HDMI – VGA/Audio Wall-Plate Transmitter, UHD-4K

Installation Guide

500455-TX

SAFETY PRECAUTIONS

To insure the best performance from the product, please read all instructions carefully before using the device. Save this manual for future reference.

- Follow basic safety precautions to reduce the risk of fire, electrical shock and injury.
- Do not dismantle the housing or modify the module. It may result in electrical shock or burn.
- Do not open or remove the housing of the device as you may be exposed to dangerous voltage or other hazards.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture and do not install this product near water. Keep the product 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 module immediately.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- Using supplies or parts not meeting the products' specifications may cause damage, deterioration or malfunction.
- Refer all servicing to qualified service personnel.
- Install the device in a place with adequate ventilation to avoid damage caused by overheat.
- Unplug the power when left unused for a long period of time.
- Information on disposal of devices: do not burn or mix with general household waste, please treat them as normal electrical waste.
- Unpack the equipment carefully and save the original box and packing material for possible future shipment.

NOTICE: Please read this manual carefully before using this product.

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1. Introduction

1.1 Introduction to HDMI – VGA/Audio Wall-Plate Transmitter

HDMI – VGA/Audio Wall-Plate Transmitter is a Decora® style transmitter that installs in a double-gang wall box to provide a convenient interface for HDMI / VGA input sources. It has one (1) HDMI IN, one (1) VGA IN, one (1) Audio In and one (1) HDBaseT Out. It supports VGA with full HD scaler, and HDMI 1.4 with 4k& 3D, input signals support auto-switching and manual-switching. The HDBaseT output supports 60m UHD video transmission, enables bi-directional RS232 communication between HDMI – VGA/Audio Wall-Plate Transmitter and remote device.

The unit is powered by a 12VDC Power Supply.

1.2 Features

- Selectable HDMI/ VGA with audio input.
- Support of VGA output resolution up to 1920x1200.
- High bandwidth: 10.2Gbps.
- Built-in scaler function supports scaling HDMI/ VGA signals to match the native resolution of the display.
- Transmission of HDMI signals up to 4K.
- Compliant with HDMI 1.4, supports 1080p and 3D.
- HDCP compliance, equipped with HDCP auto-tracking solution.
- Auto-switching capability.
- Support of multiple control methods including front panel buttons and RS232. Serial interface supports bi-directional RS232 pass-through control.
- Supports firmware upgrading via USB.
- Powered by local 12VDC power supply.
- Aluminium design for elegant and better cooling.

1.3 Package Contents

- One (1) HDMI – VGA/Audio Wall-Plate Transmitter
- Four (4) Screws (for HDMI – VGA/Audio Wall-Plate Transmitter)
- Two (2) Pluggable Terminal Blocks (One 2-pin block & One 3-pin block)
- One (1) Power Adapter; 12VDC, 2A
- One (1) User Manual

Notes：Please confirm if the product and the accessories are all included. If not, please contact the location at which you purchased the unit.
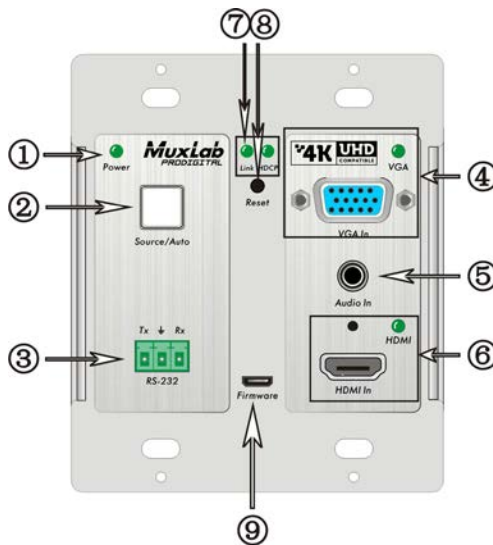
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2. Specifications

