

# EX-57V2K-U

HDBaseT 2.0 Extender with RS232,  
Bi-directional IR, Ethernet, PoC & USB

## User Manual



rev: 150805  
Made in Taiwan



## **Safety and Notice**

The **EX-57V2K-U HDBaseT 2.0 Extender with RS-232, Bi-directional IR, Ethernet, PoC & USB2.0** has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the **EX-57V2K-U** 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 **EX-57V2K-U HDBaseT 2.0 Extender with RS-232, Bi-directional IR, Ethernet, PoC & USB2.0** boosts up your video/audio transmission distance up to 100m (330ft) in HDTV 1080p with 48-bit color depth or 80m (264ft) at 4K2K@60 4:2:0 8bit. EX-57V2K-U also supports the most advanced 3D video format compliant with HDMI specification and therefore guarantees the highest 3D video compatibility in the market. With single 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 or Dolby TrueHD audio, and HDCP support 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, EX-57V2K-U is also equipped with bi-directional IR pass-through path, USB2.0 and RS-232 serial port control. These bonus features allow users to boost IR control distance up to 100m (330ft) through only single Cat.5/5e/6 cable including HDMI signals. In addition, serial port and USB2.0 offer the convenient path for interactive application, such as touch panels. In addition, EX-57V2K-U also supports PoC (Power over Cable) which can power both units from TX or RX with power supply.

The EX-57V2K-U includes two units: transmitting unit EX-57V2K-U-TX and receiving unit EX-57V2K-U-RX. The transmitting unit is used to capture the input HDMI / DVI signals with control packets. The receiving unit is responsible for equalizing the transmitted HDMI signal and reconstructing IR and serial control signals. EX-57V2K-U offers the most convenient solution for digital signage with long distance A/V transmission path, and with 10G transmission bandwidth ready, EX-57V2K-U is ready for your next HDMI generation and applications!

# FEATURES

- Supports HDMI Deep Color, full 3D & 4K2K@60 4:2:0 8bit (HDBaseT2.0 technology)
- Extends the transmission up to 100m (330ft) from the HDMI source at Full HD 1080p 48-bit and 80m (264ft) at 4K2K@60 4:2:0 8bit
- Supports PoC (Power over Cable) which can power extender either from TX or RX with single power supply.
- Supports ARC on transmitter & receiver unit
- HDCP & EDID Bypass
- CEC support
- Auto signal equalization
- USB2.0 over Cat.5/5e/6 cable transmission
- Analog audio over Cat.5/5e/6 cable transmission from transmitter to receiver
- Pure unaltered uncompressed 7.1ch digital HDMI over Cat.5/5e/6 cable transmission
- DTS-HD Master Audio and Dolby TrueHD high bit rate audio support
- Supports full frequency IR signal from 20KHz to 60KHz
- Bi-directional IR path-through
- Full Duplex RS-232 control up to 115,200 bps through connector
- Integrated port for LAN/ network device
- Wall mounting housing design for easy and robust installation

