

Pro AV Over IP

## NAV SD 501 and NAV SD 101


Streaming HDMI Scaling Decoders




**Extron**

# 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](http://www.extron.com).


## تعليمات السلامة • العربية


**⚠ تحذير:** هذا الرمز، , عند استخدامه على المنتج، مخصص لتنبيه المستخدم فيما يتعلق بوجود جهد كهربائي غير معزول على الغلاف الخارجي للمنتج وهو ما قد ينطوي على مخاطر حدوث صدمة كهربائية.

**انتبه:** هذا الرمز، , عند استخدامه على المنتج، مخصص لتنبيه المستخدم بتعليمات التشغيل والصيانة الهامة (الخدمة) في المواد التي يتم توفيرها مع المعدات.

لحصول على المزيد من المعلومات حول إرشادات السلامة، والتوافق التنظيمية، والتوافق الكهرومغناطيسي/المجال الكهرومغناطيسي، وإمكانية الوصول، والموضوعات ذات الصلة، يرجى مراجعة دليل السلامة والتوافق التنظيمي [www.extron.com](http://www.extron.com) الخاص بإكسترون، الجزء رقم 01-290-68، على موقع إكسترون،


## Sicherheitsanweisungen • Deutsch


**WARNUNG:** Dieses Symbol , auf dem Produkt soll den Benutzer darauf aufmerksam machen, dass im Inneren des Gehäuses dieses Produktes gefährliche Spannungen herrschen, die nicht isoliert sind und die einen elektrischen Schlag verursachen können.

**VORSICHT:** Dieses Symbol , auf dem Produkt soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Weitere Informationen über die Sicherheitsrichtlinien, Produkthandhabung, EMI/EMF-Kompatibilität, Zugänglichkeit und verwandte Themen finden Sie in den Extron-Richtlinien für Sicherheit und Handhabung (Artikelnummer 68-290-01) auf der Extron-Website, [www.extron.com](http://www.extron.com).


## Instrucciones de seguridad • Español


**ADVERTENCIA:** Este símbolo, , cuando se utiliza en el producto, avisa al usuario de la presencia de voltaje peligroso sin aislar dentro del producto, lo que puede representar un riesgo de descarga eléctrica.

**ATENCIÓN:** Este símbolo, , cuando se utiliza en el producto, avisa al usuario de la presencia de importantes instrucciones de uso y mantenimiento recogidas en la documentación proporcionada con el equipo.

Para obtener información sobre directrices de seguridad, cumplimiento de normativas, compatibilidad electromagnética, accesibilidad y temas relacionados, consulte la Guía de cumplimiento de normativas y seguridad de Extron, referencia 68-290-01, en el sitio Web de Extron, [www.extron.com](http://www.extron.com).


## Instructions de sécurité • Français


**AVERTISSEMENT :** Ce pictogramme, , lorsqu'il est utilisé sur le produit, signale à l'utilisateur la présence à l'intérieur du boîtier du produit d'une tension électrique dangereuse susceptible de provoquer un choc électrique.

**ATTENTION :** Ce pictogramme, , lorsqu'il est utilisé sur le produit, signale à l'utilisateur des instructions d'utilisation ou de maintenance importantes qui se trouvent dans la documentation fournie avec le matériel.

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](http://www.extron.com).


## Istruzioni di sicurezza • Italiano


**AVVERTENZA:** Il simbolo, , se usato sul prodotto, serve ad avvertire l'utente della presenza di tensione non isolata pericolosa all'interno del contenitore del prodotto che può costituire un rischio di scosse elettriche.

**ATTENZIONE:** 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.

Per informazioni su parametri di sicurezza, conformità alle normative, compatibilità EMI/EMF, accessibilità e argomenti simili, fare riferimento alla Guida alla conformità normativa e di sicurezza di Extron, cod. articolo 68-290-01, sul sito web di Extron, [www.extron.com](http://www.extron.com).


## Instrukcje bezpieczeństwa • Polska


**OSTRZEŻENIE:** Ten symbol, , gdy używany na produkt, ma na celu poinformować użytkownika o obecności izolowanego i niebezpiecznego napięcia wewnątrz obudowy produktu, który może stanowić zagrożenie porażenia prądem elektrycznym.

**UWAGI:** Ten symbol, , gdy używany na produkt, jest przeznaczony do ostrzeżenia użytkownika ważne operacyjne oraz instrukcje konserwacji (obsługi) w literaturze, wyposażone w sprzęt.

Informacji na temat wytycznych w sprawie bezpieczeństwa, regulacji wzajemnej zgodności, zgodność EMI/EMF, dostępności i Tematy pokrewne, zobacz Extron bezpieczeństwa i regulacyjnego zgodności przewodnik, część numer 68-290-01, na stronie internetowej Extron, [www.extron.com](http://www.extron.com).

## Инструкция по технике безопасности • Русский

**ПРЕДУПРЕЖДЕНИЕ:** Данный символ, , если указан на продукте, предупреждает пользователя о наличии неизолированного опасного напряжения внутри корпуса продукта, которое может привести к поражению электрическим током.

**ВНИМАНИЕ:** Данный символ, , если указан на продукте, предупреждает пользователя о наличии важных инструкций по эксплуатации и обслуживанию в руководстве, прилагаемом к данному оборудованию.

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](http://www.extron.com), номер по каталогу - 68-290-01.

## 安全说明 • 简体中文

**警告:** ⚠️ 产品上的这个标志意在警告用户, 该产品机壳内有暴露的危险电压, 有触电危险。

**注意:** ⚠️ 产品上的这个标志意在提示用户, 设备随附的用户手册中有重要的操作和维护(维修)说明。

关于我们产品的安全指南、遵循的规范、EMI/EMF 的兼容性、无障碍使用的特性等相关内容,

敬请访问 Extron 网站, [www.extron.com](http://www.extron.com)

, 参见 Extron 安全规范指南, 产品编号 68-290-01。

## 安全記事 • 繁體中文

**警告:** ⚠️ 若產品上使用此符號, 是為了提醒使用者, 產品機殼內存在未隔離的危險電壓, 可能會導致觸電之風險。

**注意:** ⚠️ 若產品上使用此符號, 是為了提醒使用者, 設備隨附的用戶手冊中有重要的操作和維護(維修)說明。

有關安全性指導方針、法規遵守、EMI/EMF 相容性、存取範圍和相關主題的詳細資訊, 請瀏覽 Extron 網站 [www.extron.com](http://www.extron.com) 然後參閱《Extron 安全性與法規遵守手冊》, 準則編號 68-290-01。

## 安全上のご注意 • 日本語

**警告:** この記号 ⚠️ が製品上に表示されている場合は、筐体内に絶縁されていない高電圧が流れ、感電の危険があることを示しています。

**注意:** この記号 ⚠️ が製品上に表示されている場合は、本機の取扱説明書に記載されている重要な操作と保守(整備)の指示についてユーザーの注意を喚起するものです。

安全上のご注意、法規遵守、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](http://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

**경고:** 이 기호 ⚠️가 제품에 사용될 경우, 제품의 인클로저 내에 있는 접지되지 않은 위험한 전류로 인해 사용자가 감전될 위험이 있음을 경고합니다.

**주의:** 이 기호 ⚠️가 제품에 사용될 경우, 장비와 함께 제공된 책자에 나와 있는 주요 운영 및 유지보수(정비) 지침을 경고합니다.

안전 가이드라인, 규제 준수, EMI/EMF 호환성, 접근성, 그리고 관련 항목에 대한 자세한 내용은 Extron 웹 사이트([www.extron.com](http://www.extron.com))의 Extron 안전 및 규제 준수 안내서, 68-290-01 조항을 참조하십시오.

## Copyright

© 2021 Extron. All rights reserved. [www.extron.com](http://www.extron.com)

## Trademarks

All trademarks mentioned in this guide are the properties of their respective owners.

The following registered trademarks (®), registered service marks (SM), and trademarks (TM) are the property of RGB Systems, Inc. or Extron (see the current list of trademarks on the [Terms of Use](#) page at [www.extron.com](http://www.extron.com)):

Registered Trademarks (®)
Extron, Cable Cubby, ControlScript, CrossPoint, DTP, eBUS, EDID Manager, EDID Minder, eLink, Flat Field, FlexOS, Glitch Free, Global Configurator, Global Scriptor, GlobalViewer, Hideaway, HyperLane, IP Intercom, IP Link, Key Minder, LinkLicense, LockIt, MediaLink, MediaPort, NAV, NetPA, PlenumVault, PoleVault, PowerCage, PURE3, Quantum, Sharelink, Show Me, SoundField, SpeedMount, SpeedSwitch, StudioStation, System <i>INTEGRATOR</i> , TeamWork, TouchLink, V-Lock, VN-Matrix, VoiceLift, WallVault, WindoWall, XPA, XTP, XTP Systems, and ZipClip
Registered Service Mark (SM): S3 Service Support Solutions
Trademarks (TM)
AAP, AFL (Accu-RATE Frame Lock), ADSP (Advanced Digital Sync Processing), AVEdge, CableCover, CDRS (Class D Ripple Suppression), Codec Connect, DDS (Digital Display Sync Processing), DMI (Dynamic Motion Interpolation), Driver Configurator, DSP Configurator, DSVP (Digital Sync Validation Processing), EQIP, Everlast, FastBite, Flex55, FOX, FOXBOX, IP Intercom HelpDesk, MAAP, MicroDigital, Opti-Torque, PendantConnect, ProDSP, QS-FPC (QuickSwitch Front Panel Controller), Room Agent, Scope-Trigger, SIS, Simple Instruction Set, Skew-Free, SpeedNav, Triple-Action Switching, True4K, Vector™ 4K, WebShare, XTRA, and ZipCaddy

## 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.

**NOTE:** 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

**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.

**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.
- 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.



## Conventions Used in this Guide

### Notifications

The following notifications are used in this guide:

