

HAE 100

HDMI Audio Extractor



Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

Precautions

Safety Instructions • English

-  This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.
-  This symbol 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.

Caution

- Read Instructions** • Read and understand all safety and operating instructions before using the equipment.
- Retain Instructions** • The safety instructions should be kept for future reference.
- Follow Warnings** • Follow all warnings and instructions marked on the equipment or in the user information.
- Avoid Attachments** • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français

-  Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).
-  Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

- Lire les instructions** • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.
- Conservé les instructions** • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.
- Respecter les avertissements** • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.
- Eviter les pièces de fixation** • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch

-  Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.
-  Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

- Lesen der Anleitungen** • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.
- Aufbewahren der Anleitungen** • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.
- Befolgen der Warnhinweise** • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.
- Keine Zusatzgeräte** • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español

-  Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.
-  Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

- Leer las instrucciones** • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.
- Conservar las instrucciones** • Conservar las instrucciones de seguridad para futura consulta.
- Obedecer las advertencias** • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.
- Evitar el uso de accesorios** • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

安全须知 • 中文

-  这个符号提示用户该设备用户手册中有重要的操作和维护说明。
-  这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

- 阅读说明书** • 用户使用该设备前必须阅读并理解所有安全和使用说明。
- 保存说明书** • 用户应保存安全说明书以备将来使用。
- 遵守警告** • 用户应遵守产品和用户指南上的所有安全和操作说明。
- 避免追加** • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

Warning

- Power sources** • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.
- Power disconnection** • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).
- Power cord protection** • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.
- Servicing** • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.
- Slots and openings** • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.
- Lithium battery** • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

- Alimentations** • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.
- Déconnexion de l'alimentation** • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.
- Protection du cordon d'alimentation** • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.
- Réparation-maintenance** • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.
- Fentes et orifices** • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.
- Lithium Batterie** • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un ype équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Vorsicht

- Stromquellen** • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.
- Stromunterbrechung** • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.
- Schutz des Netzkabels** • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.
- Wartung** • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.
- Schlitze und Öffnungen** • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.
- Litium-Batterie** • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

- Alimentación eléctrica** • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.
- Desconexión de alimentación eléctrica** • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.
- Protección del cables de alimentación** • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.
- Reparaciones/mantenimiento** • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.
- Ranuras y aberturas** • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.
- Batería de litio** • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

警告

- 电源** • 该设备只能使用产品上标明的电源。设备必须使用有地线的供电系统供电。 第三条线（地线）是安全设施，不能不用或跳过。
- 拔掉电源** • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。
- 电源线保护** • 妥善布线，避免被踩踏，或重物挤压。
- 维护** • 所有维修必须由认证的维修人员进行。设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。
- 通风孔** • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。 不要用任何东西挡住通风孔。
- 锂电池** • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

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. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

NOTE: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance with FCC emissions limits.
For more information on safety guidelines, regulatory compliances, EMI/EMF compliance, accessibility, and related topics, [click here](#).

Conventions Used in this Guide

In this user guide, the following are used:

TIP: A tip provides a suggestion to make setting up or working with the device easier.

NOTE: A note draws attention to important information.

CAUTION: A caution warns of things or actions that might damage the equipment.

WARNING: A warning warns of things or actions that might cause injury, death, or other severe consequences.

Commands are written in the fonts shown here:

```
^ARMerge Scene,,Op1 scene 1,1 ^B 51 ^W ^C
[ 01 ] R 0004 00300 00400 00800 00600 [ 02 ] 35 [ 17 ] [ 03 ]
[Esc] [X1] * [X17] * [X20] * [X23] * [X21] CE ←
```

