Extron

NAV E 501 and NAV E 101

Streaming HDMI Encoders



User Guide
NAV Pro AV Over IP

68-2751-01, Rev. D
11 26

Safety Instructions

Safety Instructions • English

WARNING: This symbol, ⚡, when used on the product, is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

ATTENTION: This symbol, ⚠, when used on the product, is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

For information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the Extron Safety and Regulatory Compliance Guide, part number 68-290-01, on the Extron website, **www.extron.com.**

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Pour en savoir plus sur les règles de sécurité, la conformité à la réglementation, la compatibilité EMI/EMF, l'accessibilité, et autres sujets connexes, lisez les informations de sécurité et de conformité Extron, réf. 68-290-01, sur le site Extron, **www.extron.com**.

Istruzioni di sicurezza • Italiano

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ATTENTZIONE: Il simbolo, ⚠, se usato sul prodotto, serve ad avvertire l'utente della presenza di importanti istruzioni di funzionamento e manutenzione nella documentazione fornita con l'apparecchio.

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Для получения информации о правилах техники безопасности, соблюдении нормативных требований, электромагнитной совместимости (ЭМП/ЭДС), возможности доступа и других вопросах см. руководство по безопасности и соблюдению нормативных требований Extron на сайте Extron: , **www.extron.com**, номер по каталогу - 68-290-01.

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敬请访问 Extron 网站，**www.extron.com**，参见 Extron 安全规范指南，产品编号 68-290-01。

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安全上のご注意、法規厳守、EMI/EMF適合性、その他の関連項目については、エクストロンのウェブサイト **www.extron.com** より『Extron Safety and Regulatory Compliance Guide』(P/N 68-290-01) をご覧ください。

안전 지침 • 한국어

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FCC Class A Notice

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. The Class A limits 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 interference. This interference must be corrected at the expense of the user.

ATTENTION:

- The Twisted Pair Extension technology works with unshielded twisted pair (UTP) or shielded twisted pair (STP) cables; but to ensure FCC Class A and CE compliance, STP cables and STP Connectors are required.
- La technologie extension paires torsadées fonctionne avec les câbles paires torsadées blindées (UTP) ou non blindées (STP). Afin de s'assurer de la compatibilité entre FCC Classe A et CE, les câbles STP et les connecteurs STP sont nécessaires.

NOTES:

- This unit was tested with shielded I/O cables on the peripheral devices. Shielded cables must be used to ensure compliance with FCC emissions limits.
- For more information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the **Extron Safety and Regulatory Compliance Guide** on the Extron website.

Battery Notice

This product contains a battery. Do not open the unit to replace the battery. If the battery needs replacing, return the entire unit to Extron (for the correct address, see the Extron Warranty section on the last page of this guide).

CAUTION: Risk of explosion. Do not replace the battery with an incorrect type. Dispose of used batteries according to the instructions.

ATTENTION : Risque d'explosion. Ne pas remplacer la pile par le mauvais type de pile. Débarrassez-vous des piles usagées selon le mode d'emploi.

Conventions Used in this Guide

Notifications

The following notifications are used in this guide:



CAUTION: Shock hazard. Disconnect all power sources.

ATTENTION : Risque d'électrocution. Débranchez toutes les sources d'alimentation.

CAUTION: Risk of minor personal injury.

ATTENTION :Risque de blessure mineure.

ATTENTION:

- Risk of property damage.
- Risque de dommages matériels.

NOTE: A note draws attention to important information.

TIP: A tip provides a suggestion to make working with the application easier.

Software Commands

Commands are written in the fonts shown here:

```
^AR Merge Scene,,0p1 scene 1,1 ^B 51 ^W^C.0
[01] R 0004 00300 00400 00800 00600 [02] 35 [17] [03]
Esc X1 * X14 * X17 * X20 * X18 CE ←
```

NOTE: For commands and examples of computer or device responses used in this guide, the character "0" is the number zero and "O" is the capital letter "o."

Computer responses and directory paths that do not have variables are written in the font shown here:

```
Reply from 208.132.180.48: bytes=32 times=2ms TTL=32
C:\Program Files\Extron
```

Variables are written in *italics* as shown here:

```
ping xxx.xxx.xxx.xxx –t
SOH R Data STX Command ETB ETX
```

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the **File** menu, select **New**.

Click the **OK** button.

Specifications Availability

Product specifications are available on the Extron website, **www.extron.com**.

Extron Glossary of Terms

A glossary of terms is available at **https://www.extron.com/technology/glossary.aspx**

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Introduction

This section contains the following topics:

- **About this Guide**
- **About the NAV System**
- **Features**

About this Guide

This guide contains installation, configuration, and operating information for the following Extron streaming encoders:

- **NAV E 501 Encoder** — Streams HDMI video and audio over a managed 1G IP network. Also supports USB and Ethernet extension.
- **NAV E 101 Encoder** — Streams HDMI video and audio over a managed 1G IP network.

NOTE: In this guide:

- The NAV E 501 and NAV E 101 are both referred to as an “encoder.” They are referenced by model name when differences exist.
- NAV encoders and decoders collectively are referred to as “endpoints.”

About the NAV System

The Extron NAV decoders and one or more compatible encoders form an AV distribution and switching matrix on an Internet Group Management Protocol (IGMP) Managed IP Network. The encoders are configured for low latency multicast streaming. The decoders are configured to join the assigned multicast group.

About the Encoder

A NAV encoder inputs an HDMI video signal and generates a video and audio stream that can be transmitted over an IP network using the Extron PURE3 Codec. The PURE3 Codec exceeds many of the performance characteristics of existing compression formats and provides exceptionally robust protection against network errors, making it ideal for quality-critical applications.

The data stream can include:

- HDCP-compliant HDMI video (which can include embedded digital audio [SMPTE 299M and SMPTE 272M-A]) at resolutions up to 4k @ 60 Hz
- Optional analog audio
- **NAV E 501 only** — USB 2.0 port control and data signals
- **NAV E 501 only** — An Ethernet Extension port allows communication to the same network

You can manage the endpoints using an Extron NAVigator System Manager (see figure 1). The base version of the NAVigator can control up to 16 endpoints. Available LinkLicense expansion options can accommodate up to 240 endpoints.

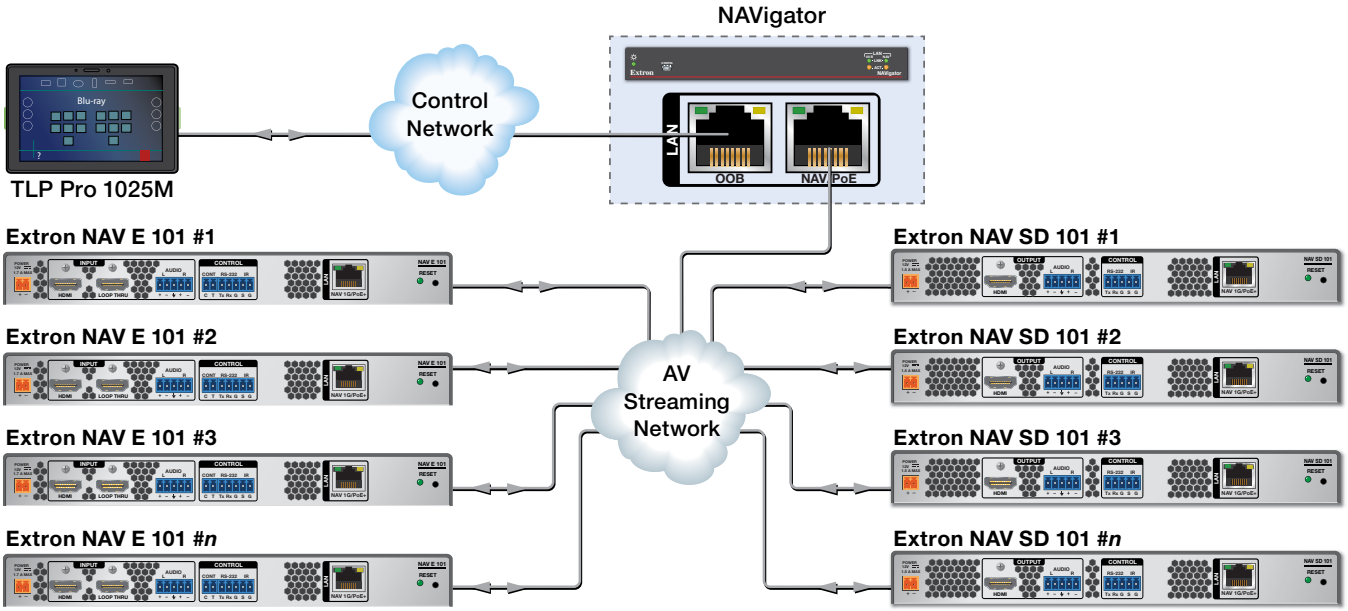


Figure 1. Typical NAV Application

The streamed NAV signal is routed using a managed network switch and can be dedicated to a specific LAN. AV switching can be done via a control system by interfacing to the NAV decoder or the NAVigator.

NOTE: The RS-232 and IR communications are driven via a control system. The encoder and decoder do not generate or respond to the RS-232 and IR communication signals.

About the Decoder

One or more compatible decoders, such as the NAV SD 501 or NAV SD 101, decode the data stream back into the original video and audio signal formats and output them locally.

System Interaction and Capabilities

Each encoder and decoder has an integrated web interface. All normal system configuration and control is via the web interface of the NAVigator. Using a computer on the same network and a standard web browser; such as Google Chrome™, Mozilla™ Firefox™, or Microsoft® Edge™; you can configure any encoder or decoder unit in the system.

The embedded audio can be transported as a 2-channel LPCM uncompressed stream. Audio can follow video to the same decoder or be broken away to a different endpoint.

Equipped with an IP Link Pro Series Expansion Port, is available for distributing RS-232 and IR data with the coded/decoded video, such as for control of a projector. Tally and Contact Closure supports Extron Show Me Cables.

The units are housed in 1-inch high, half-rack width metal enclosures that can be mounted in any standard 19-inch rack or under furniture with optional mounting kits.

The external 100 VAC to 240 VAC, 50-60 Hz power supply provides worldwide power compatibility.

Features

- **Encodes and streams video and audio over 1 Gbps Ethernet networks** — Standard 1 Gbps Ethernet supports flexible system design and transmission over large distances to any location.
- **Supports HDMI 2.0 at resolutions up to 4K/60 @ 4:4:4** — HDMI up to 4K @ 60 Hz (4096 x 2160) with full 4:4:4 chroma subsampling ensures accurate reproduction of source images.
- **PURE3 Codec** — Patented by Extron, the wavelet-based compression technology delivers high image quality with very low-latency at highly efficient bit rates. With its high immunity to network errors and built-in error concealment, PURE3 facilitates reliable, real-time delivery of visually lossless video over IP networks.
- **PURE3 Intelligent Selective Streaming (ISS)** — Leverages low motion content to achieve extremely low bitrates while maintaining visually lossless performance.
- **Interoperable with 10 Gbps NAV endpoints** — 1 Gbps video can be readily decoded by 10 Gbps decoders for greater compatibility in mixed 1 Gbps/10 Gbps solutions.
- **Ultra-low latency with high quality video** — Streams professional-grade video with ultra-low latency using the unique wavelet-based Extron PURE3 codec, guaranteeing exceptional user experience and accurate reproduction of every detail.
- **AES67 audio support** — Supports the AES67 audio over IP standard, providing compatibility with Extron and third-party DSP processors.
- **HDCP 2.3 compliant** — Ensures display of content-protected media and interoperability with other HDCP-compliant devices.
- **(NAV E 501 only) USB 2.0 extension** — Built-in USB 2.0 extension facilitates connection to peripheral USB devices over the same cable as video and audio. Ideal for KVM applications or remote connectivity for USB cameras or storage devices.
- **(NAV E 501 only) Ethernet expansion** — Built-in Ethernet expansion facilitates connection to peripheral Ethernet-enabled devices over the same cable as video and audio. Saves on cabling cost in installations with any remote devices requiring LAN connectivity.
- **PoE+ compatibility eliminates the need for a local power supply** — PoE+ enables receipt of power directly from the PoE switch, eliminating the need for bulky local power supplies.
- **SRTP stream encryption (SRTP)** — Ensures encryption, message authentication, and data integrity for video and data streams.
- **Audio breakaway enables independent audio and video switching** — Provides the capability to break away an audio signal from its corresponding video signal.
- **Customizable Screen Saver** — Displays a user-supplied custom image, black screen, blue screen, or the last video frame when no active video signal or stream is present.
- **Custom Borders** — Displays full-screen borders in a variety of colors applied by the control system. These borders may be used in many applications such as security classification, alarm condition, or active displayidentification.
- **Priority Routing** — Assign custom tags to endpoints using built-in NAVigator HTML pages. Tags can be used to further classify endpoints, easily locate them on the network, or apply rules for routing with an Extron control system.
- **802.1X port-based Network Access Control** — Supports 802.1X port-based authentication, requiring that all devices are approved before network access is granted.
- **Certified FIPS 140-2 module** — Extron cryptographic module meets NIST and CCS guidelines and is certified by CMVP to the FIPS 140-2 information processing standard in order to ensure protection of sensitive data.
- **Active Directory support** — Integrates with Microsoft Active Directory, simplifying user management, group authentication, and helping to maintain strong security policies.
- **Adjustable bit rate** — Selects bit rates while maintaining image quality for a more flexible network configuration that easily adapts to different application requirements. A non-blocking solution is available to accommodate even very large installations.

- **Error concealment** — Offers high immunity to network errors, ensuring reliable transmission of high quality imagery with the ability to conceal errors even during incidents of heavy packet loss.
- **HDMI loop-through** — Local HDMI output provides signal for a local display, an AV system, or a hardware codec, enabling monitoring or sharing of content without the need for a separate distribution amplifier.
- **Embedded web interface** — Intuitive, user-friendly embedded web interface simplifies device configuration, setup, and system operation.
- **EDID Minder automatically manages EDID communication between connected devices** — EDID Minder ensures that all sources power up properly and reliably output content for display.
- **Key Minder continuously verifies HDCP compliance for quick, reliable switching** — Key Minder authenticates and maintains continuous HDCP encryption between input and output devices to ensure quick and reliable switching in professional AV environments, while enabling simultaneous distribution of a single source signal to one or more displays.
- **HDCP Visual Confirmation** — When HDCP-encrypted content is transmitted to a non-HDCP compliant display, a full-screen green signal is sent to the display for immediate visual confirmation that protected content cannot be viewed on that display.
- **Supports analog and embedded HDMI audio signals** — Directly interfaces with common AV source signals for compatibility with most audio devices.
- **Compatible with Show Me cables** — Show Me cables and retractors provide convenient connectivity, user input selection, and control of AV systems.
- **Integrates with Pro Series control systems for secure, user-friendly external control** — Designed to integrate directly with Extron Pro Series control systems for secure, encrypted RS-232 and IR control of external devices without the need for additional control processors.
- **Consumer Electronics Control (CEC) capability** — CEC commands can be triggered to control displays or other AV devices connected over HDMI.
- **IP Link Secure Platform Interface** — Working natively with NAV Systems, Extron Pro Series control systems offer flexible system management and matrix switching control via a Secure Platform Interface that encrypts all commands from control processor to endpoint. Together, NAV and Extron Pro Series control systems create the most secure and reliable Pro AV over IP solution on the market.
- **Multicast filtering with IGMPv3** — Supports multicast filtering with IGMPv3 for lower bandwidth consumption. Enables use of standard network equipment.
- **One-button endpoint identification** — Identify endpoints with an ID button and indicator for quick discovery of units on a network, simplifying diagnostics and installation.
- **External Extron Everlast power supply included** — Provides worldwide power compatibility with high-demonstrated reliability and low power consumption.
- **Extron Everlast Power Supply is covered by a 7-year parts and labor warranty.**
- **1-inch (2.5 cm) high, half rack width metal enclosure** — Compact, low profile enclosure for discreet placement and concealment.
- **ZipClip 400 included** — Enables quick and secure mounting to rack rails, tables, shelves, and lecterns.

Installation and Basic Operation

This section describes the installation and the operation of the NAV E 501 and NAV E 101 encoders, including:

- **Mounting**
- **Rear Panel Connections and Features**
- **Front Panel Connection and Indicators**
- **Startup and Basic Operation**

Mounting

If desired, mount the encoder in a rack (see **Mounting the Encoder**).

Rear Panel Connections and Features

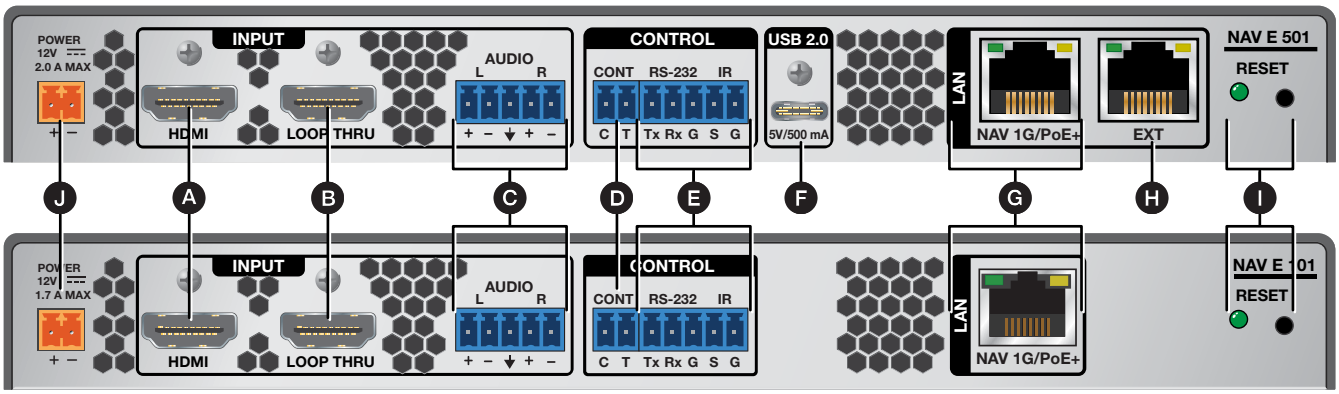


Figure 2. NAV E 501 and NAV E 101 Rear Panel Connectors and Features

- **A HDMI input port**
- **B LOOP THRU port**
- **C AUDIO input port**
- **D CONTROL Contact Closure port**
- **E CONTROL RS-232/IR port**
- **F USB 2.0 port** *(NAV E 501 only)*
- **G NAV 1G/PoE+ port**
- **H Extension port** *(NAV E 501 only)*
- **I RESET button and LED**
- **J Power connector**

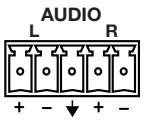
A HDMI input port — Connect an HDMI cable between this port and the HDMI output port (or DVI port, with an appropriate adapter) of the digital video source (see **LockIt Plus Lacing Brackets** to use the LockIt HDMI Cable Lacing Bracket to secure the connector to the encoder).



B LOOP THRU port — Connect a display to this female HDMI connector for local loop-through monitoring of the source signal (see **LockIt Plus Lacing Brackets**).



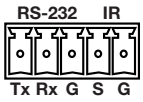
C Audio input port — Connect balanced or unbalanced stereo audio input to this 5-pole, 3.5 mm captive screw connector (see **Analog audio connectors** to wire the connector).



D CONTROL Contact Closure port — Connect an Extron Show Me cable to the port to allow an Extron Teamwork 400 user to request to take over the presentation from this encoder (see the *Teamwork 400 User Guide* available at **www.extron.com**).



Ⓔ **CONTROL RS-232/IR port** (see **figure 2**) — Connect a serial RS-232 signal, amodulated IR signal, or both to this 3.5 mm, 5-pole captive screw connector for bidirectional RS-232 and IR communication (see **Control connector wiring** to wire the connector).



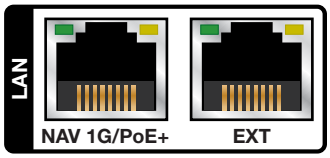
Ⓕ **USB 2.0 port** (NAV E 501 only) — Connect a USB Type-C® cable from a USB host or a USB device (see **LockIt Plus Lacing Brackets** to securely fasten the USB connector to the encoder).

NOTE: This connector is limited to supplying 500 mA in USB device mode.



Ⓖ **NAV 1G/PoE+ port** — Connect to an Ethernet LAN on which one or more decoders also reside for streaming, control, and PoE+.

Ⓗ **Extension port** (NAV E 501 only) — If desired, connect another networked device to this port. The port acts as a networked switch to the NAV 1G/PoE+ port (Ⓖ).



NOTES:

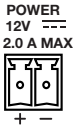
- See **TP cable termination** to properly wire the RJ-45 connectors Ⓖ and Ⓗ.
- The Extension port (Ⓗ) cannot provide PoE.
- RJ-45 port LEDs for both ports indicate as follows:
  - Act (amber) LED — Indicates transmission of data packets on the RJ-45 connector. This LED blinks as the encoder communicates.
  - Link (green) LED — Indicates that the encoder is properly connected to an Ethernet LAN. This LED lights steadily.

Ⓘ **RESET button and LED** — The RESET button initiates three levels of encoderreset. For the different reset levels, press and hold the button while the encoder is running or while you power up the encoder (see **Reset Operations** for details).



Ⓙ **Power connector** — Plug the included external 12 VDC power supply into this 2-pole connector to power the encoder locally.

NOTE: Alternatively, the encoder can be powered via PoE.



ATTENTION:

- Do not connect power to the encoder until you have read the **CAUTION** and **ATTENTION** notices.
- Ne connectez pas l'alimentation à l'encodeur avant d'avoir lu les rubriques « **ATTENTION** » des page 10.

Connector and Cable Details

HDMI connectors

HDMI signals for 4K video run at a very high frequency and are especially prone to errors caused by bad video connections, too many adapters, or excessive cable length. To avoid the loss of an image or jitter, follow these guidelines:

- Do not exceed 12 feet (3.6 meters) on the encoder input or loop-thru output.
- Use only a cable designed for HDMI signals.
- Limit or avoid the use of adapters.
- Use only cables specifically intended for HDMI or DVI signals. Use of non-HDMI or non-DVI cables or modified cables can result in a missing video output.

Lockit Plus Lacing Brackets

To securely fasten an HDMI or USB cable cable to a device:

1. **Plug in the cable** – Connect the HDMI cable to the port (see figure 3, ❶).

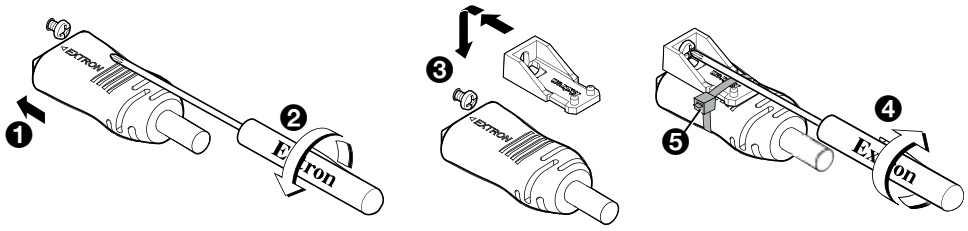


Figure 3. Installing the Lockit Plus Lacing Bracket

2. **Loosen the screw** – Slightly loosen the mounting screw (do not remove it, ❷).
3. **Attach the bracket** – Place the bracket over the screw (❸) and tighten it (❹). Do not overtighten the connector mounting screw.
4. **Secure the cable** – Tighten the tie wrap around the connector and bracket (❺), and cut off the extra length.

Analog audio connectors

See figure 4 to wire a connector for the appropriate input type. Connectors are included with the encoder, but you must supply the audio cable. Use the supplied tie-wrap to strap the cable to the extended tail of the connector.

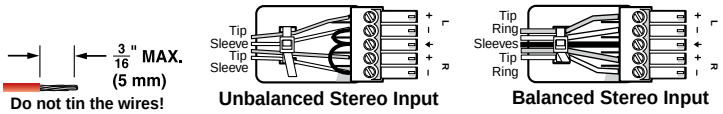
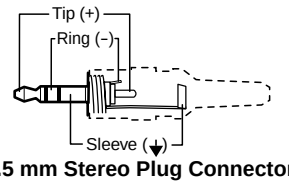


Figure 4. Captive Screw Connector Wiring for Audio Inputs

NOTES:

- The length of exposed wires is important. The ideal length is 3/16 inch (5 mm).
  - If the stripped section of wire is longer than 3/16 inch, the exposed wires may touch, causing a short circuit.
  - If the stripped section of wire is shorter than 3/16 inch, wires can be easily pulled out even if tightly fastened by the captive screws.
- Do not tin the wires before installing them in the connector. Tinned wires are not as secure in the connector and could be pulled out.

A balanced stereo audio connector consists of a tip, ring, and sleeve. An unbalanced mono audio connector consists of a tip and sleeve. When you are making connections for the units from existing audio cables, see the drawing at right to identify the tip, ring, and sleeve parts of the connector. The ring, tip, and sleeve wires are also shown on the captive screw audio connector diagram (see figure 4).



3.5 mm Stereo Plug Connector

Control connector wiring

Figure 5 shows how to wire the Control RS-232/IR connector.

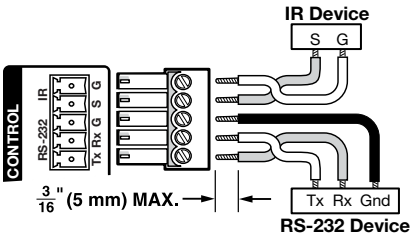


Figure 5. Control Connector Wiring

NOTES:

- The IR S and G line pair and the RS-232 Tx and Rx line pair must each cross once between this connector and the source or destination.
- The length and preparation of exposed wires is important (see the audio connector **NOTES** above for details).

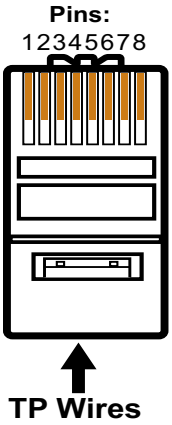
TP cable termination

The encoder NAV 1G/PoE+ port supports 1000Mbps (1000base T — Gigabit Ethernet), half-duplex and full-duplex Ethernet connections. It is vital that your Ethernet cable be the correct cable type and that it be properly terminated with the correct pinout. Ethernet links use Category (CAT) 5e or CAT 6, unshielded twisted pair (UTP) or shielded twisted pair (STP) cables, terminated with RJ-45 connectors. Ethernet cables are limited to a length of 328 feet (100 meters).

NOTES:

- A CAT 5e cabling infrastructure is the minimum acceptable to support a NAV system. Anything less is insufficient.
- Do not stretch or bend cables. Transmission errors can occur.

The Ethernet cable must be terminated as a patch (straight-through) cable and must be properly terminated in accordance with the **TIA/EIA T568-B** wiring standard (see figure 6).



Pin	TIA/EIA T 568B Wire color
1	White-orange
2	Orange
3	White-green
4	Blue
5	White-blue
6	Green
7	White-brown
8	Brown

Figure 6. RJ-45 Connector and Pinout Table

Power supply wiring

Figure 7 shows how to wire the connector. Use the supplied tie-wrap to strap the power cord to the extended tail of the connector.

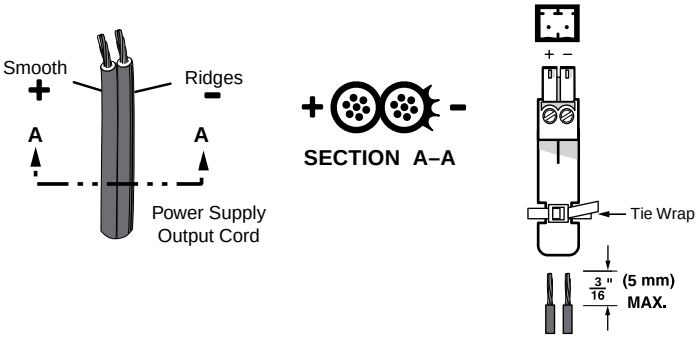


Figure 7. Power Connector Wiring

CAUTION:

ATTENTION :

- The DC output cables must be kept separate from each other while the power supply is plugged in. Remove power before wiring.
- Les câbles de sortie CC doivent être séparés les uns des autres tant que la source d'alimentation est branchée. Coupez l'alimentation avant d'effectuer les raccordements.

- The length of exposed wires is critical. The ideal length is 3/16 inch (5 mm).
  - Any longer and the exposed wires may touch, causing a short circuit.
  - Any shorter and the wires can be easily pulled out even if tightly fastened by the captive screws.
- La longueur des câbles exposés est primordiale. La longueur idéale est de 5 mm (3/16 inches).
  - S'ils sont un peu plus longs, les câbles exposés pourraient se toucher et provoquer un court circuit.
  - S'ils sont un peu plus courts, ils pourraient sortir, même s'ils sont attachés par les vis captives.

- Do not tin the power supply leads before installing them in the connector. Tinned wires are not as secure in the connector and could be pulled out.
- Ne pas étamer les conducteurs avant de les insérer dans le connecteur. Les câbles étamés ne sont pas aussi bien fixés dans le connecteur et pourraient être retirés.

ATTENTION:

- If not provided with a power supply, this product is intended to be supplied by a UL Listed power source marked "Class 2" or "LPS" and rated output 12Vdc, minimum 2.0 A or 56Vdc (PoE), minimum 0.8 A. Always use a power supply supplied by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.
- Si le produit n'est pas fourni avec une source d'alimentation, il doit être alimenté par une source d'alimentation certifiée UL de classe 2 ou LPS, avec une tension nominale 12 Vcc, 2.0 A minimum ou 56Vdc (PoE), minimum 0.8 A. Utilisez toujours une source d'alimentation fournie ou recommandée par Extron. L'utilisation d'une source d'alimentation non autorisée annule toute conformité réglementaire et peut endommager la source d'alimentation ainsi que le produit final.

- Power over Ethernet (PoE) is intended for indoor use only. It is to be connected only to networks or circuits that are not routed to the outside plant or building.
- L'alimentation via Ethernet (PoE) est destinée à une utilisation en intérieur uniquement. Elle doit être connectée seulement à des réseaux ou des circuits qui ne sont pas routés au réseau ou au bâtiment extérieur.

- Unless otherwise stated, the AC/DC adapters are not suitable for use in air handling spaces or in wall cavities.
- Sauf mention contraire, les adaptateurs AC/DC ne sont pas appropriés pour une utilisation dans les espaces d'aération ou dans les cavités murales.

ATTENTION:

- The installation must always be in accordance with the applicable provisions of National Electrical Code ANSI/NFPA 70, article 725 and the Canadian Electrical Code part 1, section 16. The power supply shall not be permanently fixed to a building structure or similar structure.
- Cette installation doit toujours être en accord avec les mesures qui s'applique au National Electrical Code ANSI/NFPA 70, article 725, et au Canadian Electrical Code, partie 1, section 16. La source d'alimentation ne devra pas être fixée de façon permanente à une structure de bâtiment ou à une structure similaire.

- Power supply voltage polarity is critical. Incorrect voltage polarity can damage the power supply and the unit. The ridges on the side of the cord (see **figure 7**) identify the power cord negative lead.
- La polarité de la source d'alimentation est primordiale. Une polarité incorrecte pourrait endommager la source d'alimentation et l'unité. Les stries sur le côté du cordon (voir **l'illustration 7**) permettent de repérer le pôle négatif du cordon d'alimentation.

To verify the polarity before connection, plug in the power supply with no load and check the output with a voltmeter.

Front Panel Features

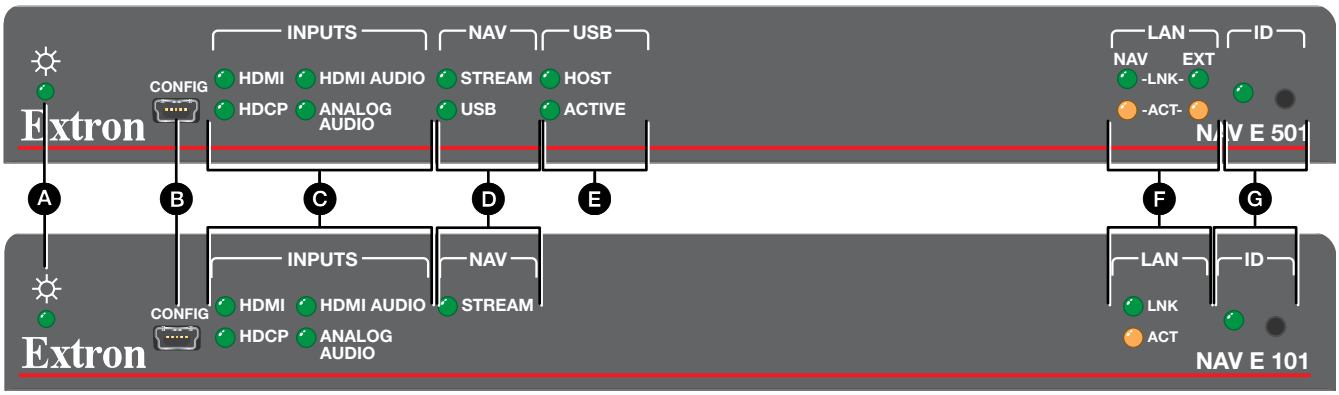


Figure 8. Encoder Front Panel Features

- **A Power LED**
- **B CONFIGURATION port**
- **C INPUTS LEDs**
- **D NAV LEDs**
- **E USB LEDs** (NAV E 501 only)
- **F LAN LEDs**
- **G ID button and LED**

A Power LED — Indicates power and startup status, as follows:

- **Blinking** — The unit is receiving power, either locally or via PoE and is booting up.
- **Lit** — The unit is receiving power, either locally or remotely (via PoE) and is operational.

B CONFIGURATION port — This USB mini-B port (USB 2.0) can be used to configure the encoder and to update firmware.

C INPUTS LEDs — Indicate status of the signal inputs, as follows:

- **HDMI LED** — The encoder is receiving an active HDMI input signal.
- **HDCP LED** — The HDMI signal is HDCP encrypted.
- **HDMI Audio LED** — The embedded HDMI audio input is selected.
- **Analog Audio LED** — The analog audio input is selected.

D **NAV LEDs** (see **figure 8**) — Indicate the output status of the AV and USB (NAV E 501 only) streams, as follows:

- **Stream LED**
  - **Lit steadily** – The encoder is actively streaming a NAV output consisting of video, audio, or both to one or more NAV decoders.
  - **Blinking** – The encoder is actively streaming a NAV output, but network errors are present.
  - **Unlit** - The encoder is not actively streaming a NAV output.
- **USB** (NAV E 501 only)
  - **Lit steadily** – The encoder is actively sending and receiving a NAV USB stream.
  - **Blinking** – The encoder is unable to establish a NAV USB stream.
  - **Unlit** — The encoder is not actively sending and receiving a NAV USB stream.

E **USB LEDs** (NAV E 501 only)— Indicate the mode and status of the rear panel USB port, as follows:

- **Host**
  - **Lit steadily** – The encoder is in USB host mode, the default condition.
  - **Unlit** – The encoder is in USB device mode.