**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.

### Software Commands

Commands are written in the fonts shown here:

```
^ARMerge Scene, ,0p1 scene 1,1 ^B 51 ^W^C.0
```

```
[01] R 0004 00300 00400 00800 00600 [02] 35 [17] [03]
```

```
Esc [X1] * [X22] * [X23] * [X26] * [X23] 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 slanted form 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**.

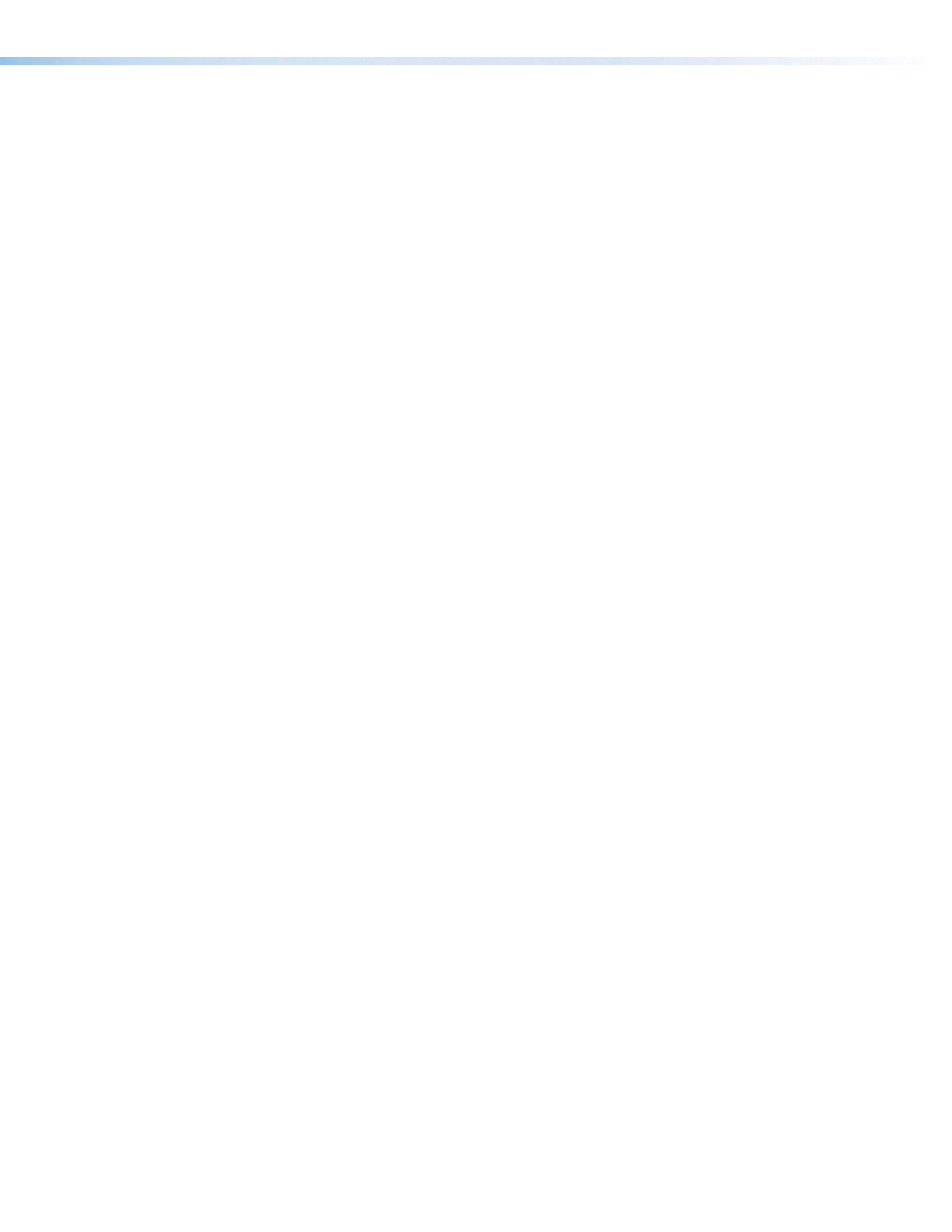
Click the **OK** button.

## Specifications Availability

Product specifications are available on the Extron website, [www.extron.com](http://www.extron.com).

## Extron Glossary of Terms

A glossary of terms is available at <http://www.extron.com/technology/glossary.aspx>.



# Contents

<b>Introduction .....</b>	<b>1</b>	Tools Pages .....	36
About this Guide.....	1	Device Tools page.....	36
About the NAV System .....	1	Diagnostic Tools page.....	42
About the Encoder .....	1	Monitoring .....	43
About the Decoder .....	2	Ethernet Extension Utilization pane (NAV SD 501 only) .....	44
System Interaction and Capabilities .....	2	USB Devices pane (NAV SD 501 only) .....	45
		Primary Controller pane .....	45
		Settings Page .....	48
		Device Details .....	48
		USB (NAV SD 501 only) .....	54
<b>Installation and Basic Operation .....</b>	<b>5</b>		
Rear Panel Connections and Features .....	5	<b>Control System .....</b>	<b>59</b>
Connector and Cable Details .....	7	Secure Platform Device .....	59
TP cable termination and recommendations.....	7	Toolbelt.....	59
HDMI connectors.....	8	Secure Sockets Layer (SSL) Certificates .....	60
Analog audio connectors .....	9	Global Configurator Plus and Professional .....	61
Control connector wiring.....	9	Global Scripiter.....	62
Front Panel Features.....	11		
Startup and Basic Operation .....	13	<b>SIS Operation.....</b>	<b>63</b>
Power.....	13	Secure Platform Device .....	63
Pairing Devices Manually .....	13	Common symbol definitions.....	65
System operation with a NAVigator.....	14	Command and Response Table for Decoder Commands .....	65
		Command and Response Table for IP-Specific SIS Commands.....	68
<b>HTML Operation .....</b>	<b>17</b>	<b>Troubleshooting.....</b>	<b>69</b>
Opening the Embedded HTML Pages .....	17	Alarms.....	69
Using the HTML Pages.....	20		
Input Configuration Page .....	21	<b>Reference Information .....</b>	<b>72</b>
Audio pane .....	21	Mounting the Decoder .....	72
Output Configuration Page .....	22	Tabletop Use .....	72
Video pane .....	23	Mounting kits.....	72
Audio pane .....	24	UL Rack-Mounting Guidelines .....	72
On Screen Display (OSD) pane .....	26	Download a Firmware or Software Package .....	73
Scaler Settings page.....	29		
Scaler pane .....	30		
Ties Page .....	34		
Current Output pane.....	35		
Available Inputs pane.....	35		



# 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 decoders:

- **NAV SD 501 Scaling Decoder** — Receives HDMI video, audio, and RS-232 and IR communications via a managed IP network using multicast streaming technology. Also supports USB and Ethernet extension.
- **NAV SD 101 Scaling Decoder** — Receives HDMI video, audio, and RS-232 and IR communications via a managed IP network using multicast streaming technology.

**NOTE:** In this manual:

- The NAV SD 501 and NAV SD 101 are both referred to as a “decoder.” They are referenced by model name when differences exist.
- NAV decoders and encoders 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.

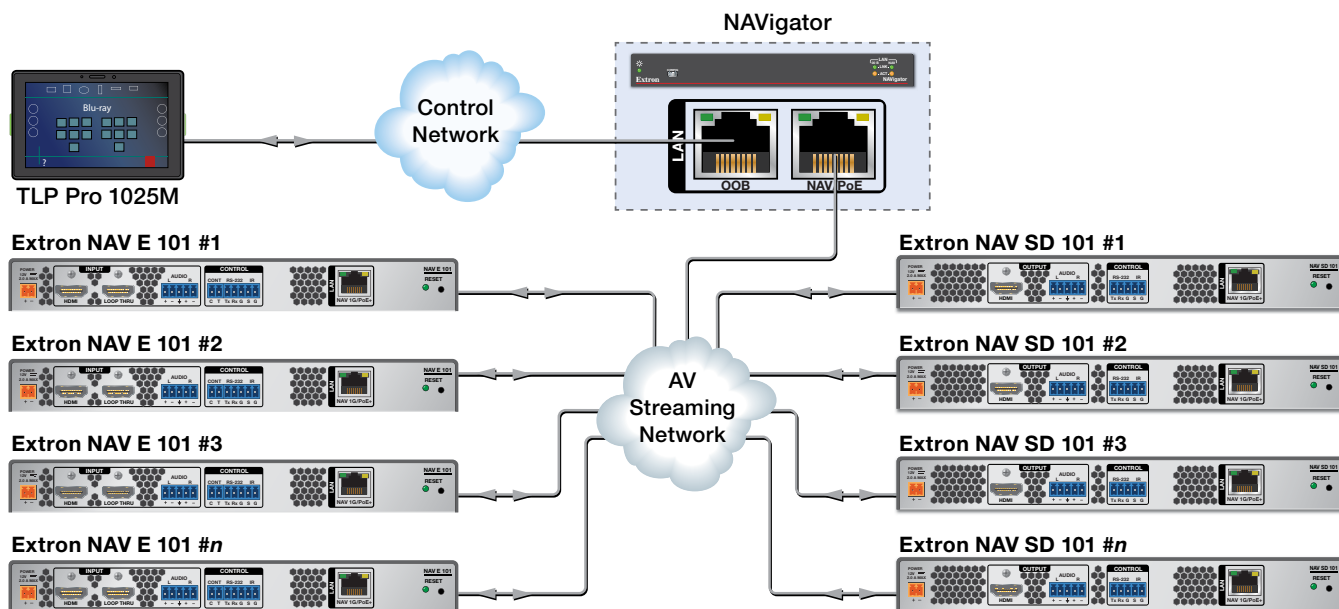
### About the Encoder

A NAV encoder encodes inputs from an HDMI video source, compresses them into a data stream, and streams the coded signal across an IP network using the Extron PURE3 Codec. PURE3 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
- RS-232 and IR control signals
- **NAV E 501 streaming to NAV SD 501 only** — USB 2.0 port control and data signals
- **NAV E 501 streaming to NAV SD 501 only** — An Ethernet Extension port that 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 VLAN. AV switching can be done via a control system by interfacing to the NAV decoder or the NAVigator.

**NOTE:** 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.

A dedicated RS-232 port is available for distributing RS-232 data with the coded/decoded video, such as for control of a projector.

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

- **Decodes video, audio, Ethernet, and USB (Ethernet and USB for NAV SD 501 only) signals from 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)** — Intelligent Selective Streaming 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** — Decodes and scales 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.
- **Advanced Extron Vector 4K scaling technology** — Vector 4K scaling technology ensures critical-quality 4K imagery, with best in class image upscaling and downscaling, enhanced color accuracy, and picture 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.
- **USB 2.0 extension (NAV SD 501 only)** — 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.
- **Ethernet expansion (NAV SD 501 only)** — 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.
- **WindoWall Mode supports videowall applications** — NAV scaling decoders support videowall applications using the Extron WindoWall processing, enabling a mix of full screen and image magnification across multiple displays. WindoWall presets provide a quick and easy way to manipulate the videowall canvas between different image arrangements.
- **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.
- **Secure Real-Time Transport Protocol (SRTP) stream encryption** — SRTP ensures encryption, message authentication, and data integrity for video and data streams.
- **Priority Routing** — Assign custom tags to the built-in decoder HTML pages of endpoints. 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.
- **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.
- **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.
- **New 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.
- **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.
- **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 SD 501 and NAV SD 101 decoders, including:

- [Mounting](#)
- [Rear Panel Connections and Features](#)
- [Front Panel Connection and Indicators](#)
- [Operation](#)

## Mounting

If desired, mount the decoder in a rack (see [Mounting the Decoder](#) on page 72).

## Rear Panel Connections and Features

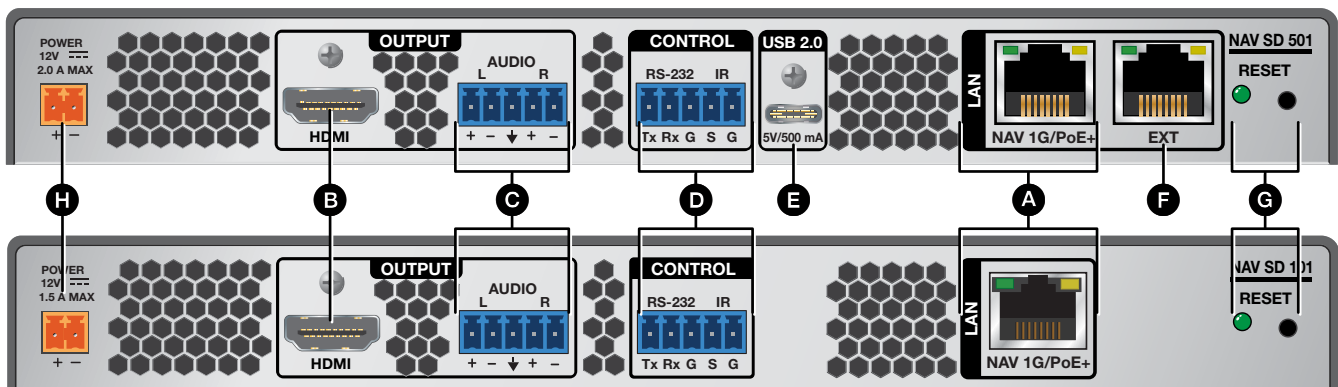
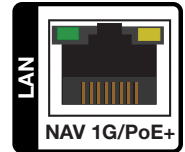


Figure 2. NAV SD 501 and NAV SD 101 Rear Panel Connectors

- **A** NAV 1G/PoE+ port
- **B** HDMI output port
- **C** Audio output port
- **D** Control port
- **E** USB 2.0 port (NAV SD 501 only)
- **F** Extension port (NAV SD 501 only)
- **G** Reset button and LED
- **H** Power connector

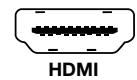
- A NAV 1G/PoE+ port** (see **figure 2** on page 5) — Connect to an Ethernet LAN on which one or more encoders also reside for streaming, control, and PoE+.



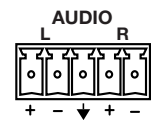
**NOTES:**

- See **TP cable termination** on page 7 to properly wire the RJ-45 connectors **A** and **F**.
- The Extension port (**F**) 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 decoder communicates.
  - **Link (green) LED** — Indicates that the decoder is properly connected to an Ethernet LAN. This LED lights steadily.

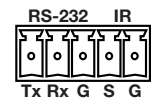
- B HDMI output port** — Connect an HDMI cable between this port and an HDMI display. See **LockIt Lacing Brackets** on page 8 to use the LockIt HDMI Cable Lacing Bracket to secure the connector to the decoder.



- C Audio output port** — This 5-pole, 3.5 mm captive screw connector outputs the streamed, unamplified, line level analog audio. Connect an audio device, such as an audio amplifier or powered speakers (see **Analog audio connector** on page 9 to wire the connector).



- D Control (RS-232/IR port)** — Connect a serial RS-232 signal, a modulated 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** on page 9 to wire the connector).

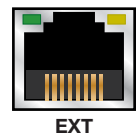


- E USB 2.0 port** (NAV SD 501 only) — Connect a USB Type-C® cable from a USB host or a USB device. See **LockIt Lacing Brackets** to securely fasten the USB connector to the decoder.



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

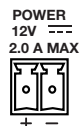
- F Extension port** (NAV SD 501 only) — If desired, connect another networked device to this port. The port acts as a networked switch to the NAV 1G/PoE+ port (**A**).



- G Reset button and LED** — The Reset button initiates three levels of decoder reset. For the different reset levels, press and hold the button while the decoder is running or while you power up the decoder (see **Reset Operations** on page 15 for details).



- H Power connector** — Plug the included external 12 VDC power supply into this 2-pole connector.



**NOTE:** Alternatively, the decoder can be powered via PoE.

**ATTENTION:**

- Do not connect power to the decoder until you have read the **CAUTION** and **ATTENTION** notices on pages 10 and 11.
- Ne connectez pas l'alimentation à l'encodeur avant d'avoir lu les rubriques « **ATTENTION** » des pages 10 et 11.

## Connector and Cable Details

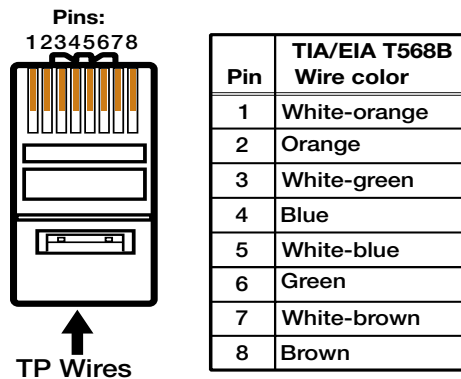
### TP cable termination and recommendations

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 3).



**Figure 3. RJ-45 Connector and Pinout Table**

## HDMI connectors

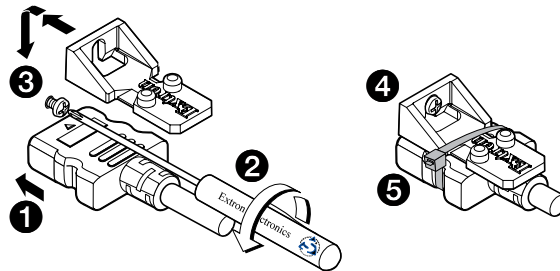
HDMI signals for 4K video run at a very high frequency and are especially prone to errors caused by bad video connections, too many adapters, or excessive cable length. To avoid the loss of an image or jitter, follow these guidelines:

- Do not exceed 12 feet (3.6 meters) on the input of the encoder or the output of the networked decoder.
- 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 Lacing Brackets

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

1. Plug the rear panel HDMI or USB (NAV SD 501 only) cable into the panel connection (see figure 4, **1**).



**Figure 4. Installing the LockIt Lacing Bracket**

2. Loosen the connection mounting screw from the panel enough to allow the LockIt lacing bracket to be placed over it (**2**). The screw does not have to be removed.
3. Place the LockIt lacing bracket on the screw and against the connector, then tighten the screw to secure the bracket (**3**).

### ATTENTION:

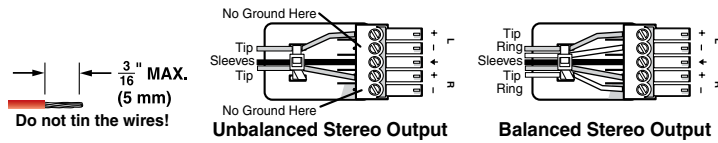
- Do not overtighten the HDMI connector mounting screw. The shield to which it fastens is very thin and can easily be stripped.
- Ne serrez pas trop la vis de montage du connecteur HDMI. Le blindage auquel elle est attachée est très fin et peut facilement être dénudé.

4. Loosely place the included tie wrap around the HDMI connector and the LockIt lacing bracket as shown (**4**).
5. While holding the connector securely against the lacing bracket, use pliers or similar tools to tighten the tie wrap, then remove any excess length (**5**).



## Analog audio connectors

See figure 5 to wire a connector for the appropriate output type. Connectors are included with the decoder, but you must supply the audio cable. Use the supplied tie-wrap to strap the cable to the extended tail of the connector.



**Figure 5. Captive Screw Connector Wiring for Audio Outputs**

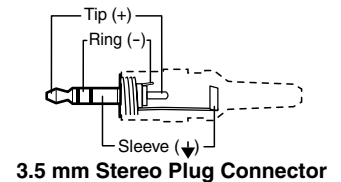
### ATTENTION:

- For unbalanced audio, connect the sleeves to the ground contact. **DO NOT** connect the sleeves to the negative (-) contacts.
- Pour l'audio asymétrique, connectez les manchons au contact au sol. **NE PAS** connecter les manchons aux contacts négatifs (-).

### 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 power supply leads before installing them in the connector. Tinned wires are not as secure in the connector and could be pulled out.

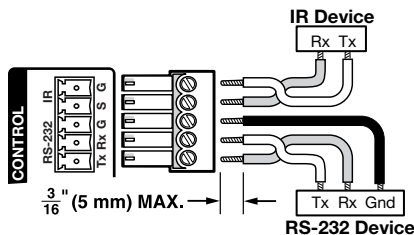
A balanced stereo audio connector consists of a tip, ring, and sleeve. An unbalanced mono audio connector consists of a tip and sleeve. When you are making connections for the units from existing audio cables, see the drawing at right to identify the tip, ring, and sleeve parts of the connector. The ring, tip, and sleeve wires are also shown on the captive screw audio connector diagram, figure 5.



**3.5 mm Stereo Plug Connector**

## Control connector wiring

Figure 6 shows how to wire the Control (RS-232 and IR) connector.



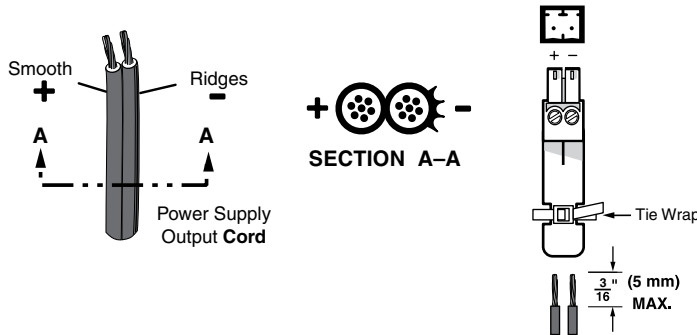
**Figure 6. Control Connector Wiring**

### 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).

## 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:**

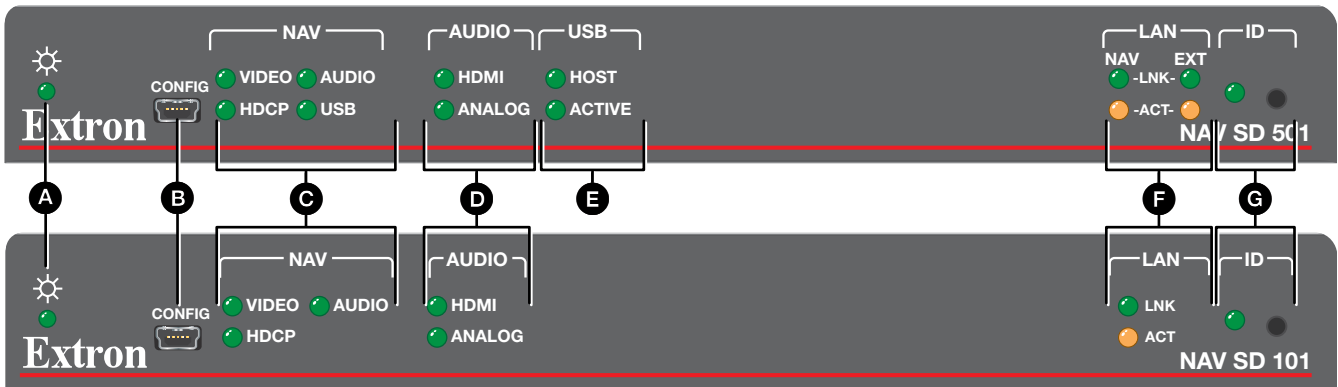
- This product is intended to be supplied by a UL Listed power source marked "Class 2" or "LPS," rated 12 VDC, 2.0 A minimum. Always use a power supply supplied by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.
- Ce produit est destiné à une utilisation avec une source d'alimentation listée UL avec l'appellation « Classe 2 » ou « LPS » et normée 12 Vcc, 2.0 A minimum. 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.

**ATTENTION:**

- 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.
- 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](#) on page 10) 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](#) sur la page 10) 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. Decoder Front Panel Features**

- A Power LED** (see below)
- B Configuration port**
- C NAV LEDs** (see page 12)
- D Audio 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 remotely (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 decoder and to update firmware.

