


USB Extender Plus Series


Twisted Pair Extenders for USB Peripherals



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.


تعليمات السلامة • العربية


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Sicherheitsanweisungen • Deutsch


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Instrucciones de seguridad • Español


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Instructions de sécurité • Français


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ATTENTION : Ce pictogramme, , lorsqu'il est utilisé sur le produit, signale à l'utilisateur des instructions d'utilisation ou de maintenance importantes qui se trouvent dans la documentation fournie avec l'équipement.

Pour en savoir plus sur les règles de sécurité, la conformité à la réglementation, la compatibilité EMI/EMF, l'accessibilité, et autres sujets connexes, lisez les informations de sécurité et de conformité Extron, réf. 68-290-01, sur le site Extron, www.extron.com.


Istruzioni di sicurezza • Italiano


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ATTENZIONE: Il simbolo, , se usato sul prodotto, serve ad avvertire l'utente della presenza di importanti istruzioni di funzionamento e manutenzione nella documentazione fornita con l'apparecchio.

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Instrukcje bezpieczeństwa • Polska


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安全上のご注意 • 日本語

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안전 지침 • 한국어

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

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

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

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. The Class A limits provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference. This interference must be corrected at the expense of the user.

ATTENTION: The Twisted Pair Extension technology works with unshielded twisted pair (UTP) or shielded twisted pair (STP) cables; **but to ensure FCC Class A and CE compliance, STP cables and STP Connectors are 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.

NOTES:

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

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VCCI-A

Conventions Used in this Guide

Notifications

The following notifications are used in this guide:

ATTENTION:

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

NOTE: A note draws attention to important information.

