

HDMI DA Series

Distribution Amplifiers



Extron Electronics
INTERFACING, SWITCHING AND CONTROL

Safety Instructions

Safety Instructions • English

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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.

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Instructions de sécurité • Français

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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.

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Chinese Simplified (简体中文)

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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。

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Korean

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)의 Extron 안전 및 규제 준수 안내서, 68-290-01 조항을 참조하십시오.

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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.

NOTES:

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

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Conventions Used in this Guide

Notifications

In this user guide, the following are used:

WARNING: Potential risk of severe injury or death.

AVERTISSEMENT : Risque potentiel de blessure grave ou de mort.

ATTENTION:

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

NOTE: A note draws attention to important information.

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

Software Commands

Commands are written in the fonts shown here:

```
^ARMerge Scene , ,Op1 scene 1,1 ^B51 ^W^C
```

```
[01] R000400300004000080000600 [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.

Specifications Availability

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

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Introduction

This guide describes the function, installation, and operation of the HDMI DA2, HDMI DA4, and HDMI DA6. Unless otherwise stated, the terms “distribution amplifier,” “DA,” or “HDMI DA Series” refer to any of these distribution amplifiers.

This section provides the following information:

- [About the HDMI DA2, HDMI DA4, and HDMI DA6](#)
- [Features](#)
- [Application Diagram](#)

About the HDMI DA2, HDMI DA4, and HDMI DA6

These Extron distribution amplifiers distribute one HDMI input signal to two (HDMI DA2), four (HDMI DA4), or six (HDMI DA6) simultaneous outputs. All three models are fully High-bandwidth Digital Content Protection (HDCP) compliant.

These distribution amplifiers support data rates up to 6.75 Gbps (2.25 Gbps per color) with up to 12-bit deep color and use the EDID Minder feature for EDID management.

The automatic output compatibility correction feature scans each output device to ensure that the output signal is compatible with the color depth and format requirements of the device. Each output is adjusted independently.

Features

HDMI signal distribution — distributes one HDMI input to two (HDMI DA2), four (HDMI DA4), or six (HDMI DA6) simultaneous HDMI video and embedded multi-channel digital audio signal outputs. Supported HDMI specification features include data rates up to 6.75 Gbps, Deep Color up to 12-bit, 3D, Lip Sync, and HD lossless audio formats.

Supports high-resolution video — including computer-video to 1920x1200, HDTV 1080p/60 and 2K.

HDCP compliant

Key Minder — continuously verifies HDCP compliance. Key Minder authenticates and maintains continuous HDCP encryption between all input and output devices to enable simultaneous distribution of a single source signal to multiple displays.

EDID Minder — automatically manages EDID communication between connected devices. EDID Minder ensures that the source powers up properly and reliably outputs content for display. This feature allows the user to assign EDID to the input from a list of 48 factory-loaded EDID files, one of the connected display devices, or from a custom user slot:

- **Factory EDID:** 48 unique EDID files categorized by video format, resolution, and audio support.
- **Outputs:** automatically stores the EDID of the display connected to the specified output.
- **User slots:** EDID is saved from an output or imported from a PC.

Automatic input cable equalization — up to 50 feet at 1080p/60 with 8-bit color when used with Extron HDMI Pro Series cable. Actively conditions incoming HDMI signals to compensate for signal loss when using long cables, low quality cables, or source devices with poor signal output.

Output Compatibility Correction — monitoring the EDID of each connected display allows the distribution amplifier to ensure the EDID is compatible with the current input signal. The following adjustments are made for each output independently:

- **Interface format:** If the connected display is DVI and the input signal is HDMI, the signal is reformatted to DVI. If the output is HDMI and the input is DVI, no reformatting is needed because HDMI is backwards compatible with DVI.
