HDMI® EXTENDER
over Fiber with IR and RS-232

Vanco Part Number EVEXFBR1

HDMI® Extender over Fiber with IR and RS-232

EVOLUTION
BY VANCO
ADVANCING DIGITAL CONNECTIVITY

www.vanco1.com • 800.626.6445

DEAR CUSTOMER

Thank you for purchasing this product.
For optimum performance and safety, please
read these instructions carefully before connecting, operating or
adjusting this product. Please keep this manual for future reference.

This product is 100% inspected and tested in the United States to verify
HDMI performance parameters.

WARNING

1. Do not expose this unit to water, moisture, or excessive humidity.

2. Do not install or place this unit in a built-in cabinet, or other confined space without adequate ventilation.

3. To prevent risk of electrical shock or fire hazard, due to overheating do not obstruct unit's ventilation openings.

4. Do not install near any source of heat, including other units that may produce heat.

5. Do not place unit near flames.

6. Only clean unit with a dry cloth.

7. Unplug unit during lightening storms or when not used for an extended period of time. A surge protector is strongly recommended.

8. Protect the power cord from being walked on or pinched, particularly at the plugs.

9. Use unit only with accessories specified by the manufacturer.

10. Refer all servicing to qualified personnel.

CAUTION

HDMI is a very complex technology requiring continuous authentication of the signal and the same video resolution and audio settings on all electronic equipment in the system. When there are multiple sources and displays, the video resolution and audio setting on all connected units must be adjusted to correspond with that of the display having the lowest video and audio capability.

INTRODUCTION

The Evolution by Vanco EVEXFBR1 HDMI Extender with bi-directional IR and RS-232, extends 4K HDR video and audio signals up to 984ft/300M over multi-mode fiber optic cables, and 6.2mi/10km over single mode fiber optic cables and modules! Bi-directional IR pass-through allows for source and/or display control. Also features RS-232 pass-through for additional control. For extending HDMI with 4K HDR resolution at an extreme distance, the EVEXFBR1 is a great solution for any application.

The EVEXFBR1 includes two units: transmitting unit (EVEXFBR1-TX) and receiving unit (EVEXFBR1-RX). The transmitting unit is used to capture the HDMI input with control signals and carries the signals via fiber optic cables. The receiving unit is responsible for equalizing the transmitted HDMI signal and reconstructing IR signals. Both units require power.

HDMI® Extender over Fiber with IR and RS-232
Part # EVEXFBR1

- Transmits audio and video via HDMI as well as bi-directional IR and RS-232
- Transmission range: 984ft/300m over duplex multi-mode fiber optic cables; 6.2mi/10km over duplex single mode fiber optic cables
- Supports 4K@60Hz, 4:2:0 chroma sampling and HDR; 4K@60Hz and 4:4:4 chroma sampling
- Supports HDR10 and Dolby Vision
- Features bi-directional IR (20kHz to 60kHz) pass-through for source and/or display control
- RS-232 pass-through
- Supports HDCP2.2
- Multi-mode SFP modules included
- Dimensions: 4.9" W x 4.4" H x 1.1" D

PACKAGE CONTENTS

- EVEXFBR1 (TX & RX)
- (1) IR Transmitter
- (1) IR Receiver
- (2) DC 12V Power Supply
- (2) Multi-mode SFP Modules
- (4) Mounting Screws
- Product Manual

SPECIFICATIONS

HDMI Compliance .... HDMI 2.0a

HDCP Compliance .... HDCP 2.2

Video Bandwidth .... Single-link 594MHz [18Gbps]

Video Support .... HDR 4K@60Hz [4:2:0 10-bit color] / 4K@60Hz [4:4:4 8-bit color]

HDMI over UTP.. Yes

Audio Support .... Surround sound [up to 7.1ch] or stereo digital audio

Input TMDS Signal .... 1.2 Volts [peak-to-peak]

Input DDC Signal .... 5 Volts [peak-to-peak, TTL]

ESD Protection .... Human body model — ±15kV [air-gap discharge] & ±8kV [contact discharge]

PCB Stack-up .... 4-layer board [impedance control — differential 100Ω; single 50Ω]

IR Pass-thru... Bi-directional

RS-232 Support .... Yes

HDMI Source Control .... Controllable via IR pass-through from RX to TX with IR extenders

