Marshall Electronics

VAC-HT12-KIT

4K HDBaseT Extender Kit

User Manual

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IMPORTANT SAFETY INSTRUCTIONS:

⚠️ The VAC-HT12-KIT 4K HDBaseT Extender Kit has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipment, the VAC-HT12-KIT 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.

1. Introduction

The **VAC-HT12-KIT 4K HDBaseT Extender Kit** allows you to extend 4K HDMI signals, RS232 and infrared control signals up to 100m (328 ft). The VAC-HT12-KIT consists of two units: the **VAC-HT12-T Transmitter** and **VAC-HT12-R Receiver**.

- The VAC-HT12-T combines HDMI with IR remote control & RS232 over a single CAT5e/6/6a/7 cable.
- The VAC-HT12-R receives and separates HDMI, IR remote control & RS232 signals and provides 12VDC (max 1A) accessory power.
- HDCP (High-bandwidth Digital Copy Protection) and EDID (Extended Display Identification Data) is passed transparently.

2. Features

- Supports HDMI Deep Color, full 3D & 4K2K@30 fps (HDBaseT)
- Can extend 4K30 4:4:4 8-bit or 4K60 4:2:0 8-bit up to 100M via CAT6a/7 cable, 1080p30 4:2:2 12/16-bit up to 100M via CAT5e/6 cable or 1080p30 to 4K30 4:4:4 8-bit and 4K60 4:2:0 8-bit up to 70M via CAT5e/6 cable
- Supports PoC(Power over Cable) which can power both units from TX or RX side with power supply
- HDCP & EDID pass through
- CEC support
- Auto equalization
- Pure unaltered and uncompressed 7.1ch digital HDMI over CAT5e/6/6a/7 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
- Wall mounting housing design for easy and secure installation
- 12VDC 1A power available at both Tx and Rx for cameras, controllers & accessories

3. Package Contents

- **VAC-HT12-T Transmitter** and **VAC-HT12-R Receiver**
- 1x IR blaster
- 1x IR receiver
- 1x DC24V 2.7A in-line power supply with C7 power cord
- 1x User Manual
- 2x power adapter to 2-pin terminal block
- 2x 4-pin female terminal block

4. Specifications

| VAC-HT12-KIT	VAC-HT12-T / Transmitter [TX]	VAC-HT12-R / Receiver [RX]
HDMI compliance	HDMI 1.4 full 3D & 4K2K@30	
Video bandwidth	Single-link 340MHz [10.2Gbps]	
Video support	SDI: 480i/576i HD: 720p50/59.94/60 1080i50/59.94/60 1080p23.98/24/25/29.97/30 3G: 1080p50/59.94/60 4K: 3840x2160/29.97p/25p	
HDMI over UTP	CAT5e/6 extend 100M for up to 1080p30 4:2:2 12/16 bit and 70M for over 1080p30 to 4K30 4:4:4 8-bit and 4K60 4:2:0 8-bit CAT6a/7 extend 100 M for up to 4K30 4:4:4 8-bit and 4K60 4:2:0 8-bit	
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	[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]	
IR pass-thru	Bi-directional	
RS-232 support	Yes	
PoC support	Yes	
Input	1x HDMI / 1x 3.5mm IR RX	1x RJ-45 / 1x 3.5mm IR RX
Output	1x RJ-45 / 1x 3.5mm IR TX	1x HDMI / 1x 3.5mm IR TX
In / Out	1x RS-232	1x RS-232
HDMI source control	Controllable via IR pass-through from RX to TX with IR extenders	
HDMI connector	Type A [19-pin female]	
Min DIN connector	DIN-9	
RJ-45 connector	WE/SS 8P8C (Reverse Mode)	
Rotary control switch	None	
3.5mm connector	IR receiver / IR blaster	IR receiver / IR blaster
Mechanical	**VAC-HT12-T**	**VAC-HT12-R**
Housing	Metal enclosure	
Dimensions [L x W x H]	Model: 120.5 x 74 x 19.5mm [4.7" x 2.9" x 0.8"] Package: 264 x 170 x 77mm [10.3" x 6.7" x 3"]	
Weight	Model: 121g [4.3 oz] Package: 690g [1.5 lbs]	
Mounting	Wall-mounting case with screws	
Power supply	I/P 100-240 VAC 50-60Hz O/P 24VDC, 2.7A	
Power consumption	24VDC 8W nominal (up to 22W with 12V accessory connected)	
Operation Temperature	0~40°C [32~104°F]	
Storage Temperature	-20~60°C [-4~140°F]	
Relative Humidity	20~90% RH [no condensation]	

