CPLUS-21FRX

4K UHD+ HDMI over Fiber Receiver

Operation Manual

HIGH-DEFINITION MULTIMEDIA INTERFACE

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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
VS1	2018/06/21	Final technical review

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1. INTRODUCTION

This HDMI over Fiber Receiver is designed to extend your 4K UHD HDMI signal using a single segment of multi-mode optical fiber cable. Using fiber optical cable provides many advantages over traditional copper-based extension methods, including immunity to RF and magnetic interference, thinner and lighter cables, and much longer extension distances (up to 300 meters per segment). Multiple fiber Transceiver units can be placed between the Transmitter and Receiver to greatly extend the total extension distance via cascading (up to 300 additional meters per Transceiver) if the extra distance or flexibility is desired.

The HDMI input and output of this unit supports resolutions up to 4K@60Hz (4:4:4, 8-bit), 10/12-bit HDR, 16-bit Deep Color up to 1080p@60Hz, HD audio formats and other features defined by the HDMI 2.0 specification. The fiber input of this unit supports sources with bandwidth up to 10.2Gbps (4K@30Hz or 4K@60Hz, YUV 4:2:0). Six pre-defined internal EDIDs, one external EDID selection and two User uploaded EDIDs are available for EDID management. The unit provides intuitive front panel controls as well as RS-232, Telnet and WebGUI control options.

2. APPLICATIONS

- Entertainment Rooms & Home Theaters
- Showrooms & Demo Rooms
- Lecture Hall Presentations
- Public Commercial Displays

3. PACKAGE CONTENTS

- 1×HDMI over Fiber Receiver
- 1×5V/2.6A DC Power Adapter
- 1×3.5mm to 9-pin D-sub Adapter Cable
- 1×Shockproof Feet (Set of 4)
- 1×Operation Manual

4. SYSTEM REQUIREMENTS

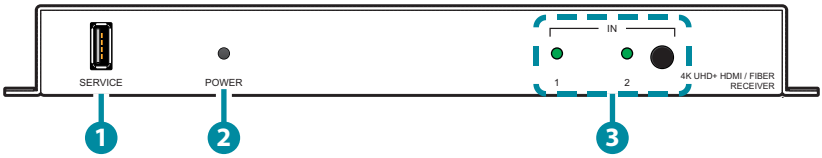
- HDMI source equipment such as a media player, video game console or set-top box.
- HDMI receiving equipment such as an HDTV, monitor or audio amplifier.
- The use of “Premium High Speed HDMI” cables is highly recommended.
- Use of the optical fiber input requires a compatible fiber Transmitter or Transceiver and appropriate paired LC multi-mode fiber in a crossover configuration.

5. FEATURES

- HDMI with 3D & 4K@60Hz with HDR support
- DVI 1.0 compliant with the use of an HDMI-DVI adaptor
- HDCP 2.2 and 1.x compliant
- 1 HDMI (18Gbps) input
- 1 Fiber (10.2Gbps, LC pair, multimode) input
- 1 HDMI (18Gbps) output
- Supports UHD resolutions up to 4K@60Hz (4:4:4, 8-bit)
- Supports 16-bit Deep Color up to 1080p@60Hz
- Supports pass-through of audio formats: LPCM 2.0/5.1/7.1, Bitstream, and HD Bitstream
- Comprehensive EDID management support including 6 pre-defined internal EDIDs, 1 external EDID, and 2 User uploaded EDIDs
- Compatible with the 3×2 HDMI and Fiber Matrix Transceiver (optional)
- Fiber transmission distances of up to 300 meters
- Supports control via front panel, WebGUI, Telnet, and RS-232

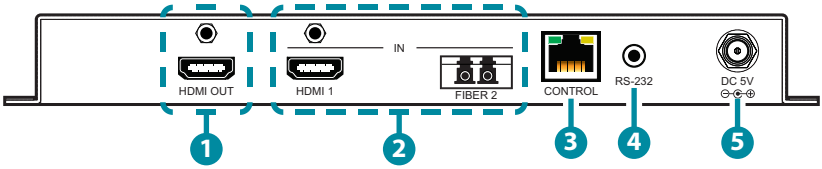
6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel



1. **SERVICE:** This slot is reserved for firmware update use only.
2. **POWER LED:** This LED will illuminate to indicate the unit is on and receiving power.
3. **IN Button & LEDs:** Press this button to sequentially switch through both inputs and mute. The LED will illuminate solid to indicate which source is currently selected. When both LEDs are blinking, the output is muted.

