

# FOXBOX HDMI

FIBER OPTIC EXTENDER FOR  
HDMI, AUDIO, AND RS-232

- ▶ Extends HDMI video, stereo audio, and RS-232 control signals very long distances over fiber optic cable
- ▶ All digital technology for high performance signal transmission
- ▶ Pixel-for-pixel image quality, up to 1920x1200, including HDTV 1080p/60
- ▶ HDCP compliant
- ▶ Key Minder® continuously verifies HDCP compliance
- ▶ EDID Minder® automatically manages EDID communication between connected devices
- ▶ Audio embedding with gain, attenuation, and muting control
- ▶ HDMI audio de-embedding with analog stereo outputs
- ▶ Buffered HDMI input loop-through
- ▶ Auto Input Memory
- ▶ Available as 850 nm multimode and 1310 nm singlemode models



FOXBOX Tx HDMI

FOXBOX Rx HDMI

The Extron FOXBOX HDMI is a fiber optic extender for long haul transmission of HDCP-compliant HDMI video, audio, and RS-232 control signals over fiber optic cable. Engineered for reliability and exceptional high resolution image performance, it uses Extron all-digital technology. The FOXBOX HDMI also includes a host of features for easier and quicker AV system integration.



**Extron® Electronics**  
INTERFACING, SWITCHING AND CONTROL

## DESCRIPTION

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The Extron **FOXBOX HDMI** Fiber Optic Extender is a transmitter and receiver set for long haul transmission of HDCP compliant HDMI video, audio, and RS-232 control signals over fiber optic cable. Engineered for reliability and exceptional high resolution image performance, it uses Extron all-digital technology to deliver perfect pixel-for-pixel transmission of HDMI video images up to 1920x1200 resolution, including HDTV 1080p/60. The FOXBOX HDMI also includes EDID Minder®, Key Minder®, Auto Input Memory, internal test patterns, and real-time system monitoring. Compact, low profile enclosures allow for discreet installation behind a flat-panel display.

Part of the larger, comprehensive FOX Series of fiber optic products from Extron, the FOXBOX HDMI is compatible with FOXBOX, FOX 500, and PowerCage™ FOX HDMI, DVI Plus, DVI, VGA, and VGA/YUV extenders. The FOXBOX HDMI transmitter and receiver can be used for simple point-to-point applications or in combination with FOX Series matrix switchers for enterprise wide distribution of HDCP-compliant HDMI video.

The FOXBOX HDMI is ideal for a wide range of applications requiring long distance transmission of high resolution content with the highest quality. Because transmission of content is inherently secure and immune to outside interference, fiber applications are favored in government, military, and medical environments. The FOXBOX HDMI transmitter and receiver feature industry standard LC-type connectivity.