HDMI Connector .... Type A [19-pin female]

3.5mm Connector.. IR receiver / IR blaster

Operation Temperature.. 0~40°C [32~104°F]

Storage Temperature .... -20~60°C [-4~140°F]

Relative Humidity .... 20~90% RH [no condensation]

Power Supply 12V, 2A

Power Consumption .... Max 10W

Fiber Optic Specifications

Cable Type	Connector	Rating	Core/Cladding	Transmission Distance (10GB)	Optical Fiber Module
Multi Mode, Duplex	LC	OM1	62.5/125 µm	32m	10GBASE-SR SFP+ Transceiver Module, Multimode, 850nm, 300m reach
	LC	OM2	50/125 µm	82m	
	LC	OM3-OM5	50/125 µm	300m*	
Single Mode, Duplex	LC	OS1	9/125 µm	2km	10GBASE-LR SFP+ Transceiver Module, Single Mode, 1310nm, 10km reach
	LC	OS2	9/125 µm	5-10km*	
*= Dependent on manufactuerer ratings and specifications					

FIBER CABLE & MODULE SPECIFICATIONS

Multi-Mode Cabling

Duplex, LC Connector

Cable Type	Color of Cable	Core/Cladding	850nm VCSEL Transmission Distance (10GB)
OM1	Orange	62.5/125 μm	32m
OM2	Orange	50/125 μm	82m
OM3	Blue	50/125 μm	300m
OM4	Blue	50/125 μm	300m*
OM5	Green	50/125 μm	300m*
*= Provided fiber modules is rated for a maximum distance of 300m. Cable capabilities may exceed this limit			

Single Mode Cabling

Duplex, LC Connector

Cable Type	Color of Cable	Core/Cladding	1310nm VCSEL Transmission Distance (10GB)
OS1	Yellow	9/125 μm	2km
OS2	Yellow	9/125 μm	5-10km*
*= Dependent on manufacturer ratings and specifications			

Multi-Mode Module

10GBASE-SR SFP+ Transceiver Module, Multimode, 850nm, 300m Reach

Multi-Mode Cabling

10GBASE-LR SFP+ Transceiver Module, Single mode, 1310nm, 10km Reach
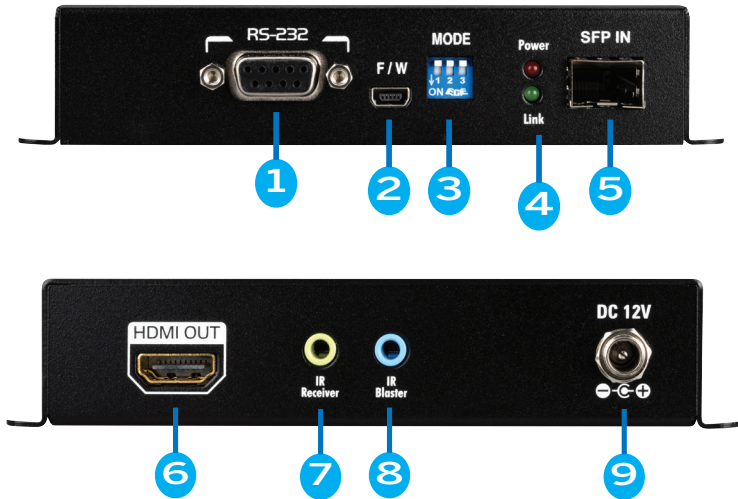
PANEL DESCRIPTIONS

