User Guide

Fiber Optic Extenders

FOX3 T/R 301
FOX3 T/R 311

Fiber Optic HDMI Transmitters and Receivers

Extron

68-2711-01 Rev. B
05 21

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**.

تعليمات السلامة • العربية

تحذير: ⚠ هذا الرمز، ⚠، عند استخدامه على المنتج، مخصص لتنبيه المستخدم فيما يتعلق بوجود جهد كهربائي غير معزول على الغلاف الخارجي للمنتج وهو ما قد ينطوي على مخاطر حدوث صدمة كهربائية.

انتبه: هذا الرمز، ⚠، عند استخدامه على المنتج، مخصص لتنبيه المستخدم بتعليمات التشغيل والصيانة الهامة (الخدمة) في المواد التي يتم توفيرها مع المعدات.

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Sicherheitsanweisungen • Deutsch

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

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

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

Instrucciones de seguridad • Español

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

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

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**.

Instructions de sécurité • Français

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

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

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

Istruzioni di sicurezza • Italiano

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

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

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

Instrukcje bezpieczeństwa • Polska

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

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

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

Инструкция по технике безопасности • Русский

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

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**, номер по каталогу - 68-290-01.

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

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

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

安全記事 • 繁體中文

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

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

安全上のご注意 • 日本語

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

안전 지침 • 한국어

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

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FCC Class A Notice

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

Battery Notice

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

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

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

Class 1 Laser Product

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

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

NOTE: For more information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the "**Extron Safety and Regulatory Compliance Guide**" on the Extron website.

Produit laser de classe 1

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

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

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

Conventions Used in this Guide

Notifications

The following notifications are used in this guide:

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.

Software Commands

Commands are written in the fonts shown here:

```
^AR Merge Scene,,0p1 scene 1,1 ^B 51 ^W^C.0
[01] R 0004 00300 00400 00800 00600 [02] 35 [17] [03]
Esc X1 * X17 * X20 * X23 * X21 CE ←
```

NOTE: For commands and examples of computer or device responses used in this guide, the character "**0**" is the number zero and "O" is 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 specifications are available on the Extron website, **www.extron.com**.

Extron Glossary of Terms

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

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Introduction

WARNING: The FOX3 T/R 301 and FOX3 T/R 311 output continuous invisible light (Class 1 rated), which may be harmful to the eyes; use with caution.

AVERTISSEMENT : Le FOX3 T/R 301 et FOX3 T/R 311 émet une lumière invisible en continu (conforme à la classe 1) qui peut être dangereux pour les yeux, à utiliser avec précaution.

- Do not look into the rear panel fiber optic cable connectors or into the fiber optic cables themselves.
- Ne regardez pas dans les connecteurs de câble fibre optique sur le panneau arrière ou dans les câbles fibre optique eux-mêmes.

- Plug the attached dust cap into the optical transceiver when the fiber optic cable is unplugged.
- Branchez la protection contre la poussière dans l'ensemble émetteur/récepteur lorsque le câble fibre optique est débranché.

About this Guide

This guide contains information about the Extron FOX3 T/R 301 and FOX3 T/R 311 fiber optic extenders.

Product Description

The FOX3 T/R 301 and FOX3 T/R 311 Transmitter and Receiver are ultra-high performance fiber optic extender sets for long haul transmission of the following over two fiber optic cables (see **figure 1** on page 2):

- Uncompressed or visually lossless HDCP-compliant 4096x2160 or 3840x2160 (UHD) @ 60 Hz video HDMI video
- 2-CH LPCM audio
- RS-232 and IR control signals
- USB HID (for Human Interface Devices such as keyboards and mice
- USB 2.0 (FOX3 T/R 301 transmitter and receiver only)
- 3D Sync

The transmitter and receiver extend HDMI signals up to:

- 20 km (12.4 miles) for the singlemode cables
- 500 m (1640 feet) with 50 µm OM4 4700 MHz bandwidth laser optimized multimode cables

(see **Fiber Cable Transmission Modes** on page 4).

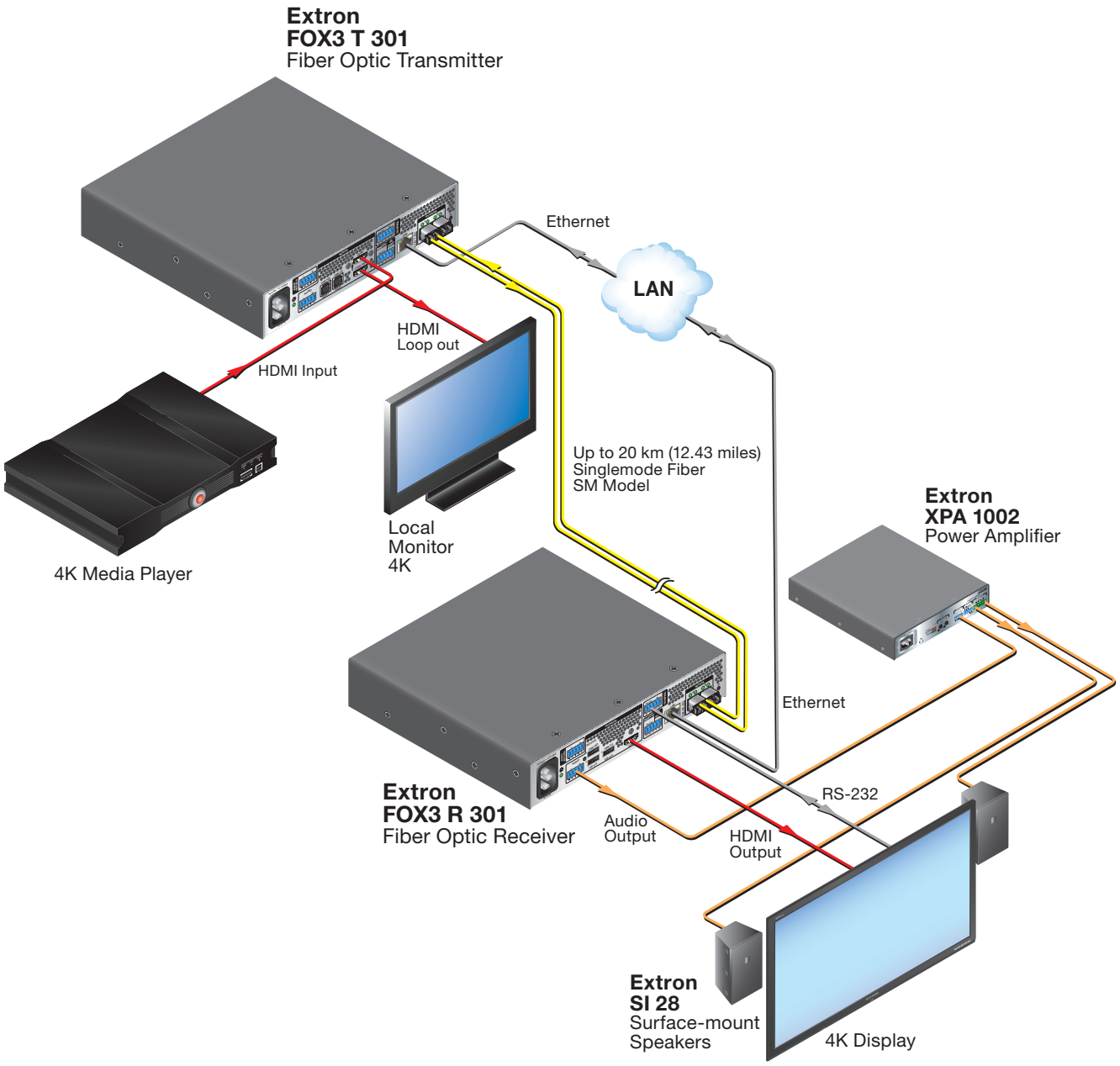


Figure 1. Typical FOX3 T/R 301 Transmitter and Receiver Application

Transmitter

The FOX3 T 301 and FOX3 T 311 transmitters accept HDMI video, at a resolution of up to 4K (4096x2160 @ 60 Hz). The video input can also include embedded audio. The transmitter also loops the HDMI input through for a local monitor.

The transmitter can accept an analog audio input on a 5-pole captive screw connector. The transmitter automatically detects whether embedded audio is present on the HDMI input. If none is detected, the transmitter selects the analog audio for the unit to embed in the digital video stream and transmit to the receiver. Audio can be selected via an Simple Instruction Set (SIS) command or Product Configuration Software (PCS).

The transmitter has an HID USB port (both models) and a USB 2.0 port (FOX3 T 301) that connects directly to USB ports on a PC or USB host. The transmitter includes USB peripheral emulation to enable trouble-free booting of a host computer that is not connected to a keyboard or mouse.

It also accepts a 3D sync signal.

The transmitter can receive an optional return (receiver-to-transmitter) stream of serial RS-232 communications from a controlled device, such as projector responses.

The transmitter converts the HDMI video, the selected audio, and the RS-232 serial communication, one or both USB inputs, and 3D sync into two proprietary data streams and outputs them as optical signals via fiber optic small form factor pluggable (SFP) modules on two LC connector to a compatible Extron FOX3 fiber optic receiver. It also can receive an audio return channel.

The transmitter has a built-in color bars test pattern to assist in setting up the display equipment.

Receiver

The FOX3 R 301 and FOX3 R 311 receivers accept proprietary optical signals on one, two, or up to three LC connectors from a compatible fiber optic FOX3 transmitter. The receiver is compatible with all Extron FOX3 transmitters.

The receiver outputs HDMI video, digital audio (embedded in the HDMI output), analog audio, RS-232 and IR commands and data, USB signals, and 3D sync.

The receiver has two HID USB ports (both models) to connect one or two peripheral devices and a USB 2.0 port (FOX3 R 301) that connects directly to USB devices.

If the receiver is appropriately configured and has return fiber optic cables installed, it also can receive RS-232, IR, and USB returns from controlled devices and send them to the transmitter via a proprietary optical signal.

The video output of the receiver is a lossless HDMI image up to 4K (4096x2160 @ 60 Hz), including 1080p/60 Hz with Deep Color.

Both Units

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

System Compatibility

NOTE: The FOX3 products are **not** compatible with legacy FOX, FOXBOX, FOX II, PowerCage 401 FOX, or PowerCage 1600 FOX products.

Fiber Cable Transmission Modes

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

Multimode — Long distance, up to 500 m (1640 feet) (depending on the fiber cable)

Singlemode — Very long distance, up to 20 km (12.4 miles)

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

Extron LinkLicense

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

LinkLicense upgrades available for the FOX3 transmitter and receiver include the following:

- **Uncompressed Video Upgrade** —
  - This LinkLicense is enabled once and lasts for the life of the product.
  - Allows the FOX3 devices to pass uncompressed 4K @ 60 Hz video on the second SFP module, enabling the highest video performance.

Features

- **FOX3 T 301** — Transmits HDMI video, USB HID, USB 2.0, stereo audio, RS-232 control, IR control, and 3D sync signals over fiber optic cabling.
- **FOX3 T 311** — Transmits HDMI video, USB HID, stereo audio, RS-232 control, IR control, and 3D sync signals over fiber optic cabling.
- **FOX3 R 301** — Receives HDMI video, USB HID, USB 2.0, stereo audio, RS-232 control, IR control, and 3D sync signals over fiber optic cabling.
- **FOX3 R 311** — Receives HDMI video, USB HID, stereo audio, RS-232 control, IR control, and 3D sync signals over fiber optic cabling.
- **Supports mathematically lossless 4K video up to 4096x2160 @ 60 Hz with 4:4:4 chroma sampling over one fiber.**
- **Supports uncompressed 4K video up to 4096x2160 @ 60 Hz with 4:4:4 chroma sampling over two fibers.**
- **Supported HDMI 2.0 specification features include data rates up to 18 Gbps, Deep Color up to 12 bit, and 3D.**
- **HDCP 2.3 compliant**
- **Device class filtering on USB HID port restricts the range of device types to HID** — Device class filtering prevents unauthorized downloading or uploading of content via the USB port in secure environments. The USB HID port is configured at the factory, such that device class filtering cannot be removed or altered in the field.
- **Supports USB 2.0 to 1.0 devices and USB 3.0 devices that can operate at USB 2.0 data rates of up to 480 Mbps (FOX3 T/R 301)** — Provides USB extension, allowing connection to peripheral devices over the same fiber optic cable as video and audio.
- **Buffered HDMI input loop-out (FOX3 transmitters)** — Local HDMI output provides signals for a local display, enabling monitoring or sharing of content without the need for a separate distribution amplifier.

- **HDMI audio de-embedding with analog stereo outputs (FOX3 receivers)** — Digital HDMI audio is made available as a balanced or unbalanced analog stereo signal on captive screw connectors.
- **Key Minder continuously verifies HDCP compliance for quick, reliable switching** — Authenticates and maintains continuous HDCP encryption between input and output devices to ensure quick and reliable switching in professional AV environments.
- **EDID Minder automatically manages EDID communication between connected devices (FOX3 transmitters)** — EDID Minder ensures that all sources power up properly and reliably output content for display.
- **Audio gain and attenuation adjustment capability (FOX3 transmitters)** — Setting the level of gain or attenuation eliminates noticeable volume differences when switching between sources.
- **Audio embedding (FOX3 transmitters)** — Analog stereo audio signals are converted to digital HDMI audio.
- **Analog audio return channel** — Provides balanced return analog stereo audio input to support a remote audio source at the receiver.
- **Bidirectional RS-232 and IR signal transmission over fiber optic cabling for AV device control** — Bidirectional RS-232 and IR control pass-through enables a remote display to be controlled without the need for additional cabling. Two fibers are required for bidirectional communications.
- **User-selectable HDCP authorization (FOX3 transmitters)** — Allows the transmitter to appear HDCP compliant or non HDCP compliant to the connected source.
- **HDCP Visual Confirmation (FOX3 receivers)** — When HDCP encrypted content is transmitted to a non HDCP compliant display, a full screen green signal is sent to the display for immediate visual confirmation that protected content cannot be viewed on that display.
- **Integrated two-port HID hub with 100mA available on each port (FOX3 receivers)** — Allows simultaneous connection to multiple peripheral devices, including keyboards, mice, and other HID - Human Interactive Devices.
- **Host emulation on the USB HID ports (FOX3 receivers)** — Offers increased system reliability by emulating a continuous connection between the HID-compliant keyboard and mouse and a host.
- **Peripheral emulation on USB HID port (FOX3 transmitters)** — Offers increased system reliability by emulating a continuous connection between the host and an HID-compliant keyboard and mouse.
- **LinkLicense Support** — Extron LinkLicense unlocks features that add convenience, expand system functionality, and enhance the capabilities of Extron products.
- **Front panel USB configuration port** — Enables easy system configuration and firmware upgrading without having to access the rear panel.
- **Ethernet monitoring and control** — Enables control and proactive monitoring over a LAN, WAN, or the Internet.
- **RS-232 control** — Features an RS-232 serial port for control and configuration.
- **Real-time status LED indicators for troubleshooting and monitoring** — Front and rear panel LEDs verify signal presence, HDCP authentication, fiber link status, audio, USB HID, USB 2.0, and power.
- **Easy setup and commissioning with Extron PCS - Product Configuration Software** — Conveniently configures multiple products using a single software application.