Software Commands

Commands are written in the fonts shown here:

```
^AR Merge Scene,,0p1 scene 1,1 ^B 51 ^W ^C.0  
[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 used 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.

Extron Glossary of Terms

A glossary of terms is available at <http://www.extron.com/technology/glossary.aspx>.

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Introduction

This section provides an overview of the *USB Extender Plus Series User Guide* and the following products:

- USB Extender Plus (rack-mountable)
- USB Extender Plus HID Only
- USB Extender Plus AAP
- USB Extender Plus D

The following topics are discussed:

- **About this Guide**
- **About the USB Extender Plus Series**
- **Features**

About this Guide

This user guide contains information to install, configure, and operate the Extron USB Extender Plus Series transmitter and receiver pairs. Additional product information can be found on the Extron website at www.extron.com.

In this guide, the term “extender” refers to either the transmitter or the receiver. Where differences exist between the transmitter and receiver, they are noted. Unless otherwise specified, the product name “USB Extender Plus” refers to Extender Plus models.

About the USB Extender Plus Series

The USB Extender Plus extends signals over a single CATx twisted pair cable from USB peripheral devices that are located long distances from the host computer. It is compatible with USB 3.0, 2.0, 1.1, and 1.0 devices with a high speed data transfer rate of up to 480 Mbps.

The transmitter connects directly to a USB port on a PC or USB host and includes USB peripheral emulation to enable trouble-free booting of a host computer that is not connected to a keyboard or mouse. The receiver features a built-in active four-port hub that supplies power to multiple attached USB devices.

The transmitters and receivers are available in three form factors that can be mixed and matched:

- **Rack mountable models** — The USB Extender Plus models are 1 inch (25 mm) high, 6 inches (152 mm) deep, a quarter rack wide and can be mounted to a rack or under furniture, or placed on a tabletop (see **Mounting the USB Extender Plus Series** on page 35).

The USB Extender Plus Human Interface Device (HID) models extend the usable distance of USB human interface peripheral devices, and card and CAC readers. HID peripherals include standard keyboards, mice, and hubs that do not require special USB device drivers. The standard and the HID-only rack-mountable transmitters have identical enclosures and connectors, as do the receivers. The only visible difference between these models is an “HID Only” label on the rear panels of the HID-only models.

- **Architectural Adapter Plate (AAP) model** — The USB Extender Plus AAP transmitter and receiver fit into a double-space AAP opening and is wall mountable. It can be mounted to a one-gang junction box if desired.

- **Decorator-Style model** — The USB Extender Plus D is a decorator-style wall plate that fits into a one-gang junction box.

NOTE: The transmitter and receiver pair work with unshielded twisted pair (UTP) or shielded twisted pair (STP) cables. However, to ensure FCC Class A and CE compliance, STP cables are required.

Features

- **Point-to-point long distance transmission** — Extends USB peripherals up to 330 feet (100 meters) on one CAT 5/5e/6/7 cable for point-to-point applications.
- **Supports USB 3.0, 2.0, 1.1, and 1.0 devices** — Supports bulk, control, interrupt, and isochronous transfers as defined by the USB specification.
- **1:N pairing over the network** — One transmitter can be connected to up to four receivers.
- **Extended transmission distance through network connection** — Up to five gigabit network switches can be connected between the transmitter and receiver to increase the signal distance to up to 1980 feet (600 meters).
- **Provides data transfer rates up to 480 Mbps** — Allows high speed transfer from thumb drives and other mass storage devices.
- **Integrated four-port hub** — The receiver has a four-port integrated USB hub, which provides 5 volts, 500 mA on each port. Allows simultaneous connection to multiple peripheral devices such as the Extron Annotator 300, mass storage devices, keyboards, mice, or other human interface devices (HID).
- **Peripheral emulation** — Offers increased system reliability by emulating a continuous connection between the host and an HID-compliant keyboard and mouse.
- **Real-time status LED indicators for troubleshooting and monitoring** — Front and rear panel LED indicators provide visual confirmation of port activity between an active host and each connected peripheral device.
- **Rack and furniture mountable** — Low-profile, 1-inch (2.5 cm) high, quarter rack wide metal enclosures enable the extenders to be installed discreetly, such as beneath a table or inside a lectern.
- **Remote configuration and control** — The transmitter and receiver can be configured via Extron SIS (Simple Instruction Set) commands issued from a computer.
- **Choice of rack-mountable and architectural form factors** — Available in a rack mountable metal enclosure, a dual AAP frame version, and a one-gang decorator-style wall plate for easy integration into a variety of environments.
- **USB switching controller lets you easily create small or large USB switching systems** — Any switcher configuration using up to 64 USB Extender Plus transmitters and receivers can be configured using one controller. Enables the use of serial or IP commands for integration into a control system.
- **Extends human interface devices** — The USB Extender Plus HID-only models extend the usable distance of smart card readers and USB human interface peripheral devices that do not require special USB device drivers, including a standard keyboard, mouse, hub, and other devices.
- **External Extron Everlast power supply included** — Provides worldwide power compatibility with high-demonstrated reliability and low power consumption.
- **Extron Everlast Power Supply is covered by a 7-year parts and labor warranty**

Application Diagrams

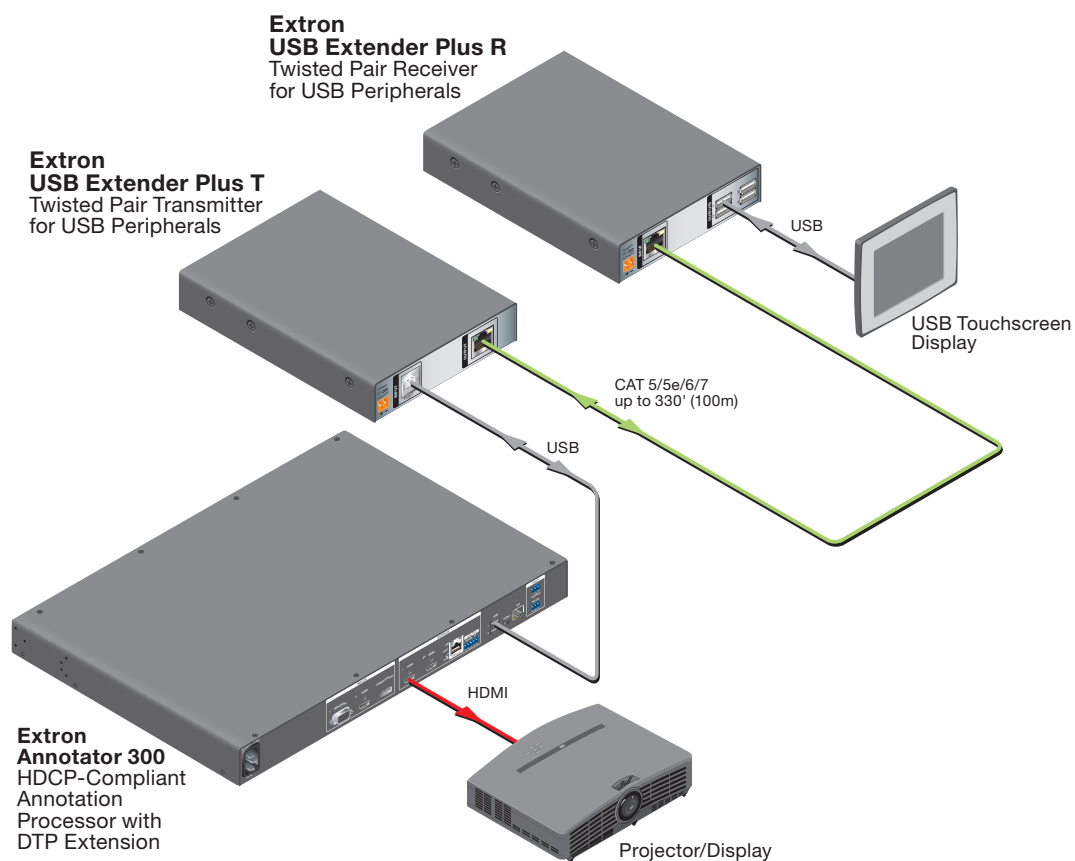


Figure 1. USB Extender Plus Application with the Annotator 300

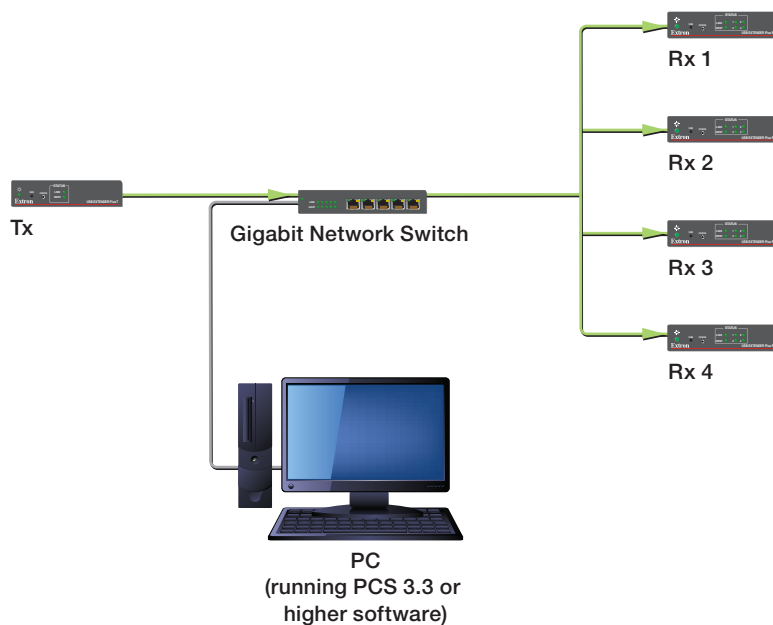


Figure 2. USB Extender Plus using a Network Connection with Multiple Receivers

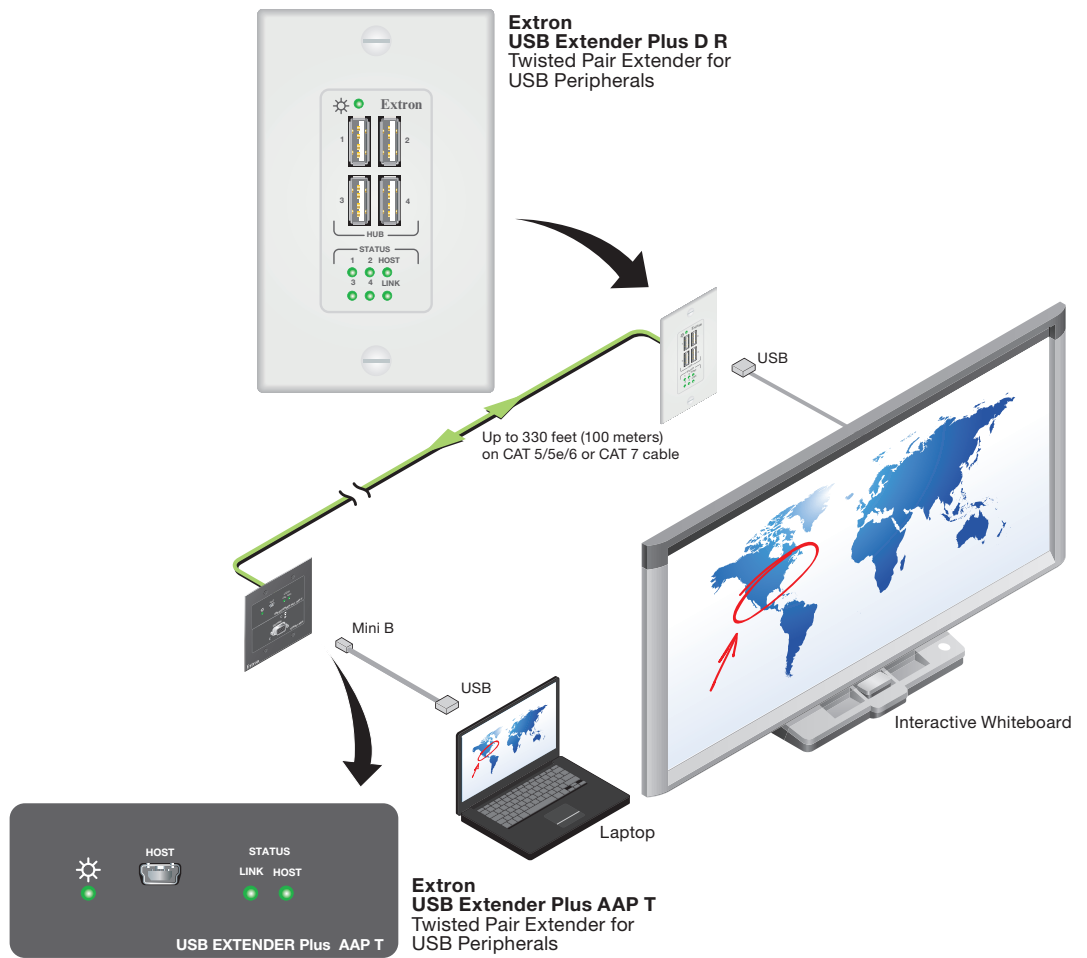


Figure 3. Application with Mixed USB Extenders Plus AAP and D Models

Installation and Operation

This section provides the following details:

- [Connection Guidelines](#)
- [Rear Panel Connections](#)
- [Cabling and Setup](#)
- [Front Panel Features](#)
- [System Operation](#)
- [Troubleshooting](#)

Connection Guidelines

The USB Extender Plus can be installed in existing and new systems within the following guidelines:

- The USB Extender Plus cannot be cascaded (you cannot sequentially connect a USB Extender Plus to another USB Extender Plus or to a FOX T/R USB Extender Plus).
- The extenders have three internal hubs, two of which can be disabled via SIS or the Product Configuration Software (PCS). The hubs that can be disabled are those for peripheral emulation and 1:/N network pairing.
- The USB Extender Plus is able to support a maximum of 31 downstream USB devices (including hubs). For example, if two four-port USB hubs are connected to a receiver, that totals ten devices (two hub connections plus the eight hub ports).
- When extenders are configured for 1:/N (multiple) network pairing, a transmitter can support only one high speed device at a time. For point-to-point pairing, the transmitter can support multiple high speed devices.

Rear Panel Connections

Transmitter Rear Panels – USB Extender Plus T, Standard and HID-only

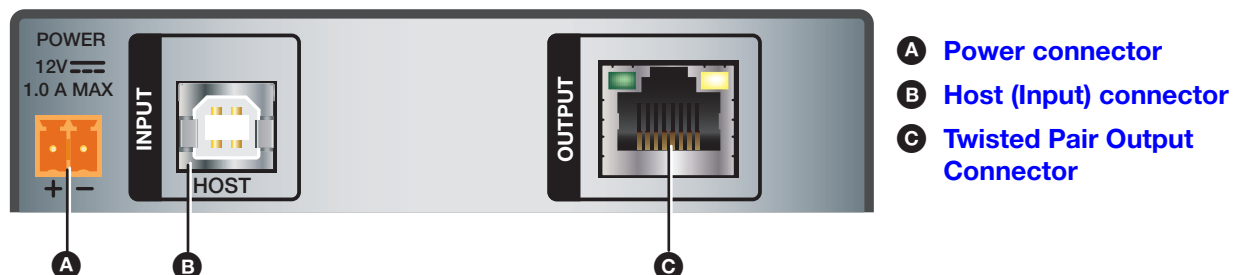


Figure 4. Transmitter Rear Panel Connectors (Rack Mountable Models)

Receiver Rear Panels — USB Extender Plus R, Standard and HID-only

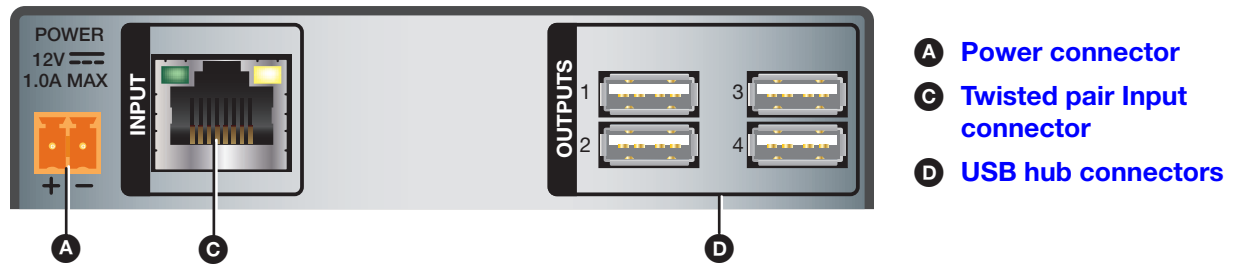


Figure 5. Receiver Rear Panel Connectors (Rack Mountable Models)

- A Power connector** — Connect a provided 12 VDC, 0.5 A max. (transmitter) or 12 VDC, 1.0 A max. (receiver) external power supply to this 2-pole, 3.5 mm captive screw connector.

ATTENTION:

- Do not connect any external power supplies until you have read the **Attention** notifications on page 9.
- Veuillez lire les encadrés « **Attention** » de la page 9 avant de brancher une source d'alimentation externe.

- B Host (input) connector** — Connect a USB Type A to B cable between this USB type B port and the USB port of a host. The USB Extender Plus is USB 3.0 compliant and supports data transfers of 480 Mbps (high speed), 12 Mbps (full speed), and 1.5 Mbps (low speed).

- C Twisted pair connector** —

NOTES:

- On the **transmitters**, the RJ-45 connector is the **output** port.
- On the **receivers**, the RJ-45 connector is the **input** port.

- **Transmitter** — Connect a TP cable from the RJ-45 Input connector of the receiver (see figure 5, **C**) to this female RJ-45 connector.
- **Receiver** — Connect a TP cable from the RJ-45 Output connector of the transmitter to this connector.

See **Twisted Pair Cable Termination** on page 34 to wire the RJ-45 connectors.