**C NAV LEDs** (see **figure 8** on page 11)

**Video LED** — Indicates the status of the input video stream.

**Lit steadily**— The unit is decoding the video input stream.

**Blinking** — The unit is decoding the video input stream, but network errors are present that affect the image.

**HDCP LED** — The video input stream is HDCP encrypted.

**Audio LED** — Indicates the status of the input audio stream.

**Lit steadily**— The unit is decoding the audio input stream.

**Blinking** — The unit is decoding the audio input stream, but network errors are present that affect the audio quality.

**USB LED** (NAV SD 501 only) — Indicates status of the USB stream.

**Lit steadily** - The decoder is actively receiving and sending a NAV USB stream.

**Blinking** — The decoder is unable to establish a NAV USB stream.

**Unlit** — The decoder is not actively sending and receiving a NAV USB stream.

**D Audio LEDs**

**HDMI Audio LED** — Indicates the status of the HDMI audio output.

**Lit steadily**— HDMI audio output is being output on the HDMI port (see **B** on page 6).

**Unlit** — HDMI audio is muted.

**Analog Audio LED** — Indicates the status of the analog audio output.

**Lit steadily**— HDMI audio output is being output on the audio port (see **C** on page 6).

**Unlit** — Analog audio is muted.

**E USB LEDs** (NAV SD 501 only) — Indicates the status of the USB mode, as follows:

**Host LED**

**Lit steadily** – The decoder is in USB host mode.

**Unlit** – The decoder is in USB device mode, the default condition.

**Active LED**

**Lit steadily** – A USB device or host is connected to the rear panel USB port.

**Blinking** – A USB device or hub is connected to the decoder and is attempting to draw more power than the USB port can supply.

**Unlit** – No host or USB device is connected to the rear panel USB port.

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

**NAV LED** (NAV SD 501) or **LAN LED** (NAV SD 101) — Indicates the NAV network connection status.

**Link LED** — Lit steadily indicates that a network link is established. Blinking indicates a link speed less than 1G.

**Act LED** — Blinking indicates network traffic. The blink rate corresponds to activity.

**Ext LED** (NAV SD 501 only) — Indicates the Ethernet Extension status.

**Link LED** — Lit steadily indicates that a network link is established. Blinking indicates a link speed less than 1 Gbps.

**Act LED** — Blinking indicates network traffic. The blink rate corresponds to activity.

- Ⓒ **ID button and LED** (see **figure 8** on page 11) — The recessed ID button, when pressed, identifies the decoder to other network units and to the embedded HTML pages (see **Pairing Devices Manually** on page 13). The LED blinks when the decoder is in pairing mode and lights steadily when it is paired or device identification is selected from the decoder or NAVigator HTML page.

**NOTE:** The ID button triggers the status on-screen display (OSD), which shows on the HDMI Output port (see **item B** on page 6).

## Startup and Basic Operation

### Power

The decoder can be powered in one of three ways:

- Locally, from the included external power supply and via the power connector (see **H** on page 6).
- Remotely, receiving PoE via the NAV 1G/PoE+ port (see **A** on page 6); either from the network switch or from an optional PI 140 Power Injector.
- Locally (**H**) and remotely (**A**), with priority on the NAV 1G/PoE+ port. If PoE voltage drops below a threshold, the decoder immediately transitions to the power connector with no effect on system operation.

When power is applied, the decoder runs a series of self-tests that blink the front panel Power LED and all other indicators. The decoder 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.

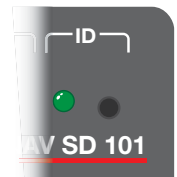
**NOTES:**

- The decoder is NOT operational until the boot process is complete (the Power LED is lit steadily).

### Pairing Devices Manually

Pair devices as follows:

1. Use a Tweezer 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 Tweezer 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 Tweezer 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 (see **Ties Page** on page 34) or a connected NAVigator (see the *NAVigator User Guide*, available at <https://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 <https://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 on page 17) or Extron Toolbelt. Simple Instruction Set (SIS) commands (see **SIS Operation**, starting on page 63) cannot be issued directly to the decoder, 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 <https://www.extron.com> for details).



## Reset Operations

The rear panel **Reset** button (see **G** on page 12) initiates three levels of resets (numbered 1, 4, and 5 for comparison with an Extron IPL product). The **Reset** button is recessed, so use a pointed stylus, ballpoint pen, or small screwdriver to access it.

See the table below 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 a decoder 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:

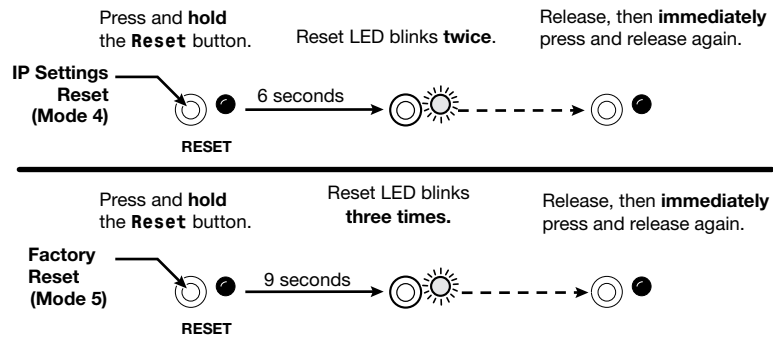
- The reset modes listed in the table are separate functions, not a continuation from mode 1 to mode 5.
- The modes listed close all open IP and other connections and close all sockets.

Reset Mode Comparison and Summary			
Mode	Activation	Result	Purpose and Notes
1 Hardware reset	Hold down the recessed <b>Reset</b> button while applying power to the unit.  <b>NOTE:</b> After a mode 1 reset, update the unit firmware to the latest version. Do not operate the firmware version that results from the mode 1 reset. If you want to use the factory default firmware, upload that version again (see <b>Firmware tab</b> on page 39 for details on uploading firmware).	<b>The unit reverts to the factory default firmware.</b> All user files and settings, such as IP settings, are maintained.  <b>NOTE:</b> If you do not want to update firmware, or you performed a mode 1 reset by mistake, cycle power to the unit to return to the firmware version that was running before the mode 1 reset (see <b>About Page</b> on page 58 to find the firmware version).	Use mode 1 to return the unit to the factory default firmware version if incompatibility issues arise with user-loaded firmware.
4 Reset IP (SW) settings	Hold the <b>Reset</b> button for approximately 6 seconds, until the Reset LED blinks twice (once at 3 seconds and again at 6 seconds). Then momentarily press <b>Reset</b> within 1 second.	<b>Resets all the IP settings without affecting the device configuration. Mode 4:</b> <ul style="list-style-type: none"> <li>• Enables ARP capability.</li> <li>• Sets the IP address, subnet address, gateway address, and port mapping to the factory default.</li> <li>• Sets the Multicast IP, stream number and device name to the factory default.</li> <li>• Turns DHCP on.</li> </ul> The Reset LED blinks three times in succession during the reset.	Mode 4 enables you to set IP address information using ARP and the MAC address.
5 Factory (SW) reset	Hold the <b>Reset</b> 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 <b>Reset</b> within 1 second.  <b>NOTE:</b> Mode 5 reset reverts the factory-configured username to <code>admin</code> and password to <code>extron</code> .	<b>Mode 5 performs a complete reset to factory defaults (with the exception of the firmware):</b> <ul style="list-style-type: none"> <li>• Does everything mode 4 does.</li> <li>• Resets all settings with the exception of factory firmware.</li> <li>• Resets all IP options.</li> <li>• Removes all files from the unit.</li> <li>• Removes the initial serial number passwords and sets them to <code>extron</code>.</li> </ul> The reset LED blinks four times in succession during the reset.	Mode 5 is for starting over with configuration and uploading or to replace events. Same as the <code>Esc ZQQQ←</code> SIS command on page 66.

## Performing Mode 4 and 5 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 an absolute (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 SD 501 and NAV SD 101 decoders, including:

- [Opening the Embedded HTML Pages](#)
- [Using the HTML Pages](#)

The decoder can be controlled and operated through either the front panel Configuration (USB) port (see [figure 8, B](#) on page 11) or the rear panel NAV 1G/PoE+ port (see [figure 2, A](#) on page 5). 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 decoder using HTML pages as follows:

1. Start the web browser.

### NOTE:

- 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/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		

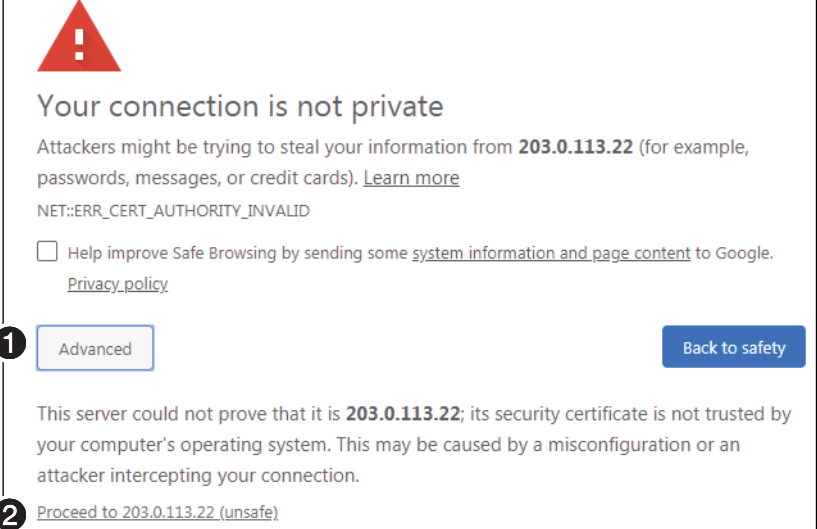
\* **For the Config port**, the address for IP over USB **CANNOT** be changed.

- If you use IP over USB, Extron recommends waiting a minute after plugging in the cable for 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). 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** on page 59). Once the certificate is loaded, the notification does not occur.

The browser opens to the **Log in** dialog box (see figure 11).



**Figure 11. Login Dialog Box**

4. Enter the **Username** (see figure 11, ❶) and **Password** (❷) and click **Sign In** (❸). The browser opens the embedded decoder web pages (see **figure 12** on page 19).

**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.
- The default username is `admin` and the default password is `extron`.
- Passwords are case sensitive.

**NOTE:** The HTML page may open with any of the panels (items 2 through 8 below) selected.

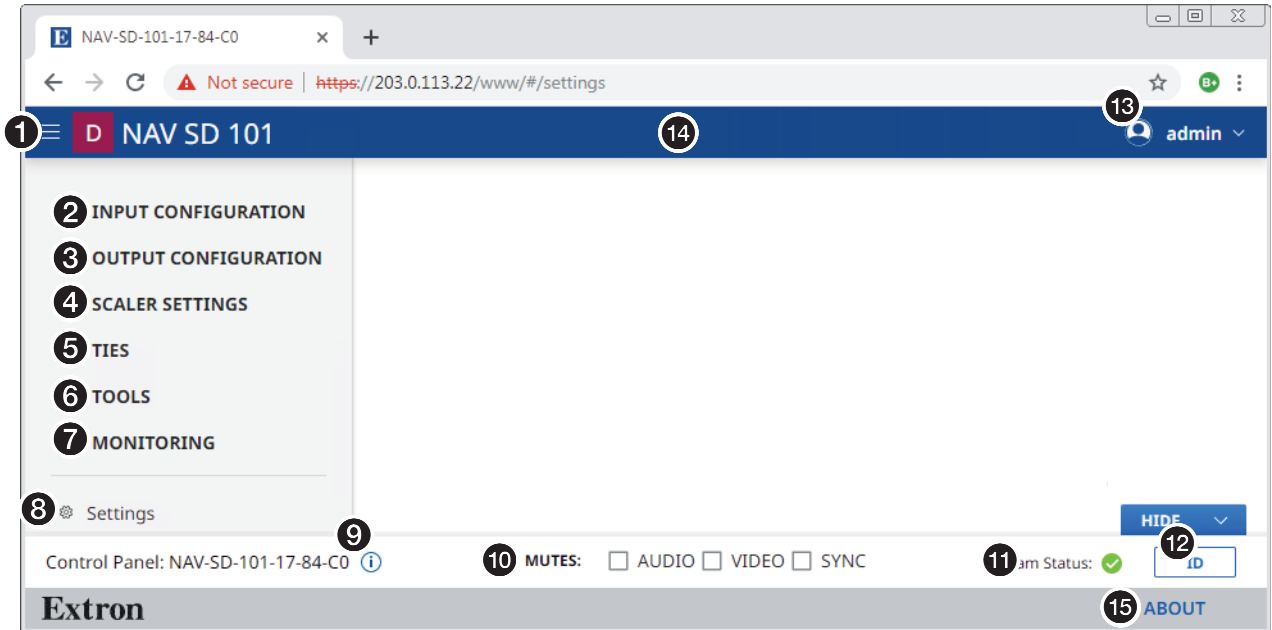
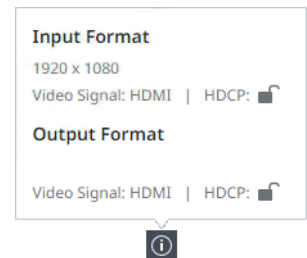


Figure 12. Home Page

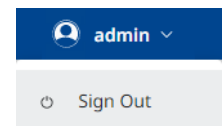
## Using the HTML Pages

See [figure 12](#) on page 19 and the following sections for detailed descriptions of the following pages or functions:

- 1 **Menu icon** — Toggles to hide or show the links pane (items 2 through 8).
- 2 **Input Configuration link** — Opens a page that provides configuration information on the audio portion of the streaming input and the ability to change an input value (see [Input Configuration Page](#) on page 21).
- 3 **Output Configuration link** — Opens a page that provides output configuration information and the ability to change some output values (see [Output Configuration Page](#) on page 22).
- 4 **Scaler Settings link** — Opens a page that provides scaler and preset information and the ability to select scaler values and to save presets (see [Scaler Settings Page](#) on page 29).
- 5 **Ties link** — Opens a page that displays the status of the current output of the decoder and the available inputs (encoder streams) (see [Ties Page](#) on page 34).
- 6 **Tools link** — Opens two pages that provide decoder and diagnostic tools (see [Tools Pages](#) on page 36).
- 7 **Monitoring link** — Opens a page that shows device status information (see [Monitoring Page](#) on page 43).
- 8 **Settings link** — Opens a page that provides access to many device settings (see [Settings Page](#) on page 48).
- 9 **Information indicator** — Pops up a dialog box that displays the format, resolution, and rate of the input and output. Click anywhere outside the dialog box to close the box.



- 10 **Mutes panel** — Select (click) **Audio**, **Video**, or **Sync** to toggle the mute on (do not output) and off (output) for the associated plane.
- 11 **Stream Status indicator** — Displays the AV stream input status of the decoder, active (green checkmark), not active (yellow triangle), or error (red circle).
- 12 **ID button** — Click to show the Status OSD on the HDMI Output port (see [item B](#) on page 6) and light the front panel ID LED (see [item F](#) on page 11).
- 13 **admin link** — Click to display the **Sign out** button. Click **Sign Out** to log out of the decoder HTML pages.



**NOTES:**

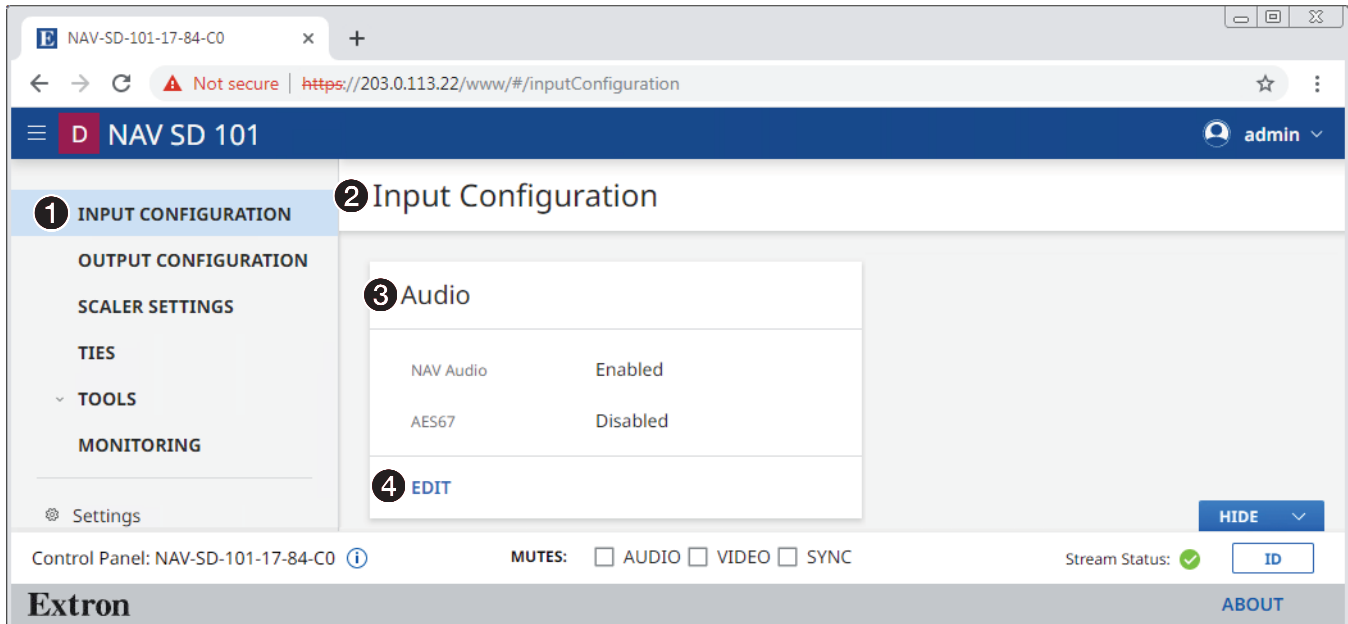
- The log in to the HTML pages automatically times out after 30 minutes of user inactivity.
- Signing out is disabled when the decoder is accessed via proxy from the NAVigator (see the [NOTES](#) on page 35).

- 14 **Name banner** — Normally displays the host name. Resting a cursor over this banner changes the display from host name to the device name.
- 15 **About link** — Opens a page that provides information about the decoder (see [About Page](#) on page 58).



## Input Configuration Page

Access the **Input Configuration** page (see figure 13) by clicking the link on the left side of the browser (❶). The browser displays the **Input Configuration** panel (❷).



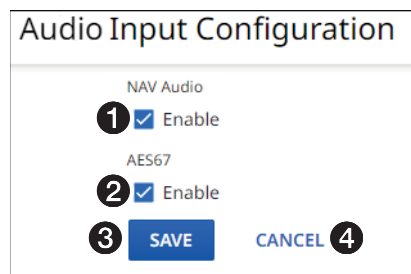
**Figure 13. Input Configuration Page**

The **Input Configuration** page consists of a read-only **Audio** pane (❸) that displays the status of the audio portion of the streaming input to the decoder.

The audio settings are accessible to change from the **Audio** pane by clicking the **Edit** link (❹) in the appropriate pane. The **Audio** pane opens (see “**Audio pane**” below).

### Audio pane

See figure 14. If you change either setting in the **Audio Input Configuration** dialog box (❶ and ❷), the **Save** button (❸) becomes selectable. Click **Save** to take changes or **Cancel** (❹) to abandon them. Clicking either button closes the dialog box.



**Figure 14. Audio Input Configuration Dialog Box and Selection Process**

- ❶ **NAV Audio** — Click to enable and disable **NAV Audio**. NAV audio is the default encrypted audio signal.
- ❷ **AES67** — Click to enable and disable **AES67**. AES67 is a standards-based audio over IP signal.

## Output Configuration Page

Access the Output Configuration page (see figure 15) by clicking the link on the left side of the browser (❶). The browser displays the Output Configuration panel (❷).

