

# FOX DA8 Plus

Eight Output Fiber Optic Distribution Amplifier



**Extron® Electronics**  
INTERFACING, SWITCHING AND CONTROL

## Safety Instructions • English



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



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

### Caution

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

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

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

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

## Consignes de Sécurité • Français



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



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

### Attention

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

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

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

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

## Sicherheitsanleitungen • Deutsch



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



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

### Achtung

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

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

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

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

## Instrucciones de seguridad • Español



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



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

### Precaución

**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 específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

## 安全须知 • 中文



这个符号提示用户该设备用户手册中有重要的操作和维护说明。



这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

### 注意

**阅读说明书** • 用户使用该设备前必须阅读并理解所有安全和使用说明。

**保存说明书** • 用户应保存安全说明书以备将来使用。

**遵守警告** • 用户应遵守产品和用户指南上的所有安全和操作说明。

**避免追加** • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

## Warning

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

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

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

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

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

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

## Avertissement

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

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

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

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

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

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

## Vorsicht

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

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

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

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

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

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

## Advertencia

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

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

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

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

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

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

## 警告

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

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

**电源线保护** • 妥善布线，避免被踩踏，或重物挤压。

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

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

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

## FCC Class A Notice

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

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

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

## Specifications Availability

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

## Conventions Used in this Guide

### Notifications

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

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

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

## Software Commands

Commands are written in the fonts shown here:

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

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

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

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

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

Variables are written in slanted form as shown here:

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

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

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

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## Trademarks

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# Introduction

The topics covered in this section are:

- [About this Guide](#)
- [About the FOX DA8 Plus](#)
- [Features](#)

**WARNING:** **Risk of serious physical injury:** The FOX DA8 Plus outputs continuous invisible light, which may be harmful to the eyes; use with caution.

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

## About this Guide

This guide contains information about the two models of Extron FOX DA8 Plus fiber optic distribution amplifiers (DAs). The FOX DA8 Plus is available in two transmission modes that define the transmission range of the DA:

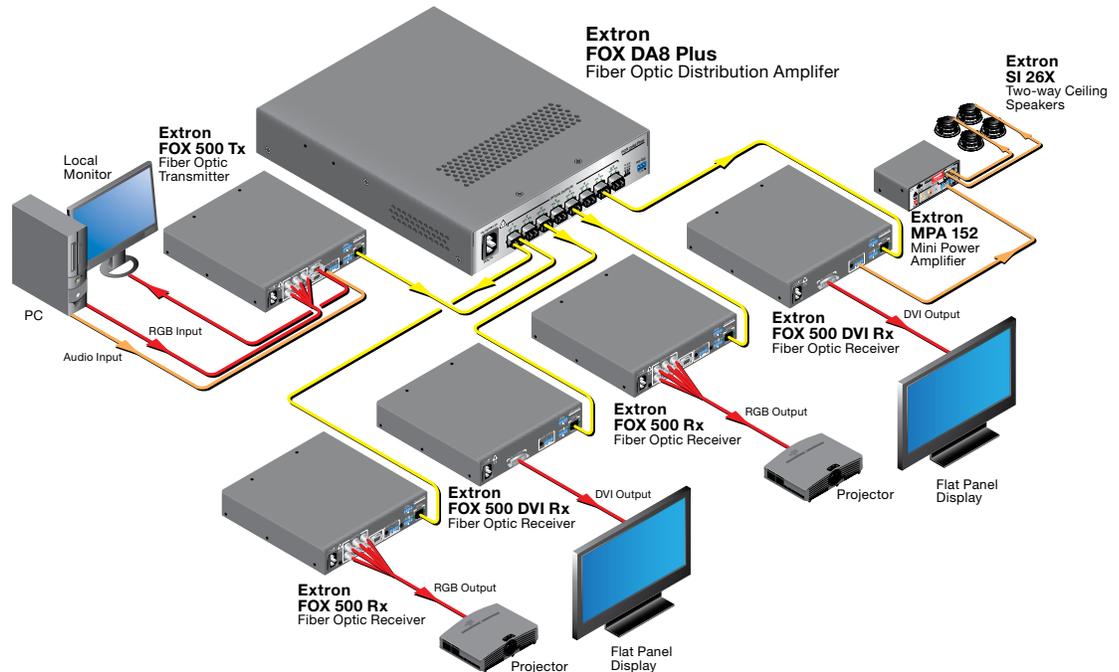
- **FOX DA8 Plus MM** — A 1-input, 8-output multimode DA, with a range of up to 2 km (6561 feet) on the input and on each output
- **FOX DA8 Plus SM** — A 1-input, 8-output singlemode DA, with a very long range of up to 30 km (18.75 miles) on the input and on each output

**NOTES:**

- The multimode and singlemode DAs are physically and functionally identical with the exception of the effective range of transmission. In this guide, the terms “FOX DA8 Plus” and “FOX DA” refer to a DA of either transmission mode.
- Many products are compatible with the FOX DA8 Plus. They are identified where appropriate, but not specifically described in this guide.
- The FOX DA8 Plus MM and the FOX DA8 Plus SM are not compatible.

## About the FOX DA8 Plus

The FOX DA8 Plus units are singlemode and multimode ultra-high performance fiber optic distribution amplifiers. The DA (see [figure 1](#)) accepts a proprietary input optical signal from a compatible Extron fiber optic transmitter (Tx) or other device. The optical signal can include video, audio, and one-way (transmitter-to-receiver [Rx]) RS-232 communications.



**Figure 1.** Typical FOX DA8 Plus Application

- NOTES:**
- Compatible optical signals are digital signals from 2.0 Mbps through 4.25 Gbps that are sent and received via fiber optic SFP modules.
  - The video component of the signal from an Extron Tx can be either VGA - UXGA RGB video, High-Definition Multimedia Interface (HDMI), or digital visual interface (DVI) video.
  - Distribution of HDMI video is **not** HDCP-compliant.
  - The serial component of the signal is for applications such as projector control and transmitter control of the receiver.