  NOTES:
  - You can tie a USB host only to a USB device for proper system operation.
  - If you connect a host, such as a PC, to an endpoint that is in USB device mode, the endpoint cannot recognize the device.
- **Active**
  - **Lit steadily** – A host or USB device is connected to the rear panel USB port.
  - **Unlit** – No host or USB device is connected to the rear panel USB port.
  - **Blinking** – A USB device or hub is connected to the encoder and is drawing more power than the USB port can supply.

F **LAN LEDs** — Indicate the status of the network connections, as follows:

- **NAV LEDs** (NAV E 501) or **LAN LEDs** (NAV E 101) — Indicates the NAV network connection status.
- **Link LED** — Indicates the status of the link.
  - **Lit steadily**— Indicates that a network link is established at 1 Gbps.
  - **Blinking** – Indicates that network link is established less than 1 Gbps.
- **Act LED** — Indicates the network traffic rate. The blink rate corresponds to activity.
- **Ext LEDs** (NAV E 501 only) — Indicates the Ethernet Extension status.
- **Link LED** — Indicates the status of the link.
  - **Lit steadily**— Indicates that a network link is established.
  - **Blinking** – Indicates that network link is established less than 1 Gbps.
- **Act LED** — Indicates the network traffic rate. The blink rate corresponds to activity.

G **ID button and LED** — The recessed ID button, when pressed, identifies the encoder to other network units and to the embedded HTML pages (see **Pairing Devices Manually**). The LED blinks when the encoder is in pairing mode and lights when it is paired or device identification is selected from the encoder or NAVigator HTML page.

NOTE: The `ID` button triggers the `Status` on-screen display (OSD), which shows on the LOOP THRU port (see **figure 2**, **B**).

Startup and Basic Operation

Power

The encoder can be powered in one of three ways:

- Locally, from the included external power supply and via the power connector (see **figure 2**, J).
- Remotely, receiving PoE via the NAV 1G/PoE+ port (see G); either from the network switch or from an optional PI 140 Power Injector.
- Locally (J) and remotely (G), with priority on the NAV 1G/PoE+ port. If PoE voltage drops below a threshold, the encoder immediately transitions to the power connector with no effect on system operation.

When power is applied, the encoder runs a series of self-tests that blink the front panel Power LED and all other indicators. The encoder then boots the NAV operating system. It can take approximately 45 seconds for self-test and system startup to complete. When the process is complete, the Power LED lights steadily.

NOTE: The encoder is NOT operational until the boot process is complete (the Power LED is lit steadily).

Pairing Devices Manually

Manually pair devices as follows:



1. Use a Tweeker or other small screwdriver to press and hold the encoder front panel **ID** button for approximately 3 seconds, until the ID LED blinks. The encoder enters pairing mode.
2. One at a time, use a Tweeker or other small screwdriver to press and hold the decoder front panel **ID** button for approximately 3 seconds, until the ID LED blinks. Release the **ID** button. The decoder is now paired to the encoder.
3. Repeat step 2 for each decoder.
4. Use a Tweeker or other small screwdriver to press and release the encoder front panel **ID** button. The encoder exits pairing mode.
5. Repeat steps 1 through 4 to pair decoders to other encoders.

NOTE: Units can be paired manually via the ID button, but they cannot be unpaired manually. To unpair units, use the embedded HTML pages of either the decoder (see the applicable decoder user guide) or of the NAVigator (see the *NAVigator User Guide*). The applicable user guides are available at **www.extron.com**.

Operation

After the encoder, all decoders, and their connected devices are fully booted up and operational (the Power LED on each unit is lit steadily) and the devices are paired, the system is fully operational. If any problems are encountered, ensure all cables are routed and connected properly.

System operation with a NAVigator

Your NAV system must include an Extron NAVigator, a system manager that configures and controls the AV streaming system. The NAVigator allows you to make changes to multiple endpoints in the system from a central location, simplifying operations such as making ties or bulk configuration.

The base version of the NAVigator can support up to 16 endpoints by default, but if a LinkLicense is installed, support can be expanded to up to 240 endpoints, depending on the LinkLicense.

See the *NAVigator User Guide*, available at **www.extron.com** for details.

Configuration and other operations

Configuration and more complex operation of the system is accomplished via embedded web pages (see **HTML Operation**, beginning) or Extron Toolbelt. Simple Instruction Set (SIS) commands (see **SIS Operations**, starting) cannot be issued directly to the encoder, but are issued via an Extron control system on the AV network using a process known as “encapsulation” (see the *NAVigator User Guide*, available at **www.extron.com** for details).

Reset operations

The rear panel **RESET** button initiates three levels of resets. The RESET button is recessed, so use a pointed stylus, ballpoint pen, or small screwdriver to access it.

See the **table** for a summary of the modes.

ATTENTION:

- Review the reset modes carefully. Using the wrong reset mode may result in unintended loss of flash memory programming, port reassignment, or an encoder reboot.
- Étudier de près les différents modes de réinitialisation. Appliquer le mauvais mode de réinitialisation peut causer une perte inattendue de la programmation de la mémoire flash, une reconfiguration des ports ou une réinitialisation du contrôleur.

NOTES:

- The reset modes listed in the **table** are separate functions, not a continuation from mode 1 to mode 5.
- The modes listed close all open IP and other connections and close all sockets.

Reset Mode Comparison and Summary			
Mode	**Activation**	**Result**	**Purpose and Notes**
Run boot code	Hold down the recessed **RESET** button while applying power to the unit. NOTE: After a boot code reset, update the unit firmware to the latest version. Do not operate the unit firmware version that results from the mode 1 reset. If you want to use the factory default firmware, you must upload that version again (see **FIRMWARE tab** for details on uploading firmware).	**The unit reverts to the factory default firmware.** All user files and settings, such as IP settings, are maintained. NOTE: If you do not want to update firmware, or you performed this reset by mistake, cycle power to the unit to return to the firmware version that was running before the mode 1 reset (see **About Page** to find the firmware version).	Use to return the unit to the factory default firmware version if incompatibility issues arise with user-loaded firmware.
Reset network IP settings	Hold the **RESET** button for approximately 6 seconds, until the `Reset` LED blinks twice (once at 3 seconds and again at 6 seconds). Then momentarily press **RESET** within 1 second.	**Resets all the IP settings without affecting the device configuration:** • Enables ARP capability. • Sets the IP address, subnet address, gateway address, and port mapping to the factory default. • Sets the Multicast IP, stream number and device name to the factory default. • Turns DHCP on. The `Reset` LED blinks three times in succession during the reset.	Enables you to set IP address information using ARP and the MAC address.

Full factory reset	Hold the **RESET** button for approximately 9 seconds, until the `Reset` LED blinks three times (once at 3 seconds, again at 6 seconds, and then again at 9 seconds). Then momentarily press **RESET** within 1 second.
	
	NOTE: Reverts the factory-configured username to `admin` and password to `extron`.
		Performs a complete reset to factory defaults (with the exception of the firmware):
		• Does everything mode 4 does.
		  • Resets all settings with the exception of factory firmware.
		  • Resets all IP options.
		  • Removes all files from the unit.
		  • Removes the initial serial number passwords and sets them to `extron`.
		The `Reset` LED blinks four times in succession during the reset.
			For starting over with configuration and uploading or to replace events.
			Same as the Esc**ZQQQ**← SIS command.

Performing Factory and IP Resets

Perform resets of the unit as follows (see figure 9):

1. Use a small screwdriver to press and **hold** the rear panel **RESET** button until the rear panel `Reset` LED blinks either:
   - Twice, for an IP settings reset
   - Three times for a full factory) reset

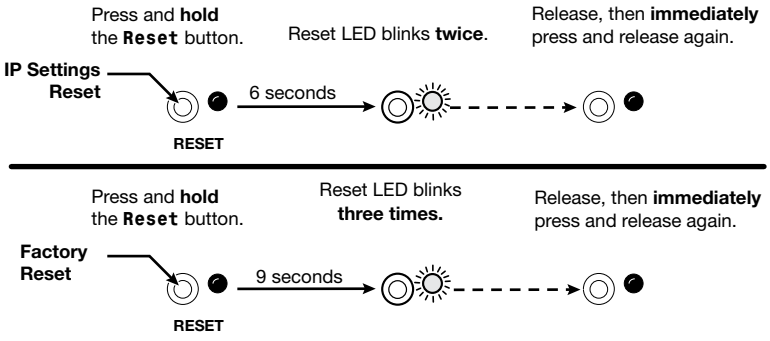


Figure 9. Resets

2. Release the **RESET** button and then immediately press and release the **RESET** button again. Nothing happens if you do not momentarily **RESET** within 1 second.

HTML Operation

This section introduces using the built-in HTML pages to configure and operate the NAV E 501 and NAV E 101 encoders, including:

- **Opening the Embedded HTML Pages**
- **Using the HTML Pages**

The encoder can be controlled and operated through either the front panel Configuration (USB) port (see **figure 8**, B) or the rear panel NAV 1G/PoE+ port (see **figure 2**, G). The Configuration port uses IP over USB technology. The factory-embedded HTML pages are always available and cannot be erased or overwritten.

Opening the Embedded HTML Pages

Access the encoder using HTML pages as follows:

1. Start the web browser.

   NOTES:

   - Extron recommends the following browsers to fully support the NAV system:
     - Google Chrome — All screen images in this guide use Chrome
     - Mozilla Firefox
     - Microsoft Edge
   - The network must be properly configured for multicasting (IGMP). Failure to do so may result in degraded performance.

2. Click in the **`Address`** field of the browser and enter the IP address.

   NOTES:

   - For the NAV 1G/PoE+ port, if unit does not receive an IP address from the DHCP server, it self-assigns a Link Local IP address in the range 169.254.*X*.*X*.
   - **Default settings:**

Port	DHCP	IP address	Subnet mask
Config (USB)*****		`203.0.113.22`	
NAV 1G/PoE+ (RJ-45)†	On		

     ***** **For the Config port**, the address for IP over USB **CANNOT** be changed.

     † **For the NAV 1G/PoE+ port**, if unit does not receive an IP address from the DHCP Server, it self-assigns a Link Local IP address in the range `169.254.`*X*.*X*.

     If you use IP over USB, Extron recommends waiting a minute after plugging in the cable from your PC to identify the USB connection as a valid Ethernet port.

3. Press the keyboard <**`Enter`**> key.

NOTES:

- If you do not have the appropriate SSL Certificate, the browser displays a privacy notification (see figure 10 for a Chrome example). Continue to the login dialog box as follows:

  1. Click **Advanced** (❶). The button changes to `Hide Advanced` and explanatory text and a link appear below the button.

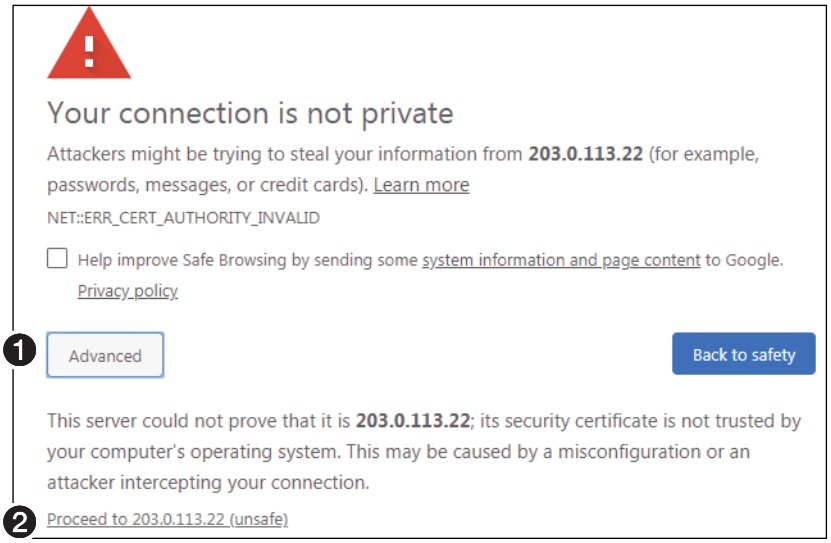


Figure 10. Privacy Notification

  2. Click **Proceed to** <***IP address***> **(unsafe)** (❷).

- Your IT department can provide an uploadable SSL Certificate (see **Toolbelt**). Once the certificate is loaded, the notification does not occur.

The browser opens to the Login dialog box (see figure 11).



Figure 11. Login Dialog Box

4. Enter the **Username** (❶) and **Password** (❷) and click **Sign In** (❸). The browser opens the embedded NAVigator web pages (see **figure 12**).

NOTES:

- The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords revert to the default, which is `extron`.

  The default username is `admin`.
- If the superadmin password is not either the factory password, <*serial number*>, or the default password (`extron`), the encoder cannot be assigned to a NAVigator.
- Passwords are case sensitive.

NOTE: The HTML page shown may open with any of the panels (❷ through ❼ below) selected.

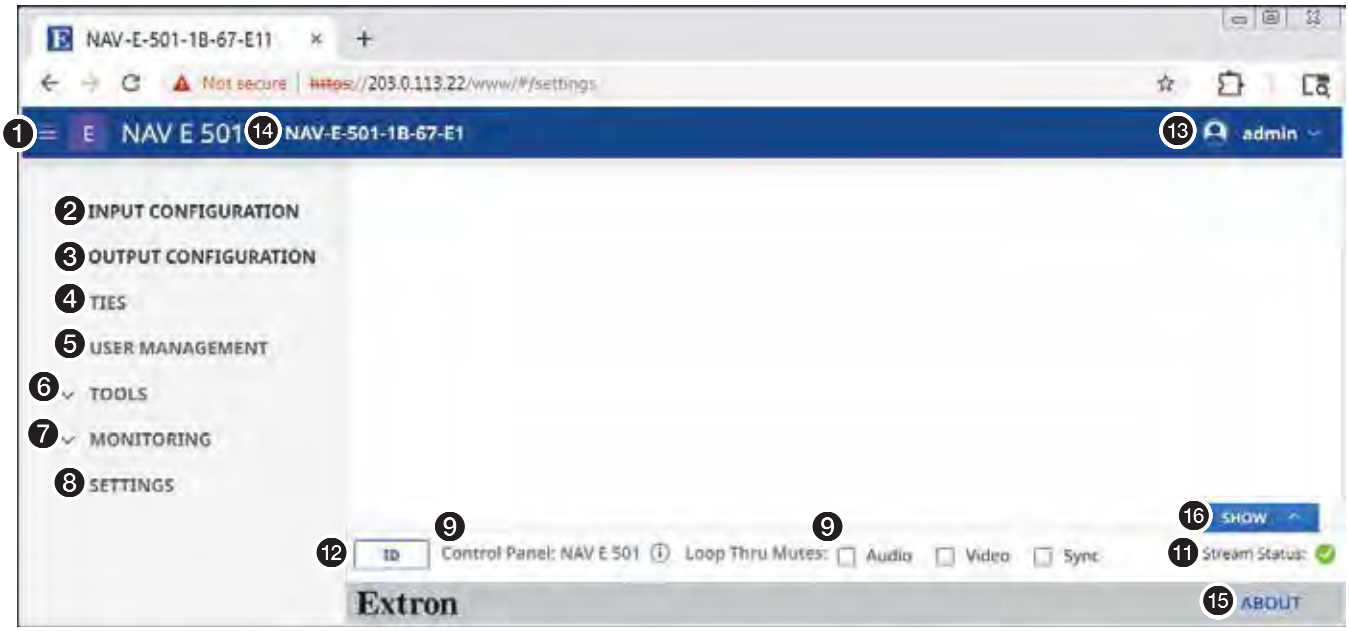


Figure 12. Home Page

See figure 12 and the detailed descriptions in “Using the HTML Pages”.

- ❶ **Menu icon**
- ❷ **INPUT CONFIGURATION link**
- ❸ **OUTPUT CONFIGURATION link**
- ❹ **TIES link**
- ❺ **USER MANAGEMENT link**
- ❻ **TOOLS link**
- ❼ **MONITORING link**
- ❽ **SETTINGS link**
- ❾ **ID button**
- ❿ **Control Panel Information indicator**
- ⓫ **Loop Thru Mutes panel**
- ⓬ **Stream Status indicator**
- ⓭ ***<account name>* link**
- ⓮ **Name banner**
- ⓯ **ABOUT link**
- ⓰ **Show button**

Using the HTML Pages

See figure 12 and the following sections for detailed descriptions of the following pages or functions:

❶ **Menu icon** — Toggles to hide or show the links pane (❷ through ❽).

❷ **INPUT CONFIGURATION link** — Opens a page that provides input configuration information and the ability to change some input values (see **INPUT CONFIGURATION Page**).

❸ **OUTPUT CONFIGURATION link** — Opens a page that provides streaming output configuration information and the ability to change some output values (see **OUTPUT CONFIGURATION Page**).

❹ **TIES link** — Opens a page that displays the status of the input to the encoder and the streaming output (see **TIES Page**).

❺ **USER MANAGEMENT link** — Opens a page that provides tools to manage accounts, access, and passwords and to connect to an Active Directory server (see **USER MANAGEMENT Page**).

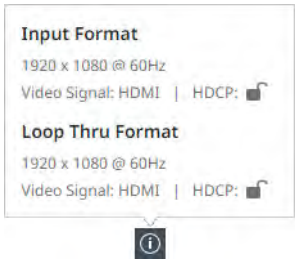
❻ **TOOLS link** — Opens pages that provide NAVigator tools and tools for entire system, including the endpoints (see **Tools Pages**).

❼ **MONITORING link** — Opens a page that shows device status information (see **Monitoring Pages**).

❽ **SETTINGS link** — Opens a page that provides access to many system settings (see **Settings Pages**).

⑨ **ID button** (see **figure 11**) — Click to show the Status OSD on the LOOP OUT port (see **figure 2**, Ⓓ) and light the front panel ID LED (see **figure 8**, Ⓘ).

⑩ **Control Panel Information indicator** — Opens a dialog box that displays the format, resolution, and rate of the input and LOOP OUT output. Click anywhere outside the dialog box to close the box.



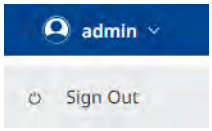
⑪ **Loop Thru Mutes panel** — Select (click) **`Audio`**, **`Video`**, or **`Sync`** to toggle the mute on (do not output) and off (output) for the associated plane.



NOTE: The mute function is for the LOOP OUT port output only (**figure 2**, Ⓓ). Video, audio, and sync are still streamed to the AV network.

⑫ **Stream Status indicator** — Displays the AV stream output status of the encoder, active (), not active (), or error ().

⑬ ***<account name>* link** — Click to display the `Sign Out` button. Click **`Sign Out`** to log out of the NAVigator HTML pages. This is the account name or username for the current device session. It can be:



- `superadmin`, `admin`, or `user`
- A locally-created custom name (see **Creating local accounts**)
- The username of an active directory account currently signed in, such as jsmith (see **USER MANAGEMENT Page**)

NOTES:

- The log in to the HTML pages automatically times out after 30 minutes of user inactivity.
- Signing out is disabled when the encoder is accessed via proxy from another device (see the **NOTE**).

⑭ **Name banner** — Displays the model name and hostname.

⑮ **ABOUT link** — Opens a pane that provides information about the encoder (see **About Page**).

⑯ **SHOW button** — Opens a pane that displays the format, resolution, and rate of the input and LOOP OUT output (see figure 13, ❶). If Confidence Preview is enabled on a NAVigator to which the encoder is assigned (see the "Confidence Preview page" in the *NAVigator User Guide*, available at **www.extron.com**) the pane displays the confidence preview of the encoder. Click **`Hide`** (❷) to close the `Confidence Preview` pane.

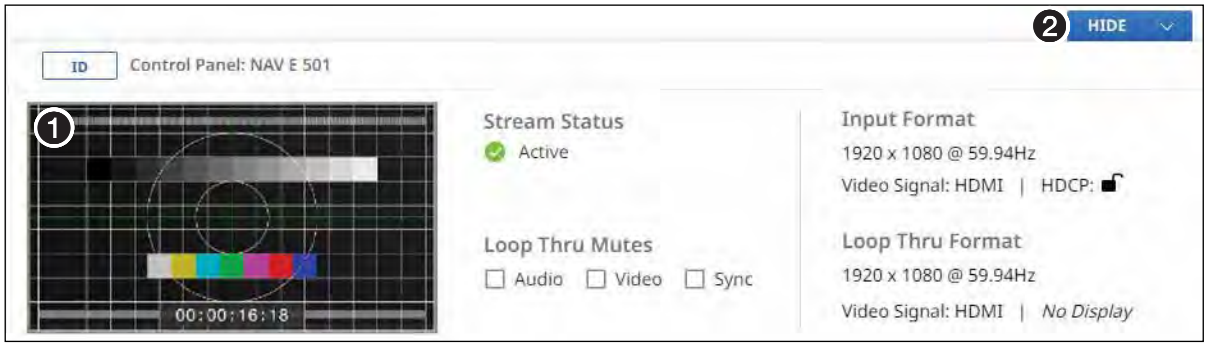
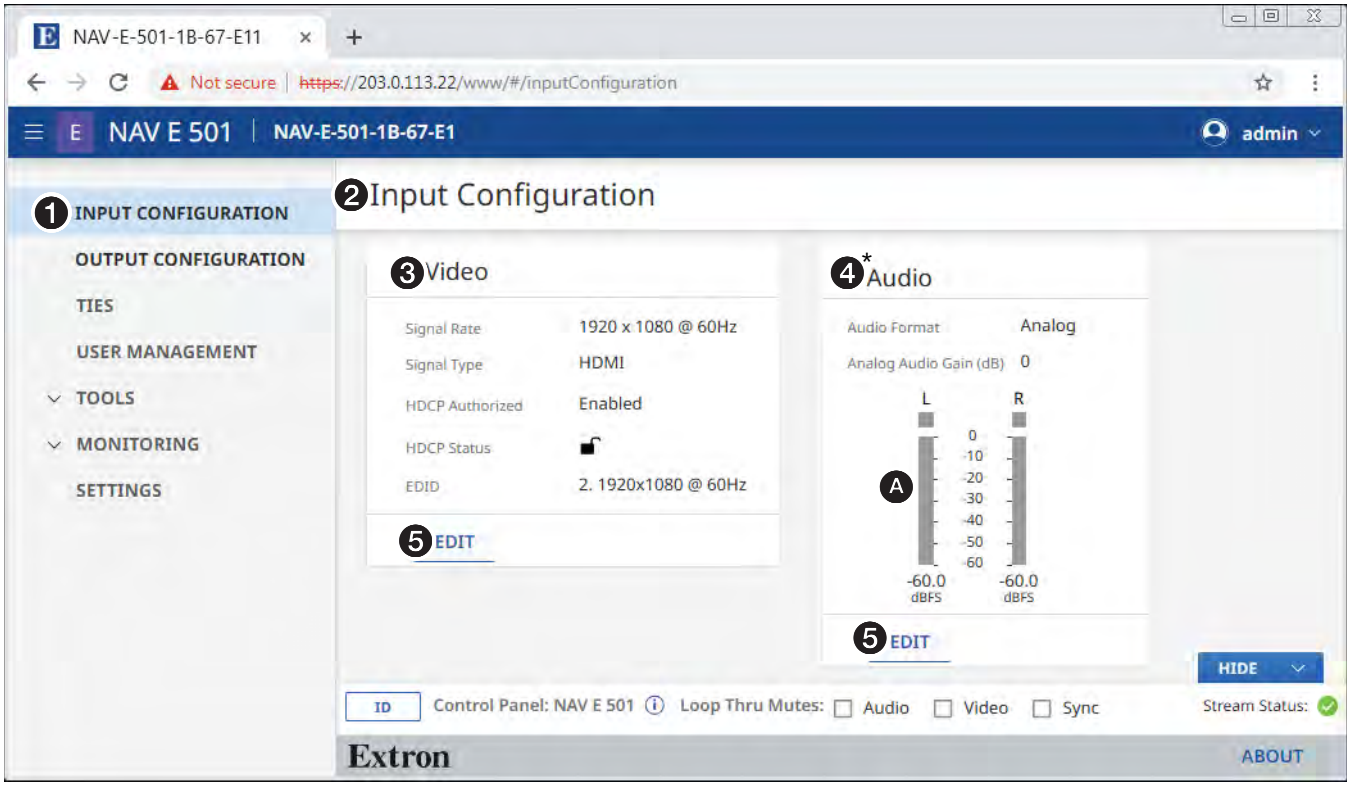


Figure 13. Show Pane

INPUT CONFIGURATION Page

Access the `Input Configuration` page (see figure 14) by clicking the link on the left side of the browser (❶). The browser displays the `Input Configuration` panel (❷).



* Shown with `Analog` selected.

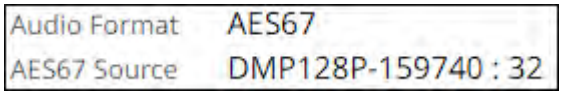
Figure 14. Input Configuration Page

The `Input Configuration` page consists of two read-only panes, `Video` (❸) and `Audio` (❹) that display the status of the input to the encoder.

The HDCP Authorized and EDID settings are accessible to change from the `Video` pane and the audio selected for input is accessible from the `Audio` pane by clicking the **`EDIT`** button (❺) in the appropriate pane. The selected pane opens (see **Video pane** and **Audio pane**).

TIPS:

- Level meters (Ⓐ), present only when analog audio is being streamed (see **Audio pane**), can help prevent overdriving the audio.
- The read-only Audio pane, when AES67 (see **figure 16**, ❸) is selected, displays the selected AES67 audio source.



Video pane

If you change any of the settings in the `Video Input Configuration` dialog box (see figure 15, ❶ through ❹), the `SAVE` button (❺) becomes selectable. Click **`SAVE`** to take changes or **`CANCEL`** (❻) to abandon them. Clicking either button closes the dialog box.

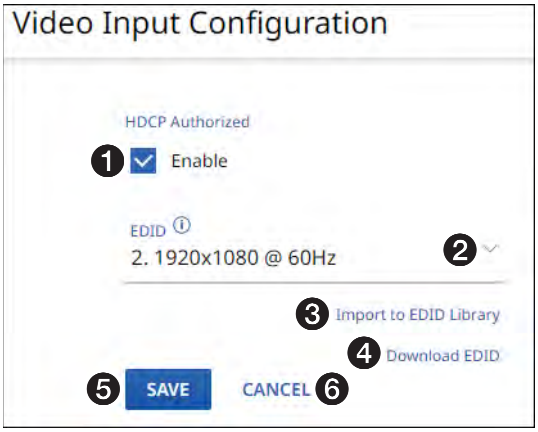


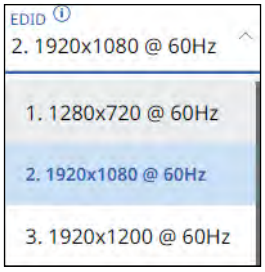
Figure 15. Video Input Configuration Dialog Box

❶ **HDCP Authorized** — Click to toggle **`HDCP Authorized`** on and off. HDCP Authorized is used to determine if the HDMI input reports as an HDCP authorized sink to a source.

This helps with devices like Apple TV® that always encrypt the output even when not displaying HDCP content.

> **NOTE:** When **`HDCP Authorized`** is selected the encoder communicates to the source device that it supports HDCP encrypted content. When deselected the encoder indicates that it does not support HDCP. If the source is unable to decrypt its output, the encoder generates a green screen.

❷ **EDID** — Click the drop-down list to select among theavailable EDIDs. When an EDID is selected, the encoder sends this information to the source, which adjusts its AV output to the EDID. The table below details the default encoder EDIDs. All EDIDs shown are HDMI format with 2-channel audio.



Slot	Resolution	Slot	Resolution
1	1280x720@60 Hz	5	3480x2160@60 Hz
2	**1920x1080@60 Hz***	6	Loop-thru monitor
3	1920x1200@60 Hz	7	Decoder output
4	3480x2160@30Hz	8	User EDID slot

*** Default**

❸ **Import to EDID Library** — Click to import a custom external EDID to the encoder EDID library, slot 8 if the EDID supplied by the encoder does not meet your needs.

> **NOTE:** `Import to EDID library` (❸) is disabled when the encoder is accessed via proxy from another device (see the **NOTE**).

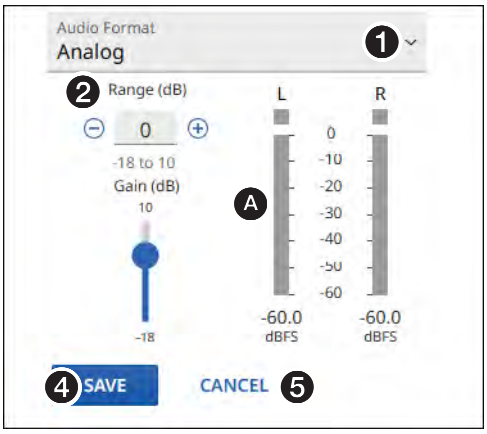
❹ **Download EDID** — Click to download the currently-selected EDID to the connected computer to save it for use in other encoders. This feature is typically used when EDID slot 6 (loop-thru monitor) or 7 (decoder output) is selected to save the EDID from a connected display.

Audio Pane

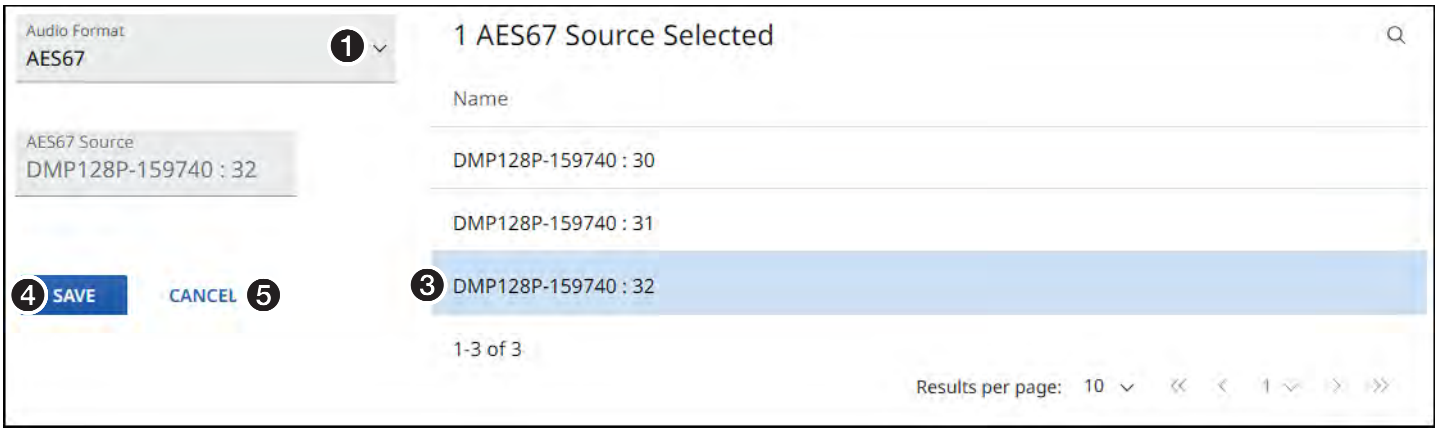
If you change any of the settings in the `Audio Input Configuration` dialog box (see figure 16, ❶ through ❸), the SAVE button (❹) becomes selectable. Click **SAVE** to take changes or **CANCEL** (❺) to abandon them. Clicking either button closes the dialog box.



HDMI Selected



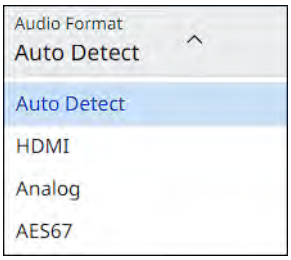
Analog Selected



AES67 Selected

Figure 16. Audio Input Configuration Dialog Box

❶ Audio Format — Click the drop-down list to select among the following:



- **Auto Detect** — Stream the active audio input, with audio embedded in the input HDMI having priority. If there is no embedded HDMI audio, and if no analog audio is connected, the audio stream stays silent.
- **HDMI** — Stream the digital audio embedded in video. Analog audio is not streamed.
- **Analog** — Stream the analog audio on the captive screw input. Digital audio is not streamed.
- **AES67** — Stream the AES67 audio from the selected input. .

❷ **Gain** (**Audio** selected) — Adjust the audio gain or attenuation value from +10 dB to -18 dB in one of three ways:

- Click and drag the fader control.
- Click the ⊖ and ⊕ buttons.
- Directly type a rate into the field.

NOTE:	The level meters (Ⓐ) are present only when analog audio is being streamed.

TIP:	Watching the level meters may help prevent overdriving the audio.

❸ **Name** (**AES67** selected) — Displays and allows you to select from available AES67 streams. When you SAVE the selection, the `Audio` pane displays the sleected streaming source.

OUTPUT CONFIGURATION Page

Access the Output Configuration page (see figure 17) by clicking the link on the left side of the browser (❶). The browser displays the Output Configuration panel (❷).