Environment	HDMI 1.4
Devices	DVD, plasma, projectors, monitors, TV, PC, laptops, servers supporting HDMI.
Transmission	Transparent to the user
Video Bandwidth	10.2 Gbps
Video Resolution	VGA: 800 x600, 1024 x 768, 1280 x 800,1280 x 1024, 1440 x 900,1600 x 1200, 1920 x 1080, 1920 x 1200; HDMI: 4K @ 24, 25 & 30 Hz, 3D 1080p/1080i/720p/576p/ 576i/480p/480i
Audio Bandwidth	20Hz to 20KHz
Audio Impedance	>10Ω
Audio SNR	>85dB @ 20Hz to 20KHz
Signals	HDMI 1.3a protocol and HDCP
Connectors	One (1) HDMI receptacle. One (1) VGA HD-15 receptacle One (1) Audio 3.5mm Stereo Jack Two (2) 3 pin terminal block for RS232 One (1) 2 pin terminal block for Power One (1) RJ45S for Cat 5e/6 unshielded or shielded twisted pair *Note: HDMI cables not included.*
Maximum Distance *Based on a maximum length of 6.6 ft. (2 m) of HDMI cable per end.*	Cat 5e/6: 230 ft (70 m) up to 1080p Deep Color 131 ft (40 m) for 4K; 3840 X 2160/24, 25 & 30 Hz *Note: When installed in an electrically noisy environment, an STP cable must be used. Also, cross-connection reduces the effective distance depending on the grade of twisted cable used.*
Cable	One (1) Cat 5e/6 or better twisted pair cable required
Compatible Receiver	500451-RX (No Serial Port) 500454-RX
Power Supply	One (1) 110-240V/12VDC power supply with interchangeable blades
Power Consumption	10.3 Watt

| Temperature	Operating: 0° to 40°C Storage: -20° to 85°C
	Humidity: Up to 95% non-condensing
Enclosure	Metal
Chassis Style	Decora® two gang
Dimensions	4.11" x 3.50" x 1.73" (104.5 x 89 x 44 mm)
Weight	1.35 lb (0.61 kg)
Compliance	Regulatory: FCC, CE, RoHS
Warranty	2 years
Order Information	500455-TX HDMI – VGA/Audio Wall-Plate Tx, UHD-4K

3. Panel Description

3.1 Front Panel

No.	Name	Description
①	Power indicator	Illuminates green when power on

No.	Name	Description
②	SOURCE/ AUTO	• Used as video source selection button (with backlight off): Press to select one source, press again to select next source, switching between HDMI and VGA. The indicator of the selected input source will illuminate green. • Used as switching mode selection button (with backlight on): Press and hold for 3 seconds or more to enter in Auto-switching mode, the indicator illuminates green when in auto-switching mode. Press and hold for 3 seconds or more again to enter in Manual-switching mode.
③	RS232	Serial port, 3-pin pluggable terminal block, connects with the terminal software to control the HDMI – VGA/Audio Wall-Plate Transmitter, and supports bi-directional RS232 control (to send control signal from a local device or receive control signal sent from far-end devices).
④	VGA IN	Connects with VGA source device. The indicator: • illuminates yellow when there is VGA signal input • illuminates green when the signal source is chosen as input source • turns off when there is no VGA input signal
⑤	AUDIO IN	Connects with the audio output socket of VGA source device, delivers synchronous audio source with VGA signal source when choosing VGA as source signal.
⑥	HDMI IN	Connects with HDMI source device. The indicator illuminates yellow when there is an HDMI signal input and illuminates green when the signal source is chosen as input source.
⑦	LINK &HDCP	• LINK: Twisted Pair Link status indicator, illuminates green when successfully connected. • HDCP: HDCP compliance indicator, illuminates green when the source signal is with HDCP, and is off otherwise.
⑧	RESET	Press the button to reboot HDMI – VGA/Audio Wall-Plate Transmitter.
⑨	FIRMWARE	USB port, used for firmware update. Plug a flash disk or other storage device with update file (MERGE.bin), and send command **50698%** to update firmware.

3.2 Side Panel
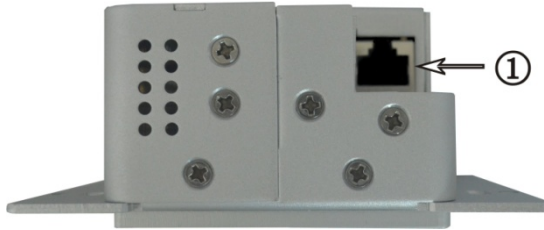
① HDBaseT Out: RJ45 port, connect with receiver via a CAT5e/6 cable to deliver Audio/Video signals.

3.3 Rear Panel

| No.	Name	Description
①	Power In	Power input port, 2-pin pluggable terminal block, connect with DC 12VDC power adapter
②	RS232	Serial port, 3-pin pluggable terminal block, connects with a far-end receiver and supports bi-directional RS232 control (send control signal from local or receive control signal sent from far-end devices).

