Extron

FOX3 Matrix Series

Configurable Fiber Optic Digital Matrix Switcher



User Guide

Fiber Optic Matrix Switchers

68-2987-01, Rev. H
06 26

Safety Instructions

Safety Instructions • English

WARNING: This symbol, ⚠, when used on the product, is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

ATTENTION: This symbol, ⚠, when used on the product, is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

For information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the Extron Safety and Regulatory Compliance Guide, part number 68-290-01, on the Extron website, **www.extron.com**.

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Sicherheitsanweisungen • Deutsch

WARUNG: Dieses Symbol ⚠ auf demProdukt soll den Benutzer darauf aufmerksam machen, dass im Inneren des Gehäuses dieses Produktes gefährliche Spannungen herrschen, die nicht isoliert sind und die einen elektrischen Schlag verursachen können.

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

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

Instrucciones de seguridad • Español

ADVERTENCIA: Este símbolo, ⚠, cuando se utiliza en el producto, avisa al usuario de la presencia de voltaje peligroso sin aislar dentro del producto, lo que puede representar un riesgo de descarga eléctrica.

ATENCIÓN: Este símbolo, ⚠, cuando se utiliza en el producto, avisa al usuario de la presencia de importantes instrucciones de uso y mantenimiento estas estan incluidas en la documentación proporcionada con el equipo.

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Instructions de sécurité • Français

AVERTISSEMENT : Ce pictogramme, ⚠, lorsqu'il est utilisé sur le produit, signale à l'utilisateur la présence à l'intérieur du boîtier du produit d'une tension électrique dangereuse susceptible de provoquer un choc électrique.

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

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

Istruzioni di sicurezza • Italiano

AVVERTENZA: Il simbolo, ⚠, se usato sul prodotto, serve ad avvertire l'utente della presenza di tensione non isolata pericolosa all'interno del contenitore del prodotto che può costituire un rischio di scosse elettriche.

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

Per informazioni su parametri di sicurezza, conformità alle normative, compatibilità EMI/EMF, accessibilità e argomenti simili, fare riferimento alla Guida alla conformità normativa e di sicurezza di Extron, cod. articolo 68-290-01, sul sito web di Extron, **www.extron.com**.

Instrukcje bezpieczeństwa • Polska

OSTRZEŻENIE: Ten symbol, ⚠, gdy używany na produkt, ma na celu poinformować użytkownika o obecności izolowanego i niebezpiecznego napięcia wewnątrz obudowy produktu, który może stanowić zagrożenie porażenia prądem elektrycznym.

UWAGI: Ten symbol, ⚠, gdy używany na produkt, jest przeznaczony do ostrzegania użytkownika ważne operacyjne oraz instrukcje konserwacji (obsługi) w literaturze, wyposażone w sprzęt.

Informacji na temat wytycznych w sprawie bezpieczeństwa, regulacji wzajemnej zgodności, zgodność EMI/EMF, dostępności i Tematy pokrewne, zobacz Extron bezpieczeństwa i regulacyjnego zgodności przewodnik, część numer 68-290-01, na stronie internetowej Extron, **www.extron.com**.

Инструкция по технике безопасности • Русский

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

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

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

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

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

安全記事 • 繁體中文

警告: 若產品上使用此符號，是為了提醒使用者，產品機殼內存在未隔離的危險電壓，可能會導致觸電之風險。

注意 若產品上使用此符號，是為了提醒使用者，設備隨附的用戶手冊中有重要的操作和維護（維修）說明。

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

安全上のご注意 • 日本語

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

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

안전 지침 • 한국어

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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 manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference. This interference must be corrected at the expense of the user.

NOTE: 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.

Battery Notice

This product contains a battery. **Do not open the unit to replace the battery**. If the battery needs replacing, return the entire unit to Extron (for the correct address, see the **Extron Warranty** section on the last page of this guide).

CAUTION: Risk of explosion. Do not replace the battery with an incorrect type. Dispose of used batteries according to the instructions.

ATTENTION : Risque d'explosion. Ne pas remplacer la pile par le mauvais type de pile. Débarrassez-vous des piles usagées selon le mode d'emploi.

Class 1 Laser Product

Any service to this product must be carried out by Extron and its qualified service personnel.

CAUTION: Using controls, making adjustments, or performing procedures in a manner other than what is specified herein may result in hazardous radiation exposure.

NOTE: 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.

Complies with 21 CFR 1040.10 and 1040.11.

Produit laser de classe 1

Si ce produit a besoin d'un quelconque entretient, celui-ci doit être fait par Extron et son personnel qualifié.

ATTENTION : L'utilisation de commandes, la réalisation de réglages, ou l'exécution de procédures de manière contraire aux dispositions établies dans le présent document, présente un risque d'exposition dangereuse aux radiations.

Remarque : Pour plus d'informations sur les directives de sécurité, les conformités de régulation, la compatibilité EMI/EMF, l'accessibilité, et les sujets en lien, consultez le « **Informations de sécurité et de conformité Extron** » sur le site internet d'Extron.

Conforme aux sections 1040.10 et 1040.11 du titre 21 du Code des règlements fédéraux des États-Unis.

Conventions Used in this Guide

Notifications

The following notifications are used:

WARNING: Potential risk of severe injury or death.
AVERTISSEMENT : Risque potentiel de blessure grave ou de mort.

CAUTION: Risk of minor personal injury.
ATTENTION : Risque de blessure mineure.

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

NOTE: A note draws attention to important information.

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

Software Commands

Commands are written in the fonts shown here:

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

Esc X13 *X18* X26* X29* X27 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 italics form as shown here:

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

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

From the **File** menu, select **New**.

Click the **OK** button.

Specifications Availability

Product specification are available on the Extron website, **www.extron.com**.

Extron Glossary of Terms

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

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Introduction

WARNING: The FOX3 matrix switcher outputs continuous invisible light (Class 1 rated), 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 cap into the optical transceiver when the fiber optic cable is unplugged.

AVERTISSEMENT : Le FOX3 émet une lumière invisible en continu (conforme à la classe 1) qui peut être dangereuse pour les yeux , à utiliser avec précaution.

- Ne regardez pas dans les connecteurs de câble fibre optique sur le panneau arrière ou dans les câbles fibre optique eux-mêmes.
- Branchez la protection contre la poussière dans l'ensemble émetteur/récepteur lorsque le câble fibre optique est débranché.

- About this Guide
- About the FOX3 Matrix Switchers
- Features

About this Guide

This guide contains installation, configuration, and operating information for the Extron FOX3 Matrix Switchers. These customizable matrix switchers support Extron fiber optic endpoints (transmitters and receivers) up to:

- **FOX3 Matrix 24x** — 24 inputs and outputs.
- **FOX3 Matrix 40x** — 40 inputs and outputs.
- **FOX3 Matrix 80x** — 80 inputs and outputs.
- **FOX3 Matrix 160x** — 160 inputs and outputs.
- **FOX3 Matrix 320x** — 320 inputs and outputs.
- **FOX3 Matrix 560x** — 560 inputs and outputs.
- **FOX3 Matrix 840x** — 840 inputs and outputs.

About the FOX3 Matrix Switchers

The FOX3 Matrix Switcher (see **figure 1** on page 2) distributes optical input signals to one or more optical outputs. The matrix switcher can route multiple input/output configurations simultaneously. The switcher is configurable, assembled from individual input/output (I/O) boards, each of which supports 8 inputs and 8 outputs.

The FOX3 Matrix Switchers are compatible with the FOX3 endpoints.

NOTE: FOX3 Matrix is not compatible with FOX and FOX II signals unless a matrix partition is created and configured to support 4G signals in PCS. In the event of a factory reset, the data rate resets to the factory default of 10G (see the *FOX3 Matrix Series PCS Help File* for partition configuration details).

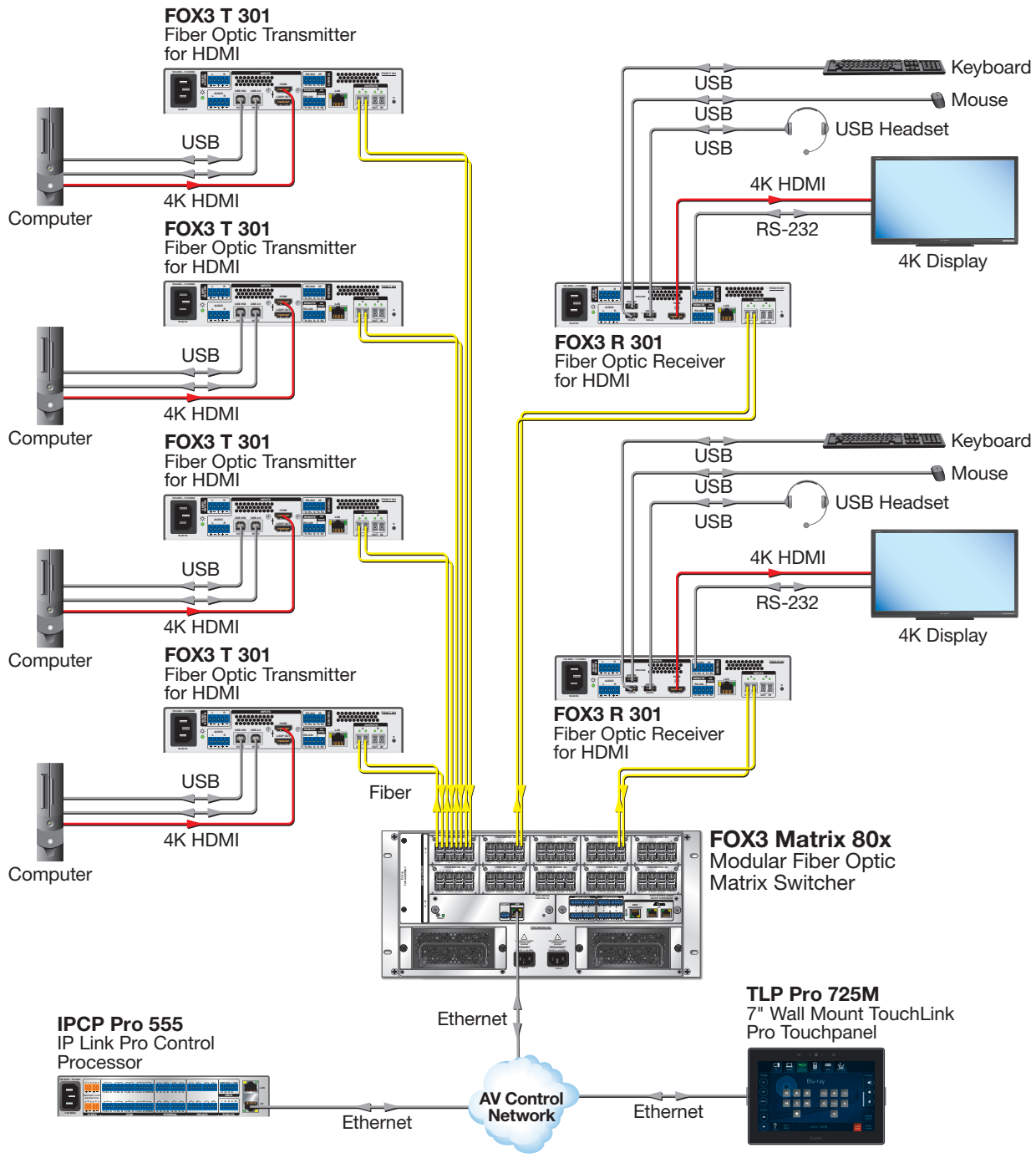


Figure 1. Typical FOX3 Matrix 80x Application

The matrix switchers are a single box solution to complex fiber optic and broadcast signal routing applications. Each input and output is individually isolated and buffered. Any input can be switched to any one output or all outputs with virtually no crosstalk or signal noise between channels.

The FOX3 matrix switchers are housed in rack-mountable, metal enclosures with mounting flanges for a standard 19-inch rack. The FOX3 Matrix 560x switcher is housed in a 21 RU metal enclosure and the FOX3 Matrix 840x switcher is housed in 29 RU metal enclosure with wheels. The switchers have two IEC power input connectors to provide 100 VAC to 240 VAC, 50-60 Hz power to the unit.

Fiber Optic I/O Boards

By adding or removing I/O boards, the size of the FOX3 matrix switcher can be increased and decreased within the range of an 8-input by 8-output matrix to:

- **FOX3 Matrix 24x** — 24 inputs and outputs.
- **FOX3 Matrix 40x** — 40 inputs and outputs.
- **FOX3 Matrix 80x** — 80 inputs and outputs.
- **FOX3 Matrix 160x** — 160 inputs and outputs.
- **FOX3 Matrix 320x** — 320 inputs and outputs.
- **FOX3 Matrix 560x** — 560 inputs and outputs.
- **FOX3 Matrix 840x** — 840 inputs and outputs.

NOTE: The I/O boards are hot-swappable. You do not need to power down the switcher to remove or install an I/O board.

The Extron proprietary fiber optic signal can include video, stereo audio, 3D sync, IR, and transmitter-to-receiver RS-232 serial communications. The FOX3 series transmitters and receivers include all of the same content plus USB extension.

Audio I/O Board

The matrix switchers have a removable audio board that includes four analog audio inputs and four analog audio outputs, a DMP expansion port, and two Dante® audio network ports.

NOTES:

- The FOX3 Matrix 24x has two analog audio inputs and two analog audio outputs.
- The audio board is hot-swappable. You do not need to power down the switcher to remove or install an audio board.
- The FOX3 Matrix 24x audio board is not removable.

Controller Board

The controller board has the reset button and two rear panel remote control connectors, the LAN (Ethernet) RJ-45 port and Remote RS-232 port.

The matrix switcher can be remotely controlled using either the Extron Product Configuration Software (PCS) or the Simple Instruction Set (SIS). Control is available via:

- A rear panel Remote RS-232 port
- A rear panel LAN port
- A front panel USB Config (configuration) port

If the FOX3 Matrix has the IPCP Pro Matrix Q xi control card, there are additional options:

- A rear panel AV LAN port
- A rear panel Reset button and LED for the IPCP Pro control card

SIS is a set of basic ASCII code commands that provide simple control through a control system or PC without the need to enter long strings of code. SIS commands can be entered via any of the ports listed above.

The switcher can be operated remotely by any of the following connected to the switcher:

- A control system
- A PC computer

NOTE: The controller board is hot-swappable. You do not need to power down the switcher to remove or install a controller board.

Fiber Cable Transmission Modes

The FOX3 Matrix switchers are assembled from individual input/output (I/O) boards. The switcher can include multiple I/O boards, depending on the matrix model. Each I/O board supports up to 8 inputs and 8 outputs. The two types of I/O boards are:

- **Singlemode** — Very long distance, up to 20 km (12.43 miles)
- **Multimode** — Long distance, up to 500 m (1640 feet)

Increase or decrease the size of the FOX3 Matrix Switchers from an 8-input by 8-output matrix by adding or removing I/O boards to up to a 840-input by 840-output matrix for the FOX3 Matrix 840x.

NOTE: Multimode and singlemode fiber optic I/O boards can be mixed in a FOX3 matrix switcher, but be sure to connect the proper transmission mode fiber cables to each board.

Extron LinkLicense

An Extron LinkLicense unlocks features that add convenience, expand system options, and enhance the capabilities of Extron products. Each LinkLicense can be purchased separately for the FOX3 device and activated as the need arises.

LinkLicense upgrades available for the FOX3 Matrix include the following:

- **KVM System Configuration and Control** —
  - This LinkLicense is enabled once and lasts for the life of the product.
  - Gives the user the ability to break USB 2.0 and HID away from the video in the matrix switcher. This is required for applications that use OSD switching.

    When the LinkLicense is loaded onto the matrix switcher, the user can use the USB tie commands to switch USB separate from the video or intelligent cross-display switching.

Features

- **I/O sizes:**
  - **FOX3 Matrix 24x:** 8x8 to 24x24
  - **FOX3 Matrix 40x:** 8x8 to 40x40
  - **FOX3 Matrix 80x:** 8x8 to 80x80
  - **FOX3 Matrix 160x:** 8x8 to 160x160
  - **FOX3 Matrix 320x:** 8x8 to 320x320
  - **FOX3 Matrix 560x:** 8x8 to 560x560
  - **FOX3 Matrix 840x:** 8x8 to 840x840
- **Switches 4K/60 video, audio, USB, control, and 3D sync over fiber optic cable**
- **Compatible with all Extron FOX3 Series transmitters and receivers** — Supports FOX3 extenders for an enterprise-wide fiber optic distribution system.
- **Compatible with FOX and FOX II Series transmitters and receivers** — FOX3 Matrix Switchers can be configured to support FOX and FOX II Series HDMI, VGA, DisplayPort transmitters and receivers that operate at a 4.25 Gbps rate, including the FOXBOX T HD-SDI fiber optic transmitter.
- **Supports mathematically lossless 4K video up to 4096x2160 at 60 Hz with 4:4:4 chroma sampling over one fiber.**
- **Supports uncompressed 4K video up to 4096x2160 at 60 Hz with 4:4:4 chroma sampling over two fibers** — Provides the highest quality video distribution system.
- **Audio embedding** — Any selected two-channel PCM audio signal can be embedded into any selected output signal, including the analog return audio signal.
- **Audio de-embedding** — Any two-channel PCM audio signal from a transmitter or analog return audio from a receiver can be extracted and independently routed.
- **Analog audio extraction** — Four local stereo audio outputs provide audio from any audio input, including any connected FOX3 transmitter, DMP expansion port, analog audio input port, or Dante audio network.

- **Analog audio insertion** — Four local stereo audio inputs can be routed to any audio output, including audio to any connected FOX3 receiver, analog return audio to a FOX3 transmitter, the DMP expansion port, any analog output port, or a Dante audio network.

  NOTE: The FOX3 Matrix 24x has only two analog inputs and outputs (50001-50002).

- **Integrated IPCP Pro Q xi control processor – IPCP Pro Models** —
  - **AV LAN port allows AV devices to be isolated from the facility network** — Enables local control of AV devices connected to this port, while securing this equipment from outside interference or intrusion.
  - **LAN port provides a secure network connection to facility LAN** — Secures the network connection to the product and is compliant with NIAP/Common criteria and JITC network protocols.
  - **The LAN port will only permit discovery, setup and firmware updates for Extron devices connected to the AV LAN port** — Extron PCS, DSP and XTP Configurator allow customers to discover, manage and update Extron devices from the LAN to the AV LAN.
  - **Supports secure industry standard communications protocols** — Uses industry standard communication protocols, including HTTP (insecure), HTTPS, SSH, SFTP, SMTP, NTP, Discovery Service, DHCP, DNS, ICMP, and 802.1X.
  - **DHCP server for AV LAN** — Automatically distributes IP addresses and network configuration parameters for AV devices connected to the local AV LAN, which streamlines system setup and management.
  - **Supports 10/100/1000Base-T.**
  - **Multi-level password protection** — Allows security to be set based on user roles.
  - **Supports 802.1X Authentication** — Provides support for IEEE 802.1X authentication standard for port-based Network Access Control.
  - **USB-C Configuration Port** — Enables local configuration of the IPCP Pro control processor.
- **Digital audio expansion port provides a connection to an Extron DMP 128 Plus processor for audio system scalability** — The DMP expansion port allows the FOX3 Matrix and any non-AT DMP model to be linked together via a single shielded CAT 6 cable. This creates a 16-channel bidirectional 24-bit/48 kHz high-resolution digital audio expansion bus between the two units, allowing expanded input and output signal management and routing capabilities.
- **Dante® audio network interface, DMP expansion port, and analog audio inputs and outputs** — The FOX3 Matrix features unique audio capabilities with leading-edge audio matrix switching between any input and any output in the FOX3 systems.
- **Audio breakaway** — Offers the capability to separate an embedded audio signal from its corresponding video signal within the matrix switcher, allowing two-channel PCM audio and the video signal from one source to be routed to different destinations.
- **64x64 Dante I/O audio networking with Dante Domain Manager and AES67 support** — Two Dante ports provide scalability supporting up to 32 stereo inputs and 32 stereo outputs. An audio input received from a Dante network can be routed to any audio output, including analog audio return channel. An audio output delivered to the Dante network can originate from any 2-channel audio input. Dante Domain Manager offers security and logical segmenting on the network. AES67 support ensures compatibility with a wide variety of network audio devices using standard protocols.
- **Compatible with Dante Controller software** — Configuration software for setting up and managing Dante-enabled audio products on an audio network.
- **Secure partitioning segregates sources and destinations in a secure environment** — Secure partitioning enables the FOX3 Matrix to be partitioned into smaller sub-switchers for segregating sources and destinations. Sources can only be routed to destinations within the same partition.
- **Priority switching prevents unauthorized access to sensitive data in a secure environment** — Each input and output is assigned a security level. An output can only be tied to an input at the same security level or lower, preventing unauthorized access to sensitive data in a secure environment.

- **Modular, field-upgradeable and hot-swappable design** — The FOX3 Matrix provides substantial flexibility, expandability, and affordability by allowing users to select the configuration required for their systems. Additional input and output boards may be added at any time for easy and quick upgradeability, expansion, or new technologies. Hot-swappable components allow the user to replace an I/O board or power supply at any time without the need to power down the switcher. This is especially useful for mission-critical applications that require continuous operation.
- **RS-232 insertion from the Ethernet control port** — System level device control to all remote locations via the matrix switcher Ethernet port, providing comprehensive control of endpoints and attached devices without needing additional cabling.
- **Multimode and Singlemode I/O boards available** — The FOX3 Matrix is configurable with a mix of multimode and singlemode versions of the FOX3 Matrix I/O boards, so that both short and long haul transmission can be supported.
- **Dual redundant and hot-swappable power supplies** — One primary and one back-up power supply provide added reliability for critical applications.
- **Advanced computer-aided diagnostics** — Provide 24-hour self-diagnostics of input/output boards, primary and redundant power supply voltages, fiber links, and overall functional status of the matrix. Using the Ethernet or RS-232 communications port, status monitoring is possible for off-site or unmanned locations, such as government, military, medical, or any other sensitive, 24/7 environments.
- **Two AC power inputs** — For added power reliability, some 24-hour environments require two separate AC power sources, one as the primary source and the second for redundancy. The FOX3 Matrix provides two AC power inputs for continuous connection to both power sources.
- **Industry standard LC connectors provide reliable physical connectivity and precise fiber core alignment.**
- **Ethernet monitoring and control** — The matrix switcher can be proactively monitored and managed over a LAN, WAN, or the Internet, using standard TCP/IP protocols. Ethernet control provides for remote selection of input and output ties, system set-up and configuration, and advanced system diagnostics.
- **Secure Ethernet communication using SSH - Secure Shell protocol** — SSH protocol ensures communication between the control system and the matrix is encrypted.
- **RS-232 control port** — Enables the use of serial commands for integration into a control system. Extron products use the SIS - Simple Instruction Set command protocol, a set of basic ASCII commands that allow for quick and easy programming.
- **Front panel USB configuration Port** — Enables easy system configuration without having to access the rear panel.
- **JITC Certified** — Successfully completed interoperability and information assurance testing for use in government applications and other mission-critical environments.
- **Easy setup and commissioning with Extron PCS - Product Configuration Software** — Conveniently configure multiple products using a single software application.
- **Rack-mountable up to 12U, full rack width metal enclosure.**
- **Internal Extron Everlast power supply** — Provides worldwide power compatibility, with high-demonstrated reliability and low power consumption for reduced operating cost.
- **Extron Everlast Power Supply is covered by a 7-year parts and labor warranty.**

Installation

This section details the installation and configuration of the FOX3 matrix switchers, including:

- **Setup and Installation Checklist**
- **Rear Panel Boards, Cabling, and Features**

Setup and Installation Checklist

Get Ready

- Familiarize yourself with the FOX3 matrix switcher.
- Obtain IP setting information for the matrix switcher from the local network administrator (see **Network Panel** on page 58).

Configure the Matrix Switcher

1. Install the desired I/O boards (see **Removing and Installing a Module** on page 64).
2. Install the Product Configuration Software (PCS) (see **Software/Firmware Installation** on page 38).
3. (Optional) Upload a System Map (see the *FOX3 Matrix System Map Setup Guide* available at **www.extron.com** and the *FOX3 Matrix Series PCS Help File* available in PCS for detailed instructions).
4. (Optional) Partition the Matrix and the data rate, 4G or 10G (see the *FOX3 Matrix Series PCS Help File*).

Perform Physical Installation

1. If desired, install the switcher in a rack (see **Removing and Installing a Module** on page 64).
2. Cable input and output devices to the I/O boards (see **Rear Panel Boards, Cabling, and Features** on page 8).
3. If desired, connect computers or control systems to any of the remote control ports on the switcher
   - Rear panel Remote RS-232 serial port (see **Remote Port** on page 11).
   - Rear panel LAN port (see **Ethernet Connection** on page 10).
   - Rear panel AV LAN port, if the FOX3 Matrix has the IPCP Pro Matrix Q xi control card (see **IPCP Pro Matrix Q xi Control Card** on page 13).
   - Front panel USB Configuration port (see **Front Panel Configuration Port** on page 20).
4. Connect power (see **Power** on page 15).
5. Test the switcher by creating a tie (see **Output switching** on page 27).

Rear Panel Boards, Cabling, and Features

WARNING: The FOX3 matrix switchers outputs continuous invisible light (Class 1 rated), which may be harmful to the eyes; use with caution. Plug the attached dust cap into the optical transceiver when the fiber optic cable is unplugged.

