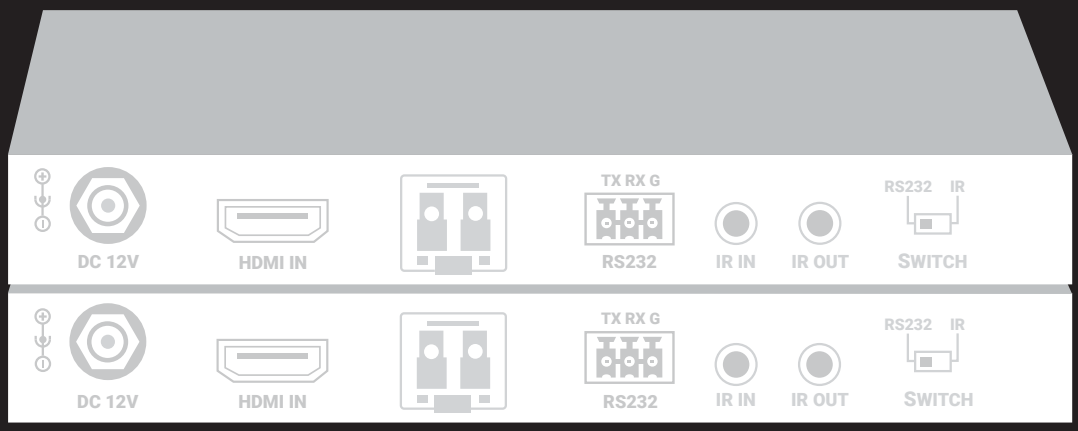
USER MANUAL

AVX-HDMI2-FO-HDB

HDMI 2.0 EXTENDER OVER FIBER

24/7 TECHNICAL SUPPORT AT 1.877.877.2269 OR VISIT BLACKBOX.COM



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IMPORTANT SAFETY INSTRUCTIONS

1. Do not expose this apparatus to rain, moisture, dripping or splashing liquids. Do not place any objects filled with liquids, such as vases, on the apparatus.
2. Do not install or place this unit in a bookcase, built-in cabinet or in another confined space. Make sure 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 open flames, such as lighted candles, on the unit.
6. Clean this apparatus only with a dry cloth.
7. Unplug this apparatus during lightning storms or when unused for long periods of time.
8. Do not walk on or pinch the power cord, particularly at plugs.
9. Only use attachments/accessories specified by the manufacturer.
10. Refer all servicing to qualified service personnel.

CHAPTER 1: SPECIFICATIONS

TABLE 1-1. SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Transmitter	
Video Input	(1) HDMI female
Input Signal Type	HDMI 2.0 and HDCP 2.2
Input Resolution Support	800 x 600, 1024 x 768, 1280 x 720, 1280 x 768, 1280 x 800, 1280 x 960, 1280 x 1024, 1360 x 768, 1366 x 768, 1440 x 900, 1600 x 900, 1600 x 1200, 1680 x 1050, 1920 x 1080, 1920 x 1200, 2560 x 1440, 2560 x 1600, 3840 x 2160P, 4096 x 2160P
Input Video Level	0.5 – 1.0 V p-p
Maximum Pixel Clock	600 MHz
Output	(1) optical output with LC connector
Output Fiber Type	MM module standard, SM can be purchased separately
Fiber Connector Type	(2) LC
Max. Transmission Distance	1000 ft. (300 m) over OM3 cable
Receiver	
Video Input	(1) optical input with LC connector
Input Fiber Type	MM module standard, SM can be purchased separately
Fiber Connector Type	(2) LC
Max. Transmission Distance	1000 ft. (300 m) over OM3 cable
Output Signal Type	HDMI 2.0 and HDCP 2.2
Output Resolution Support	800 x 600, 1024 x 768, 1280 x 720, 1280 x 768, 1280 x 800, 1280 x 960, 1280 x 1024, 1360 x 768, 1366 x 768, 1440 x 900, 1600 x 900, 1600 x 1200, 1680 x 1050, 1920 x 1080, 1920 x 1200, 2560 x 1440, 2560 x 1600, 3840 x 2160P, 4096 x 2160P
Video Impedance	100 Ohms

