

## HDMI Transmitters

# DTP T HWP 232/332 D

# DTP T UWP 232/332 D

### HDMI Twisted Pair Extender Transmitters



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

## Instructions de sécurité • Français

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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.

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

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

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

Для получения информации о правилах техники безопасности, соблюдении нормативных требований, электромагнитной совместимости (ЭМП/ЭДС), возможности доступа и других вопросах см. руководство по безопасности и соблюдению нормативных требований Extron на сайте Extron: [www.extron.com](http://www.extron.com), номер по каталогу - 68-290-01.

## Chinese Simplified (简体中文)

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

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

关于我们产品的安全指南、遵循的规范、EMI/EMF 的兼容性、无障碍使用的特性等相关内容, 敬请访问 Extron 网站 [www.extron.com](http://www.extron.com), 参见 Extron 安全规范指南, 产品编号 68-290-01。

## Chinese Traditional (繁體中文)

**警告:** ⚠ 若產品上使用此符號, 是為了提醒使用者, 產品機殼內存在著可能會導致觸電之風險的未絕緣危險電壓。

**注意:** ⚠ 若產品上使用此符號, 是為了提醒使用者。

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

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

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

安全上のご注意、法規遵守、EMI/EMF適合性、その他の関連項目については、エクストロンのウェブサイト [www.extron.com](http://www.extron.com) より『Extron Safety and Regulatory Compliance Guide』(P/N 68-290-01) をご覧ください。

## Korean

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

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

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

## FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. The Class A limits provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction guide, 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.

**ATTENTION:** The Twisted Pair Extension technology works with shielded twisted pair (STP) cables **only**. To ensure FCC Class A and CE compliance, STP cables and STP connectors are also required.

For more information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the "[Extron Safety and Regulatory Compliance Guide](#)" on the Extron website.

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## Conventions Used in this Guide

### Notifications

The following notifications are used in this guide:

**CAUTION:** A caution indicates a situation that may result in minor injury.

**ATTENTION:** Attention indicates a situation that may damage or destroy the product or associated equipment.

**NOTE:** A note draws attention to important information.

### Software Commands

Commands are written in the fonts shown here:

```
^AR Merge Scene , ,Op1 scene 1 , 1 ^B 51 ^W^C  
[ 01 ] R 0004 00300 00400 00800 00600 [ 02 ] 35 [ 17 ] [ 03 ]
```

```
Esc [X1] * [X17] * [X20] * [X23] * [X21] CE ←
```

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

Computer responses and directory paths that do not have variables are written in the font shown here:

```
Reply from 208.132.180.48: bytes=32 times=2ms TTL=32  
C:\Program Files\Extron
```

Variables are written in slanted form as shown here:

```
ping xxx.xxx.xxx.xxx -t  
SOH R Data STX Command ETB ETX
```

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

```
From the File menu, select New.  
Click the OK button.
```

### Specifications Availability

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

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DTP T HWP D and DTP T UWP D systems consist of a transmitter (Tx) and a receiver (Rx). The transmitters and corresponding compatible receivers are sold separately. Each purchased 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 a compatible receiver can power both units through the twisted pair cable that links the units.

## Twisted Pair 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 (see [TP Cable Termination and Recommendations](#) on page 12 for more information).

**NOTE:** Do **not** use Extron UTP23SF-4 Enhanced Skew-Free AV UTP cable or STP201 cable to link the transmitter and receiver. The DTP T HWP and UWP 232 and 332 do not work properly with these cables.

## 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 twisted pair cable, graphics card, and display used in the system.

- **DTP T HWP and UWP 232 D** transmitters can transmit 720p, 1080i or 1080p HDTV video signals up to 230 feet (70 m) over STP cable.
- **DTP T HWP and UWP 332 D** transmitters can transmit 720p, 1080i or 1080p HDTV video signals up to 330 feet (100 m) over STP cable.

## Features

**Transmits single link HDMI-D signals over one STP cable** — Twisted pair cables provide an economical, easily installed cable solution.

**Transmits single link HDMI-D and VGA signals over one STP cable (UWP models)** — Twisted pair cables provide an economical, easily installed cable solution.

**Supports DDC and HDCP transmission** — The transmitters fully support 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 transmitters also route unbalanced stereo audio.

### **Wall-mountable enclosures**

**External 100 VAC to 240 VAC, 50-60 Hz, international power supply** — Included with transmitters.

**Remote powering of the 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 extenders, including:

- **Mounting the Transmitter**
- **DTP T HWP 232 and 332 D Connections**
- **DTP T UWP 232 and 332 D Connections**
- **TP Cable Termination and Recommendations**
- **Power Supply Wiring**
- **RS-232 and IR Connector Wiring**
- **Operation**

## Mounting the Transmitter

### **ATTENTION:**

- Installation and service must be performed by authorized personnel.
- The installation must conform to national and local building, electrical, and safety codes and to the size requirements of the wall plate.

The transmitters can be installed in a two-gang electrical wall box, or with a mud ring, with a Decora wall plate cover (supplied).

## UL and Safety Guidelines

The following UL guidelines pertain to the installation of the Decora transmitters into a wall or furniture.

- These units are not to be connected to a centralized DC power source or used beyond their rated voltage range.
- These units must be installed in UL Listed wall boxes.
- These units must be installed with conduit in accordance with National Electrical Code.

## Site Preparation and Wall Box Installation

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

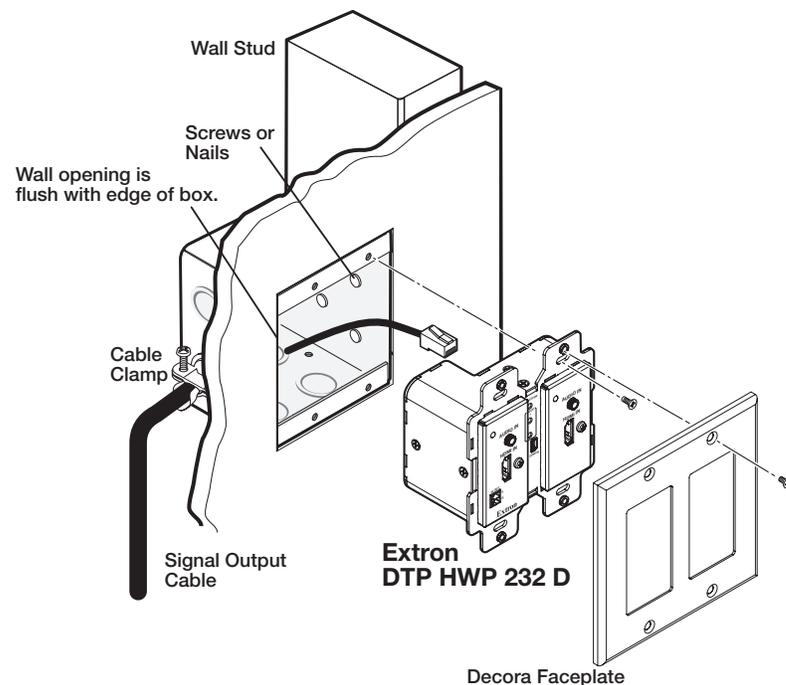
**NOTE:** The extender units are very deep and have connectors on the back side. Extron recommends a 2-gang wall box which has a depth of at least 3.0 inches (7.6 cm) to accommodate the connectors and cables.

