User Manual

TL-FO2-VLC

HDMI 2.0 & Control over Two Fiber Optic Cable Extender

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Version: TL-FO2-VLC _191016

Preface

Read this user manual carefully before using this product. Pictures shown in this manual are for reference only; the actual product may vary.

This manual is only for operation instruction only and not for any maintenance or repair.

Trademarks

Product model and logo are trademarked. Any other trademarks mentioned in this manual are acknowledged as the properties of the trademark owner. No part of this publication may be copied or reproduced without prior written consent.

FCC Statement

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at their own expense will be required to take whatever measures may be necessary to correct the interference.

Any changes or modifications not expressly approved by the manufacture would void the user's authority to operate the equipment.

SAFETY PRECAUTIONS

To insure proper operation, please read all instructions carefully before using the device. Save this manual for further reference.

- Unpack the equipment carefully and save the original box and packing material for possible future shipment

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

- Do not dismantle the housing or modify the module. It may result in electrical shock or burn.

- Using supplies or parts not meeting the products' specifications may cause damage, deterioration or malfunction.

- Refer all servicing to qualified service personnel.

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

- Do not remove the housing of the device, as opening or removing housing may expose you to dangerous voltage or other hazards.

- Install the device in a place with adequate ventilation to avoid damage caused by overheating.

- Keep the device away from liquids.

- Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the device immediately.

- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.

- Unplug the power cord when left unused for a long period of time.

- If disposing of the unit, do not burn or mix with general household waste. The device must be disposed of per local regulations for electronic recycling.

Table of Contents

1. Introduction

1.1 Introduction to TL-FO2-VLC

The TechLogix TL-FO2-VLC is an HDMI extender set with HDCP 2.2 compatibility, which offers the distribution of compressed UHD video, audio, and either RS232 or IR up to 10km over fiber optic cable. In addition to 4K/60 video with multichannel audio, the TL-FO2-VLC supports HDR, RGB, and YCbCr 4:4:4 color spaces. When the video signal bandwidth exceeds 9 Gpbs, the video scaling processor will dynamically scale the content for a visually lossless viewing experience. The TL-FO2-VLC features bi-directional RS232 or IR ports for controlling of AV devices. Sources and displays can be controlled from either the transmitter or receiver end using either RS232 or IR signals. The TL-FO2-VLC supports multi-mode duplex fiber up to 300m/1000ft, which is immune to RF and EM interference.

The TL-FO2-VLC comes in two variations:

The TL-FO2-VLC-MM is compatible with multimode fiber (OM3/4/5) and has a distance limit of 300m (984').

The TL-FO2-VLC-SM is compatible with single mode fiber (OS2) and has a distance limit of of 10km (6.2 miles).

1.2 Features

- Transmit HDMI and control over fiber optic cabling
- Supports bi-directional IR or RS232 (selectable via dip switch)
- Supports full 18G 4K@60 4:4:4 8 bit HDMI
- Supports multichannel audio including 7.1 DTS Master HD and Dolby TrueHD
- HDMI 2.0, HDCP 2.2 and HDR compatible
- Requires duplex fiber (two strands) with LC connectors

1.3 Package Contents

- ➢ 1 x TL-FO2-VLC Transmitter
- ➢ 1 x TL-FO2-VLC Receiver
- ➢ 2x 10 Gbit/s SFP+ module
- ➢ 2 x Power Adapter (DC 12V 2A)
- ➢ 1 x IR Emitter Cables
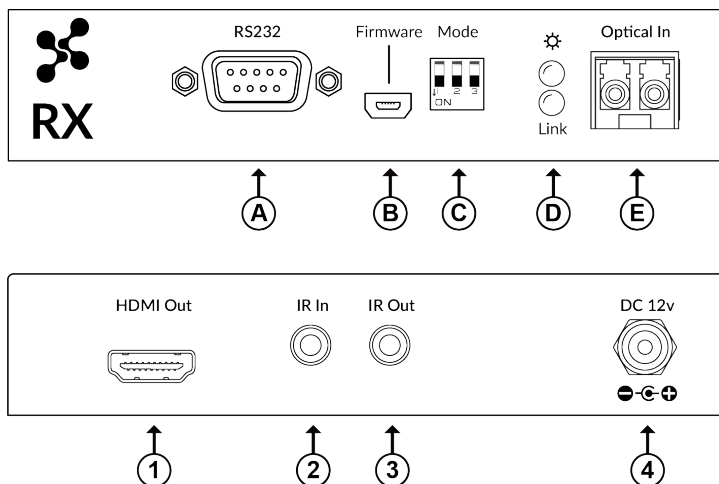- ➢ 1 x IR Broadband Receiver Cables