NOTE: For commands and examples of computer or device responses mentioned in this guide, the character “0” is used for the number zero and “O” represents 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.
```

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Trademarks

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Introduction

This section gives an overview of the user guide and describes the Extron HAE 100 HDMI Audio Extractor and its features. Topics that are covered include:

- [About this Guide](#)
- [About the HAE 100 HDMI Audio Extractor](#)
- [Features](#)

About this Guide

This guide contains installation, configuration, and operating information for the HAE 100 HDMI Audio Extractor.

About the HAE 100 HDMI Audio Extractor

The HAE 100 is a one HDMI input, one HDMI output audio extractor. Its primary function is to accept an HDMI input, de-embed (extract) the digital audio from the HDMI signal, and provide a digital S/PDIF audio output and an analog stereo audio output. In addition, it provides an HDMI output, with the digital audio still embedded on the HDMI signal. For example, if the HDMI input is presented with an embedded 5.1 Dolby® Digital audio signal, the 5.1 Dolby Digital audio signal outputs on the HDMI output and on the S/PDIF output. The audio output over HDMI can be disabled by using the DIP switch located on the back of the HAE 100 if necessary. Figure 1 shows a typical HAE 100 application.

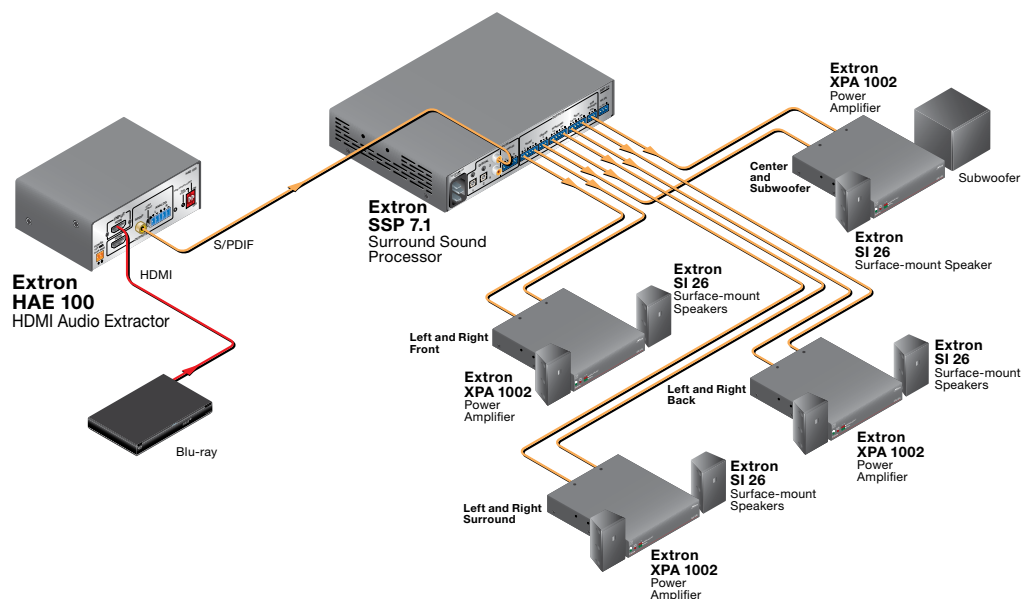


Figure 1. HAE 100 Application Diagram

NOTE: This product **does not** decode or downmix Dolby Digital or DTS® audio formats.

The HAE 100 incorporates EDID Minder® to define specific audio formats and video resolutions for the input. It also has the ability to store EDID obtained from the display device to non-volatile memory. In addition, the HAE 100 has a front panel configuration port which is used to configure and update the product in the field in the event that new firmware is required.

The product is HDCP compliant and supports HDMI 1.3 standards. The HAE 100 is housed in a 1U high, ¼ rack width, 3 inch deep metal enclosure.

Features

S/PDIF output — Allows for digital audio output over a single RCA connector.

Analog output — Allows for two channel stereo analog audio output over a 5-pole, 3.5 mm captive screw connector.

S/PDIF & Analog audio toggle switch — Selects the output format of the audio which is taken from the HDMI input signal.

Embedded digital audio output — The HDMI output re-embeds the audio taken from the HDMI input.

HDMI 1.3 compatible — Supports HDMI 1.3 specification features, including data rates up to 6.75 Gbps and Deep Color.

EDID Minder — A proprietary EDID management process from Extron. EDID Minder automatically manages the EDID between a digital display device and one or more input sources. By maintaining continuous EDID communication with all sources, EDID Minder ensures that digital sources power up properly and maintain their video output, whether or not they are actively connected to the digital display device.

Selectable HDMI audio pass-through — The user can control whether the HDMI output passes audio by setting a DIP switch on the rear panel.

Automatic input cable equalization — Automatically compensates for weak source signals or signal loss when using long input cable assemblies.

Input and Output LEDs — Eight green LEDs provide the status of the various functions of the product.

Front panel USB configuration port — One female mini USB type B is used to update the firmware of the product and check the status of the various functions of the product.

Versatile mounting options — The unit is 1U high, 3 inches deep, and ¼ rack wide, allowing it to be conveniently mounted in a rack, mounted under a desk, or set on a tabletop.

HDCP compliant — Prevents the reproduction of copyright protected content.

External universal ENERGY STAR® qualified power supply included, replacement part number 70-775-01 — Provides worldwide compatibility, low power consumption, and reduced operating costs.

Panels and Cabling

This section provides information on:

- [Installation Overview](#)
- [Front Panel Features](#)
- [Rear Panel Features](#)

Installation Overview

1. Make sure that the input source, the HAE 100, and all output devices are turned off. Disconnect all power sources.
2. If necessary, mount the unit ([page 20](#)).
3. Connect an HDMI input device ([page 6](#)).
4. Connect an HDMI output device ([page 6](#)).

NOTE: It is not required to connect an HDMI output device.

5. Connect audio devices to the analog and/or S/PDIF outputs ([page 6](#)).
6. Set the Audio Format toggle switch as desired ([page 6](#)).
7. Set the DIP switches as desired ([page 7](#)).
8. Plug in the power supply for the HAE 100 ([page 5](#)) and all necessary devices. Turn on all devices.

