adertech

EXT-FU4HAR-TR



HDMI 2.0 4K60 4:4:4
Fiber Optic Extender up to 10 km

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1. Introduction

EXT-FU4HAR-TR – is a HDMI 4K 4:4:4 extender over one core fiber optic cable. System supports point-to-point extension, featured bidirectional transmission for RS232 and IR ports. The extension range is up to 10 km. Extender supports the maximum signal resolution up to 4K@60 4:4:4 with 18Gbps video bandwidth. Transmitter equipped with HDMI loop throughout for local display connection and unbalanced stereo analog audio input for audio embedding. Transmitter has EDID management feature to provide maximum compatibility between different sources and display devices. When no HDMI source connected Transmitter acts as HDMI signal Generator with 1080@60 Black Field Pattern output. Receiver has equipped with unbalanced analog stereo out port for de-embedding audio signal from HDMI stream. Extender offers long-range extension of UHD video, audio and control signals using bidirectional SFP+ modules. The recommended type of fiber is Single Mode with simplex LC connectors. Transmitter and receiver units housed in the compact and robust metal cases and ensure protection and cooling the system components. Thanks to fixing plates both units could be easy mounted to walls or under desktop or any other surface.

2. Features

- HDMI 1.4/2.0, HDCP 1.4/2.2
- Support 18 Gbps video bandwidth
- Support signal video resolution up to 4K60 4:4:4
- Color space: RGB, YCbCr 4:4:4, 4:2:2, 4:2:0
- Extension distance up to 10 000 meters over SM fiber
- SFP+ modules with simplex LC connector
- EDID management and Black Field signal generator feature
- Local HDMI output and audio embedding on transmitter
- Audio de-embedding feature on receiver
- Two-way IR and RS232 extension
- Field firmware update option over USB
- Units are housed in compact cases with wall mount ability
- Power, Link and Data status indicators

3. Package Contents

1× EXT-FU4HAR-TX Transmitter Unit
1× EXT-FU4HAR-RX Receiver Unit
2× IR Receiver cable (1.5 meters)
2× IR Blaster cable (1.5 meters)
2× 3-pin Phoenix Connector
2× Power Supply 5V, 1A
1× User Manual

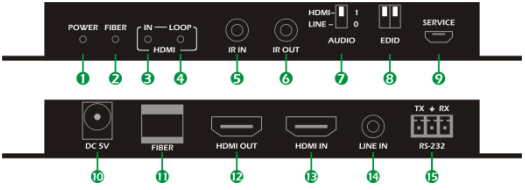
4. Warranty Information

ADERTECH warrants all units to be free from defects in workmanship and materials, under normal use and service, for a period of one (1) year from the date of purchasing from authorized reseller.
If a product does not work as it warranted during this period, ADERTECH will repair or replace the defective product or its part. Replacement products may be new or reconditioned.

Warranty ends if the product has been damaged due to abuse, misuse, neglect, accident, unusual physical or electrical stress, unauthorized modifications, tampering, alterations, or servicing other than by ADERTECH or its authorized centers, causes other than from ordinary use or failure to properly use the Product in the application for which said Product is intended.

5. Unit's interfaces

5.1 Transmitter Unit



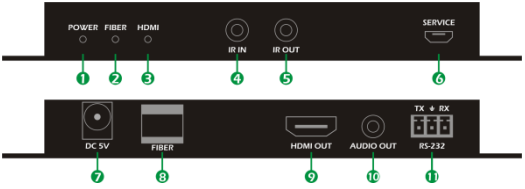
N	Type	Description
1	LED Red	Power Indicator, active when power is applied to the unit
2	LED Green	Fiber Indicator, active when optical link has established
3	LED Green	HDMI Input Indicator, active when source signal present
4	LED Green	HDMI Output Indicator, active when local display found
5	mJack 3.5mm Socket	IR Input Port – connect IR Receiver cable
6	mJack 3.5mm Socket	IR Output Port – connect IR Blaster cable
7	Audio Mode Switch	Select Audio Source - HDMI or Analog for embedding
8	EDID Switch	Select desired EDID mode
9	Micro USB Socket	Service Only - firmware update port
10	Power Socket	DC Power Connector, 5V, 1A – connect Power Supply
11	SFP Module Socket	SFP output - connect fiber optic cable to Receiver
12	HDMI Socket 19 pin	HDMI Local Output – connect to Display
13	HDMI Socket 19 pin	HDMI Input – connect to Source
14	mJack 3.5mm Socket	Unbalanced Stereo Audio Input – connect to Source
15	Phoenix 3-pin Socket	RS232 port – connect to control system or device

5.2 EDID Management

EDID emulator allows setting different modes for the source device. Use data from display connected to Transmitter or Receiver units, or use EDID data stored in the non-volatile memory. See the table below for details:

SW1	SW2	Description
0	0	Set native mode to 1080p@60, LPCM 2.0 Audio
0	1	Set native mode to 4K@60, LPCM 2.0 Audio
1	0	Copy EDID data from Transmitter Local Output
1	1	Copy EDID data from Receiver Remote Output

5.3 Receiver Unit



N	Type	Description
1	LED Red	Power Indicator, active when power is applied to the unit
2	LED Green	Fiber Indicator, active when optical link has established
3	LED Green	HDMI Output Indicator, active when local display found
4	mJack 3.5mm Socket	IR Input Port – connect IR Receiver cable
5	mJack 3.5mm Socket	IR Output Port – connect IR Blaster cable
6	Micro USB Socket	Service Only - firmware update port
7	Power Socket	DC Power Connector, 5V, 1A – connect Power Supply
8	SFP Module Socket	SFP input - connect fiber optic cable to Transmitter
9	HDMI Socket 19 pin	HDMI Output – connect to Display
10	mJack 3.5mm Socket	Unbalanced Stereo Audio Output – connect to Speakers
11	Phoenix 3-pin Socket	RS232 port – connect to control system or device

5.4 Audio Features

Embedding - the Transmitter unit allows to embed an analog stereo unbalanced signal into the HDMI stream by connecting an audio source to the Line In port on the Transmitter unit and set the Audio Mode Switch to the to lower (Line) position. In this case audio signal in the original HDMI stream will be replaced by the audio signal from analog input. The HDMI signal will be send to Local and Remote HDMI outputs. If no signal will be detected on HDMI In port the analog audio will be still transmitted and present on analog output and in the HDMI stream. In this case, the video signal on HDMI Out ports (Local and Remote) will be automatically scaled at 1080p@60 and show the Black Field Pattern.
De-Embedding – the signal received from the Transmitter will be sent to the Remote HDMI Out port of the Receiver unit, while the audio will be also de-embedded on the Audio Out port in unbalanced format.

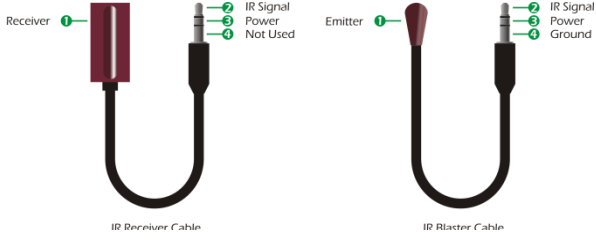
5.5 IR Extension Usage

Extender supports to send IR control data in both directions simultaneously. For example, this feature allows user to control a remote display device using its IR Remote control from the transmitter side – by sending IR data to receiver and at the same time - send IR control signals from the remote location to an HDMI source using its IR Remote control.

The supported IR range is 20 – 60KHz. The actual distance could vary depending on several IR parameters and environment conditions. The aiming of IR Remote is very important for distance. To achieve best results always point IR Remote to IR Receiver in between 45 to 90 degree angle, then the working distance will be about 5 to 8 meters in the line of sight.

5.6 IR Cables Pinout

We recommend use only IR cables from the set of the unit. The pinout of the mini Jack connector for IR cables may differ for different vendors. Always carefully check the connection of the peripheral equipment before powering the system.



6. Best Practice

ADERTECH engineers design products at the highest quality standards. To get the best results from our products, please read this manual carefully. We recommend using the best quality connectors, cables, and adapters. Consider the points below when you choose accessories and position equipment.

For best results with HDMI/DVI, use good quality cables up to 5 meters long for 4K and up to 15 meters for 1080p, or shorter if you are using any connection adapters. If you need to place your equipment more than 15 meters apart, we recommend using a signal extender. See ADERTECH Smart Extension product line of signal extenders to find correct one. Use only graded Speed HDMI cables. In industrial environments, use shielded CAT cables (STP, FTP, F/UTP or S/FTP) with digital extenders. To achieve best performance and maximum distance use appropriate fiber optical cable type cores (MM or SM) with optical extenders.

7. Safety Instructions

WARNING: To reduce the risk of fire or electric shock, do not expose this device to rain or moisture. Do not use this device near water. Clean only with a dry cloth.