2. Panel Description

2.1 Transmitter
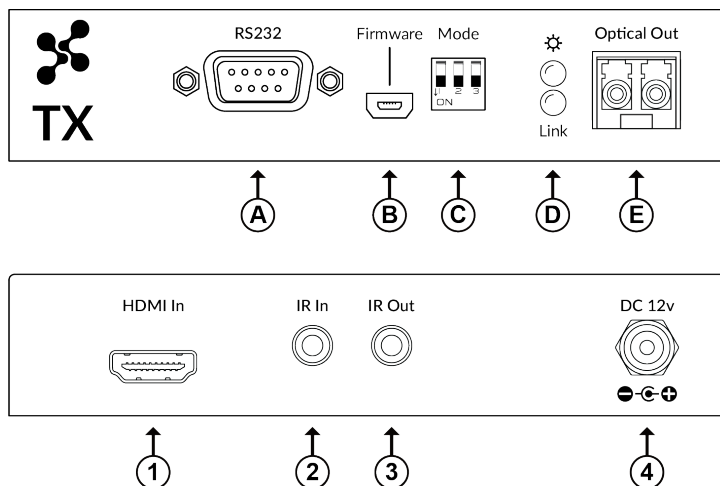
No.	Name	Description
A	RS232	RS232 control connector
B	Firmware	Mini-USB connection for firmware updates only
C	Mode	DIP switches for operation modes – see Sec
D	Power/Link Indicators	RED: Power LED Indicator GREEN: Fiber optic link indicator
E	Optical Output	SFP+ module port – insert SFP+ modules.
1	HDMI IN	Connect to an HDMI source
2	IR IN	Connects to a 5V IR receiver (with carrier); signals tranmitted to the remote receiver
3	IR OUT	Connects to a 5V IR emitter (with carrier); signals tranmitted from the remote receiver
4	12V DC	Connect to the power supply

📖 Pictures shown in this manual are only for reference.

2.2 Receiver

No.	Name	Description
A	RS232	RS232 control connector
B	Firmware	Mini-USB connection for firmware updates only
C	Mode	DIP switches for operation modes – see Sec. 4
D	Power/Link Indicators	RED: Power LED Indicator GREEN: Fiber optic link indicator
E	Optical Input	SFP+ module port – insert SFP+ modules.
1	HDMI Out	Connect to an HDMI Display
2	IR IN	Connects to a 5V IR receiver (with carrier); signals tranmitted to the remote receiver
3	IR OUT	Connects to a 5V IR emitter (with carrier); signals tranmitted from the remote receiver
4	12V DC	Connect to the power supply

📖 Pictures shown in this manual are only for reference.

3. System Connection

1. Using quality HDMI cables, connect an HDMI source (such as Blu-ray, games console, satellite/cable TV, media server etc.) to HDMI IN of the TL-FO2-VLC transmitter (TX).

2. Connect a good quality, well-terminated fiber cable between the OPTICAL OUT of the TL-FO2-VLC transmitter (TX) to the OPTICAL IN Input of the TL-FO2-VLC receiver (RX).

3. Connect the HDMI display device (LED/LCD display or projector) to the HDMI OUT of the TL-FO2-VLC receiver (RX).

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 TL-FO2-VLC transmitter (TX) and TL-FO2-VLC receiver (RX), and then insert IR Receivers into the IR IN ports of the TL-FO2-VLC transmitter (TX) and TL-FO2-VLC receiver (RX).

