

FOXBOX Tx / Rx HDMI

High Resolution Fiber Optic Transmitters and Receivers



Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

Safety Instructions • English



This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.



This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français



Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).



Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conservier les instructions • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch



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



Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español



Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.



Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

安全须知 • 中文



这个符号提示用户该设备用户手册中有重要的操作和维护说明。



这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentations • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il y a danger d'explosion s'il y a un remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Lithium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

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

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearla ni eliminarla.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

警告

电源 • 该设备只能使用产品上标明的电源。设备必须使用有地线的供电系统供电。第三条线（地线）是安全设施，不能不用或跳过。

拔掉电源 • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

电源线保护 • 妥善布线，避免被踩踏，或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。不要用任何东西挡住通风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产的建议处理废弃电池。

FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

NOTE: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance with FCC emissions limits.

For more information on safety guidelines, regulatory compliances, EMI/EMF compliance, accessibility, and related topics, [click here](#).

Conventions Used in this Guide

Notifications

DANGER: A danger indicates a situation that will result in death or severe injury.

WARNING: A warning indicates a situation that has the potential to result in death or severe injury.

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.

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

Software Commands

Commands are written in the fonts shown here:

```
^ARMerge Scene , ,Op1 scene 1,1 ^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 "Ø" is used for the number zero and "O" represents the capital letter "o."

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

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

Variables are written in slanted form as shown here:

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

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

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

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Introduction

CAUTION: The FOXBOX Tx/Rx HDMI units output continuous invisible light, which may be harmful to the eyes; use with caution.

- **Do not look** into the rear panel fiber optic cable connectors or into the fiber optic cables themselves.
- Plug the attached dust caps into the optical transceivers when the fiber cable is unplugged.

- [About this Guide](#)
- [About the FOXBOX Tx/Rx HDMI](#)
- [Features](#)

About this Guide

This guide contains information about the ultra-high performance Extron FOXBOX Tx/Rx HDMI fiber optic transmitters and receivers (see figure 1).

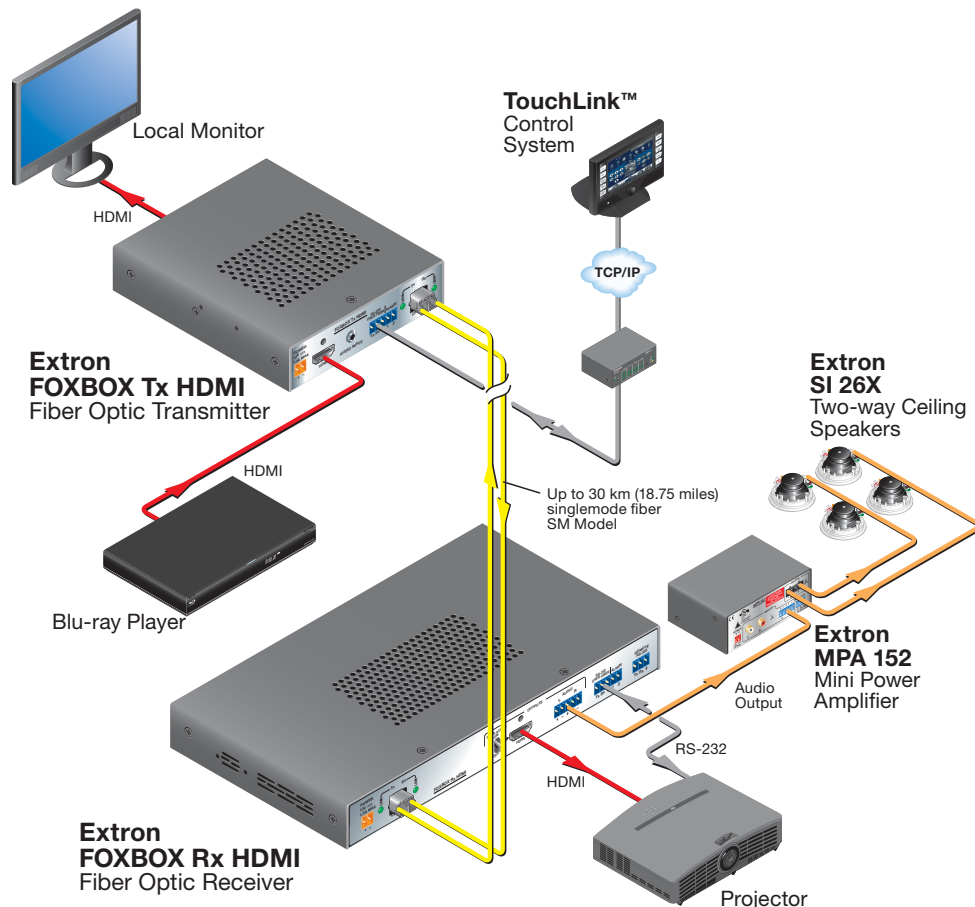


Figure 1. Typical FOXBOX Tx/Rx HDMI Application

About the FOXBOX Tx/Rx HDMI

The FOXBOX HDMI Fiber Optic Extender is an ultra-high performance fiber optic transmitter and receiver set for long haul transmission of HDCP-compliant HDMI video, audio, and RS-232 control signals over fiber optic cabling. The transmitter and receiver can extend HDMI signals up to 30 km (18 miles).

NOTE: For HDCP compliance:

- A FOXBOX HDMI or PowerCage FOX HDMI transmitter must be paired with a FOXBOX HDMI or PowerCage FOX HDMI receiver.
- You must connect both fiber optic cables between the transmitter and receiver.
- A signal **cannot** be daisy-chained and retain HDCP compliance.
- The bidirectional Consumer Electronics Control (CEC) is **not** supported.

Transmitter

The FOXBOX Tx HDMI transmitter accepts HDMI video or DVI-D video (with an applicable adapter), at resolutions up to 1920 x 1200 at 60 Hz. The video input can also include embedded audio. The transmitter also loops the HDMI input through for a local monitor.

The transmitter can also accept an analog audio input on 3.5 mm mini jack. A front panel DIP switch selects either the embedded audio or the separate analog audio for the unit to transmit to the receiver.

The transmitter accepts a one-way (transmitter-to-receiver) RS-232 serial communication (for applications such as projector control) serial signal input. The transmitter can receive an optional return (receiver-to-transmitter) stream of serial RS-232 communications, such as projector responses.

The transmitter converts the HDMI video, the selected audio, and the RS-232 serial communication into a proprietary data stream and outputs it as an optical signal on a single LC connector to a compatible fiber optic receiver. It also can receive a proprietary optical signal from the receiver consisting of the RS-232 return from a controlled device.

Receiver

The FOXBOX Rx HDMI receiver accepts a proprietary optical signal on a single LC connector from a compatible fiber optic transmitter or daisy-chained receiver.

The receiver outputs a single link of HDMI video, digital audio (embedded in the HDMI output), analog audio, and RS-232 serial commands.

If the receiver is appropriately configured and has a second fiber optic cable installed, it also can either:

- Receive an RS-232 return from a controlled device and send it to the transmitter via a proprietary optical signal.
- Output a daisy-chained signal to another receiver.

If either RS-232 return or daisy-chained communications are implemented, the receiver outputs a proprietary signal on the second fiber optic cable carrying the signal.

For video resolutions up to 1600 x 1200, 1080p, or 1920 x 1200, the video output of the receiver is a perfect, pixel-for-pixel recreation of the video signal input to the transmitter.

With the appropriate adapter, the single link of HDMI video output by FOXBOX Rx HDMI can be converted to DVI-D video.

The receiver has built-in alternating pixels, color bars, and grayscale test patterns to assist in setting up the display equipment.

Both Units

The transmitter and receiver have many controls, including image and audio adjustments, that are available under RS-232 Simple Instruction Set (SIS™) control. Both units have image, audio, fiber light status, and lost-light alarm indicators.

System Compatibility

The FOXBOX Tx HDMI **transmitter** operates in either of two modes, selected under RS-232 control, for compatibility with other, non-HDMI, units:

- **Plus** — Support resolutions up to 1920 x 1200 @ 60Hz. The fiber optic output of the transmitter can be received only by one of four receivers: a FOXBOX HDMI Rx, a FOXBOX DVI Plus Rx, a PowerCage HDMI Rx, or a PowerCage FOX DVI Plus Rx.
- **Non-Plus** — Supports resolutions up to 1600 x 1200 @ 60 Hz. The fiber optic output of the transmitter can be received by any FOXBOX, PowerCage FOX, and FOX 500 VGA and DVI unit, including the Plus and non-Plus units.

The FOXBOX Rx HDMI **receiver** operates interchangeably with all FOXBOX, PowerCage FOX, and FOX 500 VGA and DVI units, including Plus and non-Plus units.

Cable transmission modes

The transmitter and receiver are further categorized by the type of fiber optic cable, multimode or singlemode, which define the effective range of transmission:

- **Multimode** — Long distance, up to 2 km (6,560 feet) (depending on the fiber cable)
 - FOXBOX Tx HDMI MM
 - FOXBOX Rx HDMI MM
- **Singlemode** — Very long distance, up to 30 km (18.75 miles)
 - FOXBOX Tx HDMI SM
 - FOXBOX Rx HDMI SM

NOTE: The multimode and singlemode units are physically and functionally identical, with the exception of the effective range of transmission. In this manual, any reference applies to either transmission mode unless otherwise specified.

Features

Ultra high performance — Offers pixel-for-pixel HDMI or DVI-D (with an adapter) video transmission, up to 1920 x 1200 at 60 Hz (in Plus mode) or 1600 x 1200 at 60 Hz (in non-plus mode).

Video input — The transmitter accepts a single link of HDMI or DVI-D video.

Loop-through on transmitter — The transmitter has an HDMI loop-through on a HDMI connector that allows connection of a local monitor.

EDID emulation mode (Display Data Channel [DDC]) — The FOXBOX Tx HDMI transmitter provides a selector switch for specifying the rate of the incoming digital video signal. EDID emulation mode allows proper operation when no local monitor is present.

Video output — The receiver outputs a single link of HDMI video.

Extron fiber optic product compatibility — Enables ultra-long distance HDMI-to-analog RGB and analog RGB-to-HDMI conversion without the need for extra signal conversion devices.

Compatibility with FOX 500 DA6 distribution amplifier and FOX Matrix Switchers

Analog audio input — The transmitters accept an unbalanced stereo or mono audio input on a 3.5 mm mini jack.

Analog audio input gain/attenuation — The input audio level of the analog audio can be adjusted within a range of -18 dB (attenuation) to +10 dB (gain) via the RS-232 link.

Analog audio output — The receiver outputs balanced or unbalanced stereo audio on a 5-pole captive screw connector and digital audio embedded in the HDMI output.

Links monitoring — The panels of the transmitter and receiver have indicators for monitoring image and audio transmission and both fiber optic links.

