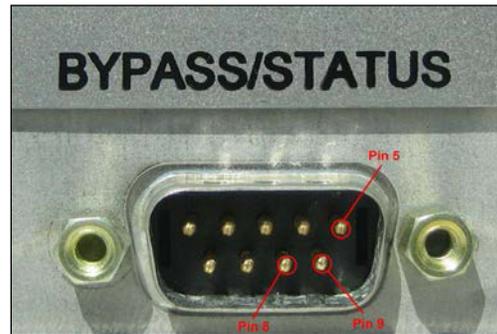
Figure 49: DE-9 M Pins for Remote Error Status Monitoring

The pins are connected to an internal relay of the encoder. The relay contacts are rated at 0.3A max, 24VDC

2.5.5.2. Pinouts for Remote Monitor of Encoding/Bypass Status

To allow remote monitoring of the encoding and bypass modes, the following connections are provided in the DE-9 M plug at the rear of the encoder (as shown in Figure 50):

- Pin 3 – Bypass/Encode Common connection
- Pin 4 – Bypass mode (pins 3+4 shorted, 3+7 open)
- Pin 7 – Encode mode (pins 3 + 7 shorted, 3+4 open)

Table 6: DE-9 M Pin Connections for Remote Bypass/Encode Modes Status Monitoring

Pin	Status = ENCODE	Status = BYPASS
Pin 4	Open to pin 3	Shorted to pin 3
Pin 7	Shorted to pin 3	Open to pin 3
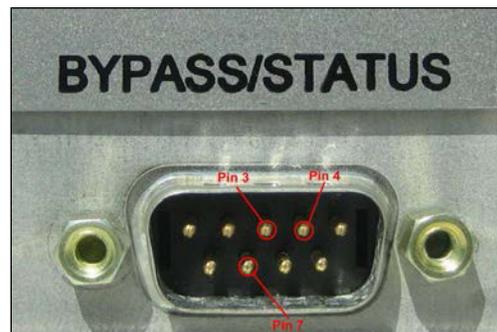
Figure 50: DE-9 M Pins for Monitoring Bypass and Encode Modes

The pins are connected to an internal relay of the encoder. The relay contacts are rated at 0.3A max, 24VDC.

2.5.5.3. Pinouts for Remote Control of Encoding/Bypass Mode

To allow setting the encoder into Bypass or Enable modes from a remote location, the following pin connections must be established with the DE-9 M plug at the rear of the encoder (shown in Figure 51):

- 5-20V DC positive terminal to pin 1

- Negative terminal to pin 6

Table 7: DE-9 M Pin Connections for Remote Bypass/Encode Mode Control

Pin	BYPASS	ENABLE
Pin 1	DC (5-20V) positive	DC (0 V) positive
Pin 6	DC negative	DC negative
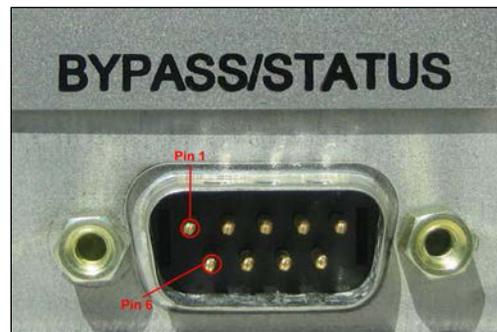
Figure 51: DE-9 M Pins for Remote Bypass/Encode Mode Control

2.5.6. Synchronizing the Encoder System Time

Time is an essential element in attributing credit for specific programs for audience measurement. The Nielsen Audio 1000-1212 Encoder includes the time a program was encoded in the encoding it adds to program material.

The encoder maintains an internal system time using a real-time clock. This clock is set to the correct UTC time at the factory during the manufacturing final test, but like all clocks, this clock can drift and should be periodically synchronized to ensure the encoder uses accurate encoding times.

There are two external time sources the encoder can use to synchronize its real-time clock:

- Station time, in the form of a Linear Time Code (LTC) in one of the following formats:

  o SMPTE complying with the SMPTE 12M-1 2008 standard, supporting 30 frames per second

  o EBU complying with the SMPTE 12M-1 2008 standard, supporting 25 frames per second

- o ESE TC89
- o ESE TC90
- o DQS
- o IRIG-B (un-modulated)
- Time provided by a network time server

The type of clock synchronization the encoder uses (none, LTC, or SNTP) is determined by configuration settings established by Nielsen Audio per agreement with the encoder user. Contact Nielsen Audio to change this setting. See the "Contacts" section on page 10.

If the encoder is set to synchronize its real-time clock using an external source, it does so at several different times:

- When the encoder is powered up
- When attempting RTC synchronization at boot time:
  - o If the external time source is LTC and the RTC is found to have drifted from the LTC time source by more than 15 minutes, the encoder will synchronize the RTC and will record in the Log a message to alert the user.
  - o If the external time source is NTP, the encoder will synchronize the RTC regardless of drift. If the amount of drift is more than 15 seconds, the encoder will record in the Log a message to alert the user.
- Once a day at 02:20:30 UTC

  When attempting the daily RTC synchronization:
  - o If the external time source is LTC and the most recent time synchronization attempt failed and if the RTC has drifted from the LTC time source by more than 15 minutes, the encoder will synchronize the RTC and will record in the Log a message to alert the user.
  - o If the external time source is LTC and the most recent time synchronization attempt succeeded and if the RTC has drifted from the LTC time source by more than 15 seconds, the encoder will synchronize the RTC and will record in the Log a message to alert the user.
  - o If the external time source is NTP and the RTC has drifted from the LTC time source by more than 15 seconds, the encoder will synchronize the RTC and record in the Log a message to alert the user.
- When the encoder is switched from bypass mode to encode mode (See Section 3.2.)

  When attempting RTC synchronization when the encoder goes from bypass to encode mode:
  - o If the external time source is LTC and the most recent time synchronization attempt failed and if the RTC has drifted from the LTC time source by more than 15 minutes, the encoder will synchronize the RTC and will record in the Log a message to alert the user.
  - o If the external time source is LTC and the most recent time synchronization attempt succeeded and if the RTC has drifted from the LTC time source by more

than 15 seconds, the encoder will synchronize the RTC and will record in the Log a message to alert the user.

o   If the external time source is NTP and the RTC has drifted from the LTC time source by more than 15 seconds, the encoder will synchronize the RTC and record in the Log a message to alert the user.

When the encoder switches into enable mode, if the RTC is found to have deviated from the external time source by more than 15 seconds, the encoder asserts a condition to alert the user. In this case, if the external time source is LTC, the encoder will not perform the synchronization.

If the encoder is not configured to use an external time source for synchronization, or if no valid time source is provided to the encoder, the encoder will use its internal real-time clock to maintain time. In this case, the internal real-time clock will not be synchronized with an external source to correct drift. See Section 4.4.1 for information on setting the list of time servers the encoder may access.

2.5.6.1.   Using Station Time Code Input to Synchronize the Encoder Real Time Clock

The encoder can use an LTC station time code as an external time source for synchronizing its real-time clock. The encoder can recognize station time in the following formats: SMPTE 12M-1 (30 FPS), EBU (complying with SMPTE 12M-1 at 25 FPS), ESE TC89, ESE TC90, DQS, and IRIG-B (un-modulated). When powered on, the encoder automatically senses whether station time LTC input has been connected as described in Step 8 of Section 2.3, but the encoder will only use the LTC input to synchronize its real-time clock if it is configured to do so. If the encoder is configured to use the station time input, but no LTC input is connected, the front-panel LCD will display the system information message NO_STATION_CLOCK.

> **Note:**   To ensure that the encoder will synchronize to the station time upon boot-up, one of the supported time code sources must be properly connected to the time code input at installation time *prior to applying power to the encoder*.

The encoder real-time clock maintains time in UTC (Coordinated Universal Time, which is a more rigorous form of Greenwich Mean Time, or GMT). For this reason, the LTC station time input to the encoder must be in UTC to provide an appropriate time synchronization source. In circumstances where the LTC is not UTC, the encoder can be configured to apply an offset to the incoming LTC to convert it to UTC. If the LTC source does not reflect UTC, notify Nielsen Audio so the appropriate configuration settings can be established. See the "Contacts" section on page 10.

> **Note:**   Failure to set the UTC offset in encoders using non-UTC LTC station time input can result in incorrect encoding. To Confirm the Encoder Is Synchronizing with an LTC Time Source

Once the LTC time code source is connected to the encoder, a small LED at the rear of the encoder (Item 5 in Figure 2) indicates that the time on demand module is receiving and correctly decoding the code presented. This LED blinks on/off at a one-second rate when the module is receiving and correctly decoding the code presented. The LED remains unlit when a correct time code is not connected.

2.5.6.2. Using SNTP to Synchronize the Encoder Real Time Clock

The encoder can use the time provided by a time server as an external time source for synchronizing its real-time clock. Because NTP time sources provide the date as well as time of day, this is considered more reliable than using LTC station time, or allowing the encoder's clock to run without synchronization.

The SNTP daemon is started on boot-up and the encoder is pre-configured to use the `pool.ntp.org` servers (numbered `0`, `1`, `2`, and `3` as shown in Item 1 of Figure 62). If the encoder is configured by Nielsen Audio to use SNTP for RTC synchronization *and* the encoder is configured to access one or more NTP time servers as described in Section 4.4.1, *and* the encoder has access to at least one of the configured servers, then the encoder will synchronize its RTC using the SNTP time input using the schedule described in Section 2.5.6.

To use this function, the broadcast facility must have access to a time server. (The station engineer should be aware of which time servers, if any, are available from within the facility's network.) SNTP uses port 123, which must be un-blocked by any firewalls in place at the facility If the SNTP client on the encoder determines that the encoder real-time clock is not within a specified tolerance of the network time, the encoder updates its internal RTC to match the network time.

The encoder maintains a list of up to five valid time servers from which it can accept the time. When the encoder is configured to use SNTP, it attempts to use each server in the list, starting with the first one, until it finds a server that is reachable. (If no time servers are available the front-panel LCD will display the system information message NO_SNTP_TIME_SOURCE.)

Section 4.4 describes how web interface users can set the list of known time servers and test the servers listed to verify the connection via the SNTP protocol through port 123.

If the encoder is configured to use SNTP but is not connected to a time server, the front-panel LCD will display the system information message NO_SNTP_TIME_SOURCE

2.5.6.3. To Confirm the Encoder is Synchronizing with a Time Source

Use the test capability provided on the web interface View/Edit Time Servers page, described in Section 4.4.2.

3. Operation

3.1. Initiating Encoding

Once the encoder is connected as described in Section 2.3, follow these instructions to begin encoding:

1. Push the Enable/Bypass push button on the front panel to the "in" position to enable encoding mode.

2. The LCD displays a station specific message, which is usually configured to be "Encoding" followed by station identification information.

3. The Encoding Status LED displays an unblinking green light to indicate normal operation, and the relays switch from bypass mode to encoding mode. An audible click may be heard.

The encoder can be removed from the signal path and put into bypass mode by pushing the Enable/Bypass button to the "out" position. This connects the input connectors directly to their respective output connectors. See Section 3.2 for more information.

3.2. Bypass Features

In bypass mode, the encoder does not perform any encoding; the input signal passes through the encoder unchanged. The encoder provides two types of bypass modes: hard bypass and soft bypass. When the encoder is powered, it can assume three different modes of hard bypass: front-panel bypass, network bypass, and the rear-panel bypass (also known as remote bypass). The next two sections describe these bypass types. The encoder is in bypass mode if any one of the bypass types is asserted, as illustrated by Table 8.

Table 8: Encoder Bypass Status Truth Table

Soft Bypass	Hard-Bypass Source			Encoder State
	Front Panel	Rear Panel	Network	
Enabled	Enabled	Enabled	Enabled	Enabled
Enabled	Enabled	Enabled	Bypass	Bypass
Enabled	Enabled	Bypass	Enabled	Bypass
Enabled	Enabled	Bypass	Bypass	Bypass
Enabled	Bypass	Enabled	Enabled	Bypass
Enabled	Bypass	Enabled	Bypass	Bypass

Soft Bypass	Hard-Bypass Source			Encoder State
	Front Panel	Rear Panel	Network	
Enabled	Bypass	Bypass	Enabled	Bypass
Enabled	Bypass	Bypass	Bypass	Bypass
Bypass	Enabled	Enabled	Enabled	Bypass
Bypass	Enabled	Enabled	Bypass	Bypass
Bypass	Enabled	Bypass	Enabled	Bypass
Bypass	Enabled	Bypass	Bypass	Bypass
Bypass	Bypass	Enabled	Enabled	Bypass
Bypass	Bypass	Enabled	Bypass	Bypass
Bypass	Bypass	Bypass	Enabled	Bypass
Bypass	Bypass	Bypass	Bypass	Bypass

3.2.1. Hard Bypass Mode

In hard bypass mode, the physical relay within the encoder, which routes the incoming signal to the encoding process, is switched so the signal is instead routed directly to the output connection, leaving the signal unchanged. Because activating and deactivating hard bypass mode trips a relay within the encoder, it can cause a brief but audible defect in the output audio. Hard bypass mode can be activated and deactivated by any of the following means:

- Power off hard bypass

  When power is removed from the system, an internal relay routes the input connectors directly to the output connectors. When power is restored, that relay is reset to re-enable normal operation. (Power-off bypass.)

- Front-panel hard bypass

  The front panel of the encoder has a push button labeled RELAY BYPASS (Item 6 in Figure 1). This button has two positions: in for encoding mode, and out for bypass mode. When the encoder is powered, pushing in this button enables encoding, and pushing this button to set it to the out position routes the input connectors directly to the output connectors.

- Network hard bypass

  The encoder may be put into hard bypass mode through the web interface (see Section 4.2.2), or through the front-panel LCD menu. (See Appendix E for detailed charts to navigate the front-panel menu.) Putting the encoder into hard bypass mode using either of these methods is known as "network bypass."

- Rear-panel (aka remote) hard bypass

  The DE-9 M connector on the encoder rear panel (Item 3 in Figure 2) provides a remote interface through which the encoder can be set to hard bypass mode. Step 7 in Section 2.3 describes how to establish the physical connection to support this feature. Using this connection, a remote device can put the encoder in and out of bypass mode. See Section 3.3 for more information on using this feature.

  > **Note** All of the sources of hard bypass above are triggered by user direction.

In addition to those triggers, whenever the encoder is in a SYSTEM_ERROR state (see Table 13 in Appendix B), it does not display a bypass state on the Encoder Status page, but it does cease encoding. The status on the Encoder Status page (Item 1 in Figure 55 through Figure 58) will read "Not Encoding." In this case, internally, the encoder actuates the bypass relay, which can cause a "no lock" condition to cascade down the signal chain from the encoder, (Downstream systems should reacquire signal lock after the brief no lock episode.) Once all SYSTEM_ERRORs and ENCODING_ERRORs are cleared, the encoder should resume encoding. See Section 4.2 for information about reading the Encoder Status web interface page.

3.2.2. Soft Bypass Mode

In soft bypass mode, the relays within the encoder (and the signal path through the device) remain unchanged. In soft bypass, the encoder simply stops applying the encoding algorithm to the audio signal as it proceeds through the hardware. Activating and deactivating soft bypass mode causes no defect in the output audio.

Users may activate and deactivate soft bypass mode either via the Front Panel menu (see Appendix E) or through the web interface (see Section 4.2.2). The encoder will put itself into soft bypass mode in the event of a FAILED_COMM_DSP error or license expiration (See Section 4.3.4).

> **Note** In addition to the soft bypass triggers listed above, when the encoder is in the ENCODING_ERROR state it ceases encoding. See Table 18 in Appendix B.

The status on the Encoder Status page (Item 1 in Figure 55 through Figure 58) will read "Not Encoding." The encoder state is essentially the same as soft bypass (although no bypass state is displayed on the Encoder Status page). In this case the encoder does not attenuate any internal relays, and systems in the broadcast chain downstream of the encoder will detect no difference in signal. Once all SYSTEM_ERRORs and ENCODING_ERRORs are cleared, the encoder should resume encoding. See Section 4.2 for information about reading the Encoder Status web interface page.

3.2.3. Bypass Monitoring

The encoder may have more than one type of bypass in effect at the same time. The encoder provides a number of ways the observer may determine its bypass status:

- Front-panel LCD

  When the encoder is in bypass mode, the LCD displays a message like that shown in Figure 52.

```
BYPASS (FP NW RP SF)
Encoding Disabled
```

Figure 52: Front-Panel LCD Hard and Soft Bypass Message

The precise text of the first line varies depending upon the source(s) of the hard bypass state. On the first line the message includes one of the abbreviations listed below for each type of bypass currently in force:

- o FP: the encoder front-panel bypass button is depressed.
- o NW: the encoder has been put into bypass mode through the web interface
- o RP: the encoder has been put into bypass mode by a remote device connected through the rear-panel DE-9 M connector
- o SF: the encoder has been put into soft bypass mode

- Front -panel LED

When the encoder is in bypass mode (hard or soft), the front-panel LED is in one of two states:

- o If the encoder is in bypass mode with a system error condition asserted, the front-panel LED flashes alternating red/off.
- o If the encoder is in bypass mode with no errors, or an error of lower priority than system error, the front-panel LED is dark.

Section 5, Section 6.8, and Table 10 in Appendix B provide more details about the front-panel LED behavior.

- Encoder web interface

The web interface provides a status page that includes the encoder bypass status. See Section 4.2 for more information.

- SNMP application

If you use an SNMP application to access the encoder, you can get the current encoder bypass state using the MIB objects listed below. (See Appendix D for the full text of the encoder MIB.)

nEncObjSerialNumber (read-only)

nEncObjSystemVersion (read-only)

nEncObjSystemTime (read-only)

nEncObjAlarmStatus (read-only)

nEncObjEncodingState (read-only)

nEncObjFrontPanelBypassState (read-only)

nEncObjRearPanelBypassState (read-only)

nEncObjNetworkBypassState (read/write)

nEncObjSoftBypassState (read/write)

`nEncObjActiveConditions` (read-only)

For more information on using SNMP, see Section 2.5.4.

- Remote monitoring via the rear-panel DE-9 M connection

  If a remote device is connected to the encoder rear-panel DE-9 M connector (as described in Step 7 of Section 2.3), and that device complies with the pin connections described in "Pinouts for Remote Monitor of Encoding/Bypass Status" on page 56, that device can be used to poll the encoder for its current bypass status as described in Section 3.3.

3.3.   Using Remote Monitoring and Control

Through its rear-panel DE-9 M connection, the encoder supports the following remote features:

- The ability to remotely monitor the encoder encoding/bypass status

- The ability to remotely monitor the encoder error status

- The ability to remotely switch the encoder between bypass and enable modes

To use these features, a third-party device must be connected to the encoder as described in Step 7 of Section 2.3. (This connection can be established at any time without interfering with encoder operation; it does not have to be established at installation time.) The device must be capable of applying or detecting voltages to/from the DE-9 M pins as described in the following sections:

- "Pinouts for Remote Monitor of Encoder Error Status" on page 55

- "Pinouts for Remote Monitor of Encoding/Bypass Status" on page 56

- "Pinouts for Remote Control of Encoding/Bypass Mode" on page 57

For remote monitoring of encoder error or bypass/enable status, within the encoder, the alarm and encoding relays receive signals from the microcontroller and the contacts shown in Figure 53 close or open, indicating the appropriate condition at the pins of the DE-9 M interface.

For remote bypass/enable control, the voltage applied at the remote control interface pins (1 and 6) is sent to an optically isolated translator within the encoder. The translator then sends the signal to the encoder controller input in a manner similar to the front-panel bypass switch signal. There is no dominance between the paths of the remote control (rear-panel) bypass and front-panel bypass. Otherwise the encoder remains in bypass mode.

Note that the encoder is in "enable mode" only if ALL of the following are true:

- The remote bypass mode control pins are in enable mode.

- The front-panel bypass switch is in enable mode.

- The network bypass setting in the web interface is in enable mode.