The FOX DA8 Plus actively splits the proprietary signal into eight identical optical signals and outputs the signals on fiber optic cables to compatible receivers.

- NOTES:**
- The eight optical outputs are identical.
  - The FOX DA8 Plus does not support transmission of a return (Rx-to-Tx) serial data stream.
  - The DA can receive and send the proprietary signal from and to any compatible Extron fiber optic transmitter, receiver, or switcher (see [“Compatible Equipment”](#) on page 20 for a partial list of compatible products).

The connected receivers convert the proprietary signals back to video (RGB, HDMI, or DVI, depending on the source transmitter and the receiver), audio, and serial RS-232 communication, and output the signals locally. For video resolutions up to 1900x1200, the video outputs for the receivers are a perfect, pixel-for-pixel or digital recreation of the video signal input to the FOX DA8 Plus via a transmitter.

## Features

**Ultra high performance** — Outputs up to eight perfect, pixel-by-pixel RGBHV or digital video transmissions to compatible receivers. The FOX DA8 Plus can handle analog video resolutions up to 1900x1200 at 60 Hz. Higher resolutions can be transmitted, but with some loss of video quality.

**Optical input and outputs** — The FOX DA8 Plus inputs and outputs the optical signal on LC video connectors.

**Active and individually isolated outputs** — The FOX DA8 Plus uses active signal splitting to maintain equal transmitter power to all outputs, maximizing distance capabilities by ensuring full availability of optical loss budget for each output.

**Three user selectable DA configurations** — Configurable as a single 8-output distribution amplifier, or as two 4-output or four 2-output distribution amplifiers.

**Selectable input reclocking** — Reshapes and restores timing of the digital signal on the input (affecting the buffered output) at a rate selected among 4.25 Gbps, 2.125 Gbps, or 1.25 Gbps. You can also bypass the reclocking function.

**Remote control operation** — The DA can be remotely controlled via either of two remote control ports. Control is using either the Simple Instruction Set (SIS™) or the Extron FOX Extenders Control Program.

**Front panel USB configuration port** — The FOX DA8 Plus features a front panel USB port provides easy access for remote control operation.

**RS-232 control** — The FOX DA8 Plus features a rear panel RS-232 serial port for remote control operation.

**Rack mounting** — The unit is rack mountable in any conventional 19-inch wide rack, using an Extron full size rack shelf.

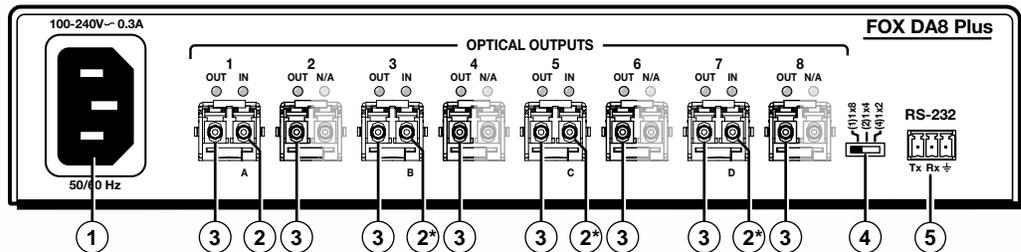
**Power** — The 100 VAC to 240 VAC, internal power supply provides worldwide power compatibility.

# Installation and Operation

The topics covered in this section are:

- Rear Panel Features
- Front Panel Features
- System Operation

## Rear Panel Features



\* See first NOTE, below.

**Figure 2.** FOX DA8 Plus Connectors

**WARNING:** Risk of serious physical injury: This unit outputs continuous invisible light, which may be harmful to the eyes; use with caution. For additional safety, plug the attached dust caps into the optical transceivers when the fiber optic cable is unplugged.

- NOTES:**
- Input LC connectors (on the right) marked with an asterisk (\*) in figure 2 (inputs 3, 5, and 7) are functional only when selected as an input using the DA configuration switch (item 4). The connector on the right for transceiver blocks 2, 4, 6, and 8 can never be functional.
  - Singlemode and multimode devices are not interchangeable. Ensure that you connect transmitting and receiving devices that are compatible with the FOX DA8 Plus.
  - Ensure that you use the proper fiber cable for your system. Typically, singlemode fiber has a yellow jacket and multimode cable has an orange or aqua jacket.
  - In this guide, the term “sending connector” refers to an LC connector on a device that outputs a fiber optic signal. The term “receiving connector” refers to an LC connector that receives an optical signal.

- ① **AC power connector** — Plug a standard IEC power cord into this connector to connect the FOX DA8 Plus to a 100 VAC to 240 VAC, 50-60 Hz power source.

- ② **Input connectors and LEDs** —

**NOTE:** Input LC connectors (on the right) marked with an asterisk (\*) in figure 2 are functional only when selected as an input using the DA configuration switch (item ④). The right-hand connector for transceiver blocks 2, 4, 6, and 8 can never be functional.

**Optical transceiver Input connector** — For one-way video, audio, and serial communications from the transmitter to the FOX DA8 Plus for distribution to the receivers, connect a fiber cable to the optical transceiver input LC connector on transceiver block 1 ( the LC connector on the right).

Connect the far end of this fiber optic cable to the sending connector on the transmitter or another compatible Extron device.

**Optical transceiver block 1 Input LED** — When this LED is lit, the link is active (light is received from the transmitter).

**NOTE:** The LEDs on the right for transceiver blocks 2, 4, 6, and 8 may light, but do not indicate that there is an input to that connector.