Loss-of-light alarms — The panels of the transmitters and receivers have discrete outputs that indicate if either of the fiber optic links have suffered a loss of the light signal.

FOX Extenders Control Program — For RS-232 remote control from a PC, the Extron FOX Extenders Control Program, which runs under Microsoft® Windows®, provides a graphical interface and drag-and-drop/point-and-click operation.

Simple Instruction Set — The transmitter and receiver use the SIS for easy remote control operation.

Analog audio level — The analog audio output is at the consumer level (-10 dBV).

Upgradable firmware — The firmware that controls the operation of each unit can be upgraded in the field via an RS-232 link without taking the unit out of service. Firmware upgrades are available for download on the Extron Web site, www.extron.com, and they can be installed using the FOX Extenders Control Program.

Memory presets — 30 memory presets are a time-saving feature that lets you store input size and position settings relative to a specific input resolution. You can then recall those settings, when needed, using the SIS or the control software.

Rack mounting — Both FOXBOX HDMI units are rack mountable in any conventional 19-inch wide rack, using an Extron 9.5-inch or 6-inch deep rack shelf.

Power — The 100 VAC to 240 VAC, 50-60 Hz external power supply for each unit provides worldwide power compatibility.

Installation and Operation

This section details the installation of the FOXBOX Tx/Rx HDMI, including:

- [Installation Overview](#)
- [Connections](#)
- [Operation](#)

Installation Overview

Follow these steps to install and set up an Extron FOXBOX HDMI transmitter and receiver system for operation:

1. Turn off all of the equipment. Ensure that the video sources and the output display are all turned off and disconnected from the power source.
2. Mount the transmitter and one or more receiver (see "[Mounting the Units](#)" on page 41).
3. Connect the cables and configure the receivers (see "[Connections](#)," below).
4. Plug in the power supplies, then turn on the display devices and the input devices.

Connections

Transmitter Connections, Controls, and Indicators

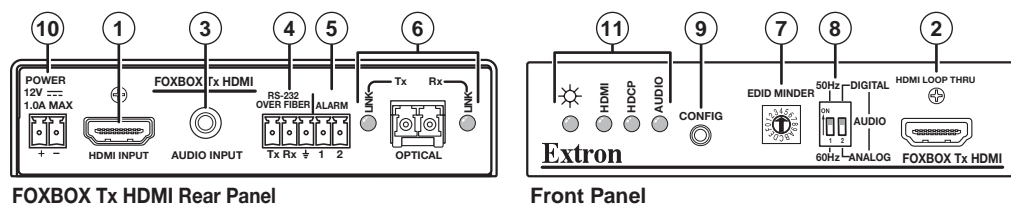


Figure 2. FOXBOX Tx transmitter connectors

- ① **HDMI Input connector (FOXBOX HDMI only)** — Connect a single link of HDMI or DVI-D (with the appropriate adapter) to this HDMI connector (see "[HDMI connector](#)" on page 12 for pin assignments).
The FOXBOX Tx HDMI also accepts embedded digital audio on this connector.
- ② **HDMI Loop-through connector** — If desired, connect a local monitor to this HDMI connector.

- ③ **Audio connector** — Plug an audio input into the transmitter via this stereo mini jack connector.

NOTE: See figure 3 to identify the tip, ring, and sleeve when you are making connections for the transmitter from existing audio cables. A mono audio connector consists of the tip and sleeve. A stereo audio connector consists of the tip, ring, and sleeve.

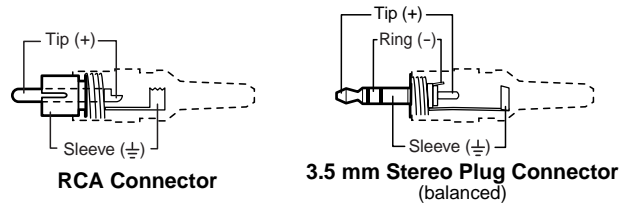
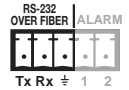


Figure 3. Typical audio connectors

The input audio level can be set via an **SIS command** to the transmitter or using the **FOX Extenders Control Program**.

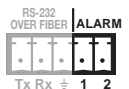
- ④ **RS-232 Over Fiber port** — If you want the FOXBOX to pass serial command signals to the receiver, for serial control of a projector for example, connect the host device to the transmitter via the first three leftmost poles (Tx, Rx, and $\frac{\pm}{\pm}$) of this 5-pole captive screw connector (see “**RS-232 connections**” on page 13 to wire this connector).



NOTES:

- If you connect only one fiber optic cable (item ⑥, on the next page), or you configure the receiver for daisy-chaining, you will not receive reports from the controlled device. To receive responses from the controlled device, you must install two fiber optic cables and leave link 2 enabled (via an **SIS command** to the receiver or using the **FOX Extenders Control Program**).
- The FOXBOX can pass RS-232 commands and responses at rates up to 115200 baud.

- ⑤ **Alarm outputs port** — For remote monitoring of the status of fiber optic link 2, connect a locally-constructed or furnished monitoring device to the transmitter via the two rightmost poles (1 and 2) of this 5-pole captive screw connector. When the transmitter does not detect a light link on fiber cable Rx (optional), pin 1 and pin 2 of this port are shorted together. (see “**Alarm outputs connection**” on page 13 to wire this connector).



⑥ Fiber optic connectors and LEDs —

CAUTION: These units output continuous invisible light, which may be harmful to the eyes; use with caution. For additional safety, plug the attached dust caps into the optical transceivers when the fiber cable is unplugged.

NOTES:

- Ensure that you use the proper fiber cable for your transmitter/receiver pair. Typically, singlemode fiber has a yellow jacket and multimode cable has an orange or aqua jacket.
- Only one fiber optic cable, transmitter-Tx-to-receiver-Rx, is required for video, audio, and serial command transmission. **But**, if you connect only one fiber optic cable, or if your receiver is configured to daisy-chain the optical signal:
 - The HDMI signal output by the receiver **is not** HDCP-compliant.
 - You **will not** receive RS-232 reports from the controlled device.

To receive responses from the controlled device and for HDCP compliance, you need to install both fiber optic cables and leave link 2 enabled (via an **SIS command** to the receiver or using the **FOX Extenders Control Program**).

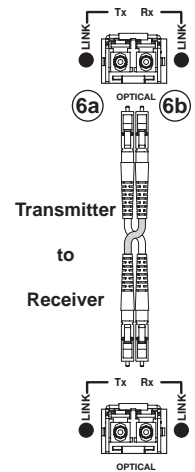
⑥a **Tx (required)** — For all one-way video, audio, and serial communications from the transmitter to the receiver, connect a fiber optic cable to the Tx LC connector.

Connect the free end of this fiber optic cable to the Rx connector on the FOXBOX HDMI receiver (item 15 on figure 4 on page 9) or to any other compatible Extron FOX device.

⑥b **Rx (optional)** — Connect a fiber optic cable for all one-way return serial communications from the receiver to the transmitter.

Connect the free end of this fiber optic cable to the Tx connector on a FOXBOX Rx HDMI receiver (item 15 on figure 4 on page 9) or to any other compatible Extron FOX device.

Tx Link and Rx Link LEDs — When lit, the link is active (light is received).



⑦ **EDID Minder switch** — Set this switch to one of the positions below to select the source of the DDC or a specific resolution.

- **Position 0** — A user-recorded EDID that has been captured from the display connected to the HDMI loop-thru connector on the transmitter (item 2 on figure 2 on page 5) or manually imported via an **SIS command** to the transmitter.
- **Position 1** — The EDID is selected via one of the serial ports in the system using an SIS command or the FOX Extenders Control Program.
- **Position 2 - F** — Specify a resolution. The table below identifies the switch positions and the associated resolutions.

Pos.	Source or resolution	Pos.	Resolution	Pos.	Resolution
0	User recorded EDID	6	1280 x 800	C	1600 x 1200
1	RS-232	7	1280 x 1024	D	1680 x 1050
2	800 x 600	8	1360 x 768	E	1920 x 1080 (1080p)
3	1024 x 768	9	1366 x 768	F	1920 x 1200
4	1280 x 720 (720p)	A	1400 x 1050		
5	1280 x 768	B	1440 x 900		

⑧ **DIP switches** —

50 Hz / 60 Hz switch — This switch selects the vertical refresh rate of the resolution selected by the EDID Minder hex switch (item ⑦ on figure 2 on page 5). Up selects the 50 Hz rate and down selects the 60 Hz refresh rate.

Audio switch — This switch selects which audio input, the audio embedded in the HDMI input or the analog audio, is sent to the receiver. Up selects the digital (embedded) audio and down selects the analog audio.



⑨ **Configuration port** — Connect a controlling device, such as a PC, to this port via a 2.5 mm mini jack TRS RS-232 cable for RS-232 protocol control of all FOXBOX functions. See “[Front panel Configuration ports](#)” on page 14 for more details on the adapter cable. See “[Remote Control](#)” on page 17 for SIS commands and software control.

The TRS RS-232 cable is included with the FOXBOX Tx HDMI transmitter.

⑩ **DC power connector** — Plug the included external 12 VDC power supply into this connector. See “[Power supply wiring](#)” on page 15, to wire the connector.

⑪ **Indicators** —

Power LED — This LED lights to indicate that power is applied to the unit.

HDMI LED — This LED lights when the transmitter detects an input signal on its video input.

HDCP LED — This LED lights when the input signal is HDCP encrypted.

Audio LED — This LED lights when the transmitter detects a low level audio signal for a short period of time on the selected (embedded or analog) input. It returns to unlit if the audio signal drops below the minimum threshold for a short period of time.

Receiver Connections, Controls, and Indicators

Rear panel

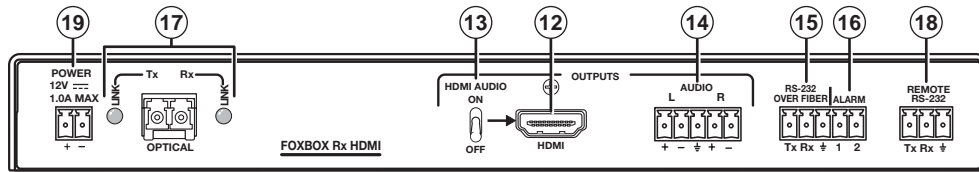
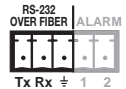
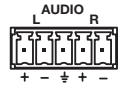


Figure 4. FOXBOX Rx Receiver Rear Panel Features

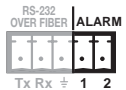
- ⑫ **HDMI Output connector** — Connect a video display to this HDMI connector. See “[HDMI connector](#)” on page 12 for pin assignments.
- ⑬ **HDMI Audio switch** — This switch mutes (Off position) and unmutes (On position) the embedded audio output on the HDMI output connector. The audio on the captive screw output always remains active regardless of the setting of this switch.
- ⑭ **Audio output connector** — This 5-pole, 3.5 mm captive screw connector outputs the transmitted, unamplified, line level audio. Connect audio devices, such as an audio amplifier or powered speakers. See “[Audio output connector](#)” on page 14 to wire a captive screw connector for the appropriate output type and impedance level.