## FEATURES

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- ▶ **Extends HDMI video, stereo audio, and RS-232 control signals very long distances over fiber optic cable**
- ▶ **All digital, technology provides pixel-for-pixel performance with signals up to 1920x1200, including HDTV 1080p/60**
- ▶ **HDCP compliant** – Ensures display of content protected media and interoperability with other HDCP-compliant devices.
- ▶ **Key Minder® continuously verifies HDCP compliance** – Key Minder authenticates and maintains continuous HDCP encryption between input and output devices to ensure quick and reliable switching in professional AV environments, while enabling simultaneous distribution of a single source signal to one or more displays.
- ▶ **HDCP Visual Confirmation provides a green signal when encrypted content is sent to a non-compliant display** – A full-screen green signal is sent when HDCP-encrypted content is transmitted to a non-HDCP compliant display, providing immediate visual confirmation that protected content cannot be viewed on the display.
- ▶ **EDID Minder® automatically manages EDID communication between connected devices** – EDID Minder ensures that all sources power up properly and reliably output content for display.
- ▶ **Buffered HDMI input loop-through** – A buffered HDMI input loop-through on the FOXBOX HDMI transmitter provides an output signal to drive a local monitor.
- ▶ **Audio embedding with gain, attenuation, and muting control** – A DIP switch on the transmitter front panel enables selection of analog audio input or digital HDMI audio. When the analog input is selected, analog stereo audio signals are converted to digital HDMI audio.
- ▶ **HDMI audio de-embedding with analog stereo outputs** – Digital HDMI audio is made available as a balanced or unbalanced analog stereo signal on captive screw connectors.
- ▶ **Selectable HDMI audio pass-through** – A rear panel toggle switch enables or disables audio signal pass-through on the HDMI output.
- ▶ **Available as an 850 nm multimode model for moderate-range transmissions, and a 1310 nm singlemode model 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** – The FOXBOX HDMI transmitter or receiver can be set up to trigger an external control system for immediate notification when a fiber link has been lost.
- ▶ **Auto Input Memory** – When activated, the FOXBOX HDMI receiver automatically stores position and detail settings based on the incoming signal. When that signal is detected again, the proper image settings are automatically recalled from memory.
- ▶ **30 user memory presets** – In addition to Auto Memory, 30 user memory presets on the FOXBOX HDMI receiver are available to save and recall the position and detail information for multiple incoming sources. The ability to save and recall presets is useful in switcher-based environments.
- ▶ **RS-232 control** – The FOXBOX HDMI transmitter and receiver feature RS-232 serial ports for control and configuration.
- ▶ **Real-time status LED indicators for troubleshooting and monitoring** – Front and rear panel LEDs verify signal presence, HDCP authentication, link status, and power.
- ▶ **Internal test patterns for calibration and setup** – Three test patterns are available, including grayscale, color bars, and alternating pixels.
- ▶ **Compatible with FOX Matrix Switchers - Create HDCP compliant signal distribution systems up to 1000x1000 and larger**
- ▶ **Compatible with Extron FOX Series HDMI, DVI Plus, DVI, VGA, and VGA/YUV transmitters and receivers** – Compatible with FOX Series HDMI and DVI Plus extenders up to 1920x1200, including HDTV1080p/60. Compatible with FOX Series DVI, VGA, and VGA/YUV extenders up to 1600x1200, including HDTV 1080p/60.
- ▶ **1" (2.5 cm) high, mountable metal enclosures** – Transmitter: quarter-rack width, Receiver: half-rack width
- ▶ **Includes LockIt® HDMI cable lacing brackets**
- ▶ **Energy-efficient external universal power supply included**

# SPECIFICATIONS

**NOTE:** These transceivers are class 1 laser products. They meet the safety regulations of IEC-60825, FDA 21 CFR 1040.10, and FDA 21 CFR 1040.11.

## OPTICAL FIBER INTERCONNECTION BETWEEN TRANSMITTER AND RECEIVER

<b>Number/type</b>	2 fiber optic
<b>Connectors</b>	2 LC connectors
<b>Operating distance</b>	
Singlemode	30 km (18.75 miles) with singlemode (SM) cables with a FOXBOX SM
Multimode	300 m (985') with 62.5 µm multimode (MM) cables with a FOXBOX MM 1 km (3280') with 50 µm multimode (MM) cables with a FOXBOX MM 2 km (6561') with 50 µm 2000 MHz bandwidth laser optimized multimode cable with a FOXBOX MM

**NOTE:** Operating distance is approximate. These are typical maximum distances that may vary depending on factors such as fiber type, fiber bandwidth, connector splicing, losses, modal or chromatic dispersion, environmental factors, and kinks.

<b>Nominal peak wavelength</b>	850 nm for FOXBOX MM, 1310 nm for FOXBOX SM
<b>Data rate</b>	4.25 Gbps

### 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

## VIDEO

**NOTE:** \*Appropriate HDMI to DVI-D cables or adapters are required for DVI signal input/output.

<b>Resolution range</b>	Up to 1920x1200 or 1080p @ 60 Hz pixel for pixel
<b>Formats</b>	RGB, YCbCr, and xvYCC digital video
<b>EDID</b>	Supports emulation of custom or factory preset Extended Display Identification Data (EDID) tables.
<b>HDCP</b>	Compliant with High-bandwidth Digital Content Protection (HDCP) using DVI and HDMI 1.3 standards
<b>Standards</b>	DVI 1.0, HDMI 1.3, HDCP 1.1, CEA-861E

