



HDMI Extender over Dual Cat.X with RS-232 & Bi-directional IR



To avoid EMI issue, complete STP Cat6 cable is strongly recommended!



Safety and Notice

The **AV-GM04D3-S1 HDMI Extender over Dual Cat.X with RS-232 & Bi-directional IR** has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the **AV-GM04D3-S1** 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.



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INTRODUCTION

The AV-GM04D3-S1 HDMI Extender over Dual Cat.X with RS-232 & Bi-directional IR boosts up your video/audio transmission distance up to 60m (200ft) in HDTV 1080i format, 40m (130ft) in HDTV 1080p format, and 20m (65ft) in HDTV 1080p with 36 bit color depth. With two cost effective LAN cable, users can readily extend HDTV sources from DVD players, Blu-ray Disc player, PS3, PC, and any other kinds of sources compliant with TMDS to distant display monitors including HDMI/DVI enabled TV sets or LCD PC monitors. With the state-of-the-art Silicon Image chipsets equipped, deep color video, DTS-HD or Dolby TrueHD audio, and HDCP supports and compatibility are all further insured. This flexibility makes HDCP compliant DVD players or PS3 transmit utmost high quality video and audio with a greater distance at the minimal cost, when integrating several components apart. In addition, AV-GM04D3-S1 is also equipped with bi-directional IR pass-through path. This bonus feature allows users to boost IR control distance up to 100m (330 ft) and makes IR control possible through only single CAT-5 type cable including HDMI signals. Furthermore, AV-GM04D3-S1 is equipped with a popular serial control path RS-232. With high definition digital signal and serial control, AV-GM04D3-S1 makes your digital signage application with the upmost performance in pure digital domain.

The AV-GM04D3-S1 includes two units: transmitting (AV-GM04D3-S1-TX) and receiving (AV-GM04D3-S1-RX) units. The transmitting unit is used to capture the input HDMI/DVI signals with IR control packets and serial port, such as COM1 to carry the signals through one RJ45 connector into cost effective Cat-5/5e/6 cable. The receiving unit is responsible for equalizing the transmitted HDMI signal, reconstructing IR signals and receiving serial command. The transmission distance between the sending and receiving units can be up to 60m (200ft) under HD (720p/1080i) or 40m (130ft) under Full HD (1080p). With an 8-level equalization rotary control on the receiving unit, users can adjust the equalization strength to the received HDMI signals accordingly, and therefore optimize the transmission distance between source and destination.

FEATURES

- Support HDMI Deep Color & full 3D
- Extends the transmission distance up to 60m (200ft) from the sources under 1080i or 720p
- Extends the transmission distance up to 40m (130ft) from the sources under 1080p
- Provides independent DDC channel, fully HDCP compliant
- Minimizes the cable skew by adjustable 8-level equalization rotary control switch
- Support bi-directional full bandwidth of IR signal, 20KHz ~ 60KHz
- Pure unaltered uncompressed 7.1ch digital HDMI over CAT5/6 cable transmission
- Supports serial port RS-232 [TX & RX] control
- Wall mounting housing design for easy and robust installation
- Perfectly integrated with other HDMI over Cat.X series products



The length depends on the characteristics and quality of the cables. Higher resolutions and longer transmission distances require low skew cables (<25ns/100m) for best performance. Unshielded CAT6 with metal RJ45 connectors is recommended.

The claimed transmission distance here is subject to the grade of installed cable(s), source device and display.

For over Cat.X/COAX transmission, the cable(s) has to be solid, not stranded. Any keystone jack along the transmission path will kill the transmission performance significantly!

