Skywalker communications

ELEMENT Hz

HDMI™ EXTENDER

ELE8089

INSTALLATION MANUAL

Full HD 1080 | WUXGA 1920x1200 | HDCP HIGH-DEFINITION CONTENT PROTECTION | x.v.Color | 7.1 CH AUDIO | CAT-5e/6/7 SINGLE PATENTED | Blu-ray 3D READY | FC CE RoHS Compliance | Made in Taiwan

SAFETY AND NOTICE

The **ELE8089 HDMI™ EXTENDER** has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the **ELE8089** 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 **ELE8089 HDMI™ EXTENDER** 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. ELE8089 also supports the most advanced 3D video format and therefore guarantees the highest 3D video compatibility on the market. With only one cost effective Cat.5/5e/6 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™ or DVI enabled TV sets or LCD PC monitors. With the advanced design for the latest HDMI™ technology, deep color video, DTS-HD Master Audio 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, ELE8089 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.5/5e/6 cable including HDMI™ signals.

The ELE8089 includes two units: transmitting unit and receiving unit. The transmitting unit is used to capture the input HDMI™ / DVI signals with IR control packets and carry the signals via one cost effective Cat.5/5e/6 cable. The receiving unit is responsible for equalizing the transmitted HDMI™ signal and reconstructing IR signals. The transmission distance between the sending and receiving units can be up to 60m (200ft) at HD 720p or 1080i; or 40m (130ft) at 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 up to 60m (200ft) from the HDMI™ source at HD 1080i or 720p 24-bit

» Extends the transmission up to 40m (130ft) from the HDMI™ source at Full HD 1080p 24-bit

» Extends the transmission up to 20m (65ft) from the HDMI™ source at Full HD 1080p 36-bit

» HDCP 1.1 compliant

» Minimizes the cable skew by adjustable 8-level equalization control

» Pure unaltered uncompressed 7.1ch digital HDMI™ over Cat.5/5e/6 cable transmission

» DTS-HD and Dolby TrueHD high bit rate audio support

» Supports full frequency IR signal from 20KHz to 60KHz

» Bi-directional IR path

» Allows cascading

» Wall mounting housing design for easy and robust installation

» Perfectly integrated with other HDMI™ over CAT5 series products

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

For over CAT5/COAX transmission, the cable(s) has to be solid, not stranded. Any keystone jack along the transmission path will kill the transmission performance significantly!

Package Contents

» ELE8089 x1 (TX unit & RX unit)

