Hall Technologies • 1234 Lakeshore Dr Suite #150 Coppell, TX 75019 • halltechav.com

FXT-460

4K HDMI 2.0 over a single LC Fiber Optic Extender

USER MANUAL

August 9, 2023

Important Safety Instructions

1. Do not expose this apparatus to rain, moisture, dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.

2. Do not install or place this unit in a bookcase, built-in cabinet or in another confined space. Ensure the unit is well ventilated.

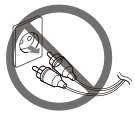
3. To prevent risk of electric shock or fire hazard due to overheating, do not obstruct the unit's ventilation openings with newspapers, tablecloths, curtains, and similar items.

4. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

5. Do not place sources of naked flames, such as lighted candles, on the unit.

6. Clean this apparatus only with dry cloth.

7. Unplug this apparatus during lightning storms or when unused for long periods of time.



8. Protect the power cord from being walked on or pinched particularly at plugs.

9. Only use attachments / accessories specified by the manufacturer.

10. Refer all servicing to qualified service personnel.

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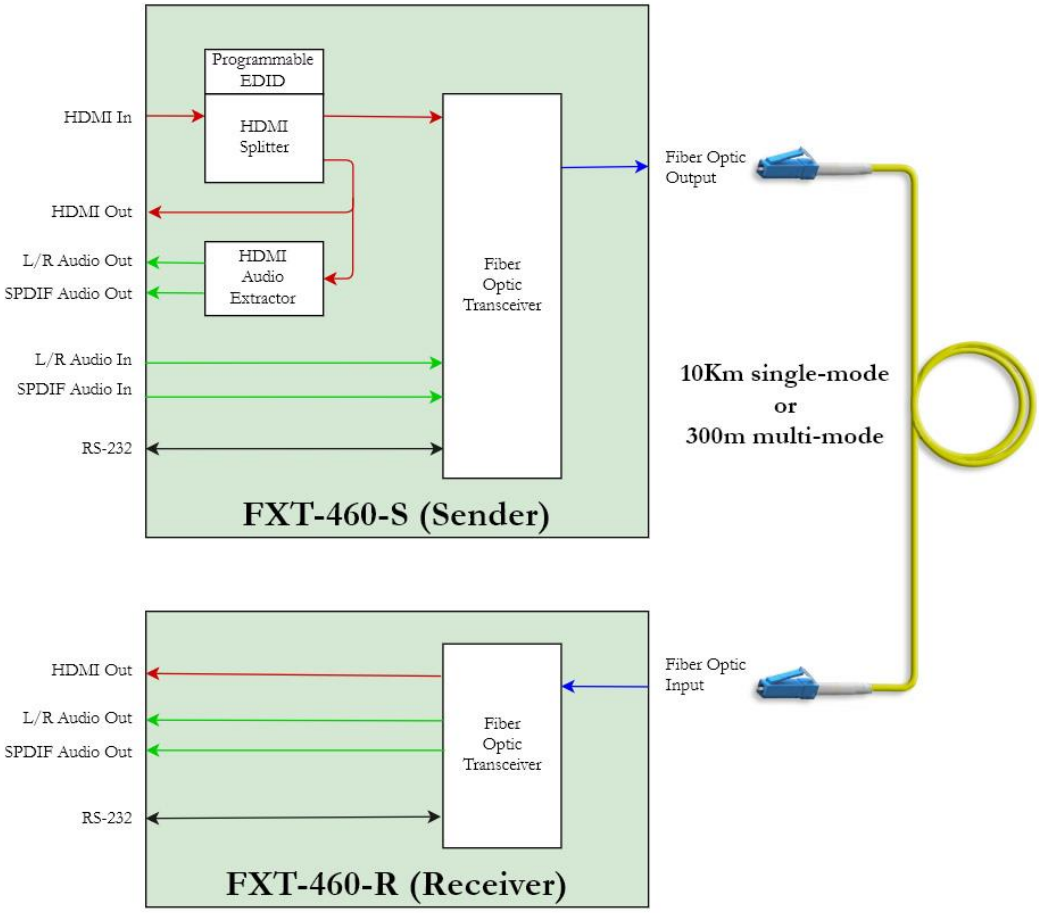
Introduction

OVERVIEW

The Hall Technologies FXT-460 is a compact and high-performance extender for full bandwidth HDMI 2.0 audio/video with HDR, up to 10 Kilometers, over a single strand of LC-terminated fiber-optic cable. The product supports 18.2 Gbps of bandwidth and 600 MHz TMDS Clock frequency and can extend 4K 60 Hz video with multi-channel audio and RS232.