SPECIFICATIONS

Model Name	AV-GM04D3-S1	
Technical	AV-GM04D3-S1[Tx]	AV-GM04D3-S1[Rx]
Role of usage	Transmitter [TX]	Receiver [RX]
HDMI compliance	HDMI Deep Color & full 3D	
HDCP compliance	Yes	
Video bandwidth	Single-link 225MHz [6.75Gbps]	
Video support	480i / 480p / 720p / 1080i / 1080p60	
HDMI over UTP transmission [24-bit]	Full HD (1080p)-40m (130ft) [CAT.X] HD (720p/1080i)-50m (165ft) [CAT.X]	
Audio support	Surround sound (up to 7.1ch) or stereo digital audio	
Equalization	8-level digital control at RX	
Input TMDS signal	1.2 Volts [peak-to-peak]	
Input DDC signal	5 Volts [peak-to-peak, TTL]	
ESD protection	[1] Human body model — 19kV [air-gap discharge] & 12kV [contact discharge] [2] Core chipset — 8kV	
PCB stack-up	4-layer board [impedance control — differential 100Ω ; single 50Ω]	
IR pass-through	Half-duplex bi-directional	
Input	1x HDMI + 1x RS-232 + 1x 3.5mm	2x RJ-45 + 1x 3.5mm
Output	2x RJ-45 + 1x 3.5mm	1x HDMI + 1x RS-232 + 1x 3.5mm
HDMI source control	Controllable via IR pass-through from RX to TX and from TX to RX with IR extenders	
IR remote control	Electro-optical characteristics: $\pi = 25^\circ$ / Carrier frequency: 20-60kHz	
HDMI connector	Type A [19-pin female]	
RJ-45 connector	WE/SS 8P8C with 2 LED indicators	
3.5mm connector	IR blaster & IR receiver	IR receiver & IR blaster
Rotary control switch	None	8-Signal level equalization
Mechanical		
Housing	Metal enclosure	
Dimensions	Model	107 x 83 x 27mm [4.2" x 3.3" x "]

[L x W x H]	Package	270 x 175 x 80mm [10.6" x 6.9" x 3.1"]
	Carton	450 x 370 x 300mm [1'6" x 1'3" x 1']
Weight	Model	284g [10 oz]
	Package	TBA
Fixedness		Wall-mounting case with screws
Power supply		5V 2A DC
Power consumption		1.5 Watt [max]
Operation temperature		0~40°C [32~104°F]
Storage temperature		-20~60°C [-4~140°F]
Relative humidity		20~90% RH [no condensation]

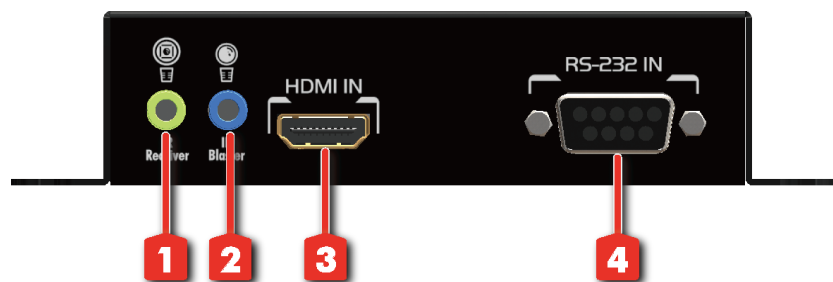
PACKAGE CONTENTS

- 1x AV-GM04D3-S1 [TX & RX]
- 2x IR receiver
- 1x User Manual
- 2x IR blaster
- 2x DC 5V 2A wall wart

PANEL DESCRIPTIONS

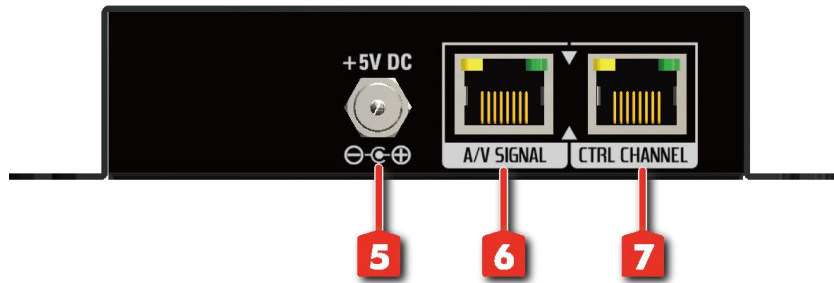
Transmitting unit ► AV-GM04D3-S1-TX

Front Panel



- 1. IR Receiver:** Infrared 3.5mm socket for plugging in the extension cable of IR receiver
- 2. IR Blaster:** Infrared 3.5mm socket for plugging in the extension cable of IR blaster
- 3. HDMI IN:** Connects to a HDMI source with a HDMI male-male cable here
- 4. RS-232 IN:** Connect to PC serial port with a DSUB-9 male-male cable here