To install a new wall box, perform steps 1 through 9. 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, use the **Decora Template Dimensions** on page 24 to create a template. If installing directly into furniture, cut out the center portion of the template.
2. Place the wall box (or the full size 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 (see figure 2).

### 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 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 2.** Installing the Wall Box and Mounting the Unit

6. Feed the twisted pair cables and, if applicable, the 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 wall box, the twisted pair 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 (see [Power Supply Wiring](#) on page 13).

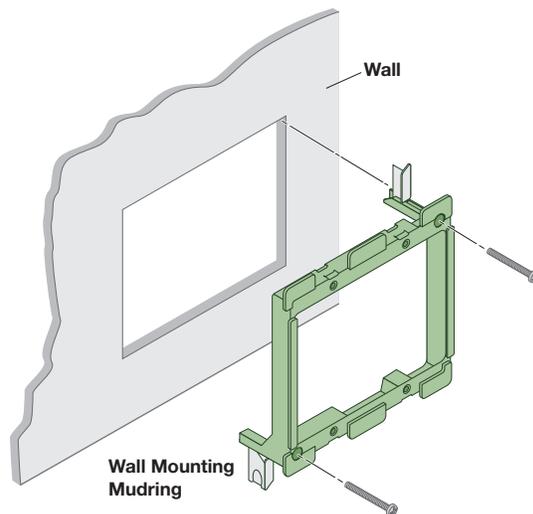
7. Trim back and insulate exposed cable shields with heat shrink to reduce the chance of short circuits.

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.
9. Connect front panel devices (see “Front Panel” on pages 8 and 10 for connector details), restore the power supply, and test the transmitter and receiver system. Make any cabling adjustments before final installation, as the cables will be inaccessible afterwards.

## Mud Ring Installation

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 shown in figure 3.
3. Follow steps 6 through 9 of “Site preparation and wall box installation” above, and [Final Installation](#) on the next page.



**Figure 3.** Installing the Mud Ring

## Final Installation

After testing and making any adjustments, do the following:

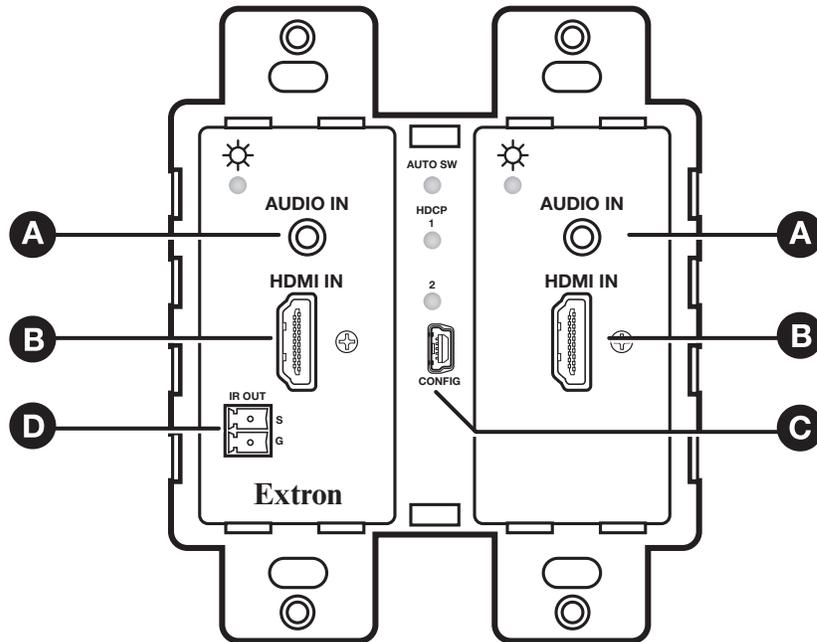
1. At the power outlet, unplug the power supply.

**NOTE:** One power supply can power both the transmitter and the receiver (see [Power Supply Wiring](#) on page 13).

2. Mount the transmitter into the wall box or mud ring and attach the supplied Decora faceplate to the unit (see [figure 2](#) on page 5).
3. At the power outlet, reconnect the power supply. This powers up both units.

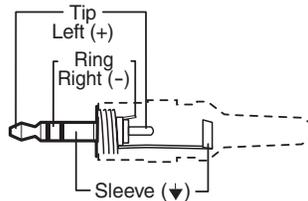
# DTP T HWP 232 and 332 D Connections

## Front Panel



**Figure 4. DTP T HWP 232 and 332 D Front Panel Connectors**

- A** Audio input connector — Connect an unbalanced stereo audio source to this 3.5 mm mini stereo jack. Figure 5 shows how to wire the audio plug.