## VIDEO INPUT

<b>Number/signal type</b>	1 single link HDMI
<b>Connectors</b>	1 female HDMI type A
<b>Equalization</b>	Automatic for up to 50' (15 m) of cable

## VIDEO OUTPUT

<b>Number/signal type</b>	1 single link HDMI
<b>Connectors</b>	1 female HDMI type A
<b>Nominal level</b>	0.8 Vp-p
<b>Video delay</b>	1-2 frames

## AUDIO

<b>Gain</b>	
Range	Adjustable, -18 dB to +10 dB
Default	Unbalanced output: 0 dB
<b>Frequency response</b>	20 Hz to 20 kHz, ±0.5 dB
<b>THD + Noise</b>	0.10% @ 1 kHz at nominal level
<b>S/N</b>	>80 dB at maximum output (unweighted)
<b>CMRR</b>	65 dB @ 20 Hz to 20 kHz
<b>Audio bits per sample</b>	18 bits per channel, 2 channels (L, R)
<b>Sampling rate</b>	48 kHz

## AUDIO INPUT — TRANSMITTERS

<b>Number/signal type</b>	1 unbalanced stereo or 2 unbalanced mono
<b>Connectors</b>	(1) 3.5 mm mini stereo jack
<b>Impedance</b>	18k ohms unbalanced, DC coupled
<b>Nominal level</b>	-10 dBV (316 mVrms)

<b>Maximum level</b>	+8.9 dBV, (unbalanced) at 1% THD+N
<b>NOTE:</b>	0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV ≈ 2 dBu

## AUDIO OUTPUT — RECEIVERS

<b>Number/signal type</b>	1 unbalanced stereo or 2 unbalanced mono
<b>Connectors</b>	(1) 3.5 mm captive screw connector, 5 pole
<b>Impedance</b>	50 ohms unbalanced
<b>Nominal level</b>	-10 dBV (316 mVrms)
<b>Maximum level (Hi-Z)</b>	+7.6 dBu, unbalanced at 1% THD+N
<b>Maximum level (600 ohm)</b>	>+6.3 dBu, unbalanced at 1% THD+N
<b>Audio delay</b>	1.5 frames

## CONTROL/REMOTE

### Serial control ports on each unit (transmitter and receiver)

Control	1 RS-232, 2.5 mm mini stereo jack (front panel)
Pass-through	1 RS-232, 3.5 mm captive screw connector, 5-pole (3 pins are used) (rear panel)

### Baud rate and protocol

Control	9600 baud, 8 data bits, 1 stop bit, no parity
Pass-through	9600 to 115,200 baud

### Program control

Extron control/configuration program for Windows®  
Extron Simple Instruction Set (SIS™)

