CYP ///

4K UHD

HDCP 2.2

AVX-101F-KIT

UHD+ HDMI over Fiber Transmitter & Receiver

/// **OPERATION MANUAL**

CYP///

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Version 1.1

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SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply. Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.

- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.

- Never spill liquid of any kind on or into this product.

- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.

- Do not attach the power supply cabling to building surfaces.

- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.

- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.

- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.

- Please completely disconnect the power when the unit is not in use to avoid wasting electricity.

VERSION HISTORY

REV.	DATE	SUMMARY OF CHANGE
RDV1	2021/07/09	Preliminary release

CONTENTS

1. INTRODUCTION

This 4K UHD[+] HDMI over Fiber Transmitter and Receiver Set is designed for high-quality AV extension with minimum latency. By using a sophisticated ultra-light compression scheme (lossless for most content) it's a great solution for extending 4K@60Hz (4:4:4) HDMI audio/video streams. Advanced HDMI content such as HDR (High Dynamic Range), 10-bit colour and multi-channel HD Bitstream audio can be easily transmitted. The use of interchangeable, field replaceable, SFP+ modules allows for transmission distances of up to 30km (Maximum transmission distance depends on the SFP+ modules used). Additionally, this extender set's compact form factor makes it ideal for installation in tight spaces, or inclusion in A/V travel kits.

2. APPLICATIONS

/// A/V extension without RF interference

/// Long distance data and video transmission

/// Household entertainment

/// Lecture halls, meeting rooms, and classrooms

/// Point-to-Point Secure Video Conferencing

3. PACKAGE CONTENTS

/// 1× UHD[+] HDMI over Fiber Transmitter

/// 1× UHD[+] HDMI over Fiber Receiver

/// 2× 5V/2.6A DC Power Adapter

/// 1× Operation Manual

4. SYSTEM REQUIREMENTS

/// HDMI receiving equipment such as an HDTV, monitor, or audio amplifier

/// IEEE 802.3ae compatible SFP+ fiber module supporting a dual-optical fiber connection style, such as LC, or a pre-terminated crossover dual-optical fiber cable

Note: Single-mode and multi-mode support is dependent on the SFP+ modules used.

5. FEATURES

/// HDMI 2.0 and DVI 1.0 compatible

/// HDCP 2.2 and HDCP 1.x compliant

/// 1 HDMI input (TX), 1 HDMI Output (RX)

/// 1 fiber (SFP+) Connection

/// Ultra-light compression, lossless for most content

/// Extension up to 30km (maximum distance depends on the SFP+ module and type of fiber used)

/// Supports up to 4K UHD$^+$ (18Gbps, 4K@50/60Hz 4:4:4, 8-bit) video input and output

/// Supports pass-through of 10/12-bit HDR sources

/// Supports pass-through of audio formats including LPCM (up to 8 channels), Bitstream and HD Bitstream

/// Simple, hassle free, point-to-point connection

6. OPERATION CONTROLS AND FUNCTIONS
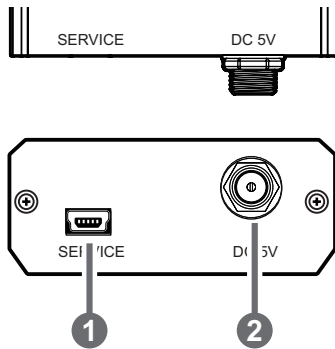
6.1 Transmitter Front Panel
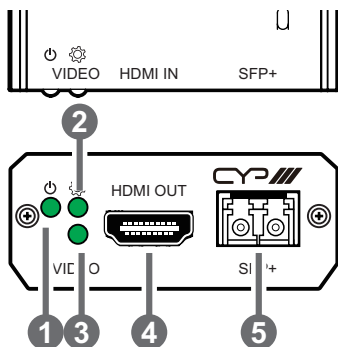
1 **Power (⏻) LED:** This LED will illuminate to indicate the unit is on and receiving power.

Note: This LED will blink during the firmware update process.

2 **System (⚙) LED:** This LED will illuminate to indicate that the system is stable and ready to process audio/video streams.

Note: This LED will blink during the firmware update process.

3 **VIDEO LED:** This LED will illuminate to indicate that the video source is stable, and streaming is in process.

4 **HDMI OUT Port:** Connect to an HDMI TV, monitor, or amplifier for digital video and audio output.

5 **SFP+ Port:** Insert a standard SFP+ module, and connect the appropriate optical cable to allow data reception from a compatible transmitter.
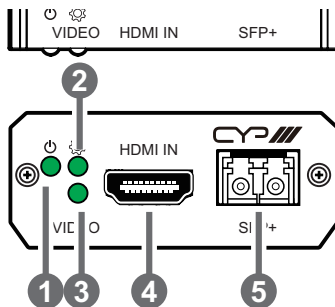
Note: The SFP+ module must support a dual-optical fiber connection style, such as LC, or be pre-terminated dual-optical fiber cables. Single-mode and multi-mode support is dependent on the SFP+ modules used.

6.2 Transmitter Rear Panel

1 **SERVICE (USB Mini-B) Port:** This port is for firmware update only.

