

HD 4K 110 Series

HDMI Signal Regenerator



Extron Electronics
INTERFACING, SWITCHING AND CONTROL

Safety Instructions

Safety Instructions • English

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

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

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

Sicherheitsanweisungen • Deutsch

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

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Instrucciones de seguridad • Español

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

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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.

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Istruzioni di sicurezza • Italiano

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Instrukcje bezpieczeństwa • Polska

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

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

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Инструкция по технике безопасности • Русский

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안전 지침 · 한국어

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

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

안전 가이드라인, 규제 준수, EMI/EMF 호환성, 접근성, 그리고 관련 항목에 대한 자세한 내용은 Extron 웹 사이트(www.extron.com)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: 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.

Conventions Used in this Guide

Notifications

The following notifications are used in this guide:

CAUTION: Risk of minor personal injury.

ATTENTION : Risque de blessure mineure.

ATTENTION:

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

NOTE: A note draws attention to important information.

Specifications Availability

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

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Introduction

This section gives an overview of the Extron HD 4K 110 Signal Regenerator and provides application examples. The following topics are covered:

- [About the HD 4K 110 Signal Regenerator](#)
- [Application Diagrams](#)

About the HD 4K 110 Signal Regenerator

The Extron HD 4K 110 is an HDMI signal regenerator that maximizes the quality of a digital signal at the beginning of its path by regenerating the signal. The HD 4K 110 reshapes a poor quality output signal, providing optimal image quality.

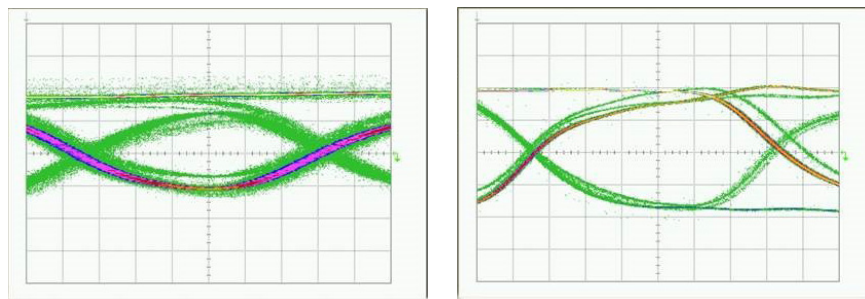
The HD 4K 110 is HDCP compliant, and supports video resolutions up to 4096x2160 @ 30 Hz, including 1080p/60 with 12-bit Deep Color. Source signals up to 4K resolution can be extended up to 25 feet (7.6 meters) when used with Extron HDMI Pro Series cables.

This product is available in decorator-style and AAP (Architectural Adapter Plate) form factors. Both models are available in black or white.

Signal Eye Pattern

The red, green, and blue TMD5 channels in an HDMI signal create an “eye” pattern (see figure 1), which indicates the “shape” of the signal. A distorted eye pattern (figure 1, left) indicates noise and jitter, which can result in erratic or no image display.

Figure 1 (right) shows this same signal after it has passed through the HD 4K 110 and been regenerated. The eye pattern is now “open” and clears the limit mask, which allows for reliable image display.



Before Regeneration

After Regeneration

Figure 1. HDMI Signal Before and After Regeneration through the HD 4K 110

Features

- **Supports computer and video resolutions up to 4096x2160 @ 30 Hz, including 1080p/60 with 12-bit Deep Color, and 2560x1600 @ 60 Hz 8-bit.**
- **Extends reconditioned 4K video signals up to 25 feet (7.6 meters) when used with Extron HDMI Pro Series cable.**
- **Available in AAP or decorator-style form factors** — Available as a double-space AAP or as a single-gang decorator-style wallplate.
- **Power and Signal indicator** — The bicolored LED on the front panel lights amber to indicate that power is on and green to indicate source signal presence.
- **Data rates** — Supports data rates of up to 10.2 Gbps; 3.4 Gbps per color.
- **Supports DDC and HDCP** — DDC channels are pass through or buffered, allowing pass-through of EDID and HDCP information between the source and the display.
- **Power supply (included)** — An energy-efficient external universal power supply provides worldwide power compatibility and low power consumption.