- **Internal color bars test pattern for calibration and setup** — Simplifies setup and installation by providing a video signal when a source is unavailable.
- **Compatible with Extron FOX3 Series matrix switchers** — Creates HDCP-compliant signal distribution systems.
- **JITC Certified** — Successfully completed interoperability and information assurance testing for use in government applications and other mission-critical environments.
- **Industry standard LC connectors provide reliable physical connectivity and precise fiber core alignment**
- **Available as an 850 nm multimode model for moderate-range transmissions up to 500 m (1640 feet) and a 1310 nm singlemode model for extreme distances up to 20 km (12.4 miles).**
- **1U high, half 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 and Operation

This section details the installation of the FOX3 T/R 301/311 transmitter and receiver system, including:

- **Installation Overview**
- **Rear Panel Features**
- **Front Panel Features**
- **Connector and Cable Details**
- **Operation**

Installation Overview

Follow these steps to install and set up an Extron FOX3 T/R 301/311 transmitter and receiver system for operation:

- ☐ Turn off all of the equipment. Ensure that the video source and the output display are all turned off and disconnected from the power source.
- ☐ Mount the transmitter and receiver (see **Equipment Mounting** on page 48).
- ☐ Connect the cables and configure the units (see "Transmitter Rear Panel Connections," starting below).
- ☐ Plug in the power supplies, then turn on the display and the input.

Rear Panel Features

Transmitter Rear Panel Connections

NOTE: Figure 2 shows the FOX3 T 301 transmitter. The FOX3 T 311 looks similar, with the exception of the USB ports (E). It does not have the USB 2.0 port.

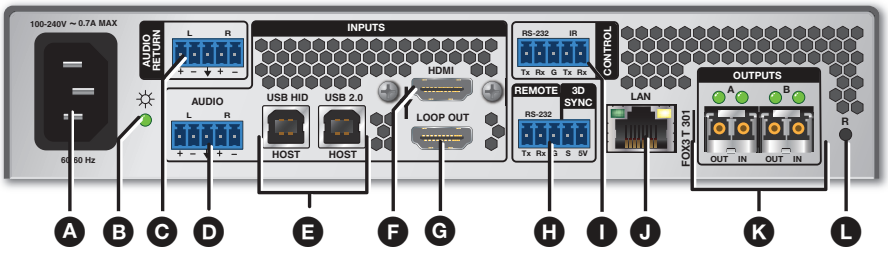


Figure 2. FOX3 T 301 Transmitter Rear Panel Connectors

- A Power inlet
- B Power LED
- C Audio Return
- D Audio input
- E USB Host ports
- F HDMI input
- G HDMI Loop Out
- H Remote RS-232/3D Sync port
- I Control RS-232/IR port
- J LAN Ethernet port
- K SFP module and LEDs
- L Reset button

Ⓐ **Power inlet** (see **figure 2** on page 7) — Plug a standard IEC power cord into this connector to connect the unit to a 100 VAC to 240 VAC, 50-60 Hz power source.

Ⓑ **Power LED** — The lit LED indicates power is applied and device is ready to transmit.

Ⓒ **Audio Return** — Connect an audio device, such as an amplifier or powered speakers to this 5-pole, 3.5 mm captive screw connector. This connector outputs returned, unamplified, line level audio from the receiver (see **Analog Audio Connectors** on page 14 to wire this connector).

Ⓓ **Audio input** — This 3.5 mm, 5-pole captive screw connector accepts balanced or unbalanced line level analog audio input that can be transmitted to the receiver (see **Analog Audio Connectors** to wire this connector).

Ⓔ **USB Host ports** — (see **USB HID and USB 2.0 Connectors** on page 16)

- **USB HID** — Connect USB type A to B cables between this USB type B port and the USB port of a host. The USB HID ports are used only for a mouse or keyboard.
- **USB 2.0** (FOX3 T 301 only) — Connect USB type A to B cables between this USB type B port and the USB port of a host. The USB 2.0 ports are used for thumb drives, cameras, keyboards, a mouse, CAC reader, and such devices.

Ⓕ **HDMI input** — Connect a digital video input to this HDMI port. The transmitter also accepts embedded digital audio on this connector (see **HDMI Connectors** on page 13 to use the included Extron Lock-It Lacing Bracket).

Ⓖ **HDMI Loop Out** — If desired, connect a local monitor to this HDMI port.

Ⓗ **Remote RS-232/3D Sync port** —

- **Remote RS-232 port** — For serial control of the transmitter, connect a host device, such as a computer or touch panel control, via the three left poles (Tx, Rx, and G) of this 5-pole captive screw connector (see **RS-232, IR, and Sync Connectors** on page 14 to wire this connector).
- **3D Sync port** — For stereoscopic 3D sync, such as external IR emitter for glasses, connect a PC to the two right poles of the REMOTE RS-232/3D Sync 5-pole captive screw port on the transmitter (see **RS-232, IR, and Sync Connectors** to wire this connector).

Ⓘ **Control RS-232 and IR port** — Connect a serial RS-232 signal, a modulated or unmodulated IR signal, or both to this 3.5 mm, 5-pole captive screw connector for bidirectional RS-232 and IR communication (see **RS-232, IR, and Sync Connectors** to wire the connector).

NOTES:

- To receive responses from the controlled device over RS-232 or IR, two fiber optic cables must be connected.
- The FOX3 system can pass RS-232 commands and responses at rates up to 115200 baud.
- RS-232 and IR can be active simultaneously.

Ⓙ **LAN Ethernet port** — Connect the transmitter to an Ethernet LAN or WAN via this RJ-45 port. Ethernet control allows the operator to configure the transmitter from a remote location. When connected to an Ethernet LAN or WAN, the transmitter can be accessed and operated from a computer running a standard Internet browser (see **TP Cable Termination and Recommendations** on page 15 to wire the connector).

- **Link (green) LED** — Indicates that the unit is properly connected to an Ethernet LAN. This LED should light steadily.
- **Act (yellow) LED** — Indicates transmission of data packets on the RJ-45 connector. This LED should blink as the unit communicates.

NOTE: This is not a pass-through LAN connection

K SFP module and LEDs — (see **figure 2** on page 7)

WARNING: The units output 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 produit 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.

NOTES:

- Ensure the proper fiber cables for the transmitter and receiver pair are used. Typically, singlemode fiber has a yellow jacket and multimode cable has an orange or aqua jacket.
- See figure 3 for fiber cable connections. Connect the transmitter to a receiver in one of three ways:
  - One way (transmitter to receiver) only, connect transmitter Outputs A (❶) to receiver Inputs A (❶).
  - Two way (transmitter to receiver and return), connect transmitter Outputs A (❶) to receiver Inputs A (❶) and connect transmitter Outputs A (❷) to receiver Inputs A (❷).
  - Output B is available to transmit a 4K @ 60 Hz uncompressed signal when the FOX3 4K @ 60 Hz Uncompressed Video LinkLicense is purchased.

❶ **Port A Out (required)** — For all one-way video, audio, and serial communications from the transmitter to the receiver, connect a fiber optic cable to the Out LC port.

Connect the opposite end of this fiber optic cable to the Port A In LC port on the receiver (see **figure 4**, **J** on page 10) or to any other compatible Extron FOX3 device.

❷ **Port A In (optional)** — For one-way return audio, USB, and serial communications from the receiver to the transmitter, connect a fiber optic cable to the In LC port.

Connect the opposite end of this fiber optic cable to the Port A Out LC port on a receiver (see **figure 4,** **J**) or to any other compatible Extron FOX3 device.

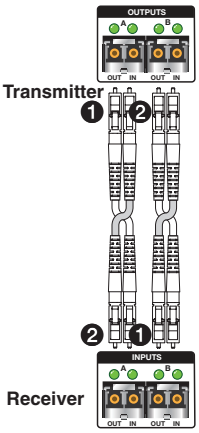


Figure 3. Connection

SFP Link LEDs —

- Transmit Optical OUT LED lights solid green when powered and lights off when there is no power on the endpoint.
- Receive Optical IN LED lights solid green when light is present and lights off when there is no power or light present.

L Reset button — Initiates three levels of resets (1, 4, and 5). Use a pointed stylus, ballpoint pen, or small screwdriver to access the recessed button (see **Reset** on page 18 for detailed reset information).

Receiver Rear Panel Connections

NOTE: Figure 4 shows the FOX3 R 301 receiver. The FOX3 R 311 looks similar, with the exception of the USB ports (H). It has no USB 2.0 port.

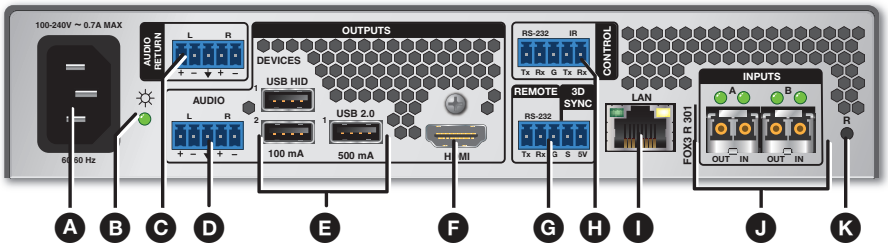


Figure 4. FOX3 R 301 Receiver Rear Panel Connectors

- A Power inlet
- B Power LED
- C Audio Return
- D Audio output
- E USB Hub ports
- F HDMI output
- G Remote RS-232/3D Sync port
- H Control RS-232/IR port
- I LAN Ethernet port
- J SFP module and LEDs
- K Reset button

A Power inlet — Plug a standard IEC power cord into this connector to connect the unit to a 100 VAC to 240 VAC, 50-60 Hz power source.

B Power LED — The lit LED indicates power is applied.

C Audio Return — Connect a balanced or unbalanced audio input to this 3.5 mm, 5-pole captive screw connector for return to the transmitter (see **Analog Audio Connectors** on page 14 to wire this connector).

D Audio output — This 5-pole, 3.5 mm captive screw connector outputs the transmitted, unamplified, line level analog audio (see **Analog Audio Connectors** to wire this connector).

NOTE: If embedded digital audio is present on the HDMI output, these analog audio connectors do not output audio unless forced to so by an SIS command (see **Input audio selection** on page 30).

E USB Hub ports — (see **USB HID and USB 2.0 Connectors** on page 16)

- **USB HID** — Connect USB type A to B cables between this USB type B port and the USB port of a device. The USB HID ports are used only for a mouse or keyboard.
- **USB 2.0** (FOX3 R 301 only) — Connect USB type A to B cables between this USB type B port and the USB port of a device. The USB 2.0 ports are used for thumb drives, cameras, keyboards, a mouse, CAC reader, and such devices.

F HDMI output — Connect a video display to this HDMI output port with a maximum resolution of 4096x2160 @ 60 Hz, 8-bit, 4:4:4 chroma sampling (see **HDMI Connectors** on page 13 to use the included Extron Lock-It Lacing Bracket).

G **Remote RS-232/3D Sync port** — (see **figure 4** on page 10)

- **Remote RS-232 port** — For serial control of the receiver, connect a host device, such as a computer or touch panel control, via the three left poles (Tx, Rx, and G) of this 5-pole captive screw connector (see **RS-232, IR, and Sync Connectors** on page 14 to wire this connector).
- **3D Sync port** — For stereoscopic 3D sync, such as external IR emitter for glasses, connect a PC to the two right poles of the REMOTE RS-232/3D Sync 5-pole captive screw port on the receiver (see **RS-232, IR, and Sync Connectors** to wire this connector).

H **Control RS-232/IR port** — Connect a serial RS-232 signal, a modulated or unmodulated IR signal, or both to this 3.5 mm, 5-pole captive screw connector for bidirectional RS-232 and IR communication (see **RS-232, IR, and Sync Connectors** on page 14 to wire the connector).

NOTES:

- If only one fiber optic cable is connected (see **figure 5** on page 12), RS-232 or IR reports from the controlled device cannot be recieved. To receive responses from the controlled device, two fiber optic cables must be connected.
- The transmitter can pass RS-232 commands and responses at rates up to 115200 baud.

I **LAN Ethernet port** — If desired, connect the receiver to an Ethernet LAN or WAN via this RJ-45 connector. Ethernet control allows the operator to control the receiver from a remote location. When connected to an Ethernet LAN or WAN, the receiver can be accessed and operated from a computer running a standard Internet browser (see **TP Cable Termination and Recommendations** on page 15 to wire the connector).

- **Link (green) LED** — Indicates that the unit is properly connected to an Ethernet LAN. This LED should light steadily.
- **Act (yellow) LED** — Indicates transmission of data packets on the RJ-45 connector. This LED should blink as the unit communicates.

J SFP module and LEDs —

WARNING: The devices output 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 produit 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.

