# level® one

# HDSpider™ HDMI 1.3 over Single Cat.5 Distribution Series

HVE-9000
HVE-9001
HVE-9002
HVE-9003
HVE-9004
HVE-9008
HVE-9900

## User Manual

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## HVE-9900    HDSpider™ Short Range Cat.5 HDMI Receiver

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## Introduction

The HDSpider™ HDMI 1.3 over Single Cat.5 Distribution Series provides the most flexible solution by which the uncompressed, unmodified, and pure digital HDMI signals with 7.1-channel audio can be transmitted to different locations over a long distance. The cascadability of HDSpider™ series is virtually unlimited, allowing you to extend HDMI/DVI displays almost anywhere.

The whole HDSpider™ series products can be easily inter-connected to suit almost every application through Cat.5/5e/6 cables. By taking the advantage of Cat.5/5e/6 cables, installation work becomes so easy and particularly cost effective wherever the distribution of HDMI signals is required.

## Features

The HDSpider™ HDMI 1.3 over Single Cat.5 Distribution Series offers the users:

- Silicon Image (founder of HDMI) chipset embedded

- HDMI signal transmission via Cat.5/5e/6 cables

- Cat.5/5e/6 cable implementation to minimize use of high-cost HDMI cable

- Minimum 40m extension for 1080p resolution*

- Maximum extension up to 80m**

- Uncompressed, unmodified HDMI with 7.1-channel audio/video pure digital transmission

- Cascading virtually unlimited for HVE-9003

- Compliant with HDMI 1.2 / 1.3

- Build in 8-level signal level equalizer to fine tune video quality

- EDID learning ability to read and store the EDID information of the display to avoid any incompatibility among displays

- Software not required, purely hardware installation. Virus risk free

*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.*
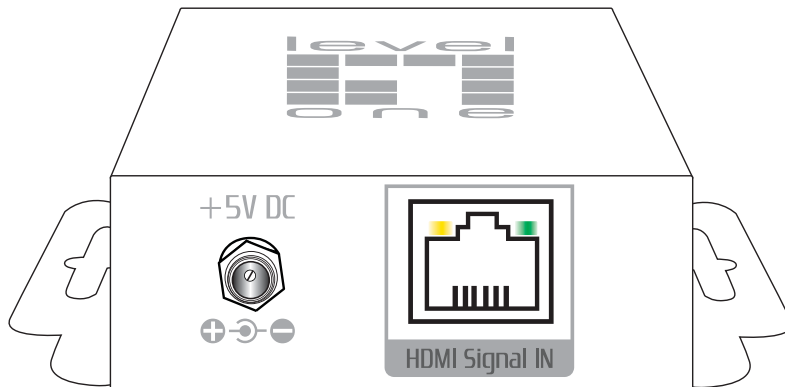
*single link of HVE-9000. For connection with HVE-9900, 1080p distance at minimum 15m.

**single link at 480p resolution, with high quality, minimal delay skew Cat-6 cable
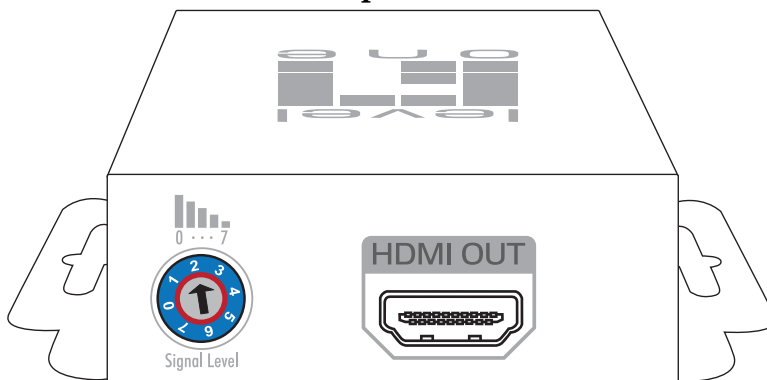
## HVE-9000　HDSpider™ Long Range Cat.5 HDMI Receiver

**Input Panel**



**HDMI Signal IN:** Connect to the **HDMI Signal OUT** port on the HVE-9001, HVE-9002, HVE-9004, or HVE-9008 with a Cat.5e/6 cable.

**+5V DC:** Connect to 5V 2A DC power supply.

**Output Panel**



**Signal Level:** Adjust the 8-level signal 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. Dial 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 issues that would shorten the product's life significantly!