- ③ **Output connectors and LEDs** —

**Connectors** — For one-way video, audio, and serial communications from the FOX DA8 Plus to the receivers, connect up to eight fiber optic cables to the output LC connectors on transceiver blocks 1 through 8.

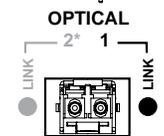
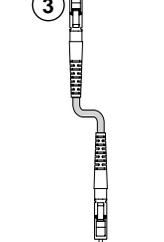
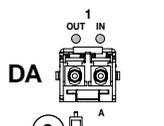
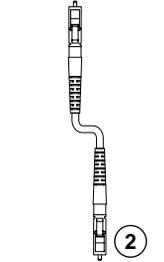
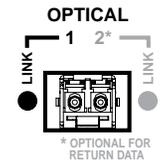
Connect the far ends of these fiber optic cables to the receiving connectors on the receivers or other compatible Extron devices.

**LEDs** — These LEDs are always lit, whether the output is active (unmuted) or not.

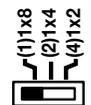
- ④ **DA configuration switch** — Set this switch to configure the unit in any of the following configurations (see “[Configuration](#)” on page 8).

- One 8-output DA
- Two 4-output DAs
- Four 2-output DAs

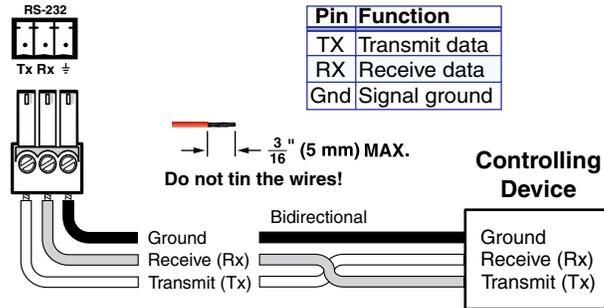
#### Transmitter



#### Receiver



- ⑤ **RS-232 port** — For serial control of the DA, connect a host device, such as a computer, touch panel control, or RS-232 capable PDA, via this 3-pole captive screw connector (see figure 3, below, to wire this connector).



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

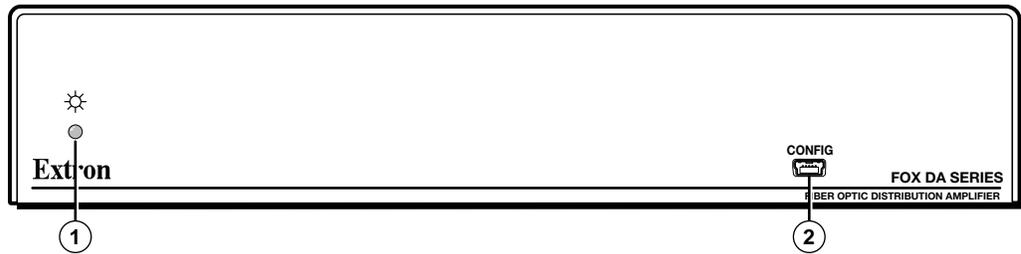
**Figure 3. RS-232 Connector**

- NOTES:**
- The length of exposed wires is critical. The ideal length is 3/16 inches (5 mm).
  - If the stripped section of wire is longer than 3/16 inches, the exposed wires may touch, causing a short circuit.
  - If the stripped section of wire is shorter than 3/16 inches, wires can be easily pulled out even if tightly fastened by the captive screws.

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

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

## Front Panel Features



**Figure 4.** FOX DA8 Plus Front Panel Features

- ① **Power LED** — This LED lights when power is applied to the unit.
- ② **Config(uration) port** — For USB control of the DA, connect a host device, such as a computer or touch panel control, via this mini USB B port.

## System Operation

After the transmitter, the FOX DA8 Plus, the receivers, and their connected devices are powered up, the system is fully operational. If any problems are encountered, ensure all traditional and fiber cables are routed and connected properly:

- Ensure that the video source and the displays are properly connected to the transmitter, the FOX DA8 Plus, and the receivers, and that all equipment has power applied.
- Ensure that the rear panel Input monitoring LED (see figure 2, [item ②](#)) is indicating correctly for your system configuration.

**NOTE:** If problems persist, call the Extron S3 Sales and Technical Support Hotline (see [Contact Information](#) on the last page of this guide for the phone number in your region of the world).

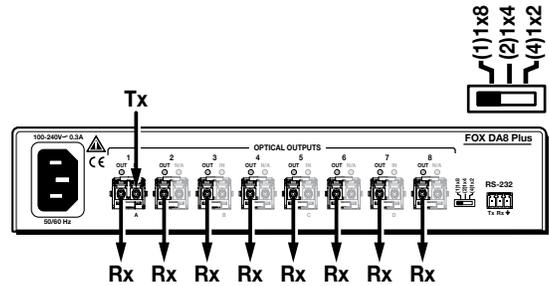
## Configuration

The DA configuration switch selects any of the three configurations as identified in figure 5, below.

**NOTE:** When you change the position of the DA configuration switch, the reclocking feature returns to the default setting of 4.25 Gbps on all inputs. See the Reclocking information in the **SIS commands** section and **FOX Extenders** section to set the reclocking feature to the desired values.