## GENERAL

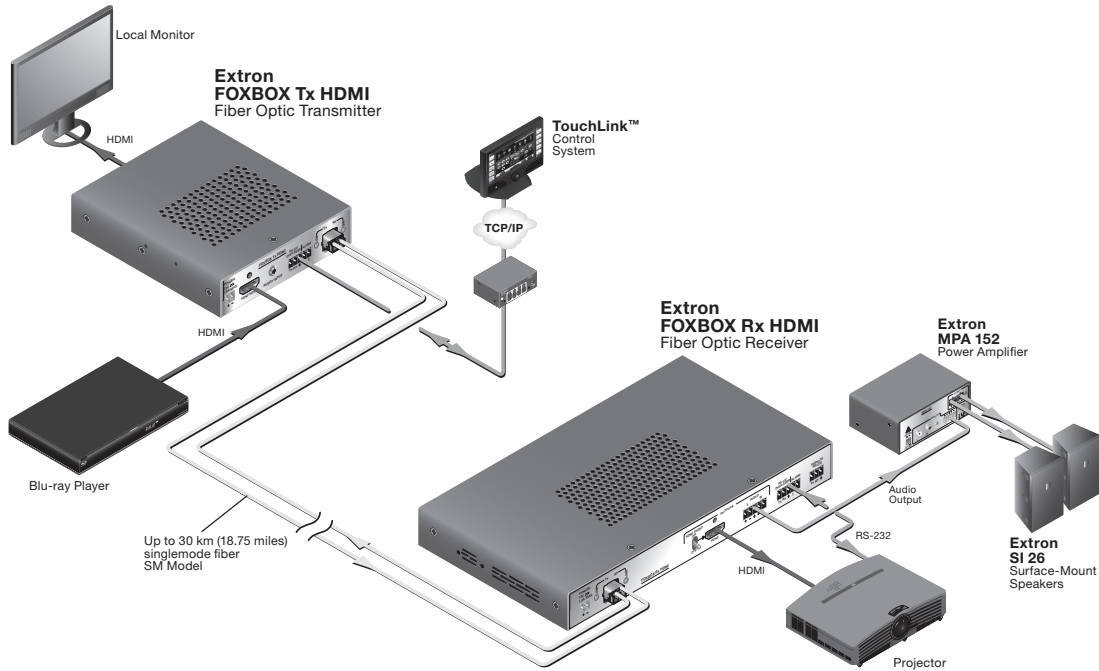
<b>External power supply</b>	100 VAC to 240 VAC, 50-60 Hz, external; to 12 VDC, 1 A, regulated
<b>Power input requirements</b>	12 VDC, 0.6 A
<b>Temperature/humidity</b>	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
<b>Cooling</b>	Convection, vents on top and side panels
<b>Thermal dissipation</b>	
Transmitter	
115 VAC, 60 Hz	2.9 BTU/hr
240 VAC, 50 Hz	4.0 BTU/hr
Receiver	
115 VAC, 60 Hz	2.7 BTU/hr
240 VAC, 50 Hz	3.9 BTU/hr
<b>Mounting</b>	
Rack mount	Yes, with optional rack shelf
Furniture mount	Yes, with optional under desk mounting kit
<b>Enclosure type</b>	Metal
<b>Enclosure dimensions</b>	
Transmitter	1.0" H x 4.3" W x 6.0" D (quarter rack wide) (2.5 cm H x 10.9 cm W x 15.2 cm D) (Depth excludes connectors.)
Receiver	1.0" H x 9.5" W x 6.0" D (half rack wide) (2.5 cm H x 24.1 cm W x 15.2 cm D) (Depth excludes connectors and switch.)
<b>Product weight</b>	
Transmitter	0.7 lbs (0.3 kg) per unit
<b>Shipping weight</b>	
Transmitter	3 lbs (2 kg) per unit
<b>Vibration</b>	ISTA 1A in carton (International Safe Transit Association)
<b>Regulatory compliance</b>	
Safety	CE, c-UL, FDA Class 1, UL
EMI/EMC	CE, C-tick, FCC Class A, ICES, VCCI
MTBF	30,000 hours
<b>Warranty</b>	3 years parts and labor

**NOTE:** All nominal levels are at ±10%.

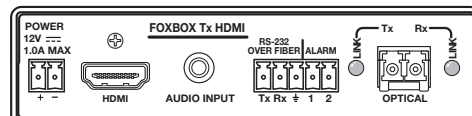
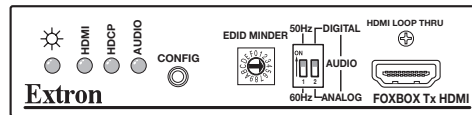
Model	Version Description	Part number
FOXBOX Tx HDMI MM	Multimode - Transmitter	60-1174-11
FOXBOX Tx HDMI SM	Singlemode - Transmitter	60-1174-12
FOXBOX Rx HDMI MM	Multimode - Receiver	60-1174-21
FOXBOX Rx HDMI SM	Singlemode - Receiver	60-1174-22

For complete specifications, please go to [www.extron.com](http://www.extron.com)  
Specifications are subject to change without notice.

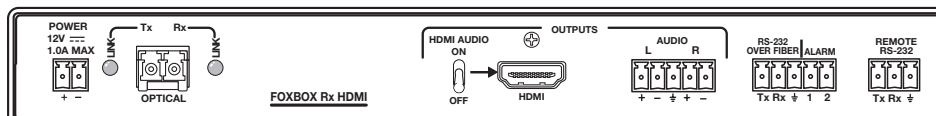
# APPLICATION DIAGRAM



# PANEL DRAWINGS



FOXBOX Rx HDMI - Front



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