4. System Connection

4.1 Safety Precautions

1) System should be installed in a clean environment with proper temperature and humidity levels.

2) All devices should be connected before power on.

4.2 System Diagram
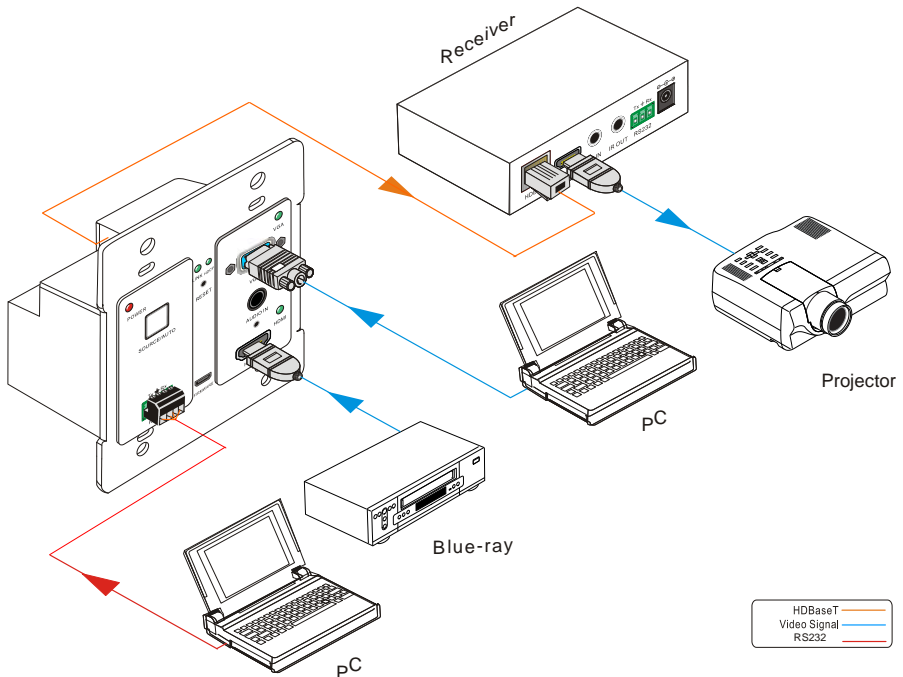
4.3 Connection Procedure

Step1. Connect HDMI source device (e.g. Blue-ray DVD) to HDMI input ports of the HDMI – VGA/Audio Wall-Plate Transmitter with an HDMI cable. Connect a VGA source device (e.g. PC) to the VGA input port of the HDMI – VGA/Audio Wall-Plate Transmitter with a VGA cable.

Step2. Connect an HDMI Receiver (like 500454-Rx) to the HDBaseT port on the rear panel with twisted pair.

Step3. Connect an HDMI display to the HDMI Out port of the HDMI Receiver.

Step4. Connect the PC Serial Port to the RS232 port on the front panel of the HDMI – VGA/Audio Wall-Plate Transmitter.

Step5. Connect the device to be controlled (e.g. Projector) to the RS232 port of HDMI Receiver (bi-directional communication RS232 control is available).

Step6. Connect the 5VDC power adaptor to the power port of the HDMI Receiver; and connect the 12VDC power adapter to the HDMI – VGA/Audio Wall-Plate Transmitter.

4.4 Application

The HDMI – VGA/Audio Wall-Plate Transmitter can be used for the type of applications such as computer realm, monitoring, conference room, large screen displays, television education, command & control center, smart home, etc.

5. Operations

5.1 Operations of front panel buttons

The HDMI – VGA/Audio Wall-Plate Transmitter has a channel switching button (Source/ Auto) on the front panel, through which users can switch between input sources.

It supports both Manual switching and Auto switching (default is Auto switching). Press and hold the Source/Auto button for 3 seconds or send the RS232 command "**50770%**" and "**50771%**" to switch between the two modes.

Switching modes:

➢ Auto switching mode:

In this mode, the button backlight illuminates green, and the HDMI – VGA/Audio Wall-Plate Transmitter will recognize the last active connected source device as the input source. If you disconnect this source device, it will automatically connect to the other source signal (if present).

➢ Manual switching mode:

In this mode, the button backlight will remain off. Press the Source/Auto button to select input source, it will switch between the HDMI and the VGA. You can switch source by sending the corresponding RS232 command.

The indicator of the selected input source will illuminate green.