AVERTISSEMENT : Le FOX3 émet une lumière invisible en continu (conforme à la classe 1) qui peut être dangereux pour les yeux, à utiliser avec précaution. Branchez la protection contre la poussière dans l'ensemble émetteur/récepteur lorsque le câble fibre optique est débranché.

ATTENTION:

- Use electrostatic discharge (ESD) precautions (be electrically grounded) when you make connections. ESD is damaging, even if you cannot feel, see, or hear it.
- Prenez des précautions contre les décharges électrostatiques (ESD) (soyez électriquement relié à la terre) lorsque vous effectuez des connexions. Les ESD peuvent endommager l'équipement, même si vous ne pouvez pas le sentir, le voir ou l'entendre.

NOTE: Below is the rear panel for the FOX3 Matrix 80x. The other Matrix frames have the same types of connections with a difference in the number of inputs and outputs.

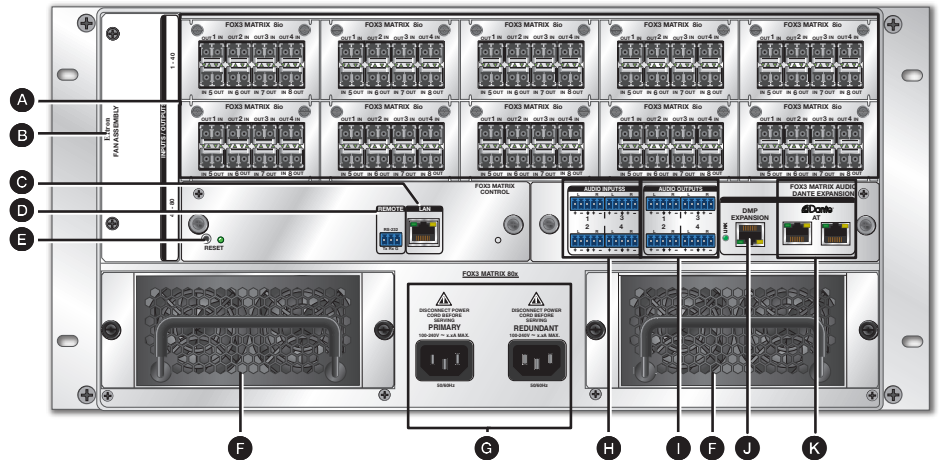


Figure 2. FOX3 Matrix 80x Fiber Optic Matrix Switcher Rear Panel

- **A Fiber optic boards with connectors and LEDs**
- **B Replaceable fan assembly**
- **C LAN Ethernet port**
- **D Remote RS-232 port**
- **E Reset button and LED**
- **F Power supplies**
- **G Power connectors**
- **H Audio Inputs**
- **I Audio Outputs**
- **J DMP Expansion port and LED**
- **K Dante AT Expansion ports**

CAUTION: Shock hazard. Disconnect all power sources.

ATTENTION : Risque d'électrocution. Débranchez toutes les sources d'alimentation.

I/O Boards

As shown in **figure 2** on page 8, each I/O board slot is identified by the input and output numbers supported by the board position, which are printed on the side of each fan module.

NOTES:

- Ensure the proper fiber cable for your I/O board. Typically, singlemode fiber has a yellow jacket and multimode cable has an orange or aqua jacket.
- Each I/O board has 8 SFPs with an IN and OUT, numbered from left to right.
- Unlike most Extron transmitters and receivers, which output an optical stream on one connector in a block and receive a return optical stream on the second connector in the same block, the FOX3 matrix switchers use one connector on the block as an input and the second connector on the same block as a separate output.
- All transceiver modules on a fiber optic I/O board, as delivered from Extron, are configured the same: either all multimode or all singlemode.
- Multimode and singlemode fiber optic I/O boards in a FOX3 matrix switcher can be used, but be sure to connect the proper transmission mode fiber cables to each board.

Ⓐ **Fiber optic boards with connectors and LEDs** — (see **figure 2**)

❶ **Input connector** — Connect a fiber optic cable between each Input LC connector and a FOX3 transmitter or any other compatible Extron FOX device.

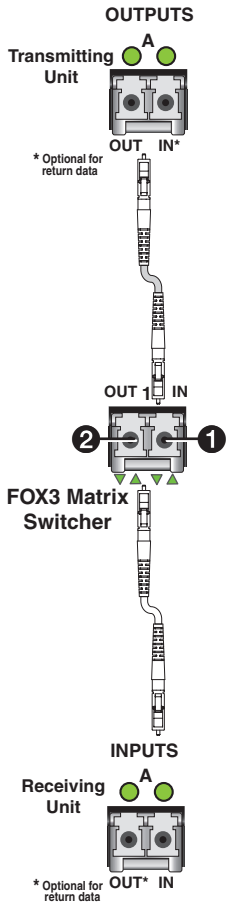
NOTE: For USB, return audio, and serial RS-232 (receiver-to-transmitter) function, connect the far end to the optical Out connector on a FOX receiver.

Input LED — See Fiber optic I/O board LED indications.

❷ **Output connector** — Connect a fiber optic cable between each output LC connector and a FOX3 receiver or any other compatible Extron FOX device.

NOTE: For USB, return audio, and serial RS-232 (receiver-to-transmitter) function, connect the far end to the optical In connector on a FOX transmitter.

Output LED — See Fiber optic I/O board LED indications.



Fiber optic I/O board LED indications

On the fiber optic I/O boards, the input and output LEDs on the transceivers light green when 10G light is detected. The arrow LEDs point to the input and output port they represent (see figure 3).

In figure 3, SFP 1 and SFP 5 are examples of the LEDs that indicate the input and output port (different colors are used to indicate the connection only).

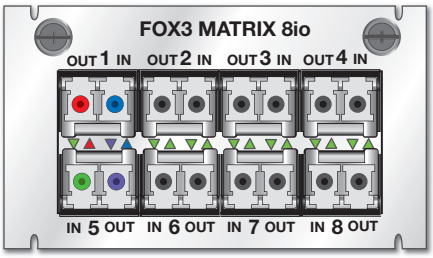


Figure 3. Fiber Optic I/O Board LEDs

- Out 1 is red and the corresponding arrow LED is red.
- In 1 is blue and the corresponding arrow LED is blue.
- Out 5 is purple and the corresponding arrow LED is purple.
- In 5 is green and the corresponding arrow LED is green.

Cooling Fan Assembly

Ⓑ **Replaceable fan assembly** (see **figure 2** on page 8) — This removable fan assembly has multiple fans (see **Removing and Installing a Module** on page 64 to replace the fan assembly).

Ethernet Connection

NOTE: The following information is for the standard LAN port. If the device has the IPCP Pro Matrix Q xi control card, which includes an AV LAN port, see **IPCP Pro Matrix Q xi Control Card** on page 13.

Ⓒ **LAN Ethernet port** — For IP control of the system, connect the matrix switcher to a PC or an Ethernet LAN via this RJ-45 connector. Use a PC to control the networked switcher with **SIS Configuration and Control** on page 20 or **Product Configuration Software** on page 37 from anywhere in the world.

- **Link LED indicator** — The green (link) LED indicates that the switcher is properly connected to an Ethernet LAN. This LED should light steadily.
- **Act LED indicator** — The yellow (activity) LED indicates transmission of data packets on the RJ-45 connector. This LED should flicker as the switcher communicates.

NOTE: The factory default settings are: IP address = `192.168.254.254`, Subnet mask = `255.255.255.0`, Gateway = `0.0.0.0`, and DHCP = `Off`

Cabling

It is vital that the Ethernet cables be the correct cable type and be properly terminated with the correct pinout. Ethernet links use Category (CAT) 3, 5e, CAT 6, or CAT 7 unshielded twisted pair (UTP) or shielded twisted pair (STP) cables, terminated with RJ-45 connectors. Ethernet cables are limited to a length of 328 feet (100 meters).

NOTES:

- Do not use standard telephone cables. Telephone cables do not support Ethernet.
- Do not stretch or bend cables. Transmission errors can occur.

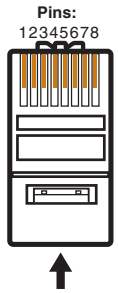
The cable used depends on your network speed. The unit supports:

- **10 Mbps** (10Base-T — Ethernet) — Requires CAT 3 UTP or STP cable at minimum.
- **100 Mbps** (100Base-T — Fast Ethernet) — Requires CAT 5e UTP or STP cable at minimum.
- **1000 Mbps** (1000Base-T — IEEE 802.3ab) half-duplex and full-duplex Ethernet — Requires CAT 5, CAT 5e, CAT 6, or CAT 7 UTP or STP cable.

RJ-45 connector wiring

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (see figure 4).

- **Crossover cable** — Direct connection between the computer and the FOX3 matrix switcher.
- **Patch (straight) cable** — Connection of the FOX3 Matrix Switcher to an Ethernet LAN.



Crossover Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-green	White-orange
2	Green	Orange
3	White-orange	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Orange	Green
7	White-brown	White-brown
8	Brown	Brown
	T568A	T568B

A cable that is wired as T568A at one end and T568B at the other (Tx and Rx pairs reversed) is a "crossover" cable.

Straight-through Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-orange	White-orange
2	Orange	Orange
3	White-green	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Green	Green
7	White-brown	White-brown
8	Brown	Brown
	T568B	T568B

A cable that is wired the same at both ends is called a "straight-through" cable, because no pin/pair assignments are swapped.

Figure 4. RJ-45 Connector and Pinout Tables

Remote Port

NOTE: The following information is for the standard RS-232 port. If the device has the IPCP Pro Matrix Q xi control card, see **IPCP Pro Matrix Q xi Control Card** on page 13.

D **Remote RS-232 port** (see **figure 2** on page 8) — Connect a host device, such as a computer or touchpanel control, to the switcher via this 3-pole captive screw port for serial RS-232 control (see figure 5 for wiring).

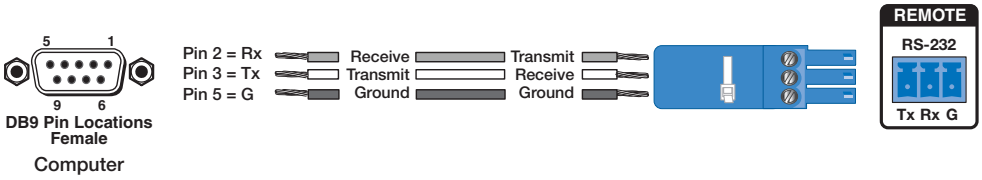


Figure 5. Remote RS-232 Wiring

See **SIS Configuration and Control** on page 20 for definitions of the SIS commands (serial commands to control the switcher via this connector) and **Product Configuration Software** on page 37 for details on how to install and use the control software.

Reset Button and LED

NOTE: The following information is for the standard Reset button and LED. If the device has the IPCP Pro Matrix Q xi control card, see **IPCP Pro Matrix Q xi Control Card** on page 13.

E **Reset button and LED** — Initiate three levels of matrix switcher reset. For different reset levels, press and hold the recessed button while the switcher is running or while powering up the switcher (see **Reset Operations** on page 17 for details).

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is **extron** for the `Admin` and `User`.

Power Supply Modules

F **Power supplies** — The Primary and Redundant power supplies are hot-swappable (see **Removing and Installing a Module** on page 64 to replace power supplies).

NOTE: The Redundant power supply for the FOX3 Matrix 24x is optional. It must be purchased separately.

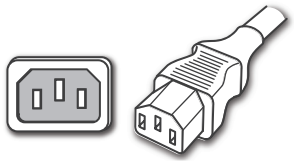
There are two corresponding LEDs on the front panel that indicate the status of each power supply (see **Front Panel Features** on page 14).

G **Power connectors** — Plug standard IEC power cords into these connectors to connect the switcher to 100 VAC to 240 VAC, 50 or 60 Hz power sources.

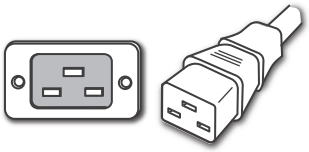
NOTE: For the most reliable power, connect the power cord from the Redundant power connector to either an uninterruptible power source or a power source completely independent from the primary power source.

FOX3 Matrix 24x, 40x, 80x, 160x —

- 100-240 VAC, 50-60 Hz power source.
- Connect via standard IEC power cord.



FOX3 Matrix 320x only —



North America —

- Nominal 120 VAC, 60 Hz, 20 A protected power source.

OR

- Nominal 240 VAC, 60 Hz, 15 A minimum protected power source.
- Connect via C19 power cord with NEMA 5-20 plug or 240V NEMA 6-20 plug.

Other regions —

- 100-120 VAC, 50-60 Hz, 15 A protected power source. Connect via C19 power cord and a plug configuration of 15 A minimum.

OR

- 200-240 VAC, 50-60 Hz, 13 A or 16 A protected power source. Connect via C19 power cord and a plug configuration of 7 A minimum.

FOX3 Matrix 560x and 840x —



North America — Terminated AC power cord

- Single phase, 200-240 VAC, 50-60 Hz, 20 A protected power source.
- Connect the 9.85 feet (3 m) terminated power cord to a NEMA L6-20R single phase 220 VAC, 60 Hz, 20 A protected power source.

Other regions — Unterminated AC power cord

- Single phase, 200-240 VAC, 50-60 Hz, 20 A protected power source.
- Have either a licensed electrician or qualified personnel terminate the AC power cord with a region-specific power plug (not included). Ensure the wiring is in accordance with local electrical codes.
- Connect the 9.85 feet (3 m) terminated power cord to a single phase 200-240 VAC, 50-60Hz, 20 A protected power source.

Audio Connections

H **Audio Inputs** (see **figure 2** on page 8) — Connect audio input devices to an audio 5-pole captive screw port (see figure 6 to wire the captive screw connector).



Figure 6. Audio Input Wiring

I **Audio Outputs** — Connect audio output devices to an audio 5-pole captive screw port (see figure 7 to wire the captive screw connector).

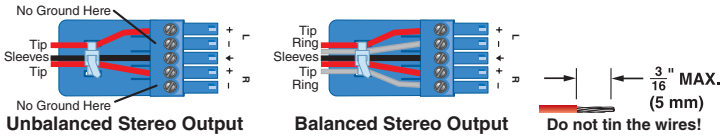


Figure 7. Audio Output Wiring

ATTENTION:

- For unbalanced audio, connect the sleeves to the ground contact. DO NOT connect the sleeves to the negative (-) contacts.
- Pour l'audio asymétrique, connectez les manchons au contact au sol. Ne PAS connecter les manchons aux contacts négatifs (–).

J **DMP Expansion port and LED** — (see **figure 2** on page 8)

- **Expansion Port** — Connect an STP cable between this port and the Expansion port on an optional Extron DMP Digital Matrix Processor for digital audio connection. Receive and transmit eight 2-channel stereo inputs and eight 2-channel stereo outputs via this RJ-45 connection.

  NOTE: Only connect non-AT audio devices to the DMP Expansion port.

- **Link LED** — Lights to indicate that the port is connected to a compatible device.

K **Dante AT Expansion ports** — Connect RJ-45 connectors to external Dante devices for digital audio networking. Receive and transmit 32 2-channel inputs and 32 2-channel outputs via these two RJ-45 connections.

The FOX3 Matrix uses Dante Controller for Windows from Audinate® to select and route inputs and outputs for all connected Extron FOX3 transmitters and receivers and other Dante-compatible audio devices (see **Dante Controller** on page 46).

IPCP Pro Matrix Q xi Control Card

The Extron IPCP Pro Matrix Q xi control card integrates Ethernet connection into AV systems to allow users to remotely control, monitor, and troubleshoot AV equipment, including display devices and switchers. Use Extron Toolbelt software to discover and manage the IPCP Pro control processor. Configure the control processor using Extron Global Configurator® software running in Global Configurator Professional (GC Professional) or Global Configurator Plus (GC Plus) mode, or program the control processor using Extron Global Scripter® (GS).

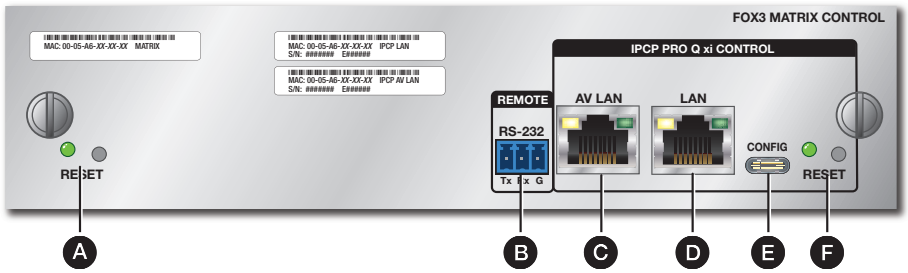


Figure 8. IPCP Pro Matrix Q xi Control Panel

NOTE: For detailed information on how to configure the IPCP Pro Matrix Q xi control card, see the IPCP Pro Q xi guides available at **www.extron.com**.

A **Reset button and LED** — Initiate three levels of reset of the matrix switcher. For different reset levels, press and hold the recessed button while the switcher is running or while powering up the switcher (see **Reset Operations** on page 17 for details).

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is **extron** for the `Admin` and `User`.

B **Remote RS-232 port** — Optionally, connect a control system or computer to the rear panel Remote RS-232 port (see **figure 5** on page 11 for wiring).

C **AV LAN Ethernet port** — Connect a PC directly to the FOX3 Matrix for configuration.

NOTE: If it has not been changed, the *IPCP Pro Matrix Q xi* AV LAN default IP address is `192.168.254.250` and the FOX3 Matrix default IP address is `192.168.254.254` .

D **LAN Ethernet port** — Connect the IPCP to an Ethernet network (for configuration and control of the IPCP and the devices connected to it). Plug a cable into this RJ-45 socket and connect the other end of the cable to a network switch, hub, router, or PC connected to a local network or the Internet.

NOTE: If it has not been changed, the default *IPCP Pro Matrix Q xi LAN* IP address is `192.168.253.250`.

E **USB-C Config port** — Connect a USB-C cable to this port for direct access to the IPCP Pro xi controller for configuration.

F **Reset button and LED** — Initiate six different resets or recovery of the IPCP Pro Matrix Q xi control card (see the *IPCP Pro Q xi and xi Series Setup Guide* for more information, available at **www.extron.com**).

Operation

This section describes the front panel operation of the FOX3 matrix switcher, including:

- **Front Panel Features**
- **Power**
- **Matrix Operations**
- **Secure Direct Port Access**
- **Source Information OSD**
- **Reset Operations**
- **Troubleshooting**

Front Panel Features

NOTE: Below is the front panel for the FOX3 Matrix 80x. The other Matrix frames have the same connection and power indicator LEDs.

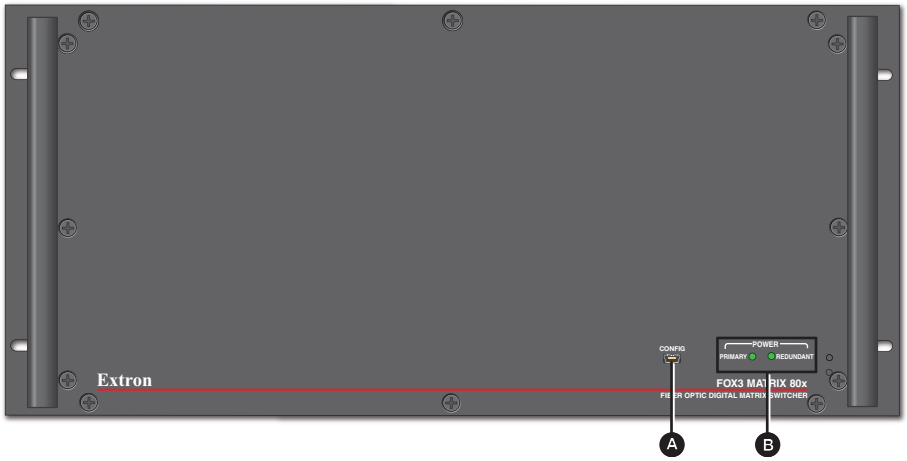


Figure 9. Front Panel, FOX3 Matrix 80x Switcher

Ⓐ **USB Config port** — If desired, connect a control system or computer to the front panel Configuration port.

NOTE:

- A front panel Configuration port connection and a rear panel Remote port connection can both be active at the same time.
- The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is **extron** for the Admin and User.

Ⓑ **Primary and Redundant Power Supply LEDs** — Light to indicate the power supply status.

- **Green** — Indicates that the associated power supply is operating within normal tolerances.
- **Red** — Indicates that the associated power supply is operating outside the normal tolerances, there is no AC connected to the power supply, or the power supply has failed (see **Removing and Installing a Module** on page 64 to replace the power supply).
- **Unlit** — Indicates that the power supply is not installed in the frame or is not fully seated in the bay.

Power

Apply power by connecting one or both power cords between the Primary and Redundant AC power connectors and the AC sources. The switcher performs a self-test that flashes the front panel power LEDs. The current configuration and all presets are saved in non-volatile memory. When power is applied, the most recent configuration is retrieved.

If an error occurs during the self-test, the switcher locks up and fails to respond to commands. If the switcher locks up on power-up, call the Extron S3 Sales and Technical Support Hotline (see the contact numbers listed on the **Extron website**).

Matrix Operations

The FOX3 Matrix can be operated in one of two modes: Port mode and System Map mode.

NOTE: The FOX3 matrix is initially in Port mode when it is powered for the first time.

- In **Port mode**, each physical SFP on the Matrix represents 1 Input and 1 Output, numbered according to its physical location on the Matrix.
- In **System Map mode**, multiple SFP modules can be combined via PCS to create a configuration map. This mode is used to simplify system switching and USB group switching for cross display applications (see the *FOX3 Matrix System Map Setup Guide* available at **www.extron.com** and the *FOX3 Matrix Series PCS Help File* available in PCS for detailed instructions).

Switching Partitions

The FOX3 Matrix can be partitioned via PCS to segregate groups of SFPs as an independent set of inputs and outputs. Ties can only be made from inputs to outputs within a partition. Partitions should be configured as part of the initial configuration of the matrix.

Using the partitions, the FOX3 Matrix can switch between FOX and FOX II endpoints in a 4G partition, while switching between FOX3 endpoints in a completely separate 10G partition (see the *FOX3 Matrix Series PCS Help File* for detailed instructions to partition the matrix).

NOTES:

- If the user attempts to make a tie between an input and output that are not in the same partition, the matrix does not make the tie and issues an `E14` error message.
- The matrix audio inputs and outputs are not part of any partition and can be connected to any input or output regardless of the SFP partitions.

Secure Direct Port Access

Open an associated UART port to send serial data to an endpoint captive screw port on an SSH connection. The control system connects via LAN port to the FOX3 Matrix LAN port. The device being controlled connects to the receiver RS-232 captive screw port. The user must configure the endpoint for Ethernet to Captive Screw RS-232 Insertion via PCS (see the *FOX3 Matrix Series PCS Help File*).

Example of an Ethernet to captive screw system (see figure 10):

- On the FOX3 Matrix, configure the `Secure Direct Port Access` via PCS and assign the UART ports.
- On the FOX3 transmitter and receiver, configure the `RS-232` Insertion via PCS.
- The control system is connected to the FOX3 Matrix Ethernet LAN port.
- The control system then sends a control command through the receiver fiber SFP A port, to the receiver captive screw port, to the display to take some action.
- The response from the display is sent back to the control system.

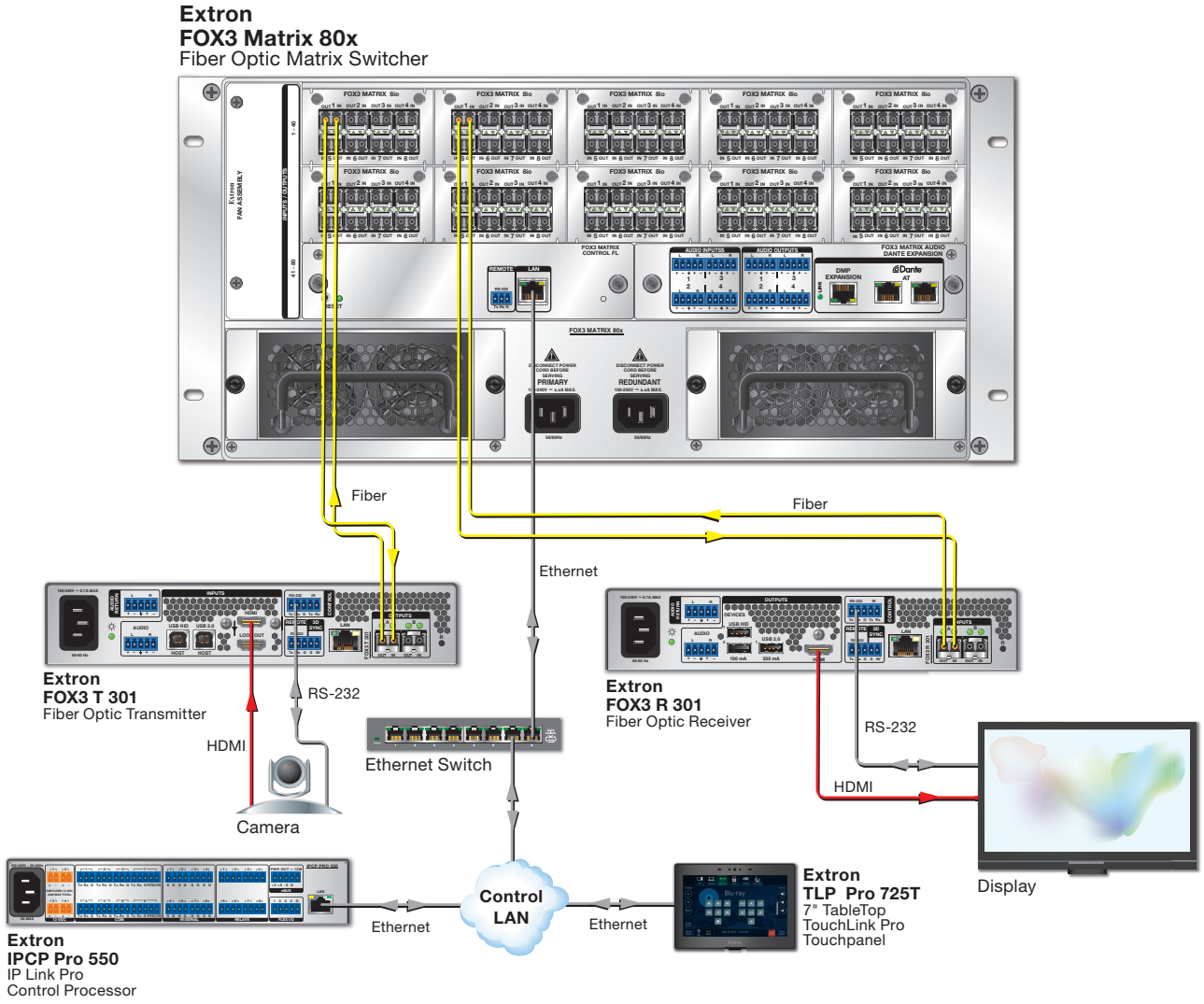


Figure 10. Typical Secure Direct Port Access Configuration

Source Information OSD

The FOX3 scaling receivers can overlay the source name in a bidirectional or unidirectional connection to the FOX3 matrix. The OSD settings can be customized via SIS commands on both the FOX3 Matrix and the FOX3 scaling receiver. This feature is disabled by default and must be enabled to use it.

