CYP ///

4K HDR

HDCP 2.2

SDVoE ALLIANCE

SDV-FTRX

Full HDR and 4K SDVoE Transceiver over FIBER (10GbE).

/// **OPERATION MANUAL**

DISCLAIMERS

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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.

REVISION HISTORY

VERSION NO.	DATE	SUMMARY OF CHANGE
v1.00	08/02/2019	First release
v1.01	04/06/2019	Corrected Cover Image

CONTENTS

1. INTRODUCTION

This Transceiver is designed for high-quality, IP routable, AV extension with minimum latency. Every Transceiver can be configured to function as either a Transmitter or a Receiver, enhancing the flexibility of any installation. By using a sophisticated ultra-light compression scheme (lossless for most content) it's a great solution for extending 4K audio/video streams (HDMI or DisplayPort) and data. Advanced HDMI content such as HDR (High Dynamic Range), 10-bit colour and multi-channel HD Bitstream audio can be transmitted in pass-through mode. 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). Multiple control and data signals may also be transmitted along with the audio and video, including IR, RS-232, USB (for KVM) and Ethernet.

2. APPLICATIONS

/// Video, Audio, LAN, IR, RS-232, and USB over fiber extension

/// Hotel or convention center display

/// Long distance data and video transmission immune to RF interference

/// Remote KVM system control

3. PACKAGE CONTENTS

/// 1×HDMI/DP over Fiber (10GbE) Transceiver

/// 1×12V/3A DC Power Adapter

/// 1×Power Cord

/// 1×3-pin Terminal Block to DE-9 (Male) Adapter Cable

/// 1×3-pin Terminal Block to DE-9 (Female) Adapter Cable

/// 1×USB Mini-B to Type-A Adapter Cable

/// 1×Shockproof Feet (Set of 4)

/// 1×Operation Manual

4. SYSTEM REQUIREMENTS

- HDMI or DisplayPort source equipment such as a media player, video game console, PC, or set-top box
- HDMI receiving equipment such as an HDTV, monitor, or audio amplifier
- Analogue audio receiving equipment such as headphones, an audio amplifier or powered speakers.
- 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. Single-mode and multi-mode support is dependent on the SFP+ modules used.
- A 10 Gigabit fiber Ethernet network switch with jumbo frame and IGMP snooping support is required for distributed video systems. (Optional, required for multi-Tx/Rx systems)

5. FEATURES

- HDMI 2.0 and DVI 1.0 compatible
- HDCP 2.2 and HDCP 1.x compliant
- Can be configured to function as either a Transmitter or a Receiver
- 1 HDMI and 1 DisplayPort input
- 1 HDMI output (Functions as local monitor output in Transmitter mode)
- 1 analogue stereo jack (switchable between input/output mode)
- Ultra-light compression, lossless for most content
- Extension up to 30km (depending on the fiber module used)
- Supports pass-through of 10/12-bit HDR sources (Point-to-Point and Genlock mode only)
- Supports pass-through of audio formats including LPCM 2.0/5.1/7.1, Bitstream and HD Bitstream from HDMI or DisplayPort sources
- Analogue stereo audio extension, insertion and extraction (insertion and extraction requires optional control center or control software)
- Bi-directional LAN, IR, RS-232 & USB 2.0 extension
- Signal transmission interfaces with 10-Gigabit Ethernet switches via XFI, IEEE 802.3ae, compatible SFP+ fiber modules
- Basic configuration via front panel buttons with an On-Screen Display (OSD)

6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel
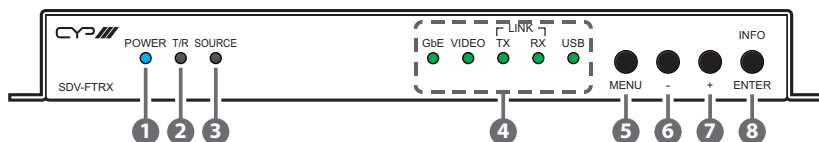
1 POWER LED: This LED will illuminate to indicate the unit is on and receiving power.