- D USB Hub connectors** — The built-in four port hub has four female USB Type A connectors. The connections are USB 3.0 compatible, providing +5 VDC at up to 500 mA to connected USB peripherals requiring power.

Transmitter and Receiver Rear Panels — USB Extender Plus AAP and Decorator-Style

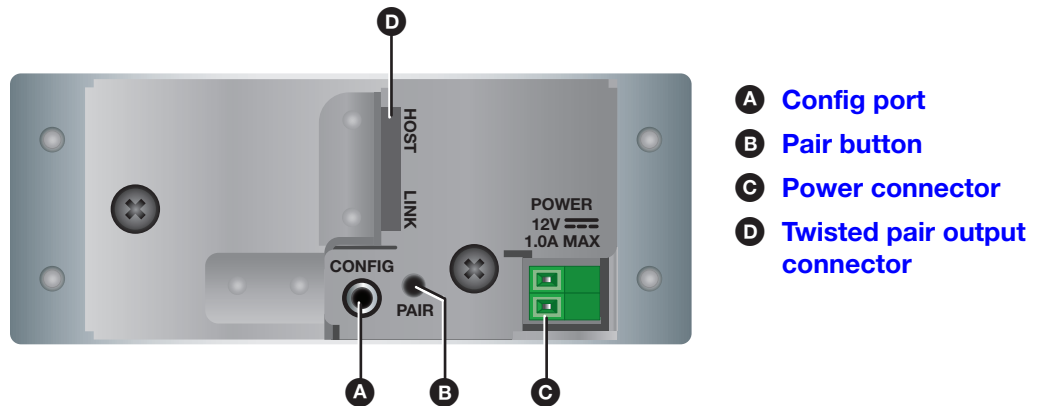


Figure 6. Rear Panel — USB Extender Plus AAP Transmitter and Receiver

ATTENTION:

- The USB Extender Plus AAP transmitter and USB Extender Plus AAP receiver are to be used with UL Listed Extron products that accept Architectural Adapter Plates.
- L'émetteur USB Extender Plus AAP et le récepteur USB Extender Plus AAP doivent être utilisés avec des produits Extron conformes à la norme UL, qui prennent en charge des plaques d'adaptation architecturale.

NOTE: The rear panel of the USB Extender Plus AAP receiver is identical to that of the transmitter except for the function of the RJ-45 connector. On the transmitter, this connector is used for output, while on the receiver it is used for input.

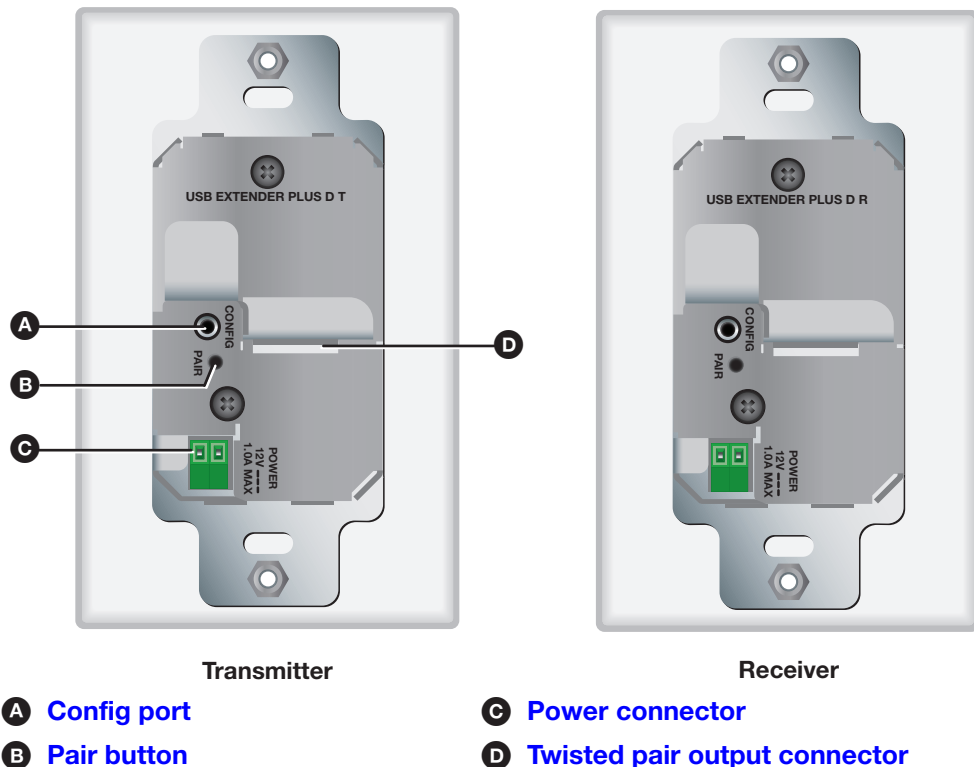


Figure 7. Rear Panel — USB Extender Plus D Transmitter and Receiver

ATTENTION:

- Install the USB Extender Plus Decorator-Style transmitter and USB Extender Plus TR Decorator-Style Receiver into a UL listed outlet/junction box with the provided faceplate or a UL listed faceplate.
- Installez le USB Extender Plus Decorator-Style transmitter et USB Extender Plus TR Decorator-Style Receiver dans une prise de courant ou un boîtier de raccordement certifié(e) UL avec le panneau avant fourni ou un panneau avant certifié UL.

- A Config port** — Connect a 9-pin D-to-2.5 mm TRS cable from a computer to this 2.5 mm TRS jack for RS-232 communication (see [Connecting for Serial Communication](#) on page 13). The Config port enables serial communication with the computer for configuration and control of the transmitter via SIS commands (see [Remote Configuration and Control](#) starting on page 20).

NOTE: Because this connector is on the rear panel, you are not able to access it after the extender has been mounted. All communication via this port must be done before mounting.

- B Pair button** — This recessed button pairs the transmitter with the receiver. Use a small screwdriver or stylus to press this button (see [Pairing and Unpairing the Transmitter and Receiver \(Point-to-Point Only\)](#) on page 12).

NOTES:

- Pairing is required only for point to point non-network applications. For other types of applications, use PCS to set up the connection (see [Using the Configuration Software](#) starting on page 25, for more information).
- For point-to-point non-network applications, pairing must be done before operation the first time the transmitter and receiver are used together.

- C Power connector** — Connect a provided 12 VDC, 1.0 A max external power supply to this 2-pole, 3.5 mm captive screw connector.

ATTENTION:

- Do not connect power to the device until you have read the [power Attention](#) on page 9 on the next page.
- Ne branchez pas l'alimentation au sélecteur avant d'avoir lu les mises en garde [power Attention](#) de la page suivante.

- D Twisted pair connector** — Connect a TP cable between this RJ-45 connector and that of the other unit.

NOTES:

- On the **transmitters**, the RJ-45 connector is the **output** port.
- On the **receivers**, the RJ-45 connector is the **input** port.

See [Twisted Pair Cable Termination](#) on page 34 to wire the RJ-45 connectors.

Power Supply Attention Notices

ATTENTION:

- The power supply must not be permanently fixed to the building structure or similar structures.
- La source d'alimentation ne devra pas être fixée de façon permanente à une structure de bâtiment ou à une structure similaire.
- Do not mount the power supply in air handling spaces or in wall cavities.
- Ne pas installer la source d'alimentation dans des espaces d'aération ou dans des cavités murales.
- 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.
- Cette installation doit toujours être conforme aux dispositions applicables du Code américain de l'électricité (National Electrical Code) ANSI/NFPA 70, article 725, et du Code canadien de l'électricité, partie 1, section 16.
- The power supply must be located within the same vicinity as the Extron AV processing equipment in an ordinary location, Pollution Degree 2, secured to a podium, a desk, or an equipment rack within a dedicated closet.
- La source d'alimentation doit être située à proximité de l'équipement audiovisuel Extron dans un emplacement habituel, avec un degré de pollution 2, fixée à une estrade, un bureau, ou dans une baie technique à l'intérieur d'un placard dédié.
- Always use a power supply provided by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.
- Utilisez toujours une source d'alimentation fournie ou recommandée par Extron. L'utilisation d'une source d'alimentation non autorisée annule toute certification de conformité réglementaire, et peut endommager la source d'alimentation et l'unité.
- If not provided with a power supply, this product is intended to be supplied by a power source marked "Class 2" or "LPS" and rated at 12 VDC, minimum 1.0 A.
- Si ce produit ne dispose pas de sa propre source d'alimentation électrique, il doit être alimenté par une source d'alimentation de classe 2 ou LPS et paramétré à 12 V et 1,0 A minimum.

Cabling and Setup

Figure 8 shows connections for the USB Extenders Plus, rack-mountable models. The connectors are the same for the AAP and decorator-style models except that the USB Hub connectors are on the receiver front panels and are accessible after wall mounting.

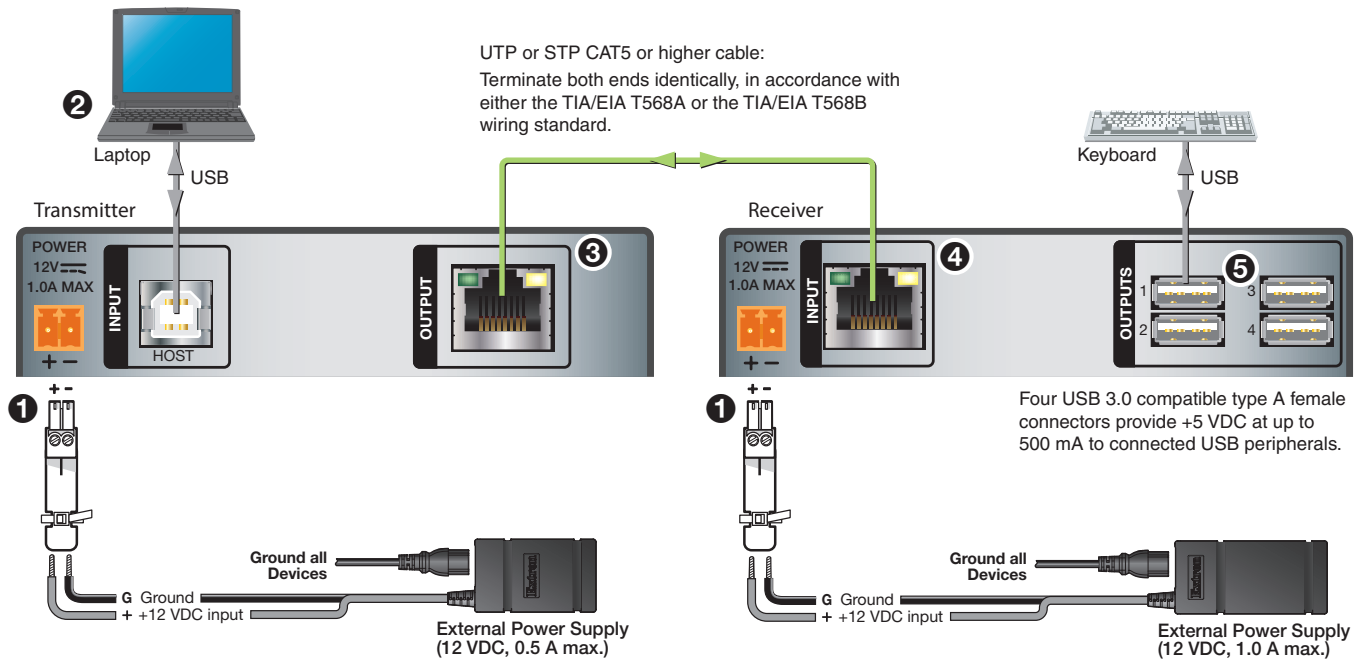


Figure 8. USB Extender Plus T-R Connection with Two External Power Supplies

Installation Procedure

ATTENTION:

- Installation and service must be performed by authorized personnel only.
- L'installation et l'entretien doivent être effectués uniquement par un technicien qualifié.

To ensure proper operation, the transmitter, receiver, USB host, and USB peripherals must be connected properly and in the sequence described here (see figure 8).

1. Power off all devices that will be directly connected to the receiver.
2. Wire the two provided power supplies to the 2-pole captive screw connectors (see figure 8, ①) on the rear panels of the transmitter and of the receiver.
 - **Rack mountable models** — The USB Extender Plus standard and HID Only models are provided with power supplies to which 2-pole captive screw plugs are wired. Plug these connectors into the rear panel captive screw connectors of the transmitter and receiver. If it is necessary to wire a power supply to its connector, see figure 9.

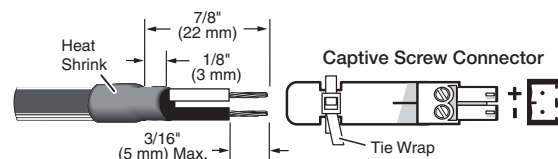


Figure 9. Wiring the Power Connector for the Rack Mountable Models

- **AAP and Decorator-Style models** — These models have green insertion type 2-pole captive screw connectors on their rear panels. The power supply cables are terminated with bare wire. Insert the wires directly into the rear panel captive screw connector, as shown in figure 10.

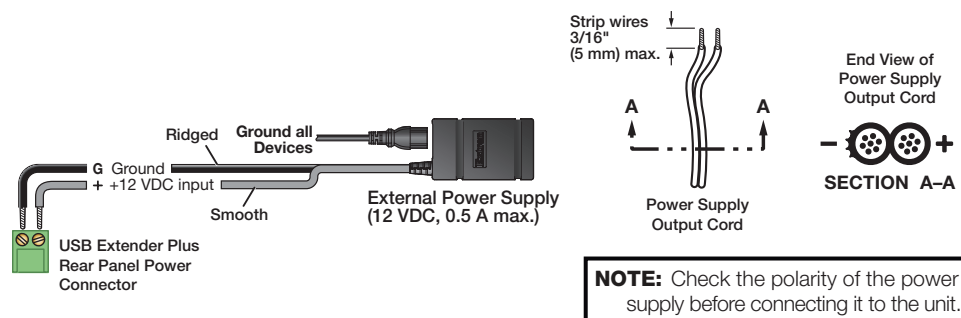


Figure 10. Wiring the Power Connectors for the AAP and Decorator-Style Models

The green power LED (shown at right) on the front panel of each extender lights.

3. Connect a USB Type A-B cable from a USB port of the host computer to the transmitter Host port (see [figure 8](#), [2](#) on the previous page). Shortly after, the receiver Host LED (shown at right) starts blinking, indicating that communication between the USB and host has been established.
4. Connect a CATx twisted pair cable from the RJ-45 Output port of the transmitter ([3](#)) to the Input port of the receiver ([4](#)).
5. Pair the transmitter with the receiver (see [Pairing and Unpairing the Transmitter and Receiver \(Point-to-Point Only\)](#) on the next page). When the pairing process is complete, the Link LEDs on the front panels of the transmitter and receiver light (shown at right).
6. If appropriate, choose a location and mount the transmitter and receiver (see [Mounting the USB Extender Plus Series](#) on page 35).
 - **For rack mounting**, fasten the enclosure to the rack or rack shelf.
 - **For furniture mounting**, attach units to the mounting brackets (not included), then fasten the brackets to the furniture.
 - **For table mounting**, attach the provided four rubber feet to the bottom of the unit and place it where desired.
 - **For wall mounting (AAP and Decorator-Style models only)**, install the junction boxes, mud rings, mounting frames, or AAP frames, following the instructions provided by the manufacturer. Attach the units to the frames.
7. Power on the host computer. On the transmitter, the Host LED on the front panel and the green Activity LED on the rear panel RJ-45 LAN connector light when the computer recognizes the transmitter. When the transmitter and receiver are paired with each other, the front panel Link LEDs light on both the transmitter and receiver.
8. Connect up to four USB cables from peripheral devices (such as a keyboard, mouse, scanner, or printer) to the receiver Hub ports ([5](#)). When the first device is connected, the Host LED stops blinking and remains lit steadily.



HOST		AAP and Decorator-Style Models
HOST		Rack-mountable Models