- ⑮ **RS-232 Over Fiber port** — If you want the FOXBOX to pass serial command signals to a slave device, for serial control of a projector for example, connect the slave device to the receiver via the first three leftmost poles (Tx, Rx, and $\frac{\oplus}{\ominus}$) of this 5-pole captive screw connector. See “[RS-232 connections](#)” on page 13 to wire this connector.



NOTES:

- If you connect only one fiber optic cable ([item 17](#), on the next page), or you configure the receiver for daisy-chaining, you will not receive reports from the controlled device. To receive responses from the controlled device, you must install two fiber optic cables and leave link 2 enabled (via an [SIS command](#) to the receiver or using the [FOX Extenders Control Program](#)).
- The FOXBOX can pass RS-232 commands and responses at rates up to 115200 baud.

- ⑯ **Alarm outputs port** — For remote monitoring of the status of fiber optic link 1, connect a locally-constructed or furnished monitoring device to the receiver via the two rightmost poles (1 and 2) of this 5-pole captive screw connector. When the receiver does not detect a light link on fiber cable Rx, pin 1 and pin 2 of this port are shorted together (see “[Alarm outputs connection](#)” on page 13 to wire this connector).



17 Fiber optic connectors and LEDs —

CAUTION: These units output continuous invisible light, which may be harmful to the eyes; use with caution. For additional safety, plug the attached dust caps into the optical transceivers when the fiber cable is unplugged.

NOTES:

- You can connect the transmitter to one or more receivers in one of three ways:
 - One way (transmitter-Tx-to-receiver-Rx) only** — Connect fiber cable 17a (from transmitter connector 6a) **only**.
 - Two way (transmitter to receiver and return)** — Connect fiber cable 17a (from transmitter connector 6a) and fiber cable 17b back to the transmitter (connector 6b). See figure 5.
 - One way (transmitter to receiver) with daisy chain (receiver to receiver)** — Connect fiber cable 17a from a fiber optic source and cable 17b to the next receiver in the daisy chain. See figure 6. Set each receiver in the daisy chain to daisy chain mode. Up to 10 properly-configured receivers can be connected in a daisy chain to a single transmitter.
- See the transmitter fiber connector **NOTES** on page 7, which also apply to these connectors.

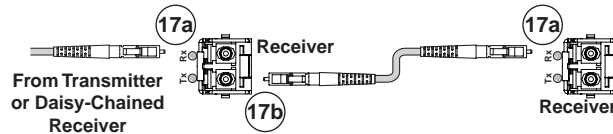


Figure 6. Daisy Chain Configuration

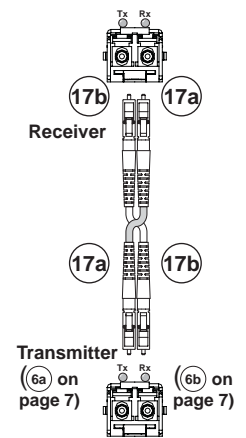


Figure 5. Two Way Configuration

17a Rx (required) — For all one-way video, audio, and serial communications from the transmitter to the receiver, connect a fiber optic cable to the Rx LC connector.

Connect the free end of this fiber optic cable to the Tx connector on the FOXBOX Tx transmitter (item 6a on page 7) or to any other compatible Extron FOXBOX device.

17b Tx (optional) — Connect a fiber optic cable to the Tx LC connector for either of the following functions:

Normal configuration — For all one-way return serial communications from the receiver to the Rx connector on the transmitter. See figure 5.

Daisy chain configuration — For daisy-chained video, audio, and serial communications to the Rx connector on another receiver. See figure 6.

NOTE: The Tx connector emits light in either case and the Rx port receives light.

Connect the free end of this fiber optic cable to either:

- The Rx connector on the FOXBOX Tx transmitter (item 6a on page 7) or to any other compatible Extron FOX device
- The Rx connector on another receiver in the daisy chain

Tx Link and Rx Link LEDs — When lit, the link is active (light is received).

- ⑱ **Remote RS-232 port** — For serial control of the receiver, connect a host device, such as a computer, touch panel control, or RS-232 capable PDA, to the transmitter via this 3-pole captive screw connector. See “[RS-232 connections](#)” on page 13 to wire this connector. See “[Remote Control](#)” on page 17 for SIS commands and software control.
- ⑲ **DC power connector** — Plug the included external 12 VDC power supply into this connector. See “[Power supply wiring](#)” on page 15, to wire the connector.

Front panel

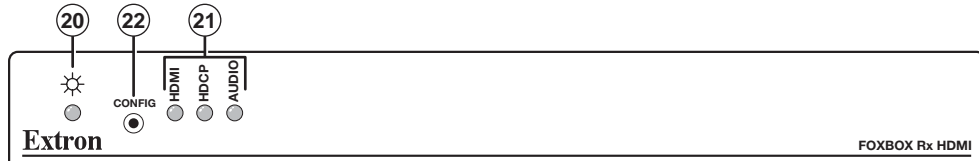


Figure 7. FOXBOX Rx Receiver Front Panel Features

- ⑳ **Power LED** — This LED lights to indicate that power is applied to the unit.
- ㉑ **Indicators** —
 - HDMI LED** — HDMI video input
 - HDCP LED** — This LED lights when the output signal is HDCP encrypted.
 - Audio LED** — This LED lights on the receiver when the transmitter detects a low level audio signal for a short period of time. It returns to unlit if the audio signal drops below the minimum threshold for a short period of time.
- ㉒ **Configuration port** — Connect a controlling device, such as a PC, to this port via a 2.5 mm mini jack TRS RS-232 cable for RS-232 protocol control of all FOXBOX functions. See “[Front panel Configuration ports](#)” on page 14 for more details on the adapter cable. See “[Remote Control](#)” on page 17 for SIS commands and software control.
The TRS RS-232 cable is included with the FOXBOX Tx HDMI transmitter.

Making Connections

HDMI connector

Figure 8 defines the HDMI pin assignments.



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

Figure 8. HDMI Connectors

HDMI signals run at a very high frequency and are especially prone to errors caused by bad video connections, too many adapters, or excessive cable length. To avoid the loss of an image or jitter, follow these guidelines:

- Do not exceed 16.4 feet (5 meters) on the input or buffered loop-through of the FOXBOX HDMI transmitter or the output of the FOXBOX HDMI receiver.
- Use only the cable designed for HDMI signals that is supplied by Extron.
- Limit or avoid the use of adapters.
- Use only cables specifically intended for HDMI or DVI signals. Use of non-HDMI or non-DVI cables or modified cables can result in a missing video output.

To securely fasten an HDMI cable to a device:

1. Plug the HDMI cable into the panel connection (see ① in figure 9).

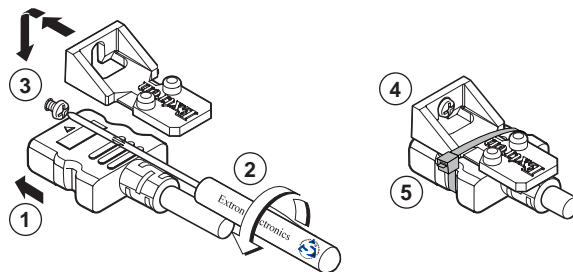


Figure 9. Installing the LockIt Lacing Bracket

2. Loosen the HDMI connection mounting screw from the panel enough to allow the LockIt lacing bracket to be placed over it (②). The screw does not have to be removed.

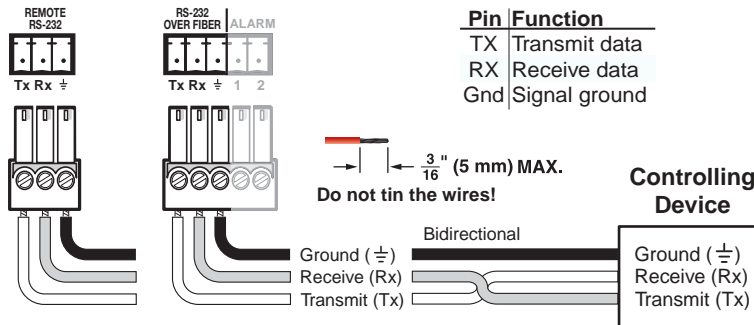
- Place the LockIt lacing bracket on the screw and against the HDMI connector, then tighten the screw to secure the bracket (③).

ATTENTION: Do not overtighten the HDMI connector mounting screw. The shield to which it fastens is very thin and can easily be stripped.

- Loosely place the included tie wrap around the HDMI connector and the LockIt lacing bracket as shown (④).
- While holding the connector securely against the lacing bracket, use pliers or similar tools to tighten the tie wrap, then remove any excess length (⑤).

RS-232 connections

The Remote RS-232 port on the receiver **only** is for remote control of the receiver. The RS-232 Over Fiber port on both units is for transmission of serial signals, such as projector control signals, between the transmitter and receiver. See figure 10 to properly wire the connectors.



NOTE: Cross the Tx and Rx lines once between the source and the target.

Figure 10. RS-232 Over Fiber Connector

NOTE: The length of exposed wires is critical. **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.

Alarm outputs connection

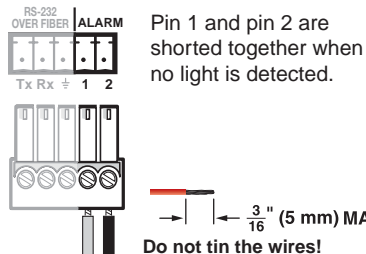


Figure 11. Alarm Connector

NOTES: The length of exposed wires is critical (see the RS-232 connector **NOTE** above.)

Audio output connector

See figure 12 to properly wire a captive screw output connector. The connector is included with transmitter, but you must supply the audio cable. Use the supplied tie-wrap to strap the audio cable to the extended tail of the connector.

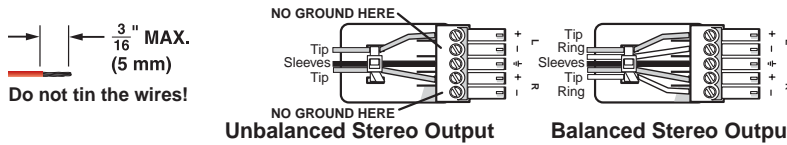


Figure 12. Captive Screw Connector Wiring for Stereo Audio Output

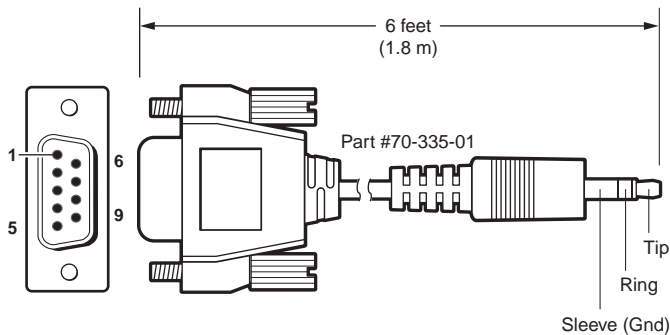
ATTENTION: For unbalanced audio, connect the sleeves to the ground contact. **DO NOT** connect the sleeves to the negative (-) contacts.

NOTES: The length of exposed wires is critical (see the RS-232 connector **NOTE** on page 13 for more information.)

Front panel Configuration ports

NOTE: These ports are for remote control of the transmitter or receiver, not for the over fiber RS-232 link.

The Configuration ports on the transmitter and receiver are 2.5 mm mini stereo jacks. The 9-pin D to 2.5 mm mini jack TRS RS-232 cable, part #70-335-01 (figure 13), included with the transmitter, can be used for this connection.



9-pin D	Connection	TRS Plug
Pin 2	Rx line on the computer	Tip
Pin 3	Tx line on the computer	Ring
Pin 5	Signal ground on the computer	Sleeve

Figure 13. 9-pin TRS RS-232 cable

This port is RS-232 only, with the following protocols:

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

NOTE: The maximum distances from the transmitter or receiver to the controlling device can vary up to 200 feet (61 m). Factors such as cable gauge, baud rates, environment, and output levels (from the unit and the controlling device) all affect transmission distance. Distances of about 50 feet (15 m) are typically not a problem. In some cases, the unit may be capable of serial communications via RS-232 up to 250 feet (76 m) away.

See “[Remote Control](#)” on page 17 for definitions of the SIS commands (serial commands to control the transmitter via this connector) and software control.

Power supply wiring

ATTENTION: Always use power supplies specified by Extron for the FOXBOX units. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the unit.

Figure 14 shows how to wire the power connector.