2 T/R LED: This LED indicates if the unit is in Transmitter (Green LED) or Receiver (Amber LED) mode.

3 SOURCE LED: This LED will illuminate to indicate that a local video input is selected and live. Green indicates that the local HDMI input is live and amber indicates that the local DisplayPort input is live.

Note: When the unit is in Receiver mode, and streaming is active, this LED will remain off.

4 STREAMING STATUS LED BLOCK

    A GbE LED: This LED will illuminate and blink to indicate a live and active connection on the local gigabit Ethernet port.

    B VIDEO LED: This LED will illuminate when a video signal is live on the optical fiber streaming port. When no video is active the LED will remain off, even if the streaming connection is valid.

    C TX & RX LINK LEDs: These LEDs will illuminate and blink to indicate data transmission and reception activity across the optical fiber streaming connection.

5 MENU BUTTON: Press to enter the OSD menu, or to back out from menu items.

6 – (MINUS) BUTTON: Press to move down or adjust selections within OSD menus. When not in a menu, press to manually switch between the available inputs.

7 + (PLUS) BUTTON: Press to move up or adjust selections within OSD menus. When not in a menu, press to manually switch between the available inputs.

8 ENTER/INFO BUTTON: When inside an OSD menu, press to confirm a selection within the OSD or to go deeper into a menu item. When not in a menu, press to activate the Information OSD.

6.2 Rear Panel
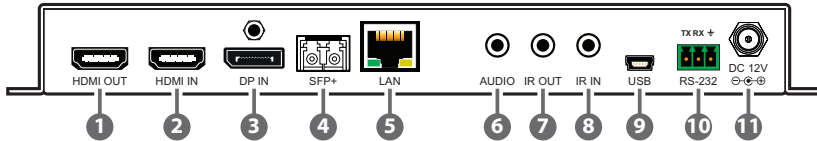
1 **HDMI OUT PORT:** Connect to an HDMI TV, monitor or amplifier for digital video and audio output.

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

3 **DP IN PORT:** Connect to DisplayPort source equipment such as a PC, laptop or set-top box.

4 **SFP+ PORT:** Insert a standard SFP+ module, and connect the appropriate optical cable to allow data transmission between compatible Transmitter/Receiver units or to a 10-gigabit optical fiber network switch.

Note: Single-mode and multi-mode support is dependent on the SFP+ modules used. Simplex SFP+ modules must use different wavelengths for each end (e.g. 1330/1270nm).

5 **LAN PORT:** Connect to an Ethernet supporting device or to your local network as appropriate to extend the network between the Transmitter and Receiver.

6 **AUDIO PORT:**

A **Transmitter Mode:** Connect to the stereo analogue output of a device such as a CD player or PC. The audio signal is passed directly to the audio port on the connected Receiver.

B **Receiver Mode:** Connect to powered speakers or an amplifier for stereo analogue audio output. The audio signal comes directly from the audio port on the connected Transmitter.

7 **IR OUT PORT:** Connect to an IR Blaster to transmit IR signals to devices within direct line-of-sight of the IR Blaster.

8 **IR IN PORT:** Connect to an IR Extender to extend the IR control range

of remotely located devices. Ensure that the remote being used is within direct line-of-sight of the IR Extender.

⑨ USB PORT:

Ⓐ Transmitter Mode: Connect directly to a PC or other USB host device to extend the USB functionality to the connected Receiver.

Ⓑ Receiver Mode: Connect directly to USB peripherals such as a keyboard and mouse, to control the USB host device connected to the Transmitter.

⑩ RS-232 TERMINAL BLOCK: Reserved for future use.

⑪ DC 12V PORT: Plug the 12V DC power adapter into this port and connect it to an AC wall outlet for power.