- The soft bypass setting in the web interface is in enable mode.

- The encoder is not in any SYSTEM_ERROR or ENCODING_ERROR state.

When the encoder is in hard bypass mode, the encoder controller de-energizes the bypass relays and connects the corresponding input and output connector through the normally closed (NC) path of the relay.
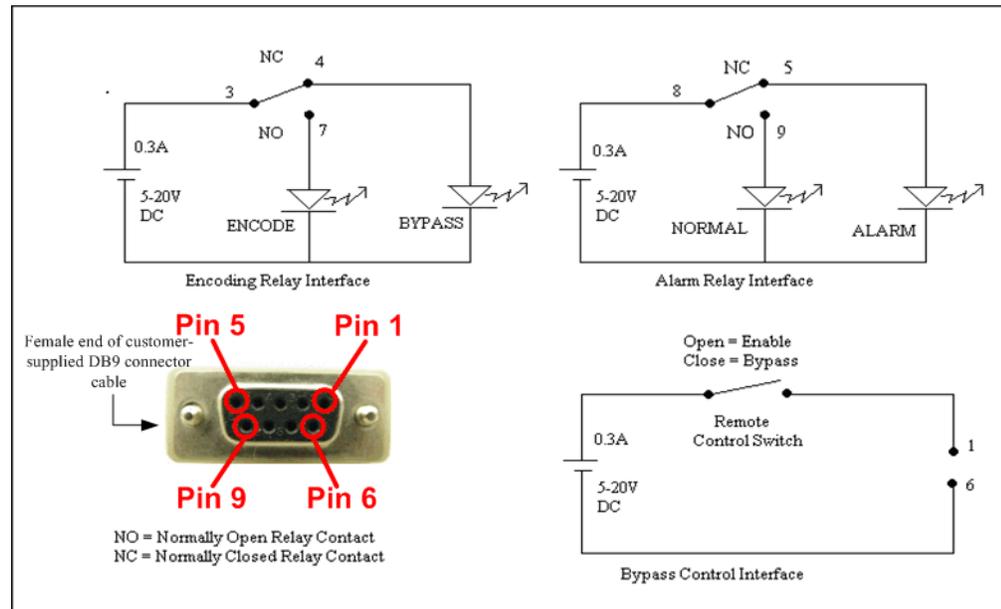
Figure 53: Remote Monitoring and Control DE-9 M Connection Scheme

3.4.   Downloading Log Files

The encoder maintains a log of system initialization messages, shutdown notifications, error messages, and warnings for various inputs (video, audio, time code, and Ethernet) in an XML format. This log file can be downloaded for offline analysis of errors encountered or reported by the encoder.

The encoder supports two ways of extracting the log file:

- Download to a USB flash memory device via the front-panel USB Type A port

- Through the web interface

To extract the log file using the web interface, see Section 4.6.

To extract the log file using the front-panel USB Type A port, follow these instructions:

1. Prepare a text file containing a single line of text that reads: `DumpLog`. Name the file `Encoder.cmd`.

    Note   The filename `Encoder.cmd` is case sensitive. The encoder does not recognize the file unless the precise upper and lower case syntax shown is used.

2. Place the file on the top-level directory of a USB flash memory device with a minimum of 128 MB free space.

3. Insert the flash drive into the encoder front-panel USB Type A port. (Item 3 in Figure 1)

> **Note** Connecting an external hard disk that requires power from the USB Type A connection greater than that specified by the USB v 1.1 specification can result in locking up the USB port. In this case the encoder must be rebooted to recover.The encoder automatically recognizes the

USB device, searches for the `Encoder.cmd` file, reads the `DumpLog` command, and copies the log file to the USB device.

4. When the front-panel LCD reads `Copied Log Report Remove USB Disk…` the download is complete; remove the USB device.

You may transfer the log file to any PC for inspection. The file is in XML format (readily viewable using Microsoft Internet Explorer or any text editor); the file name incorporates the encoder serial number and the date and time the log file is downloaded (for example. `AnaDig_950007_Log_21121211_175811_233.xml`). A sample log file is provided in Appendix C.

3.5. Changing the Mode of Operation (AKA Unit Type: Analog/Digital)

The encoder mode of operation (or unit type) can be changed from analog to digital or vice-versa in one of three ways:

- Upload a new configuration file with the appropriate settings. To apply a new configuration to the encoder, see Section 3.8.

- Use the Change Unit Type option in the web interface. See Section 4.7.

- Use the front-panel menu. See Appendix E.

3.6. Using Low Level Alarm Sets

The encoder can be configured to treat groups of input channels as a single unit for the purpose of signaling a low signal level alarm (listed in Table 11 in Appendix B). Such a group is called a Low Level Alarm set (or LLA set). Like many aspects of the encoder configuration, LLA sets are configured by Nielsen Audio in consultation with customers to suit the particular needs of the broadcast facility where each encoder is installed.

LLA sets can be useful in facilities that process multi-channel audio sources. In such environments, if some but not all channels of a multi-channel group operate at a signal level below an accepted threshold (measured in dBFS for digital mode, dBu for analog mode), this may be acceptable because other channels operating at normal levels can compensate.

For instance, a station might broadcast some material in two-channel stereo and other material in single-channel mono. When the station switches from broadcasting stereo material to mono material, the encoder detects input on one of the two channels it is configured to use. Normally, this would cause the encoder to generate a low audio level alarm for the channel not in use, and in this instance that would be a false alarm. But if the two input channels are configured as members of an LLA set, the encoder will not generate a low audio level alarm unless both channels fall below the threshold configured for low signal level.

LLA sets and the acceptable signal threshold are established by Nielsen Audio at configuration time in consultation with customers to establish the correct functionality for each broadcast facility.

LLA sets are configured and operate under the following rules:

- The encoder supports up to 2 LLA sets; an LLA set may be comprised of 1 or two member channels.

- The capability to detect and alarm on low input levels is configured on a per-LLA-set basis.

- The existence of an LLA set does not necessarily mean the low level alarm is enabled for that set; the low level alarm can be enabled or disabled for each LLA set individually.

- Any given input channel may not be configured for membership in more than one LLA set.

- Member channels of an LLA set may have encoding enabled or disabled; member channels with encoding disabled shall not be taken into account when determining whether the alarm is raised for the set.

- A low level alarm shall be raised for an LLA set when all of the following conditions are met:

  o The low level alarm capability is enabled for the set.

  o All member channels of the set for which encoding is enabled are operating at input levels below the configured threshold.

The Encoder Status page on the web interface displays the current configuration and status for LLA sets. See Section 4.2.1 for more information.

3.7. Updating Encoder Software

When Nielsen Audio issues software updates for the encoder, the software can be installed using two different methods:

- Via the front-panel USB Type A port, using a thumb-drive

  When Nielsen Audio issues software updates for the encoder, USB installation instructions specific to that update will be distributed along with the new software.

- Via the Upload Software Update page in the Web interface

  For instructions, see Section 4.11.

3.8.   Updating Encoding Configuration

Many aspects of the encoder's functionality are determined by parameter settings loaded on to the encoder by Nielsen Audio. Nielsen Audio determines the appropriate settings for each facility in consultation with each customer.

The web interface provides the ability to download the current encoder configuration to the PC in the form of an encrypted file. This is not useful to the typical user, but may be used by Nielsen Audio personnel when diagnosing any potential problem. See Section 4.3.6 for more information.

The encoder configuration can be updated in three different ways:

- The web interface provides the ability to change certain aspects of the encoder configuration as described in Section 4.3.

- The web interface provides the ability to upload an entire new configuration as described in Section 4.12.

- The encoder configuration can be updated using files on a USB flash memory device inserted in the front-panel Type A USB port, as described in this section.

To Update the Encoder Configuration via USB Flash Memory Device

First obtain two files from Nielsen Audio:

A configuration file, which will be named either `station.dat` or *`serial`*`.dat`, where *`serial`* is the serial number of the encoder. This is an encrypted file that contains the configuration information requested for the target encoder.

A command file, which will be named `Encoder.cmd`. It will be a text file containing a single line that reads as follows:

```
ConfigUpdate="\Configs\configfile.dat"
```

Where *`configfile`* is the same as the base name of the configuration file (`station` or *`serial`*).

> **Note**   The filename `Encoder.cmd` is case sensitive; the encoder will not recognize a file named `encoder.cmd`.

Follow these instructions to perform the update:

1. Place the `Encoder.cmd` file on the top level of the folder structure of a USB flash memory device. (There may be other files on the flash drive.)

2. Place the configuration file on the USB flash drive in a subdirectory called `Configs`.

3. Put the encoder into bypass mode using the front-panel bypass switch (Item 6 in Figure 1).

4. Insert the flash drive in the front-panel Type A USB port (Item 3 in Figure 1).

> **Note**   Connecting an external hard disk that requires power from the USB Type A connection greater than that specified by the USB v 1.1 specification can result in locking up the USB port. In this case the encoder will need to be rebooted to recover.

5. The encoder automatically recognizes the flash drive, searches for the `Encoder.cmd` file, and performs the action it specifies—in this case, uploading a new configuration on to the encoder. Observe the front-panel LCD for messages reporting the progress of the update.

6. When the front-panel LCD reads, `Config Update done Remove USB Disk…` the update is complete.

7. Put the encoder back into enable mode.

3.9. Using the Reset Button

On the far right of the encoder front panel there is a recessed reset button (Item 7 in Figure 1). This button is provided as a means of performing a hard reboot of the encoder should it lock up and fail to respond to the normal means of reboot via the front panel menu (see Appendix E for a detailed diagram of the front-panel menu) or the web interface (see Section 4.8).

> **Note**   The reset button is provided for recovery in the event of an error that locks up the encoder. It should not be used in the course of normal operation.

To activate the reset switch, insert a blunt tool such as the end of a paper clip into the access port and press the hidden reset switch. Once the switch is activated, the encoder will initiate its reboot process; the LCD will display messages confirming the encoder is performing a hard reboot. The reboot will take about two minutes. When the reboot is complete, the LCD will display the current encoder status.

4. Using the Web Interface

The Nielsen Audio 1000-1212 Encoder web interface is accessible by a PC using a web browser and provides access to status and configuration information associated with the encoder. The interface has been tested with the Microsoft Internet Explorer; Firefox or Chrome browsers. (Within this document, screen shots present the web interface as it behaves with Internet Explorer.)

> **Note** See Section 4.1.5 for information about anomalies that may be observed when using the encoder web interface with Firefox.

As with all web interfaces, status information presented in on the encoder web interface pages reflects the status values at the time the page was last refreshed. The web interface can be accessed via the front-panel USB Type B port using USB Ethernet Gadget (as described in Section 2.5.3.3), or through the Ethernet connection (as described in Section 2.5.2.3). Some information presented on the encoder web interface is also accessible through the front-panel menu. (See Appendix E for detailed charts to navigate the front-panel menu.)

> **Warning** Most web browsers cache the authentication for web pages. This means that, once a user has logged into the encoder web interface through a browser window, if the window is subsequently used to access other web pages not associated with the encoder, that window can access the encoder again simply by pointing it at the appropriate URL—an additional login is not required. Some users find this a convenience, but it does present a security risk, because unauthorized users (including malware scripts) may exploit this feature to access the authenticated encoder web pages. As a sound security practice, Nielsen Audio recommends that users CLOSE the browser (not just the current tab, but all running instances of the browser) after completing activities on the encoder web pages.

Once login is successful, the initial web interface display is the Encoder Status page. There are two versions of this page; one for encoders configured for analog input, and one for encoders configured for digital input. Both versions are described in Section 4.2.

> **Note** Some browsers exhibit unexpected behavior when used with certain features of the encoder web interface. See Section 4.1.5 for details.

4.1. Web Interface Overview

All pages of the encoder web interface share certain characteristics to present a consistent look and feel to the user. The following discussion of these common elements refers to the items labeled with red numbers in Figure 54 below.

Figure 54: Web Interface Elements Common to All Pages

4.1.1. Elements of the Web Interface Title Bar

The blue title bar across the top of the web interface provides the information below. Numbers in the list below correspond to the red labels in Figure 54:

1   Unit Type

This indicates whether the encoder is processing analog or digital input. (This can be changed using the Change Unit Type feature; see Section 4.7.)

2   Encoder Type

Model 1212

3   Current User

Indicates the type of user currently logged into the encoder interface. This manual is addressed to Station users, as reflected by Item 3 in Figure 54 and in all GUI examples throughout this document.

4   Log Out Link

Provides a clean exit from the web interface. The browser will display links that may be used to log back into the encoder interface.

4.1.2.   Encoder Information Provided on All Web Interface Pages

Under the title bar of each page, the web interface displays the following Encoder Information. Numbers in the list below correspond to the red labels in Figure 54.

5   Serial Number

Nielsen Audio assigns each encoder a unique serial number for tracking purposes. This serial number is also accessible through the front-panel menu, and stamped on the bar code sticker on the top panel of the encoder exterior housing.

6   System Version

This number uniquely identifies the software currently installed in the unit. This information is also accessible through the front-panel menu.

7   CPLD Version

This number uniquely identifies the version of the Complex Programmable Logic Device (a programmable chip) installed in the unit.

8   System Time UTC

Displays the time of the encoder real-time clock at the time the status page was last refreshed. This information is also accessible through the front-panel menu.

9   Temperature

Displays (in degrees C) the temperature registered by two different sensors within the encoder at the time the status page was last refreshed. This information is also accessible through the front-panel menu.

4.1.3.   Navigating the Web Interface Pages

10 / 11 Menu and Arrow on Menu

All pages of the encoder web interface display a menu of links to other pages that comprise the interface. This list appears on the right side of each page, as shown by Item 10 in Figure 54. Clicking on a link in this list brings up the page named in that link. The page currently displaying at any time is highlighted in the list as shown in Figure 54, where the Encoder Status page is displayed.

The menu (Item 10) can be collapsed so it takes less space on the display page. To collapse/restore the menu, click the blue triangle at the bottom of the menu (Item 11). This feature can be useful when viewing some of the web interface pages, such as the View/Download MIB page (described in Section 4.9).

A Note on Refreshing GUI Pages: Clicking the menu link for a page while it is currently displayed refreshes current values. Refreshing updates the system UTC time and temperature to current values, as well as restores any editable values on that page which the user has changed but not put into force with an update operation. Some pages also offer other means of refreshing and updating their displayed values; these are described in the sections addressing each page below.

> **Note**   Do not use the browser refresh button to refresh encoder web pages. (Doing so may send spurious bypass commands to the encoder.)

Each of the web interface pages listed in this menu are described in detail in the ensuing sections of this document.

- Encoder Status Page

  The Encoder Status page provides an overview of the encoder status. More information is provided in Section 4.2.

- View/Edit Configuration Page

  This page displays information about the encoding configuration and provides the ability to change certain configuration parameters. There are two versions of this page: one for encoders operating in analog mode, and the other for encoders operating in digital mode. More information is provided in Section 4.3.

- View/Edit Time Servers Page

  This page displays information about the time servers the encoder can access. It also provides the user with the ability to change the list of time servers the encoder will attempt to use, test the connections with those servers, and force a time synchronization through SNTP. See Section 4.4 for more information.

- View/Edit Ethernet Configuration Page

  This page displays information about the Ethernet configuration for the encoder and provides the user with the ability to change that configuration. More information is provided in Section 4.5.

- Encoder Logging

  This page provides the ability to see the current size of the Log file and to download the Log file. See Section 4.6 for more information.

- Change Unit Type

  This page provides the ability to change the operating mode of the encoder between analog and digital. This also causes the encoder to "clone" configuration values of common configuration items from the current Unit Type to the target Unit Type. See Section 4.7 for details.

- Shutdown/Reboot Encoder

  This page provides the ability to perform a clean shutdown or reboot of the encoder. See Section 4.8 for details.

- View/Download MIB

  This page provides the ability to download the encoder SNMP Control Management Information Base (MIB), which can be used to configure and monitor the encoder via an SNMP protocol. For more information on using the SNMP Control MIB, see Section 2.5.4. For details about the View/Download Encoder MIB page, see Section 4.9.

- View/Edit SNMP Notification Configuration

  This page provides the ability to set up the encoder to send SNMP trap notifications to a list of up to five SNMP manager servers. Note that the SNMP Notification MIB accessed through this page is independent from the SNMP Control MIB described in Section 4.9, and provides access to establish SNMP Manager server(s) to receive event notification traps from the encoder. See Section 4.10 for details.

- Upload Software Update

  This page provides the ability to load a software update file provided by Nielsen Audio from the user PC to the encoder. The encoder validates the software update file and if it is valid, applies the update to the encoder system software. See Section 4.11 for details.

- Upload Configuration Update

  This page provides the ability to load a configuration update file provided by Nielsen Audio from the user PC to the encoder. The encoder validates the configuration update file and if it is valid, applies the configuration update to the encoder. See Section 4.12 for details.

4.1.4.   Elements of the Web Interface Footer

The footer area across the bottom of each page of the web interface provides the following for Items 12, 13, and 14 in In Figure 54:

12   Contact Information

The contact information for product support

13   TOP

A link to refresh the display to show the top of the current page. This is useful when the content of a page becomes too long to fit on the screen all at once.

14   Legal

A link to the product legal disclaimer information

4.1.5.   Caveats Regarding Using Certain Web Browsers

Nielsen Audio has noted certain unexpected behaviors in the web interface under certain circumstances. These are noted below. None of these issues reflect problems with the encoder itself; they are issues associated with differences among web browsers.

When using the Firefox browser (version 53 and later), you will still need to add a security exception for the encoder even after installing the SSL certificate pair. This is because Firefox treats a self-signed Root Authority Certificate as not secure.

4.2.   Encoder Status Page

The Encoder Status page provides an overview of the encoder status. The title bar, encoder information, page navigation menu, and footer on this page are the same as for all other pages of the web interface; see Section 4.1 for details.

The contents of this page vary depending on the encoder's mode of operation and status. Figure 55 through Figure 58 provide four different examples with their features labeled with red numbers as a guide for the ensuing discussion:

- Figure 55 shows the Encoder Status page for digital with encoding enabled and two LLA Sets configured.

- Figure 56 shows the Encoder Status page for digital with encoding disabled via soft bypass.

- Figure 57 shows the Encoder Status page for analog with encoding enabled and one LLA Set configured.

- Figure 58 shows the Encoder Status page for analog with encoding disabled via network bypass.

> **Note**   Information about Low Level Alarm sets appears on the Encoder Status page only when the encoder in question is configured with LLA sets by Nielsen Audio, *and* when the encoder is actually encoding. (See Section 3.6 for an explanation of Low Level Alarm sets.)

Figure 55: Encoder Digital Status Page with Encoding Enabled

Figure 56: Encoder Digital Status Page with Encoding Disabled via Soft Bypass

Figure 57: Encoder Analog Status Page: Encoding Enabled

Figure 58: Encoder Analog Status Page: Encoding Disabled via Network Bypass

Once a user has logged into the encoder web interface, if the browser window is used to access other web addresses not related to the encoder, that same window can gain access to the encoder again without re-authentication. Simply point the browser to one of the following:

- `https://IP_ADDRESS /EncoderStatus.klx` to bring up the Encoder Status page if using Ethernet (where *IP_ADDRESS* is the address configured as directed in Section 2.5.2).

- `https://10.97.5.1/EncoderStatus.klx` to bring up the Encoder Status page if using USB Ethernet Gadget.

The numbered items in Figure 55 through Figure 58 are described in the following sections.

4.2.1.   Viewing Encoding Status Information from the Encoder Status Page

4.2.1.1.   For Digital Encoders

Items 1 through 7 in Figure 55 and Figure 56 provide information about the encoding for a unit configured for digital input.

1   Encoding Status

The page displays "Encoding" in green text (as shown in Figure 55) or "Not Encoding" in red text (as shown in Figure 56) as appropriate for the encoding status of the unit.

If the unit is not encoding, it may be in bypass mode, as indicated in the Bypass status area of the Encoder Status page. (See Section 4.2.2.) Or it may be in a SYSTEM_ERROR or an ENCODING_ERROR state, as described in Section 4.2.3.