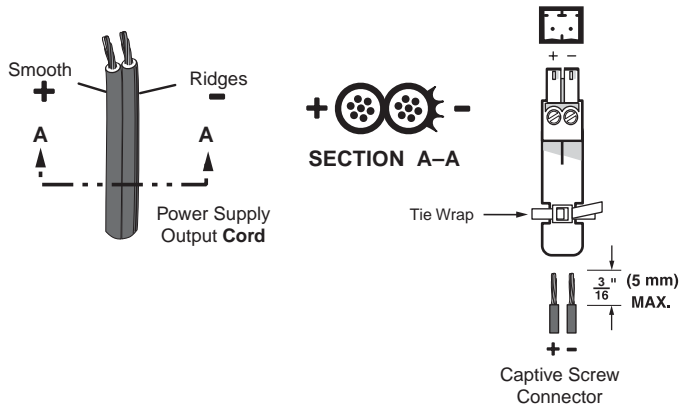


Figure 14. Power Connector Wiring

ATTENTION:

- This product is intended to be supplied by a Listed Power Unit marked “Class 2” or “LPS,” rated 12 VDC, 1.0 A minimum. Always use power supplies supplied by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.
- Unless otherwise stated, the AC/DC adapters are not suitable for use in air handling spaces or in wall cavities. The installation must always be in accordance with the applicable provisions of National Electrical Code ANSI/NFPA 70, article 75 and the Canadian Electrical Code part 1, section 16. The power supply shall not be permanently fixed to a 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 (figure 14) 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.

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

ATTENTION: The length of the exposed (stripped) copper wires is important. **The ideal length is 3/16 inch (5 mm).** See the RS-232 Connections [NOTE](#) for more information.

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

Use the supplied tie wrap to strap the power cord to the extended tail of the connector.

Alternatively, an optional Extron PS 124 Universal 12 VDC Power Supply, part #60-1022-01, can power multiple Extron 12 VDC devices using only one AC power connector.

Operation

After the transmitter, all receivers, and their connected devices are powered up, the system is fully operational. If any problems are encountered, verify that the cables are routed and connected properly, and that all display devices have identical resolutions and refresh rates. If your problems persist, call the Extron S3 Sales & Technical Support Hotline. See the contact numbers on the last page of this guide for the Extron office nearest you.

To take advantage of the various adjustments and test patterns available in the FOXBOX, you need to connect a computer or other RS-232 capable device to the front panel Configuration port on either unit or the rear panel Remote RS-232 port on the receiver and operate using either SIS commands or the FOX Extenders Control Program (see "[Remote Control](#)" on page 17).

Remote Control

This section describes the remote control operation of the FOXBOX HDMI and, including:

- [Simple Instruction Set Control](#)
- [FOX Extenders Control Program](#)

The transmitter and receiver each have a front panel Configuration port, a 2.5 mm mini stereo jack (see "[Front panel Configuration Ports](#)" in the "Installation and Operation" section). The receiver has a rear panel Remote RS-232 port, a 3-pole captive screw connector (see "[RS-232 connections](#)" in the "Installation and Operation" section). Any of these ports can be connected to a host device such as a computer running the HyperTerminal or DataViewer utility, or a control system to make serial control of the transmitter and receiver possible.

The protocol for all ports is as follows:

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

NOTE: RS-232 commands and FOX Extenders Control Program functions are transmitter- or receiver-specific or may have different responses depending on the unit connected. You must connect to the appropriate device for the command or function to work properly or to get the expected response.

Simple Instruction Set Control

Host-to-Unit Instructions

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 unit executes the command and sends a response to the host device. All responses from the unit to the host 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.

Symbol Definitions

- \leftarrow = CR/LF (carriage return/line feed)
- \leftarrow = Carriage return (no line feed)
- | = Pipe (can be used interchangeably with the \leftarrow character)
- = Space (hard) character
- Esc** = Escape key (hex 1B)
- W** = Can be used interchangeably with the **Esc** character
- X1** = EDID hex switch position

- X2** = Refresh rate
- X3** = EDID
- X4** = Native resolution
- X5** = EDID record
- X6** = Audio gain adjustment range
- X7** = Audio level adjustment range
- X8** = Audio attenuation adjustment range
- X9** = Mode switch position and enable or disable status
- X10** = HDCP authorized device
- X11** = Link and input status
- X12** = Internal temperature
- X13** = Transmission mode
- X14** = Firmware version
- X15** = Frequency

- | | |
|-------------------------|------------------|
| 00 = User captured EDID | 08 = 1360 x 768 |
| 01 = RS-232 control | 09 = 1366 x 768 |
| 02 = 800 x 600 | 10 = 1400 x 1050 |
| 03 = 1024 x 768 | 11 = 1440 x 900 |
| 04 = 720p* | 12 = 1600 x 1200 |
| 05 = 1280 x 768 | 13 = 1680 x 1050 |
| 06 = 1280 x 800 | 14 = 1080p* |
| 07 = 1280 x 1024 | 15 = 1920 x 1200 |

* 720p and 1080p also include a block for embedded audio; all other positions are video only

- | | |
|-----------|-----------|
| 1 = 50 Hz | 2 = 60 Hz |
|-----------|-----------|

See the [table](#) on page 20.

Resolution and rate in an easily-viewed format, such as "800x600@60Hz".

128 or 256 bytes

00 to 10

-18 to +10 (in 1.0 dB steps)

00 to 18

0 = off (down) or disable

1 = on (up) or enable

0 = off

1 = on

0 = link or input not detected

1 = link or input detected

nnnF•nnC

SM = singlemode

MM = multimode

v.vv

n.nn

Unit-initiated Messages

When a local event, such as an equipment power-up, occurs, the unit responds by sending a message to the host. The unit-initiated messages are listed below:

(c) Copyright 20nn, Extron Electronics FOXBOX Tx HDMI, Vx.xx, 60-1174-xx↵↵

- or -

(c) Copyright 20nn, Extron Electronics FOXBOX Rx HDMI, Vx.xx, 60-1174-xx↵↵

The connected unit issues the appropriate copyright message (above) when it first powers on. Vx.xx is the firmware version number; 60-1174-xx is the part number of the connected unit.

Reconfig↵

The unit sends the Reconfig message whenever the video input signal to the transmitter is changed.

1Lnk[x11]•2Lnk[x11]•Vid[x11]•Aud[x11]↵

The unit sends the status message whenever a change in the fiber link and video connection occurs.

EmbedAud[x13]↵

The unit sends the Embedded audio message whenever a change in the position of the receiver rear panel HDMI Audio switch occurs.

Error Responses

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

- E10 - Invalid command
- E11 - Invalid preset number
- E13 - Invalid parameter
- E14 - Invalid command for this configuration

Using the Command/Response Tables

The command/response table begins on the next page. Either uppercase or lower case letters are acceptable in the command field except where indicated for the audio level (gain and attenuation) commands. Symbols are used throughout the table to represent variables in the command/response fields. Command and response examples are shown throughout the table. The ASCII to HEX conversion table below is for use with the command/response table.

		ASCII to Hex Conversion Table																Esc	1B	CR	ØD	LF	ØA									
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

Command/Response Table for Transmitter SIS Commands

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Switch status			
Request EDID and refresh rate switch positions	[Esc]Stat←	EdidMdr[x1]•Vrate[x2]←	
<i>Example:</i>	[Esc]Stat←	EdidMdr15•Vrate2←	EDID switch is set to 15 (1080p) and the vertical rate switch is set to 2 (60 Hz).
Request EDID switch position	[Esc]2Stat←	[x1]←	
Request Refresh rate switch position	[Esc]3Stat←	[x2]←	

EDID minder

NOTES: • The table below the commands defines the value of each EDID value.

- The front panel EDID minder rotary switch on the transmitter must be in position 1 for the variables to be changeable via an SIS command. The unit returns the E14 error if the switch is in other than position 1.

Set EDID resolution and refresh rate	[Esc]A[x3]EDID←	Edid•A[x3]←	Assign an EDID value of [x3].
<i>Example:</i>	[Esc]A58EDID←	Edid•A58←	Assign an EDID value of 720p at 60 Hz (the default resolution and rate).
View assigned EDID	[Esc]AEDID←	[x3]←	The assigned EDID value is [x3].
Save EDID	[Esc]SØEDID←	EdidSØ←	Save the resolution of the display connected to the transmitter pass-through port to EDID location 0.
Show native EDID value	[Esc]NEDID←	[x4]←	Show the native resolution of the display connected to the receiver.
Import EDID	[Esc]IØEDID←[x5]	EdidI←	

[x3]	Value	[x3]	Value	[x3]	Value	[x3]	Value	[x3]	Value
00	User captured EDID								
DVI Pro values (with HDMI-to-DVI adapters)									
01	800x600 @ 50 Hz	07	1280x768 @ 50 Hz	13	1360x768 @ 50 Hz	19	1440x900 @ 50 Hz	25	1680x1050 @ 50 Hz
02	800x600 @ 60 Hz	08	1280x768 @ 60 Hz	14	1360x768 @ 60 Hz	20	1440x900 @ 60 Hz	26	1680x1050 @ 60 Hz
03	1024x768 @ 50 Hz	09	1280x800 @ 50 Hz	15	1366x768 @ 50 Hz	21	1600x900 @ 50 Hz	27	1920x1080 @ 50 Hz
04	1024x768 @ 60 Hz	10	1280x800 @ 60 Hz	16	1366x768 @ 60 Hz	22	1600x900 @ 60 Hz	28	1920x1280 @ 60 Hz
05	1280x720 @ 50 Hz	11	1280x1024 @ 50 Hz	17	1400x1050 @ 50 Hz	23	1600x1200 @ 50 Hz	29	1920x1200 @ 50 Hz
06	1280x720 @ 60 Hz	12	1280x1024 @ 60 Hz	18	1400x1050 @ 60 Hz	24	1600x1200 @ 60 Hz	30	1920x1200 @ 60 Hz
HDMI PC values, all with 2-channel embedded audio									
31	1024x768 @ 50 Hz	36	1280x800 @ 60 Hz	41	1366x768 @ 50 Hz	46	1440x900 @ 60 Hz	51	1680x1050 @ 50 Hz
32	1024x768 @ 60 Hz	37	1280x1024 @ 50 Hz	42	1366x768 @ 60 Hz	47	1600x900 @ 50 Hz	52	1680x1050 @ 60 Hz
33	1280x768 @ 50 Hz	38	1280x1024 @ 60 Hz	43	1400x1050 @ 50 Hz	48	1600x900 @ 60 Hz	53	1920x1200 @ 50 Hz
34	1280x768 @ 60 Hz	39	1360x768 @ 50 Hz	44	1400x1050 @ 60 Hz	49	1600x1200 @ 50 Hz	54	1920x1200 @ 60 Hz
35	1280x800 @ 50 Hz	40	1360x768 @ 60 Hz	45	1440x900 @ 50 Hz	50	1600x1200 @ 60 Hz		
HDMI HDTV values, all with 2-channel embedded audio									
55	480p @ 60 Hz	57	720p @ 50 Hz	59	1080i @ 50 Hz	61	1080p @ 50 Hz		
56	576p @ 50 Hz	58*	720p @ 60 Hz	60	1080i @ 60 Hz	62	1080p @ 60 Hz		

* Default value