» IR receiver x1

» DC 5V 2A wall wart x1

» IR blaster x1

» DC 5V 4A in-line with C7 power cord x1

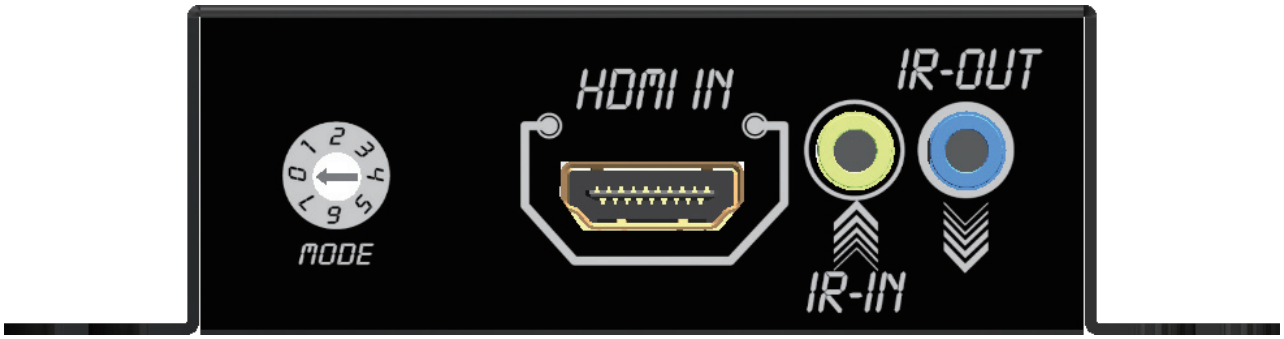
» Installation manual x1

Specifications

Model Name		Transmitter	Receiver
Technical			
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) [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	
Signal Equalization		8-level digital control at receiving unit	
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-thru		Full-duplex bi-directional	
Input		1x HDMI™ + 1x 3.5mm	1x RJ45 + 1x 3.5mm
Output		1x RJ45 + 1x 3.5mm	1x HDMI™ + 1x 3.5mm
HDMI™ source control		Controllable via IR pass-through from receiver to transmitter and from transmitter to receiver with IR extenders	
IR remote control		Electro-optical characteristics: π = 25° / Carrier frequency: 20-60kHz	
HDMI™ connector		Type A [19-pin female]	
RJ45 connector		WE/SS 8P8C with 2 LED indicators	
3.5mm connector		IR blaster & IR receiver	
Rotary control switch		EDID Mode selection	Signal level equalization
Mechanical			
Housing		Metal enclosure	
Dimensions [L x W x H]	Model	2.9" x 3.5" x 1" (75 x 91 x 24mm)	
	Package	10.6" x 6.9" x 3.1" (270 x 175 x 80mm)	
	Carton	1'6" x 1'3" x 11.8" (450 x 370 x 300mm)	
Weight	Model	8.4oz (239g)	
	Package	2.2 lbs (1000g)	
Fixedness		Wall-mounting case with screws	
Power supply		5V 2A DC	
Power consumption		1 Watts	
Operation temperature		32~104°F (0~40°C)	
Storage temperature		-4~140°F (-20~60°C)	
Relative humidity		20~90% RH (no condensation)	

Transmitting unit (TX)

INPUT PANEL



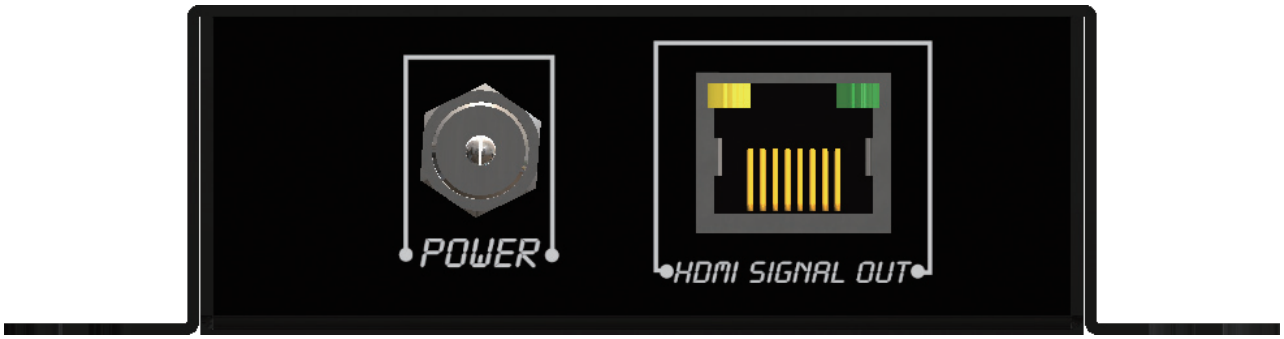
MODE: 0 - EDID Full-HD(1080p@60) - 24bit 2D video & 7.1ch audio
1 - EDID Full-HD(1080p@60) - 24bit 2D video & 2ch audio
2 - EDID Full-HD(1080p@60) - 36bit 2D video & 7.1ch audio
3 - EDID Full-HD(1080p@60) - 36bit 2D video & 2ch audio
4 - EDID HD(1080p@30)(1080i@60)(720p@60) - 24bit 2D video & 7.1ch audio
5 - EDID HD(1080p@30)(1080i@60)(720p@60) - 24bit 2D video & 2ch audio
6 - EDID Full-HD(1080p@60) - 36bit 3D video & 2ch audio
7 - EDID learning mode