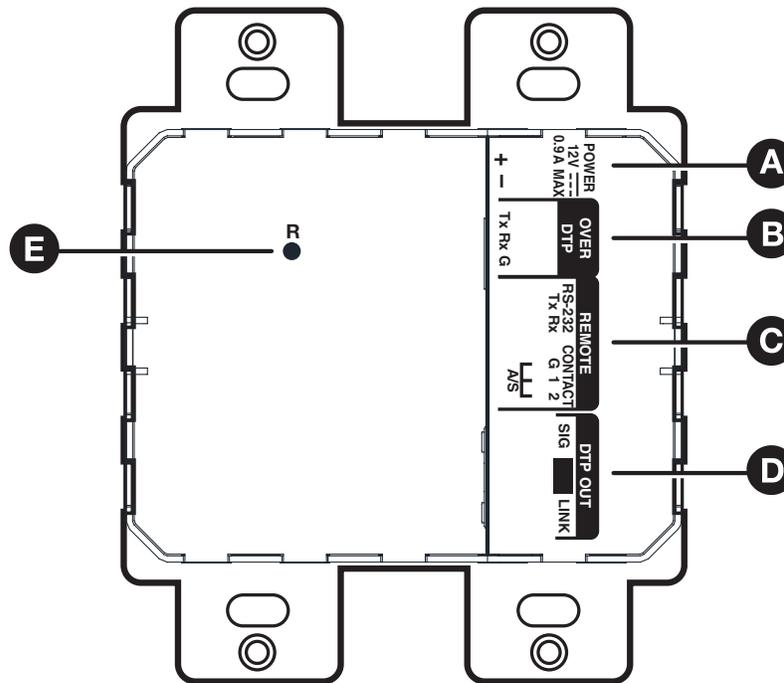


**Figure 5. Audio Input Connector Wiring**

**NOTE:** The extenders do NOT embed analog audio onto the HDMI signal. This analog audio signal is transmitted simultaneously with audio embedded within the HDMI signal.

- B** **HDMI input connector** — Connect an HDMI cable between this port and the HDMI output port of the digital video source.
- C** **Mini USB port** — Connect a male USB mini-B cable to this port for SIS configuration and firmware updates.
- D** **IR output connector** — Connect an IR device to this 2-pole, 3.5 mm captive screw pass-through connector for IR control (see [RS-232 and IR Connector Wiring](#) on page 14 to properly wire the IR connector).

## Rear Panel

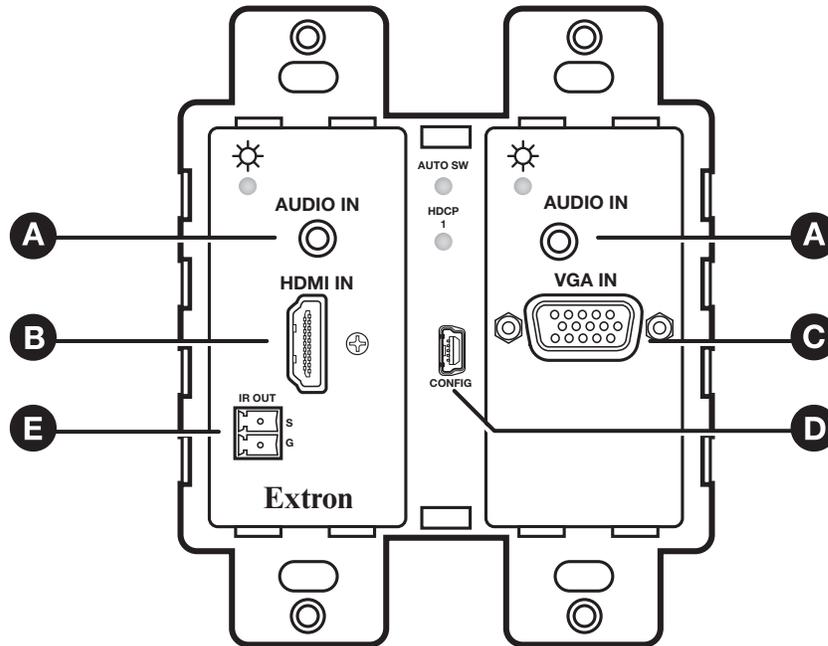


**Figure 6. DTP T HWP 232 and 332 D Rear Panel Connectors**

- A DC power input connector** — Plug the included external 12 VDC power supply into either this 2-pole connector (see [Power supply wiring](#) on page 13 to wire the power connector) or the power input connector on the receiver (see the user guide of your respective receiver for more information).
- B Over DTP control port** — Connect an RS-232 device to this 3-pole, 3.5 mm captive screw connector for pass-through RS-232 control (see [RS-232 and IR Connector Wiring](#) on page 14 to properly wire the RS-232 connector).
- C Remote (RS-232 and contact closure) control port** — Connect an RS-232 device, contact closure device, or both to this 5-pole, 3.5 mm captive screw connector to control switching on the unit (see [RS-232 and IR Connector Wiring](#) on page 14 to properly wire the Remote connector).
- **RS-232** — To control the unit through this port, connect an RS-232 device and configure it as follows: 9600 baud rate, 8 data bits, 1 stop bit, no parity.
  - **Contact** — Momentarily short pins 1 **or** 2 to ground (G) to select the corresponding input. Connect pins 1 **and** 2 to ground (G) to set the unit to auto switch mode. The device will select the highest active input.
- D DTP Out port** — Connect one end of the twisted pair cable to the RJ-45 connector on the transmitter (see [TP Cable Termination and Recommendations](#) on page 12 to properly wire the RJ-45 connectors). Connect the opposite end of the cable to the appropriate receiver.
- ATTENTION:** Do not connect this device to a telecommunications or computer data network.
- E Reset button** — Use an Extron Tweezer or small screwdriver to press and hold the recessed button for 6 seconds while the extender is running to perform a factory reset.

## DTP T UWP 232 and 332 D Connections

### Front Panel



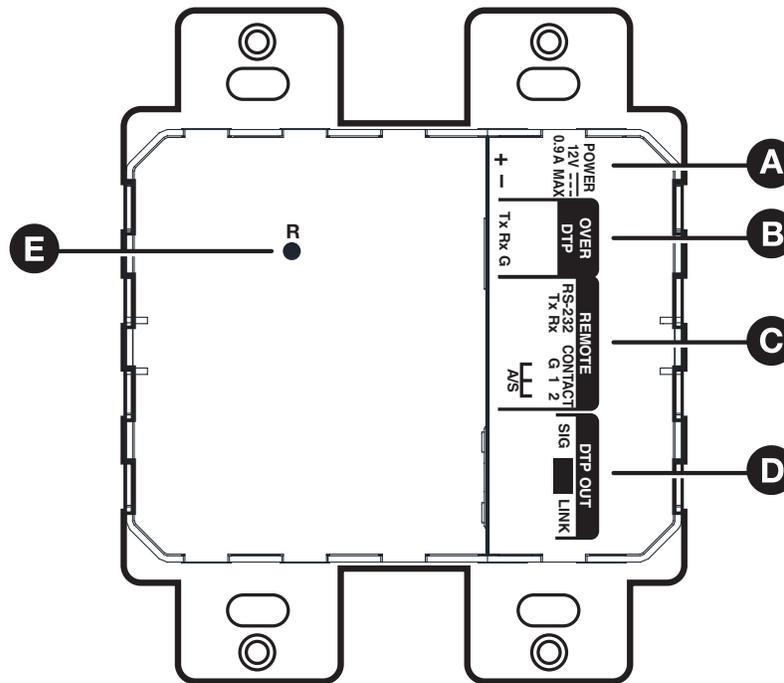
**Figure 7. DTP T UWP 232 and 332 D Front Panel Connectors**

- A Audio input connector** — Connect an unbalanced stereo audio source to this 3.5 mm mini stereo jack (see [figure 5](#) on page 8 for wiring details).