6.3 IR Cable Pinouts

IR Blaster Cable

❶ Power
❷ Infrared
❸ Not Used

IR Extender Cable

❶ Infrared
❷ Power
❸ Ground
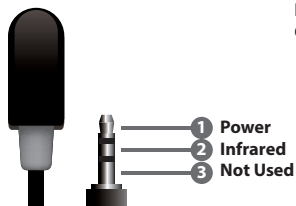
6.4 OSD Menu

Many functions of this unit can be controlled by using the OSD (On Screen Display) which is activated by pressing the Menu button on the front of the unit. Use the + (PLUS), − (MINUS), and ENTER buttons to navigate the OSD menu. Press the Menu button to back out from any menu item and then press it again to close the menu.
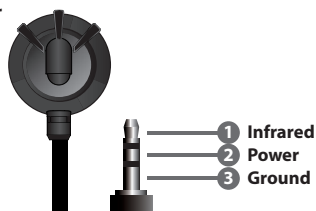
MAIN MENU
OSD
EDID
HDCP
Device Setting
Information
Factory Setting

The individual functions of the OSD will be introduced in the following section. Items marked in **BOLD** are the factory default settings.

OSD	
2ND LEVEL	**3RD LEVEL**
Display Information	**ON**
	Off
Information Timeout	Off
	10~40 Sec **[10 Sec]**
Menu Timeout	Off
	10~40 Sec **[10 Sec]**

1) **Display Information:** Enable or disable the Information OSD.

2) **Information Timeout:** Set the display timeout for the Information OSD.

3) **Menu Timeout:** Set the display timeout for the OSD Menu.

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EDID	
2ND LEVEL	**3RD LEVEL**
HDMI EDID	**INTERNAL 1**
	Internal 2
	Internal 3
	Internal 4
	Internal 5
	Internal 6
	External A
	External B (Transmitter Mode only)
	User 1
	User 2
DP EDID	**INTERNAL 1**
	Internal 2
	Internal 3
	Internal 4
DP EDID	Internal 5
	Internal 6
	External A
	External B (Transmitter Mode only)
	User 1
	User 2

1) **HDMI EDID:** Select the EDID to send to the HDMI input.

2) **DP EDID:** Select the EDID to send to the DisplayPort input. This unit provides the following 6 Internal EDIDs:

Internal 1	1920×1080p@60Hz (148MHz), 8-bit colour	LPCM 2.0
Internal 2	1920×1080p@60Hz (148MHz), 8-bit colour	LPCM 7.1 & Bitstream
Internal 3	3840×2160p@30Hz (297MHz), Deep Colour (8/10/12-bit)	LPCM 2.0
Internal 4	3840×2160p@30Hz (297MHz), Deep Colour (8/10/12-bit)	LPCM 7.1 & Bitstream
Internal 5	3840×2160p@60Hz (594MHz), Deep Colour (8/10/12-bit)	LPCM 2.0
Internal 6	3840×2160p@60Hz (594MHz), Deep Colour (8/10/12-bit)	LPCM 7.1 & Bitstream

Note: In some rare cases it is possible for custom or external EDIDs to cause compatibility issues with certain sources. If this happens, it is recommended to switch to one of the 6 default EDIDs for maximum compatibility.

HDCP	
2ND LEVEL	**3RD LEVEL**
HDMI HDCP	Follow In
	FOLLOW OUT
	Disable
DP HDCP	Follow In
	FOLLOW OUT
	Disable

1) **HDMI HDCP:** Set the HDCP behavior of the HDMI input.

2) **DP HDCP:** Set the HDCP behavior of the DisplayPort input.

3) **Follow In:** The input supports up to the HDCP version required by the connected source.

   Follow Out: The input supports up to the HDCP version supported by the connected display.

Disable: HDCP support is completely disabled.

DEVICE SETTING	
2ND LEVEL	**3RD LEVEL**
Status	**TRANSMITTER**
	Receiver
Fan Mode	**FOLLOW TEMP**
	Always On
Input	**INPUT 1**
	Input 2
	Input 3
Local Priority	HDMI
	DP
	OFF

1) **Status:** Set the operational mode of the Transceiver. After changing the operation mode, the unit will automatically reboot.

2) **Fan Mode:** Set the fan's activation behavior. Selecting "Follow temp" will result in the fan only turning on if the internal temperature becomes too high.

3) **Input:** Select the source to display on the HDMI output. Input 1 is the local HDMI input, Input 2 is the DisplayPort input, and Input 3 is the optical fiber streaming video input.

   Note: In Transmitter Mode, selecting Input 3 will automatically revert to Input 1 due to the streaming input not being available.