6.2 Rear Panel



1. **HDMI OUT:** Connect to an HDMI TV, monitor or amplifier for digital video and audio output.
2. **HDMI 1 & FIBER 2 IN:** Connect to HDMI source equipment such as a media player, game console or set-top box. Connect the fiber (paired LC) input to the fiber output from a compatible fiber Transmitter or Transceiver unit.
3. **CONTROL:** Connect directly, or through a network switch, to your PC/ laptop to control the unit via Telnet/WebGUI.
4. **RS-232:** Connect, via the provided 9-pin adapter cable, to a PC, laptop or other serial control device to send RS-232 commands to control the unit.
5. **DC 5V:** Plug the 5V DC power adapter into the unit and connect it to an AC wall outlet for power.

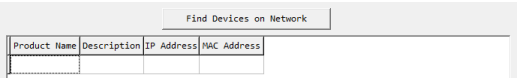
6.3 WebGUI Control

- **Device Discovery APP**

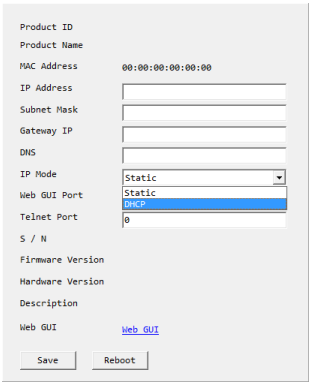
Please obtain the “Device Discovery” software from your authorized dealer and save it in a directory where you can easily find it.

Connect the unit and your PC/Laptop to the same active network and execute the “Device Discovery” software. Click on “Find Devices on Network” and a list of devices connected to the local network will show up indicating their current IP address.

Note: The unit’s default IP address is 192.168.1.50.



By clicking on one of the listed devices you will be presented with the network details of that particular device.

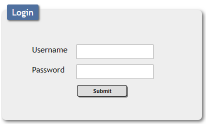


1) **IP Mode:** If you choose, you can alter the static IP network settings for the device, or switch the unit into DHCP mode to automatically obtain proper network settings from a local DHCP server. To switch to DHCP mode, please select DHCP from the IP mode drop-down, then click “Save” followed by “Reboot”.
2) **WebGUI Hotkey:** Once you are satisfied with the network settings, you may use them to connect via Telnet or WebGUI. The network information window provides a convenient link to launch the WebGUI directly.

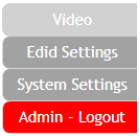
- **WebGUI Control Page**

After connecting to the WebGUI's address in a web browser, the login screen will appear. Please enter the appropriate user name and password then click "Submit" to log in.

Note: The default user name and password is "admin".



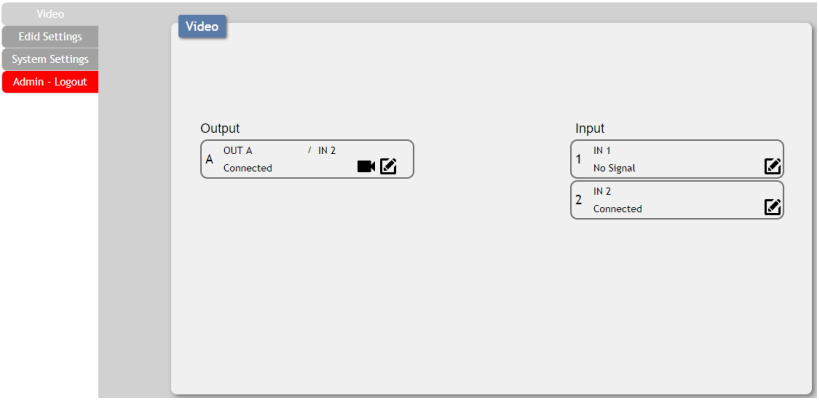
On the left side of the browser you will see the following menu tabs where all primary functions of the unit (Video, EDID Settings and System Settings) are controllable via the built in WebGUI. The individual functions will be introduced in the following sections.