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

## HVE-9001   HDSpider™ Cat.5 HDMI Sender

**Output Panel**
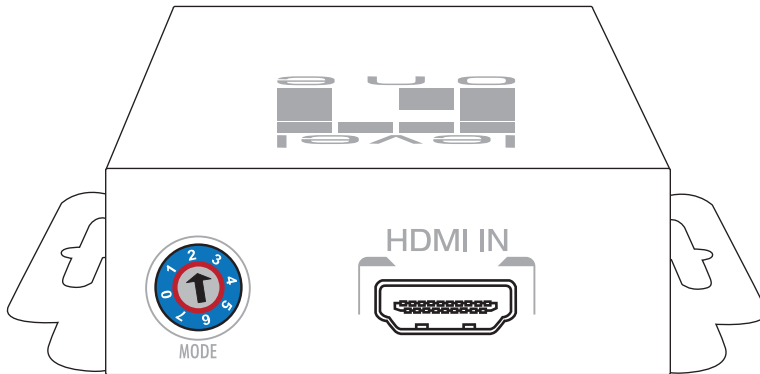


**HDMI IN:** Connect to a HDMI source with a HDMI male-male cable

**Mode:** 0 = HDMI mode with surround sound (up to 7.1ch) audio output

      1 = HDMI mode with stereo (2ch) audio output

      2 = DVI mode

      3 ~ 5 = Not in use

      6 = Use default EDID profile

      7 = Learn the EDID from the display*

> ### Note for EDID (Extended Display Identification Data) learning
>
> 1. Connect the display which you want to read EDID with a HDMI cable to **HDMI-IN** on HVE-9001 and dial **MODE** to 7 so the HVE-9001 can learn the EDID information from the connected display.  The LED on the RJ-45 connector will dim and bright again in a few seconds, which indicates the EDID learning process is complete.
>
> 2. Dial **MODE** clockwise [↻] from 7 to 0 or 1 for desirable audio setting and enjoy the experience.  DO NOT let the rotary control arrow pass by 6.  Doing so will erase the EDID just learned and restore the default EDID profile.
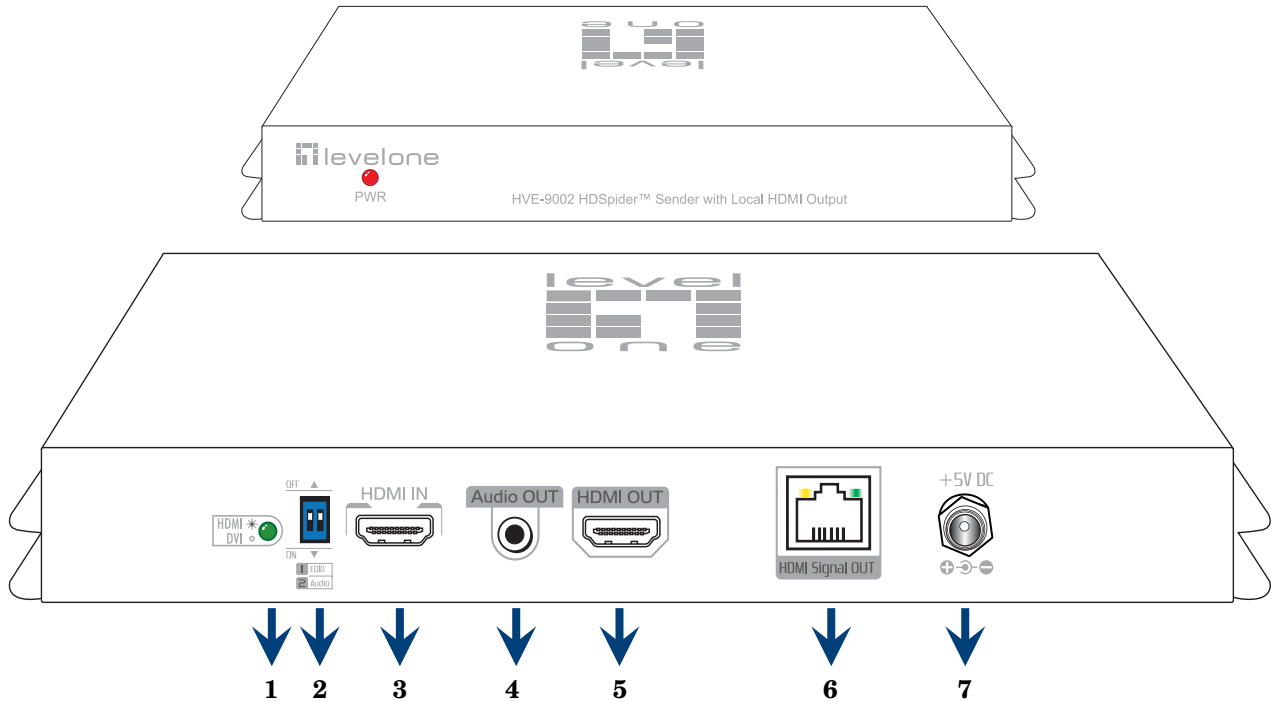
**Output Panel**
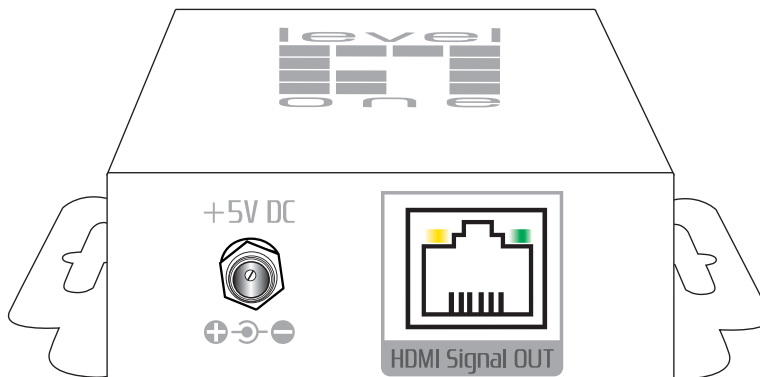