2   AES Input Lock Status

The page displays the signal lock status for the AES channel pair. Figure 55 shows the status as Locked. (This means the encoder has detected a signal meeting AES specifications and its phase lock loops are tracking the signal.) When encoding is disabled, the Encoder Status page does not display lock status information, as shown in Figure 56.

3   Sample Rate

The page displays the sample rate detected on the AES channel pair. Possible values are 32 kHz, 44.1 kHz, 48 kHz, and 96 kHz. Figure 55 shows the Sample Rate as 48 kHz. When encoding is disabled, the Encoder Status page does not display sample rate information, as shown in Figure 56.

4   Block Format

The page displays the type of block format defined by the AES3 specification being detected on the incoming signal: Consumer, or Professional. Figure 55 shows the Block Format at Professional. When encoding is disabled, the Encoder Status page does not display block format information, as shown in Figure 56.

5   Errors

The following errors might be reported by the AES receiver chips within the encoder: Bi-Phase, ChStat CRC, Validity, and Parity. (Figure 59 illustrates a scenario in which two of these errors are displayed due to a loss of signal lock.) If this display area is blank, no errors are detected (as shown in Figure 55. When encoding is disabled, the Encoder Status page does not display AES receiver chip errors, as shown in Figure 56.

6   Channels Enabled

The page displays the channel(s) that are enabled for encoding.

The encoder can be configured to encode up to two channels of incoming audio signal. For AES3 input, these channels are organized into a channel pair. Item 6 in Figure 55 indicates which channels are currently enabled for encoding. The signal level for each encoding enabled channel is also shown below the corresponding channel. The same information is presented in a different format on the View/Edit Configuration page for digital encoders, shown in Figure 61.

When encoding is disabled, the Encoder Status page does not display channel enablement information, as shown in Figure 56.

The encoding enable settings for each channel are determined by the configuration installed in the encoder and cannot be changed through this interface. See Section 3.8 for information on uploading a new configuration to the encoder.

7   Low Level Alarm

The encoder can be configured to treat groups of input channels as a single unit for the purpose of signaling a low signal level alarm (listed in **Error! Reference source not found.** in **Appendix B**). Such a group is called a Low Level Alarm set (or LLA set). LLA sets are described in full detail in Section **3.6**.

In Figure 57, Item 7 shows two LLA sets have been configured, each consisting of a single channel. This will cause the encoder to alarm on low input level in the same manner as if no LLA sets were defined: an alarm will be asserted when either channel falls below the threshold configured for low signal.

Information about Low Level Alarm sets appears on the Encoder Status page only when the encoder in question is configured with LLA sets by Nielsen Audio, *and* when the encoder is actually encoding. Since Figure 56 reflects the encoder in bypass, this screen shot does not show LLA set information even though the encoder is configured to use LLA sets.

4.2.1.2. For Analog Encoders

Items 1, 2, and 7 in Figure 57 provide information about the encoding for a unit configured for analog input:

1 Encoder Status

The page displays "Not Encoding" in red text or "Encoding" in green text, as appropriate for the encoding status of the unit.

If the unit is not encoding, it may be in bypass mode, as indicated in the Bypass status area of the Encoder Status page. (See Section 4.2.2). If the unit is not encoding and the bypass status area does not indicate bypass mode, the unit may be in a SYSTEM_ERROR or ENCODING_ERROR state. Error states are displayed at the bottom of the Encoder Status page; see Section 4.2.3.

2 Channel Enablement

The encoder can be configured to encode up to two channels of incoming audio signal. If encoding is enabled, the Encoder Status page indicates which channel(s) are configured for encoding as shown in Figure 57. In that example, Item 2 shows that channels A and B are currently configured for encoding. The signal level for each encoding enabled channel is also shown below the corresponding channel. The same information is presented in a different format on the View/Edit Configuration page for analog, shown in Figure 60.

When encoding is disabled, the Encoder Status page does not display channel enablement information, as shown in Figure 58.

The encoding enable settings for each channel are determined by the configuration installed in the encoder and cannot be changed through this interface. See Section 3.8 for information on uploading a new configuration to the encoder.

7 Low Level Alarm

The encoder can be configured to treat groups of input channels as a single unit for the purpose of signaling a low signal level alarm (listed in **Error! Reference source not found.** in Appendix B). Such a group is called a Low Level Alarm set (or LLA set). LLA sets are described in full detail in Section 3.6.

In Figure 57, one LLA set has been configured, consisting of both channels A and B. This is the sort of configuration that might be used by a station that could expect to broadcast material in two-channel stereo. When the station switches from broadcasting stereophonic material to broadcasting monophonic material, the encoder detects no input on one of the two input channels it is configured to use. Normally, this would cause the encoder to generate a low audio level alarm for that channel, and in this instance that would be a false alarm. But in this example, since both channels are configured as members of an LLA set, the encoder will not generate a low audio level alarm unless both channels fall below the threshold configured for low signal.

Information about Low Level Alarm sets appears on the Encoder Status page only when the encoder in question is configured with LLA sets by Nielsen Audio, *and* when the encoder is actually encoding. Since Figure 58 reflects the encoder in bypass, this screen shot does not show LLA set information even though the encoder is configured to use LLA sets.

4.2.2.   Viewing and Changing Encoder Bypass Status from the Encoder Status Page

The area at the bottom of the Encoder Status page labeled Bypass displays the current bypass status of the unit and provides the means to change the bypass status. In Figure 55 through Figure 58, Items 8 through 11 display the current status (asserted/de-asserted) of the four types of bypass described in Section 3.2:

- Front-panel hard bypass (Item 8 in Figure 55 through Figure 58)

- Rear-panel hard bypass (aka remote bypass) (Item 9 in Figure 55 through Figure 58)

- Network hard bypass (Item 10 in Figure 55 through Figure 58)

- Soft bypass (Item 11 in Figure 55 through Figure 58)

> **Note**   If the encoder is in any SYSTEM_ERROR state it goes into hard bypass mode, but that is not indicated in this area of the Encoder Status page. (See Table 13: System Error Messages in Appendix B.)

When the encoder is in an ENCODING_ERROR state (see Table 18 in Appendix B) it goes into a state essentially the same as soft bypass mode, but bypass is not indicated in this area of the Encoder Status page. In both cases, the encoding status (Item 1 in Figure 55 through Figure 58) will read "Not Encoding." SYSTEM_ERRORs and ENCODING_ERRORs are reported in the Active Status Conditions area of the page, as described in Section 4.2.3.

If any type of bypass is asserted, the encoder does not encode.

In addition to displaying the current status of all modes of bypass, the interface provides buttons to activate/deactivate soft bypass and network bypass. When the user clicks on a bypass mode Assert or Deassert button, the web page updates and the selection goes into effect immediately—there is no need to refresh the web page.

4.2.3.   Viewing Encoder Error and Status Conditions from the Encoder Status Page

Item 12 in Figure 55 through Figure 58 displays the current encoder status conditions. Possible values are listed in Appendix B. Multiple conditions may exist concurrently.

Whenever the encoder is in a SYSTEM_ERROR state (see

Table 13 in Appendix B), or an ENCODING_ERROR state (see Table 18 in Appendix B), it stops encoding. If the encoder stops encoding due to a SYSTEM_ERROR or an ENCODING_ERROR, a bypass state will not be indicated in the bypass area of the Encoder Status page (Items 8 through 11 in Figure 55 through Figure 58). However the encoding status (Item 1 in Figure 55 through Figure 58) will read "Not Encoding." This scenario is illustrated in Figure 59, where the encoder indicates it has lost its signal lock due to ENCODING_ERROR type AES_NO_SIGNAL_LOCK. Once all SYSTEM_ERRORs and ENCODING_ERRORs are cleared, the encoder should resume encoding.

Figure 59: Encoder Digital Status Page: Encoding Disabled by Loss of Signal Lock

4.3.   View/Edit Configuration Page

The View/Edit Configuration Page displays information about the encoding configuration, and provides the ability to change certain configuration parameters. The title bar, encoder information, page navigation menu, and footer on this page are the same as for all other pages of the web interface; see Section 4.1 for details.

The contents of this page vary depending on the encoder's mode of operation/unit type: analog or digital. Figure 60 shows the encoder View/Edit Analog Configuration page with its parts labeled with red numbers as a guide for the ensuing discussion. Figure 61 shows the encoder View/Edit Digital Configuration page with its parts similarly labeled.

Figure 60: View/Edit Configuration Page for Analog

Figure 61: View/Edit Configuration Page for Digital

4.3.1. Viewing and Changing the Watchdog Timer Setting from the View/Edit Configuration Page

The Nielsen Audio 1000-1212 Encoder has an automatic fault recovery feature built into it. This feature uses a watchdog timer to detect when the encoder has locked up, and automatically reboots the encoder if normal operation is not restored within one minute. When the watchdog timer causes a reboot, the encoder goes into bypass mode, and the input signal is passed directly to the output connectors without watermarking. Once the reboot is complete and normal operation is restored, the encoder resumes watermarking the input signal.

The current watchdog status can be viewed and changed using interface Item number 1 shown in Figure 60 and Figure 61. When the user changes the selection, the new value is not put into effect until the Update button at the bottom of the page is clicked. (See Section 4.3.5.)

NOTE: The watchdog status can also be changed via configuration file update (see Section 3.8). The web interface and the configuration file are peers—the latest value applied through either method is the one put into effect on the encoder.

The watchdog timer should be rarely, if ever, needed. When the watchdog is activated, the switch to and from bypass mode which it causes will briefly disrupt the audio stream, which may be unacceptable in an operational environment. However, the watchdog provides the benefit of restoring the encoding process for an encoder that is manifesting difficulties. The judgment call as to whether to use the watchdog is ultimately up to the facilities engineer. As always, should you experience difficulty with an encoder, contact Nielsen Audio.

4.3.2. Viewing and Changing Analog-Specific Settings on the View/Edit Configuration Page

When the encoder is configured to process analog input, the analog-specific configuration settings may be viewed and edited as described below and illustrated in Figure 60.

4.3.2.1. Viewing the Encoder LCD Message Settings from the View/Edit Configuration Page

The Station user has the capability to set the LCD message for the Encoder. The controls to make this possible are shown by Item 2 in Figure 60.

4.3.2.2. Viewing the Encoding Enable/Disable Settings for Analog Audio from the View/Edit Configuration Page

For encoders processing analog input, all input comes into the encoder through the two rear-panel analog XLR input connections Item 14 in Figure 2). The channels are labeled A and B, as shown by Items 3 and 4 in Figure 60. These display items indicate the current enable status for each channel. If encoding is enabled for a channel its corresponding box is checked; if encoding is disabled, the corresponding box is not checked.

Input channel enablement is determined by the configuration installed in the encoder and cannot be changed through this interface; hence the checkboxes are greyed out in the display. See Section 3.8 for information on uploading a new configuration to the encoder.

4.3.2.3. Viewing and Changing the Input Impedance for Incoming Audio Analog Audio from the View/Edit Configuration Page

For units processing analog input, Item 5 in Figure 60 provides the ability to change the impedance setting for incoming audio. Use the drop-down menu to select one of the following:

- For a 600 ohm termination, select "600 ohm"

- For a 10k ohm (bridging) termination, select "High"

Be sure to click the Update button at the bottom of the page (Item 10 in Figure 60) to put the selection into effect.

The input impedance setting is also accessible via the front-panel menu. See Section 1.3.1.4.

Note	Because changing the input impedance setting may cause spurious signal path disruptions downstream from the encoder, Nielsen Audio recommends that the encoder be placed into bypass mode using the front-panel RELAY BYPASS button before changing this setting.

4.3.3. Viewing and Changing Digital-Specific Settings on the View/Edit Configuration Page

When the encoder is configured to process digital input, the digital-specific configuration settings may be viewed and edited as described below and illustrated in Figure 61.

4.3.3.1. Viewing the Encoder LCD Message Settings from the View/Edit Configuration Page

The Station user has the capability to set the LCD message for the Encoder. The controls to make this possible are shown by Item 2 in Figure 61.

4.3.3.2. Viewing the Encoding Enable/Disable Settings for Digital Audio from the View/Edit Configuration Page

Encoders processing digital input process a single audio channel pair, corresponding to the rear-panel digital inputs [BNC (Item 8 in Figure 2) or XLR (Item 11 in Figure 2)]. These channels are labeled 1 and 2, as shown by Items 3 and 4 in Figure 61. These display items indicate the current enable status for each channel. If encoding is enabled for a channel its corresponding box is checked; if encoding is disabled, the corresponding box is not checked.

Input channel enablement is determined by the configuration installed in the encoder and cannot be changed through this interface; hence the checkboxes are greyed out in the display. See Section 3.8 for information on uploading a new configuration to the encoder.

4.3.3.3. Viewing and Changing the Digital Audio Word Size from the View/Edit Configuration Page

When processing digital input, the encoder can support signals using an audio word size of 20-bit or 24-bit. This is determined by a parameter in the configuration file, but that setting can be overridden on the View/Edit Configuration page. Use interface Item 5 shown in Figure 61 to select the audio word size the encoder will use to process input audio. This must match the actual word size of the input signal for proper encoding.

When the user changes the selection, the new value is not put into effect until the Update button at the bottom of the page (item 10 in Figure 61) is clicked. (See Section 4.3.5.)

Note	Changing the audio word size will not interfere with encoding. The audio word size setting is also accessible via the front-panel menu. See Section 1.3.1.4.

4.3.3.4. Viewing and Changing the Active Digital Input Connectors from the View/Edit Configuration Page

As shown in Figure 2, the encoder can accept digital input through a BNC connector (Item 8) or an XLR connector (Item 11). Connectors of both types may be attached to the encoder rear-panel at the same time, but the encoder can process input from only one connection at any given time.

Use interface Item 6 shown in Figure 61 to force the encoder to use either the XLR or BNC connectors. (The connector you choose must have an input cable connected to it, providing a digital AES signal. See Section 2.2.2 for more information.)

When the user changes the selection, the new value is not put into effect until the Update button at the bottom of the page is clicked. (See Section 4.3.5.)

The active digital input connector setting is also accessible via the front-panel menu. See Section 1.3.1.4.

Note	Because changing the active audio digital input connector may cause spurious signal path disruptions downstream from the encoder, Nielsen Audio recommends that the encoder be placed into bypass mode using the front-panel RELAY BYPASS button before changing this setting.

4.3.4. Viewing Encoder License Information from the View/Edit Configuration Page

If license checking is enabled, the checkbox labeled Item 7 in Figure 60 and Figure 61 is checked; the checkbox is clear if license checking is not enabled. If license checking is enabled, the Nielsen Audio 1000-1212 Encoder can encode only when it has a valid license issued by Nielsen Audio. Items 8 and 9 in Figure 60 and Figure 61 display the start and end date for the license currently installed in the unit. All license checking information is determined by the configuration installed in the encoder and cannot be changed through this interface; hence the information is greyed out in the display.

This information is also available through the front-panel LCD menu; see Appendix E for detailed charts to navigate the front-panel menu.

When the encoder license will expire within 30 days, the front-panel LCD displays a warning message. When the encoder license has expired, the front-panel LCD displays an error message and the encoder stops encoding, as it does for all SYSTEM_ERROR conditions.

Contact Nielsen Audio to obtain a new license; it is best to do so before the current license expires, because the encoder will not operate with an expired license.

4.3.5. Updating Configuration Settings from the View/Edit Configuration Page

There are two buttons at the bottom of the View/Edit Configuration page that affect the page overall:

- Update (Item 10 in Figure 60 and Figure 61)

  Click this button after changing configuration settings on the display page to validate those changes and put them into effect on the encoder.

- Reset Form to Current Values (Item 11 in Figure 60 and Figure 61)

  Click this button after changing configuration settings on the display page to restore the displayed values to the values that are currently in effect on the encoder.

4.3.6. Downloading the Encoder Configuration from the View/Edit Configuration Page

Click the Download Config button on the View/Edit Configuration page (labeled 12 in Figure 60 and Figure 61) to download to the PC the configuration currently in effect on the encoder. The interface will provide the user with the opportunity to choose the destination on the PC where the file will be saved. The encoder assigns the file an auto-generated name of `serial_num.dat` (for example, `950001.dat`). (The configuration will be in the form of an encrypted file; this is not useful to the typical user, but may be used by Nielsen Audio personnel when diagnosing any problem that may arise.)

4.4. View/Edit Time Servers Page

The View/Edit Time Servers page provides the interface to perform the following activities related to maintaining the encoder real time clock (RTC) using a time server:

- Set the list of time servers that are available to the encoder

- Test the servers listed to verify the connection via the SNTP protocol through port 123

The title bar, encoder information, page navigation menu, and footer on this page are the same as for all other pages of the web interface; see Section 4.1 for details.

The View/Edit Time Servers page is shown in Figure 62 with its features numbered to serve as a guide in the ensuing description. The content of this page is the same whether the encoder is configured to process analog or digital signals.

Figure 62: View/Edit Time Servers Page

4.4.1.   Setting the List of Time Servers

When synchronizing its Real Time Clock (RTC) with a time server, the encoder attempts to use each of the servers listed in the Time Servers window (Item 1 in Figure 62), in the order they are listed, until it finds a reachable server. (See Section 2.5.6 for a description of when synchronization occurs.) At a minimum, the encoder comes pre-configured with the `pool.ntp.org` servers listed, as shown in Figure 62. If the broadcast facility cannot support this server, it is the responsibility of the station or network engineer to provide a list of time servers available within the facility. (If the `wtime32` service is enabled and running on the local PC, the `time.windows.com` server is usually accessible on any Windows-based network and may be used as an NTP Time Server.) Type the names of these servers (no more than five total) in the Time Servers window, separated by a carriage return.

Modifying the list of time servers in the Time Servers window does not automatically update the internal list of servers the encoder will use. Before committing to the updated list on the display, the connections with each of the servers in the list can be tested, as described in Section 4.4.2.

If one or more servers fail testing, there are two courses of action:

- Click the Cancel button (Item 4 in Figure 62) to discard the changes to the displayed list and restore the display to match the internal saved list. Clicking Cancel also clears the test results display.

- Click the Update button (Item 3 in Figure 62) to save the new list, including the servers that failed. This configures the encoder to use the failed servers should they be connected/activated later.

If the changes to the displayed server list pass the tests, click on the Update button to write the displayed list as the new internal list and re-run the tests on the new list of time servers. (The encoder will perform an RTC synchronization according to the schedule described in Section 2.5.6.)

4.4.2.   Testing the Connections with Time Servers

Once the list of time servers has been established (see Section 4.4.1), the web interface provides a means to test the encoder's connection with those servers. Click on the Test button on the View/Edit Time Servers page (Item 2 in Figure 62), and the encoder will test its ability to communicate with each of the time servers listed in the Time Servers window (Item 1 in Figure 62). The test results will be displayed as simple pass/fail indicators in the Time Server Test Results window (Item 1 in Figure 63). Should you choose to accept the list by clicking the Update button, the encoder saves the list as displayed, but uses only the servers that passed the test when synchronizing its RTC using SNTP.

Figure 63: Time Server Test Results on View/Edit Time Servers Page

4.5. View/Edit Ethernet Configuration Page

The encoder View/Edit Ethernet Configuration page provides the ability to view and edit the configuration of the encoder rear-panel Ethernet port. The content of this page is the same whether the encoder is configured to process analog or digital signals.

The title bar, encoder information, page navigation menu, and footer on this page are the same as for all other pages of the web interface; see Section 4.1 for details.

Figure 64 and Figure 65 shows the Ethernet Configuration page with its features labeled with red numbers as a guide for the ensuing discussion. Some information presented on this page of the encoder web interface is also accessible through the front-panel menu as described in Section 2.5.3. (See Appendix E for detailed charts to navigate the front-panel menu.)

This page is viewable when the PC is connected to the encoder through the front-panel USB Type B port using USB Ethernet Gadget or through the rear-panel Ethernet port. Note that when using this page when connected via Ethernet, it is possible to change the Ethernet configuration in such a manner that the current active web session with the encoder would be disconnected.

