

## Fiber Optic Matrix Switchers

# FOX3 Matrix Series

Configurable Fiber Optic Digital Matrix Switcher



# 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](http://www.extron.com).

## Sicherheitsanweisungen • Deutsch

**WARNUNG:** Dieses Symbol ⚠ auf dem Produkt 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](http://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 recogidas en la documentación proporcionada con el equipo.

Para obtener información sobre directrices de seguridad, cumplimiento de normativas, compatibilidad electromagnética, accesibilidad y temas relacionados, consulte la Guía de cumplimiento de normativas y seguridad de Extron, referencia 68-290-01, en el sitio Web de Extron, [www.extron.com](http://www.extron.com).

## 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 le matériel.

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](http://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.

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

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](http://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](http://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.

**ВНИМАНИЕ:** Данный символ, ⚠, если указан на продукте, предупреждает пользователя о наличии важных инструкций по эксплуатации и обслуживанию в руководстве, прилагаемом к данному оборудованию.

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](http://www.extron.com), номер по каталогу - 68-290-01.

## 安全说明 • 简体中文

**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](http://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, 產品機殼內存在著可能會導致觸電之風險的未絕緣危險電壓。

**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](http://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。

**注意:** この記号 ⚠️ が製品上に表示されている場合は、本機の取扱説明書に記載されている重要な操作と保守(整備)の指示についてユーザーの注意を喚起するものです。

安全上のご注意、法規遵守、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](http://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

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

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

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

## Copyright

© 2020 Extron Electronics. All rights reserved. [www.extron.com](http://www.extron.com)

## Trademarks

All trademarks mentioned in this guide are the properties of their respective owners.

The following registered trademarks (®), registered service marks (SM), and trademarks (TM) are the property of RGB Systems, Inc. or Extron Electronics (see the current list of trademarks on the [Terms of Use](http://www.extron.com) page at [www.extron.com](http://www.extron.com)):

Registered Trademarks (®)
Extron, Cable Cubby, ControlScript, CrossPoint, DTP, eBUS, EDID Manager, EDID Minder, Flat Field, FlexOS, Glitch Free, Global Configurator, Global Scriptor, GlobalViewer, Hideaway, HyperLane, IP Intercom, IP Link, Key Minder, LinkLicense, LockIt, MediaLink, MediaPort, NAV, NetPA, PlenumVault, PoleVault, PowerCage, PURE3, Quantum, ShareLink, Show Me, SoundField, SpeedMount, SpeedSwitch, StudioStation, System INTEGRATOR, TeamWork, TouchLink, V-Lock, VideoLounge, VN-Matrix, VoiceLift, WallVault, WindoWall, XPA, XTP, XTP Systems, and ZipClip
Registered Service Mark (SM) : S3 Service Support Solutions
Trademarks (TM)
AAP, AFL (Accu-RATE Frame Lock), ADSP (Advanced Digital Sync Processing), Auto-Image, AVEdge, CableCover, CDRS (Class D Ripple Suppression), Codec Connect, DDSP (Digital Display Sync Processing), DMI (Dynamic Motion Interpolation), Driver Configurator, DSP Configurator, DSVP (Digital Sync Validation Processing), eLink, EQIP, Everlast, FastBite, Flex55, FOX, FOXBOX, IP Intercom HelpDesk, MAAp, MicroDigital, Opti-Torque, PendantConnect, ProDSP, QS-FPC (QuickSwitch Front Panel Controller), Room Agent, Scope-Trigger, SIS, Simple Instruction Set, Skew-Free, SpeedNav, Triple-Action Switching, True4K, True8K, Vector™ 4K, WebShare, XTRA, and ZipCaddy

