VANCO
ADVANCING...CONNECTIVITY

HDMI® over Single Cat5e/Cat6 Cable Extender

Vanco Part Number:
280591

Technical Support
www.vanco1.com • info@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

The Vanco 280591 HDMI Extender over Single Cat5e/6 with Bi-directional IR extends high definition video and audio signals and IR, at a distance of up to 164ft/50m over a single Cat5e/6 cable. Features EDID management, which allows and encourages source and display "handshake" for seamless integration. With only one Cat5e/6 cable, high definition sources with HDMI outputs can be connected to high definition displays with HDMI inputs over long distances. Deep color video, DTS-HD or Dolby TrueHD audio, and HDCP is supported and compatible with the 280591. In addition, 280591 is also equipped with bi-directional IR pass-through which allows for source or display control. For extending HDMI over a single Cat5e/6 with IR and the ability to overcome compatibility issues, the 280591 is a great solution!

The 280591 includes two units: transmitting unit (280591-TX) and receiving unit (280591-RX). The transmitting unit is used to capture the HDMI input with IR signals and carries the signals via one cost effective Cat5e/6 cable. The receiving unit is responsible for equalizing the transmitted HDMI signal and reconstructing IR and serial control signals. The 280591 offers the most convenient solution for HDMI extension over a single Cat5e/6 with long distance capability, and is the perfect solution for any application.

HDMI® over Single Cat5e/Cat6 Cable Extender

Part # 280591

- Allows HDMI Audio/Video signals to be transmitted over a single Cat5e/6 cable
- Transmission Range: Extends 1080p resolution up to 164ft/50m over a single Cat5e or Cat6 cable
- Wideband Bi-directional IR system allowing for control of source or display (IR accessories included)
- Wideband IR signal from 20KHz to 60KHz
- Features EDID management which supports default HDMI EDID and has the ability to learn the EDID of display equipment
- Features EQ distance adjustment switch for perfect transmission and reception of HDMI signals
- Pure unaltered uncompressed 7.1ch digital HDMI over a single Cat5e/6 cable transmission
- Supports DTS-HD and Dolby TrueHD high bit rate audio
- Works with HDMI and HDCP compliant devices
- Supports up to 1080p High Definition resolution
- Compact design for an easy and flexible installation
- Power Supply: 5V DC
- Dimensions: 1.9" (49mm) W x 1" (25mm) H x 3.2" (80mm) D

SPECIFICATIONS

HDCP Compliance	Yes
Video Bandwidth	Single-link 165Mhz (4.95Gbps)
Video Support	480i/480p/720p/1080i/1080p @60
Audio Support	Surround Sound (up to 7.1 ch) or stereo digital audio
Transmission Range	HD (1080p 24-bit color) – up to 50m (164ft)
Input TMDS Signal	3.3 volts
Input DDC Signal	5.0 volts/P-P
ESD Protection: Human Body model	+/- 8 kV (air-gap discharge)
+/- 4 kV (contact discharge)	
PCB stack-up	4 layouts
HDMI connector	Type A 19 pin female
RJ-45 connector	WE/SS 8P8C
3.5mm connector	(TX and RX) IR Receiver/IR Blaster
MECHANICAL SPECS	
Housing	Metal enclosure
Power Supply	(2) 5V1A DC
Power consumption	2.5 watts (TX); 1.2 watts (RX)
Operation temperature	32~104 °F
Storage temperature	-4 ~140 °F
Relative humidity	20~90 % RH (no condensation)

PACKAGE CONTENTS

Before attempting to use this unit, please check the packaging and make sure the following items are contained in the shipping carton:

- (1) 280591 (TX & RX)
- (1) IR Blaster (TX)
- (1) IR Receiver (RX)
- (2) DC 5V in line power supply
- (1) User Manual