The following OSD settings can be configured on the FOX3 Matrix:

- **Font color** — Configure the font as white or black. The default is white.
- **Background color** — Configure the background as one of nine options: green, red, yellow, blue (default), violet, orange, pink, gray, or black. The opacity level of all colors is 85%.
- **Input name** — The name assigned to the FOX3 input is used for the OSD. The name can be changed and is limited to 32 alpha-numeric characters, including the following special characters: -, !, #, $, %, ^, &, *, (,), _, +, ., /

The following OSD settings can be configured on the FOX3 scaling receiver:

- **Location** — Set the location for the input text to one of six locations: top left, top right, top center, bottom left, bottom right, or bottom center. The default is top left.
- **Font size** — Set the font size in pixels to one of three sizes: 24 px, 36 px, or 72 px. The default size is 36 px.
- **Duration** — Set the duration of time for the OSD information to present on the display. The three options are disabled, always on, or on for a selectable period of time, from 1 to 500 seconds. The default is disabled.

NOTES:

- The Source OSD information settings are transferred from the matrix to the scaling receiver only when a switch is made or removed at the matrix or the matrix is powered on. Changes made at the matrix are not transferred to the scaling receiver until a switch is made to the output.
- SIS commands can be made on the scaling receiver through the matrix using bracketed { } commands.
  Example: Command — {R1: Esc V4WNDW ← } ← Response — {R1} X4 ↵

The font type is not configurable and is set at Noto Sans Semibold. The number of lines is also not configurable and is set at one line of text.

NOTES:

- The firmware on the FOX3 Matrix must be v1.02.0002-b004 or higher for this feature to operate.
- The firmware on the FOX3 SR 201 must be v1.02.0001-b001 or higher for this feature to operate.
- If the Source Info OSD is shown and the user selects the Scaling OSD, the Source Info OSD disappears and the Scaling OSD takes precedence. The Source Info OSD times out independent of the duration.
- If the Source Info OSD duration is set to **`Always On`** and the user selects the Scaling OSD, the Source Info OSD disappears and the Scaling OSD takes precedence. The Source Info OSD appears once the user completes making the changes or the Scaling OSD times out.
- If no input is selected to an output, the OSD displays `No Input Connected`.

Reset Operations

The rear panel has a **`Reset`** button (see **figure 2**, E page 8) that initiates three levels of resets. The **`Reset`** button is recessed, so use a small screwdriver, a pointed stylus, or a ballpoint pen.

For different reset levels, press and hold the button while the switcher is running or press and hold the button while applying power to the switcher.

See the table of **Reset Modes** on page 18 for a summary of the modes.

ATTENTION:

- Review the reset modes carefully. Using the wrong reset mode may result in unintended loss of flash memory programming, port reassignment, or processor reboot.
- Analysez minutieusement les différents modes de réinitialisation. Appliquer le mauvais mode de réinitialisation peut causer une perte inattendue de la programmation de la mémoire flash, une reconfiguration des ports ou une réinitialisation du processeur.

NOTE: The reset modes close all open IP connections and close all sockets. Also, the following modes are separate functions, not a continuation from one mode to another.

Reset Modes

Mode	Activation	Result	Purpose and Notes
Use Factory Firmware	Hold down the recessed **Reset** button while applying power to the switcher. **NOTE:** After this reset is performed, update the switcher firmware to the latest version. Do not operate the switcher firmware version that results from this reset. If you want to use the factory default firmware, you must upload that version again (see the **Firmware Panel** on page 60 for details on uploading firmware).	**The switcher reverts to the factory default firmware**. Event scripting will not start if the switcher is powered on in this mode. All user files and settings (such as drivers, adjustments, and IP settings) are maintained. **NOTE:** If you do not want to update firmware, or this reset was performed by mistake, cycle power to the switcher to return to the firmware version that was running before the this reset (see **Firmware Panel** to confirm that the factory default firmware is no longer running (look for the asterisk [*] following the version number).	Use to revert to the factory default firmware version if incompatibility issues arise with user-loaded firmware.
Reset Network Settings	Hold down the **Reset** button for about 6 seconds, until the Reset LED blinks twice (once at 3 seconds and once at 6 seconds). Then press and release **Reset** within 1 second. Nothing happens if the second momentary press does not occur within 1 second.	**This reset does the following**: • Enables ARP capability. • Sets the IP address to the factory default. • Sets the subnet address to the factory default. • Sets the gateway address to the factory default. • Sets port mapping to the factory default. • Turns DHCP off. • Turn events off. The Reset LED flashes four times in quick succession during the reset.	Use to set IP address information using ARP and the MAC address.
Full Factory Reset	Hold down the **Reset** button for about 9 seconds, until the Reset LED blinks three times (once at 3 seconds, once at 6 seconds, and once at 9 seconds). Then press and release **Reset** within 1 second. Nothing happens if the second momentary press does not occur within 1 second.	**Performs a complete reset to factory defaults (with the exception of the firmware)**: • Does everything the Reset Network Settings does. • Resets most all real time adjustments, including: clears all ties and presets clears all mutes clears all I/O grouping clears all passwords • Resets all IP options. • Resets the fiber data rate setting to the factory default (10G). • Removes and clears all files for the switcher. The Reset LED flashes four times in quick succession during the reset.	Use to start over with configuration and uploading or to replace events.

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is extron for the Admin and User (see **Passwords Panel** on page 59 to change a password).

Performing Soft System Resets

Perform a soft reset of the switcher as follows:

1. Use an Extron Tweeker or other small screwdriver to press and **hold** the rear panel **Reset** button until Reset LED blinks the number of times for the desired reset: twice (IP reset) or three times (absolute reset) (see figure 11).

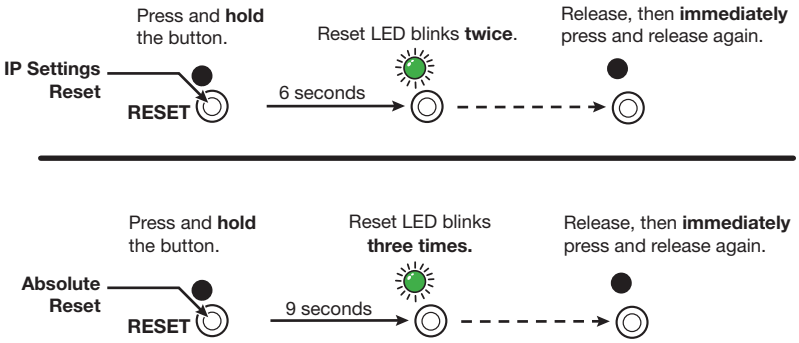


Figure 11. Soft System Resets

2. Release the **Reset** button and then immediately press and release the **Reset** button again. Nothing happens if the second momentary press does not occur within 1 second.

Performing a Hard Reset

The hard reset function restores the switcher to the base firmware it was shipped with. After a hard reset, events do not automatically start, but user settings and files are restored.

Perform a hard reset as follows:

NOTE: The hard reset restores the factory-installed firmware. The switcher reverts to that factory firmware the next time power is cycled off and on **unless** a firmware update is performed before the power cycle.

1. If necessary, turn off power to the switcher.
2. Press and **hold** the **Reset** button on the rear panel **while** applying AC power to either switcher power connector.

Troubleshooting

If problems occur while operating the switcher.

1. Ensure that all devices are plugged in and powered on.
2. Check to see if one or more outputs are muted.
3. Ensure an active input is selected for output on the switcher.
4. Ensure that the proper signal format is supplied.
5. Check the cabling and make corrections as necessary.
6. Call the Extron S3 Sales and Technical Support Hotline if necessary (see the **Contact Information** on page 70 of this guide for the nearest Extron office).

SIS Configuration and Control

This section describes the operation of the FOX3 matrix switchers via SIS commands, including:

- **Connections Options**
- **Host-to-Switcher Instructions**
- **Using the Command and Response Tables**
- **System Definitions**
- **Command and Response Table for SIS Commands**

Connections Options

The FOX3 Matrix Switcher can be configured and controlled using SIS commands or PCS. Configure and control the FOX3 remotely via a host computer or other device (such as a control system) by connecting to the rear panel RS-232 port, LAN port, or the front panel USB Config port of the FOX3 device via an SSH (Secure Shell) client.

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is **extron** for the `Admin` and `User`.

Rear Panel RS-232 Port

The FOX3 Matrix Switcher rear panel RS-232 port (see **figure 2**, D on page 8) can be connected to a host device such as a computer running the DataViewer utility, or a control system. This port makes serial control of the switcher possible.

The default protocol for the port is as follows:

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

NOTE: The serial port can be configured to operate at the 9600, 19200, 38400, or 115200 baud rate, but Extron recommends leaving these ports at 9600 baud only.

Front Panel Configuration Port

The USB mini-B port is located on the front panel (see **figure 9**, A on page 14). Connect to a host computer for configuration using SIS commands via an SSH client and IP address `203.0.113.22` and port `22023` (see **Establishing a Connection** on page 21 to connect to an SSH client).

NOTE: The IP address for the USB port cannot be changed.

Ethernet (LAN) Port

The rear panel Ethernet port (see **figure 2**, C) on the switcher can be connected to an Ethernet LAN or WAN. Communications between the switcher and the controlling device is via an SSH client, using port `22023`. The SIS commands and the actions of the switcher are identical to the commands and actions the switcher has when communicating with it via RS-232.

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (see **Ethernet Connection** on page 10).

Default IP addresses

To access the FOX3 matrix switcher via the LAN port, or AV LAN port on the IPCP Pro control card, the IP address for the unit is needed, as well as the subnet mask and the gateway address. If the addresses have not been changed, the defaults are:

	FOX3 Matrix	AV LAN	LAN Port
IP address	192.168.254.254	192.168.254.250	192.168.253.250
Gateway address	0.0.0.0	0.0.0.0	0.0.0.0
Subnet mask	255.255.255.0	255.255.255.0	255.255.255.0

Establishing a Connection

Establish a network connection to a FOX3 matrix switcher via an SSH client:

1. Download the SSH client software to the connected PC.
2. Open the SSH software.
3. Enter the IP address of the Matrix Switcher in the **Host Name** or **IP address** field.

   NOTES:
   - If the local system administrators have not changed the value, the AV LAN FOX3 Matrix default IP address is 192.168.254.254.
   - If connecting via the USB port, the IP address is 203.0.113.22.

4. Enter **22023** in the **Port** field.
5. The Matrix Switcher is password protected, so the appropriate administrator or user name and password must be entered.
   a. Enter **admin** or **user** name.
   b. Enter the password next to the **Password** prompt.
      - If the login and password are correct, the Matrix Switcher responds with a copyright message including the copyright year, the name of the product, firmware version, part number, and the current date and time.
      - If the login and password are incorrect, the login prompt returns. Enter the **admin** or **user** and password again.

   NOTES:
   - The Matrix is shipped password-protected. The factory configured passwords for all accounts on this device have been set to the device serial number.
   - In the event of a complete system reset, the password converts to the default, which is **extron**. New passwords must be configured to secure the device.
   - On password-protected connections, there are two levels of protection: administrator and user. Administrators have full access to all switching capabilities and editing functions. Users can create ties, recall presets, set mutes, and view all settings with the exception of passwords.

Connection Timeouts

The Ethernet link times out after a designated period of time of no communications. By default, this timeout value is set to five minutes.

NOTE: Extron recommends leaving the default timeout at 5 minutes and periodically issuing the SIS **I** command (see **Information request** on page 33) to keep the connection active. If there are long idle periods, Extron recommends disconnecting the socket and reopening the connection when another command must be sent.

Using Verbose Mode

SSH connections to a FOX3 matrix switcher can be used to monitor for changes that occur on the switcher, such as SIS commands from other LAN sockets or a serial port. For an SSH session to receive change notices from the switcher, the session must be in verbose mode 1 or 3 (see the **Verbose mode** SIS command on page 34).

Host-to-Switcher Instructions

The switcher accepts SIS commands through the serial port, USB config port, and the LAN port. SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. When a command is valid, the unit executes it and sends a response to the host device. Each switcher response to an SIS command ends 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.

Switcher-initiated Messages

When a local event occurs, such as powering on the FOX3 Matrix, the switcher responds by sending a message to the host. The switcher-initiated messages are listed below.

The switcher does not expect a response from the host, but, for example, the host program might request a new status.

`(C) Copyright 2020-2022, Extron Electronics, FOX3 Matrix xxx, Vx.xx, 60-nnnn-01`↵
`{day,date,time}`↵

The switcher issues the copyright message when it is first powered on or when a connection via Internet protocol (IP) is established. *xxx* is the Matrix model. V*x.xx* is the firmware version number and `60-nnnn-01` is the switcher part number.

NOTE: *{Day,date,time}* are only reported if the connection is via the LAN or USB port.

`Password:`↵
The switcher issues the password message after the copyright message when the controlling system is connected using TCP/IP or immediately when accessing the switcher using an SSH client. This message means that the switcher requires an administrator or user level password before it will perform the commands entered via this link. The switcher repeats the password message response for every entry other than a valid password until a valid password is entered.

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is **extron** for the `Admin` and `User` (see **Passwords Panel** on page 59 to change a password).

Switcher Error Responses

When the switcher receives an SIS command and determines that it is valid, it performs the command and sends a response to the host device. If the switcher is unable to perform the command because the command is invalid or contains invalid parameters, the switcher returns an error response to the host. The error response codes are:

E01 — Invalid input number

E10 — Invalid command

E11 — Invalid preset number

E12 — Invalid output number

E13 — Invalid parameter

E14 — Invalid command for this configuration

> **NOTE:** If the user attempts to make a tie between an input and output that are not in the same partition, the matrix does not make the tie and issues an E14 error message.

E17 — Invalid command for signal type

E18 — System or command timed out

E21 — Invalid room number

E22 — Busy

E24 — Privileges violation (Ethernet or USB. Personnel logged in as users attempting operations requiring administrator privileges. Users have access to all view and read commands [other than the administrator password], and can make ties and recall presets, and mute and unmute the output.)

> **NOTE:** Certain commands give E24 if not administrator level.

E25 — Device not present

E26 — Maximum number of connections exceeded

E28 — Bad filename or file not found

> **NOTE:** If the unit does not support or recognize the entered commands, no response is issued.

SIS Command and Response to Endpoints

This section explains how to send SIS commands from the Matrix to control any bidirectionally connected endpoint. The SIS commands and responses for the Matrix appear in the SIS tables (see **Command and Response Table for SIS Commands** starting on page 27).

> **NOTES:**
> - In order to be able to send commands from the Matrix to the endpoints:
>   - Endpoints must have bidirectional fiber connection.
>   - The Matrix must be System Mapped (see the *FOX3 Matrix System Map Setup Guide* available at **www.extron.com**).
>   - Verbose mode 1 or 3 must be enabled on the Matrix.
> - For SIS command for each specific endpoint, refer to the endpoint user guide.

To send commands to endpoints connected to the Matrix, use the following format:

{X0: *SIS command*}← (X0 = Endpoint I/O designator)

> **NOTE:** To enter multiple endpoints, separate each endpoint with a comma (,).

SIS responses return in the following format:

{X0}*response*↵ (X0 = Endpoint I/O designator)

> **NOTE:** If multiple endpoints are defined in the command, responses from each endpoint are separated onto different lines.

Example of endpoint I/O commands:

Command — {T1:1B}←
Response — {T1}Vmt1↵

Command — {T1:Esc ZXXX←}←
Response — {T1}Zpx↵

Endpoint I/O Designators	
FOX3 Matrix System	**Designation (X0)**
FOX3 transmitters (inputs)	T (1 through *xxx*)
FOX3 receivers (outputs)	R (1 through *xxx*)

Using the Command and Response Tables

The **Command and Response Table for SIS Commands** on page 27. Symbols used in the table represent variables in the command and response fields. Command and response examples are shown throughout the table. The SIS commands 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

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

Esc 1B CR 0D LF 0A

NOTES:

- For commands and examples of computer or device responses used in this guide, the character "0" is used for the number zero and "O" is the capital letter "o."
- Only instances marked with a • character require a space. Any spaces between characters in the command and response tables are only inserted for ease of reading.
- Unless stated otherwise, SIS commands are **not** case sensitive.

Special Characters

The switcher accepts all alpha-numeric characters except | and "space", as the name of the switcher, passwords, or locally created file names.

System Definitions

↵	=	CR/LF (carriage return/line feed) (hex 0D 0A)
← or |	=	Carriage return or pipe symbol (no line feed, hex 0D)
Esc	=	Escape key, or hex 1B (use W instead of Esc for web browsers, or at any time)
•	=	Space
*	=	Asterisk character
X1	=	**Input number** — 000 to max number of inputs (Input = 0 Untie)
X3	=	**Output number** — 000 to max number of outputs (Output = 0 Untie)
X4	=	**Enable or Disable** — 0 = Off/disable 1 = On/enable
X5	=	**Laser control** — 0 = Off/disable 1 = On/enable (**default**)
X6	=	**I/O board type** — 0 = No board detected 1 = Active MM board 2 = Active SM board 5 = Unknown
X7	=	**I/O board slot number** — 1 to maximum number of slots (3 for 24x, 5 for 40x, 10 for 80x, 20 for 160x, 40 for 320x, 70 for 560x, 105 for 840x)
X8	=	**Room number** — 1 to 80
X9	=	**Active Fiber Link detection** — SFP A/B "IN LED"
X10	=	**Active signal detection (SFP A/B "IN LED")** — 0 = Not detected 1 = Detected **NOTE:** SFP A and B "OUT LED" is always active.
X11	=	**Global preset number** — 0 to 16 (0 = current ties for system in view)
X12	=	**Room preset number** — 1 to 10
X13	=	**Audio gain/attenuation value** — -18 to +24
X14	=	**Mute status** — 0 = Off (unmuted) 1 = On (muted)
X15	=	**Video/Audio mute status** — 0 = No mute 1 = Video mute 2 = Audio mute 3 = Both video and audio mute
X16	=	**Volume adjustment range** — 0 to 100 (approximately 1 dB per step 0% to 100% [**default**])
X17	=	**SFP data rate per SFP module** — 0 = 10G (**default**) 1 = 4G
X18		**SFP modules installed** — 0 = No SFP 1 = MM SFP 2 = SM SFP 3 = Unknown SFP
X19	=	**Video signal status** — 0 = No video signal at input 1 = Video Input signal detected
X20	=	**Verbose mode** — 0 = Clear/none (**default for Ethernet**) 1 = Verbose mode (**default for RS-232**) 2 = Tagged response for queries 3 = Verbose mode and tagged responses for queries
X21	=	**Timeout** — The number of seconds before timeout on IP connections (min = 1, max = 65000 [**default** = 30 = 300 seconds]).
X22	=	**Enable Telnet port 23** — 0 = Off (**default**) 23 = Telnet port 23 enabled
X23	=	**Port number** — Response is 5 digits with leading zeros, i.e. 00000 or 00023
X24	=	**Power supply voltage** — P = Primary is listed first R = Redundant is listed second
X25	=	**Temperature** — Degrees Fahrenheit and Celsius (example: *xx.xx*F • *xx.xx*C)
X26	=	**Fan speed** — Revolutions per Minute - RPM (example: *xxxx*RPM)
X27	=	**Power supply status** — 0 = Power Supply inactive/not installed 1 = Power Supply active/installed 2 = Power Supply failed/installed
X28	=	**Maximum virtual video matrix size (InputxOutput)** — Example: 80x80
X30	=	**Input name** —
X31	=	**Output name** —
X32	=	**Preset name** —
X33	=	**Room preset name** —
X34	=	**Room name** — **NOTE:** Up to 32 characters. Input, Output, and Preset name command supports the following special characters: -, !, #, $, %, ^, &, *, (,), _, +, ., /.
X35	=	**Audio input number** — 00 to max number of inputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004
X36	=	**Audio output number** — 00 to max number of outputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004

X37	=	**Return audio source number** — 00 to max number of outputs (from an Rx unit, Expansion 30001-30008, Dante 40001-40032, or Analog 50001-50004)
X38	=	**Analog audio destination number (to Tx)** — 00 to max number of inputs
X39	=	**Analog audio input number** — Analog 50001-50004
X40	=	**Analog audio output number** — Analog 50001-50004 **NOTE:** The FOX3 Matrix 24x has only two analog outputs (50001-50002).
X41	=	**Input source number** — 1 to 840

X42	=	**Font color** —
		1 = #FFFFFF — White (**default**)
		2 = #000000 — Black

X44	=	**Background color** —
		1 = #0DBA5C — Green
		2 = #E50022 — Red
		3 = #FFDB00 — Yellow
		4 = #0062CC — Blue (**default**)
		5 = #6F57C0 — Violet
		6 = #EF667A — Pink
		7 = #FF8F00 — Orange
		8 = #9DA3A8 — Gray
		9 = #27292A — Black

X45	=	**OSD duration** — Seconds OSD displays, 1 to 500 seconds (**default** is 5 seconds), 501 = always on
X46	=	**OSD location** — 1 = Top left (**default**) 2 = Top right 3 = Top center 4 = Bottom left 5 = Bottom right 6 = Bottom center
X47	=	**OSD font size** — 24px, 36px (**default**), 72px

Command and Response Table for SIS Commands

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
NOTE: Commands can be entered back-to-back in a string, with no spaces. For example: 1*1!002*002!003*003!.			
Output switching			
NOTES: • The quick multiple tie and tie input to all output commands activate all I/O switches simultaneously. • The matrix switchers support 3-digit numeric (001*001) and 5- digit for Audio ties (50001*50001). • The **! tie** command connects all available signals for the Tx to the Rx. • When you create a tie where X1 = 00, you tie no input to the specified output (X3) (untie X3). • When you create a tie where X3 = 00, you untie all outputs from input X1. • If a System Map has been initiated, the Input number (X1) or Output number (X3) can represent a single physical SFP port or a group of SFP ports. • If the user attempts to make a tie between an input and output that are not in the same partition, the matrix does not make the tie and issues an E14 error message. • The ^ and # commands issue an E14 error message if the FOX3 matrix does not have the LinkLicense for USB breakaway.			
Tie input to output	X1*X3!	Out X3 • In X1 • All ↵	Tie input X1 to output X3, all signals.
Tie input to output	X1*X3%	Out X3 • In X1 • Vid ↵	Tie input X1 to output X3, video only.
Tie input to output	X35*X36$	Out X36 • In X35 • Aud ↵	Tie input X35 to output X36, audio.
Tie return audio source to destination	X37*X38&	Out X38 • In X37 • Rta ↵	Tie return audio source to destination.
Tie input to output USB 2.0	X1*X3^	Out X3 • In X1 • Usb ↵	Tie input X1 to output X3, USB 2.0.
Tie input to output HID	X1*X3#	Out X3 • In X1 • Hid ↵	Tie input X1 to output X3, HID.
TIP: 0*! clears all ties.			
KEY: X1 = Input number X3 = Output number X35 = Audio input number X36 = Audio output number X37 = Return audio source number X38 = Analog audio destination number (to Tx)		000 – Maximum number of inputs for your configuration (0 = untie) 000 – Maximum number of outputs for your configuration (0 = untie) 00 – Maximum number of inputs or DMP Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004 00 – Maximum number of outputs or DMP Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004 00 – Maximum number of outputs (from a Rx unit, DMP Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004 00 – Maximum number of inputs	
NOTE: The FOX3 Matrix 24x has only two analog outputs (50001-50002).			
Tie an input to all outputs			
Tie input to all outputs	X1*!	In X1 • All ↵	Tie video and audio input, 3D sync and IR signals to all outputs.
NOTE: USB 2.0, USB HID, and Return Audio are not switched with this command.			
Tie input to all outputs	X1*%	In X1 • Vid ↵	Tie video input to all outputs.
Tie input to all outputs	X1*$	In X1 • Aud ↵	Tie audio input to all outputs.
KEY: X1 = Input number		000 – Maximum number of inputs for your configuration (0 = untie)	
Untie			
Untie all outputs	0*!	In00 • All ↵	Untie all outputs.
Untie an output	0*X3!	Out X3 • In00 • All ↵	Untie a particular output.
Untie an input	X1*0!	Out00 • In X1 • All ↵	Untie an input from all tied outputs.
KEY: X1 = Input number X3 = Output number		000 – Maximum number of inputs for your configuration (0 = untie) 000 – Maximum number of outputs for your configuration (0 = untie)	

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Quick tie			
Quick multiple tie	Esc+Q X1 * X3 ! . . . X1 * X3 ! ←	Qik↵ or Qik14↵	Make multiple ties with one command. Qik14 responds back when part of the command is invalid or incorrect and some ties could not be made.

