VGA, Audio & RS-232 Serial with IR Pass-Thru over Single CAT5/RJ45 Extender Kit

User Manual

(VAS-E)

[Must be used with Solid CAT5e or CAT6 Cable]

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Rev.1003

WUXGA 1920×1200 | CAT-5e/6/7 SINGLE | FC CE | RoHS Compliance

Made in Taiwan

Safety and Notice

The **VAS-E VGA, Audio & RS-232 Serial with IR Pass-Thru over Single CAT5/RJ45 Extender Kit** has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the **VAS-E** 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.

Table of Contents

With only one cost effective Cat-5e/6 cable, the VAS-E lets you extend VGA (WUXGA), bi-directional IR signals and RS-232 serial commands at the same time to cover the distance up to 330m (1,000ft). The devices are composed of a transmitter and a receiver. The transmitter (TX) of VAS-E is installed near the signal source and the receiver (RX) of VAS-E is placed near the desired display. With built-in equalization and gain control, the transmission path can be adjusted to adapt the cable quality and video bandwidth. In order to extend the control path, VAS-E also has built-in RS-232 half-duplex long range extender along with VGA video signals.

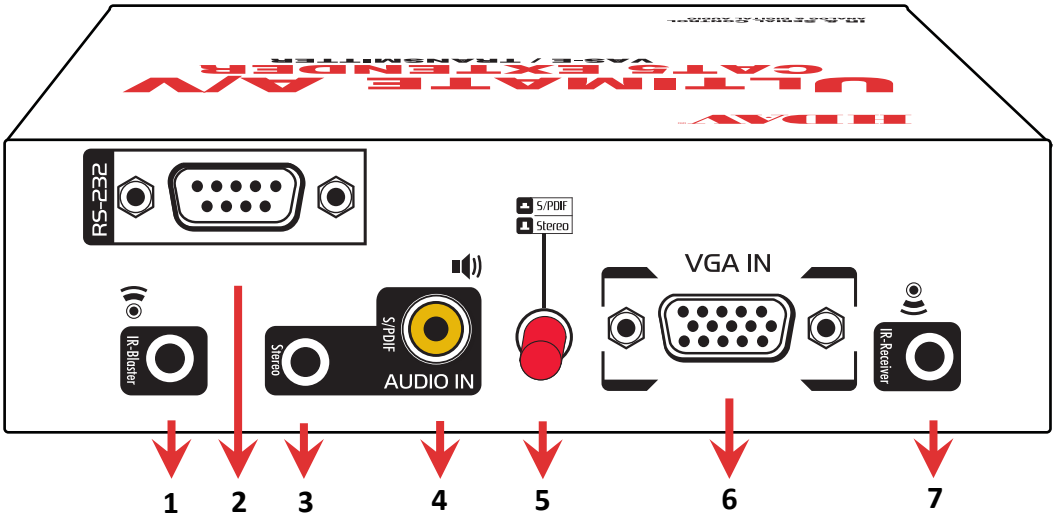
Features

- Supports up to WUXGA [1920x1200@60] or UXGA [1600x1200@60] to 330m (1,000ft)
- Supports RS-232 half-duplex & bi-directional IR pass-through
- Supports analog stereo audio and S/PDIF digital audio
- Video and audio local out on transmitting unit
- Adjustable equalization and gain control on receiving unit
- Wall mounting housing design for easy installation