NOTE: [x1] = EDID hex switch position 00 = User captured EDID 04 = 1280x720* (720p) 08 = 1360x768 12 = 1600x1200
 01 = RS-232 control 05 = 1280x768 09 = 1366x768 13 = 1680x1050
 02 = 800x600 06 = 1280x800 10 = 1400x1050 14 = 1920x1080p* (1080p)
 03 = 1024x768 07 = 1280x1024 11 = 1440x900 15 = 1920x1200
 * 720p and 1080p also include a block for embedded audio; all other positions are video only
 [x2] = Refresh rate 1 = 50 Hz 2 = 60 Hz
 [x3] = EDID See the table above.
 [x4] = Native resolution Resolution and rate in an easily-viewed format, such as "800x600@60Hz"
 [x5] = EDID record 128 or 256 bytes

Command/response table for Transmitter SIS commands (continued)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Audio input gain and attenuation			
NOTES: <ul style="list-style-type: none"> The set gain (G) and set attenuation (g) commands are case sensitive. The increment level, decrement level, and show level are not case sensitive. When the controlling PC is connected to the receiver, the PowerCage FOX can perform this command only if the receiver-Tx-to-transmitter-Rx fiber cable is connected. The unit returns the E14 error if the Rx fiber is not connected. 			
Set input audio gain to a +dB value <i>Example:</i>	<u>X6</u> G 2G	Aud <u>X7</u> ← Aud+02.0←	Set the input level to <u>X7</u> dB (gain). Set the input level to +2 dB (gain).
Set input audio attenuation to a -dB value	<u>X8</u> g	Aud <u>X7</u> ←	Set the input level to <u>X7</u> dB (attenuation).
Increment input level <i>Example:</i>	+G +G	Aud <u>X7</u> ← Aud+03.0←	Increase the audio level by 1 dB. Increment the input level from +2 dB to +3 dB.
Decrement input level	-G	Aud-01.0←	Decrease the audio level from 0 dB to -1 dB.
Show input level	G	<u>X7</u> ←	
Plus mode transmission			
NOTE: Plus mode forces the transmitter to emulate a FOXBOX DVI Plus or PowerCage FOX DVI Plus transmitter).			
Enable Plus mode	81*1#	Plus1←	Turn on Plus mode (default).
Disable Plus mode	81*0#	Plus0←	Turn off Plus mode.
View Plus mode	81#	<u>X9</u> ←	Show Plus mode status.
Input reports as an HDCP authorized device			
HDCP authorized device on	<u>Esc</u> E1HDCP←	HdcpE1←	Set the transmitter as an HDCP authorized device.
HDCP authorized device off	<u>Esc</u> E0HDCP←	HdcpE0←	Set the transmitter as not an HDCP authorized device.
View HDCP authorized device status	<u>Esc</u> EHDCP←	<u>X10</u> ←	Show HDCP authorized device status.
Status requests			
View link 1 (Tx-to-Rx) status	1S	<u>X11</u> ←	
View link 2 (Rx-to-Tx) status	2S	<u>X11</u> ←	
View input video status	3S	<u>X11</u> ←	
View input audio status	4S	<u>X11</u> ←	
View all signal status	5S	SigI <u>X11</u> •SigO <u>X11</u> •HdcpI <u>X11</u> •HdcpO <u>X11</u> ←	Report the status of the HDMI input, HDMI output, HDCP encoding on the input, and HDCP encoding on the output.
View HDMI signal status	6S	SigI <u>X11</u> •SigO <u>X11</u> ←	Report the status of the HDMI input and HDMI output (always -- for a transmitter).
View HDCP status	7S	HdcpI <u>X11</u> •HdcpO <u>X11</u> ←	Report the status of the HDCP encoding on the input and HDCP encoding on the output.
View temperature	20S	<u>X12</u> F• <u>X12</u> C←	Show temperature in degrees Fahrenheit and Celsius.
NOTE: <ul style="list-style-type: none"> <u>X6</u> = Audio gain adjustment range 00 to 10 <u>X7</u> = Audio level adjustment range -18 to +10 (in 1.0 dB steps) <u>X8</u> = Audio attenuation adjustment range 00 to 18 <u>X9</u> = Enable or disable status 0 = off (down) or disable 1 = on (up) or enable <u>X10</u> = HDCP authorized device 0 = off 1 = on <u>X11</u> = Link and input status 0 = link or input not detected 1 = link or input detected <u>X12</u> = Internal temperature nnnF•nnnC 			

Command/response table for Transmitter SIS commands (continued)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Information requests			
Information request	I	1Lnk[X11]•2Lnk[X11]•Vid[X11]•Aud[X11]•[X13]•Tx←	The unit responds with the current status (signal detected) of optical link 1, optical link 2, the video input, and the audio link; the fiber optic transmission mode (singlemode or multimode); and the device type (Tx).
Show firmware version	Q	[X14]←	The factory-installed firmware version is 1.23 (sample value only).
<i>Example:</i>	Q	1.23←	
Request part number	N	60-1174- <i>nn</i> ←	See “ Part Numbers ” in the “Reference Information” section.
Input sync detection	1LS	[X14] ^{horizontal} , [X14] ^{vertical} ←	Shows horizontal frequency in kHz and vertical freq in Hz. 000.0,000.0 if no signal is detected.
Resets			
Reset audio	[Esc]ZA←	Zpa←	Reset audio setting to default levels (0 dB gain).
System reset	[Esc]ZXXX←	Zpx←	Reset all settings to factory defaults.
NOTE:			
[X11] = Link status		0 = light or signal input not detected	
		1 = light or signal detected	
[X13] = Transmission mode		SM = singlemode MM = multimode	
[X14] = Firmware version		v.vv	

Symbol definitions for receiver SIS commands

↵	= Carriage return/line feed		
←	= Carriage return (no line feed)		
|	= Pipe (can be used interchangeably with the ← character)		
•	= Space (hard) character		
Esc	= Escape key (hex 1B)		
W	= Can be used interchangeably with the Esc character		
X9	= Mute/auto memory status and enable or disable status	0 = off or disable	1 = on or enable
X11	= Link and input status	0 = link or input not detected	1 = link or input detected
X12	= Internal temperature	<i>nnnF•nnC</i>	
X13	= Transmission mode	SM = singlemode	MM = multimode
X14	= Firmware version	<i>v.vv</i>	
X15	= Switch position	0 = off (right)	1 = on (left)
X16	= Horizontal and vertical position	000 through 255	
X17	= Sync frequency	<i>xxx.xx</i> (frequency in kHz [H] or Hz [V])	
X18	= Memory preset number	01 to 30	
X19	= Test pattern	0 = none	2 = grayscale
		1 = color bars	3 = alternating pixels
X20	= Rx link and daisy chain enable	0 = disable	2 = daisy chain enable
		1 = return link enable	
X21	= Video delay (0 plus six steps at 0.25 seconds per step)	0 = 0 second	4 = 1.0 second
		1 = 0.25 second	5 = 1.25 second
		2 = 0.5 second (default)	6 = 1.5 second
		3 = 0.75 second	
X22	= Video bit depth	0 = auto	1 = 8-bit

Command and Response Table for Receiver SIS Commands

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Video mute			
Mute output	1B	B1k1↵	Blank the video output.
Unmute output	0B	B1k0↵	Output video.
Show video mute status	B	X9↵	Video mute status is X9.
Horizontal shift			
Set a horizontal position	X16H	HphX16↵	Set horizontal centering to X16.
Increment position	+H	HphX16↵	Shift the image one pixel to the right.
Decrement position	-H	HphX16↵	Shift the image one pixel to the left.
Show position	H	X16↵	
Vertical shift			
Set a vertical position	X16/	VphX16↵	Set vertical centering to X16.
Increment position	+/	VphX16↵	Shift the image down one line.
Decrement position	-/	VphX16↵	Shift the image up line.
Show position	/	X16↵	
List sync frequency			
View input frequency	1LS	X17, X17↵	List the input sync frequency as X17 kHz (horizontal) and X17 Hz (vertical).

NOTE: X9 = Mute and auto memory status 0 = off 1 = on
X16 = Horizontal and vertical position 000 through 255
X17 = Sync frequency xxx.xx (frequency in kHz [H] or Hz [V])

Command/response table for Receiver SIS commands (continued)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Memory presets			
Save preset	<u>X18</u> ,	Spr <u>X18</u> ←	Command code is a comma.
Recall preset	<u>X18</u> .	Rpr <u>X18</u> ←	Command code is a period.
Auto memory			
Disable auto memory	55*0#	Img0←	
Enable auto memory	55*1#	Img1←	
Show auto memory status	55#	<u>X9</u> ←	
Audio mute			
Mute the audio	1Z	Amt1←	Silence the audio output of the receiver.
Unmute the audio	0Z	Amt0←	The receiver outputs audio.
Show audio mute status	Z	<u>X9</u> ←	Audio mute status is <u>X9</u> .
Test pattern			
NOTE: You must have a video input connected to the transmitter and the transmitter-Tx-to-receiver-Rx fiber cable connected for the receiver to output a selected test pattern. The test pattern turns off if the input signal rate changes or is disconnected or if power is removed.			
Output color bars	1J	Tst1←	Set the receiver to output the color bars test pattern.
Output grayscale	2J	Tst2←	Set the receiver to output the grayscale test pattern.
Output alternating pixels	3J	Tst3←	Set the receiver to output the alternating pixels test pattern.
Turn test pattern off	0J	Tst0←	Set the receiver to output the input video (no test pattern is selected).
Show test pattern status	J	<u>X19</u> ←	
Disable and enable return link and daisy chain			
NOTE: The disable return link function is primarily used and recommended when the transmitting device is a FOX 500 DA6 and the receiver is connected to any of outputs 2 through 6 on the DA.			
Disable return link	66*0*0#	Rle*0*0←	Disable link 2.
Enable return link to transmitter	66*0*1#	Rle*0*1←	Enable link 2 (default setting).
Enable daisy chain	66*0*2#	Rle*0*2←	Enable receiver daisy chain mode.
Show return link and daisy chain status	66*0#	0* <u>X20</u> ←	
Video bit depth			
Set video bit depth to auto	<u>Esc</u> V0BITD←	BitdV0←	
Force video to 8-bit depth	<u>Esc</u> V1BITD←	BitdV1←	
View video bit depth	<u>Esc</u> VBITD←	<u>X22</u> ←	
HDCP notification			
Enable notification	<u>Esc</u> N1HDCP←	HdcpN1←	
Disable notification	<u>Esc</u> N0HDCP←	HdcpN0←	
View notification status	<u>Esc</u> NHDCP←	<u>X9</u> ←	

NOTE:	<u>X9</u> = Mute and auto memory status	0 = off	1 = on
	<u>X16</u> = Horizontal and vertical position	000 through 255	
	<u>X18</u> = Memory preset number	01 to 30	
	<u>X19</u> = Test pattern	0 = none	2 = grayscale
		1 = color bars	3 = alternating pixels
	<u>X20</u> = Rx link and daisy chain enable	0 = disable	1 = return link enable
	<u>X22</u> = Video bit depth	0 = auto	1 = 8-bit

Command/response table for Receiver SIS commands (continued)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Video shutdown delay			