NOTES:

- The quick multiple tie and tie input to all outputs commands activate all I/O switches simultaneously.
- The matrix switchers support 3-digit numeric (001*001) and 5-digit for audio ties (50001*50001)
- The quick tie applies to fiber I/O, audio expansion, Dante, or analog audio sections.
- Commands can be made back to back with no spaces.
- If the user attempts to make a tie between an input and output that are not in the same partition, the matrix does not make the tie and issues an E14 error message.

KEY: X1 = Input number — 000 – Maximum number of inputs for your configuration (0 = untie)
X3 = Output number — 000 – Maximum number of outputs for your configuration (0 = untie)

View ties			
View video current ties	Esc0 * X3 * 1VC← Verbose mode 2/3	X1 • X1 • X1 . . . • X1[16] • Vid↵ Vgp00•Out X3 * X1[1] • X1 . . . • X1[16] • Vid↵	Show the input X1 tied to 16 sequential outputs, starting from output X3.
View audio ties	Esc0 * X36 * 2VC← Verbose mode 2/3	X35 • X35 • X35 . . . • X35[16] • Aud↵ Vgp00•Out X36 * X35[1] • X35 . . . • X35[16] • Aud↵	Show the input X35 tied to 16 sequential outputs, starting from output X36.
View USB 2.0 ties	Esc0 * X3 * 3VC← Verbose mode 2/3	X1 • X1 • X1 . . . • X1[16] • Usb↵ Vgp00•Out X3 * X1[1] • X1 . . • X1[16] • Usb↵	Show the input X1 tied to 16 sequential outputs, starting from output X3.
View USB HID ties	Esc0 * X3 * 4VC← Verbose mode 2/3	X1 • X1 • X1 . . . • X1[16] • Hid↵ Vgp00•Out X3 * X1[1] • X1 . . . • X1[16] • Hid↵	Show the input X35 tied to 16 sequential outputs, starting from output X36.
View return audio ties	Esc0 * X38 * 5VC← Verbose mode 2/3	X37 • X37 • X37 . . . • X37[16] • Rta ↵ Vgp00•Out X38 * X37[1] • X37 . . . • X37[16] • Rta↵	Show the input X37 tied to 16 sequential outputs, starting from output X38.
View DMP expansion audio ties	Esc0 * 1 * 6VC← Verbose mode 2/3	X35 • X35 • X35 . . . • X35[8] • Dmp↵ Vgp00•Out01 * X35[1] • X35 . . . • X35[8] • Dmp↵	Show the input X35 Expansion 30001- 30008 tied to 8 outputs, starting from output 1.
View Dante audio ties	Esc0 * 1 * 7VC← Verbose mode 2/3	X35 • X35 • X35 . . . • X35[32] • Dte↵ Vgp00•Out X36 * X35[1] • X35 . . . • X35[32] • Dte↵	Show the input X35 Dante 40001 - 40032 tied to 32 sequential outputs, starting from output 1.
View local analog audio ties	Esc0 * 1 * 8VC← Verbose mode 2/3	X35 • X35 • X35 • X35[4] • Ana↵ Vgp00•Out01 * X35[1] • X35 • X35[4] • Ana↵	Show the input X35 Analog Audio Output 50001 - 50004 tied to 4 sequential outputs, starting from output 1.

NOTE: The FOX3 Matrix 24x has only two analog outputs (50001-50002).

KEY:

X1 = Input number	000 – Maximum number of inputs for your configuration (0 = untie)
X3 = Output number	000 – Maximum number of outputs for your configuration (0 = untie)
X35 = Audio input number	00 – Maximum number of inputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004
X36 = Audio output number	00 – Maximum number of outputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004
X37 = Return audio source number	00 – Maximum number of outputs (from a Rx unit, Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004
X38 = Analog audio destination number (to Tx)	00 – Maximum number of inputs

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description

View individual ties

NOTE: If the view follow-all tie command to an output with a break-away tie is used, the switcher will respond with an error message E13.

View follow all ties	X3 ! Verbose mode 2/3	X1 ↵ Out X3 • In X1 • All ↵	
View video output ties	X3 % Verbose mode 2/3	X1 ↵ Out X3 • In X1 • Vid ↵	
View audio output ties	X36 $ Verbose mode 2/3	X35 ↵ Out X36 • In X35 • Aud ↵	
View return audio ties	X36 & Verbose mode 2/3	X35 ↵ Out X36 • In X35 • Rta ↵	
View USB 2.0 tie	X3 ^ Verbose mode 2/3	X1 ↵ Out X3 • In X1 • Usb ↵	
View USB HID tie	X3 # Verbose mode 2/3	X1 ↵ Out X3 • In X1 • Hid ↵	

KEY:
- X1 = Input number — 000 – Maximum number of inputs for your configuration (0 = untie)
- X3 = Output number — 000 – Maximum number of outputs for your configuration (0 = untie)
- X35 = Audio input number — 00 – Maximum number of inputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004
- X36 = Audio output number — 00 – Maximum number of outputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004

Video mute

Video mute	X3 *1B	Vmt X3 *1 ↵	Mute video per output.
Video unmute	X3 *0B	Vmt X3 *0 ↵	Unmute video per output.
Video mute all	1*B	Vmt *1 ↵	Mute video on all outputs.
Video unmute all	0*B	Vmt *0 ↵	Unmute video on all outputs.
Read video mute	X3B	X14 ↵	View mute status per output.

KEY:
- X1 = Input number — 000 – Maximum number of inputs for your configuration (0 = untie)
- X3 = Output number — 000 – Maximum number of outputs for your configuration (0 = untie)
- X14 = Mute — 0 = Unmuted, 1 = Muted

Audio mute

Audio mute	X36 *1Z	Amt X36 *1 ↵	Mute audio per output.
Audio unmute	X36 *0Z	Amt X36 *0 ↵	Unmute audio per output.
Audio mute all	1*Z	Amt *1 ↵	Mute audio on all outputs.
Audio unmute all	0*Z	Amt *0 ↵	Unmute audio on all outputs.
Read audio mute	X36Z	X14 ↵	View mute status per output.

KEY:
- X14 = Mute — 0 = Unmuted 1 = Muted
- X36 = Audio output number — 00 – Maximum number of outputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004

NOTE: The FOX3 Matrix 24x has only two analog outputs (50001-50002).

View mute

View output mutes	Esc VM ← Verbose mode 2/3	X15[1] X15[2] . . . X15[n] X15[50001] . . . X15[50004] ↵ Mut X15[1] X15[2] . . . X15[n] X15[50001] . . . X15[50004] ↵ The last four numbers are 50001-50004 local analog audio output.	

KEY: X15 = Mute — 0 = No mute 1 = Video mute 2 = Audio mute 3 = Both video and audio mute

NOTE: For variable X15, if the Matrix system map has not been set, this variable represents the physical SFP ports. If the system map has been applied, this variable represents the SFP ports per system mapping (see the FOX3 Matrix System Map Setup Guide available at www.extron.com).

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Presets and names			
Name input	Esc X1 , X30 NI ←	Nmi X1 , X30 ↵	Assign input name.
Read input name	Esc X1 NI ← Verbose mode 2/3	X30 ↵ Nmi X1 , X30 ↵	Display assigned input name. The default is Input #X1.
Name output	Esc X3 , X31 NO ←	Nmo X3 , X31 ↵	Assign output name.
Read output name	Esc X3 NO ← Verbose mode 2/3	X31 ↵ Nmo X3 , X31 ↵	Display assigned output name. The default is Output #X3.

KEY:
- X1 = Input number — 000 – Maximum number of inputs for your configuration (0 = untie)
- X3 = Output number — 000 – Maximum number of outputs for your configuration (0 = untie)
- X30 = Input name — Up to 32 characters. Supports the following special characters: -, !, #, $, %, ^, &, *, (,), _, +, ., /
- X31 = Output name — Up to 32 characters. Supports the following special characters: -, !, #, $, %, ^, &, *, (,), _, +, ., /

Global presets			
Save global preset	X11 ,	Spr X11 ↵	
Recall global preset	X11 .	Rpr X11 ↵	
Reset all global presets	Esc ZG ←	Zpg ↵	
Reset individual presets	Esc X11 ZG ←	Zpg X11 ↵	
Name global preset	Esc X11 , X32 NG ←	Nmg X11 , X32 ↵	The default is Preset #X11.
Read global preset name	Esc X11 NG ← Verbose mode 2/3	X32 ↵ Nmg X11 , X32 ↵	Presets not created return [unassigned] when name is queried.

KEY:
- X11 = Global preset number — 0 to 16 (0 = current ties for system in view)
- X32 = Preset name — Up to 32 characters. Supports the following special characters: -, !, #, $, %, ^, &, *, (,), _, +, ., /

Direct write presets		
Write and save global preset	Esc + X11 P X1 * X3 %... X1 * X3 % ←	Spr X11 ↵
Write and save a room preset	Esc + X8 * X12 P X3 %... X1 * X3 % ←	Rmm X8 . Spr X12 ↵

KEY:
- X1 = Input number — 000 – Maximum number of inputs for your configuration (0 = untie)
- X3 = Output number — 000 – Maximum number of outputs for your configuration (0 = untie)
- X8 = Room number — 1 to 80
- X11 = Global preset number — 0 to 16 (0 = current ties for system in view)
- X12 = Room preset number — 1 to 10

Room/Output groups

NOTES:
- An output can be assigned to multiple rooms.
- The default Room and Output group names are [Unassigned].
- After a room is saved, the default room name is Room#(rm#)
- The room names are limited to 32 characters.

Write room outputs	Esc X8 , X3[1] , X3[2] , X3[n] MR ←	Mpr X8 , X3[1] , X3[2] ... X3[n] ↵	Assign a group of outputs to a Room X8.
Read room outputs	Esc X8 MR ← Verbose mode 2/3	X3[1] , X3[2] , X3[n] ↵ Mpr X8 , X3[1] , X3[2] ... X3[n] ↵	The MR command returns [Unassigned] if a room has no outputs mapped to it.
Save room preset	X8 * X12 ,	Rmm X8 , Spr X12 ↵	
Recall room preset	X8 * X12 .	Rmm X8 , Spr X12 ↵	

KEY:
- X3 = Output number — 000 – Maximum number of outputs for your configuration (0 = untie)
- X8 = Room number — 1 to 80
- X12 = Room preset number — 1 to 10

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Room/Output Groups continued			
Name room/outputs group	Esc X8 , X34 NR ←	Nmr X8 , X34 ↵	The NR command returns [Unassigned] if a room has no outputs mapped to it.
Read room/outputs name	Esc X8 NR ← Verbose mode 2/3	X34 ↵ Nmr X8 , X34 ↵	Display name assigned to room configuration X8.
Name room/output group preset	Esc X8 * X12 , X33 NP ←	Nmp X8 * X12 , X33 ↵	
Read room/output group preset name	Esc X8 * X12 NP ← Verbose mode 2/3	X33 ↵ Nmp X8 * X12 , X33 ↵	
Reset all output group maps	Esc ZR ←	Zpr ↵	
Reset individual output group map	Esc X8 ZR ←	Zpr X8 ↵	
Reset all output group presets	Esc ZP ←	Zpp ↵	
Reset individual output group preset	Esc X8 * X12 ZP ←	Zpp X8 * X12 ↵	

KEY:

X8 = Room number	1 to 80	
X12 = Room preset number	1 to 10	
X33 = Room preset name	Up to 32 characters. Supports the following special characters: -, !, #, $, %, ^, &, *, (,), _, +, ., /	
X34 = Room name	Up to 32 characters. Supports the following special characters: -, !, #, $, %, ^, &, *, (,), _, +, ., /	

View presets

NOTES:

- The MR command returns [unassigned] for any Room that has no outputs mapped to it.
- If a global preset is saved, but not named, then the default name is Preset X11 (X11 = preset number).
- If Room preset is saved, but not yet named then default name is Rm X8 Prst X12.
- If a user tries to recall a preset that is not saved, then the unit responds with an E11 error response.
- If a user tries to save a room preset to a non-existent room, the units responds with an E21 error response.
- An output can be sent to multiple rooms.

View global preset video ties	Esc X11 * X3 *1VC ← Verbose mode 2/3	X1 • X1 • X1 . . . • X1[16] • Vid ↵ Vgp X11 • Out X3[1] • X3 . . . • X3[16] • Vid ↵	Show the input X1 tied to 16 sequential outputs, starting from output X3.
View global preset audio ties	Esc X11 * X36 *2VC ← Verbose mode 2/3	X35 • X35 • X35 . . . • X35[16] • Aud ↵ Vgp X11 • Out X36[1] • X36 . . . • X36[16] • Aud ↵	Show the input X35 tied to 16 sequential outputs, starting from output X36.
View global preset USB 2.0 ties	Esc X11 * X3 *3VC ← Verbose mode 2/3	X1 • X1 • X1 . . . • X1[16] • Usb ↵ Vgp X11 • Out X3[1] • X3 . . . • X3[16] • Usb ↵	Show the input X1 tied to 16 sequential outputs, starting from output X3.
View global preset USB HID ties	Esc X11 * X3 *4VC ← Verbose mode 2/3	X1 • X1 • X1 . . . • X1[16] • Hid ↵ Vgp X11 • Out X3[1] • X3 . . . • X3[16] • Hid ↵	Show the input X1 tied to 16 sequential outputs, starting from output X3.
View global preset return audio ties	Esc X11 * X38 *5VC ← Verbose mode 2/3	X37 • X37 • X37 . . . • X37[16] • Rta ↵ Vgp X11 • Out X38[1] • X38 . . . • X38[16] • Rta ↵	Show the input X37 tied to 16 sequential outputs, starting from output X38.

KEY:

X1 = Input number	000 – Maximum number of inputs for your configuration (0 = untie)
X3 = Output number	000 – Maximum number of outputs for your configuration (0 = untie)
X11 = Global preset number	0 to 16 (0 = current ties for system in view)
X35 = Audio input number	00 – Maximum number of inputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004
X36 = Audio output number	00 – Maximum number of outputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004
X37 = Return audio source number	00 – Maximum number of outputs (from a Rx unit, Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004
X38 = Analog audio destination number (to Tx)	00 – Maximum number of inputs

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
View presets continued			
View global preset DMP expansion audio ties	Esc X11 *1* 6VC↵ Verbose mode 2/3	X35 • X35 • X35 . . . • X35[8] • Dmp↵ Vgp X11 * X35[1] • X35 . . . • X35[8] • Dmp↵	Show the input X35 Expansion 30001- 30008 tied to 8 outputs, starting from output 1.
View global preset Dante audio ties	Esc X11 *1* 7VC↵ Verbose mode 2/3	X35 • X35 • X35 . . . • X35[32] • Dte↵ Vgp X11 * X35[1] • X35 . . . • X35[32] • Dte↵	Show the input X35 Dante 40001 - 40032 tied to 32 sequential outputs, starting from output 1.
View global preset local Analog audio ties	Esc X11 *1* 8VC↵ Verbose mode 2/3	X35 • X35 • X35 • X35[4] • Ana↵ Vgp X11 * X35[1] • X35 • X35[4] • Ana↵	Show the input X35 Analog Audio Output 50001 - 50004 tied to 4 sequential outputs, starting from output 1.

KEY:
X11 = Global preset number — 0 to 16 (0 = current ties for system in view)
X35 = Audio input number — 00 – Maximum number of inputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004

View room presets

NOTES:

- The MR command returns [unassigned] for any Room that has no outputs mapped to it.
- If a global preset is saved, but not named, then the default name is Preset X11 (X11 = preset number).
- If room preset is saved, but not yet named then default name is "Rm X8 Prst X12".
- If a user tries to recall a preset that is not saved, then the unit responds with an E11 error response.
- If a user tries to save a room preset to a non-existent room, the units responds with an E21 error response.
- An output can be sent to multiple rooms.

View room preset video ties	Esc X8 * X12 * X3 *1VC↵ Verbose mode 2/3	X1[1] • X1 • X1 . . . • X1[16] • Vid↵ Vrp X8 * X12 Out X3 * X1[1] • X1 . . . • X1[16] • Vid↵	Show the input X1 tied to 16 sequential outputs, starting from output X3.
View room preset audio ties	Esc X8 * X12 * X36 *2VC↵ Verbose mode 2/3	X35 • X35 • X35 . . . • X35[16] • Aud↵ Vrp X8 * X12 Out X36 * X35[1] • X35 . . . • X35[16] • Aud↵	Show the input X35 tied to 16 sequential outputs, starting from output X36.
View room preset USB 2.0 ties	Esc X8 * X12 * X3 *3VC↵ Verbose mode 2/3	X1[1] • X1 • X1 . . . • X1[16] • Usb↵ Vrp X8 * X12 Out X3 * X1[1] • X1 . . . • X1[16] • Usb↵	Show the input X1 tied to 16 sequential outputs, starting from output X3.
View room preset USB HID ties	Esc X8 * X12 * X3 *4VC↵ Verbose mode 2/3	X1[1] • X1 • X1 . . . • X1[16] • Hid↵ Vrp X8 * X12 Out X3 * X1[1] • X1 . . . • X1[16] • Hid↵	Show the input X35 tied to 16 sequential outputs, starting from output X36.
View room preset return audio ties	Esc X8 * X12 * X38 *5VC↵ Verbose mode 2/3	X37[1] • X37 • X37 . . . • X37[16] • Rta ↵ Vrp X8 * X12 Out X38 * X37[1] • X37 . . . • X37[16] • Rta↵	Show the input X37 tied to 16 sequential outputs, starting from output X38.

KEY:
X1 = Input number — 000 – Maximum number of inputs for your configuration (0 = untie)
X3 = Output number — 000 – Maximum number of outputs for your configuration (0 = untie)
X8 = Room number — 1 to 80
X12 = Room preset number — 1 to 10
X35 = Audio input number — 00 – Maximum number of inputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004
X36 = Audio output number — 00 – Maximum number of outputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004
X37 = Return audio source number — 00 – Maximum number of outputs (from a Rx unit, Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004
X38 = Analog audio destination number (to Tx) — 00 – Maximum number of inputs

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description

NOTES:

- Input gain and attenuation does not affect video inputs (with embedded audio) that are tied to video outputs.
- For attenuation, the negative sign (–) must be entered and is reported in the response. For gain, the positive sign (+) is optional and is returned in response.
- The FOX3 Matrix 24x has only two analog outputs (50001-50002).

Audio input gain

Set audio input gain	X39*X13G	InX39•AudX13↵	Set audio gain per input.
Example	50001*+1g 50001*-15g	In50001•Aud+01↵ In50001•Aud-15↵	
Increase input audio gain	X39+G	InX39•AudX13↵	Increase input audio gain 1 step per input.
Decrease input audio gain	X39-G	InX39•AudX13↵	Decrease input audio gain 1 step per input.
View gain for audio input	X39G Verbose mode 2/3	X13↵ InX39•AudX13↵	View audio gain level per input.

KEY:
X13 = Audio gain/attenuation value — -18 to +24
X39 = Analog audio input number — Analog 50001-50004

Audio output volume

Set output volume level	X40*X16V	OutX40•VolX16↵	Set audio volume level per output.
Output audio volume increment	X40 +V	OutX40•VolX16↵	Increment audio volume per output.
Output audio volume decrement	X40-V	OutX40•VolX16↵	Decrement audio volume per output.
View audio volume for output	X40V Verbose mode 2/3	X16↵ OutX40•VolX16↵	View audio volume level per output.

KEY:
X16 = Volume adjustment range — 0 to 100 (approximately 1 dB per step 0% to 100%, default 100%)
X40 = Analog audio output number — Analog 50001-50004

Matrix status

Information request	I/i Verbose mode 2/3	VX28X28•AX1X35•SX6¹X6²...X6ⁿ↵ Inf00*VX28X28•AX1X35•SX6¹X6²...X6ⁿ↵	
Slot/LC connector information	0*X7I Verbose mode 2/3	X18X18X18X18X18X18X18X18↵ Inf*X18X18X18X18X18X18X18X18↵	
Slot/LC 10G-4G data rate information	1*X7I Verbose mode 2/3	X17X17X17X17X17X17X17X17↵ Inf*X17X17X17X17X17X17X17X17↵	
Request part number	N/n	60-*nnnn-nn*↵	
View Extron serial number	19I/i Verbose mode 2/3	*Serial number*↵ Inf19**Serial number*↵	

KEY:
X1 = Input number — 000 – Maximum number of inputs for your configuration (0 = untie)
X6 = I/O board type — 0 = No board detected 1 = Active MM board 2 = Active SM board 5 = Unknown
X7 = I/O board slot number — 1 – Maximum number of slots (3 for 24x 5 for 40x 10 for 80x 20 for 160x, 40 for 320x 70 for 560x 105 for 840x)
X17 = SFP data rate per SFP module — 0 = 10G (**default**) 1 = 4G
X18 = SFP modules installed — 0 = No SFP 1 = MM SFP 2 = SM SFP 3 = Unknown SFP
X28 = Maximum virtual video matrix size — InputxOutput (example: 80x80)
X35 = Audio input number — 00 – Maximum number of inputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004

NOTE: The FOX3 Matrix 24x has only two analog outputs (50001-50002).

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Matrix status (continued)			
View power supply voltages, unit temperature, fan speeds and power supply status	S/s Verbose mode 2/3	X24P • X24R • X25 • X261 • X262 • X263 . . . X26n •• X27P • X27R↵ Sts00* X24P • X24R • X25 • X261 • X262 • X263 . . . X26n •• X27P • X27R↵	
View temperature of the unit	Esc 20STAT← Verbose mode 2/3	X25↵ 20Stat • X25↵	
View status of power supplies (Primary, Redundant)	Esc 21STAT← Verbose mode 2/3	X24P • X24R↵ 21Stat • X24P • X24R↵	
View fan speeds	Esc 22STAT← Verbose mode 2/3	X261 • X262 • X263 . . . X26n↵ 22Stat • X261 • X262 • X263 . . . X26n↵	24x and 80x have 3 fans, 40x has 4 fans 160x has 6 fans, 320x has 9 fans, 560x has 15 fans, 840x has 24 fans
View individual video input signal status	Esc X1 LS← Verbose mode 2/3	X19↵ In X1 • X19↵	
View all video input signal status per SFP	Esc 0LS← Verbose mode 2/3	X191 X192 . . . X19n↵ In00 • X191 X191 . . . X19n↵	Each response is the video input status, starting from Input 1 and *n* = highest numbered installed input.
View LinkLicense	Esc LELIC←	LinkLicense for KVM System Configuration and Control↵	If a LinkLicense is not installed, returns ↵↵
View virtual size	36I	X28 * X28↵	

KEY:
- X1 = Input number — 000 – Maximum number of inputs for your configuration (0 = untie)
- X19 = Video signal status — 0 = No video signal at input; 1 = Video Input signal detected
- X24 = Power supply voltage — P = Primary is listed first; R = Redundant is listed second
- X25 = Temperature — Degrees in Fahrenheit and Celsius (example: *xx.xx*F • *xx.xx*C)
- X26 = Fan speed — Revolutions per Minute (RPM) (example: *xxxx*RPM)
- X27 = Power supply status — 0 = Power Supply inactive/Not installed; 1 = Power Supply active/Installed, 2 = Power Supply failed/Installed
- X28 = Maximum virtual video matrix size — (InputxOutput) Example: 80x80

Verbose mode

Set verbose mode	Esc X20 CV←	Vrb X20↵
View verbose mode	Esc CV←	X20↵

NOTE: Verbose mode will revert back to default in the event of a power cycle, disconnect from SSH client, or disconnect from the Ethernet.

KEY: X20 = Verbose mode — 0 = Clear/none (**default for Ethernet**); 1 = Verbose mode (**default for RS-232**); 2 = Tagged response for queries; 3 = Verbose mode and tagged responses for queries

Timeout Ethernet data port

Set current port timeout	Esc 0 * X21 TC←	Pti0 * X21↵	If no data is received during the timeout period, the Ethernet connection closes.
View current port timeout	Esc 0TC←	X21↵	

KEY: X21 = Timeout — The number of seconds (each step = 10 seconds) before timeout on IP connections (min=1, max=65000 [**default**=30=300 seconds]).

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Telnet port			
Set Telnet port map	Esc Z X22 PMAP ←	PmapZ X23 ↵	Set Telnet port map to X22.
View Telnet port map	Esc ZPMAP ←	X23 ↵	

NOTE: The Telnet port can be enabled on the RJ-45 LAN port only. The CONFIG port supports configuration using secure communications (SSH) only.