**+5V DC:** Connect to 5V 2A DC power supply unit.

**HDMI Signal OUT:** Connect to the **HDMI Signal IN** of the HVE-9000 or HVE-9900 with a Cat.5e/6 cable.

# HVE-9002 HDSpider™ Cat.5 HDMI Sender with Local HDMI Output



1. Input video format indicator [lights up for HDMI signal, lights off for DVI signal]
2. DIP switch [see table below]
3. **HDMI IN:** Connect a HDMI source with a HDMI male-male cable here
4. **Audio OUT:** Plug in a local speaker here
5. **HDMI OUT:** Local HDMI for connecting to a HDMI display with a HDMI male-male cable here or cascade to the **HDMI IN** of another HVE-9001, HVE-9002, HVE-9004, or HVE-9008.
6. **HDMI Signal OUT:** Link to HVE-9003 for cascading; or link to HVE-9000 or HVE-9900 to another HDMI display with a Cat.5e/6 cable
7. **+5V DC:** Connect to a 5V 4A DC power supply unit

## DIP Switch

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

## HVE-9003　HDSpider™ Cat.5 Cascadable HDMI Sender



1. Input video format indicator [lights up for HDMI signal, lights off for DVI signal]

2. **Signal Level:** Adjust the 16-level equalization control corresponding to the transmission distance of receiving HDMI signals. For surround sound audio output, please adjust from 0-to-7 (longest-to-shortest transmission length). For stereo audio output, please adjust from 8-to-F (longest-to-shortest transmission length). It is recommended to adjust from 7-to-0 or from F-to-8 to find the optimal visual experience.

3. **HDMI Signal IN:** Link to HVE-9001,HVE-9002, HVE-9003, HVE-9004, or HVE-9008 with a Cat.5e/6 cable

4. **Audio OUT:** Plug in a local speaker here

5. **HDMI OUT:** Local HDMI for connecting to a HDMI display with a HDMI male-male cable here or cascade to the **HDMI IN** of another HVE-9001, HVE-9002, HVE-9004 or HVE-9008.

6. **HDMI Signal OUT:** Link to HVE-9003 for cascading; or link to HVE-9000 or HVE-9900 to another HDMI display with a Cat.5e/6 cable

7. **+5V DC:** Connect to a 5V 4A DC power supply unit

## HVE-9004 HDSpider™ 4-Port Cat.5 HDMI Sender
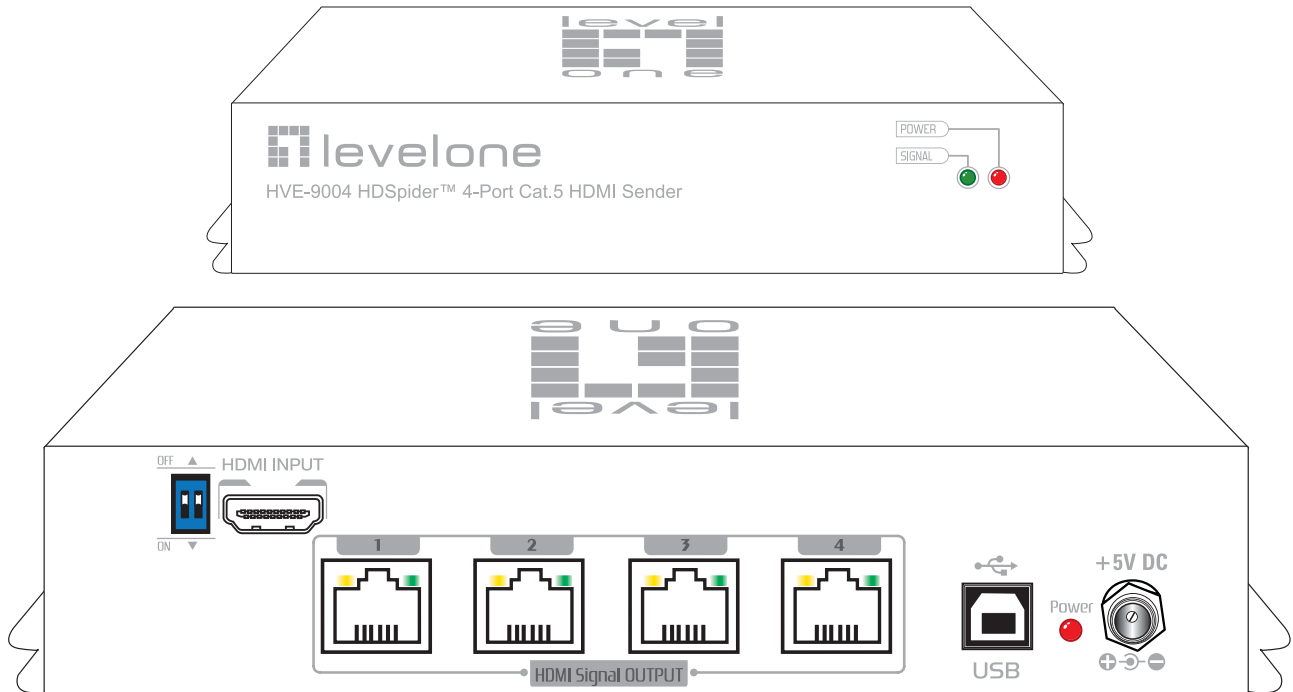


**DIP Switch**: Please see more detail in the table below

**HDMI INPUT**: Connect to a HDMI source

**HDMI Signal OUTPUT 1 – 4**: Link to each HDMI display via a Cat.5e/6 cable with HVE-9000, HVE-9003, or HVE-9900.

**USB**: For firmware update (technical support use only)

**+5V DC**: interlocking power jack for 5V DC power supply unit

### DIP Switch

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

### EDID Learning

1. To make the HVE-9004 learn the EDID of the desired display, connect the display to the **HDMI INPUT** port via a HDMI cable.

