

4K HDMI® EXTENDER

over Single Coax Cable
with Bi-directional IR



**Vanco Part Number
EV4K2004**

**4K HDMI® Extender
over Single
Coax Cable with
Bi-directional IR**

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.

FEATURES

INTRODUCTION

The Evolution by Vanco EV4K2004 HDMI Extender can send and receive 4K resolutions over single RG6 coaxial cable with Bi-directional IR. Capable of extending 4K@60Hz up to a distance of up to 330ft/100m and 4K@60Hz with HDR10 High Dynamic Range up to 230ft/70m. The EV4K2004 also features bi-directional IR, which allows for control of the source or display. Also features dynamic EDID management, which allows and encourages source and display "handshake" for seamless integration. Compact design with mounting ears included, for an easy and flexible installation. Can't run a Cat6 cable to a location? No problem, the EV4K2006 is a great solution for applications which already have an existing RG6 coaxial cable in place.

The EV4K2004 includes two units: transmitting unit (EV4K2004-TX) and receiving unit (EV4K2004- RX). The transmitting unit is used to capture the HDMI input with IR signals and carries the signals via one RG6 coaxial cable. The receiving unit is responsible for equalizing the transmitted HDMI signal and reconstructing IR and control signals. The EV4K2004 offers the most convenient solution for HDMI extension over a single coaxial cable with long distance capability, and provides a solution in applications where additional cables cannot be installed.

*Installation Note: RG6 coaxial cable must be used, RG59 and mini coax will not work with this product; coaxial connections must be BNC and home-run cable strongly recommended.

4K HDMI® over Single Coax Cable with Bi-Directional IR

Part # EV4K2004

- Allows HDMI audio/video signals to be transmitted using a single coaxial cable
- Supports up to 4K@60Hz, 4:4:4 chroma subsampling, 8bits and HDR10
- Transmission range: Extends 4K@60Hz up to 330ft (100m); 4K@60Hz and HDR10 up to 230ft (70m) over a single RG6 coaxial cable
- HDMI 2.0 and HDCP 2.2/1.4 compliant
- Uncompressed 2CH digital HDMI over coaxial cable transmission
- Audio sample rate supports 32KHz, 44.1KHz, 48KHz
- Auto signal equalization and dynamic EDID
- Supports full frequency IR signal from 20KHz to 60KHz
- Bi-directional IR pass-through for source and/or display control
- Compact and wall mounting housing design for easy and robust installation
- Dimensions: 3.5" x 3.7" x 1"

PACKAGE CONTENTS

- EV4K2004 (TX & RX)
- (1) IR Blaster (TX)
- (1) IR Receiver (RX)
- Mounting Hardware
- (2) DC 5V, 2A Power Supplies
- Product Manual

SPECIFICATIONS

TECHNICAL SPECS

HDMI Compliance	HDMI Deep Color 30/36/48 bit color depth, Full 3D
HDCP Compliance	Yes
Video Bandwidth	594 MHz
Video Support	480i/480p/720p/1080i/1080p/4Kx2K @60
Audio Support	Surround Sound (up to 7.1 ch) or stereo digital audio
Input TMDS Signal	1.2 Volts (peak to peak)
Input DDC Signal	5 Volts (peak to peak, TTL)
ESD protection	(1) Human body model +/- 6kV (air-gap discharge) & (contact discharge) (2) Core chipset - +/-8KV
PCB stack-up	4 layer board (impedance control - differential 100, single 50
IR pass-thru	Full-duplex bi-directional
Input	(TX) 1xHDMI; (RX) 1xRJ45 + 2x3.5mm
Output	(TX) 1xRJ45 + 2x3.5mm; (RX) 1xHDMI
HDMI source control	Controllable via IR pass-through from RX to TX and from TX to RX with IR extenders or via CEC integrated
HDMI connector	Type A 19 pin female
RJ-45 connector	WE/SS 8P8C
LED indicators	Video lock yellow, Power, green
3.5mm connector	(TX and RX) IR Receiver/ IR blaster

MECHANICAL SPECS

Housing	Metal enclosure
Power supply	(1)12V 2A
Power consumption	3.5 Watts TX, 2.5 Watts RX
Operation temperature	0 ~ 45 degrees Celsius
Storage temperature	-20~85 degrees Celsius
Relative humidity	20-90% RH (no condensation)

Supported Resolutions		
480i 60Hz	1080p 29.97 (30) Hz	4K2K 50Hz 4:2:0
480P 60Hz	1080p 50Hz	4K2K 50Hz 4:2:0 10/12bit**
576i 50Hz	1080p 59.94 (60) Hz	4K2K 50Hz 4:2:2
576P 50Hz	1080p 59.94 (60)Hz 10/12bit**	4K2K 50Hz 4:4:4
720P 50Hz	4K2K 24Hz 4:4:4	4K2K 60Hz 4:2:0
720P 59.94(60)Hz	4K2K 24Hz 4:4:4 10/12bit**	4K2K 60Hz 4:2:0 10/12bit**
1080i 59.94(60)Hz	4K2K 25Hz 4:4:4	4K2K 60Hz 4:2:2
1080P 23.98(24)Hz	4K2K 30Hz 4:4:4	4K2K 60Hz 4:4:4
1080P 25Hz	4K2K 30Hz 4:4:4 10/12bit**	