**NOTE:** The extenders do NOT embed analog audio onto the HDMI signal. This analog audio signal is transmitted simultaneously with audio embedded within the HDMI signal.

- B HDMI input connector** — Connect an HDMI cable between this port and the HDMI output port of the digital video source.
- C VGA input connector** — Connect a VGA cable between this port and the output port of the video source.
- D Mini USB port** — Connect a male USB mini-B cable to this port for SIS configuration and firmware updates.
- E IR output connector** — Connect an IR device to this 2-pole, 3.5 mm captive screw pass-through connector for IR control (see [RS-232 and IR Connector Wiring](#) on page 14 to properly wire the IR connector).

## Rear Panel

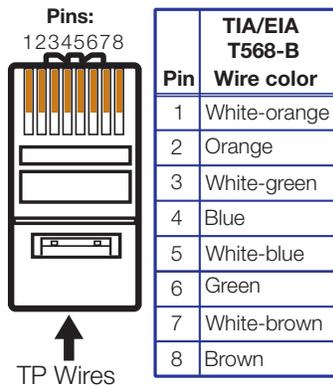


**Figure 8. DTP T UWP 232 and 332 D Rear Panel Connectors**

- A DC power input connector** — Plug the included external 12 VDC power supply into either this 2-pole connector (see [Power supply wiring](#) on page 13 to wire the power connector) or the power input connector on the receiver (see the User Guide of your respective receiver for more information).
- B Over DTP control port** — Connect an RS-232 device to this 3-pole, 3.5 mm captive screw connector for pass-through RS-232 control (see [RS-232 and IR Connector Wiring](#) on page 14 to properly wire the RS-232 connector).
- C Remote (RS-232 and contact closure) control port** — Connect an RS-232 device, contact closure device, or both to this 5-pole, 3.5 mm captive screw connector to control switching on the unit (see [RS-232 and IR Connector Wiring](#) on page 14 to properly wire the Remote connector).
- **RS-232** — To control the unit through this port, connect an RS-232 device and configure it as follows: 9600 baud rate, 8 data bits, 1 stop bit, no parity.
  - **Contact** — Momentarily short pins 1 **or** 2 to ground (G) to select the corresponding input. Connect pins 1 **and** 2 to ground (G) to set the unit to auto switch mode. The device will select the highest active input.
- D DTP Out port** — Connect one end of the twisted pair cable to the RJ-45 connector on the transmitter (see [TP Cable Termination and Recommendations](#) on page 12 to properly wire the RJ-45 connectors). Connect the opposite end of the cable to the appropriate receiver.
- ATTENTION:** Do not connect this device to a telecommunications or computer data network.
- E Reset button** — Use an Extron Tweezer or small screwdriver to press and hold the recessed button for 6 seconds while the extender is running to perform a factory reset.

## TP Cable Termination and Recommendations

Figure 9 details the recommended termination of both ends of TP cables with RJ-45 connectors in accordance with the **TIA/EIA-T568B** wiring standard.



**Figure 9. TP Cable Termination**

**NOTE:** Do **not** use Extron UTP23SF-4 Enhanced Skew-Free AV UTP cable or STP201 cable to link the transmitter and receiver. The DTP T HWP D and DTP T UWP D family of transmitters do not work properly with these cables.

### Supported cables —

The DTP T HWP D and DTP T UWP D family of transmitters are compatible with shielded twisted pair cables (F/UTP, SF/UTP, and S/FTP).

### Cable recommendations —

Extron recommends using the following practices to reduce transmission errors and achieve full transmission distances up to 230 feet (70 m) on the 232 models or 330 feet (100 m) on the 332 models.

- Use the following Extron XTP DTP 24 SF/UTP cables and DTP 24 connectors for the best performance:
  - **XTP DTP 24/1000** Non-Plenum 1000' (305 m) spool 22-236-03
  - **XTP DTP 24P/1000** Plenum 1000' (305 m) spool 22-235-03
  - **XTP DTP 24 Plug** Package of 10 101-005-02
- If not using XTP DTP 24 cable, at a minimum, Extron recommends 24 AWG, solid conductor, STP cable with a minimum bandwidth of 400 MHz.
- Terminate cables with shielded connectors to the TIA/EIA-T568B standard.
- Use no more than two pass-through points, which may include patch points, punch down connectors, couplers, and power injectors. If these pass-through points are required, use shielded couplers and punch down connectors.

**NOTE:** When using STP cable in bundles or conduits, consider the following:

- Do not exceed 40% fill capacity in conduits.
- Do not comb the cable for the first 20 meters, where cables are straightened, aligned, and secured in tight bundles.
- Loosely place cables and limit the use of tie wraps or Velcro®.
- Separate twisted pair cables from AC power cables.

## 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 power supply is included with each individually-packaged transmitter.

Figure 10 shows how to wire the connector. Snap the provided ferrite bead onto the DC power cable, between the power supply and the connector on the unit.

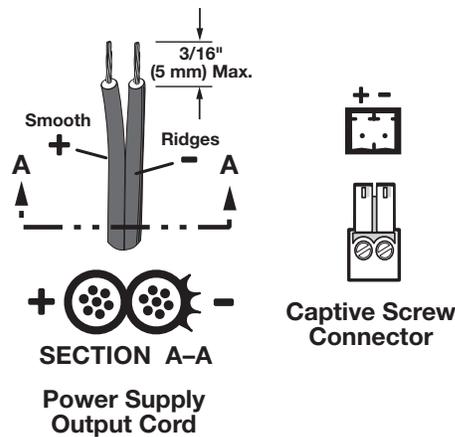


Figure 10. Power Connector Wiring

### CAUTION: Failure to follow these instructions may result in injury.

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

### ATTENTION:

- 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 725 and the Canadian Electrical Code part 1, section 16. The power supply shall not be permanently fixed to building structure or similar structure.
- Power supply voltage polarity is critical. Incorrect voltage polarity can damage the power supply and the unit. The ridges on the side of the cord (see figure 10) 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.
- 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 and IR Connector Wiring

### Remote RS-232 and Contact Closure Connector

Wire the rear Remote RS-232 and contact closure connector as shown in figure 11.