Clicking the red "Logout" tab will automatically log the currently connected user out of the WebGUI and return to login page.

- **Video Tab**

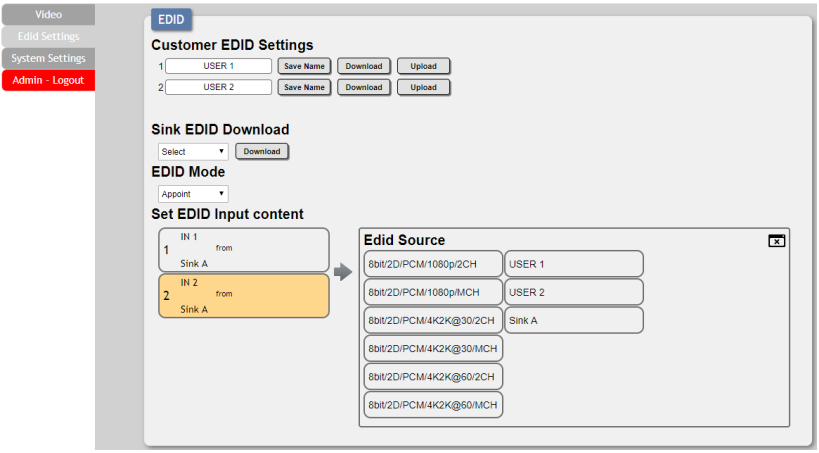
This tab provides video routing control as well as control over the HDCP behavior and naming of the HDMI Inputs and Output. To assign a new video route, please click the Output button and then click on the button of the preferred Input port to route. As you select each button they will change their color to orange. The new route will become active immediately and the routing information displayed on the buttons will change accordingly.



1) **Output:** Rename the Output by clicking on the edit icon to open the editing window then type in the preferred name for the output. Click on “Save” to confirm and activate any changes made to a name. Clicking on the camera icon will mute or unmute the output.
2) **Input:** Rename or modify the HDCP behavior of either Input by clicking on the appropriate edit icon to open the editing window. Click on “Save” to confirm and activate any changes made to a name. Changes made to the HDCP behavior are applied immediately.
   - **Apple Mode:** Completely disables HDCP support on the input.
   - **Follow In:** HDCP support follows the HDCP mode required by the connected source device.
   - **Follow Out:** HDCP support follows the HDCP mode supported by the connected sinks.

- **EDID Settings Tab**

This tab provides control over the EDID behavior of the unit. There are six internal EDIDs, two customer uploaded EDIDs, and one sink sourced EDID that can be assigned to each input port individually. The sink EDID and both Customer EDIDs are also available for download to the connected PC.



1) **Customer EDID Settings:** Manage the uploadable User EDID content.
   - **Save Name:** Type the preferred name for the User EDID in the space provided then click “Save Name” to confirm the change.
   - **Download:** Click to download and save the current User EDID as a file (*.bin) on the connected PC.
   - **Upload:** Click to upload a previously saved EDID file (*.bin) from the connected PC into the User EDID slot.
2) **Sink EDID Download:** Select and save the EDID from a connected display.
   - **Drop-down Menu:** Select the sink to read an EDID from for download.
   - **Download:** Click to download the EDID from the selected sink as a file (*.bin) to the connected PC.
3) **EDID Mode:** This dropdown controls how EDIDs are assigned to the unit’s Inputs.
   - **All:** Selecting this will allow the assignment of a single EDID to all Inputs simultaneously.

- **Appoint:** Selecting this allows for a different EDID to be assigned to each Input.