## 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 Electronics 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 entretien, celui-ci doit être fait par Extron Electronics 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:

```
^ARMerge 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 slanted form as shown here:

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

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

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

## Specifications Availability

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

## Extron Glossary of Terms

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



# Contents

---

## Introduction ..... 1

About this Guide.....	1
About the FOX3 Matrix Switchers .....	1
Fiber Optic I/O Boards.....	3
Audio I/O Board.....	3
Controller Board .....	3
Fiber Cable Transmission Modes .....	4
Features .....	4

---

## Installation ..... 7

Setup and Installation Checklist .....	7
Get Ready .....	7
Configure the Matrix Switcher .....	7
Perform Physical Installation .....	7
Rear Panel Boards, Cabling, and Features.....	8
I/O Boards.....	9
Cooling Fan Assembly .....	10
Ethernet Connection.....	10
Remote Port .....	11
Reset Button and LED.....	11
Power Supply Modules.....	12
Audio Connections .....	12

---

## Operation..... 13

Front Panel Features.....	13
Power.....	14
Matrix Operations .....	14
Secure Direct Port Access.....	14
Reset Operations.....	15
Performing Soft System Resets (Resets 3, 4, and 5) .....	17
Performing a Hard Reset (Reset 1).....	17
Troubleshooting .....	17

---

## SIS Configuration and Control ..... 18

Connections Options.....	18
Rear Panel RS-232 Port .....	18
Front Panel Configuration Port.....	18
Ethernet (LAN) Port.....	19
Establishing a Connection.....	19
Using Verbose Mode .....	20
Host-to-Switcher Instructions .....	20
Switcher-initiated Messages .....	20
Switcher Error Responses .....	21
Using the Command and Response Tables .....	22
System Definitions.....	23
Command and Response Table for SIS Commands .....	24

---

## Product Configuration Software..... 29

Product Configuration Software.....	29
Software Operation via Ethernet .....	29
Software/Firmware Installation .....	30
Connecting to PCS.....	32
Device Discovery Panel.....	32
TCP/IP Panel.....	33
Offline Device Preview.....	34
Software Overview.....	35
Software Menu .....	35

---

## Internal Web Pages ..... 40

Accessing the Internal Web Page .....	40
Disabling Compatibility Mode.....	41
Web Page Panels .....	41
Device Info Panel.....	42
Device Status Panel.....	43


Network Settings Panel .....	43
Firmware Panel.....	44
Roles and Permissions Panel.....	45
Dante Device Info Panel.....	46
About the FOX3 Matrix .....	46

---

**Maintenance and Modifications ..... 47**

Mounting the Switcher.....	47
UL Guidelines .....	47
Mounting Instructions .....	48
Battery and Power Precautions .....	48
FOX3 Matrix Replacement Cards.....	48
Removing and Installing an I/O Module.....	49
Removing and Installing a Power Supply Module .....	51
Removing and Installing a Fan Assembly .....	52

# 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

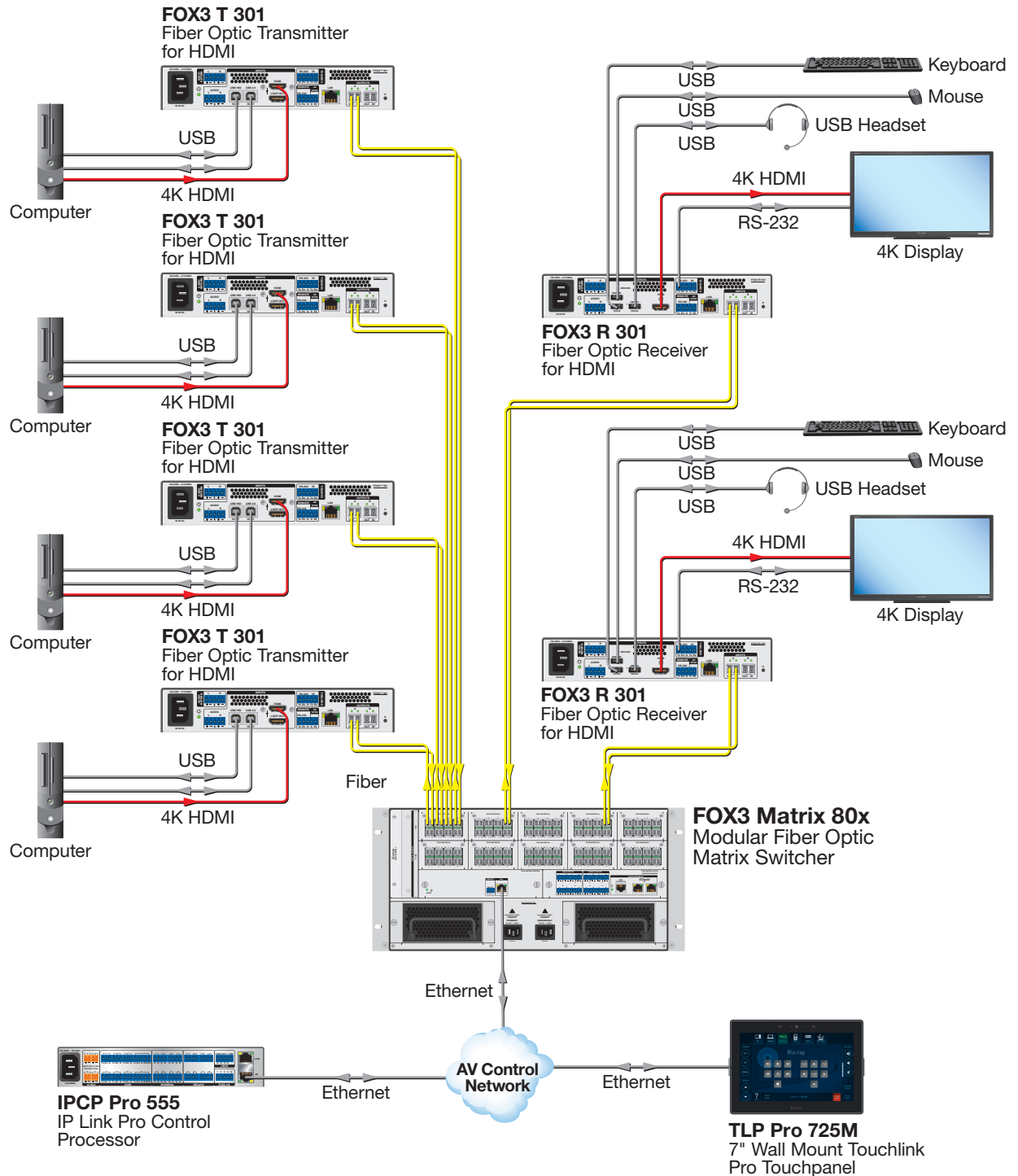
This guide contains installation, configuration, and operating information for the Extron FOX3 Matrix Switchers. These customizable matrix switchers support Extron fiber optic endpoints (transmitters and receivers) up to:

- **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.

## 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.**



**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 matrix switchers are housed in rack-mountable, high metal enclosures with mounting flanges for a standard 19-inch rack. 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.

**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, and transmitter-to-receiver RS-232 serial communications. The FOX3 transmitters 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.

## 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 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

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 320-input by 320-output matrix for the FOX3 Matrix 320x.

**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.

## 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
- **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.
- **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 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.
- **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.
- **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 bi-directional 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 Settings Panel](#) on page 43).

### Configure the Matrix Switcher

- Install the desired I/O boards (see [Removing and Installing an I/O Module](#) on page 49).
- Install the Product Configuration Software (PCS) (see [Software/Firmware Installation](#) on page 30).
- (Optional) Upload a System Map (see the *FOX3 Matrix Series PCS Help File*).

### Perform Physical Installation

- If desired, install the switcher in a rack (see [Mounting the Switcher](#) on page 47 ).
- Cable input and output devices to the I/O boards (see [Rear Panel Boards, Cabling, and Features](#) on page 8).
- 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).
  - Front panel USB Configuration port (see [Front Panel Configuration Port](#) on page 18).
- Connect power (see [Power](#) on page 14).
- Test the switcher by creating a tie (see [Output switching](#) on page 24).

## Rear Panel Boards, Cabling, and Features

### 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.



**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.

**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.

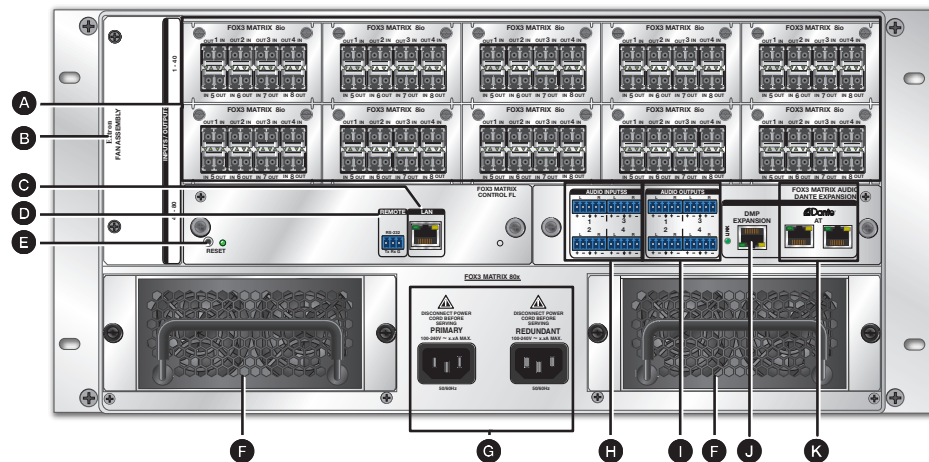


Figure 2. FOX3 Matrix 80x Fiber Optic Matrix Switcher Rear Panel

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

## 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.

### A Fiber optic boards with connectors and LEDs — (see [figure 2](#))

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

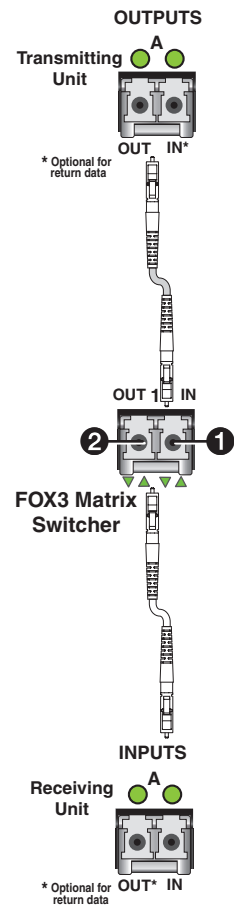
**NOTE:** For USB, return audio, and serial RS-232 (receiver-to-transmitter) function, connect the far end to the optical Out connector on a FOX receiver.

**Input LED** — See [Fiber optic I/O board LED indications](#) on page 10.

- 2 **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.

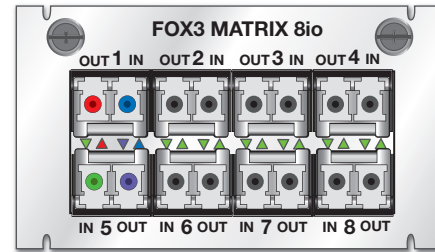
**Output LED** — See [Fiber optic I/O board LED indications](#) on page 10.



## 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

- B Replaceable fan assembly** (see [figure 2](#) on page 8) — This removable fan assembly has multiple fans (see [Removing and Installing a Fan Assembly](#) on page 52 to replace the fan assembly).

## Ethernet Connection

- C 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 18 or [Product Configuration Software](#) on page 29 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, or CAT 6, 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.

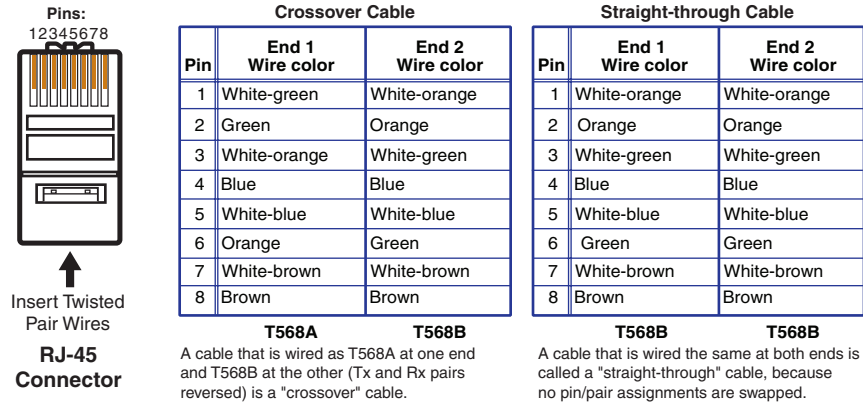
The cable used depends on your network speed. The unit supports:

- 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).

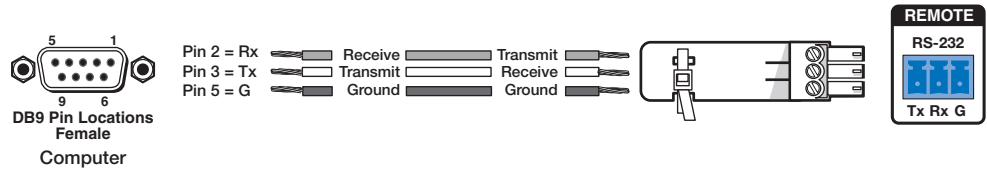
- **Crossover cable** — Direct connection between the computer and the FOX3 matrix switcher.
- **Patch (straight) cable** — Connection of the FOX3 Matrix Switcher to an Ethernet LAN.



**Figure 4. RJ-45 Connector and Pinout Tables**

## Remote Port

- **Remote RS-232 port** — 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 18 for definitions of the SIS commands (serial commands to control the switcher via this connector) and [Product Configuration Software](#) on page 29 for details on how to install and use the control software.