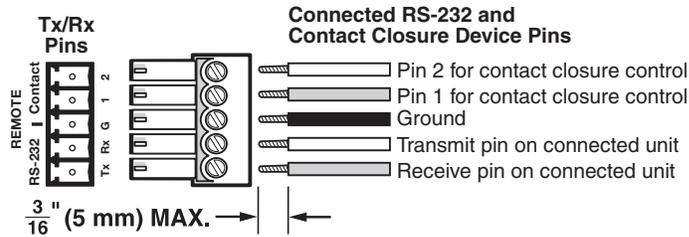


Figure 11. RS-232 and Contact Closure Connector Wiring

### IR Control Connector

Wire the front panel IR control connector as shown in figure 12.

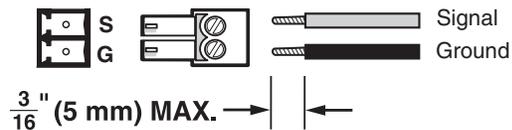


Figure 12. IR Out Connector Wiring

### Over DTP RS-232 Connector

Wire the rear Over DTP RS-232 connector as shown in figure 13.

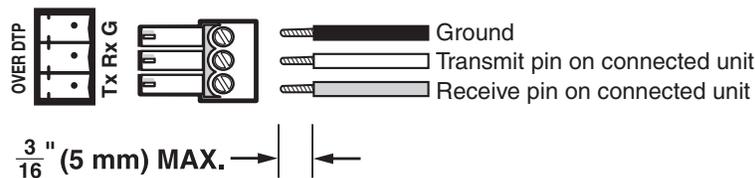


Figure 13. Over DTP Connector Wiring

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

## Operation

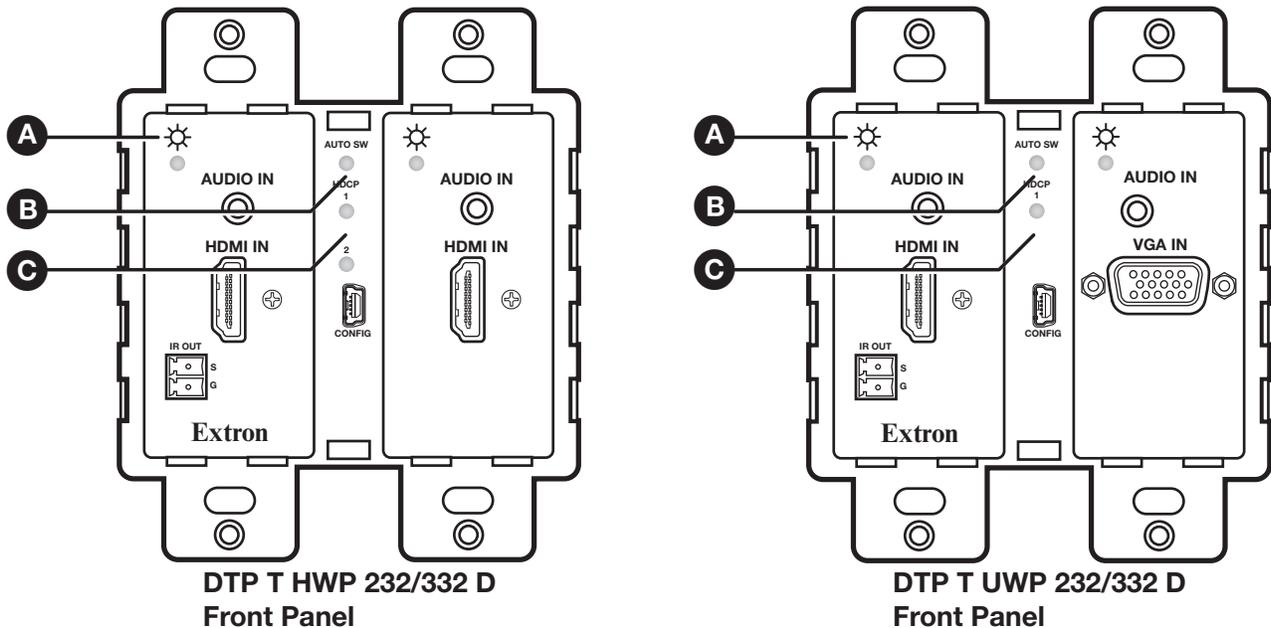


Figure 14. Transmitter LED Indicators

### Transmitter LEDs

- A Power LEDs** — Two-color front panel LEDs on the transmitters light to indicate signal and power status as follows:
- Amber** — The unit is receiving power but there is no signal on the associated input.
  - Green** — The unit is receiving power and a signal is present on the associated input.
- NOTE:** Both inputs on the transmitters have their own separate LEDs.
- B Auto Switch LED** — Lights green when auto switch is active (see “Contact” of item **C** on pages 9 and 11).
- C HDCP LEDs** — Lights green when HDMI input has been authenticated on the source device.

### 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.

#### NOTES:

- Ensure that the video source and display are properly connected to the transmitter and 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.
- Input switching can only be performed via auto switching, RS-232, or contact closure through the rear panel connectors.

# Remote Control

This section includes:

- **Contact Closure Control**
- **Simple Instruction Set Control**

The DTP T HWP D and DTP T UWP D family of transmitters can be remotely controlled via their front panel configuration (USB) port, rear panel Remote RS-232 port, and rear panel Remote Contact port. Remote control devices can be:

- A host device such as a computer or control system and the Extron Simple Instruction Set (SIS)
- A contact closure device such as an Extron KP 6 Keypad Control or a Show Me video cable

## Contact Closure Control

The rear panel Remote port provides a way to select an input to the extender using a remote contact closure device. The contact closure pin assignments are detailed in “Contact” of item **C** on pages **9** and **11**.

To select a different input number using a contact closure device, momentarily short the pin for the desired input number to ground. To force one of the inputs to be always selected, leave the short to ground in place.