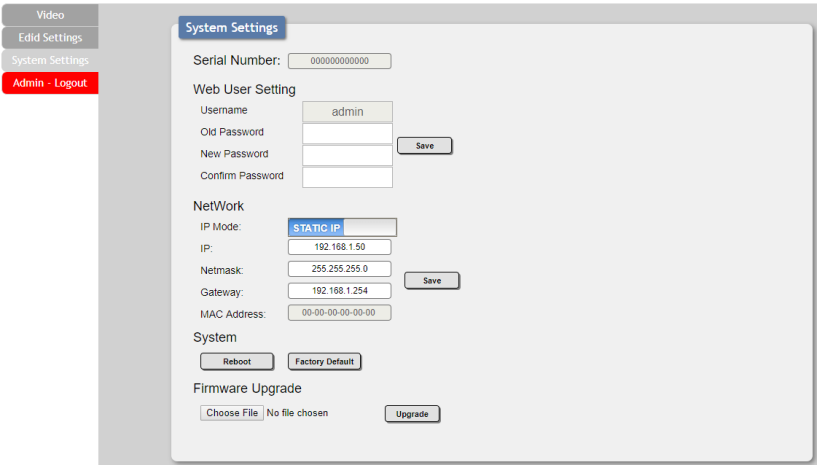
4) **Set EDID Input Content:** This section provides a way to set the EDID to use with the selected Input.
   - **IN 1:** Click this button to select the HDMI Input and open the EDID Source table for assigning an EDID.
   - **IN 2:** Click this button to select the Fiber Input and open the EDID Source table for assigning an EDID.
   - **EDID Source:** Click the EDID to assign to the selected Input. Once the EDID has been selected, the change will be occur immediately.

   The EDIDs available in the EDID Source table are:

EDID Source	EDID Content
8bit/2D/PCM/1080p/2CH	1080p@60Hz, LPCM 2.0
8bit/2D/PCM/1080p/MCH	1080p@60Hz, LPCM 7.1+Bitstream
8bit/2D/PCM/4K2K@30/2CH	4K@30Hz, LPCM 2.0
8bit/2D/PCM/4K2K@30/MCH	4K@30Hz, LPCM 7.1+Bitstream
8bit/2D/PCM/4K2K@60/2CH	4K@60Hz, LPCM 2.0
8bit/2D/PCM/4K2K@60/MCH	4K@60Hz, LPCM 7.1+Bitstream
USER 1	The currently uploaded Customer EDID
USER 2	The currently uploaded Customer EDID
SINK A	EDID from the device on Output A

- **System Settings Tab**

This tab provides access to control a number of system configuration controls including displaying the unit's serial number, modifying the web access privileges, changing the IP configuration, performing a factory reset, rebooting the system, and updating the firmware.



1) **Serial Number:** Displays the unit's serial number.
2) **Web User Setting:** This section provides A way to change the password for the Administrator account. Click on "Save" to confirm and activate any changes made to these settings.

   Note: The default password is "admin".
3) **Network:** The IP Address, Netmask and Gateway can be set manually, or DHCP can be enabled for automatic IP Configuration if your local network supports it. Click on "Save" to confirm and activate any changes made to these settings.

   Note: If the IP address is changed then the IP address required for WebGUI or Telnet access will also change accordingly.
4) **System**
   - **Reboot:** Click this button to reboot the unit.
   - **Factory Default:** Click this button to reset the unit to the factory default settings.
5) **Firmware Upgrade:** To update the unit's firmware, click the "Choose File" button to open the file selection window and then select the firmware

update file (*.bin format) located on your local PC. After selecting the file, click the “Upgrade” button to begin the firmware update process. Once the process completes the unit will automatically reboot.

6.4 RS-232 Control

Unit	
Pin	**Definition**
1	
2	TxD
3	RxD
4	
5	GND
6	
7	
8	
9	

Controlling PC	
Pin	**Definition**
1	
2	RxD
3	TxD
4	
5	GND
6	
7	
8	
9	

Serial Port Settings	
Baud Rate	115200
Data Bits	8
Parity Bit	None
Stop Bits	1
Flow Control	None

6.5 Telnet Control

Before attempting to use Telnet control, please ensure that both the unit and the PC are connected to the same active networks.