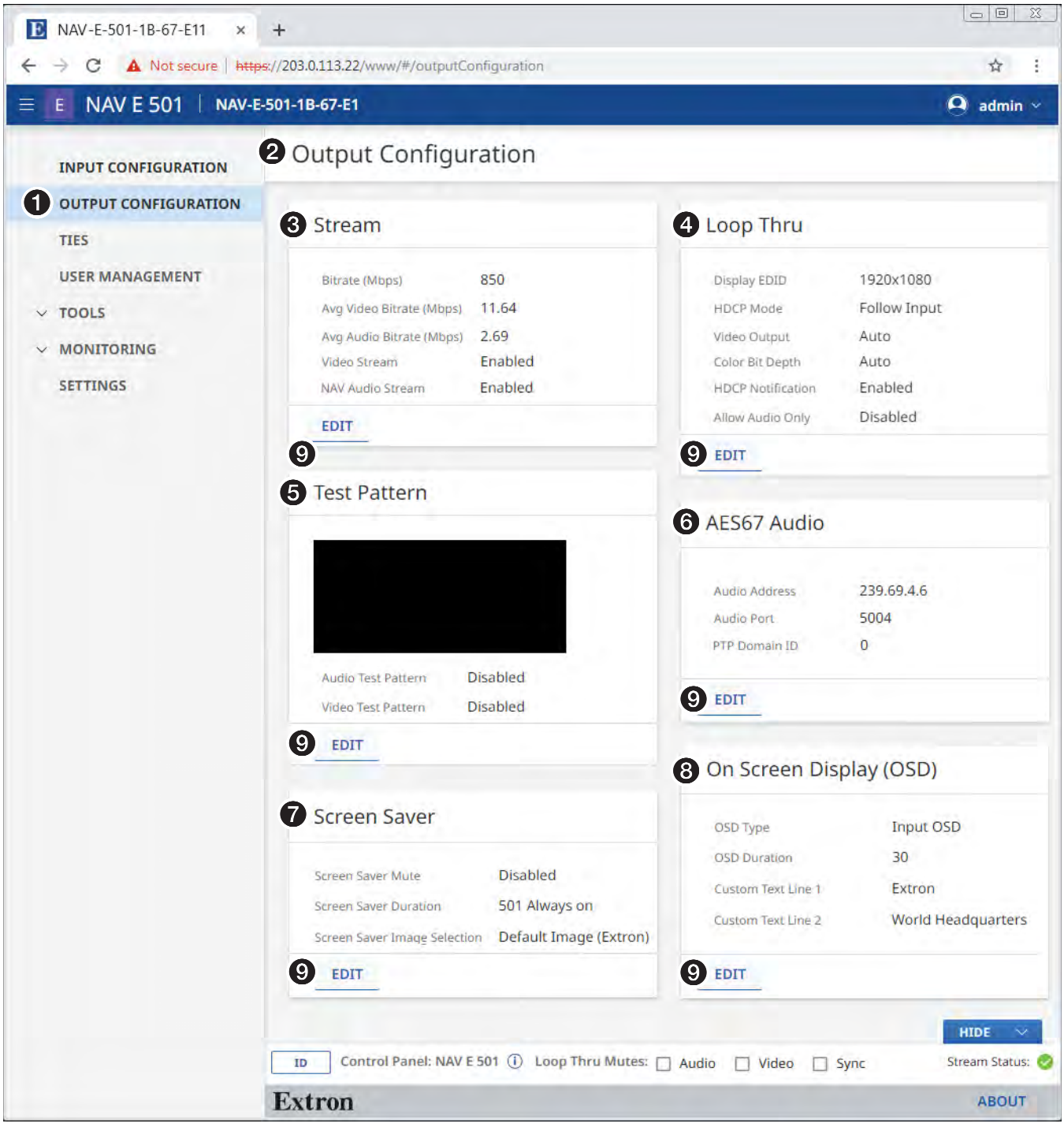


Figure 17. Output Configuration Page

The Output Configuration page consists of six panes, Stream (❸), Loop Thru (❹), Test Pattern (❺), AES67 Audio (❻), Screen Saver (❼), and On Screen Display (OSD) (❽) that display the status of the streamed output.

Each pane has settings that can be changed by clicking the **EDIT** button (see figure 17, ❾) in the appropriate pane. The selected dialog box opens (see **Stream pane**, **Loop Thru pane**, **Test Pattern pane**, **AES67 Audio**, **Screen Saver pane**, and **On Screen Display (OSD) pane**).

Stream pane

If you change any of the settings in the `Stream Configuration` dialog box (see figure 18, ❶ through ❸), the `SAVE` button (❹) becomes selectable. Click **`SAVE`** to take changes or **`CANCEL`** (❺) to abandon them. Clicking either button closes the dialog box.

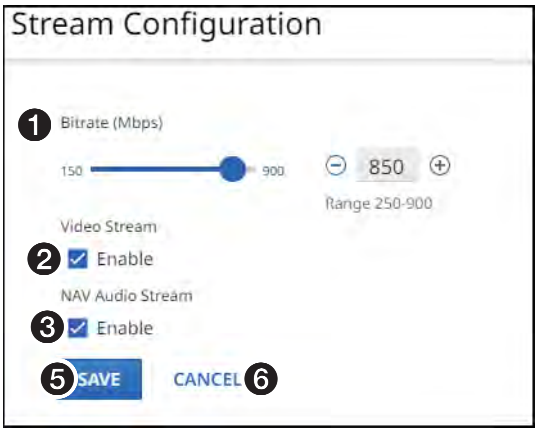


Figure 18. Stream Configuration Dialog Box

❶ **Bitrate** — Set the `Bitrate` in one of three ways:

NOTE: Extron recommends leaving the bitrate at the default setting, 850 Mbps. The bitrate is the rate at which the encoder transmits data. The bitrate affects the video image quality. Decreasing the bitrate lowers the quality, increasing the bitrate improves the quality.

- Click and drag the fader control.
- Click the ⊖ and ⊕ buttons.
- Directly type a rate into the field.

❷ **Video stream** — Click to toggle **`Video Stream`** on (stream video) and off (do not stream).

❸ **NAV Audio Stream** — Click to toggle **`NAV Audio Stream`** on (stream NAV audio) and off (do not stream).

NOTE: NAV Audio can only be routed to other Extron NAV products. Select **`NAV Audio`** only when your system is interfacing solely with other NAV products and the audio needs minimal processing.

Loop Thru pane

If you change any of the settings in the `Loop Thru Configuration` dialog box (see figure 19, ❶ through ❺), the `SAVE` button (❻) becomes selectable. Click **`SAVE`** to take changes or **`CANCEL`** (❼) to abandon them. Clicking either button closes the dialog box.

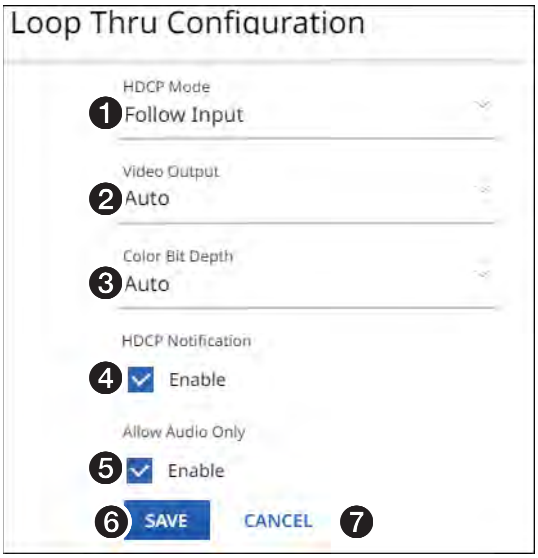
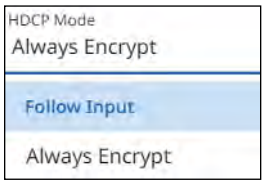


Figure 19. Loop Thru Pane

❶ **HDCP Mode** — Click the drop-down list to select between the following two output modes for the LOOP THRU port (see **figure 2**, Ⓑ).



- **`Follow Input`** — Mimics the HDCP encryption state of the connected source.
- **`Alway Encrypt`** — Maintains the HDCP encrypted state with the output sink device to improve system switching performance.

❷ **Video Output** — Click the drop-down list to select among the various output formats and colorspace for the LOOP THRU port (Ⓑ). The table below shows the available formats.



Format	Format
Auto (based on the EDID of the sink [default])	HDMI YUV 444 Full
DVI RGB 444	HDMI YUV 444 Limited
HDMI RGB 444 Full	HDMI YUV 422 Full
HDMI RGB 444 Limited	HDMI YUV 422 Limited

❸ **Color Bit Depth** — Click the drop-down list to select between the following two output formats for the LOOP THRU port (Ⓑ).



- **`Auto`** — Adjusts color bit depth based on the display EDID (10 bit or 8 bit) (**default**).
- **`Force 8-Bit`** — Always uses 8 bit output.

❹ **HDCP Notification** (see **figure 19**) — Click to toggle **HDCP Notification** on and off. This selection lets you select what is displayed on the HDMI output when the input signal contains HDCP-protected content and the output is a non-HDCP sink.

When **HDCP Notification** is checked, a green screen is generated to clearly indicate an HDCP issue has been encountered. When **HDCP Notification** is unchecked, a black screen is generated to discretely show there is an HDCP issue.

This feature has no effect on the functionality of HDCP. Extron recommends leaving **HDCP Notification** enabled to easily know when a HDCP issue has occurred.

❺ **Allow Audio Only** — Click to toggle **Audio Only** on and off. **Audio only** prevents a display with no video source from going to standby by generating a blackburst signal.

NOTE: Allow Audio Only must be disabled to use a screen saver.

Test Pattern pane

If you change the test pattern setting (see figure 20, ❶ or ❷), the SAVE button (❸) becomes selectable. Click **SAVE** to take change or **CANCEL** (❹) to abandon it. Clicking either button closes the dialog box.

Test patterns aid in preliminary set-up of the AV system and are useful to test AV streams during initially configuration and when sources are not present.

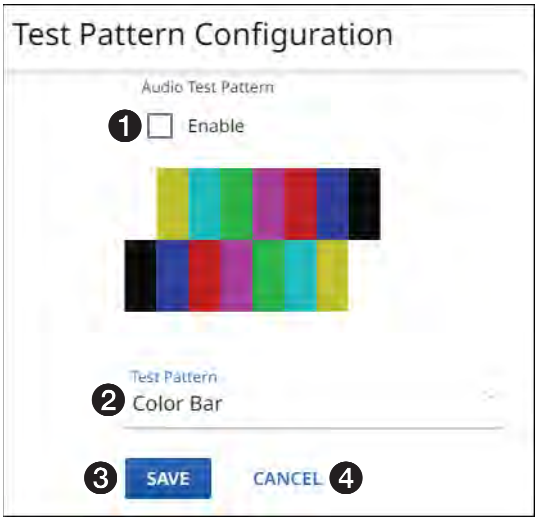
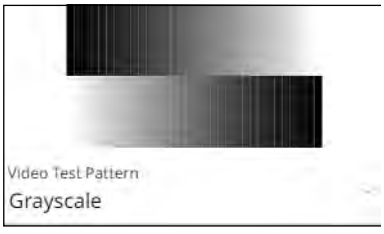


Figure 20. Test Pattern Pane

❶ **Audio Test Pattern** — Select (click) to toggle the audio test pattern, a 400 Hz sine wave, on and off.

❷ **Test Pattern** — Click the drop-down list to select among test patterns to display on the Loop Thru (see **figure 2**, Ⓑ) and streamed outputs:

- **Disabled** (no test pattern)
- **Color Bar** (see figure 20)
- **Grayscale**



AES67 pane

If you make any changes in this pane, the SAVE button (see fgure 21, ❸) becomes selectable. Click **SAVE** to take change or **CANCEL** (❹) to abandon it. Clicking either button closes the dialog box.

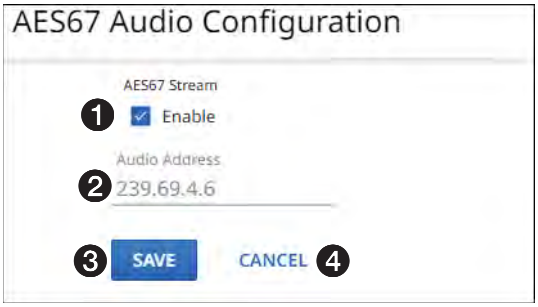


Figure 21. AES67 Pane

❶ **AES67 Audio Stream** — Click to toggle **AES67 Audio Stream** on (stream AES67 audio) and off (do not stream).

> NOTE: The AES67 standard allows for interoperability among AES67 capable devices. Enabling AES67 audio allows the device to transmit a audio stream to a third-party AES67 capable receiver.

❷ **Audio Address** — Click in the **Audio Address** field and directly enter a new address as necessary.

Screen Saver pane

This pane shows the options for the screen saver on the LOOP THRU port (see **figure 2**, Ⓑ) and streamed outputs. If you change any setting, either directly or by clicking **RESET** (see figure 22, ❻), the SAVE button (❹) becomes selectable. Click **SAVE** to take change or **CANCEL** (❺) to abandon the changes. Clicking either button closes the dialog box.

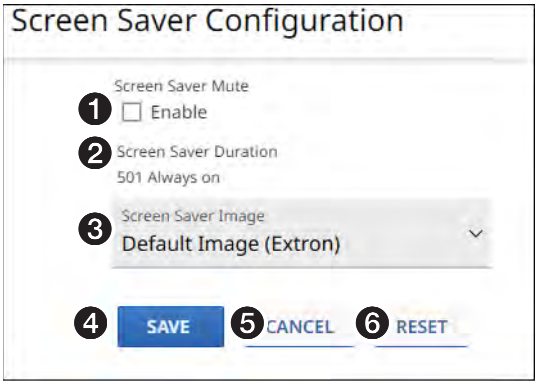


Figure 22. Screen Saver Configuration Pane

❶ **Screen Saver Mute** — Click to toggle the **Screen Saver Mute** on (muted) and off (unmuted) for the Loop Thru (see Ⓑ) and streamed outputs. This control sets whether the screen immediately enters low power mode (Screen Saver Mute is off) upon loss of sync or displays the user-entered screen saver image (see **Screen Saver Image**, ❸) for a period of time set by the **Screen Saver Duration** setting, ❷.

NOTE: Allow Audio Only (see **Allow Audio only**, ❺) must be disabled to use a screen saver.

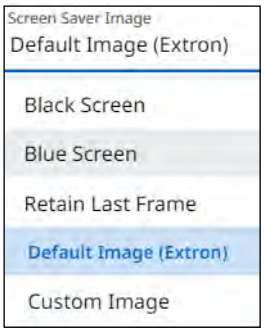
❷ **Screen Saver Duration** (available when Screen Saver Mute is **Enabled** ❶), — Click in the **Duration** field and edit it as desired or click ⊕ or ⊖ to increment or decrement the delay (in seconds) of how long the screen saver stays active and streaming, before muting sync to a display. The valid range is from 1 to 500 (seconds) or 501 Always on.



When Screen Saver Mute is unchecked (❶), the duration automatically becomes 501 Always on.

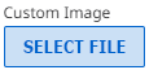
After the duration expires, the decoder drops the active sync, allowing the monitor to turn off or enter low power mode.

❸ **Screen Saver Image** — Click the drop-down list to select among the images to display as the screen saver. **Retain Last Frame** displays the last frame of input data before the OSD was activated. **Black Screen** shows a black screen. **Blue Screen** shows a blue screen. **Default Image** (**Extron**) displays the Extron logo. **Custom Image** displays an image of your choosing.



NOTES:

- To be available for selection, the custom image must be manually uploaded into the endpoint (see “Upload a custom image” below).
- If you select the blue screen as the screen saver, the blue screen itself streams to the decoder, but any enabled OSD does not. The OSD does output on the encoder LOOP THRU port (see Ⓑ).
- If you have not already uploaded an image, the pane displays the **SELECT FILE**. button



Upload a custom image

You can upload a custom image to use for the screen saver background as follows:

NOTES:

- A valid custom image must be in the .png file format with a maximum size of 4K (4096 x 2160).
- The custom image may be cropped but cannot be scaled. For example: if you upload a 1080p image and the output is 4K, you will see black borders.

1. On the editable `Screen Saver Configuration` pane (see **figure 22**), click the `Screen Saver Image` drop-down list and select **`Custom Image`** (see figure 23, ❶). If you have not already uploaded an image, the pane displays the **`SELECT FILE`** button (❷).

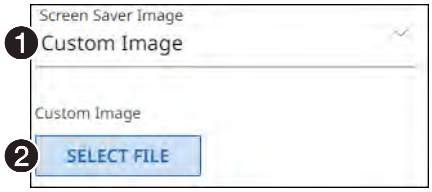


Figure 23. Upload a Custom Image, Steps 1 and 2

2. Click **`SELECT FILE`** (figure 23, ❷).

   An `Open` dialog box opens (see figure 24).

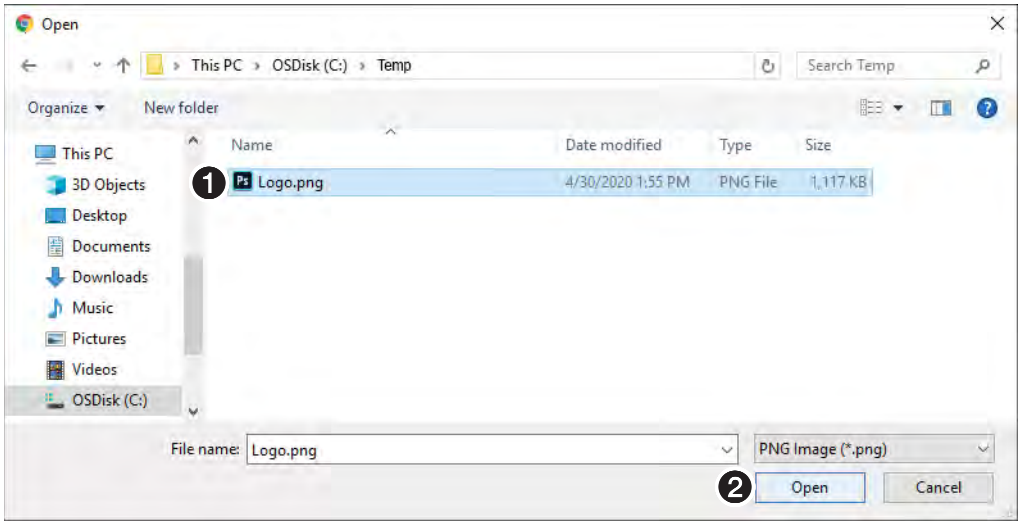
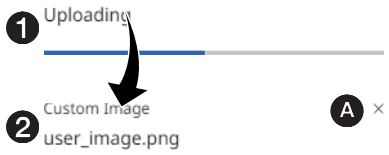


Figure 24. Open Dialog Box

3. Navigate to the folder where the image file is saved (see figure 24, ❶). Select the file.
4. Click **`Open`** (❷).

   The `Screensaver` pane reports that it is uploading the image (❶, at right) and then reports that it is the custom image (renamed `user_image.png`) (❷).



NOTE: Click × (Ⓐ) to delete the image. This action is necessary to replace the custom image.

On Screen Display (OSD) pane

This pane shows the options for the OSD and screen saver on the Loop Thru port (see **figure 2**, Ⓑ) and streamed outputs. If you change any setting, either directly or by clicking **RESET** (see figure 25, ❼), the SAVE button (❺) becomes selectable. Click **SAVE** to take change or **CANCEL** (❻) to abandon the changes. Clicking either button closes the dialog box.

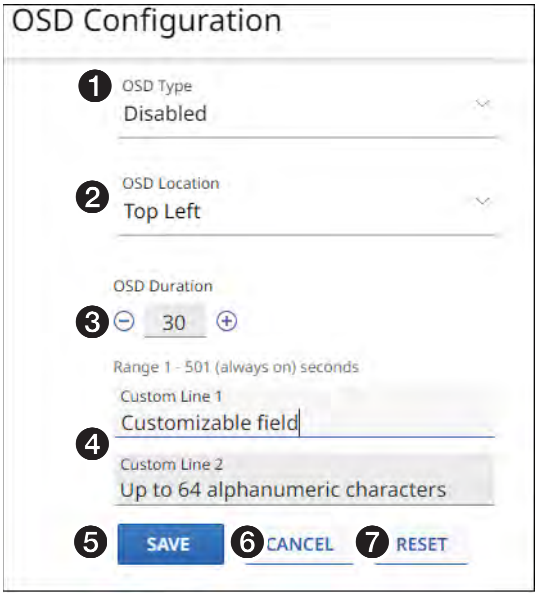
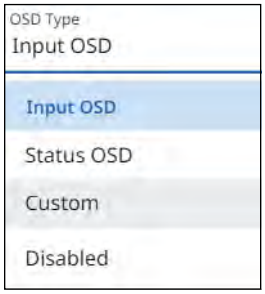


Figure 25. OSD Configuration Pane

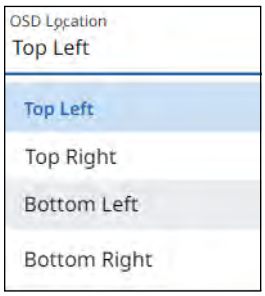
❶ **OSD Type** — Click the drop-down list to select among the OSD options for display (see **figure 26** for typical on-screen displays).

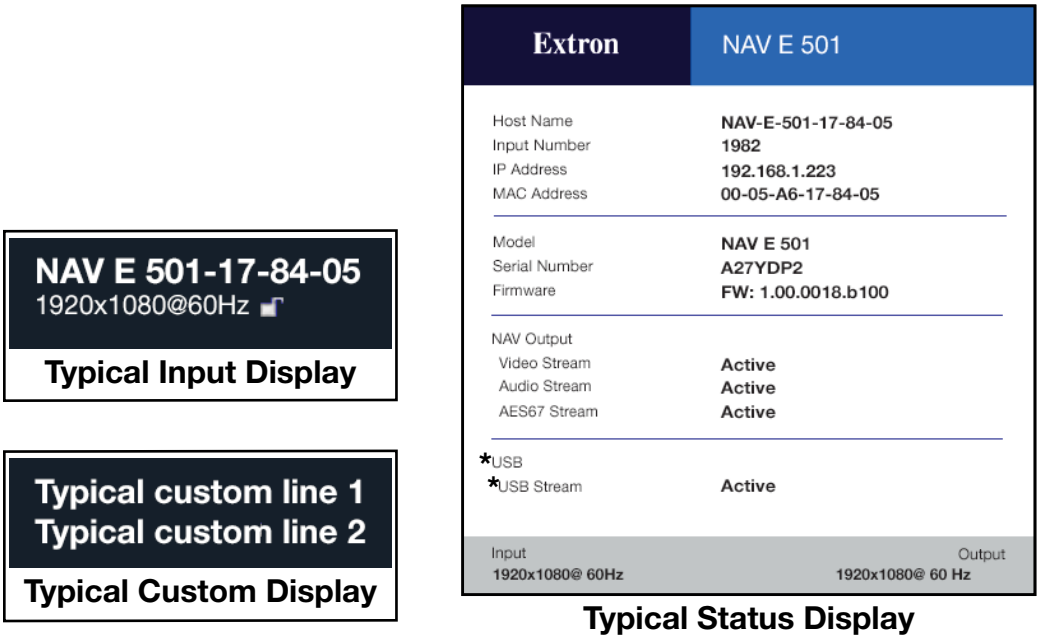


- **`Input OSD`** — Input connection details that can alert users of an input change
- **`Status OSD`** — General encoder details
- **`Custom`** — User specified to indicate information pertinent to the application, such as source or security
- **`Disabled`** — No OSD

NOTE: When **`Input OSD`**, **`Status OSD`**, or **`Custom`** is selected, `OSD Duration` appears below `OSD Type` (see ❸).

❷ **OSD Location** (Available only when **`Custom`** is selected [❶]) — Click the drop-down list to select among the OSD location options.





* NAV E 501 only

Figure 26. Typical On-Screen Displays

❸ **OSD Duration** (see **figure 25**, available only when OSD Type is NOT **Disabled** [see ❶]) — Click in the **Duration** field and edit it as desired or click ⊕ or ⊖ to increment or decrement the delay (in seconds) the screen saver stays active and streaming, before muting sync to a display. The valid range is from 1 to 500 (seconds) or 501 Always on.

⊖ 500 ⊕

When **Screen Saver Mute** is unchecked (❷), the duration automatically becomes 501 Always on.

After the duration expires, the decoder drops the active sync, allowing the monitor to turn off or enter low power mode.

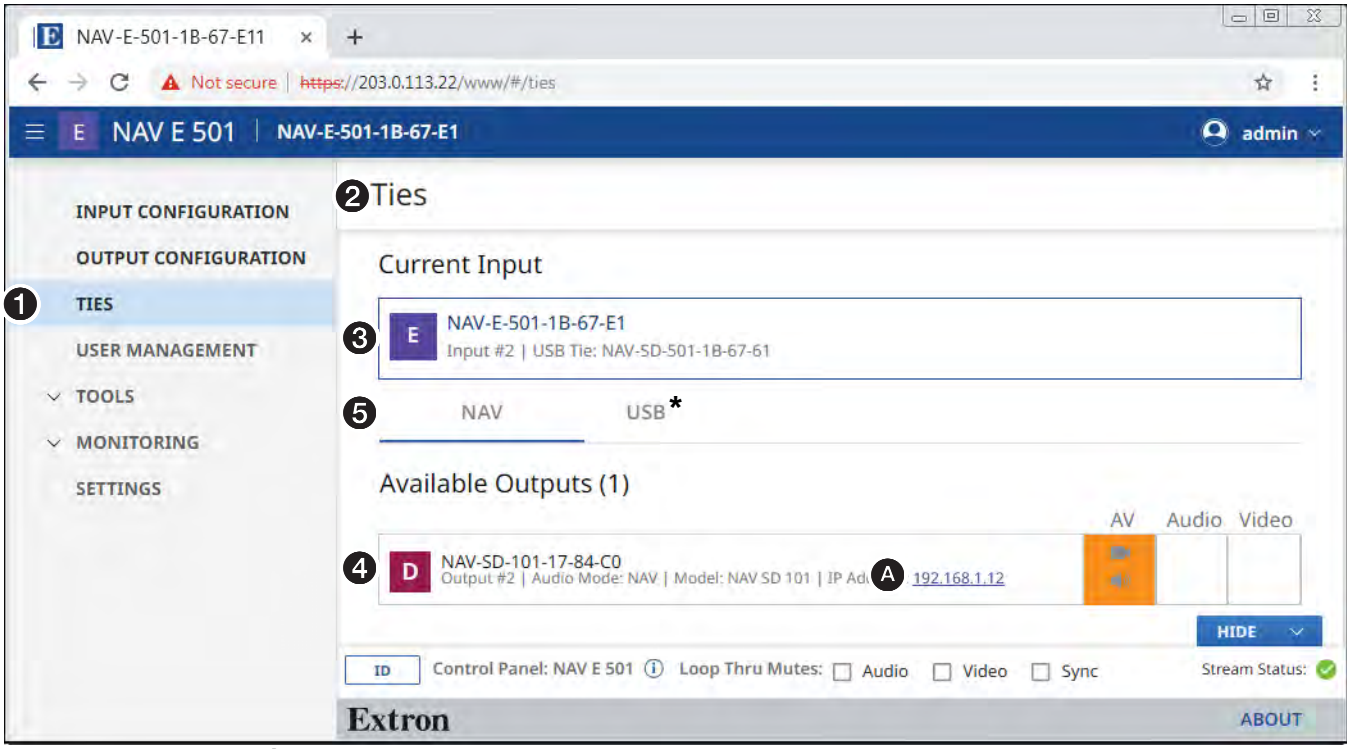
❹ **Custom Line 1 and 2** (available only when OSD Type **Custom** is selected [see ❶]) — Click in the either **Custom Line** field and type in the custom information of your choice. Delete all text to clear a custom line.

NOTE: A valid custom line entry meets the following requirements:

- The length is up to 64 characters.
- All alphanumeric characters and ASCII symbols are permitted except | (pipe).
- The custom line cannot start with a space.

TIES Page

Access the Ties page (see figure 27) by clicking the link on the left side of the browser (❶). The browser displays the Ties panel (❷), which allows you to display AV ties and display and make USB ties (NAV E 501 only).



* **NAV E 501 only**

Figure 27. Ties Page

The Ties page consists of two panes, Current Input (❸) and Available Outputs (❹) that display the status of input and endpoints and tabs (❺) that allow you to tailor the ties shown.

NOTES:

- Your tab display may differ from figure 27. The USB tab is present for NAV E 501 only.
- AV ties are read-only on this page.
- You can make and break USB ties (NAV E 501 only) on this page.
- You can make and break ALL ties from the embedded HTML pages of a NAVigator or decoder (see the *NAVigator User Guide* or the applicable decoder user guide, available at **www.extron.com**, and the embedded HTML tie page for those devices).

Current Input pane

The Current Input pane displays the input number and name of the encoder.

Available Outputs pane

The `Available Outputs` pane (see **figure 27**, ❹) displays the output number, audio mode, model, and IP address of all decoders available for tying to this encoder.

NOTES:

- Also on the `Ties` page, you can open an HTML page of a connected decoder. This is a direct page to the decoder, rather than a proxied endpoint as through a NAVigator. Click the **`IP Address`** link in the desired output (Ⓐ). The HTML page opens a new tab in the browser that is connected to the selected decoder. The decoder HTML page behaves as described in the guide for the decoder (see the applicable decoder guide available at **www.extron.com**).
- When you select the **`AES67`** tab or **`USB`** tab (NAV E 501 only) (see figure 28), the appearance of the `Available Outputs` pane changes. The name changes to `Available Devices` and only decoders that can receive streamed AES67 or USB ties are shown.



Figure 28. Available Devices for USB Tab

- To tie AES67 or USB from this encoder to a decoder, select that tab and click the desired decoder (**`Available Device(s)`** [see figure 28, Ⓐ]). An AES67 audio tie is indicated in red and a USB tie is indicated in yellow. Click in an existing tie to untie it.

USER MANAGEMENT Page

NOTES:

- The accounts for all endpoints assigned to a NAVigator System Manager can be managed from the NAVigator and pushed to the endpoints.
- Using the management feature is disabled when the encoder is assigned to a NAVigator.

The USER MANAGEMENT page provides tools for managing accounts, access, and passwords and to connect to an Active Directory server to more easily manage personnel access and permissions. Access the USER MANAGEMENT page (see figure 29) by clicking the link on the left side of the browser (❶). The browser displays the USER MANAGEMENT page (❷) with the LOCAL ACCOUNTS tab selected (❸).

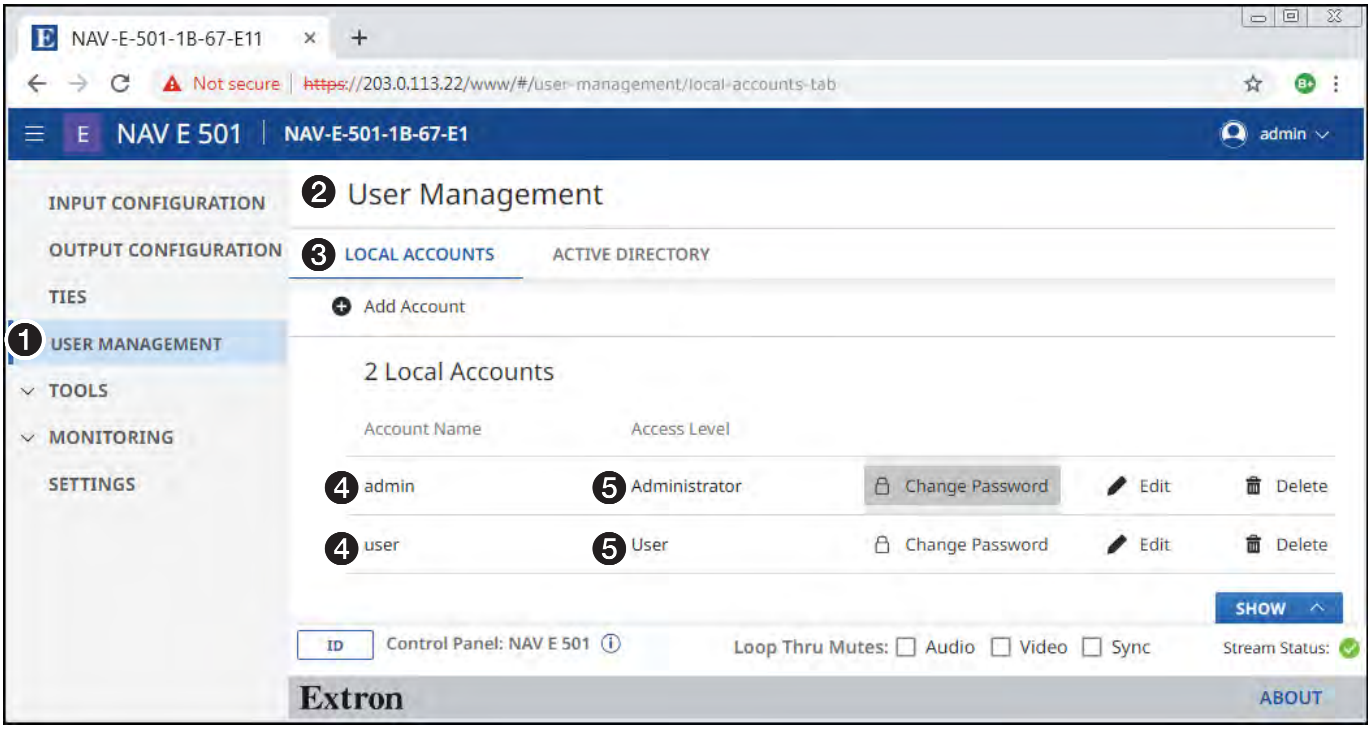


Figure 29. USER MANAGEMENT Page, LOCAL ACCOUNTS Selected

LOCAL ACCOUNTS tab

The LOCAL ACCOUNTS tab on the User Management page (see figure 29) opens a pane that shows the accounts existing on the encoder by name (❹) and the access level (Superadministrator, Administrator, or User, ❺) on each account. The page also provides tools for adding and deleting local accounts and editing account credentials (see **Creating local accounts**).

NOTES:

- The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords revert to the default, which is extron.
- The default usernames are superadmin, admin, and user.
- When you change the password on a connected NAVigator, in its built-in admin account, the NAVigator automatically pushes the new password all assigned endpoints.

ACTIVE DIRECTORY tab

The ACTIVE DIRECTORY tab on the User Management page (see figure 30, ❶) opens a pane that allows you to add and manage user groups. IT professionals at your organization can assign personnel to the group or groups that have permissions appropriate to duties of the personnel in the organization (see **Connecting to an Active Directory server** and **Adding user groups**).

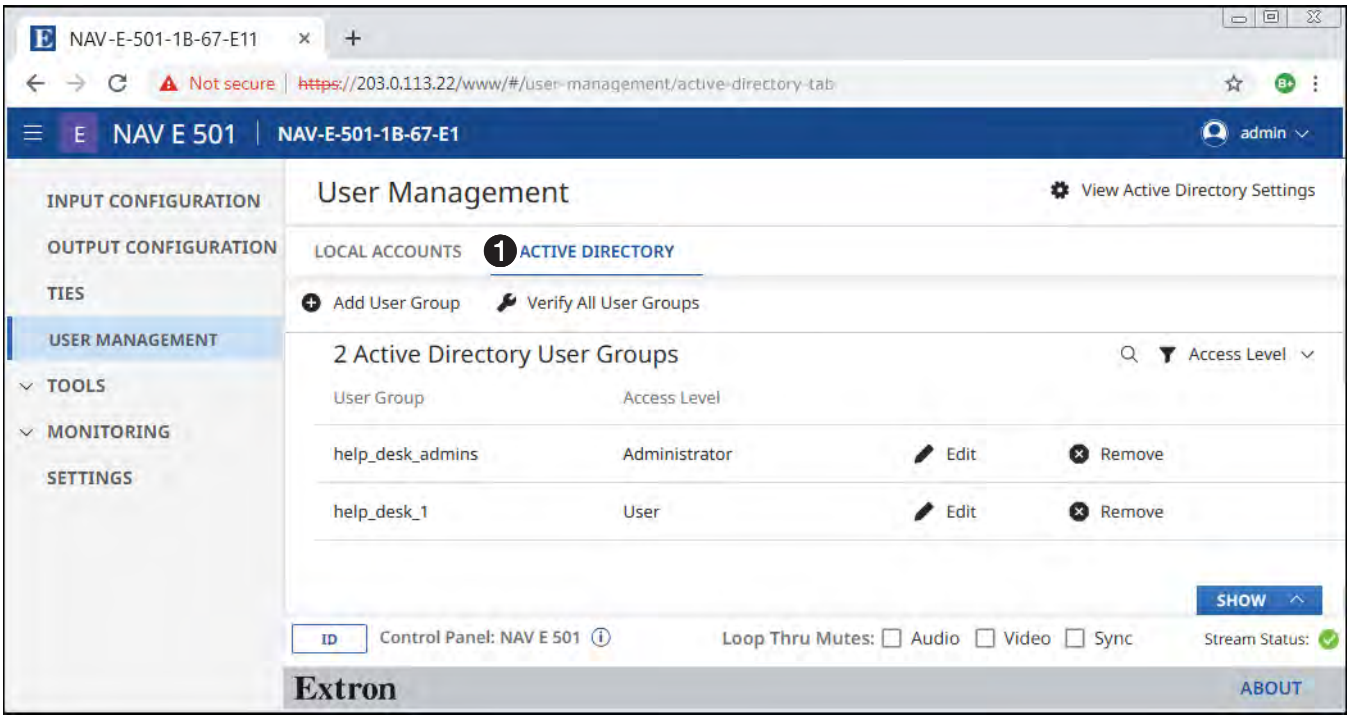


Figure 30. User Management Page, ACTIVE DIRECTORY Selected

Using the User Management feature

NOTE: Using the management feature is disabled when the encoder is assigned to a NAVigator.