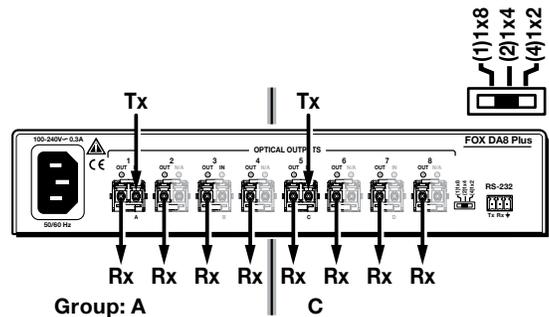
### One 8-output DA

- **Not grouped.**
  - Single input on input 1
  - Outputs 1 through 8



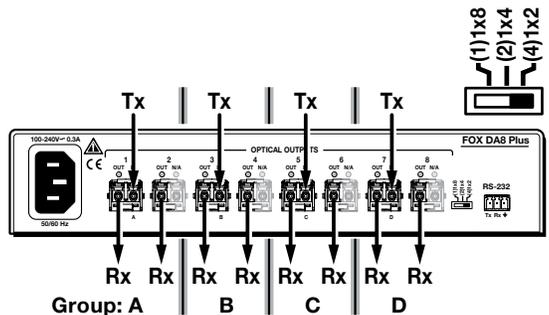
### Two 4-output DAs

- **Group A:**
  - Input 1
  - Outputs 1 through 4
- **Group C:**
  - Input 5
  - Outputs 5 through 8



### Four 2-output DAs

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• <b>Group A:</b> <ul style="list-style-type: none"> <li>• Input 1</li> <li>• Outputs 1 and 2</li> </ul> </li> <li>• <b>Group B:</b> <ul style="list-style-type: none"> <li>• Input 3</li> <li>• Outputs 3 and 4</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• <b>Group C:</b> <ul style="list-style-type: none"> <li>• Input 5</li> <li>• Outputs 5 and 6</li> </ul> </li> <li>• <b>Group D:</b> <ul style="list-style-type: none"> <li>• Input 7</li> <li>• Outputs 7 and 8</li> </ul> </li> </ul> |
|--|--|



**Figure 5.** DA Configurations Based on Switch Position

# Remote Control

The topics covered in this section are:

- **Remote Control Ports**
- **Simple Instruction Set Control**
- **FOX Extenders Program**

## Remote Control Ports

The FOX DA8 Plus has two ports that can be connected to a host device such as a computer running the Extron DataViewer utility or the HyperTerminal utility, an RS-232 capable PDA, or a control system. These ports make remote control of the DA possible. The ports are:

- **The rear panel RS-232 port** — This is a 3-pole captive screw connector (**item ⑤** on page 6). The protocol for this port is as follows:
  - 9600 baud
  - 1 stop bit
  - no parity
  - no flow control
  - 8 data bits
- **The front panel Config(uration) port** — This is a mini USB B port and requires the DataViewer utility (version 2.0 or newer).

**NOTE:** Before you use the USB port for the first time, you need to install and activate the USB driver on your computer. The simplest way to do this is to install version 1.5 or newer of the FOX Extenders Program and then run the Found New Hardware Wizard (see “**Installing the Software**” on page 12 and “**Activating a USB port for the first time**” on page 13).

# Simple Instruction Set Control

## Host-to-interface Communications

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

## Start-up Message

The FOX DA8 Plus issues the following copyright message when it first powers on. Vx.xx is the firmware version number, 60-1171-xx is the part number.

(C) COPYRIGHT 20yy, EXTRON ELECTRONICS FOX DA8 PLUS SM (or MM),  
Vx.xx, 60-1171-xx $\leftarrow$

## 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 $\leftarrow$  — Invalid command
- E12 $\leftarrow$  — Invalid output number
- E13 $\leftarrow$  — Invalid range
- E14 $\leftarrow$  — Not available for current 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 and Response Table

The **Command and Response Table for SIS Commands** begins on page 11. Commands in the table are **NOT** case sensitive. The ASCII to Hex conversion table, below, is for use with the command and response table.

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

## Symbol Definitions

Symbols (variables), defined below, are used in the command and response table. The symbols represent variables in the command and response table fields.

↵	= Carriage return and line feed		
←	= Carriage return (no line feed)		
•	= space		
X1	= Output	1 through 8	
X2	= Mute status	Ø = off (unmuted)	1 = on (muted)
X3	= Reclockable input number	ØØ = all inputs	
		Ø1 = input 1 (group A)	Ø3 = input 3 (group B)
		Ø5 = input 5 (group C)	Ø7 = input 7 (group D)
X4	= Input reclocker rate	ØØ = Bypass (no reclocking)	Ø2 = 2.125 Gbps
		Ø1 = 1.25 Gbps	Ø3 = 4.25 Gbps (default)
X5	= Name	Up to 24 alphanumeric characters, excluding spaces or blank characters. The first character must be alphabetic and the last character cannot be a hyphen or minus sign.	
X6	= Firmware version	Vx.xx	
X7	= Transceiver module status	Ø = no light input	1 = light input
X8	= Temperature	nnnF = whole degree Fahrenheit	
X9	= Transceiver module status	Ø = no module installed	2 = singlemode
			1 = multimode
X10	= DA configuration switch position	1 = 1x8 DA (Default)	2 = Two 1x4 DAs
			3 = Four 1x2 DAs

