Extron® Electronics

INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual

FOXBOX 4G Tx / Rx VGA
FOXBOX 4G Tx / Rx DVI

High Resolution Fiber Optic Transmitters and Receivers

68-1464-01 **Rev. A**
01 09

Extron **USA - West**
Headquarters
+800.633.9876
Inside USA / Canada Only
+1.714.491.1500
+1.714.491.1517 FAX

Extron **USA - East**
+800.633.9876
Inside USA / Canada Only
+1.919.863.1794
+1.919.863.1797 FAX

Extron **Europe**
+800.3987.6673
Inside Europe Only
+31.33.453.4040
+31.33.453.4050 FAX

Extron **Asia**
+800.7339.8766
Inside Asia Only
+65.6383.4400
+65.6383.4664 FAX

Extron **Japan**
+81.3.3511.7655
+81.3.3511.7656 FAX

Extron **China**
+400.883.1568
Inside China Only
+86.21.3760.1568
+86.21.3760.1566 FAX

Extron **Middle East**
+971.4.2991800
+971.4.2991880 FAX

Precautions

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.

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

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

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

Sicherheitsanleitungen • Deutsch

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

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

Achtung

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

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

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

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

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones 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.

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

Warning

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

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

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

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

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

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

Avertissement

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

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

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

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

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

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Vorsicht

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

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

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

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

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

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

Advertencia

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

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

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

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

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento 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.

Extron's 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 USA
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

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

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

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

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

Middle East:
Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

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.

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。

警告

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

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

电源线保护 • 妥善布线， 避免被踩踏，或重物挤压。

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

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

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

FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (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.

Quick Start Guide — FOXBOX 4G Tx/Rx

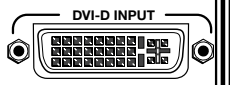
Step 1

Turn all of the equipment off or disconnect it from the power source. If desired, mount the FOXBOX 4G units in a rack or furniture, or place them on desktops.

Step 2

FOXBOX 4G Tx VGA: Connect a VGA to UXGA source to the transmitter's RGB Input 15-pin HD connector.

FOXBOX 4G Tx DVI: Connect a digital visual interface (DVI-D) source to the transmitter's DVI-D Input connector.

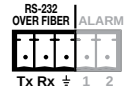


Step 3

Connect an unbalanced, stereo or mono audio input to the transmitter's Audio Input 3.5 mm mini jack.

Step 4

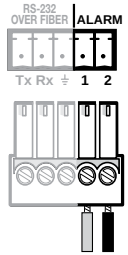
If you want the FOXBOX 4G to pass serial data and/or control signals, such as for serial control of a projector, connect the host device to the transmitter and the controlled device to the receiver via three poles of the RS-232 Over Fiber captive screw connector on both units.



NOTE *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 transmitter is configured to daisy chain the optical signal, system functionality is reduced.*
You will not receive RS-232 reports from the controlled device, and some Windows-based control program functions and RS-232 commands will not work. To receive responses from the controlled device and for full functionality, you need to install both fiber optic cables and leave the FOXBOX receiver in normal configuration (the receiver's Mode DIP switch 1 down). See Step 7.

Step 5

For remote monitoring of the status of the optical links, connect a locally constructed or obtained device to the two Alarm poles of the units' RS-232/Alarm 5-pole captive screw connectors. The two poles are shorted together when no light is detected.

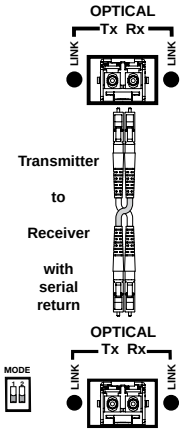


NOTE *The transmitter's Alarm port reports the status of the Rx light link.*
The receiver's Alarm port reports the status of the Tx light link.

Quick Start Guide — FOXBOX 4G Tx/Rx cont'd

Step 6

Connect the primary (transmitter Tx to receiver Rx) (required) fiber cable between the Tx connector on the transmitter and Rx connector on the receiver.



NOTE *Only the primary cable is required for video, audio, and serial command transmission. The secondary cable is required only to return serial data from the controlled device to the host device. For the return data, the receiver must also be in normal configuration.*

NOTE *For normal configuration with serial return, perform step **7** and skip step **8**. For daisy chain configuration, skip step **7** and perform step **8**.*

Step 7a (normal configuration)

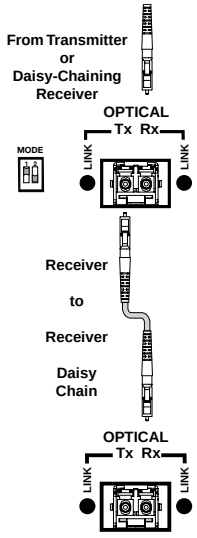
Connect the secondary fiber cable between the Tx connector on the receiver and Rx connector on the transmitter. See the drawing above.

Step 7b

Set the receiver's Mode DIP switch 1 down.

Step 8a (daisy chain configuration)

Connect the receiver's Tx output to the Rx input on another receiver. See the drawing at right.



Step 8b

Set the receiver's Mode DIP switch 1 up.

Step 9a

FOXBOX 4G Rx VGA: Connect an RGBHV or RGsB display to the receiver's RGB Output 15-pin HD connector.

FOXBOX 4G Rx DVI: Connect a DVI display to the receiver's DVI-D Output connector.

Step 10

Connect balanced or unbalanced stereo or mono audio devices to the receiver, using the Audio Outputs 3.5 mm mini jack.

Step 11

For serial control of the transmitter's and receiver's adjustment and test pattern functions, connect a host device to either unit's front panel Configuration connector via the included TRS RS-232 cable.

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Chapter One

Introduction

About this Manual

About the FOXBOX 4G Tx/Rx

Features

WARNING *The FOXBOX 4G Tx/Rx units output continuous invisible light, which may be harmful and dangerous 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 optic cable is unplugged.*

About this Manual

This manual contains information about the Extron FOXBOX 4G family of fiber optic products. The FOXBOX 4G family (figure 1-1) consists of two compatible sets of ultra-high performance fiber optic transmitters and receivers:

- **FOXBOX 4G Tx VGA** transmitter — Accepts an analog RGB video input, an audio input, and an RS-232 serial input and outputs a proprietary optical signal to a FOXBOX 4G or FOX 500 receiver. Also can receive a proprietary optical signal from the receiver consisting of the RS-232 return from a controlled device.
- **FOXBOX 4G Rx VGA** receiver — Accepts a proprietary optical signal from a FOXBOX 4G or FOX 500 transmitter or daisy-chained receiver and outputs analog RGB video, audio, and RS-232 serial commands. 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.
- **FOXBOX 4G DVI Tx** transmitter — Accepts a single link of DVI video input, an audio input, and an RS-232 serial input, and outputs a proprietary optical signal to a FOXBOX 4G or FOX 500 receiver. Also can receive a proprietary optical signal from the receiver consisting of the RS-232 return from a controlled device.
- **FOXBOX 4G DVI Rx** receiver — Accepts a proprietary optical signal from a FOXBOX 4G or FOX 500 transmitter or daisy-chained receiver, and outputs a single link of DVI video, audio, and RS-232 serial commands. 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.

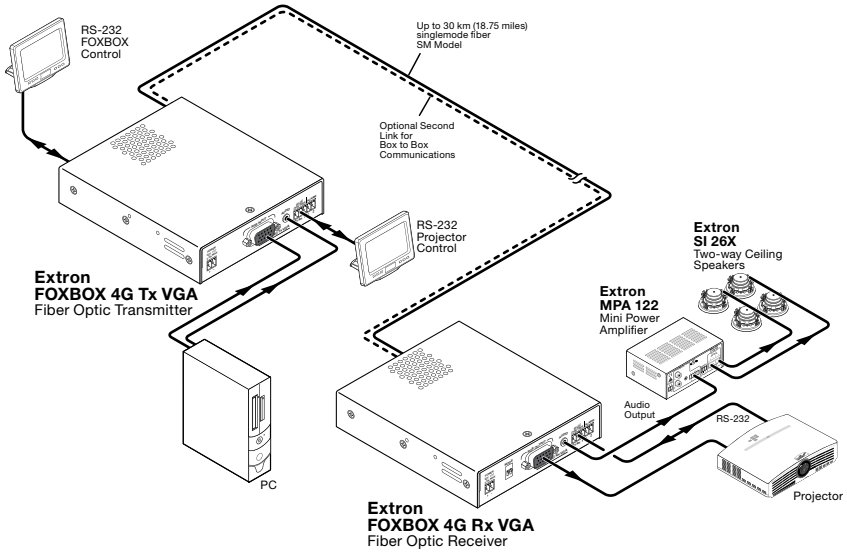


Figure 1-1 — Typical FOXBOX 4G Tx/Rx application

NOTE *In this manual, the term "FOXBOX 4G" refers to either an analog RGB video or a DVI video unit. Where differences exist between the VGA and DVI models, the unit's full name is used.*

About the FOXBOX 4G Tx/Rx

General system operation

The FOXBOX 4G VGA transmitter inputs VGA - UXGA RGB video.

The FOXBOX 4G DVI transmitter inputs a single link of DVI video.