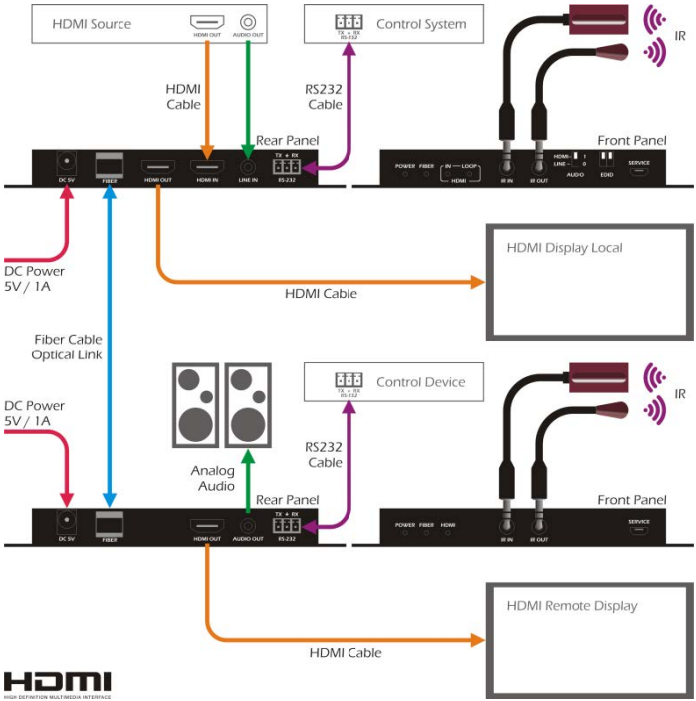
Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the device. This unit must be connected to an earthed mains socket outlet with the supplied cable. The AC wall outlet should be installed near to the unit and be easily accessible.

If using extenders which run a long distance, the protective earth circuit of the socket should be verified by a skilled person to ensure equipotential earth bonding. Do not use unit on objects or installations where power lines have grounding and/or different phase issues. Unplug units during lightning storms or when unused for long periods of time. Do not install unit near any heat sources such as radiators, heat registers, stoves, or devices (including amplifiers) that produce heat. Do not block any ventilation openings. This unit uses active cooling with fans. Do not install unit in dusty and/or dirty places. Use professional equipment racks with air condition and filters.

8. Specifications

SKU	EXT-FU4HAR-TR
Type	HDMI Fiber Optic Extender
HDMI Compliance	HDMI 1.4/2.0
HDCP Compliance	HDCP1.4/2.2
Resolutions supported	480i, 480p, 576i, 576p,720p,1080i,1080p, 3840x2160, 4096x2160
Color Scales, Subsampling	RGB, YUV, 4:2:0, 4:2:2, 4:4:4
Color Depth Resolution	8 , 10, 12-bit
HDMI Audio Formats	LPCM up to 7.1, Dolby Digital, Dolby TrueHD, Dolby Digital Plus, DTS, DTS-ES, DTS HD Master, DTS HD-HRA, DTS-X
RS232	Up to 115200 baud
IR Range	20 – 60KHz
Extension Link	Optical, SFP+, SFP-BL32TG-10DC
Fiber Optic Type	Single Mode Fiber, LC simplex connector
Transmission Distance	Up to 10 000 meters
ESD Protection	±8kV air-gap, ±4kV contact (human body model discharge)
Enclosure material	Metal
Finished colour	Black
Dimension	160x68x18mm
Weight (each unit)	0,16 kg
Operating Temperature	0°C ~ 40°C
Storage Temperature	-20°C ~ 60°C
Relative Humidity	20%~90% RH (non-condensing)
Transmitter	**EXT-FU4HAR-TX**
Video Input	HDMI up to 3840x2160@60Hz, 4:4:4, HDMI type A ,19-pin
Input Video Bandwidth	18Gbps
Video Output (Loop)	HDMI up to 3840x2160@60Hz, 4:4:4, HDMI type A ,19-pin
Audio Input	1x Analog Stereo Unbalanced, mJack 3,5 mm, stereo
RS232	1x Serial, Phoenix 3,81 mm, 3 -pin
IR Input	1x IR, mJack 3,5 mm, stereo
IR Output	1x IR, mJack 3,5 mm, stereo
Extension Link Output	1x Optical, SFP+ module
Power Supply	AC 110-240V, 50-60Hz / DC 5V,1A
Power Consumption	<3.85W
Receiver	**EXT-FU4HAR-RX**
Video Output	HDMI up to 3840x2160@60Hz, 4:4:4, HDMI type A ,19-pin
Output Video Bandwidth	18Gbps
Audio Output	1x Analog Stereo Unbalanced, mJack 3,5 mm, stereo
RS232	1x Serial, Phoenix 3,81 mm, 3-pin
IR Input	1x IR, mJack 3,5 mm, stereo
IR Output	1x IR, mJack 3,5 mm, stereo
Extension Link Input	1x Optical, SFP+ module
Power Supply	AC 110-240V, 50-60Hz / DC 5V,1A
Power Consumption	<2.7W

9. Connection Scheme Example



Note: to achieve maximum distance and signal resolution support it is recommended to use Single Mode Fiber Core Cables for Optical Link connection, at the same time for short distances the Multi Mode Fiber Core is also could be used, but actual distance and resolutions are not guaranteed.