The Extron **FOX Matrix 320x** is a high performance, modular fiber optic matrix switcher for complete, end-to-end digital AV signal transmission and routing over fiber optic cable. The matrix switcher is expandable from 16x16 up to 320x320 and is fully compatible with the FOX Series of fiber optic transmitters and receivers. Supporting video resolutions up to 4K, it features high speed, all-digital switching of DisplayPort, HDMI, DVI, 3G-SDI, RGB, HD component, and standard definition video. Equipped with integrator-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 320x delivers highly reliable, enterprise-wide switching of fiber optic AV and control for mission-critical environments.

Modular Fiber Optic I/O Boards

The FOX Matrix 320x is a modular design featuring 20 board slots. Each slot accepts a FOX Matrix I/O 1616 Board having sixteen ports populated with LC-type fiber optic connectors. Two versions of the board are available. The FOX Matrix I/O 1616 Board - MM supports multimode fiber at 850 nm, which is typically used within buildings or facilities with moderate-range transmission distances. The FOX Matrix I/O 1616 Board - SM supports singlemode as well as multimode fiber at 1310 nm. Singlemode fiber offers long-range transmission capability over extreme distances of several kilometers or 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 campuses.

The FOX Matrix 320x can be configured with all or some of the board slots occupied. The I/O boards are hot-swappable and may be added at any time in the field for easy and quick upgradeability or expansion. The FOX Matrix 320x also accommodates any combination of singlemode or multimode I/O boards. This can allow, for example, a multimode fiber link input to the matrix switcher from a multimode transmitter, and a singlemode output from the switcher for transmission over extreme distances to a singlemode receiver.

Flexible I/O Configuration

Each fiber optic port comprises two individual fiber links. In the standard I/O configuration for the FOX Matrix 320x, these links are defined as a separate input and a separate output. Therefore, up to 320 single fiber link inputs and 320 single fiber link outputs are possible when configuring and controlling the matrix switcher with the Extron control software.

However, through RS-232 serial control, each fiber optic connection can also be defined as a "linked" input or output, with the two fiber optic links supporting bidirectional capabilities for a FOX Series product. Any group of linked connections, anywhere on the rear panel can function as inputs or outputs, enabling the creation of a custom I/O configuration. For example, a FOX Matrix 320x, populated with two I/O boards and 32 available linked connections, may be operated as a 24x8 bidirectional switcher. In the standard I/O configuration, these same two boards would support 32x32 switching with single fiber link inputs and outputs. For added flexibility, the FOX Matrix 320x can function with a combination of linked and single fiber link inputs and outputs.

Streamlining Migration to 4K Video Distribution

Designed with uncompromising quality and proven performance, FOX Matrix Switchers are designed to work with all FOX and FOX II Series products. When used with FOX II 4K Series extenders, Extron FOX Matrix Switchers accept and route 4K video, multi-channel audio, and control, enabling a 4K video distribution system up to 1000x1000 and larger. This capability enables 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 resolutions. Extron FOX Matrix Switchers are ideal for 4K video distribution in a wide variety of applications, including simulation, defense, medical, entertainment, digital cinema, and other environments.

Designed for Secure Systems

The FOX Matrix 320x uses two methods to ensure sensitive data is properly segregated and protected – Priority Switching and Secure Partitioning. Priority Switching assigns a security level to each input and

output. Six security levels are available, with the sixth being the highest level. An output can only be tied to an input at the same security level or lower, preventing unauthorized access to 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 security level one, the lowest level, can only be tied to inputs that are also security 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 into partitions. 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

The FOX I/O 1616 HD-SDI board is available as an option for the FOX Matrix 320x, and enables connection to local 3G-SDI-equipped devices. This board offers a 16x16 configuration for switching and distribution of signals up to 2.97 Gbps, including 3G-SDI, HD-SDI, and SDI. With this board, the FOX Matrix 320x can be configured as a dedicated 3G-SDI matrix switcher up to 320x320, or for a combination of SDI and fiber optic matrix switching. The FOX I/O 1616 HD-SDI board is compliant with SMPTE 259M, 292M, 424M, and ITU digital video standards. Each input and output on the hot-swappable board is individually buffered to maximize performance with virtually no crosstalk. To optimize signal transmission to and from the board, input signals are automatically equalized and output signals are reclocked.

The FOX I/O 1616 HD-SDI board enables a local BNC connection to the FOX 3G HD-SDI fiber optic extender for 3G-SDI. Incoming signals from the FOX 3G HD-SDI can then be routed to the board's BNC outputs, or through the fiber optic outputs to remote FOX 3G HD-SDI units. Similarly, local BNC inputs can be output on fiber or BNC. In broadcast and production applications, a 3G-SDI-equipped FOX Matrix 320x, together with several FOX 3G HD-SDI units, offers expanded opportunities for system integration. For example, the matrix switcher can be used to route signals to and from local editing equipment, while also providing the capability to receive or transmit 3G-SDI signals very long distances to devices in remote locations, such as cameras and production monitors.

The Extron FOX 3G I/O 1616 SM P board is available as an option for the FOX Matrix 320x modular fiber optic matrix switcher, and enables the transmission and distribution of fiber optic 3G-SDI signals, including pathological signals, over singlemode fiber optic cabling. The board offers a 16x16 configuration for switching and distribution of signals up to 2.97 Gbps, including 3G-SDI, HD-SDI, and SDI. With the board, a FOX Matrix switcher can be configured as a dedicated 3G-SDI matrix switcher, or with a combination of SDI and fiber optic matrix switching solutions. The FOX 3G I/O 1616 SM P board is compliant with SMPTE 259M, 292M, 424M, RP 178 and RP 198 for pathological immunity, and ITU digital video standards.

