DVI & HDMI Extenders

HDMI 201
HDMI Twisted Pair Extender

Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

Safety Instructions • English

⚠ **This symbol is intended to alert the user of important operating and mainte-nance (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.

Conserver 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 impor-tantes 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 elemen-tos 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.

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 remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement 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 Erdanschluß, 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 Stomversorgung (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.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

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 u 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. Desechar 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.

Contents

Introduction

- **About this Manual**
- **About the HDMI 201 Transmitter and Receiver**
- **Features**

About this Manual

This manual describes the Extron® HDMI 201 family of High Definition Multimedia Interface (HDMI™) Extenders, which consists of HDMI 201 Tx transmitters and HDMI 201 Rx receivers. This manual describes how to install, operate, and configure them.

About the HDMI 201 Transmitter and Receiver

The Extron HDMI 201 Tx/Rx is a family of HDMI transmitters and receivers (figure 1), in enclosures that support different mounting options. A transmitter and receiver pair extends the usable distance of DVI or HDMI digital video and RS-232 control signals over two Category (CAT) 5/5e/6 unshielded twisted pair (UTP) or shielded twisted pair (STP) cables. Extron DTP26 digital cable is also recommended. The HDMI 201 A D transmitter and receiver also route audio, **but not on the TP link**. The video and control (and audio, if applicable) signals can be transmitted up to 200 feet (60 m).
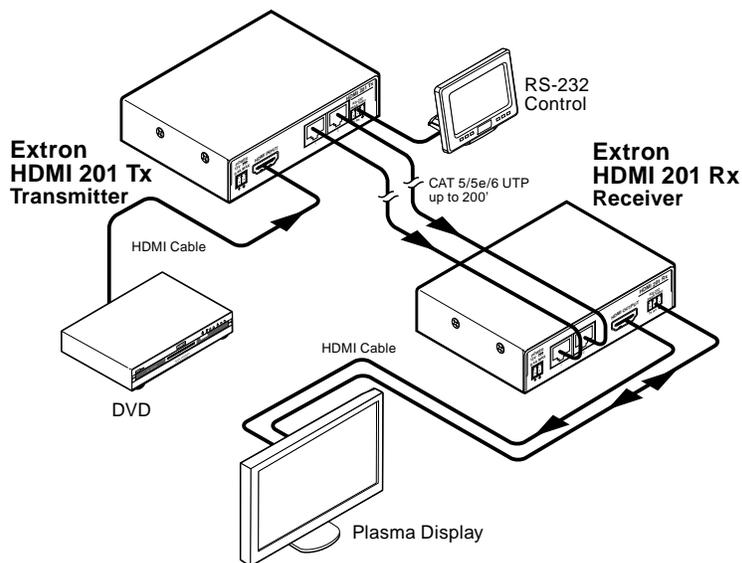

Figure 1. Typical Transmitter and Receiver Application

An HDMI 201 system consists of a transmitter (Tx) and a receiver (Rx). The pair can handle a single link of HDMI digital video and a bidirectional RS-232 link. The HDMI 201 A D also converts a computer audio input into balanced or unbalanced stereo audio output.

There are two subsets of transmitters and receivers in two different enclosures or form factors:

- **HDMI 201 Tx/Rx —** These units are housed in quarter rack width metal enclosures. They can be set on a tabletop or mounted in a rack, under or through furniture, or to a projector pole.

  > **NOTE:** The non-Decora models do not input, transmit, receive, or output audio.

- **HDMI 201 A D Tx/Rx —** These units are housed in enclosures that can be mounted in UL standard wall boxes with Decora®-style face plates. These units also convert computer level audio to balanced or unbalanced stereo audio.

  > **NOTES:** • A non-Decora transmitter or receiver is partially compatible with a Decora receiver or transmitter.
  > • A mixed form factor system *can* transmit and receive video and RS-232 communications.
  > • A mixed form factor system *cannot* transmit and receive audio, as the non-Decora models do not input, transmit, receive, or output audio.

<table>
<tr><td colspan="2" rowspan="2"></td><td colspan="2">Transmitters</td><td colspan="2">Receivers</td></tr>
<tr><td>HDMI 201 Tx
non-Decora</td><td>HDMI 201 A D Tx
Decora</td><td>HDMI 201 Rx
non-Decora</td><td>HDMI 201 A D Rx
Decora</td></tr>
<tr><td rowspan="2">Transmitters</td><td>HDMI 201 Tx
non-Decora</td><td></td><td></td><td>HDMI video
Control</td><td>HDMI video
Control</td></tr>
<tr><td>HDMI 201 A D Tx
Decora</td><td></td><td></td><td>HDMI video
Control</td><td>HDMI video
Control
Audio (pass)</td></tr>
<tr><td rowspan="2">Receivers</td><td>HDMI 201 Rx
non-Decora</td><td>HDMI video
Control</td><td>HDMI video
Control</td><td></td><td></td></tr>
<tr><td>HDMI 201 A D Rx
Decora</td><td>HDMI video
Control</td><td>HDMI video
Control
Audio (pass)</td><td></td><td></td></tr>
</table>

The units can be purchased as a pair (of the same form factor) or individually. Each purchased pair and each individual transmitter is shipped with a single external desktop 12 VDC power supply that accepts 100 to 240 VAC, 50-60 Hz input. A single power supply connected to either the transmitter or the receiver can power both units through one of the TP cables that link the units.

> **NOTE:** In this manual, the terms "HDMI 201," "HDMI 201 Tx," "HDMI 201 Rx," "transmitter," and "receiver" refer to the applicable unit in either form factor, unless otherwise specified.

TP Cable Advantages

Twisted pair cable is much smaller, lighter, more flexible, and less expensive than coaxial or HDMI cable. These transmitter and receiver twisted pair (TP) products make cable runs simpler and less cumbersome. Termination of the cable with RJ-45 connectors is simple, quick, and economical.

> **NOTES:**
> - The transmitter and receiver pair works with unshielded twisted pair (UTP) or shielded twisted pair (STP) cables; but, to ensure FCC Class A and CE compliance, STP cables are required.
> - Do not use Extron UTP23SF-4 Enhanced Skew-Free™ A/V UTP cable to link the transmitter and receiver. Skew-free A/V cable was designed for most Extron TP transmitter/receiver applications, but the HDMI 201 Tx/Rx does not work properly with this cable.

Control Communications

The RS-232 or infrared (IR) communications are pass-through only; the transmitter and receiver do not generate or respond to these signals.

Transmission Distance

The maximum transmission distance is determined by the resolution of the signal and the TP cable that is used.

- **With CAT 5/5e/6 <u>unshielded</u> TP cable**, the Tx/Rx pair can transmit and receive 720p and 1080i HDTV or XGA video signals up to 200 feet (60 m) and 1080p HDTV or UXGA video up to 100 feet (30 m).

- **With CAT 5/5e/6 <u>shielded</u> TP cable**, the Tx/Rx pair can transmit and receive 720p and 1080i HDTV or XGA video signals up to 200 feet (60 m) and 1080p HDTV or UXGA video up to 125 feet (38 m).

> **NOTES:**
> - The transmission distance varies greatly, depending on the signal resolution, type of cable used, graphics card, and display used in the system.
> - For resolutions of 1600x1200, 1920x1200, and 1080p, Extron strongly recommends DTP26 cable, or equivalent. Extron DTP26 cable consists of four individually shielded copper pairs and an overall braided shield that help reduce crosstalk. DTP26 cable extends these resolutions up to 150 feet (45 m).

Features

Transmits single link HDMI signals over two CAT 5/5e/6 cables — Standard twisted pair cables provide an economical, easily installed cable solution.

Supports DDC and HDCP copy protection transmission — The Tx/Rx pair fully supports long distance transmission of the DDC and HDCP signals.

Control communications pass-through — Bidirectional RS-232 or IR control signals can be transmitted alongside the HDMI signal, so that the remote display can be controlled without the need for additional cabling.

Audio routing — The HDMI 201 A D Tx/Rx also routes unbalanced stereo audio when **both units** are the Decora form factor.

Supports CEC signal transmission

1-inch high, quarter rack width, metal enclosures (HDMI 201 Tx and HDMI 201 Rx [non-Decora] only)— With low profile enclosures, both transmitter models and both receiver models can be discreetly installed in locations such as behind a plasma or LCD flat-panel display.

Wall-mountable enclosures (HDMI 201 A D Tx and HDMI 201 A D Rx [Decora] only)

External 100 VAC to 240 VAC, 50-60 Hz, international power supply (part #70-055-01) — Included with units sold as a paired system and with transmitters

Remote powering of transmitter or receiver — Only one power supply is necessary to power both devices.

Installation and Operation

This section describes the installation and the operation of the HDMI 201, including:

- **Mounting the Transmitter or Receiver**
- **Connections**
- **Operation**
- **Technical Points for Digital Video and Content Protection Encryption**
- **Troubleshooting**
- **Application Examples**

Mounting the Transmitter or Receiver

CAUTION: Installation and service must be performed by authorized personnel only.

Non-Decora Unit Mounting

The 1-inch high, quarter rack width HDMI 201 (non-Decora) transmitters and receivers can be placed on a tabletop, mounted on a rack shelf, or mounted under a desk or tabletop. The receiver can be mounted on a projector bracket.

Tabletop use

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

Rack shelf mounting

For rack mounting, mount the transmitter or receiver using any of the following rack mounting options:

- RSF 123 3.5-inch deep rack shelf kit (part #60-190-20) (**figure 2**)
- RSB 123 3.5-inch deep rack shelf (part #60-604-21)
- RSU 126 6-inch deep universal rack shelf kit (part #60-190-10)
- RSB 126 6-inch deep basic rack shelf (part #60-604-11)
- RSU 129 9.5-inch deep universal rack shelf kit (part #60-190-01) (**figure 3**)
- RSB 129 9.5-inch deep basic rack shelf (part #60-604-02)

UL guidelines for rack mounting

The following Underwriters Laboratories (UL) guidelines pertain to the installation of an HDMI 201 unit onto a rack.