Both transmitters input audio and one-way (transmitter-to-receiver) RS-232 serial communication (for applications such as projector control). The transmitters convert all of their inputs into a proprietary signal; and output the signal on a single fiber optic cable to the receiver. An optional return (receiver-to-transmitter) stream of serial RS-232 communications, such as projector responses, requires a second fiber optic cable. Rather than the return RS-232 communications, the receivers can be configured to output a daisy-chained primary fiber optic signal to another receiver.

The FOXBOX 4G VGA receiver outputs VGA - UXGA RGB video.

The FOXBOX 4G DVI receiver outputs a single link of DVI video.

The receivers convert the proprietary signal(s) back to video (either RGB or DVI as applicable to the model), audio, and serial RS-232 communication, and output the signals locally. If either RS-232 return or daisy-chained communications are implemented (a second fiber optic cable is installed), the receiver outputs a proprietary serial communication signal on the second fiber optic cable. For video resolutions up to 1600 x 1200, the receiver's video output is a perfect, pixel-for-pixel recreation of the video signal input to the transmitter.

The transmitter and receiver have image and audio adjustments available under RS-232 control. Both units have image, audio, and fiber light status and lost-light alarm indicators.

The FOXBOX 4G VGA transmitter can handle an RGBHV, RGBS, RGsB, or RsGsBs input signal. The FOXBOX 4G VGA receiver can output RGBHV or RGsB, as selected by the user.

The receivers have built-in alternating pixels, Color Bars, and grayscale test patterns to assist in setting up the display equipment.

The FOXBOX 4G transmitters and receivers are rack and furniture mountable and have external power supplies that provide worldwide power compatibility.

NOTE *The FOXBOX 4G DVI does **not** support the transmission of signals with High-bandwidth Digital Content Protection (HDCP).*

NOTE *A FOXBOX 4G Tx VGA transmitter is **fully compatible** with a FOXBOX 4G DVI Rx receiver.*

*A FOXBOX 4G DVI Tx transmitter is **fully compatible** with a FOXBOX 4G Rx VGA receiver.*

*The FOXBOX 4G units are **fully compatible** with all Extron FOX 500 products and a variety of other fiber optic products. Those other products are identified where appropriate, but not specifically described in this manual.*

Cable transmission modes

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

- **Multimode —** Up to 150 m (450')
  - FOXBOX 4G Tx VGA MM
  - FOXBOX 4G Rx VGA MM
  - FOXBOX 4G Tx DVI MM
  - FOXBOX 4G Rx DVI MM
- **Singlemode —** Very long distance, up to 30 km (18.75 miles)
  - FOXBOX 4G Tx VGA SM
  - FOXBOX 4G Rx VGA SM
  - FOXBOX 4G Tx DVI SM
  - FOXBOX 4G Rx DVI SM

NOTE *The multimode and singlemode products 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 perfect, pixel-for-pixel RGBHV video or DVI video transmission, up to 1600 x 1200 at 60 Hz.

Video input —

FOXBOX 4G VGA — The transmitter accepts RGBHV, RGBS, RGsB, or RsGsBs on a 15-pin HD connector.

FOXBOX 4G DVI — The transmitter accepts a single link of DVI-D video on a DVI-I connector.

EDID emulation mode (FOXBOX 4G Tx DVI only) — The FOXBOX 4G DVI transmitter provides a function, under RS-232 control, for specifying the rate of the incoming DVI signal. EDID emulation mode allows proper operation when no local monitor is present.

Video output —

FOXBOX 4G VGA — The receiver outputs RGBHV or RGsB (user-selectable) on a 15-pin HD connector.

FOXBOX 4G DVI — The receiver outputs a single link of DVI-D video on a DVI-I connector.

FOXBOX 4G VGA and FOXBOX 4G DVI are mutually compatible — Enables ultra-long distance DVI-to-analog RGB and analog RGB-to-DVI conversion without the need for extra signal conversion devices.

Compatible with FOX 500 DA6 distribution amplifier and Fiber Matrix 6400 matrix switcher

Audio input — The transmitters accept a balanced or unbalanced stereo audio input on a 3.5 mm mini jack.

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

Audio output — Balanced or unbalanced stereo audio is output from the receivers on a 3.5 mm mini jack.

Links monitoring — The transmitters' and receivers' front panels have indicators for monitoring image and audio transmission and both fiber optic links.

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

Windows®-based control program — For RS-232 remote control from a PC, the Extron Windows-based FOX Extender control software provides a graphical interface and drag-and-drop/point-and-click operation.

Simple Instruction Set (SIS™) — The transmitters and receivers use Extron's SIS for easy remote control operation.

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

Upgradable firmware — The firmware that controls each unit's operation 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 Windows-based 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 — All FOXBOX 4G Tx and Rx units are rack mountable in any conventional 19" wide rack, using Extron's 9.5" or 6" deep rack shelf.

Power — Each unit's 100 VAC to 240 VAC external power supply provides worldwide power compatibility.

Chapter Two

Installation and Operation

Mounting the Unit

Connections

Operation

Mounting the Unit

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

Any of the 1" high, quarter-rack width units can be placed on a tabletop, mounted on a rack shelf, or mounted under or through a desk or other furniture.

CAUTION *The FOXBOX 4G units generate heat during operation. Ensure there is ample room between units in multiple unit installations for ventilation and/or ensure adequate equipment cooling. Units too close together may overheat.*

Tabletop placement

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

Rack mounting

UL guidelines

The following Underwriters Laboratories (UL) guidelines pertain to the installation of a FOXBOX 4G transmitter or receiver into a rack (figure 2-1).

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 (Tma) of +122 °F (+50 °C) specified by Extron.
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).

Mounting instructions

For optional rack mounting, mount any of the 1" high, quarter rack width units on any of the following rack shelves:

- RSU 126 6" deep universal rack shelf kit (part #**60-190-10**)
- RSB 126 6" deep basic rack shelf (part #**60-604-10**)
- RSU 129 9.5" deep universal rack shelf kit (part #**60-190-01**)
- RSB 129 9.5" deep basic rack shelf (part #**60-604-01**)

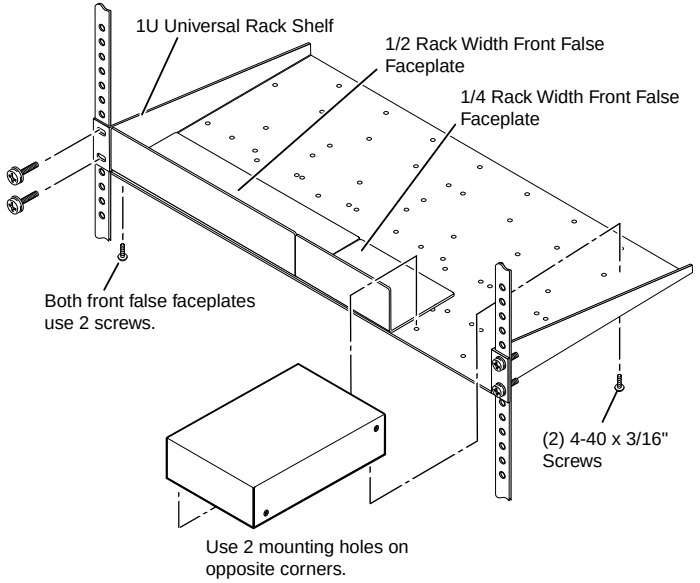


Figure 2-1 — Mounting the unit on a standard rack shelf

1. If installed, remove the feet from the bottom of the unit.
2. Mount the unit in one of four positions on the shelf, using two 4-40 x 3/16" screws in opposite (diagonal) corners to secure the unit to the shelf.
3. Install false faceplates or other units to the rack shelf.
4. Insert the shelf into the rack, aligning the holes in the shelf with those of the rack.
5. Secure the shelf to the rack using the supplied machine screws.

Furniture mounting

Mount any of the 1" high, quarter-rack width units under a desk or podium using the optional Extron MBU 125 under desk mounting kit (part #**70-077-01**) as follows:

1. If rubber feet were previously installed on the bottom of the unit, remove them.
2. Secure the mounting brackets to the unit with the provided machine screws (figure 2-2).

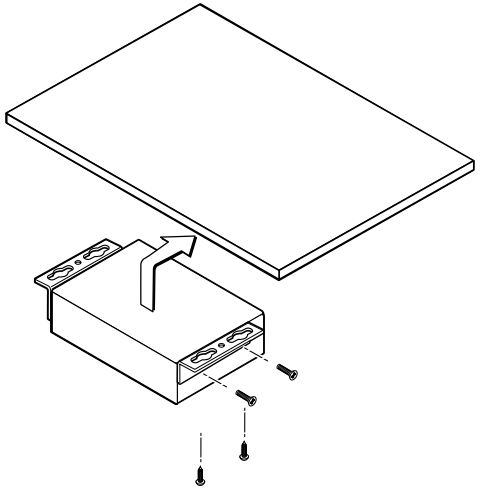


Figure 2-2 — Under-desk mounting the unit

3. Hold the unit with the brackets attached against the underside of the table or other furniture. Mark the location of the screw holes of the bracket on the mounting surface.
4. Drill four pilot holes, each 3/32" (2 mm) in diameter by 1/4" deep (6.3 mm) deep in the mounting surface at the marked screw locations.
5. Insert provided #8 wood screws into the four pilot holes. Tighten each screw into the mounting surface until just less than 1/4" (6.3 mm) of the screw head protrudes.
6. Align the mounting screws with the slots in the brackets and place the unit against the surface, with the screws through the bracket slots.
7. Slide the unit slightly in or out, then tighten all four screws to secure the unit in place (figure 2-2).