TABLE 1-1 (CONTINUED). SPECIFICATIONS

SPECIFICATION	DESCRIPTION
General	
ESD Protection	Human-Body Model: ±8 kV (air-gap discharge)/±4 kV (contact discharge)
Surge Protection	Voltage: ±1 kV
Electrical Fast Transient/Burst	Data communication cord: 1 kV Power cord: 2 kV
Approvals	CE, FCC, IC, RCM, and VCCI
Power	
Power Supply	Each unit: (1) External 12 VDC, 0.5 A
Power Consumption	3.9 W (max.)
Environmental	
Operating Temperature	32 to 113° F (0 to 45° C)
Storage Temperature	-4 to +158° F (-20 to +70° C)
Humidity	0 to 90%, noncondensing
Mechanical	
Dimensions	Each unit: 0.8" H x 5.9" W x 2.9" D (2 x 15 x 7.4 cm)
Weight	Each unit: 0.7 lb. (0.3 kg)

CHAPTER 2: OVERVIEW

2.1 INTRODUCTION

The HDMI 2.0 Extender over Fiber is an HDMI Extender with HDCP 2.2 compatibility. It distributes compressed UHD video, audio, RS-232 or IR together up to 1000 feet (300 meters) over fiber optic cable.

The extender features bi-directional RS-232 or IR ports to control AV devices, easy to choose by the slide switch on the rear panels. Sources and displays can be controlled from either the transmitter or receiver end using either RS-232 or IR signals.

The extender supports duplex fiber up to 1000 feet (300 meters).

2.2 FEATURES

- Supports up to 4K @ 60 4:4:4 8 bit HDMI signal transmission
- Supports HDCP 2.2 passthrough
- Supports HDR
- Transmits 4K @ 60 4:4:4 signals up to 1000 ft. (300 m) via MM OM3 cable with 10 Gbit/s multimode SFP+ modules (SFP+ modules are included)
- Compressed video transmits when the data rate is above 3 Gbps (e.g. 4K @ 60 Hz 4:4:4)
- Uncompressed video transmits when the data rate equal or less than 3 Gbps (e.g. 4K @ 30 Hz 4:4:4)
- Supports Bi-directional IR or RS-232 passthrough (select via the DIP switch on the rear panel)
- Multichannel audio supports up to PCM 7.1, DTS Master HD and Dolby True HD
- Locking DC power plugs
- Visual LED indication for power supply to units, HDCP presence in signal, units status and fiber optic cable link

2.3 WHAT'S INCLUDED

Your package should include the following items. If anything is missing or damaged, contact Black Box Technical Support at 877-877-2269 or info@blackbox.com

AVX-HDMI2-FO-HDB includes:

- (1) Transmitter with 10 Gbit/s MM SFP+ module
- (1) Receiver with 10 Gbit/s MM SFP+ module
- (2) Power adapters (12 VDC, 0.5 A)
- (2) Phoenix male connectors (3.5-mm, 3-pin)
- (1) IR emitter cable
- (1) IR broadband receiver cable
- (4) Mounting brackets

2.4 OPTIONAL ITEMS

The SFPs are included by the manufacturer, but you can also use our SM or MM SFP+ modules to replace a lost SFP or to use SM instead of MM. Parts are:

- LSP421, SFP+, 10-Gb, Extended Diagnostics, 850-nm Multimode Fiber, 300-m, LC
- LSP422, SFP+, 10GBASE-SR, 1310-nm Single-Mode, 10 km, Extended Diag, LC

2.5 HARDWARE DESCRIPTION

The HDMI 2.0 Extender over Fiber consists of a Transmitter unit and a Receiver unit.

2.5.1 TRANSMITTER

Figures 2-1 and 2-2 show the front and back panels of the transmitter. Table 2-1 describes its components.