Application Diagram

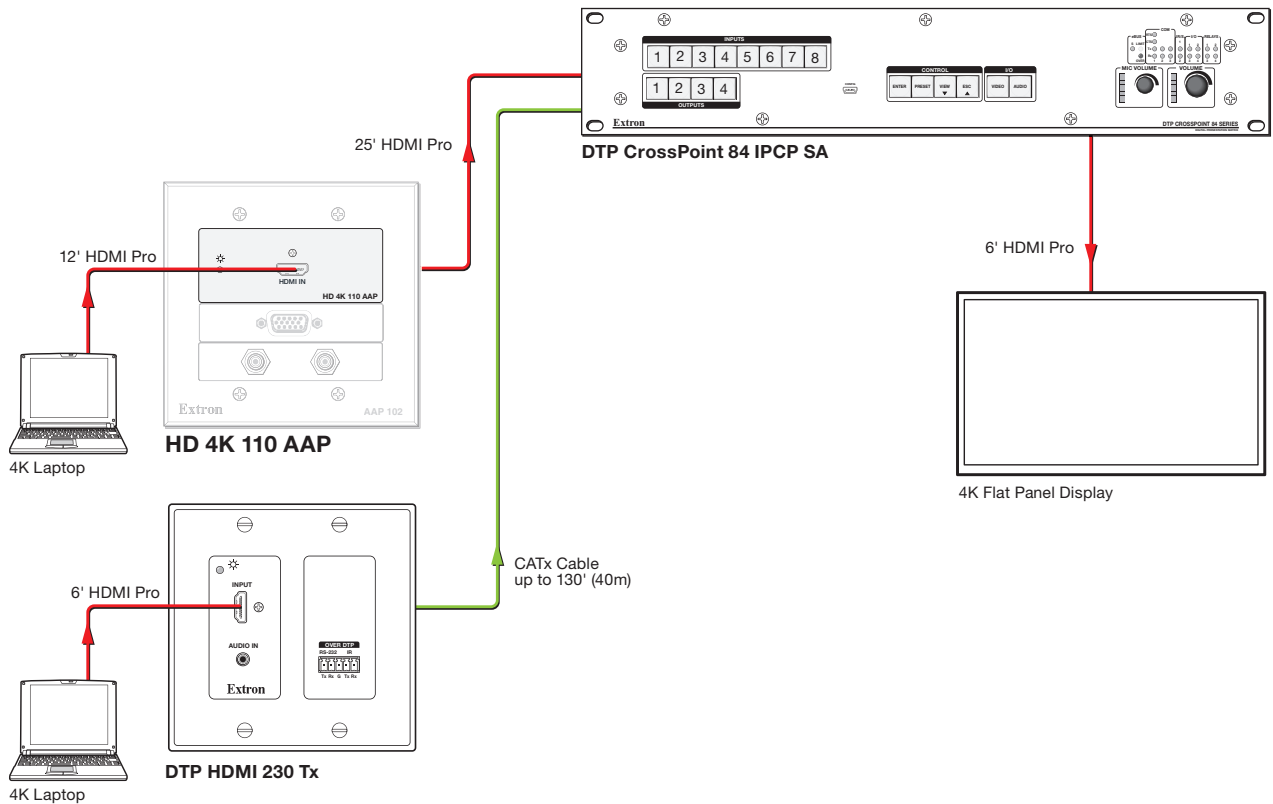


Figure 2. Using the HD 4K 110 with an HDMI Switcher

Installation

This section provides installation instructions for the HD 4K 110, including:

- [Mounting](#)
- [Cabling](#)

Mounting

ATTENTION:

- Installation and service must be performed by authorized personnel.
 - L'installation et l'entretien doivent être effectués par le personnel autorisé uniquement.
 - The unit must be installed in accordance with the National Electrical Code and with local electrical and safety codes.
 - L'unité doit être installée conformément au National Electric Code et aux normes électriques et de sécurité locales.
- The **HD 4K 110 AAP** can be installed in an Extron two-gang, four-gang, or half rack width AAP frame. The AAP frame can be mounted in a wall or furniture using a wall box or mud ring (see “Mounting a Wall Box” below, or [Mounting a Mud Ring](#) on page 5).
The HD 4K 110 AAP can also be installed in the faceplate of another Extron device that accepts double-space AAPs (see the mounting instructions for the device).
 - The **HD 4K 110 D** can be installed in a standard or compact one-gang wall box or mud ring (see “Mounting a Wall Box” below, or [Mounting a Mud Ring](#) on page 5).