2 **DC 5V Port:** Plug the 5V DC power adapter into this port and connect it to an AC wall outlet for power.
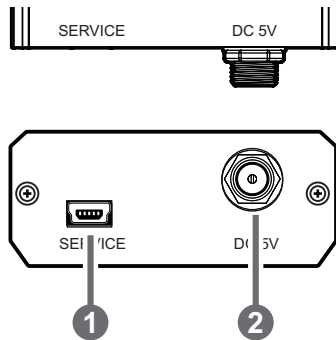
6.3 Receiver Front Panel

1 **Power (⏻) LED:** This LED will illuminate to indicate the unit is on and receiving power.

Note: This LED will blink during the firmware update process.

2 **System (⚙) LED:** This LED will illuminate to indicate that the system is stable and ready to process audio/video streams.

Note: This LED will blink during the firmware update process.

③ **VIDEO LED:** This LED will illuminate to indicate that the video source is stable, and streaming is in process.

④ **HDMI IN Port:** Connect to HDMI source equipment such as a media player, game console, or set-top box.

⑤ **SFP+ Port:** Insert a standard SFP+ module, and connect the appropriate optical cable to allow data transmission to a compatible receiver.

Note: The SFP+ module must support a dual-optical fiber connection style, such as LC, or be pre-terminated dual-optical fiber cables. Single-mode and multi-mode support is dependent on the SFP+ modules used.

6.4 Receiver Rear Panel

❶ **SERVICE (USB Mini-B) Port:** This port is for firmware update only.

❷ **DC 5V Port:** Plug the 5V DC power adapter into this port and connect it to an AC wall outlet for power.