Specifications & Package Contents

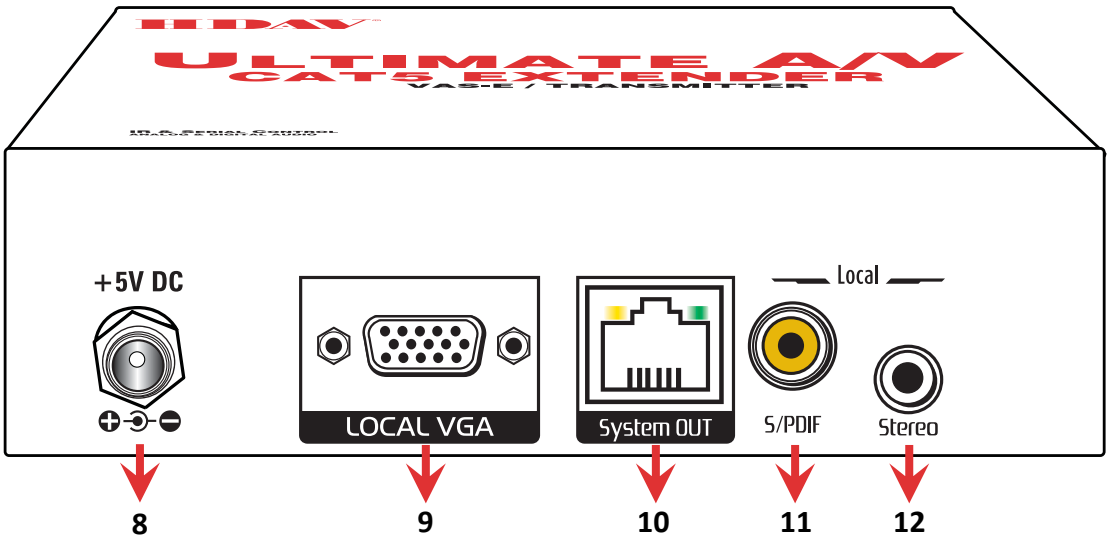
Model Name		VAS-E	
Technical			
Role of usage		Transmitter [TX]	Receiver [RX]
Video bandwidth		350MHz	150MHz
Video support		VESA	
Transmission range over CAT5e cable		WUXGA [1920x1200] — 330m (1,000ft)	
Audio support		Stereo	
RS-232 signal type		Half-duplex	
IR pass-through		Bi-directional Electro-optical characteristics: τ = 25° Carrier frequency: 36-40kHz	
Input video signal		1.2 Volts [peak-to-peak]	
Signal equalization		Continuous analog control	
Local loop-out		1 VGA local-out + 1 audio local-out at TX	
ESD protection		Human body — ±19kV [air-gap discharge] & ±12kV [contact discharge]	
Input		1x VGA + 1x RS-232 + 2x 3.5mm + 1x RCA	1x RJ-45 + 1x 3.5mm
Output		1x RJ-45 + 1x VGA + 2x 3.5mm + 1x RCA	1x VGA + 1x RS-232 + 1x 3.5mm + 1x RCA
VGA connector		HD-15 [15-pin D-sub female]	
RJ-45 connector		WE/SS 8P8C with 2 LED indicators	
RS-232 connector		DE-9 [9-pin D-sub female]	
3.5mm connector		Earphone jack for analog stereo audio or IR cable	
RCA connector		S/PDIF digital audio	
Mechanical			
Housing		Metal enclosure	
Dimensions [L x W x H]	Model	[TX/RX] 92 x 153 x 27mm [3.6”x6”x1.1”]	
	Package	200 x 330 x 95mm [8” x 1’1” x 4”]	
Weight	Model	390g [14oz]	340g [12oz]
	Package	1240g [2.7 lbs]	
Fixedness		Wall-mounting case with screws	
Power supply		Interlocked 5V 2A DC	
Power consumption		6 Watts [max]	
Operation temperature		0~40°C [32~104°F]	
Storage temperature		-20~60°C [-4~140°F]	
Relative humidity		20~90% RH [no condensation]	
Package Contents		1x **VAS-E** (in a pair set) 1x IR blaster 1x User manual	2x 5V power supply unit 1x IR receiver

Input Panel — VAS-E Transmitter (TX)