The screenshot shows the NAV SD 101 web interface. The browser address bar shows the URL <https://203.0.113.22/www/#/outputConfiguration>. The page title is "NAV SD 101" and the user is logged in as "admin". The sidebar on the left has a menu with "OUTPUT CONFIGURATION" selected, indicated by a circled 1. The main content area is titled "Output Configuration" with a circled 2. It contains four configuration panes: "Video" (circled 3), "Audio" (circled 4), "Test Pattern" (circled 5), and "On Screen Display (OSD)" (circled 6). Each pane has an "EDIT" link (circled 7). The Video pane shows settings: Display EDID (1920x1080 @ 60Hz), HDCP Mode (Follow Input), Video Output (Auto), Color Bit Depth (Auto), and HDCP Notification (Enabled). The Audio pane shows Analog Volume (%) at 100 and Allow Audio Only at Enabled. The Test Pattern pane shows a black video test pattern and Video Test Pattern at Disabled. The OSD pane shows OSD Type (Disabled), Screen Saver Mute (Disabled), Screen Saver Duration (501 Always on), and Background Image Selection (Black Screen). The footer includes "Control Panel: NAV-SD-101-17-84-C0", "MUTES: AUDIO VIDEO SYNC", "Stream Status: [green checkmark]", and the Extron logo.

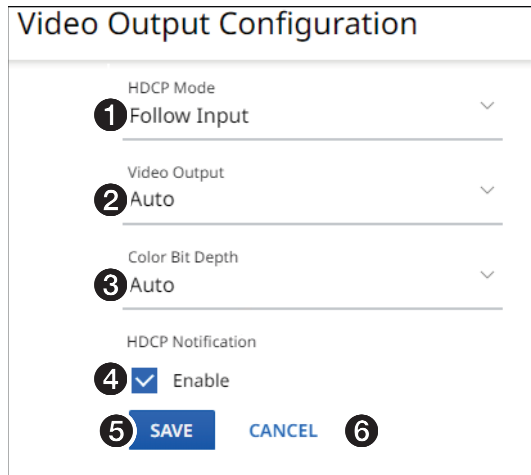
**Figure 15. Output Configuration Page**

The Output Configuration page consists of four panes, Video (❸), Audio (❹), Test Pattern (❺) and Scaler Settings (❷) that display the status of the output signal.

Each pane has settings that can be changed by clicking the **Edit** link (❼) in the appropriate pane. The selected dialog box opens (see [Video pane](#) on page 23, [Audio pane](#) on page 24, and [Test Pattern pane](#) on page 25, and [On Screen Display \(OSD\) pane](#) on page 26).

## Video pane

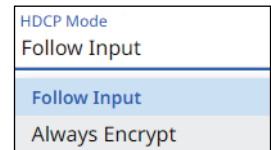
See figure 16. If you change any of the settings in the **Video** dialog box (❶ through ❹), the **Save** button (❺) becomes selectable. Click **Save** to take changes or **Cancel** (❻) to abandon them. Clicking either button closes the dialog box.



**Figure 16. Video Output Configuration Dialog Box**

❶ **HDCP Mode** — Click the drop-down list to select between the following two output modes for the HDMI Output port (see [item B](#) on page 6).

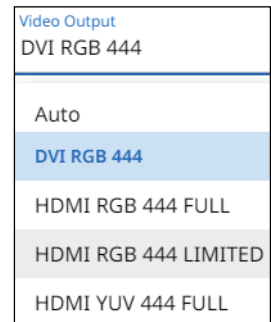
- **Follow Input** (the decoder follows the streamed HDCP encryption status)
- **Always Encrypt** (the decoder outputs HDCP encryption regardless of the content)



**NOTE:** **Follow Input** mimics the HDCP encryption state of the connected source. **Always Encrypt** maintains the HDCP encrypted state with the output sink device to improve system switching performance.

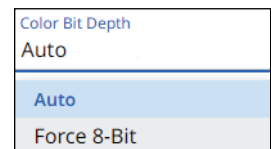
❷ **Video Output** — Click the drop-down list to select among the various output formats and colorspace for the HDMI Output port ([item B](#)). The table below shows the available formats.

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 HDMI Output port (see [item B](#)).

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



❹ **HDCP Notification** (see [figure 16](#) on page 24) — Click to toggle **HDCP Notification**

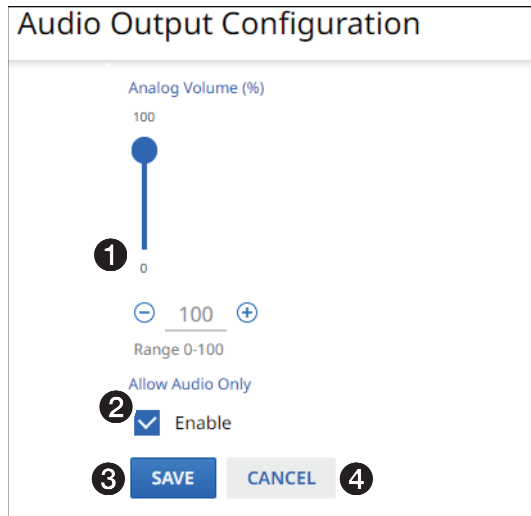
on and off. This selection lets you select what is displayed on the HDMI output when the input signal contains HDCP-protected content and the output is a non-HDCP sink.

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 a 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.

## Audio pane

See figure 17. If you change any of the settings in the **Audio** dialog box (1 and 2), the **Save** button (3) becomes selectable. Click **Save** to take changes or **Cancel** (4) to abandon them. Clicking either button closes the dialog box.



**Figure 17. Audio Dialog Box**

**1 Audio Volume** — Set the Audio Volume in one of three ways:

- Click and drag the slider control.
- Click the  $\ominus$  and  $\oplus$  buttons.
- Directly type a rate into the field.

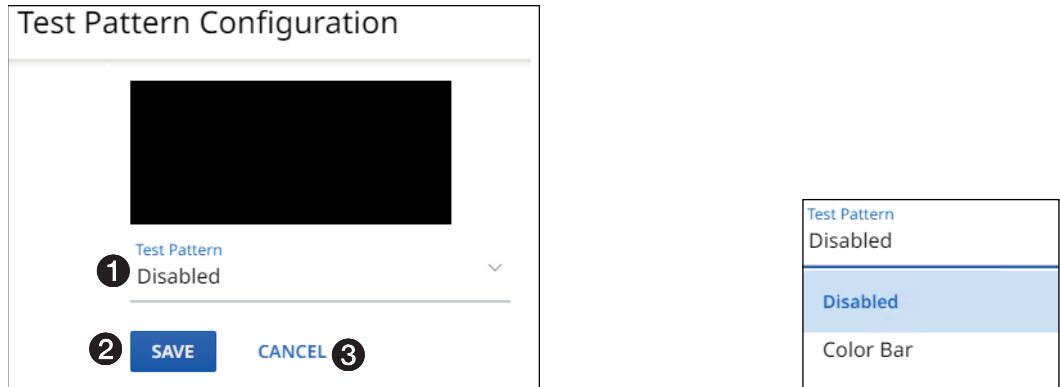
**2 Allow Audio Only** — Click to toggle **Audio Only** on and off.

### NOTES:

- **Audio Only** sends a black video signal and sync to the attached display to prevent it from going into a standby state. This allows audio to continue be played using the internal speakers of the display when there is no video.
- **Allow Audio Only** must be disabled to use the NAV screen saver (see [On Screen Display \(OSD\) pane](#) on page 26).

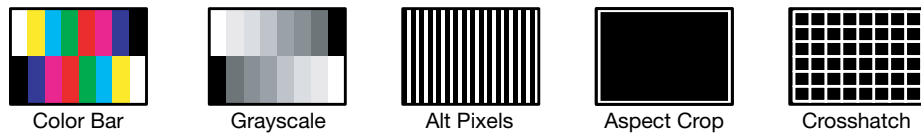
## Test Pattern pane

See figure 18. If you change the test pattern setting (❶), the **Save** button (❷) becomes selectable. Click **Save** to take change or **Cancel** (❸) to abandon it. Clicking either button closes the dialog box.



**Figure 18. Test Pattern Dialog Box**

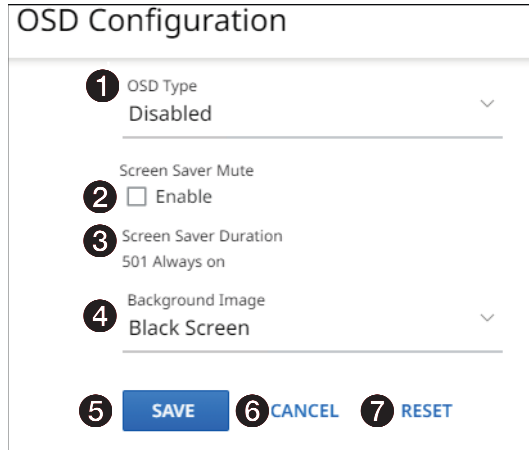
- ❶ **Test Pattern** — Click the drop-down list to select among **Disabled** (no test pattern on the output) and the test patterns shown at right (figure 19 shows examples), which can be useful when setting up a display.



**Figure 19. Test Patterns**

## On Screen Display (OSD) pane

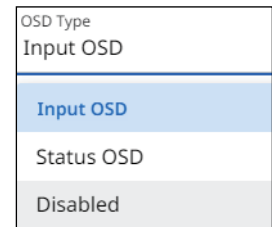
See figure 20. This pane shows the options for the OSD and screen saver on the HDMI output (see [item B](#) on page 6). If you change any setting, either directly or by clicking **Reset** (7), the **Save** button (5) becomes selectable. Click **Save** to take change or **Cancel** (6) to abandon the changes. Clicking either button closes the dialog box.



**Figure 20. OSD Configuration Pane**

**1 OSD Type** — Click the drop-down list to select among the OSD options for display:

- **Input OSD** (input stream from encoder details)
- **Status OSD** (general decoder details)
- **Disabled** (no OSD)



**NOTE:** When **Input OSD** or **Status OSD** is selected, an extra control, **OSD Duration** appears below **OSD Type**.  
 Click **+** or **-** to increment or decrement the duration (from **1** to **500** in seconds) of how long the OSD stays active. **501** is always on.

See [figure 21](#) on page 27 for typical on-screen displays.

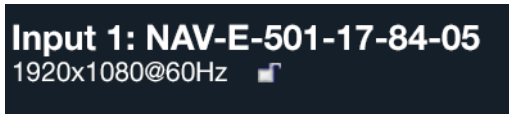
**2 Screen Saver Mute** — Click to toggle the **Screen Saver Mute** on (muted) and off (unmuted) for the HDMI output (see [item B](#)). This control sets whether the screen immediately enters low power mode (screen saver is muted) upon loss of sync or displays the user-entered background image (see **Background Image**, 4) for a period of time set by the **Screen Saver Duration** setting, 3.

**3 Screen Saver Duration** (available when **Screen Saver** [2] is selected) — **500**  
 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, before muting sync to a display (Blackburst). The valid range is from **1** to **500** (seconds) or **501** Always on.

When **Screen Saver Mute** is unchecked (see 2, above), 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.

Extron		NAV SD 501	
Host Name	NAV-SD-501-1B-67-61	Output Number	2082
Output Number	2082	IP Address	192.168.1.224
IP Address	192.168.1.224	MAC Address	00-05-A6-1B-67-61
MAC Address	00-05-A6-1B-67-61	Model	NAV SD 501
Model	NAV SD 501	Serial Number	A27YE3N
Serial Number	A27YE3N	Firmware	FW: 1.00.0006.b040
Firmware	FW: 1.00.0006.b040	NAV Output	
NAV Output		Video Stream	NAV-E-501
Video Stream	NAV-E-501	Audio Stream	NAV-E-501
Audio Stream	NAV-E-501	AES67 Stream	Disconnected
AES67 Stream	Disconnected	* USB	
* USB		* USB Stream	NAV-E-501
* USB Stream	NAV-E-501	Input	Output
Input	1920x1080@60Hz	1920x1080@60Hz	



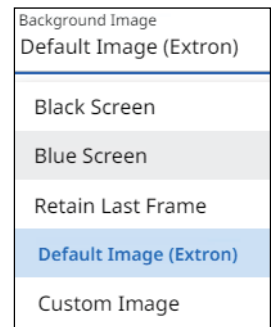
Typical Input Display

\* NAV SD 501 only

Typical Status Display

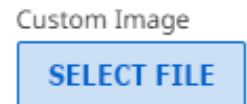
Figure 21. Typical On-Screen Displays

④ **Background Image** (see [figure 20](#) on page 26)— 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.
- 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 boarders.
- If you have not already uploaded an image, the pane displays the **Select File** button. See [Upload a custom image](#) on page 28.

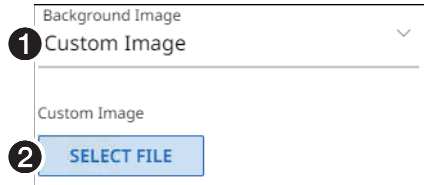


## Upload a custom image

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

**NOTE:** A valid custom image must be in the .png file format with a maximum size of 4K (4096 x 2160).

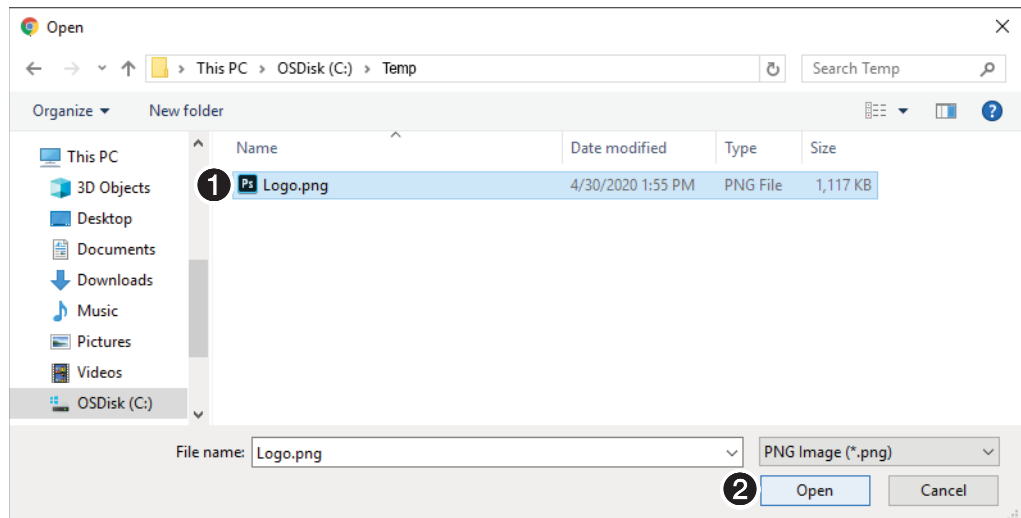
1. On the editable OSD Configuration pane (see **On Screen Display (OSD) pane** on page 26), click the **Background Image** drop-down list and select **Custom Image** (see figure 22, ①). If you have not already uploaded an image, the pane displays the **Select File** button (②).



**Figure 22. Upload a Custom Image, Steps 1 and 2**

2. Click **Select File** (②).

An **Open** dialog box opens (see figure 23).



**Figure 23. Open Dialog Box**

3. Navigate to the folder where the image file is saved (see figure 23, ①). Select the file.
4. Click **Open** (②).

The OSD pane reports that it is uploading the image (①, at right) and then reports that it is the custom image (renamed `User_image.png`) (②).

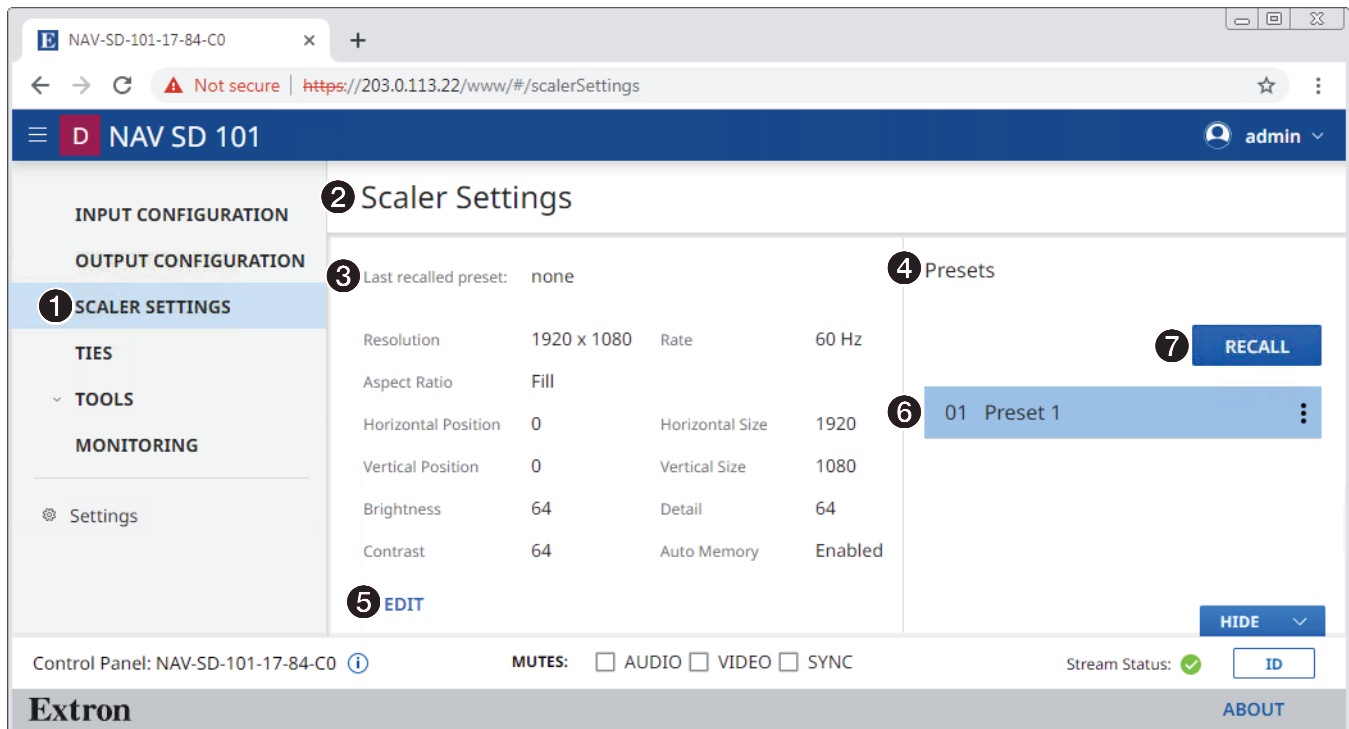
**NOTE:** Click **×** (A) to delete the image. This action is necessary to replace the custom image.





## Scaler Settings page

Access the Scaler Settings page (see figure 24) by clicking the link on the left side of the browser (1). The browser displays the Scaler Settings panel (2).



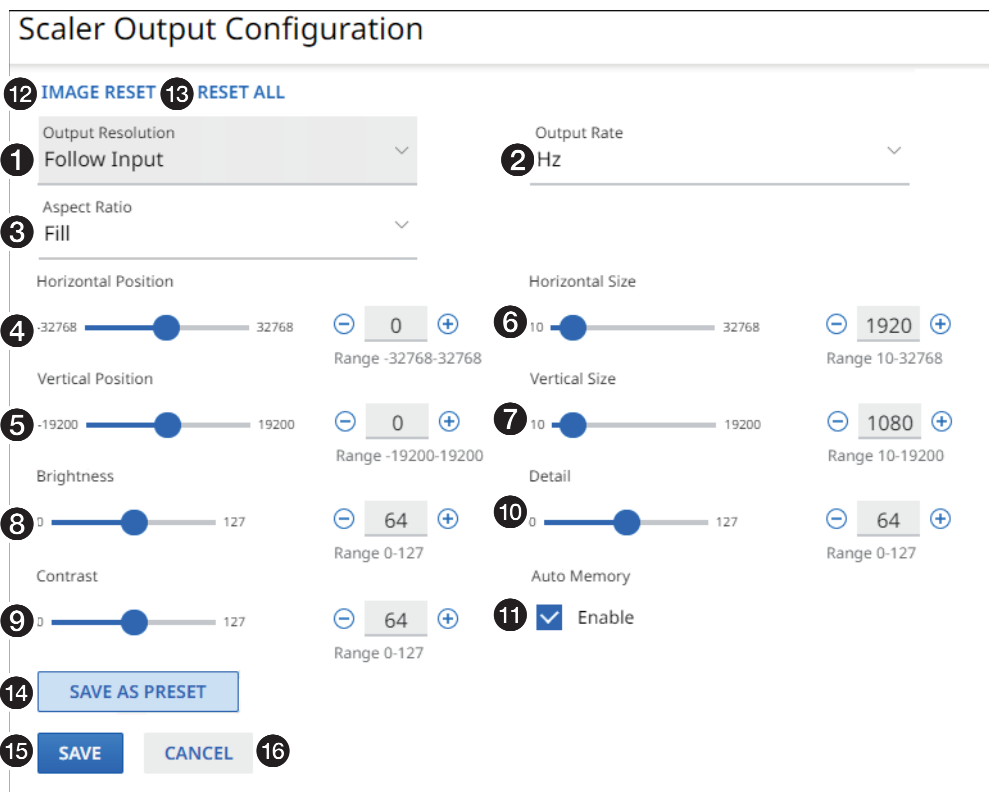
**Figure 24. Scaler Settings Page**

The Scaler Settings page consists of two panes:

- Scaler (3), which shows the current scaler settings. This pane has settings that can be changed by clicking the **Edit** link (5). An editable scaler pane opens (see [Scaler pane](#) and [figure 25](#) on page 30).
- Presets (4), which shows existing presets and allows you to recall, rename, and delete presets (see [Preset pane](#) on page 33). To recall a preset, click it (6) and click **Recall** (7).

## Scaler pane

See figure 25. If you change any of the variables (1 through 13), the **Save** button (15) becomes selectable. Click **Save** to take change or **Cancel** (16) to abandon it. Clicking either button closes the dialog box.



**Figure 25. Scaler Output Configuration Dialog Box**

- |                                     |                              |
|-------------------------------------|------------------------------|
| 1 Output Resolution (see below)     | 9 Contrast                   |
| 2 Output Rate                       | 10 Detail                    |
| 3 Aspect Ratio                      | 11 Auto Memory Enable        |
| 4 Horizontal Position (see page 32) | 12 Image Reset               |
| 5 Vertical Position                 | 13 Reset All                 |
| 6 Horizontal Size                   | 14 Save as Preset button     |
| 7 Vertical Size                     | 15 Save button (see above)   |
| 8 Brightness                        | 16 Cancel button (see above) |



- 1 **Output Resolution** — Click the drop-down list to select among available output resolutions. See the [table](#) on page 31 for valid resolution and rate combinations; invalid combinations of resolution and rate are not available.
- 2 **Output Rate** — Click the drop-down list to select among available output rates. See the [table](#) for valid resolution and rate combinations; invalid combinations of resolution and rate are not available.
- 3 **Aspect Ratio** — Click the **Aspect Ratio** drop-down list to select between **Follow** (no scaling, maintain the aspect ratio of the input video) or **Fill** (scale the output to fill the connected display).


Resolution (①)	Output Rate (Hz) (②)							
	23.98	24	25	29.97	30	50	59.94	60
Follow input*								•
640x480								•
800x600								•
1024x768								•
1280x768								•
1280x800								•
1280x1024								•
1360x768								•
1366x768								•
1400x1050								•
1440x900								•
1600x900								•
1680x1050								•
1600x1200								•
1920x1200								•
480p (720x480)							•	•
576p (720x576)						•		
720p (1280x20)			•	•	•	•	•	•
1080p (1920x1080)	•	•	•	•	•	•	•	•†
2048x1080	•	•	•	•	•	•	•	•
2048x1200								•
2048x1536								•
2560x1080								•
2560x1440								•
2560x1600								•
3840x2160	•	•	•	•	•	•	•	•
4096x2160	•	•	•	•	•	•	•	•

\* Bypass the scaler and output the resolution and frame rate from the encoder.

† **Default setting**

**NOTE:** For variables 4 through 10, observe the display connected to the Output port (see item B on page 6) and set the variable in one of three ways:

- Click and drag the slider control.
- Click the  and  buttons.
- Directly type a rate into the field.

- 4 **Horizontal Position** (see figure 25 on page 30) — Adjust the variable to center the image horizontally. The adjustment range is from **-32678** through **+32678**. The default setting is **0**. 
- 5 **Vertical Position** — Adjust the variable to center the image vertically. The adjustment range is from **-19200** through **+19200**. The default setting is **0**. 
- 6 **Horizontal Size** — Increase or decrease the horizontal size of the image. The adjustment range is from **10** through **32678**. The default setting is the horizontal resolution. 
- 7 **Vertical Size** — Increase or decrease the vertical size of the image. The adjustment range is from **10** through **19200**. The default setting is the vertical resolution. 
- 8 **Brightness** — The range for this adjustment is **0** to **127**. The default setting is **64**. 
- 9 **Contrast** — The range for this adjustment is **0** to **127**. The default setting is **64**. 
- 10 **Detail** — Increase or decrease the sharpness of the image. The adjustment range depends on the selected output resolution. The range for this adjustment is **0** to **127**. The default setting is **64**. 