When the PC is connected to the encoder via Ethernet and DHCP is disabled, the View/Edit Ethernet Configuration page appears as shown in Figure 64.

Figure 64: View/Edit Ethernet Configuration Page as Seen via Ethernet Connection

When the PC is connected to the encoder via the front-panel USB connection and DHCP is enabled, the View/Edit Ethernet Configuration page appears as shown in Figure 65.

Figure 65: View/Edit Ethernet Configuration Page as Seen via USB Connection

4.5.1. Viewing and Changing the Ethernet Configuration

When the PC is connected to the encoder via front-panel USB, the View/Edit Ethernet Configuration page appears as shown in Figure 65. In this case, the encoder LAN address for the encoder USB Ethernet connection (Item 1 in Figure 65) is fixed at `10.97.5.1.`, as described in Section 2.5.3.3. When the user is logged in via the front-panel USB connection or the Ethernet jack, the Ethernet configuration parameters shown on this page are editable. Be careful when editing these parameters while connected via the Ethernet jack, you can easily disconnect yourself when you click the UPDATE button.

Any changes made on this page do not take effect until the user has clicked on the Update button (Item 8 in Figure 65). To rescind any changes made to this page that have not yet been committed with the Update button, click on the Reset Page button (Item 9 in Figure 65).

Under the heading "Ethernet Configuration" the View/Edit Ethernet Configuration page presents the user with the opportunity to view six and change five different aspects of the configuration for the encoder's rear-panel Ethernet connection:

- MAC Address (Item 2 in Figure 65)

This is the fixed MAC address assigned to the network interface card for the encoder. It cannot be changed.

- DHCP Enable (Item 3 in Figure 65)

This is set to TRUE by default (checkbox checked as shown in Figure 65), in which case the encoder expects to be connected with a LAN that is DHCP-enabled, and expects to be automatically assigned an IP address. In this case the remaining Ethernet configuration parameters on this page (IP Address, Subnet Mask, Default Gateway, and Domain Name System) are greyed out and not editable, as shown in Figure 65. The current IP address assigned for Ethernet connection is displayed on this page (see Item 4 Figure 65).

When the Enable DHCP checkbox is not checked, the remaining settings on this page for connection by Ethernet (IP Address, Subnet Mask, Default Gateway, and Domain Name System [DNS]) become editable, and the user may assign values to these parameters as appropriate. It is the user's responsibility to make selections that ensure proper encoder HTTP operation.

Note	**Changing the DHCP enablement setting does not interfere with encoding.** The DHCP enablement setting is also accessible via the front-panel menu. See Section 2.5.2.

- IP address (Item 4 in Figure 65)

If the Enable DHCP checkbox is not checked, set this field to assign an IP address to the encoder. It is the user's responsibility to assign an IP address that ensures proper encoder HTTP operation, and does not interfere with any other device on the LAN. For example, the IP addresses `0.0.0.0` and `127.0.0.1` should not be used, since `0.0.0.0` cannot be resolved, and `127.0.0.1` is the standard loopback address for all IP devices. In addition, `10.97.5.1` is reserved for the encoder front-panel USB Type B connection (using USB Ethernet Gadget), so that IP address should be avoided as well. (See Section 2.5.2 for more information about using the encoder with and without DHCP.)

Note	When DHCP is not enabled, the IP address setting is also accessible via the front-panel menu. See Section 2.5.2.2.

- Subnet Mask (Item 5 in Figure 65)

If the Enable DHCP checkbox is not checked, set this field to assign a subnet mask to the encoder. A subnet mask of `0.0.0.0` is not permitted; the least restricted subnet mask value that may be used is the default value, which is `255.0.0.0`.

Note	When DHCP is not enabled, the Subnet Mask setting is also accessible via the front-panel menu. See Section 2.5.2.2.

- Default Gateway (Item 6 in Figure 65)

If the Enable DHCP checkbox is not checked, set this field to assign a default gateway to the encoder.

Note	When DHCP is not enabled, the Default Gateway setting is also accessible via the front-panel menu. See Section 2.5.2.2.

Domain Name System (DNS) (Item 7 in Figure 65.)

If the Enable DHCP checkbox is not checked, set this field to assign a DNS to the encoder.

4.6.   Download Log File

The encoder maintains a log of System Initialization, Shutdown, Errors, and Warnings for the various inputs (Video, Audio, Time Code, and Ethernet) in an XML format. This log file can be downloaded for offline analysis in case of any errors encountered/issued by the encoder.

The encoder log can also be downloaded using a flash memory device; see Section 3.4 for details.

The Encoder Logging page shows the current size of the Log file in bytes (Item 1 in Figure 66), and provides a button to allow the user to view or download the Log. When the Encoder Logging link is clicked on the encoder main menu (Item 10 in Figure 54), the Encoder Logging page is displayed (see Figure 66). When the Download LOG File button is clicked (Item 2 in Figure 66) the file appears for viewing in the same browser window. Use the browser's Save As function to save a copy of the file. Use the browser's Back button to return to the encoder interface. When Refresh Status button is clicked (Item 3 in Figure 66), the Log file size is updated (in the case background activity added to the log).

See Appendix C to view a sample log file.

Figure 66: Encoder Logging Page

4.7. Change Unit Type

To change the encoder mode of operation from analog to digital or vice-versa, select Change Unit Type from the web interface main menu (Item 10 in Figure 54). The Change Unit Type page appears as shown in Figure 67 below.

Figure 67: Change Unit Type Page

- To change the encoder unit type, select Analog or Digital from the selection menu (Item 1 in Figure 67).

- Click the Update button (Item 2 in Figure 67) to put your selection in force. Click OK on the confirmation dialog that appears.

- Click the Cancel button (Item 3 in Figure 67) to cancel the operation and restore the page to current settings.

When the unit type is changed, the encoder copies or "clones" the channel configuration parameters common to both analog and digital operation, and performs unit conversions to maintain compatibility. This maps the channel configuration settings using the channel assignment scheme shown below:

- Analog Channel A ←→ Digital Channel 1

- Analog Channel B $\leftrightarrow$ Digital Channel 2

When a configuration is cloned, configuration settings that are unique to a given mode (such as analog Input Impedance) will not be copied. When switching to a unit type with configuration parameters for which there are no corresponding parameters in the previous unit type, the encoder uses the value last set for those parameters. If no previous value was set for those parameters, the default values are used. (For instance, when switching from digital to analog, the encoder will use that last value set for the Input Impedance parameter, or the default value provided with the encoder if the value has never been changed from that default.)

Note	The unit type setting is also accessible via the front-panel menu. See Section 1.3.1.1.
Note	Because changing the unit type may cause spurious signal path disruptions downstream from the encoder, Nielsen Audio recommends that the encoder be placed into bypass mode using the front-panel RELAY BYPASS button before changing this setting.

4.8. Shutdown/Reboot Encoder

To shut down or reboot the encoder, select Shutdown/Reboot Encoder from the web interface main menu (Item 10 in Figure 54). The Shutdown/Reboot Encoder page appears as shown in Figure 68 below.

Figure 68: Encoder Shutdown/Reboot Page

The page displays the status of the encoder application at the time the page first appeared (Item 1 in Figure 68). Possible values are:

- The Encoder Application is shutting down

- It is SAFE TO REMOVE POWER from the Encoder

- Requesting Reboot…

- The Encoder has been requested to reboot

- The Encoder Application is starting up

- The Encoder Application is Running

From this page the following options are available:

- To re-check the status of the encoder application, click the Refresh Status button.

(Item 2 in Figure 68.) This will update the status message. (Item 1 of Figure 68)

- To shut down the encoder (which causes a clean exit of the encoding application, and stops logging activity) click on the Shutdown button. (Item 3 of Figure 68) The interface will display an "Are you sure?" prompt. Click OK in response to the prompt to proceed with the shutdown. Once the encoder LCD reads, "Encoder is Shutdown SAFE TO REMOVE POWER," the encoder may be disconnected from its power source without risk of corrupting its stored data.

- To restart the encoder, click on the Reboot button (Item 4 in Figure 68). The interface will display an "Are you sure?" prompt. Click OK in response to the prompt to proceed with the reboot. A number of progress messages will display on the front-panel LCD. The encoder may be rebooted in this manner if the encoder application is running, or if the encoder application has been shut down.

The reboot will take about two minutes. When the reboot is complete, the LCD will display the current encoder status. Once the encoder LCD indicates the reboot has completed, to log in to the web interface:

- If the PC is connected to the encoder via the front-panel USB Type B port (using USB Ethernet Gadget), you may need to disconnect and then reconnect the Type B USB cable that connects the encoder and the PC to re-establish the connection. Then follow the instructions in Section 2.5.3.3 to access the encoder web interface.

- If the PC is connected to the encoder via Ethernet, use the instructions in Section 2.5.2.3 to log back in to the encoder. If the local area network uses DHCP, it is possible that the network will assign a new IP address to the encoder after the reboot operation. If the browser is unable to access the encoder using the same IP address as that used for the previous login, check the encoder front-panel menu to determine the encoder's current IP address, and use that address to access the encoder web interface.

> **Note**   The shutdown/reboot actions are also accessible via the front-panel menu. See Section 1.3.1.3.

4.9.   View/Download the Encoder MIB

Simple Network Management Protocol (SNMP) is a network monitoring application that uses User Datagram Protocol/Internet Protocol (UDP/IP) to set and get parameters specific to a network device (in this case, the Nielsen Audio encoder). The parameters are grouped into a Management Information Base (MIB), and comprise definitions of management information used to remotely monitor, configure, and control networked systems.

The Analog Digital Encoder comes with an SNMP Management Information Base (MIB), which can be used to configure and monitor the encoder via an SNMP protocol. To view or download the encoder SNMP MIB (named `NIELSEN-1212-ENCODER_MIB`), select View/Download MIB from the web interface main menu (Item 10 in Figure 54). The View/Download MIB page appears as shown in Figure 69 below. (Notice in Figure 69 the main menu has been collapsed so it does not overlap the MIB display window.)

Note   The `NIELSEN-1212-ENCODER_MIB` is provided for remote monitoring and control of the encoder via SNMP. This is separate and distinct from the `NIELSEN-1212-ENCODER-NOTIFICATIONS-MIB` (described in Section 4.10), which is provided to aid in setting up one or more SNMP manager servers to receive event notifications from the encoder via SNMP Traps.

Figure 69: View/Download MIB Window

The web interface displays the SNMP MIB in text form in a scrollable window (Item 1 in Figure 69). (The full text of the `NIELSEN-1212-ENCODER-MIB` is provided in Appendix D). The page also provides a link (Item 2 in Figure 69) that can be used to download the SNMP MIB using the conventions appropriate to the browser in use. Use the browser's Back button to return to the Encoder Status page.

Load the Nielsen Audio 1000-1212 Encoder SNMP MIB definition into an MIB browser application to enable setting and getting encoder information. See Section 2.5.4 for more information.

4.10. View/Edit SNMP Notification Configuration

Simple Network Management Protocol (SNMP) is a network monitoring application that uses User Datagram Protocol/Internet Protocol (UDP/IP) to set and get parameters specific to a network device (in this case, the Nielsen Audio 1000-1212 Encoder). The parameters are grouped into a Management Information Base (MIB), and comprise definitions of management information used to remotely monitor, configure, and control networked systems.

The Nielsen Audio 1000-1212 Encoder comes with an SNMP Notifications MIB, which defines event notifications the encoder can send to SNMP manager devices. To view or download the encoder SNMP Notifications MIB (named `NIELSEN-1212-ENCODER-NOTIFICATIONS-MIB`), select View/Download MIB from the web interface main menu (Item 10 in Figure 54). The View/Edit SNMP Notification Configuration page appears as shown in Figure 70.

Note	The SNMP Notification MIB (`NIELSEN-1212-ENCODER-NOTIFICATIONS-MIB`, described in this section), is provided to establish event notifications for one or more SNMP manager servers to receive from the encoder via SNMP traps. This is separate and distinct from the encoder SNMP MIB (`NIELSEN-1212-ENCODER_MIB`, described in Section 4.9), which is provided for remote monitoring and control of the encoder via SNMP.

The SNMP Notification MIB specifies three different SNMP notifications that the encoder sends to configured network managers:

1. Whenever the active state of an encoder condition changes, the encoder sends an SNMP notification containing the following parameters:

    - the encoder's serial number

    - the encoder's system time when the event occurred

    - whether the condition just went active, or inactive

    - the condition's name (for example: `AES_NO_SIGNAL_LOCK`)

    - the condition's class (for example: ENCODING_ERROR)

    - the description of the condition

2. Whenever the encoder status changes, the encoder sends an SNMP notification containing the following parameters:

    - the encoder's serial number

    - the encoder's system time when the event occurred

    - and the new encoder state (for example: `Encoding`)

3. Whenever the list of network managers changes, the encoder sends an SNMP trap to the new list of network managers. This SNMP notification is useful to verify a network manager is receiving SNMP notifications from the encoder. This SNMP notification contains the following parameters:

- the encoder's serial number

- the encoder's system time when the event occurred

- the new list of configured network managers (a semicolon-separated list)

The View/Edit SNMP Notification Configuration page (shown in Figure 70) offers user the ability to edit two parameters that are not part of the SNMP Notification MIB, but determine the following aspects of SNMP traps generated by the encoder:

- SNMP Community String

    The text box labeled Item 1 in Figure 70 provides a place to enter the SNMP community string to be included in notification traps sent from the encoder to the SNMP network managers listed in the text box labeled Item 2 in Figure 70. Devices cooperating on an SNMP network use these community strings as a filter to determine which SNMP traps they will accept and process. The SNMP community string should be set to a value determined in consultation with local network administrators.

    The SNMP Community String may be from 1 to 255 characters long, including alphanumeric characters, underscores, and hyphens. The encoder web interface requires that a syntactically valid value be set for the Community String (even if the list of SNMP Network Managers (Item 2 in Figure 70) is left blank). The default community string value set by Nielsen Audio is `NielsenEncoderNotifications`, but this can be changed to suit requirements of the local network. If you plan to use the same MIB browser to accept trap notifications from the encoder, set the notifications community to be the same as the SNMP community, which is `nielsen1212encoder`, because the encoder SNMP interface uses port 161 for both MIB browsing and for trap notifications. See Section 4.10 for more information.

- SNMP Network Managers

    The text box labeled Item 2 in Figure 70 provides a place to enter the name(s) of the SNMP network management station(s) to which the encoder will send event notifications. (If no network management station names are entered, the encoder will send no notifications.) Enter no more than five manager names, each on a separate line. These may be host names or IP4 network addresses. The encoder will send SNMP Trap notifications containing the SNMP Notification Community String entered in the text box labeled Item 1 in Figure 70 to each SNMP network manager in this list. (Whether those managers will accept and process those traps depends on how they are configured.) Like the Community Network String, the SNMP Network Managers should be selected in consultation with local network administrators.

    If no network manager names are entered in this text box, the encoder will not send any event notification traps over the SNMP network.

After changing the values for the SNMP notification community string and/or the SNMP network manager(s), to put the changes into effect click on the Update button (Item 3 in Figure 70).

To reset the page to original values for the SNMP notification community string and/or the SNMP network manager(s) without putting changes into effect, click on the Reset Form to Current Values button (Item 4 in Figure 70).

The Encoder Notifications MIB is displayed on the View/Edit SNMP Notification Configuration page in a scrollable window (Item 5 in Figure 70). The page also provides a link (Item 6 in Figure 70) to download the MIB to the local PC using the conventions appropriate to the browser in use. (Use the browser's Back button to return to the Encoder Status page.) (The full text of the `NIELSEN-1212-ENCODER-NOTIFICATIONS-MIB` is provided in Appendix E.)

Figure 70: View/Edit SNMP Notification Configuration

4.11. Upload Software Update

The Upload Software Update page (shown in Figure 71) provides the ability to load new encoder software provided by Nielsen Audio onto the encoder.

Note	Because applying a software update may cause spurious signal path disruptions downstream from the encoder, Nielsen Audio recommends that the encoder be placed into bypass mode using the front-panel RELAY BYPASS button before performing the update.

To upload a software update through the Upload Software Update page, click on the Choose File button (Item 1 in Figure 71) to bring up a dialog to navigate to and select a software update file on the PC (e.g., `AnaDigSwUpdate-1-1.0.3.0.AEU`). Once the file is selected, click the Submit button (Item 2 in Figure 71) to send the selected software update file to the encoder.

The encoder will validate the software update file. If the file is found valid, it will apply the new software and update progress messages appears on the front-pane LCD. If the file is found invalid, the encoder will reject the update without generating any notifications.

Figure 71: Upload Software Update

4.12.   Upload Configuration Update

The Upload Configuration Update page (shown in Figure 72) provides the ability to load a new encoder configuration provided by Nielsen Audio onto the encoder.

Note	Because applying a configuration update may cause spurious signal path disruptions downstream from the encoder, Nielsen Audio recommends that the encoder be placed into bypass mode using the front-panel RELAY BYPASS button before performing the update.

To upload a new configuration through the Upload Configuration Update page, click on the Browse button (Item 1 in Figure 72) to bring up a dialog to navigate to a select a software update file on the PC (e.g. `950007.dat`). Once the file is selected, click the Submit Query button (Item 2 in Figure 72) to send the selected configuration update file to the encoder.

The encoder will validate the configuration update file. If the file is found valid, it will apply the new configuration and update progress messages appears on the front-pane LCD. If the file is found invalid, the encoder will reject the update without generating any notifications.

Figure 72: Upload Configuration Update

5. Status/Error Messages

The encoder error and warning status conditions are classified into six categories that determine how the encoder notifies the user of the condition through the front-panel status LED, the front-panel LCD, and the web interface.

The front-panel Status LED (Item 6 in Figure 1) indicates encoding mode and error conditions with the following color states: solid red, solid green, alternating green/red flashing and alternating red/off flashing. The front-panel LCD (Item 1 in Figure 1) displays codes and brief descriptions of the types of errors, warnings or alerts the encoder encounters.

The condition categories in descending order of precedent are:

- System errors

   These are fatal errors that affect the encoding process; the unit requires user intervention to resume normal operation. These include errors that prevent the unit from booting up normally (missing/corrupted files, missing hardware, interrupted initialization), the unit being outside of its operating temperature range, etc. If the unit is in bypass mode the front-panel LED will be **dark**. If the unit is in encode mode, the front-panel LED will be **solid red**.

- Encoding errors

   These errors prevent the encoding process; the unit will not be able to enter encoding state and an operator must intervene to restore normal operation. If the unit is in encode mode, front-panel LED will be **solid red**. By definition, the unit cannot detect encoding errors when it is in bypass mode; in such cases the front-panel LED will be **dark**.

- System warnings

   This happens if the Real Time Clock battery is weak/dead or the internal temperature sensors are not readable. These errors do not prevent encoding. If the encoder is in encode mode, the status LED will blink **red** and **green** alternately. If the encoder is in bypass mode, the front-panel LED will be **dark**.

- Encoding alerts

   This occurs when the encoder encounters low levels on the input signals, which may reduce the amount of watermarking energy transmitted. If the encoder is in encode mode, the status LED will blink **red** and **green** alternately. If the encoder is in bypass mode, the front-panel LED will be **dark**.

- System information

   These are messages that inform the user of significant events that do not interfere with the encoding process, such as a USB device being inserted in a front-panel USB port. If the encoder is encoding, the front-panel status LED will blink **red** and **green** alternately. If the encoder is in bypass mode, the front-panel LED will be **dark**.

Each error, warning, alert, and information message that falls into one of the classes above has a condition code that appears on the front-panel LCD. Multiple conditions may exist on the encoder concurrently, but the front-panel LCD will display the condition code only for the highest precedent condition, and the front-panel LED will behave in a manner corresponding to the condition class for that condition (as described above). Once that condition is cleared, of the conditions that remain, the condition with the highest precedent shall be displayed on the LCD.