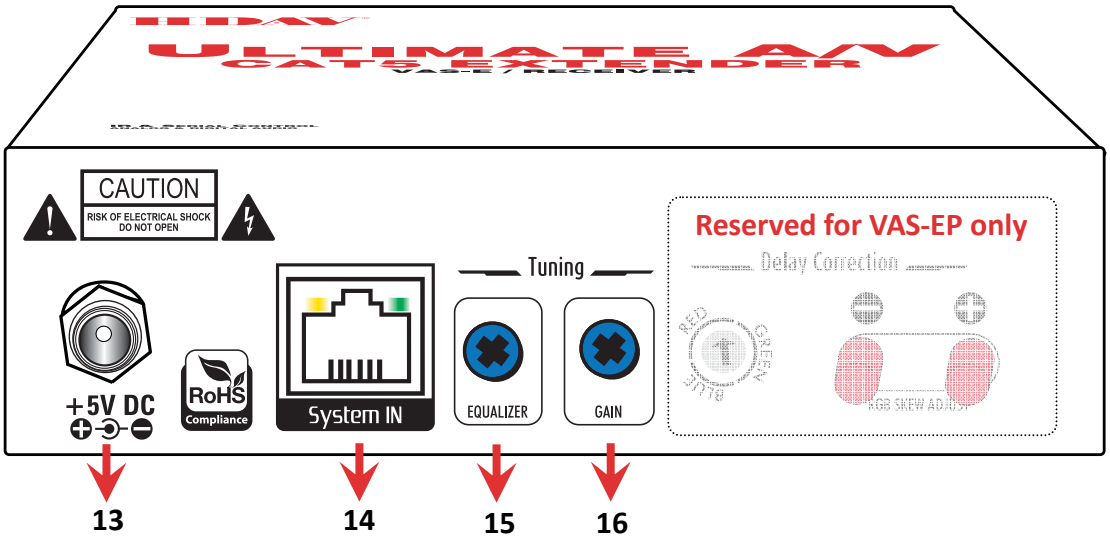
1. **IR-Blaster**: connect to IR blaster for IR pass-thru from RX to TX
2. **RS-232**: connect to an RS-232 signal source or receiver
3. **Stereo IN**: connect to analog audio source
4. **S/PDIF IN**: connect to digital audio source
5. Push-in button: select between S/PDIF and analog stereo audio [button down – S/PDIF, button up – stereo]
6. **VGA IN**: connect to a VGA input source
7. **IR-Receiver**: connect to IR receiver for IR pass-through from TX to RX

Output Panel — VAS-E Transmitter (TX)



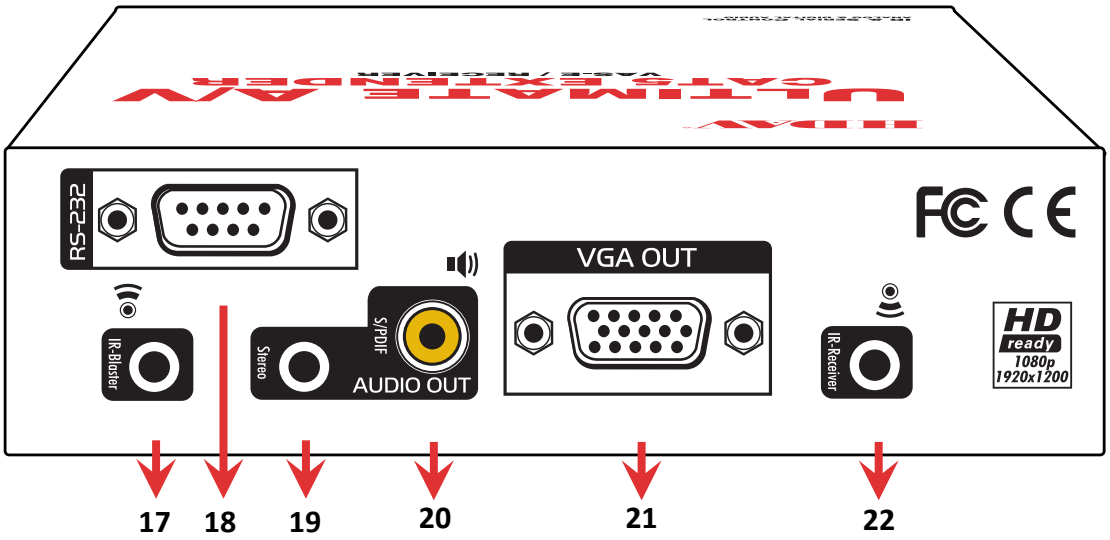
8. **+5V DC:** inter-locked power jack to connect to 5V DC power supply unit
9. **Local VGA**: VGA loop-out to a local VGA display
10. **System OUT**: Connect to the **System IN** port on the VAS-E (RX) with a Cat-5/5e/6 cable
11. **Local S/PDIF**: Digital stereo audio loop-out
12. **Local Stereo**: Analog stereo audio loop-out

Input Panel — VAS-E Receiver (RX)



13. **+5V DC** power jack: connect to 5V DC power supply unit
14. **System IN**: Connect to the **System OUT** port on the VAS-E (TX) with a Cat-5/5e/6 cable
15. **EQUALIZER**: Rotary control for equalization (i.e., equalizing the waveform) of the VGA signal
16. **GAIN**: Rotary control for gain control (i.e., adjusting the amplitude) of the VGA signal

Output Panel — VAS-E Receiver (RX)