NOTES:

- Ensure the proper fiber cables for the transmitter and receiver pair are used. Typically, singlemode fiber has a yellow jacket and multimode cable has an orange or aqua jacket.
- See figure 5 for fiber cable connections. Connect the transmitter to a receiver in one of three ways:
  - One way (transmitter to receiver) only, connect transmitter Outputs A (❶) to receiver Inputs A (❶).
  - Two way (transmitter to receiver and return), connect transmitter Outputs A (❶) to receiver Inputs A (❶) and connect transmitter Outputs A (❷) to receiver Inputs A (❷).
  - Output B is available to transmit a 4K @ 60 Hz uncompressed signal when the FOX3 4K @ 60 Hz Uncompressed Video LinkLicense is purchased.

❶ **Port A Out (required)** — For all one-way video, audio, and serial communications from the transmitter to the receiver, connect a fiber optic cable to the Out LC port.

Connect the opposite end of this fiber optic cable to the Port A In LC port on the receiver (see **figure 4**, J on page 10) or to any other compatible Extron FOX3 device.

❷ **Port A In (optional)** — For one-way return audio, USB, and serial communications from the receiver to the transmitter, connect a fiber optic cable to the In LC port.

Connect the opposite end of this fiber optic cable to the Port A Out LC port on a receiver (see **figure 4,** J) or to any other compatible Extron FOX3 device.

- Transmit Optical OUT LED lights solid green when powered and lights off when there is no power on the endpoint.
- Receive Optical IN LED lights solid green when light is present and lights off when there is no power or light present.

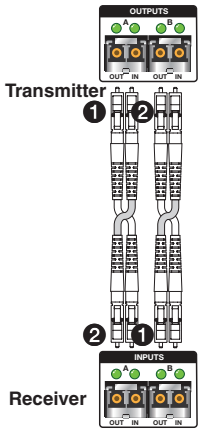


Figure 5. Fiber Cable Connection

K Reset button (see **figure 4** on page 10) — Initiates three levels of resets (1, 4, and 5). Use a pointed stylus, ballpoint pen, or small screwdriver to access the recessed button (see **Reset** on page 18 for detailed reset information).

Connector and Cable Details

HDMI Connectors

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

- Limit or avoid the use of adapters.
- Use only cables specifically intended for HDMI or DVI signals.

To securely fasten an HDMI cable to a device:

1. Plug the HDMI cable into the panel connection (see figure 6, ❶).

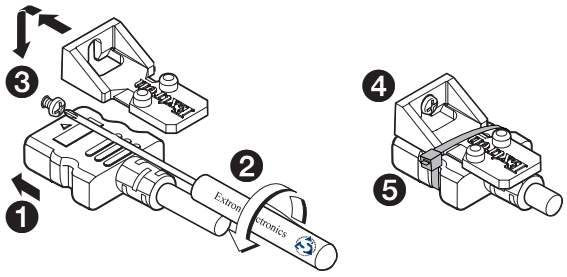


Figure 6. Installing the LockIt Lacing Bracket

2. Loosen the HDMI connection mounting screw from the panel enough to allow the LockIt lacing bracket to be placed over it (❷). The screw does not have to be removed.
3. Place the LockIt lacing bracket on the screw and against the HDMI connector, then tighten the screw to secure the bracket (❸).

ATTENTION:

- Do not overtighten the HDMI connector mounting screw. The shield to which it fastens is very thin and can easily be stripped.
- Ne serrez pas trop la vis de montage du connecteur HDMI. Le blindage auquel elle est attachée est très fin et peut facilement être dénudé.

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

Analog Audio Connectors

See figure 7 to wire connectors for the appropriate input and output type for the analog audio and audio return audio. Connectors are included with the transmitter and receiver, but you must supply the audio cable. Use the supplied tie-wraps to strap the cable to the extended tail of the connectors.

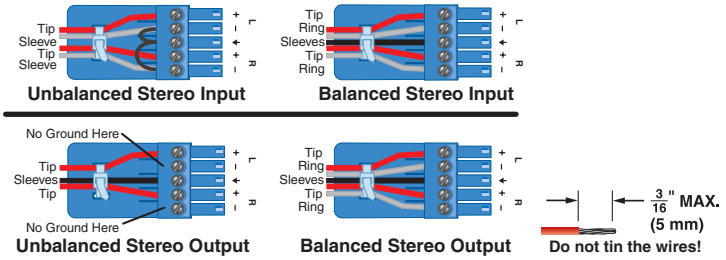


Figure 7. Captive Screw Connector Wiring for Audio Inputs and Outputs

ATTENTION:

- For unbalanced audio output, 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 (–).

NOTES:

- The length of exposed wires is important. The ideal length is 3/16 inch (5 mm).
- If the stripped section of wire is longer than 3/16 inch, the exposed wires may touch, causing a short circuit.
- If the stripped section of wire is shorter than 3/16 inch, wires can be easily pulled out even if tightly fastened by the captive screws.
- Do not tin the wires before installing them in the connector. Tinned wires are not as secure in the connector and could be pulled out.

RS-232, IR, and Sync Connectors

Figure 8 shows how to wire the Control (RS-232 and IR) and Remote (RS-232 and 3D Sync) connectors.

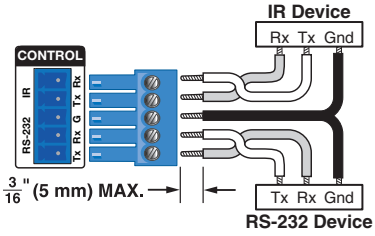


Figure 8. Control and Sync Connectors Wiring

NOTES:

- The IR Tx and Rx line pair and the RS-232 Tx and Rx line pair must each cross once between this connector and the source or destination.
- The length and preparation of exposed wires is important (see the audio connector **NOTES** above for details).

TP Cable Termination and Recommendations

It is vital that your Ethernet cable be the correct cable type and that it 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).

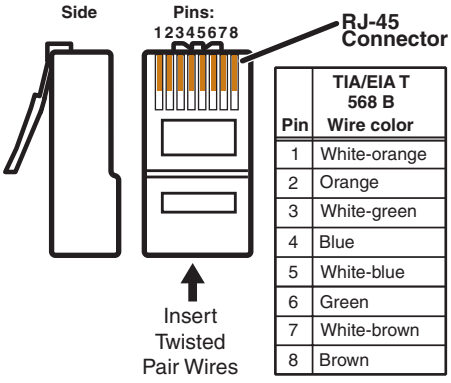
NOTES:

- Do not use standard telephone cables. Telephone cables do not support Ethernet or Fast 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), 100 Mbps (100Base-T — Fast Ethernet), and 1000 Mbps (1000Base-T — IEEE 802.3ab) half-duplex and full-duplex Ethernet connections.

- 10Base-T Ethernet requires CAT 3 UTP or STP cable at minimum.
- 100Base-T Fast Ethernet requires CAT 5e UTP or STP cable at minimum.
- 1000Base-T Gigabit Ethernet requires CAT 5, CAT 5e, CAT 6, or CAT 7 UTP or STP cable.

The Ethernet cable must be terminated as a patch (straight-through) cable and must be properly terminated in accordance with the **TIA/EIA T568-B** wiring standard (see figure 9).



Pin	TIA/EIA T 568 B Wire color
1	White-orange
2	Orange
3	White-green
4	Blue
5	White-blue
6	Green
7	White-brown
8	Brown

Figure 9. RJ-45 Connector and Pinout Tables

USB HID and USB 2.0 Connectors

NOTES:

- The FOX3 matrix switches the USB HID and USB 2.0 inputs and outputs independently of the video and each USB connection.
- The USB 2.0 port is only available on the FOX3 T/R 301 devices.
- The USB HID ports are used only for a mouse or keyboard.
- The USB 2.0 ports are used for thumb drives, cameras, keyboards, a mouse, CAC reader, and such devices.

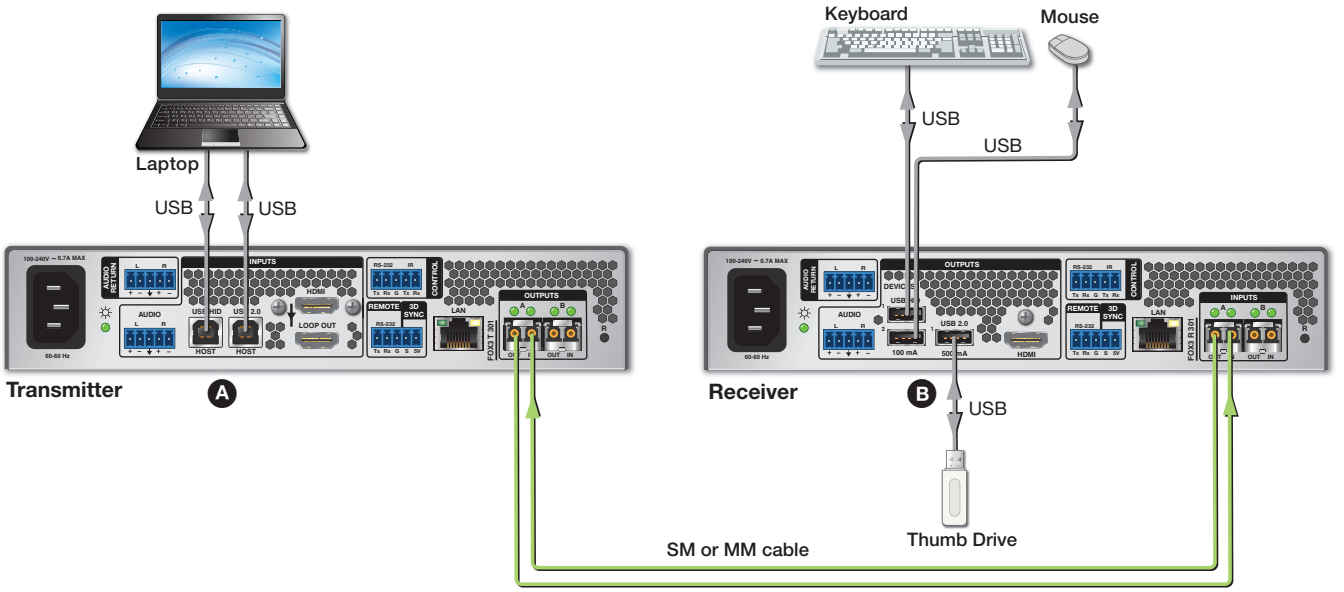


Figure 10. Peripheral USB Connections Diagram

A **USB Host ports** — Connect USB type A to B cable between these USB type B ports and the USB ports of a host.

Two separate USB cables are required: 1 for USB HID and another 1 for USB 2.0 connections.

B **USB Hub ports** — Connect a USB type A cable between the USB type A port and peripherals.

Types of USB ports

- **USB HID** — Connect USB type A to B cables between this USB type B port and the USB port of a host. The USB HID ports are used only for a mouse or keyboard.
- **USB 2.0** (FOX3 R 301 only) — Connect USB type A to B cables between this USB type B port and the USB port of a host. The USB 2.0 ports are used for thumb drives, cameras, keyboards, a mouse, CAC reader, and such devices.

Front Panel Features

NOTE: Figure 11 shows the FOX3 T 301 transmitter and FOX3 R 301 receiver. The FOX3 T/R 311 units look similar, with the exception of the USB ports (D). The FOX3 T/R 311 have no USB 2.0 LEDs.

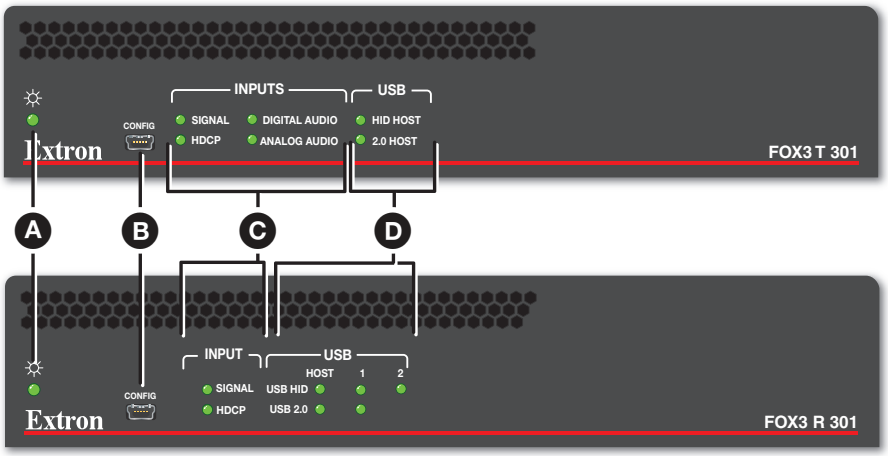


Figure 11. Transmitter and Receiver Front Panel Features

A Power LED — The unit is receiving power and is operational.

B Configuration port — This USB mini-B port is used to configure the unit and to update firmware.

C Input LEDs

- **Signal LED** — Lights when the unit detects an input video signal.
- **HDCP LED** — Lights when the input signal is HDCP encrypted.
- **Digital Audio LED** — Lights when digital audio is selected on the transmitter.
- **Analog Audio LED** — Lights when analog audio is selected on the transmitter.

D USB LEDs —

- **Transmitter** — The HID Host LED and 2.0 Host LED light when the unit is connected to the host device.
- **Receiver** —
  - **USB HID Host LED** — When the transmitter and receiver are connected through the SFP port and a host device is connected to the transmitter, the LED remains lit to indicate an active connected device.
  - **USB HID 1 and 2 LEDs** —When an active USB peripheral device is connected to the HUB ports on the receiver, the LED remains lit to indicate an active connected device.
  - **USB 2.0 Host LED** — When the transmitter and receiver are connected through the SFP port and a USB 2.0 Host device is connected to the transmitter, the LED remains lit to indicate an active connected device.
  - **USB 2.0 1 LED** — When the transmitter and receiver are connected through the SFP port and a USB 2.0 Host device is connected to the transmitter, the LED remains lit to indicate an active connected device.