To Access the Command Line Interface (CLI)	
Windows 7	Click **Start**, type “cmd” in the search field, and press **Enter**.
Windows XP	Click **Start** > **Run**, type “cmd”, and press **Enter**.
Mac OS X	Click **Go** > **Applications** > **Utilities** > **Terminal**.

Once in the Command Line Interface (CLI) type “**telnet**” followed by the IP address of the unit (and the port number if it is non-standard) and then hit “Enter”. This will connect us to the unit we wish to control. Type “**help**” to list the available commands. See below for reference.

```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Adminstrator\telnet 192.168.1.50 23
```

Note: If the IP address is changed then the IP address required for Telnet access will also change accordingly.

6.6 RS-232 and Telnet Commands

COMMAND
Description and Parameters
HELP↵
Show all available commands.
?↵
Show all available commands.
SOURCEDET↵
Show all source information.
SINKINFO↵
Show all sink information.
OUT A N1↵
Select the input to route to the output, or mute the output completely. Available values for **N1**: 0 [Audio/video mute] 1 [HDMI input] 2 [Fiber input]
OUT ?↵
Show the current input/output routing.
HDCPIN N1 N2↵
Set the HDCP mode for input **N1**. **N1** = 1 ~ 2 [Input number] Available values for **N2**: 1 [Follow In] 2 [Follow Out] 3 [Apple Mode]
EDIDMODE N1↵

COMMAND
Description and Parameters
Set the EDID mode assignment mode. Available values for **N1**: 1 [All] 2 [Appoint]
EDIDALL N1↵
Set the EDID to use with all inputs in “All” mode. Available values for **N1**: 1 [FHD/2CH] 2 [FHD/MCH] 3 [4K UHD/2CH] 4 [4K UHD/MCH] 5 [4K UHD+/2CH] 6 [4K UHD+/MCH] 7 [User EDID 1] 8 [User EDID 2] 9 [SINK A]
EDIDALL ?↵
Show the current EDID selection for “All” mode.
EDIDIN N1 N2↵
Set the EDID to use on input **N1** in “Appoint” mode. **N1** = 1 ~ 2 [Input number] Available values for **N2**: 1 [FHD/2CH] 2 [FHD/MCH] 3 [4K UHD/2CH] 4 [4K UHD/MCH] 5 [4K UHD+/2CH] 6 [4K UHD+/MCH] 7 [User EDID 1]

COMMAND	
Description and Parameters	
8	[User EDID 2]
9	[SINK A]
EDIDIN ?↵	
Show the current EDID selection for each input in “Appoint” mode.	
INNAME N1 N2↵	
Set input **N1** to name **N2**.	
N1 = 1 ~ 2	[Input number]
N2 = {name}	[16 characters max]
INNAME ?↵	
Show the current input names.	
OUTNAME A N1↵	
Set the name of the output to **N1**.	
N1 = {name}	[16 characters max]
OUTNAME ?↵	
Show the current output name.	
EDIDNAME N1 N2↵	
Set the name of User EDID **N1** to **N2**.	
N1 = 7 ~ 8	[EDID number]
N2 = {name}	[16 characters max]
EDIDNAME ?↵	
Show the user current EDID names.	
IPCONFIG↵	
Show the current IP configuration.	
SETIP N1 N2 N3↵	