- **Video color bit depth:** If the connected output device does not support the color bit depth of the input signal, it is truncated down to the next level that is supported (12-bit > 10-bit > 8-bit). The signal can be forced to always truncate to 8-bit via Simple Instruction Set (SIS) commands, disabling deep color.

Output muting via RS-232 — Provides the capability to mute one or all outputs at any time. This allows content to be viewed on a local monitor prior to appearing on the main presentation display.

Signal Status LEDs for the input and each output — provide real-time feedback and monitoring of signal presence and HDCP authentication. The bi-color EDID LED indicator notifies whether an internal or external EDID is stored.

Easy setup and commissioning — using the Extron PCS (Product Configuration Software), which allows multiple products to be configured using a single software application.

Easy mounting options — The HDMI DA2 is a quarter rack wide, 1 inch high, and 3 inches deep. The HDMI DA4 and HDMI DA6 are a half rack wide, 1 U high, and 6 inches deep. All three models can be conveniently mounted in standard racks or under furniture.

Application Diagram

This diagram shows a typical application for the HDMI DA4. The other models can be used in similar applications.

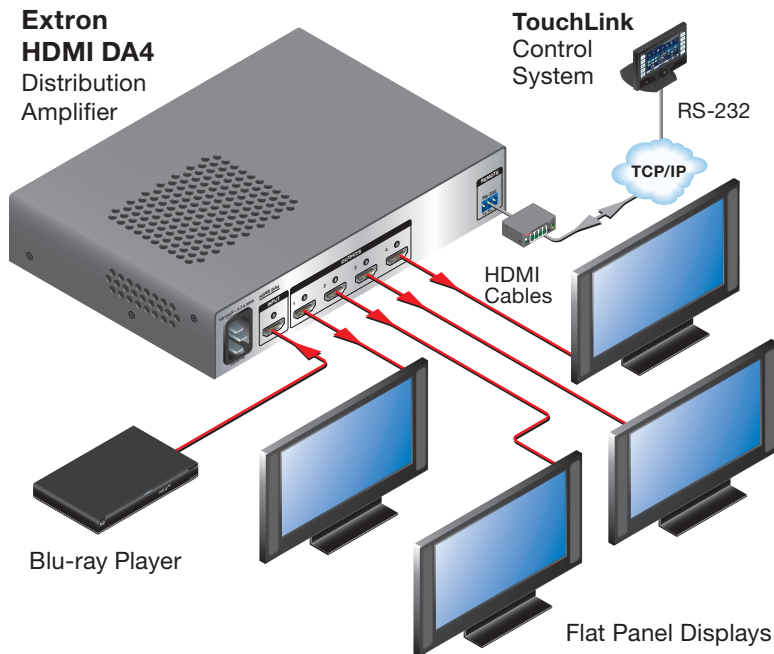


Figure 1. Application Diagram

Installation

This section of the guide describes the following topics concerned with the installation and setup of the HDMI DA2, HDMI DA4, and HDMI DA6 distribution amplifiers.

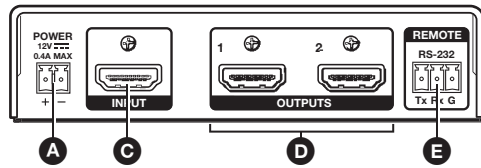
- **Installation Overview**
- **Rear Panel Features**
- **Connecting Power**
- **Connecting the Input Source**
- **Connecting Output Displays**
- **Wiring for RS-232 Control**
- **Connecting to the USB Port**

Installation Overview

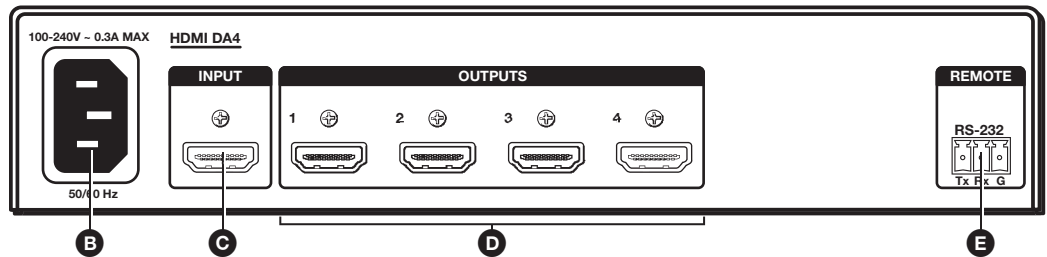
To install and set up these distribution amplifiers, follow these instructions:

1. **Mount the Distribution Amplifier** in a suitable location (see page 16).
2. **HDMI DA2 only: Connect the provided 12 VDC, 1 A power supply** (see page 5).
3. **HDMI DA4 and HDMI DA6 only: Connect to a 100-240 VAC (50 or 60 Hz) power source** using the provided IEC power cord (see page 4).
4. **Connect and power on the display devices** (see page 7).
5. If configuration using **SIS commands** is required (see page 17), connect a control PC to the **rear panel captive screw connector** (see page 8) or the **front panel USB port** (see page 9).
6. **Connect and power on the input device** (see page 7).

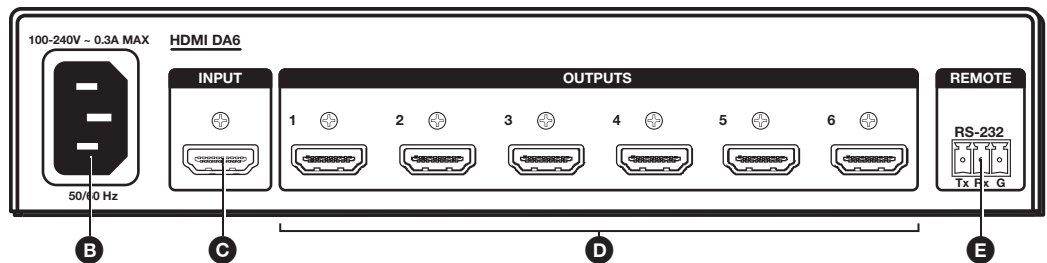
Rear Panel Features



HDMI DA2



HDMI DA4



HDMI DA6

Figure 2. HDMI DA2 (top), HDMI DA4 (middle) and HDMI DA6 (bottom)

- A** Power supply connector (see page 5)
- B** IEC connector (see below)
- C** HDMI input connector (see page 7)
- D** HDMI output connectors (see page 7)
- E** RS-232 connectors (see page 8)

Connecting Power

Connect a 100-240 VAC (50 or 60 Hz) power source, to the IEC connector of the HDMI DA4 or HDMI DA6 (figure 2, **B**, above), using the provided female IEC cable.

Connect the HDMI DA2 to the provided 12 VDC, 1 A power supply as described in **Connecting the Power Supply (HDMI DA2 Only)** on the next page.

Connecting the Power Supply (HDMI DA2 Only)

ATTENTION:

- This product is intended for use with a UL Listed power source marked “Class 2” or “LPS” and rated 12 VDC, maximum 1.0 A. Always use a power supply provided 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, 1,0 A maximum. 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.
- Extron power supplies are certified to UL/CSA 60950-1 and are classified as LPS (Limited Power Source). Use of a non-LPS or unlisted power supply will void all regulatory compliance certification.
- Les sources d'alimentation Extron sont qualifiées UL/CSA 60950-1 et sont classées LPS (Limited Power Source). L'utilisation d'une source d'alimentation non-listée ou non-listée LPS annulera toute certification de conformité réglementaire.
- 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 AV processing equipment in an ordinary location, Pollution Degree 2, secured to the equipment rack within the dedicated closet, podium, or desk.
- Sauf mention contraire, les adaptateurs AC/DC ne sont pas appropriés pour une utilisation dans les espaces d'aération ou dans les cavités murales. La source d'alimentation doit être située à proximité de l'équipement de traitement audiovisuel dans un endroit ordinaire, avec un degré 2 de pollution, fixé à un équipement de rack à l'intérieur d'un placard, d'une estrade, ou d'un bureau.
- 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 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.

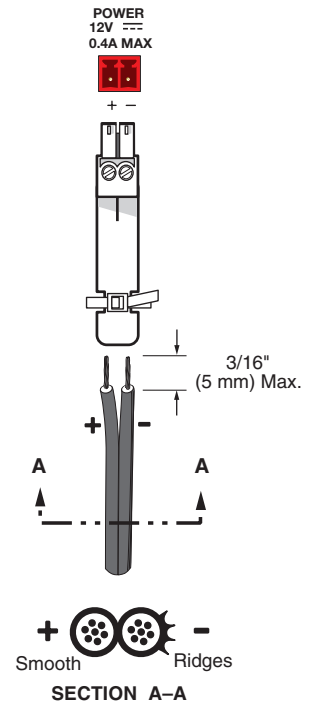
WARNING: The two power cord wires must be kept separate while the power supply is plugged in. Remove power before wiring.

AVERTISSEMENT : Les deux cordons d'alimentation doivent être tenus à l'écart l'un de l'autre quand l'alimentation est branchée. Couper l'alimentation avant de faire l'installation électrique.

ATTENTION:

- The length of the exposed wires in the stripping process is critical. The ideal length is 3/16 inches (5 mm). Any longer and the exposed wires may touch, causing a short circuit between them. 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 lorsque l'on entreprend de les dénuder. 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 wire leads before installing into 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.

1. Cut the DC output cord to the length needed.
2. Strip the jacket to expose 3/16 inch (5 mm) of the conductor wire.
3. Verify the polarity of the wires.
4. Slide the exposed end into the captive screw connector and secure by tightening the screw.
5. Use the supplied tie wrap to strap the power cord to the extended tail of the connector.
6. Insert the captive screw connector into the rear panel receptacle (Figure 2, A, on page 4).
7. Connect the power supply to a convenient 100-240 VAC (50 or 60 Hz) power source.



Connecting the Input Source

Use a HDMI cable to connect the input source to the female HDMI socket on the rear panel (**figure 2, C**, on page 4).

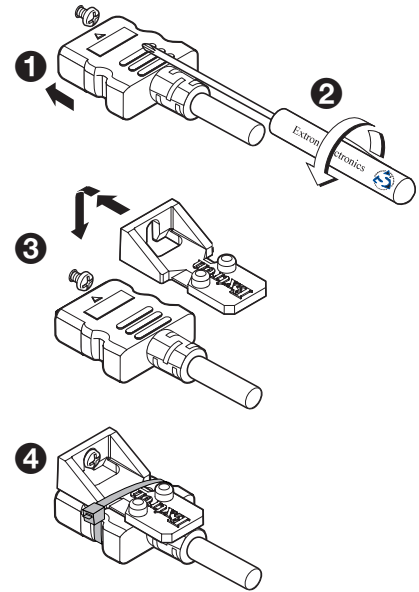
The connectors are fully HDCP compliant. With cables up to 25 feet (7.6 m) they support resolutions of up to 1080p @ 60 Hz with 12-bit color. With cables up to 50 feet (15.2 m) they support 1080p or 1920x1200 @ 60 Hz with 8-bit color.

Follow these instructions to secure the input and output HDMI connectors to the unit with the LockIt HDMI lacing bracket provided:

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

ATTENTION:

- Do not overtighten the HDMI connection mounting screw. The shield it fastens to 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.
5. While holding the connector securely against the lacing bracket, tighten the tie wrap, then remove any excess length.

Connecting the Output Displays

Use a HDMI cable to connect up to two (HDMI DA2), four (HDMI DA4), or six (HDMI DA6) output displays to the female HDMI sockets on the rear panel (**figure 2, D** on page 4).

NOTE: Secure the input and output HDMI connectors to the distribution amplifier with the provided LockIt HDMI lacing bracket (see [Connecting the Input Source](#) above).

The default EDID assignment is 720p. For more information, see [EDID Minder](#) on page 13 or [SIS Commands](#) on page 17.

The HDMI DA4 and HDMI DA6 monitor the EDID of each connected display to ensure they are compatible with the current input signal. If necessary, the following adjustments are made for each output independently:

- **Interface format:** If the connected display is DVI and the input signal is HDMI, the signal is reformatted to DVI. If the output is HDMI and the input is DVI, no reformatting is needed because HDMI is backwards compatible with DVI.
- **Video color bit depth:** If the connected output device does not support the color bit depth of the input signal, it is truncated down to the next level that is supported (12-bit > 10-bit > 8-bit). The signal can be forced to always truncate to 8-bit via SIS commands, disabling deep color.

All outputs carry +5 VDC and up to 250 mA on pin 18, regulated by a current limiting circuit.

Wiring for RS-232 Control (Optional)

RS-232 communication between the distribution amplifier and a host PC can be used to update firmware or configure the unit using SIS commands (see **Command and Response Table for SIS Commands** on page 19).

The computer connects to either the rear panel 3-pole RS-232 port (**figure 2, E** on page 4) or the front panel USB port (**figure 7, B** on page 11) of the distribution amplifier.

NOTES:

- Neither port has precedence and commands from either port are handled in the order they are received.
- Extron recommends that the USB port is used for temporary connections. If a permanent connection is required, the RS-232 port should be used.

1. Connect an RS-232 cable, such as Extron universal control cable (UC 50' or UC 100') to the computer, using a female 9-pin D connector (see figure 3):
 - Data received by the computer = pin 2
 - Data transmitted by the computer = pin 3
 - Ground = pin 5
2. Wire the opposite end of the cable to the provided 3-pole captive screw plug (see figure 3):
 - Data transmitted by the DA plugs into the Tx (transmit) port
 - Data received by the DA plugs into the Rx (receive) port
 - Ground plugs into the G (ground) port

NOTES:

- The wiring in the RS-232 cables crosses over so that the Tx on the distribution amplifier connects to the Rx of the control device and vice versa. Ground always connects to ground.
- If you use cable that has a drain wire, tie the drain wire to the ground at both ends.

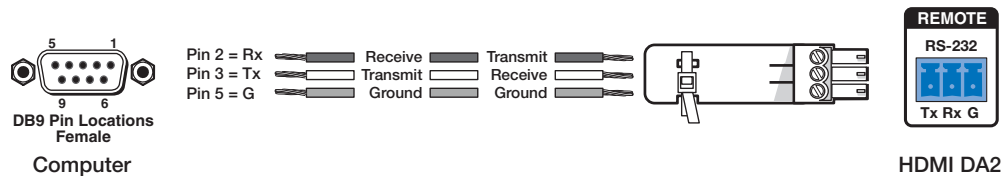


Figure 3. Wiring the HDMI DA4 and HDMI DA6 for RS-232 Control

Connecting to the USB Port

Use the mini Type B USB port on the front panel (figure 7, B on page 11) to connect the distribution amplifier to a host computer to **update firmware** (see page 21) or to configure the unit with **SIS commands** (see page 17).

1. Connect a USB A to mini B cable between the front panel USB Config port and a USB port of the PC.