17. **IR Receiver**: Connect to a IR RX cable
18. **RS-232**: Connect to a RS-232 device
19. **Stereo OUT**: Connect to analog audio output
20. **S/PDIF OUT**: Connect to digital audio output
21. **VGA OUT**: VGA output to a remote VGA display
22. **IR Blaster**: Connect to IR TX cable

Bottom Panel — VAS-E (receiver [RX])

DIP Switch Position				Description
Pin 1	Pin 2	Pin 3	Pin 4	
ON [↑]	OFF [↓]	ON [↑]	OFF [↓]	**TX&RX Extender Mode –** TxD[1] of VAS-E [TX] is connected to TxD of VAS-E [RX] RxD[2] of VAS-E [TX] is connected to RxD of VAS-E [RX]
OFF [↓]	ON [↑]	OFF [↓]	ON [↑]	**Master to Slave Mode –** TxD of VAS-E [TX] is connected to RxD of VAS-E [RX] RxD of VAS-E [TX] is connected to TxD of VAS-E [RX]

1. ***TxD: The 3rd pin of RS-232, which is in charge of sending data***
2. ***RxD: The 2nd pin of RS-232, which is in charge of receiving data***

INSTALLATION

1. Connect your VGA source, audio source, infrared and RS-232 devices to the VAS-E transmitter.
2. Connect your VGA display, audio speaker, infrared and RS-232 devices to the VAS-E receiver.
3. Connect a Cat-5e/6 cable between the VAS-E transmitter and VAS-E receiver.
4. Make sure this Cat-5e/6 cable is tightly connected and not loose.
5. Plug in 5V DC power supply unit to the power jack of the VAS-E receiver.
6. Plug in 5V DC power supply unit to the power jack of the VAS-E transmitter.
7. **If you see the monitor is displaying blurred video or even worse, not displaying at all, please adjust the EQ and Gain rotary controls to improve the cable skew. GAIN rotary control is to adjust the gain to an appropriate level for a range of input signal levels (brightness), and EQ rotary control is to equalize the wave form of the receiving video signal (sharpness). It is suggested to begin with adjusting the rotary control of EQ to get the input video displayed first, and then the rotary control of GAIN according to the video you see on the screen.**

IR Extenders

IR Blaster [IR TX]

IR Receiver [IR RX]

IR Sockets

VAS-E (TX)

IR Blaster: Plug in an IR blaster (IR TX) here to emit all IR command signals received from the IR receiver (IR RX) on VAS-E receiver to control the associated devices with built-in IR sensor

IR Receiver: Plug in an IR receiver (IR RX) here to receive all IR command signals from the IR remote controls of the associated devices

VAS-E (RX)

IR Blaster: Plug in an IR blaster (IR TX) here to emit all IR command signals received from the IR receiver (IR RX) on VAS-E transmitter to control the associated devices with built-in IR sensor

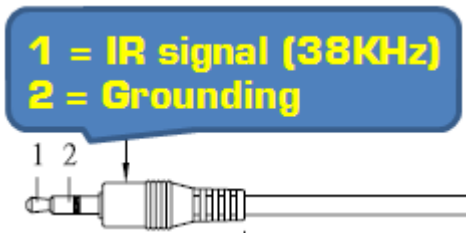
IR Receiver: Plug in an IR receiver (IR RX) here to receive all IR command signals from the IR remote control of the HDMI source device.

CAUTION!

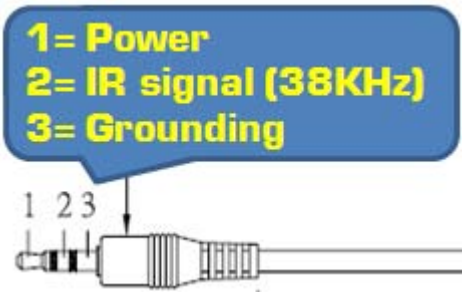
Wrongly insert IR blaster and IR receiver to wrong 3.5mm infrared sockets may result in the failure of the IR extenders. Please check carefully before plugging in the IR extender to the respective IR sockets.