1. **Elevated operating ambient —** If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature specified by the manufacturer [Tma = +32 to +122 °F (0 to +50 °C)].

2. **Reduced air flow —** Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

3. **Mechanical loading —** Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

4. **Circuit overloading —** Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

5. **Reliable earthing (grounding) —** Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (such as the use of power strips).

Rack shelf mounting instructions

On the 6-inch and 9.5-inch rack shelves, the transmitter or receiver unit can be mounted in the front or the rear of the rack.

1. Remove the feet from the bottom of the transmitter or receiver unit if installed.

2. Mount the transmitter or receiver unit on the rack shelf, using two 4-40 x 3/16-inch screws in opposite (diagonal) corners to secure it to the shelf (**figure 2**).
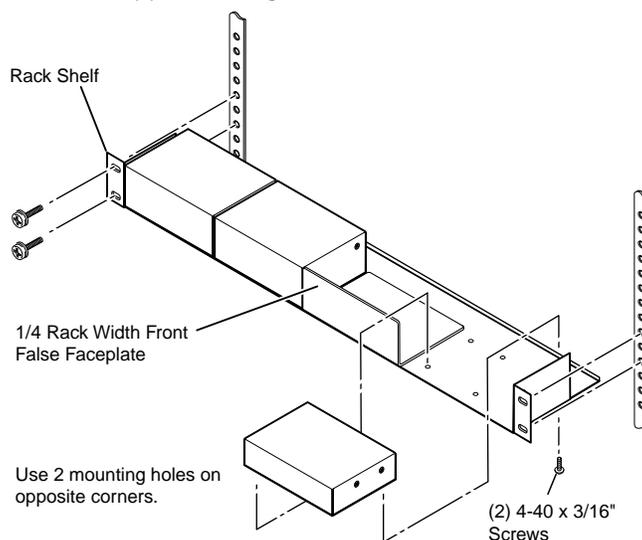

Rack Shelf

1/4 Rack Width Front False Faceplate

Use 2 mounting holes on opposite corners.

(2) 4-40 x 3/16" Screws

Figure 2. Mounting the Transmitter or Receiver unit on a 3.5-inch Rack Shelf

3. Install blank faceplates or other units on the rack shelf.

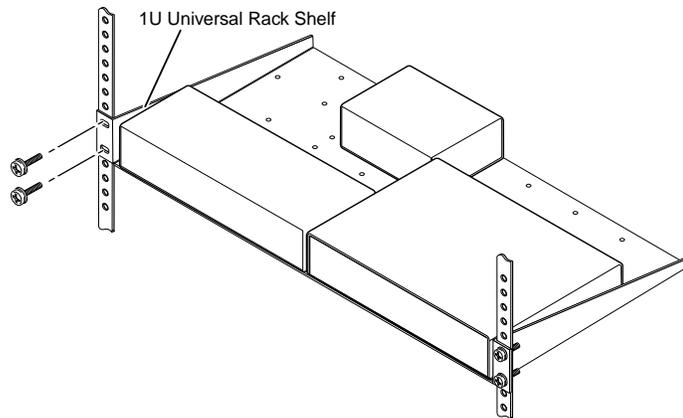4. Attach the rack shelf to the rack using the supplied bolts.

1U Universal Rack Shelf

Figure 3. Mounting the Transmitter or Receiver on a Universal Rack Shelf

Furniture mounting

Under-furniture mounting

The unit can be mounted under a horizontal surface using an optional MBU 125 under-desk mounting kit (part #70-077-01). Mount the unit under a desk or table as follows:

1. Remove feet from the bottom of the HDMI 201 unit if installed.

2. Secure the under-desk mounting brackets to the transmitter or receiver with the four machine screws provided in the mounting kit (figure 4).
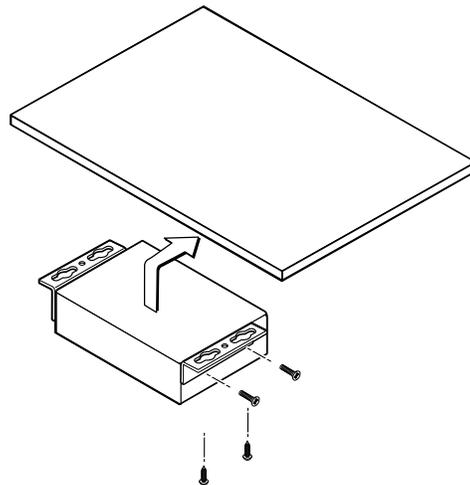

Figure 4. Under-Desk Mounting

3. Hold the transmitter or receiver with attached brackets against the underside of the desk or other furniture. Mark the location of holes for screws on the desk.

4. Drill 1/4-inch (6.4 mm) deep, 3/32-inch (2 mm) diameter pilot holes in the table or desk at the marked screw locations from the underside or inside (the concealed side) of the furniture, where the transmitter or receiver will be located.

5. Insert the four wood screws into the pilot holes. Fasten each screw into the installation surface until just less than 1/4 inch of the screw head protrudes.

6. Align the installed screws with the slots in the mounting brackets, and place the transmitter or receiver against the surface, with the screws through the bracket slots.

7. Slide the transmitter or receiver slightly forward or back, then tighten all four screws to fasten it in place.

Through-furniture mounting

The transmitter or receiver can be mounted through a desk or other furniture using an optional Extron MBD 129 through-desk mounting kit, part #70-077-02. Mount the transmitter or receiver through a desk or table as follows (figure 5):
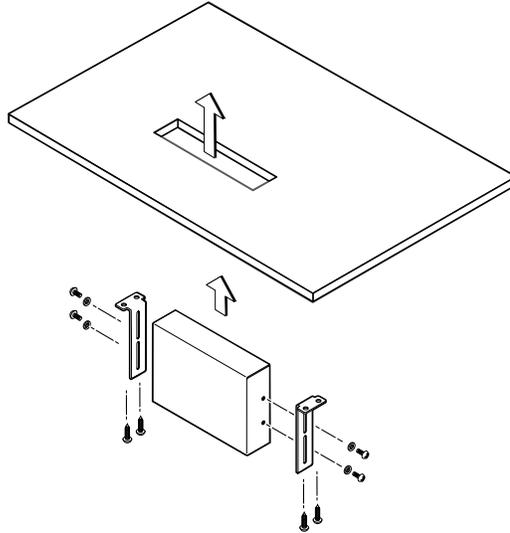

Figure 5. **Through-Desk Mounting**

1. Loosely attach the mounting brackets to the transmitter or receiver using the four machine screws and washers supplied with the mounting kit.

2. Hold the transmitter or receiver against the inside of the surface through which it will be mounted. Mark the four screw holes and the table material to be removed on the inside of the surface to which you are mounting the device.

3. Remove the table material. Test the fit by inserting the front of the device through the hole. If necessary, use a rasp or coarse file to enlarge the hole.

4. Drill four pilot holes, each 3/32-inch in diameter by 1/4 inch deep, where you made marks.

5. Using the provided four wood screws, secure the brackets to the mounting surface.

6. Slide the transmitter or receiver up and down in the mounting brackets until the face of the transmitter or receiver is at the desired height. Tighten the screws that secure the brackets in place.

If the screws are inaccessible to a screwdriver:

a. Mark the location of the brackets relative to the screws.

b. Remove the transmitter or receiver from inside the furniture.

c. Tighten the screws.

d. Replace the unit inside the surface (step **5**).

Projector mounting

The receiver can be mounted on a projector bracket using either of the following optional Extron projector mounting kits:

- PMK 300 multi-product pole mount kit (part #70-374-01)
- PMK 350 low profile, multi-product pole mount kit (part #70-563-02 [black] or part #70-563-03 [white])

PMK 300 mounting

Mount the receiver to a PMK 300 bracket as follows:

1. If necessary, remove the feet from the bottom of the receiver.

2. Mount the receiver to one of the three mounting plates on the bracket using two of the supplied 4-40 x 3/16-inch screws in opposite (diagonal) corners to secure the device to the bracket. It can be vertically mounted facing either up or down (figure 6).

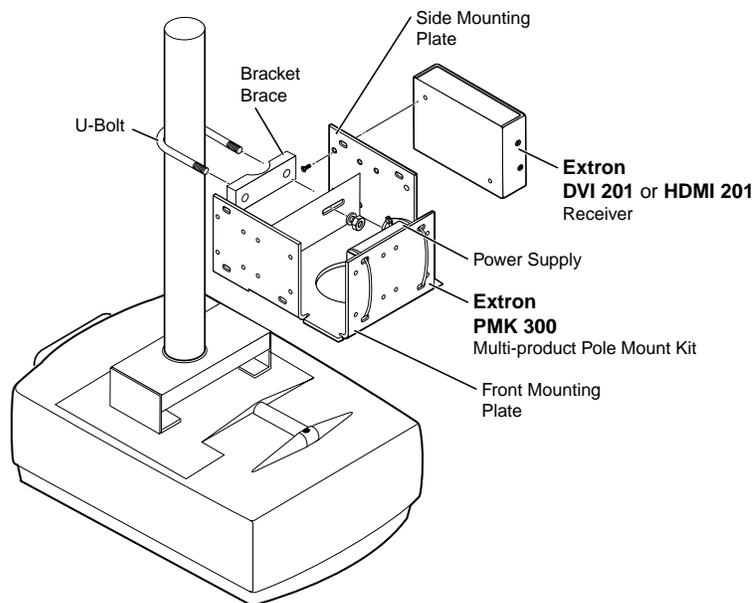
Figure 6. **PMK 300 Projector Mounting a Receiver**

> **NOTE:** On the side mounting plates, the device is typically mounted on the outside of the bracket.
> On the front mounting plate, the device is typically mounted on the inside of the bracket.

3. **If the power supply is connected to the receiver**, use the two included tie wraps to strap the power supply to one of the brackets.