4) **Local Priority:** Enable the priority auto switch mode, and select the input to prioritise, or disable the mode completely. When enabled, the unit will automatically switch to the designated input if the input becomes active.

INFORMATION	
2ND LEVEL	**3RD LEVEL**
Resolution	
Status	
FW Version	
IP	[Show the current status of each item]
LAN MAC	
USB MAC	
SN	
Fan Status	

1) **Information:** Shows details of the unit's current status including detected input resolution, transceiver mode, firmware version, IP address, LAN MAC address, USB MAC address, serial number and fan state.

FACTORY SETTING	
2ND LEVEL	**3RD LEVEL**
Are you sure?	**NO**
	Yes

1) **Factory Setting:** Selecting YES will reset all of the unit's settings back to their factory defaults.

6.6 Basic AV Extension

Point-to-Point Configuration and Operation

The most basic extension configuration available is a point-to-point system with a single unit in Transmitter Mode connected directly to a single unit in Receiver Mode. In this configuration the HDMI input on the Transmitter is transmitted to the connected Receiver without modification to the audio or video format. The analogue stereo audio port on the Transmitter functions as an input and transfers audio directly to the analogue stereo audio port on the Receiver for output. The LAN, USB, RS-232, and IR ports form direct connections between Transmitter and Receiver.
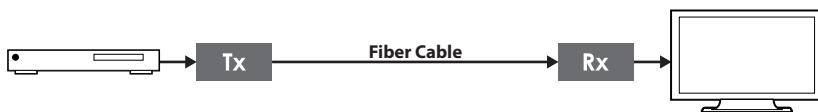
Note: No audio insertion/extraction is performed in this configuration.