LINK		AAP and Decorator-Style Models
LINK		Rack-mountable Models

As each peripheral device is connected, the LED for its hub port lights when the host PC detects the device.

9. If desired, connect a 9-pin D-to-2.5 mm TRS cable between a computer and the front panel Config port on the transmitter, receiver, or both to configure the units via SIS commands (see [Connecting for Serial Communication](#) on page 13).

The system is now ready to operate.

Pairing and Unpairing the Transmitter and Receiver (Point-to-Point Only)

In order to function together, the transmitter and receiver must be paired the first time they are used together. Both units must be connected together through their RJ-45 connectors (the transmitter Output connector and the receiver Input connector) and powered on.

NOTES:

- Pairing and unpairing via the pair button is required only for point-to-point non-network applications.
- **Before** pairing a transmitter to a receiver, Extron recommends that you **unpair and cycle power to** each unit in order to clear any previous pairing or to resolve any pairing issues that might occur (see “Unpairing the transmitter and receiver”).

Unpairing the transmitter and receiver

To unpair a transmitter and receiver that have been paired together:

1. Press and hold the **Pair** button on either the transmitter or receiver until the transmitter or receiver Link LED turns off (approximately 10 seconds) and the Link LED on the corresponding receiver or transmitter begins to blink.
2. Release the **Pair** button.
3. Repeat steps 1 and 2 for each transmitter and receiver pair.
4. Proceed with the pairing (see [Pairing the transmitter and receiver](#)).

Pairing the transmitter and receiver

You can initiate pairing from either the transmitter or the receiver (the procedure described below is for transmitter-to-receiver pairing). To pair the transmitter and receiver:

1. Using a stylus or small screwdriver, press the recessed **Pair** button on the transmitter front panel and hold it for 1 second. The front panel Link LED on the transmitter begins blinking as pairing is initiated.
2. Within 10 minutes of pressing the transmitter **Pair** button, press the receiver **Pair** button and hold it for 1 second. The receiver front panel Link LED begins to blink.

When the LEDs of both units have stopped blinking and remain lit steadily, the pairing is complete.

NOTES:

- After they have been paired, the transmitter and receiver can be powered down and disconnected from each other.
- A transmitter and receiver need to be paired only once (at startup). If the paired units are reconnected and powered on, they do not have to be paired again.
- For the AAP and decorator-style models, be sure to perform this procedure **before** mounting the units.

Canceling pairing

To stop the pairing process before it completes, do either of the following:

- Do not perform **step 2**, on the previous page, of the pairing process (that is, do not press the **Pair** button within 10 minutes).
- Press the transmitter **Pair** button and hold it for 1 second. The Link LED turns off.

Connecting for Serial Communication

The Config ports on both the transmitter and the receiver enable communication with a computer via an RS-232 connection.

NOTE: On the rack-mountable models (USB Extender Plus standard and HID-only), the Config port is on the **front** panel and easily accessible.

On the AAP and decorator-style models, the Config port is on the **rear** panel, so that it is not available after the unit is mounted. Any configuration via this port must be done before the product is mounted.

To enable serial communication, connect a 9-pin D-to-2.5 mm cable (not included) from the computer serial port to the Config port on the transmitter or receiver. You can enter SIS commands at the computer and issue them to the transmitter or receiver to control and configure the unit. The port protocol is 9600 baud, 8 data bits, 1 stop bit, and no parity.

An optional 9-pin D-to-2.5 mm TRS configuration cable is available from www.extron.com and can be used to connect your computer to this port. Figure 11 shows the configuration and pin assignments of this cable.

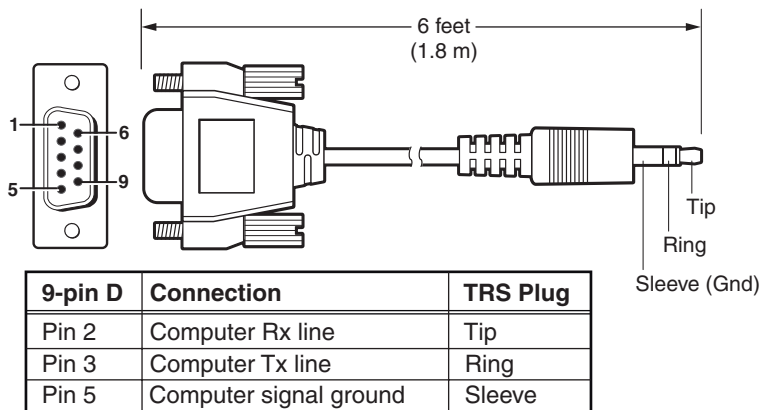


Figure 11. Optional 9-pin D to 2.5 mm TRS Cable for the Config Port

Connecting over the Network

For increased signal distance or to connect to a 1:N application, you can connect one to five gigabit network switches between the Ethernet ports of a transmitter and receiver.

- Extron recommends that gigabit network switches be used with the USB Extender Plus series in a network application. Although 10/100 network switches can be used, they allow only low and full speed USB devices such as mouse and keyboards to function correctly. No more than five network gigabit switches can be used between the transmitter and receiver.
- The USB Extender Plus series uses Layer-3 (TCP/IP) for pairing and Extron PCS, and Layer-2 (UDP, MAC address) for communication and USB data transfer. Because of this IGMP is not required or used.

- Each network switch that is added between the transmitter and receiver adds latency or degrades the signal, which may cause USB devices to function incorrectly. If a network switch being used features Quality of Service (QoS), it can reduce the effect of network congestion. However, it may not be effective in counteracting the latency that each network switch adds.
- The USB Extender Plus series is compatible with both managed and unmanaged network switchers.
- Multicast and Unicast do not apply to the USB Extender Plus series. This series features its own proprietary technology when the 1:N feature is enabled.
- Traffic and communication to one receiver is not broadcast by the transmitter to all receivers. Each packet from a transmitter is designated to a single receiver with specific MAC address.
- The USB Extender Plus series is compatible with both IPV4 and IPV6.
- USB Extender Plus models used in a network application and the PC running the PCS software must all be on the same subnet and network.
- USB Extender Plus models that are used in a network application should be on their own independent network to keep latency low. If the latency gets too high then packets are lost or take too long and the USB protocol falls apart.
- When using the USB Extender Plus series over-the-network or 1:N pairing, you can use only one high speed device at a time to one transmitter. High speed USB devices include webcams, audio devices, external hard drives, and so on.
- Each unit (transmitter or receiver) stores MAC addresses of every unit it pairs with (up to four for transmitters and one for receivers). You can have multiple transmitter and receivers connected to your system, and each transmitter be paired with up to four receivers. However, a receiver cannot be paired to more than one transmitter.
- The Extron PCS software is recommended for use during initial pairing and when configuring the IP address, subnet mask, and gateway address of each unit (transmitter or receiver) being used in a network application.

Network connection examples

Each unit can be connected and placed up to 330 feet (100 meters) from the switch for a total distance of 660 feet (200 meters), as shown in the example in figure 12.

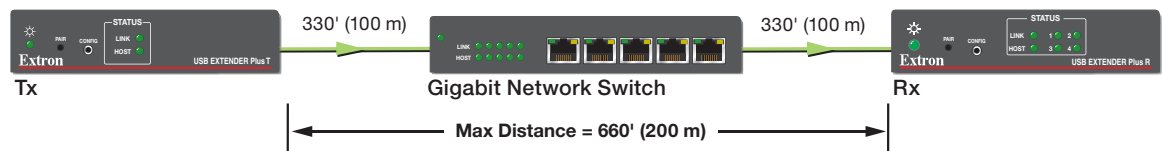


Figure 12. Network Connection with One Switch

Adding up to five network switches between the two units can increase the signal distance to up to 1980 feet (600 meters), as shown in the example in figure 13.

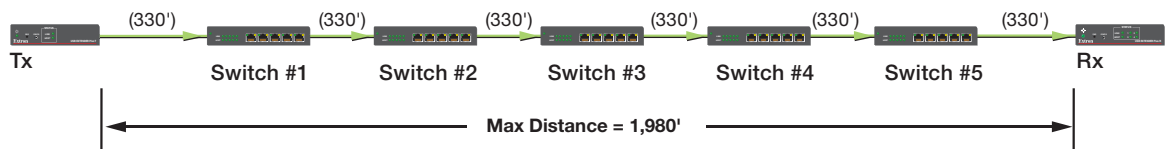


Figure 13. Network Connection using Multiple Switches

Pairing a Transmitter to Multiple Receivers

You can also connect a transmitter and up to four receivers to a network switch, then tie (pair) the transmitter to the connected receivers using the Extron PCS Control Program. The computer communicates with all connected USB Extenders via the network and makes ties through their hardware (MAC) addresses (see the example in figure 14).

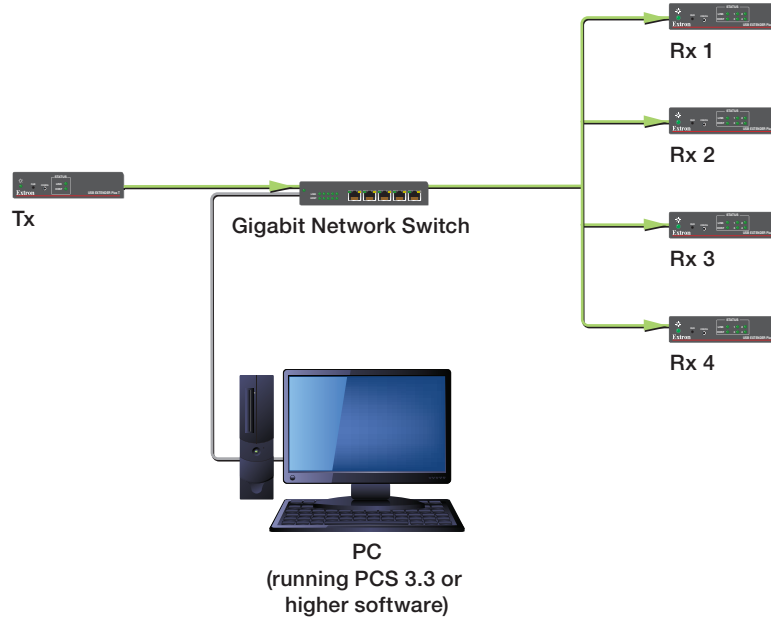


Figure 14. Tying a Transmitter to Four Receivers using a Network Connection

See [Using the Configuration Software](#) on page 25 to download the program and use it to tie the transmitter to the receivers.

Enabling and Disabling Peripheral Emulation

The transmitter can be set up to emulate a mouse and keyboard to the host computer that is connected to the transmitter Host input port. This allows the computer to boot up in the event that it requires a USB keyboard or mouse to be present.

NOTE: A USB extender with peripheral emulation enabled has three hubs internally (two hubs with peripheral emulation disabled). Additional hubs may be on the host PC.

Using SIS commands, you can disable and enable peripheral emulation (see [Remote Configuration and Control](#) starting on page 20). By default, peripheral emulation is enabled. The following peripheral emulation commands can be issued to the **transmitter only**:

- **To disable:** `[Esc] E 0 USBC←`
- **To enable:** `[Esc] E 1 USBC←`

Front Panel Features

Transmitter Front Panels



Figure 15. Transmitter Front Panel, Rack-mountable Models

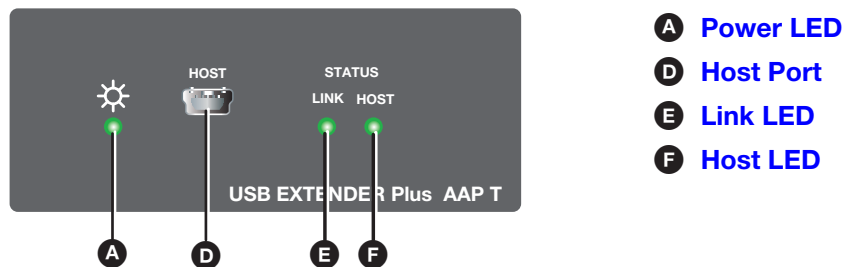


Figure 16. Transmitter Front Panel, AAP Model