NOTE: See the "[Troubleshooting](#)" section on page 10 for audio and video issues.

Front Panel Features

The front panel of the HAE 100 is shown in figure 2 below.

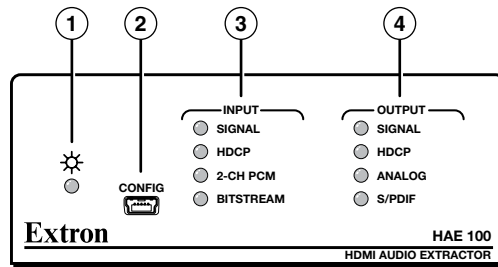


Figure 2. HAE 100 Front Panel

- ① **Power LED** — The LED indicator lights when the unit is receiving power.
- ② **Config port** — One female type B mini USB is used to update the firmware of the product, configure various functions of the unit, and view the current status of the unit.
- ③ **Input LEDs** — Four LEDs are used to provide the status of the HDMI input.
 - **Signal** — This LED lights when the unit is receiving a signal on the HDMI input.
 - **HDCP** — This LED lights when the input signal is HDCP encrypted.
 - **2-CH PCM** — This LED lights when the incoming embedded audio signal is a 2-channel Digital LPCM audio format.
 - **Bitstream** — This LED lights when the incoming embedded audio signal is a Dolby Digital or DTS audio format.
- ④ **Output LEDs** — Four LEDs are used to provide the status of the various functions of the HDMI and audio outputs.
 - **Signal** — This LED lights when the unit is providing video on the HDMI output connector.
 - **HDCP** — This LED lights when the HDMI output signal is encrypted with HDCP.
 - **Analog** — This LED lights when the unit is providing audio on the analog output.
 - **S/PDIF** — This LED lights when the unit is providing audio on the S/PDIF output.

Rear Panel Features

The rear panel of the HAE 100 is shown in figure 3.

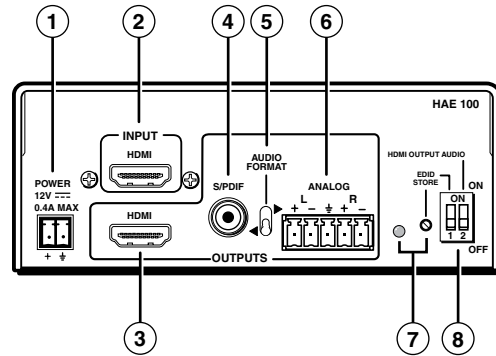


Figure 3. HAE 100 Rear Panel

- ① **Power input** — Connect the provided power supply to the 3.5 mm, 2-pole captive screw power receptacle (see figure 4).

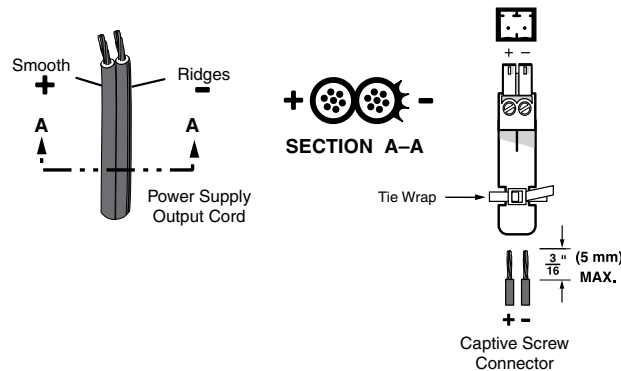


Figure 4. Power Connection

- CAUTION:**
- This product is intended to be supplied by a Listed Power Unit marked "Class 2" or "LPS," rated 12 VDC, maximum 1.0 A. Always use a power supply supplied 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.
 - Unless otherwise stated, the AC/DC adapters are not suitable for use in air handling spaces or in wall cavities. The power supply is to be located within the same vicinity as the Extron A/V processing equipment in an ordinary location, Pollution Degree 2, secured to the equipment rack within the dedicated closet, podium, or desk.
 - The installation must always be in accordance with the applicable provisions of National Electrical Code ANSI/NFPA 70, article 75, and the Canadian Electrical Code part 1, section 16. The power supply shall not be permanently fixed to building structure or similar structure.

- NOTES:**
- The length of the exposed wires in the stripping process is critical. The ideal length is 3/16 inches (5 mm). If the exposed section is longer, the exposed wires may touch, causing a short circuit between them. If it is shorter, the wires can be easily pulled out, even if tightly fastened by the captive screws.
 - Do not tin the wires. Tinned wire does not hold its shape and can become loose over time.

- ② **HDMI input** — Connect an HDMI input source into this female HDMI type A connector. Pixel clock rates up to 225 MHz (2.25 Gbps per channel) are supported.
- ③ **HDMI output** — Connect an HDMI output device into this female HDMI type A connector.

NOTES:

- It is not required to connect an HDMI output device to extract audio from the HDMI input device.
- If the HDMI input signal is HDCP encrypted, the HDMI output signal will also be encrypted. If the HDMI input signal is **not** HDCP encrypted, the output signal will **not** be encrypted.
- If the HDMI input signal is HDCP encrypted and the HDMI output device is not HDCP compliant, the unit will output a green screen.

- ④ **S/PDIF audio output** — Connect an S/PDIF audio output device into this female RCA connector. This connector outputs digital S/PDIF audio formats (2-channel LPCM, Dolby Digital, or DTS).

NOTE: The audio format that is present on this output is determined by the content on the source device (see the "[Troubleshooting](#)" section on page 10 for more information).

- ⑤ **Audio Format toggle switch** — This toggle switch is used to select the audio format that the HAE 100 will extract from the HDMI input signal. The position of this toggle switch also governs the EDID presented to the input source device.

NOTE: See the "[EDID Configuration Table](#)" on page 9 for more information on using this switch with EDID.

- **Analog (up)** — When the Audio Format toggle switch is set to this position, the 2-channel PCM audio signal is extracted from the HDMI input signal and output as a stereo analog signal via the analog output connector. 2-channel PCM audio is simultaneously output via the S/PDIF audio output. The HAE 100 provides EDID to the input source which lists support for 2-channel LPCM audio only.