5. Unit Descriptions

VAC-HT12-T Transmitter
Front Panel
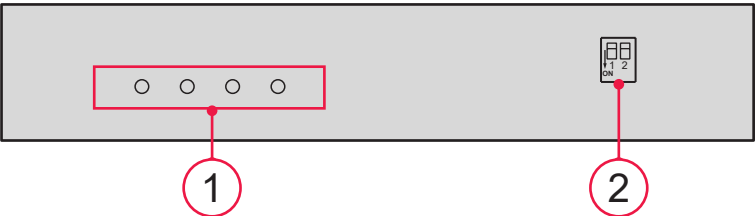
1. **LED:** Power LED, Status LED, Link LED, HDCP LED
   - (1) Power LED: Always on = OK
   - (2) Status LED: Blinking = OK
   - (3) Link LED: Always on = OK
   - (4) HDCP LED: Always on = HDCP ON

     Blinking = HDCP OFF

2. **Dip Switch:**
   - 1 ON   2 OFF   Valens firmware update
   - 1 ON   2 ON   RS232 mode
   - 1 OFF 2 ON   RS485 receiver
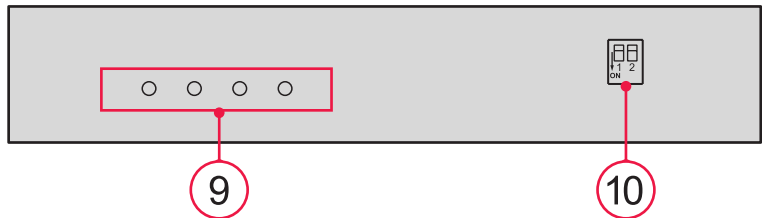   - 1 OFF 2 OFF   RS485 transmitter

VAC-HT12-T Transmitter
Rear Panel
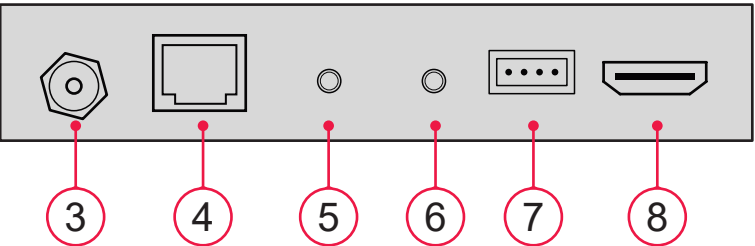
3. **Power Jack:** Connect to 24V DC power supply
4. **RJ45:** Connect a CAT5e/6/6a/7 cable linked to the VAC-HT12-R Receiver
5. **IR Receiver:** Infrared 3.5mm socket for plugging in the extension cable of IR receiver
6. **IR Blaster:** Infrared 3.5mm socket for plugging in the extension cable of IR blaster
7. **RS-232 (terminal block format):** The order of RS-232 pin are TX, RX, GND (from the left side to the right)
8. **HDMI IN:** Connects to a HDMI source with HDMI male-male cable