NOTE: The PMK 300 has a hole in the bottom plate that allows the projector pole to be inserted through the center of the plate (figure 7), rather than outside of the plate (figure 6). To install the PMK 300 in this configuration, slide the bracket up from the bottom of the pole before the projector is installed on the pole.
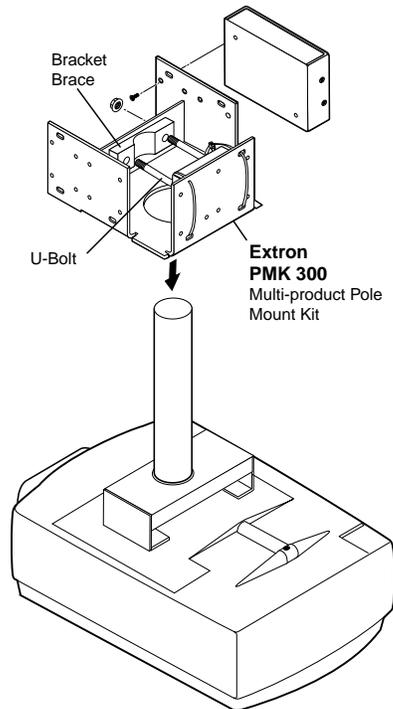
Figure 7. **Projector Pole on the Inside**

4. Place the contoured bracket brace against the pole and opposite the back plate. The pole should fit snugly into the depression in the center of the bracket brace.

5. Place the U-bolt around the ceiling pole. Insert the two legs of the U-bolt through the round holes on the contoured bracket brace and then through the slotted holes on the mounting plate on the bracket.

NOTE: The supplied U-bolt fits a typical (1.5 inch to 2.0 inch diameter) ceiling pole.

PMK 350 mounting

Mount the receiver to a PMK 350 bracket as follows:

1. Remove the front and rear plates from the PMK 350 (figure 8), using an Extron Tweeker or a #2 Phillips screwdriver. Retain the screws to reattach the plates.
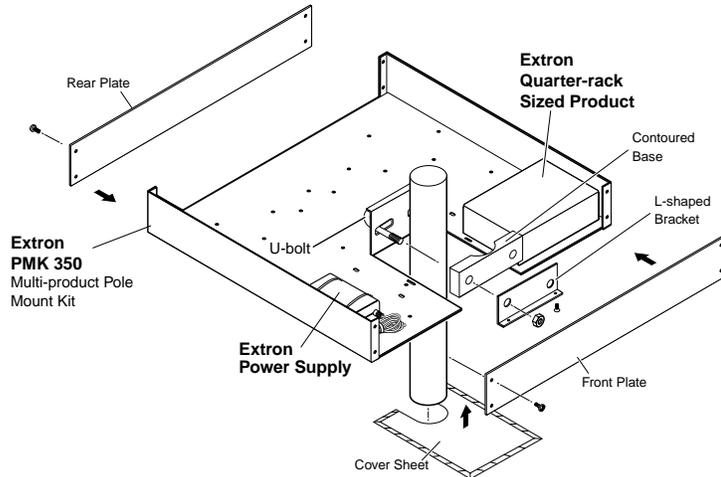

Figure 8. **PMK 350 Projector Mounting a Receiver**

2. If necessary, remove the feet from the bottom of the receiver.

3. Secure the receiver to one side of the mounting tray, using two of the supplied 4-40 x 3/16-inch screws in opposite (diagonal) corners.

4. If power supply is connected to the receiver, use the two included tie wraps to strap the power supply to the bracket.

5. Place the PMK 350 around the projector ceiling mounting pole (figure 8).

6. Assemble the U-bolt and the following parts in the following order (figure 9):

a. Pass the legs of the U-bolt through the slotted holes on the mount plate flange.

b. Place the legs around the projector pole.

c. Pass the legs through the holes in the contour base.

> **NOTE:** The pole fits snugly into the depression in the center of the contoured base.

d. Pass the legs through the holes in the L-shaped bracket.

> **NOTE:** The supplied U-bolt fits a typical (1.5-inch to 2.0-inch diameter) ceiling pole.
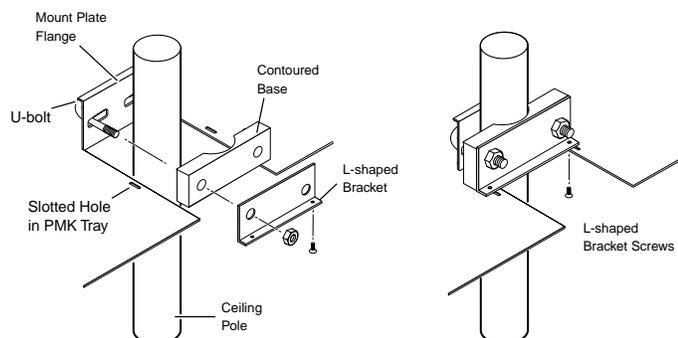
Figure 9. **Hanging the Tray on the Pole**

7. Align the two slotted holes in the bottom of the L-shaped bracket with the two slotted holes in the base of the tray. Secure the L-shaped bracket to the base by inserting two provided 6-32 x 5/16-inch screws through the aligned slots.

8. Move the PMK 350 up to the desired location on the ceiling pole, as close to the ceiling as desired.

9. Secure the L-shaped bracket to the U-bolt using the included hex nuts, washers, and lock washers. Tighten the hex nuts securely.

> **NOTE:** Be sure to tighten the hex nuts securely enough that the PMK 350 does not slide down the ceiling pole. A socket wrench is recommended to tighten the hex nuts.

10. Secure the front and rear plates to the mounting tray with four of the included #6 screws.

11. If desired, choose one of the provided four sizes of self-adhesive cover sheets, and apply it to the underside of the mounting tray.

Decora Unit Mounting

The HDMI 201 A D (Decora) transmitter and receiver can be installed in a one-gang electrical wall box with a Decora wall plate cover (supplied).

The installation must conform to national and local electrical codes and to the size requirements of the wall plate.

UL/safety guidelines

The following Underwriters Laboratories (UL) guidelines pertain to the installation of the Decora transmitters and receivers into a wall or furniture.

1. These units are not to be connected to a centralized DC power source or used beyond their rated voltage range.

2. These units must be installed in UL listed junction boxes.

3. These units must be installed with conduit in accordance with National Electrical Code.

Preparing the site and installing the wall box

Choose a location that allows cable runs without interference. Allow enough depth for both the wall box and the cables. The box should be at least 2.5 inches (6.4 cm) deep to accommodate the connectors and cables. Install the cables into the wall, furniture, or conduits before installing the wall plate.

> **NOTE:** The Decora units are very deep and have connectors on the back side (figure 10). Extron recommends its 1-gang or 2-gang junction boxes (part #s 980130 and 980084), which have a depth of 2.5 inches (6.4 cm).
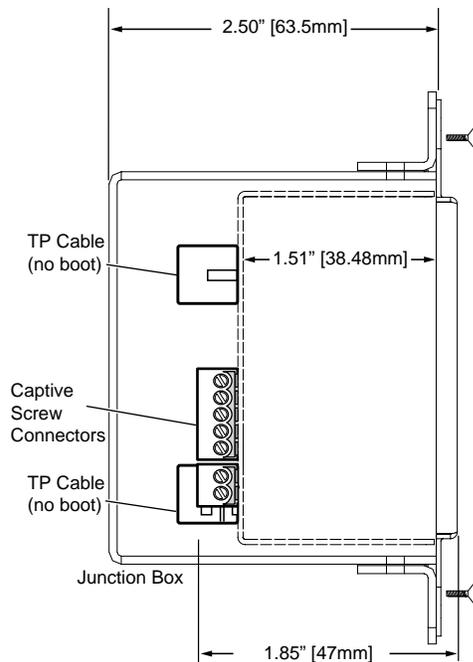

Figure 10. **Decora Unit Depth Profile**

To install a new wall box, perform steps **1** through **9** on the next page. If a suitable wall box is already installed, perform steps **6** through **9** on the next page. UL listed wall boxes are recommended.

1. If a wall box is not available to use for a template, see the **dimensions** on page 35 to create a template. If installing directly into furniture, cut out the center portion of your template.

2. Place the wall box (or your template) against the installation surface, and mark the opening guidelines.

3. Cut out the material from the marked area.

4. Insert the wall box into the opening. The rear connectors on the box or wall plate should fit easily into the opening. Enlarge or smooth the edges of the opening if needed.

5. Secure the wall box with nails or screws, leaving the front edge flush with the outer wall or furniture surface (figure 11).

> **NOTE:** 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 thread 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.
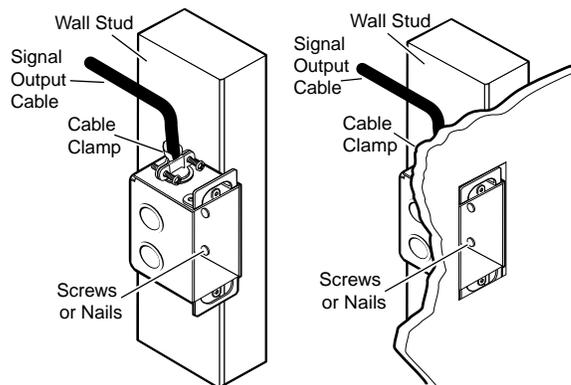
Figure 11. Installing the Wall Box

6. Feed the TP cables and, if applicable, the audio and power cables through the opening and through the wall box punch-out holes, securing them with cable clamps to provide strain relief.

> **NOTES:**
> • In order to fit in the junction box, the TP cables and RJ-45 connectors should not have a boot installed.
> • One power supply can power both the transmitter and the receiver, so only one unit needs a power supply.

7. Trim back and/or insulate exposed cable 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.

8. Connect the cables to the rear of the unit. See **Connections**, later in this manual, for connector wiring details.

9. Connect front panel devices (see **Connections**, later in this manual, for connector details), restore the power supply, and test the transmitter/receiver system. Make any cabling adjustments before final installation, as the cables will be inaccessible afterwards.

Final installation

After testing and making any adjustments, do the following:

1. At the power outlet, unplug the power supply.

> **NOTE:** One power supply can power both the transmitter and the receiver, so only one unit needs a power supply.