 - **S/PDIF (down)** — When the Audio Format toggle switch is set to this position, the S/PDIF audio signal is extracted from the HDMI input signal and output via the S/PDIF output connector. The HAE 100 provides EDID to the input source which lists support for 2-channel LPCM, Dolby Digital (up to 6 channels), and DTS (up to 7 channels).
- ⑥ **Analog audio output** — Connect an audio output device to this 5-pole 3.5 mm captive screw connector (see figure 5). This connector outputs a 2-channel stereo analog audio format.

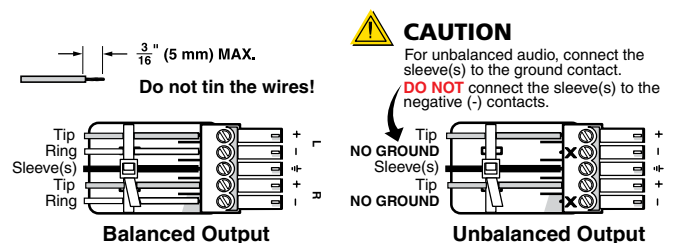


Figure 5. Analog Output Connector Wiring

- ⑦ **EDID Store button and LED** — An LED and a recessed push button switch is available for EDID Store status and configuration.

NOTE: The EDID Store DIP switch must be in the On (up) position to store EDID.

- **EDID Store LED** — A tricolored LED provides the status of the EDID.
 - **Unlit** — EDID Store is not enabled; the EDID Store DIP switch is in the Off (down) position. The factory default EDID is being used.
 - **Red** — EDID Store is enabled, but EDID from an external source has not been stored. The factory default EDID is still present.
 - **Green** — EDID Store is enabled and external EDID is currently stored.
 - **Amber** — EDID Store is enabled and an external EDID is currently being read and stored. When complete, the LED turns green.
- **EDID Store push-button** — Use this recessed push-button switch to store the EDID of the display that is connected to the HDMI output.

NOTE: See the "**EDID Configuration Table**" on page 9 for more information on using this switch with EDID.

- ⑧ **Configuration DIP switches** — A 2-pole DIP switch is used to configure the following features of the HAE 100.

- **EDID Store** — Use this DIP switch to enable or disable the EDID Store function. When in the Off (down) position, EDID Store is disabled and the factory default EDID is being used. When in the On (up) position, EDID Store is enabled and allows a stored EDID to be used.

NOTE: See the "**EDID Configuration Table**" on page 9 for more information on using this switch with EDID.

- **HDMI Output Audio** — Use this DIP switch to enable or disable audio on the HDMI output. When in the Off (down) position, audio will only be present over the S/PDIF output and/or analog output. When in the On (up) position, audio is present over the HDMI output, the Analog output, and/or the S/PDIF output simultaneously.

NOTE: If the incoming audio signal is bitstream (Dolby Digital or DTS), it may be necessary to set this switch to the Off (down) position since many display devices do not support these formats.

EDID Configuration

This section provides information on:

- [EDID Configuration Overview](#)
- [EDID Configuration Table](#)

EDID Configuration Overview

EDID Minder automatically manages the EDID between a digital display device and one or more input sources. By maintaining continuous EDID communication with all sources, EDID Minder ensures that digital sources power up properly and maintain their video output, whether or not they are actively connected to the digital display device.

EDID Minder is built into this product, which provides EDID to the input source device. The EDID provided by the HAE 100 forces the source to output the correct audio format.

The EDID can be communicated in two modes:

- Factory default
- User assigned

Factory Default Mode

In factory default mode, a factory default EDID will be used depending on which audio format is chosen with the Audio Format toggle switch. To communicate the EDID using the factory default mode, make sure that the EDID Store DIP switch is in the Off (down) position. For more information on this mode, see the "[EDID Configuration Table](#)" on the next page.

User Assigned Mode

In user assigned mode, a stored EDID can be used. The EDID can be stored from an output device (display) connected to the HDMI output. After the EDID has been stored, the EDID is modified in real time, depending on the particular characteristics of the EDID and the position of the Audio Format toggle switch. This allows for the proper audio format to be output from the source. For more information on this mode, see the "[EDID Configuration Table](#)" on the next page.

NOTE: Changing the Audio Format toggle switch updates the stored EDID automatically.

To set a user assigned EDID, follow the steps below.

1. Ensure that an output device (display) is connected to the HDMI output connector.
2. Set the EDID Store switch to the On (up) position.
3. Using a small screwdriver, press and release the EDID Store button to store the EDID of the output device (display).

