



VX-1002-TX

VX1000 Series Wallplate Transmitter—HDMI, VGA

Extend an HDMI or VGA signal up to 328 feet (100 meters) over a single CATx cable.

- Wallplate transmitter design makes installation simple.
- Requires a compatible receiver at the other end of the link.



Contact Information

Order toll-free in the U.S. or for FREE 24/7 technical support:
Call 877-877-BBOX (outside U.S. call 724-746-5500)
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FEDERAL COMMUNICATIONS COMMISSION AND INDUSTRY CANADA RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication.

It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

Normas Oficiales Mexicanas (NOM) Electrical Safety Statement INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

NOM Statement

17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
 - A: El cable de poder o el contacto ha sido dañado; u
 - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
 - C: El aparato ha sido expuesto a la lluvia; o
 - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
 - E: El aparato ha sido tirado o su cubierta ha sido dañada.

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Important Safety Instructions

1. Do not expose this apparatus to rain, moisture, dripping or splashing water and do not place objects filled with liquids, such as vases, on the apparatus.
2. Do not install or place this unit in a bookcase, built-in cabinet or in another confined space. Make sure the unit is well ventilated.
3. To prevent risk of electric shock or fire hazard caused by overheating, do not obstruct the unit's ventilation openings with newspapers, tablecloths, curtains, and similar items.
4. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
5. Do not place sources of flames, such as lighted candles, on the unit.
6. Clean this apparatus only with a dry cloth.
7. Unplug this apparatus during lightning storms or when unused for long periods of time.
8. Protect the power cord from being walked on or pinched particularly at plugs.
9. Only use attachments/accessories specified by the manufacturer.
10. Refer all servicing to qualified service personnel.

Disclaimer

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1. Specifications

Wallplate Transmitter (VX-1002-TX)

Video	
Input	(1) HDMI IN, (1) VGA IN, (1) Audio IN
Input Signal Type	HDMI 1.4 w/HDCP
Resolution Support	VGA: 1920 x 1200, 1920 x 1080, 1680 x 1050, 1600 x 1200, 1600 x 900, 1400 x 1050, 1440 x 900, 1366 x 768, 1280 x 1024, 1280 x 800, 1280 x 768, 1280 x 720, 1024 x 768, 800 x 600, 640 x 480 @60 Hz; HDMI: Up to 3840 x 2160
Input Video Level	0.5-1.0 Vp-p
Maximum Pixel Clock	297 MHz
Output	(1) HDBaseT Out
Output Signal Type	HDBaseT
Video Impedance	100 ohms

Chapter 1: Specifications

Wallplate Transmitter (continued)

Audio	
Input	(1) 3.5-mm mini jack, stereo audio binding with VGA input
Supported Audio Format	HDMI: Stereo, LPCM 5.1 LPCM 7.1, Dolby True HD, DTS-HD Master Audio; VGA: Stereo
General	
Environment	
Operating Temperature	32 to 113° F (0 to 45° C)
Storage Temperature	-4 to +158° F (-20 to +70° C)
Humidity	10 to 90%, noncondensing
ESD Protection	Human-body model ±8 kV (air-gap discharge)/4 kV (contact discharge)
Power	
Power Supply	12 VDC, 1.5 A/PoH
Power Consumption (Maximum)	3.36 W, powered by HDBaseT receiver with POH
Mechanical	
Dimensions	4.16"H x 3.58"W x 1.16"D (10.56 x 9.1 x 2.94 cm)
Weight	0.48 lb. (0.22 kg)
Approvals	CE, FCC, RoHS, PoH

Cable Specifications

Cable Type	Range	Supported Video
CAT5e/6	328 ft. (100 m)	Up to 1080p @ 60 Hz, 36-bit
	230 ft. (70 m)	3840 x 2160 @ 30 Hz, 4:4:4 bit
CAT6a/7	328 ft. (100 m)	1080p @ 60 Hz, 48-bit; 1080p @ 60 Hz, 3D; 3840 x 2160 @ 60 Hz, 4:2:0 bit

NOTE: We recommend using straight-through Category cables wired to T568B standard.

2. Overview

2.1 Introduction

The VX1000 Series Wallplate Transmitter - HDMI, VGA (VX-1002-TX) is a 2-to-1 wallplate HDBaseT transmitter with one HDMI input, one VGA input, and one HDBaseT output. It enables transmission of an HDMI signal over a single CAT5e/6 cable up to 328 feet (100 meters) for 1080p HD video and HD Audio distribution, or 230 feet (70 meters) for 3840 x 2160 @60 4:2:0 8-bit HD video and HD Audio distribution.