2. Mount the transmitter or receiver into the wall box, and attach the supplied Decora faceplate to the unit, as shown in figure 12.
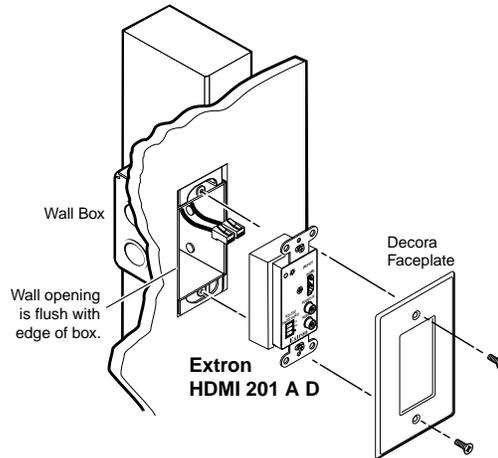
Figure 12. Mounting the Transmitter or Receiver

3. At the power outlet, reconnect the power supply. This powers up both units.

Connections

Transmitter Connections

The wall-mountable transmitter is in an enclosure that can be mounted in UL standard wall boxes with Decora-style face plates. The rack-mountable transmitter is in a quarter rack width enclosure.

Figure 13 shows the front panel of the HDMI 201 A D Tx. **Figure 14**, on the next page, shows the rear panel of both HDMI 201 Tx models.

HDMI 201 A D Tx Front Panel
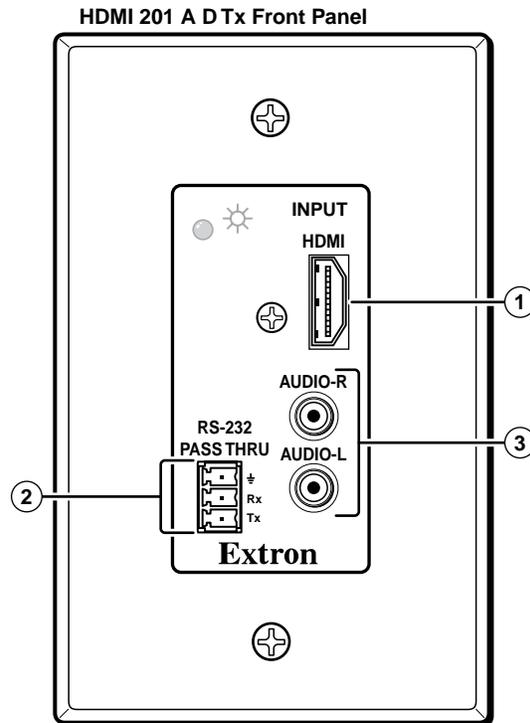
Figure 13. HDMI 201 Tx Front Panel Connectors

① **HDMI Input connector —** Connect an HDMI cable between this port and the HDMI output port of the digital video source. See **HDMI connector pin assignments** for pin assignments.

② **RS-232 connector —** Connect a serial communications port to this 3.5 mm, 3-pole captive screw connector for bidirectional RS-232 communication. See **RS-232 connector wiring** to wire the connector.

> **NOTE:** The RS-232 connector can also transmit one-way modulated infrared (IR) signals. See **Modulated IR Pass Through Application**.

HDMI 201 Tx Rear Panel

HDMI 201 A D Tx Rear Panel
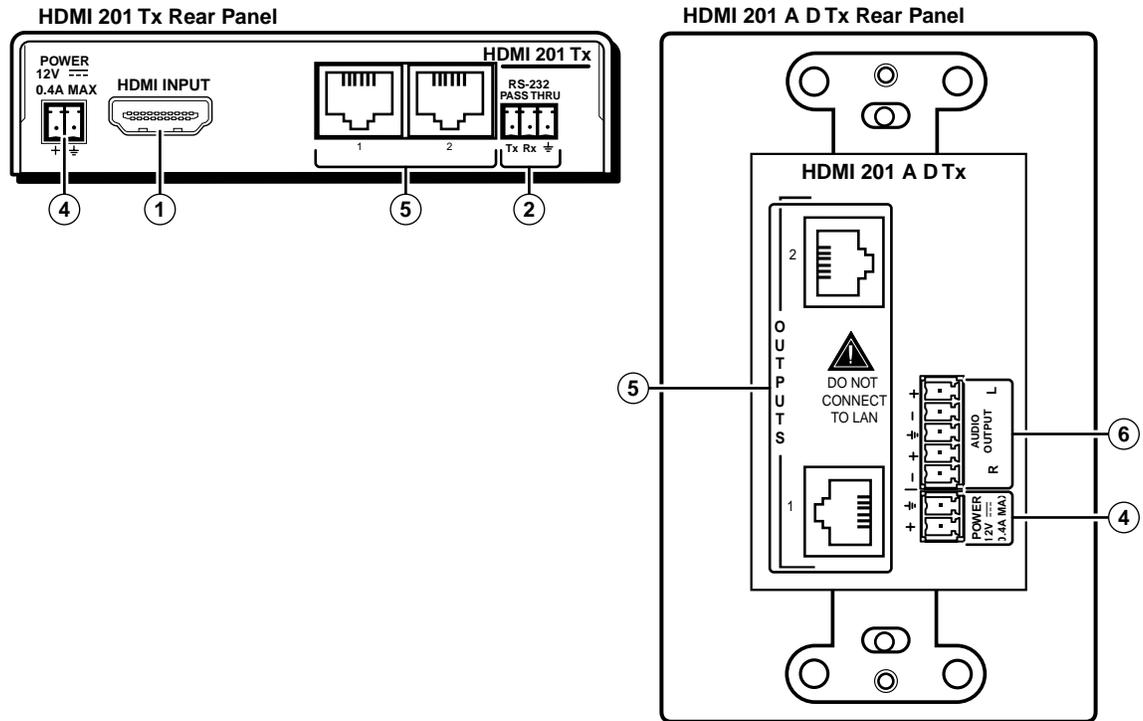
Figure 14. HDMI 201 Tx Rear Panel Connectors

③ **Input Audio (HDMI 201 A D Tx [Decora] only) connectors —** Plug an unbalanced stereo audio input into this pair, left and right, of female RCA connectors (figure 15).

Figure 15. RCA Connector Wiring

④ **DC power input connector —** Plug the included external 12 VDC power supply into either this 2-pole connector or the power input connector on the receiver (**item ⑦** on page 19). See **Power supply wiring** to wire the connector.

⑤ **Transmitter output ports —** Connect one end of two separate TP cables to these RJ-45 female connectors on the transmitter.

> **CAUTION:** Do not connect this device to a computer data or telecommunications network.

Connect the free ends of the same TP cables from the transmitter to the female Input RJ-45 connectors (**item ⑧** on page 20) on the receiver.
See **TP cable termination** to properly wire the RJ-45 connectors.

> **NOTES:** • Extron recommends 28AWG to 24AWG TP cable for the RJ-45 connectors.
>
> • For resolutions of 1600x1200, 1920x1200, and 1080p, Extron strongly recommends DTP26 cable, or equivalent.
>
> • Connect transmitter output 1 to receiver input 1. Connect transmitter output 2 to receiver input 2.
>
> • If necessary, test for proper cable connection (output 1 to input 1, output 2 to input 2) as follows:
>
> **1**. Plug both TP cables into the powered unit.
>
> **2**. Momentarily connect either of the cables on the opposite end into the "2" connector on the unpowered unit.
>
> If the Power LED on the unpowered unit is lit, the connection is correct.
>
> If the Power LED on the unpowered unit is not lit, unplug the connector on the unpowered end and connect the other cable to the "2" connector.

⑥ **Audio Output connector (HDMI 201 A D Tx [Decora] only) —** Connect one end of a 5-wire audio cable to this 3.5 mm, 5-pole direct insertion connector. Connect the free end of the same cable from the transmitter to any compatibly wired unit, such as a switcher, an amplifier, or an HDMI 201 A D Rx (Decora) receiver (**item ⑪** on page 21).
Figure 16 shows how to wire the captive screw audio connector. Insert the wires into the appropriate openings in the direct insertion connector. Tighten the screws on the side to fasten the wires.

Unbalanced Output   **Balanced Output**

AUDIO OUTPUT R: NO GROUND HERE. / Tip / Sleeve (s) / NO GROUND HERE. / Tip

AUDIO OUTPUT: Ring / Tip / Sleeve (s) / Ring / Tip

$\frac{3}{16}$" (5 mm) MAX.

Do not tin the wires!
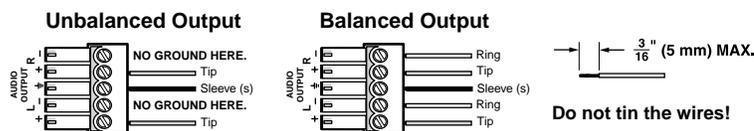
Figure 16. Captive Screw Connector Wiring for Transmitter Audio Output

> **CAUTION:** For unbalanced audio, connect the sleeves to the ground contact. **DO NOT** connect the sleeves to the negative (-) contacts).

Receiver Connections

The rack-mountable receiver is in quarter rack width enclosure. The wall-mountable receiver is in an enclosure that can be mounted in UL standard wall boxes with Decora-style face plates.