## Reset Button and LED

- **Reset button and LED** — Initiate four 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 15 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** (see [figure 2](#) on page 8) — The Primary and Redundant power supplies are hot-swappable (see [Removing and Installing a Power Supply Module](#) on page 51 to replace power supplies).

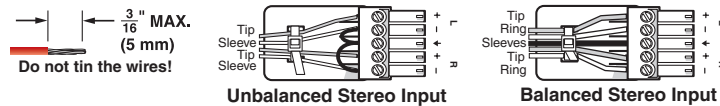
There are two corresponding LEDs on the front panel that indicate the status of each power supply (see [Front Panel Features](#) on page 13).

- 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.

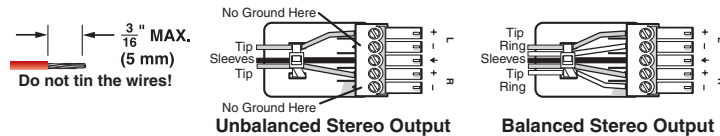
## Audio Connections

- H Audio Inputs** — 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.

Download and install the latest version of Dante Controller for Windows from the Dante Controller product page (see [Software/Firmware Installation](#) on page 30).

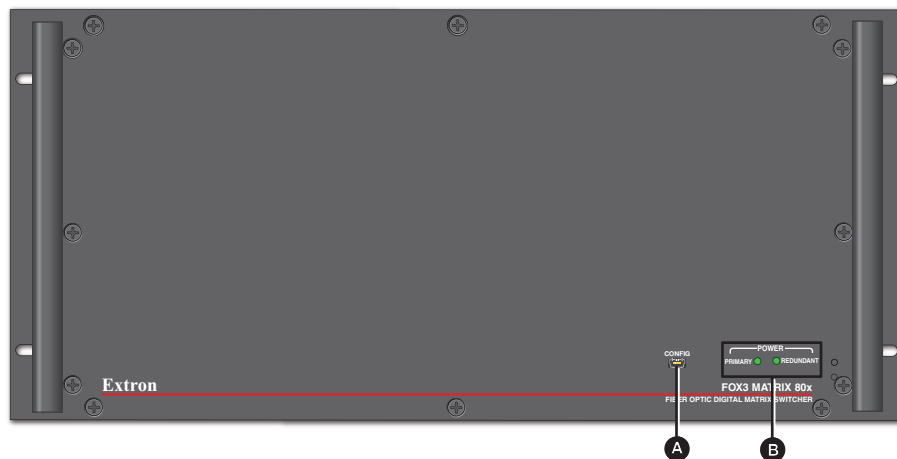
# Operation

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

- [Front Panel Features](#)
- [Power](#)
- [Matrix Operations](#)
- [Secure Direct Port Access](#)
- [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 8.** Front Panel, FOX3 Matrix 80x Switcher

- A** **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.

- B** **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 Power Supply Module](#) on page 51 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](#) for the nearest office).

## Matrix Operations

The FOX3 Matrix can be operated in one of two modes: Port mode and System Mapping 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 In 1 and Out 1.
- 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 Series PCS Help File* for detailed instructions).

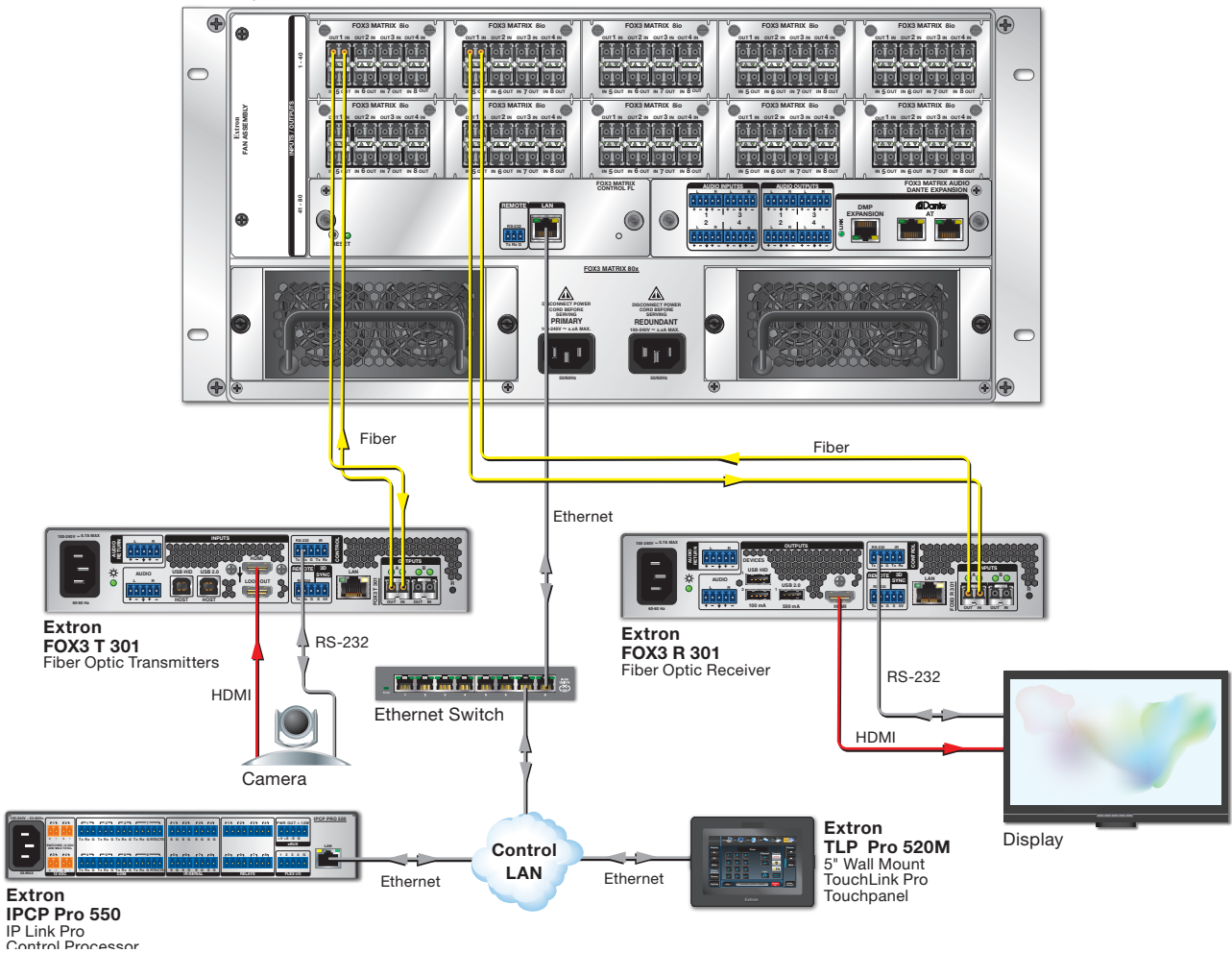
## Secure Direct Port Access

Open an associated UART port to send serial data to its captive screw connector. 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 9](#) on page 15):

- 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.

**Extron**  
**FOX3 Matrix 80x**  
 Fiber Optic Matrix Switcher



**Figure 9. Typical Secure Direct Port Access Configuration**

## Reset Operations

The rear panel has a **Reset** button (see [figure 2](#) on page 8, **E**) that initiates four levels of resets (1, 3, 4, and 5). 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 16 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 Mode 1 to Mode 5.

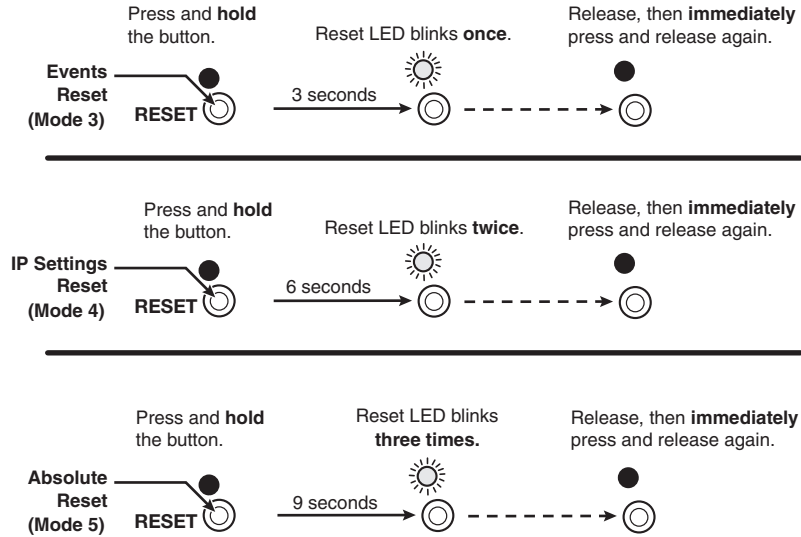
Reset Modes			
Mode	Activation	Result	Purpose and Notes
1	<p>Hold down the recessed <b>Reset</b> button while applying power to the switcher.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>NOTE:</b> After a mode 1 reset is performed, update the switcher firmware to the latest version. Do not operate the switcher firmware version that results from the mode 1 reset. If you want to use the factory default firmware, you must upload that version again (see the <b>Firmware Panel</b> on page 44 for details on uploading firmware).</p> </div>	<p><b>The switcher reverts to the factory default firmware.</b> 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.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>NOTE:</b> If you do not want to update firmware, or a mode 1 reset was performed by mistake, cycle power to the switcher to return to the firmware version that was running before the mode 1 reset (see <b>Firmware Panel</b> to confirm that the factory default firmware is no longer running (look for the asterisk [*] following the version number).</p> </div>	Use mode 1 to revert to the factory default firmware version if incompatibility issues arise with user-loaded firmware.
3	Hold down the <b>Reset</b> button for about 3 seconds, until the <b>Reset</b> LED blinks once, then press and release <b>Reset</b> within 1 second.	<b>Mode 3 turns events on or off.</b> During resetting, the Reset LED flashes 2 times if events are starting, 3 times if events are stopping.	Mode 3 is useful for troubleshooting.
4	Hold down the <b>Reset</b> button for about 6 seconds, until the <b>Reset</b> LED blinks twice (once at 3 seconds and again at 6 seconds). Then press and release <b>Reset</b> within 1 second.	<p><b>Mode 4:</b></p> <ul style="list-style-type: none"> <li>• Enables ARP capability.</li> <li>• Sets the IP address to the factory default.</li> <li>• Sets the subnet address to the factory default.</li> <li>• Sets the gateway address to the factory default.</li> <li>• Sets port mapping to the factory default.</li> <li>• Turns DHCP off.</li> <li>• Turn events off.</li> </ul> <p>The <b>Reset</b> LED flashes four times in quick succession during the reset.</p>	Mode 4 is useful to set IP address information using ARP and the MAC address.
5	Hold down the <b>Reset</b> button for about 9 seconds, until the <b>Reset</b> LED blinks three times (once at 3 seconds, again at 6 seconds, and then again at 9 seconds). Then press and release <b>Reset</b> within 1 second.	<p><b>Mode 5 performs a complete reset to factory defaults (with the exception of the firmware):</b></p> <ul style="list-style-type: none"> <li>• Does everything mode 4 does.</li> <li>• Resets most all real time adjustments, including: <ul style="list-style-type: none"> <li>clears all ties and presets</li> <li>clears all mutes</li> <li>clears all I/O grouping</li> <li>clears all passwords</li> </ul> </li> <li>• Resets all IP options.</li> <li>• Removes and clears all files for the switcher.</li> </ul> <p>The reset LED flashes four times in quick succession during the reset.</p>	Mode 5 is useful 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 **Roles and Permissions Panel** on page 45 to change a password).

## Performing Soft System Resets (Resets 3, 4, and 5)

Perform a soft reset of the switcher as follows:

1. Use an Extron Tweezer 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: once (events reset), twice (system reset), or three times (absolute reset) (see figure 10).



**Figure 10. 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 (Reset 1)

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 numbers on the last page 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 on port 22023.

### 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 ports 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 8, A](#) on page 15). 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 19 to connect to an SSH client).

## Ethernet (LAN) Port

The rear panel Ethernet port (see [figure 2, C](#) on page 8) 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, 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:

- **IP address** 192.168.254.254
- **Gateway address** 0.0.0.0
- **Subnet mask** 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.
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 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 (②).

- 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 administrator or user name 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, create and 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 28) 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 front panel operations and SIS commands from other LAN sockets or a serial port. For a 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 27). In verbose mode 3, the socket reports changes in messages that resemble SIS command responses.

## 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 such as a front panel operation or an IR 501 command string occurs, the switcher responds by sending a message to the host. The switcher-initiated messages are listed below (underlined).

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

(C) COPYRIGHT 2020, 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 version. Vx.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 immediately after the copyright message when the controlling system is connected using TCP/IP or an SSH client and the switcher is password protected. 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 **Roles and Permissions Panel** on page 45 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