This wallplate HDBaseT transmitter simplifies installation and also creates a clean seamless look with the décor.

VGA and HDMI inputs are automatically selected and switched when the unit detects a signal. A smart detection feature prioritizes inputs. You can also switch the inputs manually—just press the switch button on the front panel of the transmitter.

The VX-1002-TX also supports bi-directional IR and Ethernet passthrough. It offers an excellent solution to any commercial or residential environment where switching between VGA with audio and HDMI over distance is required.

NOTES:

1. *Must be used with a compatible receiver (VX-1003-RX or VX-1001-RX).*
2. *With 48-V PoH integrated inside, the extender pair needs just one power supply connected to the RX unit to power both units.*

2.2 Features

- Provides 2:1 switching between VGA and HDMI inputs to HDBaseT output.
- Robust HDBaseT technology distributes lossless 3840 x 2160 @ 30 Hz HD video and audio.
- Transmits an HDMI signal over a single CAT5e/6 cable under recommended conditions.*

*NOTES:

- 230 feet (70 meters): 3840 x 2160 @ 60 4:2:0 8-bit / 24-bit True Color with Chroma subsampling color palette 4K @ 60 4:2:0.

- 328 feet (100 meters): 1920 x 1080p HD video @ 60 Hz / 36bit Deep Color

- Installed in a 2-gang US Decora wall plate.
- EDID management for VGA input.
- Automatic input detection.
- HDMI V1.4 compliant.

- 4K compatible—60 Hz, 4:2:0.
- HDCP compliant.
- Bi-directional IR supported.
- Supports Ethernet passthrough.
- Supports one-way PoH (Power over HDBaseT, can be powered by the HDBaseT receivers with PSE (Power Sourcing Equipment).
- Compact size for convenient and unobtrusive installation.

2.3 What's Included

Your package should include the following items. If anything is missing or damaged, contact Black Box Technical Support at 877-877-2269 or info@blackbox.com.

- VX1000 Series Wallplate Transmitter - HDMI, VGA (VX-1002-TX)
- (1) 3.81-mm Phoenix male connector (9-pin)
- (1) cover with four screws
- This user manual

Additional items you will need:

- (1) VX1000 Series Receiver (VX-1001-RX or VX-1003-RX) or
(1) Presentation Switcher (AVSC-0802H).

2.4 Hardware Description

Figures 2-1 and 2-2 illustrate the front and back panels of the transmitter. Table 2-1 describes its components.

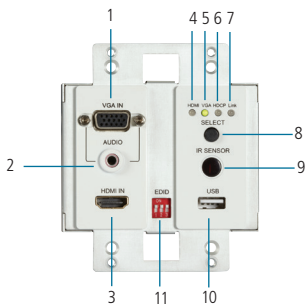


Figure 2-1. Transmitter front panel.

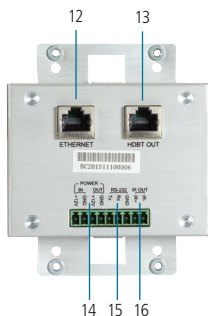


Figure 2-2. Transmitter back panel.

Table 2-1. Transmitter components.

Number	Component	Description
1	VGA IN	Connects to VGA source device.
2	Audio	Audio input (for use with VGA source)
3	HDMI IN	Connects to HDMI source device.
4	HDMI LED	ON: HDMI signal transmitted. OFF: No HDMI signal transmitted or unstable.
5	VGA LED	ON: VGA signal transmitted. OFF: No VGA signal transmitted or unstable.
6	HDCP LED	ON: HDMI video is being transmitted. Blinking: Non-HDCP video is being transmitted. OFF: No video is being transmitted.
7	LINK LED	ON: HDBaseT link is normal. Blinking/OFF: No HDBaseT link or unstable.
8	Select button	Press this button to select the input source.
9	IR sensor	IR IN with built-in IR receiver (30 to 55 kHz).
10	USB Type A port	Connect to USB/host device.
11	EDID DIP switch	Used to select EDID presets.
12	(1) RJ-45 port	Connects to Ethernet device.
13	(1) RJ-45 HDBaseT OUT port	Connects to HDBaseT IN port of the receiver (VX-1001-RX).
14	Power	IN: Connects to 12 V power source. OUT: Maximum power output is 12 V, 400 mA.
15	RS-232	RS-232 passthrough.
16	IR OUT	Connects to IR emitter cable.

Chapter 3: Automatic Input Detection

3. Automatic Input Detection

- If the current signal is VGA input, the transmitter will not automatically switch to HDMI input.
- The button switch will recognize the VGA and HDMI input signals only if they are both valid. For example, if no HDMI input signal is present, the transmitter cannot switch to HDMI input even using the button.