5. Unit Descriptions

VAC-HT12-R Receiver

Front Panel

⑨   ⑩
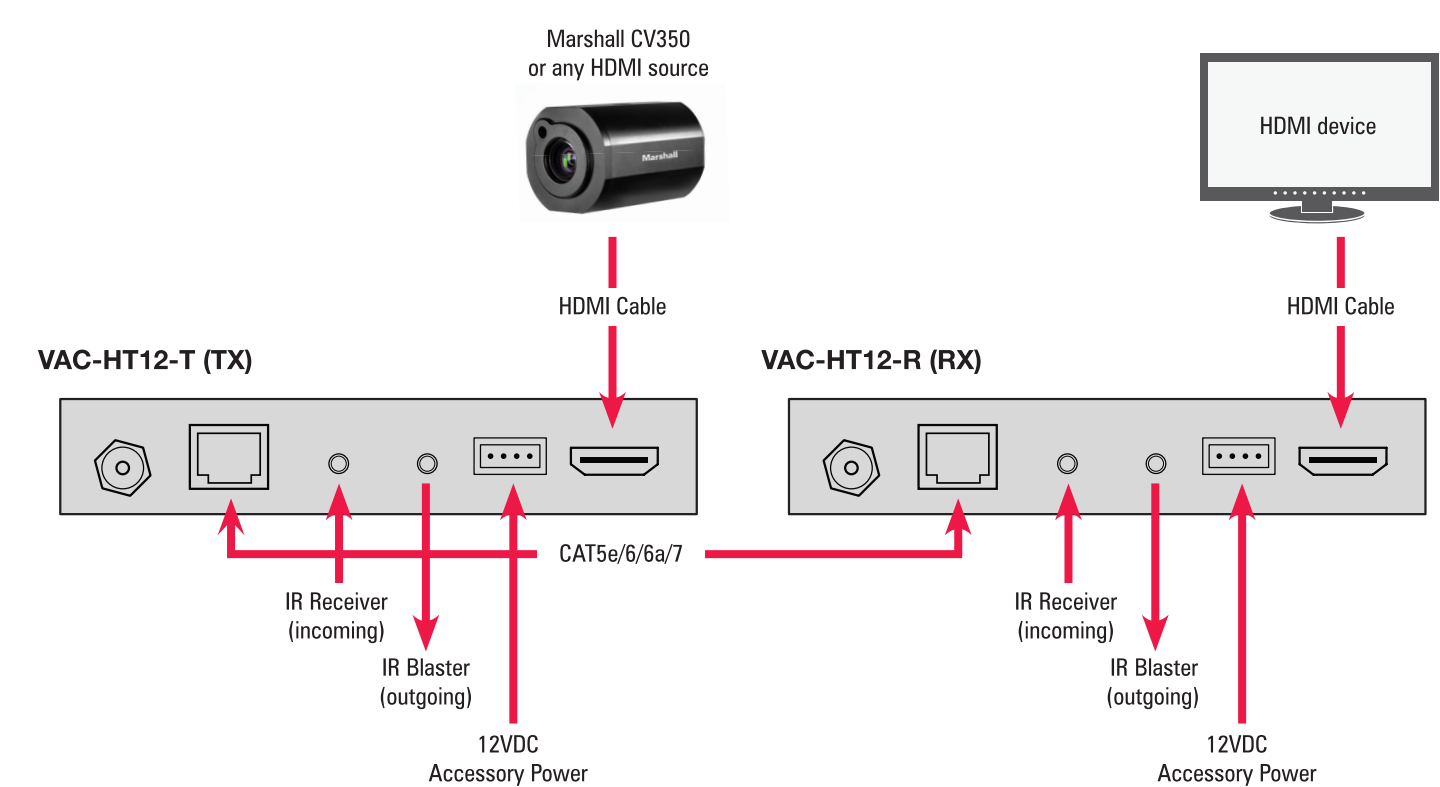
9. **LED:** Power LED, Status LED, Link LED, HDCP LED