UL Guidelines

- The Extender must be installed in an Underwriters Laboratories (UL) listed junction box. The UL-approved electrical wall box (junction box) is not included with the unit; the installer is responsible for obtaining and installing the box.
- The unit must be installed in accordance with the National Electrical Code and with local electrical codes.

Mounting a Wall Box

NOTES:

- Choose a location that allows cable runs without interference.
- Allow enough depth for the wall box and the cables.
- Install the cables into the wall, furniture, or conduits before installing the wall plate.

To mount the HD 4K 110 using a wall box:

1. Place the wall box against the installation surface and mark the guidelines for the opening.

NOTE: If a wall box is not available to use for a template, use the [Decorator-Style Template Dimensions](#) on page 10 to create a template. If installing directly into furniture, cut out the center portion of the template.

2. Cut out the material from the marked area.
3. Check the size of the opening by inserting the wall box into the opening. Enlarge or smooth the edges of the opening if needed.
4. Feed the cables through the opening and through wall box punch-out holes (see figure 3, ❶), and secure them with cable clamps to provide strain relief (❷).
5. Trim back and insulate foil or braided shields with heat shrink to reduce the chance of short circuits.

To prevent short circuits, the outer foil shield can be cut back to the point where the cable exits the cable clamp (figure 3, ❸).

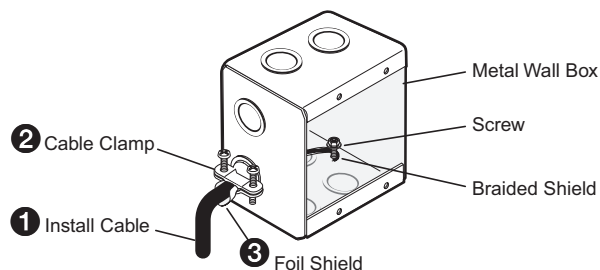


Figure 3. Grounding Outer Braided and Foil Shields

6. Insert the wall box into the opening, and secure it with nails or screws (see figure 4, ❶), leaving the front edge flush with the outer wall or furniture surface (❷).

NOTES:

- If attaching the wall box to wood, use four #8 or #10 screws or 10-penny nails. A minimum of 0.5 inch (1.3 cm) of screw threads must penetrate the wood.
- If attaching the wall box to metal studs or furniture, use four #8 or #10 self-tapping sheet metal screws or machine bolts with matching nuts.

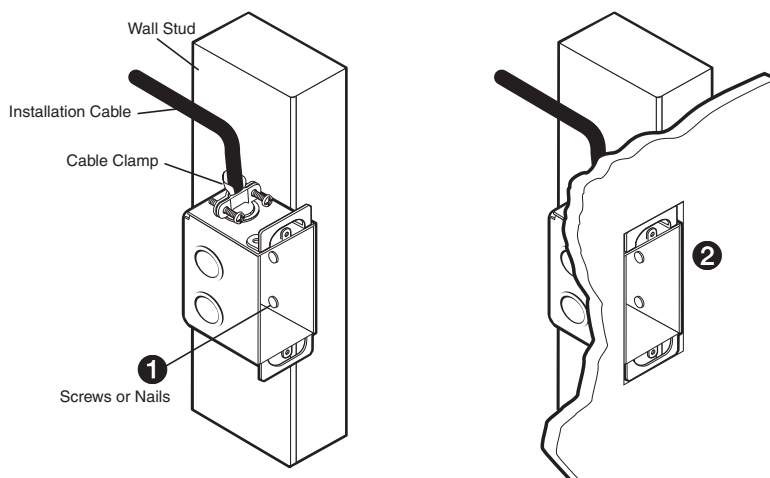


Figure 4. Attaching a Wall Box to a Wall Stud (applies to one-, two-, three-, and four-gang wall boxes)

7. Test the HD 4K 110 before fastening it into the wall box as the cables are not accessible after installation. Connect cables to the front and rear of the HD 4K 110 to test it (see [Cabling](#) on page 7).
8. After testing, see instructions on page 6 for [Mounting the HD 4K 110 D](#) or [Mounting the HD 4K 110 AAP](#) (depending on your model).