## Simple Instruction Set Control

The DTP T HWP D and DTP T UWP D family of extenders can be remotely controlled using SIS commands from a host device such as a computer or control system via its rear panel Remote RS-232 port (see item **C** on pages 9 and 11) or front panel Configuration (USB) port (see item **C** on page 8, and **D** on page 10).

The default serial port protocol of the port is as follows:

- 9600 baud
- No parity
- 8 data bits
- No flow control
- 1 stop bit

## Host-to-Extender Communications

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

## Extender-Initiated Messages

When a local event occurs, such as a front panel operation, loss or restoration of an input signal, or an error condition, the extender responds by sending a message to the host. Examples of the extender-initiated messages are listed below:

© Copyright 20yy, Extron Electronics DTP T HWP 232 D, Vx.xx, 60-nnnn-nn↵

The extender issues the copyright message when it first powers on. Vx.xx is the firmware version number and 60-nnnn-nn is the part number.

Inn All↵

The extender also sends the Inn message whenever the selected input is changed. n is the input number. A 0 in the n field indicates no input is selected.

## Error Responses

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

- E01** — Invalid input channel number (out of range)
- E06** — Invalid channel change
- E10** — Invalid command
- E13** — Invalid parameter

## Timeout

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

## Using the Command and Response Table

The **command and response table** begins on page 20. Symbols are used throughout the table to represent variables in the command and response fields. Command and response examples are shown throughout the table. The ASCII to HEX conversion table below is for use with the command and response table.

**NOTE:** Upper and lowercase text can be used interchangeably unless otherwise stated.

ASCII to Hex Conversion Table										Esc	1B	CR	0D	LF	0A
Space →	20	!	21	"	22	#	23	\$	24	%	25	&	26	'	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
0	30	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	40	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	60	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	70	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B		7C	}	7D	~	7E	DEL	7F

## Symbol definitions

### DTP T HWP 232/332 D and DTP UWP 232/332 D models

- ↵ = Carriage return/line feed
- ← = Carriage return (no line feed)
- | = Pipe (can be used interchangeably with the ← character)
- = Space
- Esc** = Escape key
- W** = Can be used interchangeably with the **Esc** character
  
- X1** = Input number  
 0 through 2 (0 = deselect input [break tie]. This results in the output being disabled.)  
 1 = HDMI, 2 = VGA (UWP models)
- X2** = Status  
 0 = off, disabled, or not detected  
 1 = on, enabled, or detected
- X3** = Auto switch mode  
 0 = disabled (**default**)  
 1 = enabled (highest active input has priority)
- X4** = EDID  
 See **table 1** on page 22.
- X5** = Input HDCP status  
 0 = No source is detected  
 1 = Source is detected with HDCP  
 2 = Source detected without HDCP
- X6** = Output HDCP status  
 0 = No sink is detected  
 1 = Sink is detected with HDCP support  
 2 = Sink is detected without HDCP support
- X7** = Transmitter name  
 A text string of up to 24 alphanumeric characters and minus sign/hyphen (-).  
 No blank or space characters are permitted as part of a name. The first letter must a letter, and the last character must not be a minus sign/hyphen (**default** is DTP-T-HWP/UWP-232/332).
- X8** = Raw EDID data  
 128 or 256 bytes of hexadecimal data
- X9** = Video color bit depth mode  
 0 = Auto (**default**, based on sink EDID)  
 1 = force 8-bit
- X10** = Analog input video format (UWP models only)  
 0 = Auto detect (**default**)  
 1 = RGB/VGA  
 2 = YUV/component video
- X11** = Current EDID native resolutions and refresh rate in plain text

**X17** = Verbose mode

**X19** = Force VGA to DVI out (UWP models only)

**X30** = Pixel phase value

**X31** = Total pixels value

**X32** = Horizontal/Vertical start value

Ø = clear/none

1 = verbose mode (**default**)

2 = tagged responses for queries

3 = verbose mode and tagged for queries

Ø = HDMI (**default**)

1 = force VGA input to be DVI output

Ø to 63, **default** is 32

±255 of default value (depends on input rate)

Ø to 255 (**default** is 128)

## Command and Response Table for SIS Commands

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional Description
<b>Select and view input</b>			
Select an input	[X1]!	In[X1]•A11←	Select input [X1] to transmit to the connected receiver.
<i>Example:</i>	1!	In01•A11←	Select input 1.
View input selection	!	[X1]←	Input [X1] is selected.
<b>Signal status</b>			
Request all signal status	[Esc]OLS←	Sig[X2]•[X2]•[X2]←	∅ = not detected 1 = detected (Example: Input 1 • Input 2 * Output)
<b>HDCP status</b>			
View the HDCP status of a specific input	[Esc]T[X1]HDCP←	HdcpT[X5]←	[X1] = input 1-2; [X5] = HDCP status (HDMI inputs only)
View the HDCP status of both HDMI inputs	[Esc]IHDCP←	HdcpT[X5]•[X5]←	
View the output HDCP status	[Esc]OHDCP←	[X6]←	
<b>Auto switch status</b>			
View the auto switch status	[Esc]AUSW←	[X3]←	∅ = disabled ( <b>default</b> ) 1 = enabled (highest active input priority)
<b>HDCP Authorized device</b>			
Set HDCP authorization per input	[Esc]E[X1]•[X2]HDCP←	HdcpE[X1]•[X2]←	[X1] = input (1 or 2) [X2] = ∅ (disabled) or 1 (enabled, <b>default</b> )
Set HDCP authorization to all inputs	[Esc]E[X2]HDCP←	HdcpE[X2]←	HDMI inputs only
View input HDCP authorization status	[Esc]EHDCP←	[X2]•[X2]←	
<b>Input video format (VGA input only, UWP models only)</b>			
Set input video format	2*[X10]\	Typ2*[X10]←	[X10] = ∅ (HDMI, <b>default</b> ) or 1 = force VGA inputs to DVI output
View current format	2\	[X10]←	View current format of input 2.
View auto-detected format	2*\	[X10]←	View auto-detected format of input ([X10] = 1).
<b>Force VGA DVI out (UWP models only)</b>			
Force VGA to DVI output	[Esc][X19]VTPO←	Vtpo[X19]←	[X19] = ∅ (HDMI, <b>default</b> ) or 1 (force VGA inputs to be DVI output)
View VGA to DVI output	[Esc]VTPO←	[X19]←	View VGA DVI out status.