The system provides advanced capabilities such as embedding and de-embedding audio, 4K UHD video (4:4:4 with HDR), HDCP 2.0, bidirectional RS-232 and EDID management.



The FXT-460-S Sender provides a HDMI input with a corresponding HDMI loop output. The audio component of the HDMI input is extracted and available as both analog (L/R) and Digital SPDIF (TOSLINK) on corresponding connectors (see diagram above).

The audio that is embedded in the extended HDMI to the remote Receiver can be selected by the user to be one of the following:

- Pass-through from HDMI input (same audio content as the HDMI input)
- External analog audio from the 3.5mm audio input connector
- External digital SPDIF audio from the Optical TOSLINK input connector

EDID management allows users to control the video and audio parts of the EDID independently. The EDID presented to the source connected to the HDMI input can pass from the downstream device or emulated from internal memory. The device can also “Learn” the EDID connected to its HDMI output.

The product has a video bandwidth of 18 Gbps and supports input resolutions of up to 4K @ 60 Hz 4:4:4 with HDR. It supports HDCP 2.2 as well as HDCP 1.4. All resolutions up to and including 4K @ 30Hz with 4:4:4 or 4K @ 60 Hz with 4:2:0 are extended with no compression.

The device has the ability to generate a blank HDMI output signal with audio embedded even if there is no HDMI input; often referred to as “HDMI Audio Bridging”. This is a convenient means to distribute audio only signals over an HDMI network.

FEATURES

- 4Kx2K@60Hz4:4:4/18.2Gbps/HDCP2.2
- Extends up to 33,000 ft (10 Km) over single mode or 1000 ft (300 M) Multi-Mode
- Bi-Directional RS-232 and EDID Management
- Can pass original HDMI audio or embed/substitute audio from external inputs.
- "HDMI Audio Bridging"
- HDMI Loop Output on Sender
- De-embedded HDMI audio available at both ends (Sender and Receiver)
- EDID Emulation with LEARN function.

Package Contents

FXT-460-S & FXT-460-R

- 1x Model FXT-460-S
- 1x 3 position terminal block for RS-232
- 1x Power Supply
- 4x Power universal adapter plugs
- 1x Web documentation card

Setup

INSTALLATION

- On both the FXT-460-S and the FXT-460-R, make sure the SFP modules are fully inserted as they could have become disconnected during shipping.

- Interconnect the FXT-460-S and FXT-460-R with an LC/PC fiber optic cable.
  *Note: Hall Technologies can provide pre-terminated LC fiber optical cable at custom lengths. You can use single mode or multimode fiber optic cable. Single mode fiber is recommended due to its 10 km range.
- *Optionally,* Connect the RS-232 *TX, RX, and GND* contacts to compatible controllers (e.g., PC or RS-232 controller).
  - Direction of data flow is shown in section below.
  - RS-232 passes bi-directionally between the FXT-460-S and FXT-460-R at 115200 baud only.

FXT-460-S

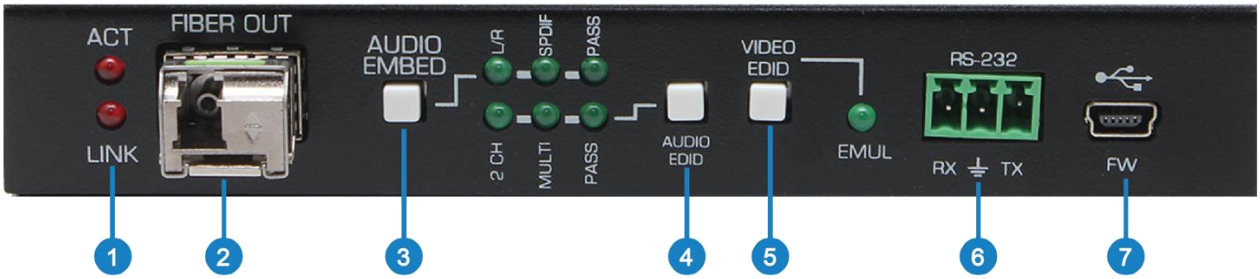
- *Optionally*, connect an HDMI source to the HDMI IN connector and if desired a HDMI compatible sink to the HDMI OUT connector.
  *Note: A video source is NOT required to embed audio onto the HDMI output at the FXT-460-R. If no HMDI source signal is present, the HDMI output at the FXT-460-R will be a black screen at 480p resolution.
- *Optionally*, for audio extraction at transmitter:
  - Connect the SPDIF OUT and/or L/R OUT audio outputs to a compatible audio device. (e.g., headphones, assistive listening devices, or Audio Amplifier such *as* the Hall Technologies AMP-4840 or AMP-7040.)
- *Optionally*, if you don't want to extend the original HMDI audio:
  - Connect the audio to embed to the SPDIF IN and/or L/R IN connector(s).

