

FOX Matrix Series

FIBER OPTIC MATRIX SWITCHERS

Enterprise-Wide Switching of
Fiber Optic AV and Control Signals

4K UHD

JITC
CERTIFIED

- ▶ Models feature I/O sizes from 8x8 up to 1000x1000 and larger
- ▶ Compatible with all FOX Series transmitters and receivers
- ▶ Engineered for high reliability and mission-critical applications
- ▶ Low power consumption for efficient cooling, lower costs, and longer life
- ▶ Multimode, singlemode, and 3G-SDI boards support multiple video formats
- ▶ Integrates easily into a wide range of 4K environments



Extron Electronics
INTERFACING, SWITCHING AND CONTROL

Introduction

The Extron FOX Matrix Series is a family of high performance, modular fiber optic matrix switchers for complete, end-to-end digital AV signal transmission and routing over fiber optic cable. The FOX Matrix Series products are available in sizes from 8x8 up to 1000x1000 and larger, and are fully compatible with FOX and FOX II 4K Series fiber optic transmitters and receivers. Supporting video resolutions up to 4K, they feature high speed, all-digital switching of DisplayPort, HDMI, DVI-D, 3G-SDI, RGB, HD component, and standard definition video. Equipped with the integration-friendly features common to Extron matrix switchers, together with hot-swappable I/O boards and fan, real-time system monitoring, and redundant, hot-swappable power supplies, the FOX Matrix Series delivers highly reliable, enterprise-wide switching of fiber optic AV and control signals for any mission-critical environment.

Modular Fiber Optic I/O Boards

FOX Matrix Fiber Optic I/O Boards are available in either multimode or singlemode versions. The multimode versions support multimode fiber at 850 nm, which is typically used within buildings or facilities with moderate-range transmission distances up to 2 km (1.25 miles). The singlemode versions support singlemode as well as multimode fiber at 1310 nm. Singlemode fiber offers long-range transmission capability over extreme distances up to 30 km (18.75 miles). It is used in very large facilities, such as hospitals and stadiums, and for connecting over very long distances between facilities such as university or corporate campuses.

Streamlining Migration to 4K Video Distribution

When used with FOX II 4K Series extenders, Extron FOX Matrix Switchers accept and route lossless 4K video, multi-channel audio, and control, enabling a 4K distribution system up to 1000x1000 and larger. FOX II 4K Series transmitters and receivers are capable

of sending 4K video images up to 4096x2160 at 30 Hz with a 4:4:4 color space. This allows existing FOX systems to be easily upgraded to 4K resolutions without requiring any cabling, hardware, software, or firmware updates to the matrix, streamlining the migration path to 4K video.

Designed for Secure Systems

FOX Matrix Switchers use two methods to ensure sensitive data is properly segregated and protected – Priority Switching and Secure Partitioning. Priority Switching assigns a security level from one to six for each input, with six being the highest level. An output can only be tied to an input at the same security level or lower, preventing unauthorized access from one to six for sensitive data. For example, an output at security level five can be tied to inputs that are security level five or lower. However, an output at level one, the lowest level, can only be tied to inputs that are also level one. Priority Switching is useful in systems with multiple security classification levels.

Secure Partitioning enables the matrix switcher to be divided into smaller sub-switchers for segregating sources and destinations. Sources can only be routed to destinations within the same partition. Any attempt to tie an input and output in different partitions is prohibited, returning an error code. Up to 12 partitions are available. Secure Partitioning is useful for separating secure and unclassified data.

3G-SDI Signal Switching and Distribution

FOX Series matrix switchers support switching and distribution of 3G-SDI signals with the optional FOX I/O HD-SDI and FOX 3G I/O SM P input/output boards. They can be configured as dedicated 3G-SDI matrix switchers, or with a combination of SDI and fiber optic matrix switching.

Extron FOX I/O HD-SDI and FOX 3G I/O SM P input/output boards are compliant with SMPTE 259M, 292M, 424M, and ITU digital video standards, and offer 8x8 or 16x16 configurations. The FOX I/O HD-SDI provides connectivity for local 3G-SDI-equipped devices. The FOX 3G I/O SM P matrix board enables the transmission and distribution of fiber optic 3G-SDI signals, including pathological signals, over singlemode fiber.

JITC-Certified FOX Systems

JITC-certified FOX Series products are available on the DoD's Unified Capabilities Approved Products List – UC APL. Inclusion on the UC APL validates that products have successfully completed interoperability and information assurance testing for use in government applications and other mission-critical environments.



Features

Compatible with all FOX Series transmitters and receivers

The FOX Matrix Series offers high-speed digital switching capability for routing audio, control, and video signals at high resolution rates and multiple formats.

Compatible with FOX II 4K Series transmitters and receivers for end-to-end 4K video distribution systems

FOX systems can be easily upgraded to 4K resolutions without any cabling, hardware, software, or firmware updates to the matrix, streamlining the migration path to 4K resolutions.

Multimode and singlemode I/O boards available

The FOX Matrix Series is configurable with a mix of multimode and singlemode I/O boards, so that both short and long haul transmissions can be supported.

3G-SDI I/O boards available

Boards provide routing of 3G-SDI signals up to 2.97 Gbps, including 3G-SDI, HD-SDI, and SDI. The FOX Matrix Series can be configured as a fully dedicated 3G-SDI matrix switcher, or a combination of 3G-SDI and fiber optic matrix switching.

Modular, field-upgradeable and hot-swappable design

Additional boards may be added for easy and quick upgradeability or expansion. Hot-swappable components allow I/O board, fan assembly, or power supply replacement without the need to power down the switcher. This is especially useful for mission-critical applications that require continuous operation.

Redundant and hot-swappable power supplies

Primary and back-up supplies provide added reliability for critical applications.

SpeedSwitch® provides exceptional switching speed for HDCP-encrypted content

Integrates easily into a wide range of 4K environments

FOX Series matrix switchers and extenders can be configured for use with 4K sources and displays with resolutions up to 4096x2160.

JITC Certified

Specific FOX Series products achieved JITC certification for use in government applications and other mission-critical environments.

Secure Partitioning segregates sources and destinations in a secure environment

Secure Partitioning enables the matrix switcher to be divided into smaller sub-switchers for segregating sources and destinations. Sources can only be routed to destinations within the same partition.

Priority Switching prevents unauthorized access to sensitive data in a secure environment

Each input and output is assigned a security level. An output can only be tied to an input at the same security level or lower, preventing unauthorized access to sensitive data in a secure environment.

Low power consumption for efficient cooling, lower costs, and longer life

Low power consumption equates to less heat generation, translating to a lower cost of ownership and an increased lifespan.

Advanced computer-aided diagnostics

Provide 24-hour self-diagnostics of input and output boards, primary and redundant power supply voltages, fiber links, and overall functional status of the matrix. Using the Ethernet or RS-232/RS-422 communications port, status monitoring is possible for off-site or unmanned locations, such as government, military, medical, or any other mission-critical environment.

Input link signal detection

The FOX Matrix Series verifies active light sources by polling all connections for input reception and output transmission. The resulting information is viewable within the internal Web pages and is easily obtained by AV control systems.

Status LED indicators for fiber link status

Alarm notification for fiber link loss

The FOX Matrix Series can be set up to trigger a control system or generate e-mail alerts for immediate notification when an inbound fiber link has been lost.

Two AC power inputs

For added power reliability, some 24-hour environments offer two separate AC power sources, one as the primary source and the second for redundancy. The FOX Matrix Series offers two AC power inputs for continuous connection to both sources.

Selectable output reclocking

Reshapes and restores timing of digital signals at the selected rate.

Industry standard LC connectors provide reliable physical connectivity and precise fiber core alignment

Global presets

Frequently used I/O configurations may be saved and recalled via Ethernet or serial control. This time-saving feature allows I/O configurations to be set up and stored in memory for future use.

Extron control software

The included Windows®-based control software features a graphical, drag-and-drop interface to make I/O configuration and other customization functions simple and convenient. This software also offers an emulation mode for configuration of an offsite matrix switcher; the I/O configuration may then be saved for future downloading to the matrix switcher.

Rooming

The FOX Matrix Series can be configured to group selected outputs into specific "rooms," each with its own set of unique presets. A total of 10 rooms, with 10 presets per room, are available.

Ethernet monitoring and control

The FOX Matrix Series can be proactively monitored and managed over a LAN, WAN, or the Internet, using standard TCP/IP protocols. Ethernet connectivity provides for remote selection of input and output ties, system setup and configuration, and advanced system diagnostics.

SNMP support for remote monitoring

RS-232 & RS-422 control port

Using serial commands, the FOX Matrix Series can be controlled and configured via the included Windows-based control software, or integrated into a control system. Extron products use the SIS™ - Simple Instruction Set command protocol, a set of basic ASCII code commands that allow for quick and easy programming. The RS-232 and RS-422 port also makes it easy to install firmware updates.

Front panel configuration port

A front panel serial port allows easy accessibility for configuring the FOX Matrix without having to access the rear panel.