Figure 17 shows the rear panel of both HDMI 201 Rx models. Figure 18, on the next page, shows the front panel of the HDMI 201 A D Rx (Decora) receiver.
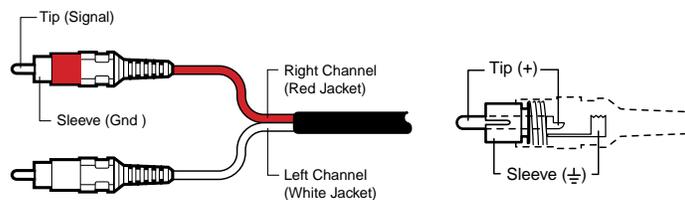
HDMI 201 Rx Rear Panel

HDMI 201 A D Rx Rear Panel
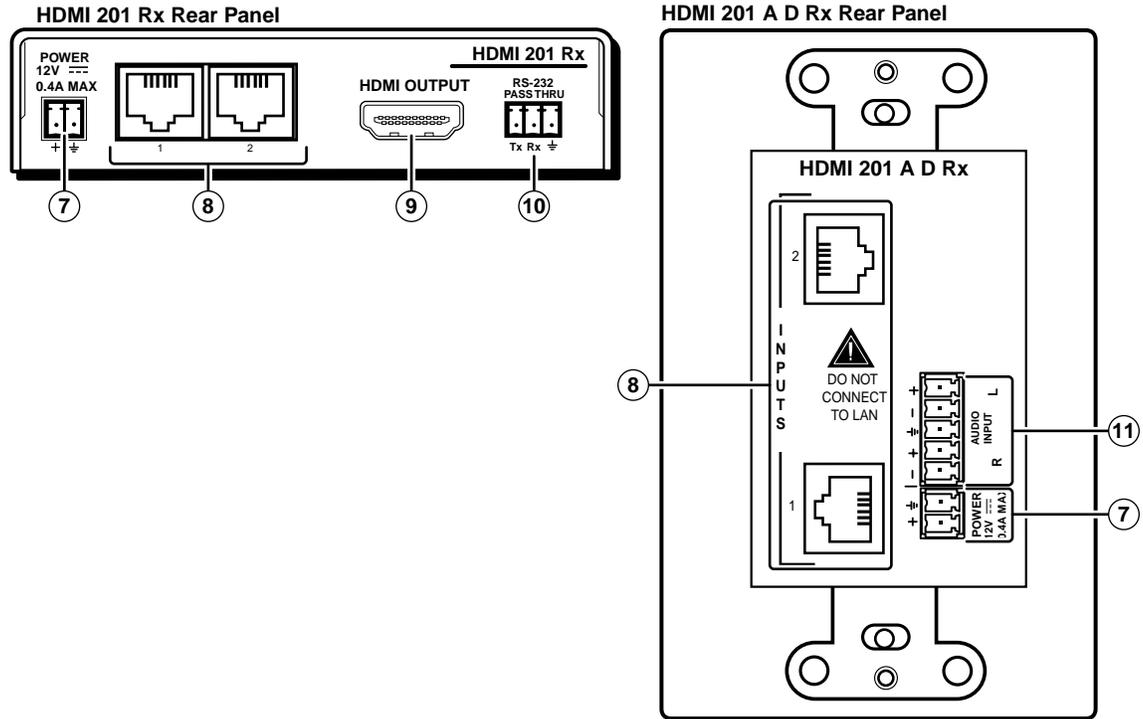
Figure 17. HDMI 201 Rx Rear Panel Connectors

⑦ **DC power input connector —** Plug the included external 12 VDC power supply into either this 2-pole connector or the power input connector on the transmitter (**item** ④ on page 17). See **Power supply wiring** to wire the connector.

HDMI 201 A D Rx Front Panel
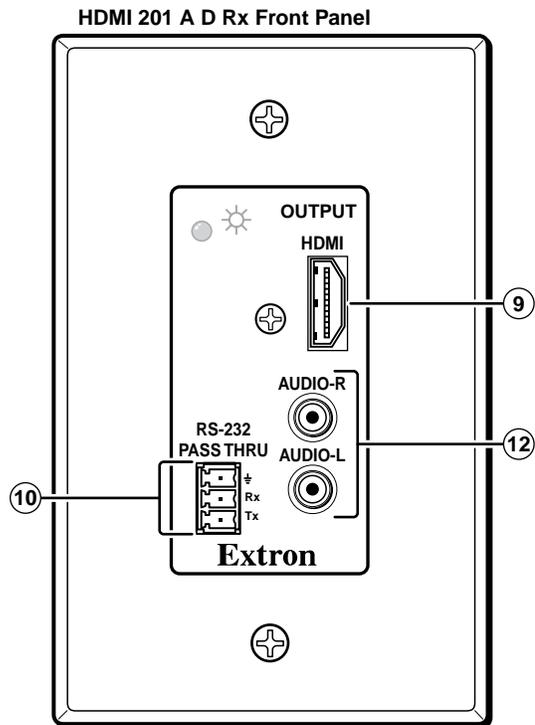
Figure 18. HDMI 201 A D Rx Front Panel Connectors

⑧ **Receiver input ports —** Connect one end of the two separate TP cables from the transmitter output connectors (**item** ⑤ on page 18) to these RJ-45 female connectors.

> **CAUTION:** Do not connect this device to a computer data or telecommunications network.

Connect the free ends of the same TP cables from the receiver to the female Output RJ-45 connectors (**item** ⑤ on page 18) on the transmitter.
See **TP cable termination** to properly wire the RJ-45 connectors.

> **NOTE:** • Extron recommends 28AWG to 24AWG TP cable for the RJ-45 connectors.
> • For resolutions of 1600x1200, 1920x1200, and 1080p, Extron strongly recommends DTP26 cable, or equivalent.
> • Connect transmitter output 1 to receiver input 1. Connect transmitter output 2 to receiver input 2.
> • If necessary, test for proper cable connection (output 1 to input 1, output 2 to input 2) as follows:
>   **1**. Plug both TP cables into the powered unit.
>   **2**. Momentarily connect either of the cables on the opposite end into the "2" connector on the unpowered unit.
>
>   If the Power LED on the unpowered unit is lit, the connection is correct.
>
>   If the Power LED on the unpowered unit is not lit, unplug the connector on the unpowered end and connect the other cable to the "2" connector.

⑨ **HDMI Output connector —** Connect an HDMI display for the transmitted direct digital image. See **HDMI connector pin assignments** for pin assignments.

⑩ **RS-232 connector —** Connect a serial communications port to this 3.5 mm, 3-pole captive screw connector for bidirectional RS-232 communication. See **RS-232 connector wiring** to wire the connector.

> **NOTE:** The RS-232 connector can also transmit one-way modulated infrared (IR) signals. See **Modulated IR Pass Through Application**.

⑪ **Audio Input connector (HDMI 201 A D Rx [Decora] only) —** Connect one end of a 5-wire audio cable to this 3.5 mm, 5-pole direct insertion connector. Connect the free end of the same cable to any compatibly wired audio source unit, such as a output of a switcher or a HDMI 201 A D Tx (Decora) transmitter (**item** ⑥ on page 18).
Figure 19 shows how to wire the captive screw audio connector. Insert the wires into the appropriate openings in the direct insertion connector. Tighten the screws on the side to fasten the wires.

Unbalanced Input   **Balanced Input**

Sleeve
Tip
Sleeve
Tip

Ring
Tip
Sleeve (s)
Ring
Tip

$\frac{3}{16}$" (5 mm) MAX.

Do not tin the wires!
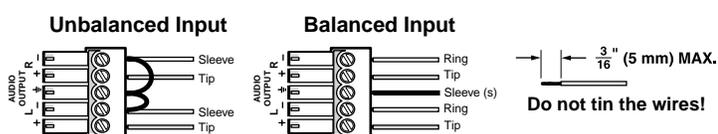
Figure 19. Captive Screw Connector Wiring for Receiver Audio Input

⑫ **Output Audio —** Plug an audio device into this pair, left and right, of female RCA connectors (**figure 15** on page 17) for an unbalanced stereo audio signal.

Pin Assignments and Wiring

HDMI connector pin assignments

Figure 20 defines the pinout for the HDMI protocol.

19   1
18   2
HDMI
Type A Receptacle

1   19
2   18
HDMI
Type A Plug
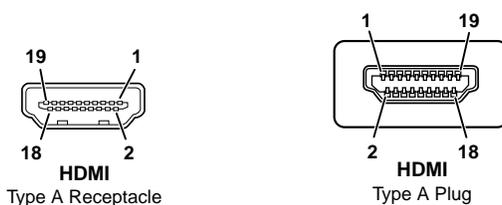
Pin	Signal	Pin	Signal	Pin	Signal
1	TMDS data 2+	7	TMDS data 0–	13	CEC control*
2	TMDS data 2 shield	8	TMDS data 0 shield	14	Reserved (NC)
3	TMDS data 2-	9	TMDS data 0-	15	SCL
4	TMDS data 1+	10	TMDS clock+	16	SDA
5	TMDS data 1 shield	11	TMDS clock shield	17	DDC / CEC Ground
6	TMDS data 1-	12	TMDS clock-	18	+5 V power
				19	Hot plug detect

* CEC control on pin 13 is a proprietary usage, not the industry standard.

Figure 20. HDMI Connectors

TP cable termination

Figure 21 details the recommended termination of TP cables with RJ-45 connectors in accordance with either the **TIA/EIA T 568A** or the **TIA/EIA T 568B** wiring standard.

Pin	TIA/EIA T 568 A Wire color	TIA/EIA T 568 B Wire color	Signal RJ-45 #1	Signal RJ-45 #2
1	White-green	White-orange	Data 0+	CEC
2	Green	Orange	Data 0–	HPD
3	White-orange	White-green	ID Clock+	RS-232 TX
4	Blue	Blue	Data 1+	DDC Clk
5	White-blue	White-blue	Data 1–	+12 V
6	Orange	Green	ID Clock–	RS-232 RX
7	White-brown	White-brown	Data 2+	DDC data
8	Brown	Brown	Data 2–	Ground
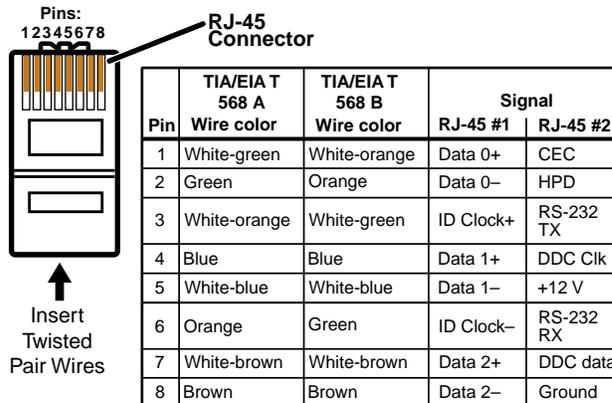
NOTE *Terminate both ends of both cables identically, in accordance with either the TIA/EIA T 568A or the TIA/EIA T 568B wiring standard.*

Figure 21. TP Cable Termination

NOTES:
- RJ-45 termination with CAT 5, CAT 5e, CAT 6, or DTP26 cable must comply with the TIA/EIA T 568A or TIA/EIA T 568B wiring standard for all connections.
- Extron recommends 28AWG to 24AWG TP cable for the RJ-45 connectors.
- Do **not** use Extron UTP23SF-4 Enhanced Skew-Free™ A/V UTP cable to link the transmitter and receiver. Skew-free A/V cable was designed for most Extron TP transmitter/receiver applications, but the HDMI 201 Tx/Rx does not work properly with this cable.
- In order to fit in the junction box, the TP cables and RJ-45 connectors should not have a boot installed.
- Connect transmitter output 1 to receiver input 1. Connect transmitter output 2 to receiver input 2.
- If necessary, test for proper cable connection (output 1 to input 1, output 2 to input 2) as follows:

    1. Plug both TP cables into the powered unit.

    2. Momentarily connect either of the cables on the opposite end into the "2" connector on the unpowered unit.

    If the Power LED on the unpowered unit is lit, the connection is correct.