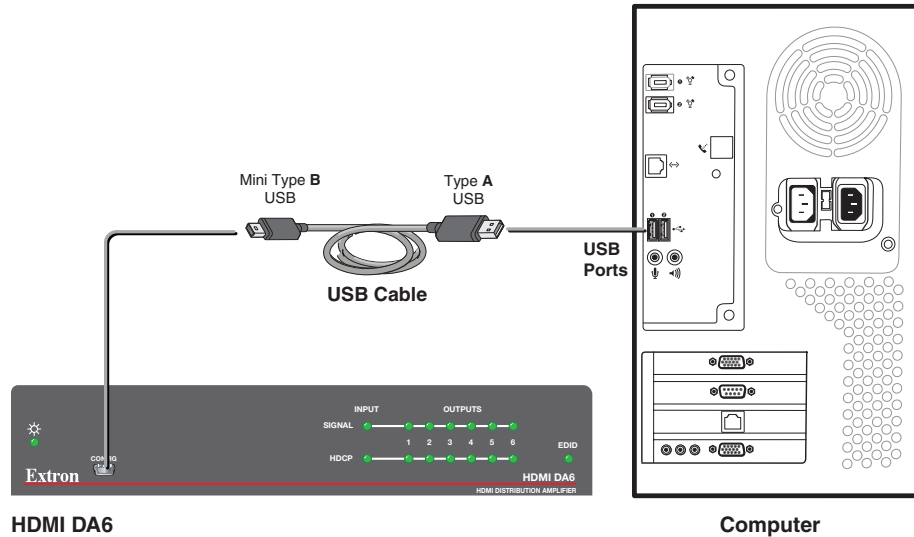


Figure 4. Connecting a PC to the HDMI DA6 Front Panel USB Port

2. If this is the first time a HDMI DA series device has been connected to the PC, the Found New Hardware Wizard opens. Connect to Windows Update to search the web for the driver needed for the USB port to communicate with the distribution amplifier. This is not necessary if the USB driver is already on your PC.

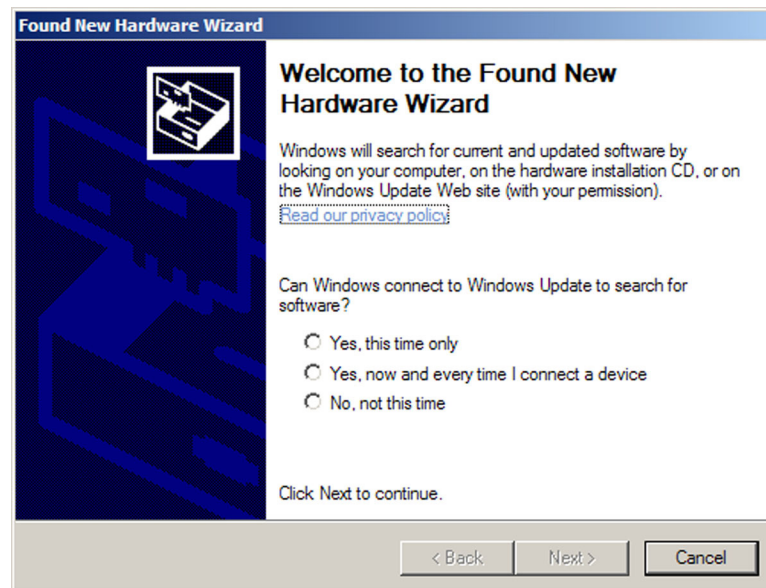


Figure 5. Found New Hardware Wizard Welcome Screen

- Select **Yes, this time only** to connect the PC to Windows Update only this time.
- Select **Yes, now, and every time I connect a device** to automatically connect to Windows Update every time the distribution amplifier connects to this USB port.
- Select **No, not this time** if you do not want to connect to Windows Update (for example, if the driver is already on the PC).

3. Click **Next**. The next screen of the Wizard opens:

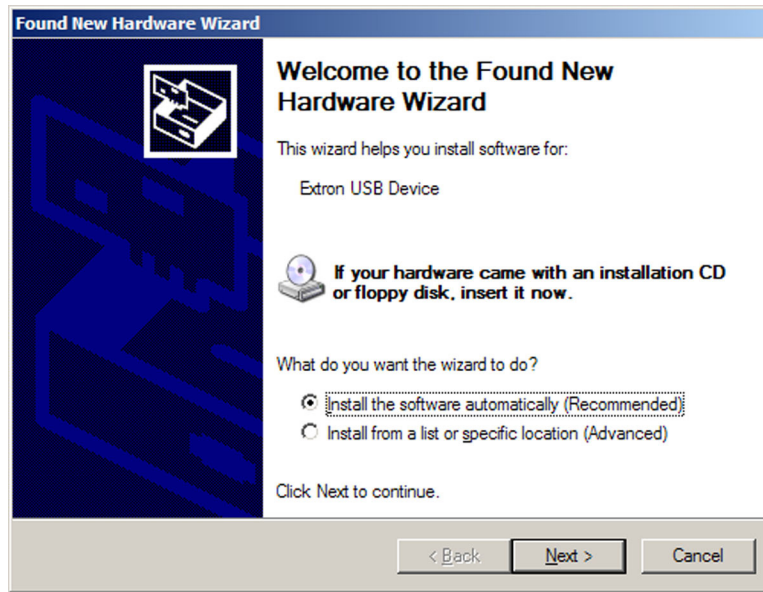


Figure 6. Installing the Software Automatically

4. Select **Install the software automatically (Recommended)** and click **Next**.

NOTE: You do not need to insert an installation disc.

The PC locates the driver needed and installs it in the correct location on the hard drive.

5. When the Completed screen appears, click Finish to close the wizard.

NOTE: The wizard opens only on the first occasion you connect the distribution amplifier to that USB port. The wizard reappears if you connect the unit to a different USB port or if you connect a different piece of equipment, requiring a different driver, to the same USB port.

6. Configure the distribution amplifier as required (see **Operation** on the next page).

Operation

This section of the manual provides information on:

- **Front Panel Features**
- **EDID Minder**

Front Panel Features

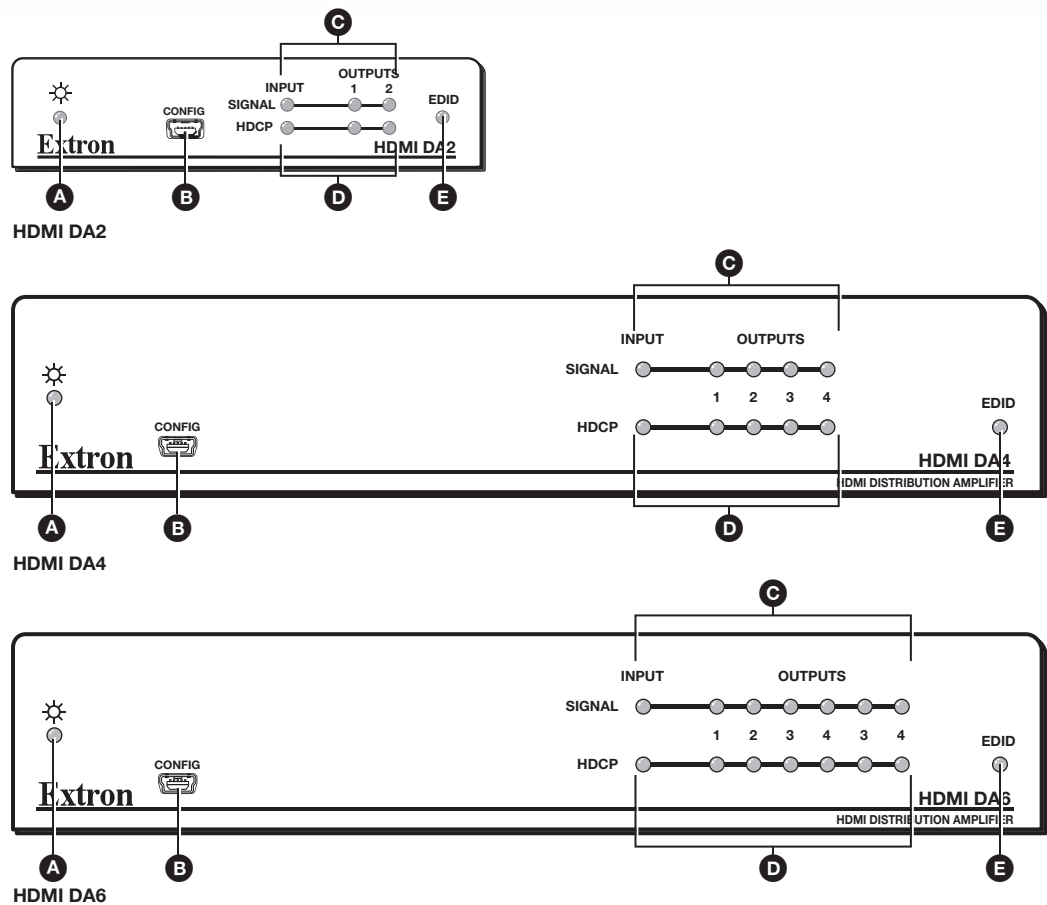


Figure 7. HDMI DA2 (top), HDMI DA4 (middle) and HDMI DA6 (bottom)

- A** **Power Status LED** (see below)
- B** **USB Config Port** (see page 12)
- C** **Signal LEDs** (see page 12)
- D** **HDCP LEDs** (see page 12)
- E** **EDID LED** (see page 12)

Power Status LED

The power status LED lights green when power is applied to the unit.

USB Config Port

The USB Config port is used for SIS configuration, monitoring, and firmware updates. This port can be used as an alternative to the rear panel RS-232 captive screw connectors.

NOTES:

- Neither port has precedence and commands from either port are handled in the order they are received.
- Extron recommends that the USB port is used for temporary connections. If a permanent connection is required, the RS-232 port should be used.

When the USB Config Port is connected to the distribution amplifier for the first time, the Found New Hardware Wizard opens to install the correct device driver (see [Connecting to the USB Port](#) on page 9).

Signal Status LEDs

Input Signal LED

The input signal LED lights green when a TMDS signal is detected on the HDMI input. If the source requires HDCP encryption, this LED may light only after the HDCP has been authenticated.

Output Signal LEDs

There are two (HDMI DA2), four (HDMI DA4), or six (HDMI DA6) output signal LEDs, one for each of the outputs. The LEDs light green when an active sink device is connected to the corresponding output (based on hot plug detect).

HDCP LEDs

Input HDCP LED

The Input HDCP LED lights green when the source device requires HDCP encryption and it has been authenticated with the HDMI input.

Output HDCP LEDs

There are two (HDMI DA2), four (HDMI DA4) or six (HDMI DA6) output HDCP LEDs, one for each of the outputs. The LEDs light green when HDCP has been authenticated between the HDMI output and the corresponding sink device. This happens when the source device requires HDCP encryption and it has already been authenticated on the HDMI input.

The LEDs do not light if the source does not require HDCP encryption or if the sink is not HDCP compliant.

EDID LED

The EDID LED lights green when the EDID is successfully stored from the selected output device. This only occurs when an output EDID slot has been assigned.

The LED lights amber if the internal, factory-installed EDID is used or if the EDID was not successfully stored.

For information about using the EDID Minder, see [EDID Minder](#) on the next page.

EDID Minder

EDID Minder ensures that the connected source sees the EDID of a display, even if a display is not connected. Depending on the EDID assignment (by SIS command), the EDID of a connected display can be stored automatically, or the user can manually select from the table of factory EDID files. This EDID is stored on an EEPROM located at the HDMI input.

The **EDID Lookup Table** is shown on the following page. The default EDID assignment is 720p 60 Hz, 2ch Audio (slot 34 in the EDID Lookup Table). The unit reverts to this configuration after a factory reset.

Factory EDID

The user can select from 48 factory loaded EDID files, each categorized by rate type (PC or HDTV), video format (DVI or HDMI), audio type (2-Ch or Multi-Ch), and native resolution.