Transmitting Unit
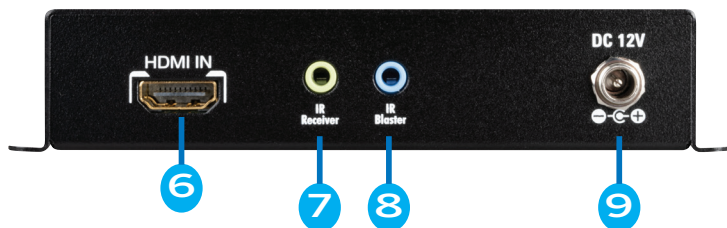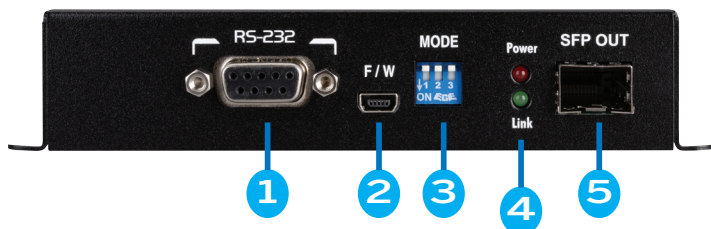
1. RS-232: Connect for control via PC or third party control system
2. Firmware Update Port: any available f/w updates will be available under the EVEXFBR1 product page on www.vanco1.com
3. DIP Switch for Control: Enable or disable bi-directional IR and/or RS-232; see "Control Type Setup" section
4. Power and Link lights: Both LEDs should be illuminated for proper functionality, link indicates that both the TX and RX are communicating
5. SFP OUT: Connect fiber optical cables from this unit to the RX (multimode modules included)
6. HDMI IN: Connect an HDMI source
7. IR IN: Connect the included IR Receiver (RX) to control the display
8. IR OUT: Connect the included IR Transmitter (TX) to control the source
9. DC 12V: Connect the included 12V Power Supply (both TX and RX need to be plugged into power)

PANEL DESCRIPTIONS

Receiving Unit

1. RS-232: Connect for control via PC or third party control system

2. Firmware Update Port: Any available f/w updates will be available under the EVEXFBR1 product page on www.vanco1.com

3. DIP Switch for Control: Enable or disable bi-directional IR and/or RS-232; see "Control Type Setup" section

4. Power and Link Lights: Both LEDs should be illuminated for proper functionality, link indicates that both the TX and RX are communicating

5. SFP IN: Connect multimode fiber optical cables from this unit to the TX (multimode modules included)

6. HDMI OUT: Connect an HDMI display

7. IR IN: Connect the included IR Receiver (RX) to control the source

8. IR OUT: Connect the included IR Transmitter (TX) to control the display

9. DC 12V: Connect the included 12V Power Supply (both TX and RX need to be plugged into power)

CONTROL TYPE SET UP

Passing through IR and/or RS-232 Signals

The EVEXFBR1 can pass-through bi-directional IR and RS-232, both control types can be deactivated. Note that both controls are activated by default. See the below table (PIN #2 and #3). The dip switches allow for firmware updates and to either activate or de-activate IR as well (PIN #1)

See below for dip switch settings, note that DOWN is ON and both TX and RX need to be set to the same dip switch settings.

DIP Switch Position			Description
TX & RX			
PIN #1	ON	↓	For system firmware update
	OFF	↑	Default and normal setting
PIN #2	ON	↓	Reserved for future use
	OFF	↑	RS-232/IR function ON
PIN #3	ON	↓	Disable IR function
	OFF	↑	Enable IR function

CONNECTION DIAGRAM
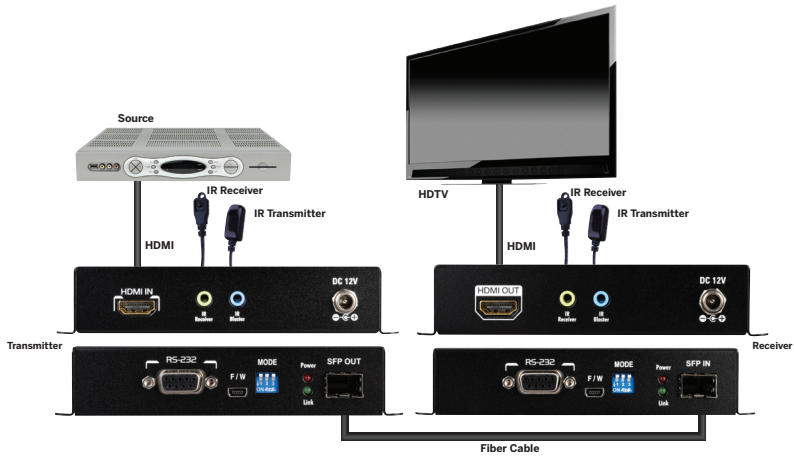
CONNECT AND OPERATE

1. Connect a source such as a Blu-Ray Player, game console, A/V Receiver, Cable or Satellite Receiver, etc. to the HDMI input on the transmitting unit

2. Connect a display such as an HDTV or HD Projector to the HDMI output on the receiving unit

3. Connect fiber optical cables with modules and insert into the output of the Transmitting unit, and the other end to the SFP input of the Receiving unit