    If the Power LED on the unpowered unit is not lit, unplug the connector on the unpowered end and connect the other cable to the "2" connector.
- The transmitter and receiver pair works with unshielded twisted pair (UTP) or shielded twisted pair (STP) cables; but, to ensure FCC Class A and CE compliance, STP cables are required. See **Terminating shielded cable**.

Terminating shielded cable

The Tx and Rx each include two shielded RJ-45 connectors and a length of self-adhesive shielded tape that you can use to make the STP cables that connect the transmitter and receiver.

> **NOTES:** • The transmitter and receiver pair works with unshielded twisted pair (UTP) or shielded twisted pair (STP) cables; but, to ensure FCC Class A and CE compliance, STP cables are required.
> • Extron supplies the connectors and the shielded tape. You must supply the CAT 5, 5e, 6, or DTP26 cable.

Terminate the STP cable as follows:

1. Peel back the cable shielding (figure 22) from the end of the cable the length of the RJ-45 connector body (approximately 7/8 inch [2.2 cm]) and fold it back.

Peel back shield and fold back.
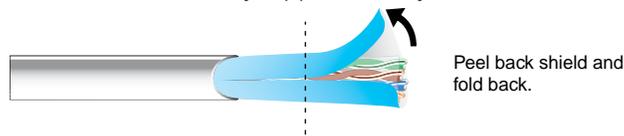
Figure 22. Peeling Back the Cable Shielding

2. Cut away and discard the clear cellophane inner wrapper from the end of the cable back to the folded-over cable shielding.

3. Peel the backing off the self-adhesive shielded aluminum tape and wrap it around the folded-over cable shielding, **slightly overlapping** the beginning of the tape (figure 23).

Aluminum Tape

Wrap tape around folded foil shielding.
Slightly overlap.
Cut and save the excess tape for other connectors.

Figure 23. Wrapping the Shielded Tape

4. Cut the unused portion of the shielded tape and retain for shielding other RJ-45 connectors.

5. Feed each individual wire into the appropriate slot of the RJ-45 connector and crimp the cable in the normal manner, folding the tangs at the end of the connector over the shielded tape (figure 24).

Crimped Connector

Figure 24. Crimped RJ-45 Connector

Power supply wiring

NOTES: • Only one power supply is required. A single power supply connected to either unit in the pair powers both units.

• A single power supply is included with systems packaged as a pair.

• A power supply is also included with each individually-packaged transmitter.

Figure 25 shows how to wire the connector. Snap the provided ferrite bead onto the DC power cable, between the power supply and the connector on th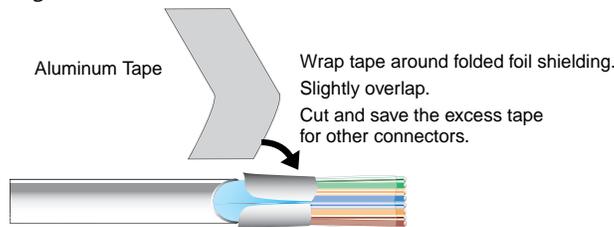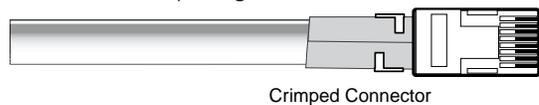e HDMI unit. **For non-Decora units only,** use the supplied tie-wrap to strap the power cord to the extended tail of the connector.
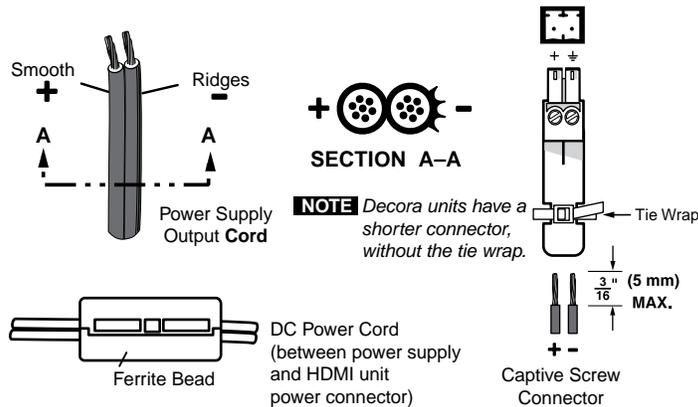
Figure 25. Power Connector Wiring

CAUTION: Always use a power supply supplied and 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 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.

CAUTION: Power supply voltage polarity is critical. Incorrect voltage polarity can damage the power supply and the unit. The ridges on the side of the cord (figure 25) identify the power cord negative lead.

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

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

CAUTION: The length of the exposed (stripped) copper wires is important. **The ideal length is 3/16 inch (5 mm)**. Longer bare wires can short together. Shorter wires are not as secure in the connectors and could be pulled out.

NOTE: Do not tin the power supply leads before installing them in the direct insertion connector. Tinned wires are not as secure in the connectors and could be pulled out.

RS-232 connector wiring

Figure 26 shows how to wire the RS-232 connector for non-Decora and Decora units.
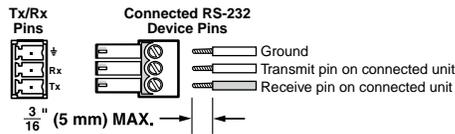
Figure 26. RS-232 Connector Wiring

CAUTION: The length of the exposed (stripped) copper wires is important. **The ideal length is 3/16 inch (5 mm)**. Longer bare wires can short together. Shorter wires are not as secure in the connectors and could be pulled out.

NOTES:
- Do not tin the power supply leads before installing them in the direct insertion connector. Tinned wires are not as secure in the connectors and could be pulled out.
- The RS-232 connector can also transmit one-way modulated infrared (IR) signals. See **Modulated IR Pass Through Application**.

Operation

Figure 27 shows the power indicator on the non-Decora and Decora models.

> **NOTE:** Two units are shown. All transmitter and receiver models have power indicators in the locations shown.

HDMI 201 Tx *and* **HDMI 201 Rx Front Panel**

HDMI 201 A D Tx *and* **HDMI 201 A D Rx Front Panel**
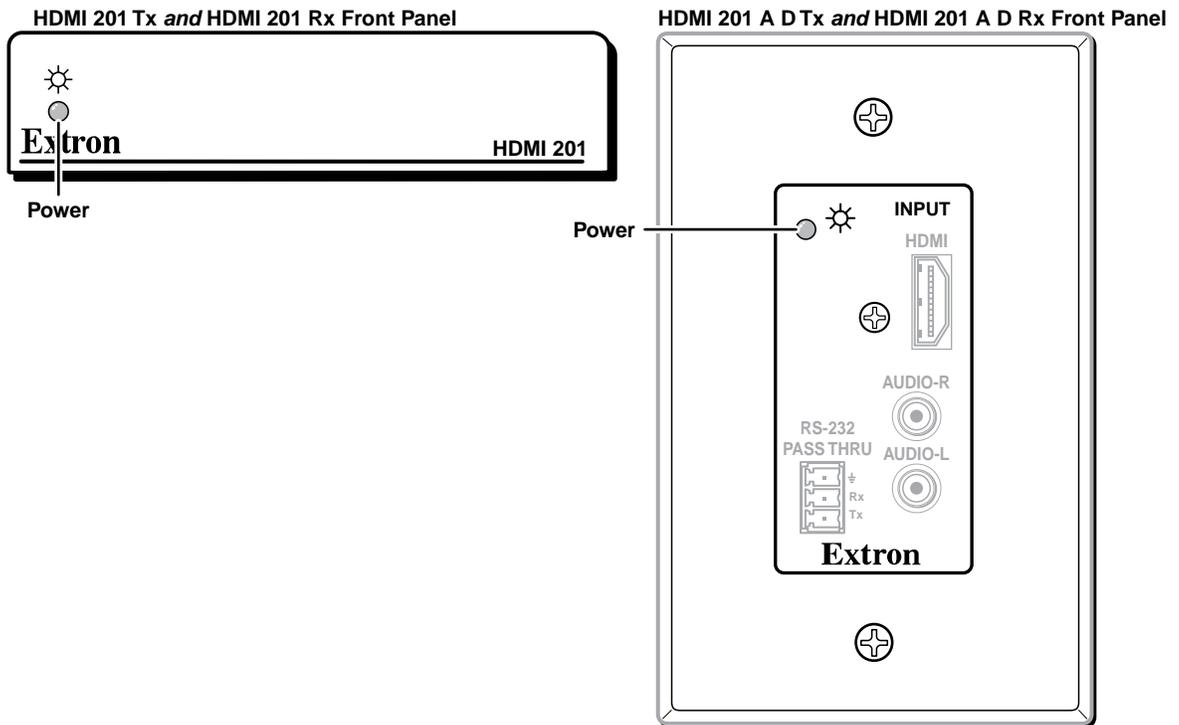
Figure 27. Front Panel Indicators

Transmitter Power Indicator

Power LED —

HDMI 201 Tx (non-Decora) — This front panel LED lights green to indicate that the unit is receiving power:

HDMI 201 A D Tx (Decora) — This two-color front panel LED lights to indicate signal and power status as follows:

Amber — The unit is receiving power but not an HDMI input.