After EDID Store has been enabled, the push button switch is used to record the EDID from the display device connected to the HDMI output of the HAE 100. Press and release the push button to initiate the EDID recording process. The EDID is stored in non-volatile memory and is retained even during a power cycle of the product.

NOTES:

- See the "**EDID Store button and LED**" section on page 7 for more information on using the EDID Store button and the associated LED.
- To erase a stored EDID, press the EDID Store button with no output device connected to the HDMI output connector **or** see the "**Command and Response Table for SIS Commands**" on page 19.

EDID Configuration Table

Settings		EDID Origin	Output Capabilities	
Audio Format Toggle Switch	EDID Store DIP Switch		Video	Audio
Analog	Off	Factory default	720p 1080p*	2-Ch LPCM
S/PDIF	Off	Factory default	720p 1080p*	S/PDIF formats
Analog	On	Stored	Copied from stored EDID	2-Ch LPCM
S/PDIF	On	Stored	Copied from stored EDID	S/PDIF formats
*The factory default EDID uses 720p as a native resolution. 1080p can be selected by using the "Assign factory EDID" SIS command (see the " Command and Response Table for SIS Commands " on page 19).				
S/PDIF supported audio formats include the following: • LPCM 2-channel, 16/20/24 bit depths, 32/44.1/48 kHz sampling • Dolby Digital (AC-3) 6-channel, 640k max bit rate, 32/44.1/48 kHz sampling • DTS 7-channel, 1536k max bit rate, 44.1/48 kHz sampling				
2-Ch LPCM audio format is as follows: • LPCM 2-channel, 16/20/24 bit depths, 32/44.1/48 kHz sampling				

Reference Information

This section provides information on:

- [Troubleshooting](#)
- [Specifications](#)
- [Part Numbers and Accessories](#)

Troubleshooting

Use this section to troubleshoot the HAE 100. Check the following possibilities before contacting an Extron representative (see the back cover for contact information).

- **The audio format selected with the Audio Format toggle switch is output from the source device incorrectly.**

The HAE 100 relies on EDID to “force” the source device to output the correct audio format. In a small percentage of source devices, the EDID may be ignored. In this case, the source device must be manually configured to output the desired audio format. Check the documentation of the source device for instructions on how to do this.

- **The Audio Format toggle switch is set to output S/PDIF audio, but the source will only output 2-channel PCM (not Dolby Digital or DTS).**

This is normal, as 2-channel PCM is an S/PDIF format. However, it is possible that the source device has been manually configured to downsample to 2-channel PCM, or the content itself is using a 2-channel PCM audio track. Check the settings of the source device and ensure the content contains a bitstream (Dolby Digital or DTS) audio track.

- **The audio produces a static or popping sound on the device connected to the HDMI output.**

The audio format of the HDMI input device is bitstream and the connected HDMI output device does not support that particular format. Set the HDMI Output Audio DIP switch to the Off (down) position or change the Audio Format toggle switch to the Analog (up) position (see “[Rear Panel Features](#)” on page 5).

- **The audio signal is present on the Analog output and/or the S/PDIF output, but not on the HDMI output.**

Ensure that the HDMI Output Audio DIP switch is in the On (up) position (see “[Rear Panel Features](#)” on page 5) and that the device connected to the HDMI output is compatible with the format of the audio signal.

If the issue continues, power cycle the input source, the display (HDMI output device), and/or the HAE 100.

- **A green screen is shown on the display connected to the HDMI output.**

The source device is outputting HDCP encrypted content and the display connected to the HDMI output is not HDCP compliant. This can be confirmed using the HDCP input and output LEDs on the front panel (see “[Front Panel Features](#)” on page 4). Connect a display that is HDCP compliant.

- **Video and/or audio cuts in and out.**

This is most likely an HDCP issue. If the HDCP output LED is not lit (see "**Front Panel Features**" on page 4), disconnect the HDMI output device to see if the extracted audio stabilizes. Power cycle the HAE 100 and the connected HDMI devices, paying attention to the HDCP status LEDs.

If the issue continues, call the Extron S3 Sales and Technical Support Hotline.

- **No image, the image is showing incorrect colors, or other video problems are visible on the HDMI output.**

The source content has been corrupted or there is a compatibility problem. Power cycle the source, display, and/or HAE 100.

If the issue occurred after changing the Audio Format or EDID Store switch settings (see "**Rear Panel Features**" on page 5), note that it is best to make these adjustments prior to connecting a source device to the HAE 100.