HDMI IN: Connects to a HDMI™ source with a HDMI™ male-male cable

IR-IN: Infrared 3.5mm socket for plugging in the extension cable of IR receiver

IR-OUT: Infrared 3.5mm socket for plugging in the extension cable of IR blaster

OUTPUT PANEL

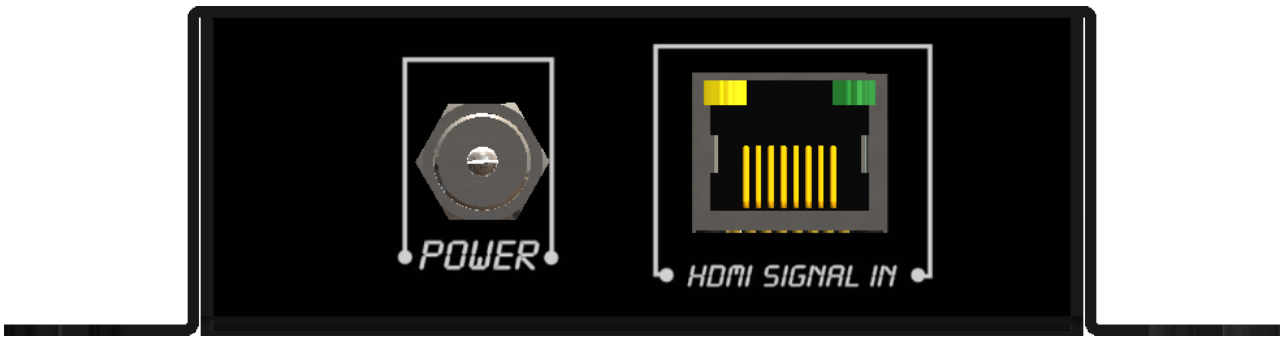


POWER: Connect to 5V DC power supply

HDMI SIGNAL OUT: Plug in a Cat-5/5e/6 cable that needs to be linked to the transmitting unit

Receiving unit (RX)

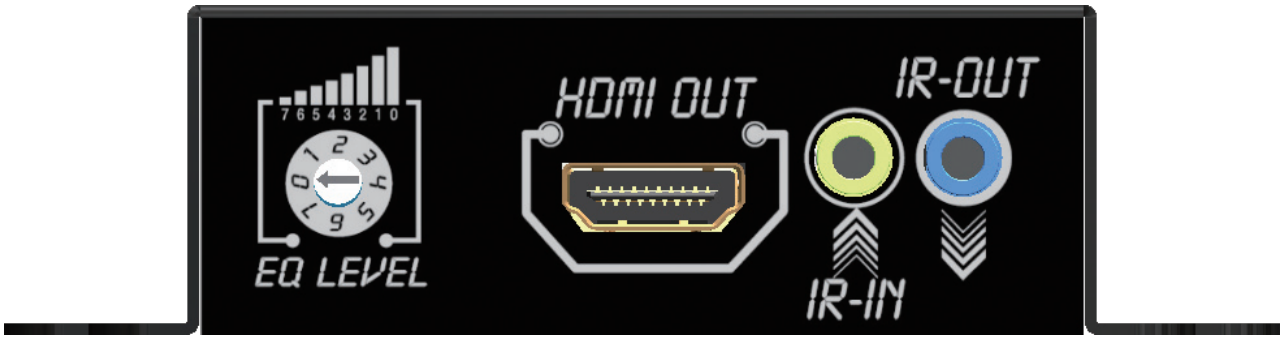
INPUT PANEL



POWER: Connect to 5V DC power supply

HDMI SIGNAL IN: Plug in a Cat-5/5e/6 cable that needs to be linked to the receiving unit

OUTPUT PANEL



EQ LEVEL: Adjust the 8-level equalization control to the received HDMI™ signals. The HDMI™ signal level varies from 0 (strongest) to 7 (weakest) for respective transmission length from longest possible range to short distance. Please adjust the signal level from 7 to 0 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!

HDMI OUT: Connect to a HDMI™ display with a HDMI™ male-male cable

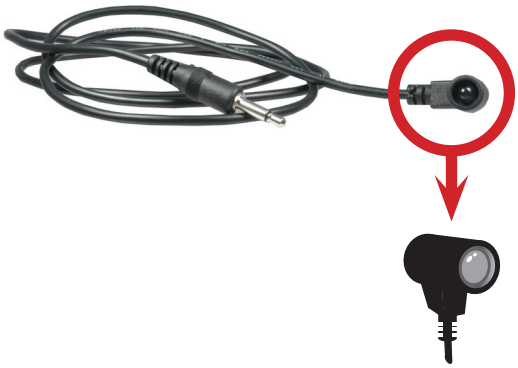
IR-IN: Infrared 3.5mm socket for plugging in the extension cable of IR receiver

IR-OUT: Infrared 3.5mm socket for plugging in the extension cable of IR blaster

IR PASS-THROUGH

IR Extenders

IR Blaster



IR Receiver

IR Sockets

IR-OUT: plug in the IR blaster to emit all IR command signals received from the IR receiver from the other enf to control the devices corresponding to the IR signals.