Mounting a Mud Ring

NOTES:

- Choose a location that allows cable runs without interference.
- Allow enough depth for the mud ring and the cables.
- Install the cables into the wall, furniture, or conduits before installing the wall plate.

To mount the HD 4K 110 using a mud ring:

1. Using the mud ring as a guide, mark the edges and cut out the material within the marked area.
2. Insert the mud ring into the opening, rotate and secure the locking arms with the supplied screws as shown in figure 5.

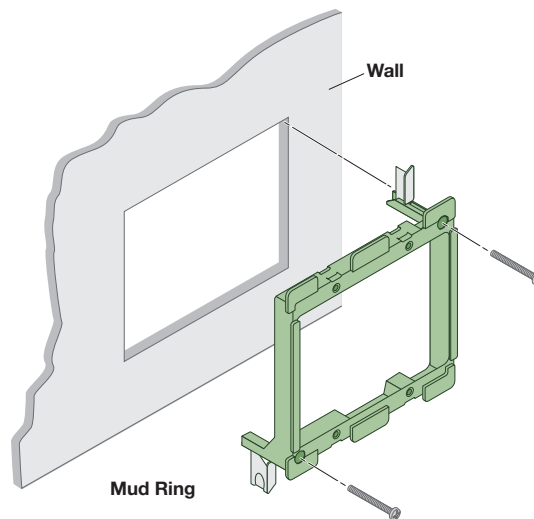


Figure 5. Installing the Mud Ring

3. Test the HD 4K 110 before fastening it into the mud ring as the cables are not accessible after installation. Connect cables to the front and rear of the HD 4K 110 to test it (see [Cabling](#) on page 7).
4. After testing, follow the steps on the next page for [Mounting the HD 4K 110 D](#) or [Mounting the HD 4K 110 AAP](#) (depending on your model).

Mounting the HD 4K 110 D

1. Remove power from the HD 4K 110 D by disconnecting the power supply.
2. Insert the HD 4K 110 D into the wall box or mud ring.
3. Attach the HD 4K 110 D to the wall box or mud ring using machine screws as shown in figure 6. Be careful not to damage cables behind the HD 4K 110 D.

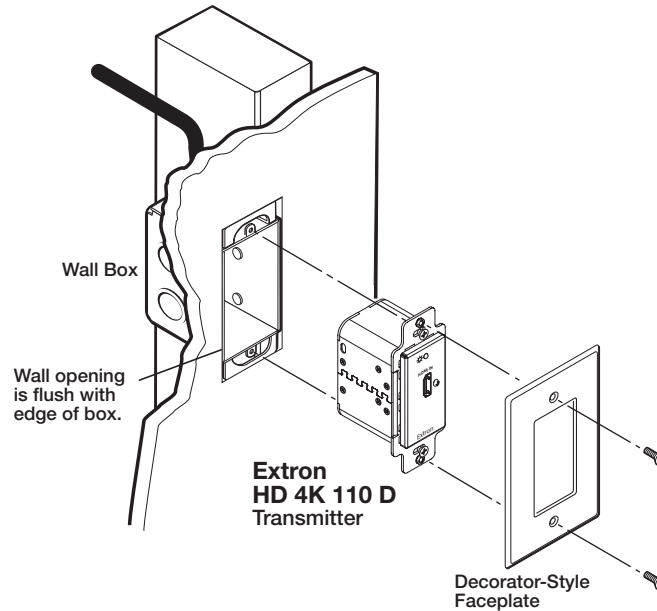


Figure 6. Mounting the HD 4K 110 D to a Wall Box

4. Attach the decorator-style wallplate to the HD 4K 110 D as shown in figure 6.
5. Reconnect the power supply and restore power to the equipment.

