

EX-G015

2x8 HDMI 1.3 over Single CAT5
Distribution Amplifier

User Manual



Safety and Notice

The **EX-G015 2x8 HDMI 1.3 over Single CAT5 Distribution Amplifier** has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the EX-G015 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.

Introduction

The **EX-G015 2x8 HDMI 1.3 over Single CAT5 Distribution Amplifier** provides the most flexible solution by which the high definition video and high quality audio can be transmitted to different locations over a long distance. The devices are cascable, allowing you to extend HDMI compliant displays almost anywhere. Installed with a 2x1 HDMI 1.3 compliant switch, one of the input HDMI sources can be duplicated and distributed to up to 8 HDMI enable displays through cost effective Cat-5/5e cables and RJ-45 to HDMI mini-extendors (EX-G076B). With the built in equalization, the input HDMI cable can be extended up to 20 meters (66 feet) long under Full HD, and make the overall transmission distance superior than regular HDMI splitters or matrix switches in the market.

Features

- State-of-the-art Silicon Image (founder of HDMI) chipset embedded for upmost compatibility and reliability
- HDMI 1.3c compliant
- HDCP compliant
- Regenerates the HDMI signal
- Acts as a 2x1 HDMI switch plus a 1x8 HDMI over CAT5 splitter
- Supports default HDMI EDID and has the ability to learn the EDID of displays
- Extends up to 20m (66ft) of input HDMI cable
- Extends up to 60m (200ft) of output CAT-5/5e/6 LAN cable under HD (720p / 1080i)
- Extends up to 40m (130ft) of output CAT-5/5e/6 LAN cable under Full HD (1080p)
- Pure unaltered uncompressed 7.1ch digital HDMI over LAN cable transmission
- Allows cascading
- Perfectly integrated with other HDMI over CAT5 series products
- 1U rack mountable