7. CONNECTION DIAGRAM
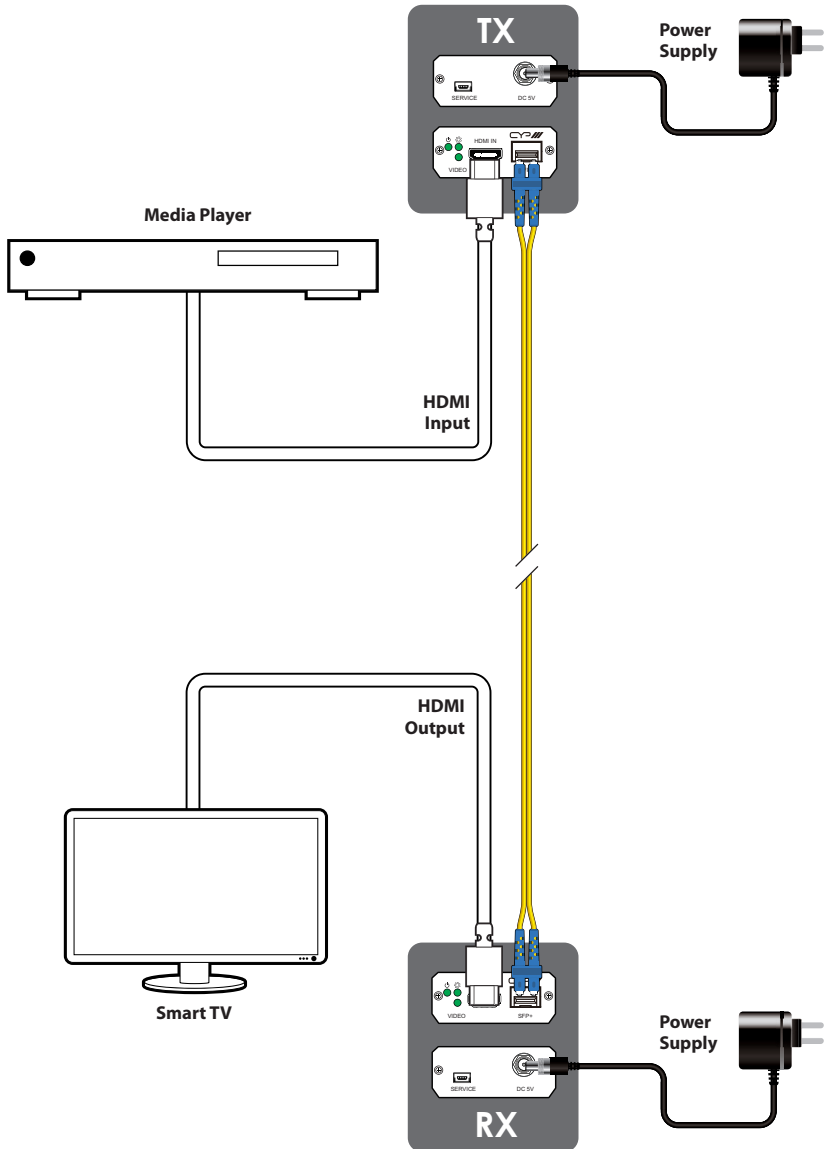
8. SPECIFICATIONS

8.1 Technical Specifications

HDMI Bandwidth	18Gbps
Fiber Bandwidth	10Gbps
Input Ports	**(RX)** 1×10GbE (SFP+)
	(TX) 1×HDMI (Type-A)
Output Ports	**(TX)** 1×10GbE (SFP+)
	(RX) 1×HDMI (Type-A)
SFP+ Module	**(TX)** 1×Single/Multi-mode (LC)
	(RX) 1×Single/Multi-mode (LC)
Service Port	1×USB 2.0 (Mini-B)
Power Supply	5V/2.6A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection (HBM)	±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions (W×H×D)	**TX** 57mm×20.6mm×87mm [Case Only] 60mm×20.6mm×87mm [All Inclusive]
	RX 57mm×20.6mm×87mm [Case Only] 60mm×20.6mm×87mm [All Inclusive]
Weight	139g (Each Unit)
Chassis Material	Metal (Steel)
Chassis Colour	Black
Operating Temperature	0˚C – 50˚C/32˚F – 122˚F
Storage Temperature	-20˚C – 60˚C/-4˚F – 140˚F
Relative Humidity	20 – 90% RH (Non-condensing)
Power Consumption	4.62W

8.2 Video Specifications

Supported Resolutions (Hz)	Input 10GbE	Output HDMI
720×400p@70/85	✓	✓
640×480p@60/72/75/85	✓	✓
720×480i@60	✓	✓
720×480p@60	✓	✓
720×576i@50	✓	✓
720×576p@50	✓	✓
800×600p@56/60/72/75/85	✓	✓
848×480p@60	✓	✓
1024×768p@60/70/75/85	✓	✓
1152×864p@75	✓	✓
1280×720p@50/60	✓	✓
1280×768p@60/75/85	✓	✓
1280×800p@60/75/85	✓	✓
1280×960p@60/85	✓	✓
1280×1024p@60/75/85	✓	✓
1360×768p@60	✓	✓
1366×768p@60	✓	✓
1400×1050p@60	✓	✓
1440×900p@60/75	✓	✓
1600×900p@60RB	✓	✓
1600×1200p@60	✓	✓
1680×1050p@60	✓	✓
1920×1080i@50/60	✓	✓
1920×1080p@24/25/30	✓	✓
1920×1080p@50/60	✓	✓

	Input	Output
Supported Resolutions (Hz)	**10GbE**	**HDMI**
1920×1200p@60RB	✓	✓
2560×1440p@60RB	✓	✓
2560×1600p@60RB	✓	✓
2048×1080p@24/25/30	✓	✓
2048×1080p@50/60	✓	✓
3840×2160p@24/25/30	✓	✓
3840×2160p@50/60 (4:2:0)	✓	✓
3840×2160p@24, HDR10	✓	✓
3840×2160p@50/60 (4:2:0), HDR10	✓	✓
3840×2160p@50/60	✓	✓
4096×2160p@24/25/30	✓	✓
4096×2160p@50/60 (4:2:0)	✓	✓
4096×2160p@24, HDR10	✓	✓
4096×2160p@50/60 (4:2:0), HDR10	✓	✓
4096×2160p@50/60	✓	✓

8.3 Audio Specifications

8.3.1 Digital Audio

10GbE Input / HDMI Output	
LPCM	
Max Channels	8 Channels
Sampling Rate (kHz)	32, 44.1, 48
Bitstream	
Supported Formats	Standard & High-Definition

8.4 Cable Specifications

Cable Length	1080p		4K30	4K60
	8-bit	12-bit	(4:4:4) 8-bit	(4:4:4) 8-bit
High Speed HDMI Cable				
HDMI Output	15m	10m	5m	3m
Fiber Cable				
Multi-mode Fiber (OM3)	300m			
Multi-mode Fiber (OM4)	550m			
Single-mode Fiber	30km			

Bandwidth Category Examples:

/// **1080p (FHD Video)**
- Up to 1080p@60Hz, 12-bit colour
- Data rates lower than 5.3Gbps or below 225MHz TMDS clock

/// **4K30 (4K UHD Video)**
- 4K@24/25/30Hz & 4K@50/60Hz (4:2:0), 8-bit colour
- Data rates higher than 5.3Gbps or above 225MHz TMDS clock but below 10.2Gbps

/// **4K60 (4K UHD[+] Video)**
- 4K@50/60Hz (4:4:4, 8-bit)
- 4K@50/60Hz (4:2:0, 10-bit HDR)
- Data rates higher than 10.2Gbps

9. ACRONYMS

ACRONYM	COMPLETE TERM
10GbE	10 Gigabit Ethernet
4K UHD	4K Ultra-High-Definition (10.2Gbps max)
4K UHD⁺	4K Ultra-High-Definition (18Gbps max)
AV	Audio/Video
AVoIP	Audio/Video over IP
Cat.5e	Enhanced Category 5 cable
Cat.6	Category 6 cable
Cat.6A	Augmented Category 6 cable
Cat.7	Category 7 cable
CEC	Consumer Electronics Control
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
Gbps	Gigabits per second
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDR	High Dynamic Range
kHz	Kilohertz
LAN	Local Area Network
LED	Light-Emitting Diode
LPCM	Linear Pulse-Code Modulation
MHz	Megahertz
TMDS	Transition-Minimised Differential Signaling
USB	Universal Serial Bus

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