5. Connect the included 12V power supplies to the TL-FO2-VLC transmitter (TX) and TL-FO2-VLC receiver (RX).

Check Power, Status, and HDCP & 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.

4. Mode Selection

Both the transmitter and the receiver have [3] switches labeled as 'Mode'.   The position of each switch will effect the extenders in the manner explained in the following table:

Table 4-1

DIP Switch Position		Description
Switch #1	ON [↓]	Firmware update mode
	OFF [↑]	Normal
Switch #2	ON [↓]	Reserved
	OFF [↑]	RS232 / IR functions enabled
Switch #3	ON [↓]	Disable IR functions
	OFF [↑]	Enable IR Functions

5. RS232 Pinout

The TL-FO2-VLC allow bidirectional RS232 to pass between the Tx and Rx.   Signal pin assignments for both the transmitter and receiver are shown in the following table:
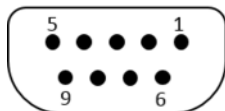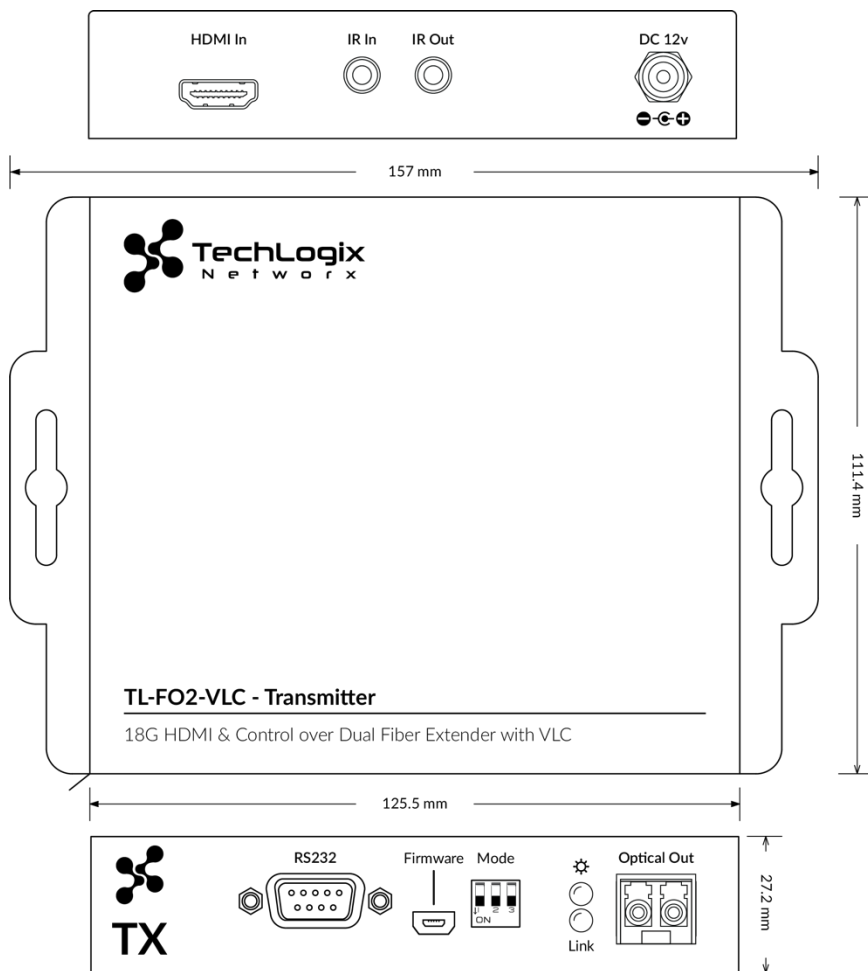
Pin2	TXD
Pin3	RXD
Pin5	Ground