Through-desk mounting

Mount any of the 1" high, quarter-rack width units through a desk or podium using the optional Extron MBD 129 through desk mounting kit (part #**70-077-02**) as follows:

1. If rubber feet were previously installed on the bottom of the unit, remove them.
2. Secure the brackets to the unit with the provided machine screws (figure 2-3). Leave the screws slightly loose.

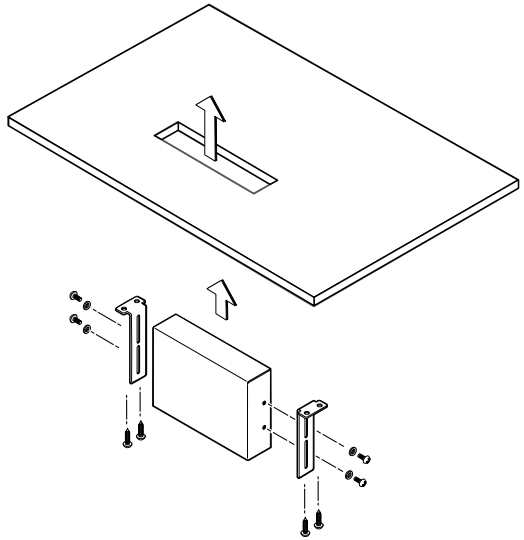


Figure 2-3 — Through-desk mounting the unit

3. Hold the unit and brackets on the underside of the surface to which you are mounting the device and mark the four screw holes and the table material to be removed.
4. Cut out and remove the table material. Test the fit by inserting the front of the device through the hole. If necessary, use a rasp or coarse file to enlarge the hole.
5. Drill four pilot holes, each 3/32" (2 mm) in diameter by 1/4" deep (6.3 mm) deep, in the locations that you marked in step **3**.
6. Using the provided four #8 wood screws, attach the brackets to the mounting surface.
7. Slide the device in or out until it is in the desired position. Tighten the screws installed in step **2**.

If the screws are inaccessible to a screwdriver:

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

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

c. Tighten the screws.

d. Replace the unit inside the surface (step **6**).

Connections

Transmitter connections and indicators

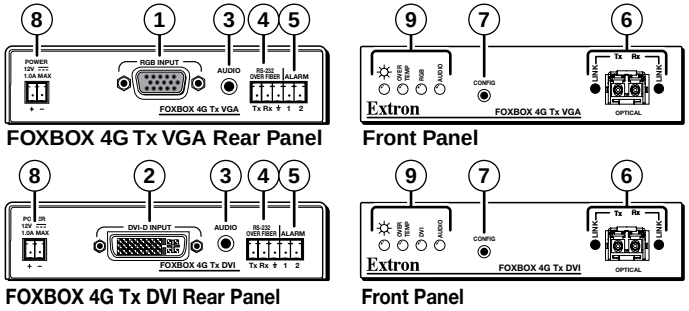


Figure 2-4 — FOXBOX 4G Tx transmitter's connectors

① **RGB Input connectors (FOXBOX 4G VGA only) —** Connect an analog VGA - UXGA RGB video source to this 15-pin HD female connector.

② **DVI-I Input connector (FOXBOX 4G DVI only) —** Connect a single link of DVI-D to this DVI-I connector. See "DVI connector (FOXBOX 4G DVI)" on page 2-13 for pin assignments.

NOTE *The FOXBOX 4G DVI accepts only the digital signals on the DVI-I Input connector. The analog pins on the port are not connected.*

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

NOTE *See figure 2-5 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.*

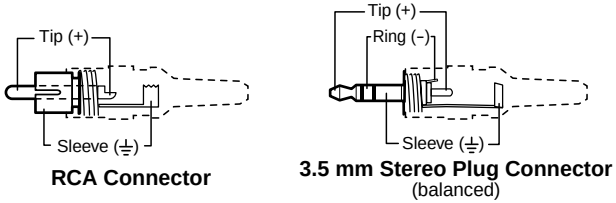
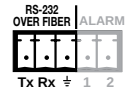


Figure 2-5 — Typical audio connectors

The input audio level can be set via RS-232 control. See chapter 3, "Remote Control".

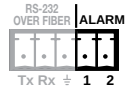
④ **RS-232 Over Fiber port —** If you want the FOXBOX 4G to pass serial command signals to the receiver, for serial control of a projector for example, connect the host device to the transmitter via the first three leftmost poles (Tx, Rx, and ⏚) of this 5-pole captive screw connector. See "RS-232 Over Fiber connection" on page 2-14 to wire this connector.



NOTE *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 the FOXBOX receiver in normal configuration (the receiver's Mode DIP switch 1 down).*

NOTE *The FOXBOX 4G 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 2-15 to wire this connector.



⑥ **Fiber optic connectors and LEDs —**

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

NOTE *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 jacket.*

NOTE *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 transmitter is configured to daisy-chain the optical signal, system functionality is reduced. You will **not** receive RS-232 reports from the controlled device, and some Windows-based control program functions and RS-232 commands will not work. To receive responses from the controlled device and for full functionality, you need to install both fiber optic cables and leave the FOXBOX receiver in normal configuration (the receiver's Mode DIP switch 1 down).*

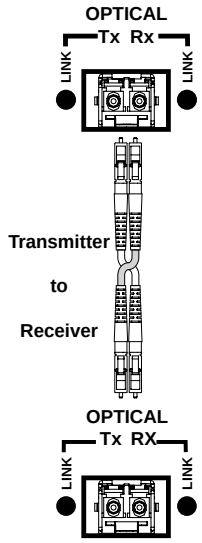
Tx (required) — For all one-way video, audio, and serial communications from the transmitter to the receiver, connect a fiber optic cable to the Tx LC connector.

Connect the free end of this fiber optic cable to the Rx connector on the FOXBOX 4G Rx receiver (item ⑮ on figure 2-6) or to any other compatible Extron FOX device.

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 4G Rx receiver in normal configuration (item ⑮ on figure 2-6) or to any other compatible Extron FOX device.

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



⑦ **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 2-16, for more details on the adapter cable. See chapter 3, "Remote Control", for SIS commands and Windows®-based program control.

NOTE *The TRS RS-232 cable is included with the Tx models.*

⑧ **DC power connector —** Plug the included external 12 VDC power supply into this connector. See "Power supply wiring," on page 2-17, to wire the connector.

⑨ **Indicators —**

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

Over Temp LED — This LED lights to indicate that the unit is operating at a dangerously high temperature (approximately 167° F [75° C]) and that equipment damage is imminent.

RGB (FOXBOX 4G VGA) or DVI (FOXBOX 4G DVI) LED — This LED lights when the transmitter detects a signal on its video input, as follows:

RGB LED — Horizontal sync (H) (for RGBHV video) or Green (Sync on green) (G) (for RGsB or RsGsBs video)

DVI LED — DVI video input

Audio LED — This LED lights when the transmitter detects a low level audio signal for a short period of time. It goes dark if the audio signal drops below the minimum threshold for a short period of time.

Receiver connections and indicators

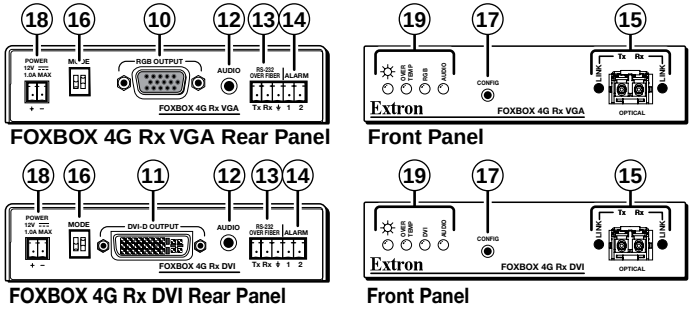


Figure 2-6 — FOXBOX 4G Rx receiver's connectors

⑩ **RGB Output connector (FOXBOX 4G Rx VGA only) —** Connect an analog VGA - UXGA RGB video display to this 15-pin HD female connector.

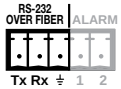
NOTE *You can set the receiver to output the desired video format: RGBHV or RGsB. RGBHV is the default. See chapter 3, "Remote Control".*

⑪ **DVI-I Output connector (FOXBOX 4G DVI only) —** Connect a DVI video display to this DVI-I connector. See "DVI connector (FOXBOX 4G DVI)" on page 2-13 for pin assignments.

NOTE *The FOXBOX 4G DVI outputs only the digital signals on the DVI-I Output connector. The analog pins on the port are not connected.*

⑫ **Audio connector —** Plug an audio device into this stereo mini jack connector.

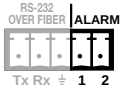
⑬ **RS-232 Over Fiber port —** If you want the FOXBOX 4G to pass serial command signals to the receiver, for serial control of a projector for example, connect the host device to the transmitter via the first three leftmost poles (Tx, Rx, and ⏚) of this 5-pole captive screw connector. See "RS-232 Over Fiber connection" on page 2-14 to wire this connector.