# SPECIFICATIONS

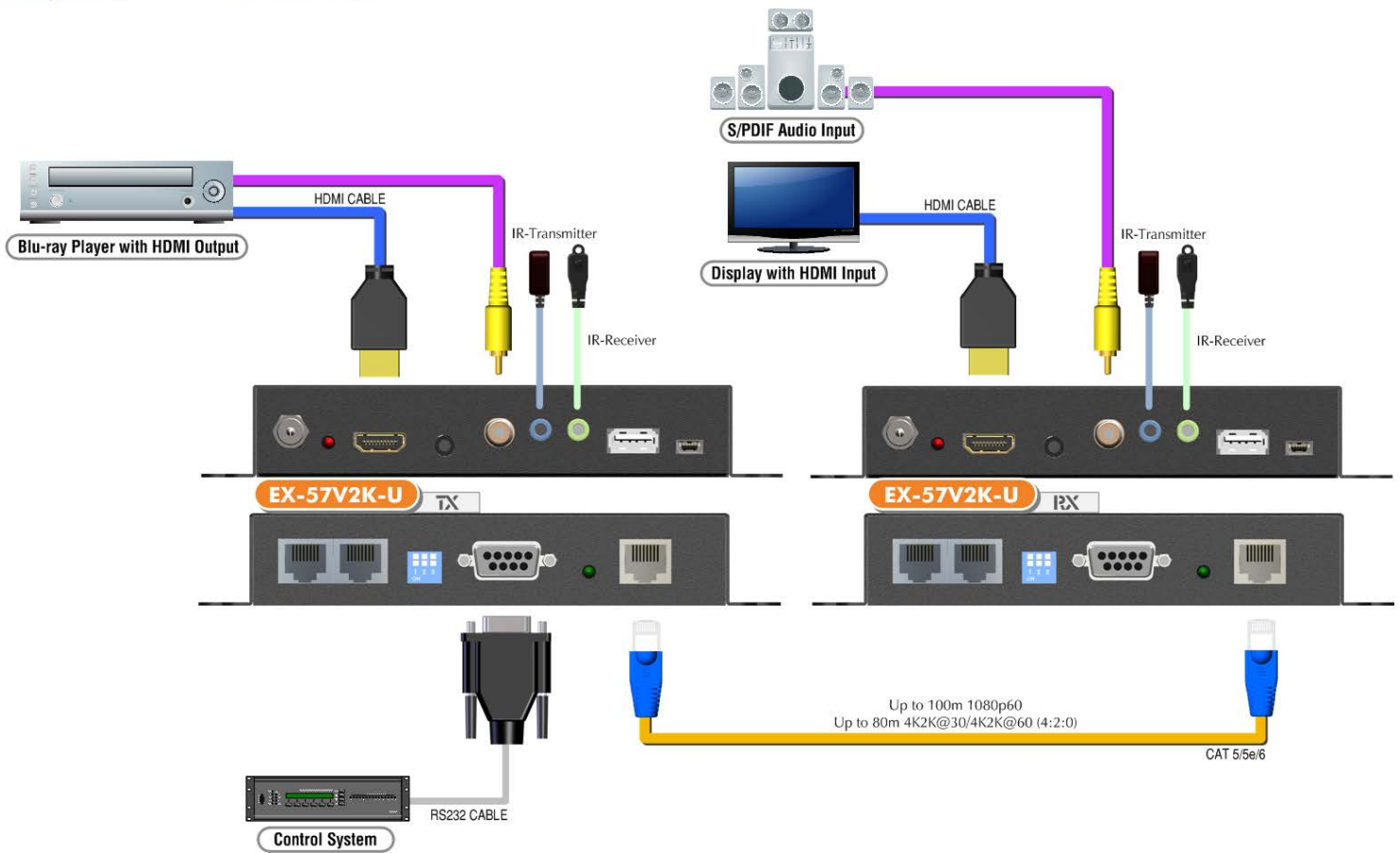
Model Name	EX-57V2K-U	
Technical	EX-57V2K-U[Tx]	EX-57V2K-U[Rx]
Role of usage	Transmitter [Tx]	Receiver [Rx]
HDMI compliance	HDMI Deep Color, full 3D & 4K2K@60 4:2:0 8bit	
HDCP compliance	Yes	
Video bandwidth	Single-link 340MHz [10.2Gbps]	
Video support	480i / 480p / 720p / 1080i / 1080p60 / 4K2K@60 4:2:0 8bit	
HDMI over UTP	1080p@60 100m (330ft) [CAT 5e] 4K2K@60 (4:2:0 8bit) 80m (264ft) [CAT 5e]	
Audio support	Surround sound [up to 7.1ch] or stereo digital audio	
Equalization	Auto	
Input TMDS signal	1.2 Volts [peak-to-peak]	
Input DDC signal	5 Volts [peak-to-peak, TTL]	
ESD protection	Human body model — ±15kV [air-gap discharge] & ±8kV [contact discharge]	
PCB stack-up	6-layer board [impedance control — differential 100Ω; single 50Ω]	
IR pass-thru	Bi-directional	
RS-232 support	Yes	
USB support	USB2.0	
PoC support	Either on TX or RX	
Input	1x HDMI/2x 3.5mm	1x RJ-45(Video)/1x 3.5mm
Output	1x RJ-45(Video)/1x 3.5mm/1x SPDIF	1x HDMI/2x 3.5mm/1x SPDIF
In / Out	1x RS-232/2x USB/2x RJ-45(Ethernet)	1x RS-232/2x USB/2x RJ-45(Ethernet)
HDMI source control	Controllable via IR pass-through from RX to TX or TX to RX with IR extenders	
HDMI connector	Type A [19-pin female]	
RJ-45 connector	WE/SS 8P8C(Reverse Mode)	
USB connector	Type A & Type mini-USB	
3.5mm connector	IR receiver / IR blaster / Stereo	IR receiver / IR blaster / Stereo
Mechanical	EX-57V2K-U[Tx]	EX-57V2K-U[Rx]
Housing	Metal enclosure	
Dimensions [L x W x H]	Model	140 x 92 x 28mm [5.5" x 3.6" x 1.1"]
	Package	263 x 170 x 97mm [10.3" x 6.7" x 3.8"]
	Carton	512 x 364 x 288mm [1'7" x 1.2' x 11.3"]
	Model	104g [3.7oz]
	Package	650g [22.9oz]
Fixedness	Wall-mounting case with screws	
Power supply	24V1A	
Power consumption	Max 12W	
Operation temperature	0-50°C	
Storage temperature	-20~60°C [-4~140°F]	
Relative humidity	20~90% RH [no condensation]	