Operation

After the transmitter, receiver, and the connected devices are powered up, the system is fully operational. If any problems are encountered, ensure all cables are routed and connected properly.

NOTE: Ensure that the video source and display are properly connected to the FOX3 pair, and power is applied FOX3 pair and the display **before** power is applied to the video source. If the other devices are not turned on before the video source, the image may not appear.

Configuration and operation of the system is accomplished via **SIS Configuration and Control** (see page 23), the **Internal Web Page** (see page 41), and **Configuration Software** (see page 32).

Reset

The rear panel **Reset** button initiates three levels of resets (numbered 1, 4, and 5) that are initiated from the rear panel reset button. Use a pointed stylus, ballpoint pen, or small screwdriver to access the recessed button.

See the **Reset Modes** table on page 19 and figure 12 for a summary of the resets.

ATTENTION:

- Review the reset modes carefully. Some reset modes delete all user loaded content and revert the device to default configuration.
- Analysez minutieusement les différents modes de réinitialisation. Certains modes de réinitialisation suppriment l'intégralité du contenu chargé de l'utilisateur et remettent l'appareil au mode de configuration par défaut.

Perform resets of the unit as follows (see figure 12):

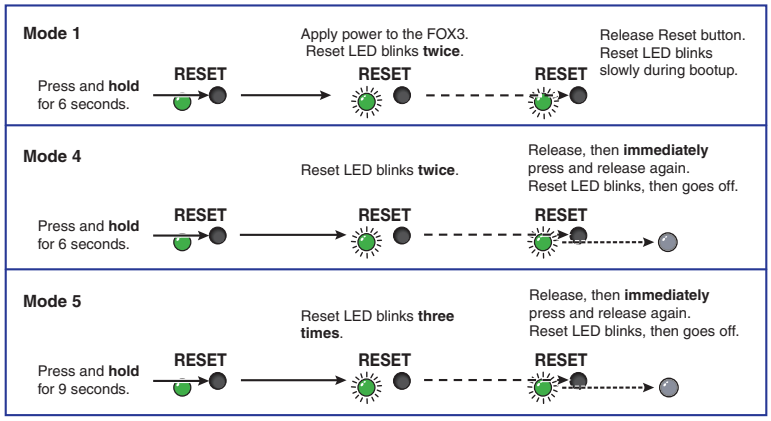


Figure 12. Resets

Reset Modes				
	Mode	**Activation**	**Result**	**Purpose and Notes**
Use Factory Firmware	**1**	Hold in the recessed rear panel **Reset** button while applying power to the unit.	The device reverts to the factory default firmware for a single power cycle.	Use mode 1 to revert to the factory default firmware for a single power cycle if incompatibility issues arise with user-loaded firmware. All user files and settings are maintained.
		NOTE: Do not operate with the default firmware loaded by a mode 1 reset. Use it only to load the most current firmware to the device.		
Reset All IP Settings	***4**	Hold in the **Reset** button until the **Power** LED blinks twice (once at 3 seconds, again at 6 seconds). Then, release and press the **Reset** button again within 1 second*.	Sets the following back to factory default: • Port mapping • IP address (**192.168.254.254**). • Subnet mask address (**255.255.255.0**). • Gateway IP address t (**0.0.0.0**). Turns DHCP off. The **Power** LED on the rear panel of the unit flashes four times in succession.	Use mode 4 to reset all IP settings back to factory defaults. Equivalent to SIS command 1ZQQQ (see **Resets** on page 30).
Reset to Factory Defaults	***5**	Hold in the **Reset** button until the **Power** LED blinks three times (once at 3 seconds, again at 6 seconds, again at 9 seconds). Then, release and press the **Reset** button again within 1 second*.	Performs a complete reset to factory defaults (except the firmware). • Does everything mode 4 does. • Clears port configurations. • Resets all IP options. • Clears all user settings. • Resets all passwords. • Clears all files from the unit. • The **Power** LED on the rear panel of the unit flashes four times in succession.	Use mode 5 to start over with default configuration and uploading, and also to replace events. Mode 5 is equivalent to SIS command ZQQQ (see **Resets** on page 30).
	NOTES: • *For modes 4 and 5, nothing happens if the momentary press does not occur within 1 second. • 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** (see **Roles and Permissions Panel** on page 45 to change a password).			

Configuration

NOTE: Transmitters and receivers can be configured via PCS (see the F*OX3 T/R 301 and FOX3 T/R 311 Help File*) and SIS commands (see **SIS Configuration and Control** starting on page 23). Product help files are available in PCS when a device is connected or an offline device is selected.

EDID

The FOX3 uses EDID Minder, which ensures that a source device connected to the transmitter input continuously sees the EDID of a sink device, even if the sink is not physically connected. By default, the EDID is set to 1080p @ 60 Hz with 2-channel audio. There is one slot to upload custom EDID to the device.

Use PCS to upload EDID to the device (see the F*OX3 T/R 301 and FOX3 T/R 311 Help File*).

HDCP

Input

The HDMI input negotiates and authenticates HDCP with the source device if the source requires HDCP encryption. The authentication process is repeated whenever the stored EDID is changed or updated, which is indicated by pulling HPD low.

HDCP support can be disabled for each input independently using SIS command (see **HDCP authorized device** on page 30) or PCS (see the F*OX3 T/R 301 and FOX3 T/R 311 Help File*).

Outputs

The output is pre-authenticated and encrypted, in accordance with the configured HDCP output mode using PCS (see the F*OX3 T/R 301 and FOX3 T/R 311 Help File*).

If an output requires encryption, but the connected sink device cannot be authenticated, that output displays a green screen.

HDCP output modes

- **Follow Input** (default) — Output authentication and encryption follows input status. Authentication times out after ~10 seconds.
- **Always Encrypt Output** — The output is always authenticated and encrypted. Authentication times out after ~10 seconds.
- **Follow Input (with continuous trials)** — Output authentication and encryption follows input status with no authentication timeout.
- **Always Encrypt Output (with continuous trials)** — The output is always authenticated and encrypted with no authentication timeout.
- **Disable Authentication** — The output is never authenticated or encrypted. When an HDCP encrypted input signal is detected, the display always shows a green screen.

RS-232 Insertion

A user can connect a control system to send and receive RS-232 data over the fiber and the captive screw port of the transmitter and receiver.

Captive Screw Insertion

A user can connect an RS-232 signal from a control system to an endpoint and pass that signal over the fiber to the connected endpoint. An RS-232 signal must be inserted in the RS-232 port on the transmitter or receiver and bidirectional fiber must be used.

The RS-232 signal settings are:

- **Baud rate:** 9600 (default) to 115000
- **Data bits:** 5 to 8 (default)
- **Stop bits:** 1 (default) to 2
- **Parity:** Odd, Even, or None (default)

The RS-232 insertion method must be set to `Captive Screw Insertion` via PCS (see the *FOX3 T/R 301 and FOX3 T/R 311 Help File*) on both endpoints passing the control signal.

Example of a bidirectional fiber system (see figure 13):

- On the FOX3 transmitter and receiver, configure the `RS-232` Insertion via PCS.
- The control system then sends a control command:
  - Into the transmitter Control RS-232 port
  - Out of the transmitter SFP A port to the receiver SFP A IN port.
  - To the receiver captive screw port.
  - Into the display to take some action.
- The response from the display is sent back to the control system.

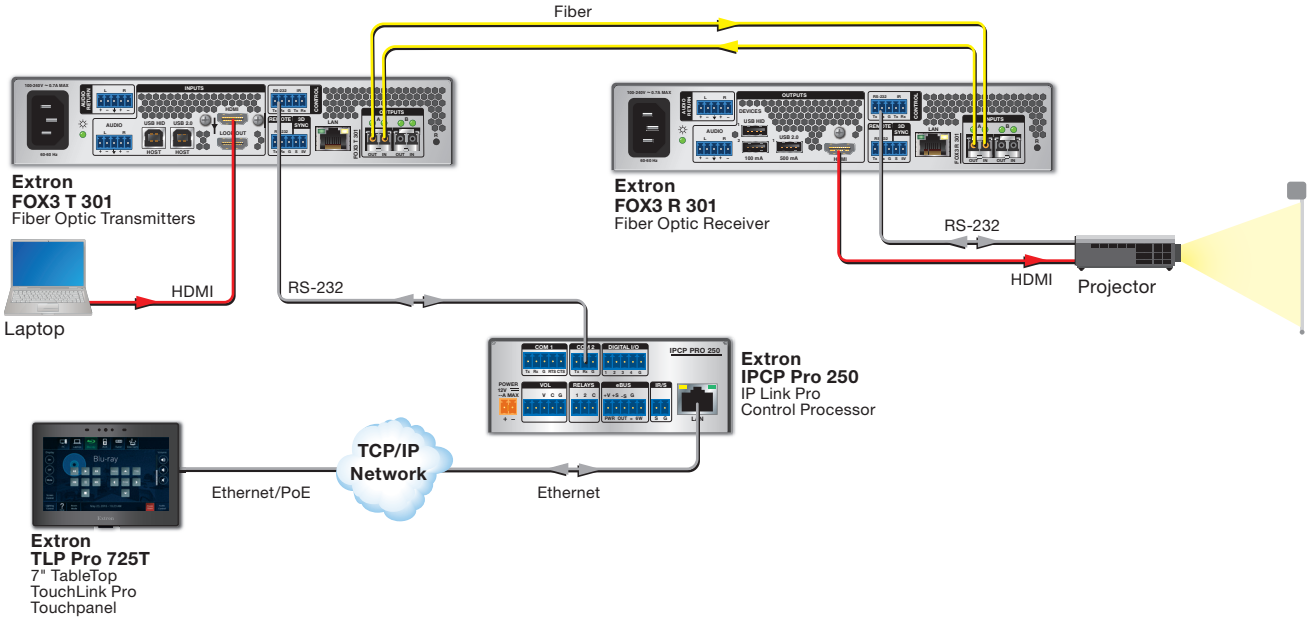


Figure 13. Typical Captive Screw Insertion Configuration

Audio Configuration

Audio Embedding

The FOX3 supports a single audio signal to pass LPCM-2CH.

- **Transmitter** — The audio input sent over the fiber output can be configured via PCS (see the F*OX3 T/R 301 and FOX3 T/R 311 Help File*) or SIS command (see **Input audio selection** on page 30). Select digital, analog, or auto.
- **Receiver** — When the audio from the transmitter is LPCM-2CH, the HDMI audio signal is output on the HDMI output and the analog audio output.

Input Audio Gain

Adjust the transmitter gain level for the analog audio input via PCS (see the F*OX3 T/R 301 and FOX3 T/R 311 Help File*). The analog audio input can be adjusted from -18 dB to +24 dB in 1 dB steps.

Input Audio

Select the audio on the input of the transmitter via PCS (see the *FOX3 T/R 301 and FOX3 T/R 311 Help File*) or SIS command (see **Input audio selection** on page 30).

The audio input options are:

- **Auto** (default) — The transmitter selects between digital and analog audio based on the digital audio input signal.
  - Digital audio is selected when embedded audio is present on the HDMI input.
  - Analog audio is selected when digital audio is not detected.
- **Force Digital** — Digital embedded audio is passed to the local HDMI and fiber output.
- **Force Analog** — Analog audio is passed to the local HDMI and fiber output.

Output Audio Volume

Adjust the overall output volume level for the receiver analog audio output as well as the embedded LPCM-2CH audio on the HDMI output via PCS (see the F*OX3 T/R 301 and FOX3 T/R 311 Help File*) or SIS command (see **Audio output volume (receiver)** on page 31).

The audio level is adjusted from 100 % to 0 % in 1 dB steps.

Audio Return

Send audio back from the receiver location to the transmitter location via the audio return ports. Connect an analog audio input to the receiver Analog Return input to pass it over the fiber link and output it on the transmitter Audio Return out.

NOTE: To receive audio return, two fiber optic cables must be connected.

Audio Mute

Mute audio on the Loop Out, HDMI output, and analog audio output individually via PCS (see the F*OX3 T/R 301 and FOX3 T/R 311 Help File*) or SIS commands (see **Audio mute — Digital Output, Return or Analog Audio Out** starting on page 28).

SIS Configuration and Control

This section describes the remote control operation of the FOX3 T/R 301/311 transmitter and receiver, including:

- **Host Control Ports**
- **Simple Instruction Set Control**
- **Command and Response Table for SIS Commands**

The FOX3 transmitters and receivers can be configured using SIS commands, PCS, or embedded web pages. The FOX3 transmitters and receivers can be controlled using SIS commands or PCS. Configure and control the FOX3 transmitters and receivers remotely via a host computer or other device (such as a control system) by connecting to the rear panel Remote RS-232 port, LAN port, or the front panel USB port of the FOX3 device.

NOTE: SIS commands and Product Configuration Software functions are transmitter or receiver specific or may have different responses depending on the unit connected. Connect to the appropriate device for the command to work properly or to get the expected response.

Host Control Ports

Rear Panel RS-232 Port

The FOX3 devices have a rear panel serial port (see **figure 2** on page 7 and **figure 4** on page 10) that can be connected to a host device such as a computer running Extron DataViewer, available at **www.extron.com**. The port makes serial control of the FOX3 device possible. Use the protocol information listed below to make the connection.

The protocol for the Remote serial port is as follows:

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

Front Panel Configuration USB Port

The front panel mini B USB Configuration port (see **figure 11**, B on page 17) can be connected to a host computer for configuration using SIS commands via an SSH client and IP address `203.0.113.22` on port `22023`. To connect the FOX3 device to a host computer, download the USB driver, follow the on-screen instructions, and configure the FOX3 device as required.

Ethernet (LAN) Ports

The rear panel Ethernet connector (see **figure 2** on page 7 and **figure 4** on page 10) can be connected to an Ethernet LAN or WAN. Communications between the transceiver and the controlling device is via an SSH client, using port `22023`. This connection makes SIS control of the unit possible using a computer connected to the same LAN or WAN (see **TP Cable Termination and Recommendations** on page 15 to wire the LAN connector).