## Command and Response Table for SIS Commands

Command Function	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional Description
<b>Mutes</b>			
<b>NOTE:</b> The channel mute commands mute the data on the output only. The output continues to emit light.			
Mute output	X1*1B	VmtX1*1↵	Blank data on optical output X1.
Unmute output	X1*ØB	VmtX1*Ø↵	Output data on optical output X1.
Show video mute status	X1B	X2↵	Output X1 data output mute status is X2.
Mute all outputs	1*B	Vmt1↵	Blank data on all optical outputs.
Unmute all outputs	Ø*B	VmtØ↵	Output data on all optical outputs.
Show mute status of all outputs	EscVM←	X2 X2 X2 X2  ... X2↵	Show output 1 through output 8 mute status.
<b>Reclocking</b>			
Set reclocker mode	X3*X4=	RteX3*X4↵	Set the reclocker mode for input X3 to X4.
Example 1:	Ø*Ø=	RteØØ*ØØ↵	Set the reclocker mode for all inputs to bypass (do not reclock).
Example 2:	5*2=	RteØ5*Ø2↵	Set the reclocker mode for input 5 (group C) to 2.125 Gbps.
Show reclocker mode	X3=	X4↵	
<b>Device naming</b>			
Set device name	EscX5CN←	Ipn•X5↵	Set the name of the DA to X5.
Example:	EscActive_DA_1CN←	Ipn•Active_DA_1↵	Name the unit "Active_DA_1."
Set device to factory default name	Esc•CN←	Ipn•FOX-DA8-Plus↵	
View device name	EscCN←	X5↵	The device name is X5.
<b>Information Requests</b>			
Information request	I	VØ1XØ8•AØØXØØ↵	VØ1XØ8 shows the number of available inputs (1) and outputs (8) for this product. AØØXØØ has no meaning for this product.
Show firmware version	Q	X6↵	
Example:	Q	1.23↵	The factory-installed controller firmware version is 1.23 (sample value only).

Command Function	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional Description
<b>Information Requests (continued)</b>			
Request part number	N	60 - 1171 - nn↵	nn indicates the transmission mode. 01 = multimode, 02 = singlemode.
Show input connections status	0LS	X7 X7 X7 X7 ... X7↵	Show light status of all inputs.
Show temperature	20S	X8↵	X8 = degrees Fahrenheit.
Show transceiver module status	0*1I	X9 X9 X9 X9 ... X9↵	Show all installed transceiver modules.
Show DA configuration switch position	EscSTAT↵	X10↵	

## FOX Extenders Control Program

The Extron FOX Extenders Control Program, which communicates with the FOX DA8 Plus via the rear panel RS-232 port or the front panel Configuration port of the unit, provides an easy way to control the DA mute function and set reclocker rates for the inputs.

The program is compatible with Windows® 2000, Windows XP, Windows 7, and newer operating systems. Updates to this program can be downloaded from the Extron website ([www.extron.com](http://www.extron.com)).

### Installing the Software

The program is contained on the Extron Software Products DVD. Install the software as follows:

1. Insert the DVD into the drive. The Extron software DVD window should open automatically (see figure 6, below). If it does not self-open, run **Launch.exe** from the DVD.



**Figure 6. Software DVD Window**

2. Click the **Software** tab (see figure 6).
3. Scroll to the desired program and click **Install** (see figure 7, below).

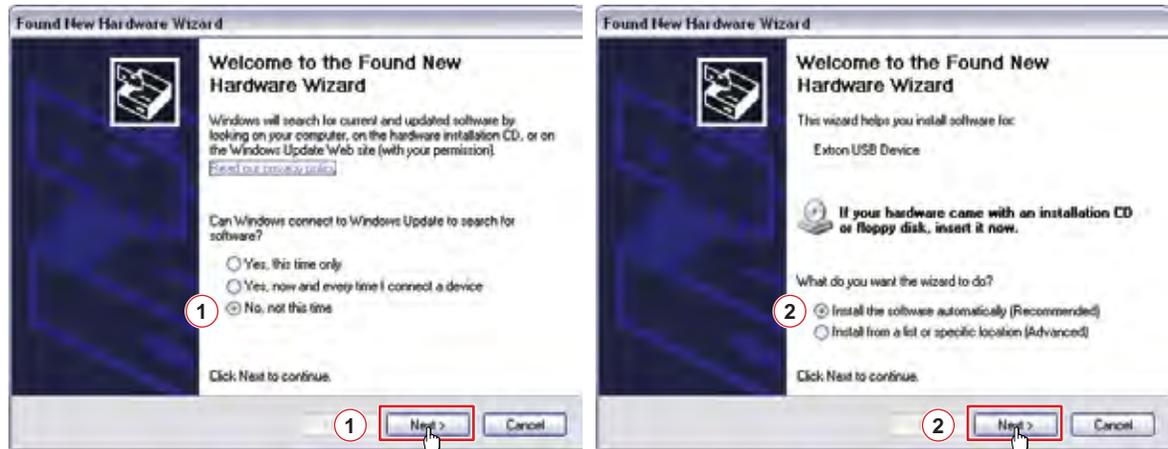


**Figure 7. Software Installation**

4. Follow the on-screen instructions. By default, the Windows installation creates a C:\Program Files\Extron\FOX\_Extenders directory, and it places the following four icons into a group folder named Extron Electronics\FOX Extenders:
  - **Check for FOX Extenders updates**
  - **FOX Extenders Control Program**
  - **FOX Extenders Help**
  - **Uninstall FOX Extenders Control Program**

## Using the Program

**NOTE:** The first time you connect to the Configuration (USB) port, the Found New Hardware Wizard appears (see figure 8, below). See “[Activating a USB port for the first time](#),” below.  
For other connections, proceed to “Starting the program,” on the next page.



**Figure 8.** Found New Hardware Wizard

### Activating a USB port for the first time

The first time you connect to the Configuration (USB) port, the Found New Hardware Wizard appears (figure 8). Activate the connected USB port for your device as follows:

**NOTE:** If you have not installed the latest FOX Extenders Control Program (version 1.5 or newer), click **Cancel**, install the program, and reboot the PC. Reconnect the computer to the Configuration port on the DA.

1. Select the **No, not this time** radio button and click **Next**.
2. Select the **Install the software automatically** radio button and click **Next**. Follow the on-screen instructions. The wizard assigns the driver necessary to access the DA to the connected Configuration (USB) port (this may take a few minutes).
3. Click **Finish** to exit the wizard.
4. Proceed to “[Starting the program](#)” on the next page or return to the “[Simple Instruction Set Control](#)” section.

**NOTE:** You may need to repeat these steps if you subsequently connect the DA to a different USB port on the same computer.