In addition to indicating the error/alert/information classes listed above, the front-panel LED indicates the following statuses:

- No active conditions, the unit is encoding properly. The front-panel LED will be **solid green**.

- The unit is in bypass mode with no active system error conditions. The front-panel LED will be **dark**.

At the bottom of the Encoder Status page the web interface displays the condition code and explanatory text for each currently active condition on the encoder. Item 12 in Figure 55 through Figure 58 provide example Encoder Status pages displaying active status conditions. Figure 73, below, shows an Encoder Status page displaying multiple active status conditions.

Figure 73: Multiple Active Status Conditions Displayed on Encoder Status Page

Appendix B provides a table for each condition class, listing the errors, warnings, alerts, and information messages that are members of each class. For each message the tables provide the condition code displayed on the front-panel LCD and the web interface, as well the expanded text that appears on the web interface.

6. Specifications for the Nielsen Audio 1U Studio Encoder, Analog and Digital, RoHS Compliant

This section provides a detailed technical description of the Nielsen Audio 1000-1212 Encoder.

6.1. Enclosure

The encoder is designed to fit in an industry standard 19" equipment rack. Its frame is made of metal, and the dimensions are:

- 1RU (1.75") high
- 7" depth

6.2. Front Panel

From left to right, the front-panel features are:

- LCD (20x2) with white backlight LED
- Two rocker switches for Menu, Select, Item, Option
- LED for power indication
- USB 1.1 Host Type 'A' port (for USB flash memory device)
- USB 2.0 Client Type 'B' port USB Ethernet Gadget access)
- LED for encoding status
- Push button switch for encode/bypass control
- Inset reset button

Figure 74: Front Panel of the Nielsen Audio Encoder (1000-1212)

6.3.   Rear Panel

From left to right, the rear-panel features are:

• Universal Power IEC input connector

• USB Type B connector (for Nielsen Audio diagnostic use)

• Remote interface for status monitor and bypass control (nine pin, male 'D' connector)

• Time decoder input: female BNC connector

• Time input status LED.

• Modular quick-disconnect time decoder connectors.

• RJ-45 Ethernet jack with integrated transmission/reception link status LED indicators.

• Unbalanced BNC connector for digital AES3 input.

• Unbalanced BNC connector for digital AES3 output.

• BNC selection indicator LED

• Balanced female XLR connector for digital AES3 input.

• Balanced male XLR connector for digital AES3 output.

• XLR selection indicator LED

• Balanced XLR female connectors for analog input, channels A and B.

• Balanced XLR male connectors for analog output, channels A and B.

Figure 75: Rear Panel of Nielsen Audio Encoder (1000-1212)

6.4.   USB Host Interface

The front-panel Type A USB host interface is used to:

Update encoding configuration parameters to the encoder.

Download the error log file from the encoder.

6.5.   USB Client Interface

The front-panel Type B USB client interface:

Presents itself as a USB Ethernet Gadget to a USB host

Supports encoder control, configuration, and monitoring via USB similar to the Ethernet interface.

6.6.   Ethernet

The rear-panel Ethernet interface:

- Complies with TCP/IP version 4 (IPv4)

- Supports 10/100Mbps connections, auto-sensing

- Supports both internal and external networks with one Ethernet controller

- Uses an Organizationally Unique Identifier (OUI) assigned to Nielsen Audio by the IEEE: `00:16:6E:xx:xx:xx` (hex).

- Supports encoder control, configuration, and monitoring.

6.7.   Rear-Panel DE-9 M Connector

The rear-panel DE-9 M connector provides the following features:

- Remote interface for monitoring alarms and encoder error status

- Remote interface for monitoring encoding/bypass status

- Remote interface for bypass control

- Internal relay contacts rated for 0.3A Max, 24VDC

- A DE-9 M connector

6.8.   Front-Panel LED for Encoding Status

The LED on the front of the encoder provides basic at-a-glance status information about the encoder as detailed in Table 9.

Table 9: Encoding Status LED Colors

LED Color	Meaning/State of Operation
Solid green	Unit is encoding properly
Red/green flashing	Unit has errors but is encoding – this is a Warning State
Solid red	Unit has errors causing it to not encode
Red/off flashing	Unit has system errors and is in bypass
Off	Unit is in bypass mode with no active system errors.

6.9.   Time Decoder Interface

The time decoder interface synchronizes information for minutes and seconds to correct for encoder clock time drift. The maximum allowable working limit voltages for the time code source signals are:

- **For BNC Input:** logic 'high': minimum 1.0 Vp, maximum 5.0 Vp. logic 'low': minimum 0.0 Vp, maximum 0.4 Vp.

- **For Quick-Disconnect Inputs:** minimum 300 mV p-p, maximum 7 V p-p.

    (For either differential or non-differential input signal)

The absolute maximum inputs must not exceed 11 Volts peak; exceeding this level risks damage to the unit.

- The interface supports the following time code formats: SMPTE 12 M-1 (30 FPS), EBU (complying with SMPTE 12M-1 at 25 FPS), ESE TC89, ESE TC90, DQS, and IRIG-B (un-modulated)

- The connection from the time code source is provided by a three-position terminal quick-disconnect connector or by a BNC jack (for select time code standard[s]), both at the rear of the encoder.

- A small LED at the rear of the encoder indicates that the encoder time-on-demand module is receiving and correctly decoding the code presented. This LED blinks on/off at a one-second rate when the module is receiving and correctly decoding the code presented. The LED remains extinguished until a correct code is connected.

6.10.   LCD

The front-panel LCD (Item 1 in Figure 1) supports two lines of text, 20 characters each.

6.11.   Rocker Switches

The front-panel rocker switches (Item 2 in Figure 1) provide the means to navigate the front-panel menu. The navigation function of each button is described in Section 1.3.
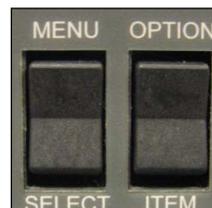
MENU = UP (exit)	OPTION = LEFT
SELECT = DOWN (enter)	ITEM = RIGHT

Figure 76: Front-Panel Menu Button Functions

6.12. Bypass Switch

The front-panel bypass switch (Item 7 in Figure 1) is used to active hard bypass, a state in which the encoding process is bypassed by switching hard contact relays within the encoder.

6.13. Environmental

The encoder is designed to operate in an ambient temperature of 0-40 deg C (32-104 deg F). The encoder is equipped with internal cooling fans that activate when the encoder temperature exceeds preset thresholds.

6.14. BTU Output

The encoder generates 76 BTUs per hour, assuming it is operating at 118.5V, 22.3 W.

6.15. Power Input

The encoder uses power meeting the following specifications:

- 100-240VAC
- 26 Watts
- 50/60 Hz

6.16. SNMP

The encoder supports SNMP version 1 and version 2c connections for monitoring and limited control.

- GET commands retrieve status information.
- SET commands can set the bypass/enable state of the unit.
- The encoder can be configured to send SNMP Trap notifications to an SNMP manager.

6.17. DHCP

The encoder can be assigned an IP address, sub-net mask, and optional gateway address either statically or dynamically. Dynamic assignment will use DHCP. (DHCP must comply with IPv4.)

The user may disable DHCP to manually set the IP address, subnet mask, default gateway, and domain name system for each encoder Ethernet port. When DHCP is disabled, it is the user's responsibility to select proper IP addresses to ensure proper encoder HTTP operation. For example, the IP addresses `0.0.0.0` and `127.0.0.1` should not be used. (Since `0.0.0.0` cannot be resolved, and `127.0.0.1` is the standard loopback address for all IP devices.) In addition, `10.97.5.1` is reserved for the encoder front-panel USB Ethernet Gadget connection, so that IP address should be avoided as well.

6.18.   Simple Network Time Protocol (SNTP)

The encoder is capable of obtaining time from NTP or SNTP servers using the Simple Network Time Protocol. If the SNTP client on the encoder determines that the current system time is not within a specified tolerance of the received network time, the encoder sets its real-time clock (RTC) to the time received from the time server. NTP servers generate absolute time stamps (in UTC). SNTP is enabled by default and the encoder comes pre-configured with at least one default time server.

SNTP may be used in lieu of a Station Time Code signal for synchronizing the encoder clock. The Time Servers web page provides the means to test the servers listed to verify the connection via the SNTP protocol through port 123.

6.19.   HTTP

The encoder provides HTTPS access via the Secure Sockets Layer (SSL) protocol. The Nielsen Audio 1000-1212 Encoder Root CA certificate should be installed onto the connecting computer to allow that computer to recognize that the connection is valid and secure. The encoder root web page provides instructions for installing the certificate. (See Section 2.5.1.) It is possible to communicate with the Nielsen Audio 1000-1212 Encoder before installing the certificate by ignoring the certificate error; see Section 2.5.2.3 (for Ethernet access) or 2.5.3.3 (for USB Ethernet Gadget access).

Encoder configuration, control, and status information is available through the HTTP interface using a web browser. Configuration and control changes require proper authentication. The encoder web pages require that JavaScript® be enabled. The web pages have been tested using the following browsers:

- Microsoft Internet Explorer
- Firefox
- Chrome

6.20.   Analog Audio Input/Output Specifications

The following specifications describe the rear panel analog input/output connections:

- Maximum input level: +20 dBu, 21.9 Vp-p

- Connectors: XLR male output and XLR female input.

- Input impedance characteristics, 600 ohm or high impedance (>10k ohms).

- Range of input audio frequency: 20 Hz -20 kHz

- Output Characteristics: 50 ohm Balanced

- Maximum Cable Length: 10 meters

6.21.   Digital Audio Input/Output Specifications

The following specifications describe the rear-panel AES3 connections:

- Digital I/O interface: XLR

  o   Minimum average input level: -20 dBFS

  o   Connectors: XLR female input, XLR male output.

  o   Input data format:AES3-2003 and AES-3id 2001

  o   Transmission standard: ANSI/SMPTE 276M-1995

  o   Input characteristics:110 ohm ± 10%, balanced, transformer isolated

  o   Minimum input working voltage: 2.0 Vp-p

  o   Maximum input working voltage: 7.0 Vp-p

  o   Maximum absolute input voltage: 12.0 Vp-p

  o   Range of sampling rate frequency: 32 kHz, 44.1 kHz, 48 kHz, 96 kHz

  o   Output characteristics: balanced, dc offset <=50 mV

  o   Output voltage into 110 ohms: 2.0 Vp-p ±10%

  o   Rise/fall time: 30–44 nsec

  o   Output jitter: <20 nsec

  o   Maximum cable length: 10 meters

- Digital I/O Interface: BNC

  o   Minimum average input level: -20 dBFS

  o   Connectors: BNC female, input and output.

  o   Input data format:AES3-2003 and AES-3id 2001

  o   Transmission standard: ANSI/SMPTE 276M-1995

  o   Input characteristics:75 ohm ± 10%, unbalanced, transformer isolated

  o   Minimum input working voltage: 0.2 Vp-p

  o   Maximum input working voltage: 1.2 Vp-p

  o   Maximum absolute input voltage: 3 Vp-p

  o   Range of input frequency: 32 k Hz, 44.1 k Hz, 48 kHz, 96 kHz

o   Output characteristics: unbalanced, dc offset <=50 mV

o   Output voltage into 75 ohms: 1 Vp-p ±10%

o   Rise/fall time: 30–44 nsec

o   Output jitter: <20 nsec

o   Maximum cable length: 10 meters

6.22. Emergency Alert System

By default, detection of the EAS signal is enabled to avoid interference with an Emergency Alert System signal (EAS).

If the "EAS Detect" mode is enabled and the encoder recognizes an incoming EAS signal, encoding ceases to not interfere with the EAS preamble. Encoding resumes within 4 to 15 seconds after the EAS signal discontinues.

6.23. EMC/Safety Requirement Standards

The Nielsen Audio 1000-1212 Encoder has been tested for compliance to the following standards of the United States of America, Europe, and Canada.

- EMC

  o   Title 47 of the Code of Federal Regulations (CFR), Part 15 Subpart B for a Class A Digital Device

  o   ICES-003 Issue 4, February 2004 for a Class A Device, Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard for Digital Apparatus

  o   EN55022:2010 (CISPR 22:2008) 2010 (CISPR 22:2008) for a Class A Device, Information Technology Equipment. Radio disturbance characteristics. Limits and methods of measurement

  o   EN55024:2010 (CISPR 24:2010) 2010 (CISPR 22:2010) for a Class A Device, Information Technology Equipment. Immunity characteristics. Limits and methods of measurement.

- Safety

  o   UL60950-1/CSA C22.2 No. 60950-1, Information Technology Equipment - Safety - Part 1: General Requirements

  o   IEC60950-1, Information Technology Equipment-Safety-Part 1: General Requirements

  o   EN60950-1, Information Technology Equipment-Safety-General Requirements

Appendix A. Installing a Root CA Certificate for HTTPS Access

When users access the encoder via HTTPS (whether using Ethernet or USB Ethernet Gadget), the Nielsen Audio 1000-1212 Encoder uses Secure Sockets Layer (SSL) authentication. This means that until and unless an SSL certificate is installed on the PC connected to the encoder, any attempt to access the encoder via HTTPS will cause a warning message to display. (See Figure 21 in Section 2.5.2.3 for an example of this warning as it appears in Internet Explorer.) The message does not prevent access, but clicking through it adds another step to the login process. Nielsen Audio recommends installing the Nielsen Audio 1000-1212 Encoder Root CA certificate provided with the encoder, as described in this appendix.

Section A.1 of this appendix describes how to install the Nielsen Audio 1000-1212 Encoder Root CA certificate that comes with the encoder. This appendix provides detailed information for installing the certificate for Windows 7 systems using Internet Explorer. This certificate must be installed regardless of the version of Windows or type of web browser used to access the encoder.

In order to use the certificate, a new host name associated with the encoder IP address must be added to the hosts file on the computer to run the web interface. Often this task is performed by System Administrators, but if your facility does not have dedicated System Administrators, you can perform this task yourself using the instructions in Section A.2.

A.1.   Installing the Security Certificate

The encoder root web page provides the basic information needed to install the certificate. To display this information, bring up a Web browser on the PC connected to the encoder and type in the address for the root web page:

- For PCs connected to the encoder via USB Ethernet Gadget the address is `http://10.97.5.1`

- For PCs connected to the encoder via Ethernet the address is `http://`***`IP_Address`*** where ***`IP_Address`*** is the address selected when the Ethernet connection is established as described in Section 2.5.2.

The message shown in Figure 17 in Section 2.5.1. appears. This message serves two purposes:

- It provides the correct address to use to access the encoder via HTTPS.

- It provides information the network administrator can use to install the Nielsen Audio 1000-1212 Encoder Root CA certificate on the PC and add an entry for the encoder to the `Hosts` file on the PC. This appendix provides detailed instructions to augment that information.

Nielsen Audio recommends that the network administrator of every facility using HTTP to access an encoder install the Nielsen Audio 1000-1212 Encoder Root CA certificate on the PCs used to access the encoder. Once the certificate is installed, the warning message shown in Figure 21 will no longer appear during the login process.

To install the Nielsen Audio 1000-1212 Encoder Root CA certificate, follow these instructions:

1. On the PC connected to the encoder, the certificate can be accessed without authentication through the encoder web interface. Simply point a web browser to the certificate stored on the encoder as described below.

   - For PCs connected to the encoder via RNDIS the address is http://10.97.5.1/cert/NielsenAudioEncoderRootCA.cer

   - For PCs connect to the encoder via Ethernet the address is http://***IP_Address***/cert/NielsenAudioEncoderRootCA.cer where ***IP_Address*** is the address selected when the Ethernet connection is established as described in Section 2.5.1.

2. A dialog like that shown in Figure 77 appears, prompting for the file to be opened or saved. Click the Open button.
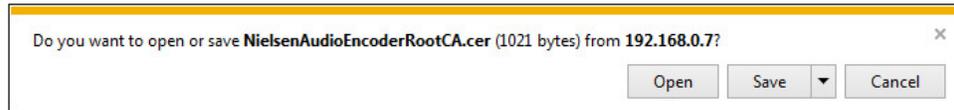
Figure 77: Root Certificate Open/Save File Prompt

3. A security dialog like that shown Figure 78 below appears. Click the Allow button to allow Windows to open the certificate.
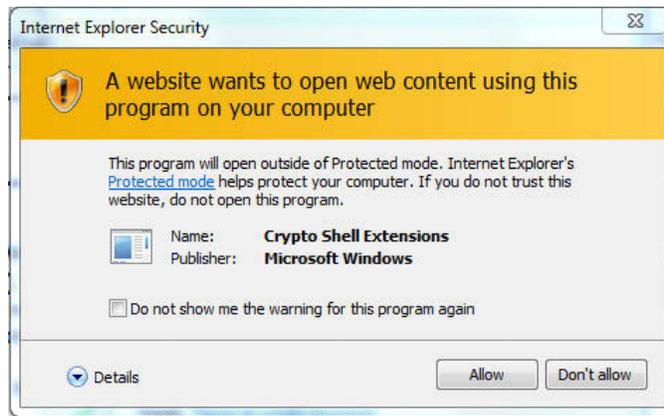
Figure 78: Allow Windows to Open Security Certificate

4. A dialog like the one in Figure 79 appears, offering to install the CA Root certificate. Click the "Install Certificate…" button.
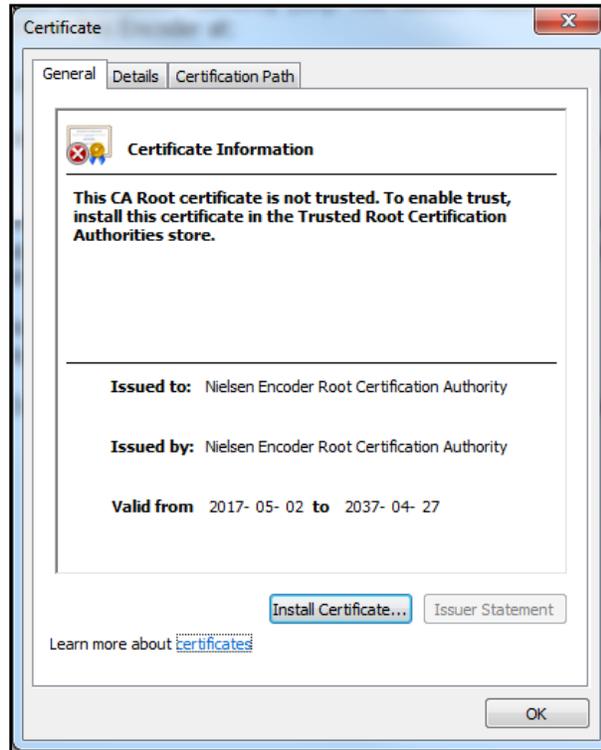
Figure 79: Certificate Information Dialog Box

5. The first screen of the Certificate Import Wizard appears as shown in Figure 80. Click Next.

Figure 80: First Screen of the Certificate Import Wizard

6. The dialog shown in Figure 81 appears, prompting for where the certificates should be stored on the PC.

Figure 81: Certificate Store Dialog Box

7. Select "Place all certificates in the following store," and click the Browse button.

8. The dialog shown in Figure 82 appears. Select the entry `Trusted Root Certificate Authorities`, and click OK.

Figure 82: Select Certificate Store Location Dialog Box

9. The Certificate Import Wizard will update to display your selection as shown in Figure 83 below. Click Next.
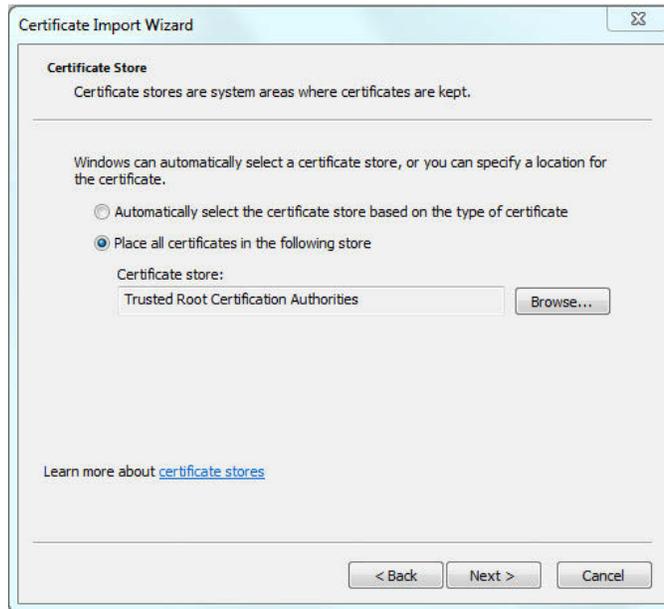
Figure 83: Certificate Store Dialog Box Displaying User Selection