- 11 **Auto Memory** — Click to toggle **Auto Memory** on and off. The decoder stores 16 auto memories, with input configuration and picture control data for each video resolution. **Auto Memory Enable** causes the decoder to automatically recall input and picture controls for previously applied signals. When **Auto Memories** is disabled, the decoder treats every applied signal as a new source. 
- 12 **Image Reset** — Click to reset the **Horizontal Size**, **Horizontal Position**, **Vertical Size**, and **Vertical Position** to their default values. 
- 13 **Reset All** — Click to reset all scaler output settings to their factory default values, 1080p at 60 Hz. 
- 14 **Save as Preset** — Click to save the current scaler settings as a scaler input preset (see **Preset pane** on page 33).

## Preset pane

The decoder has 16 memory slots in which you can save input presets. These presets allow encoders with multiple types of video inputs to stream to the decoder.

Input presets can be saved, recalled, and deleted using the embedded HTML pages.

- When you recall an input preset, the decoder fills the output based on the saved sizing and positioning. For example, a video source that was configured to be zoomed when it was previously saved as a preset is still zoomed, even if recalled to a smaller output raster.
- Input presets can be saved based on one input rate and recalled to a different rate. This enables presets to be used as aspect ratio or other quick-sizing shortcuts. Because the size and position is saved as a percent of the raster, the preset can be recalled to any scaled output and the saved size and position are scaled proportionally on the output.

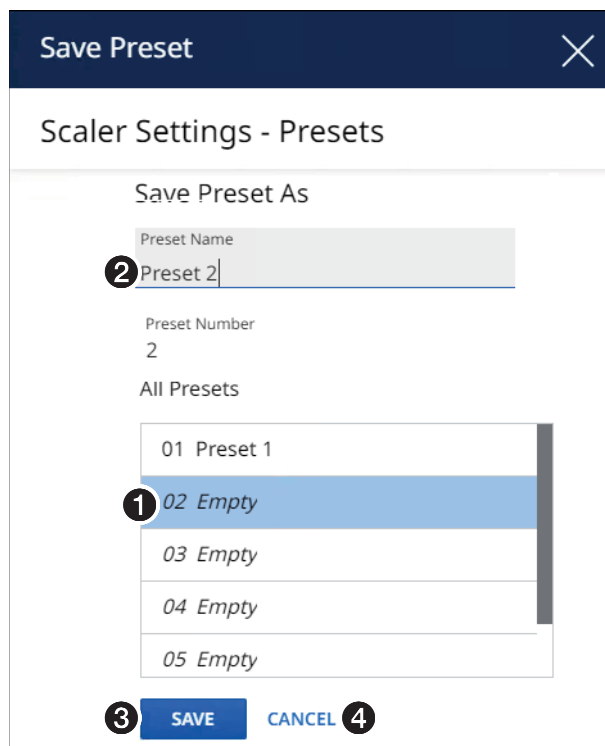
Values for the following settings are saved in input presets:

- Preset name
- Detail
- Contrast
- Brightness
- Horizontal position
- Vertical position
- Horizontal image size (width)
- Vertical image size (height)

## Save a preset

Save a input preset as follows:

1. On the **Scaler Settings** page, click **Save as Preset** (see [figure 25](#), 14 on page 30). The **Scaler Settings - Preset** dialog box opens (see [figure 26](#)).



**Figure 26. Saving an Input Preset**

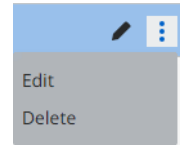
2. Click the desired preset number (see [figure 26](#), 1).

3. Click in the **Preset Name** field and type in a name (see [figure 26](#), ② on page 33).
4. Click **Save** (③) to save the preset or **Cancel** (④) to abandon it.

### Edit or delete a preset

On the **Scaler Settings** page (see [figure 24](#) on page 29), momentarily rest the cursor over the desired preset.

- **Rename** — Click the **pencil** icon (✎). Edit the name as desired and click the check icon (☑).
- **Edit** — Click the **menu** icon (☰). The editable scaler pane opens (see [figure 25](#) on page 30). Make changes to the preset as described starting on page 30.
- **Delete** — Click the **menu** icon (☰). Click **Delete**.



## Ties Page

Access the **Ties** page (see [figure 27](#)) by clicking the link on the left side of the browser (①). The browser displays the **Ties** page (②), which consists of a grid of inputs and outputs.

The screenshot shows the NAV SD 501 web interface. The left sidebar has a 'TIES' menu item highlighted with a circled 1. The main content area is titled 'Ties' with a circled 2. It features a 'Current Output' section with a circled 3 and an 'Available Inputs (3)' section with a circled 4. The 'Available Inputs' section has tabs for 'NAV', 'AES67', and '\* USB', with 'NAV' selected (circled 5). A table below shows three inputs with columns for 'AV', 'Audio', and 'Video'. The first input is 'NAV-E-101-17-84-05', the second is 'NAV-E-101-18-E2-42', and the third is 'NAV-E-101-D-19-CC-F9'. The third input has a checkmark in the 'Audio' column, labeled with a circled A. A 'BREAK TIES' button is circled C. At the bottom, there are 'MUTES' checkboxes for AUDIO, VIDEO, and SYNC, and a 'Stream Status' indicator showing a green checkmark.

**Figure 27. Ties Page**

The **Ties** page consists of two panes, **Current Output** (③) and **Available Inputs** (④) that display the status of the input and output endpoints and tabs (**AV**, **Audio**, or **Video**, ⑤) that let you tailor the ties shown.

**TIP:** Click within the grid of inputs and outputs to tie the desired input to this decoder (or all decoders) (A). Click in an existing tie to untie it

AV ties are displayed as follows:



Video and audio



Video only



Audio only

**NOTE:** Your tab display may differ from [figure 27](#) on page 34.

- The AES67 tab is present only when an Extron AES67-capable device, such as a DMP 128 ProDSP Digital Matrix Processor, is tied into the NAV system. See the user guide for the applicable device to configure that device and also the Dante documentation.
- The USB tab and USB Tie in the Current Output pane are present for NAV SD 501 only.

### Current Output pane

The Current Output pane displays the output number and name of the decoder.

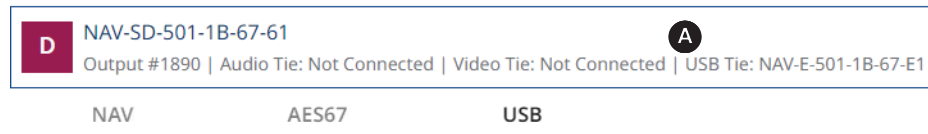
### Available Inputs pane

The Available Inputs pane displays the input number, audio mode, model, and IP address of all encoders available for tying to this decoder. To tie an encoder to this decoder, click the desired encoder (**Available Inputs**) and audio/video selection (**A/V**, **Audio**, or **Video**). A video and audio tie is indicated in amber, audio only in red, and video only in green. Click in an existing tie to untie it. [Figure 27](#) shows audio and video (A/V) from input 3322 tied to the decoder.

**NOTES:**

- Also on this page, you can open an HTML page of a connected encoder. 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 input (B). The HTML page opens a new tab in the browser that is connected to the selected encoder. The proxied encoder HTML page behaves as described in the guide for the encoder (see the applicable encoder guide available at [www.extron.com](http://www.extron.com)).
- The Break Ties (C) link unties the decoder from the input.
- When you select the **USB** tab (see figure 28), the appearance of the Current Output pane and Available Hosts pane changes.

**Current Output**



**Available Hosts (1)**

[BREAK TIES](#)



**Figure 28. Current Output and Available Hosts for USB Tab**

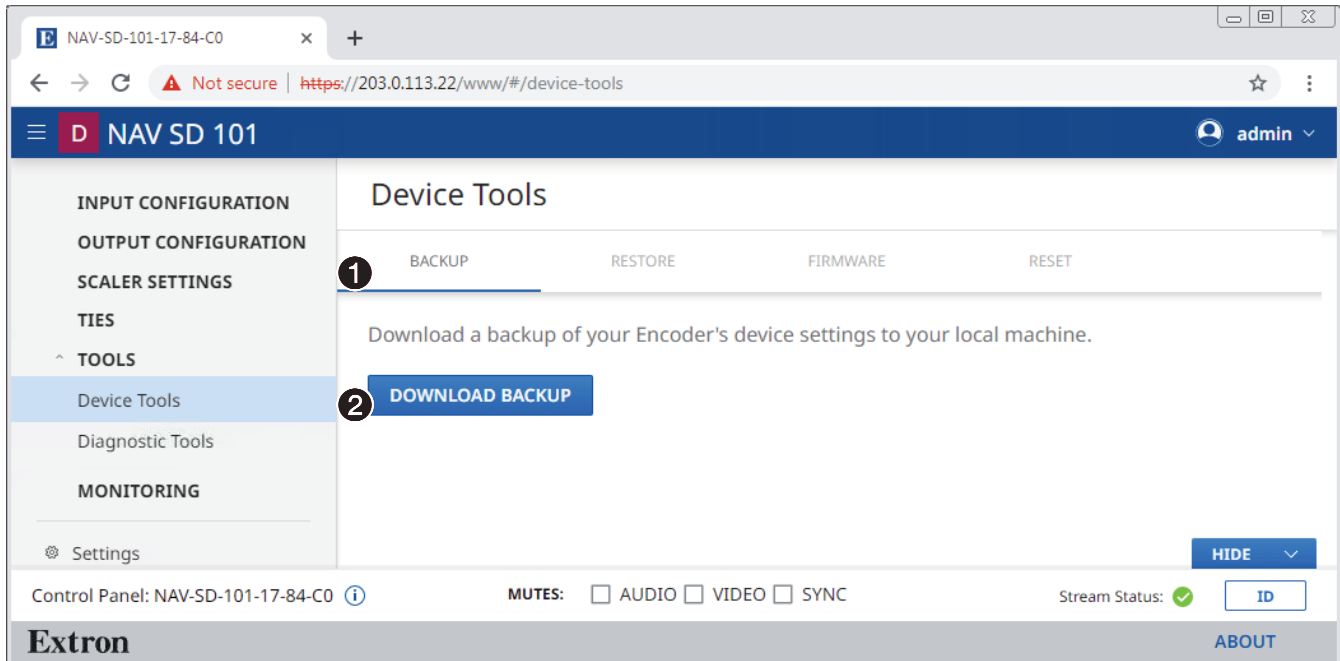
- Only encoders that can stream USB and make USB ties are shown (A) in Current Output and the tied USB decoder is shown.
- Available Hosts shows the tied USB encoder (B).
- You can make and break ALL ties from the embedded HTML pages of a NAVigator (see the NAVigator User Guide, available at <https://www.extron.com>, and the embedded HTML tie page for that device).

## Tools Pages

The Tools pages provide tools for the decoder (Device) and a tool for diagnosing communications (Diagnostic). To access the Tools pages, if necessary, click the Menu link (see figure 12, ❶ on page 19). Click Tools (see ❶ in the illustration at right) and either Device Tools (❷) or Diagnostic Tools (❸). The browser displays the selected Tools page (see figure 29, which shows the Device Tools page (❷) selected).

- ❶ ^ TOOLS
- ❷ Device Tools
- ❸ Diagnostic Tools

### Device Tools page



**Figure 29. Device Tools Page**

The Tools page (see figure 29) consists of four tabs (❶), Backup (see “Backup tab,” below) Restore (see [Restore tab](#) on page 37), Firmware (see [Firmware tab](#) on page 39) and Reset (see [Reset tab](#) on page 40) that provide decoder tools.

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

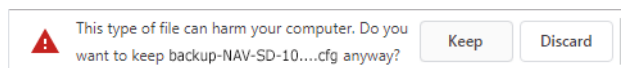
### Backup tab

Backup the decoder settings as follows:

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

1. On the Device Tools page, click **Backup** (see figure 29, ❶).
2. Click **Download Backup** (❷).

The decoder 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 decoder backup file goes to the Downloads folder of the connected PC.

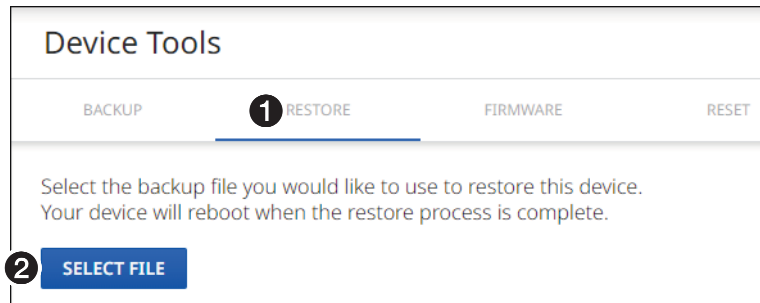
3. Click **Keep** to save the file to the Downloads folder or **Discard** as desired.

### Restore tab

Restore the decoder settings as follows:

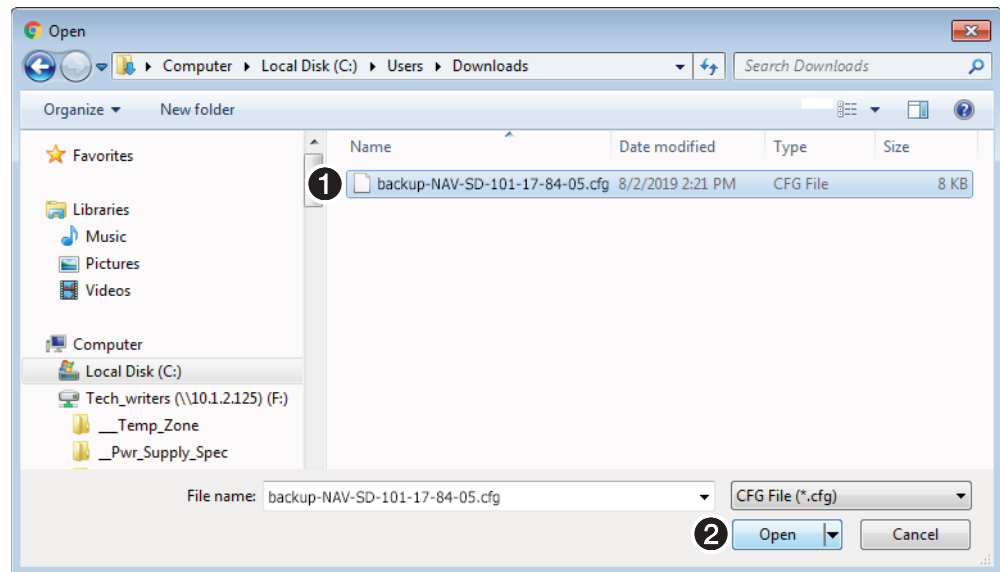
**NOTE:** Restore is disabled when the decoder is accessed via proxy from the NAVigator.

1. On the Device Tools page, click **Restore** (see figure 30, ❶).
2. Click **Select File** (❷).



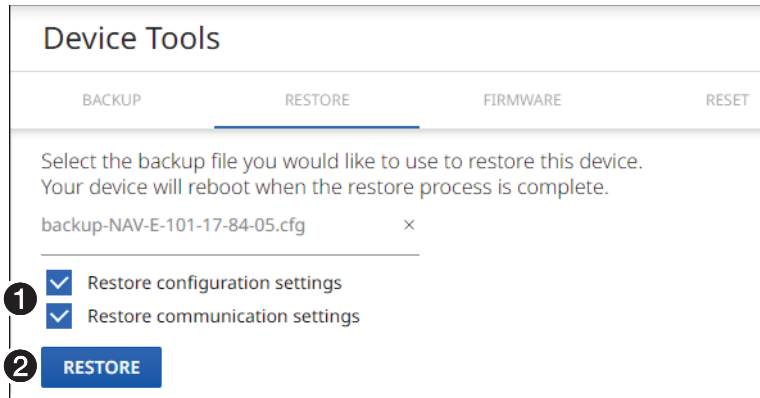
**Figure 30. Device Tools – Restore Function**

An Open dialog box opens (see figure 31).



**Figure 31. Open Dialog Box**

3. Navigate to the folder where the Restore file is saved (typically the Downloads folder) (see figure 31, ❶). Select the file.
4. Click **Open** (❷). The Device Tools page returns to the top (see [figure 32](#) on page 38).



**Figure 32. Device Tools – Restore Function, Steps 5 and 6**

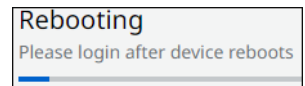
5. Select (click) the settings to restore (**Configuration**, **Communication**, or both; see figure 32, ❶).

Communication settings	Configuration settings
<ul style="list-style-type: none"> <li>• <b>Settings</b> &gt; Device Details (name)</li> <li>• <b>Settings</b> &gt; Network Connection</li> <li>• <b>Settings</b> &gt; Ports</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Settings</b> &gt; Device Details (location)</li> <li>• <b>Settings</b> &gt; Date and Time</li> <li>• <b>Settings</b> &gt; USB (NAV SD 501 only)</li> <li>• <b>Settings</b> &gt; Ports</li> <li>• <b>Settings</b>&gt; Advanced Networking</li> <li>• <b>Input Config</b> &gt; Audio</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Output Config</b> &gt; Video</li> <li>• <b>Output Config</b> &gt; Audio</li> <li>• <b>Output Config</b> &gt; Test Pattern</li> <li>• <b>Output Config</b> &gt; OSD</li> <li>• <b>Scaler Settings</b></li> </ul>

**NOTE:** Account password and custom image file are not backed up.

Click **Restore** (❷).

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



**NOTE:** You must reconnect to the decoder (see [Opening the Embedded HTML Pages](#) on page 17) if you have additional operations to perform.

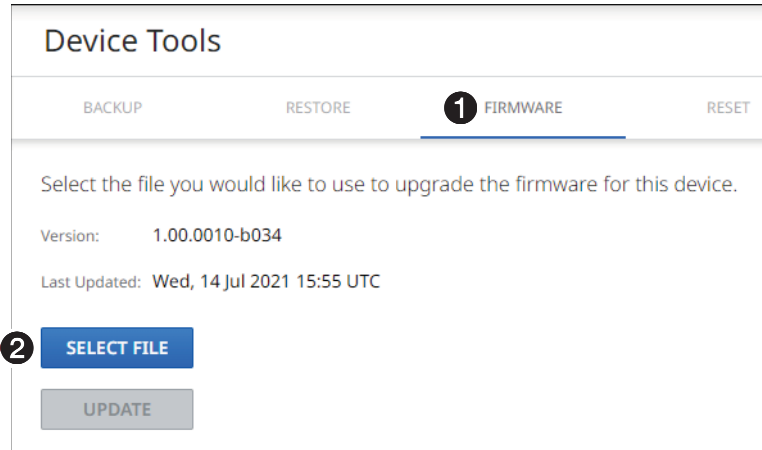
## Firmware tab

Upgrade the decoder firmware as follows:

### NOTES:

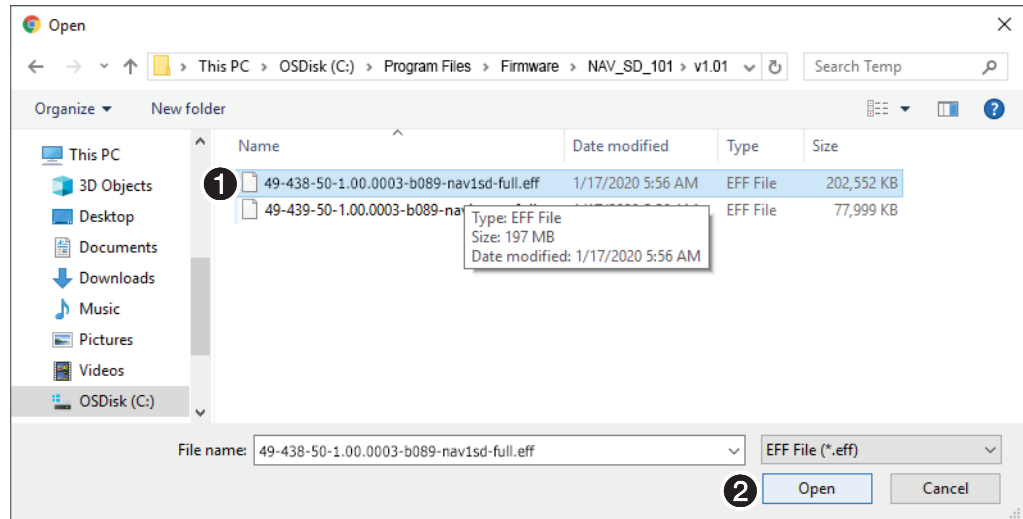
- See [Download a firmware or software package](#) on page 70 to obtain the firmware package.
- Upgrading the decoder firmware results in the unit rebooting.
- Valid firmware files have the .eff file extension. Any other file extension is not a valid firmware update.

1. Click **Firmware** (see figure 33, ❶).



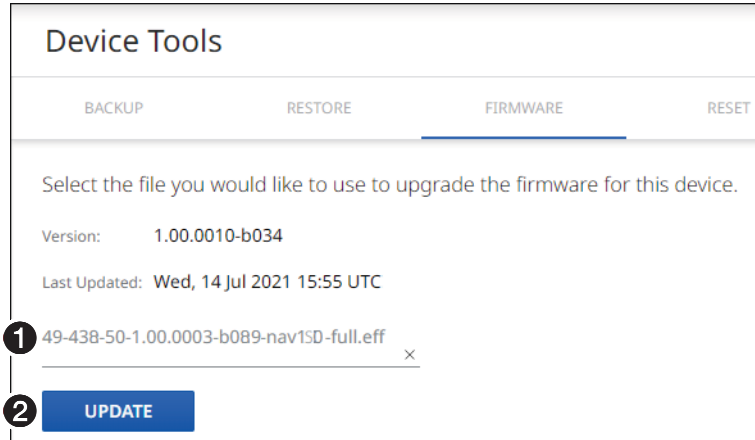
**Figure 33. Device Tools – Firmware Function**

2. Click **Select File** (❷). An Open dialog box opens (see figure 34).



**Figure 34. Open Dialog Box**

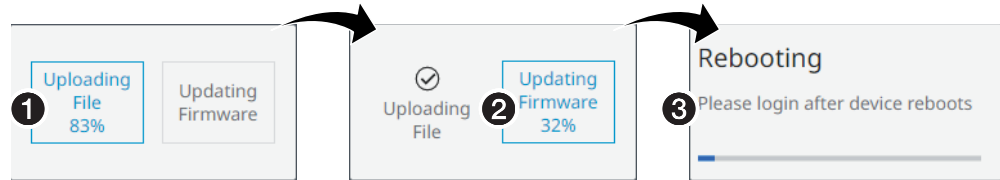
3. Navigate to the folder where you saved the firmware upgrade file (see figure 34, ❶). Select the file.
4. Click **Open** (❷). The Open dialog box closes and the Device Tools pane returns to the top, with the selected firmware file identified (see [figure 35, ❶](#) on page 40).



**Figure 35. Device Pane with Firmware File Identified**

5. Click **Update** (see figure 35, ②).

The decoder page displays a sequence that reports the progress as it uploads the file (see figure 36, ①), updates the firmware (②), and then reboots (③).



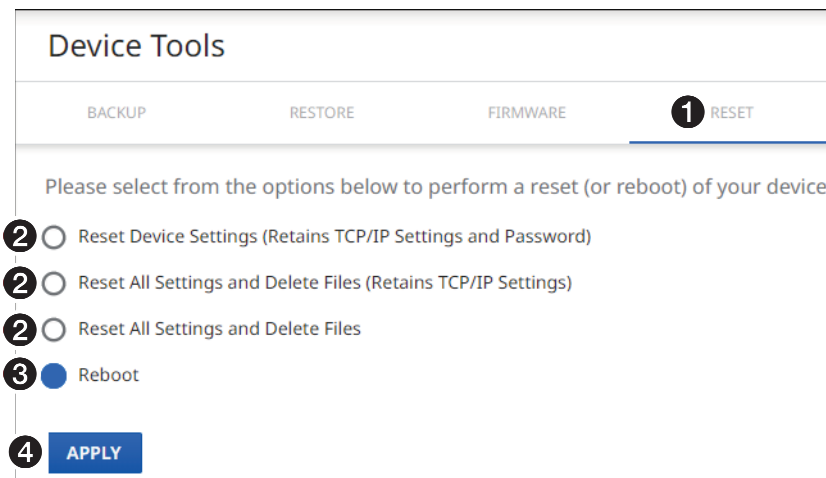
**Figure 36. Firmware Upload Progress**

When the decoder 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](#) on page 18). To continue to operate the decoder, you must reconnect (see [Opening the Embedded HTML Pages](#) on page 17).

### **Reset tab**

Reset or reboot the decoder as follows:

1. On the Device Tools page, click **Reset** (see figure 37, ①).



**Figure 37. Device Tools – Reset Function**

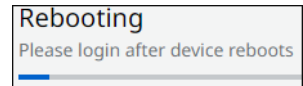
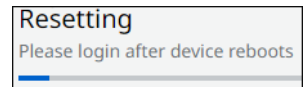
2. Select (click) a reset level (see [figure 37](#), ② on page 40) or **Reboot** (③).

**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 on page 38.
- **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 Mode 5 reset (see the [table](#) of rear panel reset modes on page 15).

3. Click **Apply** (④).

The decoder 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 decoder rebooting.

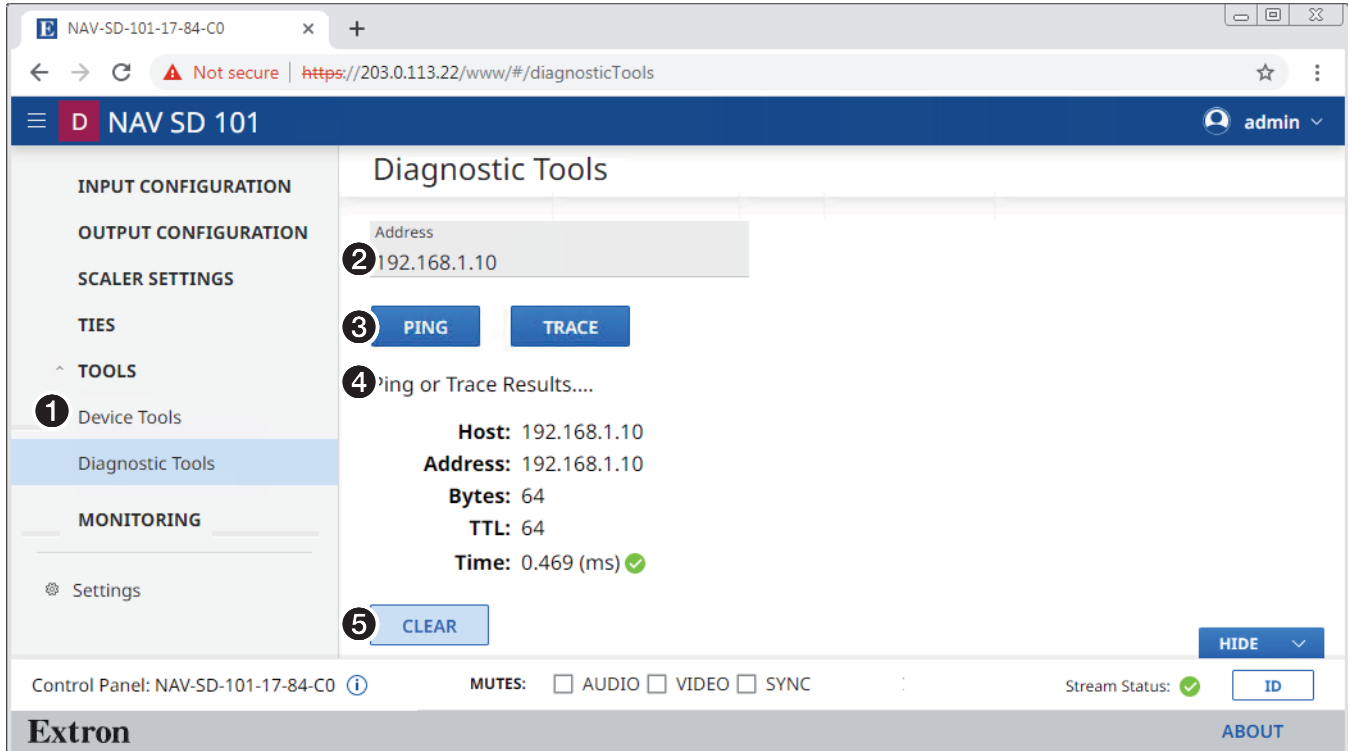


**NOTE:** You must reconnect to the decoder (see [Opening the Embedded HTML Pages](#) on page 17) if you have additional operations to perform.

## Diagnostic Tools page

The Diagnostic Tools page (see figure 38) provides tools that allow you 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.

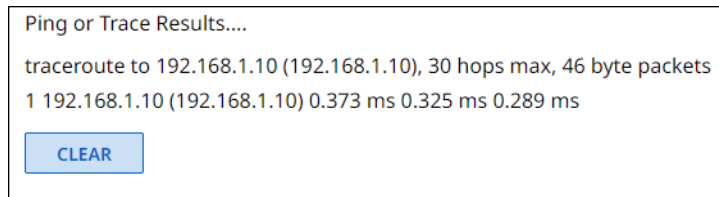


**Figure 38. Diagnostic Tools Page, Ping Results Shown**

2. Click in the **Address** field and type in the IP address of another unit on the network (❷).
3. Click either **Ping** or **Trace** (❸), depending on the diagnostic you want to run.

### NOTES:

- **Ping** — Use this tool to test the connection to another unit on the network. Figure 38, ❹ shows the typical results of a Ping diagnostic. If you see the message: **Ping to Host Address has Timed Out...**, contact your system administrator to troubleshoot.
- **Trace** — Traces the network route taken by a packet from source to destination and displays the network packet path as it traverses the network. If a trace is not fully successful, the diagnostic displays where the packet was last successful before it stopped and can no longer communicate to the next hop. Figure 39 shows the typical results of a Trace diagnostic.



**Figure 39. Trace Results Shown**

4. Click **Clear** (❺) to reset the Address field if you want to run another diagnostic.