Using the management feature to simply account management is a multi-step process consisting of the following procedures:

- Create one or more local accounts (see **Creating local accounts**).
- Connect to an Active Directory server (see **Connecting to an Active Directory** server).
- Add one or more user groups (see **Adding user groups**).

Creating local accounts

Create one or more local accounts as follows:

1. Access the `User Management` page, with the `LOCAL ACCOUNTS` tab selected (see figure 31, ❶).

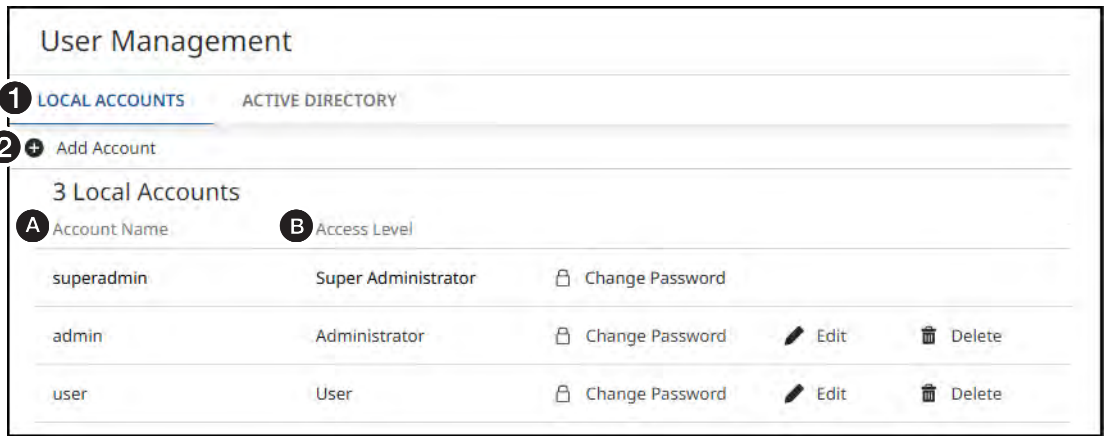


Figure 31. Creating Local Accounts

NOTES:

- The `LOCAL ACCOUNTS` tab shows accounts that are device-specific and stored on the encoder.
- Figure 31 shows three accounts (Ⓐ), `superadmin`, `admin`, and `user`, which are built-in at the factory and have the `Access Levels` (permissions), shown (Ⓑ). You can create up to 10 more local accounts, but locally-created accounts can have only the `Access Level` of `Administrator` or `User` assigned.
- Access level permissions and exceptions:

User level:

- Access is limited to the `Ties` and `Monitoring` pages.
- The `Monitoring` page access is further limited to the `Monitoring` > `Dashboard` page and the ability to download logs.

Technician level:

- Can do everything the Administrator can do with the exception of:
  - Anything **security** related.
  - Add, remove, or change another user.

Administrator level:

- Full access to all operations except super administrator.

Super administrator level:

- Full access to all operations. Cannot be deleted or managed from any other account. Not shown on the `LOCAL ACCOUNTS` tab unless logged in as superadmin.

2. To add an account, click **`Add Account`** (see figure 31, ❷). The `Add Local Accounts` dialog box opens (see **figure 32**).

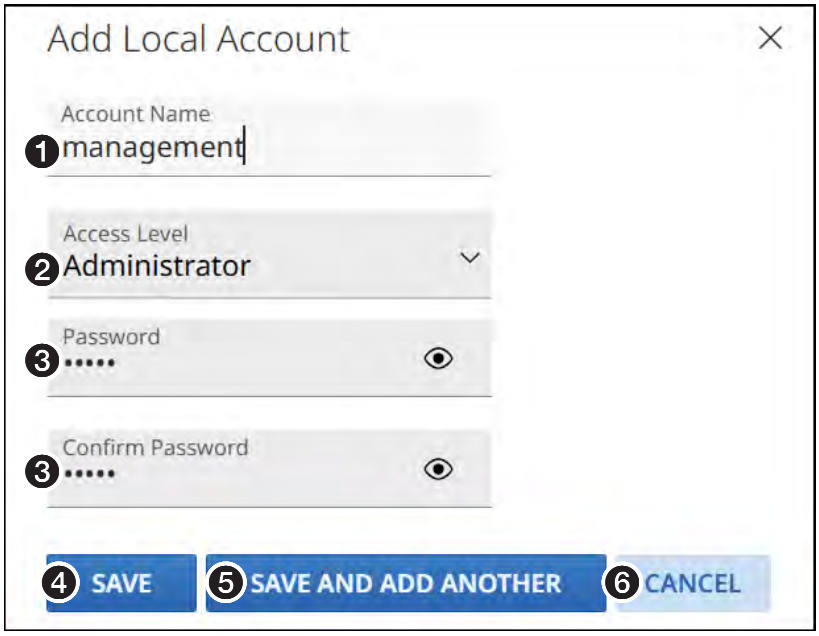


Figure 32. Add Local Accounts dialog box

3. Click in the **Account Name** field (see figure 32, ❶) and enter a valid name.

   NOTE: Valid account names consist of the following characters: a through z (lower case only), _ (underscore), and - (hyphen) only.

4. Click the **Access Level** drop-down list (❷) and select between **Administrator**, **Technician**, and **User**.
5. Click in the **Password** and **Confirm Password** fields (❸) and enter the valid passwords.

   NOTES:

   - A valid password meets the following requirements:
     - The length is up to 64 characters.
     - All alphanumeric characters and ASCII symbols are permitted except | (pipe).
     - The password cannot be blank.
     - The password cannot start with a space.
   - The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords revert to the default, which is extron. Custom or other local accounts created are lost.

     The default usernames are superadmin, admin, and user.
   - When you change the password on a connected NAVigator, in its built-in admin account, the NAVigator automatically pushes the new password all assigned endpoints.
   - If you change the encoder superadmin password to a value other than the factory password, <serial number>, or the default password, extron, the encoder cannot be assigned to a NAVigator.

6. Click outside of the field and then click **SAVE** or **SAVE AND ADD ANOTHER** to make the change (❹ or ❺), or **CANCEL** (❻) to abandon it.

Editing and deleting local accounts

Edit and delete local accounts (see figure 33) as follows:

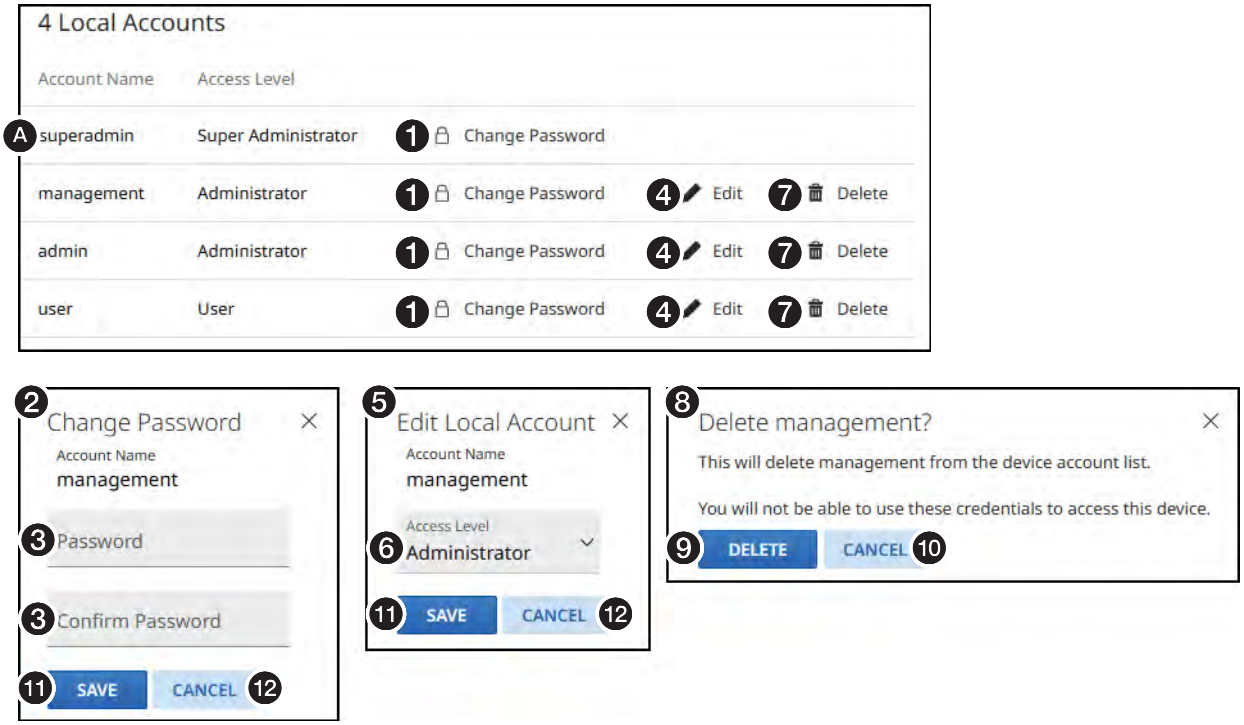


Figure 33. Editing and deleting local accounts

NOTES:

- The `superadmin` account (Ⓐ) shows only if you are logged in as the superadmin.
- The `superadmin` account **cannot** be deleted or renamed.
- Accounts with Administrator or User access cannot be renamed. They must be deleted (see step 3) and recreated with the desired name.
- If you change the encoder superadmin password to a value other than the factory password, `<serial number>`, or the default password, `extron`, the encoder cannot be assigned to a NAVigator.

1. To change a password, click **`Change Password`** (❶). The `Change Password` dialog box (❷) opens.
   a. Click in the **`Password`** and **`Confirm Password`** fields (❸) and enter the valid passwords. Proceed to step 4.
2. To change the access of an account, click the **`Edit`** link (❹). The `Edit Local Account` dialog box (❺) opens.
   a. Click the **`Access Level`** drop-down list (❻) and select between **`Administrator`** and **`User`**. Proceed to step 4.
3. To delete an account, click the **`Delete`** link (❼). The `Delete Management` dialog box (❽) opens.
   a. Click the **`Delete`** (❾) to confirm the deletion or **`Cancel`** (❿) to keep the account.
4. Click **`SAVE`** to apply the settings changes (⓫), or **`CANCEL`** (⓬) to abandon them.

Connecting to an Active Directory server

Connect to a pre-configured Active Directory environment existing in an Active Directory server as follows:

1. Obtain the following from the IT administrator for your organization:
   - Domain Name
   - Domain Controller Name
   - Port number (636 is default)
   - CA Certificate
2. Ensure that DNS Server 1 is connected and reachable by the Active Directory server that is being configured (see **Network Ports page**).
3. Ensure the NAVigator can reach the Active Directory environment via the network to which it is connected.
4. On the USER MANAGEMENT > ACTIVE DIRECTORY page (see figure 34, ❶), click **ACTIVE DIRECTORY SETTINGS** (❷). The Active Directory Settings dialog box opens (see figure 35).

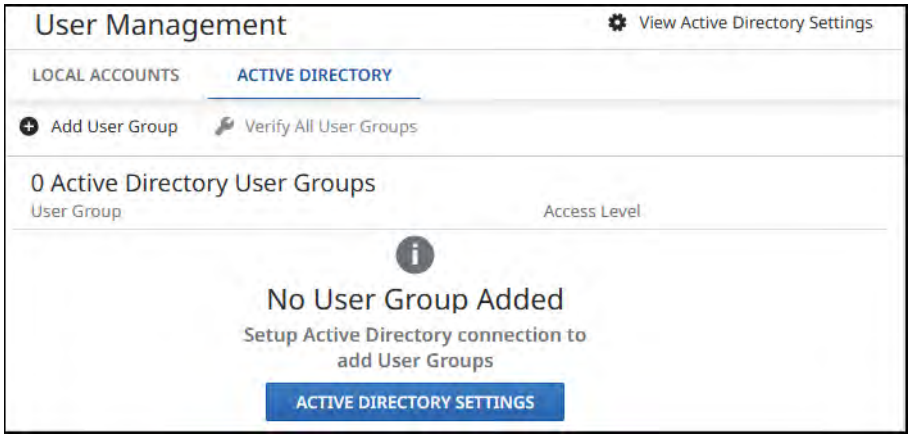


Figure 34. Connecting to an Active Directory

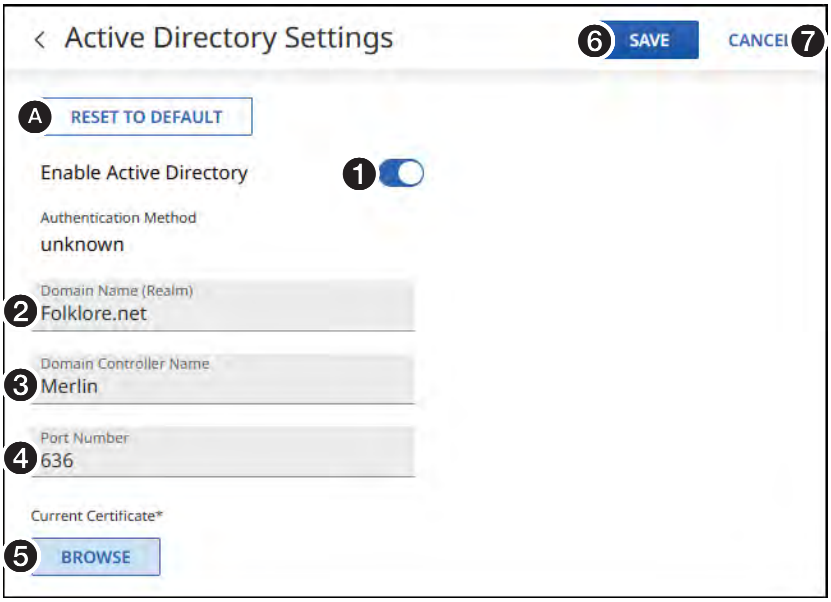


Figure 35. Defining an Active Directory

NOTE: Click **RESET TO DEFAULT** (figure 35, Ⓐ) to reset Active Directory settings including the certificate and previously added user groups.

5. Click **Enable Active Directory** (❶) to allow device access from Active Directory configuration.
6. Click in the **Domain Name** (**Realm**) field (❷) and enter the value received from the IT administrator in step 1.

7. Click in the **Domain Controller Name** field (see **figure 35**, ❸) and enter the value received from the IT administrator in step 1.
8. If necessary to change from the default value (636), click in the **Port Number** field (❹) and enter the value received from the IT administrator in step 1.
9. Click the Current Certificate **Browse** button (❺). The Open dialog box opens (see figure 36).

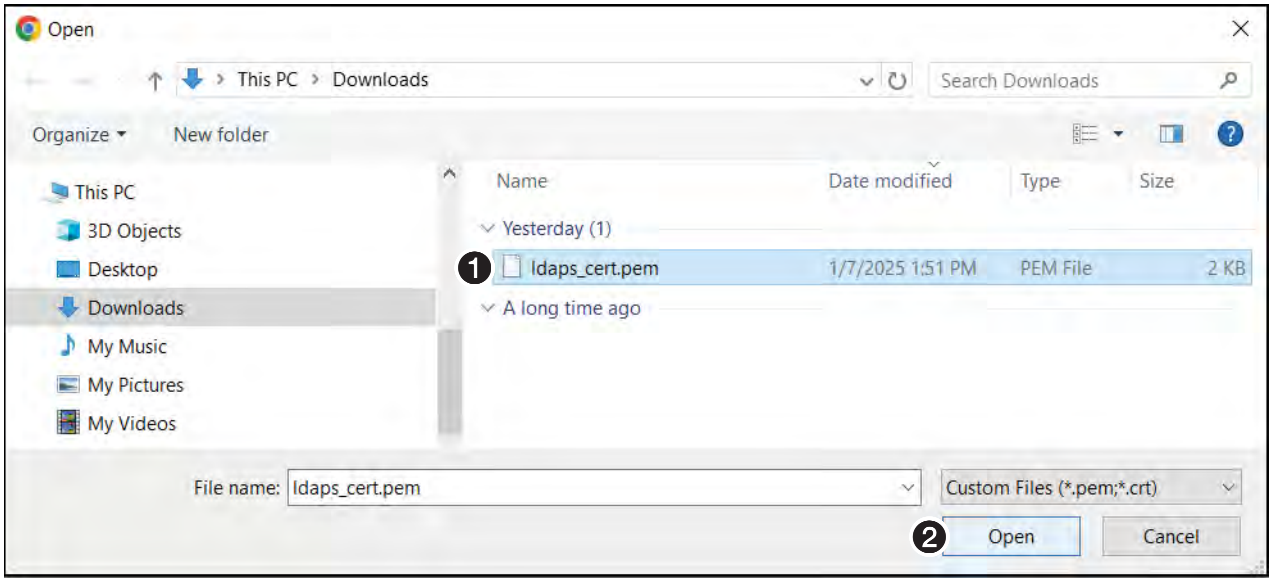
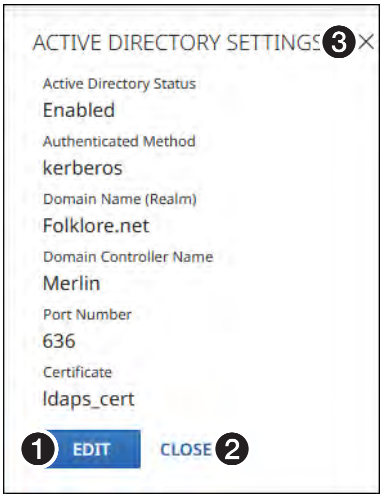


Figure 36. Loading the Certificate

10. Navigate to the folder where the certificate file is saved (❶). Select the file.
11. Click **Open** (❷). The Active Directory Settings dialog box returns to the top (see **figure 35**).
12. Click outside of the field and then click **SAVE** to apply the Active Directory settings (see **figure 35**, ❻), or **CANCEL** (❼) to abandon them.

Viewing and editing Active Directory settings



To view Active Directory settings, click **View Active Directory Settings** on the USER MANAGEMENT > ACTIVE DIRECTORY page (see **figure 37,** Ⓐ). The HTML page opens an **Active Directory Settings** pane at the right of the **USER MANAGEMENT** > **ACTIVE DIRECTORY** page.

To make variables available for editing, click **EDIT**. The Active Directory Settings page opens (see **figure 35**). Edit variables as described in **Connecting to an Active Directory**, steps 4 through 11.

Click **CLOSE** (❷) or × (❸) to dismiss the Active Directory Settings pane.

Adding user groups

Add one or more user groups that are within the configured Active Directory environment and assign them to the administrator or user role as follows:

NOTE: Active Directory user groups can be security groups, distribution groups, or both.

1. On the USER MANAGEMENT > ACTIVE DIRECTORY page, click **Add User Group** (see figure 37, ❶). The Add Active Directory User Group dialog box opens (see figure 38).

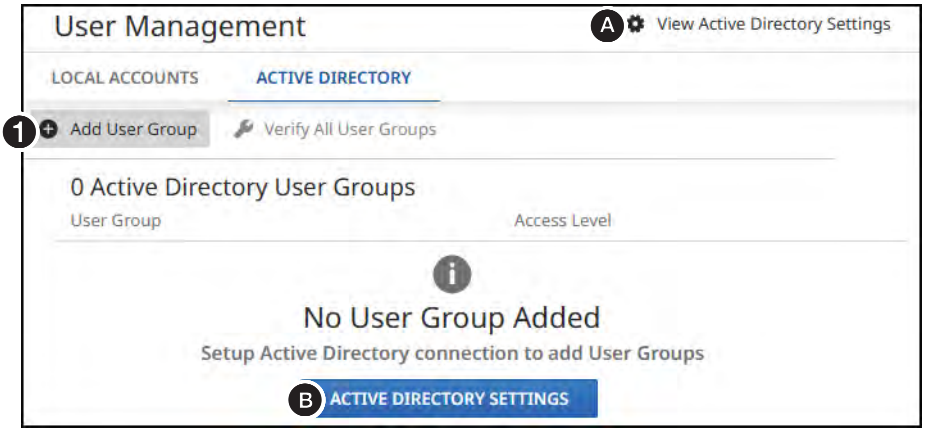


Figure 37. Adding a User Group

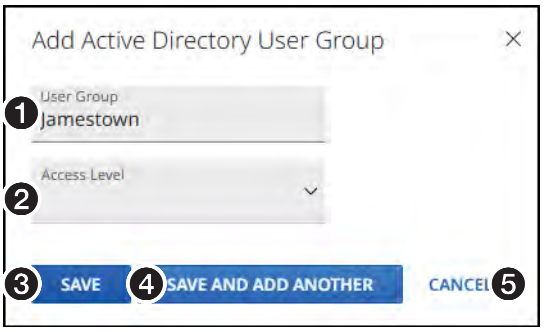


Figure 38. Defining a User Group

NOTES:

- Click **View Active Directory Settings** (see figure 37, Ⓐ) to view and edit the existing connection to the Active Directory server (see **Editing, removing, and verifying user group settings**).
- Click **ACTIVE DIRECTORY SETTINGS** (Ⓑ) (present only if **NO** user group has been added) to edit the existing connection to the Active Directory server (see **Editing, removing, and verifying user group settings**).

2. Click in the **User Group** field (❶) and enter the name.
3. Click in the **Access Level** drop-down list (❷) and select between **Administrator** or **User**.
4. Click outside of the field and then click **SAVE** or **SAVE AND ADD ANOTHER** to make the change (❸ or ❹), or **CANCEL** (❺) to abandon it.
5. Repeat steps 1 through 4 as necessary to add additional user groups.

Editing, removing, and verifying user group settings

Edit, remove, and verify user group settings (see figure 39) as follows:

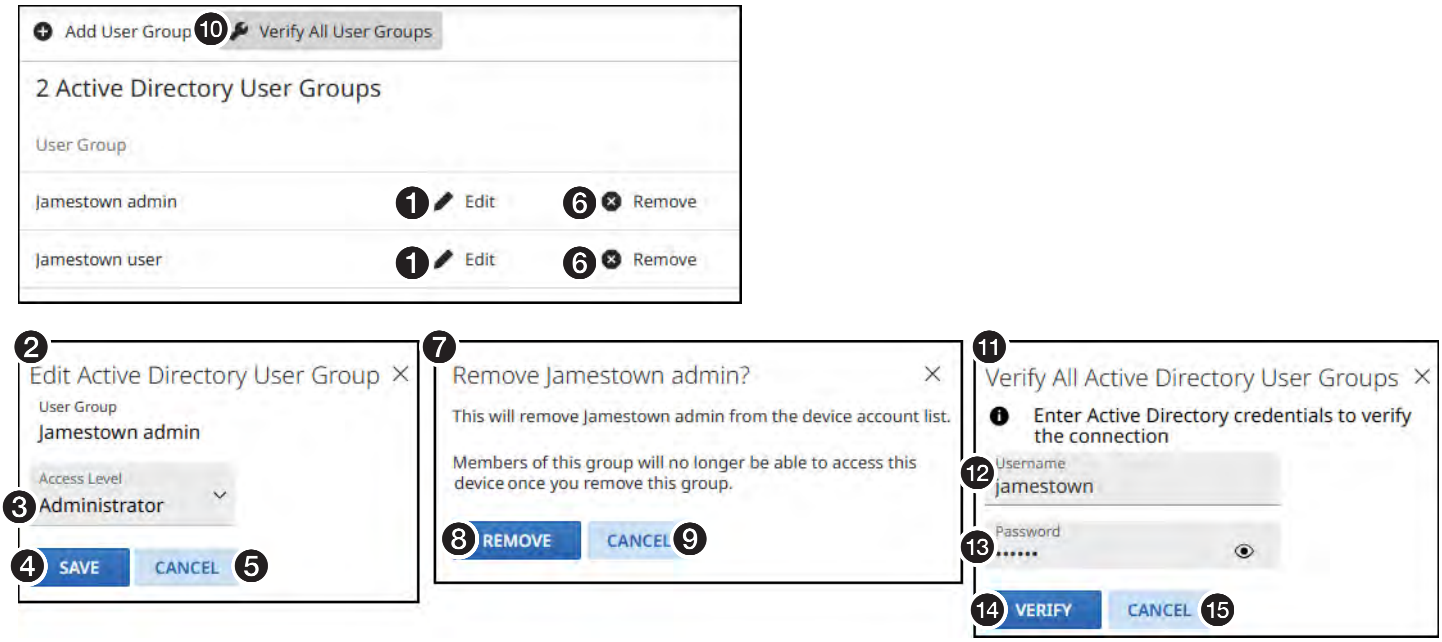


Figure 39. Editing, removing, and verifying user group settings

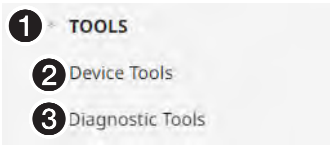
NOTE: User groups cannot be renamed. They must be removed (see step 2) and added with the desired name.

1. To change the access of a user group, click **`Edit`** (❶). The `Edit Active Directory User Group` dialog box (❷) opens.
   a. Click the **`Access Level`** drop-down list (❸) and select between **`Administrator`** and **`User`**.
   b. Click **`SAVE`** to apply the settings changes (❹), or **`CANCEL`** (❺) to abandon them.
2. To remove a user group, click **`Remove`** (❻). The `Delete Management` dialog box (❼) opens.
   a. Click **`Remove`** (❽) to confirm the removal or **`Cancel`** (❾) to keep the group.
3. To verify the user groups, click **`Verify All User Groups`** (❿). The `Verify All Active Directory User Groups` dialog box (⓫) opens.
   a. Click in the **`Username`** field (⓬) and enter the username of an Active Directory account within a specified user group with Administrator access to verify.
   b. Click in the **`Password`** field (⓭) and enter the password of the Active Directory account.
   c. Click **`Verify`** (⓮) to check the validity of added user groups or **`Cancel`** (⓯) to close the dialog box. Potential errors, displayed in the dialog box, and their causes are:

Error message	Potential cause
Failed to bind with Active Directory server. If Issue persists, contact Extron Support. (Error `E246`)	Encoder reboot required, Active Directory Certificate issue, Kerberos authentication failure, unsupported Active Directory environment configured.
Unable to reach Active Directory Server. Check Active Directory and Network Settings. (Error `E233`)	Domain Name (Realm), Domain Controller Name, Network Connection settings, Date & Time settings.
Active Directory user must reset password. (Error `E258`)	Active Directory credentials used an expired password.
Failed to complete operation. If issue persists, contact Extron Support. (Error number varies)	General errors, try again.
Username or Password is incorrect. (Error `E211`)	Invalid credentials, username contains domain

Tools Pages

The Tools pages provide tools for the encoder (Device Tools) and tools for diagnosing communications (Diagnostic Tools). To access the Settings pages, if necessary, click the **Menu** link (see figure 12, ❶). Click **TOOLS** (see ❶ at right) and either **Device Tools** (❷) or **Diagnostic Tools** (❸). The browser displays the selected Tools page (see figure 40, which shows the Device Tools page selected).



Device Tools page

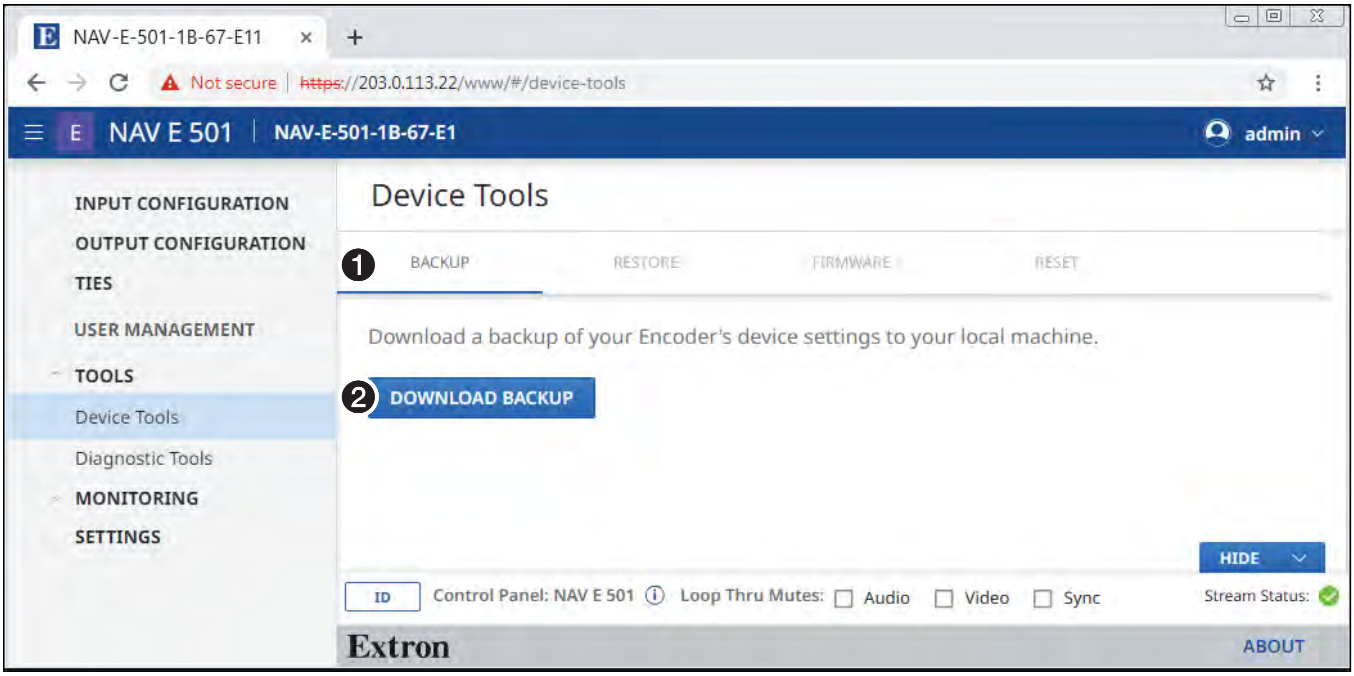


Figure 40. Device Tools Page

The Device Tools page consists of four tabs (see figure 40, ❶): BACKUP (see "BACKUP tab"), RESTORE (see **RESTORE tab**), FIRMWARE (see **FIRMWARE tab**) and RESET (see **RESET tab**) that provide encoder tools.

NOTE: System backup, restore, firmware update, and reset are available from the NAVigator (see the *Navigator User Guide*, available at **www.extron.com**).

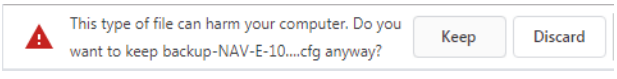
BACKUP tab

Backup the encoder settings as follows:

NOTE: Backup is disabled when the encoder is accessed via proxy from the NAVigator.

1. On the Device Tools page, click **BACKUP** (see figure 40, ❶).
2. Click **DOWNLOAD BACKUP** (❷).

   The encoder creates a file of current settings and, depending on your browser, may prompt you to confirm that you want to save them.



   NOTE: Unless otherwise directed, the encoder backup file goes to the Downloads folder of the connected PC.

3. Click **Keep** to save the file to the Downloads folder or **Discard** as desired.

RESTORE tab

Restore the encoder settings as follows:

NOTE: Restore is disabled when the encoder is accessed via proxy from the NAVigator.

1. On the `Device Tools` page, click **`RESTORE`** (see figure 41, ❶).
2. Click **`SELECT FILE`** (❷).



Figure 41. Tools — Restore Function

An `Open` dialog box opens (see figure 42).

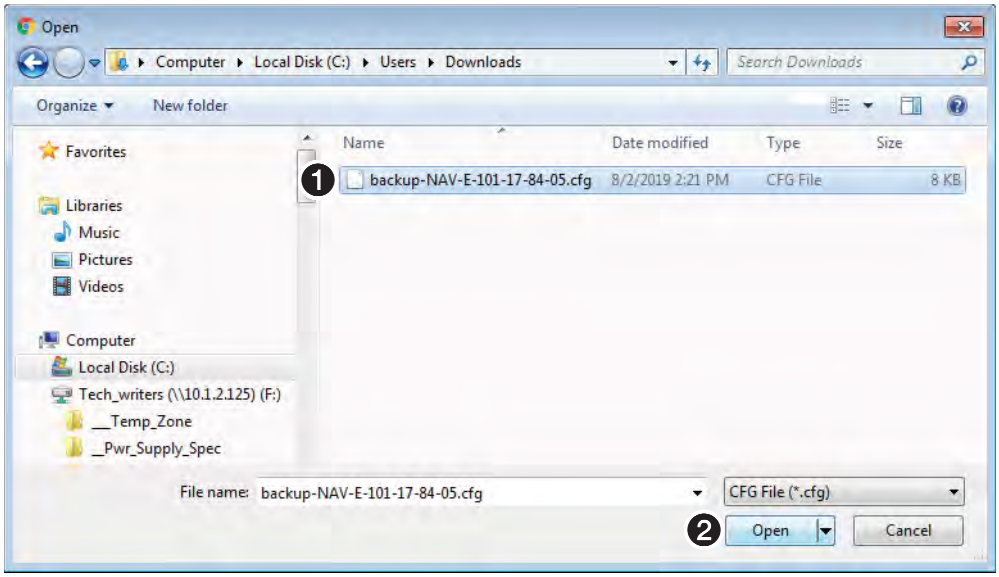


Figure 42. Open Dialog Box

3. Navigate to the folder where the `Restore` file is saved (typically the `Downloads` folder) (see figure 42, ❶). Select the file.
4. Click **`Open`** (❷). The `Tools` page returns to the top (see **figure 43**).