Default IP address

To access the FOX3 transmitter or receiver via the LAN port, the IP address, subnet mask, and the gateway address for the devices are needed. If the addresses have not been changed, the factory-specified 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 device as follows:

1. Download the SSH client software from the internet.
2. Open the SSH client software.
3. Enter the IP address of the FOX3 device in the **`Host Name or IP address`** field.

   NOTE: If the local system administrators have not changed the value, the default IP address is `192.168.254.254`.

4. Enter **`22023`** in the **`Port`** field.
5. The FOX3 device is password protected, so the appropriate administrator or user name and password must be entered.
   - If the login and password are correct, the device 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 as`** prompt returns. Enter the administrator or user name and password again.

NOTES:

- The FOX3 device 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.

Using verbose mode

SSH connections to a FOX3 device can be used to monitor for changes that occur on the device, such as SIS commands from other SSH sockets or a serial port. For a SSH session to receive change notices from the device, the SSH session must be in verbose mode 1 or 3 (see the SIS command **Verbose mode** on page 29).

Simple Instruction Set Control

Host-to-Unit Instructions

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

Device-Initiated Power-Up Message

When the device completes its start-up, it issues the following message to the host:

© Copyright 20*yy*, Extron Electronics FOX3 T (R) 301 (311) MM (SM), V*x.xx*, 60-*nnnn-nn*

- V*x.xx* is the firmware version number
- 60-*nnnn-nn* is the part number.

Error Responses

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

- E10 — Invalid command
- E11 — Invalid preset number
- E13 — Invalid parameter
- E14 — Invalid for this configuration
- E17 — Invalid command for signal type
- E18 — System or command timed out
- E21 — Invalid room number
- E22 — Busy
- E24 — Privilege violation
- E25 — Device not present
- E26 — Maximum number of connections exceeded
- E28 — Bad file name or file not found

Timeout

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

Using the Command and Response Table

The command and response table begins below. Symbols are used throughout the table to represent variables in the command and response fields. Command and response examples are shown throughout the table. The ASCII to HEX conversion table below is for use with the command and response table.

Space →

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

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

Common symbol definitions

↵ = Carriage return/line feed

• = space

← or | = Carriage return (no line feed)

Esc or W = Escape key

X1 = Video mute	0 = Unmute (**default**) 1 = Mute video only 2 = Mute video and sync
X2 = Audio output	1 = Digital (Tx Loop Out or Rx HDMI Out) 2 = Analog (Tx Return Out or Rx Analog Output) 3 = All outputs (digital and return/analog)
X3 = Audio mute status	0 = Unmute (**default**), 1 = Mute
X4 = Input video signal status	0 = Not detected, 1 = Detected
X5 = Display input audio status	0 = Not detected, 1 = Detected
X6 = Input HDCP status	0 = No source detected 1 = Source with HDCP detected (**default**) 2 = Source with no HDCP present
X7 = Output HDCP status	0 = No active sink detected 1 = Sink detected, output signal encrypted 2 = Sink detected, output signal not encrypted
X8 = Input audio selected	0 = Auto 1 = Digital 2 = Analog
X9 = Device type	TX or RX
X10 = Enable DHCP	0 = Off (**default**) 1 = On
X11 = IP address, subnet, gateway address	*xxx.xxx.xxx.xxx*
X12 = Baud rate	300 – 15200 baud (9600 **default**)
X13 = Parity	odd, even, none (**default**), mark, space (only the first letter required)
X14 = Data bits	7, 8 (**default**)
X15 = Stop bits	1 (**default**), 2
X16 = UARTs	1 = Endpoint

X17 = Verbose mode	0 = Clear/none 1 = Verbose mode (**default**) 2 = Tagged response for queries 3 = Verbose mode and tagged responses for queries
X18 = Active fiber link	1 = SFP A 2 = SFP B
X19 = Input HDCP Authorization	0 = HDCP authorized off 1 = HDCP authorized on (**default**)
X20 = Resolution and refresh rate	*nnnn*Horizontal*x**nnnn*Vertical@*xx*Hz (example: 3840x2160@59.9Hz) (0000x0000@000Hz = no input detected)
X21 = Detected audio input format	0 = Not detected 1 = Digital 2 = Analog
X22 = Detected Video input color space format	0 = Not detected 1 = YUV 2 = RGB
X23 = Detected pixel clock	4-digit response with 0 padding (example: 297 = 0297MHZ) (0000 = No pixel clock detected)
X24 = Audio output volume	Volume adjustment range; 0 to 100 (approximately 1 dB per step 0% to 100%, default 100%)
X28 = Fiber link detection	0 = Not Detected 2 = Detected
X29 = Fiber optic mode	SM or MM
X30 = Echo enable or disable	0 = Disabled 2 = Enabled (**default**)
X31 = Timeout	The number of seconds before timeout on IP connections (min=1, max=65000 [default=30=300 seconds])
X32 = Force 4K60 compressed mode	0 = Disable (**default**; after a reset, setting defaults back to 0) 1 = Force 4K60 on 1 fiber
X33 = View audio output	1 = Digital 2 = Analog

Command and Response Table for SIS Commands

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Transmitter and Receiver			
Video mute			
Mute output video only	1B	Vmt1↵	
Mute output video and sync	2B	Vmt2↵	
Unmute video and sync	0B	Vmt0↵	**Default**
View mute status	B Verbose mode 2/3:	X1↵ VmtX1↵	

KEY: X1 = Video mute 0 = Unmute (**default**) 1 = Mute video only 2 = Mute video and sync

Audio mute — Digital Output, Return or Analog Audio Out			
Enable Audio mute	X2*1Z	AmtX2*1↵	
Example:	1*1Z	Amt1*1↵	Digital audio (embedded on HDMI output) is muted; analog audio is unaffected.
Disable audio mute	X2*0Z	AmtX2*0↵	
Example:	3*0Z	Amt3*0↵	**Default**. Both audio outputs are active.
View audio mute status	X33Z	X3↵	

NOTE: To view audio mute status, digital audio status and analog audio status must be viewed individually.

KEY: X2 = Audio output 1 = Digital out (Tx Loop Out or Rx HDMI Out), 2 = Analog (Tx Return Out or Rx Analog Output)
3 = All outputs (digital and return/analog)
X3 = Audio mute status 0 = Unmute (**default**) 1 = Mute
X33 = View audio output 1 = Digital 2 = Analog

Information requests			
View firmware version	Q/q Verbose mode 2/3:	*x.xx*↵ Ver 01**x.xx*↵	
View full firmware version	*Q/q Verbose mode 2/3:	*x.xx.xxxx*↵ Bld *x.xx.xxxx*↵	
View part number	N/n Verbose mode 2/3:	60-*xxxx-xx*↵ Pno 60-*xxxx-xx*↵	
View updated FPGA version	35Q/q Verbose mode 2/3:	*x.xx*↵ Ver 35**x.xx*↵	
View input video status	4S/s Verbose mode 2/3:	X4↵ Sts04*X4↵	
View input audio status	5S/s Verbose mode 2/3:	X5↵ Sts05*X5↵	
View input HDCP status	EscIHDCP← Verbose mode 2/3:	X6↵ HdcpIX6↵	
View output HDCP status	EscOHDCP← Verbose mode 2/3:	X7↵ HdcpOX7↵	

NOTE: If a non-HDCP compliant display is connected, the HDCPO response is always 2.

KEY: X4 = Input video signal status 0 = Not detected 1 = Detected
X5 = Display input audio status 0 = Not detected 1 = Detected
X6 = Display input HDCP status 0 = No source detected 1 = Source with HDCP detected (**default**)
2 = Source with no HDCP present
X7 = Output HDCP status 0 = No active sink detected 1 = Sink detected, output signal encrypted
2 = Sink detected, output signal not encrypted

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Transmitter and Receiver (continued)			
Information requests (continued)			
Information request Verbose mode 2/3:	I	SFPALnk[X28]•SFPBLnk[X28]•SigI[X4]•HdcpI[X6]•HdcpO[X7]•AudI[X8]•[X9]•[X29]↵ Inf00*SFPALnk[X28]•SFPBLnk[X28]•SigI[X4]•HdcpI[X6]•HdcpO[X7]•AudI[X8]•[X9]•[X29]↵	
	Response description: Fiber link A•Fiber link B•Signal input•Input HDCP•Output HDCP•Input audio•Transmitter•Fiber mode↵		
Example:	I	SFPALnk1•SFPBLnk1•SigI1•HdcpI2•HdcpO1•AudI1•TX•SM↵	Signals are detected on the two fiber links, a signal is detected on the input, the input and output are HDCP devices, the digital audio input is selected, the device is a transmitter, and the fiber mode is singlemode.

KEY:
- [X4] = Input video signal status — 0 = Not detected; 1 = Detected
- [X6] = Display input HDCP status — 0 = No source detected; 1 = Source with HDCP detected (**default**); 2 = Source with no HDCP present
- [X7] = Output HDCP status — 0 = No active sink detected; 1 = Sink detected, output signal encrypted; 2 = Sink detected, output signal not encrypted
- [X8] = Input audio selection — 0 = Auto; 1 = Digital; 2 = Analog
- [X9] = Device type — TX or RX
- [X28] = Fiber link detection — 0 = Not detected; 1 = Detected
- [X29] = Fiber optic mode — SM or MM

View LinkLicense	Esc LELIC←	FOX3 Uncompressed Video, 79-2560-01↵↵ If LinkLicense is not installed, returns ↵↵	
DHCP client			
Set DHCP on or off	Esc [X10] DH←	Idh [X10]↵	
View DHCP status	Esc DH←	[X10]↵	

KEY: [X10] = Set DHCP — 0 = Off (**default**); 1 = On

Echo for SIS over SSH (port 22023)			
Enable Echo	Esc 1ECHO←	Echo1↵	Returns command entered with response.
Disable Echo	Esc 0ECHO←	Echo0↵	Returns response only.
View Echo status	Esc ECHO←	[X30]↵	

NOTE: The echo setting is for the current connection only, and remains until the connection is closed. Apply after connection is established.

KEY: [X30] = Echo enable or disable — 0 = Disable; 1 = Enable (**default**)

Verbose mode			
Set verbose mode	Esc [X17] CV←	Vrb [X17]↵	
View verbose mode	Esc CV←	[X17]↵	

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

KEY: [X17] = Verbose mode — 0 = Clear/none (**default**); 1 = Verbose mode; 2 = Tagged response for queries; 3 = Verbose mode and tagged responses for queries

Timeout Ethernet data port			
Set current port timeout	Esc 0* [X31] TC←	Pti0* [X31]↵	
View current port timeout	Esc 0TC←	[X31]↵	

KEY: [X31] = Timeout — The number of seconds before timeout on IP connections (min=1, max=65000 [default=30=300 seconds])

IP address			
Set IP address	Esc [X11] CI←	Ipi• [X11]↵	
View IP address	Esc CI←	[X11]↵	

KEY: [X11] = IP address — *xxx.xxx.xxx.xxx*

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Transmitter and Receiver (continued)			
RS-232 COMM settings			
Set serial port parameters	Esc X16 * X12 , X13 , X14 , X15 CP ←	Cpn X16 • Ccp X12 , X13 , X14 , X15 ↵	
KEY: X12 = Baud rate	300 – 15200 baud (9600 **default**)		
X13 = Parity	**o**dd, **e**ven, **n**one (**default**), **m**ark, **s**pace (only the first letter required)		
X14 = Data bits	7, 8 (**default**)		
X15 = Stop bits	1 (**default**), 2		
X16 = UARTs	1 = endpoint		
Resets			
Erase all files from flash memory	Esc ZFFF ←	Zpf ↵	Removes files created in user space.
Reset unit settings	Esc ZXXX ←	Zpx ↵	Resets unit to factory default.
Absolute system reset (retain IP)	Esc ZY ←	Zpy ↵	Same as Esc ZQQQ except excludes IP settings.
Absolute system reset	Esc ZQQQ ←	Zpq ↵	Master Reset, resets IP address and subnet mask to default.
IP system reset	Esc 1ZQQQ ←	Zpq1 ↵	Resets only IP settings.
Reset audio gain and attenuation	Esc ZA ←	Zpa ↵	Reset audio gain & attenuation to default levels.
Global unsolicited responses			
Input change		Reconfig ↵	Any change of the input frequency or a power cycle.
Fiber link		Sts02 * X18 * X28 ↵	Any change in fiber link status.
Input video signal presence		SigI X4 ↵	Any change in input signal status.
Input HDCP		HdcpI X6 ↵	Any change in input HDCP status.
Output HDCP		HdcpO X7 ↵	Any change in output HDCP status.
Audio input status		Sts05 * X5 ↵	Displays input audio selection status.
KEY: X4 = Input video signal status	0 = Not detected	1 = Detected	
X5 = Display input audio status	0 = Not detected	1 = Detected	
X6 = Input HDCP status	0 = No source detected	1 = Source with HDCP detected	
	2 = Source with no HDCP present		
X7 = Output HDCP status	0 = No active sink detected	1 = Sink detected, output signal encrypted	
	2 = Sink detected, output signal not encrypted		
X18 = Active fiber link	1 = SFP A	2 = SFP B	
X28 = Fiber Link detection (SPF A/B IN LED)	0 = Not detected	1 = Detected	
NOTE: SFP A and SFP B OUT LED is always active			
Transmitter only (common)			
HDCP authorized device			
Set HDCP authorized device on	Esc E1HDCP ←	HdcpE1 ↵	
Set HDCP authorized device off	Esc E0HDCP ←	HdcpE0 ↵	
View HDCP authorized device	Esc EHDCP ←	X19 ↵	**Default**: HDCP authorized on.
	Verbose mode 2/3:	HdcpE X19 ↵	
KEY: X19 = Input HDCP Authorization	0 = HDCP authorized off	1 = HDCP authorized on (**default**)	
Input audio selection			
Select audio input	Esc I X8 AFMT ←	AfmtI X8 ↵	**Default**. Digital has priority.
View selected audio input	Esc IAFMT ←	X8 ↵	
KEY: X8 = Input audio selection	0 = Auto (**default**)	1 = Digital	2 = Analog