2. Set the DIP switch position pin-1 at ON [⬇].

3. Reboot the HVE-9004 and you should see the green LED **SIGNAL** on the front panel blinking to indicate the EDID learning sequence is underway. The EDID learning sequence is complete when the LED stops blinking.

4. Resume the installation. Connect the sources back to HDMI inputs and let the displays connect to the receiver units via Cat.5e/6 cable.

5. Set the DIP switch pin-1 at OFF [⬆] will erase the EDID profile learned from the display and restore the default EDID profile. So please do not dial the pin-1 back to OFF [⬆] unless you want to use default EDID profile or learn new EDID from different HDMI display.

# HVE-9008　HDSpider™ 8-Port Cat.5 HDMI Sender with Local HDMI Output
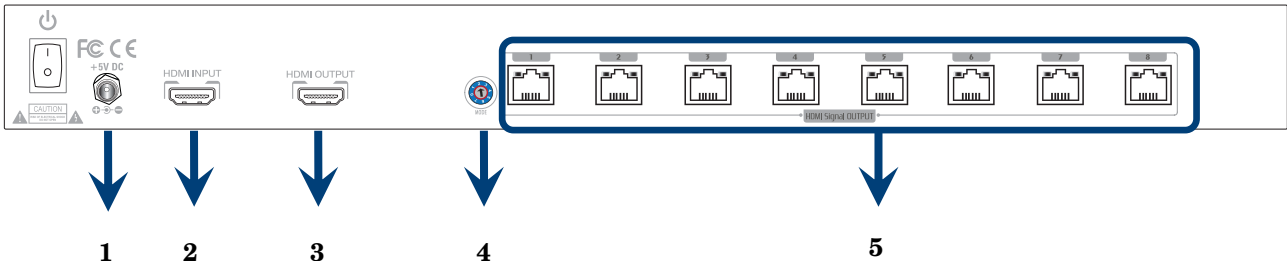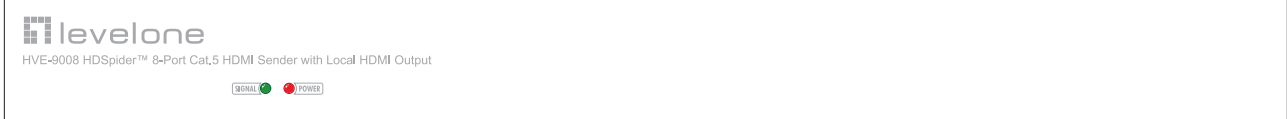


1. **+5V DC**: Connect to a 5V DC power supply unit

2. **HDMI IN**: Connect to a HDMI source

3. **HDMI OUT**: Connect to a HDMI display for local monitoring or cascade to another HDMI sender (HVE-9001, HVE-9004, or HVE-9008)

4. **MODE**:
    0 = [Video] – supports up to HDMI 1.3 output. [Audio] – supports up to 7.1ch output
    1 = [Video] – supports up to HDMI 1.3 output. [Audio] – locks to stereo audio output
    2 = [Video] – locks to HDMI 1.2 output. [Audio] – supports up to 7.1ch output
    3 = [Video] – locks to HDMI 1.2 output. [Audio] – locks to stereo audio output
    4 = [Video] – DVI display mode. [Audio] – no audio output
    5 = [Safe Mode] – uses default EDID with video supported up to 720p/1080i
    6 = [Default Mode] – uses default EDID with video supported up to 1080p
    7 = [EDID Learning Mode] – learns EDID from the display
    [For more detail info, please refer to page 6.]

5. **HDMI Signal OUTPUT 1–8**: Link to each HDMI display via a Cat.5e/6 cable with a receiver HVE-9000 or HVE-9900 on each CAT5 output port

## Audio/Video Setting

1. If you cannot get the audio/video output from the connected display for the first time setup. Please follow the instructions below to check if the HVE-9008 is OK.

   Step 1 – Please set the rotary arrow at **Mode 5** for Safe Mode, and wait for the green LED **SIGNAL** on the front panel to blink for a couple seconds.

   Step 2 – Please dial the rotary arrow counterclockwise [↺] from **Mode 5** to **Mode 3**. If you can get audio/video from the display, you can stay tune at this setting for 720p or 1080i and stereo audio. If you need to get 720p/1080i with 7.1ch audio output, please dial the rotary arrow counterclockwise [↺] from **Mode 3** to **Mode 2**.

   Step 3 – Please dial the rotary arrow counterclockwise [↺] from **Mode 3** to **Mode 7**. Wait a few seconds until the green LED **SIGNAL** on the front panel dims and then lights again.

   Step 4 – Please dial the rotary arrow clockwise [↻] from **Mode 7** to **Mode 1**. You should have normal audio/video output. If not, please contact technical support.

2. For desirable 1080p video output, please follow the instructions below:

Step 1 – Please set the rotary arrow at **Mode 6** for Default Mode, and wait for the green LED **SIGNAL** on the front panel to blink for a couple seconds.

Step 2 – Please dial the rotary arrow clockwise [↻] from **Mode 6** to **Mode 1**. If you can get audio/video from the display, you can stay tune at this setting for 1080p and stereo audio. If you need to get 1080p with 7.1ch audio output, please turn the rotary arrow counterclockwise [↺] from **Mode 1** to **Mode 0**. If you cannot get the audio/video out normally, please go on the next step.

Step 3 – Please dial the rotary arrow counterclockwise [↺] from **Mode 0** or **Mode 1** to **Mode 7**. Wait a few seconds until the green LED **SIGNAL** on the front panel dims and then lights again.