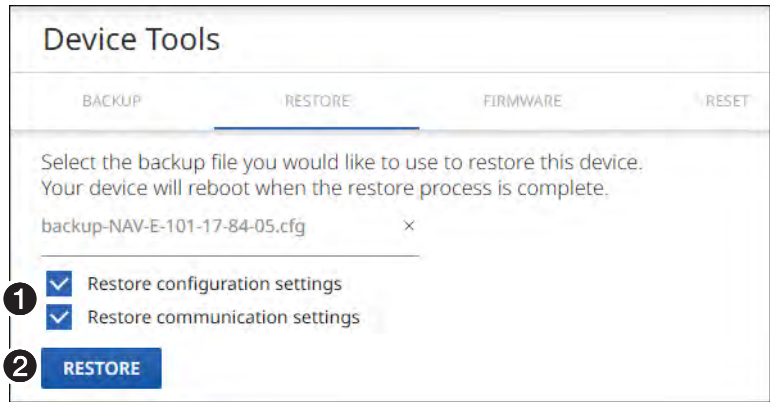


Figure 43. Tools — Restore Function, Steps 5 and 6

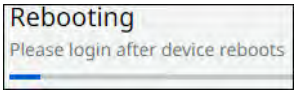
5. Select (click) the settings to restore (**`Configuration`**, **`Communication`**, or both; see figure 43, ❶).

Communication settings	Configuration settings	
Settings > General > Device Details (name)	**Settings > General >** Device Details (location)	**Output Config.** > Stream
Settings > Network > Network Connection	**Settings > General >** Date and Time	**Output Config >** AES67 Audio
Settings > Network > Ports	**Settings > General >** USB	**Output Config. >** Loop Thru
Settings > Network > Advanced Networking	**Settings > Advanced**	**Output Config >** OSD
	Input Config. > Video	**Output Config >** Screen Saver
	Input Config. > Audio	

NOTE: Account passwords are not backed up.

6. Click **`RESTORE`** (❷).

The encoder reports that it is `Rebooting` and displays a status bar that shows the progress of the `Restore` operation. When the operation completes, the encoder reboots.



NOTE: You must reconnect to the encoder (see **Opening the Embedded HTML Pages**) if you have additional operations to perform.

FIRMWARE tab

Upgrade the encoder firmware as follows:

NOTES:

- Firmware upgrade is disabled when the encoder is accessed via proxy from the NAVigator.
- Upgrading the encoder firmware results in the unit rebooting.
- Valid firmware files have the .eff file extension. Any other file extension is not a valid firmware update.

1. On the `Device Tools` page, click **`FIRMWARE`** (see figure 44, ❶).

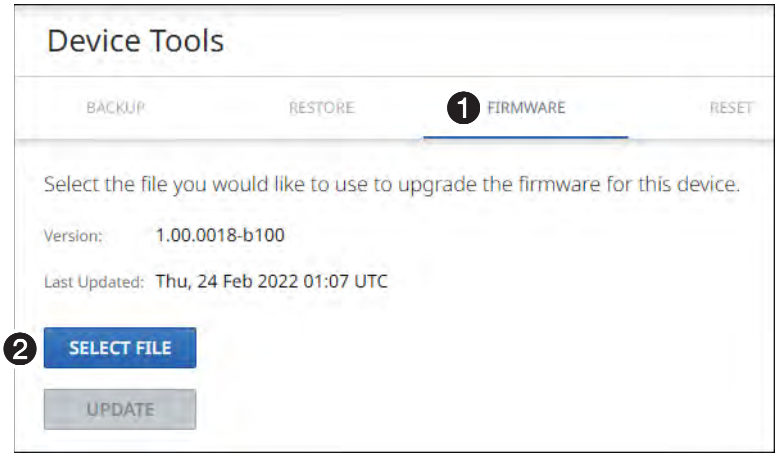


Figure 44. Tools — Firmware Function

2. Click **`SELECT FILE`** (❷). An `Open` dialog box opens (see figure 45).

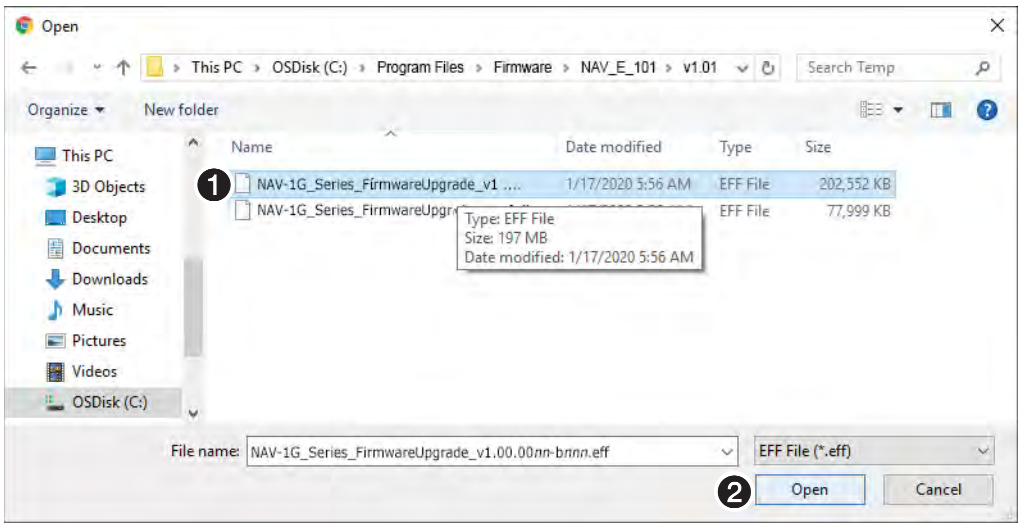


Figure 45. Open Dialog Box

3. Navigate to the folder where you saved the firmware upgrade file (see figure 45, ❶) and select the file.
4. Click **`Open`** (❷). The `Open` dialog box closes and the `Tools` pane returns to the top, with the selected firmware file identified (see **figure 46**, ❶).

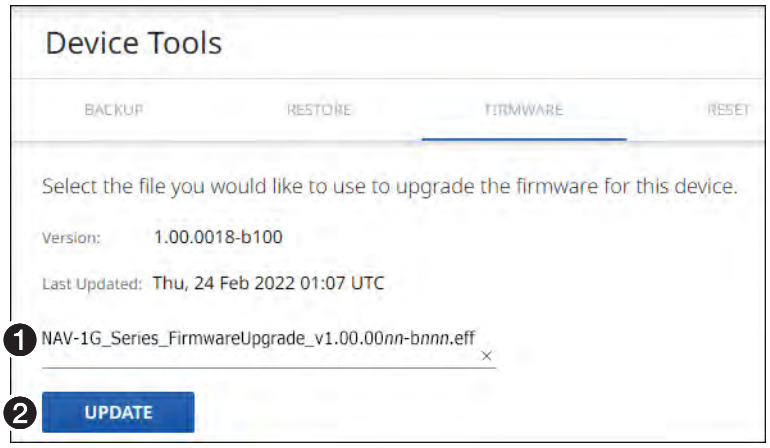


Figure 46. Device Pane with Firmware File Identified

5. Click **UPDATE** (❷).

   The encoder page displays a sequence that reports the progress as it uploads the file (see figure 47, ❶), updates the firmware (❷), and then reboots (❸).

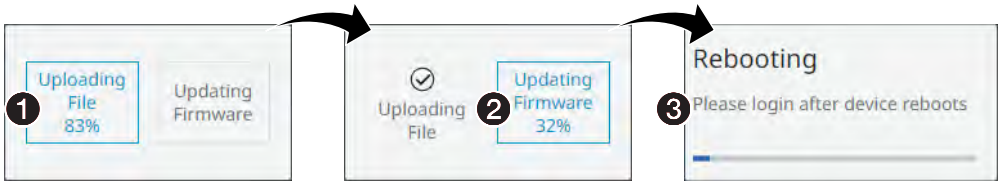


Figure 47. Firmware Upload Progress

When the encoder reboots, the connection to it is momentarily lost and after a few seconds, the browser displays the home page `Login` dialog box (see **figure 11**). To continue to operate the encoder, you must reconnect (see **Opening the Embedded HTML Pages**).

RESET tab

Reset or reboot the encoder as follows:

1. On the `Device Tools` page, click **RESET** (see figure 48, ❶).

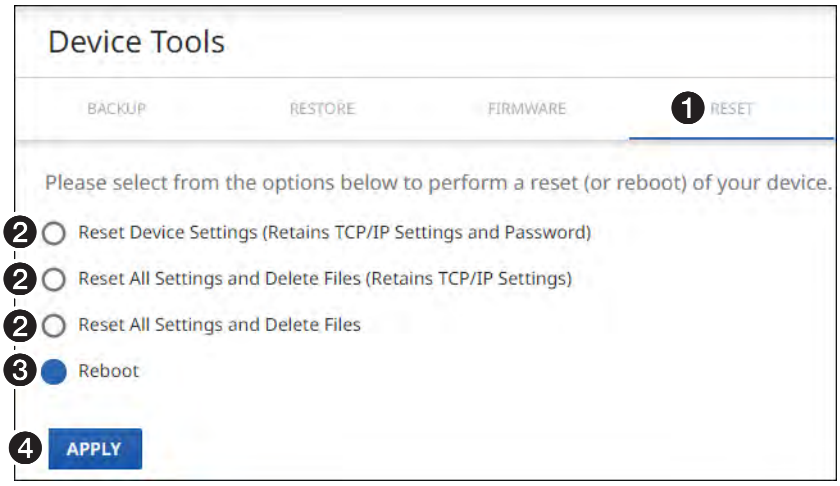


Figure 48. Tools — Reset Function

2. Select (click) a reset level (see figure 48, ❷) or **Reboot** (❸).

NOTES:

- **Reset Device Settings (Retains TCP/IP Settings and Password)** — Resets configuration settings. All communication settings and the password are retained. See the **table** of communication and configuration settings.
- **Reset All Settings and Delete Files (Retains TCP/IP Settings)** — Resets configuration settings **except** the communication settings, which are maintained. Resets the password to the default, which is `extron`. See the **table** of communication and configuration settings.
- **Reset All Settings and Delete Files** — This reset is identical to the Full Factory reset (see the **table** of rear panel resets), which resets all settings to factory defaults.

3. Click **APPLY** (**figure 48**, ❹).

   The encoder reports that it is `Resetting` and `Rebooting` and displays a status bar that shows the progress of the operation. Any of these operations concludes with the encoder rebooting.





NOTE: You must reconnect to the encoder (see **Opening the Embedded HTML Pages**) if you have additional operations to perform.

Diagnostic Tools page

The `Diagnostic Tools` page (see figure 49) provides tools to troubleshoot the connection to other units on the NAV network. Access the page as follows:

1. Click the **TOOLS** > **Diagnostic Tools** link on the left side of the browser (❶). The browser displays the `Diagnostic Tools` page.

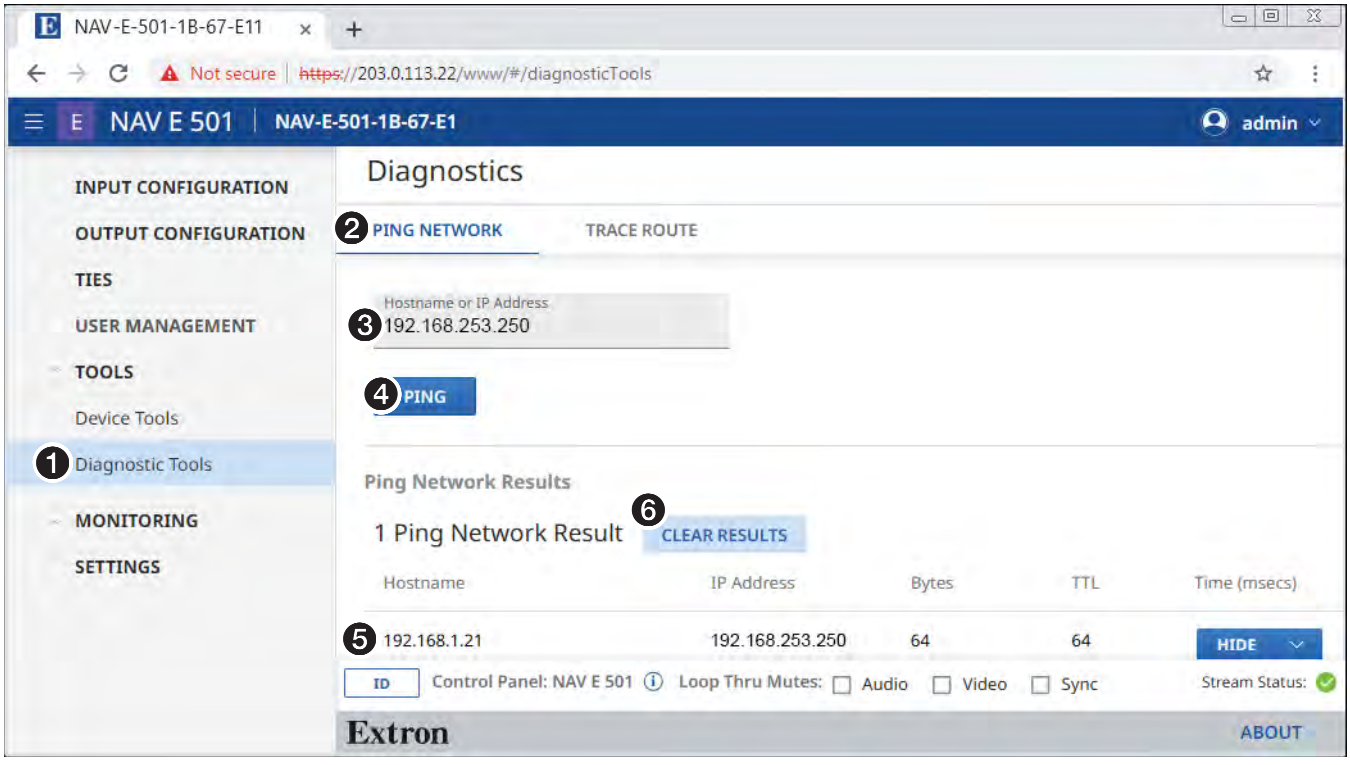


Figure 49. Diagnostic Tools Page, Ping Results Shown

2. Click either **PING NETWORK** or **TRACE ROUTE** tab (❷), depending on the diagnostic you want to run.

3. Click in the **Hostname or IP Address** field and enter the Hostname or IP address of another unit on the network (❸).
4. Click either **PING** or **TRACE** (see **figure 49, ❹**), depending on the diagnostic you want to run.

NOTES:

- **Ping** — Use this tool to test the connection to another unit on the network.
  Figure 49, ❺ shows the typical results of a Ping diagnostic.
- **Trace** — Use this tool to trace the network route taken by a packet from source to destination.
  Figure 50 shows the typical results of a Trace diagnostic.

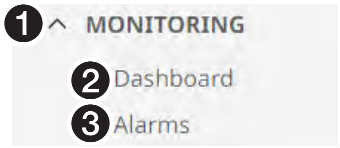


Figure 50. Trace Results Shown

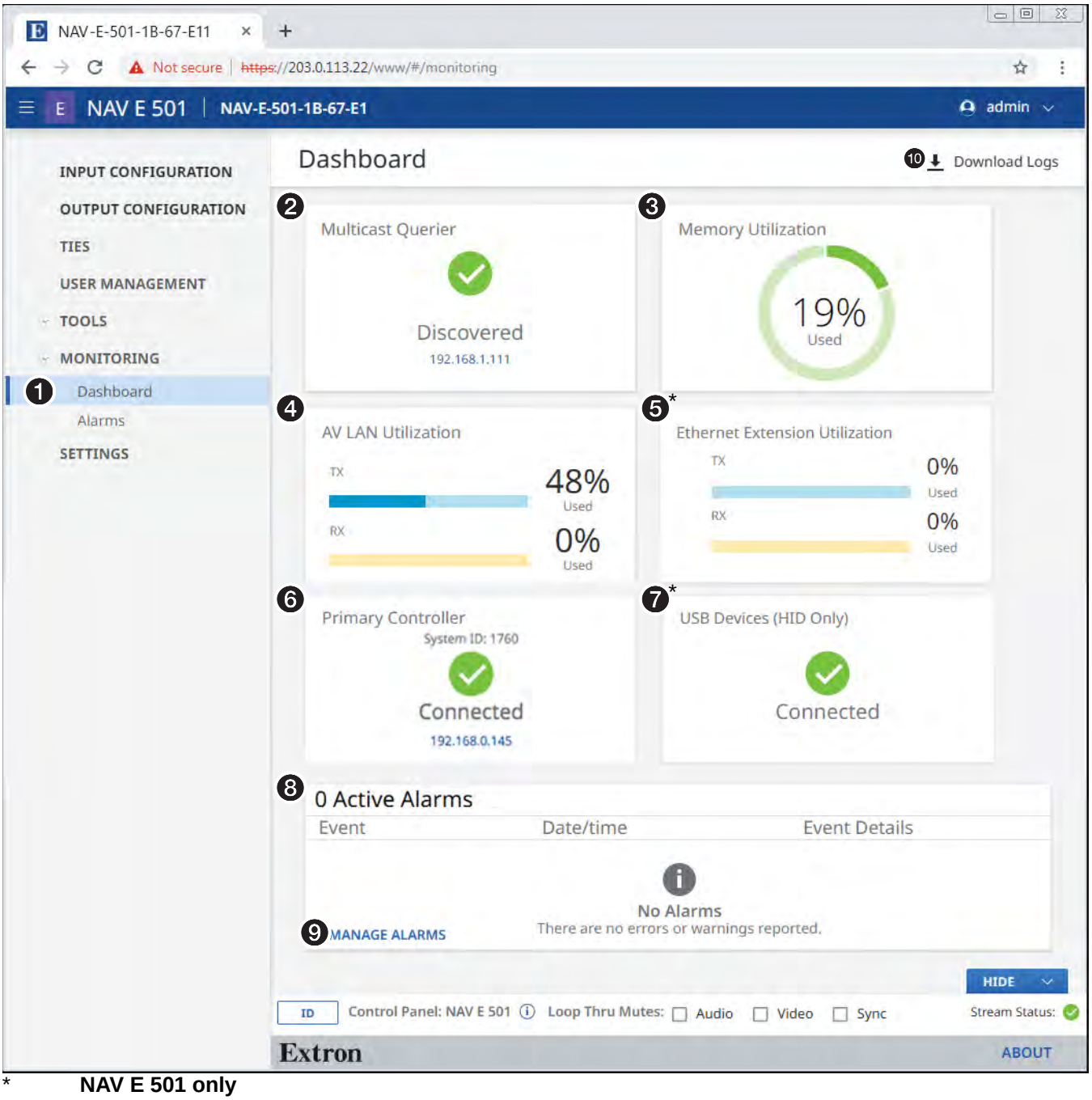
5. Click **CLEAR RESULTS** (❻) to reset the Address field if you want to run another Ping diagnostic.

Monitoring Pages

To access the Monitoring pages,click **Monitoring** (see ❶ at right) and either **Dashboard** (❷) or **Alarms** (❸). The browser displays the selected Monitoring page (see figure 51, which shows the Dashboard page selected [❶]), and device status information.



Dashboard page



* **NAV E 501 only**

Figure 51. Monitoring Dashboard Page

❷ **Multicast Querier pane**
❸ **Memory Utilization pane**
❹ **AV LAN Utilization pane**
❺ **Ethernet Extension Utilization pane** (NAV E 501 only)
❻ **Primary Controller pane**
❼ **USB Devices pane** (NAV E 501 only)
❽ **Alarms pane**
❾ **MANAGE ALARMS**
❿ **Download Logs**

❷ **Multicast Querier pane** (see **figure 51**) — See “Multicast Querier pane.“

❸ **Memory Utilization** — Indicates encoder memory usage, expressed in percent.

❹ **AV LAN Utilization** (NAV E 501 only) — Indicates the total bandwidth usage at that moment. The encoder generates an alarm if the utilization goes above 90%. The alarm clears automatically once the level drops below 90%.

NOTE: The encoder normally uses far more Tx than Rx bandwidth.

❺ **Ethernet Extension Utilization pane** — See ”Ethernet Extension Utilization pane.”

❻ **USB Devices pane** (NAV E 501 only) — See **USB Devices pane**.

❼ **Primary Controller pane** — See **Primary Controller** pane.

❽ **Alarms Pane** — Provide a read-only snapshot of current alarms.

❾ **MANAGE ALARMS** — Allows you to refesh and clear alarms. See **Alarms** pane.

❿ **Download Logs link** — See **Download Logs link**.

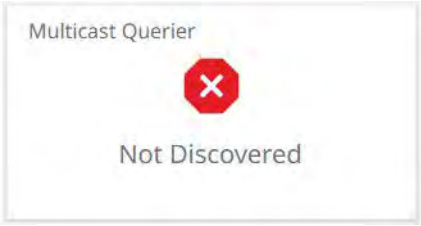
Multicast Querier pane

An multicast querier is a network service, usually running on a network switch, that can initiate IGMP/MLD queries. A multicast querier such as IGMP/MLD, depending on IPv4/IPv6 network, should be appropiately configured on the NAV network to manage the multicast traffic. If there is no multicast querier on the network, there is no effective multicast traffic management and the multicast traffic saturates the network and stream and communication errors can occur.

The Multicast `Querier` pane (see **figure 51**, ❸) shows whether or not a querier is present on the network, and the IP address of the querier. Figure 52 shows the normal indication and if no querier is present on the network.



Multicast Querier Discovered

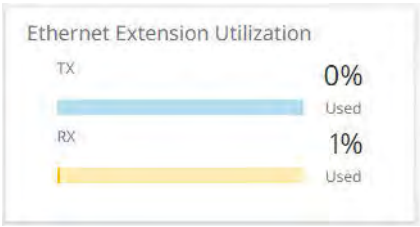


Multicast Querier Not Discovered

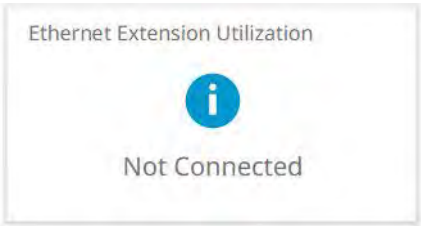
Figure 52. Multicast Querier Pane Indications

Ethernet Extension Utilization pane

The `Ethernet Extension Utilization` pane (see **figure 51**, ❻) indicates the total bandwidth usage of the rear panel Extension port (see **figure 2**, ❽) at that moment. The encoder generates an alarm if the utilization goes above 90%. The alarm clears automatically once the level drops below 90%. Figure 53 shows the normal indication and if the Extension port is either **disabled** or **enabled** (see **Physical Ports page**) with no device connected to it.



Ethernet Extension Normal Indication

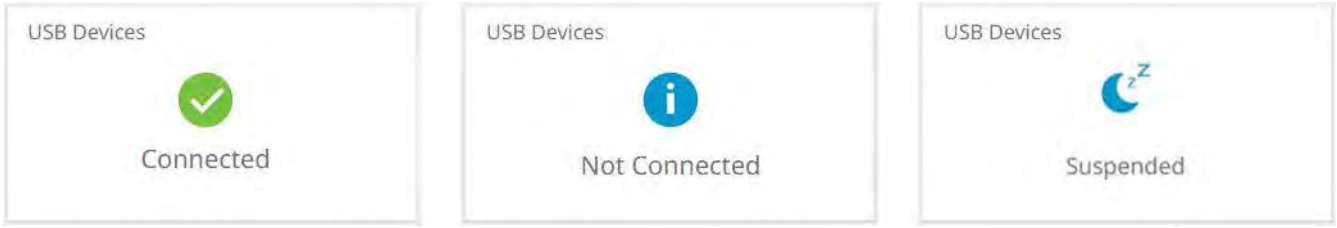


Ethernet Extension Disabled or Not Connected

Figure 53. Ethernet Extension Utilization Pane Indications

USB Devices pane

The `USB Devices` pane (see **figure 51, ❼**) shows whether or not one or more USB devices are connected and NAV USB extension is enabled. Figure 54 shows the normal indication and if no USB devices are connected or the USB Host has forced the USB bus into a suspend state.

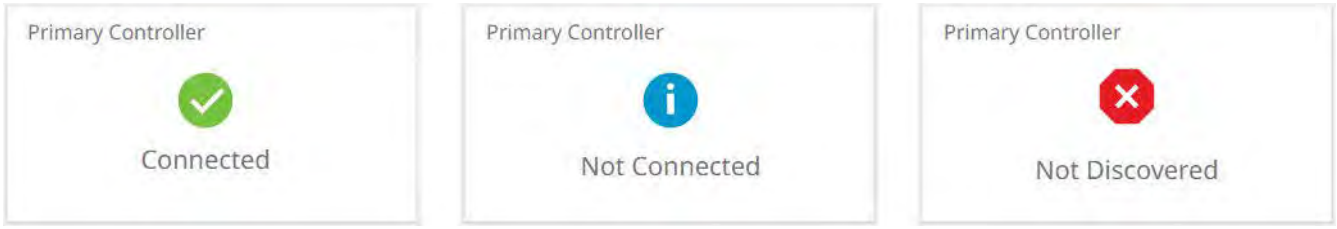


USB Devices Normal Indication | **USB Devices Not Connected** | **USB Devices Suspended Indication**

Figure 54. USB Devices Pane Indications

Primary Controller pane

The `Primary Controller` pane (see **figure 51, ❽**) shows whether or not an Extron control processor, such as an IPCP Pro xi Control Processor, is paired with the NAV device, and the IP address of the device if present. Figure 55 shows the normal indication and if no primary controller is present on the network available or the endpoint is not connected to any controller.



Primary Controller Normal Indication | **Primary Controller Not Connected** | **Primary Controller Not Discovered**

Figure 55. Primary Controller Pane Indications

Alarms pane

The MANAGE ALARMS link (see **figure 51, ❾**) opens the Alarms page, which shows any current alarms. Figure 56 shows the pane when alarm indications are present (see **Alarms**). Some alarms self-clear when specific conditions are met, others remain as long as the condition that causes it remains. As an example, a temperature alarm remains until the encoder cools down.

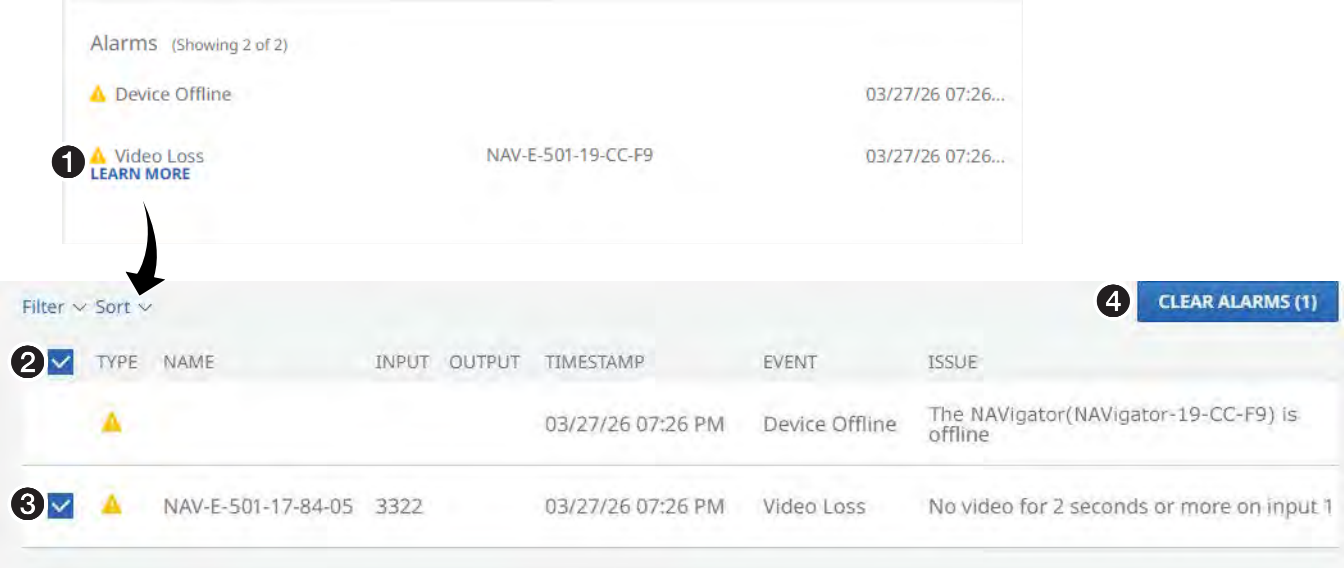


Figure 56. Clearing Alarms

NOTES:

- Critical alarms (⊗) should be resolved immediately.
- Warning alarms (⚠) are less serious.

Manually clear one or more alarms from the system as follows:

1. Click **LEARN MORE** (see figure 56, ❶).
2. Click the **All** checkbox (❷) or individual endpoint checkboxes (❸) to select one or more alarms to clear.
3. Click **CLEAR ALARMS** (❹) to clear this alarm.

Download Logs

Click the **DOWNLOAD LOGS** link (see ❶ at right) to download a history of errors in a comma-delimited .csv file that can be opened in Microsoft Excel. The figure at right shows the results of downloading an alarms log using the Chrome browser (❷).

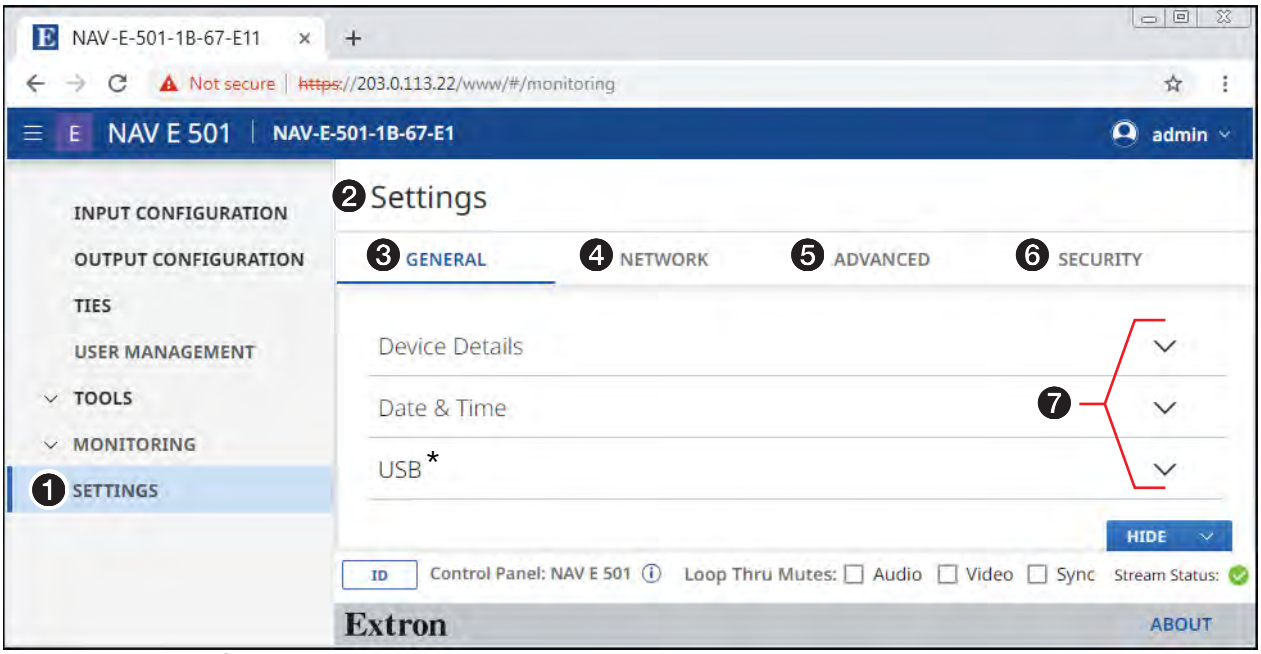


NOTES:

- Logs are a diagnostic tool that assists in troubleshooting or debugging. NAV devices log system changes that occur and time stamp each entry to assist in tracking the sequence of events that lead up to an issue. Logs can be reviewed to better understand the cause of failure.
- There is no upper limit to the number of alarms that can be logged, but a device can only have one alarm of the same type active at a time. The encoder monitors the active alarm states of all devices in the NAV system. All alarm state changes are logged even if status reporting is disabled from the encoder.

Settings Pages

To access the Settings pages, click **SETTINGS** (see figure 57, ❶). The browser displays the Settings page (❷), which consists of the following tabs: GENERAL (❸, shown selected in figure 57), NETWORK (❹, see **Network page**), ADVANCED (❺, see **Advanced page**), and SECURITY (❻, see **Security page**). Select a tab to configure its settings.



* **NAV E 501 only**

Figure 57. Device Settings Page

General page

The General page (see figure 57) provides three drop-down lists:

- **Device Details (see Device Details page)**
- **Date & Time (see Date & TIme page)**
- **USB** (see **USB page** [NAV E 501 only]**)**

Click the down arrow (❼) to open the drop-down list.

Device Details page

The Device Details selection on the General Settings page (see **figure 57**) opens a read-only pane that shows general information unique to the encoder (see figure 58). The Device Name, Input Number, and Location can be edited by clicking the **EDIT** button (❶). An editable version of the selection opens (see **figure 59**).

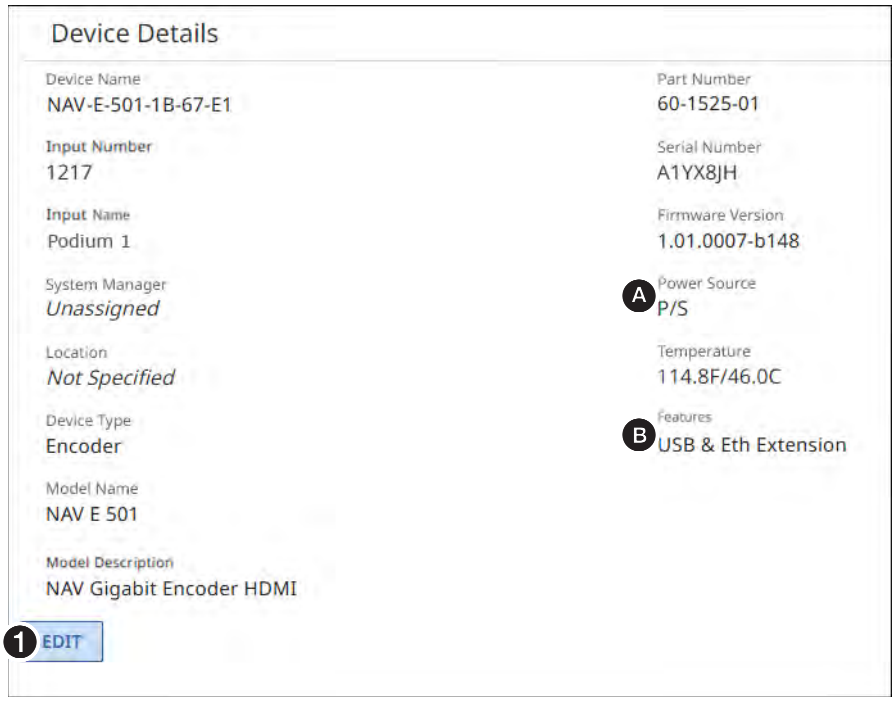


Figure 58. Device Details Selection

NOTES:

- Editing of Device Name, Input Name, and Location are disabled and the EDIT button is unavailable for selection when the encoder is assigned to a NAVigator.
- Special characters, which are not allowed in tags, names, and locations, are as follows: ! ~ ` @ # $ % ^ & * ( ) _ + = { } [ ] | \ : ; “ ‘ < > , . ? and / . A hyphen (–) is not a special character.
- Tags, names, and locations each have a 63-character limit.