## Monitoring

Access the Monitoring page (see figure 40) by clicking the link on the left side of the browser (1). The browser displays the Monitoring page (2), which shows device status information.

NAV-SD-501-1B-67-61 x +  
Not secure | https://203.0.113.22/www/#/monitoring  
D NAV SD 501 admin

**1** MONITORING

**2** Monitoring

**3** IGMP Querier  
Discovered  
192.168.1.111

**4** Memory Utilization  
19%  
Used

**5** AV LAN Utilization  
TX 48%  
Used  
RX 0%  
Used

**6** Ethernet Extension Utilization  
TX 0%  
Used  
RX 0%  
Used

**7** USB Devices  
Connected

**8** Primary Controller  
System ID: 1760  
Connected  
192.168.0.145

**9** No Alarms  
There are no errors or warnings reported.

**10** DOWNLOAD LOGS

Control Panel: NAV-SD-501-1B-67-61 MUTES:  AUDIO  VIDEO  SYNC Stream Status:  ID

Extron ABOUT

\* NAV SD 501 only

Figure 40. Monitoring Page

- 3 IGMP Querier (see page 44)
- 4 Memory Utilization
- 5 AV LAN Utilization
- 6 Ethernet Extension Utilization (NAV SD 501 only)
- 7 USB Devices (NAV SD 501 only)
- 8 Primary Controller
- 9 Alarms
- 10 Download Logs

- ③ **IGMP Querier pane** (see [figure 40](#) on page 43) — See “IGMP Querier pane” below.
- ④ **Memory Utilization** — Indicates how much decoder memory is used, expressed in percent.
- ⑤ **AV LAN Utilization** — Indicates the total bandwidth usage at that moment. The decoder generates an alarm if the utilization goes above 90%. The alarm clears automatically once the level drops below 90%.

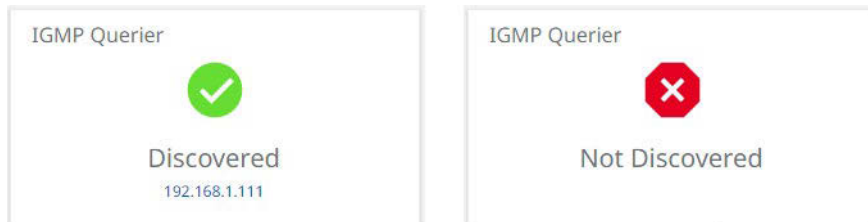
**NOTE:** The decoder normally uses far more Rx than Tx bandwidth.

- ⑥ **Ethernet Extension Utilization pane** (NAV SD 501 only) — See “Ethernet Extension Utilization pane”, below.
- ⑦ **USB Devices pane** (NAV SD 501 only) — See [USB Devices pane](#) on page 45.
- ⑧ **Primary Controller pane** — See [Primary Controller](#) pane on page 45.
- ⑨ **Alarms pane** — See [Alarms pane](#) on page 46.
- ⑩ **Download Logs link** — See [Download Logs link](#) on page 47.

### IGMP Querier pane

IGMP querier is a network service, usually running on a network switch, that can initiate IGMP queries. An IGMP querier should be configured on the NAV network. It manages the multicast traffic. If there is no IGMP querier on the network, there is no effective multicast traffic management and the multicast traffic saturates the network and stream errors can occur.

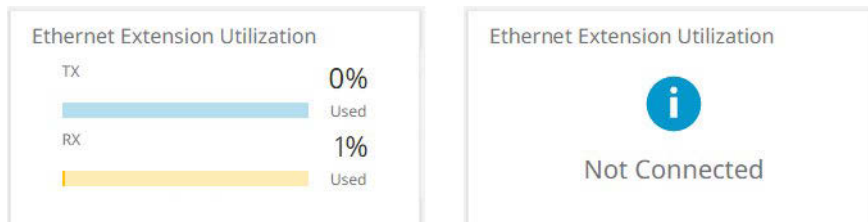
The IGMP Querier pane (see [figure 40](#), ③) shows whether or not an IGMP querying device is present on the network, and the IP address of the IGMP querier. Figure 41 shows the normal indication and if no IGMP querier is present on the network.



**Figure 41. IGMP Querier Pane Indications**

### Ethernet Extension Utilization pane (NAV SD 501 only)

The Ethernet Extension Utilization pane (see [figure 40](#), ⑥) indicates the total bandwidth usage of the rear panel Extension port (see [figure 2](#), ④ on page 5) at that moment. The decoder generates an alarm if the utilization goes above 90%. The alarm clears automatically once the level drops below 90%. Figure 42 shows the normal indication and if the Extension port is either **disabled** (see [Network Connection](#) on page 52) or **enabled** with nothing connected to it.



**Ethernet Extension Normal Indication**

**Ethernet Extension Disabled or Not Connected**

**Figure 42. Ethernet Extension Utilization Pane Indications**



### USB Devices pane (NAV SD 501 only)

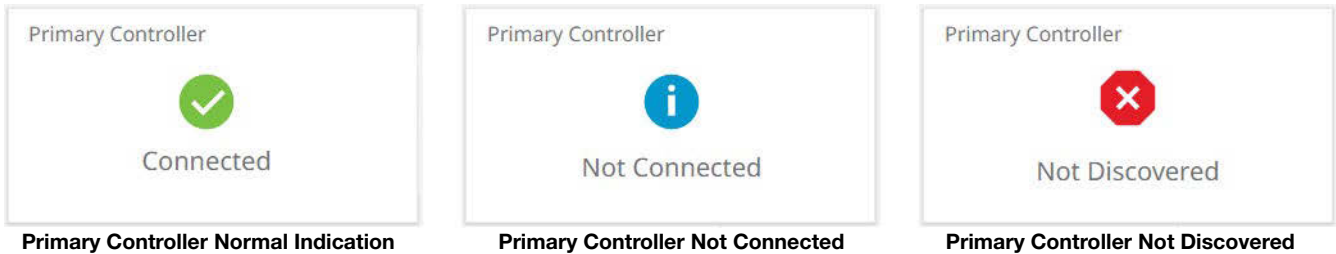
The USB Devices pane (see [figure 40, 7](#) on page 43) shows whether or not one or more USB devices are connected and NAV USB extension. Figure 43 shows the normal indication and if no USB devices are connected or the USB Host has forced the USB bus into a suspend state.



**Figure 43. USB Devices Pane Indications**

### Primary Controller pane

The Primary Controller pane (see [figure 40, 8](#)) 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 44 shows the normal indication and if no primary controller is present on the network available or an endpoint is not connected to any controller.



**Figure 44. Primary Controller Pane Indications**

## Alarms pane

The Alarms pane (see [figure 40](#), [6](#) on page 43) shows any current alarms (see [Alarms](#) on page 69). Figure 45 shows the pane when alarms are present. 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 decoder cools down.

The screenshot shows the Alarms pane with two alarms. The first alarm is 'Device Offline' with a yellow warning icon and a timestamp of '03/27/20 07:26...'. The second alarm is 'Video Loss' with a yellow warning icon, a 'LEARN MORE' link, and a timestamp of '03/27/20 07:26...'. A callout box labeled '5' points to an 'ALARM SETTINGS' gear icon. A callout box labeled '1' points to the 'LEARN MORE' link. Below the alarms, there is a table with columns: TYPE, NAME, INPUT, OUTPUT, TIMESTAMP, EVENT, and ISSUE. The table contains two rows. The first row has a yellow warning icon in the TYPE column, and the second row has a yellow warning icon and the endpoint name 'NAV-SD-101-19-CC-F9' in the NAME column. A callout box labeled '2' points to a checked checkbox in the TYPE column. A callout box labeled '3' points to a checked checkbox in the TYPE column. A callout box labeled '4' points to a 'CLEAR ALARMS (1)' button. The table data is as follows:

TYPE	NAME	INPUT	OUTPUT	TIMESTAMP	EVENT	ISSUE
<input checked="" type="checkbox"/>				03/27/20 07:26 PM	Device Offline	The endpoint(NAV-SD-101-19-CC-F9) is offline
<input checked="" type="checkbox"/>	NAV-SD-101-19-CC-F9	3322		03/27/20 07:26 PM	Video Loss	No video for 2 seconds or more on input 1

**Figure 45. Clearing Alarms**

### NOTES:

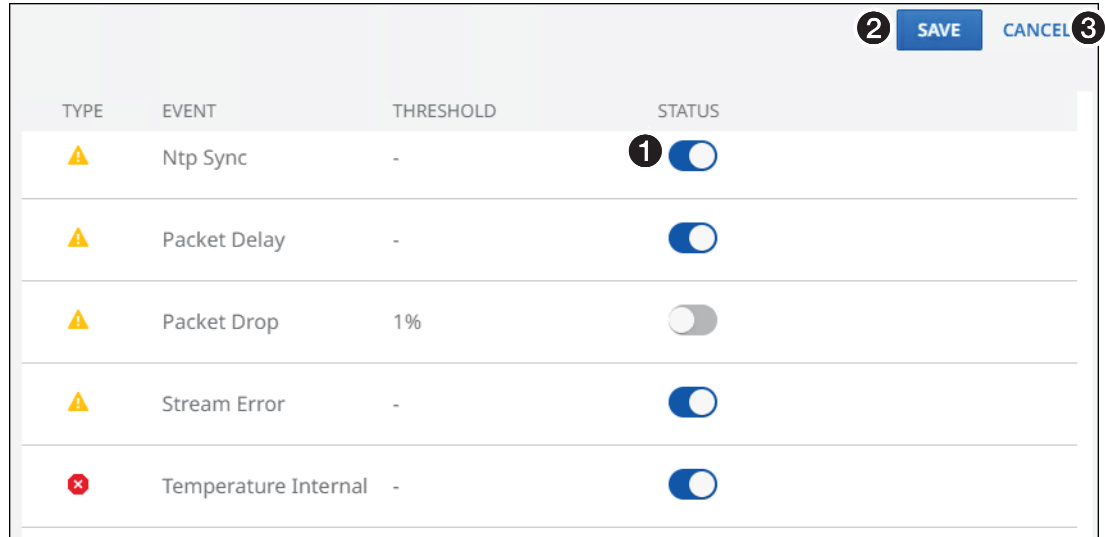
- Critical alarms (🚨) should be resolved immediately.
- Warning alarms (⚠️) are less serious.

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

1. Click **Learn More** (see [figure 45](#), [1](#)).
2. Click the **All** checkbox ([2](#)) or individual endpoint checkboxes ([3](#)) to select one or more alarms to clear.
3. Click **Clear Alarms** ([4](#)) to clear this alarm.

Configure which alarms are and are not reported in this field as follows:

1. Click **Alarm Settings** (see [figure 45](#), **5**). The Edit Alarms Settings dialog box opens (see [figure 46](#)).

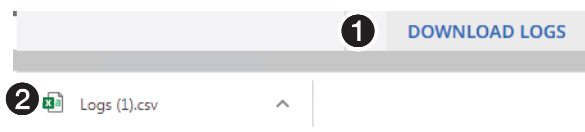


**Figure 46. Alarm Settings Window**

2. Click the **Status** switch (see [figure 46](#), **1**) to enable () and disable () alarm reporting.
3. Click **Save** (**2**) to make the changes or **Cancel** (**3**) to abandon them.

### Download Logs link

Click the **Download Logs** link (see **1** 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 (**2**).

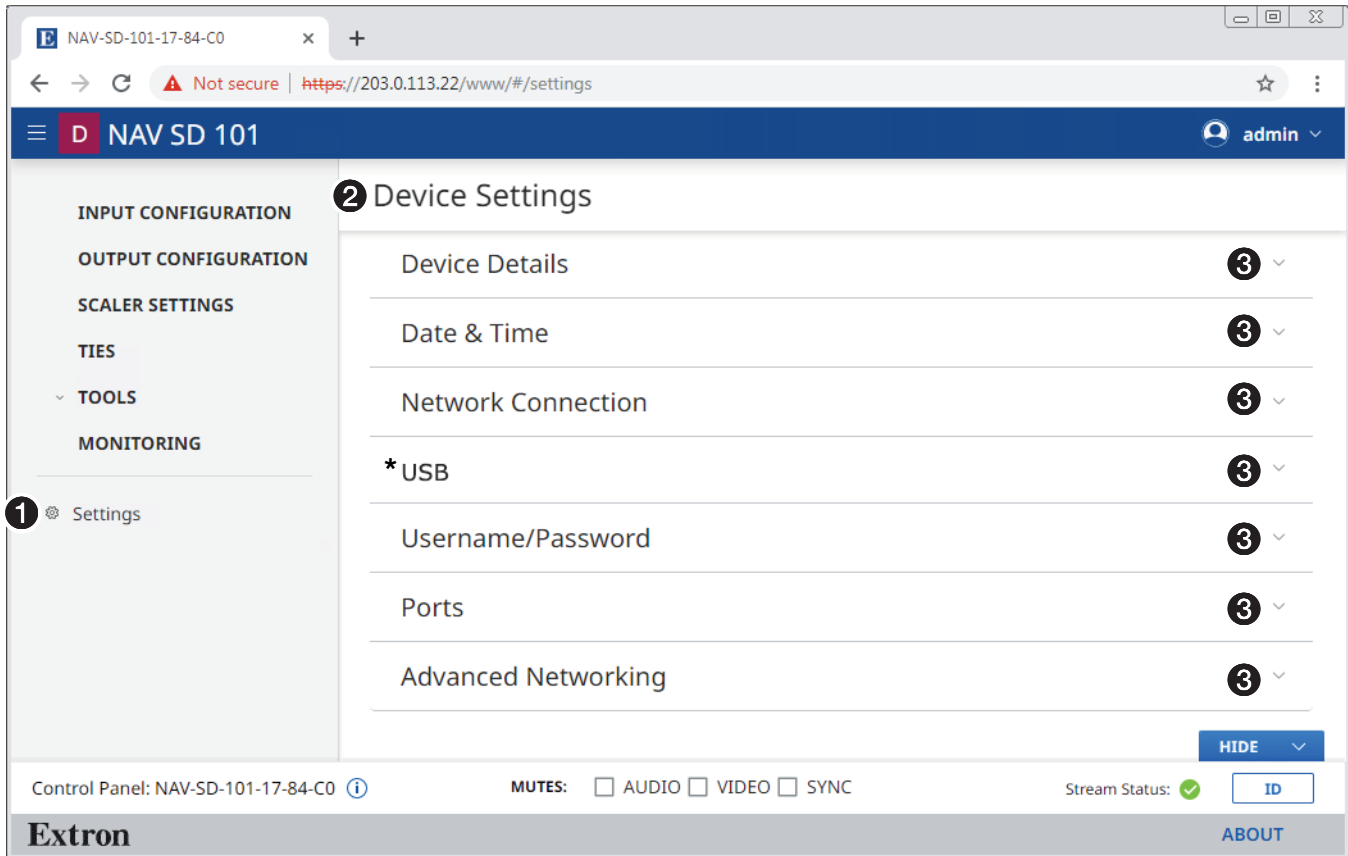


#### NOTES:

- 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 decoder.

## Settings Page

Access the **Device Settings** page (see figure 47) by clicking the link on the left side of the browser (1). The browser displays the **Device Settings** page (2), which provides access to many system settings. Click the down arrow (3) to open a selection.



\* NAV SD 501 only

Figure 47. Settings Page

### Device Details

The **Device Details** selection on the **Device Settings** page opens a read-only pane that shows general information unique to the decoder (see figure 48 on page 49). The **Device Name**, **Input Number**, and **Location** can be edited by clicking the **Edit** button (1). An editable version of the selection opens (see figure 49 on page 49).

#### NOTES:

- Editing of **Device Detail** settings is disabled and the **Edit** button is unavailable for selection when the decoder 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
<ul style="list-style-type: none"> <li>• Cannot begin or end with a hyphen.</li> <li>• Cannot begin with a space.                             <ul style="list-style-type: none"> <li>• Spaces are allowed after the first character.</li> </ul> </li> <li>• Multiple tags are allowed, making filtering and sorting searching easier.</li> </ul>	<ul style="list-style-type: none"> <li>• Must begin with a letter.</li> <li>• Cannot end with a hyphen.</li> <li>• Spaces are not allowed.</li> </ul>	<ul style="list-style-type: none"> <li>• Must begin with a letter.</li> <li>• Cannot end with a hyphen.                             <ul style="list-style-type: none"> <li>• Hyphens are allowed in any other position.</li> </ul> </li> <li>• Cannot begin with a space.                             <ul style="list-style-type: none"> <li>• Spaces are allowed after the first character.</li> </ul> </li> </ul>

### Device Details

<b>Device Name</b> NAV-SD-101-17-84-C0	<b>Part Number</b> 60-1525-14
<b>Output Number</b> 1217	<b>Serial Number</b> A1YX8JH
<b>System Manager</b> <i>Unassigned</i>	<b>Firmware Version</b> 1.00.0003-b089
<b>Location</b> <i>Not Specified</i>	<b>Power Source</b> P/S
<b>Device Type</b> Decoder	<b>Temperature</b> 114.8F/46.0C
<b>Model Name</b> NAV SD 101	<b>Features</b> <i>Base</i>
<b>Model Description</b> NAV Gigabit Scaling Decoder HDMI	

**1** EDIT

**Figure 48. Device Details Selection**

### Device Details

**1** Device Name  
NAV-SD-101-17-84-C0

**2** Output Number  
⊖ 1030 ⊕  
Range 1-4096

**3** Location  
West Coast HQ

Device Type  
Decoder

Model Name  
NAV SD 101

Model Description  
NAV Gigabit Scaling Decoder HDMI

**4** SAVE
CANCEL

**Figure 49. Editable Device Details Selection**

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

**NOTE:** The Device Name is also the “host name.”

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

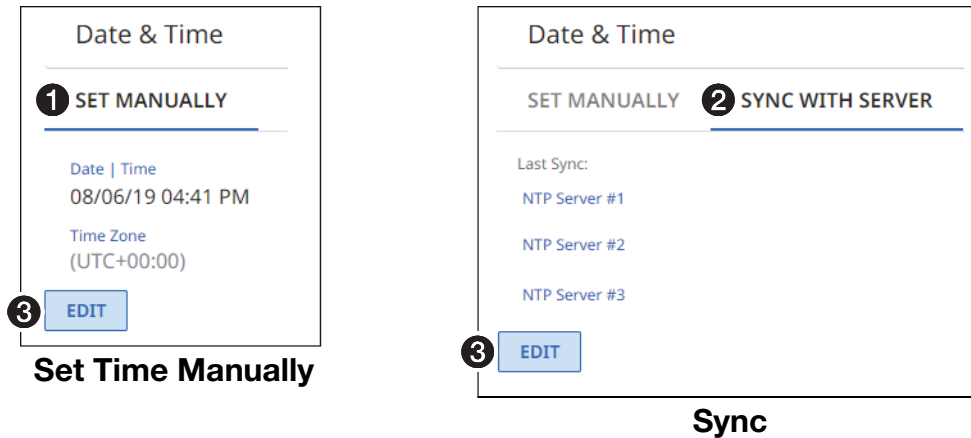
**3 Location** — Click in this field and type in a location to customize your system.

**4 Save and Cancel buttons** — Click **Save** to take Device Details changes or **Cancel** to abandon them. Clicking either button closes the editable selection.

## Date & Time

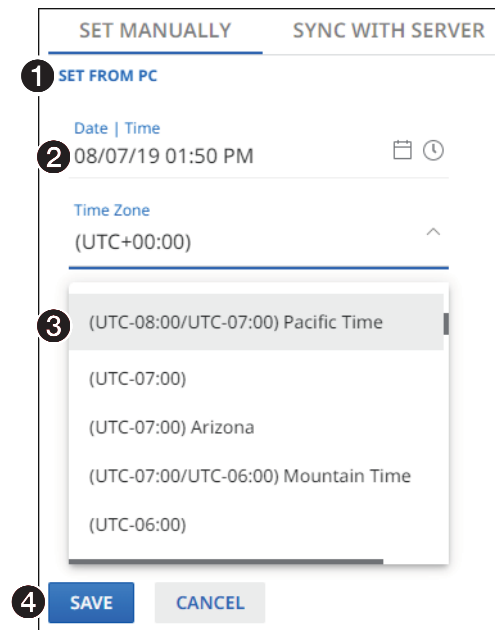
The **Date & Time** selection on the **Device Settings** page (see [figure 47](#) on page 48) opens a read-only pane showing date and time settings (see [figure 50](#)). Click **Set Manually** (❶) and **Sync with Server** (❷) to switch between the views applicable to each selection. The date and time can be edited by clicking the **Edit** button (❸). An editable pane opens (see “Set time manually” and [figure 51](#) and **Sync time with server** and [figure 53](#) on page 51).

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



**Figure 50.** Date & Time Selection

### Set time manually



**Figure 51.** Set Time Manually

- 1 Set from PC** — Click this link to sync the decoder date and time to the computer with which you are connected.
- 2 Date & Time** — Click in this field and type in the date and time.
- 3 Time Zone** — Click the drop-down list to select the offset from Greenwich Mean Time (GMT).

- 4 **Save and Cancel buttons** (see **figure 51** on page 50)— 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 52) and use those tools to set the date and time.

**Figure 52. Using Datepicker and Timepicker Tools**

**Sync time with server**

**Figure 53. Sync Time with Server**

- 1 **Sync Now** — Click to force the decoder to sync its internal clock to an NTP server.
- 2 **NTP server** — Click in these fields and type in the IP address or DNS name of an NTP server.
- 3 **Save and Cancel buttons** — Click **Save** to take **Date & Time** changes or **Cancel** to abandon them. Clicking either button closes the editable selection.

## Network Connection

The Network Connection selection on the Device Settings page (see [figure 47](#) on page 48) opens a read-only pane that shows the connection variables of the decoder (see [figure 54](#)). DHCP, IP Address, Subnet, Gateway, DNS Server, DNS Suffix, and Ethernet Extension can be edited by clicking the **Edit** button (❶). An editable version of the selection opens (see [figure 55](#) on page 53).

### NOTES:

- Ethernet Extension is **Off** by default.
- Editing of these settings is disabled and the **Edit** button is unavailable for selection when the decoder is assigned to a NAVigator.

### Network Connection

---

Link Speed  
1 Gbps

DHCP  
On

IP Address  
169.254.6.11

Subnet  
255.255.0.0

Gateway  
0.0.0.0

DNS Server  
0.0.0.0

DNS Suffix  
*Not Specified*

Link Local  
169.254.6.11

MAC Address  
00-05-A6-17-84-05

★ Ethernet Extension  
On

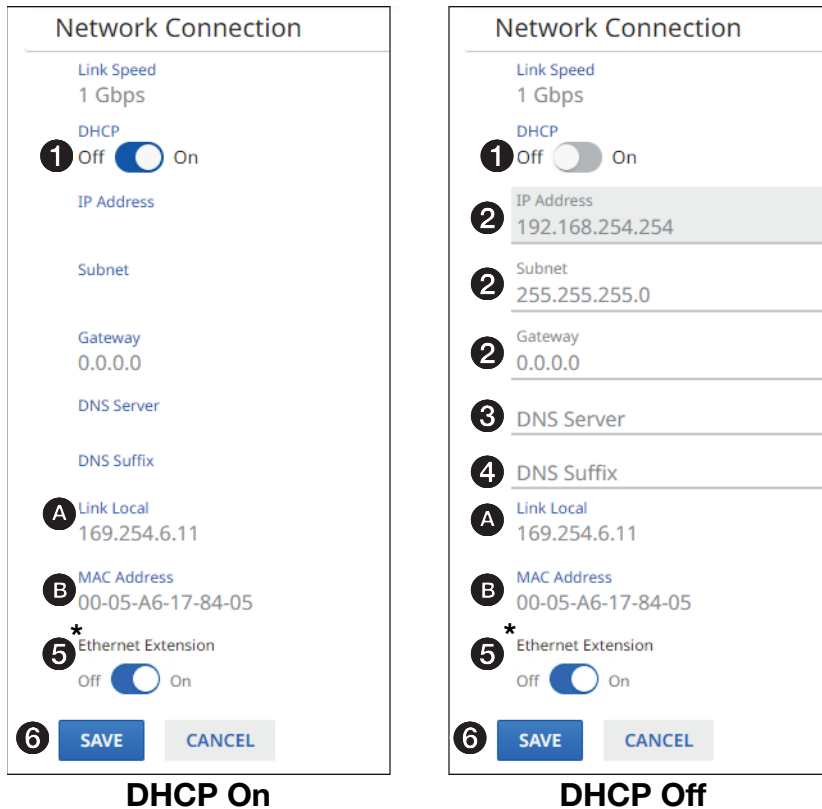
❶ **EDIT**

\* NAV SD 501 only

**Figure 54.** Network Connection Selection



**NOTE:** IP Address, Subnet, Gateway, DNS Server, and DNS Suffix are not editable when DHCP is on.



\* NAV SD 501 only

**Figure 55. Editable Network Connection Selection**

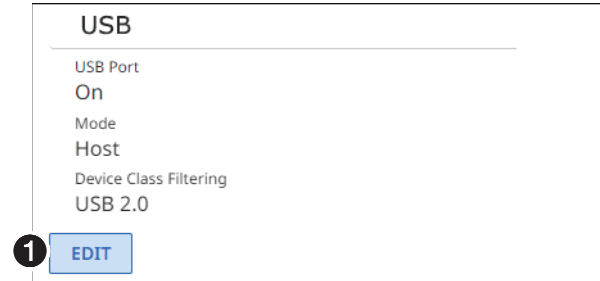
- ❶ **DHCP** — Click to toggle DHCP on and off. When off, the decoder defaults to the Link Local address (see ❶).
- ❷ **IP Address, Subnet, and Gateway** — Click in these fields and type in values to enter the appropriate connection values for your decoder.
- ❸ **DNS (Domain Name System) Server** — Click in this field and type in the name of the domain name server.
- ❹ **DNS suffix** — Click in this field and type the valid domain name suffix of the domain name server.
- ❺ **Ethernet Extension** — Click to toggle the rear panel Extension port (see figure 2, ❶) on and off.
- ❻ **Save and Cancel buttons** — Click **Save** to take Network Connection changes or **Cancel** to abandon them. Clicking either button closes the editable pane.

**NOTES:**

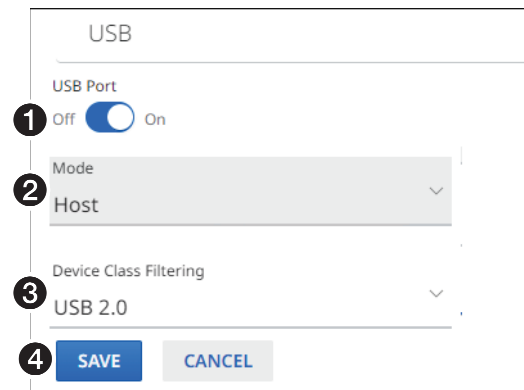
- **Link Local (❶)** — DHCP is on by default. When a DHCP server is not accessible, the Link local IP Address is available.
- **MAC Address (❷)** — A unique read-only identifier for network connected devices.