NOTE *If you connect only one fiber optic cable (item ⑮, below), 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 the FOXBOX receiver in normal configuration (Mode DIP switch 1 down).*

NOTE *The FOXBOX 4G can pass RS-232 commands and responses at rates up to 115200 baud.*

⑭ **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 Tx, pin 1 and pin 2 of this port are shorted together.



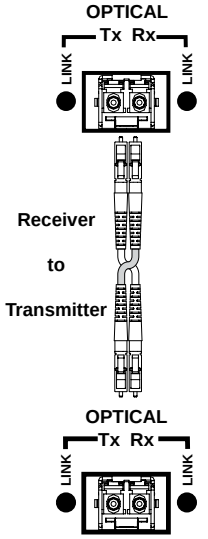
⑮ **Fiber optic connectors and LEDs —**

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

NOTE *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 jacket.*

NOTE *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 transmitter is configured to daisy-chain the optical signal, system functionality is reduced. You will **not** receive RS-232 reports from the controlled device, and some Windows-based control program functions and RS-232 commands will not work. To receive responses from the controlled device and for full functionality, you need to install both fiber optic cables and leave the FOXBOX receiver in normal configuration (Mode DIP switch 1 down).*

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 4G Tx transmitter (item ⑥ on page 2-8) or to any other compatible Extron FOXBOX 4G device.

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

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

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 4G Tx transmitter (item ⑥ on page 2-8) 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).

⑯ **Mode switch —** To connect the received optical input to another receiver in a daisy chain configuration, set DIP switch 1 to up as shown.

NOTE *Up to 10 properly-configured receivers can be connected in a daisy chain to a single transmitter.*

DIP switch 2 is not used.

⑰ **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 2-16 for more details on the adapter cable. See chapter 3, "Remote Control", for SIS commands and Windows-based program control.

⑱ **DC power connector —** Plug the included external 12 VDC power supply into this connector. See "Power supply wiring," on page 2-17, to wire the connector.

⑲ **Indicators —**

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

Over Temp LED — This LED lights to indicate that the unit is operating at a dangerously high temperature (approximately 167° F [75° C]) and that equipment damage is imminent.

RGB (FOXBOX 4G VGA) or DVI (FOXBOX 4G DVI) LED — This LED lights on the receiver when the transmitter detects a signal on its video input, as follows:

RGB LED — Horizontal sync (H) (for RGBHV video) or Green (Sync on green) (G) (for RGsB or RsGsBs video)

DVI LED — DVI video input

Audio LED — This LED lights on the receiver when the transmitter detects a low level audio signal for a short period of time. It goes dark if the audio signal drops below the minimum threshold for a short period of time.

Making connections

DVI connector (FOXBOX 4G DVI)

Figure 2-7 and the table below define the DVI pin assignments.

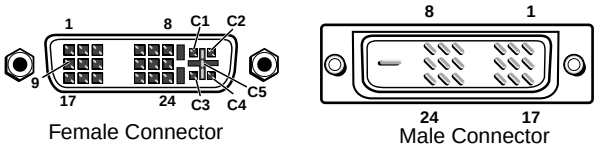


Figure 2-7 — DVI connectors

NOTE *The missing connectors on the included DVI cable are not required for the single link of DVI-D data supported by the FOXBOX 4G DVI. The analog video pins are not connected. All of these pins are grayed out on the following table.*

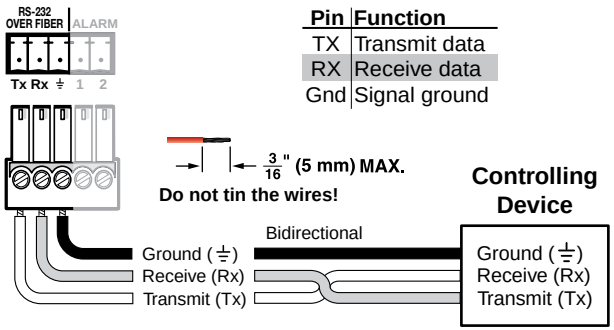
Pin	Signal	Pin	Signal	Pin	Signal
1	TMDS Data 2-	9	TMDS Data 1-	17	TMDS Data 0-
2	TMDS Data 2+	10	TMDS Data 1+	18	TMDS Data 0+
3	TMDS Data 2/4 Shield	11	TMDS Data 1/3 Shield	19	TMDS Data 0/5 Shield
4	TMDS Data 4-	12	TMDS Data 3-	20	TMDS Data 5-
5	TMDS Data 4+	13	TMDS Data 3+	21	TMDS Data 5+
6	DDC Clock	14	+5 V Power	22	TMDS Clock Shield
7	DDC Data	15	Ground (+5 V)	23	TMDS Clock
8	No Connection	16	Hot Plug Detect	24	TMDS Clock
C1	Analog Red Video	C3	Analog Blue Video	C5	Analog Ground
C2	Analog Green Video	C4	Analog H. Sync		

DVI signals run at a very high frequency and are especially prone to 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 4G DVI transmitter or the output of the FOXBOX 4G DVI receiver.
- Use only the cable designed for DVI signals that is supplied by Extron.
- Limit or avoid the use of adapters.
- Use only approved DVI/HDMI connectors.

NOTE *Use only cables specifically intended for DVI or HDMI interfaces. Use of non-DVI or non-HDMI cables or modified cables can result in a missing video output.*

RS-232 Over Fiber connection



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

Figure 2-8 — RS-232 connectors

NOTE *The RS-232 Over Fiber port is for transmission of serial signals, such as projector control signals, between the transmitter and receiver.*

NOTE *The length of exposed wires is critical. The ideal length is 3/16" (5 mm).*

- *If the stripped section of wire is longer than 3/16", the exposed wires may touch, causing a short circuit.*
- *If the stripped section of wire is shorter than 3/16", wires can be easily pulled out even if tightly fastened by the captive screws.*

Alarm outputs connection

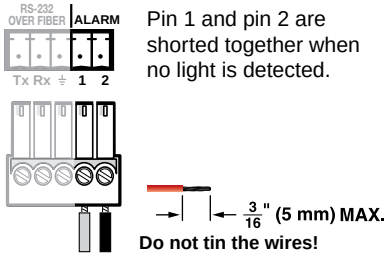


Figure 2-9 — Alarm connector

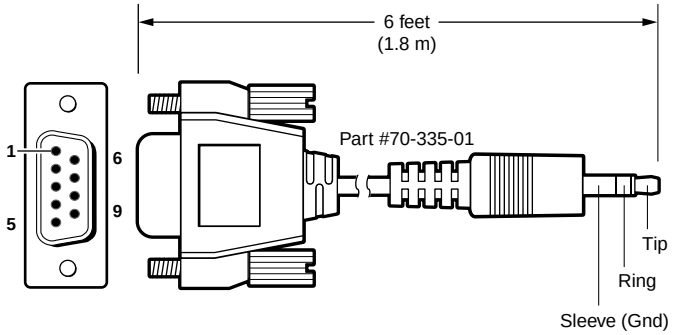
NOTE *The length of exposed wires is critical. The ideal length is 3/16" (5 mm).*

- *If the stripped section of wire is longer than 3/16", the exposed wires may touch, causing a short circuit.*
- *If the stripped section of wire is shorter than 3/16", wires can be easily pulled out even if tightly fastened by the captive screws.*

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 on 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 2-10), included with transmitters, can be used for this connection.



9-pin D	Connection	TRS Plug
Pin 2	Computer's RX line	Tip
Pin 3	Computer's TX line	Ring
Pin 5	Computer's signal ground	Sleeve

Figure 2-10 — 9-pin TRS RS-232 cable

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

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

NOTE *The maximum distances from the transmitter or receiver to the controlling device can vary up to 200' (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' (15 m) are typically not a problem. In some cases, the unit may be capable of serial communications via RS-232 up to 250' (76 m) away.*

See chapter 3, "Remote Control", for definitions of the SIS commands (serial commands to control the transmitter via this connector) and Windows-based program control.

Power supply wiring

Figure 2-11 shows how to wire the power connector.

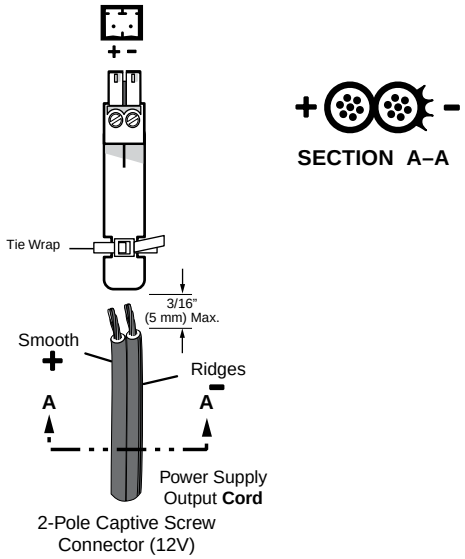


Figure 2-11 — Power connector wiring

CAUTION *Power supply voltage polarity is critical. Incorrect voltage polarity can damage the power supply and the unit. The ridges on the side of the cord (figure 2-11) identify the power cord negative lead.*

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

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

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

NOTE *Do not tin the leads before inserting them in the connector. Tinned wires are not as secure 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 123 Universal 12 VDC Power Supply, part #**60-814-01**, 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 rear of this manual for the Extron office nearest you.