NOTES: <ul style="list-style-type: none"> The Set Video Delay command delays the digital video to help monitors sync correctly during an input rate change. Only video is delayed; embedded audio is not delayed. 			
Set delay	3*[X21]#	Dly[X21]↵	Delay video by an interval of [X21].
Example:	3*3#	Dly3↵	Delay video by an interval of 0.75 seconds (3 x 0.25 seconds).
View delay	3#	[X21]↵	
Switch and signal status requests			
Request Audio switch status	[Esc]Stat↵	[X15]↵	Show the position of the Audio switch: 0 = off (embedded audio is muted) or 1 = on (unmute).
NOTE: The audio on the captive screw audio output always remains active regardless of the setting of this switch.			
Check audio embed	[Esc]5Stat↵	EmbedAud[X11]↵	Show if audio is embedded in the video stream: 0 = not detected or 1 = detected.
View link 1 (Tx-to-Rx) status	1S	[X11]↵	
View link 2 (Rx-to-Tx) status	2S	[X11]↵	
View input video status	3S	[X11]↵	
View input audio status	4S	[X11]↵	
View all signal status	5S	SigI[X11]•SigO[X11]•HdcpI[X11]•HdcpO[X11]↵	Report the status of the HDMI input, HDMI output (always -- for a transmitter), HDCP encoding on the input, and HDCP encoding on the output.
View HDMI signal status	6S	SigI[X11]•SigO[X11]↵	Report the status of the HDMI input and HDMI output (always -- for a transmitter).
View HDCP status	7S	HdcpI[X11]•HdcpO[X11]↵	Report the status of the HDCP encoding on the input and HDCP encoding on the output.
View temperature	20S	[X12]F•[X12]C↵	Show temperature in degrees Fahrenheit and Celsius.
Information requests			
Information request	I	1Lnk[X11]•2Lnk[X11]•Vid[X11]•Aud[X11]•[X13]•Rx↵	The unit responds with the current status (signal detected) of optical link 1, optical link 2, the video input, and the audio link; the fiber optic transmission mode (singlemode or multimode); and the device type (Rx).
Show firmware version	Q	[X14]↵	
Example:	Q	1.23↵	The factory-installed firmware version is 1.23 (sample value only).
Request part number	N	60-1174- <i>nn</i> ↵	See " Part Numbers " in the "Reference Information" section.
Resets			
Reset memory presets	[Esc]ZG↵	Zpg↵	Reset (erase) all memory presets.
System reset	[Esc]ZXXX↵	Zpx↵	Reset all settings to factory defaults.
NOTE: <ul style="list-style-type: none"> [X9] = Mute and auto memory status 0 = off 1 = on [X15] = Switch position 0 = off (right) 1 = on (left) [X11] = Link status 0 = light or signal input not detected 1 = light or signal detected [X21] = Video delay (0 plus six steps at 0.25 seconds per step) 0 = 0 second 1 = 0.25 second 3 = 0.75 second 5 = 1.25 second 2 = 0.5 second (default) 4 = 1.0 second 6 = 1.5 second [X14] = Firmware version v.vv [X12] = Internal temperature nnnF•nnC 			

FOX Extenders Control Program

The Extron FOX Extenders program, which communicates with the transmitter and receiver pair via the Remote RS-232 port of either unit provides an easy way to operate the pair.

The program is compatible with Windows 2000, Windows XP, or later. Updates to this program can be downloaded from the Extron Web site (www.extron.com).

Installing the Software

The program is contained on a DVD. To install the software, insert the DVD into the drive. The Extron software DVD window should appear automatically. If it does not self-start, run Launch.exe from the DVD. Click the Software tab, scroll to the desired program, and click **Install**. Follow the instructions that appear on the screen. By default, the installation creates a C:\Program Files\Extron\FOX_Extenders directory, and it places four icons into a group folder named "Extron Electronics\FOX Extender Control Program" The four installed icons are:

- Check for FOX Extenders updates
- FOX Extenders
- FOX Extenders Help
- Uninstall FOX Extenders

Starting the Program

Start the Extron FOX Extenders program as follows:

1. Click **Start > Programs > Extron Electronics > FOX Extenders Control Program > FOX Extenders**.



The Communication Setup window appears (see figure 15).



Figure 15. Communication Setup Window

2. Select the Com port to which your transmitter or receiver is connected. Click **OK**. The FOX Extenders Control Program window appears (see figure 16).

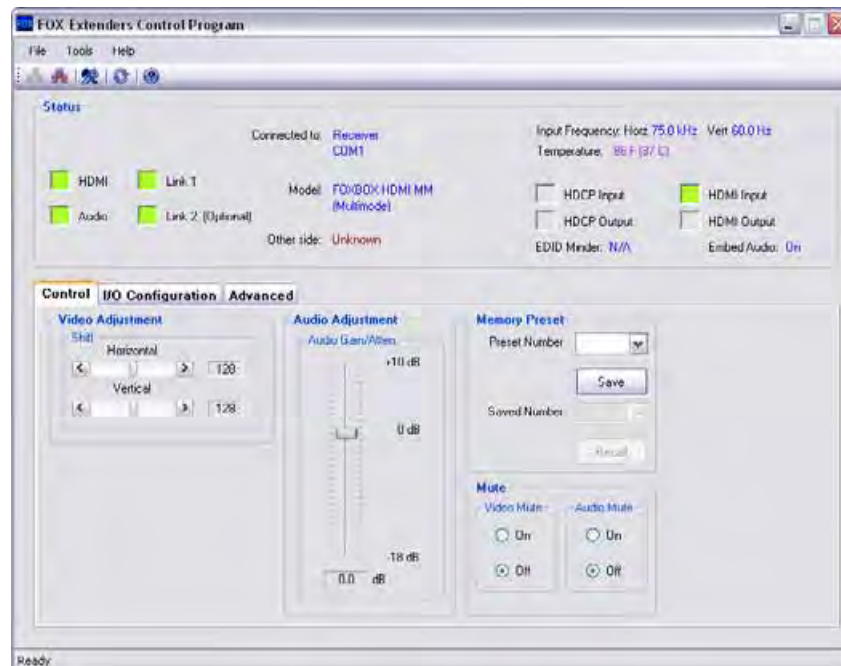


Figure 16. FOX Extenders Control Program Window

- NOTES:**
- Figure 16 is an amalgam of program displays. Some controls and displays are available when connected to the transmitter **only** and some when connected to the receiver **only**. These functions are identified in the descriptions that follow.
 - Only one fiber optic cable, transmitter-Tx-to-receiver-Rx, is required for serial command transmission. But, if you connect only one fiber optic cable, the transmitter will not receive reports from the controlled device. For the transmitter to receive responses from the controlled device, you must install two fiber optic cables and leave link 2 enabled (via an **SIS command** to the receiver or using the **FOX Extenders Control Program**).

Status area



Figure 17. Status Area

The status area provides indications of the connection status.

- **HDMI indicator** — This indicator is green when the transmitter detects a sync signal on its HDMI video input
- **Audio indicator** — This indicator is green when the transmitter detects a low level audio signal for a short period. This indicator goes dark if the audio signal drops below the minimum threshold for a short period.
- **Link 1 indicator** — This indicator is green when the receiver detects light on the fiber optic cable connected to the Tx port.

NOTE: The receiver detects the transmitter-Tx-to-receiver-Rx light. It reports the status to the transmitter via the optional Rx cable.
If the PC is connected to the transmitter **and either** the secondary (receiver-Tx-to-transmitter-Rx) cable is not connected in your system *or* the receiver is in the daisy chain mode, the Link 1 indicator in the control program does not show green (detected), whether the receiver detects the link or not.

- **Link 2 (Optional) indicator** — This indicator is green when the transmitter detects light on the fiber optic cable connected to the Rx port.

NOTE: The transmitter detects the receiver-Tx-to-transmitter-Rx light. It reports the status to the receiver via the Tx cable.
If the PC is connected to the receiver **and either** the primary (transmitter-Tx-to-receiver-Rx) cable is disconnected *or* the receiver is in the daisy chain mode, the Link 2 indicator in the control program will not show green (detected), whether the transmitter detects the link or not.

The Status area also shows to which unit the controlling PC is connected, the FOXBOX model (multimode or singlemode), the internal temperature, and the video input frequency. The **Other side** entry cannot be read on the FOXBOX HDMI.

Control tab functions

Click the **Control** tab to access the functions described below.



Video Adjustment area

NOTE: The Video Adjustments area controls are available only if you are connected to the receiver and an active video input is connected to the transmitter.

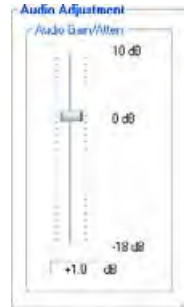


The Video Adjustment area provides slider controls that let you change the Shift Horizontal (position) and Shift Vertical (position).

Audio Adjustment area

NOTE: The Audio Adjustment area controls are available only if you are connected to the transmitter.

Audio Gain/Attenuation slider — Click and drag the Audio Gain/Attenuation slider control to select the input audio gain or attenuation value, from -18 dB to +10 dB in 1.0 dB increments.



Memory Preset area

NOTE: The Memory Preset area controls are available only if you are connected to the receiver.

The Memory Preset area provides a means to save and recall memory presets. Memory presets are stored values of the horizontal and vertical position saved in nonvolatile memory. When the FOXBOX is powered down and later powered back up, the settings are available for selection using the **Recall** button. Saving the settings to a preset using the **Save** button overwrites the settings previously written to that preset.



Mute area

NOTE: The Mute area controls are available only if you are connected to the receiver.

Click the **Video Mute** radio button, the **Audio Mute** radio button, or both in the Mute area to turn the video and audio mutes on and off.



I/O Configuration tab functions

Click the **I/O Configuration** tab to access the functions described below.



Output Configuration area

NOTE: The Output Configuration area control is available only if you are connected to the receiver.



The Video Shutdown Delay setting delays the digital video to help monitor sync correctly during an input rate change. **Only** video is delayed; embedded audio is **not** delayed.

HDCP area

NOTE:

- The HDCP Authorized controls are available only if you are connected to the transmitter.
- The HDCP Notification controls are available only if you are connected to the receiver.

Both sets of radio buttons cannot be available for selection at the same time.



HDCP Authorized radio buttons — The HDCP authorized function determines whether the transmitter operates as an HDCP authorized device or not. An HDCP authorized device allows an HDMI source to output HDCP-encrypted video. A non-authorized setting is useful for video sources that always encrypt their output if the connected device (the transmitter in this example) is HDCP capable. If the display connected to the receiver is not HDCP compliant, this automatic encryption would result in no display.

HDCP Notification radio buttons — The HDCP notification function in the receiver enables a connected display to show a green or black screen if the transmitted HDMI video is HDCP encrypted and the display is not HDCP capable.

Assigned EDID area