KEY: X22 = Enable Telnet port 23 — 0 = Off (**default**) 23 = Telnet port 23 enabled
X23 = Port number — Response is 5 digits with leading zeros, for example 00000 or 00023

Echo for SIS over SSH (port 22023)			
Enable Echo	Esc 1ECHO ←	Echo1 ↵	Returns command entered with response.
Disable Echo	Esc 0ECHO ←	Echo0 ↵	Returns response only.
View Echo status	Esc ECHO ← Verbose mode 2/3	X4 ↵ Echo X4 ↵	

KEY: X4 = Enable or disable — 0 = Disable 1 = Enable (**default**)

Laser Controls			
Enable individual laser driver	Esc X3 *1FIBR ←	Fibr X3 *1 ↵	Enable the laser for output X3. The laser lights so long as power is applied.
Disable individual laser driver	Esc X3 *0FIBR ←	Fibr X3 *0 ↵	Disable the laser for output X3. The laser is off, all data (video, audio, USB) signals are off.
View status of all laser drivers	Esc FIBR ←	$X5^1$ • $X5^2$ • ... $X5^n$ ↵	List the laser driver status of all installed outputs. *n* is the highest numbered output of the switcher
Enable global laser driver	Esc 1*FIBR ←	Fibr1 ↵	
Disable global laser driver	Esc 0*FIBR ←	Fibr0 ↵	

KEY: X3 = Output number — 1 – Maximum number of outputs for your configuration
X5 = Laser control — 0 = Disable 1 = Enable (**default**)

Source OSD Commands for the Matrix

Input name

Set input name	Esc X41 , X30 NI ←	Nmi X41 , X30 ↵	
View input name	Esc X41 NI ← Verbose mode 2/3	X30 ↵ Nmi X41 , X30 ↵	

KEY: X30 = Input name — Up to 32 characters. Supports the following special characters: -, !, #, $, %, ^, &, *, (,), _, +, ., /
X41 = Input source number — 1 to 840

Background color for source OSD scaling receiver display

Set background color	Esc K4 *1* X41 * X44 TEXT ←	Text K44*1* X41 * X44 ↵	
View background color	Esc K4 *1* X41 TEXT ←	X44 ↵	

KEY: X41 = Input source number — 1 to 840
X44 = Background color — 1 = #0DBA5C — Green; 2 = #E50022 — Red; 3 = #FFDB00 — Yellow; 4 = #0062CC — Blue (**default**); 5 = #6F57C0 — Violet; 6 = #EF667A — Pink; 7 = #FF8F00 — Orange; 8 = #9DA3A8 — Gray; 9 = #27292A — Black

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Font color for source OSD scaling receiver display			
Set font color	Esc C4*1* X41 * X42 TEXT ←	TextC4*1* X41 * X42 ↵	
View font color	Esc C4*1* X41 TEXT ←	X42 ↵	

KEY: X41 = Input source number 1 to 840
X42 = Font color 1 = #FFFFFF (White, **default**) 2 = #000000 (Black)

Source OSD Commands for the Scaling Receiver

NOTE: SIS commands can be made on the scaling receiver through the matrix using bracketed { } commands (see **SIS Command and Response to Endpoints** on page 23.) Example: Command — {R1:Esc V4WNDW ← } ← Response — {R1} X4 ↵

Input OSD setting

Set OSD	Esc V4* X4 WNDW ←	WndwV4* X4 ↵	Enable or disable the OSD setting.
View OSD setting	Esc V4 WNDW ← Verbose mode 2/3	X4 ↵ WndwV4* X4 ↵	

KEY: X4 = Enable or disable 0 = Disable (**default**) 1 = Enable

OSD duration

Set OSD duration	Esc D4* X45 WNDW ←	WndwD4* X45 ↵	
View OSD duration	Esc D4 WNDW ← Verbose mode 2/3	X45 ↵ WndwD4* X45 ↵	

KEY: X45 = OSD duration Seconds OSD displays, 1 to 500 seconds (**default** is 5 seconds), 501 = always on

OSD location

Set OSD location	Esc L4* X46 WNDW ←	WndwL4* X46 ↵	
View OSD location	Esc L4 WNDW ← Verbose mode 2/3	X46 ↵ WndwL4* X46 ↵	

KEY: X46 = OSD location 1 = Top left (**default**) 2 = Top right 3 = Top center 4 = Bottom left
5 = Bottom right 6 = Bottom center

OSD font size

Set OSD font size	Esc S4*1* X47 TEXT ←	TextS4*1* X47 ↵	
View OSD font size	Esc S4*1 TEXT ←	X47 ↵	

NOTE: Text is limited to one line.

KEY: X47 = OSD font size 24px 36px (**default**) 72px

Product Configuration Software

This section introduces the following software programs, which are available on the Extron website:

- **Product Configuration Software**
- **Software/Firmware Installation**
- **Connecting to PCS**
- **Software Overview**

Product Configuration Software

The Extron Product Configuration Software provides an easy way to make ties and sets of ties. Updates to this program can be downloaded from the **Extron website**.

NOTE: PCS is required to upload and configure a System Map on the FOX3 Matrix (see the *FOX3 Matrix System Map Setup Guide* available at **www.extron.com**).

The program communicates with the switcher via the following ports:

- **Rear panel LAN Ethernet port** — See **Ethernet (LAN) Port** on page 20 and Software Operation via Ethernet.

  NOTE: If the FOX3 Matrix has the IPCP Pro Matrix Q xi control card, see **IPCP Pro Matrix Q xi Control Card** on page 13.

- **Front Panel USB Configuration port** — See **Front Panel Configuration Port** on page 20.

Software Operation via Ethernet

When a matrix switcher is connected to an Ethernet WAN or LAN, multiple users can be connected to operate it, locally or remotely, using PCS (see **Ethernet (LAN) Port** for installation details).

Connection to the switcher via the Ethernet is password protected. There are two levels of password protection:

- **Administrators** have full access to all FOX3 matrix switching capabilities and editing functions.
- **Users** can only access the **Internal Web Pages** (see page 55).

If the same password is required for logging on as an `Admin` and `User`, all personnel log on with administrator privileges. Fields and functions that exceed user privileges are not available in PCS when the operator is logged on as a user.

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is **`extron`** for the `Admin` and `User` (see **Passwords Panel** on page 59 to change a password).

Ethernet protocol settings

The **Network Panel** (see page 58) provides a location for viewing and, if connected via a serial port or if logged on via the LAN port as an administrator, editing settings unique to the Ethernet interface.

Software/Firmware Installation

Visit **www.extron.com** to download and install the PCS software.

NOTES:

- Also download the latest versions of software and firmware for your product.
- An Extron Insider account is required to download and use PCS. Contact an Extron support representative, to obtain an Insider Account.

1. Access the **Extron website** and log in to your **Insider Account**.
2. Enter the name of the device or software in the **Power Search** field (see figure 12, ❶).Or mouse over the **Download** link at the top of the page (❷) and click the appropriate link on the drop-down list.

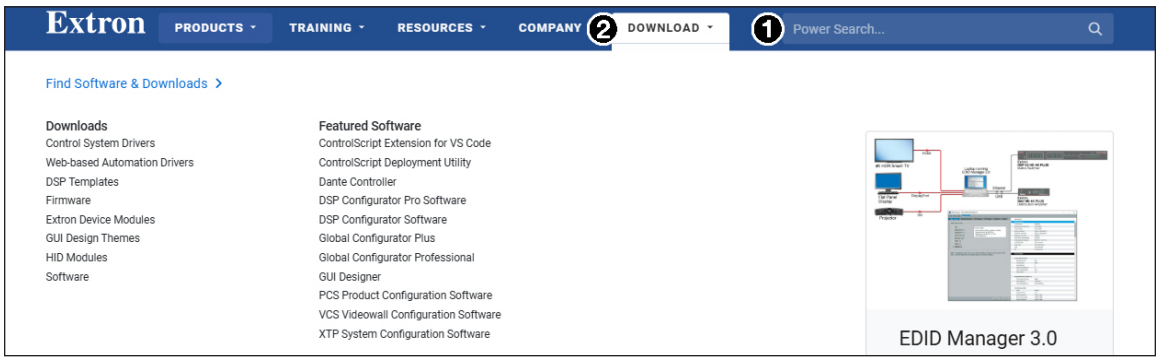


Figure 12. Software Links on Power Search

3. Click the **Downloads** tab on the product page.

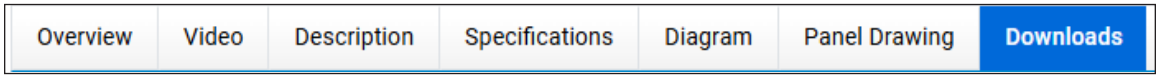


Figure 13. Product Page Downloads Tab

4. Click the product or software name, and the firmware or software executable (`.exe`) file is downloaded to the PC. Run this program to place the firmware or software on the PC for future use. Make a note of the folder where the firmware file was saved.

NOTE: The `Firmware` pane is not available unless there is a firmware update.

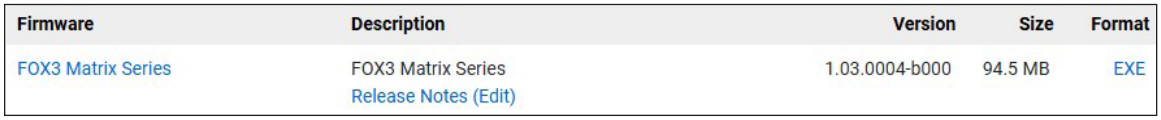


Figure 14. Firmware Download

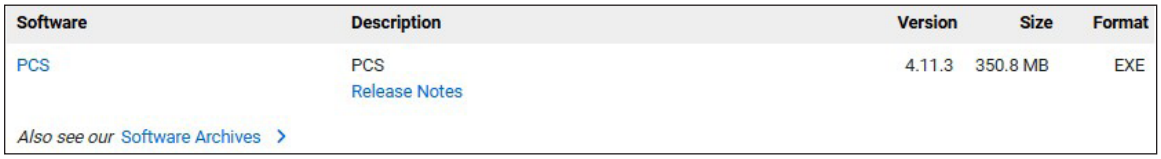


Figure 15. Software Download

5. **(Optional)** Click **Release Notes** for more information about the firmware or software update.
6. **(Optional)** Click **Firmware Archives** or **Software Archives** to download previous versions of firmware or software.

NOTE: The **Archives** links are not available unless there are prior firmware or software versions.

7. Install the software.
   a. Navigate to the folder where the software file was downloaded.
   b. Double-click the executable file and follow the on-screen directions to install the software.

For Firmware:

- To install via PCS, see Update Firmware in the **Device List** on page 44.
- To install via the internal web pages, see the **Firmware Panel** on page 60.

Connecting to PCS

The Extron Product Configuration Software window opens with the Device Discovery panel open. Connect to the switcher using the Device Discovery panel or the TCP/IP panel (see figure 16).

Device Discovery Panel

The Device Discovery panel displays accessible Extron devices connected directly to the PC or to a LAN or WAN. Devices are identified and sorted by model, IP address, device name, or connection method.

1. Open the Product Configuration Software program from the desktop shortcut.
   The Extron PCS window opens to the Device Discovery panel (see figure 16).

NOTES:

- If the FOX3 Matrix is connected to the front panel USB-C, the hardcoded IP address is 203.0.113.22. If connected to the rear panel AV LAN port, the FOX3 Matrix default IP address is 192.168.254.254. If connected to the rear panel IPCP control card LAN port, the default IP address is 192.168.253.250.
- If the FOX3 Matrix IP address is changed, the AV LAN IP address (192.168.254.250) **MUST** be changed in Toolbelt to the same subnet as the FOX3 Matrix in order to connect through the LAN port.

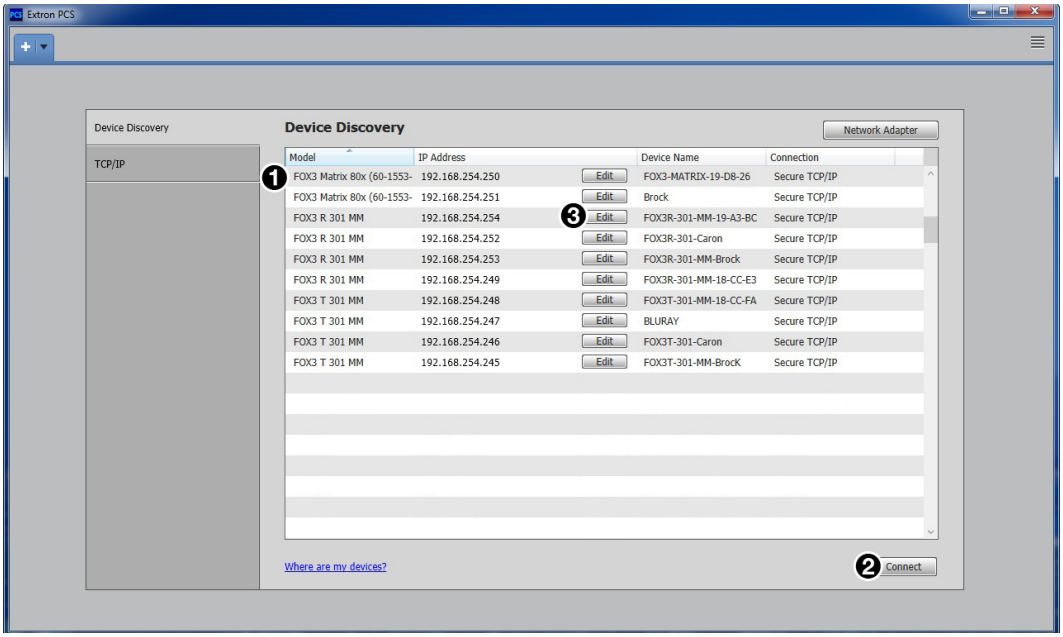


Figure 16. Device Discovery Panel

2. **If connecting through the front panel USB-C port or the rear panel AV LAN port**, select the **FOX3 Matrix** device by clicking on it to highlight it in the list (❶) and click **Connect** (❷).

   If connecting through the rear panel IPCP LAN port:

   - Select the **FOX3 IPCP Pro Matrix Q xi** device by clicking on it to highlight it in the list (❶) and click **Connect** (❷). After entering the password, the **FOX3 Matrix** device becomes available below the IPCP.
   - Select the **FOX3 Matrix** device by clicking on it to highlight it in the list and click **Connect**.

3. Enter the password in the pop-up window and click **Continue**. The FOX3 Matrix PCS main page opens.

To edit the IP address:

1. Click on the **Edit** button (see figure 16, ❸ on page 39). The Communication Settings box opens.
2. Click in the field to edit (see figure 17).
3. Click **Apply** to complete and close.

   Alternatively, click **Apply and Connect** to complete and connect to the device.

   Click **Cancel** to close the box without changes.

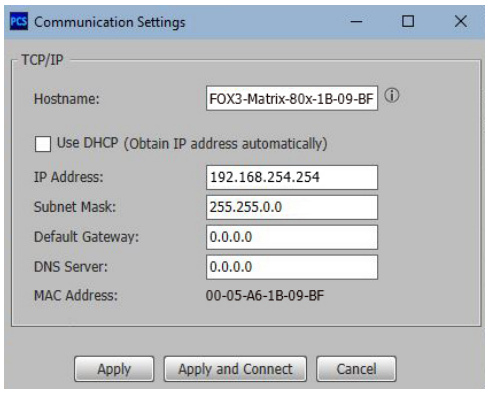


Figure 17. Communication Settings Box

TCP/IP Panel

The TCP/IP panel connects PCS to a specific device through Ethernet.

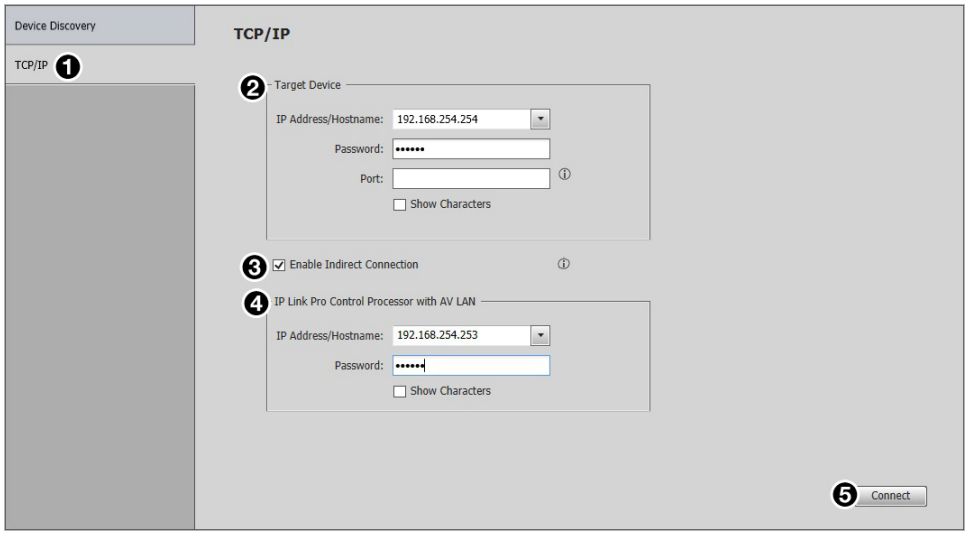


Figure 18. TCP/IP Panel

1. Click the **TCP/IP** tab (see figure 18, ❶).
2. **If connecting through the front panel USB-C port or the rear panel AV LAN port**, enter the **IP Address/Hostname** and **Password** in the Target Device panel (❷). Continue to **step 3** on page 41.

NOTES:

- If the FOX3 Matrix is connected to the front panel USB-C, the hardcoded IP address is 203.0.113.22. If connected to the rear panel AV LAN port, the FOX3 Matrix default IP address is 192.168.254.254. If connected to the rear panel IPCP control card LAN port, the default IP address is 192.168.253.250.
- If the FOX3 Matrix IP address is changed, the AV LAN IP address (192.168.254.250) **MUST** be changed in Toolbelt to the same subnet as the FOX3 Matrix in order to connect through the LAN port.
- The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is **extron** for the Admin and User (see **Passwords Panel** on page 59 to change a password).
- Select the **Show Characters** checkbox to display the password characters.

If connecting through the rear panel IPCP LAN port, enter the FOX3 Matrix **IP Address/Hostname** and **Password** in the Target Device panel (see **figure 18**, ❷ on page 40).

a. Select the **Enable Indirect Connection** checkbox (❸). The IP Link Pro Control Processor with AV LAN panel (❹) is enabled.

b. Enter the IPCP Pro Matrix Q xi control card **IP Address/Hostname** and **Password** in the IP Link Pro Control Processor with AV LAN panel.

3. Leave the **Port** field (❹) empty. The device will search for the port to connect.

NOTE: If the Telnet port number is not known, leave this field blank. PCS will scan for the port.

4. Click the **Connect** button (❺). The FOX3 Matrix PCS main page opens (see **figure 21** on page 42).

Offline Device Preview

Opening a new device tab for an offline device displays the interface and configuration options for the device without connecting to it. However, settings cannot be changed.

To open a device tab:

1. From the Configuration File drop-down list, select **New Configuration File** (see figure 19).

The New Configuration File dialog box opens (see figure 20).

2. Select the desired device model from the **Device Models** list (see figure 20).
3. Click the **Configure** button. A new offline device configuration tab opens.

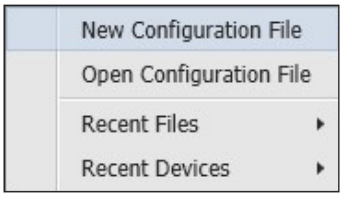


Figure 19. Configuration File Drop-down List

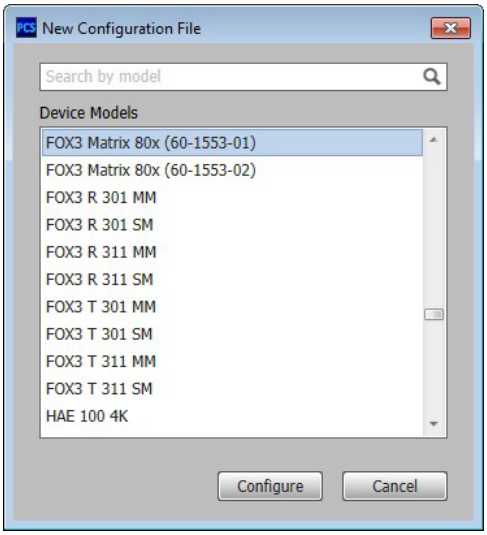


Figure 20. New Configuration File Dialog Box

Software Overview

NOTE: For details about specific software features, see the *FOX3 Matrix Series PCS Help File*.

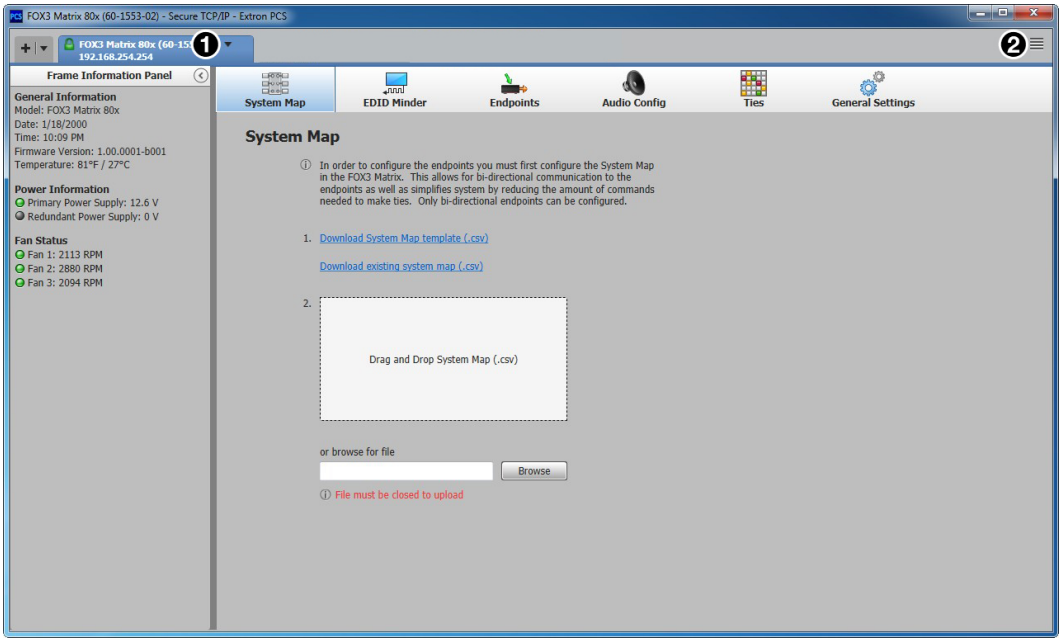


Figure 21. FOX3 Matrix Main Window

Each PCS screen has a `Device` drop-down list (see figure 21, ❶) for device configuration options. The `Software` list (❷) contains software configuration and information options.

Software List

The `Software` list (see figure 22) contains options pertaining to PCS settings.

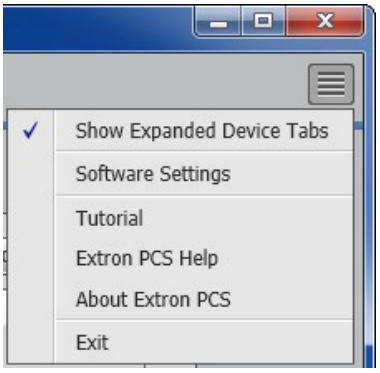


Figure 22. PCS Software List

Show Expanded Device Tabs

Selecting **Show Expanded Device Tabs** from the Software list displays the device IP address or connection method in the **Device** tab.

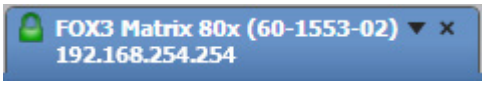


Figure 23. Expanded Device Tab

Software Settings

This option resets all disabled confirmation dialogs to the default settings.

1. From the Software list, select **Software Settings**.

   The Software Settings dialog box opens.

2. Click the **Re-enable Confirmation Dialogs** button (see figure 24, ❶). The dialog box closes and the reset is complete.

   Alternatively, click the **Close** button (❷) to close the dialog box without re-enabling the confirmation dialogs.

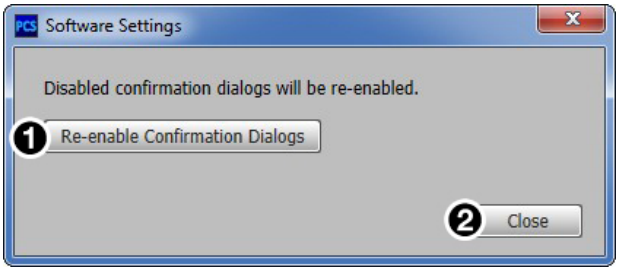


Figure 24. Software Settings Dialog Box

Tutorial

Display a general overview of where to find features in the PCS framework.

1. From the Software list, select **Tutorial**. The Tutorial dialog box opens.
2. Click the **I Get It!** button to close the dialog box.

Extron PCS Help

Open the PCS help file for general PCS operations.

From the Software list, select **Extron PCS Help**.

About Extron PCS

Display information about the current PCS version.

1. From the Software list, select **About Extron PCS**. The About - Extron PCS dialog box opens.
2. Click the **Details** button (see figure 25, ❶) for more information.
3. To display details about third-party software packages and associated licensing, click **Licenses** (❷).
4. Click the **OK** button (❸) to close the dialog box.



Figure 25. About - Extron PCS Dialog Box

Exit

Disconnect connected devices and close the application.