Overview

QS-FPC™ - QuickSwitch Front Panel Controller

Simple and intuitive operation via tri-color backlit buttons for each input and output – FOX Matrix 7200 & FOX Matrix 3200

High speed, digital switching

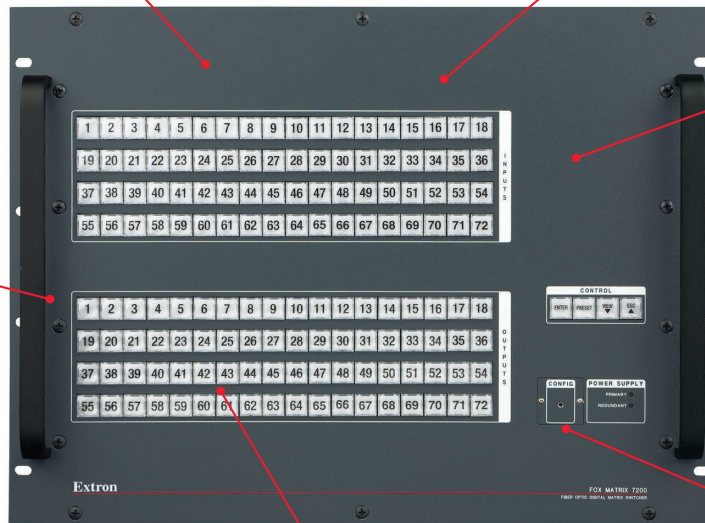
Supports computer and video resolutions up to 4K, including 1080p/60 Deep Color

SpeedSwitch® Technology

Provides exceptional switching speed for HDCP-encrypted content

Global Presets and Rooming

Reduces frustrations and time with a wide variety of I/O configurations stored in memory



FOX Matrix 7200 - Front

Front panel security lockout

Prevents unauthorized use in non-secure environments – FOX Matrix 7200 & FOX Matrix 3200

Front panel configuration port

Simplifies setup by avoiding the need to access the rear panel

Real time monitoring of fiber link conditions

Instantaneous notification if an inbound fiber link is lost

Multimode and singlemode I/O boards

Increases flexibility by supporting short haul and long haul transmissions in a single product

Hot swappable, modular field-upgradeable design

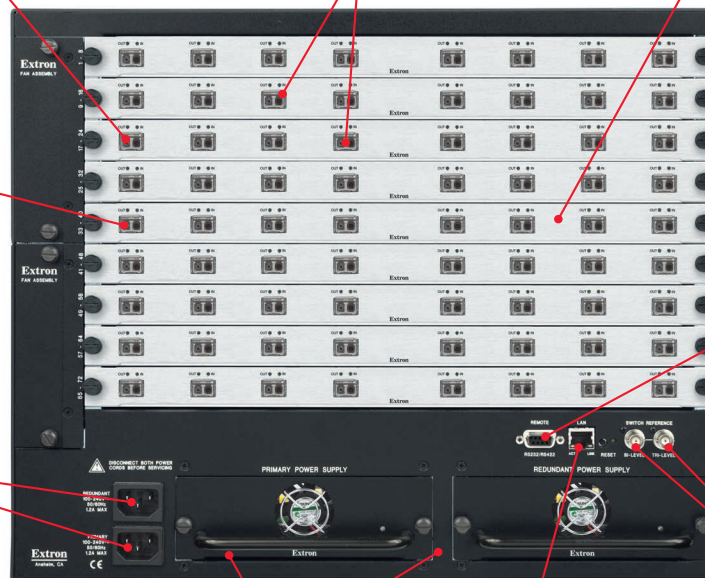
Ensures flexibility and minimizes system downtime

Selectable Output Reclocking

Reshapes and restores timing of digital signal at the selected rate

Dual AC power inputs

Increases reliability with continuous connection to separate primary and redundant power sources



FOX Matrix 7200 - Back

Dual redundant and hot-swappable power supplies

Provides reliability for mission-critical operations

Ethernet connectivity

Enables Web-based remote management, monitoring, and control

RS-232 and RS-422 Control

Enables switcher control and configuration via the Extron Windows-based control program, or integration into a control system

Video Genlock for SDI and HD-SDI signals

Provides separate bi-level and tri-level references for vertical interval switch timing – FOX Matrix 7200 & FOX Matrix 3200

Models

FOX Matrix 3200

Modular Fiber Optic Matrix Switcher from 8x8 to 32x32

Unique Features

- I/O sizes from 8x8 to 32x32
- Expandable in 8x8 increments
- Supports FOX I/O 88 HD-SDI Board
- Redundant, hot-swappable power supplies
- QS-FPC - QuickSwitch Front Panel Controller with tri-color backlit buttons
- Rack-mountable 4U metal enclosure

SPEED SWITCH

4K UHD

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Model	Version Description	Part Number
FOX Matrix 3200	FOX Matrix 3200 Frame	60-1257-01
FOX I/O 88 MM	8x8 I/O Board - Multimode	70-791-21
FOX I/O 88 SM	8x8 I/O Board - Singlemode	70-791-22
FOX I/O 88 HD-SDI	8x8 I/O Board - 3G-SDI	70-792-01
FOX 3G I/O 88 SM P	8x8 I/O Board - Singlemode, Path Comp	70-965-02
FOX Matrix Blank Plate	Blank Plate - Single I/O Slot	70-651-21



FOX Matrix 7200

Modular Fiber Optic Matrix Switcher from 8x8 to 72x72

Unique Features

- I/O sizes from 8x8 to 72x72
- Expandable in 8x8 increments
- Supports FOX I/O 88 HD-SDI Board
- Redundant, hot-swappable power supplies
- QS-FPC - QuickSwitch Front Panel Controller with tri-color backlit buttons
- Rack-mountable 8U metal enclosure

SPEED SWITCH

4K UHD

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Model	Version Description	Part Number
FOX Matrix	7200 FOX Matrix 7200 Frame	60-1256-01
FOX I/O 88 MM	8x8 I/O Board - Multimode	70-791-21
FOX I/O 88 SM	8x8 I/O Board - Singlemode	70-791-22
FOX I/O 88 HD-SDI	8x8 I/O Board - 3G-SDI	70-792-01
FOX 3G I/O 88 SM P	8x8 I/O Board - Singlemode, Path Comp	70-965-02
FOX Matrix Blank Plate	Blank Plate - Single I/O Slot	70-651-21



FOX Matrix 14400

Modular Fiber Optic Matrix Switcher from 16x16 to 144x144

Unique Features

- I/O sizes from 16x16 to 144x144
- Expandable in 16x16 increments
- Redundant, hot-swappable power supplies
- Rack-mountable 8U metal enclosure

SPEED SWITCH

4K UHD

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Model	Version Description	Part Number
FOX Matrix 14400 Frame	FOX Matrix 14400 Frame	60-1255-01
FOX I/O 1616 MM	16x16 I/O Board - Multimode	70-771-21
FOX I/O 1616 SM	16x16 I/O Board - Singlemode	70-771-22
FOX I/O 1616 HD-SDI	16x16 I/O Board - 3G-SDI	70-966-01
FOX 3G I/O 1616 SM P	16x16 I/O Board - Singlemode, Path Comp	70-965-01
FOX Matrix Blank Plate	Blank Plate - Single I/O Slot	70-651-21



Models

FOX Matrix 320x

Modular Fiber Optic Matrix Switcher from 16x16 to 320x320

Unique Features

- I/O sizes from 16x16 to 320x320
- Expandable in 16x16 increments
- Redundant, hot-swappable power supplies
- Rack-mountable 17U metal enclosure

SPEED SWITCH

4K UHD

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Model	Version Description	Part Number
FOX Matrix 320x	FOX Matrix 320x Frame	60-1082-01
FOX I/O 1616 MM	16x16 I/O Board - Multimode	70-771-21
FOX I/O 1616 SM	16x16 I/O Board - Singlemode	70-771-22
FOX I/O 1616 HD-SDI	16x16 I/O Board - 3G-SDI	70-966-01
FOX 3G I/O 1616 SM P	16x16 I/O Board - Singlemode, Path Comp	70-965-01
FOX Matrix Blank Plate	Blank Plate - Single I/O Slot	70-651-21

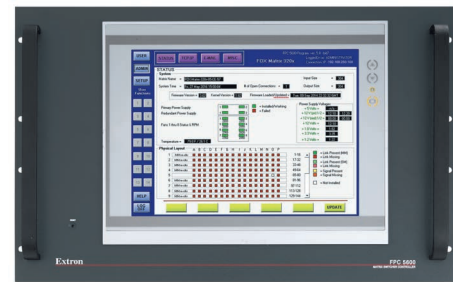
For matrix switchers larger than 320x320, please see the Extron 1K Program overview on the back cover of this brochure.