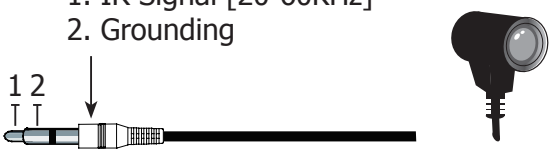
IR-IN: plug in the IR receiver to receive all IR command signals from the IR remote controls of the corresponding devices.

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

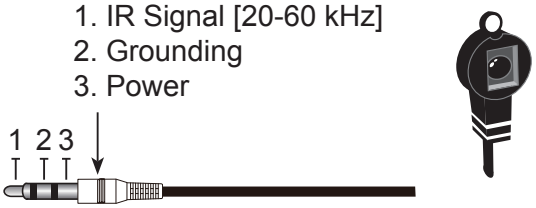
IR Blaster

1. IR Signal [20-60KHz]
2. Grounding



IR Receiver

1. IR Signal [20-60 kHz]
2. Grounding
3. Power



HARDWARE INSTALLATION

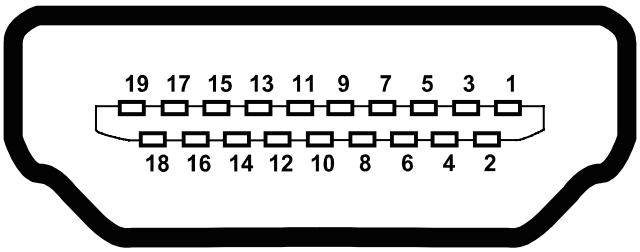
1. Connect a HDMI™ or DVI source (such as a Blu-ray Disc player) to the transmitting unit.
2. Connect a HDMI™ or DVI display (such as a LCD TV) to the receiving unit.
3. Connect IR Blaster/Receiver to both transmitting and receiving units.
4. Connect a Cat-5/5e/6 cable between the transmitting and receiving 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.
7. Plug in 5V DC power supply unit to the power jack of the transmitting unit.
8. If you see flickering or blinking image on the display, please adjust the rotary control switch to improve the cable skew. 0 stands for the strongest HDMI™ signal level for longest possible transmission length while 7 stands for the weakest HDMI™ signal level for short transmission length. Please adjust the signal level from 7 to 0 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!

EDID LEARNING

1. Turn off the transmitting unit and disconnect the Cat.5/5e/6 between transmitting and receiving units.
2. Connect the HDMI™ display to "**HDMI IN**" on the transmitting unit with a HDMI™ cable.
3. Set "**MODE**" on the transmitting unit at **7**.
4. Turn on the transmitting unit.
5. The LED on the RJ45 of transmitting unit will dim and light again, which indicates the EDID learning procedure is complete.
6. Unplug the HDMI™ cable from the display and follow the instruction in [Hardware Installation] to set up the ELE8089 and enjoy the experience.

PIN DEFINITION

HDMI™

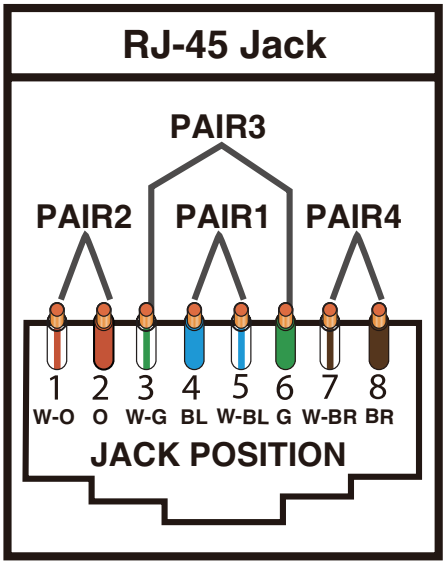


Type A (Receptacle) HDMI™

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

CAT5 [RJ45]

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+



NOTICE

1. When adjusting the signal level on the receiver unit, please dial the rotary control switch from 7 to 0 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. 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.

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 300m [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.

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