Green — The unit is receiving power and a signal is present on the HDMI input.

Receiver Power Indicator

Power LED —

HDMI 201 Rx (non-Decora) — This front panel LED lights green to indicate that the unit is receiving power:

HDMI 201 A D Rx (Decora) — This two-color front panel LED lights to indicate signal and power status as follows:

Amber — The unit is receiving power but not a TP input.

Green — The unit is receiving power and a signal is present on the TP input.

System Operation

After the transmitter, the receiver, and their connected devices are powered up, the system is fully operational. If any problems are encountered, ensure all cables are routed and connected properly.

> **NOTE:** Ensure that the video source and display selected for the DDC are properly connected to the transmitter/receiver pair, and that the transmitter, the receiver, and the display have power applied *before* power is applied to the video source. If all other devices are not turned on before the video source, the image may not appear.

Technical Points for Digital Video and Content Protection Encryption

- **Digital Visual Interface (DVI)** is a digital video format that was created by the computer industry in 1999.
- **High Definition Multimedia Interface (HDMI®)** is a multimedia format that was created by the consumer video industry in 2003.
  - o The HDMI format is built onto the DVI format, adding digital audio and control while reducing the size of the connector.
  - o The HDMI format is likely to replace the DVI format in the near future.
  - o With passive adapters, the HDMI format is backward compatible with the DVI format.
- With Extron adapters, cables, or both, the HDMI 201 fully supports either format, regardless of the connector type on the video source and display. See **Reference Information** for part numbers.
- **High-bandwidth Digital Content Protection (HDCP)** is an encryption method that protects copyrighted digital entertainment material that uses DVI video.
  - o HDCP is generated by video player hardware, enabled by the video content.
  - o The HDCP key is transmitted with the Display Data Channel (DDC).
  - o The DDC signal line was designed for the low data rate of the DDC; the HDCP key rate is much higher.
- **Without active buffering**, an HDCP key signal can travel only a short distance. The display may properly receive the digital video signal, but not the HDCP key. Without the key, the display cannot decrypt the video signal. Symptoms of undecrypted video may include a flashing black or blue screen or "snow".
- **With active buffering**, an HDCP key signal can travel as far as other signals to ensure proper decryption.
- **The HDMI 201 actively buffers the HDCP key.**

Troubleshooting

HDMI signals run at a very high frequency and are especially susceptible to bad video connections, too many adapters, or cables that are too long. To avoid the loss of an image or introduction of image jitter, follow these guidelines:

- The HDMI cable on the input to the transmitter or the output of the receiver should not exceed 10 feet (3 m).
- Use only cable designed for HDMI signals.
- Limit or avoid the use of adapters or patch points between the transmitter and receiver.
- If the display exhibits a flashing black or blue screen, snow, or other distortion, a non-HDCP compliant display may be receiving an HDCP-encrypted signal.

  Check for an HDCP problem by ejecting the DVD from the player. If the display distortion stops and the DVD menu or screen saver image is clear, the problem is HDCP-related.

- If image artifacts are present, the TP cable may be the cause. Extron recommends DTP26 cable.
- The HDMI 201 works as described in point-to-point applications. Do not use any additional adapters, patch panels, or couplers with the input HDMI cables, output HDMI cables, and twisted pair cables. Additional links in the signal chain can result in the reduction of signal integrity and overall cable length performance.

Application Examples

Audio Conversion

Figure 28 shows a standard installation with HDMI video and an audio input. The HDMI 201 A D Tx converts the video input into two proprietary TP outputs. The Tx outputs the audio directly on a captive screw connector.

Figure 28. **Typical Installation**

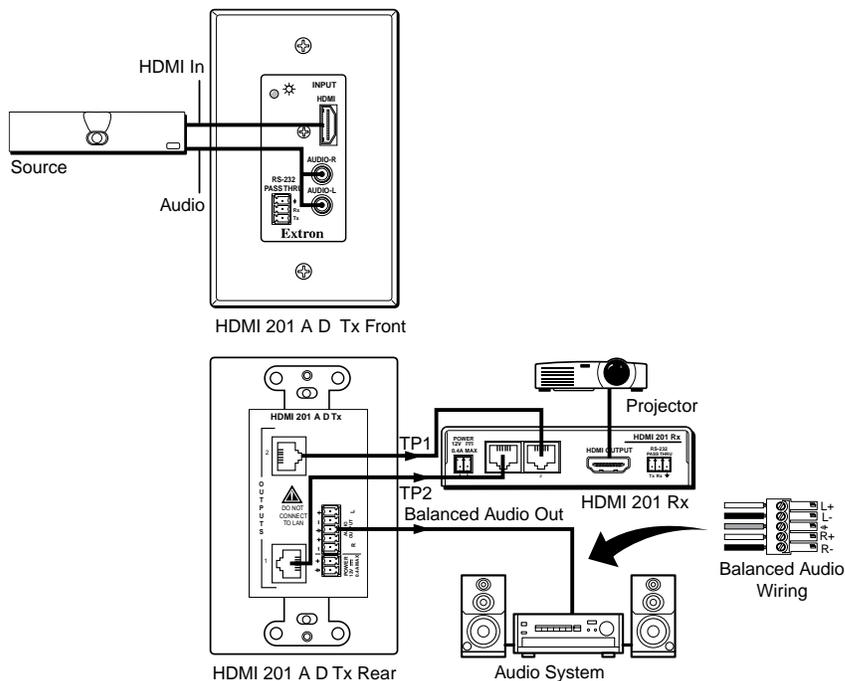## Modulated IR Pass Through Application

Figure 29 shows an installation in which the Tx/Rx pair sends a modulated infrared (IR) signal across the link. On the Tx side, control system is connected to the Tx pin (the modulated IR signal) and the Gnd (signal ground) on the transmitter. An IR emitter is connected to the Tx and Gnd receiver output.
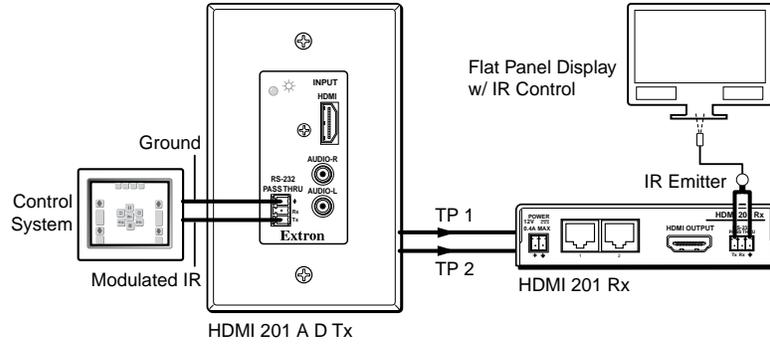
Figure 29. Installation Routing Modulated IR

Reference Information

This section discusses the specifications, part numbers, and accessories for the HDMI 201. Topics that are covered, include:

- **Specifications**
- **Part Numbers**
- **Decora Template Dimensions**

Specifications

> **NOTES:** • This product consists of a transmitter (HDMI 201 Tx or HDMI 201 A D Tx) and a receiver (HDMI 201 Rx or HDMI 201 A D Rx) with twisted pair cables linking the transmitter and receiver.
> • *Appropriate HDMI to DVI-D cables or adapters are required for DVI signal input/output.

Video

Maximum data rate	4.95 Gbps (1.65 Gbps per color)
Maximum pixel clock	165 MHz
Resolution range	Up to 1920x1200 or 1080p @ 60 Hz
Formats	RGB and YCbCr digital video
Standards	DVI 1.0, HDMI 1.2

Video input — TX units

Number/signal type	1 single link HDMI (or DVI-D*)
Connectors	1 female HDMI type A

Interconnection between transmitter and receiver

Connectors	2 female RJ-45 per unit for 2 cables connecting the transmitter and receiver
Termination standards	TIA/EIA T568A or T568B

Signal transmission distance
    1920x1200 or 1080p @ 60 Hz

Extron DTP26 cable	Up to 150' (45 m)
CAT 5/5e/6 STP	Up to 125' (38 m)
CAT 5/5e/6 UTP	Up to 100' (30 m)

    720p/1080i or 1024x768 @ 60 Hz
        CAT 5/5e/6 UTP or STP or Extron DTP26
            200' (60 m)

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

Video output — Rx units

Number/signal type	1 single link HDMI (or DVI-D*)
Connectors	1 female HDMI type A

Audio — HDMI 201 A D Tx/Rx

Gain .... Unbalanced output: 0 dB; balanced output: +6 dB

Frequency response .... 20 Hz to 20 kHz, ±0.06 dB

THD + Noise.................................. 0.18% @ 1 kHz at nominal level

S/N... >76 dB at maximum output (unweighted)

Stereo channel separation .... >63 dB @ 1 kHz

Audio input — HDMI 201 A D Tx/Rx

Number/signal type

        HDMI 201 A D Tx.............. 1 stereo, unbalanced

        HDMI 201 A D Rx .... 1 stereo, balanced/unbalanced

Connectors

        HDMI 201 A D Tx.............. 1 pair female RCA jacks (tip, ring)

        HDMI 201 A D Rx .... (1) 3.5 mm captive screw connector, 5 pole

Impedance

        HDMI 201 A D Tx.............. >10k ohms unbalanced, DC coupled

        HDMI 201 A D Rx .... >18k ohms unbalanced, 24k ohms balanced, DC coupled

Nominal level

        HDMI 201 A D Tx.............. -10 dBV (316 mVrms)

        HDMI 201 A D Rx .... +4 dBu (1.23 Vrms)