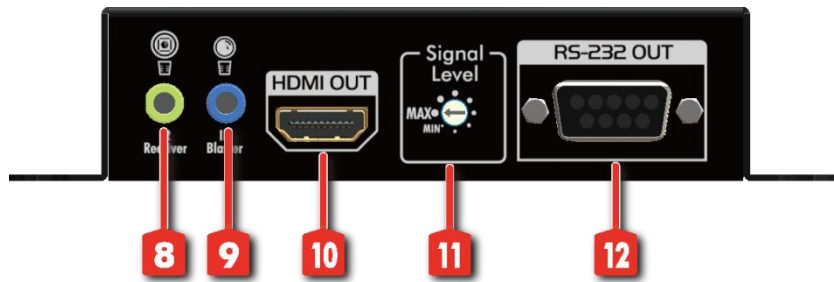
Rear Panel



- 5. **+5V DC:** Connect to 5V DC power supply
- 6. **A/V SIGNAL:** Plug in a Cat-5/5e/6 cable that needs to be linked to the **A/V SIGNAL** port of the receiving unit
- 7. **CTRL CHANNEL:** Plug in a Cat-5/5e/6 cable that needs to be linked to the **CTRL CHANNEL** port of the receiving unit

Receiving unit ▶ AV-GM04D3-S1-RX

Front Panel



- 8. **IR Receiver:** Infrared 3.5mm socket for plugging in the extension cable of IR receiver
- 9. **IR Blaster:** Infrared 3.5mm socket for plugging in the extension cable of IR blaster
- 10. **HDMI OUT:** Connect to a HDMI display with a HDMI male-male cable here
- 11. **Signal Level:** Adjust the 8-level equalization control to the received HDMI signals. The HDMI signal level varies from strongest to weakest for respective transmission length from longest possible range to short distance. Please adjust the signal level from weakest to strongest and stop turning the rotary switch whenever the audio/video is playing normally. Inappropriate signal level setting may cause overpowering issue that would shorten the product life significantly!

Mode	Strongest EQ to Weakest EQ
TX&RX Extender Mode – TxD1 of AV-GM04D3-S1-TX is connected to TxD of AV-GM04D3-S1-RX RxD2 of AV-GM04D3-S1-TX is connected to RxD of AV-GM04D3-S1-RX	0 > 1 > 2 > 3 > 4 > 5 > 6 > 7
Master to Slave Mode – TxD of AV-GM04D3-S1-TX is connected to RxD of	8 > 9 > A > B > C > D > E > F

AV-GM04D3-S1-RX

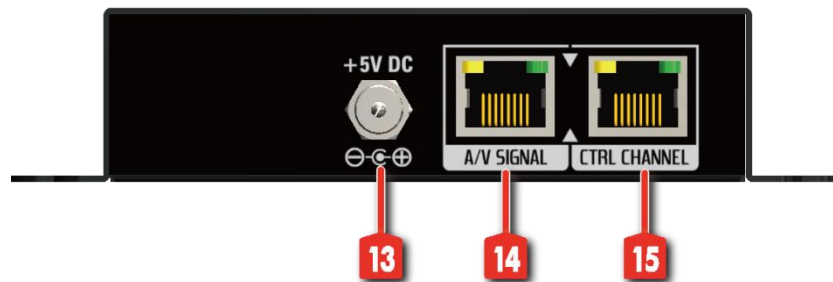
RxD of AV-GM04D3-S1-TX is connected to TxD of AV-GM04D3-S1-RX