If the issue continues, call the Extron S3 Sales and Technical Support Hotline.

Specifications

Video

Maximum data rate.....	6.75 Gbps (2.25 Gbps per color)
Maximum pixel clock.....	225 MHz
Resolution range	Up to 1920x1200 or 1080p @ 60 Hz, 12-bit color
Formats.....	RGB and YCbCr digital video
Standards.....	DVI 1.0, HDMI 1.3, HDCP 1.2, EDID 1.3

Video input

Number/signal type	1 single link HDMI
Connectors	1 female HDMI type A
Equalization	Automatic for up to -12 dB of cable loss
Input cable length	Up to 25' (7.6 m)

NOTE: The transmission distance varies greatly depending on the signal resolution and on the type of cable, graphics card, and display used in the system.

Video output

Number/signal type	1 single link HDMI
Connectors	1 female HDMI type A
Output cable length	Up to 15' (5 m)

Audio

S/N.....	>90 dB, balanced, at maximum output
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Audio input

Source formats.....	PCM, Dolby Digital 2/0, Dolby Digital 2/0 Surround, Dolby Digital 5.1, Dolby Digital EX, DTS Digital Surround 5.1, DTS-ES Matrix 6.1, DTS-ES Discrete 6.1
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Audio output — analog

Number/signal type	1 stereo balanced/unbalanced
Connector.....	(1) 3.5 mm captive screw connector, 5 pole
Impedance	Stereo: 50 ohms unbalanced, 100 ohms balanced
Maximum level (Hi-Z).....	>16 dBu, balanced; >7.8 dBV, unbalanced at 1% THD+N

Audio output — digital

Number/signal type	1 S/PDIF
Connectors	1 female RCA jack (tip, ring)
Impedance	75 ohms

Control/remote

USB control ports	1 front panel female mini USB B
USB standards	USB 2.0, low speed
Program control	Extron Simple Instruction Set (SIS™)

General

External power supply	Input: 100 VAC to 240 VAC, 50-60 Hz, external power supply Output: 12 VDC, 1 A, regulated
Power input requirements	12 VDC, 0.4 A
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling	Convection, no vents
Thermal dissipation	
115 VAC, 60 Hz	7.3 BTU/hr
240 VAC, 50 Hz	8.1 BTU/hr
Mounting	
Rack mount	Yes, with optional 1U rack shelf
Furniture mount	Yes, with optional mini under-desk mounting kit
Enclosure type	Metal
Enclosure dimensions	1.7" H x 4.3" W x 3.0" D (1U high, quarter rack wide) (4.2 cm H x 11.0 cm W x 7.6 cm D) (Depth excludes connectors and switches.)
Product weight	0.6 lbs (0.3 kg)
Shipping weight	2 lbs (1 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Regulatory compliance	
Safety	CE, c-UL, UL
EMI/EMC	CE, C-tick, FCC Class A, ICES, VCCI
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE: All nominal levels are at $\pm 10\%$.

NOTE: Specifications are subject to change without notice.

Part Numbers and Accessories

Included Parts

Description	Part Number
HAE 100	60-1075-01
12 VDC 1.0 A power supply	70-775-01
IEC power cord	
3.5 mm, 5-pole captive screw connector	
(4) Rubber feet (not attached)	
Setup Guide — HAE 100	

Optional Accessories

Description	Part Number
MBU 123 (Under-desk mount kit)	70-212-01
RSF 123 (3.5 inches deep, 1U rack shelf kit)	60-190-20
RSB 123 (3.5 inches deep, 1U basic rack shelf)	60-604-21
RSU 126 (6 inches deep, 1U rack shelf kit)	60-190-10
RSB 126 (6 inches deep, 1U basic rack shelf)	60-604-11
RSU 129 (9.5 inches deep, 1U rack shelf kit)	60-190-01
RSB 129 (9.5 inches deep, 1U basic rack shelf)	60-604-02

Firmware Updates

This section provides information on:

- [Downloading the HAE 100 Firmware](#)
- [Updating the Firmware](#)

Downloading the HAE 100 Firmware

Use the following procedure to download the latest HAE 100 firmware.

1. Go to www.extron.com/download.
2. On the Download Center screen, click the **Firmware** link on the left sidebar menu.
3. Find the HAE 100 firmware download from the alphabetical list.

TIP: Clicking on the **H** in the alphabetical menu bar brings up all of the firmware downloads that start with "H" and should assist with finding the HAE 100 firmware download link.

4. Click the **Download** link for the HAE 100 firmware and follow the instructions that appear on the screen.
5. The file is saved onto the computer. Note the folder where the firmware file is saved.

Updating the Firmware

Extron periodically updates product firmware. When updating any Extron product to the latest firmware, be sure to read the supplied release notes, or contact an Extron Application Engineer to determine if an Extron product requires a firmware update.

The following sections detail how to download and install firmware for the HAE 100.

Downloading and Installing the Firmware Loader Software

Extron recommends using the latest version of the Firmware Loader software to update the firmware on the HAE 100. If necessary, use the following procedure to download and install the Firmware Loader software.

1. Go to www.extron.com/download.
2. On the Download Center screen, click the **Software** link on the left sidebar menu.