Step 4 – Please dial the rotary arrow clockwise [↻] from **Mode 7** to **Mode 0** or **Mode 1**. You should have your desirable audio/video output. If not, please perform the EDID learning sequence.

### EDID Learning

To learn EDID from the HDMI display, please follow the instruction below:

Step 1 – Please connect the display which you want to read EDID with a HDMI cable to the **HDMI OUT** port of the AT-HD19SS and set the rotary arrow at **Mode 7** so the HVE-9008 can learn the EDID information from the connected display. The green LED **SIGNAL** on the front panel will dim and light again in a few seconds, which indicates the EDID learning procedure is complete.

Step 2 – Please turn the rotary arrow clockwise [↻] from **Mode 7** to **Mode 0** or **Mode 1** for desirable audio setting and enjoy the experience. DO NOT let the rotary arrow pass by **Mode 5** and **Mode 6** which will erase the EDID just learned and restore the default EDID.

## HVE-9900 HDSpider™ Short Range Cat.5 HDMI Receiver



RJ-45 socket: Link from HVE9001, HVE-9002, HVE-9003, HVE-9004, HVE-9008 or HVE-9900 with a Cat.5e/6 cable

HDMI socket: Connect to a local HDMI display or projector, or the HDMI output of HVE-9002 or HVE-9003 for HDMI over Cat.5 transmission

# INSTALLATION

## *Extends HDMI signals to one display at longer distance*

### HVE-9000 & HVE-9001

1. Connect HVE-9001 to a HDMI source device with a HDMI cable.

2. Connect HVE-9000 to a HDMI display or projector with a HDMI cable.

3. Connect a Cat.5e/6 cable between HVE-9000 and HVE-9001.

4. Make sure this Cat.5e/6 cable is tightly connected and not loose.

5. Plug in a 5V DC power supply unit to the power jack of HVE-9000.

6. Plug in another 5V DC power supply unit to the power jack of HVE-9001.

7. If the image on the display is flickering or blinking, 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. Use a screw driver to 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!
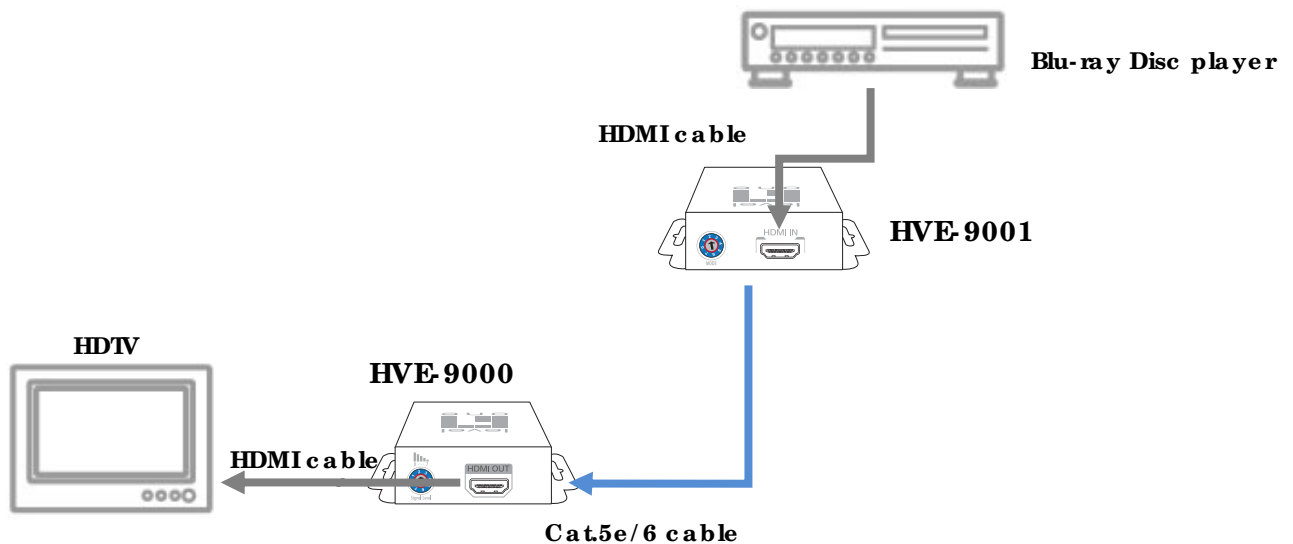
## *Extends HDMI signals to one display at shorter distance*