To take advantage of the FOXBOX 4G's various adjustments and test patterns, you need to connect a computer or other RS-232 capable device to either unit's front panel Configuration port and operate using either SIS commands or the FOX Extender Windows-based control program. See chapter 3, "Remote Control".

3

Chapter Three

Remote Control

Simple Instruction Set Control

Windows®-Based Program Control

The transmitter and receiver each have a front panel Configuration (RS-232) port, a 2.5 mm mini stereo jack, that can be connected to a host device such as a computer running the HyperTerminal or other utility, an RS-232 capable PDA, or a control system. These ports make serial control of the transmitter and receiver possible.

The protocol for the ports on both units is as follows:

- RS-232
- 9600 baud
- no parity
- 8 data bits
- 1 stop bit
- no flow control

NOTE *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 you configure the receiver for daisy-chaining, you will **not** receive RS-232 reports from the controlled device, and there will be **reduced** RS-232 command functionality on the Rx unit. To receive responses from the controlled device and for full functionality, you need to install both fiber optic cables and leave the FOXBOX receiver in normal configuration (the receiver's Mode DIP switch 1 down).*

Simple Instruction Set Control

Host-to-interface communications

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command character sequence. When a command is valid, the 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 = ↵), which signals the end of the response character string. A string is one or more characters.

Symbol definitions

Symbols (variables), defined on the next page, are used throughout the "Unit-initiated messages" section and the command/response table that begins on page 3-6. The symbols represent variables in the unit-initiated messages and the command/response table fields.

↵ = CR/LF (carriage return/line feed)

← = CR (carriage return, no line feed)

• = space

X1	= Mute/auto image status	0 or 1 (0=off and 1=on)
X2	= Resolution	1 = 1920 x 1200 2 = 800 x 600 3 = 1024 x 768 4 = 1280 x 768 5 = 1280 x 1024 6 = 1365 x 768 7 = 1366 x 768 8 = 1400 x 1050 9 = 1600 x 1200 10 = 480p 11 = 576p 12 = 720p 13 = 1080i 14 = 1080p 15 = 640 x 480
X3	= Refresh rate	1 = 50 Hz 2 = 60 Hz
X4	= Mode switch position	0 = off (down) 1 = on (up)
X5	= Output sync format	0 = RGBHV 1 = RGsB
X6	= Output sync polarity	0 = follow input 1 = force sync to negative
X7	= Horizontal and vertical position	0 to 255
X8	= Horizontal start	0 to 255
X9	= Pixel phase	0 to 31
X10	= Total pixels	± 255 of the default value
X11	= Sync frequency	*xxx.xx* (frequency in kHz [H] or Hz [V])
X12	= Memory preset number	1 to 30
X13	= Audio gain adjustment range	0 to 10
X14	= Audio level adjustment range	-18 to +10 (in 1.0 dB steps)
X15	= Audio attenuation adjustment range	0 to 18
X16	= Test pattern	0 = none 1 = Color Bars 2 = grayscale 3 = alternating pixels
X17	= Rx Link enable	0 = disable 1 = enable (default)
X18	= Link/input status	0 = link or input not sensed 1 = link or input sensed
X19	= Mode	SM = singlemode MM = multimode
X20	= Transmitter or receiver	Tx = transmitter Rx = receiver
X21	= Firmware version	*v.vv*
X22	= Internal temperature (Fahrenheit and Celsius)	*nnn*F•*nn*C

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 2008, EXTRON ELECTRONICS FOXBOX 4G Tx VGA, V*x.xx*, 60-934-*xx*↵↵

- or -

(c) COPYRIGHT 2008, EXTRON ELECTRONICS FOXBOX 4G Rx VGA, V*x.xx*, 60-934-*xx*↵↵

- or -

(c) COPYRIGHT 2008, EXTRON ELECTRONICS FOXBOX 4G Tx DVI, V*x.xx*, 60-935-*xx*↵↵

- or -

(c) COPYRIGHT 2008, EXTRON ELECTRONICS FOXBOX 4G Rx DVI, V*x.xx*, 60-935-*xx*↵↵

The connected unit issues the appropriate copyright message (above) when it first powers on. V*x.xx* is the firmware version number; 60-93*x*-*xx* is the connected unit's part number.

Reconfig↵

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

1Lnk[X1]*•2Lnk[X1]*•RGB[X1]*•Aud[X1]*↵

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

Dip[X4][X4]↵

The unit sends the DIP switch position message whenever a change in the receiver's DIP switch settings occurs.

NOTE *Only DIP switch 1 (the first [X4]) has any effect on the system operation. When the switch is on (up), the receiver is in daisy chain mode.*

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↵

Timeout

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

Using the command/response table

The command/response table begins on page 3-6. 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	2Ø	!	21	"	22	#	23	$	24	%	25	&	26	'	27	(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
Ø	3Ø	1	31	2	32	3	33	4	34	5	35	6	36	7	37	8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	4Ø	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	5Ø	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
`	6Ø	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	7Ø	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 SIS commands

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Video mute			
Mute output	1B	Blk1↵	Blank the video output.
Unmute output	0B	Blk0↵	Output video.
Show video mute status	B	X1↵	Video output mute status is X1 (0 = unmuted, 1 = muted).
Display Data Channel (DDC) resolution and rate (FOXBOX 4G DVI only)			
Set DDC resolution	41*X2*X3#	DDCX2*X3↵	Select a DDC resolution.
Show DDC resolution	41#	X2*X3↵	Show the DDC resolution.
Mode switch position			
NOTE *Only DIP switch 1 (the first X4) has any effect on the system operation. When the switch is on (up), the receiver is in daisy chain mode.*			
Show DIP switch position	8#	X4X4↵	Show the rear panel DIP switch position.
Output sync format			
Set output sync format	6*X5#	SynY5↵	Set the sync format. 0 = RGBHV, 1 = RGsB.
Show output sync format	6#	X5↵	
Output sync polarity			
Set output polarity negative	7*1#	Pol1↵	Set the receiver output polarity to always be negative.
Set polarity to the input	7*0#	Pol0↵	Polarity follows the video sync input to the transmitter.
Show output sync format	7#	X6↵	

NOTE

X1 = Mute status	0 or 1 (0=umuted and 1=muted)	
X2 = Resolution	1 through 15. See page 3-3	
X3 = Refresh rate	1 = 50 Hz	2 = 60 Hz
X4 = Mode switch position	0 = off (down)	1 = on (up)
X5 = Output sync format	0 = RGBHV	1 = RGsB
X6 = Output sync polarity	0 = follow input	1 = force sync to negative

Command/response table for SIS commands (continued)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Horizontal shift			
Set a horizontal position	X7H	HphX7↵	Set horizontal centering to X7.
Increment position.	+H	HphX7↵	Shift the image one pixel to the right.
Decrement position	-H	HphX7↵	Shift the image one pixel to the left.
Show position	H	X7↵	
Vertical shift			
Set a vertical position	X7/	VphX7↵	Set vertical centering to X7.
Increment position	+/	VphX7↵	Shift the image down one line.
Decrement position	-/	VphX7↵	Shift the image up one line.
Show position	/	X7↵	
Horizontal start			
NOTE *When the controlling PC is connected to the receiver, the FOXBOX 4G 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 a start position	X8)	HstX7↵	Set the horizontal location of the first active pixel in the active window.
Example:	128)	Hst128↵	Set pixel 128 as the first active pixel.
Increment start position	+)	HstX7↵	Increase the horizontal start location value.
Decrement start position	-)	HstX7↵	Decrease the horizontal start location value.
Show start position	)	X8↵	

NOTE

X7 = Horizontal and vertical position	0 to 255	
X8 = Horizontal start	0 to 255	

Command/response table for SIS commands (continued)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Pixel phase			
NOTE *When the controlling PC is connected to the receiver, the FOXBOX 4G 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 cable is not connected.*			
Set a pixel phase value	X9U	PhsX8↵	Set the pixel phase value to X9.
Example:	10U	Phs10↵	Set the pixel phase value to 10.
Increment pixel phase	+U	PhsX8↵	Increase pixel phase value by 1.
Decrement pixel phase	-U	PhsX8↵	Decrease pixel phase value by 1.
Show pixel phase	U	X9↵	
Total pixels			
NOTE *When the controlling PC is connected to the receiver, the FOXBOX 4G can perform this command **only** if the transmitter Tx to receiver Rx fiber cable is connected. The unit returns the E14 error if the Rx fiber is not connected.*			
Set a total pixel value	11*X10#	TpxX9↵	Set the total pixels to a specific value.
Example:	11*1555#	Tpx1555↵	Set the total pixel value to 1555.
Increment total pixel value	+11#	TpxX9↵	Increase total pixel value by 1 pixel.
Decrement total pixel value	-11#	TpxX9↵	Decrease total pixel value by 1 pixel.
Show total pixel value	11#	TpxX9↵	
List sync frequency			
View input frequency	1LS	X11,X11↵	List the input frequency as X11 kHz (horizontal) and X11 Hz (vertical.