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

12. RS-232: Connect to a RS-232 enable device or Touch panel with serial port control

Rear Panel

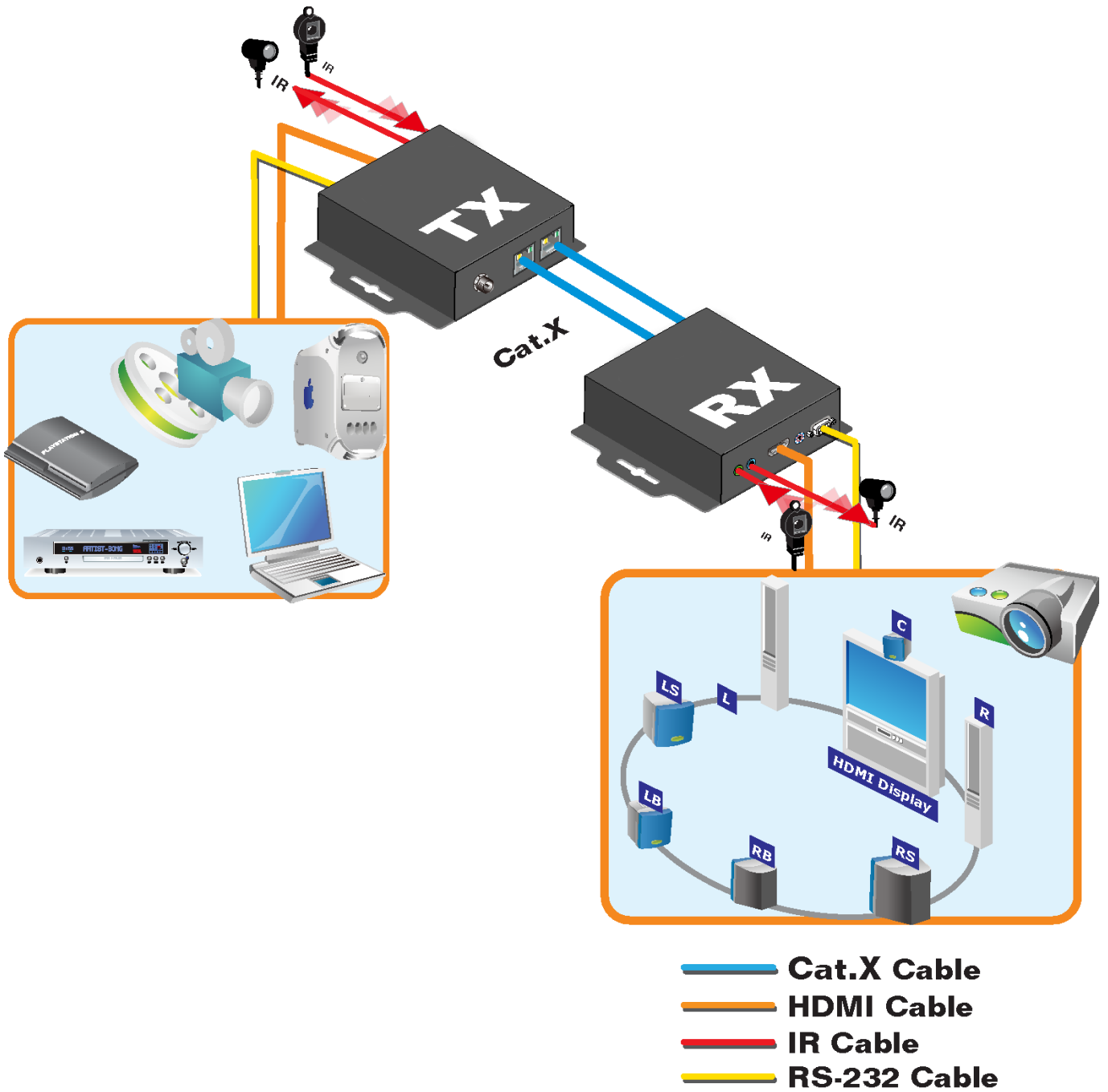


13. +5V DC: Connect to 5V DC power supply

14. A/V SIGNAL: Plug in a Cat-5/5e/6 cable that needs to be linked to the **A/V SIGNAL** port of the transmitting unit.

15. CTRL CHANNEL: Plug in a Cat-5/5e/6 cable that needs to be linked to the **CTRL CHANNEL** port of the transmitting unit