## Starting the program

Start the Extron FOX Extenders Control Program as follows:

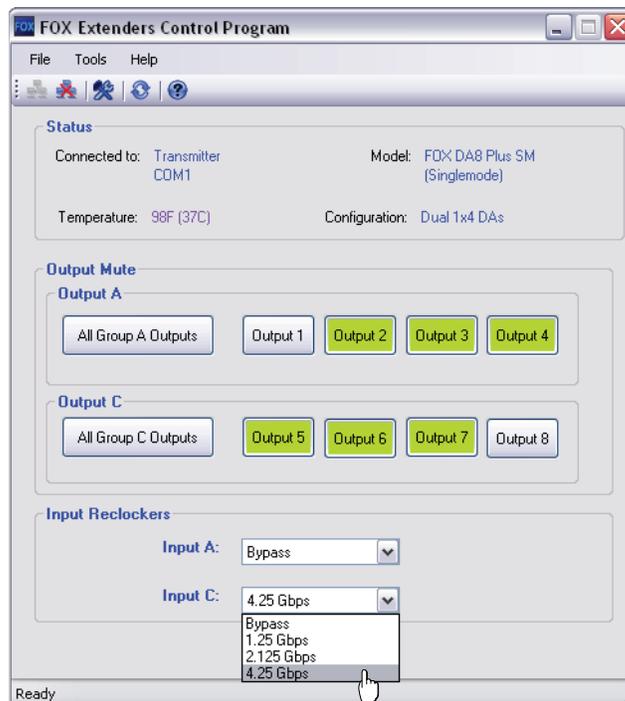
1. Connect a computer that runs the Windows operating system to either the RS-232 port or the Configuration port of the DA (see “**Installation and Operation**,” beginning on page 4).
2. Click **Start > Programs > Extron Electronics > FOX Extenders Control Program > FOX Extenders**.

The Communication Setup window appears (see figure 9, below).



**Figure 9. Communication Setup Window**

3. If necessary, select the tab, **RS-232** or **USB**, for the port you are using for the connection.
4. Depending on the tab that is selected, choose either:
  - **RS-232 tab** — The Com port to which your DA is connected
  - **USB tab** — **Extron USB Device\_0**
5. Click **Connect**. The FOX Extenders Control Program window appears (see figure 10, below).



**Figure 10. FOX Extenders Program Window**

**TIP:** If you change the configuration of the DA using the rear panel DA configuration DIP switch (item ④ in figure 2 and on page 5), click the Refresh button (⑤). This forces the FOX Extenders Control Program to show the new configuration.

6. Operate the DA as follows:

- Click the appropriate buttons to mute (gray) or unmute (green) individual outputs or all outputs.

**WARNING: Risk of serious physical injury:** The channel mute command mutes the data on the output only. The output continues to emit potentially dangerous laser light.

- Use the drop-down menu to bypass reclocking of the outputs or to select a data rate at which to reclock the outputs.

## Firmware Upgrade

Firmware can be upgraded via the front panel Configuration port of the unit only, using the Extron Firmware Loader utility from the FOX Extenders Control Program.

Upload replacement firmware as follows:

1. Visit the Extron website, [www.extron.com](http://www.extron.com), click the **Download** tab, and then click the **Firmware** link (see figure 11, below).

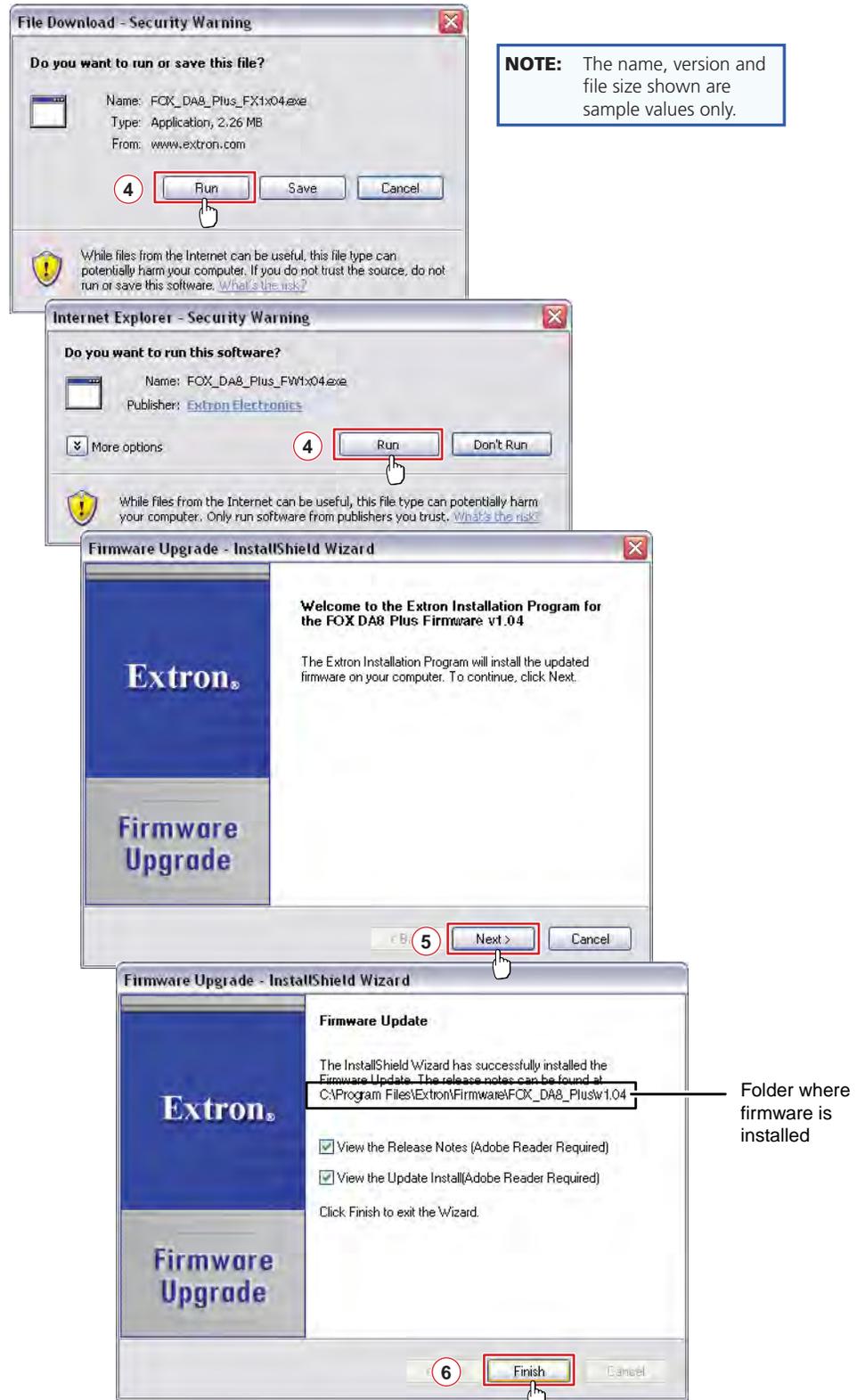
**NOTE:** The name, version, release date, and size shown are sample values only.