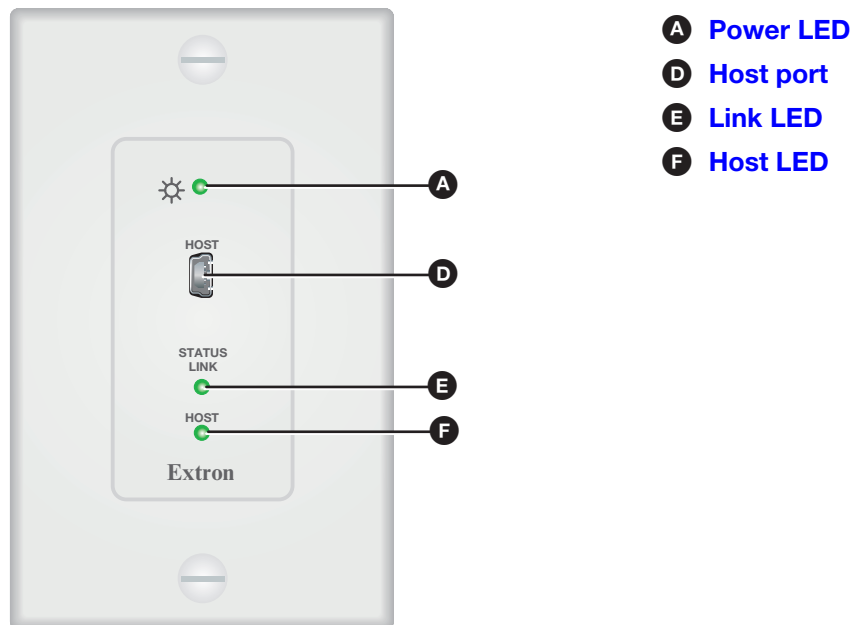


Figure 17. Transmitter Front Panel, D Model

- A Power LED** — This green LED lights to indicate that the unit is receiving power.
- B Pair button** — This recessed button pairs the transmitter with the receiver. Use a small screwdriver or stylus to press this button (see [Pairing and Unpairing the Transmitter and Receiver \(Point-to-Point Only\)](#) starting on page 12).

NOTES:

- Pairing is required only for point to point non-network applications. For other types of applications, use PCS to set up the connection (see [Using the Configuration Software](#) starting on page 25, for more information).
- For point-to-point non-network applications, pairing must be done before operation the first time the transmitter and receiver are used together.

- C Config port** (see [figure 15](#) on page 16) — Connect a 9-pin D-to-2.5 mm TRS cable from a computer to this 2.5 mm TRS jack for RS-232 communication (see [Connecting for Serial Communication](#) on page 13). The Config port enables serial communication with the computer for configuration and control of the transmitter via SIS commands (see [Remote Configuration and Control](#) starting on page 20).
- D Host (input) port** — (AAP and D models only) Connect a USB type A to mini-B cable from a computer USB port to this USB mini-B connector. The USB Extender Plus is USB 3.0 compliant and supports data transfers of 480 Mbps (high speed), 12 Mbps (full speed), and 1.5 Mbps (low speed).
- E Link LED** — This green LED lights when the transmitter and receiver are successfully paired, connected together by the twisted pair cabling, and receiving power. While the transmitter is being paired with the receiver, this LED blinks. When the pairing process is completed, the LED lights steadily.
- F Host LED** — This green LED lights when the transmitter is powered and is communicating with the host PC.

Receiver Front Panels

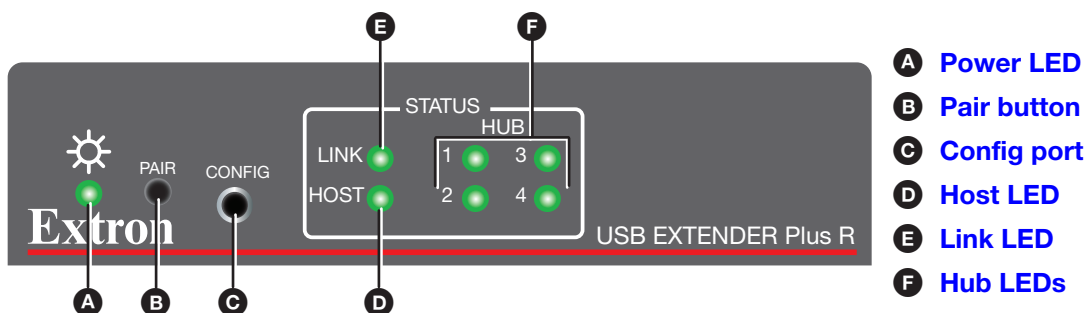


Figure 18. Receiver Front Panel, Rack-mountable Models

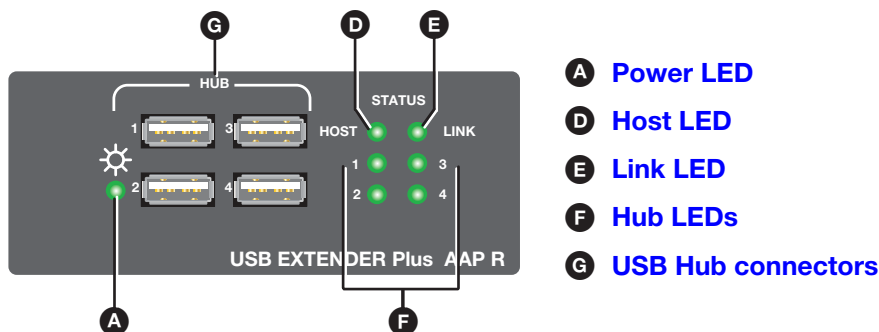


Figure 19. Receiver Front Panel, AAP Models

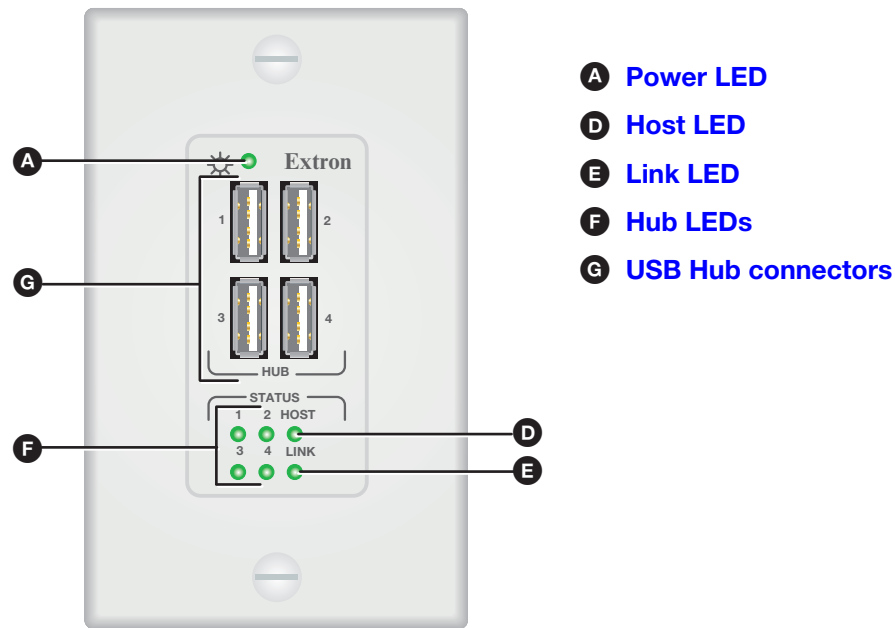


Figure 20. Receiver Front Panel, Decorator-Style Models

- A Power LED** — This green LED lights to indicate that the unit is receiving power.
- B Pair button** — This recessed button pairs the receiver with the transmitter, which must be done before operation the first time they are used together. Use a small screwdriver or stylus to press it (see [Pairing and Unpairing the Transmitter and Receiver \(Point-to-Point Only\)](#) on page 12).
- C Config port** — Connect a 9-pin D-to-2.5 mm TRS cable from a computer to this 2.5 mm TRS jack for RS-232 communication (see [Connecting for Serial Communication](#) on page 13). The Config port enables serial communication with the computer for configuration and control of the receiver via SIS commands (see [Remote Configuration and Control](#) starting on page 20).
- D Host LED** — This green LED blinks when both the transmitter and receiver are powered, both are correctly connected by the twisted pair cable, and the receiver is communicating with the host PC.
Blinks when the transmitter and receiver are both powered and connected, but no USB devices are connected.
- E Link LED** — This green LED lights when the transmitter and receiver are successfully paired, connected together by the twisted pair cabling, and receiving power.
While the receiver is being paired with the transmitter, this LED blinks. When the pairing process is completed, the LED lights steadily.
- F Hub LEDs** — A single green LED for each port lights when the peripheral device connected to the associated USB port is recognized by the host PC.
- G USB Hub connectors** — The built-in four port hub has four female USB Type A connectors. The connections are USB 3.0 compatible, providing +5 VDC at up to 500 mA to connected USB peripherals requiring power.

System Operation

No drivers are required for a host PC to function with the USB Extender Plus. The transmitter is detected by the operating system and appropriate USB drivers are loaded. Certain USB peripherals, such as gaming keyboards, USB interactive white boards, scanners, printers, and similar devices, require specific drivers installed on the PC. See the USB device installation instructions or the website of the peripheral device manufacturer to obtain drivers.

Once the transmitter, the receiver, the PC or USB host, and peripherals are connected, have appropriate drivers loaded, and are powered up, the system is fully operational. If problems are encountered, ensure all cables are routed and connected properly and the latest drivers for each peripheral are installed.

Troubleshooting

USB signals are generally reliable but are susceptible to bad connections or cables that are too long. The TP cable can have the same issues. To avoid the loss of data and communications, follow these guidelines:

- The USB cables that connect the transmitter to the host or the receiver hub ports to peripheral devices should not exceed 6 feet (1.8 meters).
- When connecting the host or peripherals, use only cables designed for USB signals.
- Avoid or limit the use of adapters.
- The USB Extender Plus works as described in point-to-point applications. Do not use additional adapters, patch panels, or couplers with the host USB cables, hub USB cables, or twisted pair cables. Additional links in the signal chain can result in the reduction of signal integrity and overall system performance.

When properly connected and operating, the transmitter and receiver Power LEDs, Link LEDs and Host LEDs are lit. The Hub LED for each connected peripheral recognized by the host PC is also lit.

Front panel LEDs are also useful for troubleshooting. The following table outlines operating details indicated by the LEDs:

	Transmitter		Receiver	
LED Indicator	On	Off	On	Off
Power	12 VDC power supply is connected and operating properly.	12 VDC power supply is not connected or is defective.	12 VDC power supply is connected and operating properly.	12 VDC power supply is not connected or defective.
Link	Both transmitter and receiver are paired, have power, and are connected properly by the TP cable.	If both Power LEDs are on, the TP cable is not connected or is improperly wired, or the units are not paired. If either Power LED is off, see the Power LED troubleshooting instructions, above.	Both transmitter and receiver are paired, have power, and are connected properly by the TP cable.	If both Power LEDs are on, the TP cable is not connected or is improperly wired, or the units are not paired. If either Power LED is off, see the Power LED troubleshooting instructions, above.
Host	When transmitter power LED is on, lights when communication with host PC is established.	If transmitter power LED is on, USB cable is not connected.	Lights when communication with host PC is established. Blinks if power and Link LEDs are on, but no USB devices are connected.	Host USB port is not connected or host is not communicating.
Hub	N/A	N/A	Lights when a connected peripheral is recognized by the host PC.	A peripheral device connected to the USB port has not been recognized or is improperly connected.

Remote Configuration and Control

This section describes the connection through which the USB Extender Plus can be configured and controlled remotely via Simple Instruction Set (SIS) commands, and describes the commands that are available. Topics include:

- **Host Control Port**
- **SIS Commands**
- **Using the Command and Response Table**
- **Command and Response Table for SIS Commands**

Using SIS commands, the USB Extender Plus devices can be remotely set up and controlled via a host computer or other device (such as a control system) that is attached to the Config port. You can issue SIS commands to the extender using a communication software program, such as Extron DataViewer.

NOTE: The SIS command for resetting must be issued to both the transmitter and the receiver. Do not reset one unit without resetting the other.

Host Control Port

To enable serial communication, connect a 9-pin D-to-2.5 mm cable (not included) from the computer serial port to the Config port on the transmitter or receiver. The port protocol is as follows:

- 9600 baud
- 8 data bits
- 1 stop bit
- no parity

An optional 9-pin D-to-2.5 mm TRS configuration cable is available from www.extron.com and can be used to connect your computer to this port. Figure 21 shows the configuration and pin assignments of this cable.

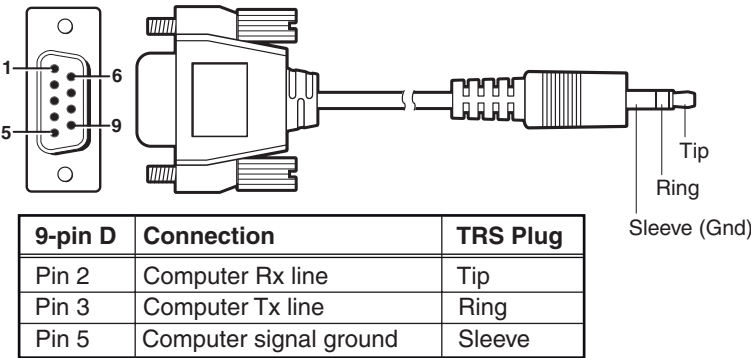


Figure 21. Optional 9-pin D to 2.5 mm TRS Cable for the Config Port

SIS Commands

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command sequence. When the USB Extender Plus determines that a command that was entered is valid, it executes the command and sends a response to the host device.

Most responses from the USB Extender Plus to the host computer end with a carriage return and a line feed (CR/LF = \leftarrow), which signals the end of the response character string. A string is one or more characters.

Extender-initiated Message

When power is applied to the extender or after the unit has been reset via SIS, it sends the following copyright message:

(C)Copyright 20nn, Extron Electronics, USB Extender Plus Series, Vn.nn,
60-nnnn-nn \leftarrow

- Vn.nn is the firmware version number
- 60-nnnn-nn is the unit part number

NOTE: This message is displayed only when power is applied to the extender while it is connected to the computer via the Config port.

Error Responses

If the extender is unable to execute a command it receives because the command is invalid or contains invalid parameters, the USB Extender Plus returns an error response to the host. The error response codes for USB Extender Plus include:

- | | |
|--|---------------------------|
| E10 — Invalid command | E22 — Busy |
| E12 — Invalid port number | E24 — Privilege violation |
| E13 — Invalid parameter | E25 — Device not present |
| E14 — Not valid for this configuration | |

Using the Command and Response Table

The [Command and Response Table for SIS Commands](#) on page 23 lists valid ASCII command codes, the responses of the extender to the host, and descriptions of the command functions or the results of executing the commands.

ASCII to Hexadecimal Conversion

The ASCII to Hex Conversion Table below is for use with the Command and Response Table.

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

Symbol Definitions

↵ = CR/LF (carriage return and line feed) (hex 0D 0A)

← = Soft carriage return (no line feed)

• = Space

Esc = Escape key (hex 1B)

X1 = On and off (enable and disable)

0 = Off or disabled

1 = On or enabled

X2 = Extender unit part number:

Transmitter: 60-1471-12

Receiver: 60-1471-13

HID Only Transmitter: 60-1539-12

HID Only Receiver: 60-1539-13

AAP Transmitter, black: 60-1472-12

AAP Receiver, black: 60-1472-22

AAP Receiver, white: 60-1472-23

Decorator-style Transmitter: 60-1473-13

Decorator-style Receiver: 60-1473-23

X3 = IP address (Default is 192.168.254.254.)

X4 = Subnet mask (Default is 255.255.0.0.)

X5 = Gateway IP address (Default is 0.0.0.0.)

X6 = Port number for Config port (Default is 6137.)

NOTE: Unless otherwise indicated, commands are not case-sensitive.
--

Command and Response Table for SIS Commands

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional Description
Information Requests			
Request part number	N	X2 ↵ 60-1471-12 60-1471-13 60-1539-12 60-1539-13 60-1472-12 60-1472-22 60-1472-23 60-1473-13 60-1473-23	Show the extender part number X2 . Transmitter Receiver HID Only Transmitter HID Only Receiver AAP Transmitter, black AAP Receiver, black AAP Receiver, white Decorator-style Transmitter Decorator-style Receiver
Query firmware version	Q	n.nn ↵	Show the firmware version, expressed to the second decimal place.
Example:	Q	1.01 ↵	The unit firmware version is 1.01.
Query firmware version and build	*Q	n.nn.nnnn ↵	Show firmware version and build number.
Peripheral Emulation (Transmitters Only)			
NOTE: These commands can be issued only to the transmitter.			
Set peripheral emulation	Esc E X1 USBC ←	Usbc E X1 ↵	Set peripheral emulation for the USB Extender Plus T to X1 .
View peripheral emulation	Esc E USBC ←	X1 ↵	
Network Pairing			
Enable 1:N network pairing	Esc N X1 USBC ←	Usbc N X1 ↵	Enable or disable pairing of the transmitter with receivers via the network.
View 1:N network pairing	Esc N USBC ←	X1 ↵	
KEY: X1 = On and off (enable and disable) 0 = Off or disabled, 1 = On or enabled (Default)			
Resetting			
NOTE: This command must be issued to both the transmitter and the receiver.			
Reset device settings to factory defaults	Esc ZXXX ←	Zpx ↵	Reset the extender to factory default values while retaining pairing and IP settings.
Absolute system reset	Esc ZQQQ ←	Zpq ↵	Reset all extender settings to factory defaults except firmware version.
Upload Firmware			
Upload firmware	Esc UPLOAD ←	...go Up1 ↵	Up1 ↵ is displayed after the upload is complete.

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional Description
Network Settings			
Set DHCP mode	[Esc] [X1] DH ←	Idh [X1] ↵	Enable or disable Dynamic Host Configuration Protocol (DHCP) automatic assignment of IP addresses.
	[Esc] DH ←	[X1] ↵	Show current DHCP status [X1] .
Set IP address	[Esc] [X3] CI ←	Ipi • [X3] ↵	Set IP address [X3] for the unit. Default: 192.168.254.254.
View IP address	[Esc] CI ←	[X3] ↵	Show the current unit IP address.
Set subnet mask	[Esc] [X4] CS ←	Ips • [X4] ↵	Set subnet mask [X4] for the unit. Default: 255.255.0.0.
View subnet mask	[Esc] CS ←	[X4] ↵	Show the current subnet mask for the unit.
Set gateway IP address	[Esc] [X5] CG ←	Ipg • [X5] ↵	Set gateway address [X5] for the unit. Default: 0.0.0.0
View gateway address	[Esc] CG ←	[X5] ↵	Show current gateway address of the unit.
Set Config port map	[Esc] K [X6] PMAP ←	Pmap K [X6] ↵	Set a port number ([X6]) for the Config port. Default: 06137
NOTE: Remapping of a port number (other than to reset it to the default 06137 or disable it by resetting it to 0) must be to port numbers higher than 1024.			
Reset Config port map	[Esc] K 06137 PMAP ←	Pmap K 06137 ↵	Reset the Config port number to the factory default (06137).
Disable Config port	[Esc] K 0 PMAP ←	Pmap K 00000 ↵	Disable the Config port.
View Config port map	[Esc] K PMAP ←	[X6] ↵	View the current Config port number.
KEY: [X1] = On and off (enable and disable) 0 = Off or disabled, 1 = On or enabled [X3] = IP address (Default is 192.168.254.254.) [X4] = Subnet mask (Default is 255.255.0.0.) [X5] = Gateway IP address (Default is 0.0.0.0.) [X6] = Port number for Config port (Default is 6137.)			

Using the Configuration Software

The Extron Product Configuration Software (PCS) is a Windows-based program for the USB Extender Plus that enables you to tie (pair) the transmitter to multiple receivers (see [Pairing a Transmitter to Multiple Receivers](#) on page 15 to set up this configuration). This program is available on the Extron website.

Downloading the PCS Configuration Software from the Extron Website

To use the PCS program, download it from www.extron.com and install it on your PC. Download updates to PCS as they become available. To access the software:

- 1. Open the Extron website and mouse over the **Download** tab (see figure 22, ❶).
- 2. Click the **PCS Product Configuration Software** link (❷).

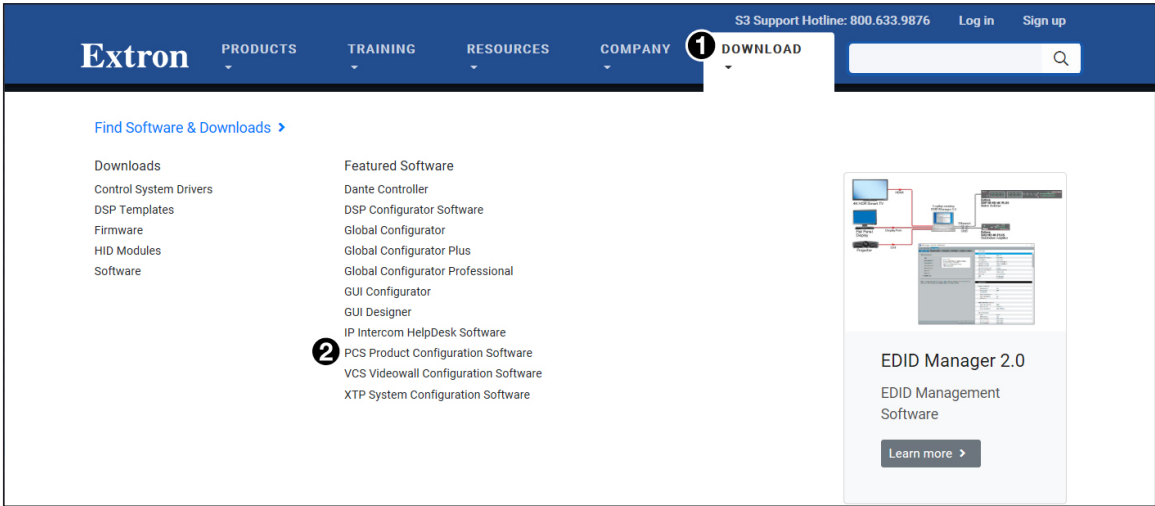


Figure 22. Software Links on the Download Page of the Extron Website

- 3. On the PCS page, click the **Download** button in the table (see figure 23, ❶).

Version	Release Date	New in the Current Release	Size
4.3.0	Jul. 9, 2018	<ul style="list-style-type: none">• Added support for HC 403• Added language support for Spanish, Simplified Chinese, Japanese, German, and French• Ability to restore configuration to multiple devices across all IN1608 products• Ability to update firmware to multiple devices across all DVS 605 products• Added new features for MediaPort 200• Various bug fixes	162.5 MB ❶ Download Login required

Figure 23. Download Button on the PCS Web Page

- 4. On the Download Center screen that opens, fill in the required information, then click the **Download pcss_vnxxn.exe** button.
- 5. If the File Download - Security Warning window appears, click **Run** to begin downloading the installer file.

NOTE: If you want to save the installation file to your computer to run later, click **Save**. On the Save As window, save the setup file to the desired location. When you are ready to install the software, double-click on the **pcss_vnxxn.exe** icon, click **Run** on the download screen, and restart this procedure at step 6.

If you see a **Download** icon at the bottom of the page, wait until the icon displays the name **pcss_vnxxn.exe**, then click it.

6. On the next prompt window that opens, click **Run** to start the installation process.
7. Follow the instructions on the InstallShield Wizard screens to complete the software program installation. By default, the installation creates a folder called **Extron PCS** at:
 - c:\Program Files (x86)\Extron\Extron PCS or
 - c:\Program Files\Extron\Extron PCS

If there is not already an Extron folder in your Program Files folder, the installation program creates it as well.

Setting Up Network Operation

To set up the USB Extender Plus for use on the network, do the following:

1. Connect the transmitter, receivers, and computer to a gigabit network switch (see [figure 12](#) on page 14 for an example).

NOTE: The transmitter, receivers, and the PC running the PCS software must all be on the same subnet and network.

2. By default, over-the-network pairing should be enabled. If it is not, enter the following SIS command to enable it:

- [Esc] N 1 USBC ←

(See [SIS Commands](#) on page 21 for information on entering these commands.)

3. Obtain the subnet mask and gateway IP address of your computer network. Either obtain this information from your system administrator, or via a Windows Command window as follows:

- a. Open a **Command** window on your computer.
- b. At the command prompt enter **ipconfig**. A screen similar to the example in [figure 23](#) appears, displaying connection information for the computer.

NOTE: Before assigning network addresses, check with your system administrator to find out what IP addresses are available or appropriate for you to use.

4. Record the Subnet Mask and Default Gateway addresses (see [figure 24](#), ①).