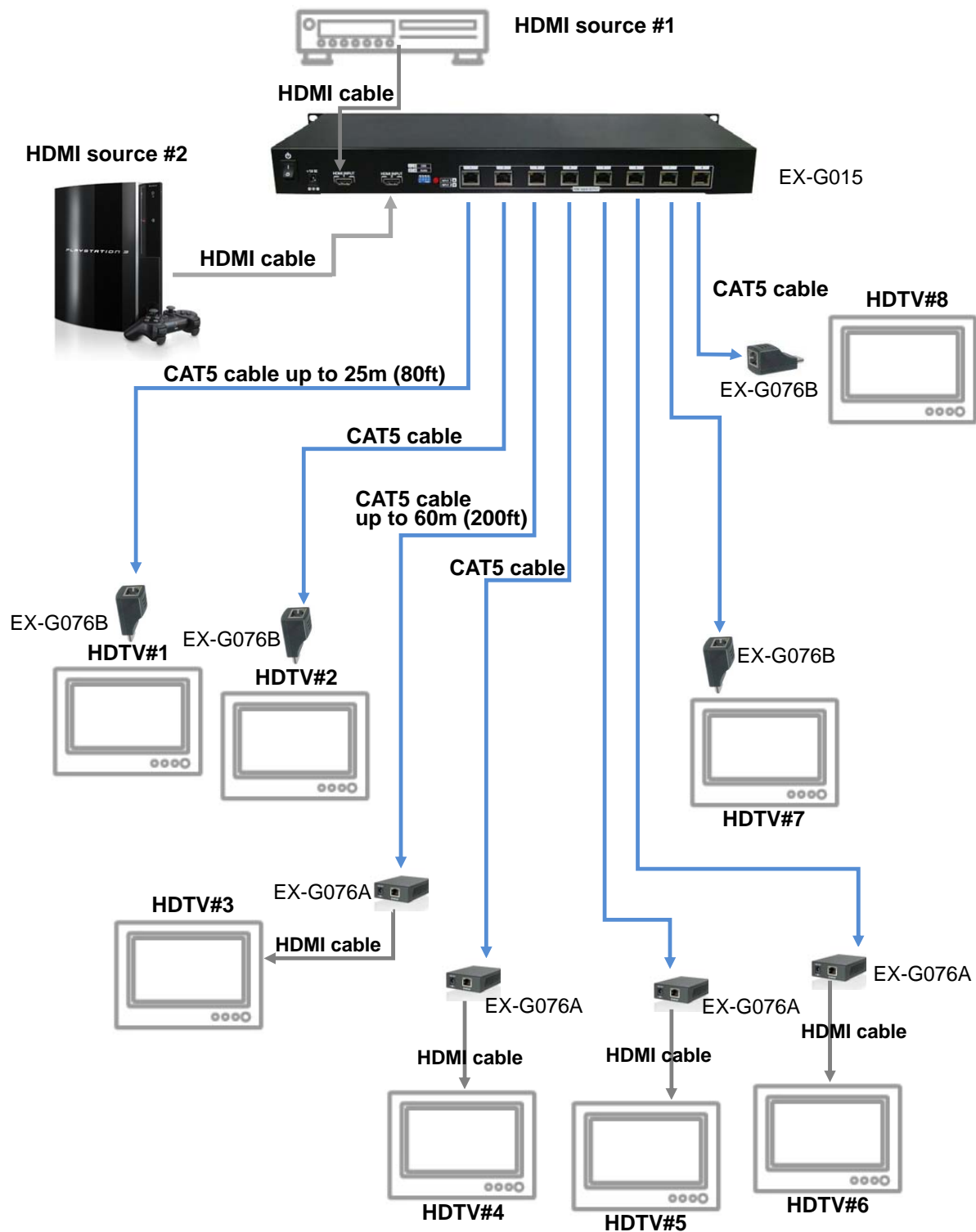


The length depends on the characteristics and quality of the cables. Higher resolutions and longer transmission distances require low skew cables (<25ns/100m) for best performance. Unshielded CAT6 with metal RJ-45 connectors is recommended.

Specifications & Package Contents

Model Name		EX-G015	EX-G076A	EX-G076B
Technical				
Role of usage		2x8 distribution amplifier Transmitter [TX]	Receiver [long range RX]	Receiver [short range RX]
HDMI compliance		HDMI 1.3c		
HDCP compliance		Yes		
Video bandwidth		Single-link 225MHz [6.75Gbps]		
Video support		480i / 480p / 720p / 1080i / 1080p60		
HDMI transmission over LAN cable		Full HD (1080p): 40m (130ft) [CAT5e] / 50m (165ft) [CAT6] HD (720p/1080i): 50m (165ft) [CAT5e] / 60m (200ft) [CAT6]		
Audio support		Surround sound (up to 7.1ch) or stereo digital audio		
Equalization		Built-in	Adjustable 8-level digital	None
Input TMDs signal		1.2 Volts [peak-to-peak]		
Input DDC signal		5 Volts [peak-to-peak, TTL]		
ESD protection [EX-G015 & EX-G076A]		[1] Human body model — $\pm 15\text{kV}$ [air-gap discharge] & $\pm 8\text{kV}$ [contact discharge] [2] Core chipset — $\pm 8\text{kV}$		
PCB stack-up		4-layer board [impedance control — differential 100 Ω ; single 50 Ω]		
Input		2x HDMI	1x RJ-45	1x RJ-45
Output		8x RJ-45	1x HDMI	1x HDMI
HDMI connector		Type A [19-pin female]	Type A [19-pin female]	Type A [19-pin male]
RJ-45 connector		WE/SS 8P8C with 2 LED indicators		
DIP switch [EX-G015]		4-pin for EDID learning and audio setting modes		
Rotary control switch		None	HDMI signal level	None
Mechanical		EX-G015	EX-G076A	EX-G076B
Housing		Metal case	Metal case	Plastic mold
Dimensions [L x W x H]	Model	438 x 158 x 44mm [1'5" x 6.2" x 1.8"]	60 x 80 x 25mm [2.4" x 3.2" x 1"]	25 x 45 x 20mm [1"x1.8"x0.8"]
	Package	230 x 545 x 110mm [9.1" x 1'10" x 4.3"]	175 x 270 x 80mm [10.6" x 6.9" x 3.2"]	115 x 170 x 40mm [4.5"x6.7"x1.6"]
	Carton	580 x 570 x 260mm [1'11" x 1'11" x 10.2"]	370 x 450 x 300mm [1'3" x 1'6" x 11.8"]	370 x 450 x 300mm [1'3" x 1'6" x 11.8"]
Weight	Model	1.4kg [3.1 lbs]	154g [5.4oz]	22g [0.8oz]
	Package	2.2kg [4.8 lbs]	453g [1 lb]	90g [3.2oz]
Fixedness		1U rack-mount with ears	Wall-mounting case with screws	Direct plug-in
Power supply		5V 4A DC	5V 2A DC	None
Power consumption		13 Watts [max]	1 Watt [max]	0.5 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 EX-G015 2x Rack-mounting ears 1x 5V power adapter 1x User Manual	1x EX-G076A 1x 5V power adapter 1x User Manual	1x EX-G076B 1x User Manual

Application Diagram



Panel Descriptions

EX-G015



1. **+5V DC**: Power jack for 5V DC
2. **HDMI INPUT 1**: Connect to one HDMI source here
3. **HDMI INPUT 2**: Connect to another HDMI source here
4. **EDID & Audio**: DIP Switch (see more detail in the next section)
5. Push-in button for switching between **HDMI INPUT 1** and **HDMI INPUT 2**
6. **HDMI Signal OUTPUT 1-8**: Link to each HDMI display via a Cat-5/5e/6 cable with a HDMI over CAT5 receiver EX-G076A or EX-G076B