PANEL DESCRIPTIONS

Transmitting Unit

Receiving Unit

1. Power Status: This LED will illuminate when the unit is connected to power, letting you know that the unit is ready to send a signal.
2. HDMI Input: Connect an HDMI cable from the source such as a Bluray player or Cable/Sat Receiver.
3. DC 5V port: Connect the included DC 5V power supply to an outlet or power source.
4. CAT5e/6 Output: Connect a single Cat5e/6 cable to this output; recommendation is to run a "home run" cable with no splicing, coupling, patch panel, etc. to avoid signal loss.
5. EDID Dial: For selecting EDID mode for compatibility issues, see below for EDID information.
6. Located on the Side Panel (Not Pictured) IR RX: Connect the IR Receiver (See below for bi-directional IR information), plugging the IR RX cable into the Transmitting unit would mean controlling the display from the source.
7. Located on the Side Panel (Not Pictured) IR TX: Connect the IR Transmitter (See below for IR information), plugging the IR RX cable into the Transmitting unit would mean controlling the source from the display.
8. Signal Status: This LED will illuminate when the Receiver is getting an HDMI signal from the Transmitting unit; if not illuminated this means that the Receiver is not getting a signal; check the cabling and the Transmitting unit.
9. HDMI Output: Connect an HDMI cable from the display such as an HDTV or a projector
10. DC 5V: Connect the included DC 5V power supply to an outlet or power source. If an outlet or power source is challenging to find at the display location, Vanco carries a cable that goes from DC to USB to utilize a USB port on the display for power. (Part # USBDC01X and/or USBDC02X)
11. CAT5e/6 Input: Connect a single Cat5e/6 cable to this input; recommendation is to run a "home run" cable with no splicing, coupling, patch panel, etc. to avoid signal loss.
12. EQ Dial: This is a gain or equalizer dial to be adjusted based on the length of the category run, please see below for adjusting this dial.
13. Located on the Side Panel (Not Pictured) IR RX: Connect the IR Receiver (See below for IR information), plugging the IR RX cable into the Receiving unit would mean controlling the source from the display.
14. Located on the Side Panel (Not Pictured) IR TX: Connect the IR Transmitter (See below for bi-directional IR information), plugging the IR TX cable into the Receiving unit would mean controlling the display from the source.

EDID

The EDID switch allows for EDID learning or to pre-set an EDID to encourage a "handshake" between the display and source.

The EDID dial helps out in forcing or encouraging a handshake between the source and display with the extender in between. If you are not receiving a video/audio signal with the extender in place, verify the category cable isn't the issue by connecting a pre-terminated jumper or patch cable. Also verify the source is actually sending a signal by connecting straight to the display via HDMI.

The default EDID setting is set at 0, which should work with most combinations, however if you are encountering no HDMI signal, then an adjustment on the EDID dial can be attempted.

Manual EDID Learning Mode

See below for EDID table, when any of the EDID position selections are made, the Transmitter will set a fixed EDID to the source. To make this adjustment, follow the below steps while every component is TURNED ON.

1. Unplug the POWER SUPPLY and HDMI cable from the Transmitting unit only
2. Adjust the EDID dial to the desired setting
3. Connect the Power Supply
4. Connect the HDMI cable

At this point the EDID you've selected is now sent to the source, check the display for video/audio signals.

Auto EDID Learning Mode

1. Power off all components; unplug power supply to both transmitter and receiver
2. Unplug HDMI cables connected to transmitter and receiver
3. Set "EDID" on the transmitting unit 280591-TX at position A to copy EDID of display connected to the receiver; Set at position 9 to copy EDID of display connected to the HDMI Loop Out port on the transmitter
4. Connect HDMI Cables
5. Power on the 280591 Transmitter, followed by the 280591 Receiver
6. Power on all components from source to display

Attention: Confirm the extender is displaying audio and video correctly after each selection. Each time the EDID is modified, the transmitter must be unplugged from power and HDMI, and then power plugged back in first, followed by the HDMI (see above for manual EDID learning).

EDID TABLE:

POSITION	EDID DESCRIPTION
0	1080P, 2CH AUDIO
1	1080P, DOLBY/DTS 5.1
2	1080P, HD AUDIO
3	1080I, 2CH AUDIO
4	1080I, DOLBY/DTS 5.1
5	1080I, HD AUDIO
6	3D,1080P, 2CH AUDIO
7	3D, 1080P,DOLBY/DTS 5.1
8	3D,1080P, HD AUDIO

EDID TABLE Continued:

POSITION	EDID DESCRIPTION
9	COPY EDID FROM THE TRANSMITTER HDMI LOOP OUT
A	COPY EDID FROM THE RECECIVER HDMI OUT
B	1080P, 2CH AUDIO
C	1080P, 2CH AUDIO
D	1080P, 2CH AUDIO
E	1080P, 2CH AUDIO
F	1080P, 2CH AUDIO