NOTE: The Assigned EDID area control is available only if you are connected to the transmitter and the transmitter front panel EDID Minder hex switch is in position 1. If the hex switch is not in position 1, the Assigned EDID area advises you "To change EDID, set rotary switch from #n to #1."



The Assigned EDID area provides a drop-down box that let you manually set the EDID resolution and refresh rate and reports the position of the transmitter front panel EDID Minder hex switch.



Save EDID area

NOTE: The Save button is available only if you are connected to the transmitter.



The Save EDID button lets you save the EDID resolution and refresh rate from the transmitter HDMI Loop Thru monitor. The data is saved to the user-captured EDID location (front panel EDID Minder hex switch position 0).

Plus Mode Transmission area

NOTE: The Plus Mode Transmission radio buttons are available only if you are connected to the transmitter.



The Plus Mode Transmission radio buttons allow you to enable and disable Plus mode.

- Enabled forces the transmitter to emulate a FOXBOX DVI Plus or PowerCage FOX DVI Plus transmitter for compatibility with one of four receivers: a FOXBOX HDMI Rx, a FOXBOX DVI Plus Rx, a PowerCage HDMI Rx, or a PowerCage FOX DVI Plus Rx.
- Disabled allows the output of the transmitter to be received by any FOXBOX, PowerCage FOX, and FOX 500 VGA and DVI unit, including the Plus and non-Plus units.

Video Bit Depth area



NOTE: The Video Bit Depth area radio buttons are available only if you are connected to the receiver.

The Video Bit Depth radio buttons allow you to force the bit depth to 8 bits or to set it to auto.

Advanced tab functions



Click the **Advanced** tab to access the functions described below.

NOTE: The Advanced functions are available only if you are connected to the receiver.

Advanced Configuration area

Link 2 and Daisy Chain radio buttons —

Select among the **Enable Link 2**, **Disable Link 2**, and **Enable Daisy Chain** radio buttons to define the function of the receiver Tx LC connector; either:



- Routing RS-232 over fiber to the transmitter
- No function
- Routing the signal received on the Rx LC connector to the next receiver in a daisy chain.

NOTE: The disable return link function is primarily used and recommended when the transmitting device is a FOX 500 DA6 and the receiver is connected to any of outputs 2 through 6 on the FOX DA.

Auto Memory radio buttons — Select the **Auto Memory** radio button to automatically apply saved position settings when the sensed input resolution changes.

Test Patterns drop box — Select one of three built-in test patterns; **Colorbars**, **Grayscale**, and **Alternating Pixels**; as necessary to help adjust the color, brightness/contrast, and focus of the display. Select **Off** to output the video that is input to the transmitter.

NOTE: You must have a video input connected, the transmitter-Tx-to-receiver-Rx fiber cable connected, and the receiver must not be in daisy-chain mode for the receiver to output a selected test pattern.

The test pattern turns off if the input signal rate is changed or disconnected or if power is removed.

Firmware upgrade

Firmware can be upgraded for each unit via the front panel Configuration port on that unit using the Extron Firmware Loader utility from the Windows-based control program.

NOTE: Your computer must be connected directly to the unit for the firmware to be updated.

Downloading the firmware from the Web site

To obtain the latest version of firmware for your FOXBOX unit:

1. Visit the Extron web site, www.extron.com, click the **Download** tab, and then click the **Firmware** link on the left sidebar menu (see figure 18).



Figure 18. Location of Firmware Upgrade Files

2. On the Download Center screen (see figure 19), click the links for the appropriate firmware file or files.

NOTE: There are different files for the transmitter (Tx) and receiver (Rx).



Figure 19. Finding FOXBOX Firmware

3. Complete the Personal Information form (see figure 20) and click the Download button.

Download Center

Download FOXBOX_RX_FW1x07.exe

Please provide the following information.

* Name:	John Smith
* Company:	Virginia Colony
Title:	Planter
* E-mail:	Jsmith@folklore.net

Remember Me
(Cookies must be enabled)

Figure 20. Personal Information Form

TIP: Select the **Remember Me** checkbox to avoid filling out this form in the future.

4. Follow the instructions on the rest of the download screens to download the firmware update from the Extron Web site, start the Extron Installation Program to extract the firmware file, and place it in a folder identified in the program window.

NOTE: Note the folder to which the firmware file is saved (see figure 21).

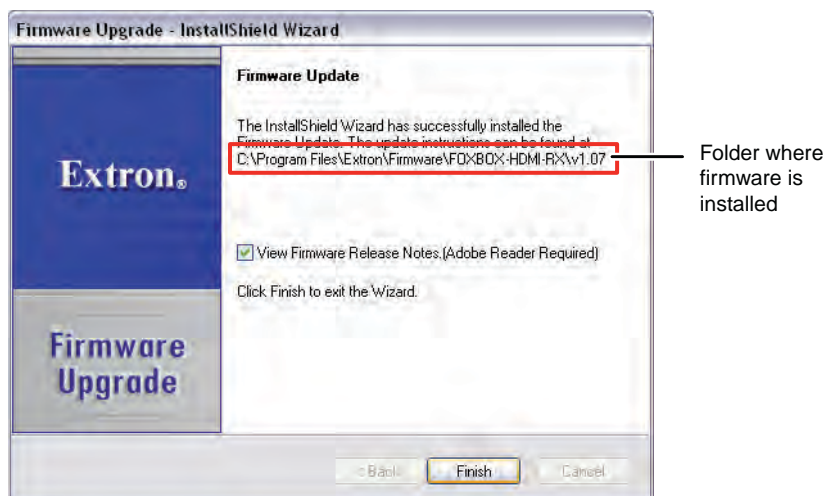



Figure 21. Location of the Firmware File

Loading the firmware to the transmitter and receiver

To load a new version of firmware to your transmitter and receiver, call the Firmware Loader software from within the FOX Extenders Control Program. The serial port on your computer must be connected to the Configuration port on the unit. See “[Front panel Configuration ports](#)” in the “Installation and Operation” section for more information.

1. In the FOX Extenders Control Program, click the Firmware Loader button  on the tool bar.

NOTE: If the Firmware Loader button does not appear on the tool bar, the Firmware Loader software is not installed. Install it as follows:

- a. On the Extron Web site, click the **Download** tab.
- b. On the Download Center page, click **Software** on the left sidebar menu.
- c. Locate the “Firmware Loader” line and click the **Download** link at the far right.
- d. Follow the instructions on the download screens to save the installer file to your computer.
- e. In Windows Explorer or another file browser, locate the Firmware Loader executable file in the file system on your computer and double-click it to open it.
- f. Follow the instructions on the Installation Wizard screens to install the Firmware Loader on your computer. Unless you specify otherwise, the installer program places the Firmware Loader file, “FWLoader.exe” in C:\Program Files\Extron\FWLoader.

If the Extron and FWLoader folders do not yet exist in your Program Files folder, the installer creates them.

- If you have not previously updated firmware for the FOXBOX unit before, on the Add Device screen (see figure 22), select the **RS - 232** tab.

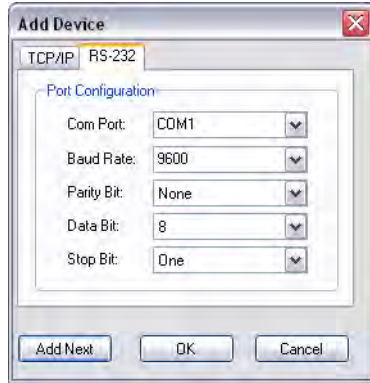


Figure 22. Add Device Screen

If you have previously updated firmware for this model, click **Cancel**. The Firmware Loader window appears. Proceed to step 5.

NOTE: Although the screen also has a TCP/IP tab, the FOXBOX unit does not have a LAN port. Do not select the TCP/IP tab.

- From the drop-down menus on the RS-232 screen, select the appropriate Com port number and baud rate (the default is 9600).
- Click **OK**. The Firmware Loader window appears (see figure 23).

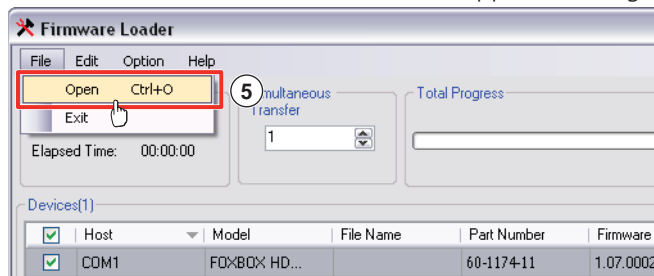


Figure 23. Extron Firmware Loader Window

- Select the FOXBOX unit and click **File > Open**. The Choose Firmware File screen appears (see figure 24).

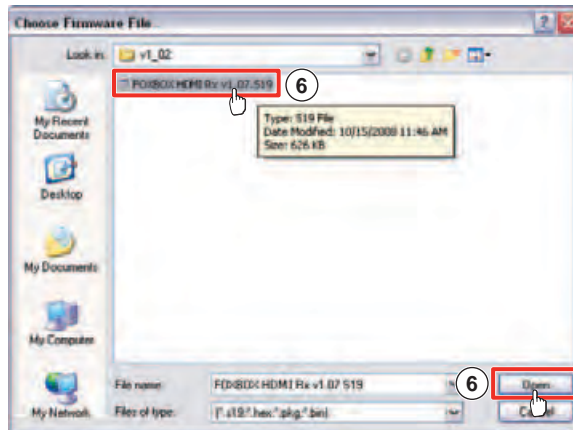


Figure 24. Choose Firmware File Window

6. Navigate to and select the new firmware file. Click **Open**. The Choose Firmware File window closes.

NOTE: When downloaded from the Extron Web site, the firmware is placed in a subfolder of C:\Program Files\Extron\Firmware.

ATTENTION: The firmware file must have a .S19 extension. Other file types can cause the unit to stop functioning.

7. In the Firmware Loader window, click **Begin** (see figure 25).

The Total Progress and Progress status bars show the progress of the upload. The firmware upload to the unit may take several minutes. Once the status bars have progressed from 0% to 100%, and Status is listed as Completed, the firmware loader utility resets the unit.

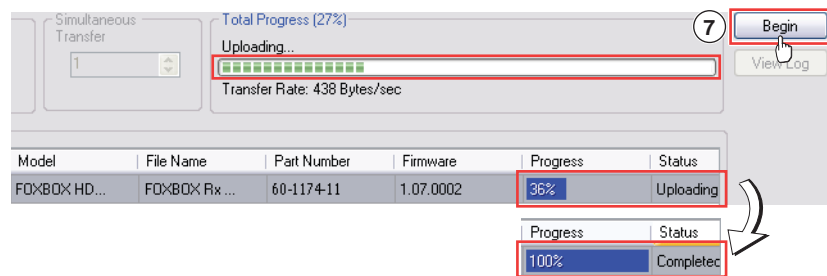


Figure 25. Firmware Loader Screen

8. Click **Exit** to close the Firmware Loader.

Reference Information

This section discusses the specifications, part numbers, and accessories for the FOXBOX Tx/Rx HDMI. Topics that are covered, include:

- [Specifications](#)
- [Part Numbers](#)
- [Mounting the Units](#)

Specifications

NOTES:

- The analog audio signal(s) is (are) digitized in the transmitter, sent through the fiber cable, and converted back to analog audio in the receiver.
- These transceivers are class 1 laser products. They meet the safety regulations of IEC-60825, FDA 21 CFR 1040.10, and FDA 21 CFR 1040.11.

Optical fiber interconnection between transmitter and receiver

Number/type.....	2 fiber optic
Connectors	2 LC connectors
Operating distance	
Singlemode	30 km (18.75 miles) with singlemode (SM) cables with a FOXBOX SM
Multimode.....	300 m (985') with 62.5 μm OM1 multimode (MM) cables with a FOXBOX MM
	1 km (3280') with 50 μm OM2 multimode (MM) cables with a FOXBOX MM
	2 km (6561') with 50 μm OM3/OM4 2000 MHz bandwidth laser optimized multimode cable with a FOXBOX MM

NOTE: Operating distance is approximate. These are typical maximum distances that may vary depending on factors such as fiber type, fiber bandwidth, connector splicing, losses, modal or chromatic dispersion, environmental factors, and kinks.

Nominal peak wavelength.....	850 nm for FOXBOX MM, 1310 nm for FOXBOX SM
Data rate.....	4.25 Gbps
Transmission power	
Singlemode	-5 dBm, typical
Multimode.....	-5 dBm, typical
Maximum receiver sensitivity	
Singlemode	-18 dBm, typical
Multimode.....	-12 dBm, typical
Optical loss budget	
Singlemode	13 dB, maximum
Multimode.....	7 dB, maximum

Video

NOTE: *Appropriate HDMI to DVI-D cables or adapters are required for DVI signal input/output.

Resolution range	Up to 1920x1200 or 1080p @ 60 Hz pixel for pixel
Formats.....	RGB, YCbCr, and xvYCC digital video