Maximum level

        HDMI 201 A D Tx.............. +6.3 dBu, unbalanced at 1% THD+N

        HDMI 201 A D Rx .... +16.6 dBu, unbalanced at 1% THD+N

NOTE: *0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV ≈ 2 dBu*

Audio output — HDMI 201 A D Tx/Rx

Number/signal type

        HDMI 201 A D Tx.............. 1 stereo, balanced/unbalanced

        HDMI 201 A D Rx .... 1 stereo, unbalanced

Connectors

        HDMI 201 A D Tx.............. (1) 3.5 mm captive screw connector, 5 pole

        HDMI 201 A D Rx .... 1 pair female RCA jacks (tip, ring)

Impedance

        HDMI 201 A D Tx.............. 50 ohms unbalanced, 100 ohms balanced

        HDMI 201 A D Rx .... 50 ohms unbalanced

Maximum level (Hi-Z)

        HDMI 201 A D Tx.............. >11.4 dBu, balanced or unbalanced at 1% THD+N

        HDMI 201 A D Rx .... >5.3 dBu, unbalanced at 1% THD+N

Maximum level (600 ohm)

        HDMI 201 A D Tx.............. >5.1 dBm, balanced or unbalanced at 1% THD+N

        HDMI 201 A D Rx .... >4.7 dBm, unbalanced at 1% THD+N

                                       >+9 dBm, balanced or unbalanced at 1% THD+N

Control/remote — external device(pass-through)

Serial control port input

     Transmitter .... RS-232 via (1) 3.5 mm, 3 pole captive screw connector

     Receiver .... 1 set of proprietary signals on a female RJ-45 jack

Serial control port output

     Transmitter .... 1 set of proprietary signals on a female RJ-45 jack

     Receiver .... RS-232 via a 3.5 mm, 3 pole captive screw connector

> **NOTE:** Protocol is mirrored between the transmitter and the receiver.

Serial control pin configuration .. Captive screw connectors: 1 = TX, 2 = RX, 3 = GND

General

External power supply .... 100 VAC to 240 VAC, 50-60 Hz, 6 W max., external; to 12 VDC, 1 A, regulated

Power input requirements .... 12 VDC, 0.4 A for both transmitter and receiver

> **NOTE:** Each transmitter or receiver can be powered either locally by an external power supply or remotely by receiver or transmitter on the other end of the CAT 5/5e/6 or Extron DTP26 cables.

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

Mounting

     HDMI 201 Tx, HDMI 201 Rx

          Rack mount .... Yes, with optional 1U deep rack shelf

          Furniture mount .... Yes, with optional under-desk mounting kit

          Pole mount .... Yes, with optional pole mount kit

     HDMI 201 A D Tx, HDMI 201 A D Rx

          Furniture mount .... Wall or furniture mountable in a Decora®-style opening

Enclosure type .... Metal

Enclosure dimensions

     HDMI 201 Tx, HDMI 201 Rx 1.0" H x 4.3" W x 3.0" D (quarter rack wide)
(2.5 cm H x 10.9 cm W x 7.6 cm D)
(Depth excludes connectors.)

     HDMI 201 A D Tx, HDMI 201 A D Rx

          Faceplate .... 2.6" H* x 1.3" W x 0.1" D (6.6 cm H* x 3.3 cm W x 0.3 cm D)
(Fits the opening in a 1 gang Decora®-style wallplate.)
*Overall height is 4.1" (10.4 cm) including mounting tabs.

          Device .... 2.7" H x 1.8" W x 1.25" D
(6.9 cm H x 4.6 cm W x 3.2 cm D)
(Height excludes mounting tabs, depth excludes connectors.)

Product weight .... 0.5 lbs (0.3 kg)

Shipping weight .... 3 lbs (2 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

> **NOTE:** **CE and FCC testing is conducted with STP (shielded twisted pair) cable.

MTBF .... 30,000 hours

Warranty .... 3 years parts and labor

> **NOTE:** All nominal levels are at ±10%.
>
> **NOTE:** Specifications are subject to change without notice.

Part Numbers

Transmitter/Receiver Pair Part Numbers

NOTE: The Tx/Rx is comprised of the transmitter and receiver pair. The transmitter and receiver can be purchased as a pair or separately. The video and RS-232 transmission functions of the non-Decora and Decora units are compatible.

HDMI 201 model	Part number
HDMI 201 Tx/Rx (non-Decora) pair	60-806-01
HDMI 201 Tx transmitter	60-806-12
HDMI 201 Rx receiver	60-806-13
HDMI 201 A D Tx/Rx (Decora) pair, black,white	60-864-02, -03
HDMI 201 A D Tx transmitter, black, white	60-864-12, -13
HDMI 201 A D Rx receiver, black, white	60-864-22, -23

Included Parts

These items are included in each order for an HDMI 201 transmitter or receiver:

Included parts	Part number
HDMI M-M Pro/6 HDMI male-to-male, 6' (1.8 m) cable	26-650-06
12 VDC, 1 A external power supply, one required to power both units (included with pairs or transmitters only)	70-775-01
3.5 mm, 2-pole captive screw connector (non-Decora only) (1)	
3.5 mm, 3-pole captive screw connectors (1)	
Shielded RJ-45 connectors (2)	
Self-adhesive shielded tape	
IEC power cord (1 per power supply)	
Tweeker (small screwdriver)	
HDMI 201 Setup Guide	

Mounting Accessories

Included parts	Part number
RSF 123 3-inch deep 1U rack shelf kit	60-190-20
RSB 123 3-inch deep 1U rack shelf	60-604-21
RSU 126 6-inch deep 1U universal rack shelf kit	60-190-10
RSB 126 6-inch deep 1U basic rack shelf	60-604-11
RSU 129 9.5-inch deep 1U universal rack shelf kit	60-190-01
RSB 129 9.5-inch deep 1U basic rack shelf	60-604-02
MBU 125 under-desk mount kit	70-077-01
MBD 129 through-desk mount kit	70-077-02
PMK 300 projector mount kit	70-374-01
PMK 350 low profile projector mount kit (black, white)	70-563-02, 03
JB 125 one-gang junction box	980130
JB 225 two-gang junction box	980084
EWB one-gang external wall box, black, white, RAL9010 white	60-452-02,03,04
EWB two-gang external wall box, black, white, RAL9010 white	60-453-02,03,04
SMB one-gang surface-mount box, black, white	60-639-02, 05
SMB two-gain surface-mount box, black, white	60-640-02, 05

Cables and Connectors

Cable	Part number
HDMI M-M Pro/6 HDMI male-to-male, 6' (1.8 m) cable	26-650-06
HDMI M-DVI-D M/6 HDMI male to DVI-D male, 6' (1.8 m)	26-614-02
DTP26/1000 digital TP cable, non-plenum, 1000' (300 m)	22-214-03
DTP26P/1000 digital TP cable, plenum, 1000' (300 m)	22-215-03
DTP RJ-45 Plug (qty. 10)	101-005-01

Adapters

Adaptor	Part number
HDMIF-DVIDM HDMI female to DVI-D male adapter	26-616-01
HDMIM-DVIDF HDMI male to DVI-D female adapter	26-617-01

Decora Template Dimensions

If you need to create a template, use the dimensions shown on figure 37, below.

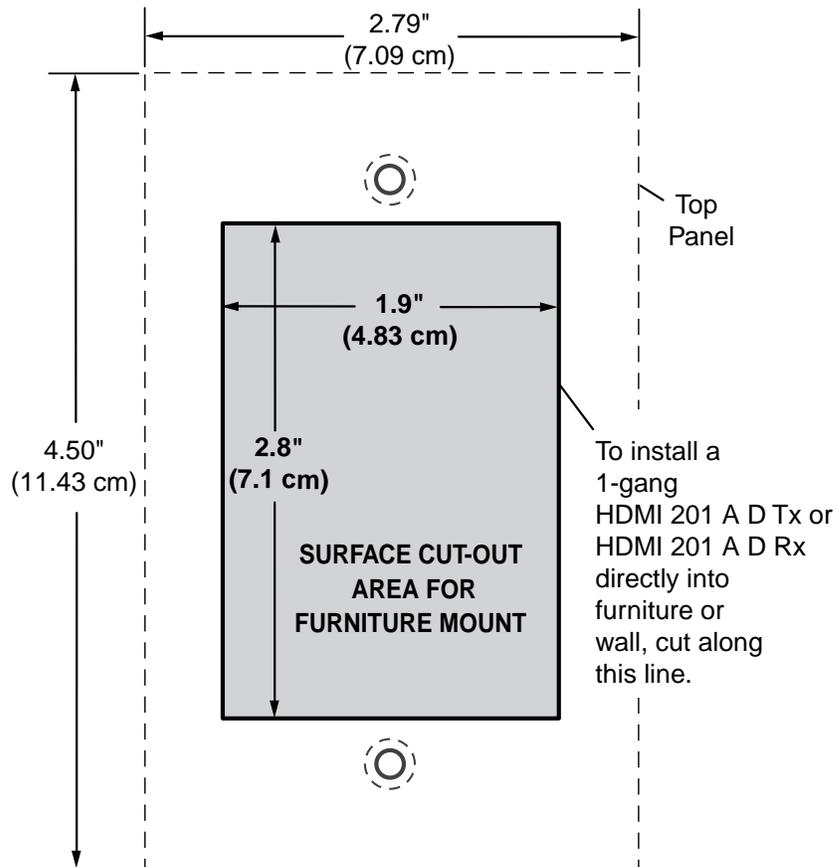**NOTE:** The drawing is not full size or to scale. Do not scale up or print to use as a template.

2.79"
(7.09 cm)

Top Panel

1.9"
(4.83 cm)

4.50"
(11.43 cm)

2.8"
(7.1 cm)

SURFACE CUT-OUT
AREA FOR
FURNITURE MOUNT

To install a
1-gang
HDMI 201 A D Tx or
HDMI 201 A D Rx
directly into
furniture or
wall, cut along
this line.

Figure 37. **Decora Template Dimensions**

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.

Europe, Africa, and the Middle East:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

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

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

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

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 modification 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 | **Europe**: | 31.33.453.4040 |
> | **Asia**: | 65.383.4400 | **Japan**: | 381.3.3511.7655 |

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.