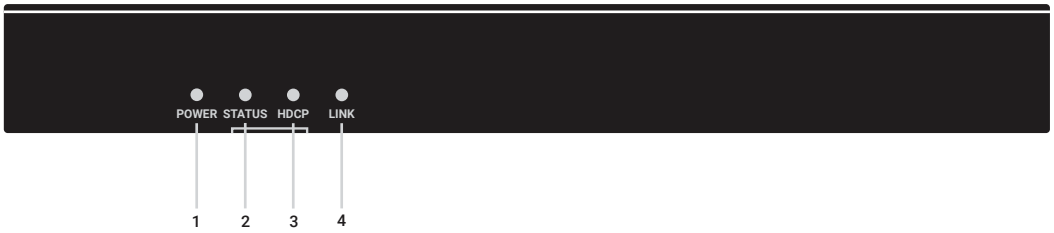

FIGURE 2-1. TRANSMITTER FRONT PANEL

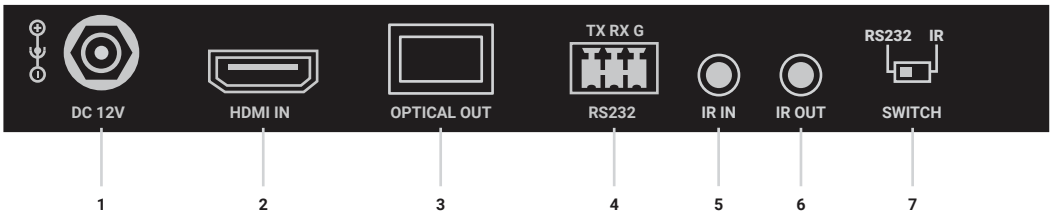

FIGURE 2-2. TRANSMITTER BACK PANEL

TABLE 2-1. TRANSMITTER COMPONENTS

NUMBER IN FIGURE 2-1	COMPONENT	DESCRIPTION
1	Power LED	ON: The transmitter is powered on. OFF: The transmitter is powered off.
2	Status LED	Flashing: The transmitter is working properly. OFF: The transmitter is not working properly.
3	HDCP LED	ON: HDCP video is being transmitted. Flashing: Non-HDCP video is being transmitted. OFF: No HDMI signal.
4	Link LED	ON: Link to receiver has been established. Blinking/OFF: Link to receiver has not been established.
NUMBER IN FIGURE 2-2	**COMPONENT**	**DESCRIPTION**
1	Power connector	Links to 12-VDC power input
2	HDMI IN	Connects to an HDMI source
3	Optical OUT	Connects to Optical IN port of receiver
4	RS-232	RS-232 passthrough
5	IR IN	Connects to IR receiver
6	IR OUT	Connects to IR emitter
7	Switch	RS-232 passthrough IR: IR passthrough

2.5.2 RECEIVER

Figures 2-3 and 2-4 show the front and back panels of the receiver. Table 2-2 describes its components.

FIGURE 2-3. RECEIVER FRONT PANEL

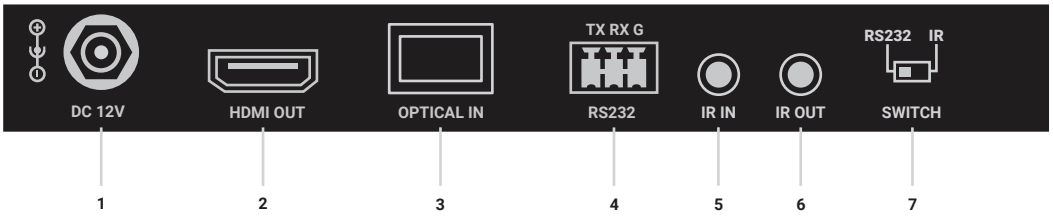

FIGURE 2-4. RECEIVER BACK PANEL

TABLE 2-2. RECEIVER COMPONENTS

NUMBER IN FIGURE 2-3	COMPONENT	DESCRIPTION
1	Power LED	ON: The receiver is powered on. OFF: The receiver is powered off.
2	Status LED	Flashing: The receiver is working properly. OFF: The receiver is not working properly.
3	HDCP LED	ON: HDCP video is being transmitted. Flashing: Non-HDCP video is being transmitted. OFF: No HDMI signal.
4	Link LED	ON: Link to transmitter has been established. Blinking/OFF: Link to transmitter has not been established.
NUMBER IN FIGURE 2-4	**COMPONENT**	**DESCRIPTION**
1	Power connector	Links to 12-VDC power input
2	HDMI OUT	Connects to an HDMI display
3	Optical IN	Connects to Optical OUT port of transmitter
4	RS-232	RS-232 passthrough
5	IR IN	Connects to IR receiver
6	IR OUT	Connects to IR emitter
7	Switch	RS-232 passthrough IR: IR passthrough