# PACKAGE CONTENTS

- 1x EX-57V2K-U [TX & RX]
- 1x IR blaster
- 1x IR receiver
- 1x DC 24V1A
- 1x User Manual

# CONNECTION DIAGRAM

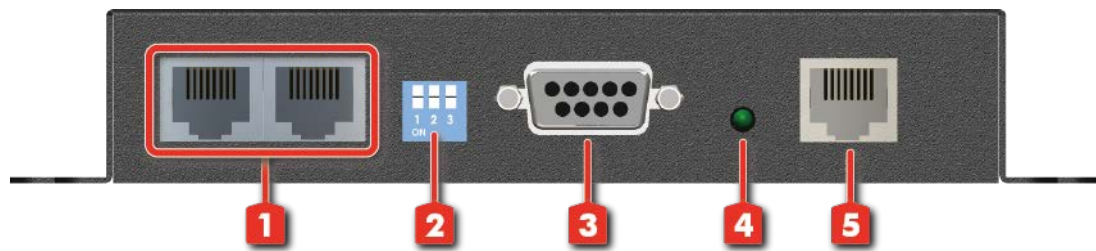
- HDMI
- CAT5/5e/6
- AUDIO
- RS-232
- IR (outgoing)
- IR (incoming)



# PANEL DESCRIPTIONS

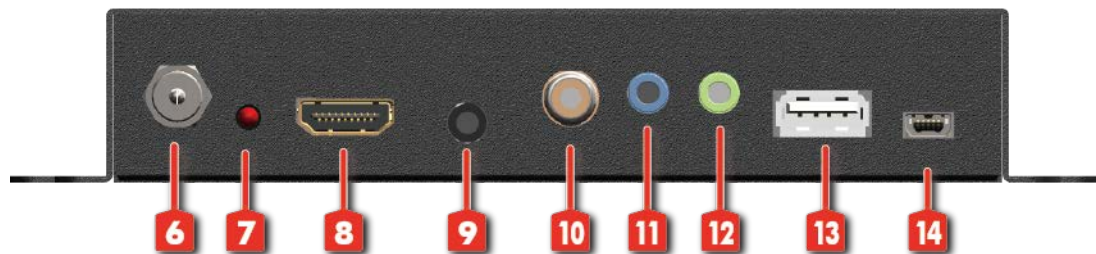
## Transmitting unit ► EX-57V2K-U-TX

### Front Panel



1. **Ethernet port for LAN:** Connect to network device
2. **DIP Switch:** PIN#1: Setup the USB communication  
PIN#2: Setup the RS-232 mode for serial communication channel  
PIN#3: For Firmware Update
3. **RS-232:** Connect to serial port device with a DSUB-9 male-male or male-female cable here  
FW update for Valens chipset
4. **LED:** TX /RX link indicator
5. **RJ45:** Plug in a Cat-5/5e/6 cable that needs to be linked to the transmitting unit RX

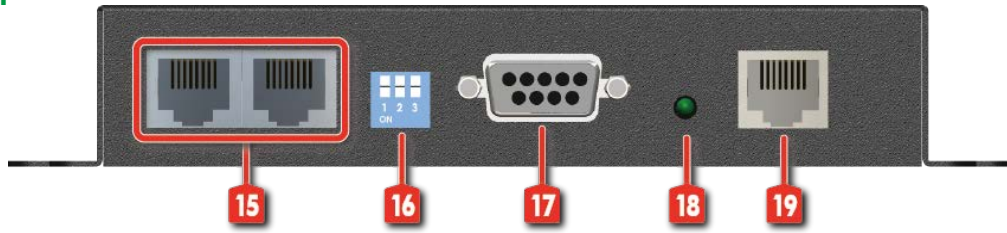
### Rear Panel



6. **+24V DC:** Connect to a 24V DC power supply.
7. **LED:** Power indicator
8. **HDMI IN:** Connect to a HDMI source with a HDMI male-male cable
9. **Stereo:** Analog audio input
10. **RCA connector:** remote ARC output
11. **IR Blaster:** Infrared 3.5mm socket for plugging in the extension cable of IR blaster
12. **IR Receiver:** Infrared 3.5mm socket for plugging in the extension cable of IR receiver
13. **USB:** Connect to USB Device
14. **Mini-USB:** Connect to USB Host