Mounting the HD 4K 110 AAP

1. Disconnect all cables from the back of the HD 4K 110 AAP.
2. Insert the HD 4K 110 AAP into the AAP frame.
3. Secure the HD 4K 110 AAP to the AAP frame using the provided #4-40 nuts and captive washers (see figure 7).
4. Reconnect all cables to the rear of the HD 4K 110 AAP.

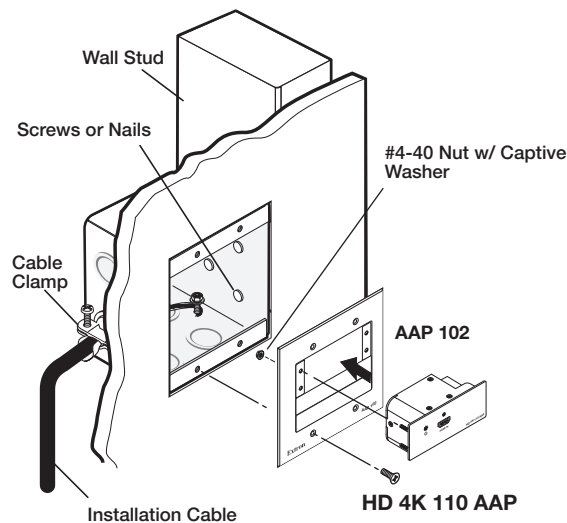


Figure 7. Mounting the HD 4K 110 AAP to an AAP Wall Plate

5. Repeat steps 2 and 3 on the previous page to mount other AAPs. Cover any openings in the AAP frame with blank plates (provided with the AAP frame).
6. Insert the assembled AAP frame into the wall box or mud ring.
7. Attach the AAP frame to the wall box or mud ring using machine screws (see figure 7 on the previous page). Be careful not to damage cables behind the AAPs.

Cabling

For best results, connect the HD 4K 110 near the HDMI source device in the system. The input and output cables to and from the HD 4K 110 should be 15 feet (4.6 m) or less.

To ensure transmission integrity in a long cable run, place an Extron HDMI 101 cable equalizer at the end of the run, immediately preceding the output device.

NOTE: Pairing the HD 4K 110 at the beginning of the cable run with an HDMI 101 at the end of the run ensures transmission integrity for up to 200 feet (61 m).

Rear Panel Features and Connections

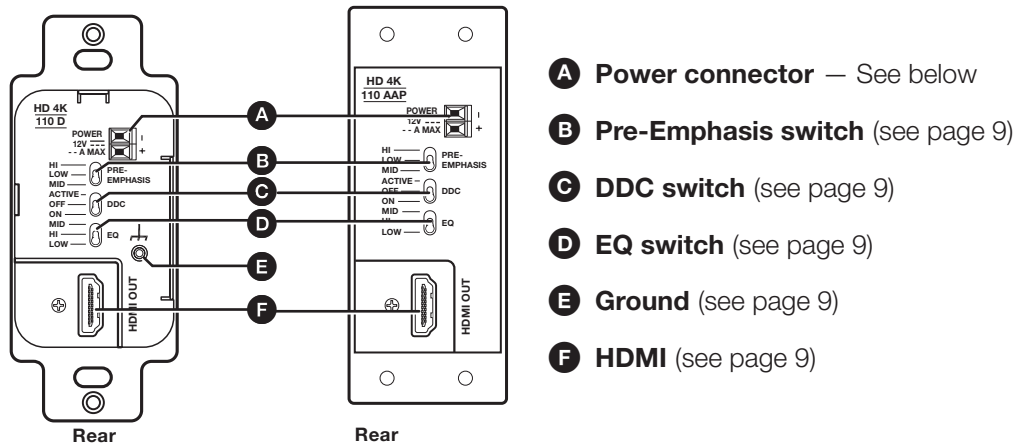


Figure 8. HD 4K 110 Rear Panel

- A Power connector** — Plug the external 12 VDC power supply (provided with the unit) into this 2-pole captive screw connector. The figure below shows how to wire the connector (see the CAUTION and ATTENTION on the next page for important information).