FPC 5600

Front Panel Controller for FOX Matrix 320x, FOX Matrix 14400, & Matrix 12800

- Intuitive, menu-driven 12.1" color touchscreen control interface
- Provides remote monitoring, access, and management of all setup and control functions
- Ethernet capabilities for matrix control from one or more locations on a network or via the Internet
- 7U, rack-mountable panel can also be installed in a control console

Model	Version Description	Part Number
FPC 5600	12.1" Touchscreen, Rack Mount, 7U	60-1620-01



SMX System Multimatrix

Digital and Analog Multi-Plane Modular Matrix Switcher

Unique Features

- SMX FOX Series boards available in I/O sizes of 8x8 and 16x16
- Digital, analog, wideband, and stereo audio matrix boards
- Single point of control for up to 10 separate switching planes
- Hot-swappable matrix boards
- Field re-configurable and updateable
- 2U, 3U, 4U, or 5U frames

Model	Version Description	Part Number
SMX 200 Frame	2U/4-Slot	60-1021-01
SMX 200 Frame RPS	2U/4-Slot with Redundant Power Supply	60-1021-11
SMX 300 Frame	3U/6-Slot	60-855-01
SMX 300 Frame RPS	3U/6-Slot with Redundant Power Supply	60-855-11
SMX 400 Frame	4U/8-Slot	60-856-01
SMX 400 Frame RPS	4U/8-Slot with Redundant Power Supply	60-856-11
SMX 500 Frame	5U/10-Slot	60-857-01
SMX 500 Frame RPS	5U/10-Slot with Redundant Power Supply	60-857-11
SMX 88 FOX SM	8x8 Fiber Optic, Singlemode; 1 slot	70-635-03
SMX 88 FOX MM	8x8 Fiber Optic, Multimode; 1 slot	70-634-03
SMX 1616 FOX SM	16x16 Fiber Optic, Singlemode; 2 slots	70-635-04
SMX 1616 FOX MM	16x16 Fiber Optic, Multimode; 2 slots	70-634-04



SPEED SWITCH

4K UHD

FOX Matrix Series I/O Boards

FOX I/O BOARDS

The Extron FOX I/O boards for the FOX Matrix Series provide support for a wide range of digital and analog video formats, including DisplayPort, HDMI, DVI, 3G-SDI, RGB, HD component, standard definition component, S-video, and composite. The 3G-SDI boards are also available to enable connections to local devices. All FOX I/O boards are hot-swappable for board addition or replacement in the field.



FOX I/O 88

FOX I/O 88

8x8 Fiber Optic I/O Board for the FOX Matrix 3200 & FOX Matrix 7200

- Compatible with all FOX Series transmitters and receivers
- Available as multimode and singlemode versions
- Selectable output reclocking
- Supports both simplex and duplex switching



FOX I/O 1616

FOX I/O 1616

16x16 Fiber Optic I/O Board for the FOX Matrix 14400 & FOX Matrix 320x

- Compatible with all FOX Series transmitters and receivers
- Available as multimode and singlemode versions
- Selectable output reclocking
- Supports both simplex and duplex switching



FOX 3G I/O 88 SM P

FOX 3G I/O 88 SM P

8x8 Fiber Optic 3G-SDI I/O Board for the FOX Matrix 3200 & FOX Matrix 7200

- Supports data rates from 270 Mbps to 2.97 Gbps
- Immunity to 3G-SDI, HD-SDI, and SDI pathological signal patterns
- Available as singlemode version, only
- Compatible with FOX 3G HD-SDI P SM extenders



FOX 3G I/O 1616 SM P

FOX 3G I/O 1616 SM P

16x16 Fiber Optic 3G-SDI I/O Board for the FOX Matrix 14400 & FOX Matrix 320x

- Supports data rates from 270 Mbps to 2.97 Gbps
- Immunity to 3G-SDI, HD-SDI, and SDI pathological signal patterns
- Available as singlemode version, only
- Compatible with FOX 3G HD-SDI P SM extenders



FOX I/O 88 HD-SDI

FOX I/O 88 HD-SDI

8x8 3G-SDI I/O Board for the FOX Matrix 3200 & FOX Matrix 7200

- Supports data rates from 270 Mbps to 2.97 Gbps
- Passes embedded audio, ancillary ID and metadata information, and SD/HD-SDTI digital video signals
- Input equalization and reclocking on buffered outputs
- Individually buffered inputs and outputs
- Standard BNC connectors



FOX I/O 1616 HD-SDI

FOX I/O 1616 HD-SDI

16x16 3G-SDI I/O Board for the FOX Matrix 14400 & FOX Matrix 320x

- Supports data rates from 270 Mbps to 2.97 Gbps
- Passes embedded audio, ancillary ID and metadata information, and SD/HD-SDTI digital video signals
- Individually buffered inputs and outputs
- Input equalization and reclocking on buffered outputs
- Includes DIN to BNC adapters

Most Complete Fiber Optic Line for Pro AV

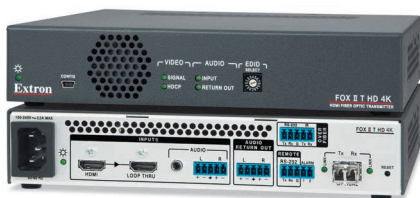
COMPLETE FIBER OPTIC SYSTEMS

FOX Matrix Switchers are part of the extensive FOX Series of fiber optic products from Extron. They can be used in combination with other products including transmitters, receivers, switchers, and distribution amplifiers, to tackle the most challenging AV system designs with numerous inputs and outputs. The Extron FOX Series provides integrators and system designers with the most complete fiber optic product offering in the industry.



FOX II 4K SERIES

The Extron FOX II 4K Series represents the highest level of performance for the extensive FOX Series of fiber optic products from Extron. They provide long haul extension of DisplayPort and HDMI video, multi-channel audio, RS-232, and IR over fiber optic cabling. Engineered with uncompromising quality and proven performance, they use Extron all-digital technology to deliver lossless video signals at resolutions up to 4096x2160 at 30 Hz with a 4:4:4 color space. The FOX II 4K Series can be used in point-to-point applications or in combination with a FOX Series matrix switcher for an enterprise-wide HDCP-compliant distribution system of 4K video, audio, and control.



FOX II T DP 4K



FOX II R DP 4K

FOX II T HD 4K

Fiber Optic Transmitter for HDMI, Multi-Channel Audio, RS-232 & IR

- Transmits HDMI video, multi-channel audio, RS-232 control, and IR control signals over fiber optic cabling
- Supports lossless 4K video up to 4096x2160 at 30-Hz with a 4:4:4 color space over one fiber
- Vertical sync lock enables lossless 4K video transmission up to 4096x2160 at 60-Hz with a 4:4:4 color space using two transmitters
- HDCP compliant
- User-selectable HDCP authorization
- Key Minder and EDID Minder
- Buffered HDMI input loop-through
- Audio return channel

FOX II DP 4K

Fiber Optic Extender for DisplayPort, Multi-Channel Audio, RS-232 & IR

- Extends DisplayPort video, multi-channel audio, RS-232 control, and IR control signals over fiber optic
- Supports lossless 4K video up to 4096x2160 at 30 Hz with a 4:4:4 color space over one fiber
- Vertical sync lock enables lossless 4K video transmission up to 4096x2160 at 60 Hz with a 4:4:4 color space using two transmitters
- HDCP compliant
- Key Minder and EDID Minder
- Type 2 dual-mode DisplayPort for interoperability with HDMI, DVI, or VGA devices
- Buffered DisplayPort input loop-through

PowerCage 1600

POWERCAGE 1600

Modular Power Enclosure for Fiber Optic and Twisted Pair Extenders

The Extron PowerCage 1600 is a rack-mountable, 16-slot enclosure that supports a wide range of Extron fiber optic and twisted pair AV transmitter and receiver boards. Providing an efficient way to power and mount multiple transmitters and receivers, the PowerCage 1600 simplifies integration for large, rack-mounted systems. The PowerCage 1600 also features an optional redundant, hot-swappable power supply plus thermal management to optimize reliability in mission-critical environments where continuous, 24/7 operation is essential. The hot-swappable, modular design allows for replacing or upgrading boards in the field at any time, without having to power down the system.

Unique Features

- Accommodates up to eight fiber optic extender boards
- Space-saving design with a compact 3U, rack-mountable enclosure
- Modular, field-upgradeable, and hot-swappable design
- Optional redundant power supply
- Hot-swappable power supplies
- Exceptional thermal management



POWERCAGE FOX FIBER OPTIC BOARDS

The Extron PowerCage FOX fiber optic extender boards are modular board-designed transmitter and receiver sets for the PowerCage 1600 enclosure, supporting long haul transmission of standard and high definition video, audio, and RS-232 control signals over fiber optic cabling. Boards are available as 850 nm multimode models for moderate transmission distances up to 2 km (1.25 miles) and as 1310 nm singlemode models for extreme distances up to 30 km (18.75 miles). Engineered for reliability and exceptional video performance, they have the Extron all-digital technology that delivers perfect pixel-for-pixel transmission of video signals.