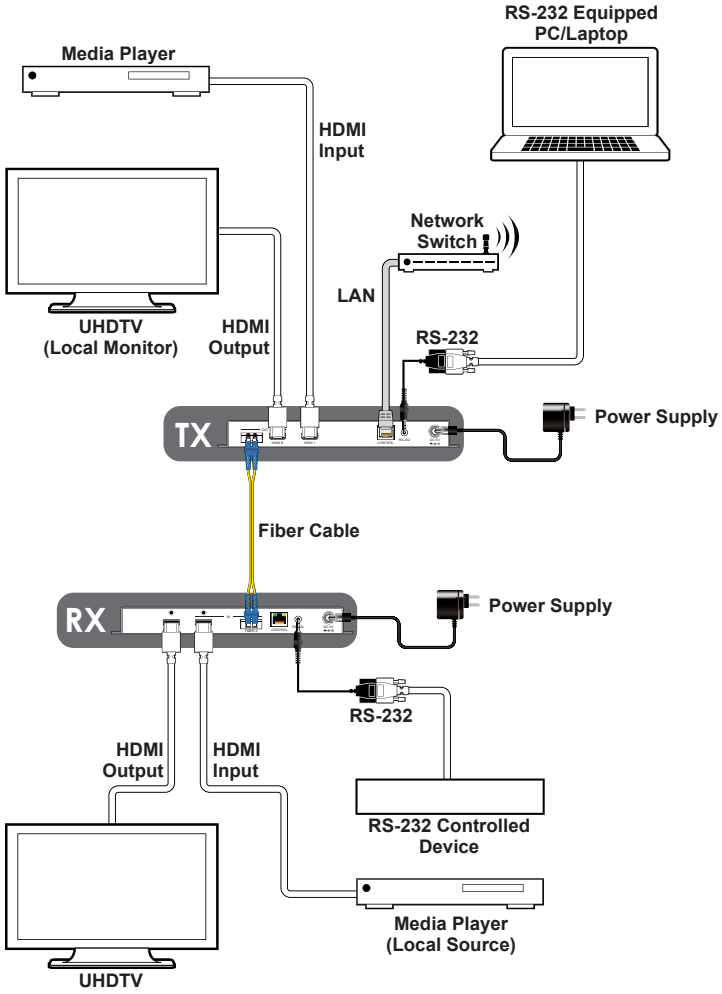
COMMAND
Description and Parameters
Set the static IP address, netmask, and gateway address for the unit with a single command. Disables DHCP. **N1** = X.X.X.X [X = 0 ~ 255, IP Address] **N2** = X.X.X.X [X = 0 ~ 255, Netmask] **N3** = X.X.X.X [X = 0 ~ 255, Gateway]
SIPADDR N1↵
Set the static IP address. Disables DHCP. **N1** = X.X.X.X [X = 0 ~ 255]
SNETMASK N1↵
Set the static Ethernet netmask. Disables DHCP. **N1** = X.X.X.X [X = 0 ~ 255]
SGATEWAY N1↵
Set the static Ethernet gateway address. Disables DHCP. **N1** = X.X.X.X [X = 0 ~ 255]
RSTIP↵
Reset the unit's Ethernet mode to use DHCP.
ECHO N1↵
Enable or disable echo when using the console connection. Available values for **N1**: 0 [Off] 1 [On]
ECHO ?↵
Show the current console echo state.
FADEFAULT↵
Reset the unit to the factory defaults.
VER↵

COMMAND
Description and Parameters
Show the unit's current firmware version.
REBOOT↵
Reboot the unit.
USBUPDATE↵
Put the unit into USB update mode.