Output EDID

EDID from each connected output is automatically saved in the corresponding output slots. This EDID is retained until a different display is connected to the output or the unit is power-cycled. If no display is connected to the specified output when the unit is powered on, then the factory default EDID (720p @ 60 Hz, 2-Ch audio) is used.

User Slots

Four user-loaded slots are available to save the EDID of any connected display. EDIDs saved to these slots are retained after a power cycle. Upon a factory reset, these EDIDs revert to the factory default (720p @ 60 Hz, 2-Ch audio).

HDMI DA2, HDMI DA4, and HDMI DA6 EDID Lookup Table

X5	Native Resolution	Refresh Rate	¹ Rate Type	² Video Format	³ Audio Type	X5	Native Resolution	Refresh Rate	¹ Rate Type	² Video Format	³ Audio Type
1	800x600	60 Hz	PC	DVI	n/a	30	2048x1080	60 Hz	PC	HDMI	2-ch
2	1024x768	60 Hz	PC	DVI	n/a	31	480p	60 Hz	HDTV	HDMI	2-ch
3	1280x720	60 Hz	PC	DVI	n/a	32	576p	50 Hz	HDTV	HDMI	2-ch
4	1280x768	60 Hz	PC	DVI	n/a	33	720p	50 Hz	HDTV	HDMI	2-ch
5	1280x800	60 Hz	PC	DVI	n/a	34	720p (default)	60 Hz	HDTV	HDMI	2-ch
6	1280x1024	60 Hz	PC	DVI	n/a	35	1080i	50 Hz	HDTV	HDMI	2-ch
7	1360x768	60 Hz	PC	DVI	n/a	36	1080i	60 Hz	HDTV	HDMI	2-ch
8	1366x768	60 Hz	PC	DVI	n/a	37	1080p	50/25 Hz	HDTV	HDMI	2-ch
9	1400x1050	60 Hz	PC	DVI	n/a	38	1080p	50 Hz	HDTV	HDMI	2-ch
10	1440x900	60 Hz	PC	DVI	n/a	39	1080p	60/24 Hz	HDTV	HDMI	2-ch
11	1600x900	60 Hz	PC	DVI	n/a	40	1080p	60 Hz	HDTV	HDMI	2-ch
12	1600x1200	60 Hz	PC	DVI	n/a	41	720p	50 Hz	HDTV	HDMI	multi-ch
13	1680x1050	60 Hz	PC	DVI	n/a	42	720p	60 Hz	HDTV	HDMI	multi-ch
14	1920x1080	60 Hz	PC	DVI	n/a	43	1080i	50 Hz	HDTV	HDMI	multi-ch
15	1920x1200	60 Hz	PC	DVI	n/a	44	1080i	60 Hz	HDTV	HDMI	multi-ch
16	2048x1080	60 Hz	PC	DVI	n/a	45	1080p	50/25 Hz	HDTV	HDMI	multi-ch
17	800x600	60 Hz	PC	HDMI	2-ch	46	1080p	50 Hz	HDTV	HDMI	multi-ch
18	1024x768	60 Hz	PC	HDMI	2-ch	47	1080p	60/24 Hz	HDTV	HDMI	multi-ch
19	1280x768	60 Hz	PC	HDMI	2-ch	48	1080p	60 Hz	HDTV	HDMI	multi-ch
20	1280x800	60 Hz	PC	HDMI	2-ch	49	Output 1				
21	1280x1024	60 Hz	PC	HDMI	2-ch	50	Output 2				
22	1360x768	60 Hz	PC	HDMI	2-ch	51	Output 3	Outputs 3 and 4 are available only on the HDMI DA4 and HDMI DA6			
23	1366x768	60 Hz	PC	HDMI	2-ch	52	Output 4				
24	1400x1050	60 Hz	PC	HDMI	2-ch	53	Output 5				
25	1440x900	60 Hz	PC	HDMI	2-ch	54	Output 6				
26	1600x900	60 Hz	PC	HDMI	2-ch	55	User loaded slot 1				
27	1600x1200	60 Hz	PC	HDMI	2-ch	56	User loaded slot 2				
28	1680x1050	60 Hz	PC	HDMI	2-ch	57	User loaded slot 3				
29	1920x1200	60 Hz	PC	HDMI	2-ch	58	User loaded slot 4				

Table 1. HDMI DA4 and HDMI DA6 EDID Lookup Table (1,2,3 see footnotes on the following page)

Footnotes for the EDID lookup table (see page 14)

The following footnotes apply to the EDID table on the previous page:

¹Rate Type

- **PC:** These are primarily VESA standard computer rates, based on the most commonly used native resolutions. They are designed to be used with computer sources.
- **HDTV:** These are video rates standardized by SMPTE and CEA. They are designed to be used with video and computer sources.

²Video Format

- **DVI:** These are 128-byte EDID files, which specify a DVI sink. They do not contain an extension block.
- **HDMI:** These are 256-byte EDID files, each containing a CEA extension block. They each specify an HDMI sink device with audio support.

³Audio Type

- **n/a:** These are DVI formatted EDID files; therefore, they do not support audio.
- **2-Ch:** These are HDMI formatted EDID files, with support for basic 2-channel (stereo) audio.
 - LPCM (2-Ch)
- **Multi-Ch:** These are HDMI formatted EDID files with support for multiple audio formats, up to 8 channels.
 - LPCM (2-Ch)
 - LPCM (8-Ch)
 - Dolby Digital (6-Ch)
 - DTS (7 Ch)
 - Dolby Digital Plus (8-Ch)
 - DTS-HD (8-Ch)
 - Dolby TrueHD (8-Ch)

Mounting

The HDMI DA units can be mounted in any of the following locations:

- **Desktop Placement**
- **Rack Mounting**
- **Under-desk Mounting**

Desktop 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 (T_{ma}: +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

See the HDMI DA Series product page at www.extron.com for a list of suitable rack mounting kits and shelf accessories. Follow the instructions provided with the shelf accessories.

Under-desk Mounting

See the HDMI DA Series product page at www.extron.com for a list of suitable under-desk mounting kits. Follow the instructions provided with the kit.

SIS Commands

This section provides information about the SIS commands that are used to configure the HDMI DA2, HDMI DA4, and HDMI DA6. The following topics are discussed:

- [Introduction to SIS](#)
- [Symbols Used in this Guide](#)
- [Command and Response Table for SIS Commands](#)

Introduction to SIS


The distribution amplifiers can be set up and controlled remotely via Extron SIS commands that are issued from a host computer running the Extron DataViewer utility or other control system. The host device can be connected to the 3-pole captive screw connector on the rear panel (see [figure 2, E](#) on page 4) or to the mini USB config port on the front panel (see [figure 7, B](#) on page 11).