```

C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Extron User>ipconfig

Windows IP Configuration

Ethernet adapter Bluetooth Network Connection:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . : 
Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix . : extron.com
    Link-local IPv6 Address . . . . : fe80::2ccb:3574:137:b547%12
    IPv4 Address. . . . . : 192.168.254.254
    Subnet Mask . . . . . : 255.255.240.0
    Default Gateway . . . . . : 10.113.64.100

Tunnel adapter isatap.{8F072EDC-F13D-4C03-8684-B589F683F2B5}:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . : 
Tunnel adapter isatap.extron.com:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . : extron.com

C:\Users\Extron User>
  
```

Figure 24. Command Prompt Window with IP Information

5. Use PCS or SIS commands to set the IP address, gateway address, and subnet mask as needed (see [figure 28](#) on page 29).

Starting the Configuration Program

In order to use the PCS software, the transmitter, receivers, and computer running the PCS software must all be on the same network and must have the same subnet mask and gateway IP address (see [Setting Up Network Operation](#) on page 26).

1. To start the PCS configuration program, do either of the following:
 - Double-click on the EAF.exe file, by default located on your computer at `c:\Program Files [or Program Files(x86)]\Extron\Extron PCS`.
 - Click **Start > All Programs > Extron Electronics > Extron Product Configuration Software/Extron Product Configuration Software**.
2. The first time you open the PCS software, a Tutorial screen appears. To close this screen, click **I Get It** or **OK**. The Extron PCS window opens, displaying a list of all devices connected to the network.
3. Check the software version and ensure that it is **3.3** or higher. To view the software version:
 - a. Click the menu icon in the upper-right corner of the PCS screen and select **About Extron PCS** from the drop-down list.

The following screen opens:

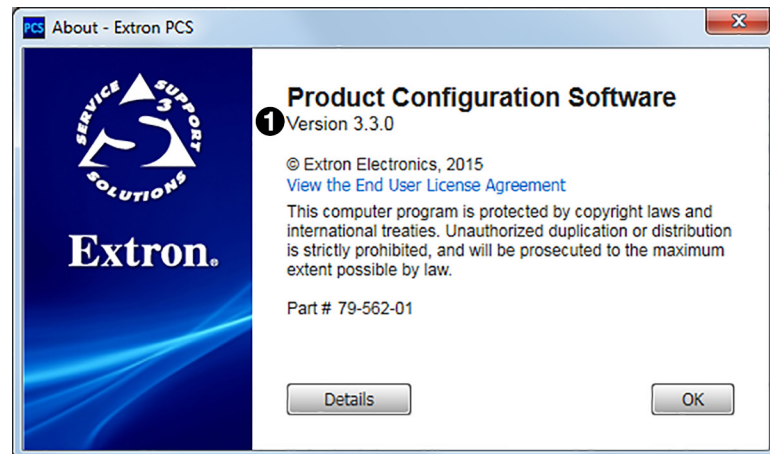


Figure 25. Software Version Number on the About PCS Screen

- b. After ensuring that the software version is 3.3 or higher (see figure 25, ①), click **OK** to close the window.
4. On the **Extron PCS** window, click the down arrow button in the upper-left corner (see figure 26, ①) to display the configuration drop-down list.
5. Select **New Configuration File** from this menu.

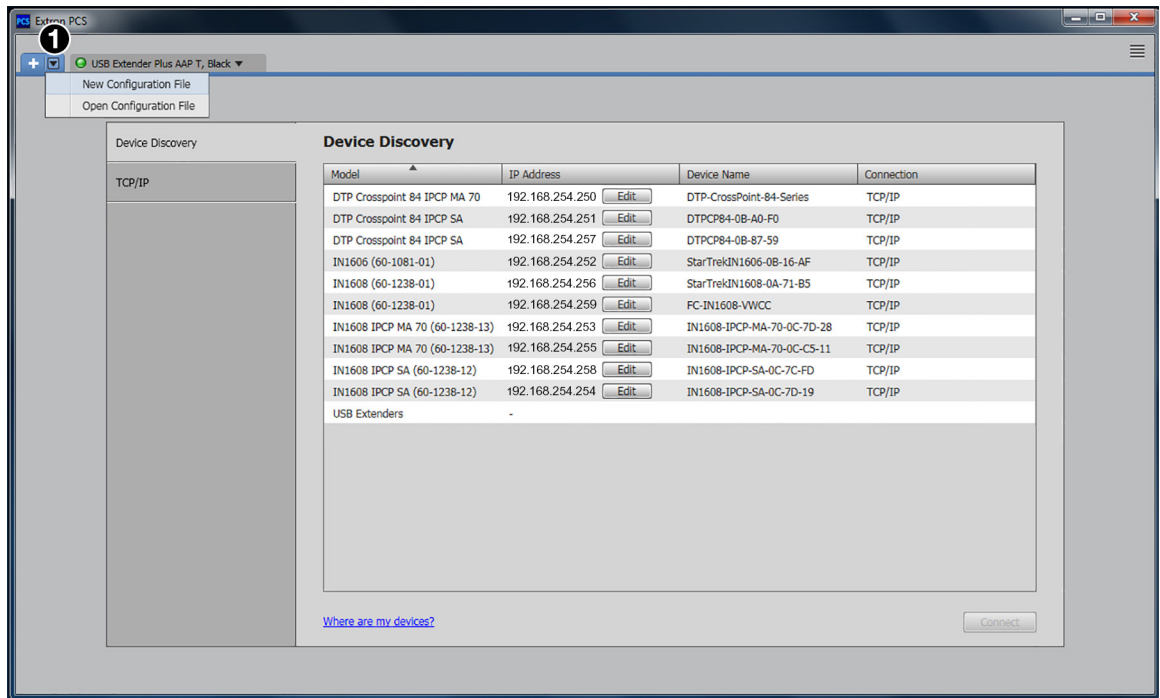


Figure 26. Selecting New Configuration File on the PCS Window

The New Configuration File dialog box opens (see figure 27), displaying a list of all USB Extender Plus devices on your network.

- On this list, click the name of the USB extender to be configured.

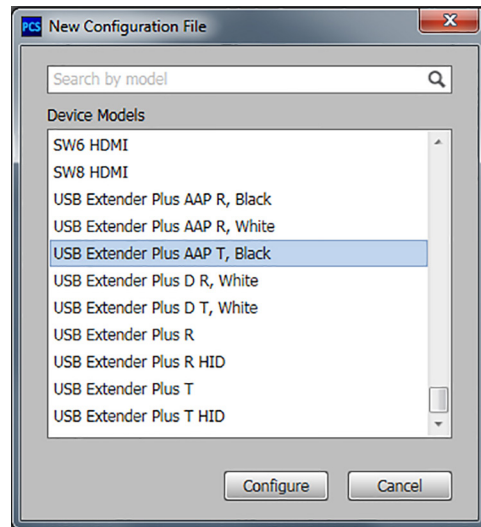


Figure 27. Selecting an Extender from the New Configuration File List

The dialog box closes and the Device Settings screen appears, with name of the selected device on a new tab at the top of the screen (see figure 28, ❶).

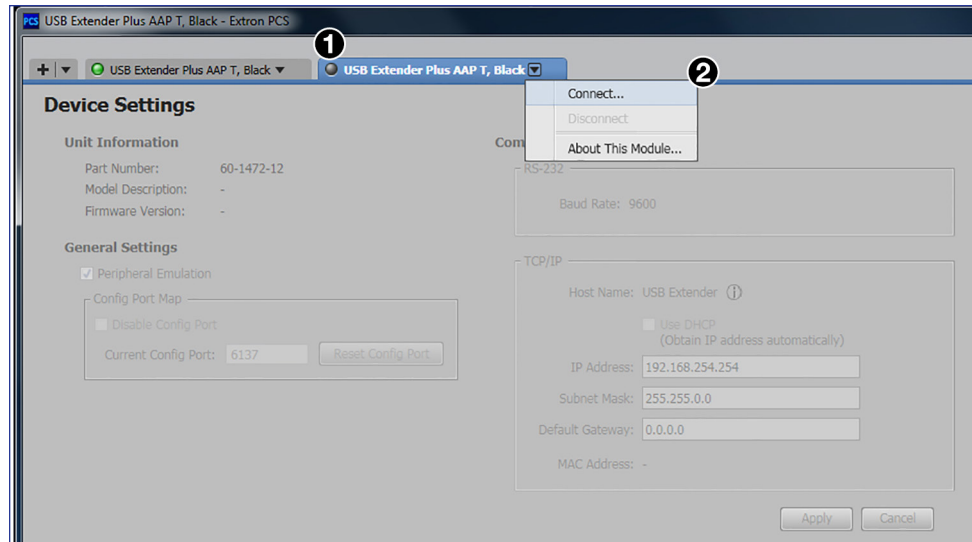


Figure 28. Selecting Connect from the Device Tab Menu

7. Click the down arrow on the device tab and select **Connect** (2) from the drop-down list. The RS-232 Connect window opens.

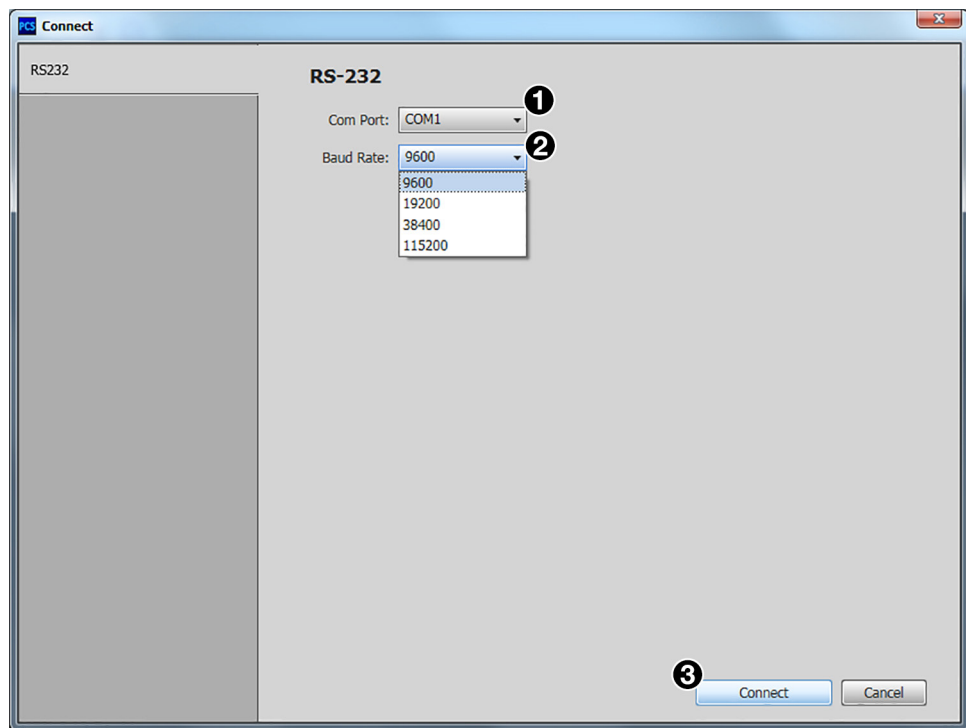


Figure 29. RS-232 Connection Window

8. From the Com Port drop-down list (see figure 29, 1), select the com port on your computer to which the USB Extender Plus is connected.
9. From the Baud Rate menu (2), select the baud rate for your RS-232 connection (the default is 9600).
10. Click the **Connect** button (3) at the bottom of the screen. The **Device Settings** screen for your USB Extender Plus opens, showing all the current extender settings.

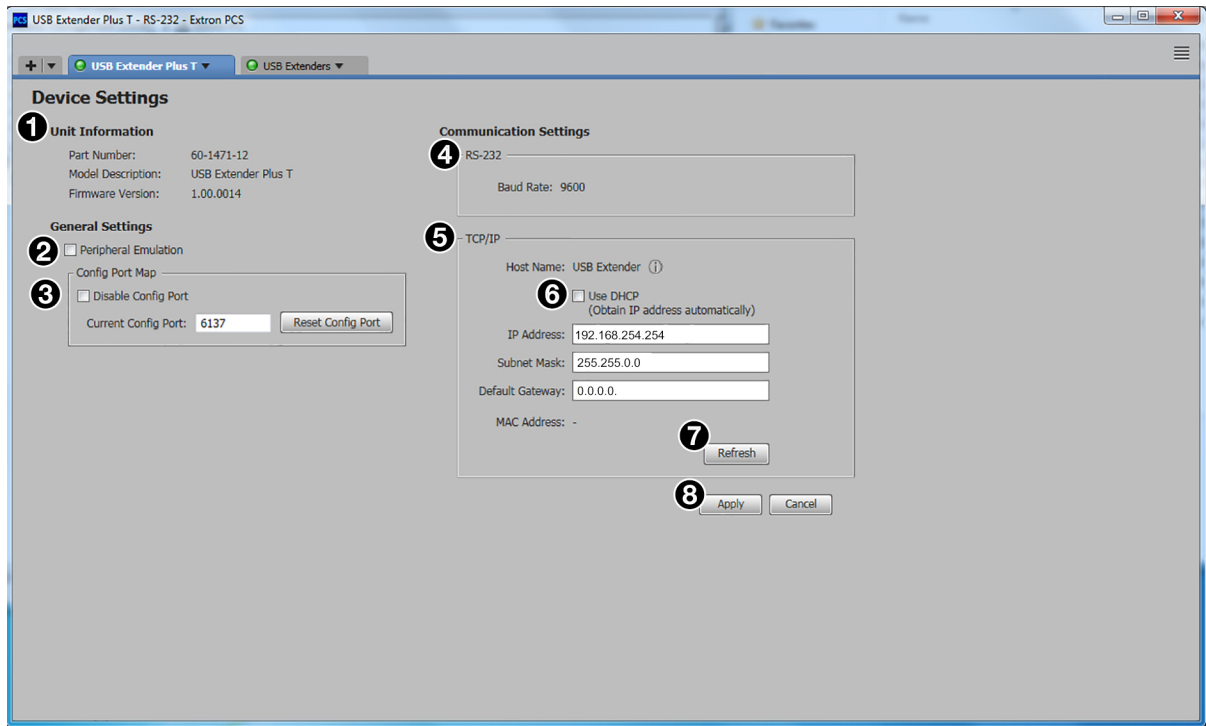


Figure 30. Device Settings Screen

- 1 Unit Information** — Displays the unit part number, model name and color, and firmware build version.
 - 2 Peripheral Emulation checkbox** — Select this checkbox to enable USB HID peripheral devices (keyboard or mouse) to always appear to the host computer.
 - 3 Config Port Map panel** — Contains a field in which you can change the number of the port through which the extender is connected to the network (the default port is 6137). The **Reset Config Port** button next to this field resets the network port number to the default.
 - 4 RS-232 panel** — Displays the connection speed (baud rate) for the front panel RS-232 Config port.
 - 5 TCP/IP panel** — Contains fields to set the unit IP address, subnet mask, and gateway address.
 - 6 Use DHCP checkbox** — Select this checkbox to enable Dynamic Host Configuration Protocol (DHCP), if desired. When DHCP is enabled, the device ignores any entered IP addresses and obtains its IP address from a DHCP server. Selecting this checkbox disables all address fields in this panel.
 - 7 Refresh button** — Click this button to update the IP address, subnet mask, and gateway address with latest assigned addresses.
 - 8 Apply button** — Click this button to confirm your selections on the screen.
- 11.** Make any desired changes to the available settings and click **Apply (8)** when finished. The PCS main window is displayed with the following items added:
- A new tab at the top of the screen, containing the model name of your new device
 - A **USB Extenders** line in the **Device Directory** panel. (The individual USB Extender Plus devices are not listed separately.)

You can now proceed to pair the transmitter and receivers (see [Making Ties Using the Configuration Program](#) on page 31).

Making Ties Using the Configuration Program

On the USB Extenders **Ties** screen, you can pair (tie) each listed transmitter with one or more listed receivers. (You cannot pair more than one transmitter with a receiver.)

Displaying the Ties screen

To display the **Ties** screen:

1. If the **PCS Device Discovery** screen is not displayed, click the down arrow button (1 in the image at right) in the upper-left corner of the screen to return to it.

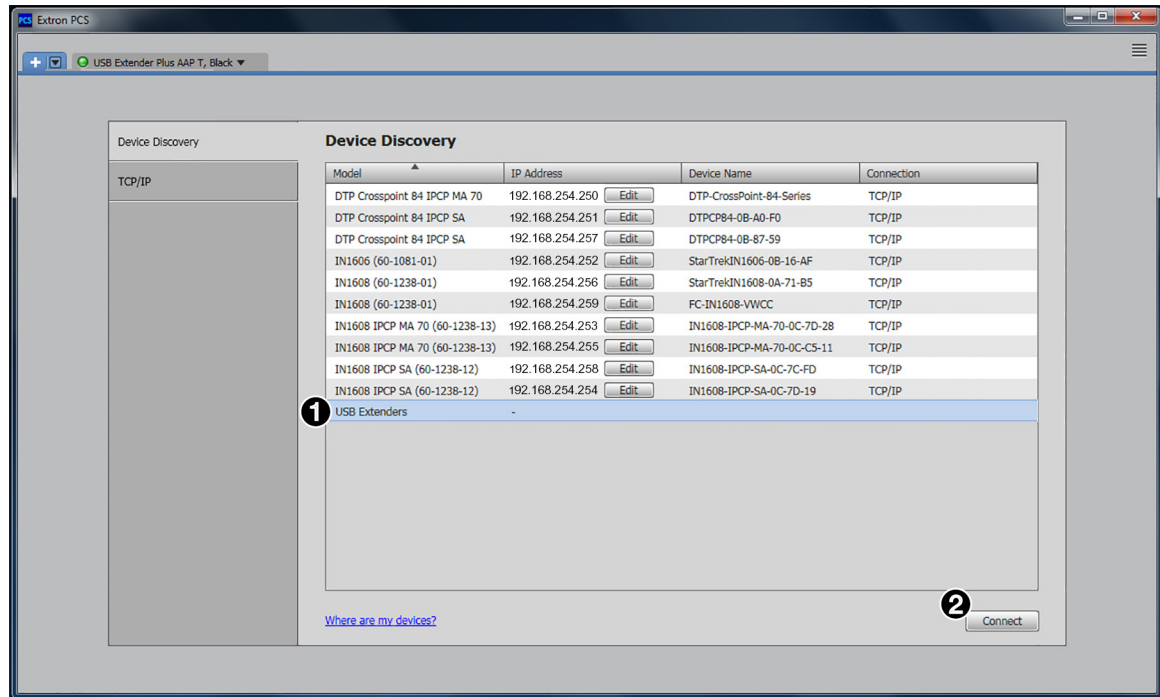
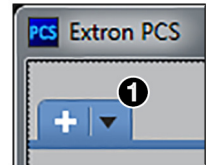


Figure 31. Selecting USB Extenders on the Device Discovery Panel

2. Click **USB Extenders** in the Device Directory panel (see figure 31, 1), so it is highlighted.
3. Click **Connect** (2). The **Ties** screen opens (see figure 32 on page 32).

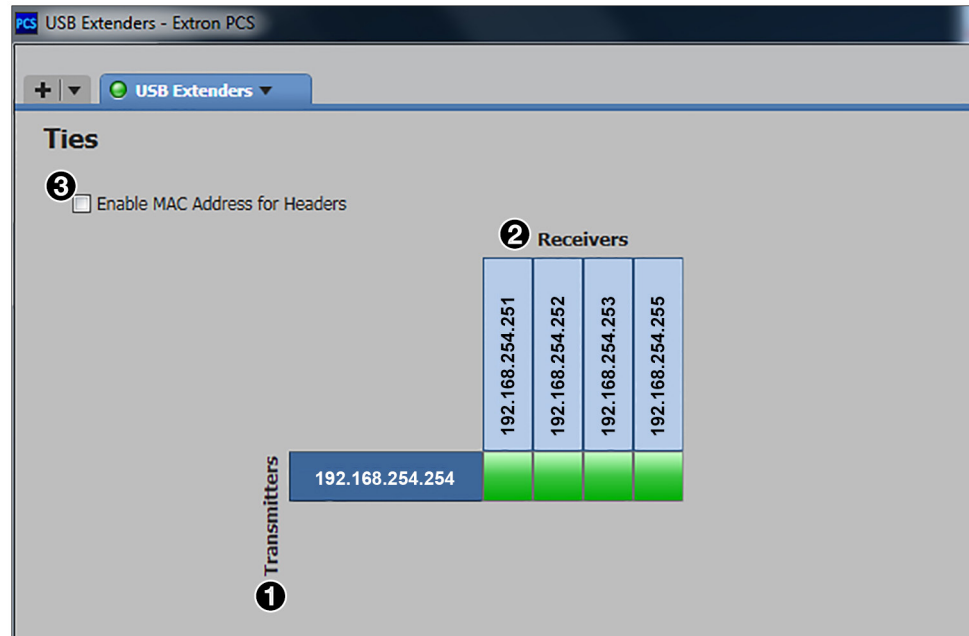


Figure 32. USB Extenders Ties Screen

In the table on the **Ties** screen, transmitters that are connected to the network are listed by their IP addresses in the rows (1). Receivers are listed in the columns (2). To list the devices by their MAC addresses instead of the IP addresses, select the **Enable MAC for Headers** checkbox (3).

Viewing MAC addresses on the Ties screen