## USB (NAV SD 501 only)

The USB selection on the **Device Settings** page (see [figure 47](#) on page 48) opens a read-only pane (see [figure 56](#)) that shows the status of the USB 2.0 port (see [E](#) on page 6). The port can be turned on and off and it can be configured by clicking the **Edit** button (1). An editable version of the selection opens (see [figure 57](#)).



**Figure 56. USB Selection**



**Figure 57. Editable USB Selection**

- 1 **USB Port** — Click to toggle the port on and off.

**NOTE:** If you turn the USB port off, the port does not appear on the **Ties** page.

- 2 **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.

- 3 **Device Class Filtering** — Click the drop-down list to select between **USB 2.0** and **HID Only** (human interface device).

**NOTE:** USB Device Class filtering limits the functionality of the USB port.

- **USB 2.0** - No restrictions, allows all USB devices to function.
- **HID Only** - Allows only devices such as a keyboard and mouse to function.

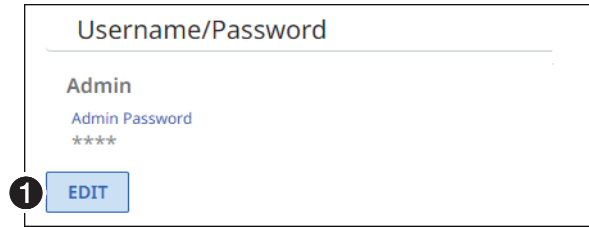
- 4 **Save and Cancel buttons** — Click **Save** to take USB changes or **Cancel** to abandon them. Clicking either button closes the editable pane.

## Username/Password

The Username/Password selection on the Device Settings page (see [figure 47](#) on page 48) opens a read-only pane that shows the credentials of the decoder (see [figure 58](#)). The Password can be edited by clicking the **Edit** button (❶). An editable version of the selection opens (see [figure 59](#)).

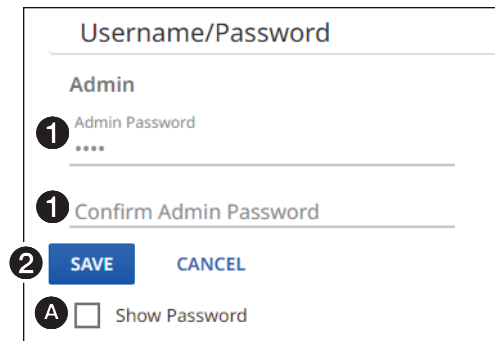
### NOTES:

- Editing of these settings is disabled and the **Edit** button is unavailable for selection when the decoder is assigned to a NAVigator.
- Any devices assigned to the NAVigator inherit the password of that NAVigator.



The screenshot shows a web interface titled "Username/Password". Underneath, it displays "Admin" and "Admin Password" followed by four asterisks. A blue button labeled "EDIT" is positioned at the bottom left, with a circled number 1 (❶) next to it.

**Figure 58. Username/Password Selection**



The screenshot shows the "Username/Password" pane in an editable state. It features two input fields: "Admin Password" and "Confirm Admin Password", both with asterisks and a circled number 1 (❶) next to them. Below the fields are two buttons: "SAVE" (highlighted in blue) and "CANCEL". At the bottom, there is a checkbox labeled "Show Password" with a circled letter A (Ⓐ) next to it.

**Figure 59. Editable Username/Password Selection**

- ❶ **Password and Confirm Password** — Click in these fields and type in valid password values to enter the appropriate values for your decoder.

### NOTES:

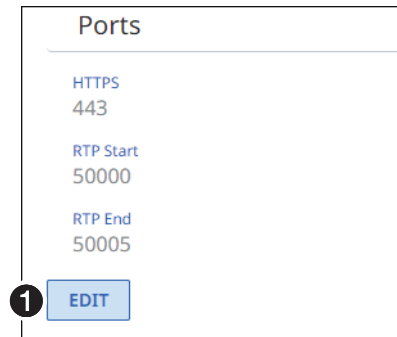
- A valid password meets the following requirements:
  - The length is up to 64 characters.
  - All alphanumeric characters and ASCII symbols are permitted except | (pipe).
  - The password cannot be blank.
  - The password cannot start with a space.
- The factory configured passwords for all accounts 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.
- The default username is `admin` and the default password is `extron`.

**TIP:** Select (click) the **Show Password** checkbox (Ⓐ) to display the password as you type it.

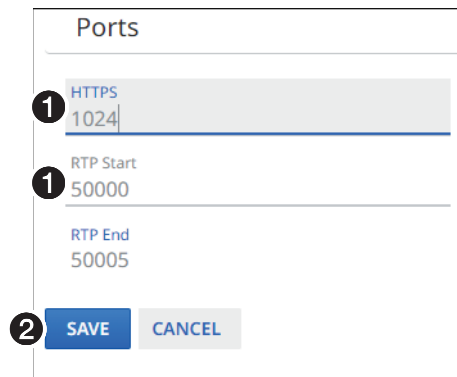
- ❷ **Save and Cancel buttons** — Click **Save** to take Password change or **Cancel** to abandon it. Clicking either button closes the editable selection.

## Ports

The **Ports** selection on the **Device Settings** page (see [figure 47](#) on page 48) opens a read-only pane that shows the port usage parameters of the decoder (see [figure 60](#)). The **HTTPS** and **RTP Start** parameters can be edited by clicking the **Edit** button (1). This feature gives the flexibility to use specific ports of your choosing, if the default ports are in use. An editable version of the selection opens (see [figure 61](#)).



**Figure 60. Ports Selection**



**Figure 61. Editable Ports Selection**

1 **HTTPS and RTP Start** — Click in these fields and type in valid values for your decoder.

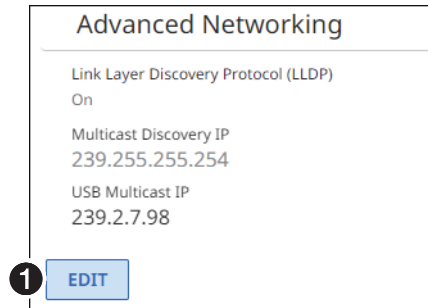
### NOTES:

- Valid HTTPS values:
  - 0 = Disabled
  - 443 = **Default**
  - 1024 - 65535 = Usable range
- Valid RTP Start values:
  - 0 = Disabled
  - 1024 - 65529 = Usable range
- See the *NAV Series Pro AV Ports and Licenses Guide*, available at <https://www.extron.com>, for more information on ports.

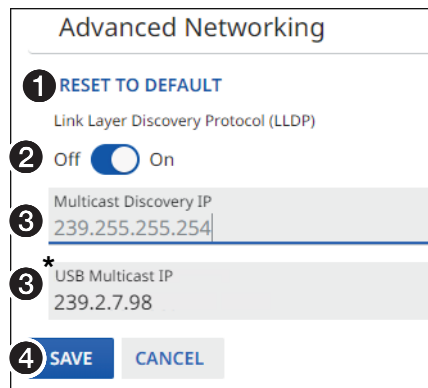
2 **Save and Cancel buttons** — Click **Save** to take Port changes or **Cancel** to abandon them. Clicking either button closes the editable selection.

## Advanced Networking

The **Advanced Networking** selection on the **Device Settings** page (see [figure 47](#) on page 48) opens a read-only pane that shows the port usage parameters of the decoder (see [figure 62](#)). The parameters can be edited by clicking the **Edit** button (❶). An editable version of the selection opens (see [figure 63](#)).



**Figure 62.** Advanced Networking Selection



\* NAV SD 501 only

**Figure 63.** Editable Advanced Networking Selection

- ❶ **Reset to Default** — Click to restore the advanced networking settings of the decoder to their default values.
- ❷ **Link Layer Discovery Protocol (LLDP)** — LLDP, a vendor-neutral protocol, is used by network devices to discover, identify and share information between two directly connected network devices. Click to toggle LLDP on and off.
- ❸ **Multicast IP addresses** — Click in these fields and type in valid IP addresses for your decoder.

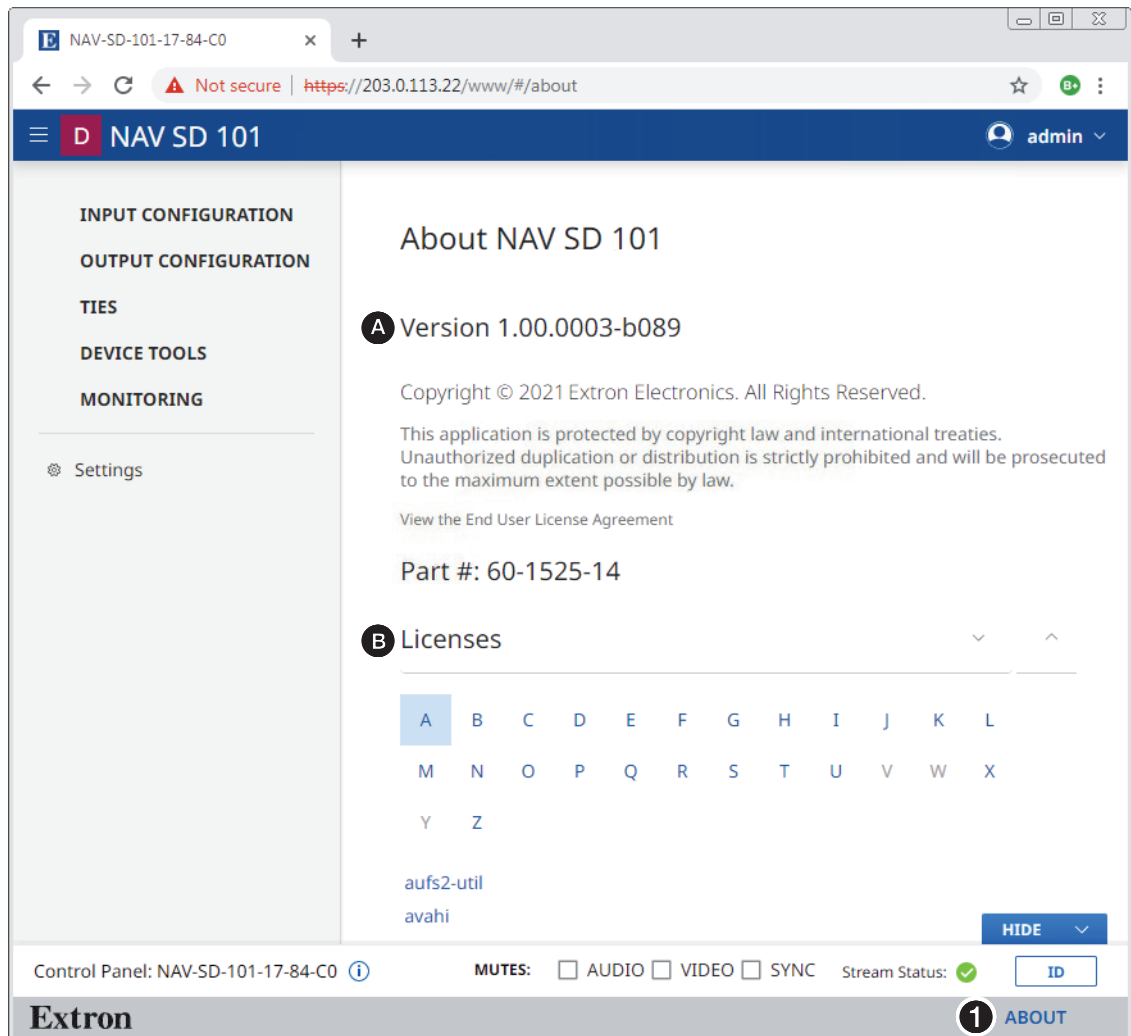
### NOTES:

- **Multicast Discovery IP** is the multicast IP address that the decoder uses to discover and communicate with all other NAV devices on the network.
- **USB Multicast IP** (NAV SD 501 only) is the multicast IP address that the decoder uses to send and receive the USB stream.

- ❹ **Save and Cancel buttons** — Click **Save** to take changes or **Cancel** to abandon them. Clicking either button closes the editable selection.

## About Page

Access the About pane by clicking **About** (see figure 64, ❶).



**Figure 64. About Pane**

The About pane provides the following useful information:

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

# Control System

This section includes:

- [Secure Platform Device](#)
- [Toolbelt](#)
- [Global Configurator Plus and Professional](#)
- [Global Scripter](#)

The decoder 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 [A](#) on page 6).

## Secure Platform Device

As a Secure Platform Device (SPD), the decoder 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 decoder communicates with compatible controllers such as Extron IPCP Pro and IPL Pro series control products over a secure, encrypted channel. The decoder hosts multiple Secure Platform Interfaces, exposing control of the entire NAV system to connected primary controllers.

## 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 SD 101, 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.



## 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

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 <https://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 setup a control system with an IPCP Pro device and Global Configurator, see the applicable *Global Configurator Help File*.

## Global Scriptor

**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

Global Scriptor is a powerful and versatile control system programming software from Extron for AV systems that use an Extron Pro series control processor (such as an IPCP Pro 250). Global Scriptor, being programming (rather than just configuration) software, is much more flexible than Global Configurator. Global Scriptor allows an integrator to write customized programs for his or her specific AV system. Using customized programming commands for configuration and control allows for larger AV systems than Global Configurator.

Global Scriptor uses the easy-to-learn Python scripting language and includes the Extron-exclusive Python library: ControlScript. ControlScript increases the productivity of AV programmers by incorporating functions used in common AV control system projects, as well as helpful documentation, reference material, and sample code. Global Scriptor can insert specific AV devices (such as SPDs) and functions into the code.

In a NAV system with an Extron controller, such as an IPCP Pro 250, you can support many more devices (system controllers, NAVigators, and endpoints) than Global Configurator, send very specific SIS commands (as programmed code), and get feedback.

**NOTE:** Global Scriptor software users and integrators must know how to program with Python and should know how to use Extron ControlScript.

For detailed descriptions and procedures to setup a control system with an IPCP Pro device and Global Scriptor, see the *Global Scriptor Help File*.

# SIS Operation

The decoder can be remotely controlled directly or via an Extron NAVigator System Manager. The decoder can be 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 decoder, 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, Global Configurator Pro, or Global Scripser (see **Control System** on page 59).
- Built-in HTML pages (see **HTML Operation** on page 17).

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

- **Secure Platform Device**
- **Host-to-Decoder Instructions**
- **Decoder-Initiated Messages**
- **Decoder Error Responses**
- **Using the Command and Response Tables**
- **SIS Command and Response Tables**

## Secure Platform Device

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

As a Secure Platform Device (SPD), the NAVigator communicates with Extron Pro Series Control Processors over a secure, encrypted channel. The NAVigator is the host device for Secure Platform Interfaces for native device controls and Pro Series Control Ports to control external devices.

Communication, using Global Configurator Plus or Global Configurator Professional, is via a SPD interface. See the applicable Help file to configure the program to issue SIS commands to the NAVigator.

## Host-to-Decoder 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 =  $\leftarrow$ ), which signals the end of the response character string. A string is one or more characters.

## Decoder-Initiated Power-Up Message

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

© Copyright 20yy, Extron Electronics NAV SD n01, Vx.xx, 60-nnnn-nn $\leftarrow$  (n01= 501 or 101)

Vx.xx is the firmware version number and 60-nnnn-nn is the part number.

## Decoder Error Responses

When the decoder receives a valid SIS command, it executes the command and sends a response to the host device. If the decoder is unable to execute the command because the command is invalid or it contains invalid parameters, the decoder 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
- 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.

ASCII to Hex		Conversion Table										Esc 1B	CR 0D	LF 0A	
Space →	20	!	21	"	22	#	23	\$	24	%	25	&	26	'	27
	( 28	) 29	* 2A	+ 2B	, 2C	- 2D	· 2E	/ 2F							
	0 30	1 31	2 32	3 33	4 34	5 35	6 36	7 37							
	8 38	9 39	: 3A	; 3B	< 3C	= 3D	> 3E	? 3F							
	@ 40	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 50	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							
	` 60	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 70	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

## SIS Command and Response Tables

### Command and Response Table for Decoder Commands

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
<b>Create AV tie</b>			
Select video stream input	[Esc]X1%↵	InX1•Vid↵	
Select audio stream input	[Esc]X1\$↵	InX1•Aud↵	
Select video and audio stream inputs	[Esc]X1!↵	InX1•All↵	
<b>View AV tie</b>			
View video stream input	%	X3↵	
View audio stream input	\$	X3↵	
View video and audio stream inputs	!	X3↵	
<b>Recall input preset</b>			
Recall input preset	[Esc]R2*X5PRST↵	PrstR2*X5↵	
<b>Video mute</b>			
Mute video only	1B	Vmt1↵	
Mute video and sync	2B	Vmt2↵	
Unmute video and sync	0B	Vmt0↵	<b>Default.</b> Video output is active.
Show mute status	B	X6↵	
<b>Volume</b>			
Set output volume	X7V	VolX7↵	
Increment volume	+V	VolX7↵	
Decrement volume	-V	VolX7↵	
Show volume	V	X7↵	

**KEY:** X1 = Input (can be name, number, or IP address)      Name = X2 (see below)  
 X2 = Name      Number = X3 (see below)  
 X3 = Device number      IP address = X4 (see below)  
 X4 = IP address      A text string of up to 24 alphanumeric characters and minus sign/hyphen (-).  
 X5 = Preset number      No blank or space characters are permitted as part of a name.  
 X6 = Video mute status      The first character must be a letter, and the last character cannot be a -sign  
 X7 = Volume      0001 — 4096  
 01 — 16  
 0 = Unmute      1 = Mute video      2 = Mute video and sync  
 00 (effectively muted) — 100 (full volume)

**NOTE:** See [Device Details](#) on page 48 to edit input and output names, numbers and IP addresses.

## Command and Response Table for Decoder SIS Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
<b>Audio mute</b>			
Mute digital or analog audio <i>Example:</i>	<code>X8*1Z</code> <code>1*1Z</code>	<code>AmtX8*1</code> <code>Amt1*1</code>	Digital audio (embedded on HDMI output) is muted; analog audio is unaffected.
Unmute digital or analog audio <i>Example:</i>	<code>X8*0Z</code> <code>2*0Z</code>	<code>AmtX8*0</code> <code>Amt2*0</code>	Analog audio output is active.
Mute digital and analog audio	<code>1Z</code>	<code>Amt1</code>	Mute both audio outputs.
Unmute digital and analog audio	<code>0Z</code>	<code>Amt0</code>	Unmute both audio outputs.