The protocol is 9600 baud, 8 data bit, 1 stop bit, and no parity.

NOTES:

- The wiring in the RS-232 cables crosses over so that the distribution amplifier transmit (Tx) wire connects with the control device receive (Rx) and vice versa.
- Only one control port can be used at a time. If the front port is in use, the rear captive screw connector must be disconnected from the computer or other control device. Likewise, if the captive screw port is in use, the USB port on the front panel must be disconnected from the computer or other control device.

Host-to-Distribution Amplifier Communications

SIS commands consist of strings (one or more characters per command field). No special characters are required to begin or end a command sequence. Unless otherwise stated, upper and lower case characters can be used interchangeably. Most responses from the distribution amplifier ends with a carriage return and a line feed (CR/LF = ) , which signals the end of the response character string. When the switcher determines that a command is valid, it executes the command and sends a response to the host device.

Distribution Amplifier-initiated Messages

When a local event such as a change in signal status takes place, the distribution amplifier responds by sending a message to the host, indicating the status change. No response is required from the host.

When the distribution amplifier is first switched on, it sends the message:

(c) Copyright 20yy, Extron Electronics HDMI DA Series, V x.xx, 60-99x-01] where 20yy is the year the currently installed version of the firmware was released, 60-99x-01 is the catalog part number and V x.xx is the firmware version number.

NOTE: This response is only seen when the control computer is connected by the rear panel RS-232 control port.

Symbols Used in this Guide

When programming in the field, certain characters are most conveniently represented by their hexadecimal rather than their ASCII values. The table below shows the hexadecimal equivalent of each ASCII character:

ASCII to HEX Conversion Table															
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

Table 2. ASCII to HEX Conversion Table

↵ — carriage return with line feed

← — carriage return (no line feed)

• — space character

Esc — Escape key

The **X_n** values defined in this section are the variables used in the fields of the **Command and Response Table for SIS Commands** on the following page.

X1 — Output

1 or 2 (HDMI DA2)

1, 2, 3, or 4 (HDMI DA4)

1, 2, 3, 4, 5, or 6 (HDMI DA6)

X2 — Video mute status

0 = disabled

1 = video mute

2 = video and sync mute

X3 — Status

0 = disabled, off, or undetected

1 = enabled, on, or detected

X4 — Video bit depth mode

0 = auto (based on EDID of sink)

1 = force 8-bit

X5 — EDID slot (see the **HDMI DA2, HDMI DA4, and HDMI DA6 EDID Lookup Table** on page 14). The default value is 34 (720p 60 Hz, 2ch audio).

X6 — EDID data as 256 bytes of Hex data (text representation)

X7 — Native resolution and refresh rate (translated from Hex)

for example: 1600x1200 @60Hz

X8 — Controller firmware version to the second decimal place

X9 — Unit name: Up to 24 alphanumeric characters (including the hyphen [-])

No spaces are allowed

There is no distinction between upper and lower case letters

The first character must be a letter

The last character cannot be a hyphen (-)

Error Messages

- E01 — Invalid output channel number (too large)
- E10 — Invalid command
- E13 — Invalid value (too large)

Command and Response Table for SIS Commands

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
Video Mute			
Video mute single output	X1 * X2 B	Vmt X1 * X2 ↵	Video mute output X1 only 1 or 2 (HDMI DA2) 1, 2, 3, or 4 (HDMI DA4) 1, 2, 3, 4, 5, or 6 (HDMI DA6) X2 = 0 (video mute disabled) or 1 (video mute) or 2 (video and sync mute)
Video mute all outputs	X2 B	Vmt X2 ↵	Video mute all outputs
Query Video mute status	B	Vmt X2 • X2 •...• X2 ↵	video mute status of outputs 1 to 2 (HDMI DA2), 1 to 4 (HDMI DA4), or 1 to 6 (HDMI DA6).
Audio Mute			
Audio mute single output	X1 * X3 Z	Amt X1 * X3 ↵	Audio mute output X1 only X3 = 0 (audio mute disabled) or 1 (audio mute)
Audio mute all outputs	X3 Z	Amt X3 ↵	Audio mute all outputs
Query Audio mute status	Z	Amt X3 • X3 •...• X3 ↵	Audio mute status of outputs 1 to 2 (HDMI DA2), 1 to 4 (HDMI DA4), or 1 to 6 (HDMI DA6).
Video Bit Depth Mode			
Set video bit depth mode for a specific input	Esc V X1 * X4 BITD↵	BitdV X1 * X4 ↵	X4 = 0 (default value: auto, based on sink EDID) 1 (force 8-bit)
Set video bit depth mode for all inputs	Esc V X4 BITD↵	BitdV X4 ↵	
View video bit depth mode for all inputs	Esc VBITD↵	BitdV X4 • X4 •...• X4 ↵	video bit depth of outputs 1 to 2 (HDMI DA2), 1 to 4 (HDMI DA4), or 1 to 6 (HDMI DA6).
Signal Status			