7. CONNECTION DIAGRAM
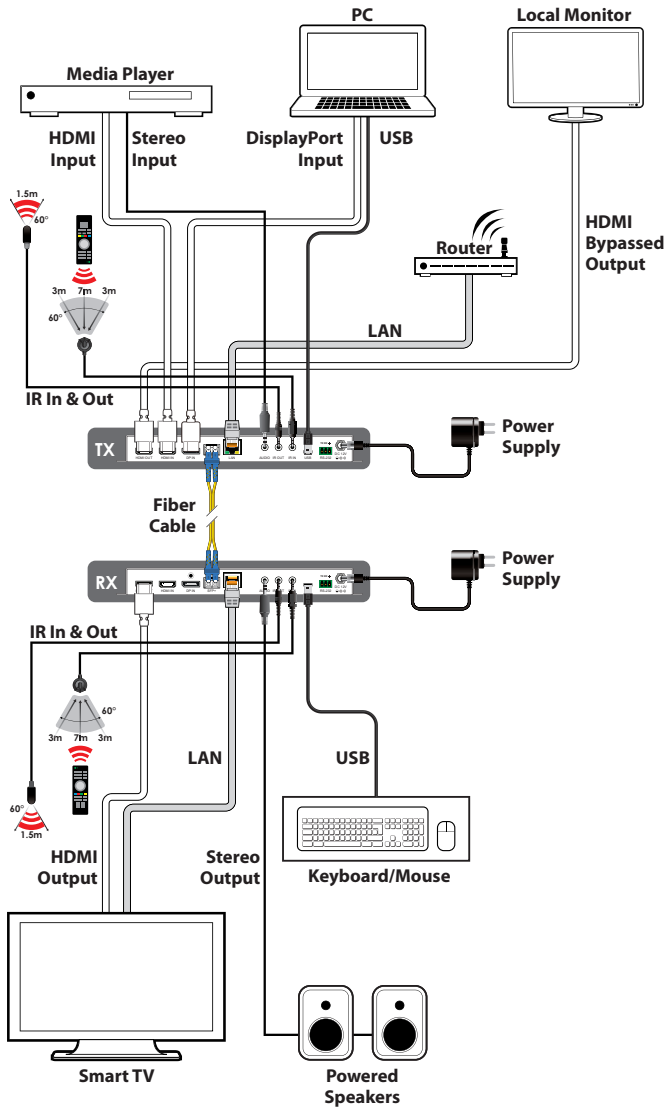
8. SPECIFICATIONS

8.1 Technical Specifications

HDMI Bandwidth	600MHz/18Gbps
Input Ports	1×HDMI 1×DisplayPort
Output Port	1×HDMI
Bidirectional Port	1×10GbE LAN (SFP+)
Pass-through Ports	1×Analogue Stereo (3.5mm) 1×IR Blaster (3.5mm) 1×IR Extender (3.5mm) 1×RS-232 (3-pin Terminal Block) 1×USB (Mini-B)
Pass-through/Control Port	1×LAN (RJ-45)
IR Frequency	30 – 50kHz (30 – 60kHz under ideal conditions)
Baud Rate	Up to 115200
Power Supply	12V/3A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection	Human Body Model: ±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions	231.5mm×25mm×158mm (W×H×D) [Case Only] 231.5mm×25mm×166.7mm (W×H×D) [All Inclusive]
Weight	916g
Chassis Material	Metal (Steel)
Silkscreen Colour	Black
Operating Temperature	0 ˚C – 40 ˚C/32 ˚F – 104 ˚F
Storage Temperature	-20 ˚C – 60 ˚C/-4 ˚F – 140 ˚F
Relative Humidity	20 – 90% RH (Non-condensing)
Power Consumption	23.408W

8.2 Video Specifications

Supported Resolutions (Hz)	Input		Output	10GbE
	HDMI	DP	HDMI	Fiber
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@60RB/60/75/85	✓	✓	✓	✓
1280×800p@60RB/60/75/85	✓	✓	✓	✓
1280×960p@60/85	✓	✓	✓	✓
1280×1024p@60/75/85	✓	✓	✓	✓
1360×768p@60	✓	✓	✓	✓
1366×768p@60RB/60	✓	✓	✓	✓
1400×1050p@60RB/60	✓	✓	✓	✓
1440×900p@60RB/60/75	✓	✓	✓	✓
1600×900p@60RB	✓	✓	✓	✓
1600×1200p@60	✓	✓	✓	✓
1680×1050p@60RB/60	✓	✓	✓	✓
1920×1080i@50/60	✓	✓	✓	✓
1920×1080p@24/25/30	✓	✓	✓	✓

Supported Resolutions (Hz)	Input		Output	10GbE
	HDMI	DP	HDMI	Fiber
1920×1080p@50/60	✓	✓	✓	✓
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@24/25/30, 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@24/25/30, HDR10	✓	✓	✓	✓
4096×2160p@50/60 (4:2:0), HDR10	✓	✓	✓	✓
4096×2160p@50/60	✓	✓	✓	✓

8.3 Audio Specifications

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

Analogue Input	
Max Audio Level	1Vrms
Impedance	10kΩ
Type	Unbalanced

Analogue Output	
Max Audio Level	1Vrms
THD+N	< −80dB@0dBFS 1kHz (A-wt)
SNR	> 80dB@0dBFS
Frequency Response	< ±1dB@20Hz~20kHz
Crosstalk	< −80dB@10kHz
Impedance	470Ω
Type	Unbalanced

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 Input	15m	10m	5m	3m
HDMI Output	15m	10m	5m	3m
DisplayPort Cable				
DisplayPort Input	15m	10m	2m	2m
Fiber Cable				
Multi-mode Fiber (OM3)	300m			
Multi-mode Fiber (OM4)	550m			
Single-mode Fiber	30km			

9. ACRONYMS

ACRONYM	COMPLETE TERM
10GbE	10 Gigabit Ethernet
ASCII	American Standard Code for Information Interchange
DHCP	Dynamic Host Configuration Protocol
DP	DisplayPort
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
GbE	Gigabit Ethernet
HD	High-Definition
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDR	High Dynamic Range
HDTV	High-Definition Television
IP	Internet Protocol
IR	Infrared
LAN	Local Area Network
LED	Light-Emitting Diode
LPCM	Linear Pulse-Code Modulation
OM	Optical Multi-mode
OSD	On-Screen Display
SNR	Signal-to-Noise Ratio
THD+N	Total Harmonic Distortion plus Noise
UHD	Ultra-High-Definition
USB	Universal Serial Bus
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)