The screenshot shows the Extron website's 'Download Center'. The top navigation bar includes 'Products', 'Applications', 'Technologies', 'Company', and 'Download' (circled 1). The left sidebar has 'Software', 'Device Drivers', and 'Firmware' (circled 1). The main content area shows 'Download Center' with 'Firmware (28 files) | 4 files'. A specific firmware file is listed: 'FOX DA8 Plus' (Firmware for FOX DA8 Plus), version '19-nnnn-01', dated 'Oct 23, 2011', size '2.3 MB', with a 'Download' button (circled 2). Below this is a 'Download Center' section for 'Download FOX\_DA8\_Plus\_FW1x04.exe'. It asks for personal information: Name (John Smith), Company (Virginia Colony), Title (Planter), and E-mail (jsmith@folklore.net) (circled 3). At the bottom, there is a 'Download FOX\_DA8\_Plus\_FW1x04.exe' button (circled 3) and a 'Remember Me' checkbox. A note at the bottom states: 'Note: By downloading this software you agree to our [terms and conditions](#).'

**Figure 11. Location of Firmware Upgrade Files**

2. Select the appropriate firmware file (FOX DA8 Plus) and click **Download**.
3. Enter the requested personal information and then click **Download** to copy the firmware to your computer.

4. Click **Run** on the next two screens (see figure 12, below). The PC downloads the firmware update from the Extron website and starts the Extron Installation Program to extract the firmware file.

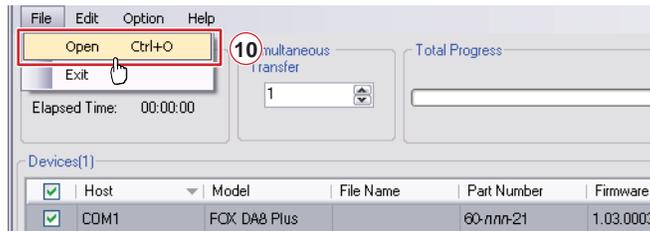


**Figure 12. Downloading Firmware Upgrade Files**

- Click **Next**. The program extracts the firmware files and places them in a folder identified in the InstallShield Wizard window.

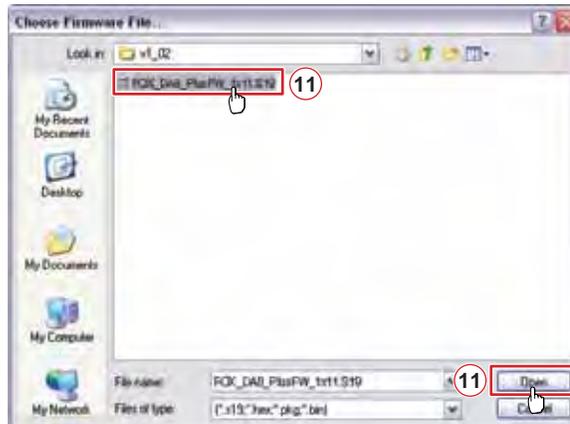
**NOTE:** Note the folder to which the firmware file is saved.

- Click **Finish** to exit the program.
- Connect a computer that runs the Windows operating system to either the RS-232 port or the Configuration port of the DA (see “**Installation and Operation**,” starting on page 4, for more details).
- Start the FOX Extenders Program and connect to the front panel Configuration (USB) port on the DA (see “**Starting the program**,” on page 14).
- Click **Tools > Update firmware** or the Update Firmware button ( ). The Extron Firmware Loader appears (see figure 13, below).



**Figure 13. Extron Firmware Loader Window and File Menu**

- Select the FOX DA8 Plus and click **File > Open**. The Choose Firmware File screen appears (see figure 14, below).



**Figure 14. Choose Firmware File Window**

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

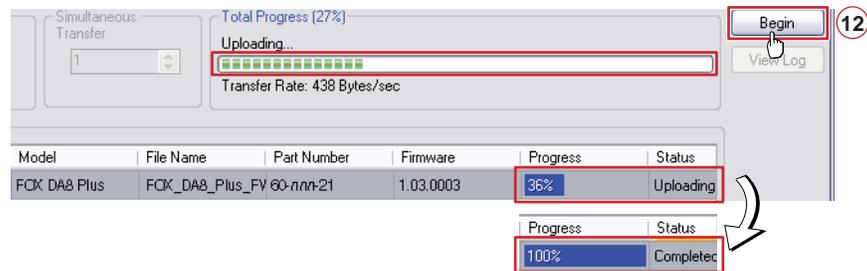
**ATTENTION:** The firmware file must have an .s19 extension. Other file types can cause the DA to stop functioning.