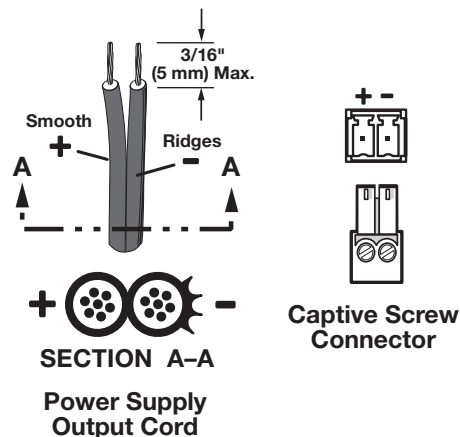


Figure 9. Wiring the Power Connector

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

ATTENTION : 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.
- Always use a power supply supplied by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.
- Utilisez toujours une source d'alimentation fournie par Extron. L'utilisation d'une source d'alimentation non autorisée annule toute conformité réglementaire et peut endommager la source d'alimentation ainsi que l'unité.
- If not provided with a power supply, this product is intended to be supplied by a power source marked "Class 2" or "LPS" and rated at 12 VDC and a minimum of 1.0 A.
- Si ce produit ne dispose pas de sa propre source d'alimentation électrique, il doit être alimenté par une source d'alimentation de classe 2 ou LPS et paramétré à 12 V et 1.0 A minimum.
- 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.

B Pre-Emphasis switch — Adjust this switch to compensate for signal degradation in applications with higher data rate, higher resolution, or both. This adjustment is recommended for resolutions of 2560x1600 @ 60 Hz or higher.



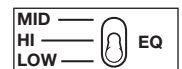
- **HI** — 2.5 dB
- **LOW** — None
- **MID** — 1.6 dB

C DDC switch — Use this switch for applications that require the DDC to be buffered.



- **ACTIVE** — For applications in which a source has a weak or no pull up resistor.
- **OFF** — Pass-through
- **ON** — Active, no pull up

D EQ switch — Adjust this switch to improve the image for applications with longer cable runs, image artifacts, or both.



- **MID** — 8.6 dB
- **HI** — 12.4 dB
- **LOW** — 4.3 dB

E Ground (decorator-style model only) — Helps to prevent ground loops, which cause noise, hum, and interference in audio and video systems. Use this ground point to ground the HD 4K 110 D to a wall box, if necessary.

F HDMI output connector — Plug the cable from this HDMI connector into an HDMI output device.

NOTE: This connector outputs reconditioned HDMI signals up to 300 Mhz pixel clock at different cable lengths ([Output Cable Lengths](#) on page 11).

Front Panel Features and Connections

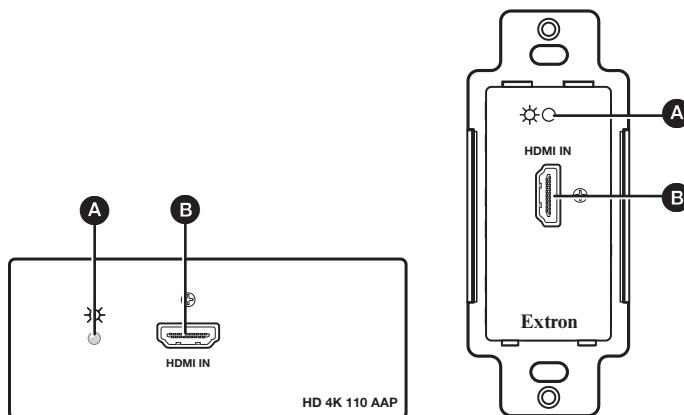


Figure 10. HD 4K 110 Front Panel

A Power and signal status LED — This dual-color LED lights amber when the HD 4K 110 is receiving power. When an HDMI input signal is present, the LED lights green.

NOTE: Use the provided external power supply to power the unit. The HD 4K 110 cannot receive power from the input device.

B HDMI input connector — Connect a digital video source to this female HDMI connector.