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional Description
<b>Picture adjustment (RGB input only, UWP models only )</b>			
Set pixel phase value	<b>[Esc]2*[X30]PHAS ←</b>	Phas2*[X30]↵	
Increment pixel phase value	<b>[Esc]2+PHAS ←</b>	Phas2*[X30]↵	<b>[X30]</b> = Pixel phase (0-63, default is 32)
Decrement pixel phase value	<b>[Esc]2 - PHAS ←</b>	Phas2*[X30]↵	
View pixel phase value	<b>[Esc]2PHAS ←</b>	<b>[X30]↵</b>	
Set total pixels value	<b>[Esc]2*[X31]TPIX ←</b>	Tpix2*[X31]↵	
Increment total pixels value	<b>[Esc]2+TPIX ←</b>	Tpix2*[X31]↵	<b>[X31]</b> = ±255 of default value (depends on input rate)
Decrement total pixels value	<b>[Esc]2 - TPIX ←</b>	Tpix2*[X31]↵	
View total pixels value	<b>[Esc]2TPIX ←</b>	<b>[X31]↵</b>	
Set horizontal start value	<b>[Esc]2*[X32]HSRT ←</b>	Hsrt2*[X32]↵	
Increment horizontal start value	<b>[Esc]2+HSRT ←</b>	Hsrt2*[X32]↵	<b>[X32]</b> = 0-255 (default is 128)
Decrement horizontal start value	<b>[Esc]2 - HSRT ←</b>	Hsrt2*[X32]↵	
View horizontal start value	<b>[Esc]2HSRT ←</b>	<b>[X32]↵</b>	
Set vertical start value	<b>[Esc]2*[X32]VSRT ←</b>	Vsrt2*[X32]↵	
Increment vertical start value	<b>[Esc]2+VSRT ←</b>	Vsrt2*[X32]↵	<b>[X32]</b> = 0-255 (default is 128)
Decrement vertical start value	<b>[Esc]2 - VSRT ←</b>	Vsrt2*[X32]↵	
View vertical start value	<b>[Esc]2VSRT ←</b>	<b>[X32]↵</b>	

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional Description
<b>EDID Minder</b>			
<b>NOTE:</b> See table 1 for the EDID values.			
Assign EDID to an input	<b>Esc</b> A[X1]*[X4]EDID←	EdidA[X1]*[X4]←	<b>Defaults:</b> 5Ø (HDMI inputs), 03 (VGA inputs)
Save the EDID of the connected display to a user location	<b>Esc</b> S[X4]EDID←	EdidS[X4]←	Save EDID of display connected to the output to the user store slot 66, 67, or 68.
View the EDID assignment	<b>Esc</b> A[X1]EDID←	[X4]←	
View/Read EDID in HEX format	<b>Esc</b> R[X1]EDID←	[X8]←	Read data as text from the EDID assigned and used on input [X1].
View EDID native resolution	<b>Esc</b> N[X1]EDID←	[X11]←	Read out native resolution and refresh rate from the EDID assigned to the specified input in plain text. Example: 1920x1200 @60Hz

**Table 1. EDID Values**

[X4]	Value	[X4]	Value	[X4]	Value	[X4]	Value
<b>VGA – PC values</b>							
01	800x600 @ 60 Hz	05	1280x800 @ 60 Hz	09	1400x1050 @ 60 Hz	13	1680x1050 @ 60 Hz
02	1024x768 @ 60 Hz	06	1280x1024 @ 60 Hz	10	1440x900 @ 60 Hz	14	1920x1080 @ 60 Hz
03*	<b>1280x720 @ 60 Hz</b>	07	1360x768 @ 60 Hz	11	1600x900 @ 60 Hz	15	1920x1200 @ 60 Hz
04	1280x768 @ 60 Hz	08	1366x768 @ 60 Hz	12	1600x1200 @ 60 Hz	16	2048x1080 @ 60 Hz
<b>DVI – PC values</b>							
17	800x600 @ 60 Hz	21	1280x800 @ 60 Hz	25	1400x1050 @ 60 Hz	29	1680x1050 @ 60 Hz
18	1024x768 @ 60 Hz	22	1280x1024 @ 60 Hz	26	1440x900 @ 60 Hz	30	1920x1080 @ 60 Hz
19	1280x720 @ 60 Hz	23	1360x768 @ 60 Hz	27	1600x900 @ 60 Hz	31	1920x1200 @ 60 Hz
20	1280x768 @ 60 Hz	24	1366x768 @ 60 Hz	28	1600x1200 @ 60 Hz	32	2048x1080 @ 60 Hz
<b>HDMI – PC values, with 2-channel audio</b>							
33	800x600 @ 60 Hz	37	1280x1024 @ 60 Hz	41	1440x900 @ 60 Hz	45	1920x1200 @ 60 Hz
34	1024x768 @ 60 Hz	38	1360x768 @ 60 Hz	42	1600x900 @ 60 Hz	46	2048x1080 @ 60 Hz
35	1280x768 @ 60 Hz	39	1366x768 @ 60 Hz	43	1600x1200 @ 60 Hz		
36	1280x800 @ 60 Hz	40	1400x1050 @ 60 Hz	44	1680x1050 @ 60 Hz		
<b>HDMI – HDTV values, with 2-channel audio</b>							
47	480p @ 60 Hz	50†	<b>720p @ 60 Hz</b>	53	1080p @ 50/25 Hz	56	1080p @ 60 Hz
48	576p @ 50 Hz	51	1080i @ 50 Hz	54	1080p @ 50 Hz		
49	720p @ 50 Hz	52	1080i @ 60 Hz	55	1080p @ 60/24 Hz		
<b>HDMI – HDTV values, with multi-channel audio</b>							
57	720p @ 50 Hz	59	1080i @ 50 Hz	61	1080p @ 50/25 Hz	63	1080p @ 60/24 Hz
58	720p @ 60 Hz	60	1080i @ 60 Hz	62	1080p @ 50 Hz	64	1080p @ 60 Hz
<b>Output and user locations</b>							
[X4]	Source	[X4]	Source	[X4]	Source	[X4]	Source
65	Output (Auto)	66	User setting 1	67	User setting 2	68	User setting 3

\* Default for input 2 (VGA) on UWP models.

† Default for input 1 (HDMI) on HWP and UWP models and input 2 on HWP models.