    (1) Power LED: Always on = OK

    (2) Status LED: Blinking = OK

    (3) Link LED: Always on = OK

    (4) HDCP LED: Always on = HDCP ON

                          Blinking = HDCP OFF

10. **Dip Switch:**

    1 ON   2 OFF   Valens firmware update

    1 ON   2 ON   RS232 mode

    1 OFF   2 ON   RS485 receiver

    1 OFF   2 OFF   RS485 transmitter

VAC-HT12-R Receiver

Rear Panel

⑪   ⑫   ⑬   ⑭   ⑮   ⑯
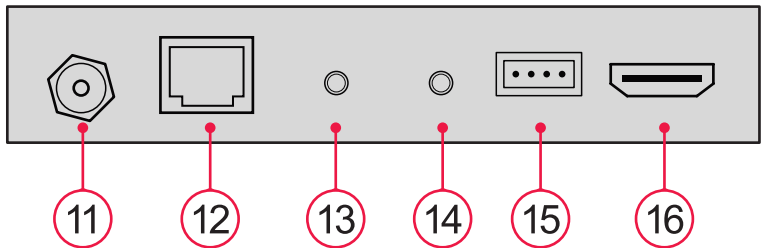
11. **Power Jack:** Connect to 24V DC power supply

12. **RJ45:** Connect a CAT5e/6/6a/7 cable linked to the VAC-HT12-T Transmitter

13. **IR Receiver:** Infrared 3.5mm socket for plugging in the extension cable of IR receiver

14. **IR Blaster:** Infrared 3.5mm socket for plugging in the extension cable of IR blaster

15. **RS-232 (terminal block format):** The order of RS-232 pin are TX, RX, GND (from the left side to the right)

16. **HDMI OUT:** Connects to a HDMI display with HDMI male-male cable

6. Connection Diagram

Marshall CV350
or any HDMI source

HDMI device

HDMI Cable   HDMI Cable

VAC-HT12-T (TX)   **VAC-HT12-R (RX)**

CAT5e/6/6a/7

IR Receiver (incoming)   IR Receiver (incoming)

IR Blaster (outgoing)   IR Blaster (outgoing)

12VDC Accessory Power   12VDC Accessory Power

7. IR Extender Cables

Connect the IR blaster & receiver cables into the appropriate jacks.

⚠ **CAUTION!**

Connecting the IR Blaster or IR Receiver into the incorrect jack may result in equipment failure, and is not covered by warranty. Please use caution when connecting the IR Blaster or Receiver.

IR Blaster   **IR Receiver**

1. IR Signal (20-60 kHz)   1. IR Signal (20-60 kHz)

2. Grounding   2. Grounding

                                 3. Power

1 2   1 2 3

* The VAC-HT12-KIT is compatible with any IR extension cables that meet these specifications.

    Please note: IR cables longer than 2m (6ft) may not function properly.

8. 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. The transmission length is largely affected by the type of CAT5e/6/6a/7 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.

3. EIA/TIA-568-B termination (T568B) for CAT5e/6/6a/7 cables is recommended for better performance.

4. The quality of CAT X cables on the market may vary greatly. Reducing the number of RJ45 patches, using higher quality cable and choosing a higher Cat X number will invariably yield better results.

9. Warranty

Marshall Electronics warranties to the first consumer that this 4K HDBaseT Extender Kit will, under normal use, be free from defects in workmanship and materials, when received in its original container, for a period of one year from the purchase date. This warranty is extended to the first consumer only, and proof of purchase is necessary to honor the warranty. If there is no proof of purchase provided with a warranty claim, Marshall Electronics reserves the right not to honor the warranty set forth above. Therefore, labor and parts may be charged to the consumer. This warranty does not apply to the product exterior or cosmetics. Misuse, abnormal handling, alterations or modifications in design or construction void this warranty.

No sales personnel of the seller or any other person is authorized to make any warranties other than those described above, or to extend the duration of any warranties on behalf of Marshall Electronics, beyond the time period described above.

Note:
Due to constant effort to improve products and product features, specifications may change without prior notice.

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