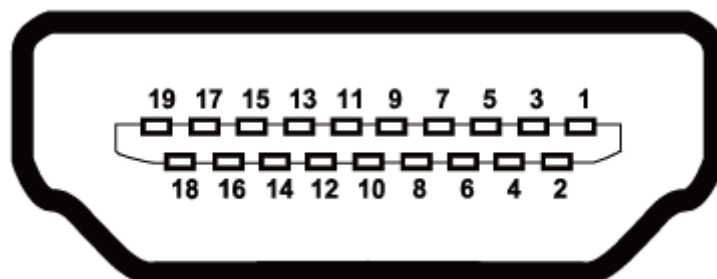
CONNECTION DIAGRAM



HARDWARE INSTALLATION

1. Connect a HDMI or DVI source (such as a Blu-ray Disc player) to the transmitting unit AV-GM04D3-S1-TX.
2. Connect a HDMI or DVI display (such as a LCD TV) to the receiving unit AV-GM04D3-S1-RX.
3. Connect IR Blaster/Receiver to both TX and RX units.
4. Connect a Cat-5/5e/6 cable between the transmitting and receiving units.
5. Make sure this Cat-5/5e/6 cable is tightly connected and not loose.
6. Plug in 5V DC power supply unit to the power jack of the receiving unit AV-GM04D3-S1-RX.
7. Plug in 5V DC power supply unit to the power jack of the transmitting unit AV-GM04D3-S1-TX.
8. **If you see flickering or blinking image on the display, please adjust the rotary control switch to improve the cable skew. MAX stands for the strongest HDMI signal level for longest possible transmission length while MIN stands for the weakest HDMI signal level for short transmission length. Please adjust the signal level from MIN to MAX and stop turning the rotary switch whenever the audio/video is playing normally. Inappropriate signal level setting may cause overpowering issue that would shorten the product life significantly!**

PIN DEFINITION



Type A (Receptacle) HDMI

Pin 1	TMDS Data2+	Pin 11	TMDS Clock Shield
Pin 2	TMDS Data2 Shield	Pin 12	TMDS Clock-
Pin 3	TMDS Data2-	Pin 13	NC
Pin 4	TMDS Data1+	Pin 14	Reserved (N.C. on device)
Pin 5	TMDS Data1 Shield	Pin 15	SCL
Pin 6	TMDS Data1-	Pin 16	SDA
Pin 7	TMDS Data0+	Pin 17	DDC/CEC Ground
Pin 8	TMDS Data0 Shield	Pin 18	+5V Power
Pin 9	TMDS Data0-	Pin 19	Hot Plug Detect
Pin 10	TMDS Clock+		

IR PASS-THROUGH

IR Extenders

IR Blaster



IR Receiver



IR Sockets

IR BLASTER: plug in the IR blaster to emit all IR command signals received from the IR receiver from the other end to control the devices corresponding to the IR signals.

IR RECEIVER: plug in the IR receiver to receive all IR command signals from the IR remote controls of the corresponding devices.

CAUTION!

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. Warranty will not cover the damage.

Definition of IR Earphone Jack

IR Blaster











IR Receiver

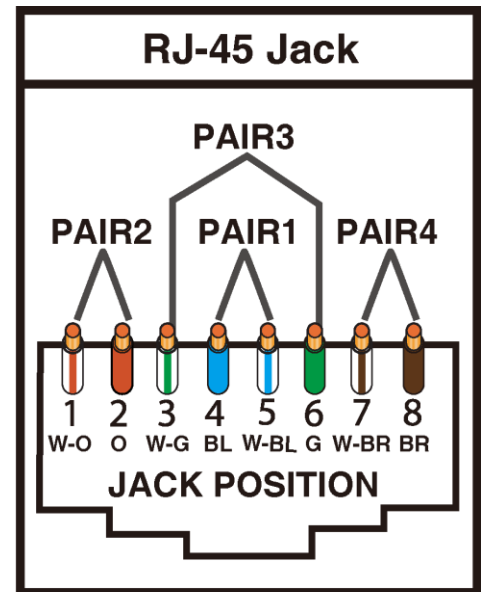


You can buy any IR extension cables in the market that are compatible to the definition of the IR sockets for the matrix if necessary for replacement use. However, IR cables longer than 2m (6-ft) may not work.