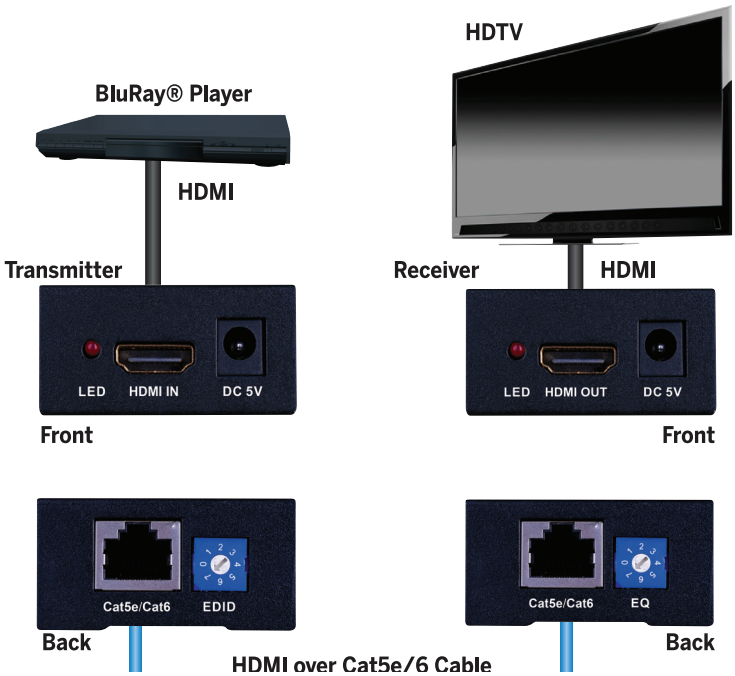
EQ ADJUSTMENT

The EQ dial is to be adjusted based on the category cable length to "fine tune" the video signal.

If you see flickering, blinking image, or artifacts such as snow or sparkles on the display, adjust the EQ dial to improve the cable skew. See table below for different adjustments based on cable length. Adjust the signal level from MIN to MAX until desired video quality is displayed.

Recommended EQ settings	
Position	***Cable Length***
0 (MIN)-2	under 15m (49.5ft)
3-4	15-30m (49.5 ft - 99ft)
5-6	30-40m (99ft - 132ft)
7 (MAX)	40-50m (132ft - 164ft)

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 Category 5e/6 up to 164ft/50m to the output of the Transmitting unit, and the other end to the input of the Receiving unit.
4. For power, plug both the Transmitting unit and Receiving unit with the included power supplies.
5. Power on each device starting with the source, and then the display (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 shorter Cat5e/6 cable (jumper or patch cable). If a display is having difficulty receiving a signal, see EDID section and perform EDID learning or 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 IR pigtail to test IR functionality. If the IR remote function is not responding, check the emitters to ensure they are placed correctly and are plugged into the correct IR jacks on the Extender set receiving and transmitting units.

IR

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.

IR RECEIVER

IR BLASTER

IR BLASTER (TX)

To control the source: Plug IR Blaster into IR TX port of transmitter unit (280591-TX); place blaster in front of the IR eye of the source.

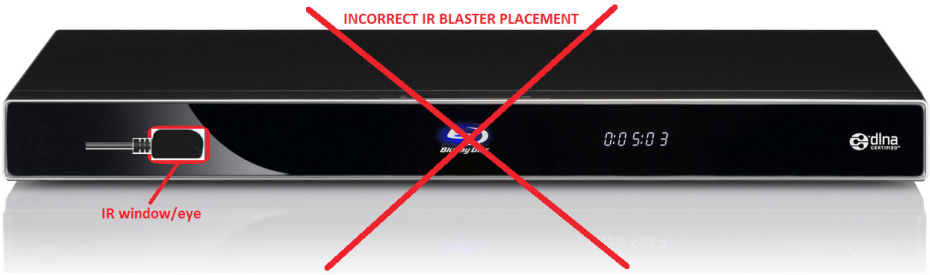
To control the display: Plug IR Blaster into IR TX port of receiver unit (280591-RX); place blaster in front of the IR eye of the display.

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:

IR Continued

IR BLASTER



IR RECEIVER (RX)

- To control the source: Plug IR Receiver into IR RX port of receiver unit (280591-RX); place receiver at or near display.
- To control the display: Plug IR Receiver into IR RX port of transmitter unit (280591-TX); place receiver in position where it is able to receive remote signals.

IR CONTROL

To Control the Source:

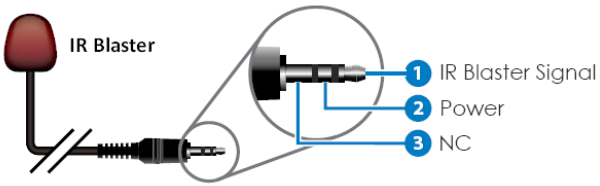
1. Plug the IR Blaster into the IR TX Port on the Transmitter

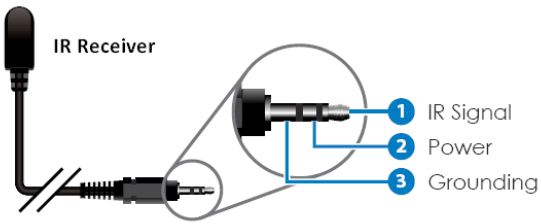
2. Plug the IR Receiver into the IR RX Port on the Receiver

To Control the Display:

1. **Plug the IR Receiver into the IR RX Port on the Transmitter**

2. **Plug the IR Blaster into the IR TX Port on the Receiver**





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

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.

1. 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”.
2. 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.
3. 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.
4. 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.
5. 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 280591 has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the 280591 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.

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.

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.

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, glossary of terms, etc. please visit vanco1.com

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