4. For power, plug in both the transmitting unit and receiving unit with the included power supplies

5. Power on each device in the same sequence (receiver and transmitter will already be powered when either unit is plugged in)

At this point the display connected should display the source signal connected to the extender set. If no signal is being displayed, connect a fiber optical cable to rule out cabling. If a display is having difficulty receiving a signal, access the display's menu and adjust the resolution (lowest to highest until signal is displayed). A 24 Hz vertical refresh rate may work better than 60 Hz or higher. Use the source remote at the receiver blaster to test IR functionality. If the IR remote function is not responding, check the blasters to ensure they are placed correctly and are plugged into the correct IR jacks on the Extender set receiving and transmitting units.

IR PASS-THRU

IR PASS-THROUGH

The bi-directional IR system allows you to control the source that is connected to the extender unit, from the display; or the display from the source, not simultaneously. There are two important things to note when setting up the IR system:

1. The IR Receiver (IR RX) is always what you point your remote at to send an IR signal. This pigtail is placed at the display for controlling the source; or at the source for controlling the display.

2. The IR Blaster (IR TX) is what sends the IR signal to what you are intending to control, whether it's the source or the display. This pigtail is placed at the source; either pointed at the source, or placed on the front panel of the source, see below for placement tips. Or placed at the display to control the display from the source.

3. Use only the IR accessories that are included with this extender, using third party IR blasters and/or receivers may not work

IR Receiver   IR Blaster

IR Blaster (TX)

- To control the source: Plug IR Blaster into IR TX port of transmitter unit (EVEXFBR1-TX); place blaster in front of the IR eye of the source

- To control the display: Plug IR Blaster into IR TX port of receiver unit (EVEXFBR1-RX); place blaster in front of the IR eye of the display

Note: Placement of the IR Blaster is important and can result in the IR system not working if improperly placed.

- First, locate the IR eye or window on the source

- If placing the IR Blaster right on the front panel of the source, do not stick right on top of the IR eye or IR window. The IR signal cannot travel through the double-sided tape on the blaster. Instead place the blaster on either side, or on the top or bottom of the IR eye or window, with the tip of the blaster facing the IR eye or window. See below for illustration of where IR signal shoots from on IR Blaster:

INCORRECT IR BLASTER PLACEMENT

IR window/eye

CORRECT IR BLASTER PLACEMENT

IR window/eye

IR RECEIVER (RX)

- To control the source: Plug IR Receiver into IR RX port of receiver unit (EVEXFBR1-RX); place receiver at or near display

- To control the display: Plug IR Receiver into IR RX port of transmitter unit (EVEXFBR1-TX); place receiver in position where it is able to receive remote signals

To Control the Source:

1. Plug the IR Blaster into the IR TX Port on the Transmitter; place transmitter in front of the IR eye of the source

2. Plug the IR Receiver into the IR RX Port on the Receiver; place receiver at or near display

To Control the Display:

1. Plug the IR Receiver into the IR Receiver Port on the Transmitter; place receiver in position where it is able to receive remote signals

2. Plug the IR Blaster into the IR Blaster port on the Receiver; place transmitter in front of the IR eye of the display

NOTICE

1. Vanco HDMI cables are strongly recommended for use with this product to ensure best results

2. Incorrect placement of IR Transmitter and Receiver may result in the failure of the IR extenders. Please check carefully before plugging in the IR extender to the respective IR sockets

3. The transmission length is largely affected by the type of fiber optical cables utilized, the type of HDMI sources, and the type of HDMI display

4. Ensure proper termination of the fiber optical cables, and if the cables are joined at some point, that it has been properly completed

5. The quality of fiber optical cables can have a major effect on how long the transmission limit can achieve and quality of picture, the actual transmission range is subject to the fiber optical cable utilized. For the best results, duplex single mode fiber optical cabling is recommended

6. If your HDMI display has multiple HDMI inputs, it is found that the first HDMI input [HDMI input #1] generally can produce better transmission performance among all HDMI inputs

TROUBLE-SHOOTING

1. Best results are usually achieved when the source and display resolutions are the same. If resolutions differ, the extenders will try to adjust the signal to match the resolution of the HDTV with the lowest resolution. This will result in a picture with a lower resolution on the other HDTV sets.