Unique Features

- Send video, stereo audio, and RS-232 control over fiber optic cabling
- Transmitter and receiver boards for HDCP-compliant HDMI, DVI, RGB, or standard definition video
- All digital technology provides pixel-for-pixel performance with signals up to 1920x1200, including HDTV 1080p/60
- Audio gain and attenuation control on transmitter boards
- Audio extraction board provides local audio outputs for up to four FOX Series fiber optic signals, extracting analog stereo audio for independent processing and routing
- Available as 850 nm multimode for moderate-range transmissions up to 2 km (1.25 miles) , and 1310 nm singlemode for extreme distances up to 30 km (18.75 miles)
- Industry standard LC connectors provide reliable physical connectivity and precise fiber core alignment
- Alarm notification for fiber link loss
- RS-232 control
- Compatible with FOX Series transmitters and receivers
- Compatible with FOX Matrix Switchers for signal distribution systems up to 1000x1000 and larger



PowerCage
FOX Tx HDMI



PowerCage
FOX Rx HDMI



PowerCage
FOX SR HDMI



PowerCage
FOX Tx DVI Plus



PowerCage
FOX Rx DVI Plus



PowerCage
FOX Tx VGA



PowerCage
FOX Rx VGA



PowerCage
FOX Tx AV



PowerCage
FOX Rx AV



PowerCage
FOX II AEX 104

Transmitters & Receivers

POWERCAGE 401

The Extron PowerCage 401 is a compact, 1U rack-mountable enclosure that supports Extron modular fiber optic extenders. Engineered with uncompromising quality and proven performance, it provides an efficient way to power, manage, and mount multiple extenders. The hot swappable, modular design of the PowerCage enclosure allows for addition or replacement of modules and power supplies in the field, without having to power down the system. The PowerCage 401 simplifies integration for large, rack-mounted systems as well as user workstations with multiple computers.



PowerCage 401

Modular Power Enclosure for Fiber Optic Extenders

- Space-saving design with a compact, 1U rack-mountable enclosure
- Accommodates up to four extender modules
- Modular, field-upgradeable, and hot-swappable design
- Ethernet monitoring and control
- Dual-redundant and hot-swappable power supplies
- RS-232 insertion from the Ethernet port
- Two AC power inputs
- Front panel LCD display and controls for easy setup and troubleshooting



PowerCage 401 FOX D HD

Dual Fiber Optic Extenders for HDMI, Audio, and RS-232

- Extends HDMI, stereo audio, and RS-232 control signals very long distances over fiber optic cabling
- HDCP compliant
- User-selectable HDCP authorization
- All-digital technology provides pixel-for-pixel performance with signals up to 1920x1200, including 1080p/60
- Key Minder and EDID Minder
- Hot-swappable modules designed for the PowerCage 401 enclosure

FOX SERIES

Extron FOX Series fiber optic transmitters and receivers enable long haul transmission of AV and RS-232 control signals or USB over fiber optic cable at extreme distances. They are engineered for reliability and exceptional high resolution image performance, and feature all digital technology, to deliver perfect pixel-for-pixel transmission of HDMI, DVI-D, 3G-SDI, RGB, HD component, and standard definition video. Transmitters and receivers are available as 850 nm multimode models for moderate transmission distances up to 2 km (1.25 miles) and as 1310 nm singlemode models for extreme distances up to 30 km (18.75 miles).



FOXBOX Tx HDMI

Fiber Optic Extender for HDMI, Audio, and RS-232

- Transmits HDMI video, stereo audio, and RS-232 control signals very long distances over fiber optic cabling
- All digital technology provides pixel-for-pixel performance with signals up to 1920x1200, including HDTV 1080p/60
- Key Minder® continuously verifies HDCP compliance
- EDID Minder® automatically manages EDID communication
- Buffered HDMI input loop-through



FOXBOX Rx HDMI

Fiber Optic Receiver for HDMI, Audio, and RS-232

- Accepts fiber optic signals from FOX Series transmitters and provides HDMI video, stereo audio, and RS-232 control signals
- All digital technology provides pixel-for-pixel performance with signals up to 1920x1200, including HDTV 1080p/60
- Key Minder® continuously verifies HDCP compliance
- HDMI audio de-embedding with analog stereo outputs
- Selectable HDMI audio pass-through

Transmitters & Receivers



FOXBOX SR HDMI

FOXBOX SR HDMI

Fiber Optic Scaling Receiver for HDMI, Audio, and RS-232

- Accepts fiber optic signals from FOX Series transmitters and provides scaled HDMI video, stereo audio, and RS-232 control signals
- High performance scaler provides selectable output resolutions up to 1920x1200, including HDTV 1080p/60 and 2K
- HDMI, DVI, RGB, and HD component video upscaling and downscaling
- Key Minder® continuously verifies HDCP compliance
- HDMI audio de-embedding with analog stereo outputs



FOXBOX DVI Plus Tx



FOXBOX DVI Plus Rx

FOXBOX DVI Plus

Fiber Optic Extender for DVI, Audio, and RS-232

- Extends single link DVI-D, stereo audio, and RS-232 control signals very long distances over a single fiber
- All digital technology provides pixel-for-pixel performance with signals up to 1920x1200, including HDTV 1080p/60
- EDID Emulation provides selectable resolutions and refresh rates to ensure reliable operation
- Daisy-chain capability



FOXBOX Tx VGA/YUV



FOXBOX Rx VGA

FOXBOX VGA/YUV Series

Fiber Optic Extender for VGA or HD Component, Audio, and RS-232

- Extends VGA or HD component video, stereo audio, and RS-232 control signals very long distances over a single fiber
- All digital technology provides pixel-for-pixel performance with signals up to 1600x1200, including HDTV 1080p/60
- Compatible with HD component video, bi-level or tri-level sync
- RS-232 control
- Daisy-chain capability



FOX T UWP 302

Two Input Fiber Optic Transmitter - Decorator-Style Wallplate

- Transmits HDMI or analog video and stereo audio signals very long distances over fiber optic cabling
- All digital technology provides pixel-for-pixel performance with signals up to 1920x1200, including HDTV 1080p/60
- Digital conversion of analog video and audio input signals
- Auto-input switching
- HDCP compliant
- Key Minder® continuously verifies HDCP compliance



FOX T USW 203

Three Input Switcher with Buffered HDMI Output and Integrated Fiber Optic Transmitter for HDMI, VGA, Audio, & RS-232

- Transmits HDMI or analog video, stereo audio, and RS-232 signals very long distances over fiber optic cabling
- All digital technology provides pixel-for-pixel performance with signals up to 1920x1200, including HDTV 1080p/60
- Digital conversion of analog video and audio input signals
- Buffered HDMI output enables local display of the selected input
- Buffered VGA input loop-through
- Key Minder® continuously verifies HDCP compliance

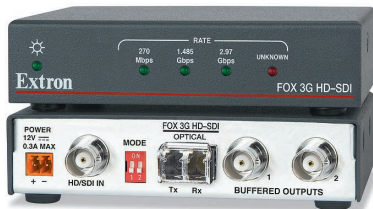


FOX T USW 103

Three Input Switcher with Integrated Fiber Optic Transmitter for HDMI, VGA, Audio, & RS-232

- Transmits HDMI or analog video, stereo audio, and RS-232 signals very long distances over fiber optic cabling
- All digital technology provides pixel-for-pixel performance with signals up to 1920x1200, including HDTV 1080p/60
- Digital conversion of analog video and audio input signals
- Auto-switching between inputs
- HDCP compliant
- Key Minder® continuously verifies HDCP compliance

Transmitters & Receivers



FOX 3G HD-SDI

FOX 3G HD-SDI

Fiber Optic Extender for 3G-SDI

- Extends 3G-SDI, HD-SDI, and SDI signals very long distances over a single fiber
- Input equalization and reclocking on buffered outputs
- Immunity to 3G-SDI, HD-SDI, and SDI pathological signal patterns - FOX 3G HD-SDI P SM
- Dual buffered outputs
- Daisy-chain capability



FOX Tx AV

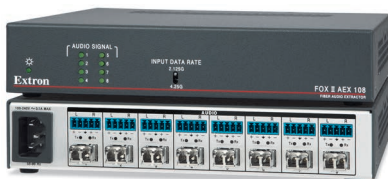


FOX Rx AV

FOX AV

Fiber Optic Extender for Video, Audio, and RS-232

- Extends standard definition video, stereo audio, and RS-232 control signals very long distances over a single fiber
- All digital technology provides pixel-for-pixel performance
- Auto Input Format Detection
- Picture and audio adjustments
- Internal transcoding with selectable output format



FOX II AEX 108

Eight Port Fiber Optic Audio Extractor

- Provides audio outputs for up to eight FOX or FOX II Series fiber optic signals, extracting analog stereo audio for independent processing and routing
- Simultaneous audio extraction ports
- Buffered input loop-throughs
- Output reclocking
- Balanced or unbalanced analog stereo audio output