6. Specification

Transmitter Input/Output	
HDMI Input	1 HDMI Receptacle – Type A Female
Optical Output	2 LC Ports via SFP+ Module
IR Input/Output	2 3.5mm TRS Ports
RS232	1 DE-9 Female Connector
12V DC	1 5.5mm OD/2.5mm ID Barrel Connector
Mode Selector	3 2-position Rocker DIP Switch
Receiver Input/Output	
HDMI Output	1 HDMI Receptacle – Type A Female
Optical Input	2 LC Ports via SFP+ Module
IR Input/Output	2 3.5mm TRS Ports
RS232	1 3-pin Removable Terminal Block
12V DC	1 5.5mm OD/2.5mm ID Threaded Barrel Connector
Control Selector	1 2-position Switch
Supported Audio, Video, and Control	
Compatible Video Signals	All SD, HD, and other resolutions up to
Video Compliance	HDMI 2.0, HDMI 1.4, DVI 2.0 (Pixel clock up to 600 MHz)
Digital Content Protection	HDCP 1.2 / HDCP 2.2 Compatible
Embedded Audio	LPCM, Dolby Digital/Plus/EX, Dolby True HD, DTS, DTS-EX, DTS-96/24,
Supported RS232 Baud Rates	2400, 4800, 9600, 19200, 38400, 57600, 115200
Supported IR Carrier	20 to 60 kHz

Fiber Optic Transmission Characteristics	
Required Cable Type	TL-FO2-VLC-MM: 2 strand OM3/4/5
	TL-FO2-VLC-SM: 2 strand OS2
Maximum Bandwidth	10 Gbps
Maximum Distance with Included SFP+ Modules	TL-FO2-VLC-MM: 300m (984 ft)
	TL-FO2-VLC-SM: 10km (32,808 ft)
Signal Compression	1.8:1 Maximum; Compression starts when video signal >9 Gbps
Chassis and Environmental	
Product Construction	Painted Steel
Product Dimensions (W*H*D)	157 mm (6.18 in) x 23 mm (0.91 in) x 112 mm (4.41in)
Operational Temperature	35 to + 44°C (95 to + 111 °F)
Environmental Operating Temperature	0 to + 45°C (32 to + 113 °F)
Environmental Operating Humidity	10% to 90%, non-condensing
Environmental Storage Temperature	-20 to +70°C (-4 to + 158 °F)
Environmental Storage Humidity	10% to 90%, non-condensing
Power and Regulatory	
Power Supply Inlet	IEC 60320/C8
Power Supply Input	100-240V AC at 50/60 Hz; 0.5A Max
Power Supply Output	12V DC at 2 A
Maximum Power Consumption	20 watts
ESD Protection	Human-body Model: ±8kV Air-gap discharge and ±4kV Contact discharge
Regulatory Compliance	UL/C-UL, C-Tick, TUV/GS, FCC, CE, RoHS, WEEE
Other	
Warranty	Three years
Diagnostic LEDs	Link and Power
Included Accessories	TL-FO2-VLC-MM: Receiver (1 ea), Transmitter (1 ea), 12V 2A DC Power Supply (2 ea), IR Receiver (1 ea), IR Transmitter (1ea), TL-10GSFPP-MM300 (2 ea)
	TL-FO2-VLC-SM: Receiver (1 ea), Transmitter (1 ea), 12V 2A DC Power Supply (2 ea), IR Receiver (1 ea), IR Transmitter (1ea), TL-10GSFPP-SM10K (2 ea)