After power on, the input signal is automatically selected according to the following tables.

Table 3-1. Power on to detect the input signal.

HDMI IN	VGA IN	Input Select
Yes	No/Yes	HDMI IN
No	No	HDMI IN
No	Yes	VGA IN

Table 3-2. After power on, press button to switch input.

Current Input	HDMI IN	VGA IN	Button Select
HDMI IN	No/Yes	No	HDMI IN
HDMI IN	Yes	Yes	VGA IN
VGA IN	Yes	Yes	HDMI IN
VGA IN	No	Yes	VGA IN

Chapter 3: Automatic Input Detection

Table 3-3. After power on, change the input signal state.

Current Input	HDMI IN	VGA IN	Input Select
HDMI IN	Yes	No—>Yes/ Yes—>No	HDMI IN
HDMI IN	No	No—>Yes	VGA IN
HDMI IN	Yes—>No	No	HDMI IN
HDMI IN	Yes—>No	Yes	VGA IN
VGA IN	No—>Yes/ Yes—>No	Yes	VGA IN
VGA IN	No/Yes	Yes—>No	HDMI IN

Chapter 4: EDiD Presets

4. EDID Presets

For VGA input, see the next table.

Table 4-1. Set EDID DIP switch for VGA input.

DIP Switch Setting	VGA Input
1 = OFF (DOWN) 2 = OFF (DOWN) 3 = OFF (DOWN)	Select 1280 x 800 as native video
1 = OFF (DOWN) 2 = OFF (DOWN) 3 = ON (UP)	Select 1920 x 1200 as native video.
1 = OFF (DOWN) 2 = ON (UP) 3 = OFF (DOWN)	Select 1920 x 1080 as native video. This is the default value.
1 = OFF (DOWN) 2 = ON (UP) 3 = ON (UP)	Select 1280 x 720 as native video.
1 = ON (UP) 2 = OFF (DOWN) 3 = OFF (DOWN)	Select 1024 x 768 as native video.
1 = ON (UP) 2 = OFF (DOWN) 3 = ON (UP)	Select 800 x 600 as native video.
1 = ON (UP) 2 = ON (UP) 3 = OFF (DOWN)	Reserved
1 = ON (UP) 2 = ON (UP) 3 = ON (UP)	Reserved

NOTE: To make the change effective, unplug the VGA cable and plug it in again.

For HDMI input:

Always passthrough copy from the detected sink.

5. Hardware Installation

1. Connect an HDMI or VGA input source (such as Blu-ray™) to the VX-1002-TX transmitter.

NOTE: Be careful when connecting cables—do not force the cable ends into the connectors.

2. Connect a good quality, well-terminal CAT5e/6 cable of no more than 230 feet (70 m) for 4K or 328 feet (100 m) for 1080p from the HDBaseT OUT port of the Transmitter to HDBaseT IN Input of the HDBaseT receiver.

NOTE: 230 feet (70 m) @ 4K or 328 feet (100 m) @ 1080p video are maximum recommended transmission distances for this model and denote perfect transmission conditions—including straight cable runs with no electrical interference, bends, kinks, patch panels, or wall outlets.

If either of the above is a factor in your installation, transmission range may be affected—avoid where possible.

3. Connect an HDMI display device (LED/LCD display or projector) to the HDMI OUT port on the HDBaseT receiver.
4. Connect the IR emitter cable to the IR OUT port of the VX-1002-TX, connect the IR receiver cable to the IR RX port of the receiver, and connect the IR emitter to the IR TX port of the receiver.
5. Power on the HDBaseT receiver. If the HDBaseT receiver doesn't support the PSE function, connect a 12 V power supply to the VX-1002-TX transmitter.

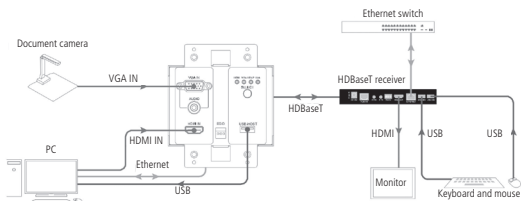


Figure 5-1. Typical application.

6. Troubleshooting

The majority of HD distribution installation issues are either caused by minor connection errors, communication problems between devices, or when the transmission of high signal bandwidth is attempted using insufficient cable.

If you encounter any technical difficulties when installing and configuring the matrix, refer to the following troubleshooting checklist. If you cannot resolve your problem, contact Black Box Technical Support at 877-877-2269 or info@blackbox.com.

Problem: No picture or poor-quality picture.