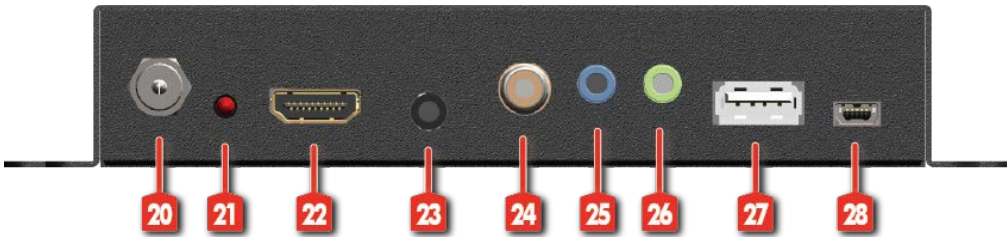
Receiving unit ► EX-57V2K-U-RX

Front Panel



- 15. **Ethernet port for LAN:** Connect to network device
- 16. **DIP Switch:** PIN#1: Setup the USB communication  
 PIN#2: Setup the RS-232 mode for serial communication channel  
 PIN#3: For Firmware Update
- 17. **RS-232:** Connect to serial port device with a DSUB-9 male-male or male-female cable here  
 F/W update for Valens chipset
- 18. **LED:** TX/RX link indicator
- 19. **RJ45:** Plug in a Cat-5/5e/6 cable that needs to be linked to the transmitting unit TX.

Rear Panel



- 20. **+24V DC:** Connect to a 24V DC power supply.
- 21. **LED:** Power indicator
- 22. **HDMI OUT:** Connect to a HDMI display with a HDMI male-male cable
- 23. **Stereo:** Analog audio output
- 24. **RCA connector:** local ARC output
- 25. **IR Blaster:** Infrared 3.5mm socket for plugging in the extension cable of IR blaster
- 26. **IR Receiver:** Infrared 3.5mm socket for plugging in the extension cable of IR receiver
- 27. **USB:** Connect to USB Device
- 28. **Mini-USB:** Connect to USB Host

\* DIP Switch Position (TX/RX)

DIP Switch Position		Description
TX & RX		
PIN#1	ON [↓]	As an USB Host (USB Type-mini-B port)
	OFF [↑]	As an USB Device (USB Type A port)
PIN#2	ON [↓]	TxD: The 2 <sup>nd</sup> pin of RS-232, which is in charge of sending data RxD: The 3 <sup>rd</sup> pin of RS-232, which is in charge of receiving data
	OFF [↑]	TxD: The 3 <sup>rd</sup> pin of RS-232, which is in charge of sending data RxD: The 2 <sup>nd</sup> pin of RS-232, which is in charge of receiving data
PIN#3	ON [↓]	Firmware Update mode
	OFF [↑]	Working mode

# 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



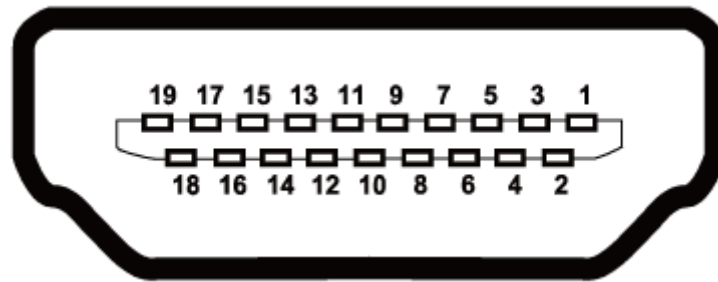
### IR Receiver



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.



# HDMI 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+		

## HARDWARE INSTALLATION

1. Connect a HDMI or DVI source (such as a Blu-ray Disc player) to the transmitting unit EX-57V2K-U-TX.
2. Connect a HDMI or DVI display (such as a LCD TV) to the receiving unit EX-57V2K-U-RX.
3. Connect IR Blaster/Receiver to both TX and RX units.
4. Connect USB Host/Device to both TX and RX units
5. Connect audio source to TX and audio receiver/speaker to RX unit.
6. Connect a Cat-5/5e/6 cable between the transmitting and receiving units.
7. Make sure this Cat-5/5e/6 cable is tightly connected and not loose.
8. Plug in 24V DC power supply unit to the power jack of the transmitting unit EX-57V2K-U-TX.

# NOTICE

1. All HDMI over CAT5 transmission distances are measured using Belden 1583A CAT5e 125MHz UTP cable and ASTRODESIGN Video Signal Generator VG-859C & VG-870B.
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. 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). 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.
4. EIA/TIA-568-B termination (T568B) for Cat-5/5e/6 cables is recommended for better performance.
5. 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.
6. 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 1080p, 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.

# WARRANTY

The SELLER warrants the **EX-57V2K-U HDBaseT 2.0 Extender with RS-232, Bi-directional IR, Ethernet, PoC & USB2.0** free from defects in the material and workmanship for 1 year from the date of purchase from the SELLER or an authorized dealer. Should this product fail to be in good working order within 1 year 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 EX-57V2K-U features and specifications is subject to change without further notice.**