FOX II RS 104

Four Port Fiber Optic RS-232 Inserter

- RS-232 insertion from the Ethernet port to one or more of the fiber optic outputs
- Buffered outputs restore optical budget to maximize distance capabilities
- Output reclocking reshapes and restores the timing of a digital signal
- Ethernet monitoring and control
- Ethernet connectivity for integration with a control system
- Available as multimode and singlemode models



FOX T USB ExtenderPlus

FOX R USB ExtenderPlus

FOX USB Extender Plus

Fiber Optic Extender for USB Peripherals

- Extends USB peripherals very long distances over fiber optic cabling
- 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
- Receiver features an integrated four-port hub with 5 Volts, 500 mA available on each port
- Peripheral emulation
- Real-time status LED indicators for troubleshooting and monitoring
- Compatible with Extron FOX Matrix Switchers for signal distribution systems up to 1000x1000 and larger
- Available as multimode and singlemode models



FOX DA8 Plus

Configurable Eight output Fiber Optic Distribution Amplifier

- Configurable as a single 8-output distribution amplifier, or as two 4-output or four 2-output distribution amplifiers
- Distributes and extends AV and control signals long distances over fiber optic cabling
- Compatible with Extron FOX-Series DVI-Plus, DVI, 3G-SDI, VGA, VGA/YUV, and AV transmitters and receivers
- Selectable output reclocking
- Eight active and individually isolated outputs
- Output muting control
- Available as multimode and singlemode models

Fiber Optic Cables & Accessories



Fiber Optic Termination Kit

Tool Kit for Field Termination of Fiber Optic Cables

- Complete kit for terminating fiber optic cables
- Compatible with all Extron Fiber Optic Quick LC Connectors
- Precision fiber cleaver
- Visual Fault Locator included
- Durable canvas tool bag



QLC MM



QLC SM

Quick LC Fiber Optic Connectors

Connectors for Field Termination of Fiber Optic Cables

- Pre-polished, field-installable connectors
- Compatible with Extron Fiber Optic Termination Kit
- Re-usable up to two times
- Wedge clip with visual indicator
- High-performance, low-loss fiber optic connectors



OM4 MM P

Bend-Insensitive Laser-Optimized Duplex Multimode Fiber - Plenum

- Laser-optimized OM4 multimode fiber
- Bend-insensitive
- OFNP plenum-rated jacket
- Durable duplex zip-cord cable construction
- Standard 2 mm duplex fiber optic cable for easy termination



SM P

Bend-Insensitive Duplex Singlemode Fiber - Plenum

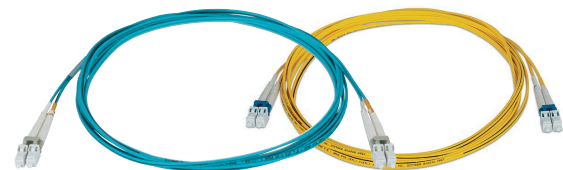
- Bend-insensitive singlemode fiber
- OFNP plenum-rated jacket
- Durable duplex zip-cord cable construction
- Standard 2 mm duplex fiber optic cable for easy termination



Fiber Optic Test Set

Complete Kit to Measure Optical Power and Loss in Fiber Optic Cable

- Complete kit for testing power and loss in multimode and singlemode fiber optic AV systems
- Fiber optic light source includes both multimode and singlemode outputs
- Fiber optic power meter accepts multimode or singlemode fiber
- Power measurements in dBm or watts and loss measurements in dB
- Automatic wavelength identification with Wave ID enables the power meter to automatically detect and set wavelengths to simplify setup
- Handheld and battery-powered
- Durable padded carrying case



2LC OM4 MM P

2LC SM P

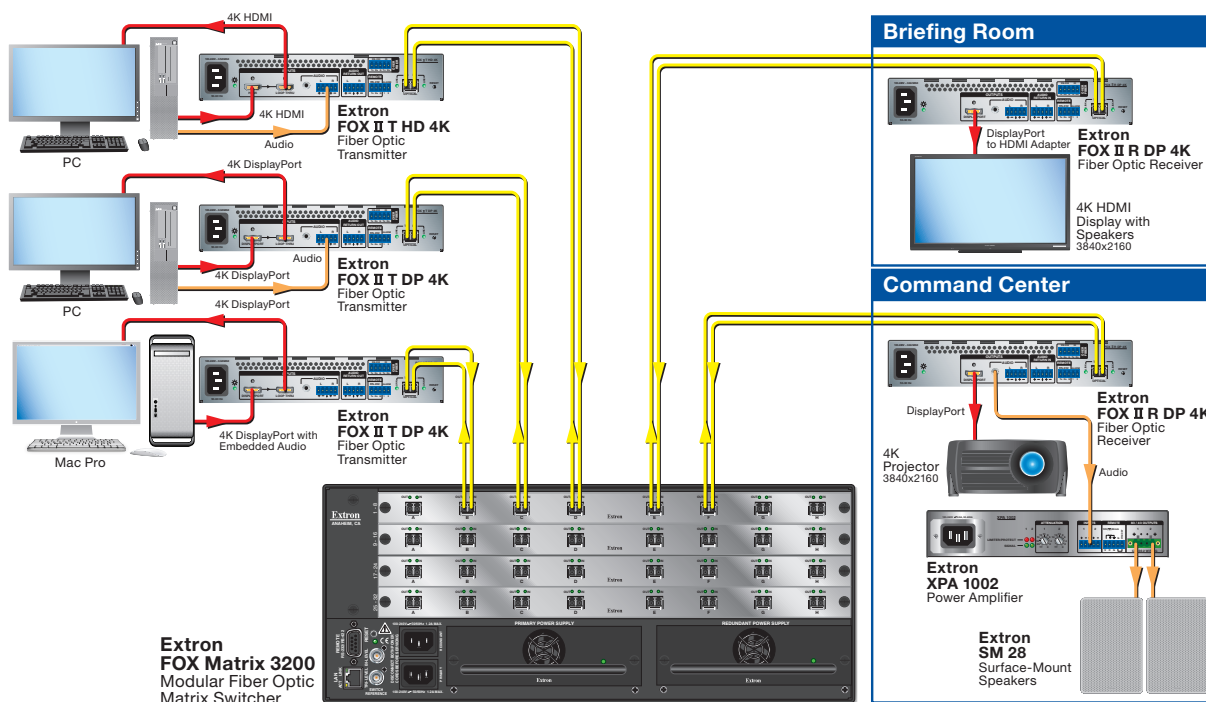
Fiber Optic Cable Assemblies

LC to LC Multimode and Singlemode Fiber Optic Cable Assemblies

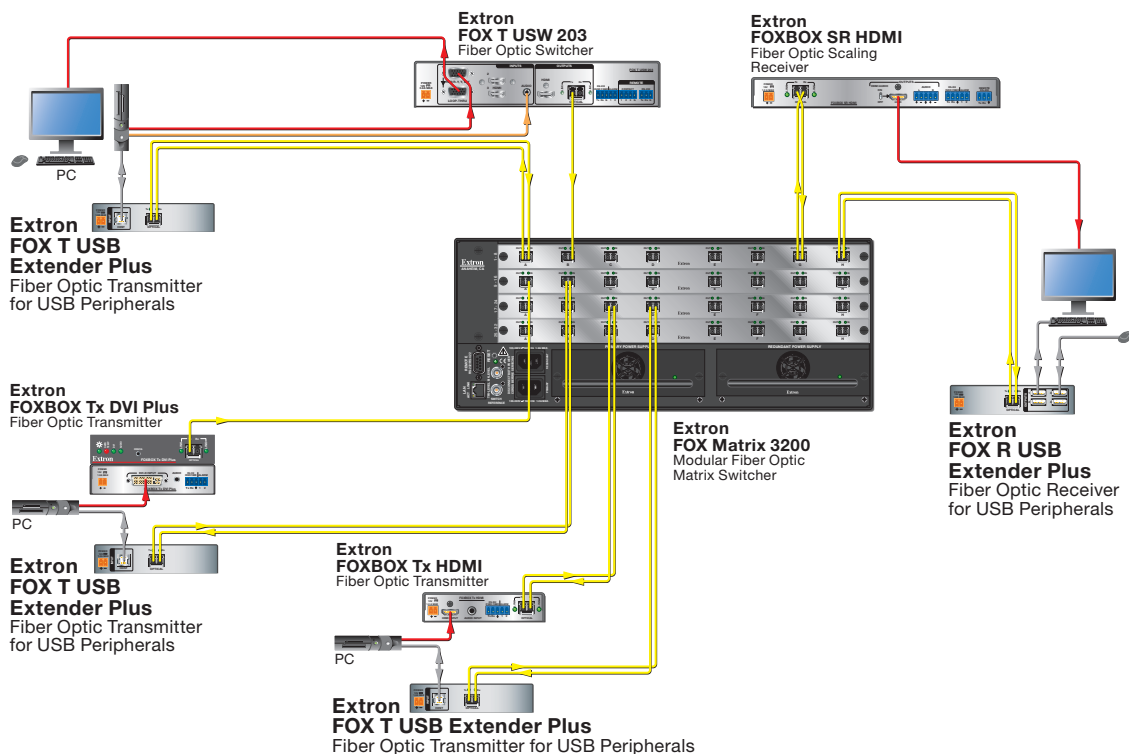
- Available in Laser-Optimized Multimode or low-loss Singlemode
- Bend-insensitive
- OFNP plenum-rated jacket
- Durable duplex zip-cord cable construction
- Terminated with industry standard LC connectors
- Available in lengths from 1 meter (3.3 feet) to 60 meters (197 feet)