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Transmitter only (common) (continued)			
Input signal detection information			
View detected input signal information	35I/i Verbose mode 2/3:	Res[X20]•AudI[X21]•VcsI[X22]•Pixcl[X23]↵ Inf35*Res[X20]•AudI[X21]•VcsI[X22]•Pixcl[X23]↵	
KEY: [X19] = Input HDCP Authorization 0 = HDCP authorized off 1 = HDCP authorized on (**default**) [X20] = Resolution and refresh rate *nnnn*Horizontal x *nnnn*Vertical @*xx*Hz (0000x0000@000Hz = no input detected) [X21] = Detected input audio format 0 = Not detected 1 = Digital 2 = Analog [X22] = Detected video input color space 0 = Not detected 1 = YUV 2 = RGB [X23] = Pixel clock (in MHz) 4-digit response with 0 padding (example: 294 = 0297MHZ) (0000 = Not detected)			
Force 4K60 compressed mode			
Force 4K 60 compressed mode	Esc C1FOXM←	FoxmC1↵	Sends 4K60 signal compressed on 1 fiber.
Disable 4K 60 comressed mode	Esc C0FOXM←	FoxmC0↵	Sends 4K60 signal uncompressed on 2 fibers.
View 4K 60 compressed mode status	Esc CFOXM← Verbose mode 2/3	[X19]↵ FoxmC[X19]↵	
NOTE: This command only applies to devices with the 4K60 Uncompressed Video LinkLicense or -13/-14 transmitter units. If the command is issued to the wrong unit, return E14.			
KEY: [X24] = Force 4K60 compressed mode 0 = Disable (**default**; after a reset, setting defaults back to 0) 1 = Force 4K60 on 1 fiber			
Receiver Commands Only			
Audio output volume (receiver)			
Set volume	[X24]V	Vol[X24]↵	
Increment	+V	Vol[X24]↵	
Decrement	-V	Vol[X24]↵	
View volume status	V Verbose mode 2/3:	[X24]↵ Vol[X24]↵	
KEY: [X24] = Audio output volume Volume adjustment range; 0 to 100 (approximately 1 dB per step 0% to 100%, default 100%)			

Configuration Software

The FOX3 301/311 transmitters and receivers can be easily configured using Extron Product Configuration Software (PCS). This section describes the software installation and communication (see the *FOX3 T/R 301/311 PCS Help File* for detailed control information). The topics covered in this section are:

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

Software/Firmware Installation

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

NOTES:

- Also download the latest versions of software and firmware for your product.
- An Extron Insider account is required to download and use either firmware or software.

1. Mouse over the **Download** link at the top of the page (see figure 14, ❶).

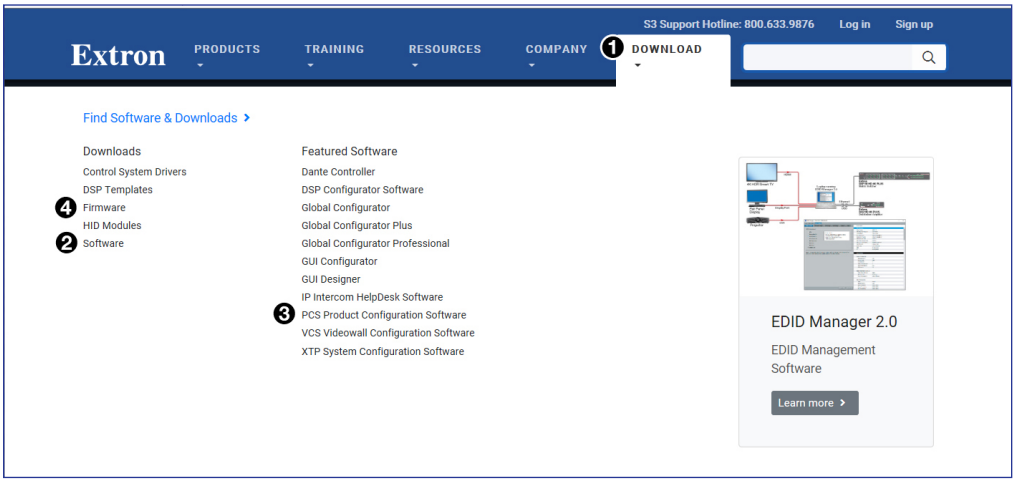


Figure 14. Software Links on Download Screen

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

   For software, either click the **Software** link (❷) or, if the software is listed, click directly on that link (see the **PCS Product Configuration Software** link ❸) and skip to **step 5** on page 33.

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

3. If there is no direct link to your software, click the **Software** link (❷).

4. Scroll down to the alphabetic navigation bar (see figure 15).

Figure 15. Software Installation

5. Click the appropriate letter to locate the software or firmware.
6. Click **Download** and follow the on-screen instructions (see figure 16, ❶ for PCS).

Figure 16. PCS Software Download

For Firmware:

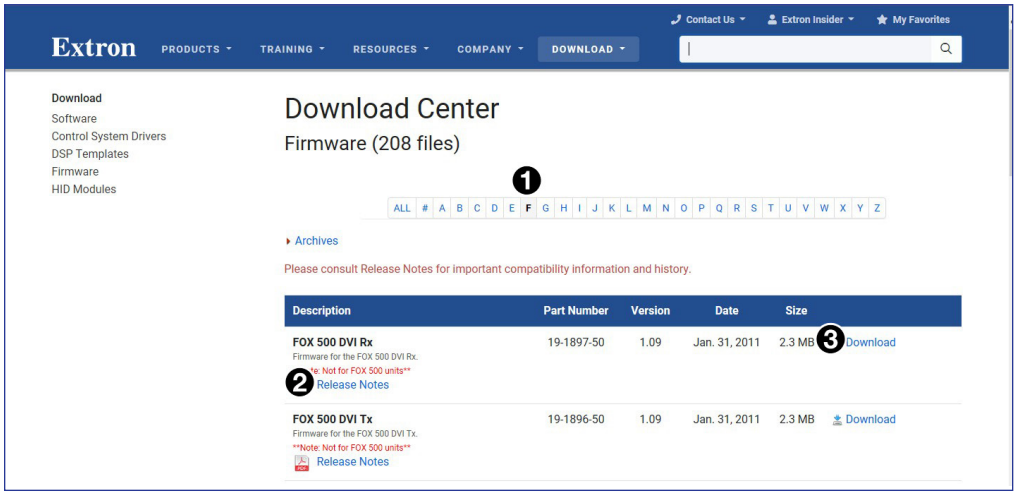


Figure 17. Firmware Page with Alphabetic Navigation Bar

a. Click the letter **F** from the alphabetic navigation bar (see figure 17, ❶).

b. Scroll down the page to find the firmware for the FOX3 T/R 301/311.

c. (Optional) Click **Release Notes** (❷) for more information about the firmware update.

d. Click **Download** (❸). 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 39.

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 device using the **Device Discovery** panel or the **TCP/IP** panel (see figure 18).

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 18).

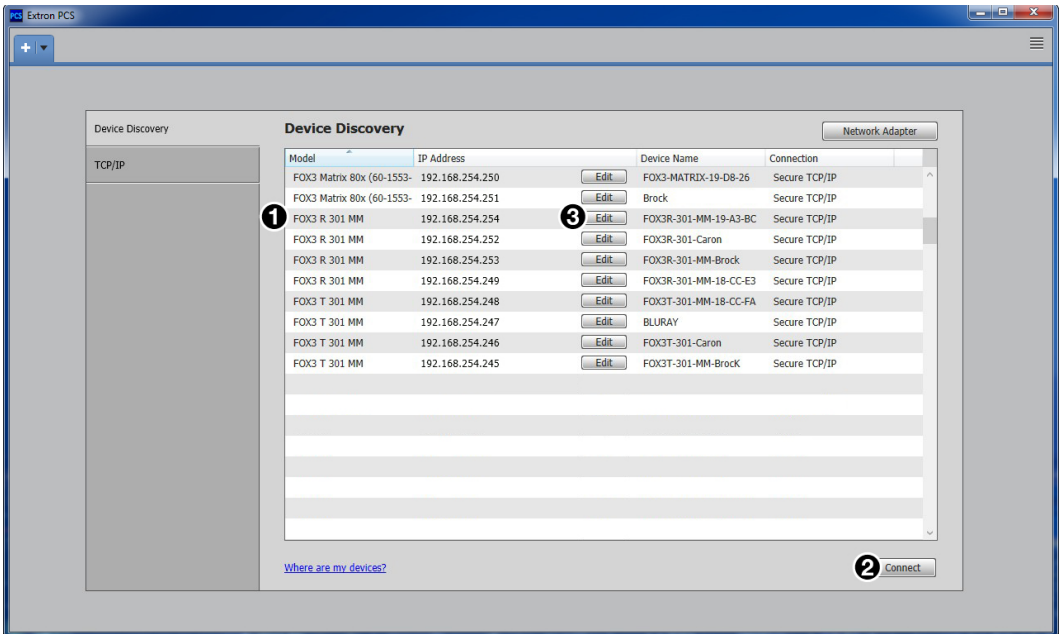


Figure 18. Device Discovery Panel

2. Select the FOX3 T/R 301/311 device by clicking on it to highlight it in the list (❶).
3. Click **Connect** (❷).

To edit the IP address:

1. Click on the **Edit** button (❸). The **Communication Settings** box pens.
2. Click in the field to edit the address (see figure 19) .
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.

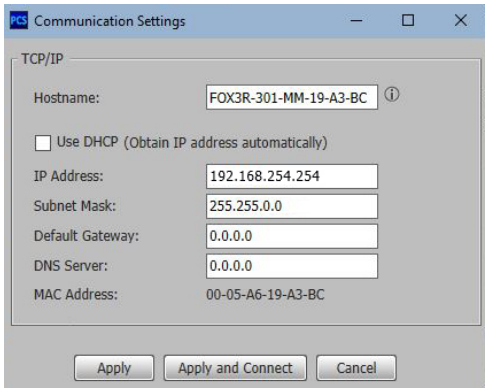


Figure 19. Communication Settings Box

TCP/IP Panel

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

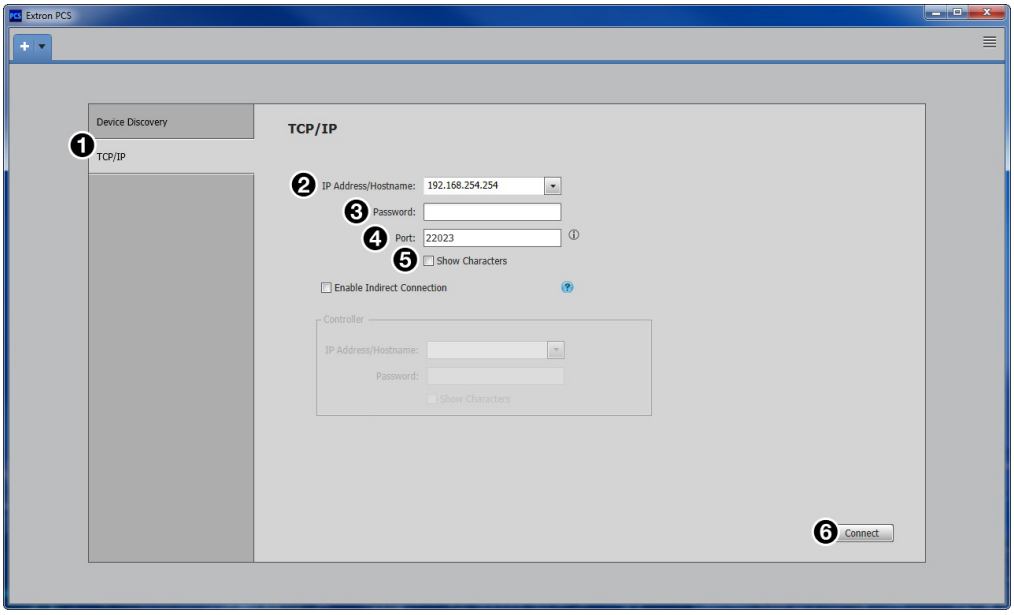


Figure 20. Comm Port Selection Windows

1. Click the **TCP/IP** tab (see figure 20, ❶).
2. In the **IP Address/Hostname** field (❷), enter the IP address of the desired device.

   NOTE: If the IP address has not been changed, it is 192.168.254.254.
3. In the **Password** field (❸), enter the device password.

   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 (see **Roles and Permissions Panel** on page 45 to change a password).
4. In the **Port** field (❹), enter the port 22023 of the desired device.

   NOTE: Select the **Show Characters** checkbox (❺) to display the password characters.
5. Click the **Connect** button (❻). 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 scaler device tab:

1. From the **Configuration File** drop-down list, select **New Configuration File** (see figure 21).

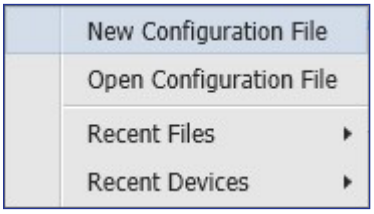


Figure 21. Configuration File Drop-Down List

The **New Configuration File** dialog box opens (see figure 22).

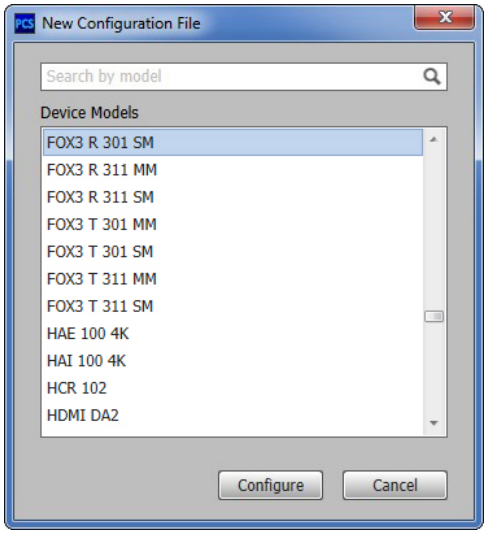


Figure 22. New Configuration File Dialog Box

2. Select the desired device model from the **Device Models** list (see figure 22).
3. Click the **Configure** button. A new offline device configuration tab opens.