5.2 RS232 Control

As the RS232 communication is bi-directional between the HDMI – VGA/Audio Wall-Plate Transmitter and the HDMI Receiver, you are able to control a third party RS232 device from the Wall-Plate location or control the HDMI – VGA/Audio Wall-Plate Transmitter from the remote location. When controlling a third party RS232 device, the baud rate of this device must be 2400, 4800, 9600, 19200, 38400, 57600 or 115200.

You can use a terminal software, to control the HDMI – VGA/Audio Wall-Plate Transmitter.   Please set the parameters of the COM Port, baud rate, data bit, stop bit and the parity bit correctly; it should be set to 9600,N,8,1.

5.2.1 RS232 Communication Commands

Communication protocol: RS232 Communication Protocol

Baud rate: 9600   Data bit: 8   Stop bit: 1   Parity bit: none

Command	Function	Feedback Example
Switch Commands		
50701%	Switch to HDMI input	Switch to HDMI
50704%	Switch to VGA input	Switch to VGA
50770%	Enable auto-switching	Auto Switching
50771%	Disable auto-switching	Manual Switching
Resolution Commands		
50619%	Change the resolution to 1360x768 HD	Resolution: 1360x768
50626%	Change the resolution to 1024x768 XGA	Resolution: 1024x768
50627%	Change the resolution to 1280x720 720p	Resolution: 1280x720
50628%	Change the resolution to 1280x800 WXGA	Resolution: 1280x800
50629%	Change the resolution to 1920x1080 1080p	Resolution: 1920x1080
50620%	Change the resolution to1920x1200 WUXGA	Resolution: 1920x1200
50621%	Change the resolution to1600x1200 UXGA	Resolution: 1600x1200
Setup Commands		
502xx%	Set the brightness to xx (xx ranges from 00 to 99)	Brightness: xx
503xx%	Set the contrast to xx (xx ranges from 00 to 99)	Contrast: xx
504xx%	Set the saturation to xx (xx ranges from 00 to 99)	Saturation: xx

Command	Function	Feedback Example
505xx%	Set the sharpness to xx (xx ranges from 00 to 99)	Sharpness: xx
50606%	Auto-adjust the input parameter	VGA Input Auto
50607%	Adjust the color temperature	Color Temperature: xx (xx can be medium, warm, user, or cool)
50608%	Set the aspect ratio	Aspect Ratio: xx (xx can be 16:9, 4:3, or auto.)
50614%	Set the picture mode	Picture Mode: xx (xx can be dynamic, standard, mild, or user.)
50699%	Check the system version	Version Vx.x.x
50779%	Switch to RS232 mode 1, enable the Wall-Plate Transmitter to control far-end devices	RS232 Mode 1: RS232 Control Scaler & Remote
50780%	Switch to RS232 mode 2, enable far-end devices to control the Wall-Plate Transmitter	RS232 Mode 2:RS232 & Remote Control Scaler
50790%	Set the HDCP status of HDMI input socket to Active	HDCP Active
50791%	Set the HDCP status of HDMI input socket to On	HDCP On
50792%	Set the HDCP status of HDMI input socket to Off	HDCP Off
50698%	Software update	
50617%	Reset to factory default	
Inquire Commands		
50632%	Check the output resolution	Resolution: xx
50633%	Check the picture mode	Picture Mode: xx

Command	Function	Feedback Example
50793%	Check HDCP status	HDCP Off HDCP On HDCP Active
50635%	Check the image aspect ratio	Aspect Ratio: xx
50636%	Check the brightness	Brightness: xx
50637%	Check the contrast	Contrast: xx
50638%	Check the saturation	Saturation: xx
50639%	Check the sharpness	Sharpness: xx
50640%	Check the color temperature	Color Temperature: xx
Adjustment Commands		
50678%	Enable screen output adjusting	Enter Output Position Adjust
50679%	Disable screen output adjusting	Exit Output Position Adjust
50670%	Move the image to left	Output Position Adjust X xx
50671%	Move the image to right	Output Position Adjust X xx
50672%	Move the image up	Output Position Adjust Y xx
50673%	Move the image down	Output Position Adjust Y xx
50674%	Stretch left from left side (increase image width)	Output Width Adjust xx
50675%	Stretch right from left side (decrease image width)	Output Width Adjust xx
50676%	Stretch upwards from bottom side (decrease image height)	Output Height Adjust xx
50677%	Stretch downwards from bottom side (increase image height)	Output Height Adjust xx
EDID Commands		
50772%	EDID pass-through	EDID: bypass mode
50773%	Set EDID data to 1080p PCM 2.0ch	EDID:1080P&PCM 2ch
50774%	Set EDID data to 1080p Dolby 5.1	EDID:1080P&5.1ch