Application Diagrams

4K VIDEO SIGNAL DISTRIBUTION OVER FIBER

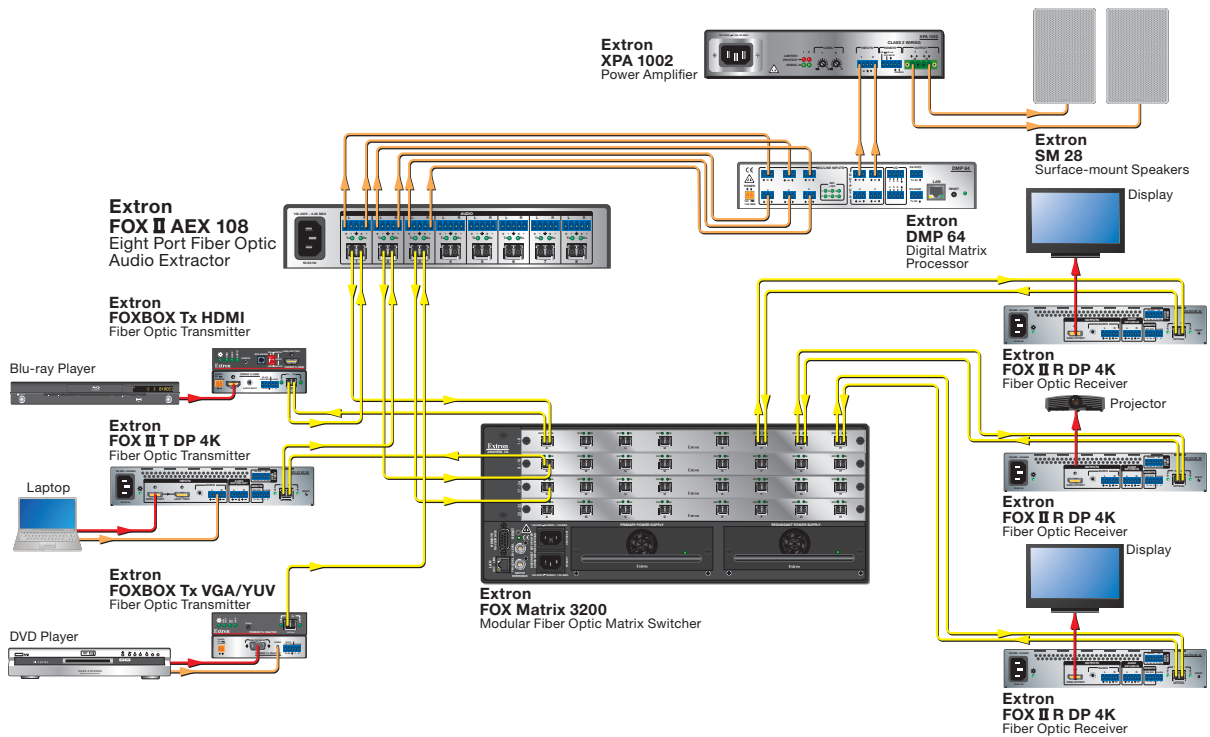


KEYBOARD VIDEO MOUSE - KVM SIGNAL ROUTING

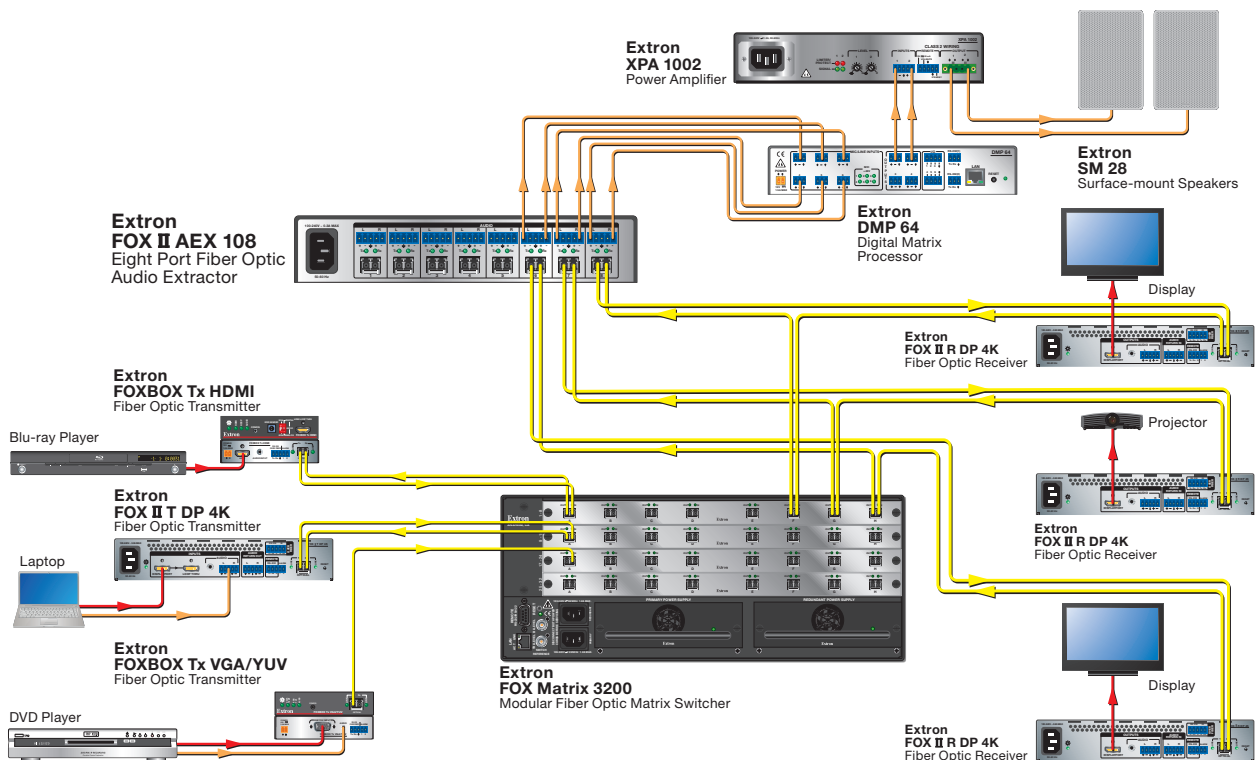


Application Diagrams

AUDIO EXTRACTION FOR PROCESSING AND ROUTING BEFORE FOX MATRIX

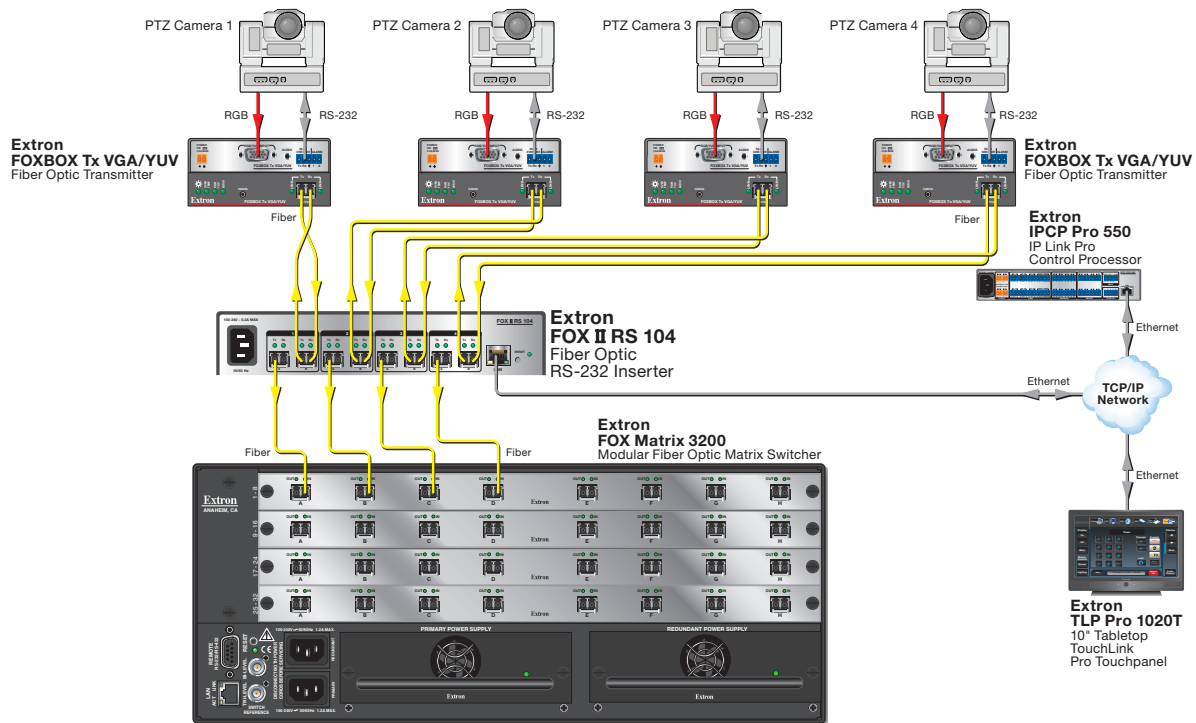


AUDIO EXTRACTION FOR PROCESSING AND ROUTING AFTER FOX MATRIX

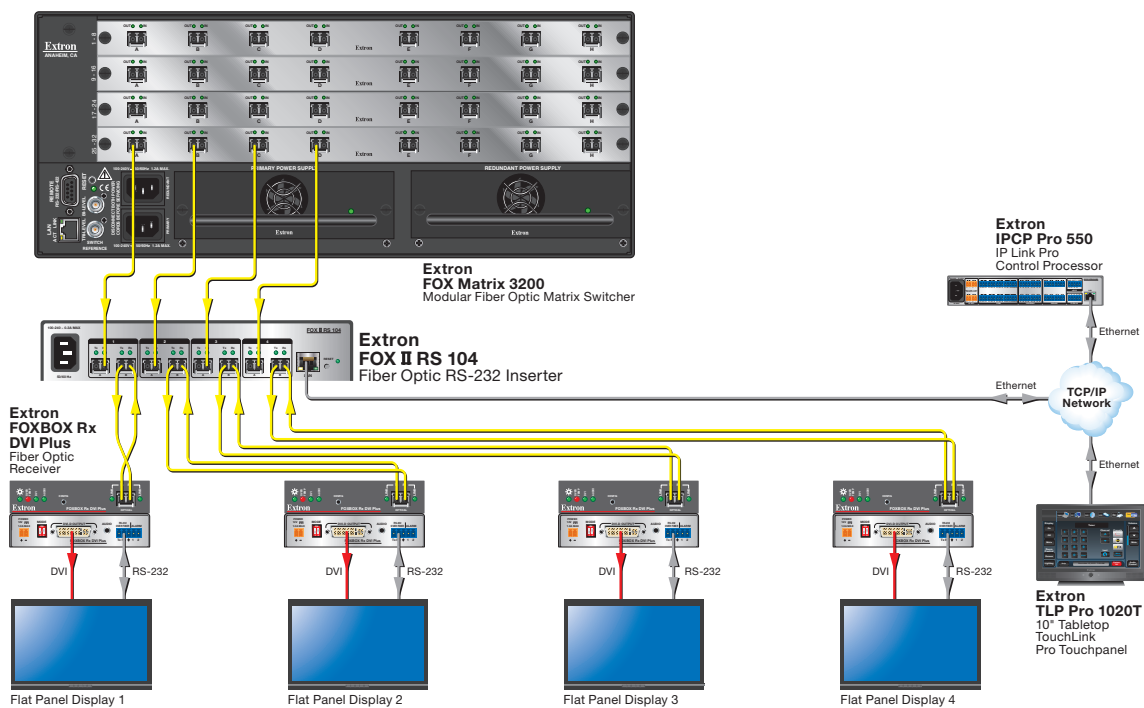


Application Diagrams

CONTROL SOURCE DEVICES FROM A CENTRAL LOCATION



CONTROL DESTINATION DEVICES FROM A CENTRAL LOCATION



GENERAL AV ENVIRONMENT

Specifications

NOTE: The I/O boards are class 1 laser products. They meet the safety regulations of IEC-60825, FDA 21 CFR 1040.10, and FDA 21 CFR 1040.11.

NOTE: FOX 3G I/O SM P boards are immune to pathological signals only when used with P model transmitter and receiver units with no other equipment between the transmitter, board, and receiver units.

OPTICAL SPECIFICATIONS

Number/type	Fiber optic inputs and outputs I/O board
3200/7200 Series	8 singlemode or 8 multimode (8 Tx and 8 Rx)
14400/320x Series	16 singlemode or 16 multimode (16 Tx and 16 Rx)
SMX 88/1616 FOX	8 or 16 singlemode, or 8 or 16 multimode
Connectors	16 or 32 LC connectors per I/O board
Operating distance	
Singlemode	30 km (18.75 miles) with singlemode (SM) cables with an Extron singlemode transmitter/receiver
Multimode	300 m (985') with 62.5 µm OM1 multimode (MM) cables with an Extron multimode Tx/Rx unit 1 km (3280') with 50 µm OM2 multimode (MM) cables with an Extron multimode Tx/Rx unit 2 km (6561') with 50 µm, OM3/OM4, 2000 MHz bandwidth, laser-optimized multimode (MM) cables with an Extron multimode Tx/Rx unit
NOTE: Operating distance is approximate. These are typical distances. The maximum distance may be greater than these typical numbers depending on factors such as fiber type, fiber bandwidth, connector splicing, losses, modal or chromatic dispersion, environmental factors, and kinks.	
Nominal peak wavelength	850 nm for multimode (MM), 1310 nm for singlemode (SM)
Transmission power	
Singlemode	-5 dBm, typical
Multimode	-5 dBm, typical
Maximum receiver sensitivity	
Singlemode	-18 dBm, typical
Multimode	-12 dBm, typical
Optical loss budget	
Singlemode	13 dB, maximum
Multimode	7 dB, maximum
Maximum channel data rate	
FOX 3G I/O SM P	2.97 Gbps
All other boards	4.25 Gbps

VIDEO — FIBER OPTIC

Routing	
3200 Series	8 x 8 up to 32 x 32 unidirectional (Tx) matrix or 4 x 4 up to 16 x 16 bidirectional (Tx/Rx) matrix
7200 Series	8 x 8 up to 72 x 72 unidirectional (Tx) matrix or 4 x 4 up to 36 x 36 bidirectional (Tx/Rx) matrix