Software Overview

NOTE: For details about specific software features, see the *FOX3 T/R 301/311 PCS Help File*.

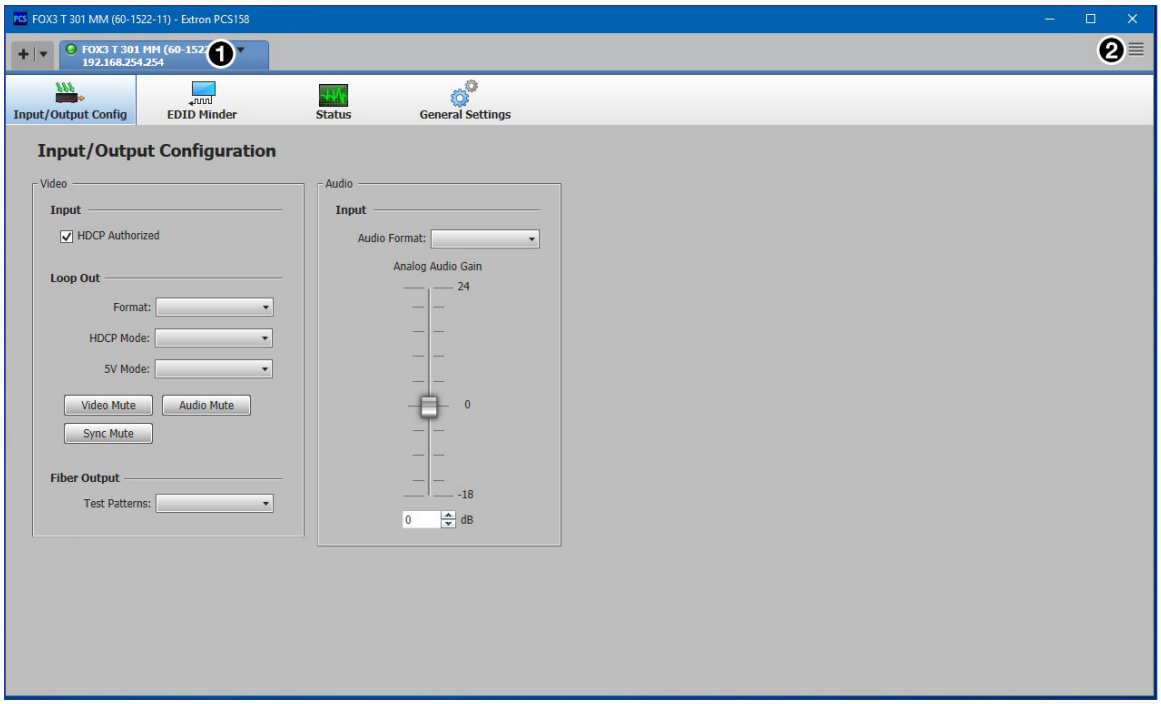


Figure 23. FOX3 T/R 301/311 Main Window

Each PCS screen has a **Device** drop-down list (see figure 23, ❶) for device configuration options. The **Software** menu (❷) contains software configuration and information options.

Software Menu

The **Software** menu (see figure 24) contains options pertaining to PCS settings.

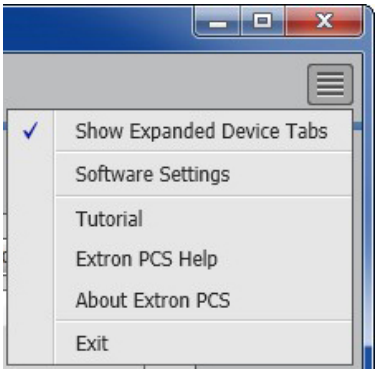


Figure 24. PCS Software Menu

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 25. 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.

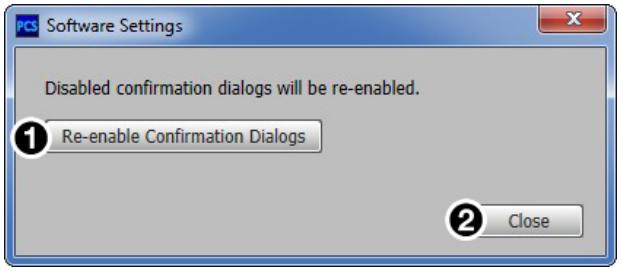


Figure 26. Software Settings Dialog Box

2. Click the **Re-enable Confirmation Dialogs** button (see figure 26, ❶). The dialog box closes and the reset is complete.

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

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.

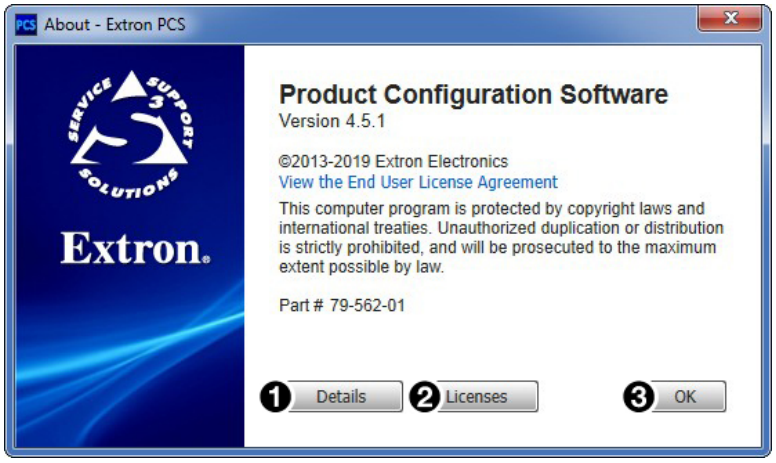


Figure 27. About - Extron PCS Dialog Box

2. Click the **`Details`** button (see figure 27, ❶) for more information.
3. To display details about third-party software packages and associated licensing, click **`Licenses`** (❷).
4. Click the **`OK`** button (❸) to close the dialog box.

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 28).

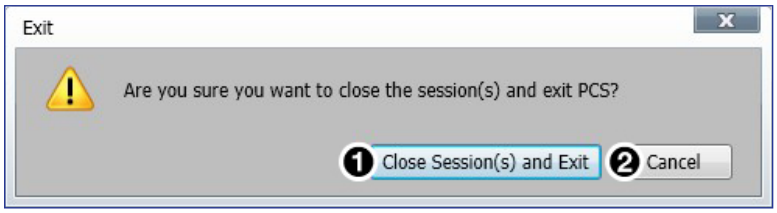


Figure 28. Exit Dialog Box

2. Click the **`Close Session(s) and Exit`** button (❶) to disconnect the software from connected devices, close all offline device tabs, and close the software.

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

Device Menu

The `Device` menu contains options pertaining to device connection, configuration, and information. For details about all these options, see the *FOX3 T/R 301/311 PCS Help File*.

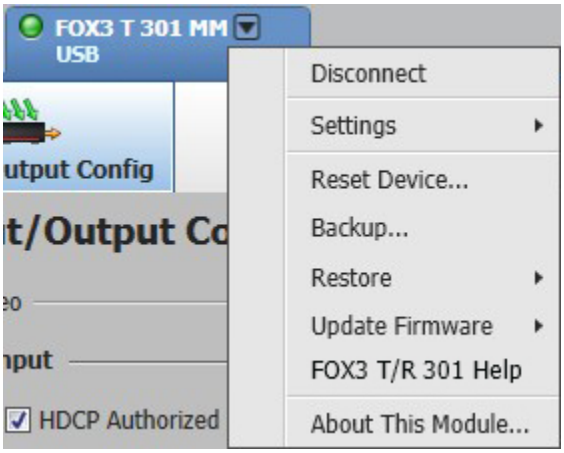


Figure 29. Device Menu

- **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` (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 T/R 301/311 to the connected device.
  - **`Restore to Multiple Devices`** — Upload a saved configuration file for an FOX3 T/R 301/311 to multiple devices on the network.

    NOTE: The connected devices must be connected via LAN.

- **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 32).

  - **`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.

- **FOX3 T/R 301/311 Help** — Open the *FOX3 T/R 301/311 PCS Help File* in a separate window.
- **About This Module** — Open the `About This Module` dialog box, with the module part number and firmware version of the connected device.

Internal Web Page

The FOX3 301 and 311 transmitters and receivers feature an internal web server, displayed as a web page. This page allows you to monitor and adjust certain settings of the FOX3 301 and 311 devices via a LAN or WAN connection. Use a web browser to view the pages on a PC connected to the device LAN port.

This section gives an overview of the internal web page, which is always available and cannot be erased or overwritten. Topics in this section include:

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

Accessing the Internal Web Page

Access the FOX3 transmitter or receiver 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 7 and **figure 4** on page 10).
2. Open a web browser on a PC connected on the same L AN or WAN.
3. Enter the FOX3 transmitter or receiver 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. The web page password page opens.

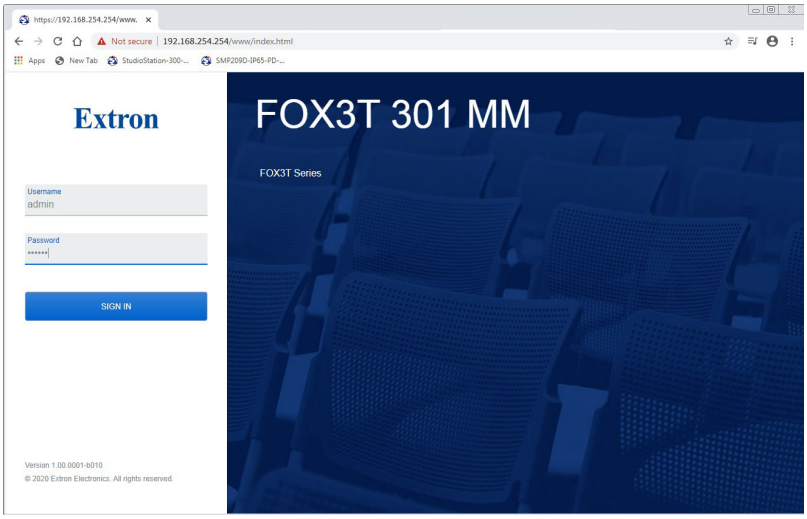


Figure 30. Network Password Prompt

5. The FOX3 is password protected. Enter a user name entry (**`user`** or **`admin`**) in the **`Username`** field and the password in the **`Password`** field when prompted (see figure 30).

   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`**.
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 T/R 301/311 internal web page (see figure 31) provides an overall, read-only view of the status of the seamless switcher, with some editable fields for the following categories:

- ❶ **Device Info Panel**
- ❷ **Device Status Panel**
- ❸ **Network Settings Panel**
- ❹ **Firmware Panel**
- ❺ **Roles and Permissions Panel**
- ❻ **LinkLicense Panel**

The panels that can be edited have an **EDIT** link to click to access the panel. To view general information about the FOX3 T/R 301/311, click the **ABOUT** link (❼ **About the FOX3 T/R 301/311**).

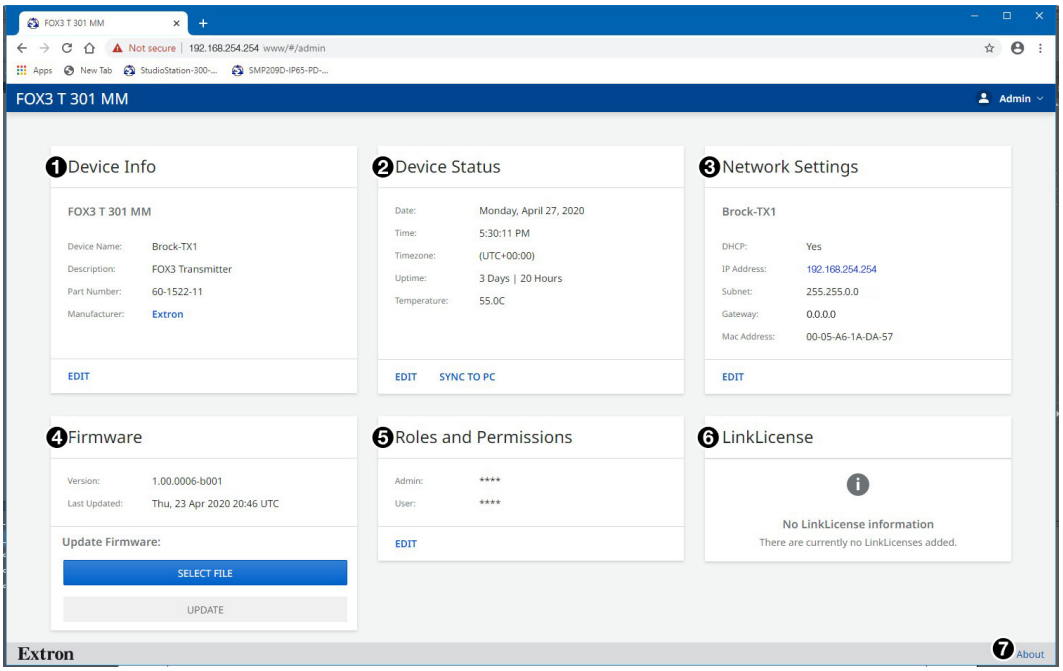


Figure 31. FOX3 T/R 301/311 Internal Web Page

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 31, 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 32 [left], ❶) in the **Device Info** panel. The **Device Info Settings** panel opens to allow edits (right).