3. On the next Download Center screen, locate and click the **Download** link for the Firmware Loader software (see figure 6).

Firmware Loader Extron Firmware Loader is a computer software application that allows you to update Extron products with field-upgradable firmware. The software supports firmware updates to Extron products connected via USB, serial (RS-232), or addressable on your local area network (LAN). Release Notes	79-508-01	5.0.1	Apr 1, 2010	11.9 MB	Download
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Figure 6. Firmware Loader Download Link

4. On the next screen, enter the requested information, then click **Download fw_loader_vnxn.exe** (where n is the Firmware Loader version number).
5. Follow the instructions on the rest of the download screens to save the executable Firmware Loader installer file to the computer. Note the folder where the file is saved.
6. Using the file browser, locate the downloaded executable installer file and run it.
7. Follow the instructions on the Installation Wizard screens to install the Firmware Loader software. Unless specified, the installer program places the Firmware Loader software at **C:\Program Files\Extron\FWLoader**.

Using Firmware Loader

Use the following procedure to install firmware to the HAE 100 using Firmware Loader. For more information on Firmware Loader, access the help file by selecting **Help > Help** from the menu bar or by pressing the <F1> key from within the program.

1. Open the Firmware Loader program by double-clicking on the **HAE 100** icon on the desktop.
2. The Add Device window appears.

NOTE: If the Add Device window does not appear, select **Edit > Add Device(s)** from the menu bar.

3. On the Add Device window (see figure 7):

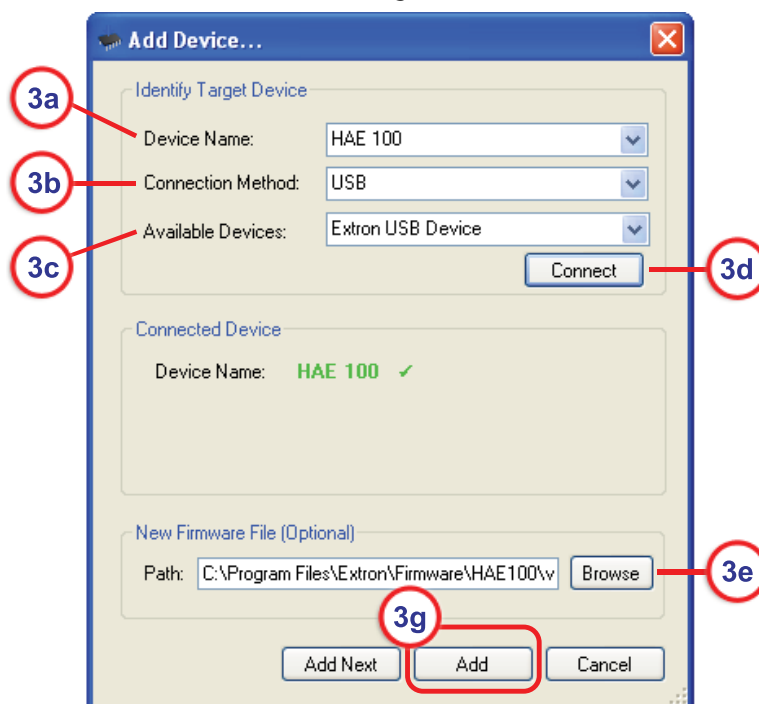


Figure 7. Add Device Window

- a. Select the **HAE 100** device from the **Device Name** drop-down menu.
- b. Select the **USB** option from the **Connection Method** drop-down menu.
- c. Select the **Extron USB Device** option from the **Available Devices** drop-down menu.
- d. Click **Connect**. When the connection is made, the HAE 100 appears in green text with a check mark next to it.
- e. Click the **Browse** button to open the Choose Firmware File browser.

- f. Navigate to the HAE 100 firmware file using the file browser. Select the file and click **Open** (see figure 8).

NOTE: The extension of the firmware file must be **.s19**.

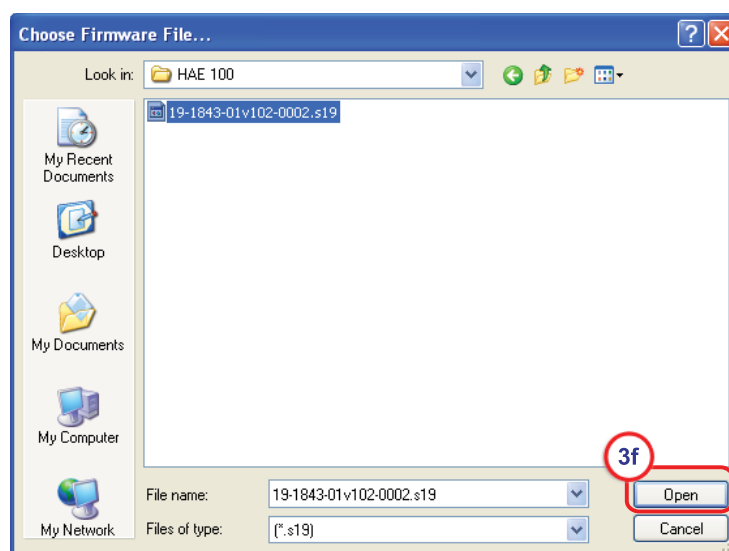


Figure 8. Choose Firmware File Window

- g. On the Add Device window, click **Add** (see figure 7). The Add Device window closes.
4. The main Firmware Loader window appears (see figure 9).

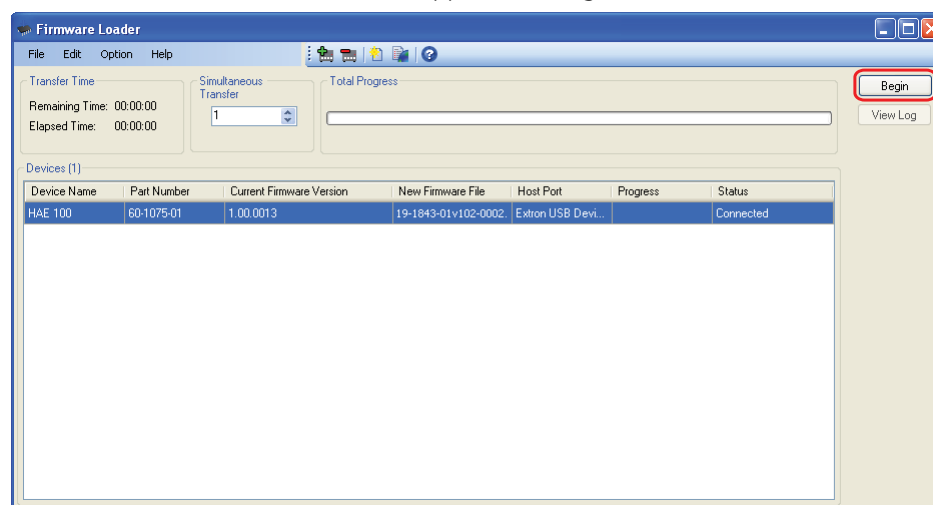


Figure 9. Firmware Loader Main Window

CAUTION: Before clicking **Begin**, check to make sure the appropriate firmware file is applied to the HAE 100. Uploading a file with an incorrect extension may cause the unit to stop functioning.

5. Click **Begin**. The firmware update is complete when the Total Progress box reads 100% and the **Status** column reads Complete. Close the Firmware Loader window.

CAUTION: Closing the Firmware Loader window before the firmware update is complete may result in corrupt firmware. For assistance with firmware issues, contact the Extron S3 Sales and Technical Support Hotline.

SIS Commands

This section provides information on:

- [Connecting a Control Computer](#)
- [Simple Instruction Set \(SIS\) Control](#)
- [Command and Response Table for SIS Commands](#)

Connecting a Control Computer

Connect a control PC to the front panel config port using a USB cable (see "[Front Panel Features](#)" on page 4). Remote communications are via SIS commands (see [page 19](#)). Use a communication utility, such as Telnet, to send SIS commands and view the responses.

Simple Instruction Set (SIS) Control

Host-to-Interface Communications

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

Error Responses

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

The error response codes and their descriptions are as follows:

E10 – Invalid command

E13 – Invalid parameter

Timeout

Pauses of 10 seconds or longer between command ASCII characters result in a timeout. The command operation is aborted with no other indication.

Using the Command and Response Table

The "[Command and Response Table for SIS Commands](#)" is on page 19. Lowercase letters are allowed in the command field only as indicated. Symbols are used throughout the table to represent variables in the command/response fields. Command and response examples are shown throughout the table. The ASCII to HEX conversion table, on the next page, is for use with the command/response table.

Symbol definitions

↵	=	CR/LF (carriage return/line feed)
←	=	Carriage return (no line feed, hex 0D)
•	=	space