Tag Rules	Name Rules	Location Rules

• Cannot begin or end with a hyphen.
• Cannot begin with a space.
  • Spaces are allowed after the first character.
• Multiple tags are allowed, making filtering and sorting searching easier.
	• Must begin with a letter.
	• Cannot end with a hyphen.
	• Spaces are not allowed.
		• Must begin with a letter.
		• Cannot end with a hyphen.
		  • Hyphens are allowed in any other position.
		• Cannot begin with a space.
		  • Spaces are allowed after the first character.

- The read-only Power Source datum (see figure 58, Ⓐ) indicates the power source of the encoder: P/S (power supply) or PoE.
- The read-only Features datum (Ⓑ) indicates the configuration of the encoder: USB & Eth Extension (NAV E 501) or Base (NAV E 101)

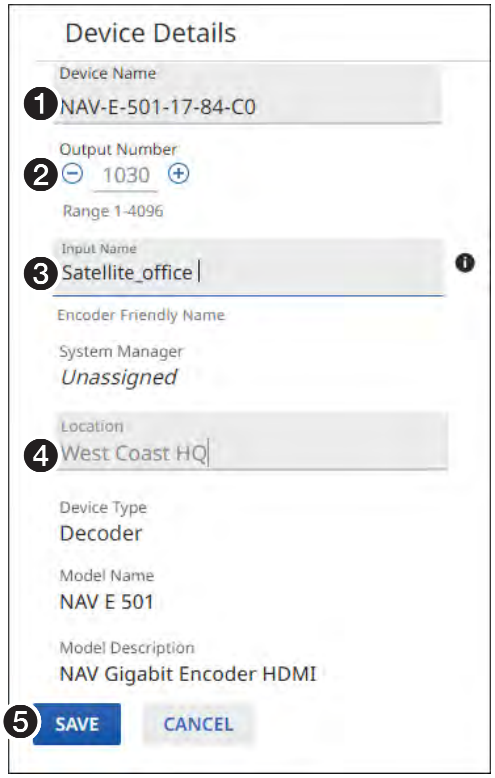


Figure 59. Editable Device Details Pane

❶ **Device Name** — Click in this field and type in a device name of your choice.

> NOTE: The `Device Name` is also the "hostname."

❷ **Input Number** — Click the ⊖ and ⊕ buttons or type a number into the field to overwrite the factory default input number, which is automatically generated in the range from `1` to `4096`.

❸ **Input name** — **If desired**, click in this field and type in an input name of your choice.

❹ **Location** — Click in this field and type in a location to customize your system.

❺ **SAVE and CANCEL buttons** — Click **`SAVE`** to take `Device Details` changes or **`CANCEL`** to abandon them. Clicking either button closes the editable pane.

Date & Time page

The Date & Time selection on the General page (see **figure 57**) opens a read-only pane showing date and time settings (see figure 60) and how these settings were last updated (manually or synced with NTP servers). The date and time can be edited by clicking the **EDIT** button (❶). An editable pane opens (see "Set time manually —" and figure 61 and **Sync time with server** and **figure 63**).

NOTE: Editing of these settings is disabled and the EDIT button is unavailable for selection when the encoder is assigned to a NAVigator.

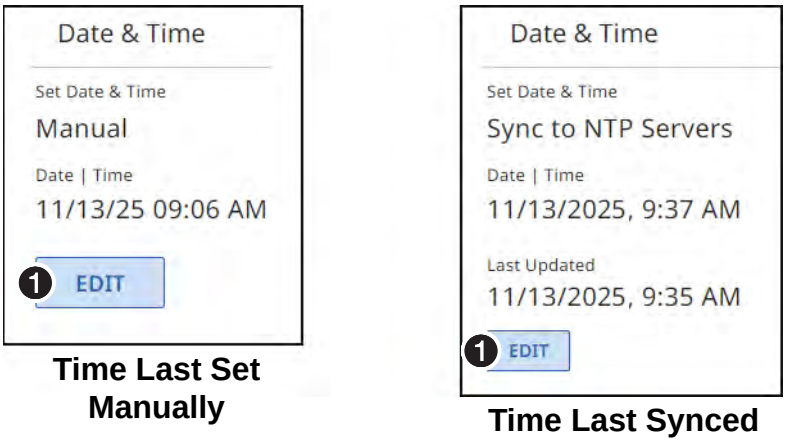


Figure 60. Date & Time Selection

Set time manually —

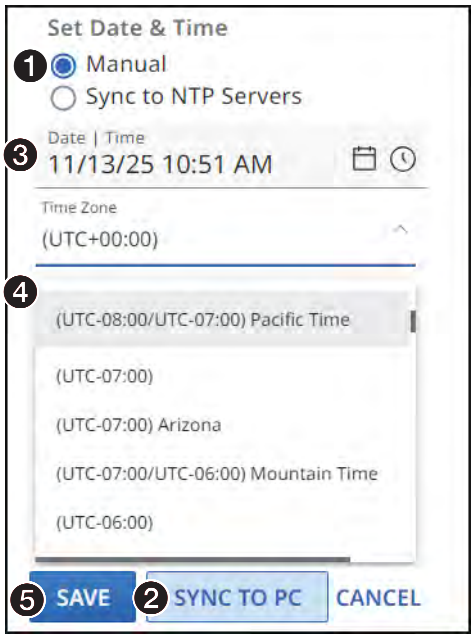


Figure 61. Set Time Manually

❶ **Manual** — Click this radio button to select manual setting of the time and date.

❷ **Sync to PC** — Click to sync the encoder date and time to the computer with which you are connected.

❸ **Date & Time** — Click in this field and type in the date and time.

❹ **Time Zone** — Click the drop-down list to select the offset from Greenwich Mean Time (GMT).

❺ **SAVE and CANCEL buttons** — Click **SAVE** to take Date & Time changes or **CANCEL** to abandon them. Clicking either button closes the editable selection.

NOTE: Or you can click the **`Datepicker`** (▭) or **`Timepicker`** (◷) icons (see **figure 61**) and use those tools to set the date and time (see figure 62).

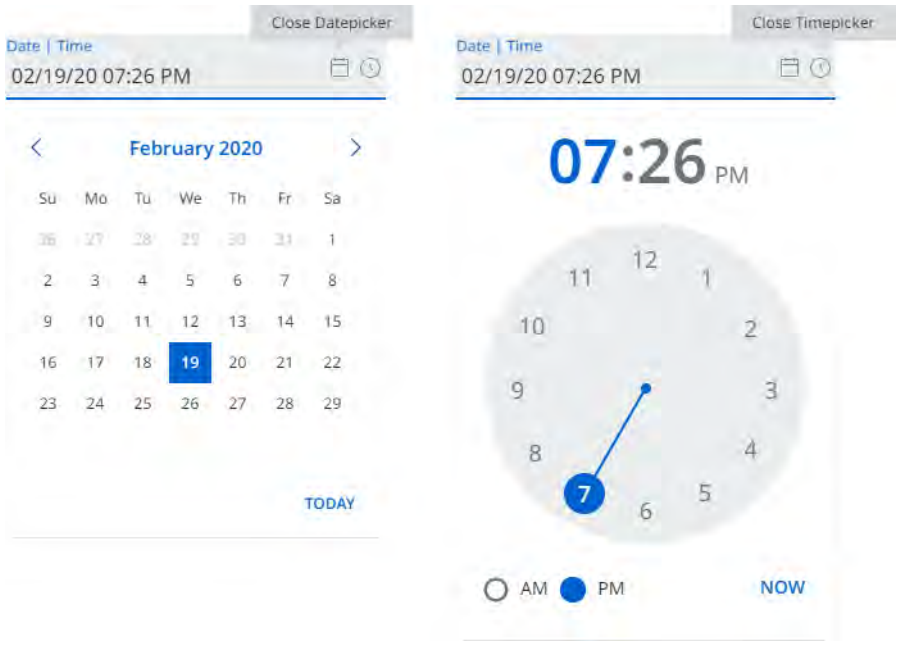


Figure 62. Using Datepicker and Timepicker Tools

Sync time with server —

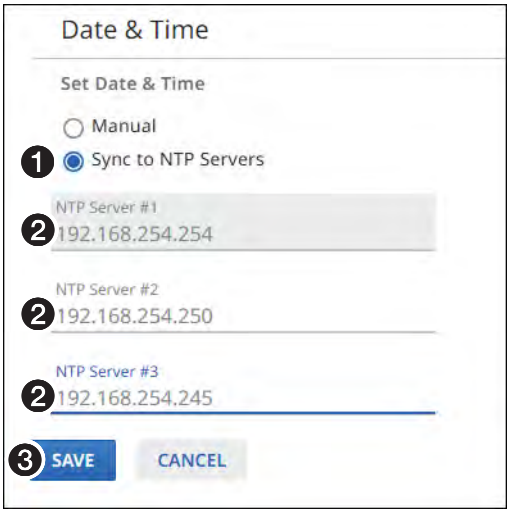


Figure 63. Sync Time with Server

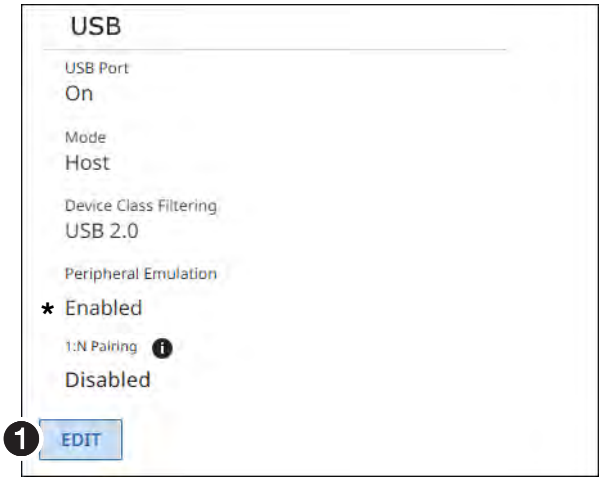
❶ **Sync to NTP Servers** — Click to force the encoder to sync its internal clock to an NTP server.

❷ **NTP server** — Click in these fields and type in the IP address or DNS name of an NTP server.

❸ **SAVE and CANCEL buttons** — Click **`SAVE`** to take `Date` & `Time` changes or **`CANCEL`** to abandon them. Clicking either button closes the editable pane.

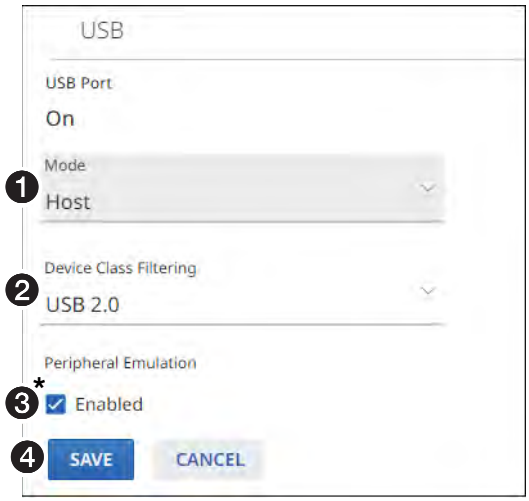
USB page

The USB selection on the General Settings page (see **figure 57**) opens a read-only pane (see figure 64) that shows the status of the USB 2.0 port (see **figure 2**, Ⓕ). The port can be turned on and off and it can be configured by clicking the EDIT button (❶). An editable version of the selection opens (see figure 65).



* If the endpoint is set to Host mode only.

Figure 64. USB Selection



* If the endpoint is set to Host mode only.

Figure 65. Editable USB Selection

❶ **Mode** — Click the drop-down list to select between **`Device`** and **`Host`**.

NOTES:

- **Host** mode allows a host device such as a PC to be connected or accepted to that endpoint.
- **Device** mode allows devices to be connected or accepted to that endpoint.
- You can only tie a USB host to a USB device for proper system operation.
- Do not connect a host to an endpoint that is in USB device mode.

❷ **Device Class Filtering** (see **figure 65**) — Click the drop-down list to select among **USB 2.0**, **HID + CAC**, and **HID Only**.



NOTES:

- USB Device Class filtering limits the functionality of the USB port.
  - USB 2.0 - No restrictions, allows all USB devices to function.
  - HID + CAC — Allows only devices such as a keyboard, mouse, and a card reader (common access card) to function.
  - HID Only - Allows only devices such as a keyboard and mouse to function.

❸ **Peripheral Emulation** — This feature, available only if the endpoint is set to Host mode, emulates a keyboard and mouse to the connected host computer, allowing the computer to boot up if it requires a USB keyboard and mouse to be present.

❹ **SAVE and CANCEL buttons** — Click **SAVE** to take USB changes or **CANCEL** to abandon them. Clicking either button closes the editable pane.

Network page

The Network Settings page displays the current network settings (see figure 66, ❶). You can use the editable panes of the page to change settings. Click the down arrow (❷) to open one of the following drop-down lists:

- **Hostname** (see **Hostname pane**)
- **TCP/IP** (see **TCP/IP page**)
- **DNS** (see **DNS page**)

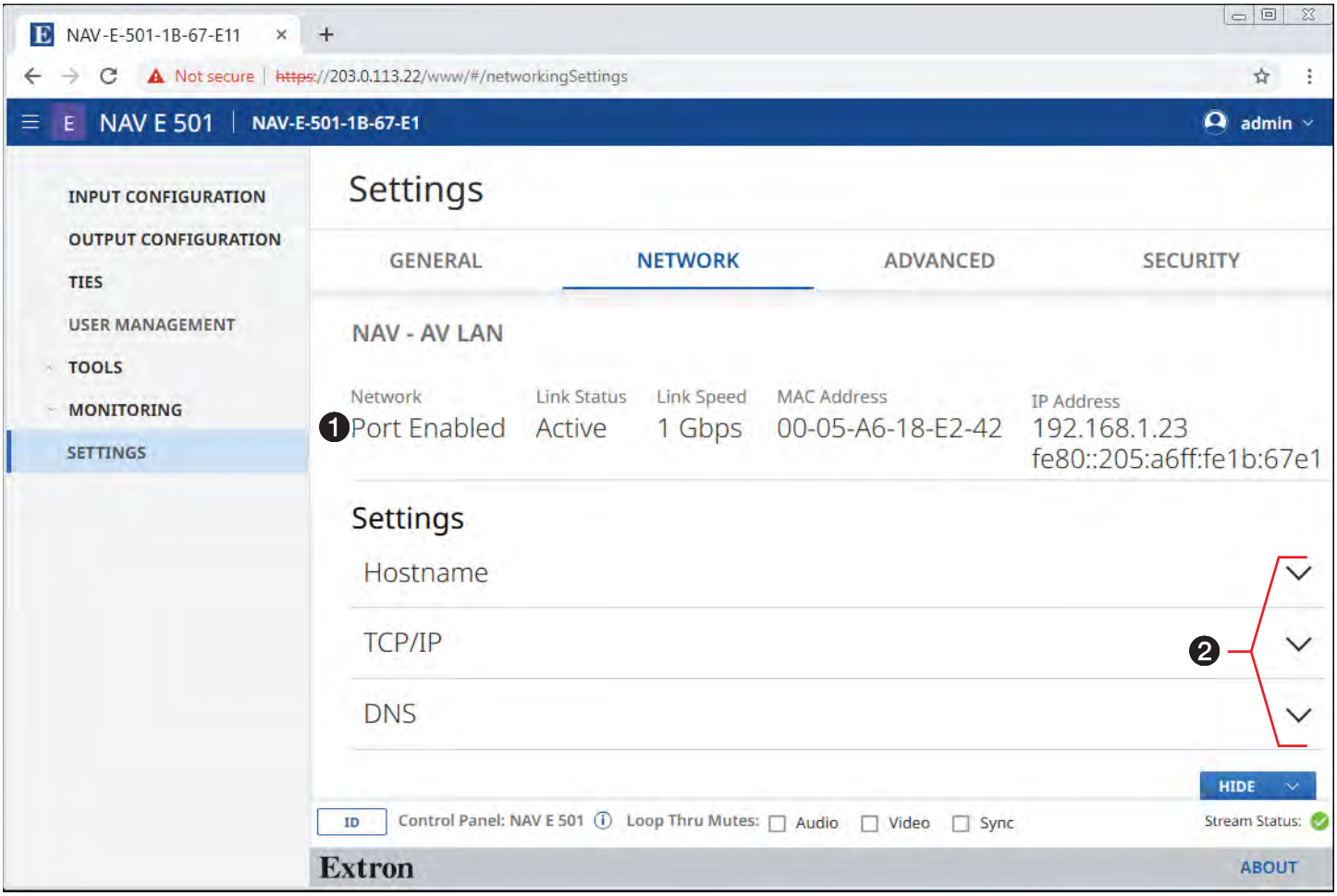
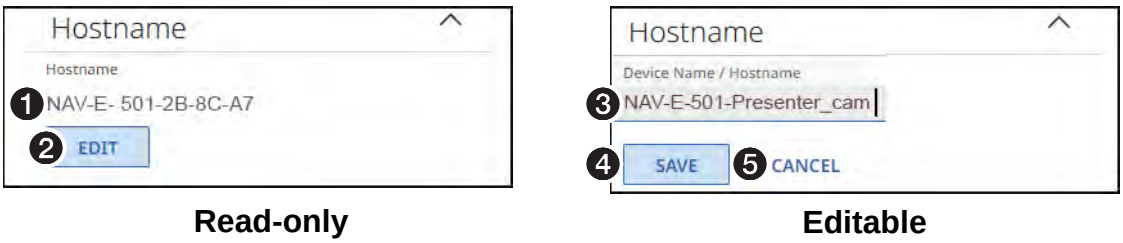


Figure 66. Networking Page

Hostname pane

The Hostname selection on the Network page (see **figure 66**, ❶) opens a read-only pane that shows the currently assigned hostname of the encoder (see figure 67,❶).

NOTE: Editing of the Hostname is disabled and the EDIT button is unavailable for selection when the encoder is assigned to a NAVigator.



Read-only **Editable**

Figure 67. Hostname Selection

Edit the hostname as follows:

1. Click the Hostname **EDIT** button (see figure 67, ❷)**.** The EDIT button changes to SAVE and the Hostname field becomes available for editing.

   NOTE: The Hostname is also the "Device Name."

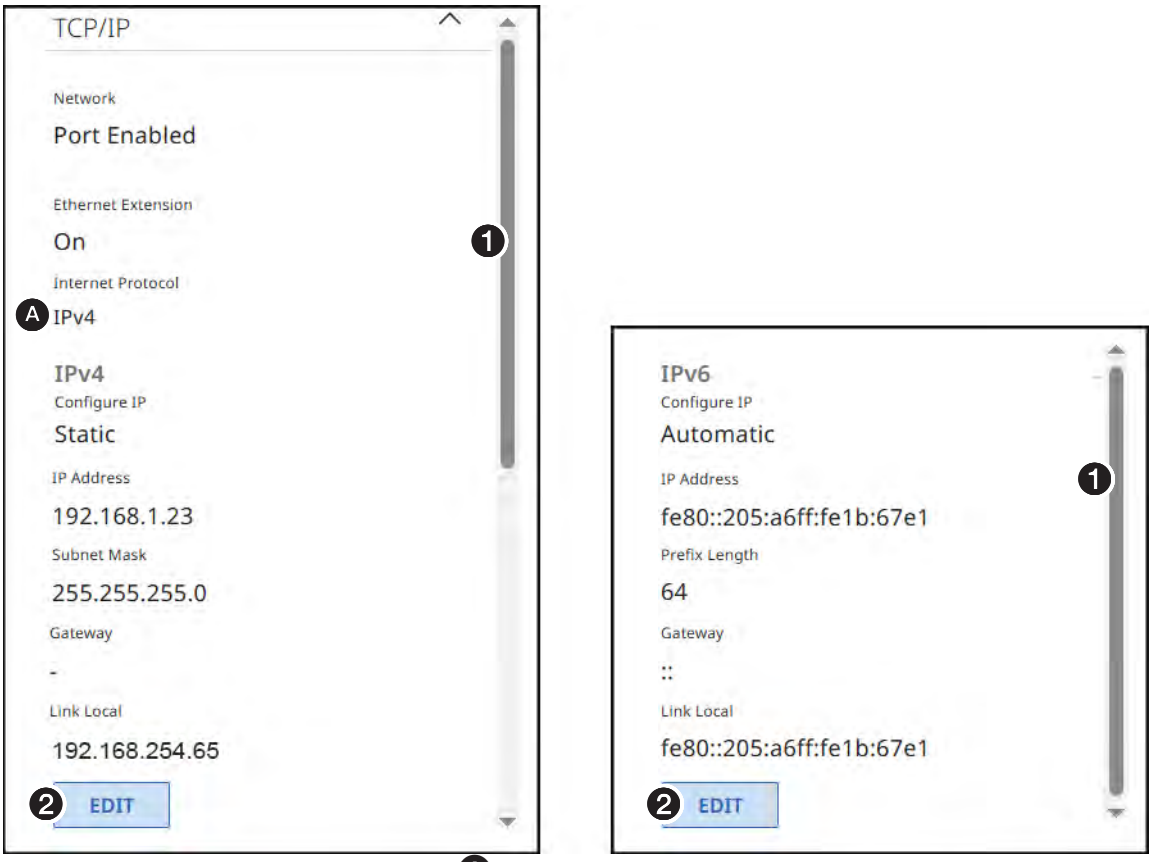
2. Click in the editable Device name/Hostname field (❸) and edit it as desired.
3. Click outside of the field and then click **SAVE** (❹) to make the change or **CANCEL** (❺) to abandon it.

TCP/IP pane

The TCP/IP selection on the Network page (see **figure 66**, ❶) opens a read-only pane that shows the connection variables of the encoder (see figure 68). If necessary, use the scroll bar (❶) to see the entire length of the pane. Network configuration changes can be made by clicking the **EDIT** button (❷).

NOTES:

- Editing of these settings is disabled and the EDIT button is unavailable for selection when the encoder is assigned to a NAVigator.
- If IPv4 and IPv6 are both enabled, both are displayed in the Internet Protocol field (Ⓐ).



Scrolled Up IPv4 selected, Ⓐ **Scrolled Down (IPv4/IPv6 Selected)**

Figure 68. Network Connection Selection

Edit network connection settings as follows:

1. Click the **EDIT** button at the bottom of the Network Connection page (see figure 68, ❷).The EDIT button changes to SAVE and the variable fields become available for editing (see **figure 69**).

   NOTE: The IP Address, Subnet, and Gateway, fields are unavailable for editing when DHCP (IPv4) and Automatic (IPv6) are on.

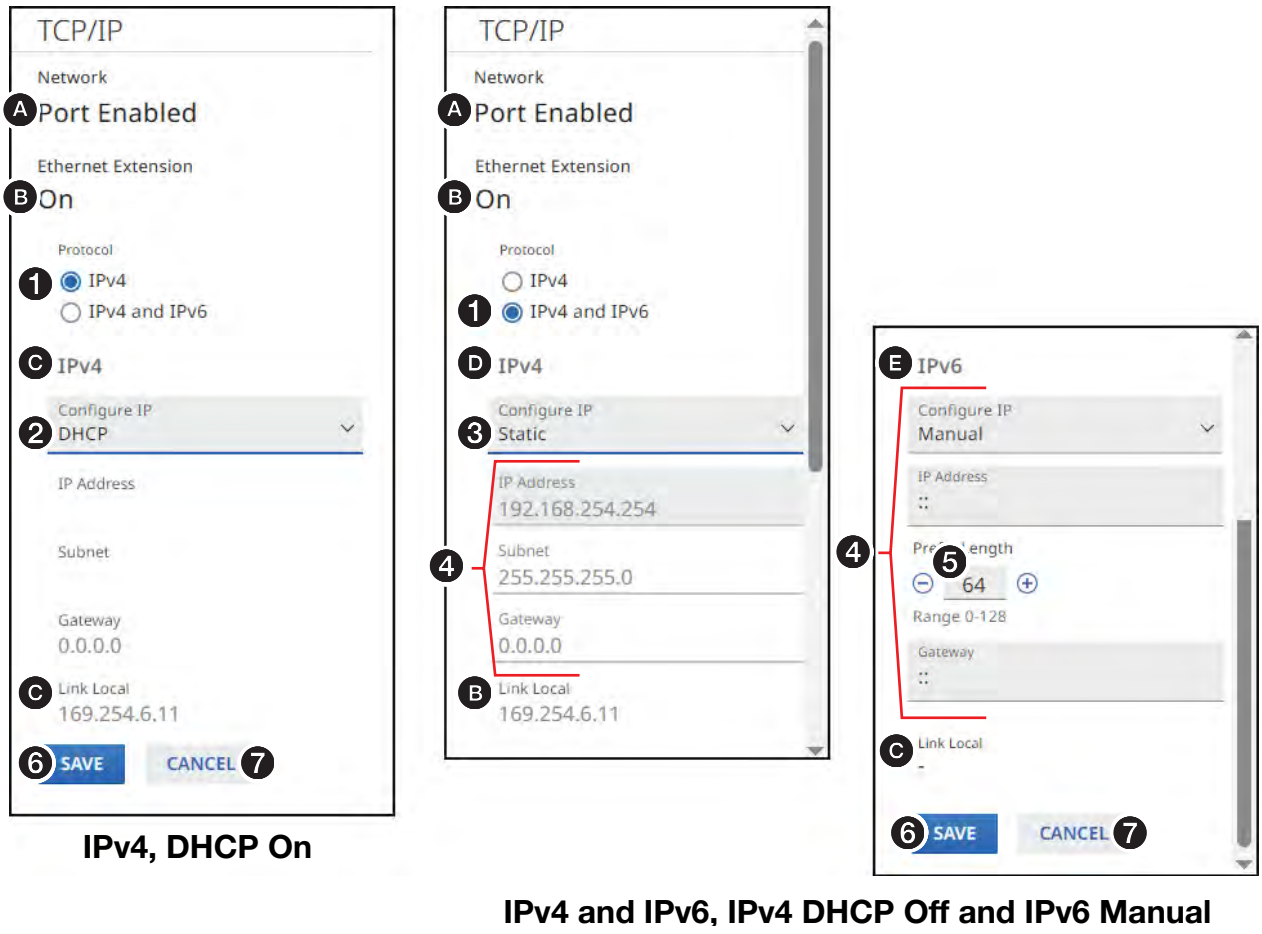


Figure 69. Editable Network Connection Selection

NOTES:

- `Port Enabled` (see figure 69, Ⓐ) indicates that the port is up and functioning normally.
- Ethernet Extension On (Ⓑ) indicates that the Ethernet extension feature is up and functioning normally.
- **Link Local** (Ⓒ) — DHCP is on by default. For IPv4, when a DHCP server is not accessible, the Link local IP Address (an address in the range of `169.254.1.0` to `169.254.254.255`), is assigned to the endpoint when no other address assignment methods are available.

2. Click the **`IPv4`** or the **`IPv4 and IPv6`** radio button (see figure 71, ❶) to select the desired internet protocol.

NOTE: If you select the **`IPv4 and IPv6`** radio button (❶), IPv6 network connection settings (Ⓔ) appear after the IPv4 group of settings (Ⓓ).

3. **For IPv4, if desired**, click the `Configure IP` drop-down list (❷) to select between **`DHCP`** (**default**) and **`Static`**.
4. **For IPv6, if desired**, click the `Configure IP` drop-down list (❸) to select between **`Automatic`** (**default**) and **`Manual`**.

NOTE: When **`Automatic`** is selected for IPv6, the `IP address`, `Prefix Length`, and `Gateway` fields become unavailable for editing. The encoder must receive these parameters from an external DHCPv6 server or a SLAAC server. If there is no such server found, the encoder assumes its IPv6 `Link local address` beginning with `FE80::` and a `Prefix Length` of `64` as its primary address.

5. **If desired**, click in an editable field (❹) and edit it as desired.

6. Repeat step 5 as necessary for other values.
7. **For IPv6, if desired**, click in the **Prefix Length** field (see figure 69, ❺) and edit it as desired or click ⊕ or ⊖ to increment or decrement, between 0 and 128, the number of leftmost bits of an IPv6 address that belong to the network part.

   NOTE: Prefix Length in IPv6 is the equivalent of the subnet mask in IPv4 addressing.

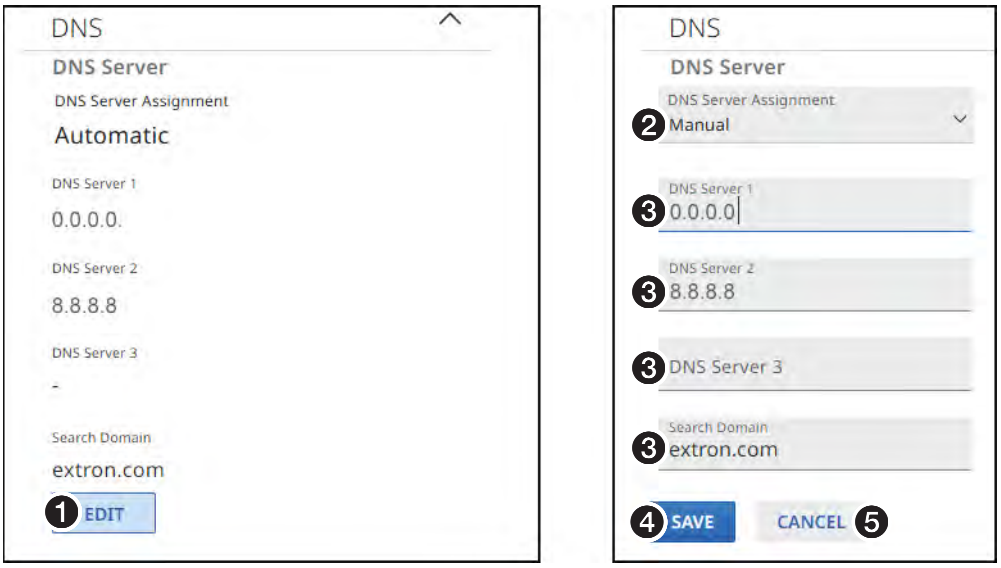
8. Click **SAVE** (❻) to save the changes or **CANCEL** (❼) to abandon them.

   NOTE: If you change the settings of the port, you lose communications momentarily while the encoder self-reconfigures. This is normal.

DNS pane

The DNS selection on the Network page (see figure 66, ❶) opens a read-only pane that shows connection variables of the of one or more DNS servers (see figure 70). DNS server assignment changes can be made by clicking the **EDIT** button (❶).

NOTE: Editing of these settings is disabled and the EDIT button is unavailable for selection when the encoder is assigned to a NAVigator.



Read Only **Editable**

Figure 70. DNS Selection

Edit the DNS variables as follows:

1. Click the **EDIT** button at the bottom of the DNS page (see figure 70, ❶).The EDIT button changes to SAVE and the variable fields become available for editing.
2. Click the **DNS Server Assignment** drop-down list and select between **Automatic** and **Manual**. **Manual** make the rest of the variables editable.

   NOTE: If **Automatic** is selected, the DNS Server and Search Domain values are received from external DHCP server.

3. **If desired**, click in an editable field (❸) and edit it as desired.
4. Repeat step 3 as necessary for other values.
5. Click **SAVE** (❹) to save the changes or **CANCEL** (❺) to abandon them.

Advanced page

On the Advanced Device Settings page (see figure 71), click the down arrow (❶) to open a drop-down list (see the following:)

- **Advanced Networking page**
- **LLDP page**

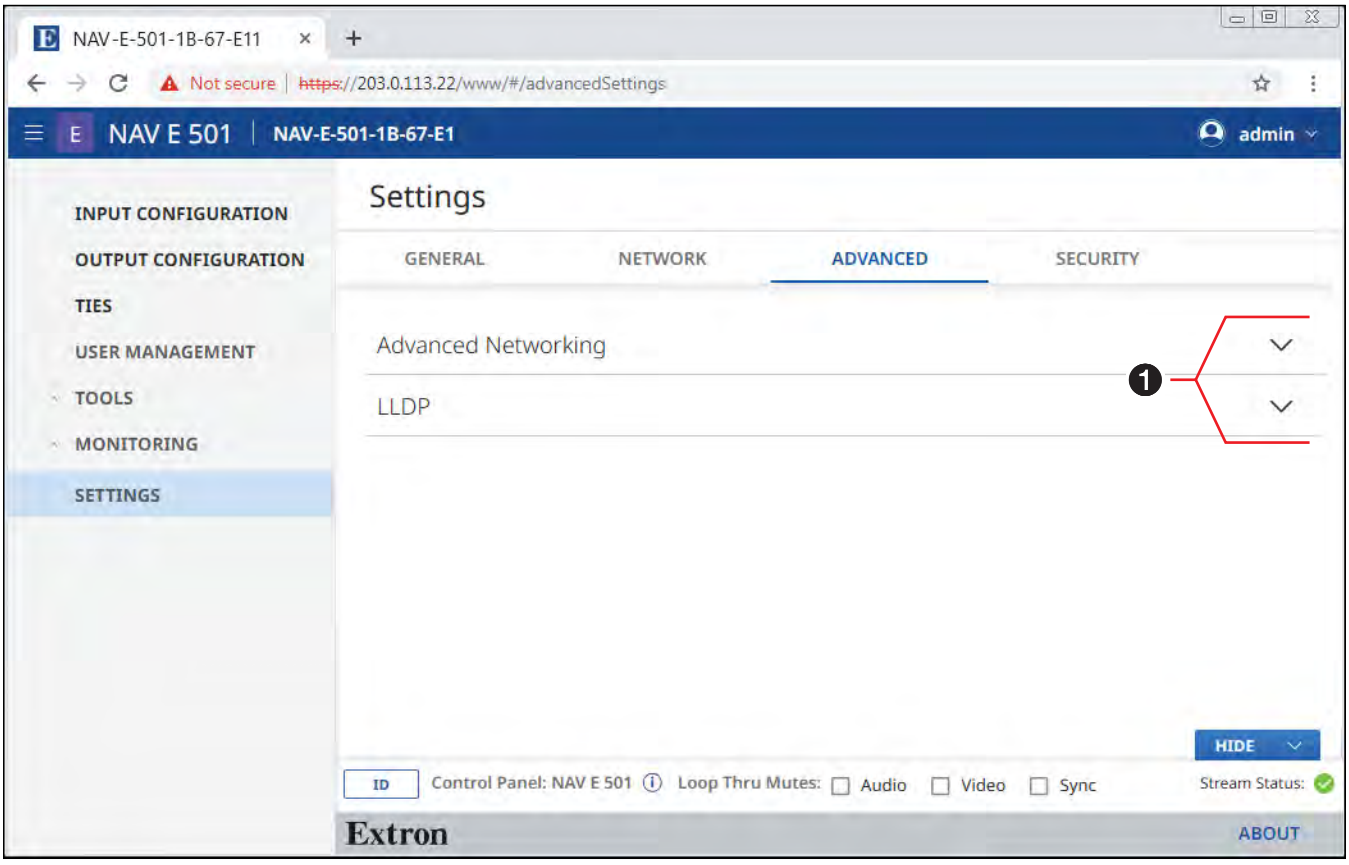
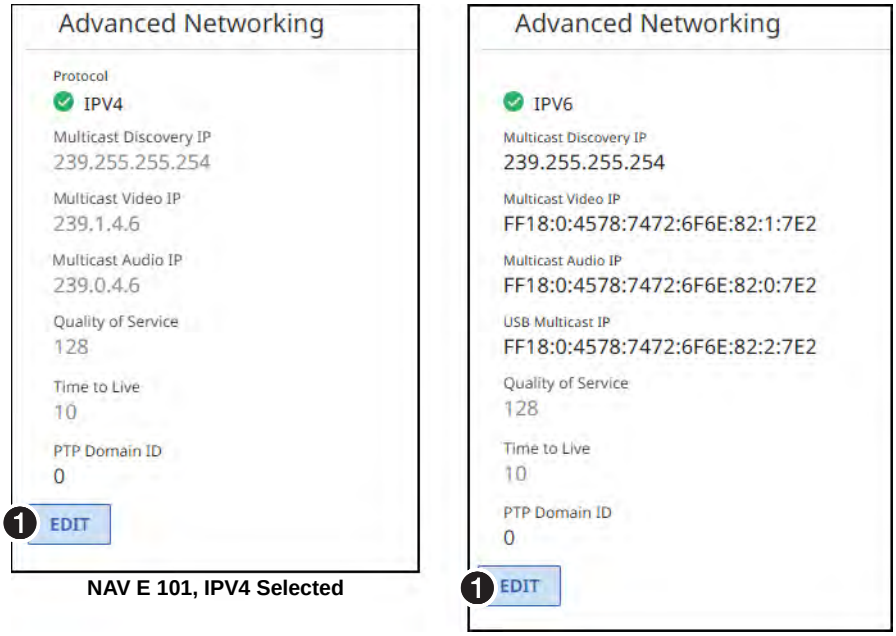


Figure 71. Advanced Settings Page

Advanced Networking page

The `Advanced Networking` selection on the `Advanced` page (see **figure 71**, ❶) opens a read-only pane that shows the port usage parameters of the encoder (see figure 72). The parameters can be edited by clicking the **EDIT** button (❶). An editable version of the selection opens(see **figure 73**).