Definition of IR Earphone Jack

IR Blaster [IR TX]



IR Receiver [IR RX]



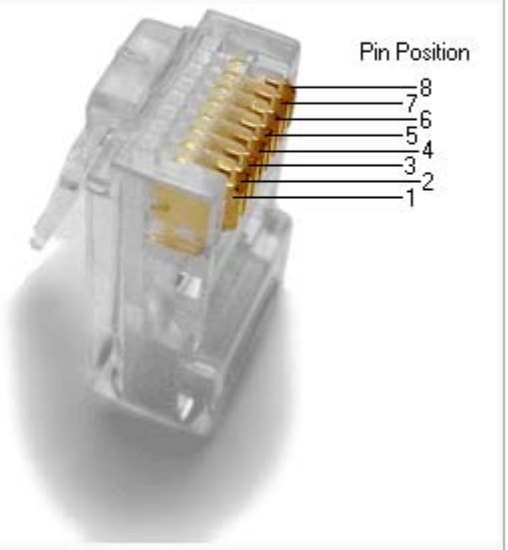
You can buy any IR extension cables in the market that are compatible to the definition of the IR sockets for the matrix if necessary for replacement use. However, IR cables longer than 2m (6-ft) may not work.

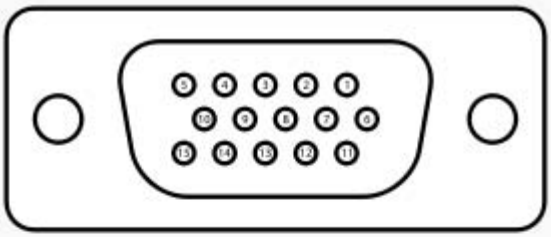
Supported IR Data Format

Data Format	Suitable	Not Recommended
NEC	○	
RC5	○	
TOSHIBA MICOM CODE	○	
GRUNDIG CODE	○	
SONY 12 BIT CODE	○	
SONY 15 BIT CODE	○	
SONY 20 BIT CODE	○	
RCA CODE		○
RCM CODE		○
MATSUSHITA CODE		○
MITSUBISHI CODE	○	
ZENITH CODE	○	
JVC CODE	○	
M50560-001P	○	
MN6125H	○	
MN6125L	○	
MN6014_C5D7	○	
MN6014-C6D6	○	
MC14457P	○	
LC7464(AHEA)	○	
GEMINI_CM	○	

PIN DEFINITION

T568A and T568B Wiring

Pin	T568A Pair	T568B Pair	Wire	T568A Color	T568B Color	Pins on plug face (socket is reversed)
1	3	2	tip	white/green stripe	white/orange stripe	
2	3	2	ring	green solid	orange solid	
3	2	3	tip	white/orange stripe	white/green stripe	
4	1	1	ring	blue solid	blue solid	
5	1	1	tip	white/blue stripe	white/blue stripe	
6	2	3	ring	orange solid	green solid	
7	4	4	tip	white/brown stripe	white/brown stripe	
8	4	4	ring	brown solid	brown solid	



A female DE15 socket (videocard side).

Pin 1	RED	Red video
Pin 2	GREEN	Green video
Pin 3	BLUE	Blue video
Pin 4	N/C	Not connected
Pin 5	GND	Ground (HSync)
Pin 6	RED_RTN	Red return
Pin 7	GREEN_RTN	Green return
Pin 8	BLUE_RTN	Blue return
Pin 9	SENSE	+5 V DC from gfx adapter
Pin 10	GND	Ground (VSync, DDC)
Pin 11	N/C	Monitor ID
Pin 12	SDA	I²C data
Pin 13	HSync	Horizontal sync
Pin 14	VSync	Vertical sync
Pin 15	SCL	I²C clock

Pair of Category Cable	Associated Definition
Green	Audio
Blue	RED channel of VGA
Orange	GREEN channel of VGA
Brown	BLUE channel of VGA

1. All transmission distances are measured using Belden 1583A CAT5e 125MHz Solid UTP cable and ASTRODESIGN Video Signal Generator VG-859C. The transmission distance is defined as the distance between the video source and the VGA display.
2. The transmission length is largely affected by the type of Cat-5e/6 cables, the type of VGA sources, and the type of VGA display. The testing result shows solid UTP cables (usually in the form of 330m [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 cable shows longer transmission range than stranded STP CAT6 cable. For long extension users, solid UTP/STP cables are the only viable choice.
3. To reduce the interference among the unshielded twisted pairs of wires in UTP cable, use double shielded STP cables to improve EMI problems, which is worsen in long transmission.
4. Because the quality of the Cat-5e/6 cables has the major effect on how long the transmission limit can achieve and how good is the received picture quality, the actual transmission range is subject to one's choice of Cat-5e/6 cables. For desired resolutions greater than 1080i or 1280x1024, a Cat-6 cable is recommended.

Performance Guide for VGA over RJ-45/CAT5 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		