**NOTES:**

- When downloaded from the Extron website, the firmware is placed in a subfolder of C:\Program Files\Extron\Firmware.
- Valid firmware files must have the file extension .S19. A file with any other extension is not a firmware upgrade.
- The original factory-installed firmware is permanently available on the DA. If the attempted firmware upload fails for any reason, the DA reverts to the factory-installed firmware.

12. In the Firmware Loader window, click **Begin** (see figure 15, below).

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



**Figure 15. Firmware Loader Screen**

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

# Reference Information

This section identifies the part numbers for the FOX DA8 Plus and suggested accessories, and provides mounting instructions. Topics that are covered include:

- [Part Numbers and Accessories](#)
- [Mounting the Unit](#)

## Part Numbers and Accessories

### FOX DA8 Plus Part Numbers

Models	Part Number
FOX DA8 Plus SM (singlemode)	60-1171-02
FOX DA8 Plus MM (multimode)	60-1171-01

### Included Parts

These items are included in each order for a FOX DA8 Plus:

Included Parts	Part Number
IEC power cord	
3-pole captive screw audio connector	
<i>FOX DA8 Plus Setup Guide</i>	
Extron Software Products DVD (FOX Extenders Control Program and <i>FOX DA8 Plus User Guide</i> )	
(1) 10 foot LC-LC duplex patch cables (SM or MM, depending on the model)	

### Optional Accessories

Accessories	Part Number
<b>RSU 129</b> 9.5-inch 1U universal rack shelf kit	60-190-01
<b>RSB 129</b> 9.5-inch 1U basic rack shelf	60-604-01
<b>MBU 125</b> under desk mounting kit	70-077-01
<b>MBD 129</b> through desk mounting kit	70-077-02
<b>USB CFG Cable</b> USB A Male to USB Mini B Male Configuration Cable	26-654-06

## Compatible Equipment

The FOX DA8 Plus is compatible with the following Extron fiber optic devices:

**NOTE:** Ensure that you match the transmission mode, singlemode or multimode, among all connected devices.

Fiber Optic RGB Video Models	Part Number
FOX 500 (RGB) Tx/Rx (set and individual units )	60-746- <i>nn</i>
FOXBOX Tx/Rx VGA	60-934- <i>nn</i>
FOXBOX Tx VGA/YUV	60-1058- <i>nn</i>
PowerCage FOX Tx/Rx VGA	70-699- <i>nn</i>

FOX DVI Models	Part Number
FOX 500 DVI Tx/Rx	60-859- <i>nn</i>
FOXBOX Tx/Rx DVI	60-935- <i>nn</i>
FOXBOX DVI Plus Tx/Rx	60-1060- <i>nn</i>
Powercage FOX DVI Tx/Rx	70-700- <i>nn</i>
Powercage FOX DVI Plus Tx/Rx	70-873- <i>nn</i>

Fiber Optic HDMI Video Models	Part Number
FOXBOX HDMI Tx/Rx	60-1174- <i>nn</i>
PowerCage FOX HDMI Tx/Rx	70-889- <i>nn</i>

FOX AV Models	Part Number
FOX AV Tx/Rx	60-941- <i>nn</i>
PowerCage FOX AV Tx/Rx	70-702- <i>nn</i>

FOX Matrix Switcher	Part Number
FOX Matrix 14400 enclosure	60-969-01
FOX Matrix 320x enclosure	60-1082-01
FOX Matrix 14400 / 320x card	70-771- <i>nn</i>
FOX Matrix 3200 Switcher enclosure	60-878-01
FOX Matrix 7200 Switcher enclosure	60-1011-01
FOX Matrix 3200 / 7200 card	70-791- <i>nn</i>

Other Fiber Optic Models	Part Number
FOX SW8	60-1172- <i>nn</i>
FOX 500 DA6	60-863- <i>nn</i>

## Fiber Cables

### Fiber cable assemblies

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

### Bulk fiber cable and termination tools

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

## Mounting the Unit

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

The 1U high, half-rack width unit can be placed on a tabletop, mounted on a rack shelf, or mounted under or through a desk or other furniture, using any of the following optional kits:

- Rack Mounting:
  - **RSU 129** — 9.5 inches 1U universal rack shelf kit (part number **60-190-01**)
  - **RSB 129** — 9.5 inches 1U basic rack shelf (part number **60-604-01**)
- Furniture Mounting:
  - **MBU 125** — Under desk mounting kit (part number **70-077-01**)
- Through-desk Mounting:
  - **MBD 129** — Through desk mounting kit (part number **70-077-02**)

Mount the FOX DA8 Plus in accordance with the instructions provided with the mounting kit.

### Rack Mounting UL Guidelines

The following Underwriters Laboratories (UL) guidelines pertain to the installation of the FOX DA8 Plus into a rack.

- 1. Elevated operating ambient** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the +122 °F (+50 °C) maximum ambient temperature (T<sub>ma</sub>) 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).

## Extron Warranty

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

**USA, Canada, South America, and Central America:**

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

**Japan:**

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

**Europe and Africa:**

Extron Europe  
Hanzeboulevard 10  
3825 PH Amersfoort  
The Netherlands

**China:**

Extron China  
686 Ronghua Road  
Songjiang District  
Shanghai 201611  
China

**Asia:**

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

**Middle East:**

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

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

**NOTE:** If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

**USA:** 714.491.1500 or 800.633.9876  
**Asia:** 65.6383.4400

**Europe:** 31.33.453.4040  
**Japan:** 81.3.3511.7655

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

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.

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