NAV E 101, IPV4 Selected

NAV E 501, IPV6 Selected

Figure 72. Advanced Networking Selection

❶ **RESET TO DEFAULT** (see **figure 73**) — Click to restore the advanced networking settings of the encoder to their default values.

❷ **Protocol** — Click in the appropriate radio button (**`IPV6`** or **`IPV4`**) to select the desired protocol.

❸ **Multicast IP addresses** — Click in these fields and type in valid IP addresses for your encoder.

NOTES:

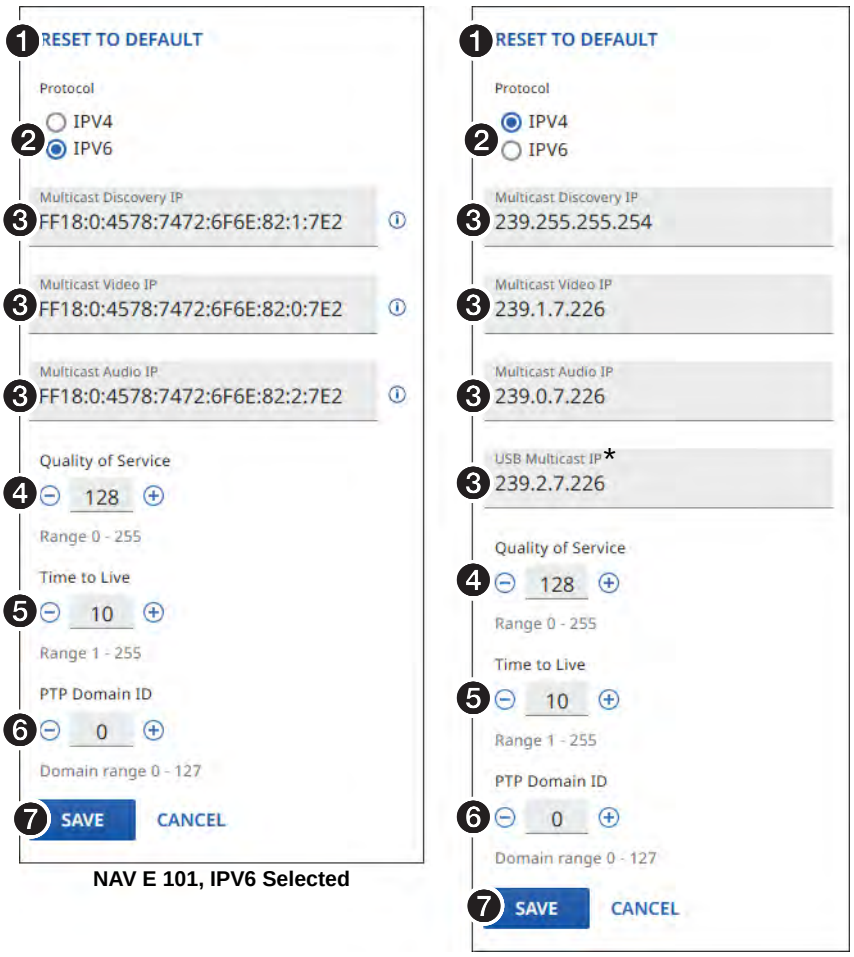
- **Multicast Discovery IP** is the multicast IP address that the encoder uses to discover and communicate with all other NAV devices on the network.
- **Multicast Video IP** is the IP address that outputs the NAV video stream.
- **Multicast Audio IP** is the IP address that outputs the NAV audio stream.
- **USB Multicast IP** (NAV E 501 only) is the IP address that outputs the NAV USB stream.

❹ **Quality of Service** — This setting affects the audio and video streams only and accepts valid differentiated services code point (DSCP) type of service (TOS) decimal values to adjust the priority of the packets. Click the ⊖ and ⊕ buttons or type a number into the field (within the range `0` to `225`) to overwrite the factory default.

NOTE: The lower the number, the lower the priority of the packet within a queue. This may result in packet loss, latency, and jitter in a saturated link.

❺ **Time to Live** — Click the ⊖ and ⊕ buttons or type a number into the field (within the range `1` to `225`) to overwrite the factory default.

NOTE: Understanding how many network hops your farthest endpoint is can help assure that the packet reaches the desired destination. If too small of a value is entered, the network could discard the packet before it reaches the destination. In this case, the endpoint does not receive the streams.



NAV E 101, IPV6 Selected **NAV E 501, IPV4 Selected**

* **NAV E 501 only**

Figure 73. Editable Advanced Networking Selection

❻ **PTP (Precision Time Protocol) Domain ID** — Click in the **`PTP Domain ID`** field and edit it as desired or click the ⊖ and ⊕ buttons to increment or decrement the `PTP Domain ID`. If you change the value, the unit re-synchronizes its internal audio time clock to the domain of the newly entered value.

NOTE: PTP Domain is an integer value used with AES67 to logically group PTP clocks on a network. This synchronizes their clocks to eliminate latency between the audio signals. Endpoints can only synchronize to other devices in the same domain and devices outside the domain are ignored.

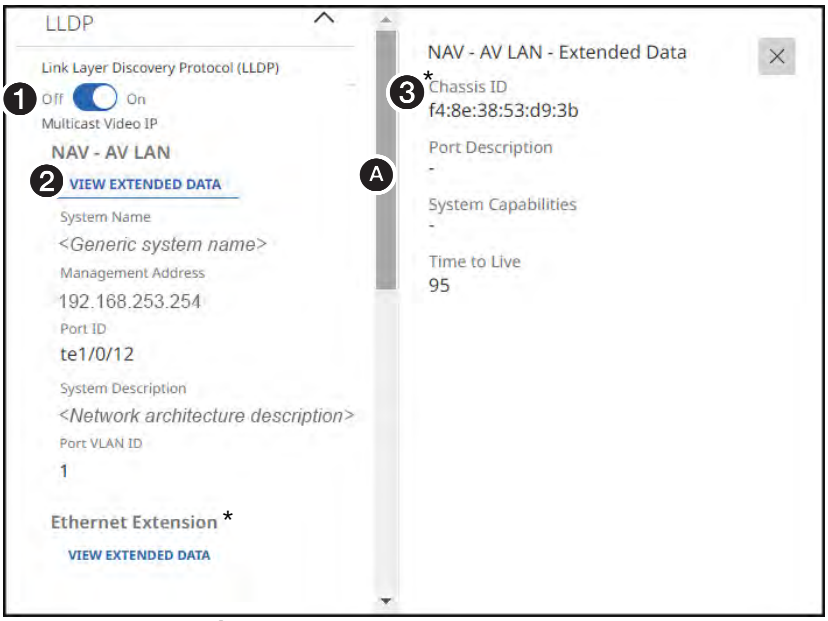
- If you enter a value above the valid range, such as **128**, the software automatically drops the value to **127**.
- If you enter a valid, but incorrect, domain, the encoder syncs to the new domain clocks and there is a potential for interrupted audio.

❼ **SAVE and CANCEL buttons** — Click **`SAVE`** to take changes or **`CANCEL`** to abandon them. Clicking either button closes the editable pane.

LLDP page

The LLDP selection on the Advanced page (see **figure 71**, ❶) opens a pane that shows the status of Link Layer Discovery Protocol (on or off) and provides general extended information about the NAV AV LAN (see figure 74) and the Ethernet Extension LAN (NAV E 501 only, see **figure 75**).

NOTE: For the NAV E 501 only, as necessary, click and drag the vertical scroll bar (see figure 74, Ⓐ and **figure 75**, Ⓐ up and down to display the entire page.



* **NAV E 501 only**

Figure 74. LLDP Page

❶ **Link Layer Discovery Protocol (LLDP)** — LLDP, a vendor-neutral protocol, is used by network devices to discovery, identify and share information between two directly connected network devices. Click to toggle `LLDP` **`On`** ( ) and **`Off`** ( ).

NOTES:

- ❷ through ❺ (see **figure 75**) are not displayed when LLDP is toggled off.
- You can only display one pane of `Extended Data` (❸), `NAV - AV LAN` or `Ethernet Extension` (❺), at a time.

❷ **VIEW EXTENDED DATA button (NAV - AV LAN)** — Opens a pane at the right of the page (❸) that shows additional LLDP neighbor information.

❸ **NAV - AV LAN Extended Data pane** (NAV E 501 only) — A read-only pane that provides additional, detailed, read-only LLDP information about the directly connected neighboring device on the interface. Click ✕ to close the pane.

❹ **VIEW EXTENDED DATA button (Ethernet Extension)** [NAV E 501 only], see figure 74) — Opens a pane at the right of the page (see **figure 75**, ❺) that shows your full Ethernet Extension LAN topology.

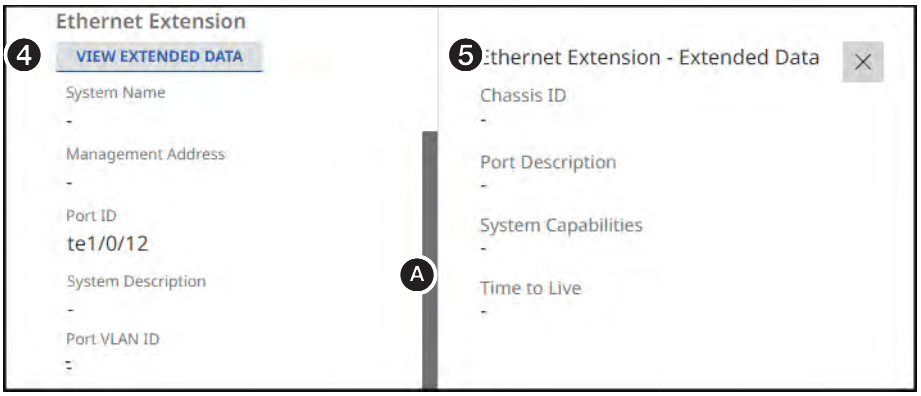


Figure 75. LLDP Page, Continued (NAV E 501 Only)

❺ **Ethernet Extension - Extended Data pane** (NAV E 501 only) — A read-only pane that provides additional details of the Ethernet Extension topology. Click ✕ to close the pane.

Security page

On the `Settings` `Security` page (see figure 76), click the down arrow (❶) to open a drop-down list (see the following:)

- **Physical Ports**
- **Network Ports**
- **Certificates**
- **Audit Logs**
- **802.1X**
- **Web Server (HTTPS)**

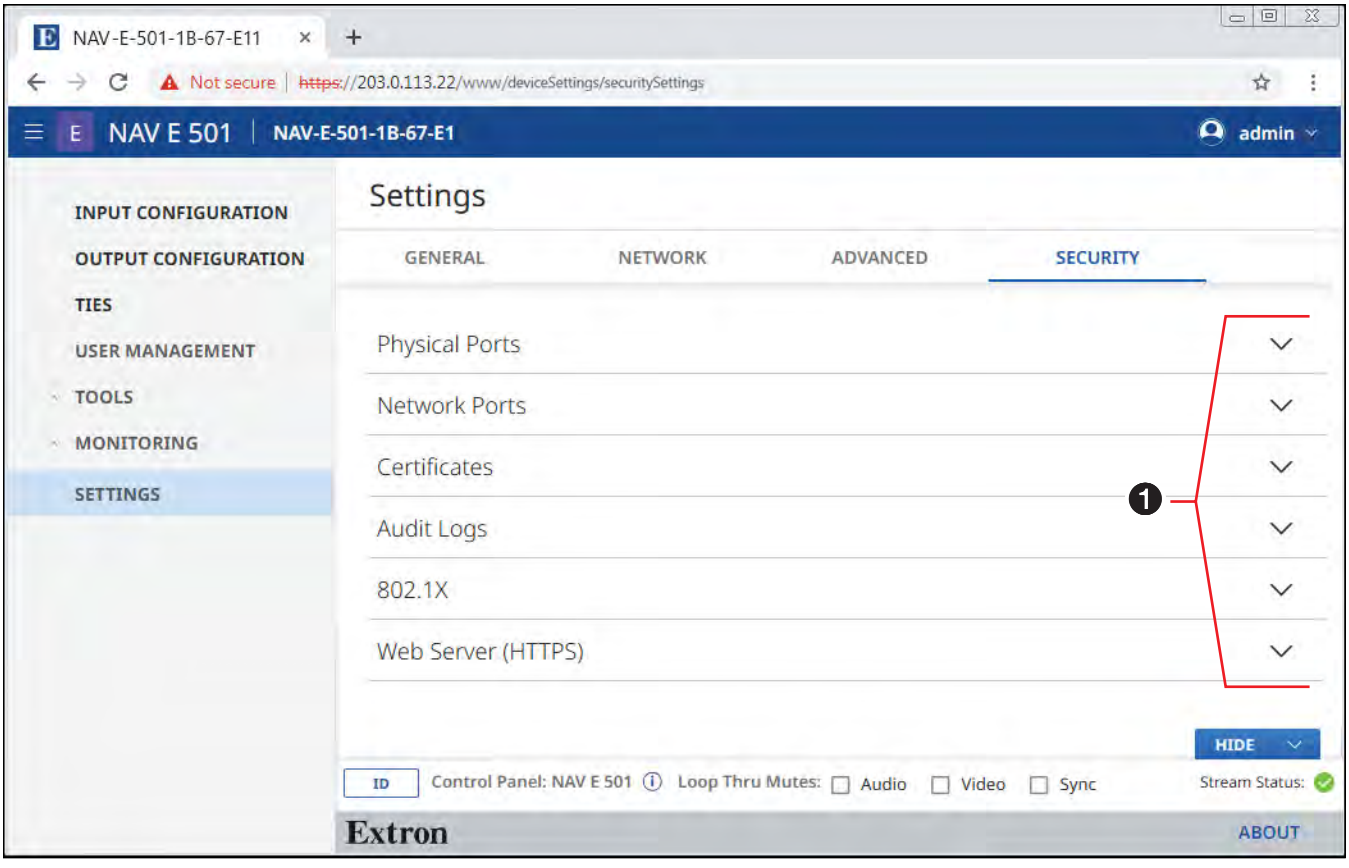
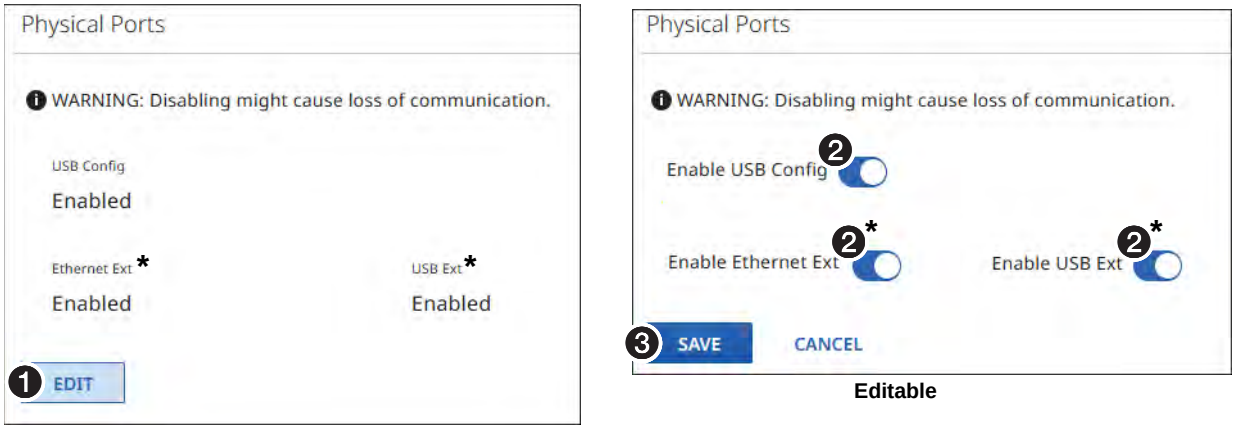


Figure 76. Security Page

Physical Ports page

The Network Ports selection on the Security page (see **figure 76**, ❶) opens a read-only pane that enable staus of the physical ports (see figure 77). The HTTP and RTP ports can be edited by clicking the **EDIT** button (❶). This feature gives the flexibility to use specific ports of your choosing. An editable version of the selection opens.

NOTE: The Enable USB Config and Enable Ethernet Ext toggles are disabled when the encoder is assigned to a NAVigator.



Read-only

Editable

* **NAV E 501 only**

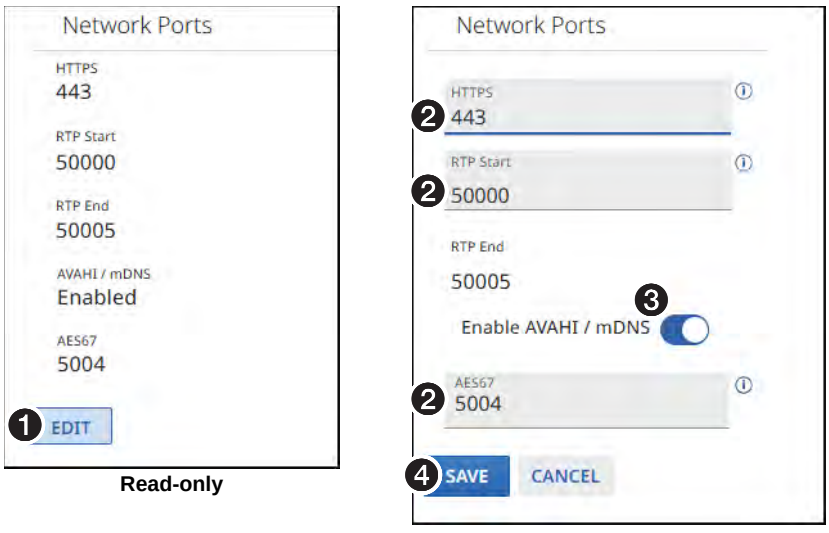
Figure 77. Physical Ports Selection

❷ Click to toggle the selected physical port **On** ( ) and **Off** ( ).

❸ **SAVE and CANCEL buttons** — Click **SAVE** to take Port changes or **CANCEL** to abandon them. Clicking either button closes the editable pane.

Network Ports page

The Physical Ports selection on the Security page (see **figure 76**, ❶) opens a read-only pane that shows the port usage parameters of the encoder (see figure 78). The HTTP and RTP ports can be edited by clicking the **EDIT** button (❶). This feature gives the flexibility to use specific ports of your choosing. An editable version of the selection opens.



Read-only

Editable

Figure 78. Network Ports Selection

❷ **HTTPS, RTP START, and AES67 fields** (see **figure 78**) — Click in these fields and enter the valid values for your encoder.

NOTES:

- Valid HTTPS values:
  - `0` = Disabled
  - `443` = **Default**
  - `1024` - `65535` = Other available options so long as they are not overlapping on the NAVigator.
- Valid RTP values:
  - `0` - Disabled
  - `5000` - **Default**
  - `1024` - `65535` = Free use. Other available options so long as they do not overlap.
- Valid AES67 values:
  - `0` - Disabled
  - `5004` - Default
  - `1024` - `65534` = Free use. Other available options so long as they do not overlap.
- See the *NAV Network Ports, Protocols, and Licenses Document*, available at **www.extron.com**, for more information on ports.

❸ **Enable AVAHI/mDNS** — Click to enable () and **`disable`** () AVAHI software implementation.

❹ **SAVE and CANCEL buttons** — Click **`SAVE`** to take `Port` changes or **`CANCEL`** to abandon them. Clicking either button closes the editable pane.

Certificates page

The Certificates selection on the `Security` page (see **figure 76**, ❶) opens a pane that shows the certificates installed in the encoder (see figure 79). Add additional certificates by clicking the **`+ Add`** button (❶).

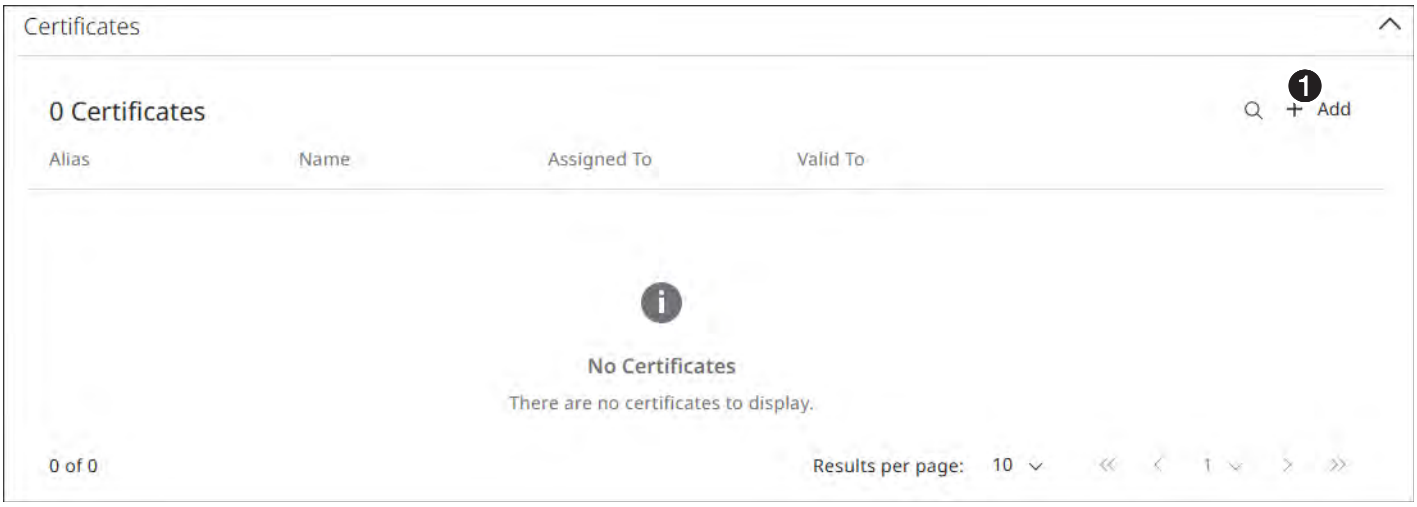


Figure 79. Certificates Selection

Audit Logs page

The `Audit Logs` selection on the `Security` page (see **figure 76**, ❶) opens a read-only pane that shows credentials for remote logging of audit logs to Syslog servers. The pane also includes a link to manually download an audit log directly to your PC (see figure 80, ❶). The parameters can be edited by clicking the EDIT button (❷). An editable version of the selection opens (see figure AA).

NOTE: Downloading audit logs is disabled when the encoder is accessed via a proxy connection.

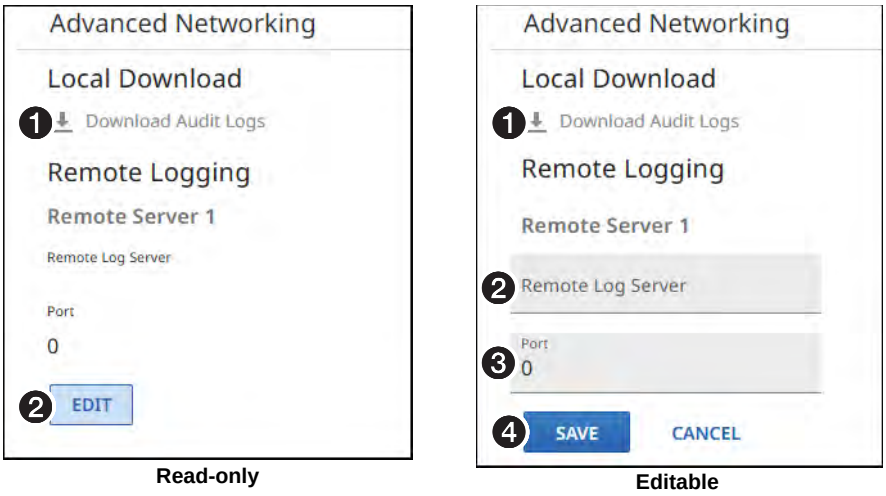


Figure 80. Audit Logs Selection

❶ **Download Audit Logs** — Manually download an audit log directly to your PC.

❷ **Remote Log Server** — Click in these fields and type in valid IP addresses for your Syslog servers.

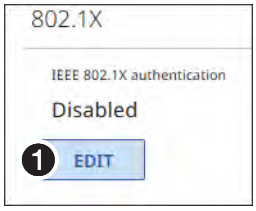
❸ **Port** — Click in these fields and type in valid port numbers for your Syslog servers.

NOTE: Contact your local IT professionals for valid parameters for ❷ and ❸.

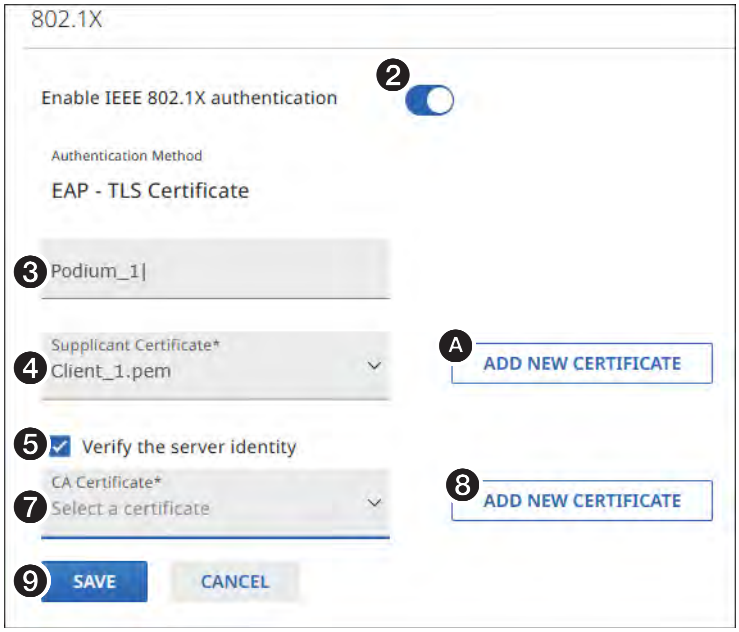
❹ **SAVE and CANCEL buttons** — Click **`SAVE`** to take changes or **`CANCEL`** to abandon them. Clicking either button closes the editable pane.

802.1X page

The `802.1X` selection on the `Security` page (see **figure 76**, ❶) opens a read-only pane that show the status of the 802.1X network access protocol (enabled or disabled) (see figure 81). IEEE 802.1X ensures devices are authorized on the network before allowing them at the port level.



Read-only



Editable

Figure 81. 802.1X Selection

Configure your 802.1X security parameters as follows:

1. Click **`EDIT`** (see figure 81, ❶). An editable version of the selection opens.
2. Click **`Enable IEEE 802.1X authentication`** (❷) to enable () and **`disable`** () authentication. If enabled, continue to step 3.
3. Click in the **`Identity`** field (❸) and enter the encoder identity.
4. Click the **`Supplicant Certificate`** drop-down list (❹) and select the valid already-loaded certificate.

NOTE: If you need to install a supplicant certificate, click **`ADD A NEW CERTIFICATE`** (Ⓐ). The Add Certificate dialog box opens (see figure 82). Load a valid certificate as follows:

1. Click **`SELECT A CERTIFICATE`** (❶). An `Open` dialog box opens.
2. Navigate to the folder holding the certificate file and double click to load.
3. Click in the Alias field (❷) and enter a value that easily identifies your certificate.
4. Click outside of the Alias field.
5. Click **`SAVE`** (❸) to take changes or **`CANCEL`** to abandon them.

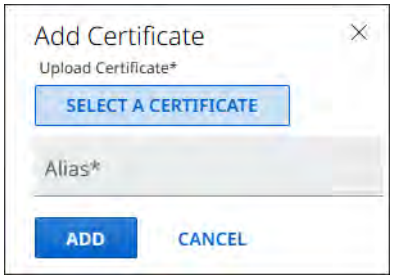


Figure 82. Add Certificate Dialog Box

6. **Optionally**, to verify the server identity, click the **`Verify the server identity`** check box (❺). The `CA Certificate` field appears (❻).
7. **Optionally**, to continue with the server identity verify operation, click the **`CA Certificate`** drop-down list (❹) and select the valid already-loaded certificate.

NOTE: **Optionally**, if you need to install a supplicant certificate, click **`ADD A NEW CERTIFICATE`** (Ⓑ) and load a valid certificate, similar to as described in the "Add Certificates" **NOTE**, above.

8. Click **SAVE** (see **figure 81**, ❾) to take changes or **CANCEL** to abandon them.

Web Server (HTTPS) page

The `Web Server (HTTPS)` selection on the `Security` page (see **figure 76**, ❶) opens a read-only pane (see figure 83) that shows installed certificate type (❶) and provides a path to switch between the two types of certificates, Device Generated and Custom Signed.

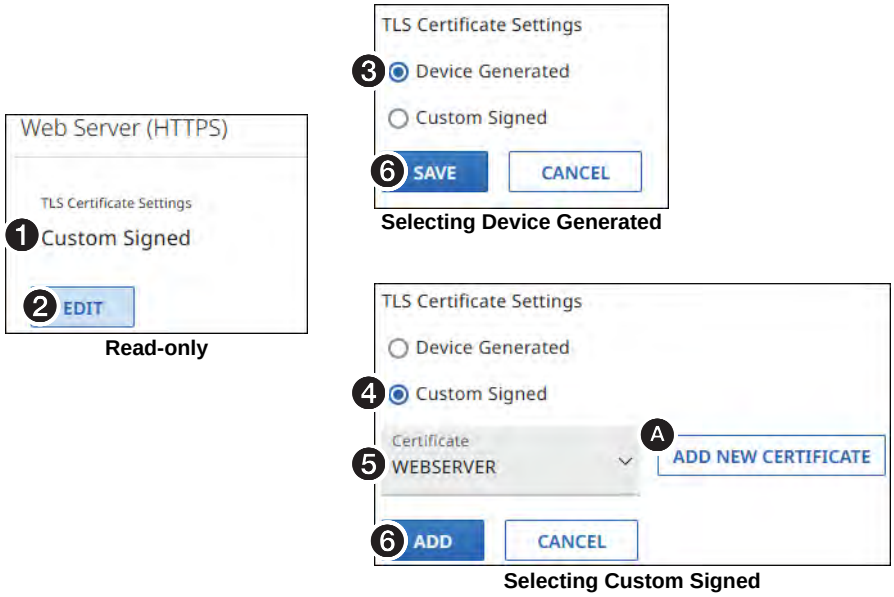


Figure 83. Web Server (HTTPS) Selection

Switch or add additional certificates by clicking the **EDIT** button (❷). An editable version of the selection opens.

❸ **Device Generated** — The NAV device creates its own self-signed certificate. This is the default option and requires no external certificate management. Because the certificate is self-signed, web browsers display security warnings unless the certificate is explicitly trusted.

❹ **Custom Signed** — A certificate that has been generated and signed externally by a corporate Certificate Authority or a trusted third-party CA has uploaded to the device. This allows web browsers to validate the certificate chain and avoid trust warnings.

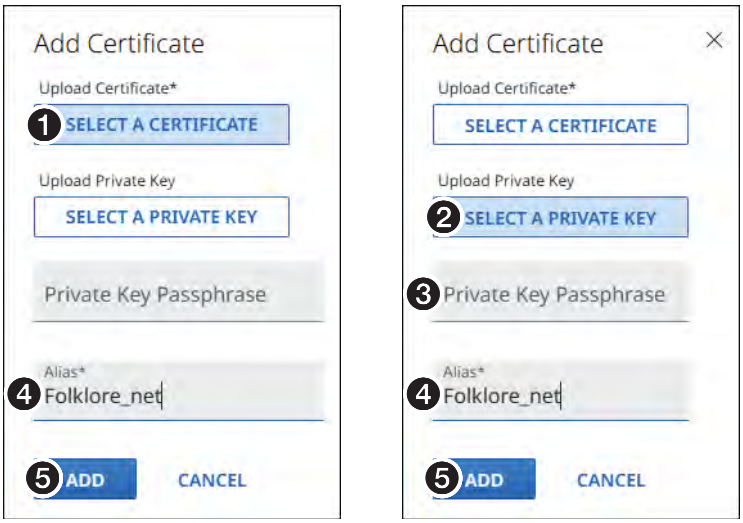
> NOTE: If you need to add a certificate, click **ADD A NEW CERTIFICATE** (Ⓐ) and load a valid certificate (see **— Add a Certificate**).