EDID.....	Supports emulation of custom or factory preset Extended Display Identification Data (EDID) tables.
HDCP.....	Compliant with High-bandwidth Digital Content Protection (HDCP) using DVI and HDMI standards
Standards.....	DVI 1.0, HDMI, HDCP 1.1, CEA-861E

Video input

Number/signal type	1 single link HDMI
Connectors	1 female HDMI type A

Video output

Number/signal type	1 single link HDMI
Connectors	1 female HDMI type A
Nominal level	0.8 Vp-p
Video delay	1-2 frames

Audio

Gain	
Range.....	Adjustable, -18 dB to +10 dB
Default.....	Unbalanced output: -6 dB; balanced output: 0 dB
Frequency response.....	20 Hz to 20 kHz, ± 0.5 dB
THD + Noise.....	0.10% @ 1 kHz at nominal level
S/N.....	>80 dB at maximum output (unweighted)
CMRR	65 dB @ 20 Hz to 20 kHz
Audio bits per sample.....	18 bits per channel, 2 channels (L, R)
Sampling rate.....	48 kHz

Audio input — transmitters

Number/signal type	1 unbalanced stereo or 2 unbalanced mono 1 stereo, de-embedded from HDMI (2-ch, PCM only)
Connectors	(1) 3.5 mm mini stereo jack 1 female HDMI, type A
Impedance	>10k ohms unbalanced, DC coupled
Nominal level	-10 dBV (316 mVrms)
Maximum level.....	+8.9 dBV, (unbalanced) at 1% THD+N

NOTE: 0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV \approx 2 dBu.

Audio output — receivers

Number/signal type	1 stereo/mono, balanced/unbalanced
Connectors	(1) 3.5 mm captive screw connector, 5 pole 1 female HDMI, type A (shared with HDMI video)
Impedance	50 ohms unbalanced
Nominal level	-10 dBV (316 mVrms)
Maximum level (Hi-Z).....	>+11.0 dBu, balanced at 1% THD+N
Maximum level (600 ohm).....	>10.0 dBu, balanced at 1% THD+N
Audio delay.....	1.5 frames

Control/remote

Serial control ports on each unit (transmitter and receiver)	
Control.....	1 RS-232, 2.5 mm mini stereo jack (front panel) 1 RS-232, 3.5 mm captive screw connector, 3-pole (rear panel) (receiver only)
Pass-through.....	1 RS-232, 3.5 mm captive screw connector, 5-pole (3 pins are used) (rear panel)
Baud rate and protocol	
Control.....	9600 baud, 8 data bits, 1 stop bit, no parity
Pass-through.....	9600 to 115,200 baud
Serial control pin configuration.....	Mini stereo jack: tip = Tx, ring = Rx, sleeve = GND Captive screw: 1 = Tx, 2 = Rx, 3 = GND
Program control.....	Extron control/configuration program for Windows® Extron Simple Instruction Set (SIS™)

General

Power supply.....	External Input: 100-240 VAC, 50-60 Hz Output: 12 VDC, 1 A, 12 watts
Power consumption	
Transmitter	
Device.....	5.7 watts, 12 VDC
Device and power supply ...	7.2 watts, 12 VDC
Receiver	
Device.....	6.9 watts, 12 VDC
Device and power supply ...	8.7 watts, 12 VDC
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling.....	Convection, vents on top and side panels
Thermal dissipation	
Transmitter	
Device.....	16.1 BTU/hr
Device and power supply ...	21.3 BTU/hr
Receiver	
Device.....	22.1 BTU/hr
Device and power supply ...	28.3 BTU/hr
Mounting	
Rack mount.....	Yes, with optional rack shelf
Furniture mount	Yes, with optional under desk mounting kit
Enclosure type.....	Metal
Enclosure dimensions	
Transmitter	1.0" H x 4.3" W x 6.0" D (quarter rack wide) (2.5 cm H x 10.9 cm W x 15.2 cm D) (Depth excludes connectors.)
Receiver.....	1.0" H x 8.75" W x 6.0" D (half rack wide) (2.5 cm H x 22.2 cm W x 15.2 cm D) (Depth excludes connectors and switch.)
Product weight	
Transmitter	0.7 lbs (0.3 kg)
Receiver.....	1.1 lbs (0.5 kg)
Shipping weight	
Transmitter	3 lbs (2 kg)
Receiver.....	4 lbs (2 kg)
Vibration.....	ISTA 1A in carton (International Safe Transit Association)

Regulatory compliance	
Safety	CE, c-UL, FDA Class 1, UL
EMI/EMC	CE, C-tick, FCC Class A, ICES, VCCI
Environmental.....	Complies with the appropriate requirements of RoHS, WEEE
MTBF	30,000 hours
Warranty.....	3 years parts and labor

- NOTES:**
- All nominal levels are at $\pm 10\%$.
 - Specifications are subject to change without notice.

Part Numbers

FOXBOX Tx/Rx HDMI Part Numbers

The FOXBOX units are available in singlemode (SM) and multimode (MM) models:

FOX Tx/Rx Enclosure and Boards	Part number
FOXBOX Tx HDMI SM	60-1174-12
FOXBOX Rx HDMI SM	60-1174-22
FOXBOX Tx HDMI MM	60-1174-11
FOXBOX Rx HDMI MM	60-1174-21

Included parts

These items are included in each order for a FOXBOX Tx HDMI transmitter:

Included parts	Part number
12V, 1A external power supply, with IEC power cord (qty. 1)*	
SFP Module (SM or MM, depending on the model)	
LockIt Lacing Bracket and tie-wrap (qty. 2)	21-235-01LF
Captive screw 5-pole connector (qty. 1)	10-703-12
9-pin D to 2.5 mm mini jack TRS RS-232 cable	70-335-01
10' LC-LC duplex patch cable (SM or MM, depending on the model)	
Rubber feet (qty. 4)	
Extron Software Products DVD (FOX Extenders Control Program)	
<i>FOXBOX HDMI Tx/Rx Setup Guide</i>	

* ZipClip™ 100 Mounting Kit available separately, see "[Mounting Accessories](#)," on the next page.

These items are included in each order for a FOX Rx HDMI receiver:

Included parts	Part number
12V, 1A external power supply, with IEC power cord (qty. 1)*	
SFP Module (SM or MM, depending on the model)	
LockIt Lacing Brackets and tie-wrap (qty. 1)	21-235-01LF
Captive screw 5-pole connectors (qty. 2)	10-703-12
Captive screw 3-pole connector (qty. 1)	10-319-13LF
10' LC-LC duplex patch cable (SM or MM, depending on the model)	
Rubber feet (qty. 4)	
Extron Software Products DVD (FOX Extenders Control Program)	
<i>FOXBOX HDMI Tx/Rx Setup Guide</i>	

* ZipClip 100 Mounting Kit available separately, see "Mounting Accessories," below.

Mounting Accessories

Mounting Kit	Part Number
ZipClip 100 Mounting Kit for PS Series Power Supplies (qty. 10)	101-002-01
RSU 126 6-inch deep 1U universal rack shelf kit	60-190-10
RSB 126 6-inch deep 1U basic rack shelf	60-604-11
RSU 129 9.5-inch deep 1U universal rack shelf kit	60-190-01
RSB 129 9.5-inch deep 1U basic rack shelf	60-604-02
MBU 125 under-desk mount kit	70-077-01
MBD 129 through-desk mount kit	70-077-02
PMK 300 projector mount kit	70-374-03
PMK 350 low profile projector mount kit (black, white)	70-563-02, 03

Cables

HDMI and DVI cable assemblies

Accessory	Part number
HDMI M-M Pro Series HDMI male to male cable	26-650- <i>nn</i>
HDMI M-DVI-D M/6 HDMI male to DVI-D male, 6' (1.8 m)	26-614-02
DVID SL Pro Series DVI-D male-to-male cable	26-649- <i>nn</i>

Fiber cable assemblies

MHR Mini High Resolution Cable	Part Number
4LC MM LC to LC Multimode Fiber Optic Cable Assemblies	26-652- <i>nn</i>
2LC OM4 MM P LC to LC Laser-Optimized Multimode Fiber Optic Cable Assemblies — Plenum	26-671- <i>nn</i>
2LC SM P LC to LC Bend-Insensitive Singlemode Fiber Optic Cable Assemblies — Plenum	26-670- <i>nn</i>

Bulk fiber cable and termination tools

RG6 Super High Resolution Cable	Part Number
OM4 MM P/2K Plenum 2 km (6,562 foot) Spool	22-225-02
SM P/2K Plenum 2 km (6,562 foot) Spool	22-223-02
Fiber Optic Termination Kit Termination Kit	100-656-01
QLC MM/10 Multimode, qty. 10	101-018-01
QLC SM/10 Singlemode, qty. 10	101-017-01

Adapters

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

Mounting the Units

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

Either of the 1-inch high, quarter-rack width (transmitter) or half-rack width (receiver) units can be placed on a tabletop, mounted on a rack shelf, or mounted under or through a desk or other furniture. The receiver can be mounted to a projector bracket.

Tabletop Use

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

Mounting

If desired, mount the unit using any of the following optional kits:

- RSU 126 6-inch deep universal rack shelf kit (part number 60-190-10)
- RSB 126 6-inch deep basic rack shelf (part number 60-604-11)
- RSU 129 9.5-inch deep universal rack shelf kit (part number 60-190-01)
- RSB 129 9.5-inch deep basic rack shelf (part number 60-604-02)
- MBB 100 Back of the rack mounting kit (part number 70-367-01)
- MBU 125 under-desk mounting kit (part number 70-077-01)
- MBD 129 through-desk mounting kit (part number 70-077-02)
- PMK 300 projector mount kit (part number 70-374-01)
- PMK 350 low profile projector mount kit (black, white) (part number 70-563-02, 03)

Follow the instructions included with the kit.

UL Guidelines for Rack Mounting

The following Underwriters Laboratories (UL) guidelines pertain to the installation of a FOXBOX Tx/Rx unit into a rack.

- 1. Elevated operating ambient** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature specified by Extron (T_{ma} = +122 °F [+50 °C]).
- 2. Reduced air flow** — Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- 3. Mechanical loading** — Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- 4. Circuit overloading** — Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- 5. Reliable earthing (grounding)** — Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (such as the use of power strips).

Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:

Extron Electronics
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

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
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

Asia: 65.6383.4400

Europe: 31.33.453.4040

Japan: 81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

Extron USA - West Headquarters	Extron USA - East	Extron Europe	Extron Asia	Extron Japan	Extron China	Extron Middle East	Extron Korea	Extron India
+800.633.9876 Inside USA/Canada Only	+800.633.9876 Inside USA/Canada Only	+800.3987.6673 Inside Europe Only	+800.7339.8766 Inside Asia Only	+81.3.3511.7655 FAX: +81.3.3511.7656	+4000.EXTRON +4000.398766 Inside China Only	+971.4.2991800 FAX: +971.4.2991880	+82.2.3444.1571 Fax: +82.2.3444.1575	1800.3070.3777 Inside India Only
+1.714.491.1500 FAX: +1.714.491.1517	+1.919.850.1000 FAX: +1.919.850.1001	+31.33.453.4040 FAX: +31.33.453.4050	+65.6383.4400 FAX: +65.6383.4664		+86.21.3760.1568 FAX: +86.21.3760.1566			+91.80.3055.3777 Fax: +91.80.3055.3737