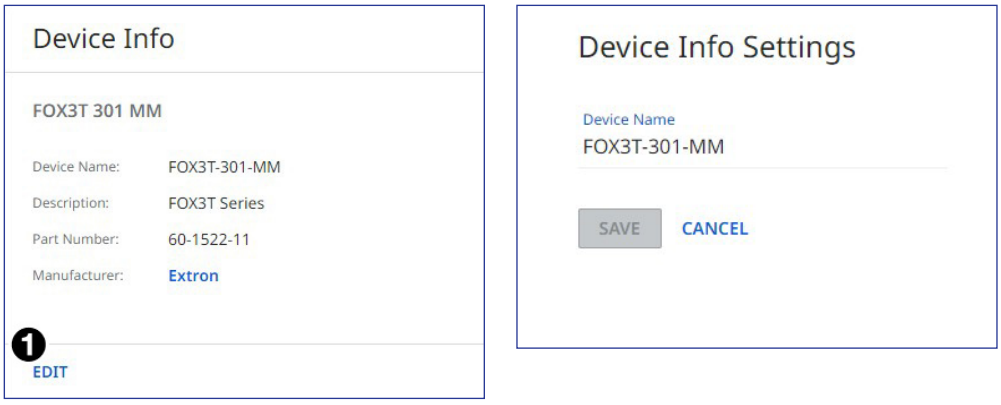


Figure 32. Device Info Panel

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 31**, ❷ 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 33 [left], ❶) in the **Device Status** panel. The **Device Status Settings** panel opens to allow edits (right).

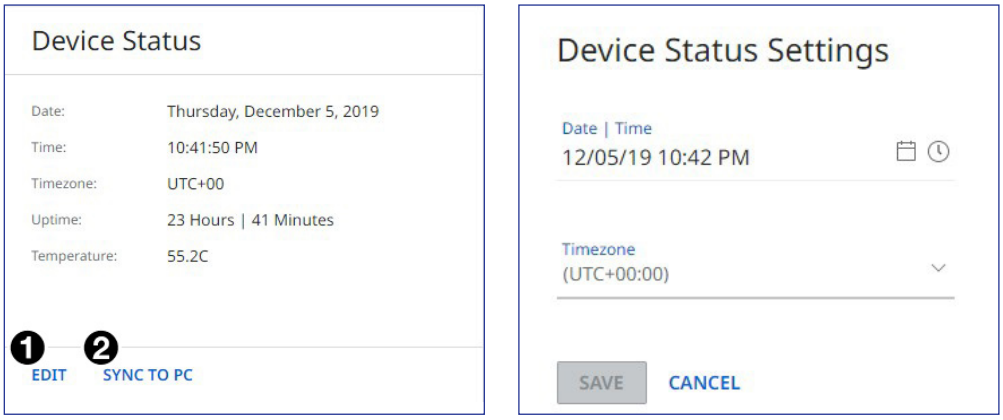


Figure 33. Device Status Panel

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** (❷) to set the date and time according to your PC.

Network Settings Panel

In the **Network Settings** panel (see **figure 31**, ❸ on page 42), 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 34 [left], ❶) in the **Network Settings** panel. The **Network Settings** panel opens to allow edits (right).

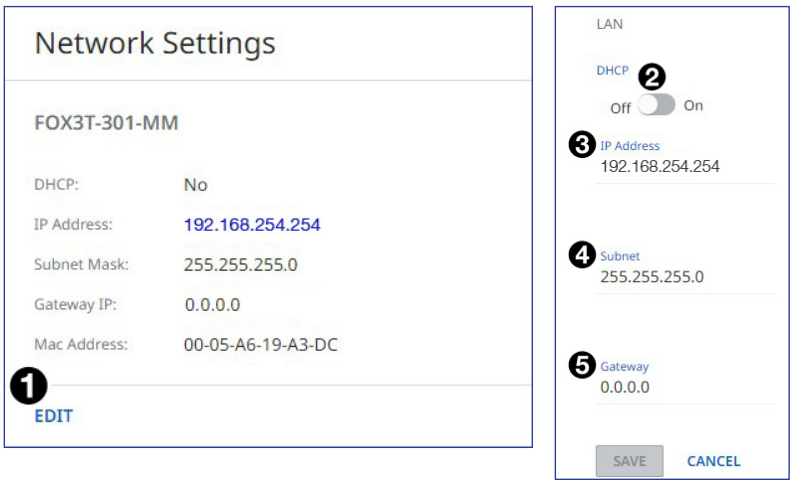


Figure 34. Network Settings Panel

2. Edit the network settings as desired:
   a. Click the **DHCP** switch (❷) 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** (❸), **Subnet** mask (❹), and **Gateway** address (❺), click in the desired field and enter the address.
3. When finished editing, click out of the field and click **SAVE** to confirm your changes or **CANCEL** to close the window without making changes. Clicking the **X** in the upper-right corner of the screen also closes the window.

Firmware Panel

The **Firmware** panel (see **figure 31**, ❹, on page 42) displays the current firmware version and the date it was last updated. Update the firmware on the FOX3 T/R 301/311 from this panel (see **Software/Firmware Installation** on page 32 to download the firmware files).

To update firmware:

1. In the **Firmware** panel, click the **SELECT FILE** button.
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 T/R 301/311 after being downloaded from the Extron web page).

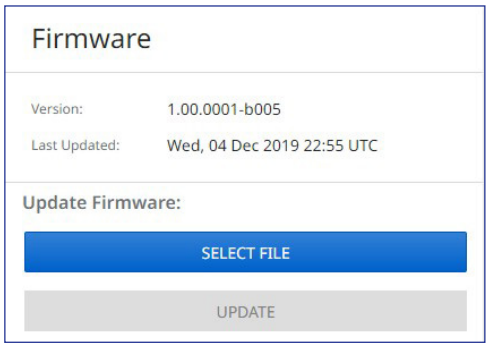


Figure 35. Firmware Panel

NOTE: Firmware files for FOX3 T/R 301/311 have a .eff extension. Do not attempt to load any other file types.

3. Double-click the firmware file name. The `Open` window closes, and the selected firmware file name appears in the `Update Firmware` panel on the web page.
4. Click **`UPDATE`** to begin (see figure 36). 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.

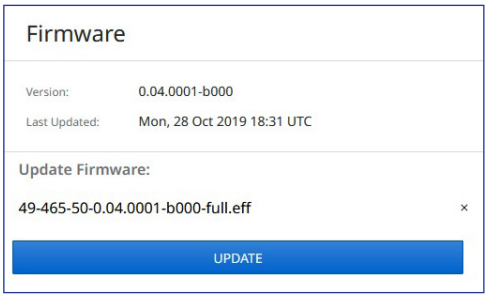


Figure 36. Firmware Update Dialog Box

Roles and Permissions Panel

The `Roles and Permissions` panel (see **figure 31**, ❺, 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.
- 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`**.

To assign administrator and user passwords:

1. In the `Roles and Permissions` panel, click **`EDIT`** (see figure 37). 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 38** on page 46).
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.

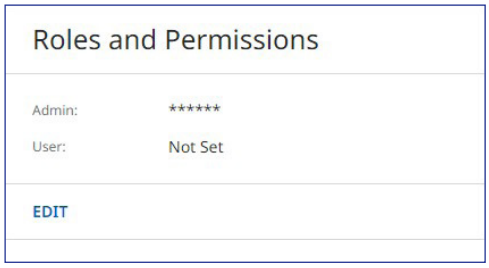


Figure 37. Roles and Permissions Panel

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 a passwords at all times. These fields cannot be blank.

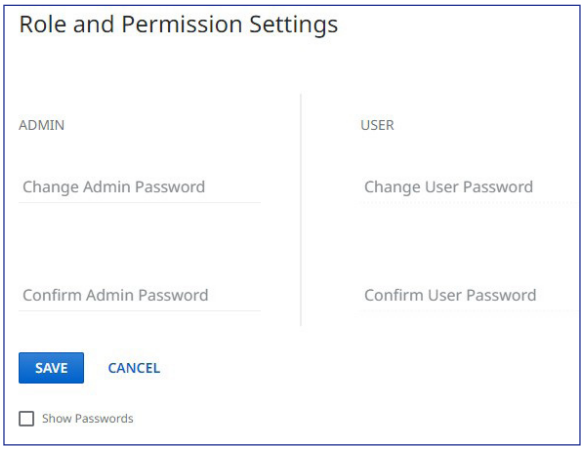


Figure 38. Passwords Dialog Box

LinkLicense Panel

The `LinkLicense` panel (see **figure 31**, ❻, on page 42) displays information about any LinkLicense applied to the FOX3 device.

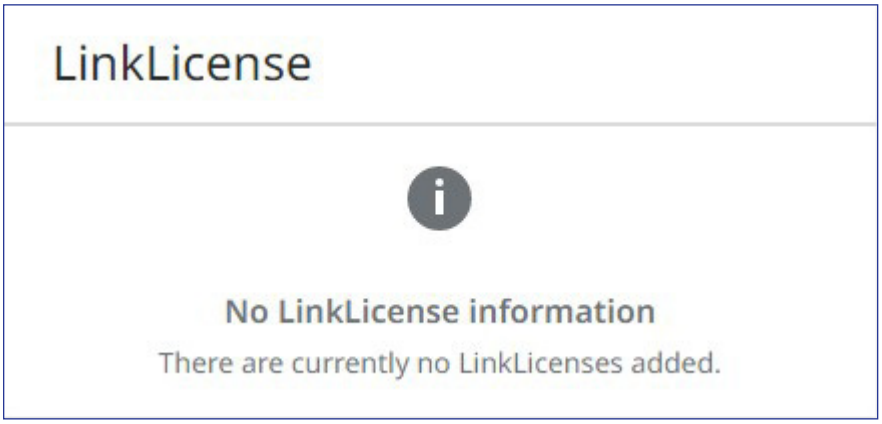


Figure 39. LinkLicense Panel

About the FOX3 T/R 301/311

Click on the **ABOUT** link (see **figure 31**, ❼ on page 42) to open the **About** dialog box to view general information about the FOX3 T/R 301/311, 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.

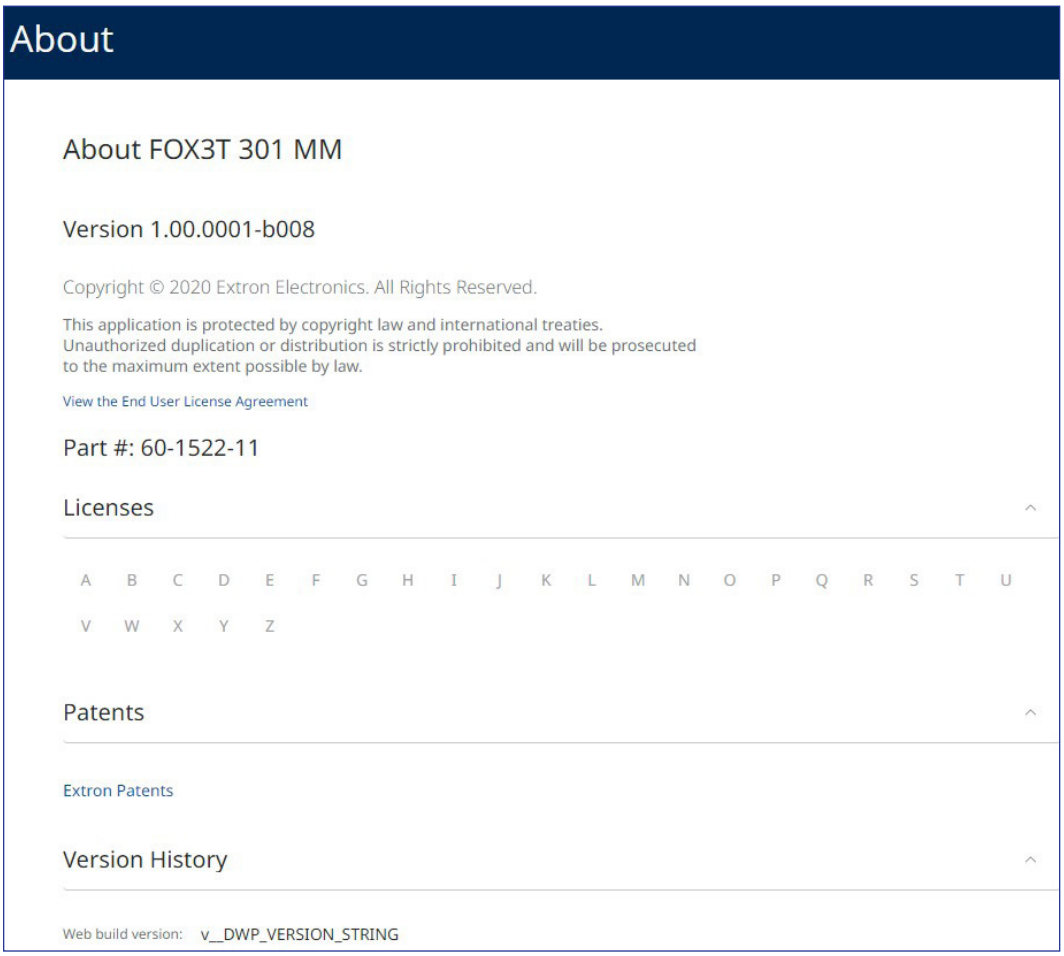


Figure 40. Roles and Permissions Panel

Equipment Mounting

This section provides procedures for mounting the FOX3 T/R 301/311 Transmitters and Receivers.

Mounting the Transmitter

ATTENTION:

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

The 1-inch high, half rack width transmitter can be placed on a table, mounted in a rack, or mounted under a desk or table. The transmitter can also be mounted on a projector bracket.

Tabletop Use

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

Mounting kits

Mount the unit using any optional compatible mounting kit listed on the Extron website (**www.extron.com**), in accordance with the directions included with the kit. For rack mounting, see "UL Rack-Mounting Guidelines," below.

UL Rack-Mounting Guidelines

The following Underwriters Laboratories (UL) requirements pertain to the installation of the unit into a rack.

- **Elevated operating ambient temperature** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature (TMA = +122 °F, +50 °C) specified by Extron.
- **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** — Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- **Circuit overloading** — Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- **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 use of power strips).

Extron Warranty

Extron 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 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
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, 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 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 be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron 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.