FXT-460-R

- *Optionally*, connect an HDMI compatible sink to the HDMI OUT connector.
  *Note: A video sink is NOT required to extract audio.
- *Optionally*, for audio extraction at transmitter:
  - Connect the SPDIF OUT and/or L/R OUT audio outputs to a compatible audio device. (e.g., headphones, assistive listening devices, or Audio Amplifier such *as* the Hall Technologies AMP-4840 or AMP-7040.)
- Connect the included power supplies to the 12V DC connectors on both the FXT-460-S and FXT-460-R.

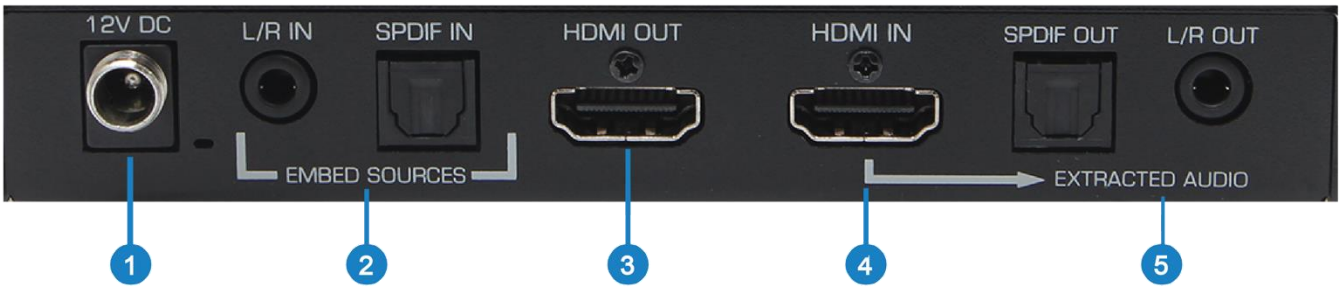
Connectors & Indicators

FXT-460-S Front



No.	Name	Description
1	STATUS LEDs	• **ACT:** ON means HDMI Input receiving video (active) • **LINK:** ON means fiber optic link to receiver is on
2	FIBER OUT	• Connects to fiber optic cable from receiver
3	AUDIO EMBED	• **L/R:** Audio on RX HDMI OUT connector comes from TX L/R IN connector. • **SPDIF:** Audio on RX HDMI OUT connector comes from TX SPDIF IN connector. • **Pass:** Audio on RX HDMI OUT connector comes from TX HDMI IN connector.
4	AUDIO EDID	• **2 CH:** Alters EDID to include only 2CH audio settings. • **Multi:** Alters EDID to include only multi-Channel audio settings. • **Pass:** Pass EDID to source from RX Sink.
5	VIDEO EDID	• **Button** • Single button press – toggles between emulated and passthru EDID modes. • 1 Blink – Hold for 3 secs – learn EDID. • 2 Blinks – Hold for 7 secs – factory default. • **LED** • OFF = pass thru EDID • ON = Emulated EDID • This LED blinks when VIDEO EDID button is pressed and held to show function selected when button is released.
6	RS-232 RX/TX	• Connect to external RS-232 controller. Data flows in direction shown.
7	FW	• Used to update system firmware.