Request all signal status	Esc LS↵	Sig X3 * X3 • X3 •...• X3 ↵	Signal status (X3) of the input and outputs 1 to 2 (HDMI DA2), 1 to 4 (HDMI DA4), or 1 to 6 (HDMI DA6). Signal status of input * output 1 • output 2 • output <i>n</i> X3 = 0 (signal undetected) or 1 (signal detected)
Request all HDCP status	Esc HDCP↵	Hdcp X3 * X3 • X3 •...• X3 ↵	X3 = 0 (HDCP on) or 1 (HDCP off) HDCP status of input * output 1 • output 2 • output <i>n</i>

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
HDCP Authorized Device			
Enable or disable HDCP authorization	Esc E[X3]HDCP ←	HdcpE[X3]↵	This command is not supported by the HDMI DA2. It is only available with the HDMI DA4 and HDMI DA6. X3 = 0 (HDCP authorization disabled) or 1 (default value : HDCP authorization enabled)
Request HDCP authorization status	Esc EHDCP ←	X3 ↵	
EDID Minder			
Assign EDID to input	Esc A[X5]EDID ←	EdidA[X5]↵	X5 = EDID memory location (1-58) see the HDMI DA2, HDMI DA4, and HDMI DA6 EDID Lookup Table on page 14
View EDID assignment	Esc AEDID ←	X5 ↵	
Save EDID of output to user location	Esc S[X1]*[X5]EDID ←	EdidS[X1]*[X5]↵	Store the EDID of output X1 into EDID memory location X5 (55-58)
View/Read EDID in Hex	Esc REDID ←	X6 ↵	Read out EDID in Hex from currently selected EDID
View EDID native resolution	Esc NEDID ←	X7 ↵	Resolution and refresh rate of currently selected EDID <i>Example: 1600x1200@60Hz</i>
Unit Name			
Set unit name	Esc [X9]CN ←	Ipn•[X9]↵	X9 = Up to 24 alphanumeric characters, including "-"
Set unit name to factory default	Esc •CN ←	Ipn•HDMA-DA-SERIES↵	
View unit name	Esc CN ←	X9 ↵	
Other			
Request part number	N	60-997-01↵ 60-998-01↵ 60-999-01↵	HDMI DA2 HDMI DA4 HDMI DA6
Query firmware version	Q	X8 ↵	X8 = Firmware build (2 decimal places)
Reset	Esc ZXXX ←	Zpx↵	

Updating Firmware

Updates to the HDMI DA Series firmware are released periodically on the Extron website. You can find which version is currently loaded on your distribution amplifier using SIS commands. Compare this with the latest release on the Extron website and decide whether to update your firmware.

TIP: Read the Release Notes provided on the website with the latest firmware to determine whether you need the latest version.

This chapter describes how to update firmware for the HDMI DA2, HDMI DA4, and HDMI DA6:

- [Downloading and Installing Firmware Loader](#)
- [Downloading HDMI DA Series Firmware](#)
- [Loading the Firmware to the Distribution Amplifier](#)

Downloading and Installing Firmware Loader

Extron recommends using the Firmware Loader software to update the firmware on Extron products. If you do not already have Firmware Loader installed on your computer, download it as follows:

1. Go to www.extron.com and click the **Download** tab.
2. On the Download Center screen, click the **Software** link on the left sidebar menu.
3. On the next Download Center screen, locate Firmware Loader and click its **Download** link.

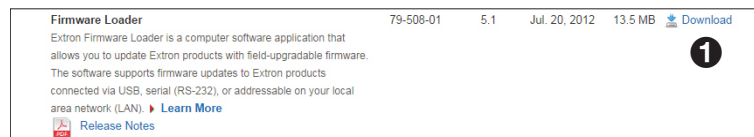


Figure 8. Firmware Loader Download Link

4. On the next screen, enter the requested information, then click the **Download fw_loader_vnxxn.exe** button (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 your computer. Note the folder to which the file was saved.
6. In Windows Explorer or another file browser, locate the downloaded executable installer file and double-click it to open it.
7. Follow the instructions on the Installation Wizard screens to install Firmware Loader on your computer. Unless you specify otherwise, the installer program places the Firmware Loader file, FWLoader.exe, at c:\Program Files\Extron\FWLoader.

Downloading HDMI DA Series Firmware

To obtain the latest version of firmware for your distribution amplifier:

1. At www.extron.com, click the **Download** link at the top of the page (figure 9, ❶), then click the **Firmware** link (❷) on the left sidebar menu.

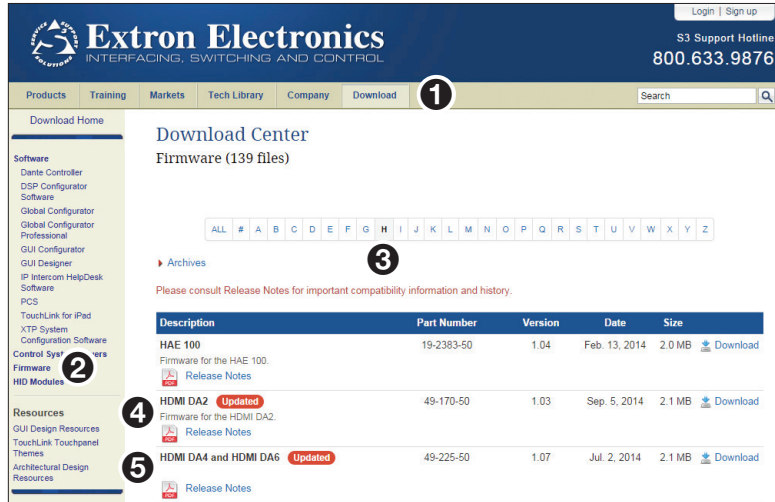


Figure 9. Firmware Link on the Download Tab

2. On the Download Center screen, click the letter H (❸) and locate the HDMI DA 2 (❹) or HDMI DA4 and HDMI DA6 (❺) firmware
3. (Optional) click **Release Notes**. These notes show the issues that are addressed by the latest update. If these issues do not affect you, you may decide not to upgrade the firmware.
4. Click **Download** for the firmware you require.
5. On the next screen that appears, enter the requested user information, then click the **Download** button.
6. Follow the instructions on the rest of the download screens to save the executable firmware file to your computer. Note the folder to which the file was saved.
7. In Windows Explorer or another file browser, locate the downloaded executable file, and double-click it to open it.
8. Follow the instructions on the **Installation Wizard** screens to install the new firmware on your computer. A Release Notes file and a set of instructions for updating the firmware are also loaded.

Loading the Firmware to the Distribution Amplifier

To load a new version of firmware to the distribution amplifier using Firmware Loader, follow these instructions.

1. If you have not already done so, download and install the Firmware Loader executable installer file to your computer (see [Downloading and Installing Firmware Loader](#) on page 21).