Command	Function	Feedback Example
50775%	Set EDID data to 1080p 3D Dolby 5.1	EDID:1080P3d&5.1ch
50776%	Set EDID data to 1080i PCM 2.0ch	EDID:1080i&PCM 2ch
50777%	Set EDID data to 4K*2K PCM 2.0ch	EDID:4K&PCM 2ch
50778%	Check EDID data	EDID:1080P&PCM 2ch EDID:1080P&5.1ch EDID:1080P3d&5.1ch EDID:4K&PCM 2ch
50799%	Program EDID file, send EDID data within 10s	Waiting for edid within 10 secs!

Note:

1. Commands with grey background are for VGA sources only.
2. EDID commands are for HDMI sources only.

6. Panel Drawing
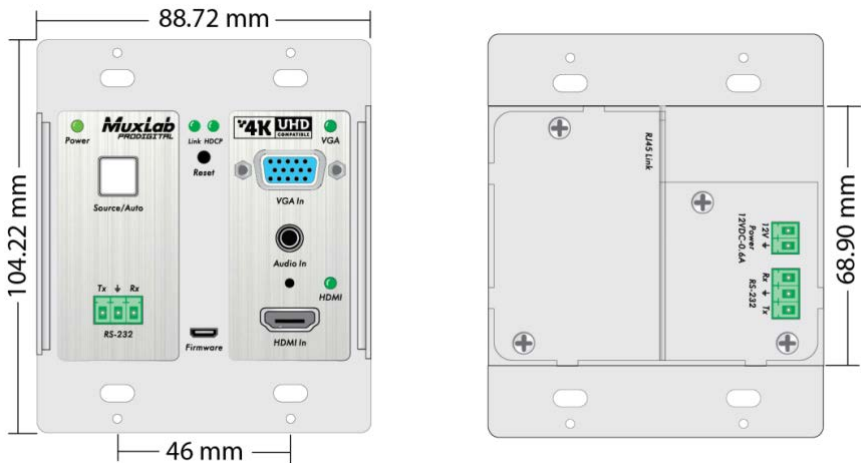
7. Troubleshooting & Maintenance

The following table describes some of the symptoms, probable causes and possible solutions in respect to the installation of the HDMI – VGA/Audio Wall-Plate Transmitter.

Problem	Cause	Solution
Losing color or no video signal output on HDMI display	The cables may not be connected correctly or may be broken	Check whether the cables are connected correctly and in working condition
No HDMI signal output in the device while local HDMI input is in normal working state		
Output image with snowflake		
POWER indicator doesn't work or no response to any operation	Loose or failed power connection	Ensure the power cord connection is good, and power supply is connected to an AC outlet
Cannot control the Wall-Plate by a control device (e.g. a PC) through RS232 port	Incompatible RS232 communication parameters	Make sure the RS232 communication parameters are correct
Static becomes stronger when connecting the video connectors	Bad grounding	Check the grounding and make sure it is well connected
Cannot be controlled through RS232 port or front panel buttons	The unit could be in Auto Mode and/or has defective RS232 cable	Press the select button for more than 3 seconds and/or replace RS232 cable

If you still cannot diagnose the problem, please call MuxLab Customer Technical Support at 877-689-5228 (toll-free in North America) or (+1) 514-905-0588 (International).

Regulatory Compliance

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CE/FCC & Recycling Information

CE Certification
This equipment complies with the requirements relating to Electromagnetic Compatibility Standards EN55022/EN55024 and the further Standards cited therein. It must be used with shielded cables only.
It has been manufactured under the scope of RoHS compliance.

FCC Certification
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.
You are cautioned that changes or modification not expressly approved by the party responsible for compliance could void your authority to operate the equipment.
This device complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions:
 1. This device may not cause harmful interference, and
 2. This device must accept any interference received, including interference that may cause undesired operation

WEEE (Waste of Electrical and Electronic Equipment), Recycling of Electronic Products

In 2006 the European Union introduced regulations (WEEE) for the collection and recycling of all waste electrical and electronic equipment. It is no longer allowable to simply throw away electrical and electronic equipment. Instead, these products must enter the recycling process.
Each individual EU member state has implemented the WEEE regulations into national law in slightly different ways. Please follow your national law when you want to dispose of any electrical or electronic products. More details can be obtained from your national WEEE recycling agency.

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