14400 Series	16 x 16 up to 144 x 144 unidirectional (Tx) matrix or 8 x 8 up to 72 x 72 bidirectional (Tx/Rx) matrix
320x Series	16 x 16 up to 320 x 320 unidirectional (Tx) matrix or 8 x 8 up to 160 x 160 bidirectional (Tx/Rx) matrix
SMX 88/1616 FOX	8 x 8 or 16 x 16 unidirectional (Tx) matrix or 4 x 4 or 8 x 8 bidirectional (Tx/Rx) matrix
Gain	Unity
Pixel data bit depth	8 bits per channel, 3 channels (R, G, B)

VIDEO/AUDIO INPUT OR OUTPUT — FIBER OPTIC

Number/signal type	
3200 Series	8 to 32 fiber optic signals
7200 Series	8 to 72 fiber optic signals
14400 Series	16 to 144 fiber optic signals
320x Series	16 to 320 fiber optic signals
SMX 88/1616 FOX	8 or 16 fiber optic signals
Connectors	
3200/7200 Series	8 LC connectors per I/O board
14400/320x models	16 LC connectors per I/O board
SMX 88/1616 FOX	8 or 16 LC connectors per I/O board
Re-clocking	2.125 Gbps, 4.25 Gbps, bypass, or automatic (SM P boards only)

DIGITAL VIDEO — SDI/HD-SDI/3G-SDI (FOX 3200/7200/14400/320X SERIES WITH FOX I/O HD-SDI)

3200 Series	
FOX I/O 88 HD-SDI	8 x 8 up to 32 x 32 matrix
7200 Series	
FOX I/O 88 HD-SDI	8 x 8 up to 72 x 72 matrix
14400 Series	
FOX I/O 1616 HD-SDI	16 x 16 up to 144 x 144 matrix
320x Series	
FOX I/O 1616 HD-SDI	16 x 16 up to 320 x 320 matrix
Maximum data rate	2.97 Gbps
Operation standards	SMPTE 292M, SMPTE 259M, SMPTE 297-2006, SMPTE 424M, ITU-RBT.601, ITU-RBT.1120

DIGITAL VIDEO INPUT — SDI/HD-SDI/3G-SDI (FOX 3200/7200/14400/320X SERIES WITH FOX I/O HD-SDI)

Number/signal type	
FOX I/O 88 HD-SDI	8 single link SDI, HD-SDI, or 3G-SDI; or 4 dual link HD-SDI per board
FOX I/O 1616 HD-SDI	16 single link SDI, HD-SDI, or 3G-SDI; or 8 dual link HD-SDI per board
Connectors	
FOX I/O 1616 HD-SDI	16 female BNC per board
Return loss	
FOX I/O 1616 HD-SDI	>13 dB @ 1 MHz to 1.3 GHz
Equalization	Automatic

Input cable equalization distance with FOX I/O 88 HD-SDI boards

3G-SDI	
Extron RG6, Belden 1694A cable	328' (100 m)
Extron R59, Belden 1505A cable	218' (66 m)
HD-SDI	
Extron RG6, Belden 1694A cable	492' (150 m)
Extron R59, Belden 1505A cable	328' (100 m)
SDI	
Extron RG6, Belden 1694A cable	984' (300 m)
Extron R59, Belden 1505A cable	650' (198 m)

Input cable equalization distance with FOX I/O 1616 HD-SDI boards

3G-SDI	
Extron RG6, Belden 1694A cable	410' (125 m)
Extron R59, Belden 1505A cable	350' (107 m)
HD-SDI	
Extron RG6, Belden 1694A cable	650' (198 m)
Extron R59, Belden 1505A cable	550' (168 m)
SDI	
Extron RG6, Belden 1694A cable	1230' (357 m)
Extron R59, Belden 1505A cable	1100' (335 m)

NOTE: The transmission distance varies depending on the signal resolution and on the type of cable, graphics card, and display used in the system.