CHAPTER 3: CONNECTIONS AND INSTALLATION

3.1 INSTALLATION STEPS

1. Using quality HDMI cables, connect an HDMI source (such as Blu-ray, games console, satellite/cable TV, media server etc.) to the HDMI IN port of the transmitter.
2. Connect a good quality, well-terminated fiber cable between the OPTICAL OUT port of the transmitter to the OPTICAL IN port of the receiver.
3. Connect the HDMI display device (LED/LCD display or projector) to the HDMI OUT port of the receiver.
4. For two-way IR control of connected sources and displays from either location, first, connect IR Emitters to the IR OUT ports of the transmitter and receiver, and then insert IR Receivers into the IR IN ports of the transmitter and receiver.
5. Connect the included 12-V power supplies to the transmitter and receiver.

Check that Power, Status, and HDCP and Link lights are illuminated on both units to indicate successful connection, with a lit HDCP light illustrating the presence of encryption within the signal. Power and Link are static lights. Status should be blinking.

3.2 IR PASSTHROUGH

The IR passthrough function allows you to control the source from the display location or control the display from the source location.

For example, you can control the DVD at the TV side. First, switch the DIP switch to IR mode, then connect the IR emitter cable to the IR OUT port on the transmitter. Connect the IR IN port on the receiver to a broadband IR receiver. You can control the DVD player from the TV location with the DVD remote.

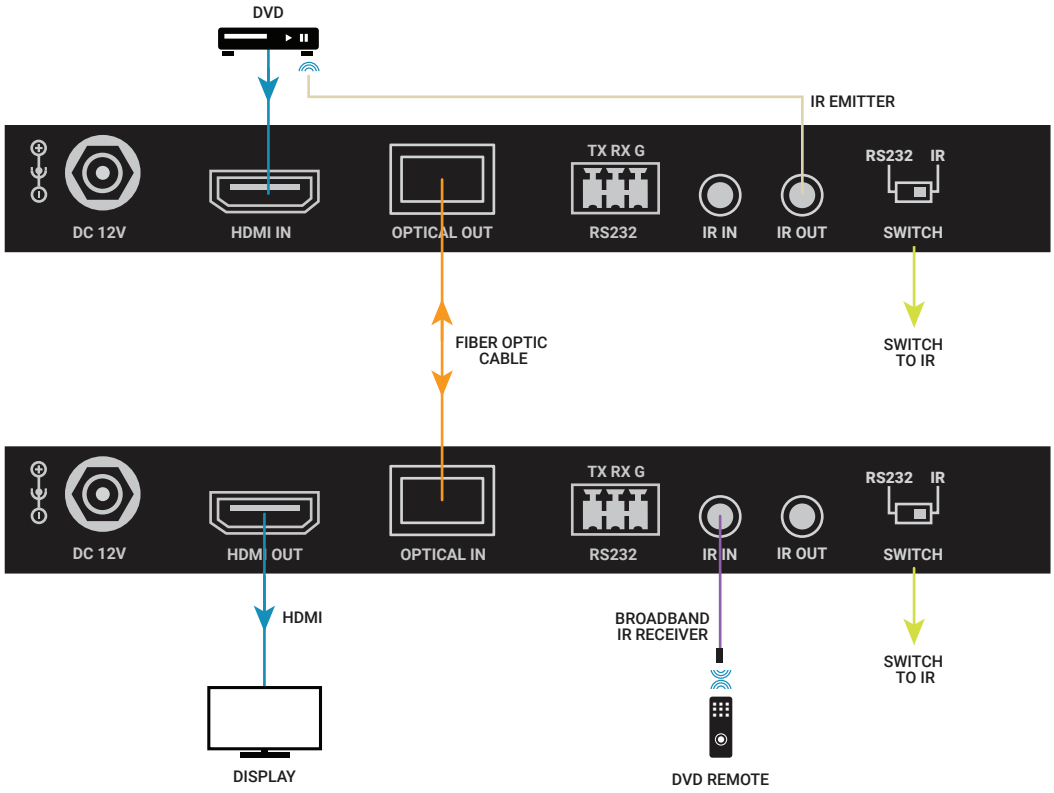

FIGURE 3-1. IR PASSTHROUGH

3.3 RS-232 PASSTHROUGH

The bi-directional RS-232 passthrough function enables you to use two devices that support RS-232 (such as a laptop and a projector) for serial communication. Connect to the devices via RS-232 cables to control the source device or the display.