10. The dialog shown in Figure 84 appears. Click Finish to complete the certificate installation.

Figure 84: Certificate Import Wizard Final Screen

11. The Certificate Wizard will display the dialog box shown in Figure 85 below. Click Yes.
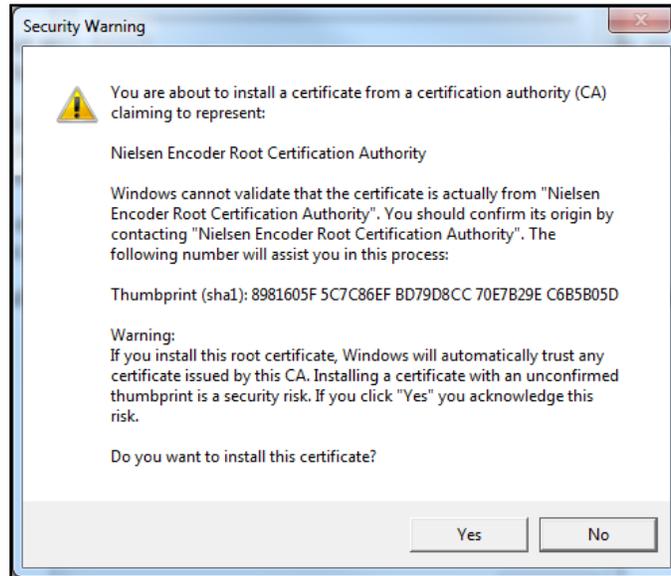
Figure 85: Certificate Import Warning

12. When the import is complete, the certificate Wizard will display the confirmation dialog box below. Click OK.
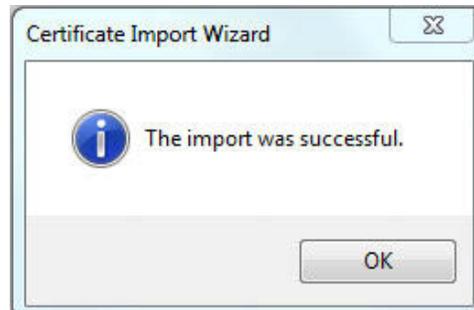
Figure 86: Certificate Import Confirmation

13.	Open the HTTPS Encoder Web page using Internet Explorer (e.g. https://192.168.0.7/). You will see this security warning.
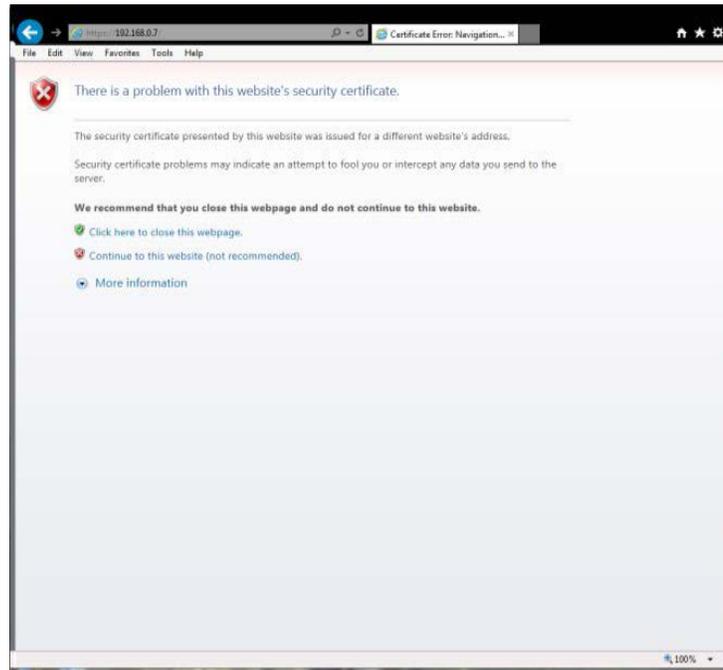
Figure 87: Internet Explorer Showing Security Warning

14.	Click "Continue to this website."

15.	Log into the Encoder when prompted by entering the following:

- User name: **Station**

- Password: **Maintenance**
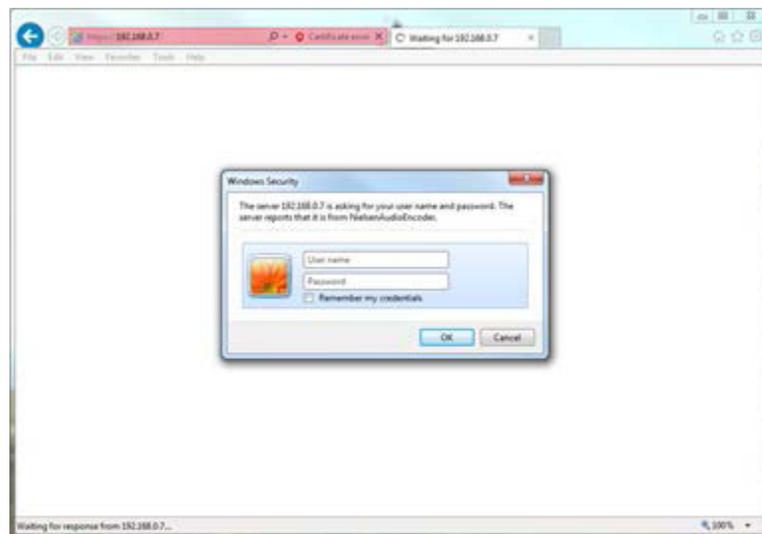
Figure 88: Internet Explorer Unsecure Login

16. Click "Certificate error," and then click "View certificates."
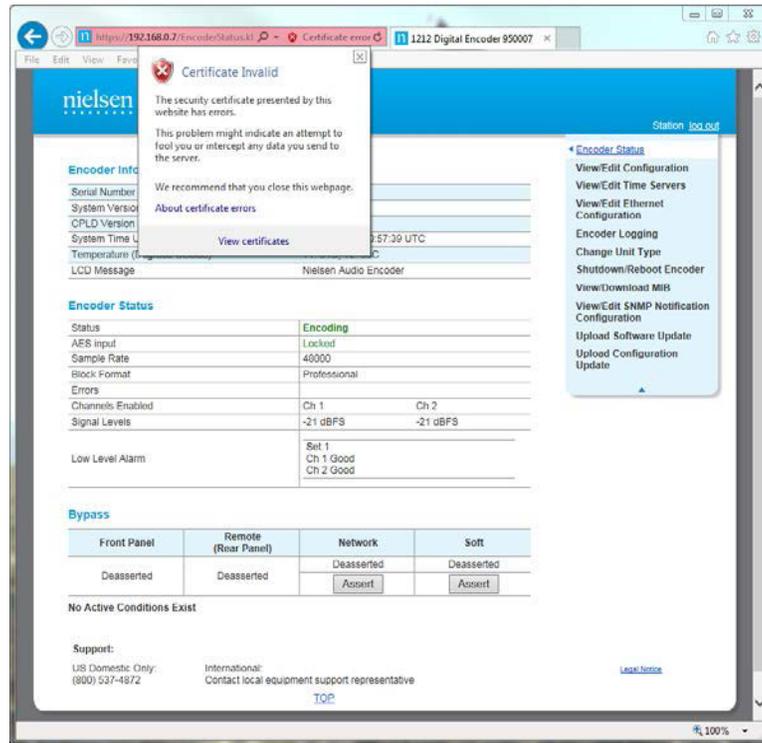
Figure 89: Internet Explorer Certificate Error

17. Now repeat steps 4 through 12 of this procedure.

18. Contact your network administrator and request that new host names associated with the encoder IP addresses be added to the `hosts` file on your computer.

Nielsen Audio recommends that you choose host names following this convention:

- For the front-panel USB connection:

    anadig*serial-numberusb*.nielsenaudio.encoder.app

- For the rear-panel Ethernet connection:

    anadig*serial-numbereth*.nielsenaudio.encoder.app

Where ***serial-number*** is the serial number of the encoder. (This is found on the bar code sticker on the encoder front panel.) For example:

    anadig950001usb.nielsenaudio.encoder.app
    anadig950001eth.nielsenaudio.encoder.app

The string `nielsenaudio.encoder.app` is **required** because it denotes the domain with which the certificate is associated. The convention `anadig`***serial-number*** provides the ability to distinguish among Nielsen Audio encoders for facilities that use multiple encoders. The `usb` naming convention allows the certificate to be associated with the front-panel USB Ethernet Gadget connection. The `eth` tag allows the certificate to be associated with the rear-panel Ethernet connection. Establishing two host names allows the certificate to be used for either connection.

As stated in Section 2.5.1., the IP address associated with the name `anadig950001usb.nielsenaudio.encoder.app` will be `10.97.5.1`. The IP address associated with the name `anadig950001eth.nielsenaudio.encoder.app` will be an address selected when the Ethernet connection is established, as described in Section 2.5.2.

> **Note** If your facility does not have a System Administrator, use the instructions in Section A.2 to establish the host name association yourself.

The computer will now be able to access the encoder using the authorized certificate session. The URL for accessing the encoder will follow the format `https://`***host_name***`/EncoderStatus.klx`. (For example, `https://anadig950001.nielsenaudio.encoder.app/EncoderStatus.klx`.) When logging into the encoder, the warning dialog shown in Figure 21 (in Section 2.5.2.3) will no longer appear.

Figure 90 shows what the Encoder Status page looks like when a user has logged in to the encoder without a Root CA Certificate installed on the PC. Note the browser address bar is red, with a Certificate Error warning. By contrast, Figure 91 shows the Encoder Status page for a user who has logged in to the encoder with a Root CA Certificate installed; the browser address bar is white, with a lock symbol to indicate that the connection with the encoder is secure.

Figure 90: Browser Accessing Encoder without Root CA Certificate

Figure 91: Browser Accessing Encoder with Root CA Certificate Installed

A.2. Creating a Host Name Association for the Encoder

Once a security certificate has been installed on a computer, before that computer can use the security certificate to access the encoder, new host names associated with the encoder IP addresses must be added to the hosts file on the computer. Often this task is performed by a System Administrator, but anyone with administrative access to the computer can do this by following the steps below.

1. Choose host names for the encoder. Nielsen Audio recommends that you choose host names following this convention:

   - For the front-panel USB connection:

     `anadig`*`serial-`*`number`*`usb.nielsenaudio.encoder.app`

   - For the rear-panel Ethernet connection:

     `anadig`*`serial-`*`number`*`eth.nielsenaudio.encoder.app`

   Where ***`serial-number`*** is the serial number of the encoder. (This is found on the bar code sticker on the encoder front panel.) For example:

   `anadig950001usb.nielsenaudio.encoder.app`
   `anadig950001eth.nielsenaudio.encoder.app`

   The string `nielsenaudio.encoder.app` is **required** because it denotes the domain with which the certificate is associated. The convention `anadig`*`serial-number`* provides the ability to distinguish among Nielsen Audio encoders for facilities that use multiple encoders. The `usb` naming convention allows the certificate to be associated with the front-panel USB Ethernet Gadget connection. The `eth` tag allows the certificate to be associated with the rear-panel Ethernet connection. Establishing two host names allows the certificate to be used for either connection.

   As stated in Section 2.5.1., the IP address associated with the name `anadig950001usb.nielsenaudio.encoder.app` will be `10.97.5.1`. The IP address associated with the name `anadig950001eth.nielsenaudio.encoder.app` will be an address selected when the Ethernet connection is established, as described in Section 2.5.2.

2. Open the Start menu and navigate to the Notepad application. (Start→All Programs→Accessories→Notepad.)

3. Right-click on the Notepad application menu Item and select "Run as administrator" from the menu as shown in Figure 92 below. (This requires administrator privileges on the system.)
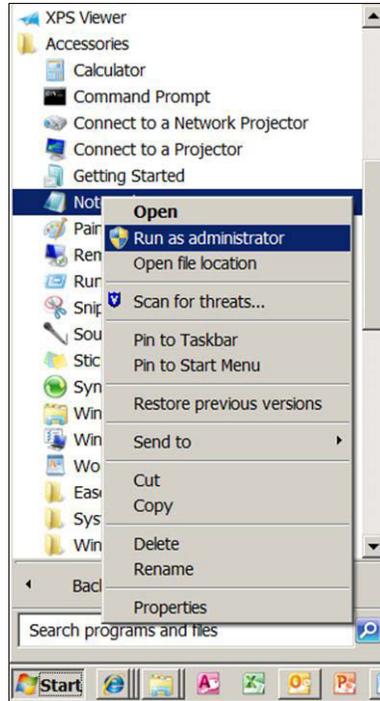
Figure 92: Running Notepad as Administrator

4. From within Notepad, navigate to the `hosts` file under the path `Windows\System32\drivers\etc` and open it for editing. (Be sure to select the option to display all files when browsing, as shown in Figure 93.
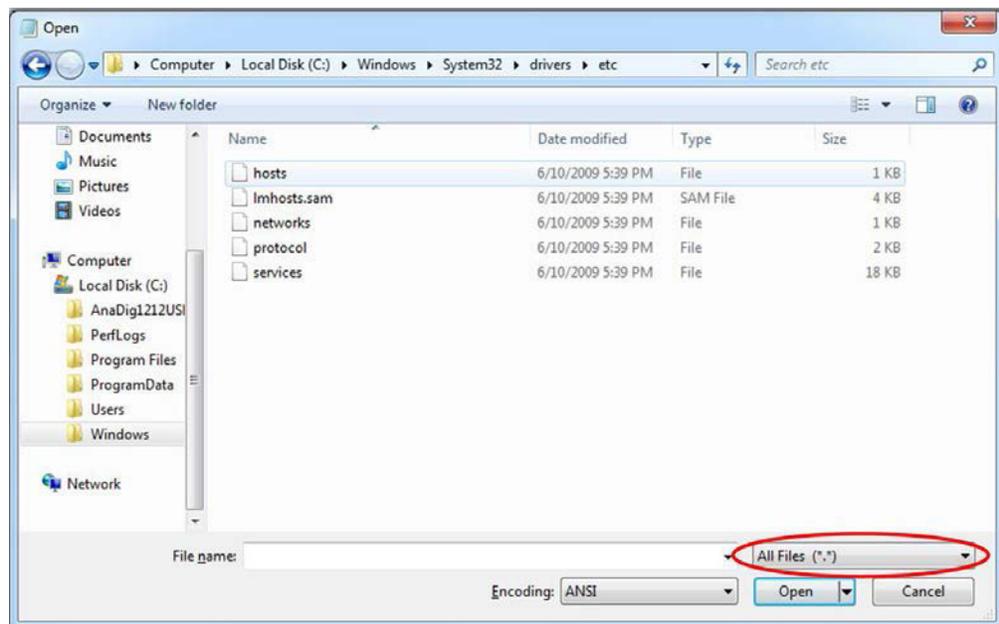
Figure 93: Locate Hosts File Using Notepad

5. At the end of the file add a line and type in:

- The IP address to associate with the certificate (e.g. `10.97.5.1` for the USB connection)

- TAB to start the next column

- The host name to be associated with that IP address and the encoder SSL certificate (e.g. `anadig950007usb.nielsenaudio.encoder.app`). See Figure 94 below.

Figure 94: Example Hosts File

6. Save the file and exit Notepad.

A.3. Uninstall an Old SSL Certificate

To avoid any conflict with an older SSL certificate for this type of Encoder, it is best to remove the older Trusted Root Certificate before installing the new one. Often this task is performed by a System Administrator, but anyone with administrative access to the computer can do this by following the steps below.

1. Click the Start button and type "internet explorer".

2. Right-click on the Internet Explorer application menu Item and select "Run as administrator" from the menu as shown in Figure 92 below. (This requires administrator privileges on the system.)
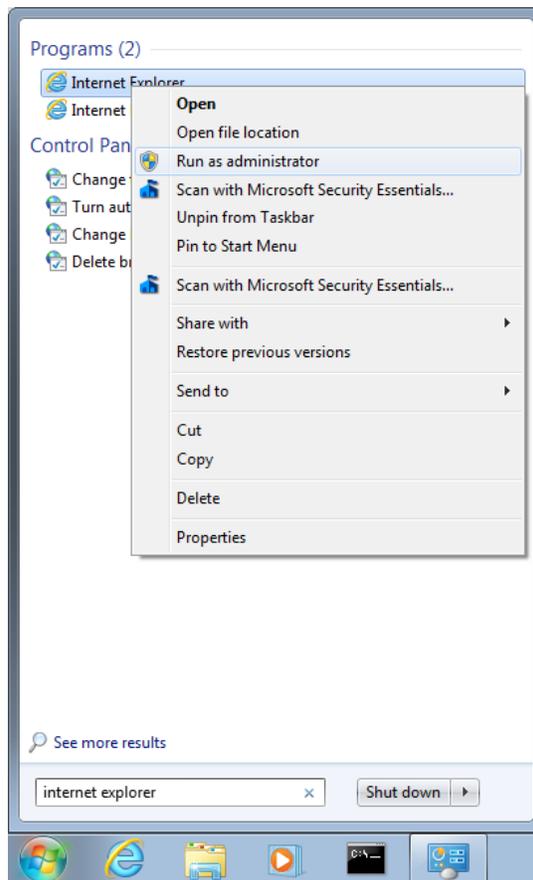
Figure 95: Running Internet Explorer as Administrator

3. Click the gear icon in the upper right corner, and then click the Internet Options menu item.
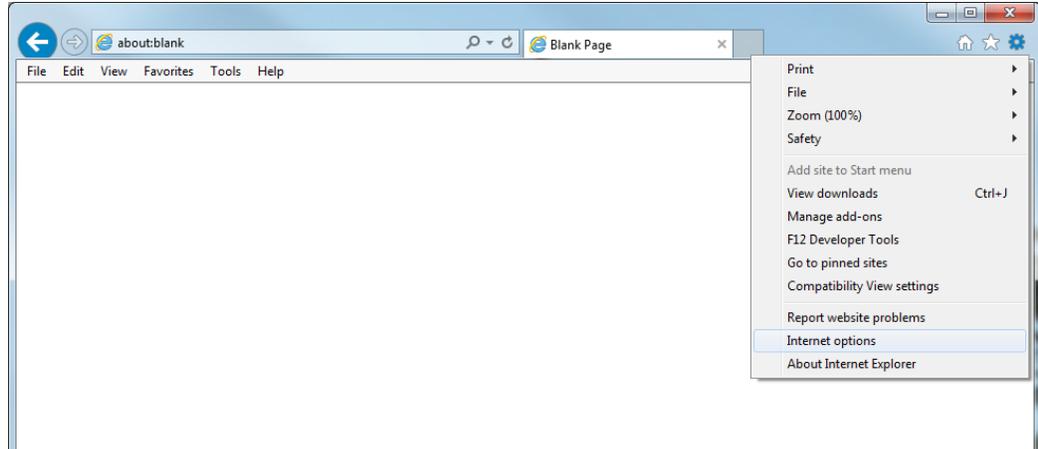
Figure 96: Internet Explorer: Internet Options