NOTE

X9 = Pixel phase	0 to 31
X10 = Total pixels	± 255 of the default value
X11 = Sync frequency	xxx.xx (frequency in kHz [H] or Hz [V])

Command/response table for SIS commands (continued)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Memory presets			
Save preset	X12,	SprX11↵	Command code is a comma.
Recall preset	X12.	RprX11↵	Command code is a period.
Audio input gain and attenuation			
NOTE *The set gain (**G**) and attenuation (**g**) commands are case sensitive.*			
NOTE *When the controlling PC is connected to the receiver, the FOXBOX 4G 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 +dB value	X13G	AudX14↵	
Example:	2G	Aud+02.0↵	Set the input audio gain to +2 dB.
Set input audio attenuation to -dB value	X15g	AudX14↵	
Increment level	+G	AudX14↵	Increase audio level by 1.0 dB.
Example:	+G	Aud+03↵	Increment the audio input level from +2 dB to +3 dB.
Decrement level	-G	AudX14↵	Decrease the audio level by 1.0 dB.
Example:	-G	Aud-09↵	Decrement audio input level from -08 dB to -9 dB.
Show input gain	G	X14↵	

NOTE

X12 = Memory preset number	1 to 30
X13 = Audio gain adjustment range	0 to 10
X14 = Audio level adjustment range	-18 to +10 (in 1.0 dB steps)
X15 = Audio attenuation adjustment range	0 to 18

Command/response table for SIS commands (continued)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Audio output level			
NOTE *The FOXBOX 4G receiver outputs audio at the consumer level (-10 dBV) only. Refer to the* FOX 500 User's Guide *if you are using one of those products to receive the fiber optic signal, as those products can be configured to output audio at the professional level.*			
Audio mute			
Mute the audio	1Z	Amt1↵	Silence the receiver's audio output.
Unmute the audio	0Z	Amt0↵	The receiver outputs audio.
Show audio mute status	Z	X1↵	Audio output mute status is X1 (0 = unmuted, 1 = muted).
Auto memory			
Disable auto memory	55*0#	Img0↵	
Enable auto memory	55*1#	Img1↵	
Show auto memory status	55#	X1↵	
Auto image			
Trigger auto image	55*2#	Img↵	

NOTE X1 = Mute/auto image status 0 = off 1 = on

Command/response table for SIS commands (continued)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Test pattern			
NOTE *You must have a video input connected and the transmitter Tx to receiver Rx fiber cable 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.*			
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 alt. pixels	3J	Tst3↵	Set the receiver to output the alternating pixels test pattern.
Test pattern off	0J	Tst0↵	Set the receiver to output the input video (no test pattern selected)
Show test pattern status	J	X16↵	
Disable and enable return link			
NOTE *This 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	66*0*1#	Rle*0*1↵	Enable link #2 (default setting).
Show return link status	66*0#	0*X17↵	

NOTE X16 = Test pattern 0 = none 1 = Color Bars 2 = grayscale 3 = alternating pixels

X17 = Rx Link enable 0 = disable 1 = enable (default)

Command/response table for SIS commands (continued)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Information requests			
Information request	I	1Link[X18]•2Link[X18]•RGB[X18]•Aud[X18]•[X19]•[X20]↵	The unit responds with the current status (signal detected) of optical link 1, optical link 2, the video input, the audio input, the fiber optic mode (singlemode or multimode), and the device type (Tx or Rx).
NOTE *The receiver monitors the primary (transmitter Tx to receiver Rx cable). If the PC is connected to the transmitter and the secondary fiber cable is not installed, for the I and the S commands, the transmitter reports 1Link0 regardless of the status of the primary cable.*			
Show firmware version	Q	[X21]↵	
Example:	Q	1.23↵	The factory-installed firmware version is 1.23 (sample value only).
Request part number	N	60-*nnn-nn*↵	See appendix A for part numbers.
Request other unit's part number	1N	60-*nnn-nn*↵	See appendix A for part numbers.
Show link 1 / 2 status	1S *or* 2S	[X18]↵	0 = light link not received at receiver, 1 = light received.
Show input video status	3S	[X18]↵	0 = video is not input to the transmitter, 1 = video is input.
Show input audio status	4S	[X18]↵	0 = audio is not input to the transmitter, 1 = audio is input.
Show temperature	20S	[X22]↵	View internal temperature in degrees Fahrenheit and Celsius.

NOTE

[X18] = Link/input status — 0 = link or input not sensed — 1 = link or input sensed
[X19] = Mode — SM = singlemode — MM = multimode
[X20] = Transmitter or receiver — Tx = transmitter — Rx = receiver
[X21] = Firmware version *v.vv*
[X22] = Internal temperature (Fahrenheit and Celsius) *nnn*F•*nn*C

Command/response table for SIS commands (continued)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Resets			
Reset audio	[Esc]ZA←	Zpa↵	Reset audio settings to default levels (0 dB gain).
Reset presets	[Esc]ZG←	Zpg↵	Reset (erase) all memory presets.
System reset	[Esc]ZXXX←	Zpx↵	Reset all settings to the factory defaults.

Windows®-Based Program Control

The Extron FOX Extender program, which communicates with the transmitter and receiver pair via either unit's rear panel Remote RS-232 port or front panel Configuration port, 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 CD-ROM. To install the software, insert the CD-ROM into the drive. The setup program should start automatically. If it does not self-start, run Launch.exe from the CD and follow the instructions that appear on the screen. By default, the Windows installation creates a C:\Program Files\Extron\FOX_Extenders directory, and it places four icons into a group folder named "Extron Electronics\FOX Extender WCP." The four installed icons are:

- Check for FOX Extender updates
- FOX Extender WCP
- FOX Extender Help
- Uninstall FOX Extender WCP

Starting the program

Start the Extron FOX Extender program as follows:

1. Click **Start** > **Programs** > **Extron Electronics** > **FOX Extender WCP** > **FOX Extender WCP**.

   The Communication Setup window appears (figure 3-1).

Figure 3-1 — Communication Setup window

2. Select the Com port to which your transmitter or receiver is connected. Click **OK**.

   The FOX Extender program window appears (figure 3-2).

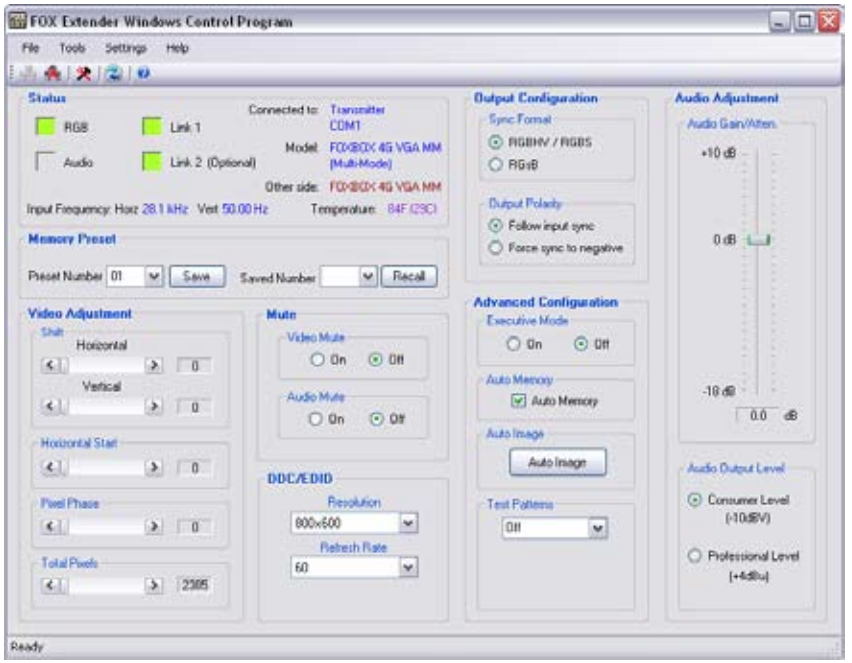


Figure 3-2 — FOX Extender program window

NOTE

*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, there will be **reduced** Windows-based control program functionality on the Rx unit. For full functionality, you need to install both fiber optic cables and leave the FOXBOX receiver in normal configuration (Mode DIP switch 1 down).*

Status area

The status area provides visual indications of the connection status.

- **RGB indicator —** This indicator is green when the transmitter detects a sync signal on its video input:
  - Horizontal sync (H) (for RGBHV video)
  - Composite sync (S) (for RGBS video)
  - Green (Sync on green) (G) (for RGsB or RsGsBs video)
  - DVI video
- **Audio indicator —** This indicator is green when the transmitter detects a low level audio signal for a short period of time. This indicator goes dark if the audio signal drops below the minimum threshold for a short period of time.
- **Link 1 indicator** — This indicator is green when the receiver detects light on the fiber optic cable Tx.

NOTE *The receiver detects the transmitter Tx to receiver Rx light. It reports the status to the transmitter via the optional Rx cable.*

*If you are connected to the **transmitter's** Configuration port, **and** the secondary (receiver Tx to transmitter Rx) cable is not connected in your system or the receiver is in the daisy chain configuration, the control program's Link 1 indicator will **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 Rx.

NOTE *The transmitter detects the receiver Tx to transmitter Rx light. It reports the status to the receiver via the Tx cable.*

*If you are connected to the **receiver's** Configuration port, **and** the primary (transmitter Tx to receiver Rx) cable is disconnected or the receiver is in the daisy chain configuration, the control program's Link 2 indicator 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 4G model (multimode or singlemode), the internal temperature, and the video input frequency. The "Other Side" entry is the device connected to the far end of the fiber optic cable.