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional Description
<b>Video mute</b>			
Enable video mute	1B	Vmt1↵	Output no video signal.
Disable video mute	ØB	VmtØ↵	Output selected video input.
View video mute status	B	X2↵	Mute status = X2 (Ø = off, 1 = on)
<b>Video breakaway</b>			
Select program video input only	X1%	InX1•Vid↵	X1 = input number Ø - 2 only
View currently selected video input	%	X1↵	
<b>Analog audio mute</b>			
Mute or unmute analog audio	X2Z	AmtX2↵	X2 = Ø (off, default), 1 (on)
Read analog audio mute	Z	X2↵	Analog audio mute status = X2.
<b>Analog audio breakaway</b>			
Select program audio input only	X1\$	InX1•Aud↵	X1 = Ø - 2 only (analog audio input)
View currently selected audio input	\$	X1↵	
<b>Video output color bit depth</b>			
Set video color bit depth mode	EscVX9BITD↵	BitdVX9↵	Ø = auto based on sink ( <b>default</b> ) 1 = force 8-bit
View video color bit depth mode	EscVBITD↵	X9↵	
<b>Device name</b>			
Set the device name	EscX7CN↵	Ipn•X7↵	Change the device name to X7.
Set device name to factory default	Esc•CN↵	Ipn•DTP - T - xxx - xxx↵	Set device name to default. (Example: DTP - T - HWP - 232)
View device name	EscCN↵	X7↵	
<b>Reset</b>			
Reset to factory setting	EscZXXX↵	Zpx↵	Reset to factory defaults.
<b>Upload firmware</b>			
Upload	EscUpload↵	...go Up1↵	Up1↵ displays after upload is completed.
<b>Information requests</b>			
Information request	I	InX1Vid•InX1Aud•AuswX3•VmtX2•AmtX2↵	
Request part number	N	6Ø - nnnn - nn↵	See the Extron website, <a href="http://www.extron.com">www.extron.com</a> , for part numbers.
Query firmware version	Q	x.xx↵	
Query firmware version w/build	*Q	x.xx . xxxx↵	
<b>Verbose mode</b>			
<b>NOTE:</b> If tagged responses are enabled (modes 2 and 3), all “view” commands return the prefix and the value, just as the “set” commands do. For example, the view autoswitch mode (EscAUSW↵) command returns “AuswX3↵” in verbose mode.			
Set verbose mode	EscX17CV↵	VrbX17↵	
Read verbose mode	EscCV↵	X17↵	Ø = clear/none 1 = verbose mode ( <b>default</b> ) 2 = tagged responses for queries 3 = verbose mode and tagged for queries

# Reference Information

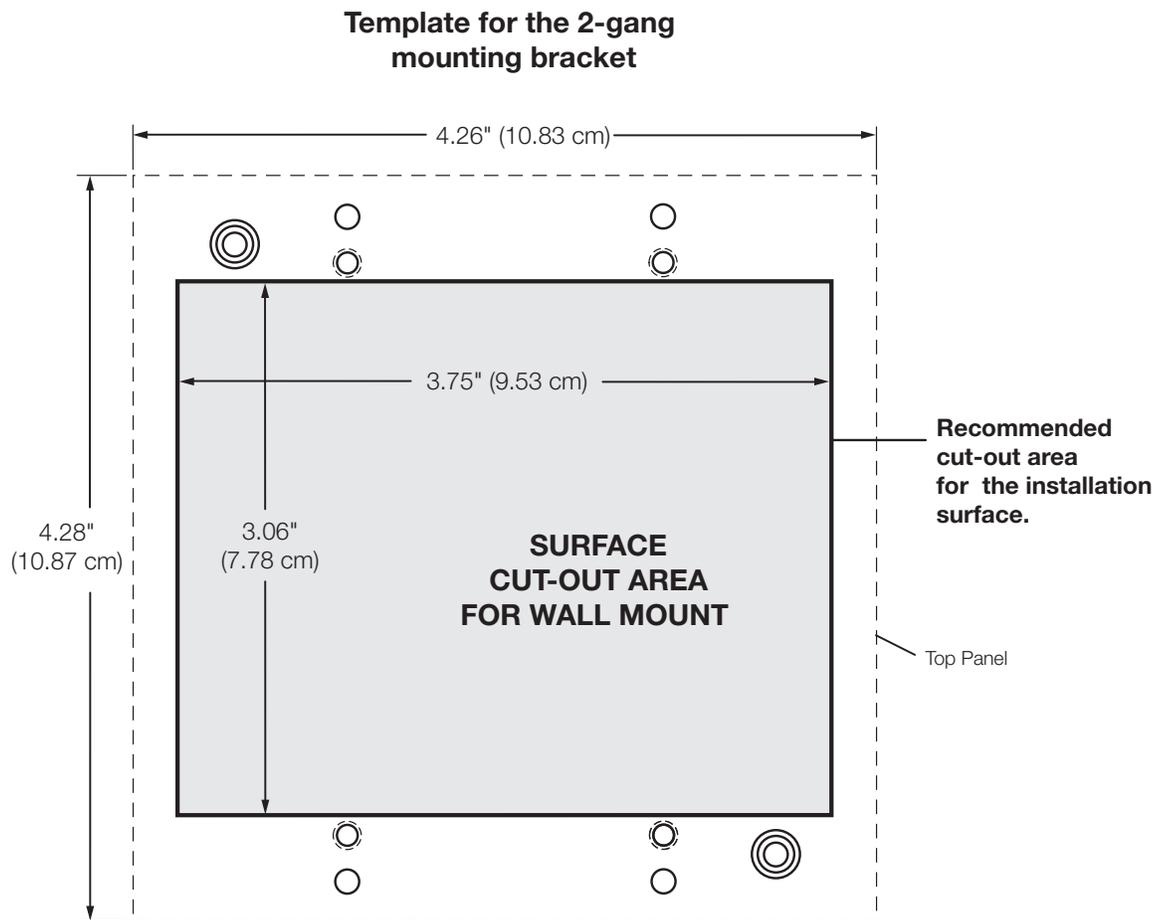
This section includes Decora template dimensions for installation of the DTP T HWP D and DTP T UWP D family of transmitters.

## Decora Template Dimensions

To create a template, use the dimensions shown on figure 14.

### NOTES:

- The drawing is not full size or to scale. **DO NOT** scale up or print to use as a template.
- Full size templates are available online at [www.extron.com](http://www.extron.com).



**Figure 15. 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  
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  
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 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.

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