### HVE-9900 & HVE-9001

1. Connect HVE-9001 to a HDMI source with a HDMI cable.

2. Connect HVE-9900 directly to your HDMI display or projector.

3. Connect one Cat.5e/6 cable between HVE-9001 and HVE-9900.

4. Make sure this Cat.5e/6 cable is tightly connected and not loose.

5. Plug in the 5V DC power supply unit to the power jack of HVE-9001.
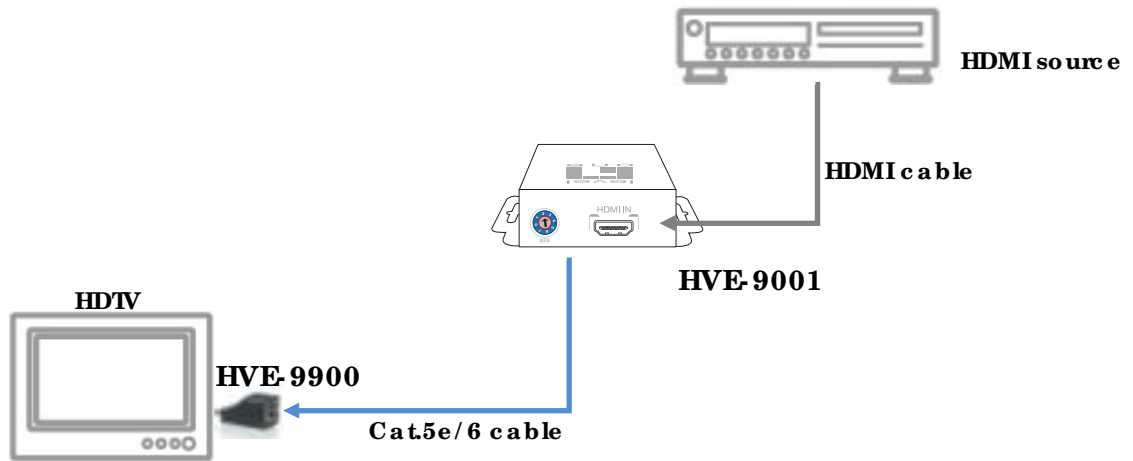
# *Extends HDMI signals to next cascading device with one local display*

## HVE-9002

1. Switch off all devices, including displays.
2. Connect a local HDMI display to the HDMI out of the HVE-9002 and then connect a speaker to the 3.5mm audio socket.
3. Connect to a HDMI source (such as a Blu-Ray Disc player)
4. Connect HVE-9002 to HVE-9003 (for cascading), to HVE-9000 (to HDTV at long range), or HVE-9900 (to HDTV at mid range) via RJ-45 Out by a Cat.5e cable.
5. Plug in 5V4A DC power supply unit.
6. Power on the HDTV.
7. Power on the HDMI source.
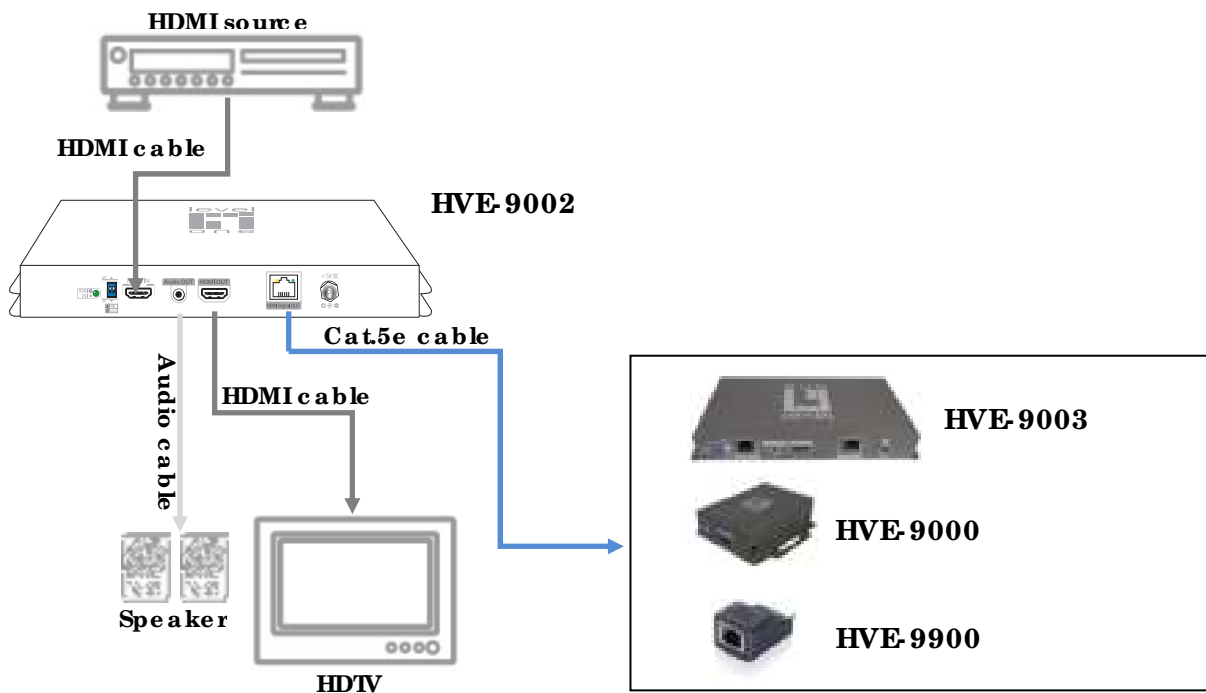
# *Relays HDMI signals to next cascading device with one local display*