RJ45 / CAT5 PIN DEFINITION

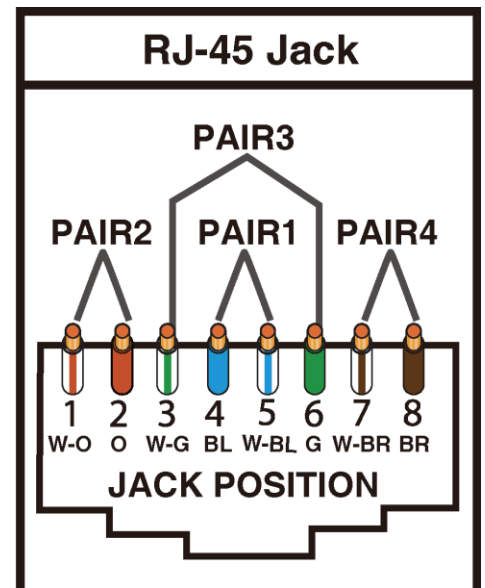
Audio/Video Port

Data Link TIA/EIA-568-B		
PIN	Color	Function
1	 W-O	TX0-
2	 O	TX0+
3	 W-G	TX1-
4	 BL	TX2-
5	 W-BL	TX2+
6	 G	TX1+
7	 W-BR	TXC-
8	 BR	TXC+



Control Channel Port

Data Link TIA/EIA-568-B		
PIN	Color	Function
1	 W-O	IR
2	 O	RS232 (RXD/TXD)
3	 W-G	DDC SCL
4	 BL	DDC SDA
5	 W-BL	GND
6	 G	GND
7	 W-BR	RS232 (RXD/TXD)
8	 BR	CEC



NOTICE

1. When adjusting the signal level on the receiver unit, please dial the rotary control switch from MIN to MAX or F to 8 and stop turning the rotary switch whenever the audio/video is playing normally. Inappropriate signal level setting may cause overpowering issue that would shorten the product life significantly!
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. Warranty will not cover the damage.
3. If the DVI or HDMI device requires the EDID information, please use EDID Reader/Writer to retrieve and provide DVI or HDMI display EDID information.
4. All HDMI over CAT5 transmission distances are measured using Belden 1583A CAT5e 125MHz UTP cable and ASTRODESIGN Video Signal Generator VG-859C & VG-870B.
5. The transmission length is largely affected by the type of Cat-5/5e/6 cables, the type of HDMI sources, and the type of HDMI 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 Cat-5e cable shows longer transmission range than stranded STP Cat-6 cable. For long extension applications, solid UTP/STP cables are the only viable choice.
6. EIA/TIA-568-B termination (T568B) for Cat-5/5e/6 cables is recommended for better performance.
7. To reduce the interference among the unshielded twisted pairs of wires in Cat-5/5e/6 cable, one can use shielded STP cables to improve EMI problems, which is worsen in long transmission.
8. Because the quality of the CAT5/6 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-5/5e/6 cables. For desired resolutions greater than 1080i or 1280x1024, a Cat-6 cable is recommended.
9. 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.



WARRANTY

The SELLER warrants the **AV-GM04D3-S1 HDMI Extender over Dual Cat.X with RS-232 & Bi-directional IR** free from defects in the material and workmanship for 3 years from the date of purchase from the SELLER or an authorized dealer. Should this product fail to be in good working order within 3 years warranty period, The SELLER, at its option, repair or replace the unit, provided that the unit has not been subjected to accident, disaster, abuse or any unauthorized modifications including static discharge and power surge. This warranty is offered by the SELLER for its BUYER with direct transaction only. This warranty is void if the warranty seal on the metal housing is broken.

Unit that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for 90 days from the day of reshipment to the BUYER. If the unit is delivered by mail, customers agree to insure the unit or assume the risk of loss or damage in transit. Under no circumstances will a unit be accepted without a return authorization number.

The warranty is in lieu of all other warranties expressed or implied, including without limitations, any other implied warranty or fitness or merchantability for any particular purpose, all of which are expressly disclaimed.

Proof of sale may be required in order to claim warranty. Customers outside Taiwan are responsible for shipping charges to and from the SELLER. Cables and power adapters are limited to a 30 day warranty and must be free from any markings, scratches, and neatly coiled.

The content of this manual has been carefully checked and is believed to be accurate. However, The SELLER assumes no responsibility for any inaccuracies that may be contained in this manual. The SELLER will NOT be liable for direct, indirect, incidental, special, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. Also, the technical information contained herein regarding the **AV-GM04D3-S1** features and specifications is subject to change without further notice.

Support

For more info or tech support
<http://www.siig.com/support>