CV-57VE-100

HDMI Extender over Single Cat.X with HDBaseT, Bi-directional IR, POC
User Manual

Safety and Notice

The CV-57VE-100 HDMI Extender over Single Cat.X with HDBaseT, Bi-directional IR, POC has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the CV-57VE-100 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 away 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 CV-57VE-100 HDMI Extender over Single Cat.X with HDBaseT, Bi-directional IR, POC boosts up your video/audio transmission distance up to 90~100m (297~330ft) in HDTV 1080p with 48-bit color depth. CV-57VE-100 also supports the most advanced 3D video format compliant with HDMI specification 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 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, CV-57VE-100 is also equipped with bi-directional IR pass-through path. These bonus features allow users to boost IR control distance up to 90~100m (297~330ft) and makes IR control possible through only single Cat.5/5e/6 cable including HDMI signals. In addition, CV-57VE-100 also supports POC (Power over Cable) which can power both units from TX or RX with power supply.

The CV-57VE-100 includes two units: transmitting unit CV-57VE-100-TX and receiving unit CV-57VE-100-RX. 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 and serial control signals. CV-57VE-100 offers the

most convenient solution for digital signage with long distance A/V transmission path, and with 10G transmission width ready, CV-57VE-100 is ready for your next HDMI generation and applications!

Features

- Support HDMI Deep Color, full 3D & 4K2K@30 (HDBaseT technology)
- Extend the transmission up to 90~100m (297~330ft) from the HDMI source at Full HD 1080p 48-bit and 75m~80m (247~264ft) at 4K2K@30
- Support POC (Power over Cable) which can power both units from TX or RX with power supply
- HDCP & EDID Bypass
- CEC support
- Auto equalization
- 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
- Support full frequency IR signal from 20KHz to 60KHz
- Bi-directional IR pass-through
- Wall mounting housing design for easy and robust installation

**Note: 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.*

Package Contents

- 1x CV-57VE-100 [TX & RX]
- 1x DC 24V 1A in-line with C7 power cord
- 1x Rack-mounting ear set
- 1x IR blaster
- 1x IR receiver
- 1x User Manual

Specifications

Model Name	**CV-57VE-100**	
Technical	**CV-57VE-100 [TX]**	**CV-57VE-100 [RX]**
Role of usage	Transmitter [TX]	Receiver [RX]
HDMI compliance	HDMI Deep Color, full 3D & 4K2K@30	HDMI Deep Color, full 3D & 4K2K@30
HDCP compliance	Yes	Yes
Video bandwidth	Single-link 340MHz [10.2Gbps]	Single-link 340MHz [10.2Gbps]

Video support	480i / 480p / 720p / 1080i / 1080p60	480i / 480p / 720p / 1080i / 1080p60
HDMI over UTP	1080p@60 90-100m (297-330ft) [CAT5e]	1080p@60 90-100m (297-330ft) [CAT5e]
Audio support	Surround sound (up to 7.1ch) or stereo digital audio	Surround sound (up to 7.1ch) or stereo digital audio
Equalization	Auto	Auto
Input TMDS signal	1.2 Volts [peak-to-peak]	1.2 Volts [peak-to-peak]
Input DDC signal	5 Volts [peak-to-peak, TTL]	5 Volts [peak-to-peak, TTL]
ESD protection	[1] Human body model — ±19kV [air-gap discharge] & ±12kV [contact discharge] [2] Core chipset — ±8kV	[1] Human body model — ±19kV [air-gap discharge] & ±12kV [contact discharge] [2] Core chipset — ±8kV
PCB stack-up	6-layer board [impedance control-differential 100Ω, single 50Ω]	6-layer board [impedance control-differential 100Ω, single 50Ω]
IR pass-thru	Bi-directional	Bi-directional
Ethernet support	Yes (LAN 10/100)	Yes (LAN 10/100)
POC support	Yes	Yes
Input	1x HDMI + 1x 3.5mm	1x RJ-45 + 1x 3.5mm
Output	1x RJ-45 + 1x 3.5mm	1x HDMI + 1x 3.5mm
HDMI source control	Controllable via IR pass-through from RX to TX with IR extenders	Controllable via IR pass-through from RX to TX with IR extenders
HDMI connector	Type A [19-pin female]	Type A [19-pin female]
RJ-45 connector	WE/SS 8P8C (Reverse Mode)	WE/SS 8P8C (Reverse Mode)
3.5mm connector	IR receiver / IR blaster	IR receiver / IR blaster