1. From the Software list, select **Exit**. If device tabs are open, the Exit dialog box opens (see figure 26).
2. Click the **Close Session(s) and Exit** button (❶) to disconnect the software from connected devices, close all offline device tabs, and close the software.

   Alternatively, click the **Cancel** button (❷) to leave the software open.

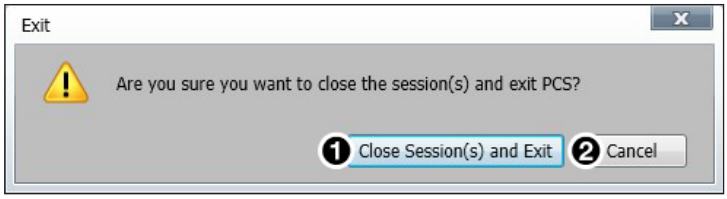


Figure 26. Exit Dialog Box

Device List

The Device list (see figure 27) contains options pertaining to device connection, configuration, and information. For details, see the *FOX3 Matrix Series PCS Help File*.

- **Disconnect** — Disconnect the device from the PCS program and close the **Device** tab.
- **Settings** — Open the following options:
  - **Hardware Settings** — Display the Hardware Settings dialog box with device information and side tabs to change the device name, internal clock, and password of the connected device.

    It also contains an **Edit Communication Settings** button, which provides an alternative method of accessing the Communication Settings dialog box.
  - **Communication Settings** — Open the Communication Settings dialog box to change IP settings of the connected device.
- **Reset Device** — Open the Reset Device dialog box, with selectable modes for resetting the connected device, as well as the Unit Information (also displayed in the Hardware Settings dialog box).

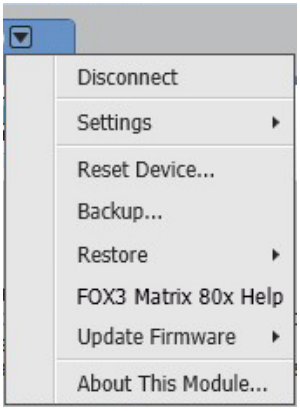


Figure 27. Device List

> **NOTE:** The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is **extron** for the Admin and User (see **Passwords Panel** on page 59 to change a password).

- **Backup** — Export all audio, video, and communication settings of the connected device to the PC. This exported configuration can be saved as a backup file (with a .extz extension), or used to replicate settings from one device to other devices of the same model. When restoring a configuration, select specific device settings.
- **Restore** — Open the restore options:
  - **Restore this Device** — Upload a saved configuration for an FOX3 Matrix to the connected device.
  - **Restore to Multiple Devices** — Upload a saved configuration file for a FOX3 Matrix to multiple devices on the network.

> **NOTE:** The connected devices must be connected via LAN.

- **FOX3 Matrix Help** — Open the *FOX3 Matrix Series PCS Help File* in a separate window.

- **Update Firmware** — Open to upload firmware from the host device to the connected device or to multiple devices.

  NOTE: If necessary, download new firmware from the Extron website (see **Software/Firmware Installation** on page 38).

  - **Update Firmware to this Device...** — Upload firmware from the host device to the connected device only.
  - **Update Firmware to Multiple Devices...** — Upload firmware to multiple devices on the network.

    NOTE: The connected devices must be connected via LAN.

- **About This Module** — Open the `About This Module` dialog box, with the module part number and firmware version of the connected device.

Dante Controller

This section describes the Matrix network installation, configuration, and control using Dante Controller for Windows and covers the following topics:

- **Overview**
- **Downloading and Installing Dante Controller**
- **Configuring the Matrix in Dante Controller**
- **Dante Controller Operation**
- **Setting up AES67 Mode**

Overview

Matrix devices use Dante technology by Audinate to provide high performance digital audio networking over standard TCP/IP networks. The Dante Controller software application is used to route audio on the network, and can be accessed from the **Audio Config** tab in PCS, after the software is downloaded. Dante allows audio channels to be transported across a switched Ethernet data network while meeting the quality requirements of professional audio.

Up to 32 stereo channels can be transmitted from the Matrix to the Dante network and up to 32 stereo channels can be received by the Matrix from the Dante network.

Audio signals are converted by Matrix devices, processed and routed to the AT bus, and transmitted onto the Dante network. Audinate recommends the Dante audio network be kept separate from other networks. However, the audio network can be shared with control traffic or unrelated data traffic. Audio channels can be unicast or multicast to make the best use of available bandwidth.

Downloading and Installing Dante Controller

Dante Controller from Audinate is required to route transmitters and receivers and can be used to configure Dante settings and monitor performance. Install Dante Controller on a PC running Microsoft® Windows® 7 or newer. For full details about computer requirements and to download the software, see the Dante Controller product page at **www.extron.com**.

To download Dante Controller:

1. On the Extron web page, mouse over the **Download** tab at the top of the page.
2. From the Featured Software list, select **Dante Controller** link.
3. On the Dante Controller page, click **Download**.
4. On the Download Center page, fill-in the required fields.
5. Click the **Download dantecontroller.exe** button.
6. If you choose to run the file, follow all prompts. If you saved the file, click the saved file to begin installation when ready.

The installed Dante Controller program files are saved in:
C:\Program Files (x86)\Audinate\Dante Controller

Configuring the Matrix in Dante Controller

Use a standard Ethernet cable to connect the Matrix to a Dante network via the rear panel AT port (see **figure 2**, Ⓚ on page 8) and power the device.

Device Name

Multiple devices on the same Dante network can present difficulty in identifying individual devices. To avoid confusion and difficulty, ensure the following steps are taken:

- Connect devices to the Dante network one at a time.
- Rename each device before making audio connections in Dante Controller.
- Rename each device with a unique and meaningful identifier.
- Rename each device before the next device is connected to the Dante network.

ATTENTION:

- It is essential that a Dante device be named before audio subscriptions with other devices are established. Existing subscriptions are removed when a device is renamed.
- Il est essentiel qu'un appareil Dante soit nommé avant l'établissement des abonnements audio avec d'autres appareils. Les abonnements existants sont supprimés lorsqu'un appareil est renommé.

In Dante Controller, a device can be renamed to identify the device on the audio network. The default device name of the Matrix consists of the model name, followed by the last six characters of the Dante interface MAC address (for example, `FOX3AT-1b6c78`). In addition to renaming the device, individual Transmitter (Tx) and Receiver (Rx) channels can be renamed.

The Dante device name must be set before making any connections to other devices on the Dante network. Renaming a device after making connections removes existing connections to and from that device. Refer to **Renaming the Matrix in Dante Controller** on page 48 for renaming procedure.

Receiver and Transmitter Names

In addition to renaming a device, individual transmitter and receiver channels can be renamed in Dante Controller. Rename transmitter and receiver channels to reflect the location of the device or the purpose of the transmitter or receiver. Ensure transmitter and receiver channels are renamed before making audio connections between devices. Refer to **Renaming a Receiver or Transmitter** on page 49 for renaming procedure.

ATTENTION:

- It is essential that a Dante device be named before audio subscriptions with other devices are established. Existing subscriptions are removed when a device is renamed.
- Il est essentiel qu'un appareil Dante soit nommé avant l'établissement des abonnements audio avec d'autres appareils. Les abonnements existants sont supprimés lorsqu'un appareil est renommé.

Dante Controller Naming Conventions

- Device names follow Domain Name System (DNS) hostname rules. Legal characters are `A-Z`, `a-z`, `0-9`, and hyphen (`-`). Names must begin with a letter and cannot end with a hyphen (`-`).
- Dante Tx and Rx channel names (also known as labels) can be up to 31 characters in length. Label names are not case-sensitive. For example, "`ANALOG OUT-1`" and "`analog out-1`" are recognized as the same name. Unicode and non-roman characters are not supported.
- Tx and Rx channel labels can use any character except equals (`=`), period (`.`), or `@`.
- Tx and Rx channel labels must be unique on a device but do not need to be unique on the network.

Renaming the Matrix in Dante Controller

NOTE: Dante device naming can also be done via DSP Configurator (see the *DSP Configurator Help File* available in the software).

1. Ensure that the control computer and a single Matrix are connected to the same network.
2. From the control computer **Start** menu select: **All Programs > Audinate > Dante Controller**
3. The Dante Controller - Network View screen opens. All Dante devices on the network are discovered and listed.
4. From the Device menu, select **Device View** or press **<Ctrl+D>** on the keyboard (see figure 28).
5. The Dante Controller - Device View dialog opens. Select the device being configured from the **(Select a Dante Device...)** drop-down list (see figure 29, ❶).

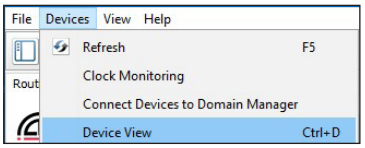


Figure 28. Device View

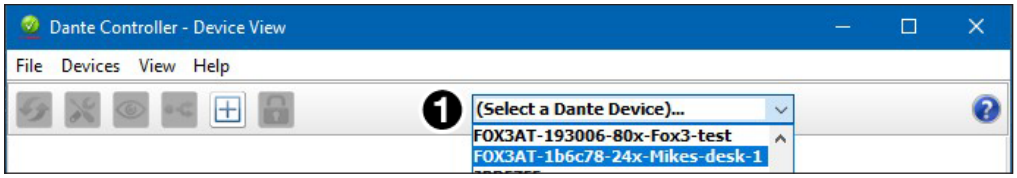


Figure 29. Device View and Select a Dante Device Drop-Down

NOTES:

- If there are multiple Matrix devices connected to the network that have not been renamed, obtain the Dante interface media access code (MAC) address of the desired device from the white label on the rear panel of the device in order to identify it in Dante Controller.
- There are two MAC addresses listed on the rear panel of a Matrix, one for the LAN port and one for the Dante interface. The Dante interface MAC address is listed beneath the LAN port MAC address.

The Device View dialog populates with the selected Matrix information.

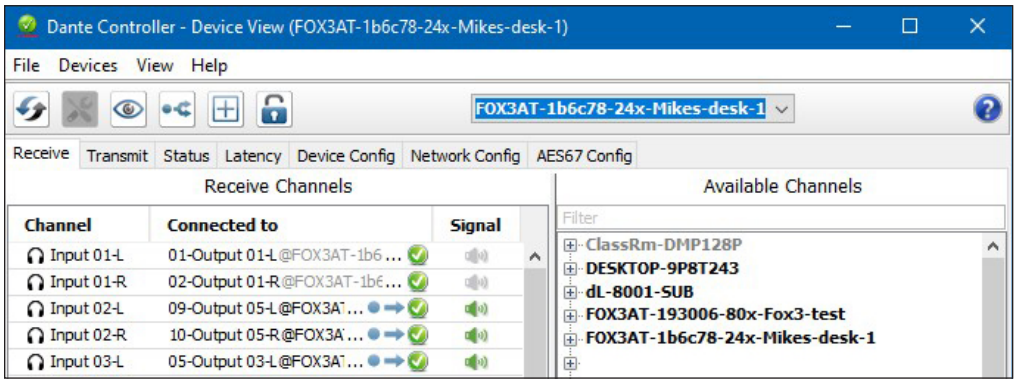


Figure 30. Populated Device View Dialog Box

6. Click the **Device Config** tab (see figure 31, ❶) to open the Device Config page.
7. In the Rename Device panel, enter the new name of the device in the text field. No spaces are allowed in the name. Names should be significant identifiers. For example, enter **FOX3AT-1b8c78-24x-Mikes-desk-1** (❷).
8. Click **Apply** (❸). A confirmation prompt opens.

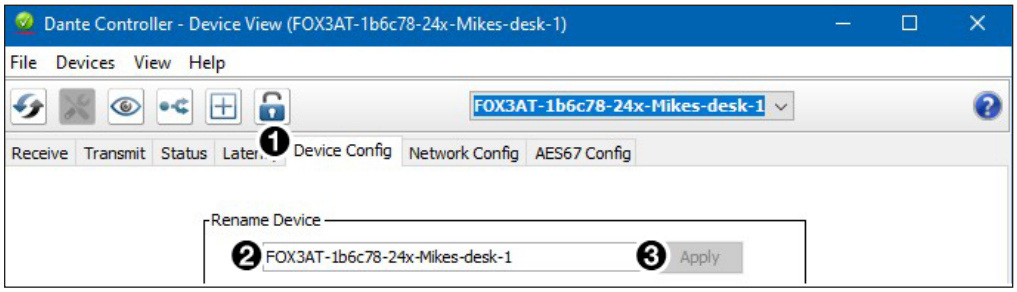


Figure 31. Device Config Dialog Box

9. Click **Yes** (see figure 32, ❹) to confirm the new name, then close the Device Configuration dialog box. The new name is written to the Dante interface of the Matrix. Repeat as necessary for all devices.

NOTE: The device name assigned in Dante Controller only applies to the Dante interface and does not affect the device name recognized in DSP Configurator.

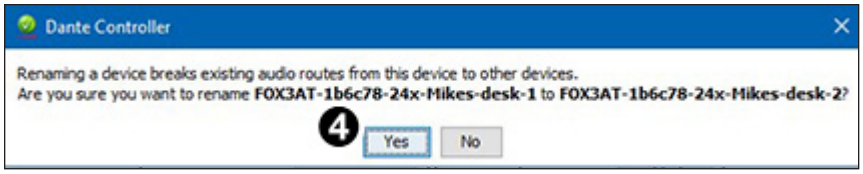


Figure 32. Rename Device Confirmation Dialog Box

Renaming a Receiver or Transmitter

In addition to renaming devices, individual receiver and transmitter channels can be renamed in Dante Controller. To better organize the various receivers and transmitters, it is recommended each receiver and each transmitter be named using a description of the device they belong to, the location of the device, or the purpose of the receiver or transmitter.

ATTENTION:

- It is essential that a Dante device be named before audio subscriptions with other devices are established. Existing subscriptions are removed when a device is renamed.
- Il est essentiel qu'un appareil Dante soit nommé avant l'établissement des abonnements audio avec d'autres appareils. Les abonnements existants sont supprimés lorsqu'un appareil est renommé.

To view the receiver or transmitter channels in Dante Controller, click the **+** sign next to the receiver or transmitter device name to expand it. The **+** sign becomes a **–** sign when the device is expanded (see figure 33, ❶).

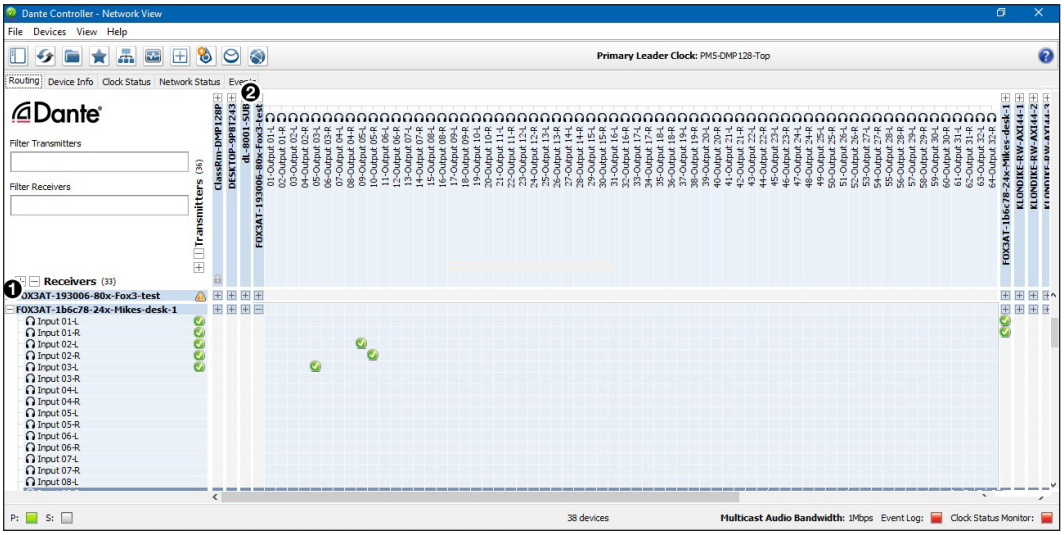


Figure 33. Expanded Device View — Input and Output Names

TIP: To simplify setup and operation of large matrix systems, rename the receiver and transmitter channels to better indicate the source at the transmitters or receivers.

The default names shown in the `Dante Receivers` column and `Dante Transmitters` row are extracted from the Dante interface of the connected device (see figure 33, ❶ and ❷). The receivers are labelled `EXP_In-01` through `EXP_In-48` because the Matrix can receive signal at the 48 EXP inputs.

The first set of transmitters is labelled `Output-01` through `Output-08` because the Matrix can transmit signals routed to the analog outputs to the Dante network. The second set of transmitters is labelled `EXP-Out-01` through `EXP-Out-16` because the Matrix can transmit signals routed to the EXP outputs to the Dante network.

To rename a Matrix receiver or transmitter:

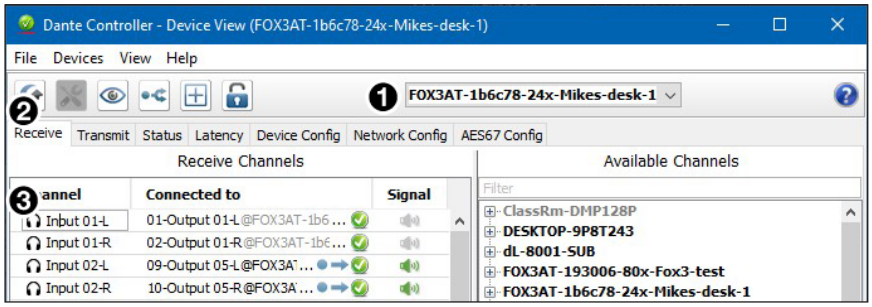


Figure 34. Device View Screen — Renaming a Receiver or Transmitter

1. From the `Device` menu on the `Network View` screen, select **`Device View`**, or press **`<Ctrl+D>`** on the keyboard. The `Device View` dialog box opens.
2. From the **`(Select a Dante Device..)`** drop-down list, select the name of the desired Matrix (see figure 34, ❶).
3. On the `Device View` screen, select the **`Receive`** tab or **`Transmit`** tab (❷) as desired.
4. Click on the name of the receiver or transmitter to be renamed. The name becomes a text box with a cursor (❸).
5. Enter the new name (up to 31 characters) using any combination of letters, numbers, and special characters except for `@`, `=`, and `.` (period).
6. Press **`<Enter>`** on the keyboard to confirm the name, or click another channel text box.
7. Repeat steps 4 through 6 to rename additional receiver or transmitter channels.
8. When finished renaming receivers and transmitters, close the `Device View` dialog box.

Finding a Dante Device IP Address

To find the IP address of a Dante device, the name of the device is needed (see **Renaming the Matrix in Dante Controller** on page 157).

NOTE: If the Matrix has not been renamed, its default name consists of the product name followed by a hyphen, plus the last 6 digits of the device MAC address (for example, `FOX3AT-1b6c78`).

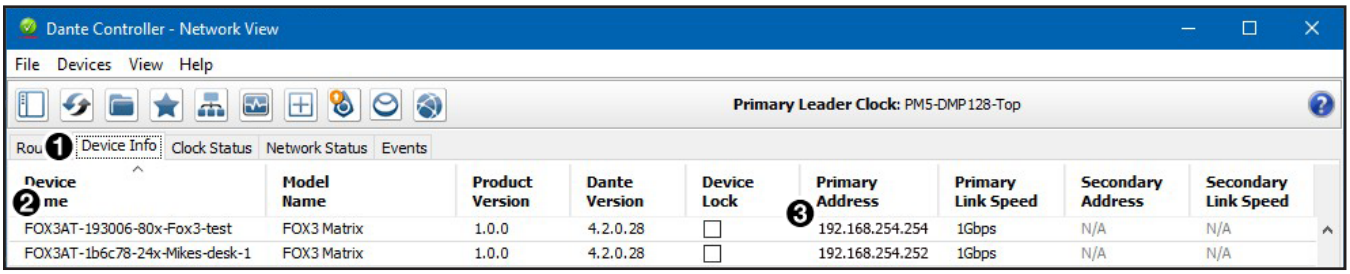


Figure 35. Device Info Page

1. Open Dante Controller.
2. On the `Dante Controller-Network View` screen, click the **`Device Info`** tab (see figure 35, ❶).
3. On the `Device Info` page, locate the name of the Matrix in the `Device Name` column (❷). The IP address is located in the `Primary Address` column (❸). In figure 35, the IP address for the connected Matrix is `192.168.254.254`.

Dante Controller Operation

Dante Transmitters and Receivers

A Dante network is comprised of transmitters that output digital audio onto the Dante network and receivers that receive digital audio input from the Dante network.

- Transmitters output digital audio from the device onto the audio network.
- Receivers take in digital audio from the audio network into the device.

Matrix Transmitters and Receivers

In the Matrix, the line output and EXP output channels are Dante transmitters because their audio output is transmitted onto the Dante network. Routing an analog output to the Dante network allows the signal to be output on both analog and Dante simultaneously, the same is true for the EXP outputs.

The Matrix input channels are Dante receivers because they receive digital audio signal from the Dante network that can then be routed and mixed into the Matrix mix matrix.

Dante Routing Operation

Dante Controller is used for all network signal routing of transmitters and receivers for Dante-enabled devices. The Matrix transmitters and receivers are available in Dante Controller for routing to other Dante devices.

Routing Devices

After the Matrix is configured, the channels can be routed to the other Dante devices on the audio network. Channels transmitted to the network or received from the network are routed using the Dante Controller **Routing** tab on the Network View page (see figure 36). The transmitters, listed horizontally along the top of the screen, and the receivers, listed vertically down the left side, form a matrix whose intersections are the connection points between the receivers and transmitters.

- To make a receiver-to-transmitter connection, click once on an intersection.
- To remove a connection, click on the icon at the intersection.

One of the following icons appears at each connection intersection, indicating the status of both the transmitter and receiver channels and the connections (subscriptions):

Icon	Description
	Indicates an active subscription.
	Indicates subscription is in progress.
	Indicates a pending subscription.
	Indicates a broken subscription.
	Indicates the transmitting device has been removed from the network or is switched off.

See the *Dante Controller User Guide*, available at **www.audinate.com**, for additional information.

Creating Subscriptions Between Devices

1. Ensure the control computer and Matrix are connected to the same network.
2. From the start menu select:
   All Programs > Audinate > Dante Controller > Dante Controller

   The Dante Controller - Network View screen opens (see figure 36).

   Dante Controller auto-discovers Dante devices on the network and advertises itself to allow other Dante-enabled devices to communicate with it. Transmitters connect to receivers using the subscription matrix.
3. To show the transmitters of a Dante device, click the **+** box next to the desired device in the Dante Transmitters panel, such as FOX3AT-193006-80x-Fox3-test (❶). The **+** changes to a **–** sign when the device expands.
4. To show the receivers of a Dante device, click the **+** box next to the desired device in the Dante Receivers panel, such as FOX3AT-1b6c78-24x-Mikes-desk-1 (❷).
5. Click the intersection of the desired subscription between a transmitter and a receiver (❸).
6. A check mark at the intersection indicates the subscription is made. A check mark also appears next to the receiver channel.

NOTE: A receiver can connect to only one transmitter. A transmitter can connect to multiple receivers.

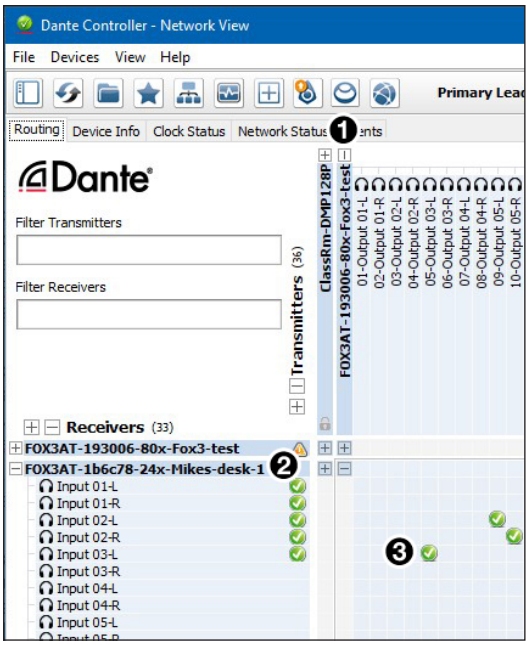


Figure 36. Routing Tab of Network Screen

Disconnecting Inputs from Outputs

To undo routing, click the junction again to disconnect the receiver from the transmitter.

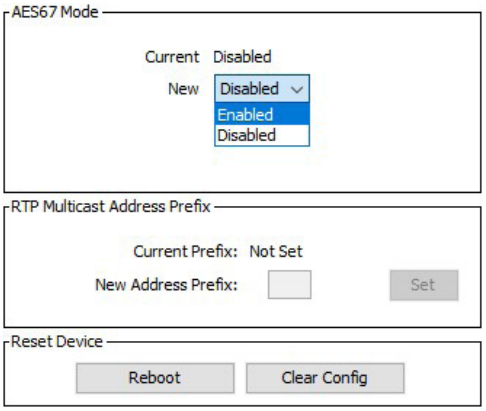
NOTE: After making changes to Dante network routing such as subscriptions, device names, or channel labels, wait at least 5 seconds before disconnecting or powering down the devices. This ensures that the new information is properly saved to those devices. Device level configuration such as sample rates, latency, and clock settings are saved instantly.

Setting up AES67 Mode

The FOX3 Matrix supports the AES67 audio over IP interoperability standard. This feature allows audio transport to and from other AES67-compatible devices, such as the Extron NAV series.