If you want to view the MAC address of a transmitter or receiver without changing the entire display, hover the mouse pointer over the desired IP address to show the MAC address in a pop-up box (see figure 33, 1).

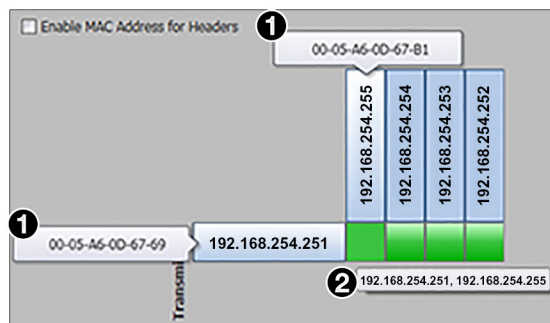


Figure 33. MAC Addresses in Pop-up Boxes

If the screen is set to display MAC addresses, you can view an individual IP address by positioning the pointer over the MAC address.

To display the addresses of tied products, hover the cursor over the green connection box in the matrix. The addresses of both tied products are displayed in a pop-up (2).

Pairing a transmitter with receivers (creating ties)

To tie a transmitter to receivers using the PCS software:

1. In the matrix in the center of the screen, locate the connection box beside the desired transmitter address and below the desired receiver address.
2. If the box is white, click it. When the box becomes green, the transmitter and receiver are paired. Figure 34 shows a transmitter paired with two receivers.

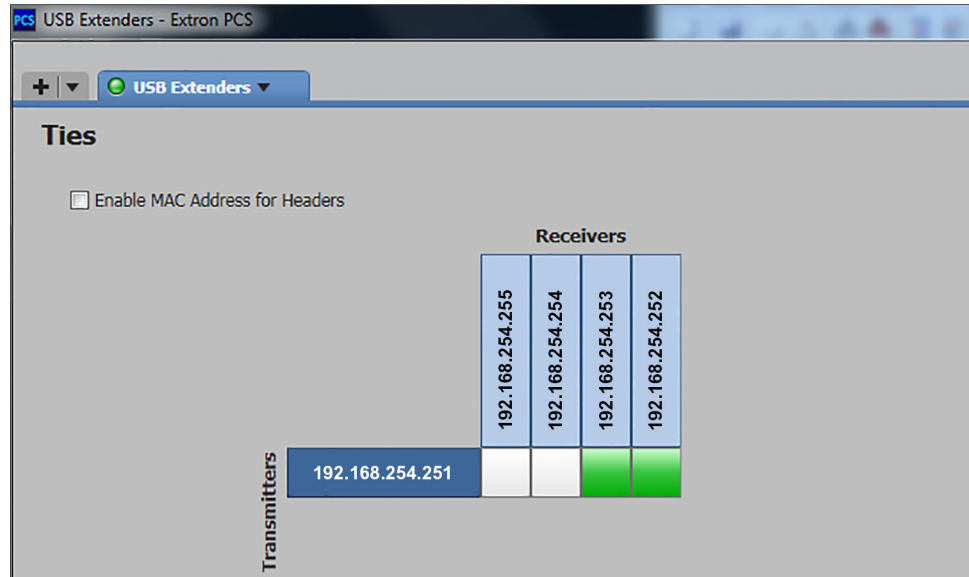


Figure 34. Tying a Transmitter to Two Receivers

3. Repeat step 2 for any additional receivers in the same row that you want to pair with the selected transmitter.
4. Repeat steps 1 through 3 for any additional transmitters to which receivers will be paired.

Reference Information

This section provides information on the following subjects:

- [Twisted Pair Cable Termination](#)
- [Mounting the USB Extender Plus Series](#)

Twisted Pair Cable Termination

NOTES:

- RJ-45 termination with CAT 5, CAT 5e, CAT 6, CAT 6e, and CAT 7 cable must comply with the TIA/EIA T568A or TIA/EIA T568B wiring standard for all connections.
- The transmitter and receiver pair work with unshielded twisted pair (UTP) or shielded twisted pair (STP) cables; but to ensure FCC Class A and CE compliance, STP cables are required.
- Terminate both ends of the cable identically, in accordance with either the **TIA/EIA T 568A** or the **TIA/EIA T 568B** wiring standard.

Figure 35 shows the recommended termination of TP cables with RJ-45 connectors.

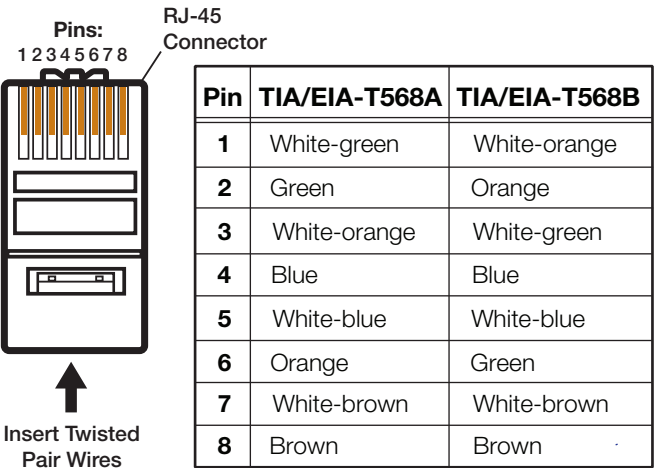


Figure 35. TP Cable Termination

NOTE: Do not use Extron UTP23SF-4 Enhanced Skew-Free AV UTP cable to link the transmitter and receiver. Skew-free AV cable is designed for Extron TP transmitter and receiver AV applications. The USB Extender Series does not work properly with this cable.

Mounting the USB Extender Plus Series

Mounting USB Extender Plus Standard and HID Only

The 6 inches (152 mm) deep, 1 inch (25 mm) high, a quarter-rack wide USB Extender Plus transmitter and receiver can be placed on a tabletop, mounted on a rack shelf, or mounted under a desk or tabletop. See the installation instructions provided with the individual mounting kits.

Tabletop Placement

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

Rack Mounting Safety Guidelines

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

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

To find an appropriate rack mounting kit for your installation, go to the product page at www.extron.com.

Furniture Mounting

The USB Extender Plus can be mounted to a desk, podium, or other furniture as follows:

- **Under furniture** — The unit can be mounted under a horizontal surface using an optional Under-Desk Mount Kit for eighth-rack and quarter-rack width products (see www.extron.com).
- **Through furniture** — The transmitter or receiver can be mounted through a desk or other furniture using an optional Extron Through-Desk Mounting Kit for quarter-rack or half-rack width products (see www.extron.com).

Mounting USB Extenders Plus AAP and D

You can install the USB Extender Plus AAP and decorator-style transmitter and receiver in an electrical junction box, attach them to AAP frames or mud rings, or both.

Wall mounting

Safety guidelines

The wall installation must conform to national and local electrical codes and to the wall plate size requirements. The following UL guidelines pertain to the installation of the wall mountable transmitters and receivers into a wall or furniture.

- Do not connect these units to a centralized DC power source or use beyond their rated voltage range.
- These units must be installed in UL Listed junction boxes.
- These units must be installed with conduit in accordance with National Electrical Code.

Preparing the site and installing the junction box

If installing the extender in a junction box:

- Choose a location that allows cable runs without interference.
- Allow enough depth for the wall box, the TP cable, and power supply wiring. The box should be at least 2.5 inches (64 mm) deep to accommodate the connectors and cables.

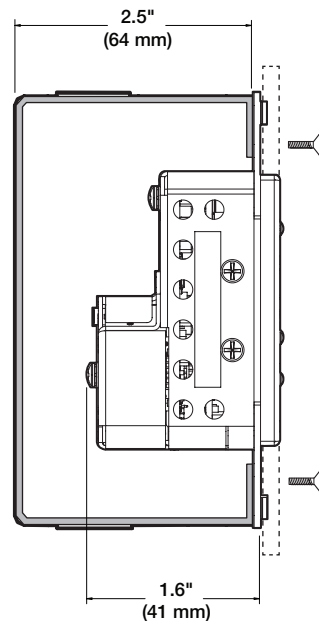


Figure 36. Wall Box Depth Profile — AAP and Decorator-Style

- Run the TP and power supply wires into the wall, furniture, or conduits before installing the wall plate.
- Follow the instructions provided with the junction box to install it.

NOTE: The Decorator-Style series mounts in a standard single-gang junction box.

Final installation

To complete the installation:

1. Test the USB Extenders Plus for proper operation.
2. At the power outlet (not the extender), unplug the power supply.
3. Mount the transmitter or receiver into the wall box.
4. At the power outlet, reconnect the power supply.

AAP mounting

The USB Extender Plus AAP transmitter and receiver can also be mounted to a two-space AAP frame, available at www.extron.com. Follow the instructions provided with the frame to attach the extenders to it.

Figure 36 shows an example of mounting both an AAP extender and a decorator-style extender to an AAP frame.

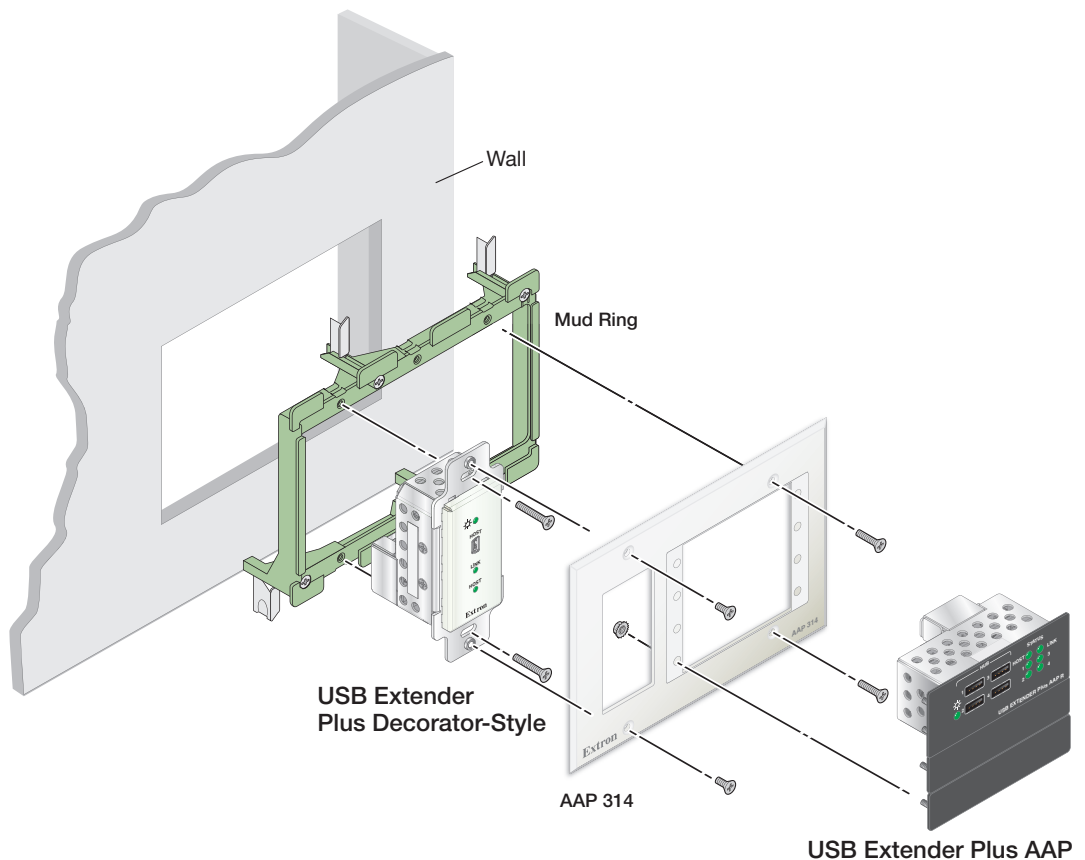


Figure 37. Mounting a USB Extender Plus AAP and Decorator-Style to an AAP Frame and a Mud Ring

Extron Warranty

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

Asia:

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

Japan:

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

Europe:

Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:

Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Middle East:

Extron Middle East
Dubai Airport Free Zone
F13, PO Box 293666
United Arab Emirates, Dubai

Africa:

Extron South Africa
3rd Floor, South Tower
160 Jan Smuts Avenue
Rosebank 2196, South Africa

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 or 800.3987.6673

Japan: 81.3.3511.7655

Africa: 27.11.447.6162

Middle East: 971.4.299.1800

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 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 be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron 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.