Reference Information

This section covers the following:

- Decorator-Style Template Dimensions
- Output Cable Lengths

Decorator-Style Template Dimensions

To create a template, use the dimensions shown in figure 10.

NOTE: The drawing below is **not** full size. Do not scale.

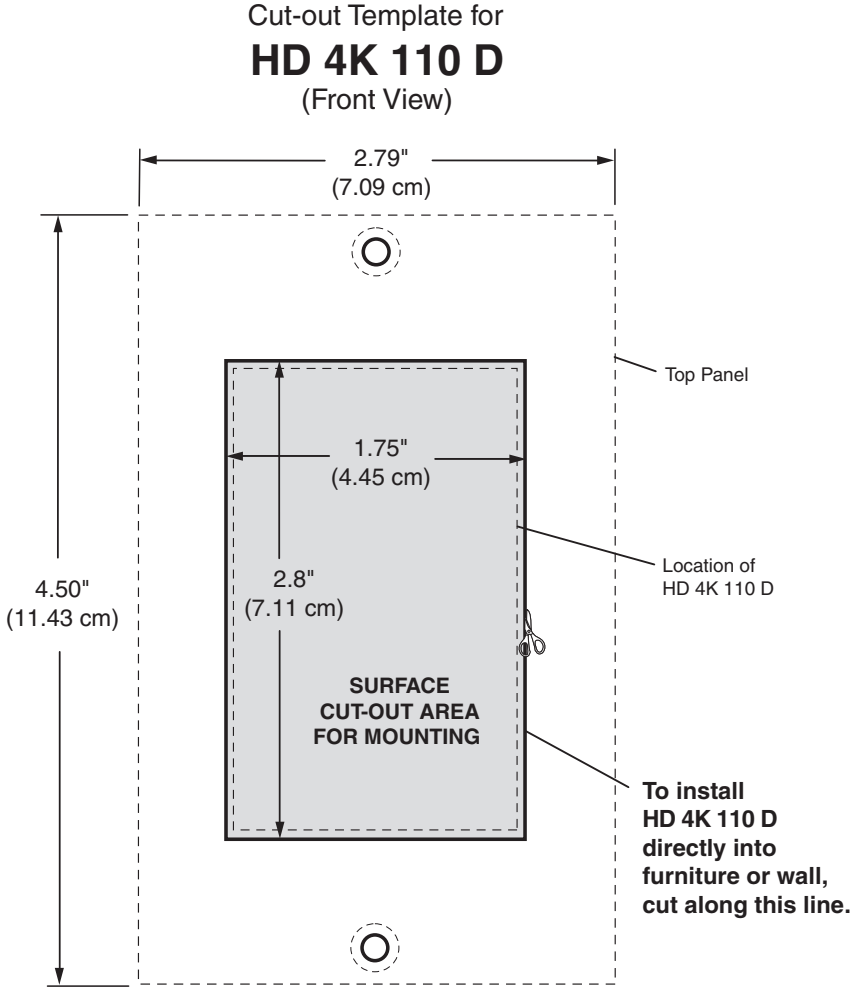


Figure 11. Decorator-Style Template Dimensions

Output Cable Lengths

Resolution	Refresh Rate (Hz)	Maximum distance (ft), powered	Maximum distance (ft), not powered
4096x2160 (4K)	30	25	25
3840x2160 (UHD)	60 (4:2:0)	25	25
3840x2160 (UHD)	30	25	25
1080p 8/10/12 bit	60	75	75
1080p 10/12 bit	30	75	75
1080p 8 bit	30	100	100
1080i	60	75	75
1080i	30	100	100
720p	24/30/60	100	100
PC Rates			
4096x2160	30	25	25
3840x2160	30	25	25
2560x1600	60	50	50
1920x1200	60	75	75
1920x1080	60	75	75
1600x1200	60	75	75
1280x1024	60	100	100
1024x768	60	125	125

NOTES:

- Only certain display models can handle 4:2:0 color sampling
- To extend signals the distances shown in the Input Cable Lengths table above, Extron recommends the use of HDMI Pro cables (see www.extron.com).

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

Middle East:

Extron Middle East
Dubai Airport Free Zone
F13, 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 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 aHDMIsed 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.

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