Familiar, Integrator-Friendly Matrix Switcher Features

Up to 64 memory presets are available for saving and recalling commonly used input and output ties. Furthermore, a rooming feature enables the creation of 10 rooms by groups of outputs, each with separate presets.

Self-Monitoring and Hot-Swappable

The FOX Matrix 320x is designed for optimum performance and reliability in applications requiring continuous operations 24 hours a day, seven days a week, such as in government, military, and medical installations. A real-time monitoring system continuously provides self-diagnostics of the I/O boards, fiber links, power supplies, internal fans, and general functions of the switcher. LED indicators on each I/O board provide a quick verification of input signal presence as well as the status of fiber links with the transmitters and receivers. The FOX Matrix 320x can be configured to trigger an external control system, generate SNMP traps, or send e-mail alerts when an inbound fiber link has been lost.

Each I/O board is hot-swappable so that the matrix switcher can be serviced or reconfigured without interrupting all signal routing by powering down the unit. The FOX Matrix 320x also features a hot-swappable fan, and four redundant and hot-swappable power supplies to ensure continuous, uninterrupted power.

Control

The FOX Matrix 320x offers convenient remote system access for configuration, operation, and monitoring through the front and rear panel RS-232 serial control ports and Ethernet control. The FOX Matrix 320x is also compatible with the FPC 5600 Front Panel Controller and MKP 3000 X-Y Remote Control Panel, which provides a convenient user interface to control the matrix switcher from remote locations.

Features

- **I/O sizes from 16x16 to 320x320**

- **Compatible with Extron FOX Series distribution amplifiers and switchers**

- **Compatible with all Extron FOX Series transmitters and receivers**

- **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.

- **SpeedSwitch® Technology 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.

- **3G-SDI I/O board available** — The FOX Matrix 320x can be configured with the FOX I/O 1616 HD-SDI board for local connection to SDI-equipped devices. This board provides 16x16 routing of incoming signals up to 2.97 Gbps, including 3G-SDI, HD-SDI, and SDI. The FOX Matrix 320x can be configured as a fully dedicated 3G-SDI matrix switcher, or a combination of SDI and fiber optic matrix switching. The FOX I/O 1616 HD-SDI board is compliant with SMPTE 259M, 292M, 424M, and ITU digital video standards.

- **Multimode and singlemode I/O boards available** — The FOX Matrix 320x is configurable with a mix of multimode and singlemode versions of the FOX Matrix I/O 1616 Boards, so that both short and long haul transmission can be supported.

- **Modular, field-upgradeable and hot-swappable design** — The FOX Matrix 320x provides substantial flexibility, expandability, and affordability by allowing users to select the configuration required for their systems. Additional input and output boards may be added at any time for easy and quick upgradeability or expansion. Hot-swappable components allow the user to replace an I/O board, fan assembly, or power supply at any time without the need to power down the switcher. This is especially useful for mission-critical applications that require continuous operation of the FOX Matrix 320x.

- **Four redundant and hot-swappable power supplies** — Two primary and two back-up power supplies provide added reliability for critical applications.

- **Secure Partitioning segregates sources and destinations in a secure environment** — Secure Partitioning enables the FOX Matrix 320x to be partitioned into smaller sub-switchers for segregating sources and destinations. Sources can only be routed to destinations within the same partition.

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

- **Low power consumption for efficient cooling, lower costs, and longer life** — The FOX Matrix 320x features an energy-efficient design for simpler cooling, lower energy costs, and extended life. Through efficiency of design and the careful selection of high quality, long-life electronic components, an all optical, fully-loaded FOX Matrix 320x draws less power than comparable fiber optic matrix switchers. Low power consumption equates to less heat generation, which translates to a lower cost of ownership and an increased product lifespan.

- **Advanced computer-aided diagnostics** — Provide 24-hour self-diagnostics of input/output boards, primary and redundant power supply voltages, fiber links, and overall functional status of the matrix. Using the Ethernet or RS-232/RS-422 communications port, status monitoring is possible for off-site or unmanned locations, such as government, military, medical, or any other sensitive, 24/7 environments.

- **Input fiber link detection** — The FOX Matrix 320x 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 and reclocking status** — LEDs on each I/O board verify active fiber links with the transmitters and receivers.

- **Alarm notification for fiber link loss** — The FOX Matrix 320x can be set up to trigger an external 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 require two separate AC power sources, one as the primary source and the second for redundancy. The FOX Matrix 320x provides two AC power inputs for continuous connection to both power sources.

- **Selectable input and output reclocking** — Reshapes and restores timing of the digital signal 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 serial or Ethernet control. This time-saving feature allows I/O configurations to be set up and stored in memory for future use.

- **Extron control software** — For serial or Ethernet remote control from a PC, 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 320x 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** — Can be proactively monitored and managed over a LAN, WAN, or the Internet, using standard TCP/IP protocols. Ethernet control provides for remote selection of input and output ties, system set-up and configuration, and advanced system diagnostics.

- **SNMP support for remote monitoring**

- **RS-232 and RS-422 control port** — Using serial commands, the FOX Matrix 320x 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 320x without having to access the rear panel.

- **New** **JITC Certified** — Successfully completed interoperability and information assurance testing for use in government applications and other mission-critical environments.

- **Rack-mountable 17U, full rack width metal enclosure**