- E17 — Invalid command for signal type
- E18 — System or command timed out
- E21 — Invalid room number
- E22 — Busy
- E24 — Privileges violation (Ethernet only. 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 create ties and presets, and mute and unmute the output.)

**NOTE:** 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.

## Using the Command and Response Tables

The **Command and Response Table for SIS Commands** on page 24. 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																Esc	1B	CR	0D	LF	0A	
Space →	20	!	21	"	22	#	23	\$	24	%	25	&	26	'	27								
	(	28	)	*	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							

### 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 permitted except |, and “space”, as the name of the switcher, passwords, or locally created file names.

## System Definitions

<b>↵</b>	=	CR/LF (carriage return/line feed) (hex 0D 0A)
<b>←</b> or <b> </b>	=	Carriage return or pipe symbol (no line feed, hex 0D)
<b>Esc</b>	=	Escape key, or hex 1B (use W instead of <b>Esc</b> for web browsers, or at any time)
<b>•</b>	=	Space
<b>*</b>	=	Asterisk character
<b>X1</b>	=	<b>Input number</b> — 00 to max number of inputs (Input = 0 Untie)
<b>X3</b>	=	<b>Output number</b> — 00 to max number of outputs (Output = 0 Untie)
<b>X4</b>	=	<b>Enable or Disable</b> — 0 = Off/disable 1 = On/enable
<b>X6</b>	=	<b>I/O board type</b> — 0 = No board detected 1 = Active MM board 2 = Active SM board 5 = Unknown
<b>X7</b>	=	<b>I/O board slot number</b> — 1 to maximum number of slots (3 for 24x, 5 for 40x, 10 for 80x, 20 for 160x, 40 for 320x)
<b>X9</b>	=	<b>Active Fiber Link detection</b> — SFP A/B “IN LED”
<b>X10</b>	=	<b>Active signal detection (SFP A/B “IN LED”)</b> — 0 = Not detected 1 = Detected
<b>NOTE:</b> SFP A and B “OUT LED” is always active.		
<b>X13</b>	=	<b>Audio gain/attenuation value</b> — -18 to +24
<b>X14</b>	=	<b>Mute status</b> — 0 = Off (unmuted) 1 = On (muted)
<b>X15</b>	=	<b>Video/Audio mute status</b> — 0 = No mute 1 = Video mute 2 = Audio mute 3 = Both video and audio mute
<b>X16</b>	=	<b>Volume adjustment range</b> — 0 to 100 (approximately 1 dB per step 0% to 100% [default])
<b>X18</b>	=	<b>SFP modules installed</b> — 0 = No SFP 1 = MM SFP 2 = SM SFP 3 = Unknown SFP

<b>X19</b>	=	<b>Video signal status</b> — 0 = No video signal at input 1 = Video Input signal detected
<b>X20</b>	=	<b>Verbose mode</b> — 0 = Clear/none (default) 1 = Verbose mode 2 = Tagged response for queries 3 = Verbose mode and tagged responses for queries
<b>X21</b>	=	<b>Timeout</b> — The number of seconds before timeout on IP connections (min = 1, max = 65000 [default = 30 = 300 seconds]).
<b>X24</b>	=	<b>Power supply voltage</b> — P = Primary is listed first R = Redundant is listed second
<b>X25</b>	=	<b>Temperature</b> — Degrees Fahrenheit and Celsius (example: <i>xx.xF • xx.xC</i> )
<b>X26</b>	=	<b>Fan speed</b> — Revolutions per Minute - RPM (example: <i>xxxRPM</i> )
<b>X27</b>	=	<b>Power supply status</b> — 0 = Power Supply inactive/not installed 1 = Power Supply active/installed 2 = Power Supply failed/installed
<b>X28</b>	=	<b>Maximum virtual video matrix size (InputxOutput)</b> — Example: 80x80
<b>X35</b>	=	<b>Audio input number</b> — 00 to max number of inputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004
<b>X36</b>	=	<b>Audio output number</b> — 00 to max number of outputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004
<b>X37</b>	=	<b>Return audio source number</b> — 00 to max number of outputs (from an Rx unit, Expansion 30001-30008, Dante 40001-40032, or Analog 50001-50004)
<b>X38</b>	=	<b>Analog audio destination number (to Tx)</b> — 00 to max number of inputs
<b>X39</b>	=	<b>Return audio source number</b> — 00 to max number of inputs (Analog 50001-50004)
<b>X340</b>	=	<b>Analog audio output number</b> — 00 to max number of outputs (Analog 50001-50004)

## Command and Response Table for SIS Commands

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
<b>NOTE:</b> Commands can be entered back-to-back in a string, with no spaces. For example: 1*1!002*002!003*003!.			
<b>Output switching</b>			
<b>NOTES:</b>			
<ul style="list-style-type: none"> <li>The quick multiple tie and tie input to all output commands activate all I/O switches simultaneously.</li> <li>The matrix switchers support 3-digit numeric (001*001) and 5- digit for Audio ties (50001*50001).</li> <li>The <b>!</b> tie command connects all available signals for the Tx to the Rx.</li> <li>When you create a tie where <b>X1</b> = 00, you tie no input to the specified output (<b>X3</b>) (untie <b>X3</b>).</li> <li>When you create a tie where <b>X3</b> = 00, you untie all outputs from input <b>X1</b>.</li> <li>If a System Map has been initiated, the Input number (<b>X1</b>) or Output number (<b>X3</b>) can represent a single physical SFP port or a group of SFP ports.</li> </ul>			
Tie input <b>X1</b> to output <b>X3</b>	<b>X1</b> * <b>X3</b> !	Out <b>X3</b> •In <b>X1</b> •All←	Tie input <b>X1</b> to output <b>X3</b> , all signals.
Tie input <b>X1</b> to output <b>X3</b>	<b>X1</b> * <b>X3</b> %	Out <b>X3</b> •In <b>X1</b> •Vid←	Tie input <b>X1</b> to output <b>X3</b> , video only.
Tie input <b>X35</b> to output <b>X36</b>	<b>X35</b> * <b>X36</b> \$	Out <b>X36</b> •In <b>X35</b> •Aud←	Tie input <b>X1</b> to output <b>X3</b> , audio.
Tie return audio source <b>X37</b> to destination <b>X38</b>	<b>X37</b> * <b>X38</b> &	Out <b>X38</b> •In <b>X37</b> •Rta←	Tie return audio source to destination.
<b>TIP:</b> 0*! clears all ties.			
<b>KEY:</b>			
<b>X1</b> = Input number		00 – Maximum number of inputs for your configuration (0 = untie)	
<b>X3</b> = Output number		00 – Maximum number of outputs for your configuration (0 = untie)	
<b>X35</b> = Audio input number		00 – Maximum number of inputs or DMP Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004	
<b>X36</b> = Audio output number		00 – Maximum number of outputs or DMP Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004	
<b>X37</b> = Return audio source number		00 – Maximum number of outputs (from a Rx unit, DMP Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004	
<b>X38</b> = Analog audio destination number (to Tx)		00 – Maximum number of inputs	
<b>Tie an input to all outputs</b>			
Tie input to all outputs	<b>X1</b> *!	In <b>X1</b> •All←	Tie video and audio input, 3D sync and IR signals to all outputs.
<b>NOTE:</b> USB 2.0, USB HID, and Return Audio are not switched with this command.			
Tie input to all outputs	<b>X1</b> *%	In <b>X1</b> •Vid←	Tie video input to all outputs.
Tie input to all outputs	<b>X1</b> *\$	In <b>X1</b> •Aud←	Tie audio input to all outputs.
<b>KEY:</b> <b>X1</b> = Input number      00 – Maximum number of inputs for your configuration (0 = untie)			
<b>Untie</b>			
Untie all outputs	0*!	In00•All←	Untie all outputs.
Untie an output	0* <b>X3</b> !	Out <b>X3</b> •In00•All←	Untie a particular output.
Untie an input	<b>X1</b> *0!	Out00•In <b>X1</b> •All←	Untie an input from all tied outputs.
<b>KEY:</b> <b>X1</b> = Input number      00 – Maximum number of inputs for your configuration (0 = untie)			
<b>X3</b> = Output number      00 – Maximum number of outputs for your configuration (0 = untie)			

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
<b>Quick tie</b> Quick multiple tie	<b>Esc+Q</b> <b>X1</b> * <b>X3</b> ! . . . <b>X1</b> * <b>X3</b> ! ←	Qik ← or Qik14 ←	Make multiple ties with one command. Qik14 responds back when part of the command is invalid or incorrect.
<b>NOTES:</b>			
<ul style="list-style-type: none"> <li>The quick multiple tie and tie input to all outputs commands activate all I/O switches simultaneously.</li> <li>The matrix switchers support 3-digit numeric (001*001) and 5- digit for audio ties (50001*50001)</li> <li>The quick tie applies to fiber I/O, audio expansion, Dante, or analog audio sections.</li> <li>Commands can be made back to back with no spaces.</li> </ul>			