4. Click the Content tab, and then click the Certificates button.
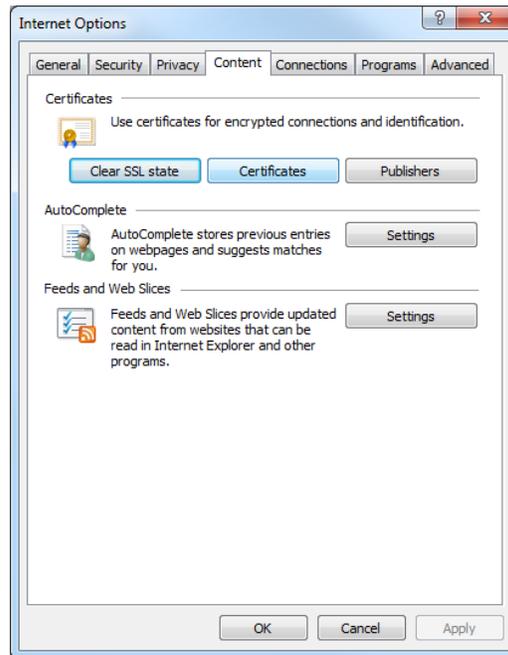
Figure 97: Internet Options Content Tab

5.   Click the Trusted Root Certification Authorities tab.

6.   Scroll down and select the old certificate(s).

7.   Click Remove.
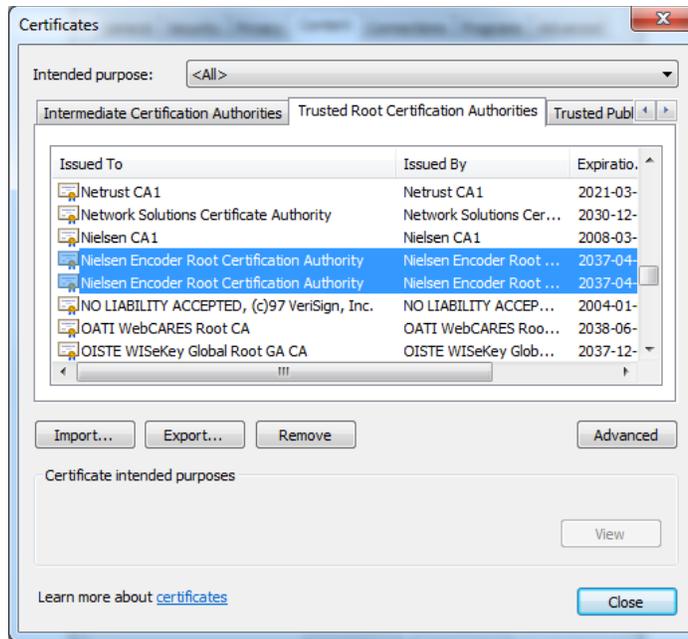
Figure 98: Trusted Root Certification Authorities Tab

8.   When prompted to confirm the removal, click Yes.
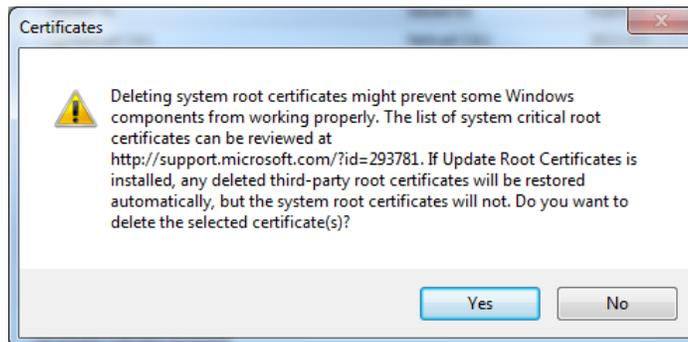
Figure 99: Confirm Removal

9.   When prompted to confirm the deletion, click Yes for each confirmation prompt.
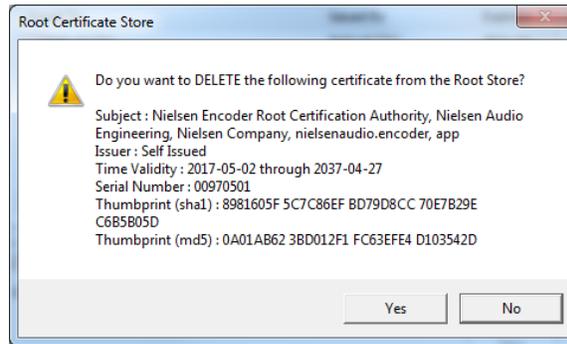
Figure 100: Confirm Deletion

10.   Close Internet Explorer.

Appendix B. Condition Codes

This appendix provides information about encoder status condition codes. Table 10 presents a summary of front-panel LED behavior discussed in Section 5. The remaining tables contain information for each condition class, listing of the errors, warnings, alerts, and information messages that are members of each class. For each message the tables provide the condition code displayed on the front-panel LCD and the web interface, as well as the expanded text that appears on the web interface.

Table 10: Front-Panel LED Color/Encoder Status Guide

Front-Panel LED Color	Class	Meaning/State of Operation
Solid GREEN	No Active Conditions	Unit is encoding properly
RED/GREEN (Flash)	`ENCODING_ALERT` `SYSTEM_INFO` `SYSTEM_WARNING`	Unit has errors but is encoding – this is a warning state
Solid RED	`SYSTEM_ERROR` `ENCODING_ERROR`	Unit has errors causing it to not encode
RED/OFF (Flash)	`SYSTEM_ERROR` `IN BYPASS`	Unit has errors and is in bypass
OFF	`IN BYPASS`	Unit is in bypass mode with no active system errors

Table 11: Encoding Alert Messages

LCD Message	Description of the Encoding Alert Condition as Shown on the Web Page
`LLASET1_LOW_SIG_LVL`	Low signal level on set #1; LLA Set #1 is enabled and all enabled-to-encode member channels have a low signal level status.
`LLASET2_LOW_SIG_LVL`	Low signal level on set #2; LLA Set #2 is enabled and all enabled-to-encode member channels have a low signal level status.

Table 12: Encoding Notice Messages

LCD Message	Description of the Encoding Notice Condition as Shown on the Web Page
PRIOR_ENCODING_FOUND	The Encoder has found prior encoding on the same layer.

Table 13: System Error Messages

LCD Message	Description of the Encoding Notice Condition
BIST_FAILURE	One or more of the Built-In-Self-Test test actions has failed.
DSP_FAILURE	A DSP hard failure has been detected.
DSP_FILE_NOT_FOUND	The DSP binary image file was not found; perform software update.
ERR_LOADING_DSP	After loading the DSP, we failed to communicate with it.
ERR_LOADNG_FPGA	Attempt to load FPGA failed.
ERR_READNG_DSP_FILE	Failed to read DSP binary image file.
ERR_READNG_FPGA_FILE	Failed to read FPGA binary image file.
FAILED_COMM_DSP	Failed to communicate with DSP, attempting recovery.
FPGA_FILE_NOT_FOUND	The FPGA binary image file was not found. Perform software update.
INVALID_FPGAFILE_CRC	The FPGA load file failed CRC validation.
MEM_LOAD_TOO_HIGH	The available memory is insufficient for proper operation, attempting to recover.
OVER_TEMPERATURE	The system internal temperature has exceeded the operational limit; Encoding is Disabled.
TIME_OUT_OF_RANGE	The current system time is out of range; encoding is disabled.

Table 14: Soft System Error Messages

LCD Message	Description of the System Error Condition as Shown on the Web Page
FAILED_COMM_DSP	Failed to communicate with DSP, attempting recovery.
LICENSE_EXPIRED	The license has expired; encoding is disabled.

Table 15: System Information Messages Associated with Bypass Mode

Note	When the encoder is in bypass mode with no active system error conditions, the front-panel LED is dark.

LCD Message	Description of the System Information Condition as Shown on the Web Page
FRONT_PANEL_BYPASS	The front-panel bypass button is asserted.
REMOTE_BYPASS	Remote bypass on rear panel DE-9 M is asserted.
NETWORK_BYPASS	Network bypass is asserted.
SOFT_BYPASS	Soft bypass is asserted.
SSA_BYPASS	Selective Step Aside asserted.

Table 16: System Information Messages

LCD Message	Description of the System Information Condition
CLOCKS_DIFF_GT_15MIN	Upon a new successful attempt to synchronize clocks, the system and station clocks differed by more than 15 minutes; station clock was ignored.
CLOCKS_DIFF_GT_15SEC	Upon a consecutive successful attempt to synchronize clocks, the system and station clocks differed by more than 15 seconds; station clock was ignored.
ETH_DATASTORM_ACTIVE	The Ethernet interface has been temporarily disabled for reception due to a data storm.
FLSH_MIRR_IN_PROGRES	After a successful Software Update, the system is making a mirror copy of the latest software that was just installed.
LTC_DQS_POLARITY_ERR	The Linear Time Source interface indicates an error. If DQS format, the time source signal may be connected backwards.
LTC_USE_ONLY_1_INPUT	Only one or the other Linear Time Source inputs may be connected at the same time.
LTC_SEC_NOT_CHANGING	An attempt was made to synchronize the clock to the LTC input, but the LTC time is not changing; synchronization was skipped.
NO_SNTP_TIME_SOURCE	Testing of all SNTP Time sources listed has failed, no valid SNTP time source has been found in the list.
NO_STATION_CLOCK	An attempt was made to synchronize clocks, however; Linear Time Code was not detected, or an unsupported format was present.

LCD Message	Description of the System Information Condition
NTP_OFFSET_GT_15SEC	The time difference between the encoder and the NTP time server was found to be greater than 15 seconds at the last time snap, your encoder RTC may be running very fast or very slow.
SOFTWARE_UPDATE_FAIL	The Software Update has failed.
SSA_BYPASS	Step Aside Mode is set to Selective or Standard and one or more codes in the SSACodeList have been detected or prior encoding has been detected on the same layer.
SYNC_SKIP_DAY_BNDRY	An attempt was made to synchronize clocks near a day boundary; synchronization was skipped.
USB_CFGUPD_NOT_FOUND	A USB flash drive device was inserted; `Encoder.cmd` specifies a configuration update, but the specified file was not found on the device.
USB_CFGUPD_NOT_VALID	A USB flash drive device was inserted; `Encoder.cmd` specifies a configuration update, but the specified file is not a valid configuration update package.
USB_CMD_FILE_BAD	A USB flash drive device was inserted; error occurred while reading `Encoder.cmd`.
USB_INSERTED	A USB flash drive device is inserted.
USB_LOG_WRITE_FAILED	Failed to copy log report file to USB flash drive device.
USB_NO_CMD_FILE	A USB flash drive device was inserted; `Encoder.cmd` was not found in the device's root directory.
USB_SWUPD_BAD_CRC	A USB flash drive device was inserted; `Encoder.cmd` specifies a software update, but the specified software update package is not intact.
USB_SWUPD_BAD_PKG	A USB flash drive device was inserted; `Encoder.cmd` specifies a software update, but the specified file is not a software update package.
USB_SWUPD_BAD_PLTFM	A USB flash drive device was inserted; `Encoder.cmd` specifies a software update, but the specified file is not for this platform.
USB_SWUPD_BAD_TGTSN	A USB flash drive device was inserted; `Encoder.cmd` specifies a Software Update, but the specified file is for a specific unit and not us.
USB_SWUPD_NOT_FOUND	A USB flash drive device was inserted; `Encoder.cmd` specifies a software update, but the specified file was not found on the device.
USB_SWUPD_OLD_VER	A USB flash drive device was inserted; `Encoder.cmd` specifies a software update, but the specified software update package is an older version.

LCD Message	Description of the System Information Condition
USB_UNKNOWN_CMD	A USB flash drive device was inserted; Encoder.cmd contains an unknown command.

Table 17: System Warning Messages

LCD Message	Description of the System Warning Condition as Shown on the web page
LIC_EXPIRES_WARNING	The license will expire on 01-JAN-2009. ENCODING STOPS when the license expires. (The expiration date is shown as an example only, your actual end date (if any) depends on your individual contract)
MEM_LOAD_WARNING	The available memory is getting low.
RTC_BATTERY_BAD	The battery-backed Real Time Clock (RTC) reports that its memory was initialized upon power-up. Typically, this implies that the RTC battery has failed and needs to be replaced.
RTC_I2C_BAD	Communication with the battery-backed Real Time Clock (RTC) has failed; the non-battery-backed RTC internal to the host processor is being used.
TEMP_SENSOR_BAD	Communications with Temperature Sensor or the sensor itself has failed.

Table 18: Encoding Error Messages

LCD Message	Description of the Encoding Error Condition as Shown on the Web Page
AES_NO_SIGNAL_LOCK	Encoding enabled, no input signal detected.
AES_SIGNAL_ERRORS	Encoding enabled, signal integrity errors exist in the digital stream.
AES_UNKN_SAMPLERATE	Encoding enabled, sample rate unknown or not supported.
DSP_SR_MISMATCH	The DSP has reported a mismatch between the current sample rate and that for which it was configured. A DSP Refresh will recover it.
NO_ENCODABLE_INPUTS	No active inputs satisfy the requirements to be encoded. Is at least one channel enabled to encode?

Appendix C. Sample Log File

An excerpt from a sample log file appears below. Some entries in the log file are encrypted because they contain confidential information and can be read only by Nielsen Audio personnel with appropriate privileges. See Section 4.6 for instructions on downloading the log file from the encoder to a PC.

```
<?xml version="1.0" encoding="utf-8" ?>

<encoder-log encoder="AnaDig1212" serial-number="950007" version-
info="1.0.0.2">

<log_entry timestamp="2012-09-07 14:04:21.916">

ArbLogger Started: 2012-09-07 14:04:21.885</log_entry>

<log_entry timestamp="2012-09-07 14:04:31.584">

Condition.FLSH_MIRR_IN_PROGRES changed from Inactive to
Active</log_entry>

<log_entry timestamp="2012-09-07 14:04:31.603">

ConditionClass.SYSTEM_INFO changed from Inactive to
Active</log_entry>

<boot_info timestamp="2012-09-07 14:04:31.612">

Reboot invoked by root from the commandline</boot_info>

<boot_info timestamp="2012-09-07 14:04:31.618">

The Encoder was reset by the Host Soft reboot command</boot_info>

<log_entry timestamp="2012-09-07 14:04:32.732">

FpgaDAL Starting up, version: 1.0_alpha</log_entry>

<log_entry timestamp="2012-09-07 14:04:32.992">

AesReceiverDAL Starting up</log_entry>

<log_entry timestamp="2012-09-07 14:04:33.095">

AesReceiverDAL is up and running.</log_entry>

<log_entry timestamp="2012-09-07 14:04:33.283">

ThermalManager Starting up, version: 0.2</log_entry>

<log_entry timestamp="2012-09-07 14:04:34.706">

DspDAL Starting up</log_entry>

<log_entry timestamp="2012-09-07 14:04:34.745">

DspDAL is up and running.</log_entry>

<log_entry timestamp="2012-09-07 14:04:39.767">
```

EncoderStatus.State changed from StartingUp to Bypassed</log_entry>

<log_entry timestamp="2012-09-07 14:04:41.776">

EncoderStatus.SystemIsUp changed from False to True</log_entry>

<log_entry timestamp="2012-09-07 14:04:41.807">

EncoderStatus.State changed from Bypassed to Warning</log_entry>

<log_entry timestamp="2012-09-07 14:04:42.614">

EncoderStatus.IsValid changed from False to True</log_entry>

<log_entry timestamp="2012-09-07 14:04:44.682">

Condition.FLSH_MIRR_IN_PROGRES changed from Active to Inactive</log_entry>

<log_entry timestamp="2012-09-07 14:04:44.690">

ConditionClass.SYSTEM_INFO changed from Active to Inactive</log_entry>

<log_entry timestamp="2012-09-07 14:04:44.733">

EncoderStatus.State changed from Warning to Encoding</log_entry>

<config_update timestamp="2012-09-07 14:05:31.642">

Config Update being applied from Config file: </config_update>

<config_update timestamp="2012-09-07 14:05:31.695">

<encoding-ops-info>wgD2AHYAZgCWAOYA8gAOAC4AlgD2AHYAzgB0AMIANgD2AHYApgDCAPYAdgBmAJYA5gDyAHYA

qgB2AJYALgAqAJ4ADgCmAMIAFgCGAHYA5gCmALwAYgCGADYAzgCmANwABADKAJ4AzgAuAKYA

tgDCAPYAdgBmAJYA5gB0AKoAdgCWAC4AKgCeAA4ApgC8ACIAlgDmAJYALgCGADYA3AAEACIA

lgDmAJYALgCGADYAogB2AMYA9gAmAJYAdgDmAMIA9gB2AGYAlgDmAHQAggDGAC4AlgBuAKYA

ggCuACYAlgD2AMIA9gB2AHYApgDGAC4A9gBOALwAQgByAMIA3AAEACIAlgDmAJYALgCGADYA

ogB2AMYA9gAmAJYAdgDmAMIA9gB2AGYAlgDmAHQAggCuACYAlgD2AOoA9gBOACYAygCWAF4A

pgC8AEwALAD6AEIAkgAqANwABAAiAJYA5gCWAC4AhgA2AKIAdgDGAPYAJgCWAHYA5gDCAPYA

dgBmAJYA5gB0AMIAFgCGAHYAdgCmADYAjACiAHYAxgD2ACYApgCiAHYAhgBGADYApgAmALwA

KgBOAK4ApgDcAAQAIgCWAOYAlgAuAIYANgCiAHYAxgD2ACYAlgB2AOYAwgD2AHYAZgCWAOYA
</encoding-ops-info>