2. If you do not get audio and video, access the "setup" menu on the TV to adjust the audio and video settings. If the HDMI control circuit cannot establish a handshake, then there usually will be no audio or video in addition to a blue or black screen with a statement similar to "this protocol not supported" or "weak signal".

3. If the above mentioned messages display, reset the receiver by disconnecting the power supply. You can also disconnect all of the HDMI and power cables, wait 15 minutes for any voltages to decay and then reconnect all of the cables.

4. If you are still encountering issues, attempt the "hot-plug concept. With all of the HDMI cables disconnected, turn on the source and plug in the HDMI cable into it's output, then power up the Vanco unit and plug the HDMI cable into it's input, finally turn on the display and plug the HDMI cable from the receiver into it. This activates all of the devices in corresponding order and results in a signal being plugged into a device that is on and will attempt to connect the signal.

5. Most of the major source and display manufacturers employ a proprietary control channel to communicate between devices from the same manufacturer. Sometimes this can interfere with the HDMI control circuit or the authentication of the signal. Call the manufacturer if you experience this issue. Sometimes a player, an audio/video receiver, or a cable/satellite box may not have the latest software update, usually this can be downloaded from the manufacturer's website.

6. If you have problems with the IR control circuit, make sure that the IR RX pigtail is plugged into extender receiver and pointed at the display, and the IR TX pigtail is attached to the extender sender and pointed at the source.

SAFETY AND NOTICE

The EVEXFBR1 has been tested for conformance to safety regulations and requirements, and has been certified for EVEXFBR1 should be used with care. Please read and follow the safety instructions to protect yourself from possible injury and to minimize the risk of damage to the unit.

- Follow all instructions and warnings marked on this unit

- Do not attempt to service this unit yourself, except where explained in this manual

- Provide proper ventilation and air circulation and do not use near water

- Keep objects that might damage the device and assure that the placement of this unit is on a stable surface

- Use only the power adapter and power cords and connection cables designed for this unit

- Do not use liquid or aerosol cleaners to clean this unit

- Always unplug the power to the device before cleaning

LIMITED WARRANTY

With the exceptions noted in the next paragraph, Vanco warrants to the original purchaser that the equipment it manufactures or sells will be free from defects in materials and workmanship for a period of two years from the date of purchase. Should this product, in Vanco's opinion, prove defective within this warranty period, Vanco, at its option, will repair or replace this product without charge. Any defective parts replaced become the property of Vanco. This warranty does not apply to those products which have been damaged due to accident, unauthorized alterations, improper repair, modifications, inadequate maintenance and care, or use in any manner for which the product was not originally intended.

Items integrated into Vanco products that are made by other manufacturers, notably computer hard drives and liquid crystal display panels, are limited to the term of the warranty offered by the respective manufacturers. Such specific warranties are available upon request to Vanco. A surge protector, power conditioner unit, or an uninterruptible power supply must be installed in the electrical circuit to protect against power surges.

If repairs are needed during the warranty period the purchaser will be required to provide a sales receipt/sales invoice or other acceptable proof of purchase to the seller of this equipment. The seller will then contact Vanco regarding warranty repair or replacement.

TECHNICAL SUPPORT

In case of problems, please contact Vanco Technical Support by dialing 1-800-626-6445. You can also email technical support issues to techsupport@vanco1.com.

When calling, please have the Model Number, Serial Number (affixed to the bottom of the unit) and Invoice available for reference during the call.

Please read this Instruction Manual prior to calling or installing this unit, since it will familiarize you with the capabilities of this product and its proper installation.

All active electronic products are 100% inspected and tested to insure highest product quality and trouble-free installation and operation. The testing process utilizes the types of high-definition sources and displays typically installed for entertainment and home theater applications.

For additional information, such as helpful installation videos, etc. please visit www.vanco1.com

LIABILITY STATEMENT

Every effort has been made to ensure that this product is free of defects. The manufacturer of this product cannot be held liable for the use of this hardware or any direct or indirect consequential damages arising from its use. It is the responsibility of the user and installer of the hardware to check that it is suitable for their requirements and that it is installed correctly. All rights are reserved. No parts of this manual may be reproduced or transmitted by any form or means electronic or mechanical, including photocopying, recording or by any information storage or retrieval system without the written consent of the publisher.

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