<b>KEY:</b>			
<b>X1</b> = Input number		00 – Maximum number of inputs for your configuration (0 = untie)	
<b>X3</b> = Output number		00 – Maximum number of outputs for your configuration (0 = untie)	
<b>View ties</b>			
View video current ties	<b>Esc</b> 0* <b>X3</b> *1VC ← Verbose mode 2/3	<b>X1</b> • <b>X1</b> • <b>X1</b> ... • <b>X1</b> <sup>16</sup> • Vid ← Vgp00* <b>X1</b> • <b>X1</b> • <b>X1</b> ... • <b>X1</b> <sup>16</sup> • Vid ←	Show the input <b>X1</b> tied to 16 sequential outputs, starting from output <b>X3</b> .
View audio ties	<b>Esc</b> 0* <b>X36</b> *2VC ← Verbose mode 2/3	<b>X35</b> • <b>X35</b> • <b>X35</b> ... • <b>X35</b> <sup>16</sup> • Aud ← Vgp00* <b>X35</b> • <b>X35</b> • <b>X35</b> ... • <b>X35</b> <sup>16</sup> • Aud ←	Show the input <b>X35</b> tied to 16 sequential outputs, starting from output <b>X36</b> .
View return audio ties	<b>Esc</b> 0* <b>X38</b> *5VC ← Verbose mode 2/3	<b>X37</b> • <b>X37</b> • <b>X37</b> ... • <b>X37</b> <sup>16</sup> • Rta ← Vgp00* <b>X37</b> • <b>X37</b> • <b>X37</b> ... • <b>X37</b> <sup>16</sup> • Rta ←	Show the input <b>X37</b> tied to 16 sequential outputs, starting from output <b>X38</b> .
View DMP expansion audio ties	<b>Esc</b> 0*1*6VC ← Verbose mode 2/3	<b>X35</b> • <b>X35</b> • <b>X35</b> ... • <b>X35</b> <sup>8</sup> • Dmp ← Vgp00* <b>X35</b> • <b>X35</b> • <b>X35</b> ... • <b>X35</b> <sup>8</sup> • Dmp ←	Show the input <b>X35</b> Expansion 30001- 30008 tied to 8 outputs, starting from output 1.
View Dante audio ties	<b>Esc</b> 0*1*7VC ← Verbose mode 2/3	<b>X35</b> • <b>X35</b> • <b>X35</b> ... • <b>X35</b> <sup>32</sup> • Dte ← Vgp00* <b>X35</b> • <b>X35</b> • <b>X35</b> ... • <b>X35</b> <sup>32</sup> • Dte ←	Show the input <b>X35</b> Dante 40001- 40032 tied to 32 sequential outputs, starting from output 1.
View local analog audio ties	<b>Esc</b> 0*1*8VC ← Verbose mode 2/3	<b>X35</b> • <b>X35</b> • <b>X35</b> • <b>X35</b> <sup>4</sup> • Ana ← Vgp00* <b>X35</b> • <b>X35</b> • <b>X35</b> • <b>X35</b> <sup>4</sup> • Ana ←	Show the input <b>X35</b> Analog Audio Output 50001- 50004 tied to 4 sequential outputs, starting from output 1.
<b>KEY:</b>			
<b>X1</b> = Input number		00 – Maximum number of inputs for your configuration (0 = untie)	
<b>X3</b> = Output number		00 – Maximum number of outputs for your configuration (0 = untie)	
<b>X35</b> = Audio input number		00 – Maximum number of inputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004	
<b>X36</b> = Audio output number		00 – Maximum number of outputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004	
<b>X37</b> = Return audio source number		00 – Maximum number of outputs (from a Rx unit, Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004	
<b>X38</b> = Analog audio destination number (to Tx)		00 – Maximum number of inputs	



Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
<b>Audio Configuration and Adjustment</b>			
<b>NOTES:</b>			
<ul style="list-style-type: none"> <li>Input gain and attenuation does not affect video inputs (with embedded audio) that are tied to video outputs.</li> <li>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.</li> </ul>			
<b>Audio input gain</b>			
Set audio input gain	<b>X39</b> * <b>X13</b> G	In <b>X39</b> • Aud <b>X13</b> ←	Set audio gain per input.
Example	50001*+1g 50001*-15g	In50001 Aud+01 ← In50001 Aud-15 ←	
Increase input audio gain	<b>X39</b> +G	In <b>X39</b> • Aud <b>X13</b> ←	Increase input audio gain 1 step per input.
Decrease input audio gain	<b>X39</b> -G	In <b>X39</b> • Aud <b>X13</b> ←	Decrease input audio gain 1 step per input.
Gain for audio input	<b>X39</b> G Verbose mode 2/3	<b>X13</b> ← In <b>X39</b> • Aud <b>X13</b> ←	View audio gain level per input.
<b>KEY:</b> <b>X13</b> = Audio gain/attenuation value -18 to +24 <b>X39</b> = Analog audio input number 00 to max number of inputs (Analog 50001-50004)			
<b>Audio output volume</b>			
Output audio volume increment	<b>X40</b> +V	Out <b>X40</b> • Vol <b>X16</b> ←	Increment audio volume per output.
Output audio volume decrement	<b>X40</b> -V	Out <b>X40</b> • Vol <b>X16</b> ←	Decrement audio volume per output.
Output volume level	<b>X40</b> * <b>X16</b> V	Out <b>X40</b> • Vol <b>X16</b> ←	Set audio volume level per output.
Audio volume for output	<b>X40</b> V	<b>X16</b> ←	View audio volume level per output.
<b>KEY:</b> <b>X16</b> = Volume adjustment range 0 to 100 (approximately 1 dB per step 0% to 100%, default 100%) <b>X40</b> = Analog audio output number 00 to max number of outputs (Analog 50001-50004)			
<b>Verbose mode</b>			
Set verbose mode	<b>Esc</b> <b>X20</b> CV ←	Vrb <b>X20</b> ←	
View verbose mode	<b>Esc</b> CV ←	<b>X20</b> ←	
<b>NOTE:</b> Verbose mode will revert back to default in the event of a power cycle, disconnect from SSH client, or disconnect from the Ethernet.			
<b>KEY:</b> <b>X20</b> = Verbose mode 0 = Clear/none (default), 1 = Verbose mode, 2 = Tagged response for queries, 3 = Verbose mode and tagged responses for queries			
<b>Timeout Ethernet data port</b>			
Set current port timeout	<b>Esc</b> 0 * <b>X21</b> TC ←	Pti0 * <b>X21</b> ←	If no data is received during the timeout period, the Ethernet connection closes.
View current port timeout	<b>Esc</b> 0 TC ←	<b>X21</b> ←	
<b>KEY:</b> <b>X21</b> = Timeout The number of seconds (each step = 10 seconds) before timeout on IP connections (min=1, max=65000 [default=30=300 seconds]).			
<b>SIS over SSH (port 22023)</b>			
Enable Echo	<b>Esc</b> 1ECHO ←	Echo1 ←	Returns command entered with response.
Disable Echo	<b>Esc</b> 0ECHO ←	Echo0 ←	Returns response only.
View Echo status	<b>Esc</b> ECHO ←	<b>X4</b> ←	
<b>KEY:</b> <b>X4</b> = Enable or disable 0 = Disable, 1 = Enable (default)			

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
<b>Matrix Status</b>			
Information request	I/i Verbose mode 2/3	V <u>X28</u> X <u>X28</u> • A <u>X1</u> X <u>X35</u> • S <u>X6</u> <sup>1</sup> <u>X6</u> <sup>2</sup> ... <u>X6</u> <sup>n</sup> ← Inf <u>00</u> * V <u>X28</u> X <u>X28</u> • A <u>X1</u> X <u>X35</u> • S <u>X6</u> <sup>1</sup> <u>X6</u> <sup>2</sup> ... <u>X6</u> <sup>n</sup> ←	
Slot/LC connector information	<u>0</u> * <u>X7</u> I ← Verbose mode 2/3	<u>X18</u> <u>X18</u> <u>X18</u> <u>X18</u> <u>X18</u> <u>X18</u> <u>X18</u> <u>X18</u> ← Inf* <u>X18</u> <u>X18</u> <u>X18</u> <u>X18</u> <u>X18</u> <u>X18</u> <u>X18</u> <u>X18</u> ←	
Request part number	N/n	60 - nnnn- nn ←	
View power supply voltages, unit temperature, fan speeds and power supply status	S/s Verbose mode 2/3	<u>X24</u> <sup>P</sup> • <u>X24</u> <sup>R</sup> • <u>X25</u> • <u>X26</u> <sup>1</sup> • <u>X26</u> <sup>2</sup> • <u>X26</u> <sup>3</sup> ... <u>X26</u> <sup>n</sup> • <u>X27</u> <sup>P</sup> • <u>X27</u> <sup>R</sup> ← Sts <u>00</u> * <u>X24</u> <sup>P</sup> • <u>X24</u> <sup>R</sup> • <u>X25</u> • <u>X26</u> <sup>1</sup> • <u>X26</u> <sup>2</sup> • <u>X26</u> <sup>3</sup> ... <u>X26</u> <sup>n</sup> • <u>X27</u> <sup>P</sup> • <u>X27</u> <sup>R</sup> ←	
View temperature of the unit	<u>Esc</u> <u>20</u> STAT ← Verbose mode 2/3	<u>X25</u> ← 20Stat • <u>X25</u> ←	
View status of power supplies (Primary, Redundant)	<u>Esc</u> <u>21</u> STAT ← Verbose mode 2/3	<u>X24</u> <sup>P</sup> • <u>X24</u> <sup>R</sup> ← 21Stat • <u>X24</u> <sup>P</sup> • <u>X24</u> <sup>R</sup> ←	
View fan speeds	<u>Esc</u> <u>22</u> STAT ← Verbose mode 2/3	<u>X26</u> <sup>1</sup> • <u>X26</u> <sup>2</sup> • <u>X26</u> <sup>3</sup> ... <u>X26</u> <sup>n</sup> ← 22Stat • <u>X26</u> <sup>1</sup> • <u>X26</u> <sup>2</sup> • <u>X26</u> <sup>3</sup> ... <u>X26</u> <sup>n</sup> ←	24x has 2 fans, 40x has 4 fans 80x has 3 fans, 160x has 6 fans, 320x has 9 fans
View individual video input signal status	<u>Esc</u> <u>X1</u> LS ← Verbose mode 2/3	<u>X19</u> ← In <u>X1</u> • <u>X19</u> ←	