**= Only INPUT resolution supports 12bit for the noted specifications

PANEL DESCRIPTIONS

Transmitting Unit



1. DC 5V: Connect included 5V DC power supply
2. POWER/SIGNAL LED: Blue LED - POWER; Green LED - SIGNAL ACTIVE
3. COAX OUT: Connect an RG6 coaxial cable using BNC connection
4. Micro-USB port: Reserved for available firmware updates; any firmware updates will be accessible on www.vanco1.com, on the product page under the "Downloads" tab
5. HDMI IN: Connect an HDMI source
6. IR Receiver: Connect the included IR Receiver (RX) to control the display
7. IR Blaster: Connect the included IR Blaster (TX) to control the source

Receiving Unit



1. DC 5V: Connect included 5V DC power supply
2. POWER/SIGNAL LED: Blue light - POWER; Green light - SIGNAL ACTIVE
3. COAX IN: Connect an RG6 coaxial cable using BNC connection
4. Micro-USB port: Reserved for available firmware updates; any firmware updates will be accessible on www.vanco1.com, on the product page under the "Downloads" tab
5. HDMI OUT: Connect an HDMI display
6. IR Receiver: Connect the included IR Receiver (RX) to control the source
7. IR Blaster: Connect the included IR Blaster (TX) to control the display

CONNECTION DIAGRAM



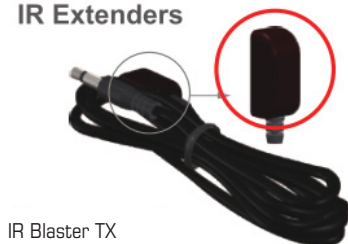
CONNECT AND OPERATE

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 a single RG6 coaxial cable to the "COAX OUT" connector of the transmitting unit, and then to the "COAX IN" connector of the Receiving unit using BNC connections
4. For power, plug in the transmitting and receiving units with included DC 5V 2A power supplies
5. Power on each device in the same sequence (transmitter and receiver 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, check coax cables and connections

IR PASS-THROUGH

IR Extenders



IR Blaster TX



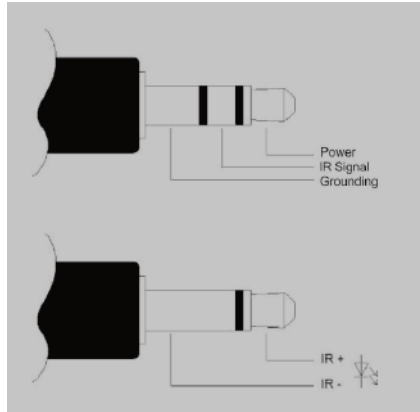
IR Receiver RX

IR BLASTER (TX)

- To control the source: Plug IR Blaster into IR TX port of transmitter unit (EV4K2004-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 (EV4K2004-RX); place blaster in front of the IR eye of the display

IR RECEIVER (RX)

- To control the source: Plug IR Receiver into IR RX port of receiver unit (EV4K2004-RX); place receiver at or near display
- To control the display: Plug IR Receiver into IR RX port of transmitter unit (EV4K2004-TX); place receiver in position where it is able to receive remote signals



NOTICE

1. Vanco HDMI and Cat5e/6 cables are strongly recommended for use with this product to ensure best results.
2. Incorrect placement of IR Blaster 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 Cat5e/6 cables utilized, the type of HDMI sources, and the type of HDMI display. The testing result shows solid UTP cables (usually in the form of 300m [1,000ft] bulk cables) can transmit a lot longer signals than stranded UTP cables (usually in the form of fixed length patch cords). Shielded STP cables are better suited than unshielded UTP cables. A solid UTP Cat5e/6 cable shows longer transmission range than stranded STP Cat-6 cable. For long extension applications, use solid UTP/STP category cables.
4. EIA/TIA-568-B termination (T568B) for Cat5e/6 cables is recommended for better performance.
5. To reduce the interference among the unshielded twisted pairs of wires in Cat5e/6 cables, one can use shielded STP cables to improve EMI problems, which worsens in long cable transmission.
6. The quality of Cat5e/6 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 Cat5e/6 cable utilized. For the best results, Cat6 is recommended.
7. 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.



Performance Guide for HDMI over Category Cable Transmission

Performance rating		Type of category cable		
Wiring	Shielding	CAT5	CAT5e	CAT6
Solid	Unshielded (UTP)	***	*****	*****
	Shielded (STP)	***	***	*****
Stranded	Unshielded (UTP)	*	**	**
	Shielded (STP)	*	*	**
Termination		Please use EIA/TIA-568-B termination (T568B) at any time		

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 EV4K2004 has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the EV4K2004 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.

Manufacturer reserves the right to revise any of its hardware and software following its policy to modify and/or improve its products where necessary or desirable. This statement does not affect the legal rights of the user in any way.



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