7. Panel Drawing

7-1 Transmitter

HDMI Out   IR In   IR Out   DC 12v

157 mm

111.4 mm

TL-FO2-VLC - Receiver

18G HDMI & Control over Dual Fiber Extender with VLC

125.5 mm

RS232   Firmware   Mode   Optical In

27.2 mm

RX

ON   1 2 3

Link
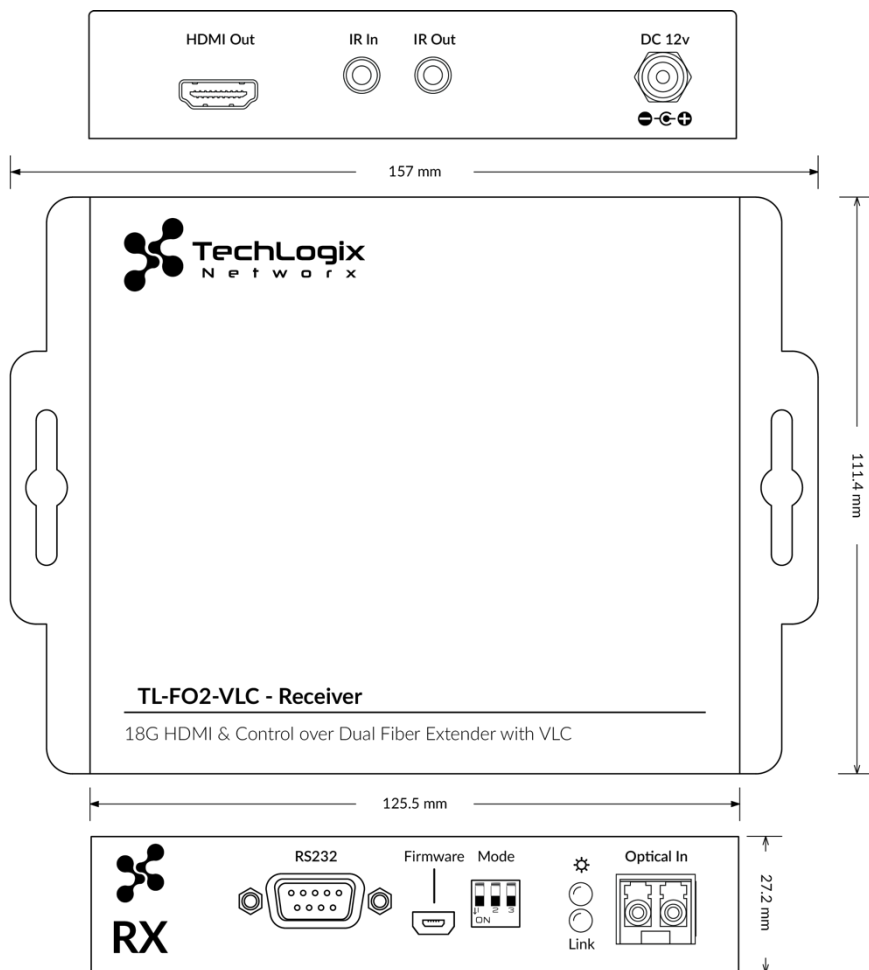
7-2 Receiver

8. Troubleshooting & Maintenance

- **No image on display:**
  - Ensure that the display device has been set to the correct input.
  - Ensure that the HDMI cables used for both the source/transmitter and the receiver/display are properly connected and are working. Test the HDMI cables directly from a source to display and ensure their operation.
  - Ensure that the fiber optic cable has not been damaged and that it has been terminated correctly on both ends. A temporary length of fiber optic cable can be used for testing to ensure that the devices are all compatible and working properly.
  - Ensure proper grounding of the power supply.
- **Color lost or poor picture quality:**
  - Ensure that the HDMI cables used for both the source and transmitter and the receiver and display are properly connected and are of good quality. Test the HDMI cables directly from a source to display and ensure their picture quality.
  - Ensure proper grounding of the power supply.
  - If the static becomes stronger or picture quality becomes worse when connecting the video connectors, this may be due to improper grounding.
  - Check the grounding and make sure all the components are properly grounded to a common ground. Improper grounding may cause damage to the receiver.

If your problem persists after following the above troubleshooting steps, please contact your authorized reseller or TechLogix technical support.

9. After-sales Service

1) **Product Limited Warranty:** We warrant that our products will be free from defects in materials and workmanship for **three years.**
2) **Warranty coverage may be voided when:**
   - The warranty period has expired
   - The factory applied serial number has been altered or removed from the product
   - There is damage, deterioration or malfunction caused by:
     - Atypical wear and tear
     - Use of supplies or parts not meeting the specifications
     - No certificate or invoice as the proof of warranty
     - Damage caused by force majeure
     - Non-authorized service
3) **Technical Support:** When contacting TechLogix support, please have the following information available:
   - Product part number
   - Installation and sale date
   - Detailed failure information