View all video input signal status	<u>Esc</u> <u>0</u> LS ← Verbose mode 2/3	<u>X19</u> <sup>1</sup> <u>X19</u> <sup>2</sup> ... <u>X19</u> <sup>n</sup> ← In <u>00</u> • <u>X19</u> <sup>1</sup> <u>X19</u> <sup>1</sup> ... <u>X19</u> <sup>n</sup> ←	Each response is the video input status, starting from Input 1 and n = highest numbered installed input.
<b>KEY:</b>			
<u>X1</u> = Input number	<u>X6</u> = I/O board type	<u>X7</u> = I/O board slot number	<u>00</u> – Maximum number of inputs for your configuration ( <u>0</u> = untie) <u>0</u> = No board detected, <u>1</u> = Active MM board, <u>2</u> = Active SM board, <u>5</u> = Unknown <u>1</u> – Maximum number of slots (3 for 24x, 5 for 40x, 10 for 80x, 20 for 160x, 40 for 320x) <u>0</u> = No SFP, <u>1</u> = MM SFP, <u>2</u> = SM SFP, <u>3</u> = Unknown SFP <u>0</u> = No video signal at input, <u>1</u> = Video Input signal detected <u>P</u> = Primary is listed first, <u>R</u> = Redundant is listed second Degrees in Fahrenheit and Celsius (example: xx.xF • xx.xC) Revolutions per Minute (RPM) (example: xxxRPM) <u>0</u> = Power Supply inactive/Not installed, <u>1</u> = Power Supply active/Installed, <u>2</u> = Power Supply failed/Installed InputxOutput (example: 80x80) <u>00</u> – Maximum number of inputs or Expansion 30001-30008, Dante 40001-40032, Analog 50001-50004

# 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.

The program communicates with the switcher via the following ports:

- **Rear panel LAN Ethernet port** — See [Ethernet \(LAN\) Port](#) on page 19 and “Software Operation via Ethernet,” below.
- **Front Panel USB Configuration port** — See [Front Panel Configuration Port](#) on page 18.

## Software Operation via Ethernet

When a matrix switcher is connected to an Ethernet WAN or LAN, up to 200 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 40).

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 [Roles and Permissions Panel](#) on page 45 to change a password).

## Ethernet protocol settings

The **Network Settings Panel** (see page 43) 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.

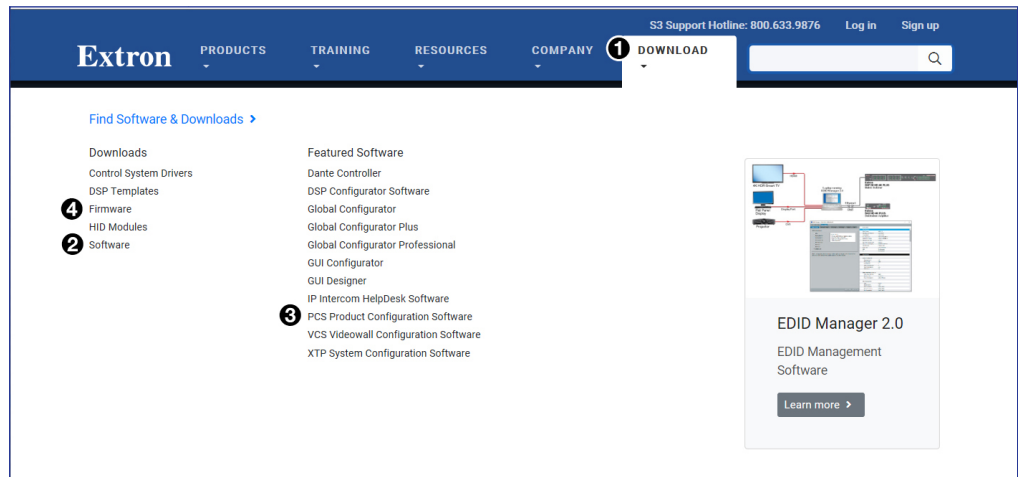
## Software/Firmware Installation

Visit [www.extron.com](http://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 either firmware or software

1. Mouse over the **Download** link at the top of the page (see figure 11, ①).



**Figure 11. Software Links on Download Screen**

2. Click the appropriate link on the drop-down list.

**For software**, either click the **Software** link (②) or, if the software is listed, click directly on that link (see the **PCS Product Configuration Software** link ③) and skip to **step 5**.

**For firmware**, click the **Firmware** link (④).

3. If there is no direct link to your software, click the **Software** link (②).
4. Scroll down to the alphabetic navigation bar (see figure 12).



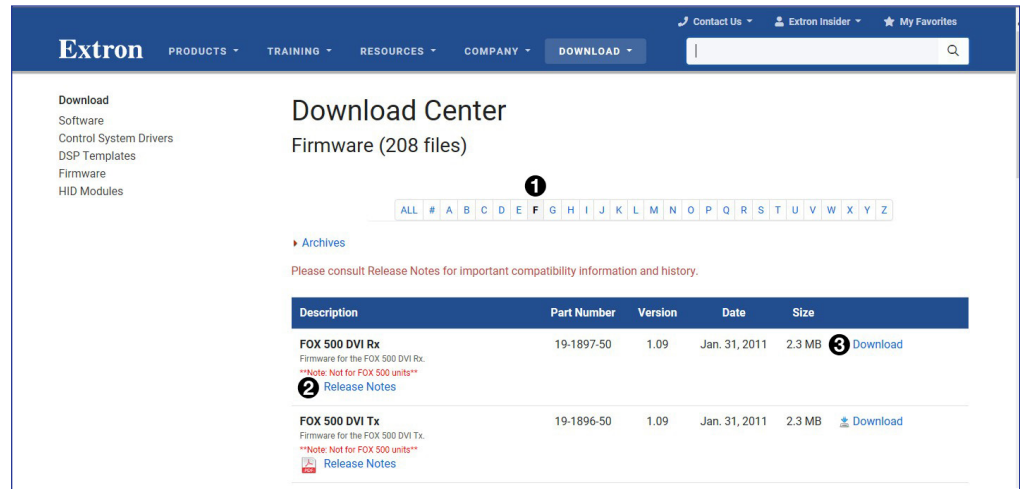
**Figure 12. Software Installation**

5. Click the appropriate letter to locate the software or firmware.
6. Click **Download** and follow the on-screen instructions (see figure 13, ① for PCS).

Version	Release Date	New in the Current Release	Size
4.3.0	Jul. 9, 2018	<ul style="list-style-type: none"><li>• Added support for HC 403</li><li>• Added language support for Spanish, Simplified Chinese, Japanese, German, and French</li><li>• Ability to restore configuration to multiple devices across all IN1608 products</li></ul>	162.5 MB <b>①</b> <a href="#">Download</a> Login required

**Figure 13. PCS Software Download**

## For Firmware:



**Figure 14. Firmware Page with Alphabetic Navigation Bar**

- a. Click the letter **F** from the alphabetic navigation bar (see figure 14, ①).
  - b. Scroll down the page to find the firmware for the FOX3 Matrix.
  - c. (Optional) Click **Release Notes** (②) for more information about the firmware update.
  - d. Click **Download** (③). The product download screen opens.
  - e. Enter the required user information and click **Download**. An executable (.exe) file is downloaded to the PC. Run this program to place the firmware on the PC for future use. Make a note of the folder where the firmware file was saved.
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:

- a. To install via PCS, see **Update Firmware** in the **Device Menu** on page 38.
- b. To install via the internal web pages, see the **Firmware Panel** on page 44.

## Connecting to PCS

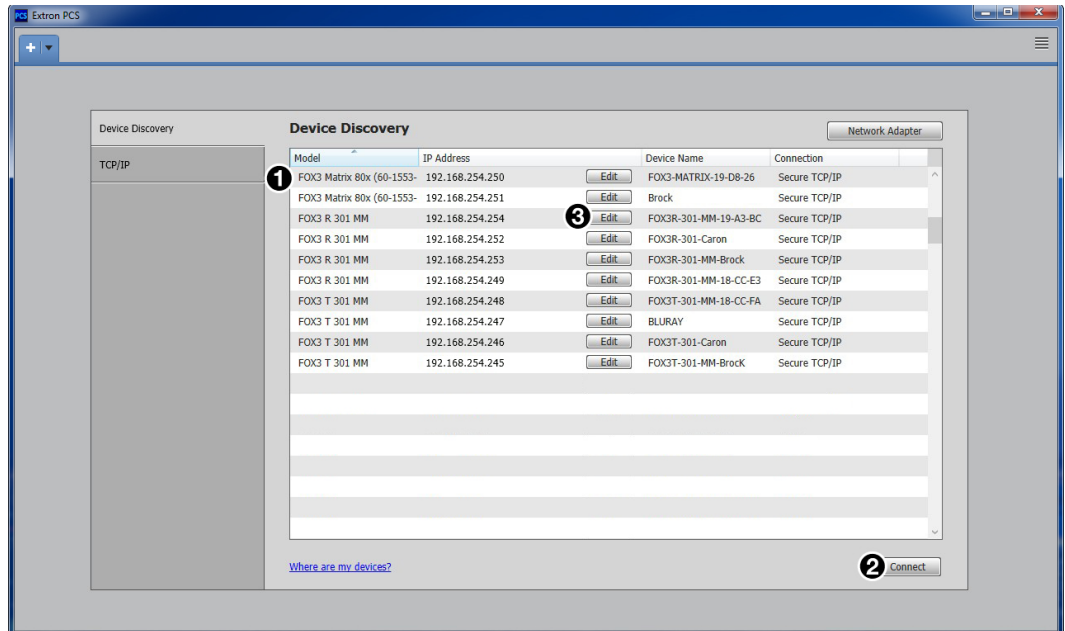
The Extron Product Configuration Software window opens with the Device Discovery panel open. Connect to the switcher using the Device Discovery panel or the TCP/IP panel (see figure 15).

### 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 15).



**Figure 15. Device Discovery Panel**

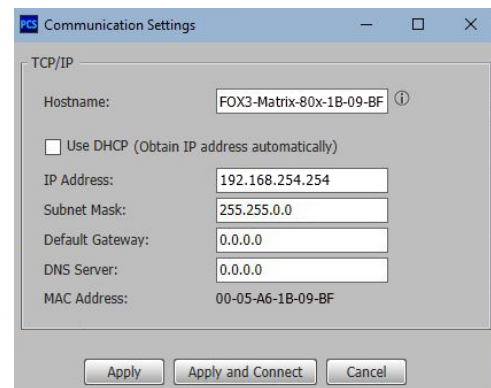
2. Select the FOX3 Matrix device by clicking on it to highlight it in the list (1).
3. Click **Connect** (2).

#### To edit the IP address:

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

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

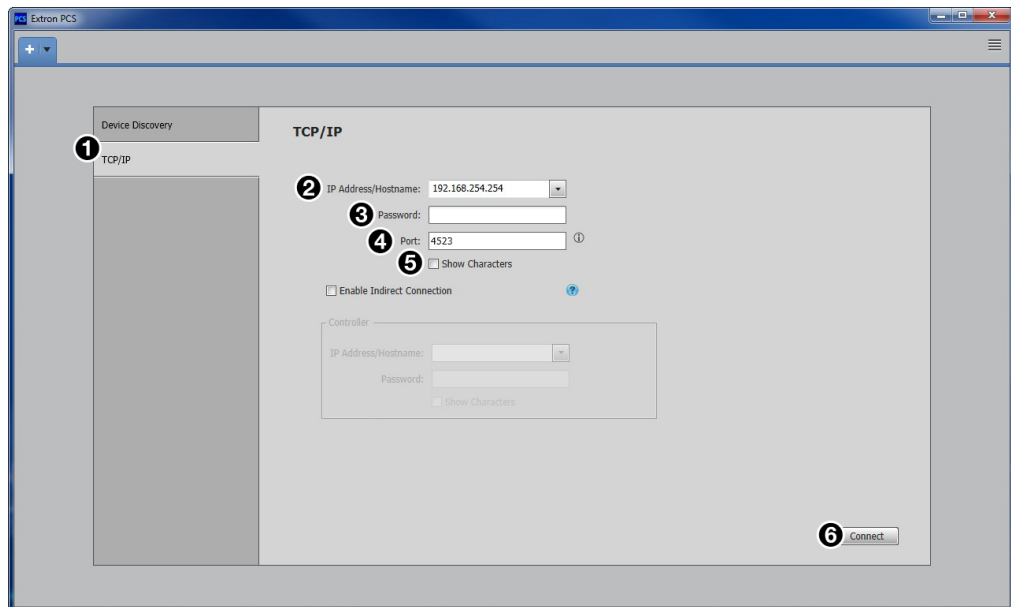
Click **Cancel** to close the box without changes.



**Figure 16. Communication Settings Box**

## TCP/IP Panel

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



**Figure 17. Comm Port Selection Windows**

**To connect to an online device or re-establish a connection via the LAN port:**

1. Click the **TCP/IP** tab (see figure 17, **1**).
2. In the **IP Address/Hostname** field (**2**), enter the IP address of the desired device.

- If connecting via the LAN Ethernet port:

**NOTE:** If the IP address has not been changed, it is **192.168.254.254**.

- If connecting via the front panel USB mini-B port:

**NOTE:** The IP address is **203.0.113.22**. This IP address cannot be changed.

3. In the **Password** field (**3**), enter the device password.

**NOTES:**

- 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 **Roles and Permissions Panel** on page 45 to change a password).
- Select the **Show Characters** checkbox (**5**) to display the password characters.

4. In the **Port** field (**4**), enter port **4523**.

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

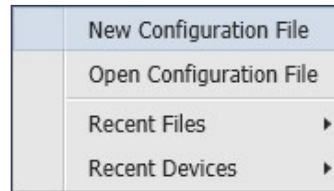
5. Click the **Connect** button (**6**). A new device tab opens.

## 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:

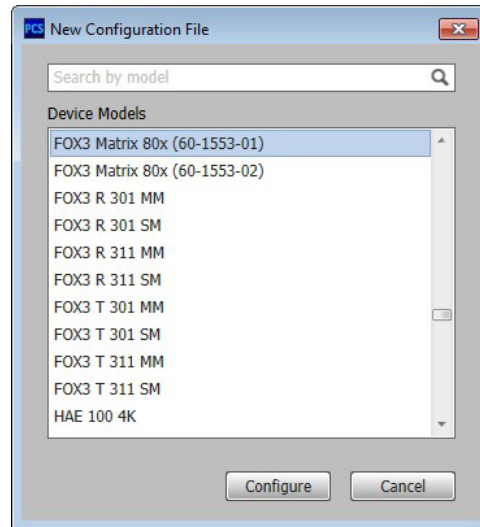
1. From the **Configuration File** drop-down list, select **New Configuration File** (see figure 18).



**Figure 18. Configuration File Drop-Down List**

The **New Configuration File** dialog box opens (see figure 19).

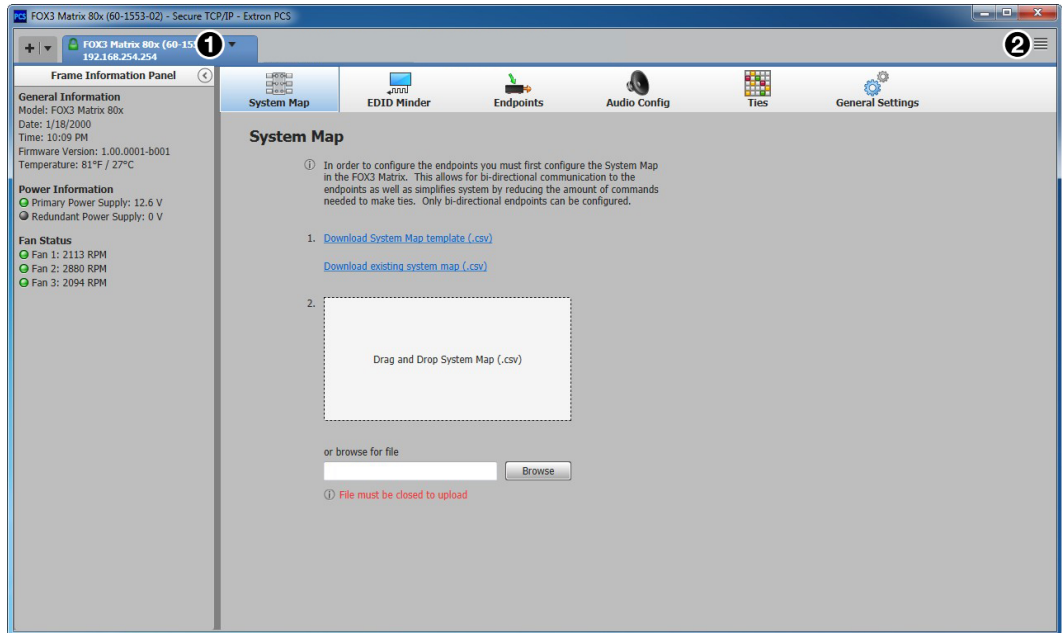
2. Select the desired device model from the **Device Models** list (see figure 19).
3. Click the **Configure** button. A new offline device configuration tab opens.



**Figure 19. New Configuration File Dialog Box**

## Software Overview

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

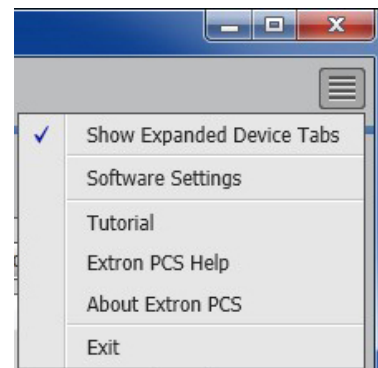


**Figure 20. FOX3 Matrix Main Window**

Each PCS screen has a **Device** drop-down list (see figure 20, ①) for device configuration options. The **Software** menu (②) contains software configuration and information options.

## Software Menu

The **Software** menu (see figure 21) contains options pertaining to PCS settings.



**Figure 21. PCS Software Menu**

## Show Expanded Device Tabs

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



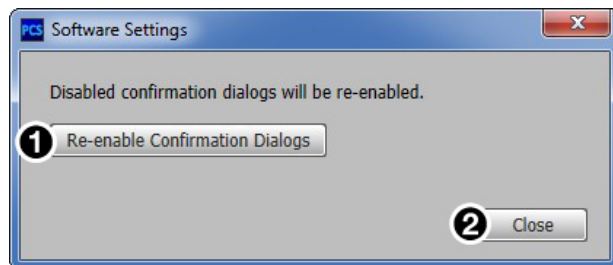
**Figure 22. Expanded Device Tab**

## Software Settings

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

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

The **Software Settings** dialog box opens.



**Figure 23. Software Settings Dialog Box**

2. Click the **Re-enable Confirmation Dialogs** button (see figure 23, **1**). The dialog box closes and the reset is complete.