Possible Solutions:

1. Power—is your transmission device and receiver powered with correct LED indication?
2. If possible, always use test equipment before installation and to troubleshoot any problems.
3. Check that the display device supports HDCP, is switched to the correct source input mode, and is compatible with the receiver—if you suspect any issues, replace the display device with another model.
4. Distance—Is the cable too long for the signal to be transmitted effectively? Make sure the cable distance matches the project requirements and is well within the maximum transmission distance of the signal.

NOTE: If you need more distance than the transmitter can provide, use another extender set to be sure that the signal reaches its destination effectively.

5. Cable joins—Joins in the cable run or RJ-45 connectors can impact signal strength, resulting in reduced transmission that may manifest itself in incorrect picture quality, picture dropping out, or no picture.
6. Cable choice and signal reduction—Are stranded patch leads used as interconnects between patch panels or wall outlets? CCA (Copper Clad aluminum) cables being used? These can reduce transmission rates by up to 40%—we recommend solid-core straightthrough cables with minimum connections used wherever possible.
7. Correct connection—Double-check that all UTP, HDMI, power and IR cables are connected to the correct ports.

NOTE: Even a fraction off target can make the difference between a perfect picture and a blank screen. Double-check all connections are firmly made in the correct ports.

8. Is the cable wired to 568B standard? Is the cable wired and terminated correctly and are those terminations connected to the correct ports? Incorrect wiring and termination will result in unstable operation or a blank screen.
9. Electrical interference—could any form of interference be generated? If so, attempt to remove the source of electrical interference or move the cable run to decrease the effects of the interference.
10. Is a picture displayed when connecting the source directly to the display? If not, then the problem could be with the input or output device rather than the cable or matrix itself.
11. HDMI lead condition and quality—HDMI cables and connectors are delicate and can be damaged much easier than component or coax cable. Lead quality varies dramatically, particularly in lower price brackets. Swap HDMI leads and check operation—damage to or quality of your leads could be the problem. If in doubt, swap them over. Be careful when inserting and extracting your HDMI from matrix ports so you don't damage the connectors or ports.
12. Picture speckles/HD “noise”— A poorly established signal that may be caused by poor quality or excessive HDMI cable lengths. Try swapping the display adapters from a location that is functioning properly or swapping the outputs of the matrix switch used.

If the problem remains on the same screen, this may be caused by a connection problem between matrix and display—turn off all equipment and swap the signal carrying cables at both ends to determine if the cable or termination is at fault.

HD Noise (NO image) may be an HDCP Issue between the source and display, but poor cabling can also cause this via poor communication.
13. Blu-ray: 3D—Is the equipment used 3D enabled/compatible? Is a 3D disk playing in a 3D-enabled Blu-ray player or through a compatible AV receiver?
14. Color distortion—a pink or green screen indicates an incompatibility between color spacing formats —the commonly used RGB or YUV used by older displays. Some sources allow switching between RGB and YUV which may solve any color problems. If not, change the HDMI cable between the source and the matrix to rule out defective cabling.

Chapter 6: Troubleshooting

Problem: No sound or poor-quality audio.

Possible Solutions:

Audio is transmitted within the video signal—there is no separate audio track—so a problem with sound will be accompanied by a problem with picture. But you might have technical issues with audio caused by problems communicating between sources, displays, and/or AV receiver settings.

1. Have specific speaker sets or zones been enabled? Some AV receivers allow individual speaker selections assigned to specific zones in the set up so check the speakers used are fully connected to the amplifier and correctly assigned within the system set up. An EDID issue might occur when the source reads the audio EDID from the display and only requests two-channel audio. You might need to copy EDID from the AV receiver or use an embedded EDID in the AMP or matrix.

NOTE: If you have problems when using an AV receiver, the cause is usually the settings of the AV receiver itself. Refer to the AVR manufacturer's guidelines for the correct settings to use for your requirements.

2. Consistency of audio output between devices—Is there any discrepancy between the audio output of the source, the audio or zonal settings of the AV receiver, and the speaker configuration used needed for successful audio replication? If outputting 7.1, make sure all devices connected are also outputting 7.1.

NOTE: Some source device settings might allow audio output through a TV or an HDMI port. If using an AV receiver, be sure to select the HDMI output option.

3. Do all the local sources work through the AV receiver? Check the operation of each source individually.
4. Bandwidth—If using a graphics-based source (such as a PC/Mac/ media server), make sure the source resolution is set to a maximum of 1080p, 50 Hz. Higher resolutions available for graphics-based systems require higher bandwidth that may affect transmission of signals as well as incompatibility with devices.

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