## **HVE-9003**

1. Switch off all devices, including displays.
2. Connect a local HDMI display to the HDMI Out of the HVE-9003 and then connect a speaker to the 3.5mm audio socket.
3. Connect to HVE-9003 via RJ-45 in by a Cat.5e cable.
4. Connect to next HVE-9003 (for cascading), to HVE-9000 (to HDTV at long range), or HVE-9900 (to HDTV at mid range) via RJ-45 out by a Cat.5e cable.
5. Plug in 5V4A DC power supply.
6. Power on the HDTV.
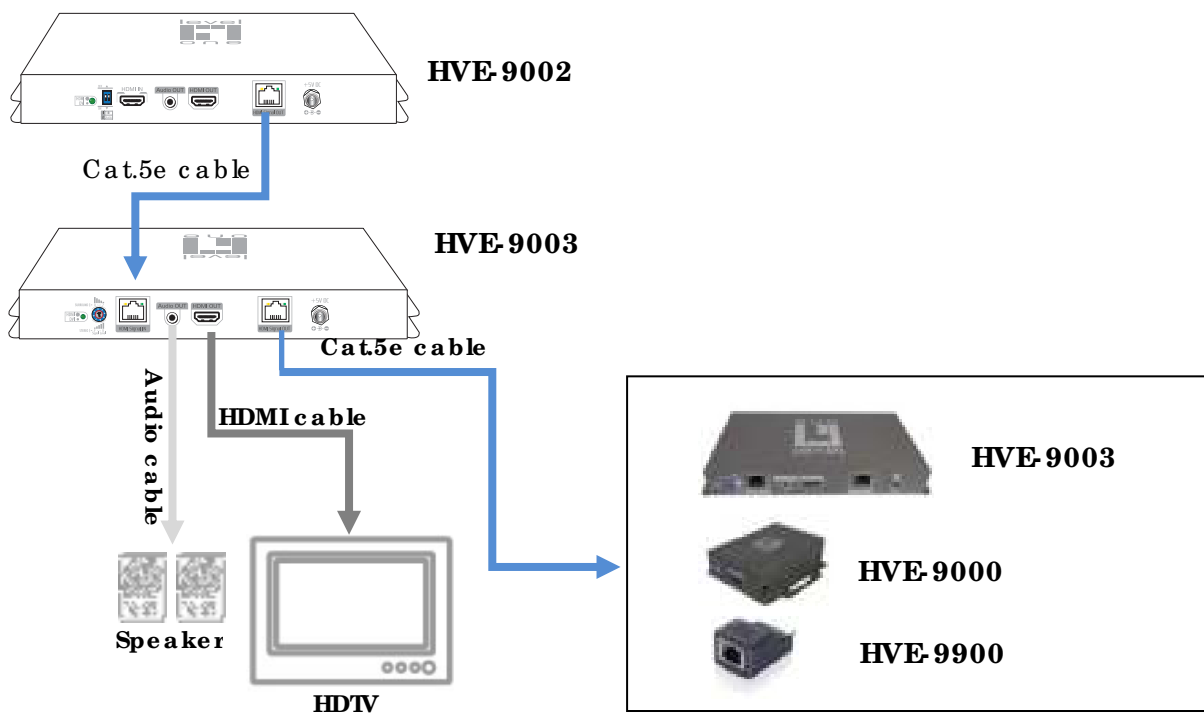
# *Broadcasts HDMI signals to 4 remote displays from one video source*

## HVE-9004

1. Switch off all devices, including displays.

2. Connect a HDMI source device to the **HDMI INPUT** port.

3. Connect the HVE-9000 and/or HVE-9900 as receivers via solid Cat.5e/6 cables to each **HDMI Signal OUTPUT** port.

4. Plug in the interlocking 5V 4A DC power supply unit.

5. Power on the HDMI displays.

6. Power on the HDMI sources.
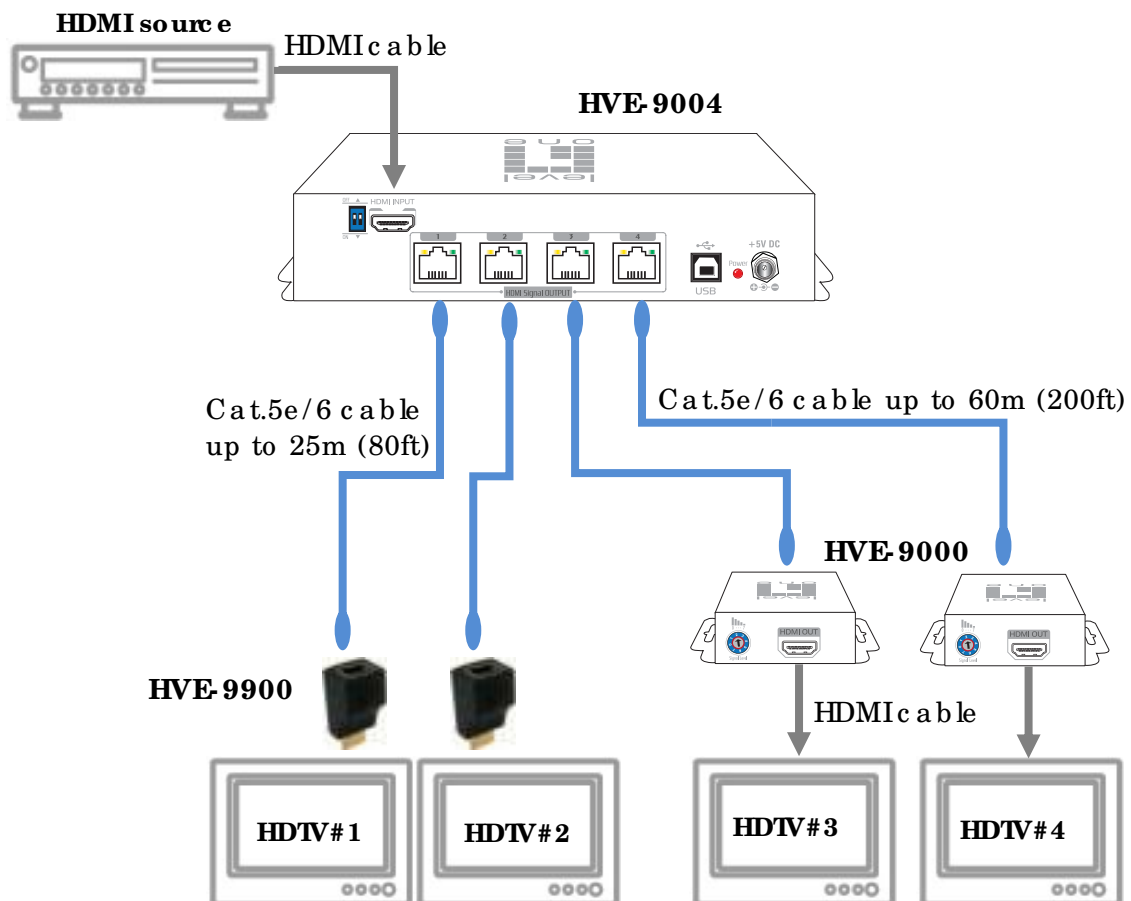
# *Broadcasts HDMI signals to 8 remote displays from one video source*