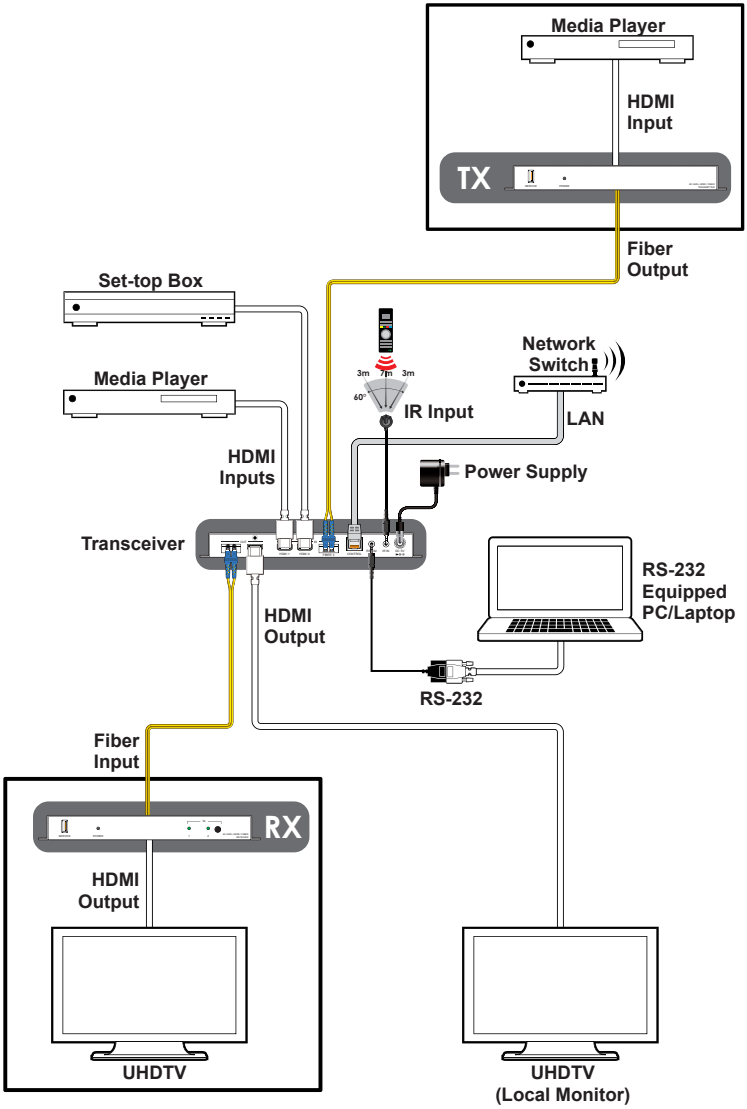
Note: Commands will not be executed unless followed by a carriage return. Commands are not case-sensitive.

7. CONNECTION DIAGRAM

7.1 Configuration 1



7.2 Configuration 2



8. SPECIFICATIONS

8.1 Technical Specifications

HDMI Bandwidth	600MHz/18Gbps
Fiber Bandwidth	340MHz/10.2Gbps
Input Ports	1×HDMI 1×Fiber (Paired LC)
Output Port	1×HDMI
Control Ports	1×RS-232 (3.5mm) 1×IP Control (RJ45)
Baud Rate	Up to 115200bps
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)	231.5mm×25mm×108mm [Case Only] 231.5mm×25mm×117mm [All Inclusive]
Weight	668g
Chassis Material	Metal
Silkscreen Color	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	6.58W

8.2 Video Specifications

Supported Resolutions (Hz)	HDMI		Fiber
	Input	Output	Input
640×480@60/72/75/85	✓		×
720×480p@60	✓		×
720×576p@50	✓		×
800×600@56/60/72/75/85	✓		✓
1024×768@60/75/85	✓		✓
1280×720p@50/60	✓		✓
1280×768@60/70/75/85	✓		✓
1280×800@60	✓		✓
1280×1024@60	✓		✓
1360×768@60	✓		✓
1600×1200@60	✓		✓
1920×1080i@50/60	✓		✓
1920×1080p@24/25/30	✓		✓
1920×1080p@50/60	✓		✓
1920×1200@60 (RB)	✓		✓
3840×2160@24/25/30	✓		✓
3840×2160@50/60	✓		×
3840×2160@50 (YUV 4:2:0)	✓		✓
3840×2160@60 (YUV 4:2:0)	✓		✓
4096×2160@24/25/30	✓		✓
4096×2160@50/60	✓		×
4096×2160@50 (YUV 4:2:0)	✓		✓
4096×2160@60 (YUV 4:2:0)	✓		✓

8.3 Cable Specifications

HDMI Cable Length	1080p		4K
	8-bit	12-bit	8-bit
Input	10m	10m	3m
Output	10m	10m	3m

Fiber Cable Length	4K
Multi-mode OM3	300m

9. ACRONYMS

ACRONYM	COMPLETE TERM
CLI	Command-Line Interface
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
GUI	Graphical User Interface
HD	High-Definition
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDR	High Dynamic Range
IP	Internet Protocol
LAN	Local Area Network
LPCM	Linear Pulse-Code Modulation
PC	Personal Computer
UHD	Ultra-High-Definition
UHDTV	Ultra-High-Definition Television
USB	Universal Serial Bus

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