2. If necessary, download the latest version of firmware for your product and install it on your computer (see [Downloading HDMI DA Series Firmware](#) on the previous page).
3. Connect the distribution amplifier to the computer using either the rear panel RS-232 connector ([figure 2, E](#) on page 4) or the front panel USB connector ([figure 7, B](#) on page 11). See [Wiring for RS-232 Control](#) on page 8 or [Connecting to the USB Port](#) on page 9.
4. Open Firmware Loader. If you do not have a desktop icon, you can open the program from the Start menu by selecting:

Start > All Programs > Extron Electronics > Firmware Loader > Firmware Loader

The Firmware Loader dialog opens with the Add Device... dialog in front of it.

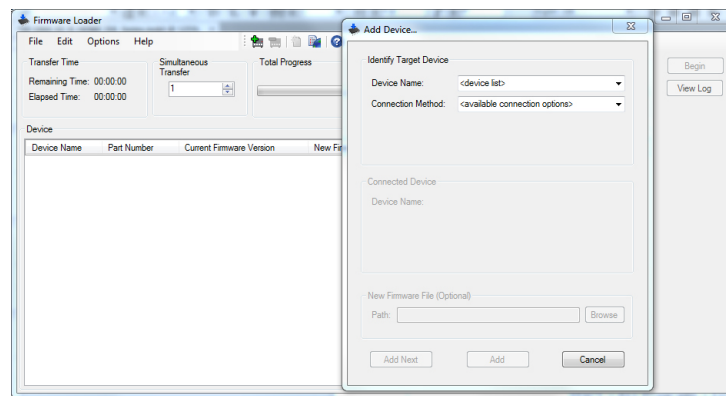


Figure 10. Opening Firmware Loader

5. Select the HDMI DA product from the **Device Name** menu.
6. Select either **RS-232** or **USB** from the **Connection Method** menu.
7. Depending on the connection method that you selected, additional options appear. Make the appropriate selections for your connection method.
 - **RS-232:** Select the appropriate options from the Com Port and Baud Rate menus (this information is provided by your system administrator).
 - **USB:** Only the Extron USB Device_0 option is available on the Available Devices menu. Make sure that it is selected.
8. Click **Connect**. If the connection is successful, HDMI DA2, HDMI DA4, or HDMI DA6 is displayed in green in the **Connected Device** panel, followed by a green check mark.
9. Click **Browse** to locate the Firmware file that was downloaded in step 2.

ATTENTION:

- Valid firmware files must have the file extension S19. A file with any other extension is not a firmware upgrade for this device and could cause the device to stop functioning.
- Les fichiers firmware valides doivent contenir l'extension fichier S19. Un fichier avec n'importe quelle autre extension n'est pas une mise à jour de firmware pour cet appareil et l'appareil pourrait arrêter de fonctionner.

NOTES:

- The original factory-installed firmware is permanently available on the HDMI DA2, HDMI DA4 or HDMI DA6. If the attempted firmware upload fails for any reason, the unit reverts to the factory version.
- By default, when the firmware is downloaded from the Extron site, it is saved in one of the following paths:

C:\Program Files\Extron\Firmware*folder_name* (Windows XP) or

C:\Program Files (x86)\Extron\Firmware*folder_name* (Windows 7)

where *folder_name* may be HDMI DA2, HDMI DA4, HDMI DA6, HDMI DA, or something similar.

10. If you have multiple units that are all connected to your computer, you can upload the same firmware to all of them. Click **Add Next**.

The first device is added to the Devices section and the **Add Device...** dialog remains open. Add additional devices, by repeating this step.

When you are about to add the last device, (or if you are only updating a single unit) press **Add** (do not press **Add Next**). The device is added to the device list in the Firmware Loader window and the **Add Device...** dialog closes.

11. Highlight the distribution amplifier in the device list and click **Begin**. The following indicators show the progress of the update:
 - The **Transfer Time** section shows the amounts of remaining and elapsed time for the update.
 - The **Total Progress** section displays a progress bar with **Uploading...** above it.
 - In the **Devices** section, the **Progress** column displays an incrementing percentage and another progress bar. The **Status** column displays **Uploading**.
12. The upload is complete when the **Remaining Time** field shows **00.00.00**, the **Progress** column shows **100%**, and **Completed** is displayed above the progress bar and in the **Status** field. Close the Firmware Loader dialog.

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

Japan:

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

Europe and Africa:

Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:

Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Asia:

Extron Electronics Asia Pte. Ltd.
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
Dubai, United Arab Emirates

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
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 Headquarters +1.800.633.9876 (Inside USA/Canada Only) Extron USA - West +1.714.491.1500 Extron USA - East +1.714.491.1517 FAX Extron USA - East +1.919.850.1000 Extron USA - East +1.919.850.1001 FAX	Extron Europe +800.3987.6673 (Inside Europe Only) +31.33.453.4040 +31.33.453.4050 FAX	Extron Asia +65.6383.4400 +65.6383.4664 FAX	Extron Japan +81.3.3511.7655 +81.3.3511.7656 FAX	Extron China +86.21.3760.1568 +86.21.3760.1566 FAX	Extron Middle East +971.4.299.1800 +971.4.299.1880 FAX	Extron Korea +82.2.3444.1571 +82.2.3444.1575 FAX	Extron India 1800.3070.3777 (Inside India Only) +91.80.3055.3777 +91.80.3055.3737 FAX
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