View audio mute status	<code>Z</code>	<code>X9<sup>HDMI</sup>•X9<sup>analog</sup></code>	HDMI and analog audio mute status is <code>X9</code> .
<b>Audio only support</b>			
Enable black signal	<code>EscB1AFMT</code>	<code>AfmtB1</code>	Black out the video for audio output only.
Disable black signal	<code>EscB0AFMT</code>	<code>AfmtB0</code>	
View black signal	<code>EscBAFMT</code>	<code>X9</code>	
<b>USB mode (NAV SD 501 only, valid as USB host or USB device)</b>			
<b>NOTES:</b>			
<ul style="list-style-type: none"> <li>You can tie a USB host only to a USB device for proper system operation.</li> <li>If you connect a host such as a PC to an endpoint that is in USB device mode, the endpoint cannot recognize the device.</li> </ul>			
View decoder USB mode	<code>EscMUSBC</code>	<code>X10</code>	
<b>USB tie (NAV SD 501 only, valid in device mode only)</b>			
<b>NOTE:</b> If the decoder is in host mode or off, it returns an E14 error in response to the <code>tie</code> , <code>untie</code> , and <code>view tie</code> commands.			
Tie decoder to USB host	<code>EscX11X12^</code>	<code>InX11X12•Usb</code>	
Untie USB	<code>Esc0i^</code>	<code>In0i•Usb</code>	The untie command is always <code>Esc0i^</code> , even for a decoder.
View USB tie	<code>^</code>	<code>X11X12</code>	
<b>USB status</b>			
View host status	<code>EscIUSBC</code>	<code>UsbcIX9</code>	
View device status	<code>EscOUSBC</code>	<code>UsbcOX9</code>	
<b>Reset</b>			
Reset to factory setting	<code>EscZQQQ</code>	<code>Zpq</code>	Reset to factory defaults. Firmware version remains the same.
<b>Device name</b>			
Set device name	<code>EscX2CN</code>	<code>Ipn•X2</code>	
Read device name	<code>EscCN</code>	<code>X2</code>	
Reset device name to factory default	<code>Esc•CN</code>	<code>Ipn•NAV-SD-n01-&lt;last 3 pairs of the MAC address&gt;</code> (n = 5 or 1)	
<b>Device tags</b>			
View device tags	<code>EscDTAG</code>	<code>Y9</code>	
<b>Device number</b>			
View device number	<code>EscDNUM</code>	<code>Y10</code>	
<b>KEY:</b>			
<code>X2</code> = Name	Up to 24 alphanumeric characters and minus sign/hyphen (-), with no blanks or spaces allowed. The first character must be a letter, and the last character cannot be a - sign.		
<code>X3</code> = Device number	0001 — 4096		
<code>X8</code> = Audio output	1 = Digital (HDMI) output	2 = Analog output	
<code>X9</code> = Status	0 = Off, disabled, not detected	1 = On, enabled, detected	
<code>X10</code> = USB mode	0 = Off	1 = Host	2 = Device
<code>X11</code> = USB host	I/O Number: <input number> or <output number>		
<code>X12</code> = Encoder (input) or decoder (output)	Only first letter (i or o) is valid.		
<code>Y9</code> = Tag	A list of text tags returned in a json string		
<code>Y10</code> = Device number	0001 — 4096		

## Command and Response Table for Decoder SIS Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
<b>Information requests</b>			
Information request	I	VidI $\overline{X9}$ •HdcpI $\overline{X13}$ •HdcpO $\overline{X13}$ •ResI $\overline{X14}$ •AudI $\overline{X15}$ •StrmI $\overline{X16}$ •Lnk $\overline{X16}$ •Dec $\overline{X}$	
Response description:		Input signal•Input HDCP•Output HDCP•Resolution•Input audio•Streaming•Link•Decoder $\overline{X}$	
Example:	I	SigI1•HdcpI2•HdcpO2•Res1920x1080@60 Hz•AudI0•StrmI1•Lnk1•Dec $\overline{X}$	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 a decoder.
View model name	1I	NAV•SD•n01 $\overline{X}$	(n = 5 or 1)
View model description	2I	NAV•Gigabit•Scaling•Decoder•HDMI $\overline{X}$	
View number of connected users	10I	$\overline{X17}$ $\overline{X}$	
View input video format	34I	$\overline{X18}$ $\overline{X}$	
View HDCP input status	35I	$\overline{X13}$ $\overline{X}$	
View audio input selection	36I	$\overline{X15}$ $\overline{X}$	
View streaming status	37I	$\overline{X16}$ $\overline{X}$	
View HDCP output status	38I	$\overline{X13}$ $\overline{X}$	
View connected video streams	39I	$\overline{X19}$ $\overline{X}$	Show the connected video stream.
Example:	39I	Conf Rm 1, 192.168.254.254, 239.199.188.175 $\overline{X}$	
View connected audio streams	40I	$\overline{X19}$ $\overline{X}$	Show the connected audio stream.
View average bandwidth	41I	$\overline{X20}$ $\overline{X}$	
View current total bandwidth	42I	$\overline{X20}$ $\overline{X}$	
View current video bandwidth	43I	$\overline{X20}$ $\overline{X}$	
View current audio bandwidth	44I	$\overline{X20}$ $\overline{X}$	
View network status	46I	$\overline{X16}$ $\overline{X}$	
View dropped packets	48I	$\overline{X21}$ $\overline{X}$	
View IGMP querier	50I	$\overline{X4}$ $\overline{X}$	
View device serial number	98I	$\overline{X22}$ $\overline{X}$	
View internal temperature	$\overline{Esc}$ 20STAT $\overline{X}$	$\overline{X23}$ $\overline{X}$	
View firmware version	Q	$\overline{X23}$ $\overline{X}$	
View full firmware version	*Q	$\overline{X25}$ $\overline{X}$	
Read full firmware version — Advanced	20Q	$\overline{X26}$ $\overline{X}$	
View part number	N	60-xxxx-xx $\overline{X}$	

KEY:		
$\overline{X4}$ = IP address	xxx.xxx.xxx.xxx	
$\overline{X9}$ = Status	0 = Off, disabled, not detected	1 = On, enabled, detected
$\overline{X13}$ = HDCP status	0 = No device	1 = Non-HDCP device    2 = HDCP device
$\overline{X14}$ = Resolution and rate in plain text	Example: 1920x1080@60 Hz)	
$\overline{X15}$ = Audio input selected	0 = Digital	1 = Analog
$\overline{X16}$ = Streaming and link status	0 = No link	1 = Active                    2 = Active with errors
$\overline{X17}$ = Number of connected users	0 — 1	
$\overline{X18}$ = Input video format	0 = Not detected	1 = HDMI                    2 = DVI
$\overline{X19}$ = Connected streams	<hostname>,<IP address>,<Multicast IP>	
$\overline{X20}$ = Streaming rate or bandwidth (in Mbps)	150 — 900 (default = 850)	
$\overline{X21}$ = Dropped packets (in percent)	00 — 100	
$\overline{X22}$ = Serial number		
$\overline{X23}$ = Internal temperature	xxxF•xxC	
$\overline{X24}$ = Firmware version	x.xx	
$\overline{X25}$ = Full firmware version	x.xx.xxxx	
$\overline{X26}$ = 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				
<b>DHCP client</b>							
Set DHCP on	[Esc]1*1DHCP ←	Dhcp•1*1 ←					
Set DHCP off	[Esc]1*0DHCP ←	Dhcp•1*0 ←					
View DHCP status	[Esc]1DHCP ←	[X30] ←					
<b>IP address</b>							
Set IP address	[Esc][X31]CI ←	Ipi[X31] ←					
View IP address	[Esc]CI ←	[X31] ←					
<b>Subnet mask</b>							
Set subnet mask	[Esc][X31]CS ←	Ips[X31] ←					
View subnet mask	[Esc]CS ←	[X31] ←					
<b>Gateway address</b>							
Set gateway address	[Esc][X31]CG ←	Ipg[X31] ←					
View gateway address	[Esc]CG ←	[X31] ←					
<b>DNS address</b>							
Set DNS address	[Esc][X31]DI ←	Ipd[X31] ←					
View DNS address	[Esc]DI ←	[X31] ←					
<b>IP address</b>							
Set IP address	[Esc]1*[X31]CISG ←	Cisg•1*[X31] ←					
<b>IP and subnet mask</b>							
Set IP address and subnet mask	[Esc]1*[X31] <sup>P</sup> *[X31] <sup>Subnet</sup> CISG ←	Cisg•1*[X31] <sup>P</sup> /[X32] <sup>Subnet</sup> *[X31] <sup>Gateway</sup> ←					
Set IP address and subnet mask	[Esc]1*[X31] <sup>P</sup> /[X32] <sup>Subnet</sup> CSIG ←	Cisg•1*[X31] <sup>P</sup> /[X32] <sup>Subnet</sup> *[X31] <sup>Gateway</sup> ←					
<b>IP, Subnet, and gateway address all at once</b>							
Set IP address, subnet address, and gateway	[Esc]1*[X31] <sup>P</sup> *[X31] <sup>Subnet</sup> *[X31] <sup>Gateway</sup> CISG ←	Cisg•1*[X31] <sup>P</sup> /[X32] <sup>Subnet</sup> *[X31] <sup>Gateway</sup> ←					
Set IP address, subnet address, and gateway	[Esc]1*[X31] <sup>P</sup> /[X32] <sup>Subnet</sup> *[X31] <sup>Gateway</sup> CISG ←	Cisg•1*[X31] <sup>P</sup> /[X32] <sup>Subnet</sup> *[X31] <sup>Gateway</sup> ←					
View IP address, subnet address, and gateway	[Esc]1*CSIG ←	[X31] <sup>P</sup> /[X32] <sup>Subnet</sup> *[X31] <sup>Gateway</sup> ←					
<b>MAC address</b>							
View MAC address	[Esc]CH ←	[X33] ←					
<table style="width: 100%; border: none;"> <tr> <td style="width: 30%; border: none;"><b>KEY:</b></td> <td style="width: 40%; border: none;">                 [X30] = Status                  [X31] = IP address, subnet, gateway address                  [X32] = Subnet prefix                  [X33] = MAC address             </td> <td style="width: 30%; border: none;">                 0 = Off, disabled, not detected                  YYY.YYY.YYY.YYY                  Number of bits used to create the subnet                  YY-YY-YY-YY-YY-YY             </td> <td style="width: 30%; border: none; text-align: right;">                 1 = On, enabled, detected             </td> </tr> </table>				<b>KEY:</b>	[X30] = Status [X31] = IP address, subnet, gateway address [X32] = Subnet prefix [X33] = MAC address	0 = Off, disabled, not detected YYY.YYY.YYY.YYY Number of bits used to create the subnet YY-YY-YY-YY-YY-YY	1 = On, enabled, detected
<b>KEY:</b>	[X30] = Status [X31] = IP address, subnet, gateway address [X32] = Subnet prefix [X33] = MAC address	0 = Off, disabled, not detected YYY.YYY.YYY.YYY Number of bits used to create the subnet YY-YY-YY-YY-YY-YY	1 = On, enabled, detected				



# Troubleshooting

## Alarms

The following table lists common NAV alarms shown on the **Monitoring** page (see **Alarms pane** on page 46) 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 <b>mode 5 reset</b> (see page 15) 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 decommissioned from the NAV system, unassign the endpoint from the "Offline endpoints" list. If endpoint still cannot be assigned, perform a <b>mode 5 reset</b> on the endpoint.
Audio Loss	The input audio signal level is below -60 dB for a period of 5 minutes or more.	Increase the output level of audio source.
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 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.

Alarm	Cause	Remedy
Disk Space	Internal storage on the NAV device is low.	Reboot the NAV device. If the issue persists, perform a software reset that delete files (see <b>Reset tab</b> on page 40).
Firmware Failure	A critical process has failed, crashing the endpoint.	Reboot the NAV device. If the failure persists, perform a <b>mode 1 reset</b> (see page 15).
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	<p><b>Encoder:</b> The video input signal is HDCP protected and HDCP negotiation has failed.</p> <p><b>Decoder:</b> The incoming stream is HDCP protected and the display connected to the output does not support HDCP or the HDCP version.</p>	<p><b>Encoder:</b></p> <ul style="list-style-type: none"> <li>• Disconnect and reconnect the video input cable into the encoder (see the applicable NAV encoder user guide at <a href="https://www.extron.com">https://www.extron.com</a>).</li> <li>• Bypass video adapter cables and make a direct HDMI male-to-male connection.</li> </ul> <p><b>Decoder:</b> Check the technical specifications of the display that is connected to the decoder for HDCP version support.</p>
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.

<b>Alarm</b>	<b>Cause</b>	<b>Remedy</b>
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 decoder has lost reception of the data stream for 2 seconds or more.	Check all network switches and routers that support your NAV system for proper multicast (IGMP) configuration.
Temperature Internal	The NAV device is overheating.	<p>Check the ambient temperature of the NAV device installation location.</p> <ul style="list-style-type: none"> <li>• If greater than 104 °F, (60 °C) use HVAC system to lower ambient temperature.</li> <li>• 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.</li> </ul>
Tie Failure	The decoder failed to establish a tie with the specified endpoint.	Debug the network connectivity between the encoder and decoder.

# Reference Information

## Mounting the Decoder

### 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 decoder can be placed on a table, mounted in a rack, or mounted under a desk or table. The decoder can also be mounted on a projector bracket.

## 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 (<https://www.extron.com>), in accordance with the directions included with the kit.

### ATTENTION:

- When mounting the decoder under furniture, mount the device upside-down to ensure proper ventilation.
- Si vous installez le decoder 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.

- **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 = +104 °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).

## Extron Warranty

Extron warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

**USA, Canada, South America, and Central America:**

Extron  
1230 South Lewis Street  
Anaheim, CA 92805  
U.S.A.

**Asia:**

Extron Asia Pte Ltd  
135 Joo Seng Road, #04-01  
PM Industrial Bldg.  
Singapore 368363  
Singapore

**Japan:**

Extron Japan  
Kyodo Building, 16 Ichibancho  
Chiyoda-ku, Tokyo 102-0082  
Japan

**Europe:**

Extron Europe  
Hanzeboulevard 10  
3825 PH Amersfoort  
The Netherlands

**China:**

Extron China  
686 Ronghua Road  
Songjiang District  
Shanghai 201611  
China

**Middle East:**

Extron Middle East  
Dubai Airport Free Zone  
F13, PO Box 293666  
United Arab Emirates, Dubai

**Africa:**

Extron South Africa  
3rd Floor, South Tower  
160 Jan Smuts Avenue  
Rosebank 2196, South Africa

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 if modifications were made to the product that were not authorized by Extron.

**NOTE:** If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

**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:** 27.11.447.6162

**Middle East:** 971.4.299.1800

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.

Extron 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 be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron 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.