X1	=	0 = Not detected / Off 1 = Detected / On
X2	=	Audio input format: 0 = No signal 1 = 2CH PCM 2 = Bitstream
X3	=	Audio output format: 0 = No signal 1 = Analog and S/PDIF 2 = S/PDIF only
X4	=	Audio Format toggle switch position: 0 = Analog 1 = S/PDIF
X5	=	1 = 720p @ 60Hz native EDID (default) 2 = 1080p @ 60Hz native EDID
X6	=	Native resolution and refresh rate (translated from EDID detailed timing I)
X7	=	EDID 256 bytes in HEX format
X8	=	Controller software version to the second decimal place

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										

Command and Response Table for SIS Commands

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
Signal status			
Request all signal status	[Esc] LS←	SigI[X1]•SigO[X1]•HdcpI[X1]• HdcpO[X1]•AudI[X2]•AudO[X3]←	
Switch status			
Request all rear panel switch status	[Esc] STAT←	AudFmt[X4]•EdidStr[X1]• HdmiAud[X1]←	Unsolicited response.
EDID Minder			
Assign factory EDID	[Esc] A*[X5]EDID←	EdidA[X5]←	
View factory EDID	[Esc] A*EDID←	[X5]←	
View EDID native resolution	[Esc] N*EDID←	[X6]←	Example: 720p @ 60Hz
View current EDID in hex	[Esc] R*EDID←	[X7]←	View EDID in HEX format.
View information, part number, and firmware			
Request part number	N/n	6Ø-xxxx-xx←	
Query firmware version	Q/q	[X8]←	View firmware build with two decimals (for example, x.xx).
Reset			
Reset	[Esc] ZXXX←	Zpx←	Resets the unit.

Mounting

This section outlines the various mounting options available for HAE 100:

- [Tabletop Placement](#)
- [Rack Mounting](#)
- [Under-desk Mounting](#)

Tabletop Placement

Attach the four provided rubber feet to the bottom of the unit and place it in any convenient location.

Rack Mounting

UL Guidelines for Rack Mounting

The following Underwriters Laboratories (UL) guidelines are relevant to the safe installation of these products in a rack:

- 1. Elevated operating ambient temperature** — If the unit is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the equipment in an environment compatible with the maximum ambient temperature (TMA: +122 °F, +50 °C) specified by Extron.
- 2. Reduced air flow** — Install the equipment in the rack so that the equipment gets adequate air flow for safe operation.
- 3. Mechanical loading** — Mount the equipment in the rack so that uneven mechanical loading does not create a hazardous condition.
- 4. Circuit overloading** — Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Consider the equipment nameplate ratings when addressing this concern.
- 5. Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (such as the use of power strips).

Rack Mounting Procedure

The unit can be mounted on any of these optional rack systems, including:

- **RSF 123:** 3.5 inches deep, 1U rack shelf kit (part number **60-190-20**)
- **RSB 123:** 3.5 inches deep, 1U basic rack shelf (part number **60-604-21**)
- **RSU 126:** 6 inches deep, 1U rack shelf kit (part number **60-190-10**)
- **RSB 126:** 6 inches deep, 1U basic rack shelf (part number **60-604-11**)
- **RSU 129:** 9.5 inches deep, 1U rack shelf kit (part number **60-190-01**)
- **RSB 129:** 9.5 inches deep, 1U basic rack shelf (part number **60-604-02**)

To mount the HAE 100 on a rack shelf, follow the instructions provided with the shelf accessories.

Under-desk Mounting

Mount the unit under a desk or podium, using the optional Extron MBU 123 under-desk mounting kit (part number **70-212-01**). Follow the instructions provided with the kit.

Extron® Warranty

Extron Electronics 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 Electronics 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 Electronics
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

Japan:

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

Europe, Africa, and the Middle East:

Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:

Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Asia:

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

Middle East:

Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

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 modifications 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

Asia: +65.6383.4400

Europe: +31.33.453.4040

Japan: +81.3.3511.7655

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 Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

Extron USA - West Headquarters	Extron USA - East	Extron Europe	Extron Asia	Extron Japan	Extron China	Extron Middle East
+800.633.9876 Inside USA/Canada Only	+800.633.9876 Inside USA/Canada Only	+800.3987.6673 Inside Europe Only	+800.7339.8766 Inside Asia Only	+81.3.3511.7655 +81.3.3511.7656 FAX	+400.883.1568 Inside China Only	+971.4.2991800 +971.4.2991880 FAX
+1.714.491.1500 +1.714.491.1517 FAX	+1.919.863.1794 +1.919.863.1797 FAX	+31.33.453.4040 +31.33.453.4050 FAX	+65.6383.4400 +65.6383.4664 FAX		+86.21.3760.1568 +86.21.3760.1566 FAX	