Alternatively, click the **Close** button (**2**) to close the dialog box without re-enabling the confirmation dialogs.

## Tutorial

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

1. From the **Software** menu, 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** menu, select **Extron PCS Help**.

## About Extron PCS

Display information about the current PCS version.

1. From the **Software** menu, select **About Extron PCS**. The **About - Extron PCS** dialog box opens.



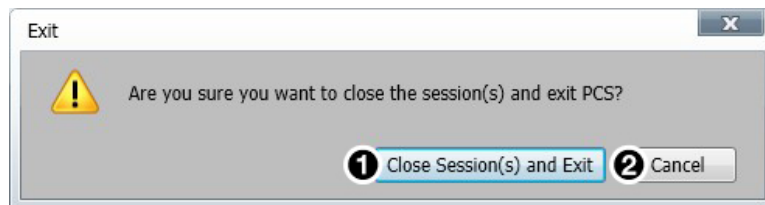
**Figure 24. About - Extron PCS Dialog Box**

2. Click the **Details** button (see figure 24, **1**) for more information.
3. To display details about third-party software packages and associated licensing, click **Licenses** (**2**).
4. Click the **OK** button (**3**) to close the dialog box.

## Exit

Disconnect connected devices and close the application.

1. From the **Software** menu, select **Exit**. If device tabs are open, the **Exit** dialog box opens (see figure 25).

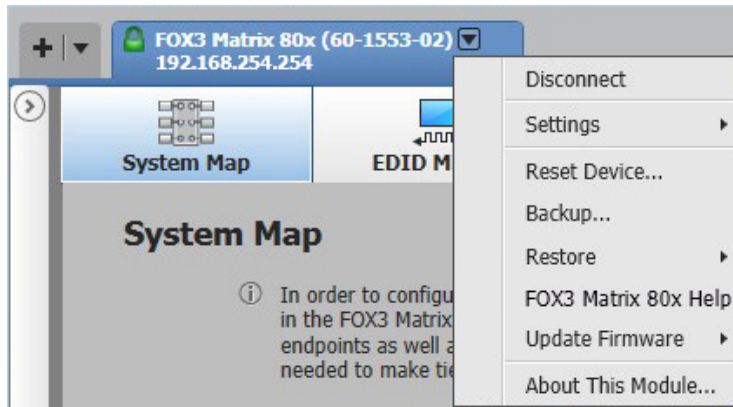


**Figure 25. Exit Dialog Box**

2. Click the **Close Session(s) and Exit** button (**1**) to disconnect the software from connected devices, close all offline device tabs, and close the software.  
Alternatively, click the **Cancel** button (**2**) to leave the software open.

## Device Menu

The **Device** menu (see figure 26) contains options pertaining to device connection, configuration, and information. For details, see the *FOX3 Matrix Series PCS Help File*.



**Figure 26.** Device Menu

- **Disconnect** — Disconnect the device from the PCS program and close the **Device** tab.
- **Settings** — Open a submenu with 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).

**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 [Roles and Permissions Panel](#) on page 45 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 a submenu containing 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 a submenu 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 30).

- **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.

# 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, connected via a LAN or WAN, using a web browser such as the Microsoft® Internet Explorer®. This chapter describes the factory-installed HTML pages, which are always available and cannot be erased or overwritten.

**NOTE:** If the Ethernet connection to the matrix switcher is unstable, try turning off the proxy server in the web browser. In Microsoft Internet Explorer, click **Tools > Internet Options > Connections > LAN Settings**, uncheck the **Use a proxy server...** box, and then click **OK**.

## Accessing the Internal Web Page

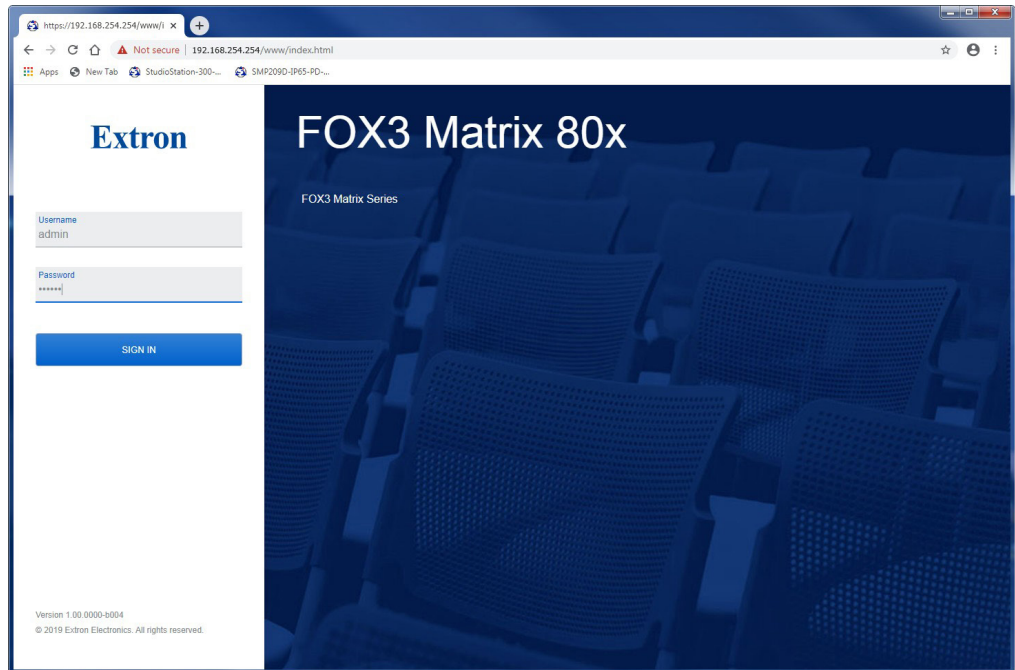
Access the FOX3 Matrix Switcher internal web page as follows:

1. Connect the FOX3 device to a LAN or WAN using the rear panel RJ-45 LAN connector (see [figure 2](#) on page 8).
2. Open a web browser on a PC connected on the same LAN or WAN.
3. Enter the FOX3 Matrix IP address in the browser **Address** field.

**NOTE:** If the local system administrators have not changed the value, the factory-specified default is **192.168.254.254**.

4. Press the **<Enter>** key on the keyboard.
5. The FOX3 is password protected. Enter a user name (**user** or **admin**) in the **Username** field and the password in the **Password** field when prompted (see [figure 27](#) on page 41).

**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 [Roles and Permissions Panel](#) on page 45 to change a password).



**Figure 27. Network Password Prompt**

6. Click the **SIGN IN** button, if the unit is password protected.

## Disabling Compatibility Mode

The internal web page does not support compatibility mode in Microsoft Internet Explorer. To check compatibility view settings:

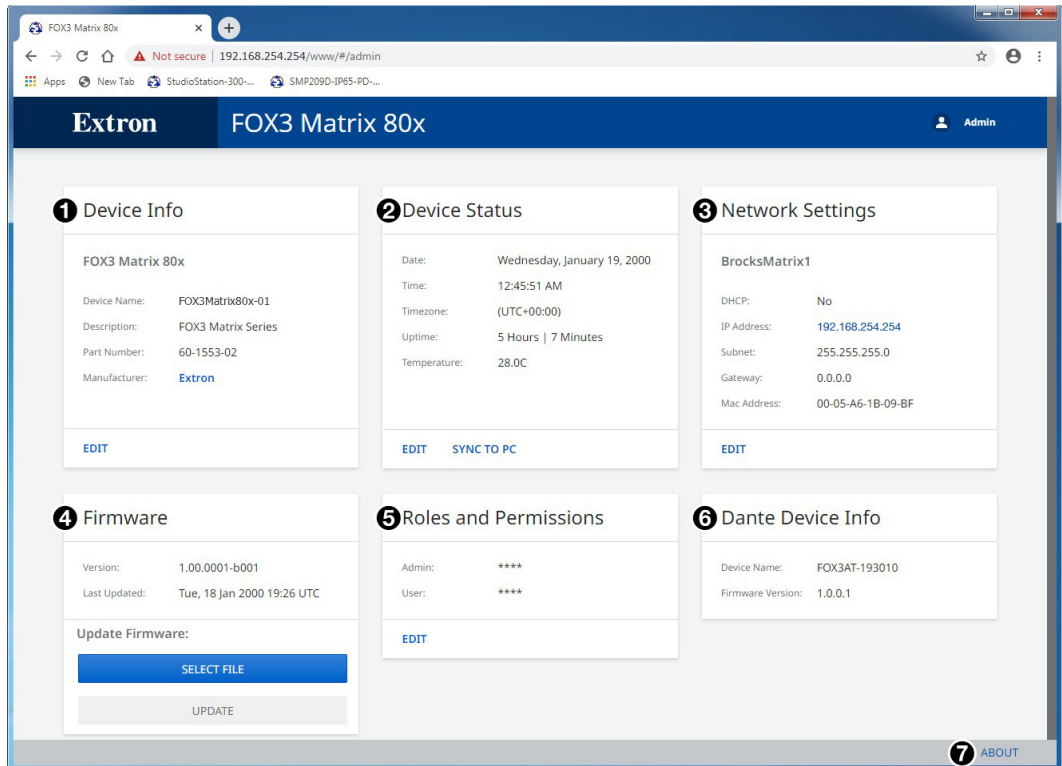
1. From the **Tools** menu of the browser, select **Compatibility View Settings**. The **Compatibility View Settings** dialog box opens.
2. Be sure the **Display all websites in Compatibility View** checkbox is clear, and the IP address of the scaler is not in the list of websites that have been added to **Compatibility View**.
3. Click **Close**.

## Web Page Panels

The FOX3 Matrix internal web page (see [figure 28](#) on page 42) provides an overall, read-only view of the status of the switcher, with some editable fields for the following categories:

- |                                 |                                      |
|---------------------------------|--------------------------------------|
| ① <b>Device Info Panel</b>      | ④ <b>Firmware Panel</b>              |
| ② <b>Device Status Panel</b>    | ⑤ <b>Roles and Permissions Panel</b> |
| ③ <b>Network Settings Panel</b> | ⑥ <b>Dante Device Info Panel</b>     |

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 (⑦ see [About the FOX3 Matrix](#)).



**Figure 28. FOX3 Matrix Internal Web Page**

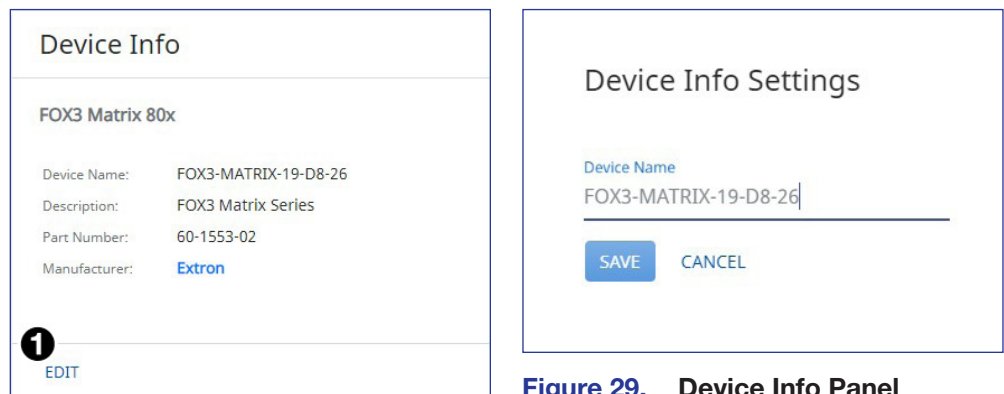
The internal web page does not automatically update. To see an updated page, click the **Refresh** button on the web browser.

## Device Info Panel

The **Device Info** panel (see figure 28, ❶) displays the device name, a brief product description, and the part number. The panel also contains an **Extron** link, which opens the **Extron website** in a new window.

To change the name:

1. Click **EDIT** (see figure 29 [left], ❶) in the **Device Info** panel. The **Device Info Settings** panel opens to allow edits (right).



**Figure 29. Device Info Panel**

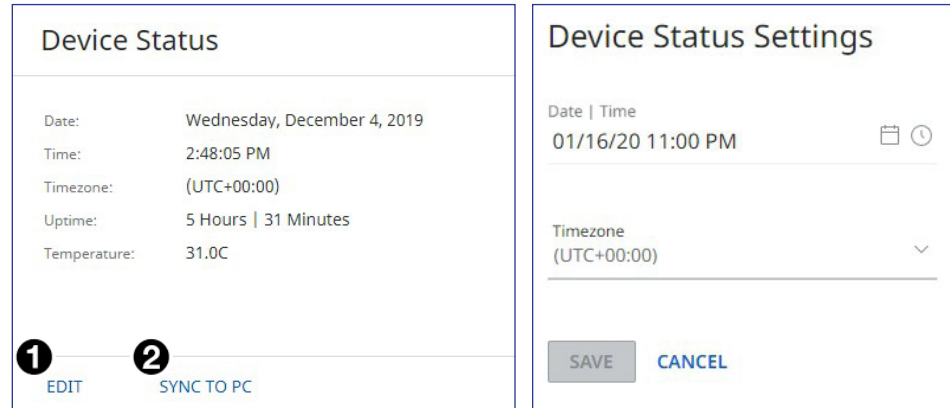
2. Edit the **Device Name** as desired.
3. When finished editing, click **SAVE** to confirm your changes or **CANCEL** to close the window without making changes. Clicking the **X** in the upper-right corner of the screen also closes the window.

## Device Status Panel

The **Device Status** panel (see [figure 28](#), [2](#) on page 42) displays the current date, time, time zone, the amount of time the device has been running (**Uptime**), and the internal temperature in degrees Celsius.

To set the date and time:

1. Click **EDIT** (see [figure 30](#) [left], [1](#)) in the **Device Status** panel. The **Device Status Settings** panel opens to allow edits (right).



**Figure 30. Device Status Panel**

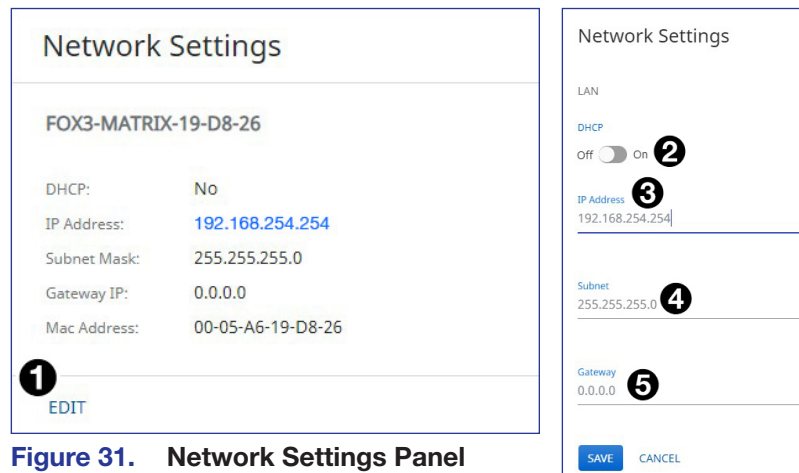
2. Edit the **Date/Time** and **Timezone** as desired.
3. When finished editing, click **SAVE** to confirm your changes or **CANCEL** to close the window without making changes. Clicking the **X** in the upper-right corner of the screen also closes the window.
4. Alternatively, click **SYNC TO PC** ([2](#)) to set the date and time according to your PC.

## Network Settings Panel

In the **Network Settings** panel (see [figure 28](#), [3](#)), set the IP address, subnet mask, and gateway address for your FOX3, and turn DHCP On and Off.

To set the IP addresses:

1. Click **EDIT** (see [figure 31](#) [left], [1](#)) in the **Network Settings** panel. The **Network Settings** panel opens to allow edits (right).



**Figure 31. Network Settings Panel**

2. Edit the network settings as desired:
  - a. Click the **DHCP** switch (see [figure 31](#) [right], **2** on page 43) 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 any of the addresses (**IP Address** **3**), **Subnet** mask **4**), and **Gateway** address **5**), click in the desired field and enter the address.
3. When finished editing, click **SAVE** to confirm your changes or **CANCEL** to close the window without making changes. Clicking the **X** in the upper-right corner of the screen also closes the window.

## Firmware Panel

The **Firmware** panel (see [figure 28](#), **4**, on page 42) 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 30 to download the firmware files).

**NOTE:** Firmware files for FOX3 Matrix have a .eff extension. Do not attempt to load any other file types.

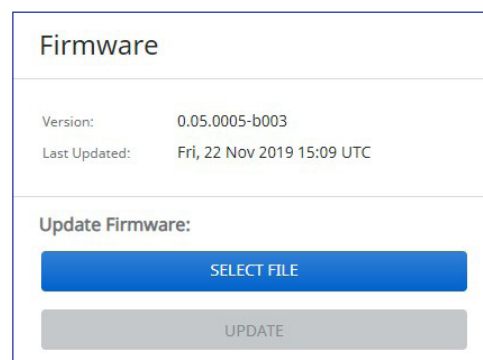