FXT-460-S Back

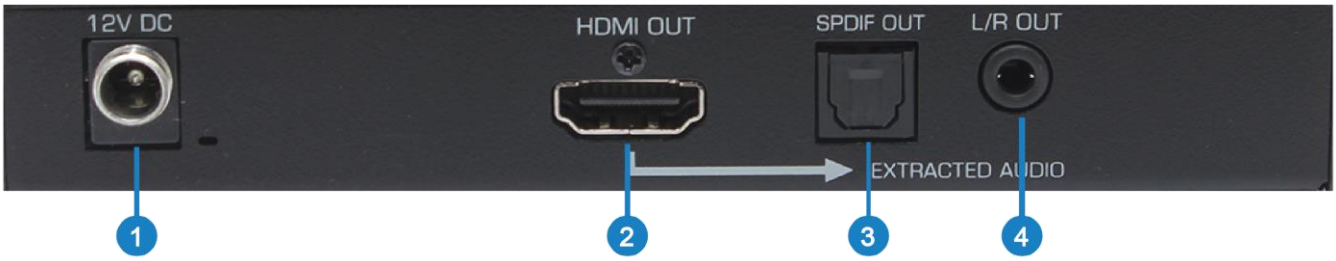


No.	Name	Description
1	12V DC	• Connects to the included power supply.
2	EMBED SOURCES	• Connect to compatible digital audio source
3	HDMI OUT	• Connect to a compatible HDMI SINK
4	HDMI IN	• Connect to a compatible HDMI source
5	EXTRACTED AUDIO	• Connect to other compatible digital audio equipment. • Note: These audio outputs are always from the HDMI INPUT

FXT-460-R Front

No.	Name	Description
1	FIBER IN	• Connects to fiber optic cable from transmitter.
2	STATUS LEDs	• ACT – ON means HDMI Input receiving video. • LINK – ON means fiber optic link to receiver active.
3	RS-232 TERMINAL	• Connect to external RS-232 controller. Data flows in direction shown.
4	MINI-USB PORT	• Used to update system firmware.

FXT-460-R Back



No.	Name	Description
1	12V DC	• Connect to the included power supply
2	HDMI OUT	• Connect to a compatible HDMI SINK
3	SPDIF OUT	• SPDIF out
4	L/R OUT	• Connect to other compatible digital audio equipment. • Note: These audio outputs can be either the HDMI INPUT audio or embedded audio from transmitter.

EDID Handling

With no SINK attached to the FXT-460-R HDMI OUT connector, the EDID presented to the SOURCE will be emulated from the current EDID stored in the system.

Troubleshooting

If you are experiencing problems getting the system to work properly, please use the following troubleshooting suggestions.

- Ensure that all connectors to the device are solid. Loose connections are the number one cause of issues.
- Try resetting the system by unplugging both power supplies and the HDMI IN connector, wait 5 seconds and plug everything back in.
  - The front panel LEDs cycle several times at power up; after 15 seconds, audio and video should be passing through the device.
- Try restoring factory defaults using the front panel VIDEO EDID button (hold for 7 seconds).
- Cycle the EDID mode with the front panel VIDEO EDID button.

Specifications

Audio & Video	
Video Standards	DVI (single link)
Connectors	**FXT-460-S** 1x HDMI Input 1x HDMI Output 1x 3.5 mm L/R Audio Output 1x TOSLINK Audio Output 1x Fiber Optic Simplex LC Bidirectional SFP+ Transmitter **FXT-460-R** 1x HDMI Output 1x 3.5 mm L/R Audio Output 1x TOSLINK Audio Output 1x Fiber Optic SFP Simplex LC Bidirectional SFP+ Receiver
Resolutions	HDMI 2.0 18Gbps Specification Resolutions up to and including 4K UHD at 60Hz
Audio Format	LPCM 2 CHN Audio (32, 44.1, and 48 KHz sample rate Digital Audio multi-channel 2.1, 5.1, 7.1

Other Signals	
RS-232	1x RX, TX, and GND on Terminal Strip RS-232 Baud Rate: 115200, N, 8, 1
SPF LC Fiber	6.2 miles (10km) over single mode 9/125-micron LC simplex fiber optic cable 984 feet (300 meters) over multimode 50/125-micrn OM3 LC simplex fiber optic cable

General	
Power Supply	100 VAC to 240 VAC, 47-63 Hz, External; 12 VDC 1.0 ADC
Temp/humidity	Storage: -40 to +158 degrees F (-40 to +70 degrees C)/ 10% to 90%, non-condensing Operating: +32 to +122 degrees F (0 to +50 degrees C) / 10% to 90%, non-condensing
Enclosure Type	Mental (steel)
Dimensions	Device = 0.9” H x 5.4” W x 3.1” D (23 mm H x 126 mm W x 79 mm D) Shipping = 4.0’ H x 12.0” W x 10” D (102 mm H x 305 mm W x 254 mm D)
Product Weight	Device = 0.75 lb (0.34 Kg) Shipping – 2.10 lb (0.95 Kg)
Safety EMI/EMC	CE CE, FCC, Class A
MTBF	90,000 hours (estimate)

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