Memory Preset area

The Memory Preset area provides a means to save and recall memory presets. Memory presets are stored values of the horizontal and vertical position and sizing information saved in nonvolatile memory. When the FOXBOX 4G 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

Click the **Video Mute** and/or **Audio Mute** radio buttons in the Mute area to turn the video and/or audio mutes on and off.

NOTE *When the video output is RGB and the output is muted, the receiver mutes the red, green, and blue planes, but leaves the sync plane(s) (horizontal and vertical or composite sync) live so that there is no loss of sync in the display device.*

NOTE *When you mute or unmute the output, the setting is changed in the receiver. It reports the changes to the transmitter via the optional receiver Tx to transmitter Rx cable.*

*If you are connected to the **transmitter's** Configuration port, **and** the receiver Tx to transmitter Rx cable is not connected in your system or the receiver is in the daisy chain configuration, you **can** still mute the output in the control program's Mute area, but the program **cannot** report the position values. The* Set video *(or* audio*)* mute On *or* Off *message is displayed for approximately 1 second (figure 3-3).*

Figure 3-3 — Alternate Mute area indication

DDC/EDID Resolution area

The DDC/EDID Resolution area provides drop boxes that let you manually set the DDC/EDID resolution and refresh rate.

Video Adjustment area

The Video Adjustment area provides slider controls that let you change the following video parameters:

- Shift Horizontal (position)
- Shift Vertical (position)
- Horizontal Start
- Pixel Phase
- Total Pixels

NOTE *When you make changes to the horizontal start, pixel phase, or total pixels settings, the value is changed in the transmitter.*

*If your PC is connected to the **receiver's** Configuration port, **and** the receiver Tx to transmitter Rx cable is not connected in your system or the receiver is in the daisy chain configuration, you **cannot** change these values using the control program. These slider controls are grayed out (unavailable).*

NOTE *When you make horizontal or vertical position changes (shift the image), the setting is changed in the receiver. It reports the shift values to the transmitter via the optional receiver Tx to transmitter Rx cable.*

*If your PC is connected to the **transmitter's** Configuration port, **and** the receiver Tx to transmitter Rx cable is not connected in your system or the receiver is in the daisy chain configuration, you **can** still shift the image in the control program's Video Adjustment area, but the program **cannot** report the position values.*

Output Configuration area

Sync Format radio buttons — The FOXBOX 4G receiver outputs RGBHV or RGsB video (depending on the input to the transmitter) only. The radio buttons in this area have no effect on the FOXBOX 4G receiver. Refer to the *FOX 500 User's Guide* if you are using one of those products to receive the fiber optic signal, as those products can be configured to output RGsB video.

Output Polarity radio buttons — Click either the **Follow input sync** or **Force sync to negative** radio button to select the desired video output sync polarity.

NOTE *When you make output configuration changes, the setting is changed in the receiver. It reports the changes to the transmitter via the optional receiver Tx to transmitter Rx cable.*

*If your PC is connected to the **transmitter's** Configuration port, **and** the receiver Tx to transmitter Rx cable is not connected in your system or the receiver is in the daisy chain configuration, the program **cannot** report the output sync format and polarity position settings in the control program's Video Adjustment area. You **can** change the output sync format and polarity, but the program **cannot** report the changes.*

Advanced Configuration area

Executive Mode buttons — The Executive Mode radio buttons have no effect on FOXBOX 4G units' operation.

Auto Memory checkbox — Click the **Auto Memory** checkbox to automatically apply saved position, horizontal start, total pixels, and pixel phase settings when the sensed input resolution changes.

Auto Image button — Click the **Auto Image** button to adjust the output settings for the best image, based on the sensed input resolution.

Test Patterns drop box — Select one of three built-in test patterns; **Color Bars**, **grayscale**, and **alternating pixels**; as necessary to help adjust the display's color, focus, and grayscale. Select **Off** to output the video input to the transmitter.

NOTE *You must have a video input connected and the transmitter Tx to receiver Rx fiber cable connected and the receiver must be in the normal configuration 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.

Audio Adjustment area

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.

NOTE *When you make input gain or attenuation changes, the setting is changed in the transmitter.*

*If your PC is connected to the **receiver's** Configuration port, **and** the receiver Tx to transmitter Rx cable is not connected in your system or the receiver is in the daisy chain configuration, you **cannot** change the input value from the control program's Audio Adjustment area.*

Audio Output Level area

The FOXBOX 4G receiver outputs audio at the consumer level (-10 dBV) only. The radio buttons in this area have no effect on the FOXBOX 4G receiver. Refer to the *FOX 500 User's Guide* if you are using one of those products to receive the fiber optic signal, as those products can be configured to output audio at the professional level.

Firmware upgrade

Firmware can be upgraded for each unit via either of that unit's serial ports using the Extron Firmware Loader utility from the Windows-based control program.

NOTE *When firmware upgrades are available, they are unique to the unit: a transmitter firmware upgrade for the Tx unit and a receiver upgrade for the Rx unit.*

Your PC must be connected directly to the unit for the firmware to be updated.

Upload replacement firmware as follows:

1. Visit the Extron web site, www.extron.com, click the **Download Center** tab, and then click the **Firmware** link (figure 3-4). Select the appropriate firmware file(s) to download and copy it (them) to your computer. Note the folder to which you save the firmware file(s).

Figure 3-4 — Location of firmware upgrade files

2. In the Windows Explorer or other file browser, double-click the downloaded executable (*.exe) file(s) to self-extract the firmware file(s).
3. Connect a Windows-based computer to the front panel Configuration port of the unit to be updated. See chapter 2, "Installation and Operation", for more details.
4. Start the FOX Extender program. See "Starting the program", on page 3-14.
5. Click **Tools** > **Update Firmware**. The Extron Firmware Loader appears (figure 3-5 on the next page).
6. Click **Browse**. The open file window appears.
7. Navigate to the folder where you saved the firmware upgrade file. Select and open (double-click) the file. The Firmware Loader returns to the top.

NOTE *Valid firmware files must have the file extension ".BIN". Any other file extension is not a firmware upgrade for your FOXBOX 4G.*

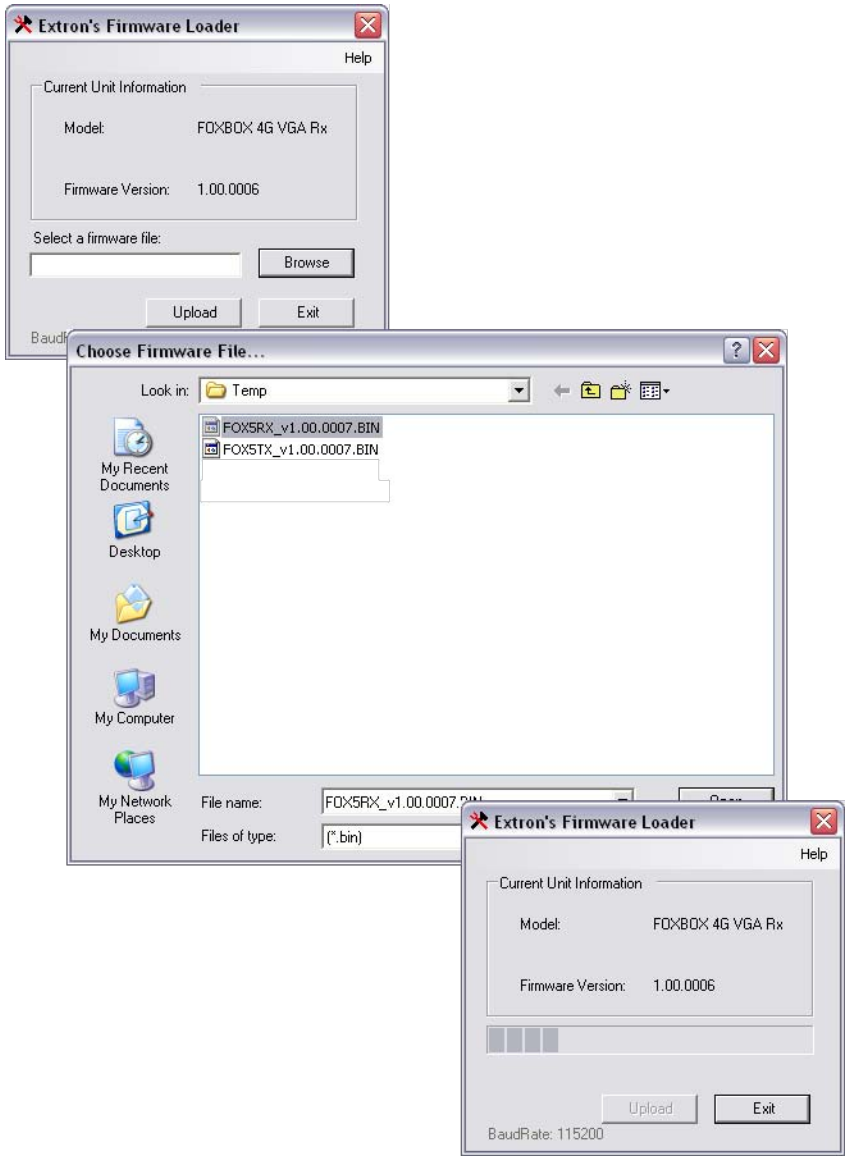


Figure 3-5 — Open window

8. Click **Upload**. The File Loader reports, "*This process could take several minutes. Please wait...*" and then displays the status of the upload.
9. When the Firmware Loader reports, "*Transfer complete*!", click the **Exit** button.
10. Cycle the FOXBOX 4G unit's power.
11. If necessary, repeat this entire procedure on the other unit of the transmitter/receiver pair.