To update firmware:

1. In the **Firmware** panel, click the **SELECT FILE** button (see [figure 32](#)).
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](#)).
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 **UPDATE** to begin (see [figure 33](#)). To cancel the update, click the **X** button in the **Update Firmware** panel.

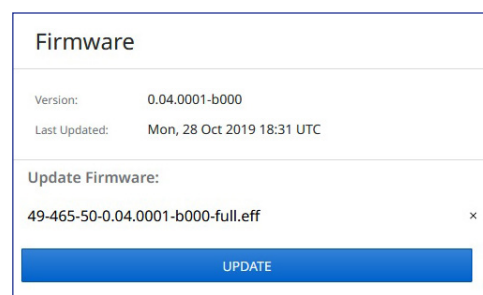
During the updating process, a window appears in the middle of the screen, showing messages giving the progress

of the update: **Initializing**, **Installing the Firmware**, and **Rebooting Device**.

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.



**Figure 32. Firmware Panel**



**Figure 33. Firmware Update Dialog Box**

## Roles and Permissions Panel

The Roles and Permissions panel (see [figure 28](#), ⑤, on page 42) displays whether **Admin** and **User** passwords have been set. It does not display the actual password.

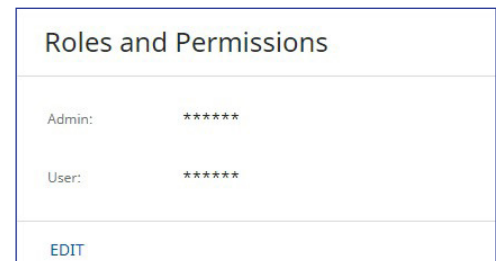
**NOTE:** The following rules apply to passwords:

- Length is 1-128 characters.
- All human-readable characters are permitted except | .
- The password cannot be a single space.
- Passwords are case-sensitive.
- If the **Admin** password is cleared, the user password is cleared as well.
- 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**.

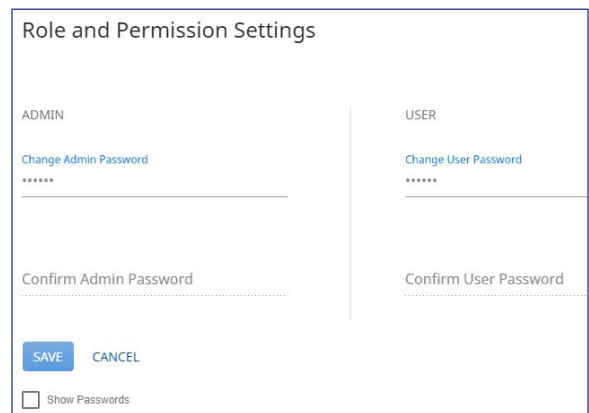
To assign a administrator and user passwords:

1. In the Roles and Permissions panel, click **EDIT** (see [figure 34](#)). The **Role and Permission Settings** dialog box opens.
2. In the **Admin** panel, click the **Change Admin Password** link and enter the new administrator password in the field below (see [figure 35](#)).
3. Click in the **Confirm Admin Password** field and enter the password from the **Change 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** or the **X** in the upper-right corner.

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



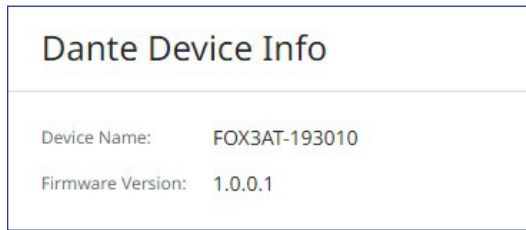
**Figure 34. Roles and Permissions Panel**



**Figure 35. Passwords Dialog Box**

## Dante Device Info Panel

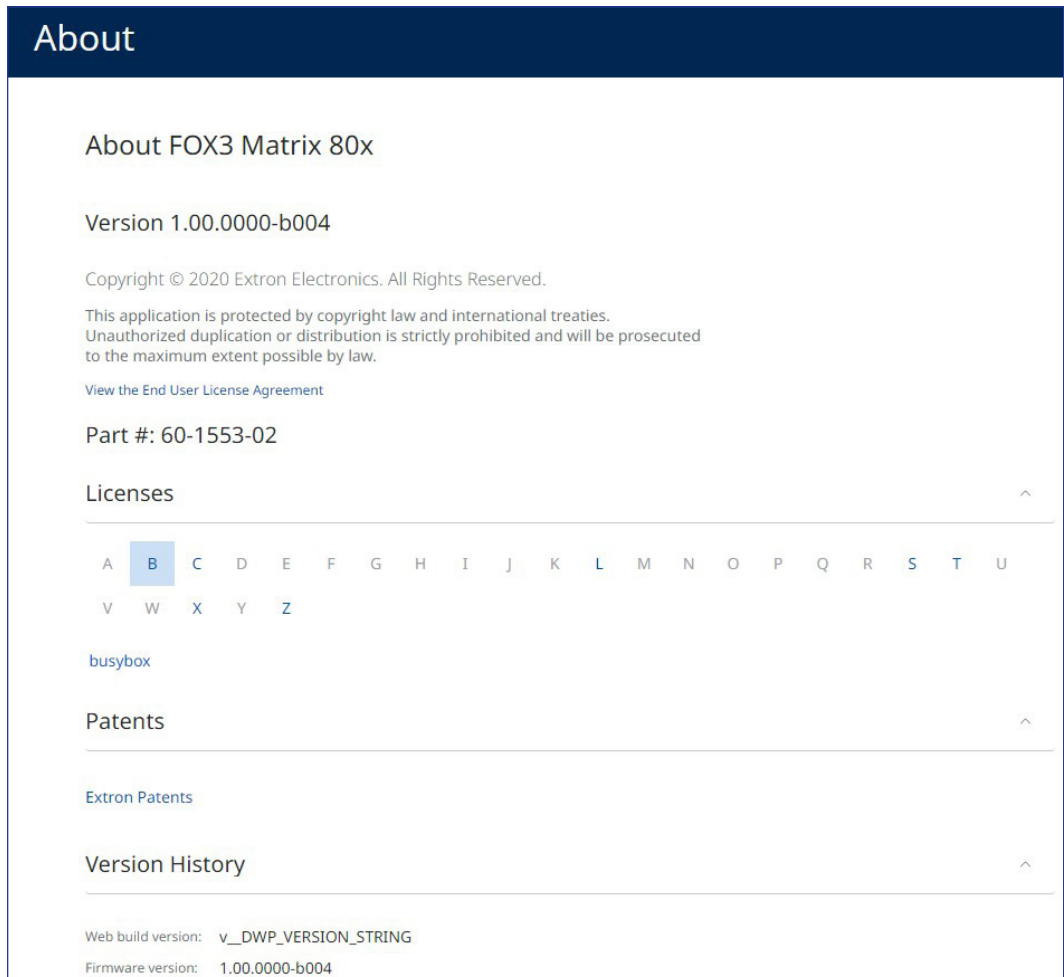
The Dante Device Info panel (see [figure 28](#), [6](#), on page 42) displays the Device Name and Firmware Version of a Dante device connected to the FOX3 Matrix.



**Figure 36.** Dante Device Info Panel

## About the FOX3 Matrix

Click on the **ABOUT** link (see [figure 28](#), [6](#) on page 42) 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 license.



**Figure 37.** 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 an I/O Module](#)
- [Removing and Installing a Power Supply Module](#)
- [Removing and Installing a Fan Assembly](#)

## 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 matrix switcher into a rack.

- **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 ( $T_{ma} = +32$  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).


## 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.

 **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 (\*) indicating the frames and their interchangeable parts.

	FOX3 24x	FOX3 40x	FOX3 80x	FOX3 160x	FOX3 320x
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

## Removing and Installing an I/O Module

**NOTE:** All the diagrams in the section show the 40x frame, which is similar in function to all the other matrix frames.

**⚠ 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.

### ATTENTION:

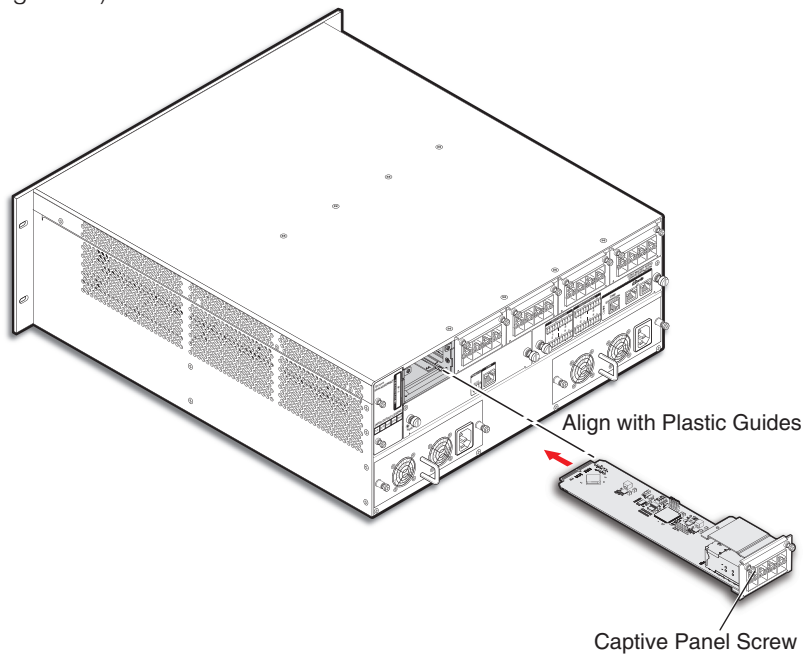
- Do not touch the electronic components or the connectors on the backplane or on the circuit boards without being electrically grounded. Handle circuit boards by their edges only. ESD can damage circuits, even if you cannot feel, see, or hear it.
- Ne pas toucher les composants électroniques ou les 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. Cela pourrait endommager le commutation de la gamme FOX.
- 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.

**NOTES:**

- 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.

Remove and replace an I/O module as follows:

1. Disconnect any connected cables.
2. Rotate the left and right captive panel screws to completely loosen the screws (see figure 38).



**Figure 38. I/O Board Replacement**

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.

## Removing and Installing a Power Supply Module

The two power supply modules (primary and redundant) are identical. Each power supply module has a 2-color status LED, visible on the rear 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.

### ATTENTION:

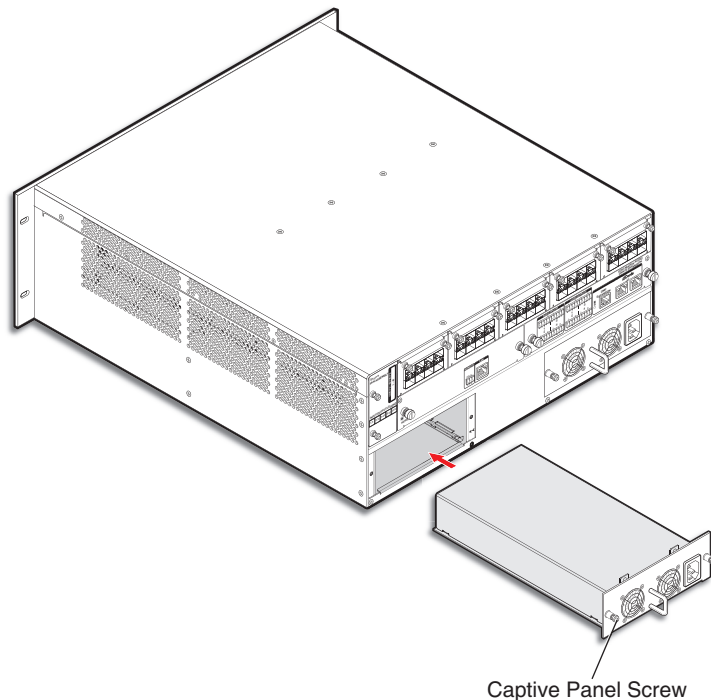
- Disconnect both power supply cords before servicing.
- Débranchez les deux câbles de la source d'alimentation avant l'entretien.

### 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.

Remove and replace a power supply as follows:

1. Rotate the left and right captive panel screws to completely loosen the screws.
2. Gently pull on the handle to loosen the power supply from the backplane (see figure 39).
3. Slide the power supply out of the chassis.



**Figure 39. Power Supply Replacement**

4. Orient the replacement power supply module to be installed with the LED to the right.
5. Align the flanges on the replacement power supply module with the left and right power supply guides (see figure 39).
6. Gently slide the replacement power supply into the enclosure until the module meets resistance.
7. Gently seat the replacement power supply in the backplane.
8. Use a screwdriver to tighten the left and right captive panel screws to secure the replacement power supply in place.

## Removing and Installing a Fan Assembly

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

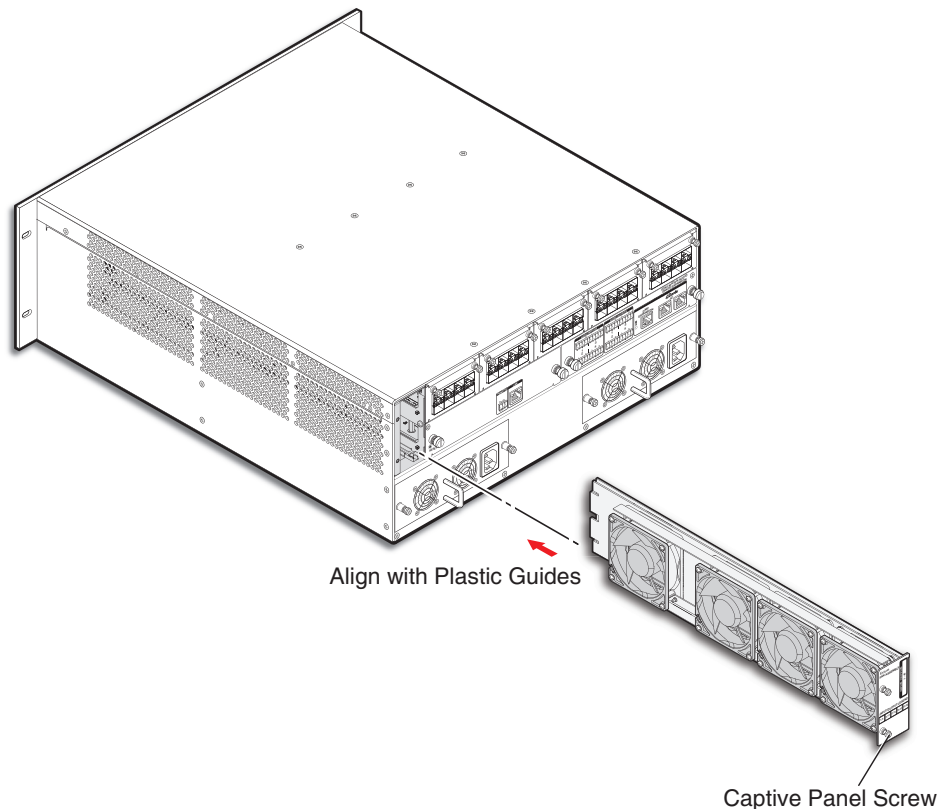
- FOX3 Matrix 24x has 2 fans
- FOX3 Matrix 40x has 4 fans
- FOX3 Matrix 80x has 3 fans
- FOX3 Matrix 160x has 6 fans
- FOX3 Matrix 320x has 9 fans

### NOTES:

- The fan modules are hot-swappable. They can be removed or installed without powering down the switcher.
- The diagram shows the 40x frame, which is similar in function to all matrix frames.

Remove and replace a fan module as follows:

1. Rotate the top and bottom captive panel screws to completely loosen the screws (see figure 40).



**Figure 40. Fan Assembly Replacement**

2. Gently pull on the captive panel screws to loosen the fan from the backplane.
3. Slide the fan assembly out of the chassis.
4. Align the flanges on the replacement fan assembly with the top and bottom fan guides (see figure 40).
5. Gently slide the replacement fan assembly into the enclosure until the fan meets resistance.
6. Gently seat the replacement fan assembly into the backplane.
7. Use a screwdriver to tighten the top and bottom captive panel screws to secure the replacement fan assembly in place.

## Extron Warranty

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

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

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

**Asia:**

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

**Japan:**

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

**Europe:**

Extron Europe  
Hanzeboulevard 10  
3825 PH Amersfoort  
The Netherlands

**China:**

Extron China  
686 Ronghua Road  
Songjiang District  
Shanghai 201611  
China

**Middle East:**

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

**Africa:**

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

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

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

**USA:** 714.491.1500 or 800.633.9876

**Asia:** 65.6383.4400

**Europe:** 31.33.453.4040 or 800.3987.6673

**Japan:** 81.3.3511.7655

**Africa:** 27.11.447.6162

**Middle East:** 971.4.299.1800

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

Extron 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.