To enable AES67 mode:

1. Open **Dante Controller** and double-click the Dante device name in the **Routing** tab to open Device View.
2. Click on the **AES67 Config** tab. The configuration screen opens (see image to the right).
3. Select **Enabled** from the drop-down list.
4. Click the **Reboot** button to reboot the device and enable AES67.



To create an AES67 Multicast Flow:

1. Open **Dante Controller** and double-click the Dante device name in the **Routing** tab to open Device View.
2. Click the **Create a new multicast flow** button .
3. In the Flow Config section, click the **AES67** radio button.
4. In the Flow Config section, select **Auto** or **Manual Destination Address**. If manual is selected, enter the destination address.
5. Check the box for each channel to be included in the Multicast Flow.
6. Click **Create**.

Dante Troubleshooting

The most common Dante troubleshooting issues occur when devices are not discovered by Dante Controller or when routing is not successful. Both issues occur when software is not able to properly discover devices operating on the Dante network.

Before moving into more difficult troubleshooting, shut down Dante Controller and reseat the Ethernet cable connecting the PC to the Dante network and restart Dante Controller. This can be enough for the software to reacquire the Dante network.

If the problem persists, perform the following troubleshooting procedures in the order listed.

Simplifying the Network for Troubleshooting

If further troubleshooting of Dante Controller is necessary, begin by simplifying the network:

1. Bypass network switches by connecting two Dante-compatible units, such as a Matrix and an AXI 44 AT, via their AT ports.
2. Connect the PC to an unused AT port with an Ethernet cable.
3. Use Dante Controller to check if the issue was resolved before moving on to network interface troubleshooting.
4. If the issue is resolved, add connections and hardware one at a time, checking for proper operation after each addition, until the point of failure is discovered (typically a bad cable or invalid redundant configuration).

Troubleshooting the Network Interface

If the issue is still present, continue to diagnose the PC network connections as described below. Check Dante Controller after each step to see if the problem is resolved.

1. Click the **`Choose a Dante Interface`** icon (see figure 37, ❶). The `Configure Dante Interfaces` dialog box opens (see figure 38).

   Be certain the correct LAN connection is selected (the PC LAN port that is physically connected to the AT network) and note the IP address.

2. If it is on, turn off the PC wireless adapter. Disable all connections except the LAN port connected to the Dante network (verify this is the correct port by checking the IP address shown in the `Configure Dante Interfaces` dialog).

3. Turn off all anti-virus and firewall software on the computer.

4. Enable DHCP on the remaining network connection. This forces the computer to acquire an IP address from the Dante interface.

   NOTE: A DHCP server must be on the network for DHCP to function correctly.

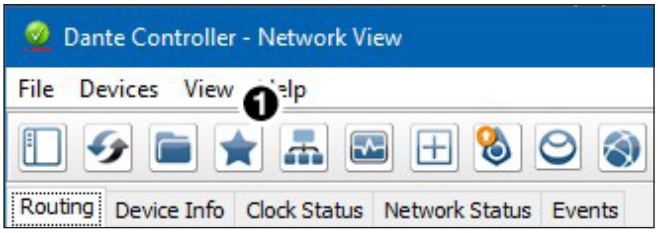


Figure 37. Choose a Dante Interface Icon

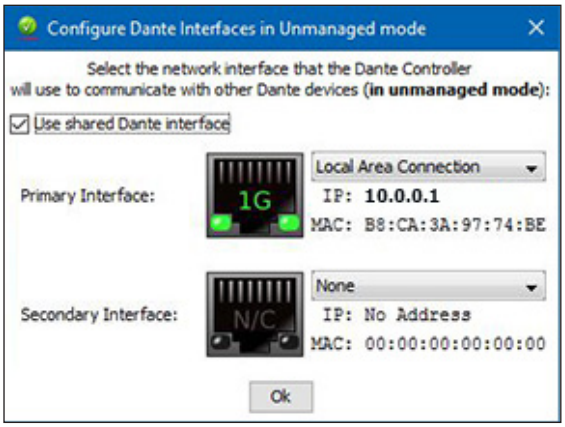


Figure 38. Configure Dante Interfaces Dialog Box

Restarting Dante Controller

If subscriptions or normal operation cannot be restored, restart Dante Controller software. **To access the Dante Controller Help file, do any of the following:**

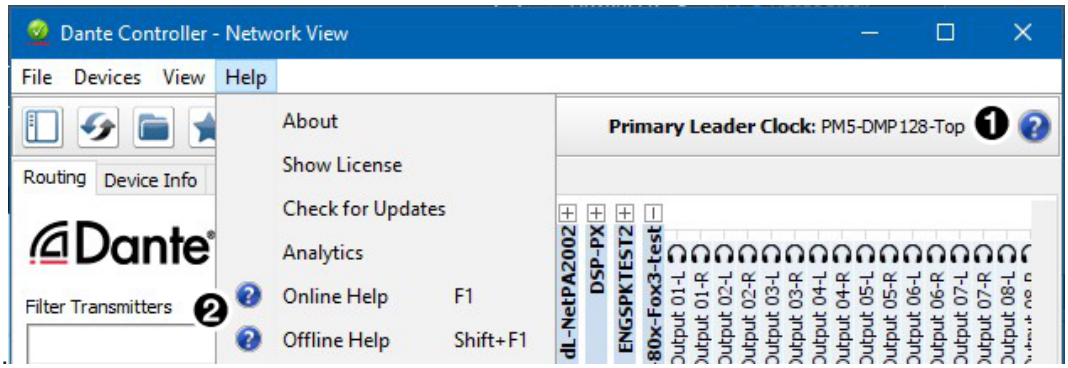


Figure 39. Accessing the Dante Help File

- Click the **`Help`** icon in the upper-right corner of the `Network View` screen (see figure 39, ❶).
- Select **`Help`**, then **`Online Help`** from the list (❷).
- Press the **`<F1>`** key on the computer keyboard for online help or **`<Shift+F1>`** for offline help.

Internal Web Pages

This section introduces using the Internal Web Page to operate the FOX3 matrix switcher, including:

- **Accessing the Internal Web Page**
- **Web Page Panels**

The matrix can be configured through its LAN port, or AV LAN port on the IPCP Pro control card, connected via a LAN or WAN using a web browser such as the Microsoft® Edge®. This chapter describes the factory-installed internal web pages, which are always available and cannot be erased or overwritten.

Accessing the Internal Web Page

Access the FOX3 Matrix Switcher internal web page as follows:

1. Connect the FOX3 device to a LAN or WAN using the rear panel RJ-45 LAN port (see **figure 2** on page 8), AV LAN port on the IPCP Pro control card (see **figure 8** on page 13), or front panel USB port (see **figure 9** on page 14).

   NOTE: If connected to the FOX3 Matrix through the IPCP Pro Matrix Q xi control card, use the AV LAN port. **DO NOT** use the LAN port.

2. Open a web browser on a PC connected on the same LAN or WAN.

   NOTE: Compatible web browsers are Microsoft® Edge®, Mozilla® Firefox®, Google Chrome™, and Apple® Safari®.

3. Enter the FOX3 Matrix IP address in the browser **`Address`** field.

   NOTE: If the FOX3 Matrix is connected to the front panel USB port, the hardcoded IP address is `203.0.113.22`. If connected to the rear panel AV LAN port, the FOX3 Matrix default IP address is `192.168.254.254`

4. Press the **`<Enter>`** key on the keyboard.
5. The FOX3 is password protected. Enter **`user`** or **`admin`** in the **`Username`** field.
6. Enter the password in the **`Password`** field when prompted (see figure 40).

   NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is **`extron`** for the `Admin` and `User` (see **Passwords Panel** on page 59 to change a password).

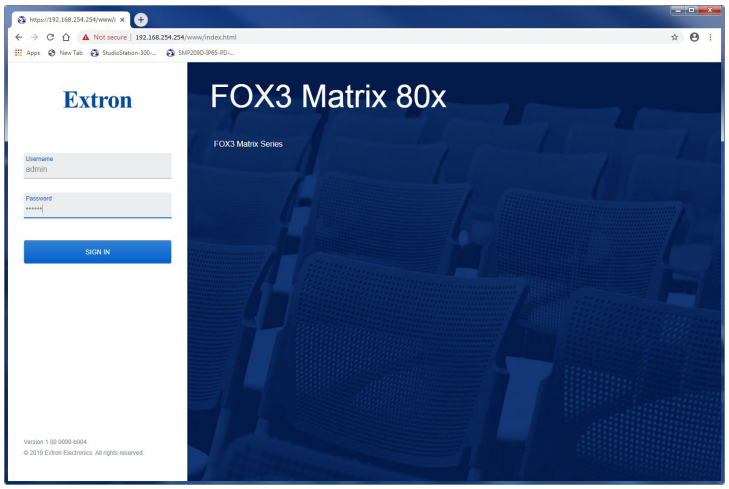


Figure 40. Network Password Prompt

7. Click the **`SIGN IN`** button. The internal web page opens (see **figure 41** on page 56).

Web Page Panels

The FOX3 Matrix internal web page (see figure 41) provides an overall, read-only view of the status of the switcher, with some editable fields for the following categories:

❶ **Details Panel**
❷ **Status Panel**
❸ **Date and Time Panel**
❹ **Network Panel**
❺ **Passwords Panel**
❻ **LinkLicense Panel**
❼ **Firmware Panel**
❽ **Dante Panel**

The panels that can be edited have an **EDIT** link to click to access the panel. To view general information about the FOX3 Matrix, click the **ABOUT** link (❾ see **About the FOX3 Matrix**).

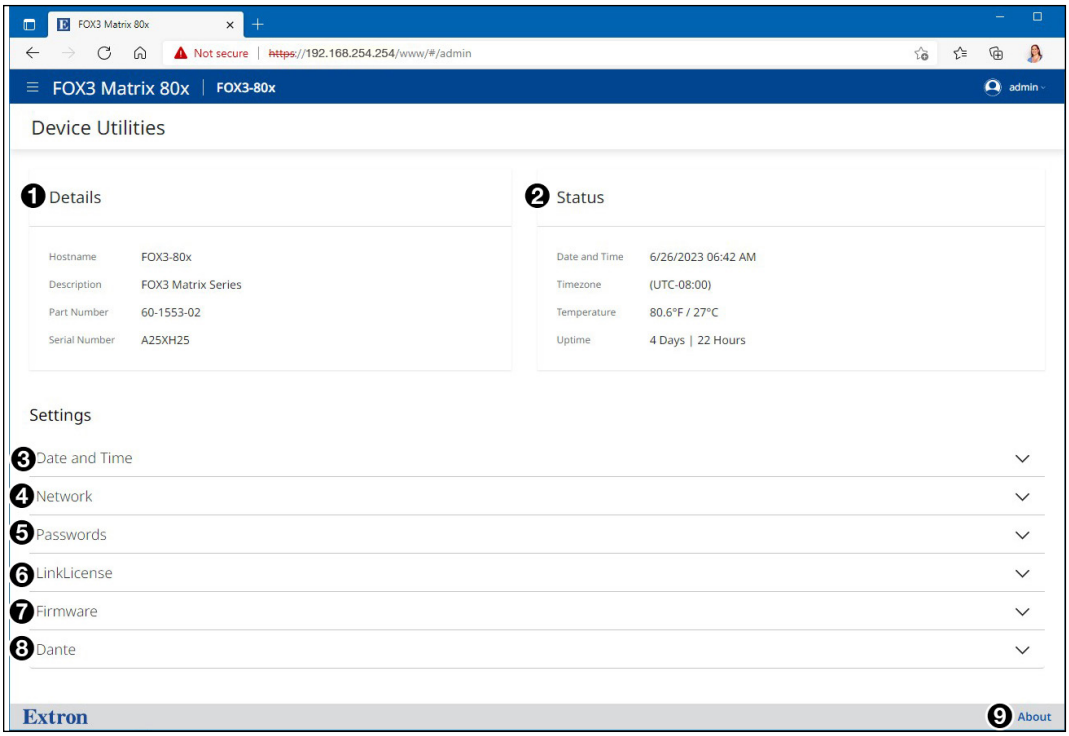


Figure 41. FOX3 Matrix Internal Web Page

The internal web page does not automatically update. To see an updated page, click the **Refresh** button on the web browser.

Details Panel

The Details panel (see figure 41, ❶) displays the device name, a brief product description, the part number, and the serial number. The name can be changed in the **Network Panel** (see page 58).

Status Panel

The Status panel (❷) displays the current date, time, time zone, internal temperature in degrees Fahrenheit and Celsius, and the amount of time the device has been running (Uptime). This information can be edited in the **Date and Time Panel** (see page 57).

Date and Time Panel

The Date and Time panel (see **figure 41**, ❸ on page 56) displays the mode used to set the date and time, the current date, and time. There are three options to set the date and time: manual mode, sync to NTP (Network Time Protocol) servers, and sync to the connected PC.

To set the date and time in Manual mode:

1. Click **EDIT** in the Date and Time panel. The editable fields are displayed (see figure 42).
2. Select the **Manual** radio button.
3. Edit the **Date/Time** as desired by typing in the date and time or using the calendar and clock.
4. Edit the **Timezone** as desired, using the drop-down list.
5. When finished editing, click **SAVE** to confirm your changes or **CANCEL** to close the window without making changes.
6. Alternatively, click **SYNC TO PC** to set the date and time according to your PC.

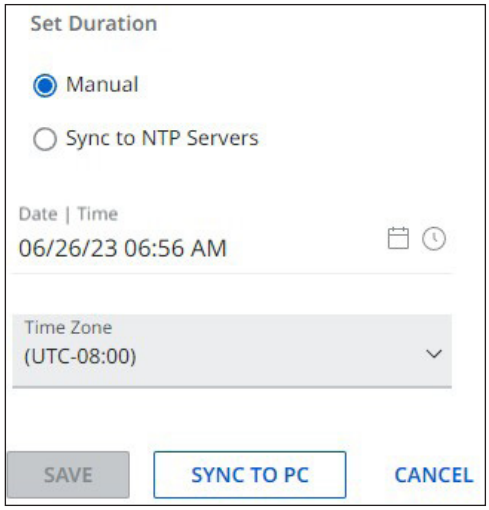


Figure 42. Manual Mode

To set the date and time in sync to NTP servers mode:

1. Click **EDIT** in the Date and Time panel. The editable fields are displayed (see figure 43).
2. Select the **Sync to NTP Servers** radio button.
3. Edit the **Time Zone** as desired, using the drop-down list.
4. Click in an **NTP Server** field and enter the IP address or host name of a desired NTP server.
5. When finished editing, click **SAVE** to confirm your changes or **CANCEL** to close the window without making changes.

To sync the date and time with your PC:

Click **SYNC TO PC** to set the date and time according to your PC.

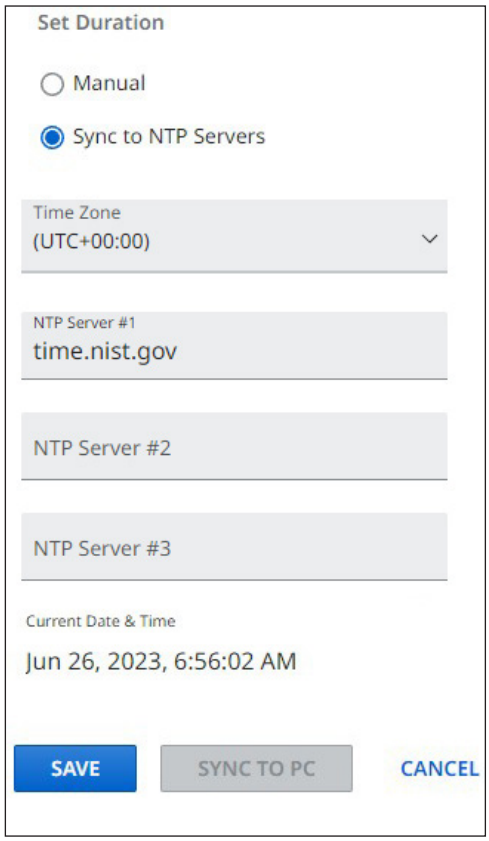


Figure 43. Sync to NTP Servers Mode

Network Panel

In the Network panel (see **figure 41**, ❹ on page 56), view the MAC address, change the device name, set the IP address, subnet mask, and DNS server for your FOX3, or turn DHCP On and Off.

To change the name:

1. Click **EDIT** in the Network panel. The editable fields are displayed (see figure 44).
2. Click in the **Device Name/Hostname** field and enter the desired device name.
3. When finished editing, click **SAVE** to confirm your changes or **CANCEL** to close the window without making changes.

To set the IP addresses:

1. Click **EDIT** in the Network panel. The editable fields are displayed
2. Edit the network settings as desired:
   a. Click the **DHCP** switch to toggle DHCP on and off. When DHCP is enabled (**On**), the unit configures its IP address and other network settings from the DHCP server. The default is **Off**.
   b. To set the network fields: **IP Address**, **Subnet Mask**, and **DNS Server**, click in the desired field and enter the address.
3. When finished editing, click out of the field and click **SAVE** to confirm your changes or **CANCEL** to close the window without making changes.

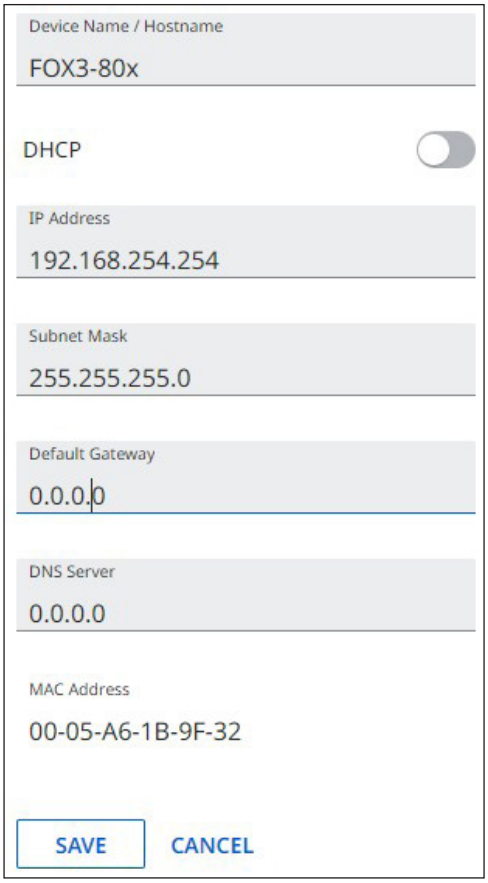


Figure 44. Network Panel

Passwords Panel

The `passwords` panel (see **figure 41**, ❺, on page 56) displays whether `Admin` and `User` passwords have been set and provides an option to set administrator or user passwords. It does not display the actual passwords.

NOTE: The following rules apply to passwords:

- Length is 1-128 characters.
- All human-readable characters are permitted except **|**.
- The password cannot be a single space.
- Passwords are case-sensitive.
- The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is **`extron`** for the `Admin` and `User`.

To assign a administrator and user passwords:

1. In the `Passwords` panel, click **`EDIT`**. The editable fields are displayed (see figure 45).

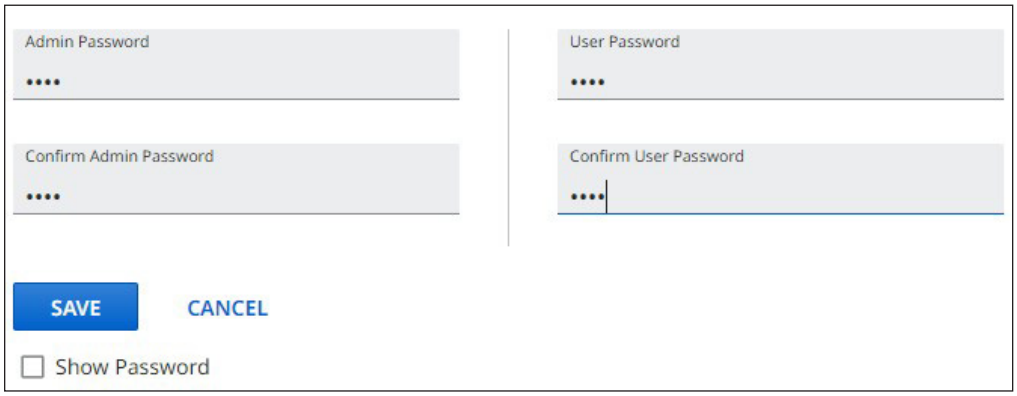


Figure 45. Roles and Permissions Panel

2. Click in the **`Admin Password`** field and enter the new administrator password.
3. Click in the **`Confirm Admin Password`** field and enter the password from the `Admin Password` field.
4. To assign a user password, repeat steps 2 and 3 in the `User` panel.
5. When finished, click **`SAVE`** to set the passwords. To close the window without saving a password, click **`CANCEL`**.

NOTE: Passwords can be changed but they cannot be removed entirely. The FOX3 must have passwords at all times. These fields cannot be blank.

LinkLicense Panel

The `LinkLicense` panel (see **figure 41**, ❻) displays information about any LinkLicense applied to the FOX3 device. A LinkLicense can be uploaded using the Extron Toolbelt software (see **Software/Firmware Installation** on page 38 and follow the instructions to download the software, selecting **`Toolbelt`** from the `Software` list).

NOTE: A user must have an Insider Account to download and use Toolbelt Software. Contact an Extron support representative, to obtain an Insider Account.



Figure 46. LinkLicense Panel

Firmware Panel

The Firmware panel (see **figure 41**, ❼, on page 56) displays the current firmware version and the date it was last updated. Update the firmware on the FOX3 Matrix from this panel (see **Software/Firmware Installation** on page 38 to download the firmware files).

To update firmware:

1. In the Firmware panel, click the **SELECT FILE** button (see figure 47).
2. In the Open dialog box, browse to locate the new firmware file on your computer (by default the file is stored at C:\Program Files (x86)\Extron\Firmware\FOX3 Matrix after being downloaded from the **Extron web page**).

   NOTE: Firmware files for FOX3 Matrix have a .eff extension. Do not attempt to load any other file types.
3. Double-click the firmware file name. The Open window closes, and the selected firmware file name appears in the Update Firmware panel on the web page.
4. Click **INSTALL** to begin.

   To cancel the update, click the **X** button in the Update Firmware panel.

   During the updating process, a window appears in the middle of the screen, showing messages giving the progress of the update: Initializing, Installing the Firmware, and Rebooting Device.

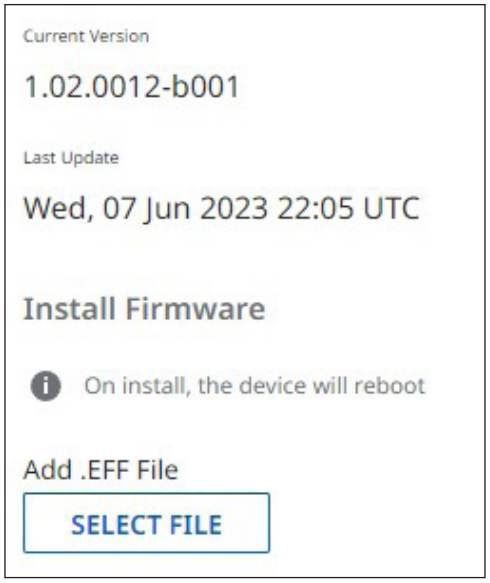


Figure 47. Firmware Panel

When the update is completed, the message window closes and the message Firmware Upload Complete appears near the top of the screen. The new firmware filename appears beside Version in the Firmware panel.

Dante Panel

The Dante panel (see **figure 41**, ❽) displays the device Name and firmware Version of a Dante device connected to the FOX3 Matrix.

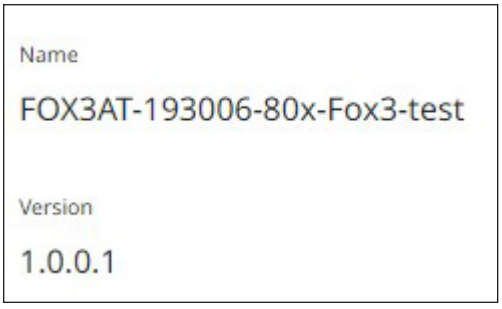


Figure 48. Dante Device Info Panel

About the FOX3 Matrix

Click on the **ABOUT** link (see **figure 41**, ❾ on page 56) to open the About dialog box to view general information about the FOX3 Matrix, such as the firmware version, copyright, part number, licenses, patents and web page version. Click on the **View the End User License Agreement** link to view the user licenses.