Specifications

DIGITAL VIDEO OUTPUT — SDI/HD-SDI/3G-SDI (FOX 3200/7200/14400/320X SERIES WITH FOX I/O HD-SDI)	
Number/signal type	
FOX I/O 88 HD-SDI	8 single link SDI, HD-SDI, or 3G-SDI; or 4 dual link HD-SDI per board
FOX I/O 1616 HD-SDI	16 single link SDI, HD-SDI, or 3G-SDI; or 8 dual link HD-SDI per board
Connectors	
FOX I/O 1616 HD-SDI	16 female BNC per board
Return loss	
FOX I/O 1616 HD-SDI	>11 dB @ 1 MHz to 1.3 GHz
Re-clocking	Automatic, or use available bypass mode for nonstandard rates
Jitter	
FOX I/O 88 HD-SDI	<0.2 UI
FOX I/O 1616 HD-SDI	<0.2 UI
Rise and fall time (20-80%)	
FOX I/O 88 HD-SDI	600 ps ±100 ps
FOX I/O 1616 HD-SDI	600 ps ±200 ps
CONTROL/REMOTE — SWITCHER	
Serial control ports	1 bidirectional RS-232 or RS-422, female 9-pin D connector (rear panel) 1 bidirectional RS-232, 2.5 mm mini stereo jack (front panel)
Baud rate and protocol	9600 to 115200 baud, 9600 baud (default), 8 data bits, 1 stop bit, no parity
Ethernet data rate	10/100Base-T, half/full duplex with autotdetect
Ethernet protocol	ARP, ICMP (ping), IP, TCP, UDP, DHCP, HTTP, SMTP, SNMP, Telnet
Program control	Extron control/configuration program for Windows® Extron Simple Instruction Set (SIS®) Microsoft® Internet Explorer® ver. 6 or higher, Telnet
GENERAL	
Power supply*	Internal, hot-swappable Input: 100-240 VAC, 50-60 Hz *A redundant power supply is standard.
3200 Series	2 (positive-negative), primary and redundant
7200 Series	2 (positive-negative), primary and redundant
14400 Series	2 (positive-negative), primary and redundant
320x Series	4 (positive-negative), primary and redundant
Power consumption	
3200 Series	Enclosure without boards: 31.4 watts Enclosure fully loaded with 4 MM boards: 83.8 watts Enclosure fully loaded with 4 SM boards: 87.0 watts Enclosure fully loaded with 4 SDI/HD-SDI boards: 68.0 watts Each MM board: 13.1 watts Each SM board: 13.9 watts Each SDI/HD-SDI board: 9 watts
7200 Series	Enclosure without boards: 50.7 watts Enclosure fully loaded with 9 MM boards: 165 watts Enclosure fully loaded with 9 SM boards: 171 watts Enclosure fully loaded with 9 SDI/HD-SDI boards: 137 watts Each MM board: 12.6 watts Each SM board: 13.3 watts Each SDI/HD-SDI board: 9.5 watts
14400 Series	Enclosure without boards: 50.9 watts Enclosure fully loaded with 9 MM boards: 250 watts Enclosure fully loaded with 9 SM reclocking boards: 269 watts
320x Series Enclosure fully loaded with 9 FOX I/O 1616 HD-SDI boards: 296 watts Each MM board: 22.1 watts Each SM board: 224.2 watts Each SDI/HD-SDI board: 27.2 watts Enclosure without boards: 206 watts Enclosure fully loaded with 20 MM boards: 640 watts Enclosure fully loaded with 20 SM boards: 676 watts Enclosure fully loaded with 20 SDI/HD-SDI boards: 734 watts Each MM board: 21.7 watts Each SM board: 23.5 watts Each SDI/HD-SDI board: 26.2 watts SMX 200 Series with SMX 88 FOX One SM or MM board: 9 watts SMX 200 Series with SMX 1616 FOX One SM or MM board: 13 watts Temperature/humidity FOX I/O 1616 HD-SDI Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +104 °F (0 to +40 °C) / 10% to 90%, noncondensing All other boards and models Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing Cooling Fan, right to left (as viewed from front panel) Thermal dissipation, full load 3200 Series 297 BTU/hr 7200 Series 584 BTU/hr 14400 Series 1011 BTU/hr 320x Series 2505 BTU/hr Mounting Rack mount Yes Enclosure type Metal Enclosure dimensions Depths exclude connectors and handles. Widths exclude rack ears. 3200 Series 7.0" H x 17.0" W x 12" D (4U high, full rack wide) (17.8 cm H x 43.2 cm W x 30.5 cm D) 7200 Series 14.0" H x 17.0" W x 12" D (8U high, full rack wide) (35.6 cm H x 43.2 cm W x 30.5 cm D) 14400 Series 14.0" H x 17.0" W x 12.25" D (8U high, full rack wide) (35.6 cm H x 43.1 cm W x 31.1 cm D) 320x Series 29.75" H x 17.0" W x 12.25" D (17U high, full rack wide) (75.6 cm H x 43.1 cm W x 31.1 cm D) Product weight (fully loaded) 3200 Series 34.5 lbs (15.6 kg) 7200 Series 61.1 lbs (27.7 kg) 14400 Series 69.1 lbs (31.3 kg) 320x Series 113 lbs (51.3 kg) Shipping weight 3200 Series 41 lbs (19 kg) 7200 Series 68 lbs (31 kg) 14400 Series 75 lbs (34 kg) 320x Series 123 lbs (56 kg) SMX 88 FOX 2 lbs (1 kg) SMX 1616 FOX 3 lbs (2 kg) Vibration ISTA 1A in carton (International Safe Transit Association) Regulatory compliance Safety CE, c-UL, UL EMI/EMC CE, C-tick, FCC Class A, ICES, VCCI Warranty 3 years parts and labor NOTE: All nominal levels are at ±10%.	

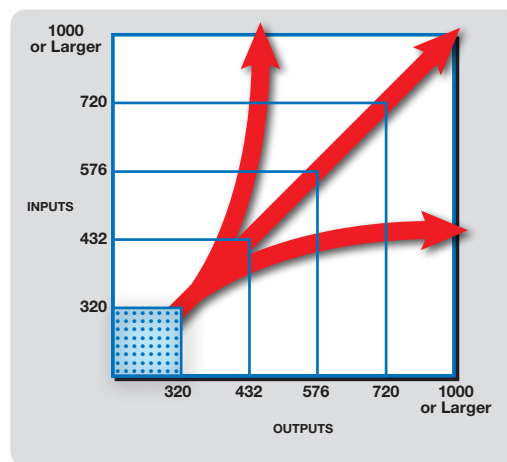
Extron 1K Program: 1000x1000 and Larger

LARGE-SCALE MATRIX SWITCHER PROGRAM

When it comes to large-scale matrix switching solutions for fiber optic, digital, or analog signal routing applications, Extron has you covered. Through the Matrix 1K Program, you can create custom, scalable matrix switchers in all common signal types with I/O sizes up to 1000x1000 and larger. Extron Matrix 1K switchers are designed and engineered to your specific project requirements. Matrix 1K digital and fiber optic matrix switchers start at 320x320, while Matrix 1K analog matrix switchers start at 128x128. Regardless of the size you need, Extron Matrix 1K switchers work with the same ease of control and day in, day out reliability you've come to expect from Extron. To begin the process of configuring your Extron Matrix 1K switcher, contact your local Extron Customer Support Representative. An Extron Applications Engineer will be assigned to your project and will work with you to ensure your complete satisfaction.

Matrix 1K Product Commissioning

Extron provides proactive, on-site product commissioning with every Matrix 1K purchase. Matrix 1K commissioning provides you with an extra level of service, ensuring that the system you design and install meets your expectations and those of your client.



Extron Matrix 1K switchers offer very large scale routing capability to handle the largest, most complex venues.



Extron Matrix 1K switchers can be custom designed in sizes from 128x128 up to 1000x1000 and larger.

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