dADCABYAhgB2AHYApgA2AEwAogB2AMYA9gAmAKYAogB2AIYARgA2AKYAJgC8ACoAT
gCuAKYA

3AAEACIAlgDmAJYALgCGADYAogB2AMYA9gAmAJYAdgDmAMIA9gB2AGYAlgDmAHQAw
gAWAIYA

dgB2AKYANgCMADIANgCGAMoApgAuALwAjADcAAQAIgCWAOYAlgAuAIYANgCiAHYAx
gD2ACYA

lgB2AOYAwgD2AHYAZgCWAOYAdADCABYAhgB2AHYApgA2AEwAMgA2AIYAygCmAC4Av
ABMANwA

BADKAJ4AzgAuAKYAtgDCAPYAdgBmAJYA5gB0AOoAhgAuAMYAFgAmAPYA5gCiAHYAh
gBGADYA

pgAmALwAYgCGADYAzgCmANwABAAiAJYA5gCWAC4AhgA2AKIAdgDGAPYAJgCWAHYA5
gDCAPYA

dgBmAJYA5gB0ADIAhgCeAKYATgC8ADIA8gDCACoAygDcAAQAIgCWAOYAlgAuAIYAN
gCiAHYA

xgD2ACYAlgB2AOYAwgD2AHYAZgCWAOYAdACyAKYAJgCWAIYAwgD2ACYApgC8AEIAo
gCCAGIA

3AAEACIAlgDmAJYALgCGADYAogB2AMYA9gAmAJYAdgDmAMIA9gB2AGYAlgDmAHQAo
gB2AMYA

9gAmAJYAdgDmADIAxgAmALIApgDOAM4AhgDmAKYAvAAiAJYA5gCWAC4AhgA2AAQAo
gB2AMYA

9gAmAJYAdgDmAAQABAAEAAQAKgCmAM4ALgCWAHYA5gAEAIwANAAEAEwANAAEAMwAd
AB0AHQA

BAAEANwABAAiAJYA5gCWAC4AhgA2AKIAdgDGAPYAJgCWAHYA5gDCAPYAdgBmAJYA5
gB0ADIA

NgCGAMoApgAuAIwAygCWAOYAdgCGADYAMgCmAG4ApgA2AIIANgCGAE4AtgCiAHYAh
gBGADYA

pgAmALwAKgBOAK4ApgDcAAQAIgCWAOYAlgAuAIYANgCiAHYAxgD2ACYAlgB2AOYAw
gD2AHYA

ZgCWAOYAdAAyADYAhgDKAKYALgCMAMoAlgDmAHYAhgA2ADIApgBuAKYANgAqABYAT
gCmAM4A

FgD2ADYAJgC8ALQALACsANwABAAiAJYA5gCWAC4AhgA2AKIAdgDGAPYAJgCWAHYA5
gDCAPYA

dgBmAJYA5gB0ADIANgCGAMoApgAuAIwAygCWAOYAdgCGADYAMgCmAG4ApgA2ALIAl
gB2AK4A

LgCmAM4AvACMAAwA3AAEACIAlgDmAJYALgCGADYAogB2AMYA9gAmAJYAdgDmAMIA9
gB2AGYA

lgDmAHQAMgA2AIYAygCmAC4ATADKAJYA5gB2AIYANgAyAKYAbgCmADYAggA2AIYAT
gC2AKIA

dgCGAEYANgCmACYAvAAqAE4ArgCmANwABAAiAJYA5gCWAC4AhgA2AKIAdgDGAPYAJ
gCWAHYA

5gDCAPYAdgBmAJYA5gB0ADIANgCGAMoApgAuAEwAygCWAOYAdgCGADYAMgCmAG4Ap
gA2ACoA

FgBOAKYAzgAWAPYANgAmALwAtAAsAKwA3AAEACIAlgDmAJYALgCGADYAogB2AMYA9
gAmAJYA

dgDmAMIA9gB2AGYAlgDmAHQAMgA2AIYAygCmAC4ATADKAJYA5gB2AIYANgAyAKYAb
gCmADYA

sgCWAHYArgAuAKYAzgC8AIwADADcAAQAygCeAM4ALgCmALYAwgD2AHYAZgCWAOYAd
ACqAM4A

pgASAPYArgBOAM4AogB2AIYARgA2AKYAJgC8AGIAhgA2AM4ApgDcAAQAygCeAM4AL
gCmALYA

wgD2AHYAZgCWAOYAdACiAB4ALgCmAE4AdgCGADYAKgCWALYApgDKAPYArgBOAMYAp
gC8AHIA

9gB2AKYA3AAEACIAlgDmAJYALgCGADYAogB2AMYA9gAmAJYAdgDmAMIA9gB2AGYAl
gDmAHQA

CgCCALIACgC8AOwADAAMAAwA3AAEACIAlgDmAJYALgCGADYAogB2AMYA9gAmAJYAd
gDmAMIA

9gB2AGYAlgDmAHQAygCCALIACgC8AKwATACsAAwA3AAEACIAlgDmAJYALgCGADYAo
gB2AMYA

9gAmAJYAdgDmAMIA9gB2AGYAlgDmAHQAKgCCALIACgC8ACwADAAMAAwA3AAEACIAl
gDmAJYA

LgCGADYAogB2AMYA9gAmAJYAdgDmAMIA9gB2AGYAlgDmAHQAigCCALIACgC8AOwAr
AAMAAwA

3AAEACIAlgDmAJYALgCGADYAogB2AMYA9gAmAJYAdgDmAMIA9gB2AGYAlgDmAHQAC
gCCALIA

CgC8AOwADAAMAAwA3AAEACIAlgDmAJYALgCGADYAogB2AMYA9gAmAJYAdgDmAMIA9
gB2AGYA

lgDmAHQAogCGAM4AIgCmAC4ApgDGAC4AlgD2AHYAogB2AIYARgA2AKYAJgC8ACoAT
gCuAKYA

3AAEACIAlgDmAJYALgCGADYAogB2AMYA9gAmAJYAdgDmAMIA9gB2AGYAlgDmAHQAM
gCWAMYA

pgB2AM4ApgDCABYApgDGANYAlgB2AOYAogB2AIYARgA2AKYAJgC8ACoATgCuAKYA3
AAEACIA

lgDmAJYALgCGADYAogB2AMYA9gAmAJYAdgDmAMIA9gB2AGYAlgDmAHQAMgCWAMYAp
gB2AM4A

pgDKAC4AhgBOAC4AvAAMAIwA9AAMAIwA9ABMAAwADAAMANwABAAiAJYA5gCWAC4Ah
gA2AKIA

dgDGAPYAJgCWAHYA5gDCAPYAdgBmAJYA5gB0ADIAlgDGAKYAdgDOAKYAygAuAPYAD
gC8AIwA

TAD0AMwAjAD0AEwADADMAOwA3AAEAMoAngDOAC4ApgC2AMIA9gB2AGYAlgDmAHQA8
gBmAGYA

zgCmAC4AYgBOAPYAtgDiALYALgCSAHYAygCmAMYA9gB2ACYAzgC8AAwA3AAE</enc oding-ops-info></config_update>

<log_entry timestamp="2012-09-07 14:06:04.325">

EncoderStatus.IsValid changed from True to False</log_entry>

<log_entry timestamp="2012-09-07 14:06:05.043">

EncoderStatus.State changed from Encoding to Bypassed</log_entry>

<log_entry timestamp="2012-09-07 14:06:05.591">

EncoderStatus.State changed from Bypassed to Encoding</log_entry>

<log_entry timestamp="2012-09-07 14:06:06.128">

EncoderStatus.IsValid changed from False to True</log_entry>

<config_update timestamp="2012-09-07 14:06:37.900">

Appendix D. Encoder MIB

This appendix provides the text of the encoder MIB, which is needed to set and get encoder parameters via SNMP. See Sections 2.5.4 and 4.9 for more information.

```
NIELSEN-1212-ENCODER-MIB DEFINITIONS ::= BEGIN

        IMPORTS

            MODULE-IDENTITY, OBJECT-TYPE, enterprises

                FROM SNMPv2-SMI

            TEXTUAL-CONVENTION, DisplayString

                FROM SNMPv2-TC

            OBJECT-GROUP

                FROM SNMPv2-CONF;

        nielsenEncoderModule MODULE-IDENTITY

            LAST-UPDATED    "201702230733Z"

            ORGANIZATION    "Nielsen"

            CONTACT-INFO    "The Nielsen Company

                            7000 Columbia Gateway Drive

                            Columbia, MD 21046

                            +1 (410) 312-8000"

            DESCRIPTION     "Nielsen Encoder MIB"

            REVISION        "201702230733Z"

            DESCRIPTION     "Updated company address, and changed
module ID to 12"

          ::= { nielsenEnterprise 12 }


        nielsenEnterprise OBJECT IDENTIFIER ::= { enterprises 23904 }


    -- Nielsen Encoder Module Conformance


        nielsenEncoderModuleConformance    OBJECT IDENTIFIER ::= {
nielsenEncoderModule 1 }

        nielsenEncoderModuleGroups         OBJECT IDENTIFIER ::= {
nielsenEncoderModuleConformance 1 }
```

```
nielsenEncoderModuleObjectsGroup OBJECT-GROUP

    OBJECTS           {

                      nEncObjSerialNumber,

                      nEncObjSystemVersion,

                      nEncObjSystemTime,

                      nEncObjAlarmStatus,

                      nEncObjEncodingState,

                      nEncObjFrontPanelBypassState,

                      nEncObjRearPanelBypassState,

                      nEncObjNetworkBypassState,

                      nEncObjSoftBypassState,

                      nEncObjActiveConditions

                      }

    STATUS          current

    DESCRIPTION     "Nielsen Encoder Objects"

  ::= { nielsenEncoderModuleGroups 1 }

-- Nielsen Encoder Objects


NielsenAssertStatus ::= TEXTUAL-CONVENTION

    STATUS      current

    DESCRIPTION "an indication of whether the item is asserted or
deasserted"

    SYNTAX INTEGER {

          asserted(1),

          deasserted(2)

        }


NielsenEncodingState ::= TEXTUAL-CONVENTION

    STATUS      current

    DESCRIPTION "an indication of whether the Nielsen Encoder is
encoding or bypassed"

    SYNTAX INTEGER {

          encoding(1),

          bypassed(2)
```

```
                }


NielsenStatusBuffer ::= TEXTUAL-CONVENTION
     DISPLAY-HINT "10240a"
   STATUS        current
   DESCRIPTION "A large (10k) buffer to display the active
conditions"
   SYNTAX        OCTET STRING (SIZE (0..10240))
   nielsenEncoderObjects OBJECT IDENTIFIER ::= {
nielsenEncoderModule 2 }


   nEncObjSerialNumber OBJECT-TYPE
       SYNTAX          DisplayString (SIZE(6))
       MAX-ACCESS      read-only
       STATUS          current
       DESCRIPTION     "The Encoder's serial number

                       example: 123456"
   ::= { nielsenEncoderObjects 1 }


   nEncObjSystemVersion OBJECT-TYPE
       SYNTAX          DisplayString (SIZE(20))
       MAX-ACCESS      read-only
       STATUS          current
       DESCRIPTION     "The Encoder's Software Version

                       example: 2007.0213.2202.30450"
   ::= { nielsenEncoderObjects 2 }


   nEncObjSystemTime OBJECT-TYPE
       SYNTAX          DisplayString (SIZE(19..25))
       MAX-ACCESS      read-only
       STATUS          current
       DESCRIPTION     "Encoder system time in UTC"
   ::= { nielsenEncoderObjects 3 }


   nEncObjAlarmStatus OBJECT-TYPE
```

```
        SYNTAX          NielsenAssertStatus

        MAX-ACCESS      read-only

        STATUS          current

        DESCRIPTION     "Rear Panel Alarm Status

                        asserted(1) or deasserted(2)"

    ::= { nielsenEncoderObjects 4 }


    nEncObjEncodingState OBJECT-TYPE

        SYNTAX          NielsenEncodingState

        MAX-ACCESS      read-only

        STATUS          current

        DESCRIPTION     "The current operational state of the
encoder.

                        encoding(1) or bypassed(2)"

    ::= { nielsenEncoderObjects 5 }


    nEncObjFrontPanelBypassState OBJECT-TYPE

        SYNTAX          NielsenAssertStatus

        MAX-ACCESS      read-only

        STATUS          current

        DESCRIPTION     "Front Panel Bypass Switch State

                        asserted(1) or deasserted(2)"

    ::= { nielsenEncoderObjects 6 }


    nEncObjRearPanelBypassState OBJECT-TYPE

        SYNTAX          NielsenAssertStatus

        MAX-ACCESS      read-only

        STATUS          current

        DESCRIPTION     "Rear Panel Bypass Input State

                        asserted(1) or deasserted(2)"

    ::= { nielsenEncoderObjects 7 }


    nEncObjNetworkBypassState OBJECT-TYPE

        SYNTAX          NielsenAssertStatus
```

```
            MAX-ACCESS        read-write

            STATUS            current

            DESCRIPTION       "Network Bypass State

                              asserted(1) or deasserted(2)"

        ::= { nielsenEncoderObjects 8 }


        nEncObjSoftBypassState OBJECT-TYPE

            SYNTAX            NielsenAssertStatus

            MAX-ACCESS        read-write

            STATUS            current

            DESCRIPTION       "Soft Bypass State

                              asserted(1) or deasserted(2)"

        ::= { nielsenEncoderObjects 9 }


        nEncObjActiveConditions OBJECT-TYPE

            SYNTAX            NielsenStatusBuffer

            MAX-ACCESS        read-only

            STATUS            current

            DESCRIPTION       "Status table"

        ::= { nielsenEncoderObjects 10 }



    END


Encoder Notifications MIB
```

This appendix provides the text of the encoder notifications MIB, which is defines event notifications the encoder can send to SNMP manager devices. See Sections 2.5.4 and 4.10 for more information.

```
NIELSEN-1212-ENCODER-NOTIFICATIONS-MIB DEFINITIONS ::= BEGIN


    IMPORTS

        NOTIFICATION-TYPE, OBJECT-TYPE

            FROM SNMPv2-SMI

        TEXTUAL-CONVENTION, DisplayString

            FROM SNMPv2-TC
```

```
        nielsenEncoderModule, nielsenEncoderObjects

             FROM NIELSEN-1212-ENCODER-MIB;



-- Event Objects



NielsenConditionState ::= TEXTUAL-CONVENTION

    STATUS          current

    DESCRIPTION     "The associated condition just activated and
is active(1), or the

                    condition just deactivated and is now
inactive(2)."

    SYNTAX INTEGER  {

                    active(1),

                inactive(2)

                    }



NielsenEncoderStatusState ::= TEXTUAL-CONVENTION

    STATUS          current

    DESCRIPTION     "The EncoderStatus State has just changed and
is now one of the following

                    values:  StartingUp(1), Bypassed(2),
Encoding(3), Error(4), Warning(5),

                ShuttingDown(6), Shutdown(7), SoftwareUpdate(8),
BIST(9)."

    SYNTAX INTEGER  {

                    StartingUp(1),

                Bypassed(2),

                Encoding(3),

                Error(4),

                Warning(5),

                ShuttingDown(6),

                Shutdown(7),

                SoftwareUpdate(8),

                BIST(9)

                    }
```

```
        nielsenEncoderEventObjects OBJECT IDENTIFIER ::= {
nielsenEncoderObjects 100 }

    nEncEvtObjSerialNumber OBJECT-TYPE

        SYNTAX          DisplayString (SIZE(6))

        MAX-ACCESS      accessible-for-notify

        STATUS          current

        DESCRIPTION     "The Encoder's serial number; example:
123456"

    ::= { nielsenEncoderEventObjects 1 }


    nEncEvtObjSystemTime OBJECT-TYPE

        SYNTAX          DisplayString (SIZE(19..25))

        MAX-ACCESS      accessible-for-notify

        STATUS          current

        DESCRIPTION     "Encoder system time in UTC when the
associated

                        condition activated or deactivated."

    ::= { nielsenEncoderEventObjects 2 }


    nEncEvtObjConditionState OBJECT-TYPE

        SYNTAX          NielsenConditionState

        MAX-ACCESS      accessible-for-notify

        STATUS          current

        DESCRIPTION     "The associated condition just activated
and is active(1), or the

                        condition just deactivated and is now
inactive(2)."

    ::= { nielsenEncoderEventObjects 3 }


    nEncEvtObjConditionName OBJECT-TYPE

        SYNTAX          DisplayString (SIZE(4..20))

        MAX-ACCESS      accessible-for-notify

        STATUS          current

        DESCRIPTION     "The name of the Condition that activated
or deactivated."

    ::= { nielsenEncoderEventObjects 4 }
```

```
nEncEvtObjConditionClass OBJECT-TYPE

    SYNTAX          DisplayString (SIZE(4..20))

    MAX-ACCESS      accessible-for-notify

    STATUS          current

    DESCRIPTION     "The condition class of the Condition
that activated or deactivated."

    ::= { nielsenEncoderEventObjects 5 }


nEncEvtObjConditionDescription OBJECT-TYPE

    SYNTAX          DisplayString

    MAX-ACCESS      accessible-for-notify

    STATUS          current

    DESCRIPTION     "The description of the Condition that
activated or deactivated."

    ::= { nielsenEncoderEventObjects 6 }


nEncEvtObjConfiguredManagers OBJECT-TYPE

    SYNTAX          DisplayString

    MAX-ACCESS      accessible-for-notify

    STATUS          current

    DESCRIPTION     "A semicolon list of configured SNMP
Network Managers"

    ::= { nielsenEncoderEventObjects 7 }


nEncEvtObjEncoderStatusState OBJECT-TYPE

    SYNTAX          NielsenEncoderStatusState

    MAX-ACCESS      accessible-for-notify

    STATUS          current

    DESCRIPTION     "Current EncoderStatus State"

    ::= { nielsenEncoderEventObjects 8 }

-- Nielsen Encoder Notifications


    nielsenEncoderEventsPrefix OBJECT IDENTIFIER ::= {
nielsenEncoderModule 3 }

    nielsenEncoderEvents OBJECT IDENTIFIER ::= {
nielsenEncoderEventsPrefix 0 }
```

```
nEncEvtConditionStateChange NOTIFICATION-TYPE
     OBJECTS          {
                           nEncEvtObjSerialNumber,
                           nEncEvtObjSystemTime,
                           nEncEvtObjConditionState,
                           nEncEvtObjConditionName,
                           nEncEvtObjConditionClass,
                           nEncEvtObjConditionDescription
                           }
     STATUS           current
     DESCRIPTION      "A Condition has either just been
activated, or deactivated."
     ::= { nielsenEncoderEvents 1 }
nEncEvtNetworkManagerChange NOTIFICATION-TYPE
     OBJECT           {
                           nEncEvtObjSerialNumber,
                           nEncEvtObjSystemTime,
                           nEncEvtObjConfiguredManagers
                           }
     STATUS           current
     DESCRIPTION      "Sent after the Configured Network
Managers list has been updated."
     ::= { nielsenEncoderEvents 2 }
nEncEvtEncoderStatusStateChange NOTIFICATION-TYPE
     OBJECT           {
                           nEncEvtObjSerialNumber,
                           nEncEvtObjSystemTime,
                      nEncEvtObjEncoderStatusState
                           }
     STATUS           current
    DESCRIPTION      "Sent when EncoderStatus State changes."
     ::= { nielsenEncoderEvents 3 }


     END
```

Appendix E. Front-Panel LCD Menu Hierarchy Charts

The menu displayed on the front-panel LCD is accessed using the front-panel rocker switches as described in 1.3. The diagrams below provide detailed maps of the menu hierarchy to be used a reference. Figure 101 shows the menu hierarchy for an encoder configured for analog mode, and Figure 102 shows the menu hierarchy for an encoder configured for digital mode.

These diagrams are provided for reference purposes; for a detailed explanation of how to use the front-panel menu, see Section 1.3.

AnaDig1212 Encoder Menu
For Analog Unit Type

Menu Button Functions:

MENU: Go Up / Exit Menu level
SELECT: Go Down / Accept entry
OPTION: Go Left / Modify item
ITEM: Go Right

NOTE:
The MENU button can be used to exit the current Menu level from any item in that Menu level, you don't need to go back to the entry point to exit.

The MENU button can be used to abort changing an item if pressed before the SELECT button makes the new entry active as indicated by the asterisk "*".

| 1212 Analog Menu Select for Status => | 1212 Analog Menu Encoding enabled => | 1212 Analog Menu Encoder Options => | 1212 Analog Menu Serial Number => | 1212 Analog Menu License Info => | 1212 Analog Menu System Version => | 1212 Analog Menu System Time UTC => | 1212 Analog Menu Station Time => | 1212 Analog Menu Unit Temperature => | 1212 Analog Menu Network Settings => | 1212 Analog Menu B.I.S.T. => | 1212 Analog Menu Shutdown/Reboot => |

Status n Conditions =>

Analog Status is OK ChA, ChB

Serial Number nnnnnn

LICENSE EXPIRES dd-mmm-yyyy

System Version v.v.v.v

System Time UTC dd mmm yyyy hh:mm:ss

Station Time <time string> <format>

Unit Temperature T1: nnC T2: nnC

Perform B.I.S.T. ? NO *

Condition # 1

ChA, ChB -34 dBu, -25 dBu

Encoder Options Input Impedance =>

Encoder Options Change Unit Type =>

Shutdown/Reboot Reboot Encoder =>

Shutdown/Reboot Shutdown Encoder=>

Condition # 2

Input Impedance High *

Switch to Digital NO *

Reboot Encoder ? NO *

Shutdown Encoder ? NO *

Condition # n — Loop back to #1

Network Settings LAN =>

Network Settings Network Bypass =>

Network Settings Soft Bypass =>

LAN DHCP =>

LAN IP Address =>

LAN Subnet Mask =>

LAN Gateway =>

LAN MAC address =>

Network Bypass Deasserted *

Soft Bypass Deasserted *

LAN DHCP Enabled *

LAN IP Address nnn.nnn.nnn.nnn *

LAN Subnet Mask nnn.nnn.nnn.nnn *

LAN Gateway nnn.nnn.nnn.nnn *

LAN MAC address nn:nn:nn:nn:nn:nn

Figure 101: Front-Panel LCD Menu Hierarchy (1000-1212-00 Shown Configured for Analog Mode)

Figure 102: Front-Panel LCD Menu Hierarchy (1000-1212-00 Shown Configured for Digital Mode)

FCC Disclaimer

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

ICES Disclaimer

This Class A digital apparatus complies with Canadian ICES-003.

CAN ICES-3 (A)/NMB-3(A)