Appendix A

Reference Information

Specifications

Part Numbers

Specifications

NOTE *The FOXBOX 4G DVI and FOXBOX 4G VGA consist of a transmitter (FOXBOX 4G DVI/VGA TX) and a receiver (FOXBOX 4G DVI/VGA RX) with one or two fiber optic cables linking the two units. They are available in singlemode or multimode versions.*

NOTE *For the VGA models, the analog RGB input signal is digitized pixel for pixel in the transmitter, sent digitally through the fiber cable, and converted back to analog RGB in the receiver.*

NOTE *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.*

NOTE *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 ..... 1 or 2 fiber optic

NOTE *Only one fiber is required to transmit video, audio, and unidirectional data. A second fiber is required to transmit return data for bidirectional control/communication.*

Connectors ..... 2 LC connectors

Operating distance..... 30 km (18.75 miles) with singlemode (SM) cables with a FOXBOX 4G SM
0.15 km (492') with multimode (MM) cables with a FOXBOX 4G MM

NOTE *Operating distance is approximate. These are typical distances. The maximum distance may be greater than these typical numbers 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 4G MM, 1310 nm for FOXBOX 4G 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 — FOXBOX 4G VGA TX/RX

Signal type..... VGA-UXGA RGBHV, RGBS, RGsB, RsGsBs

Gain..... Unity

Pixel data bit depth..... 8 bits per channel, 3 channels (R, G, B)

Maximum resolution ..... 1600x1200 @ 60 Hz, digitized pixel for pixel; higher resolutions up to 2048x1120, undersampled

Video input — FOXBOX 4G VGA TX

Number/signal type..... 1 VGA-UXGA RGBHV, RGBS, RGsB, RsGsBs

Connectors ..... 1 female 15-pin HD

Nominal level ..... 0.7 Vp-p for RGB

Minimum/maximum levels..... Analog: 0.3 V to 0.75 Vp-p with no offset, terminated

Impedance..... 75 ohms

Horizontal frequency..... 24 kHz to 100 kHz

Vertical frequency..... 40 Hz to 120 Hz

Return loss..... <-40 dB @ 5 MHz

Video output — FOXBOX 4G VGA RX

Number/signal type..... 1 VGA-UXGA RGBHV, RGsB (follows input or can be set by user)

Connectors ..... 1 female 15-pin HD

Nominal level ..... 0.7 Vp-p for RGB

Minimum/maximum levels..... 0.3 V to 0.75 Vp-p, terminated

Impedance..... 75 ohms

Return loss..... -40 dB @ 5 MHz

DC offset..... ±5 mV with input at 0 offset

Video delay ..... 1-2 frames

Sync — FOXBOX 4G VGA TX/RX

Input type	RGBHV, RGBS, RGsB, RsGsBs
Output type	RGBHV, RGsB (follows input or can be set by user)
Input level	2.5 V to 5.0 Vp-p
Output level	TTL: 5.0 Vp-p, unterminated, on HV; or 0.3 Vp-p on Gs, terminated
Input impedance	10k ohms
Output impedance	75 ohms
Polarity	Positive or negative (follows input or can be set by user)

Video — FOXBOX 4G DVI TX/RX

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

NOTE *The FOXBOX 4G DVI Series can be used to distribute HDMI signals if you use a DVI-to-HDMI adapter. However, when using HDMI signals, these units do not transmit audio and CEC signals.*

Resolution range	Up to 1600x1200 or 1080p @ 60 Hz, pixel for pixel; higher resolutions up to 1920x1200 @60 Hz, undersampled
Formats	RGB and YCbCr digital video
Standards	DVI 1.0, HDMI 1.2

Video input — FOXBOX 4G DVI TX

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

Video output — FOXBOX 4G DVI RX

Number/signal type	1 single link DVI-D (or HDMI*)
Connectors	1 female DVI-I
Nominal level	0.8 Vp-p
Video delay	1-2 frames

Audio

Gain

Range	Adjustable, -18 dB to +10 dB
Default	Unbalanced 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 (FOXBOX 4G DVI/VGA TX)

Number/signal type	1 unbalanced stereo or 2 unbalanced mono
Connectors	(1) 3.5 mm mini stereo jack
Impedance	18k 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 ≈ 2 dBu*

Audio output — receivers (FOXBOX 4G DVI/VGA RX)

Number/signal type	1 unbalanced stereo or 2 unbalanced mono
Connectors	(1) 3.5 mm mini stereo jack
Impedance	50 ohms unbalanced
Nominal level	-10 dBV (316 mVrms)
Maximum level (Hi-Z)	+7.6 dBu, unbalanced at 1% THD+N
Maximum level (600 ohm)	+6.3 dBu, unbalanced 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)
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 115200 baud
Serial control pin configuration	Mini stereo jack: tip = Tx, ring = Rx, sleeve = GND

Program control..... Extron's control/configuration program for Windows®
Extron's Simple Instruction Set (SIS™)

General

External power supply..... 100 VAC to 240 VAC, 50/60 Hz, external; to 12 VDC, 2 A, regulated

Power input requirements..... 12 VDC, 1 A

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

Mounting

- Rack mount..... Yes, with optional 1U, 9.5" deep rack shelf (RSU 129, #60-190-01 or RSB 129, 60-604-01) or 1U, 6" deep rack shelf (RSU 126, #60-190-10 or RSB 126, #60-604-10)
- Furniture mount..... Yes, with optional under desk mounting kit, (MBU 125, part #70-077-01)

Enclosure type..... Metal

Enclosure dimensions..... 1.0" H x 4.3" W x 6.0" D (<1U high, quarter rack wide)
(2.5 cm H x 10.9 cm W x 15.2 cm D)
(Depth excludes connectors.)

Product weight..... 0.7 lbs (0.3 kg) per unit, 1.4 lbs (0.6 kg) per pair

Shipping weight..... 3 lbs (2 kg) per unit, 6 lbs (3 kg) per pair

Vibration..... ISTA 1A in carton (International Safe Transit Association)

Regulatory compliance

- Safety..... CE, CUL, FDA Class 1, UL
- EMI/EMC..... CE, C-tick, FCC Class A, ICES, VCCI

MTBF..... 30,000 hours

Warranty..... 3 years parts and labor

NOTE *All nominal levels are at ±10%.*

NOTE *Specifications are subject to change without notice.*

Part Numbers

FOXBOX 4G part numbers

The FOXBOX 4G units are available in singlemode (SM) and multimode (MM) models:

FOXBOX 4G Models	Part number
FOXBOX 4G Tx VGA SM	60-934-12
FOXBOX 4G Rx VGA SM	60-934-22
FOXBOX 4G Tx VGA MM	60-934-11
FOXBOX 4G Rx VGA MM	60-934-21

FOXBOX 4G Tx DVI SM	60-935-12
FOXBOX 4G Rx DVI SM	60-935-22
FOXBOX 4G Tx DVI MM	60-935-11
FOXBOX 4G Rx DVI MM	60-935-21

Included parts

These items are included in each order for a FOXBOX 4G Tx/Rx:

Included parts	Part number
IEC power cord	
Tweeker (small screwdriver)	
User's guide	
Captive screw 5-pole connectors (qty. 6)	10-703-12
Extron Software Products CD (Universal Switcher Control Program)	
9-pin D to 2.5 mm mini jack TRS RS-232 cable (with transmitter only)	70-335-01
(2) 10' LC-LC duplex patch cables (SM or MM, depending on the model)	

Optional accessories

Accessories	Part number
RSU 129 9.5" deep 1U universal rack shelf kit	60-190-01
RSB 129 9.5" deep 1U basic rack shelf	60-604-01
RSU 126 6" deep universal rack shelf	60-190-10
RSB 126 6" deep basic rack shelf	60-604-10
MBU 125 under desk mounting kit	70-077-01
MBD 129 through desk mounting kit	70-077-02

Cables

Accessories	Part number
VGA M-M MD, 3' to 100' (0.9 m to 30.4 m) (molded)	26-238-*nn*
VGA M-M BK, 3' to 100' (0.9 m to 30.4 m) (backshell)	26-238-*nn*
VGAP M-M MD, 3' to 25' (0.9 m to 7.6 m) (molded) (plenum)	26-439-*nn*
VGAP M-M BK, 35' to 100' (10.6 m to 30.4 m) (backshell) (plenum)	26-439-*nn*
VGA-A M-M MD (with audio), 3' to 50' (0.9 m to 15.2 m) (molded)	26-490-*nn*
VGA-A M-M BK (with audio), 3' to 50' (0.9 m to 15.2 m) (backshell)	26-490-nn

DVID SL/6 DVI-D male-to-male, 6' (1.8 m) cable	26-585-02
HDMI M-M/6 HDMI male to male, 6′ (1.8 m)	26-613-02
HDMI M-DVI-D M/6 HDMI male to DVI-D male, 6′ (1.8 m)	26-614-02

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