Mechanical	CV-57VE-100 [TX]	CV-57VE-100 [RX]
Housing	Metal enclosure	Metal enclosure
Dimensions (L x W x H)	Model: 97 x 91 x 25 mm [3.2" x 2.0" x 0.8"] Package: 270 x 175 x 80 mm [10.6" x 6.9" x 3.1"] Carton: 450 x 370 x 300 mm [1'6" x 1'3" x 11.8"]	Model: 97 x 91 x 25 mm [3.2" x 2.0" x 0.8"] Package: 270 x 175 x 80 mm [10.6" x 6.9" x 3.1"] Carton: 450 x 370 x 300 mm [1'6" x 1'3" x 11.8"]
Weight	Model: 280 g [9.9 oz] / Package: 1050 g [2.3 lbs]	Model: 280 g [9.9 oz] / Package: 1050 g [2.3 lbs]
Fixedness	Wall-mounting case with screws	Wall-mounting case with screws
Power supply	24V 1A DC	24V 1A DC
Power consumption	Max 12W	Max 12W
Operation temp.	0~40°C [32~104°F]	0~40°C [32~104°F]
Storage temp.	-20~60°C [-4~140°F]	-20~60°C [-4~140°F]
Relative humidity	20~90% RH (no condensation)	20~90% RH (no condensation)

Panel Descriptions

Transmitting Unit (CV-57VE-100-TX):

- 1. IR Blaster (3.5mm)
- 2. IR Receiver (3.5mm)
- 3. HDMI IN
- 4. RJ-45 (Ethernet LAN 10/100)
- 5. Power Indicator
- 6. +24V DC Power Jack
- 7. Grounding / Reserved
- 8. TX/RX Link Indicator
- 9. RJ-45 (HDBaseT Output)
- 10. RS-232 Port
- 11. 2-pin DIP Switch

Receiving Unit (CV-57VE-100-RX):

- 1. IR Blaster (3.5mm)
- 2. IR Receiver (3.5mm)
- 3. HDMI OUT
- 4. RJ-45 (Ethernet LAN 10/100)
- 5. Power Indicator
- 6. +24V DC Power Jack
- 7. Grounding / Reserved
- 8. TX/RX Link Indicator
- 9. RJ-45 (HDBaseT Output)
- 10. RS-232 Port
- 11. 2-pin DIP Switch

Hardware Installation

1. Connect a HDMI or DVI source (such as a Blu-ray Disc player) to the transmitting unit CV-57VE-100-TX.

2. Connect a HDMI or DVI display (such as a LCD TV) to the receiving unit CV-57VE-100-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 24V DC power supply unit to the power jack of the transmitting or receiving unit (POC supported).

IR Pass-Through

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.

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.
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.

Definition of IR Earphone Jack:
• IR Blaster: Pin 1: IR Signal | Pin 2: Grounding
• IR Receiver: Pin 1: IR Signal [20-60 kHz] | Pin 2: Grounding | Pin 3: Power

HDMI Pin Definition (Type A Receptacle)

Pin #	Signal	Pin #	Signal
Pin 1	TMDS Data2+	**Pin 11**	TMDS Clock Shield
Pin 2	TMDS Data2 Shield	**Pin 12**	TMDS Clock-
Pin 3	TMDS Data2-	**Pin 13**	CEC
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+		

2-Pin DIP Switch Configuration

Both the Transmitter (TX) and Receiver (RX) units feature a 2-pin DIP switch on the rear panel to configure serial pinout and operating modes:

DIP Switch Pin	Switch Position	Operating Function / Mode Description
DIP Switch Pin	Switch Position	Operating Function / Mode Description
PIN #1 (RS-232 Mode)	ON [DCE Mode]	Pin 2 = TxD (Transmit Data) Pin 3 = RxD (Receive Data)
PIN #1 (RS-232 Mode)	OFF [DTE Mode]	Pin 2 = RxD (Receive Data) Pin 3 = TxD (Transmit Data)
PIN #2 (Operation Mode)	ON	Firmware Upgrade Mode (for system maintenance)
PIN #2 (Operation Mode)	OFF	Normal Operation Mode (default standard operating setting)

Performance Guide for HDMI over Category Cable Transmission

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). 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.

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 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 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.

Wiring	Shielding	CAT5	CAT5e	CAT6
Solid	**Unshielded (UTP)**	***	****	*****
Solid	**Shielded (STP)**	***	****	*****
Stranded	**Unshielded (UTP)**	*	**	***
Stranded	**Shielded (STP)**	*	**	***

Termination: Please use EIA/TIA-568-B termination (T568B) at any time.