DIP Switch

DIP Switch Position		Video	Audio	Description
Pin#1	Pin#2			
Pin#3	Pin#4			
OFF [↑]	OFF [↑]	Up to 1080p	Stereo ²	Default Mode³ – Up to 1080p & stereo audio output for most HDTVs
OFF [↑]	ON [↓]	Up to 720p/1080i	Stereo	Safe Mode⁴ – Enforce the system output at 720p/1080i video and stereo audio for basic compatibility among HDTV
ON [↓]	OFF [↑]	Bypass ⁵	Bypass ⁵	EDID Learning⁶ Mode – for learning EDID from the display while playing any received HDMI audio format
ON [↓]	ON [↓]	Bypass	Stereo	EDID Learning⁶ & Stereo Mode – for learning EDID from the display while enforcing stereo output if any HDTV cannot play surround sound normally



Note

¹ Pin#1 and pin#2 are for HDMI INPUT 1; while pin#3 and pin#4 are for HDMI INPUT 2

² If the HDTV shows video but without audio, please set audio mode to stereo.

³ Factory default setting is pin#1-OFF[↑], pin#2-OFF[↑], pin#3-OFF[↑] & pin#4-OFF[↑] for 1080p with stereo.

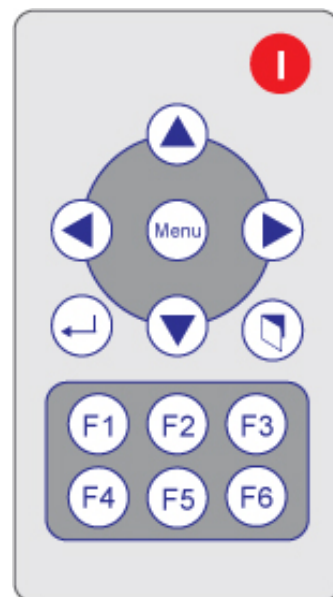
⁴ If you encounter any unsolved audio/video output problem during system installation, please dial the DIP switch to pin#1-OFF[↑], pin#2-ON[↓], pin#3-OFF[↑], & Pin#4-ON[↓] for safe mode to enforce the most compatible 720p stereo output for system check. However, the safe mode cannot be initiated if your HDMI sources are set to enforce 1080p output. In this case, please reconfigure your HDMI source to all resolution output for troubleshooting.

⁵ Bypass means this device will maintain playing the original format of HDMI signals in video and perhaps audio. By setting at this mode, the users may encounter compatibility issue among different kinds of HDMI sources and displays. If you cannot get the audio and/or video output normally at the system installation, please change the DIP switch setting to default mode or even safe mode to verify the functionality of the device.

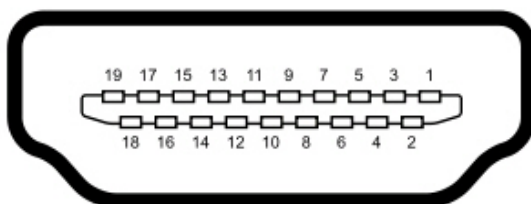
⁶ To learn the EDID of HDMI display for respective HDMI source devices, set (pin#1 and/or pin#3) at ON[↓] first then connect the HDTV sets to respective HDMI inputs via HDMI cables. Then please wait for 20 seconds for completing the EDID learning procedure. If you want to learn the EDID from another HDTV, you must set pin#1 and/or pin#3) at OFF[↑] first and repeat this procedure all over again.

IR Control

Function Key	Function Description
Power ON/OFF	Turn on/off all eight ports for HDMI over CAT5 transmission
F1	Select HDMI INPUT 1 to be the input source
F2	Select HDMI INPUT 2 to be the input source
F3	Mute button for audio output across all eight ports



HDMI Pin Definition



Type A (Receptacle) HDMI

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

Notice

1. If the DVI or HDMI device requires the EDID information, please use EDID Reader/Writer to retrieve and provide DVI/HDMI EDID information.
2. All HDMI over CAT5 transmission distances are measured using Belden CAT5e 125MHz LAN cable and ASTRODESIGN Video Signal Generator VG-859C.
3. The transmission length is largely affected by the type of LAN cables, the type of HDMI sources, and the type of HDMI display. The testing result shows solid LAN cables (usually in bulk cable 300m/1000ft form) can transmit a lot longer signals than stranded LAN cables (usually in patch cord form). 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 LAN cables are the only viable choice.
4. EIA/TIA-568-B termination (T568B) for LAN cables is recommended for better performance.
5. To reduce the interference among the unshielded twisted pairs of wires in LAN cable, one can use shielded LAN cables to improve EMI problems, which is worsen in long transmission.
6. Because the quality of the LAN 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 LAN cables. For desired resolutions greater than 1080i or 1280x1024, a Cat-6 cable 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 LAN Cable Transmission

Performance rating		Type of LAN 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		

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	Shielded (STP)	★ ★ ★	★ ★ ★	★ ★ ★ ★
Stranded	Unshielded (UTP)	★	★ ★	★ ★
	Shielded (STP)	★	★	★ ★
Termination		Please use EIA/TIA-568-B termination (T568B) at any time		