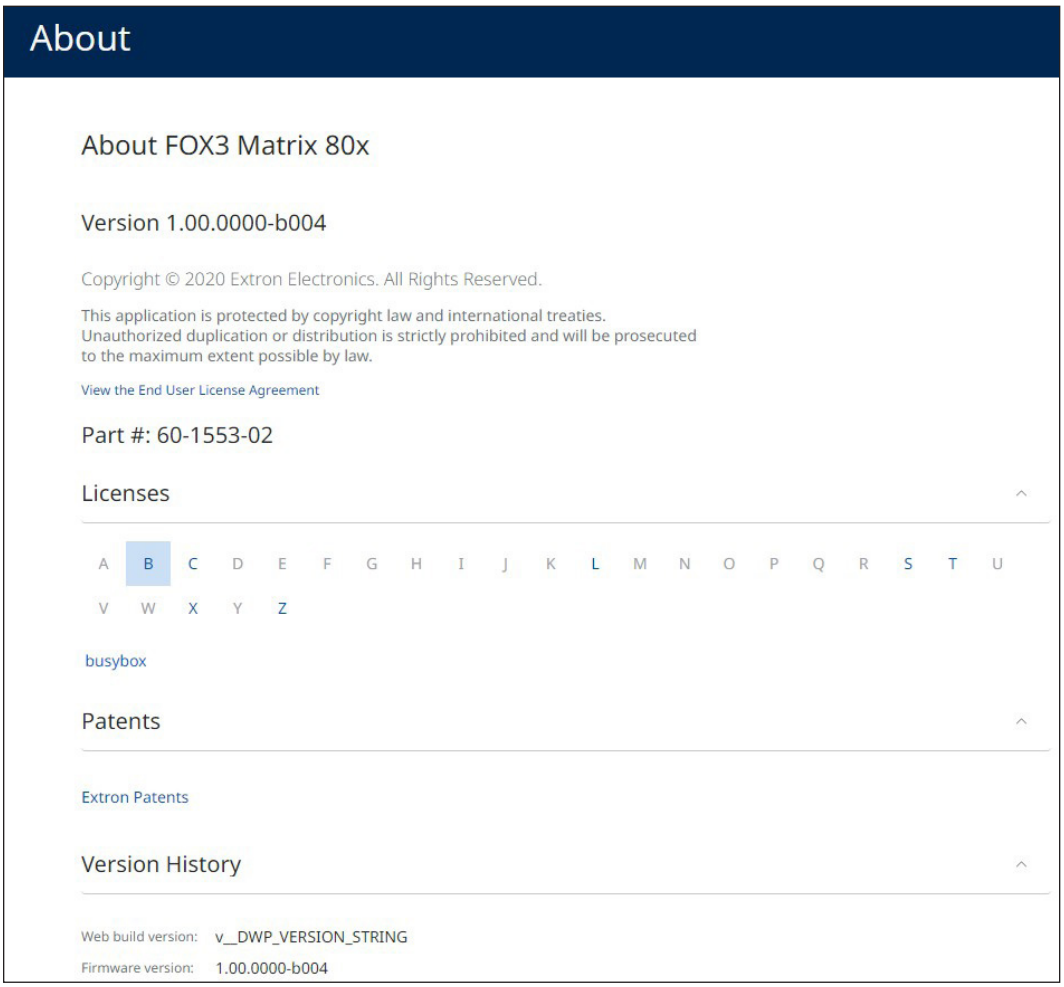


Figure 49. About Panel

Maintenance and Modifications

This section provides procedures for maintaining and modifying the FOX3 matrix switchers, including:

- **Mounting the Switcher**
- **Battery and Power Precautions**
- **FOX3 Matrix Replacement Cards**
- **Removing and Installing a Module**
- **IEEE 802.1X Certificates**
- **SNMP**
- **Best Practices for Cleaning Your Extron Products**

ATTENTION:

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

Mounting the Switcher

All FOX3 Matrix models are housed in rack-mountable, metal enclosures with mounting flanges for standard 19-inch wide racks.

UL Guidelines

The following Underwriters Laboratories (UL) guidelines pertain to the installation of the FOX3 Matrix switcher into a rack:

CAUTION:

- **Elevated operating ambient temperature** — If the equipment is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature specified by Extron (Tma = +32 to +122°F [0 to +50°C]).
- **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.
- **Mechanical loading** — Mount the equipment in the rack so that uneven mechanical loading does not create a hazardous condition.
- **Circuit overloading** — Consider 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. Use appropriate consideration of equipment nameplate ratings when addressing this concern.
- **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).

Consignes UL pour le montage en rack

Les consignes UL (« Underwriters Laboratories ») suivantes concernent l'installation en rack d'un boîtier FOX3 Matrix :

ATTENTION :

- **Température ambiante élevée** — En cas d'installation de l'équipement dans un rack fermé ou composé de plusieurs unités, la température du rack peut être supérieure à la température ambiante. Par conséquent, il est préférable d'installer l'équipement dans un environnement qui respecte la température ambiante maximale (Tma = +32 to +122°F [0 to +50°C]) spécifiée par Extron.
- **Réduction du flux d'air** — Si l'équipement est installé dans un rack, veillez à ce que le flux d'air nécessaire pour un fonctionnement sécurisé de l'équipement soit respecté.
- **Charge mécanique** — Installez l'équipement en rack de manière à éviter toute situation dangereuse causée par le déséquilibre de la charge mécanique.
- **Surcharge électrique** — Lorsque vous connectez l'équipement au circuit d'alimentation, observez la connexion de l'équipement et étudiez les effets possibles d'une surcharge du circuit sur les protections contre les surintensités et les conducteurs d'alimentation. Consultez à cet égard les indications de la plaque d'identification de l'équipement.
- **Mise à la terre** — Assurez-vous que l'équipement est correctement mis à la terre. Accordez une attention particulière aux connexions électriques autres que les connexions directes au circuit de dérivation (ex. : les multiprises).

Mounting Instructions

If desired, rack mount the switcher as follows:

1. Insert the unit into the rack, aligning the mounting bracket holes with those in the rack.
2. Secure the switcher to the rack using the supplied bolts.

Battery and Power Precautions

The Matrix Switcher is provided with a permanently installed (factory-soldered in place) lithium battery. The battery maintains the real time clock in the event of power failure or extended storage periods and does not affect the normal operation of the switcher. If the battery becomes ineffective, return the switcher to Extron for repair.

The two power supply modules (primary and redundant) are identical. Each power supply module has a 2-color status LED, visible on the front panel, that indicates the status of the power supply outputs. If the LED is lit green, the power supply is operating normally. If the LED is lit red, the supply has failed and should be replaced at the earliest opportunity.

WARNING: There is a danger of explosion if the battery is incorrectly replaced. Do not attempt to remove or replace the internal battery.

AVERTISSEMENT : Si la pile est mal remplacée, il y a un risque d'explosion. N'essayez pas de retirer ou de remplacer la batterie interne.

FOX3 Matrix Replacement Cards

Following are instructions to remove and replace I/O modules, fan assemblies and power supplies. For many of the FOX3 Matrix frames, the parts are interchangeable, but not for all of the frames. Below is a table with asterisks (*) and pound signs (#) indicating the frames and their interchangeable parts.

	FOX3 24x	FOX3 40x	FOX3 80x	FOX3 160x	FOX3 320x	FOX3 560x	FOX3 840x
8 port fiber I/O card MM		*	*	*	*	*	*
8 port fiber I/O card SM		*	*	*	*	*	*
Power supply			*	*		#	#
Fan assembly			*		*	#	#
Controller card	NA	*	*	*		#	#
Audio card	NA	*	*	*		*	*

* Indicates the frames that share the same part
# Indicates the frames that share the same part

Removing and Installing a Module

The I/O module, power supply, fan assembly, control card, and audio card can all be replaced by the user. Input/Output modules can be added or removed to increase or decrease the I/O configuration (size) of the switcher. The control card can be replaced or upgraded with the IPCP Pro Q xi controller. The power supply, fan assembly, and audio card can be replaced.

WARNING: The FOX3 matrix switchers fiber optic I/O boards output continuous invisible light (Class 1 rated), which may be harmful to the eyes; use with caution.

Do not look into the fiber optic cable connectors or into the fiber optic cables themselves. Plug the attached dust cap into the optical transceiver when the fiber optic cable is unplugged.

AVERTISSEMENT : Les cartes d'E/S fibre optique FOX3 émettent une lumière invisible continue, qui peut être dangereuse pour les yeux ; à utiliser avec précaution.

Ne regardez pas dans les connecteurs de câble fibre optique sur le panneau arrière ou dans les câbles fibre optique eux-mêmes. Branchez la protection contre la poussière dans l'ensemble émetteur/récepteur lorsque le câble fibre optique est débranché.

NOTES:

- As factory configured, the fiber optic I/O boards are either 100 percent singlemode or 100 percent multimode, but a fiber optic transceiver module (one input and one output) of one transmission mode can be removed and replaced with a block of the other transmission mode.
- Transmission mode transceiver modules can be mixed on a fiber optic I/O board, provided each fiber cable and connected devices are the appropriate transmission mode for the transceiver module. Typically, singlemode fiber has a yellow jacket and multimode cable has an orange or aqua jacket.
- For proper cooling and air flow, boards or blank panels should be installed in all locations during normal switcher operations.
- The I/O boards are hot-swappable. You do not need to power down the switcher to remove or install an I/O board.
- The diagram shows the 40x frame, which is similar in function to all matrix frames.

ATTENTION:

- Do not touch the electronic components or the connectors on the backplane or on the circuit boards without being electrically grounded. Handle circuit boards by their edges only. Electrostatic discharge (ESD) can damage circuits even though you cannot feel, see, or hear it.
- Ne pas toucher les composants électroniques ou les connecteurs sur la carte mère ou sur les circuits imprimés sans être électriquement relié à la terre. Manipuler les circuits imprimés en les tenant seulement par leurs bords. Les décharges électrostatiques peuvent endommager les puces de circuit même si vous ne pouvez pas les sentir, les voir ou les entendre.

- Disconnect both power supply cords before servicing.
- Débranchez les deux câbles de la source d'alimentation avant l'entretient.

- Thumbscrews should be tightened with a tool after both initial installation and subsequent access to the panel.
- Les vis doivent être serrées avec un outil adapté après la première installation et l'accès postérieur au panneau.

Remove and replace as follows:

1. Disconnect any connected cables.
2. Rotate the left and right captive panel screws to completely loosen the screws (see figure 50, **figure 51** and **figure 52** on page 66, and **figure 53** on page 67).
3. Gently pull on the captive panel screws to loosen the module from the backplane.
4. Slide the module out of the chassis.
5. Place the removed module on an anti-static surface or in an anti-static container.
6. Align the replacement module with the left and right chassis guides.
7. Gently slide the replacement module into the enclosure. Slide the replacement module toward the front panel until it meets resistance.
8. Gently seat the replacement module into the backplane.
9. Use a screwdriver to tighten the left and right captive panel screws to lock the replacement module in place.

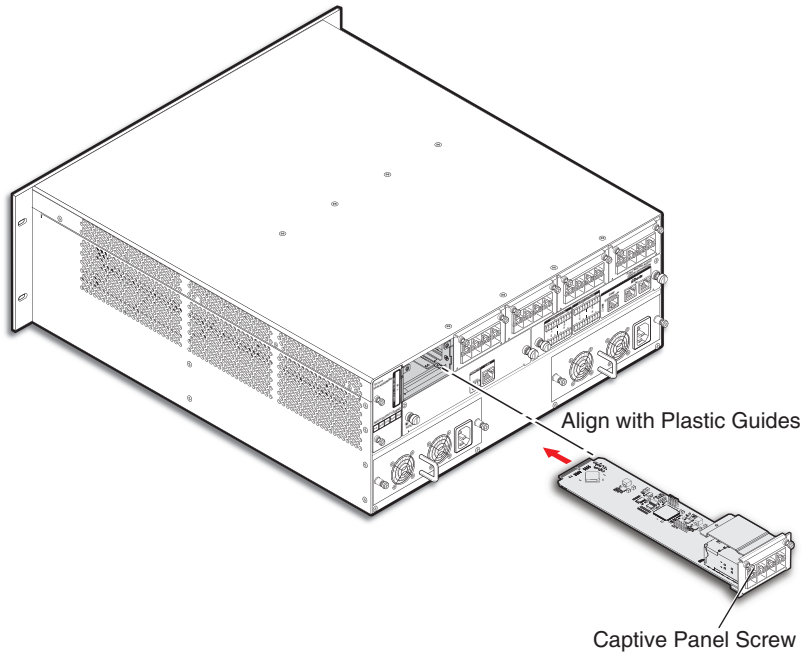
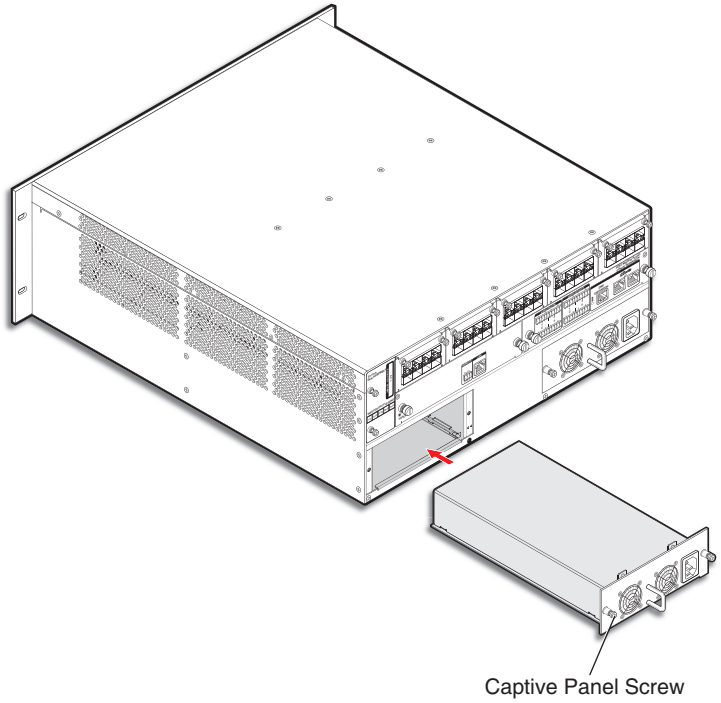


Figure 50. I/O Board Replacement



NOTES:

- The power supply modules are hot-swappable. Either power supply can be removed or installed without powering down the switcher.
- Power supply modules are not interchangeable between all FOX3 matrix models.
- The diagram shows the 40x frame, which is similar in function to all matrix frames.

Figure 51. Power Supply Replacement

If a fan fails, the fan assembly should be replaced at the earliest opportunity. Each matrix has a number of fans:

- FOX3 Matrix 24x has 3 fans
- FOX3 Matrix 40x has 4 fans
- FOX3 Matrix 80x has 3 fans
- FOX3 Matrix 160x has 6 fans
- FOX3 Matrix 320x has 9 fans
- FOX3 Matrix 560x has 15 fans
- FOX3 Matrix 840x has 24 fans

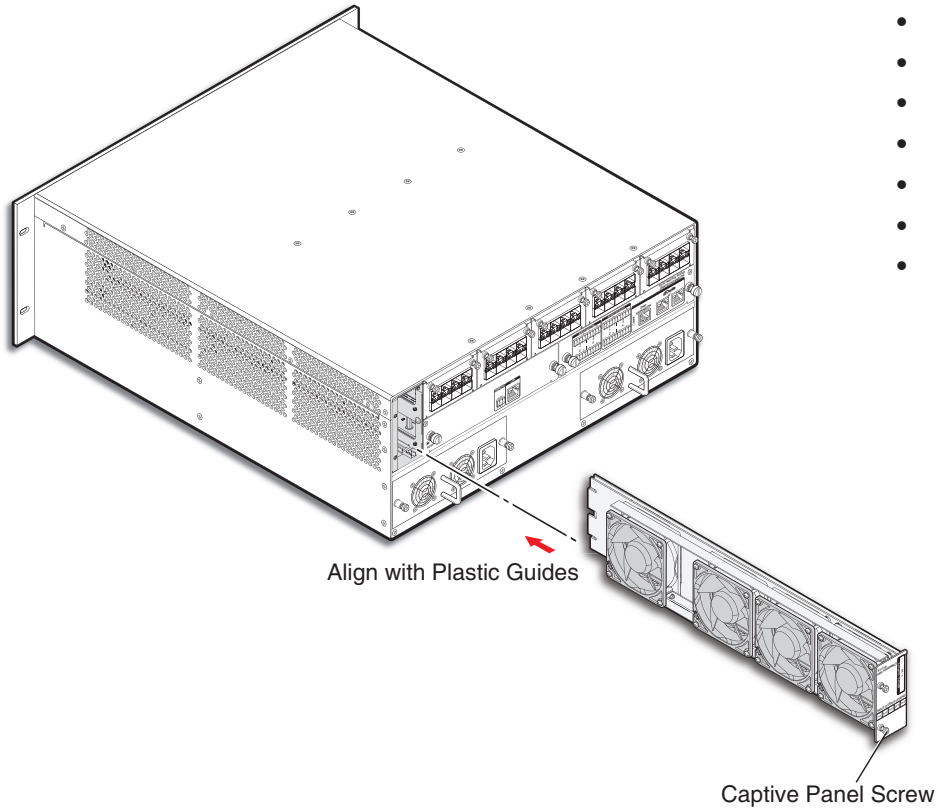


Figure 52. Fan Assembly Replacement

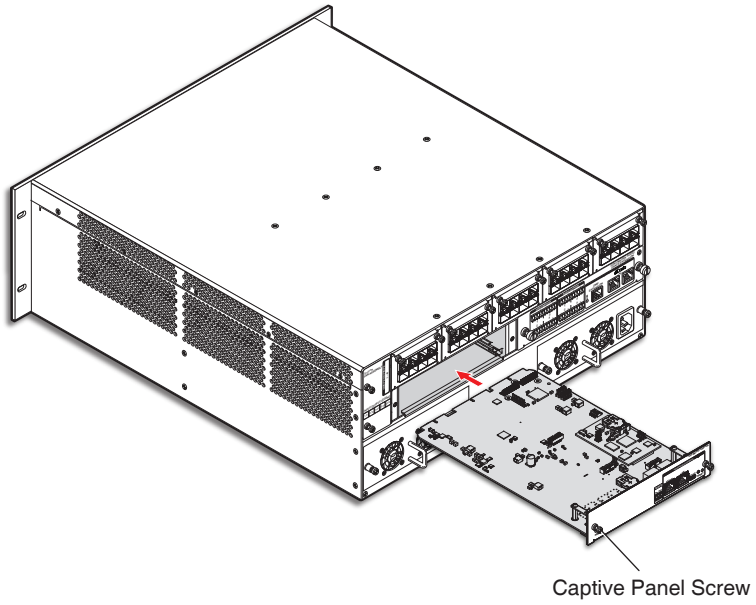


Figure 53. Control Card Replacement

IEEE 802.1X Certificates

IEEE 802.1X is a standard that enables port-based network access control via an authentication server. The protocol requires that all devices must be authenticated before gaining privileges to access the secure part of the network.

The Extron implementation of 802.1X supports PEAP - MSCHAPV2 and EAP - TLS methods of authentication. This section of the guide details the requirements for any certificate file (machine or CA) and the private key file (for the machine certificate) to be used in the system.

Extron provides resources for learning about 802.1X implementation:

- The *Extron 802.1X Technology Reference Guide*, available from **www.extron.com**, is the primary resource for background information, system planning, topology, and how to set up these systems.
- The *Toolbelt Help File* provides detailed step-by-step information on using the software to set up 802.1X and troubleshooting.
- The 802.1X Primer white paper, also available from **www.extron.com**, provides a general overview of the protocol and its use within a FOX3 Matrix.

NOTES:

- Toolbelt must be run as an administrator.
- Machine certificates require a private key file, which can be encrypted. If the default HTML page does not display after 10 minutes, close the web browser and reopen.

Certificate File Requirements

PEM (Privacy-enhanced Electronic Mail) file types are ASCII encoded, and they are the required format for 802.1X authentication for the FOX3 devices. DER (Distinguished Encoding Rules) file types are binary encoded and can typically have several file extension variations, such as `.crt` and `.cer`.

NOTE: DER encoded files (with `.der`, `.crt`, or `.cer` extensions that are encoded in DER binary format) must be converted to a PEM encoded file type (`.pem`) before being used for authentication.

DER encoded certificates must be converted to PEM encoding using a third-party tool. Contact your IT administrator for more information on required tools.

To create the 802.1X security certificate for uploading to Extron FOX3 devices, ensure that the certificate file meets the following requirements:

- It contains X.509 certificate information.
- It contains a private key (for machine certificates only).
- It is PEM encoded.
- It has a file extension that is `.crt` or `.pem`.
- Its file name consists of the following types of valid characters:
- Alphanumerical (A-Z, a-z, 0-9) characters.
- Some special characters (colon [:], underscore [_], and hyphen [-]).

NOTE: Spaces are not permitted anywhere in the name.

Private Key File Requirements

Private key files are required only when employing machine certificates. Follow these requirements for creating a private key:

- Its file name consists of the following types of valid characters:
- Alphanumerical (A-Z, a-z, 0-9) characters.
- Some special characters (colon [:], underscore [_], and hyphen [-]).
- It has a file extension that is .key or .pem.
- It can have optional encryption (via password or passphrase).

SNMP

Extron FOX3 devices support Simple Network Management Protocol (SNMP). SNMP facilitates the exchange of basic network management information between network devices. It helps in monitoring of operations and factors such as packet usage, memory usage, remote password resets, and collection of error information. An information technology administrator can use common IT tools to monitor those factors, as well as look up device location and the name of the contact person for the device.

The SNMP controls within Toolbelt provide a way to enable or disable SNMP. It also allows you to specify related information such as the name of a contact person, the physical location of the unit, and a community name. The text that is specified in these fields is seen by the network community when the unit is queried.

Extron FOX3 devices support the following security levels:

- Management Information Base 2 (MIB-II)
- SNMPv2a

Best Practices for Cleaning Your Extron Products

There may be times when it becomes necessary to clean your Extron product. Plastic surfaces and cosmetic finishes can be damaged by long term exposure to chemicals. Therefore, Extron recommends the following guidelines when cleaning our products.



All Extron products can be safely cleaned with:

1. 70% concentration or higher Isopropyl Alcohol
2. Disinfectant cleaners that:
   - Are non-ammonium based
     (for example, contains no ammonium chloride)
   - Contain 2% or less sodium hypochlorite
     (for example, 2% bleach, 98% water)

It is important to follow these general guidelines when cleaning:

1. If possible, unplug the device.
2. Spray the cleaner on a lint-free cloth until the cloth is damp.
3. Do not spray the cleaner directly onto the product.
4. Gently clean the product surface using the cloth.

Your health and safety are our top priority. Keeping devices clean, especially those in high-traffic environments and high-use applications, is a crucial step in minimizing the spread of infections. Please contact us if you have any questions about the guidelines or if you have a question about cleaning the product.

Extron Warranty

Powered Product Warranty

Extron warrants its powered products against any defects in materials and workmanship for a period of three years from the date of invoice. In the event of a malfunction during the warranty period, Extron will repair or replace a product to its original operating condition.

To assure the highest level of service, a return authorization number must be obtained from Extron before products are returned for service. Products must be shipped to Extron, prepaid along with proof of purchase ONLY after obtaining a Return Authorization (RA) number from the Extron Customer Support department.

This statement of policy is in lieu of any other policy expressed or implied and no representative or person is authorized to assume any other liability or adopt any other policy for Extron Electronics without our written consent.

Powered Product Warranty Exceptions

Everlast™ Power Supplies — Extron warrants Everlast power supplies against any defects in materials and workmanship for a period of seven years from the date of invoice. In the event of a malfunction during the warranty period, Extron will repair or replace the power supply to its original operating condition. Extron engineers will examine the returned product and determine whether the Everlast Power Supply Warranty or Powered Product Warranty applies.

Speakers — Extron warrants Flat Field®, SoundField®, SpeedMount®, Column Array, and System *INTEGRATOR*® speakers against any defects in materials and workmanship for a period of five years from the date of invoice.

Touchscreens — Extron warrants touchscreen display and overlay components against any defects in materials and workmanship for a period of one year from the date of invoice.

Annotator 300 — Extron warrants the Annotator 300 against any defects in materials and workmanship for a period of five years from the date of invoice.

Non-Powered and Cable Products - Lifetime Limited Performance Warranty

Extron warrants that its non-powered products and cable products will be free from defects in material and workmanship for as long as you or your customer owns the product. All Extron non-powered products and cables are designed and engineered to meet and exceed performance specifications. If, at anytime, the product fails due to manufacturer defect, Extron will repair or replace the product to ensure that it meets original performance specifications. Reduced performance due to normal wear and tear, or damages caused by misuse or negligence will not be covered. Extron will test and evaluate all non-powered and cable products claimed defective.

To assure the highest level of service, a return authorization number must be obtained from Extron before products are returned for service. Products must be shipped to Extron, prepaid along with proof of purchase ONLY after obtaining a Return Authorization (RA) number from the Extron Customer Support department.

This statement of policy is in lieu of any other policy expressed or implied and no representative or person is authorized to assume any other liability or adopt any other policy for Extron Electronics without our written consent.

Non-Powered and Cable Product Warranty Exceptions

Cable Cubby, Hideaway Surface Access Enclosures and Retractors — Extron warrants Cable Cubby cable access enclosures, HSA Hideaway Surface Access enclosures, and Retractor cable retraction modules for a period of three years from the date of invoice.

Active Cables and Active Adapters — Extron warrants active cables and active adapter cables for a period of three years from the date of invoice.

Cable Termination Tools and Dies — Extron warrants cable termination tools for a period of three years from the date of invoice, excluding the die.

General

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. 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.

Return Information

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.

NOTE: To assure the highest level of service, a return authorization number must be obtained from Extron before products are returned for service. Products must be shipped to Extron, prepaid along with proof of purchase **only** after obtaining a Return Authorization (RA) number from the Extron Customer Support department.

Please contact Extron to receive an RA (Return Authorization) number:

USA:	714.491.1500 or 800.633.9876	**Asia**:	65.6383.4400
Europe:	31.33.453.4040 or 800.3987.6673	**Japan**:	81.3.3511.7655
Africa and Middle East:	971.4.299.1800	**China**:	4000.398766

Worldwide Headquarters: Extron USA West, 1025 E. Ball Road, Anaheim, CA 92805, 800.633.9876