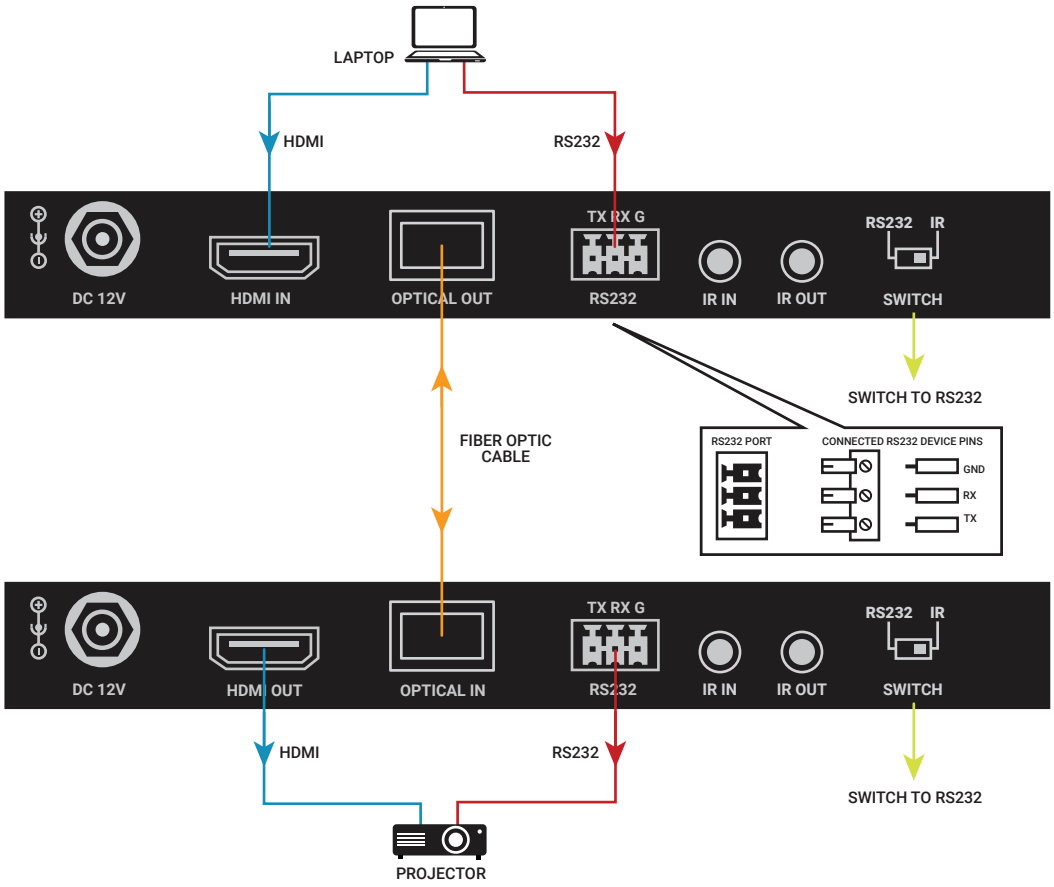

FIGURE 3-2. RS-232 PASSTRHOUGH

APPENDIX A: REGULATORY COMPLIANCE

A.1 FCC STATEMENT

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

APPENDIX A: REGULATORY COMPLIANCE

A.2 NOM STATEMENT

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
    A: El cable de poder o el contacto ha sido dañado; u
    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o
    C: El aparato ha sido expuesto a la lluvia; o
    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
    E: El aparato ha sido tirado o su cubierta ha sido dañada.

APPENDIX B: DISCLAIMER/TRADEMARKS

B.1 DISCLAIMER

Black Box Corporation shall not be liable for damages of any kind, including, but not limited to, punitive, consequential or cost of cover damages, resulting from any errors in the product information or specifications set forth in this document and Black Box Corporation may revise this document at any time without notice.

B.2 TRADEMARKS USED IN THIS MANUAL

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