❺ **Certificate** — **If you selected the `Custom Signed` radio button (❹)**, click the **Certificate** drop-down list and click the appropriate certificate.

❻ **SAVE and CANCEL buttons** — Click **SAVE** to take changes or **CANCEL** to abandon them. Clicking either button closes the editable pane.

— Add a Certificate

1. Click **ADD A NEW CERTIFICATE** (see **figure 82**, Ⓐ). The Add a Certificate dialog box opens (see figure 84).



Select a Certificate **Select a Private Key**

Figure 84. Add a Certificate Selection

2. Click either **SELECT A CERTIFICATE** (❶) or **SELECT A PRIVATE KEY** (❷), as appropriate.

> NOTE: Consult your IT professionals to determine the correct selection and, if a Private Key, the valid Passphrase.

3. **If you clicked SELECT A PRIVATE KEY (❷) in step 2**, enter a valid **Private Key Passphrase** (❸).
4. Click in the **Alias** field (❹) and enter a value.
5. Click outside of the Alias field.
6. Click **ADD** (❺) to take changes or **CANCEL** to abandon them.

About Page

Access the About page by clicking **About** (see figure 85, ❶).

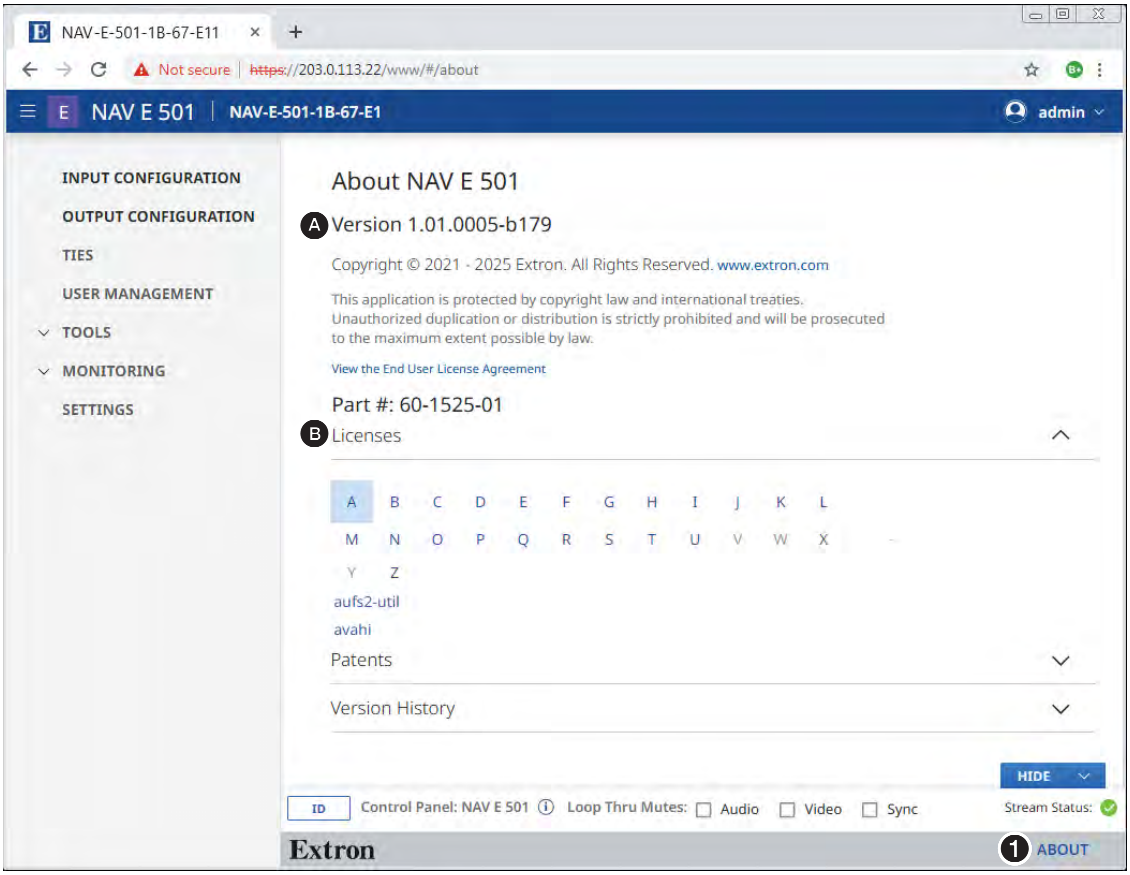


Figure 85. About Page

The About page provides the following useful information:

- Ⓐ **Firmware version number**
- Ⓑ **Installed licenses**, which can be sorted by clicking the desired filtering letter

Control System

This section includes:

- **IP Link Pro Series Expansion Port**
- **Toolbelt**
- **SSH 3rd Party Control**
- **Global Configurator Plus and Professional**
- **ControlScript Deployment Utility**
- **Dynamic Images**

The encoder can be remotely controlled from a host device such as a computer or Extron control system. The controlling device communicates over the network via the NAV/PoE+ port (see **figure 2**, G).

IPL Pro Exansion Port

Equipped with an IP Link Pro Series Expansion Port, the encoder is a system-based device that communicates with an Extron controller and supports 802.1x port-based Network Access Control. When applied, 802.1x authentication requires that all devices are approved before network access is granted.

The encoder communicates with compatible controllers such as Extron IPCP Pro and IPL Pro series control products over a secure, encrypted channel. The encoder hosts secure Serial and IR ports as well as a IP Link Pro Series Expansion Port for SIS control of the encoder.

Toolbelt

The Extron Toolbelt utility is available on the Extron **website**. Toolbelt is a stand-alone Windows application for the management of control systems. Toolbelt can automatically discover Pro Series controllers and devices and NAV devices on a network (see the *Toolbelt Help File*). You also can manually add devices, using the known IP addresses. Once you log in to a NAV device, such as a NAVigator or NAV E 501, you can perform tasks such as:

- View the device and system information
- View and edit network information
- View and set SSL certifications
- Use utilities such as `Ping`, `Reset`, and `Reboot`
- Configure 802.1x security settings
- View 802.1x status logs
- Update the firmware to a selected device or group of devices

Secure Sockets Layer (SSL) Certificates

Extron NAV devices ship with factory-installed SSL certificates created by Extron. If you want or are required to use a different SSL certificate at your installation site, then you can use system utilities in the Toolbelt software to change the SSL certificate at any time. The *Toolbelt Help File* provides instructions on how to apply an SSL certificate to a device.

NOTES:

- You must run Toolbelt as an administrator.
- Some certificates require a passphrase that is created when the certificate is created. If a passphrase is required, you must enter that passphrase before uploading and applying the certificate.

NAV devices support standard OpenSSL certificate encodings such as `.pem` (Privacy-enhanced Electronic Mail) and `.der` (Distinguished Encoding Rules) file types. PEM file types are ASCII encoded and are the required format for uploading to the device. DER file types are binary encoded and can typically have several file extension variations, such as `.crt` and `.cer`. There are many standard tools that can convert from DER to PEM file encodings if needed.

NOTE: A DER format file must be converted to PEM encoding before uploading it to the device.

To properly create the certificate for uploading to Extron NAV devices, ensure that the certificate file meets the following requirements:

- Contains X.509 certificate information
- Contains public and private keys
- Uses PEM encoding

NOTE: ITU-T standard X.509 covers aspects of public key encryption, digital cryptography, certificates, and validation.

Contact your IT administrator for more information on what tools and policies are required to obtain or create the SSL certificate and, if necessary, the corresponding passphrase.

SSH 3rd Party Control

Third party control is available as a LinkLicense addition through a NAVigator. Contact an Extron support representative on the Extron S3 Sales and Technical Support Hotline (see **www.extron.com** for the phone number in your region of the world).

Global Configurator Plus and Professional

NOTE: NAV products can be used in control systems with the following Extron control products:

- **IPCP Pro Processors** such as the IPCP Pro 250
- **IPL Pro Control Processors** such as the IPL Pro S3
- **IPCP Pro Q xi processors** such as the IPCP Pro 255Q xi
- **IPCP Pro xi processors** such as the IPCP Pro 250 xi

Global Configurator is an Extron control system configuration software for use in AV systems that include Extron Pro Series control products. Conditional logic, variables, and macros provide flexibility for elaborate control system designs. No direct programming knowledge is needed to use the program.

The functional logic is built into Global Configurator. You merely select the functions that you want to use. You can quickly set up schedules, macros, monitors, and the like, using available actions and commands, without having to write control script.

Global Configurator has two modes:

- **Global Configurator Plus** — Ideal for smaller applications requiring one control processor and one control interface.
- **Global Configurator Professional** — Suited for applications requiring multiple control processors, enhanced functionality, and advanced configuration. Access to Global Configurator Professional requires ECP Certification.

In a NAV system with an Extron controller, such as an IPCP Pro 250, you can perform actions such as:

- Load device drivers for monitoring the status of and controlling devices with the NAV system.
- Upload GUI Designer interface layouts to touchpanels and third-party touch interfaces.
- Create the configuration containing all the settings for the control processor and the products with which it interacts in the NAV system.
- Upload the configuration to the control processor.
- Send limited commands (such as some SIS commands) via the controller to a NAV device (but without receiving a response from the device).

To obtain Extron control product software, you must have an Extron Insider account and contact an Extron support representative on the Extron S3 Sales and Technical Support Hotline (see **www.extron.com** for the phone number in your region of the world). Extron provides training to our customers on how to use the software. Access to the features of Global Configurator Professional is available to users who successfully complete Extron Control Professional Certification.

For detailed descriptions and procedures to set up a control system with an IPCP Pro device and Global Configurator, see the applicable *Global Configurator Help File*.

See the *ControlScript Deployment Utility release notes*.

ControlScript Deployment Utility

NOTE: NAV products can be used in control systems with the following Extron control products:

- **IPCP Pro Control processors** — such as the IPCP Pro 550
- **IPCP Pro xi Control processors** — such as the IPCP Pro 350 xi
- **IPCP Pro Q xi Control processors** — such as the IPCP Pro 360 Q xi

The ControlScript Deployment Utility allows AV developers to deploy and debug control system programs created using Microsoft Visual Studio Code. The utility can load and retrieve projects from control processors and offers debugging tools like Program Logs and Trace Messages. Together with the Extron ControlScript Extension for VS Code, the deployment utility integrates ControlScript libraries into VS Code, enabling control system programmers to use the powerful VS Code editor to program Extron control systems.

NOTES:

- Extron recommends using Visual Studio Code to create your project file. The ControlScript Extension for Visual Studio Code is available from the Extron website.
- It is strongly recommended that all devices are updated to the latest firmware, to use all the features of the latest release of the ControlScript Deployment Utility.

Dynamic Images

Extron control systems can enable dynamic confidence preview images as JPEG files from NAV endpoints. These preview images can be accessed using HTTPS URLs.

Since these URLs are secured using HTTPS, valid Admin or User login credentials are required to access the images.

NOTE: See the applicable control system user guide and the *NAVigator User Guide* (both available at **www.extron.com**) for details on how to create and display dynamic images using NAV endpoint URLs.

SIS Operation

The encoder can be remotely controlled, monitored, or configured using the following:

- A user-defined string consisting of SIS commands (see below)

  NOTE: SIS commands cannot be issued directly to the encoder, but are issued via an Extron control system on the AV network using a process known as “encapsulation”.

- Extron Toolbelt or a control system constructed using either Global Configurator Plus or Global Configurator Pro (see **Control System**)
- Built-in HTML pages (see **HTML Operation**)

This section provides guidance on operation of the encoder via a string of commands and lists the SIS commands, including:

- **IP Link Pro Series Expansion Port**
- **Host-to-Encoder Communications**
- **Encoder-Initiated Messages**
- **Encoder Error Responses**
- **Using the Command and Response Tables**
- **SIS Command and Response Table**

IP Link Pro Series Expansion Port

SIS commands cannot be issued directly to the encoder, but are issued via a NAVigator on the system network using encapsulation (see the *NAVigator User Guide*, available at **www.extron.com** for details).

Equipped with an IP Link Pro Series Expansion Port, a NAVigator communicates with Extron Pro Series Control Processors over a secure, encrypted channel. The NAVigator is the host device for IP Link Secure Platform Interfaces for native device controls and IPL Pro Series Control Ports to control external devices.

Communication, using Global Configurator Plus or Global Configurator Professional, is via an IP Link Pro Series Expansion Port interface. See the applicable Help file to configure the program to issue SIS commands to a NAVigator.

Host-to-Encoder Communications

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command character sequence. When a command is valid, the decoder executes the command and sends a response to the host device. All responses from the decoder to the host end with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

Encoder-Initiated Messages

When the encoder completes its start-up, it issues the following message to the host:

`© Copyright 20yy, Extron Electronics NAV E n01, Vx.xx, 60-nnnn-nn`↵ (*n* = 5 or 1)
`<date>` and `<time>`↵

V*x.xx* is the firmware version number and `60-nnnn-nn` is the part number.

`Hplgl<status>`↵

The HDMI input hot plug connection is changed. `1` is plugged and `0` is unplugged.

`HplgO<status>`↵

The HDMI loop through hot plug connection is changed. `1` is plugged and `0` is unplugged.

`In<status>`↵

A change in signal input status has occurred. `1` is input detected and `0` is no input.

Encoder Error Responses

When the encoder receives a valid SIS command, it executes the command and sends a response to the host device. If the encoder is unable to execute the command because the command is invalid or it contains invalid parameters, the encoder returns an error response to the host. The error response codes are:

`E10` — Invalid command
`E12` — Invalid port number
`E13` — Invalid parameter
`E14` — Invalid for this port configuration
`E17` — Invalid command for signal type
`E18` — Command Timed Out
`E22` — Busy
`E24` — Privilege violation
`E25` — Device not present
`E28` — Bad file name or file not found

Using the Command and Response Tables

The command and response table begins below. Symbols are used throughout the table to represent variables in the command and response fields. Command and response examples are shown throughout the table. The ASCII to HEX conversion table below is for use with the command and response table.

Space →

ASCII to Hex Conversion Table										Esc	1B	CR	ØD	LF	ØA
	2Ø	!	21	“	22	#	23	$	24	%	25	&	26	‘	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
Ø	3Ø	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	4Ø	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	5Ø	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	6Ø	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	7Ø	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F

Common symbol definitions

↵ = Carriage return/line feed
← = Carriage return (no line feed)
| = Pipe (can be used interchangeably with the ← character)
• = space
Esc = Escape key
W = Can be used interchangeably with the Esc character

Command and Response Table for Encoder SIS Commands

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
HDCP authorized device			
Set an input to HDCP authorized	Esc E X1 *1HDCP ←	HdcpE X1 *1 ↵	**Default.**
Set an input to HDCP not authorized	Esc E X1 *0HDCP ←	HdcpE X1 *0 ↵	
Set ALL inputs HDCP authorized status	Esc E X2 HDCP ←	HdcpE X2 ↵	
View HDCP authorized status	Esc EHDCP ←	X2[1]•X2[2] ↵	
	Verbose mode 2 and 3	HdcpE X2[1]•X2[2] ↵	
Input signal status			
View input signal status	Esc 0LS ←	X2[1]•X2[2] ↵	
	Verbose mode 2 and 3	In•00 X2[1]•X2[2] ↵	
Streaming control			
Set video stream on	Esc V1STRC ←	StrcV1 ↵	**Default.**
Set video stream off	Esc V0STRC ←	StrcV0 ↵	
Set audio stream on	Esc A1STRC ←	StrcA1 ↵	**Default.**
Set audio stream off	Esc A0STRC ←	StrcA0 ↵	
View video stream	Esc VSTRC ←	X2 ↵	
View audio stream	Esc ASTRC ←	X2 ↵	
Streaming bit rate			
Set streaming rate	Esc V X3 BITR ←	BitrV X3 ↵	
Show streaming bit rate	Esc VBITR ←	X3 ↵	
Video mute (HDMI LOOP OUT port)			
Mute video only	1B	Vmt1 ↵	
Mute video and sync	2B	Vmt2 ↵	
Unmute video and sync	0B	Vmt0 ↵	**Default**. Video output is active.
Show mute status	B	X4 ↵	
Audio mute (HDMI LOOP OUT port)			
Mute audio	1*1Z	Amt1*1 ↵	
Unmute audio	1*0Z	Amt1*0 ↵	**Default**. Audio output is active.
View audio mute status	Z	X2 ↵	Audio mute status is X2.
Reset device name to factory default	Esc •CN ←	Ipn•NAV-E-*n*01-<*last 3 pairs of the MAC address*> ↵. *n* = 5 or 1.	
Reset			
Reset to factory setting	Esc ZQQQ ←	Zpq ↵	Reset to factory defaults. Firmware version remains the same.
Device name			
Set device name	Esc X5 CN ←	X5 ↵	
	Verbose mode 2 and 3	Ipn•X5 ↵	
Read device name	Esc CN ←	X5 ↵	
Device tags			
View device tags	Esc DTAG ←	X6 ↵	
	Verbose mode 2 and 3	Dtag•X6 ↵	

KEY:
- X1 = Input — 1 = Input 1 (USB-C); 2 = Input 2 (HDMI)
- X2 = Status — 0 = Off, disabled, not detected; 1 = On, enabled, detected
- X3 = Streaming bit rate (in Mbps) — 250 — 900 (default = 850)
- X4 = Video mute status — 0 = Unmute; 1 = Mute video; 2 = Mute video and sync
- X5 = Name — A text string of up to 63 alphanumeric characters and minus sign/hyphen (-). No blank or space characters are permitted as part of a name. The first character must be a letter, and the last character must not be a minus sign/hyphen
- X6 = Tag — A list of text tags returned in a json string

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Device number			
View device number	Esc DNUM ↵	X7 ↵	
	Verbose mode 2 and 3	Dnum X7 ↵	
Information requests			
Information request	I	SigI X2 *HdcpI X8 *HdcpO X8 *ResI X10 *AudI X11 *StrmI X11 *Lnk X11 *Enc ↵	
Response description:		*Input signal*Input HDCP*Output HDCP*Resolution*Input audio*Streaming*Link*Encoder* ↵	
Example:	I	SigI1*HdcpI2*HdcpO2*ResI1920x1080@60Hz*AudI0*StrmI1*Lnk1*Enc ↵	An input signal is detected, the input and output are HDCP devices, the resolution is 1920x1080@60 Hz, the digital audio input is selected, streaming and link are active, and the device is an encoder.
View model name	1I	NAV•E•*n*01 ↵	*n* = 5 or 1.
View model description	2I	NAV•Gigabit•Encoder ↵	
View number of connected users	10I	X12 ↵	
View input video format	34I	X13[1]•X13[2] ↵	
View HDCP input status	35I	X8[1]•X8[2] ↵	
View input audio selected	36I	X9[1]•X9[2] ↵	
View streaming status	37I	X11 ↵	
View HDCP output status	38I	X8 ↵	
View connected video streams	39I	X14[1] ↵ X14[2] ↵ • • ↵ • • ↵ X14[n] ↵ ↵	Show all (*n*) connected video streams.
Example:	39I	Conf Rm 1, 192.168.254.254, 239.199.188.175 ↵ Conf Rm 2, 192.168.254.253, 239.199.188.165 ↵ • • • ↵ Class Rm 5, 192.168.254.252, 239.199.188.155 ↵ ↵	
View connected audio streams	40I	X14[1] ↵ X14[2] ↵ • • ↵ • • ↵ X14[n] ↵ ↵	Show all (*n*) connected audio streams.
View average bandwidth	41I	X15 ↵	
View current total bandwidth	42I	X15 ↵	
View current video bandwidth	43I	X15 ↵	
View current audio bandwidth	44I	X15 ↵	
View network status	46I	X11 ↵	
View dropped packets	48I	X16 ↵	
View IGMP querier	50I	X17 ↵	
View device serial number	98I	X18 ↵	
View internal temperature	Esc 20STAT ↵	X19 ↵	

KEY:

X2 = Status	0 = Off, disabled, not detected	1 = On, enabled, detected		
X7 = Device number	1 — 4096			
X8 = HDCP status	0 = No device	1 = Non-HDCP device	2 = HDCP device	
X9 = Audio input selected	1 = digital	3 = AES67		
X10 = Resolution and rate in plain text	*Example*: 1920x1080@60 Hz)			
X11 = Streaming and link status	0 = No link	1 = Active	2 = Active with errors	
X12 = Number of connected users	0 — 1			
X13 = Input video format	0 = Not detected	1 = HDMI	2 = DVI	
X14 = Connected streams	*<hostname>,<IP address>,<Multicast IP>*			
X15 = Bandwidth (in Mbps)	000 — 900			
X16 = Dropped packets (in percent)	00 — 100			
X17 = IP address	*xxx.xxx.xxx.xxx*			
X18 = Serial number				
X19 = Internal temperature	*xxx*F•*xx*C			

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Firmware version			
Read firmware version	Q	X20↵	
Read full firmware version	*Q	X21↵	
Read full firmware version — Advanced	20Q	X22↵	
Part number			
View part number	N	60-*xxxx-xx*↵	

KEY: X20 = Firmware version x.xx
X21 = Full firmware version x.xx.xxxx
X22 = Full firmware version — advanced *x.xx.xxxx-bnnn*

Command and Response Table for IP-Specific SIS Commands

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
DHCP client			
Set DHCP on	Esc1*1DHCP←	Dhcp•1*1↵	
Set DHCP off	Esc1*0DHCP←	Dhcp•1*0↵	
View DHCP status	Esc1DHCP←	X2↵	
IP address			
Set IP address	EscX17CI←	IpiX17↵	
View IP address	EscCI←	X17↵	
Subnet mask			
Set subnet mask	EscX17CS←	IpsX17↵	
View subnet mask	EscCS←	X17↵	
Gateway address			
Set gateway address	EscX17CG←	IpgX17↵	
View gateway address	EscCG←	X17↵	
DNS address			
Set DNS address	EscX17DI←	IpdX17↵	
View DNS address	EscDI←	X17↵	
IP address			
Set IP address	Esc1*X17CISG←	Cisg•1*X17↵	
IP and subnet mask			
Set IP address and subnet mask	Esc1*X17IP*X17SubnetCISG←	Cisg•1*X17IP/X23Subnet*X17Gateway↵	
Set IP address and subnet mask	Esc1*X17IP/X23SubnetCSIG←	Cisg•1*X17IP/X23Subnet*X17Gateway↵	
IP, Subnet, and gateway address all at once			
Set IP address, subnet address, and gateway	Esc1*X17IP*X17Subnet*X17GatewayCISG←	Cisg•1*X17IP/X23Subnet*X17Gateway↵	
Set IP address, subnet address, and gateway	Esc1*X17IP/X23Subnet*X17GatewayCISG←	Cisg•1*X17IP/X23Subnet*X17Gateway↵	
View IP address, subnet address, and gateway	Esc1CISG←	X17IP/X23Subnet*X17Gateway↵	
MAC address			
View MAC address	EscCH←	X24↵	

KEY: X2 = Status 0 = Off, disabled, not detected 1 = On, enabled, detected
X17 = IP address, subnet, gateway address *xxx.xxx.xxx.xxx*
X23 = Subnet prefix Number of bits used to create the subnet
X24 = MAC address *xx-xx-xx-xx-xx-xx*

Troubleshooting

Alarms

The following table lists common NAV alarms shown on the `Monitoring` page (see **Alarms pane**) and suggested remedies:

Alarm	Cause	Remedy
`Assignment Conflict`	The endpoint is reporting a conflicting assignment status.	Verify that the endpoint is not assigned to another NAVigator. If it is, it must be unassigned from the previous NAVigator. If the previous NAVigator is unavailable, perform a **full factory reset** on the conflicted endpoint.
`Assignment Failure`	The endpoint failed to be assigned to a NAVigator.	Confirm that the NAVigator has not reached its endpoint assignment limit. If a device has been decomissioned from the NAV system, unassign the endpoint from the "Offline endpoints" list. If endpoint still cannot be assigned, perform a **full factory reset** on the endpoint.
`Auth Failures`	A user has attempted to login unsuccessfully 10 or more times.	Check whether login attempts were from internal personnel. If not, take action to strengthen security measures.
`Backup Restore Failure`	A problem occurred while trying to perform a backup or a restore.	Debug network connectivity between the NAVigator and endpoints.
`Channel Conflict`	Two or more NAV devices on the network have been given the same input or output number.	For devices affected, change the input number or output number so that each is unique to encoders in the system.
`Communication Failure`	An online assigned endpoint cannot establish a connection with the NAVigator.	Check the network settings to ensure unicast routing is possible between the NAVigator and endpoints.
`Controller Disconnect`	The NAV device is unable to connect to a paired control processor.	Verify the control processor is online. Review network settings to ensure unicast communication is possible from the NAV device to the control processor.
`CPU Usage`	The NAV device CPU is overloaded.	Check for excessive network data being delivered to the endpoint.
`Device Offline`	An assigned NAVigator is not discovered on the network.	Check the offline NAVigator for a power failure. Check the network connectivity of the endpoint.
`Disk Space`	Internal storage on the NAV device is low.	Reboot the NAV device. If the issue persists, perform a software reset that deletes files (see **Reset Operations**).

Alarm	Cause	Remedy
Firmware Failure	A critical process has failed, crashing the endpoint.	Reboot the NAV device. If the failure persists, perform a factory boot code reset (see **Reset Operations**).
Firmware Incompatible	A firmware version discrepancy exists between the NAVigator and assigned endpoints.	Upgrade the firmware on the deviating device.
Firmware Upgrade	The firmware upgrade process on NAVigator or endpoints failed to complete.	Retry the firmware upgrade. If it is again unsuccessful, use Toolbelt or a web browser to directly manage the device and perform a unit firmware upgrade.
HDCP Error	The video input signal is HDCP protected and HDCP negotiation has failed.	Disconnect and reconnect the video input cable into the encoder. Bypass video adapter cables and make a direct HDMI male-to-male connection.
IGMP Failure	The NAV device failed to receive three consecutive IGMP queries from an IGMP querier.	Debug network connectivity between the NAV device and the IGMP querier (which can be either a router or a managed switch).
Link Speed	The negotiated communication speed (Link Speed) between the NAV device and a managed switch is lower than its capability of 1 Gbps.	Check switch configuration and ensure proper settings for the switch port to which the NAV device is connected.
Name Conflict	Two or more NAV devices on the network have the same device name.	Change the device names affected so that each is unique.
Network Conflict	Two or more NAV devices on the network have the same IP address.	Change the IP addresses affected so that each is unique.
Network Utilization	The NAV device is receiving excessive network traffic.	Check the network for flooding, also check for improper network configuration.
NTP Sync	The NAVigator cannot obtain time from the specified NTP server.	Debug the network connectivity between the NAVigator and the specified NTP server.
PTP Master Stability	The clock to which all devices are synchronized is changing too frequently, for example, due to network jitter.	Check network for flooding and correct PTPv2 packet priority.
PTP Sync	NAV device cannot synchronize its PTPv2 clock with any peers.	Ensure that network policies allow PTPv2 packets to reach the NAV device from a clock master.
Stream Conflict	Multiple NAV endpoints are configured to use the same video, audio, AES67, or USB multicast IP address.	Reconfigure endpoint stream settings for a unique stream address.
Stream error	The encoder has lost reception of the USB stream for 2 seconds or more.	Check all network switches and routers that support your NAV system for proper multicast (IGMP) configuration.

Alarm	Cause	Remedy
`Temperature Internal`	The NAV device is overheating.	Check the ambient temperature of the NAV device installation location. • If greater than 104°F, (60ºC) use HVAC system to lower ambient temperature. • If ambient temperature is 104°F, (60°C) or less, check the mounting location for nearby equipment emitting excessive heat. Ensure there is an air gap around endpoint to allow adequate airflow.
`Tie Failure`	The encoder failed to establish a tie with the specified endpoint.	Debug the network connectivity between the encoder and decoder.
`Video loss`	The input is changed and video sync cannot be established for 2 seconds or more.	Debug the connectivity of the AV source device to the NAV encoder.

Reference Information

This section provides additional reference information for the following encoder topics:

- **Mounting the Encoder**
- **Best Practices for Cleaning the Encoder**

Mounting the Encoder

ATTENTION:

- Installation and service must be performed by authorized personnel only.
- L'installation et l'entretien doivent être effectués par le personnel autorisé uniquement.

The 1-inch high, half-rack width encoder can be placed on a table, mounted in a rack, or mounted under a desk or table.

Tabletop Use

Affix the included rubber feet to the bottom of the unit and place it in any convenient location.

Mounting kits

Mount the unit using any optional compatible mounting kit listed on the Extron **website,** in accordance with the directions included with the kit.

ATTENTION:

- When mounting the encoder under furniture, mount the device upside-down to ensure proper ventilation.
- Si vous installez le NAVigator sous un mobilier, veillez à installer l'unité à l'envers pour assurer une bonne ventilation.

For rack mounting, see **UL Rack-Mounting Guidelines**.

UL Rack-Mounting Guidelines

The following Underwriters Laboratories (UL) requirements pertain to the installation of the unit into a rack.

ATTENTION :

- **Elevated operating ambient temperature** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature (TMA = +122°F, +40°C) specified by Extron.
- **Reduced air flow** — Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical loading** — Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- **Circuit overloading** — Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- **Reliable earthing (grounding)** — Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (such as use of power strips).

Consignes UL pour le montage en rack

Les consignes UL (« Underwriters Laboratories ») suivantes concernent l'installation en rack d'un boîtier l'encodeur :

ATTENTION :

- **Température ambiante élevée** — En cas d'installation de l'équipement dans un rack fermé ou composé de plusieurs unités, la température du rack peut être supérieure à la température ambiante. Par conséquent, il est préférable d'installer l'équipement dans un environnement qui respecte la température ambiante maximale (Tma = +122°F, +40°C) spécifiée par Extron.
- **Réduction du flux d'air** — Si l'équipement est installé dans un rack, veillez à ce que le flux d'air nécessaire pour un fonctionnement sécurisé de l'équipement soit respecté.
- **Charge mécanique** — Installez l'équipement en rack de manière à éviter toute situation dangereuse causée par le déséquilibre de la charge mécanique.
- **Surcharge électrique** — Lorsque vous connectez l'équipement au circuit d'alimentation, observez la connexion de l'équipement et étudiez les effets possibles d'une surcharge du circuit sur les protections contre les surintensités et les conducteurs d'alimentation. Consultez à cet égard les indications de la plaque d'identification de l'équipement.
- **Mise à la terre** — Assurez-vous que l'équipement est correctement mis à la terre. Accordez une attention particulière aux connexions électriques autres.

Best Practices for Cleaning the Encoder



It may become necessary to clean your Extron encoder. Cosmetic finishes can be damaged by long term exposure to chemicals. Therefore, Extron recommends the following guidelines when cleaning our products.

The encoder can be safely cleaned with:

- 70% concentration or higher isopropyl alcohol
- Disinfectant cleaners that:
  - Are non-ammonium based (for example, contains no ammonium chloride)
  - Contain 2% or less sodium hypochlorite (for example, 2% bleach, 98% water)

It is important to follow these general guidelines when cleaning:

- If possible, unplug the device.
- Spray the cleaner on a lint-free cloth until the cloth is damp.
- Do not spray the cleaner directly onto the product.
- Gently clean the product surface using the cloth.

Your health and safety are our top priority. Keeping devices clean, especially those in high-traffic environments and high-use applications, is a crucial step in minimizing the spread of infections. Please contact us if you have any questions about the guidelines outlined or if you have a question about cleaning the product.

Extron Warranty

Powered Product Warranty

Extron warrants its powered products against any defects in materials and workmanship for a period of three years from the date of invoice. In the event of a malfunction during the warranty period, Extron will repair or replace a product to its original operating condition.

To assure the highest level of service, a return authorization number must be obtained from Extron before products are returned for service. Products must be shipped to Extron, prepaid along with proof of purchase ONLY after obtaining a Return Authorization (RA) number from the Extron Customer Support department.

This statement of policy is in lieu of any other policy expressed or implied and no representative or person is authorized to assume any other liability or adopt any other policy for Extron Electronics without our written consent.

Powered Product Warranty Exceptions

Everlast™ Power Supplies — Extron warrants Everlast power supplies against any defects in materials and workmanship for a period of seven years from the date of invoice. In the event of a malfunction during the warranty period, Extron will repair or replace the power supply to its original operating condition. Extron engineers will examine the returned product and determine whether the Everlast Power Supply Warranty or Powered Product Warranty applies.

Speakers — Extron warrants Flat Field®, SoundField®, SpeedMount®, Column Array, and System *INTEGRATOR*® speakers against any defects in materials and workmanship for a period of five years from the date of invoice.

Touchscreens — Extron warrants touchscreen display and overlay components against any defects in materials and workmanship for a period of one year from the date of invoice.

Annotator 300 — Extron warrants the Annotator 300 against any defects in materials and workmanship for a period of five years from the date of invoice.

Non-Powered and Cable Products - Lifetime Limited Performance Warranty

Extron warrants that its non-powered products and cable products will be free from defects in material and workmanship for as long as you or your customer owns the product. All Extron non-powered products and cables are designed and engineered to meet and exceed performance specifications. If, at anytime, the product fails due to manufacturer defect, Extron will repair or replace the product to ensure that it meets original performance specifications. Reduced performance due to normal wear and tear, or damages caused by misuse or negligence will not be covered. Extron will test and evaluate all non-powered and cable products claimed defective.

To assure the highest level of service, a return authorization number must be obtained from Extron before products are returned for service. Products must be shipped to Extron, prepaid along with proof of purchase ONLY after obtaining a Return Authorization (RA) number from the Extron Customer Support department.

This statement of policy is in lieu of any other policy expressed or implied and no representative or person is authorized to assume any other liability or adopt any other policy for Extron Electronics without our written consent.

Non-Powered and Cable Product Warranty Exceptions

Cable Cubby, Hideaway Surface Access Enclosures and Retractors — Extron warrants Cable Cubby cable access enclosures, HSA Hideaway Surface Access enclosures, and Retractor cable retraction modules for a period of three years from the date of invoice.

Active Cables and Active Adapters — Extron warrants active cables and active adapter cables for a period of three years from the date of invoice.

Cable Termination Tools and Dies — Extron warrants cable termination tools for a period of three years from the date of invoice, excluding the die.

General

This **Limited Warranty** does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product. Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage. Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

Return Information

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

NOTE: To assure the highest level of service, a return authorization number must be obtained from Extron before products are returned for service. Products must be shipped to Extron, prepaid along with proof of purchase **only** after obtaining a Return Authorization (RA) number from the Extron Customer Support department.

Please contact Extron to receive an RA (Return Authorization) number:

USA: 714.491.1500 or 800.633.9876 **Asia**: 65.6383.4400

Europe: 31.33.453.4040 or 800.3987.6673 **Japan**: 81.3.3511.7655

Africa and Middle East: 971.4.299.1800 **China**: 4000.398766

Worldwide Headquarters: Extron USA West, 1025 E. Ball Road, Anaheim, CA 92805, 800.633.9876