## **HVE-9008**

1. Switch off all devices, including displays.

2. Connect a HDMI source device to the **HDMI INPUT** port.

3. Connect the HVE-9000 and/or HVE-9900 as receivers via solid Cat.5e/6 cables to each **HDMI Signal OUTPUT** port.

4. Plug in the interlocking 5V 4A DC power supply unit.

5. Power on the HDMI displays.

6. Power on the HDMI sources.
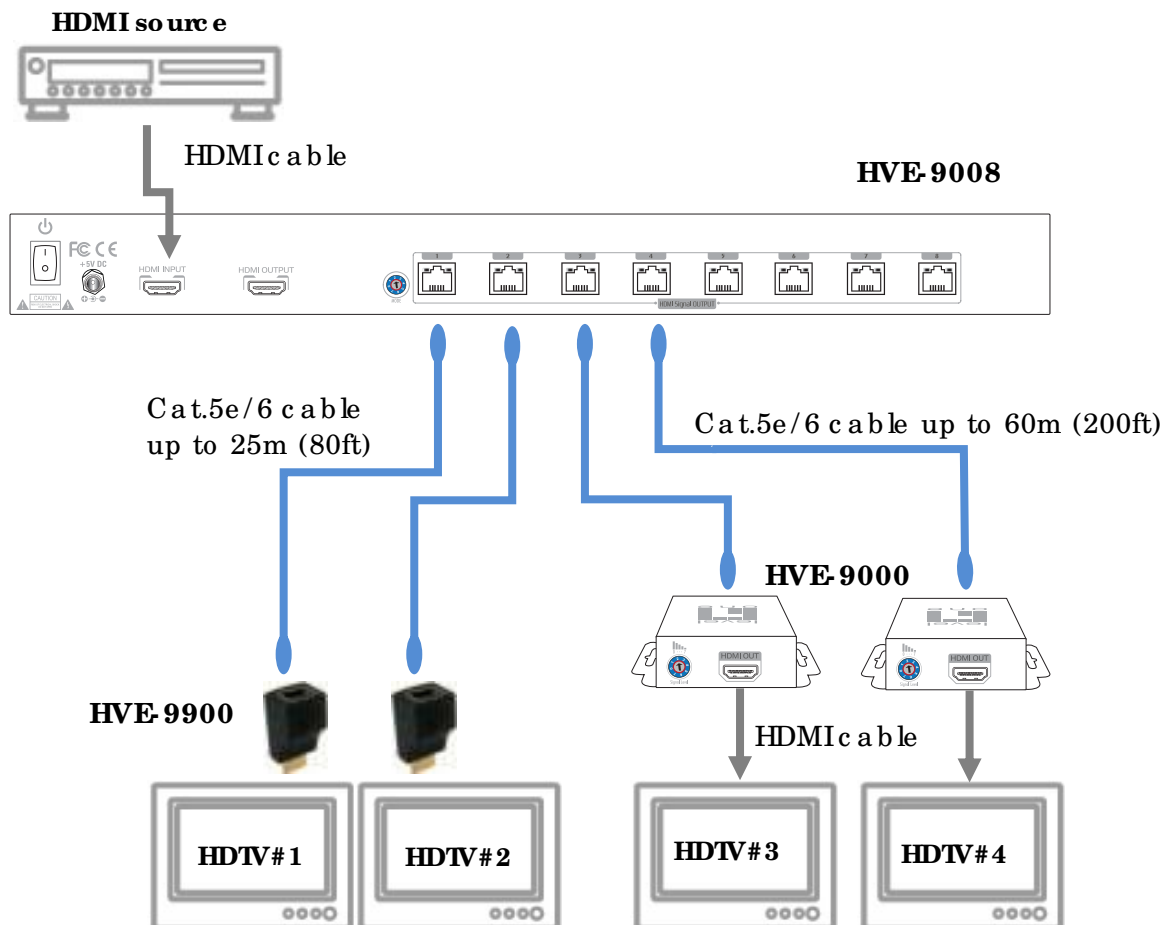
# SYSTEMATIC APPLICATION DIAGRAM

## HVE-9002 & HVE-9003 with HVE-9000 & HVE-9900



HDMI source

HDMI cable

HDTV

Speaker

HVE-9002

Audio cable

HDMI cable

Cat.5e cable

HDTV

Speaker

HVE-9003

Audio cable

HDMI cable

Cat.5e cable

HDTV

Speaker

HVE-9003

Audio cable

HDMI cable

Cat.5e cable

Cat.5e cable

HVE-9000

HDTV

HVE-9900
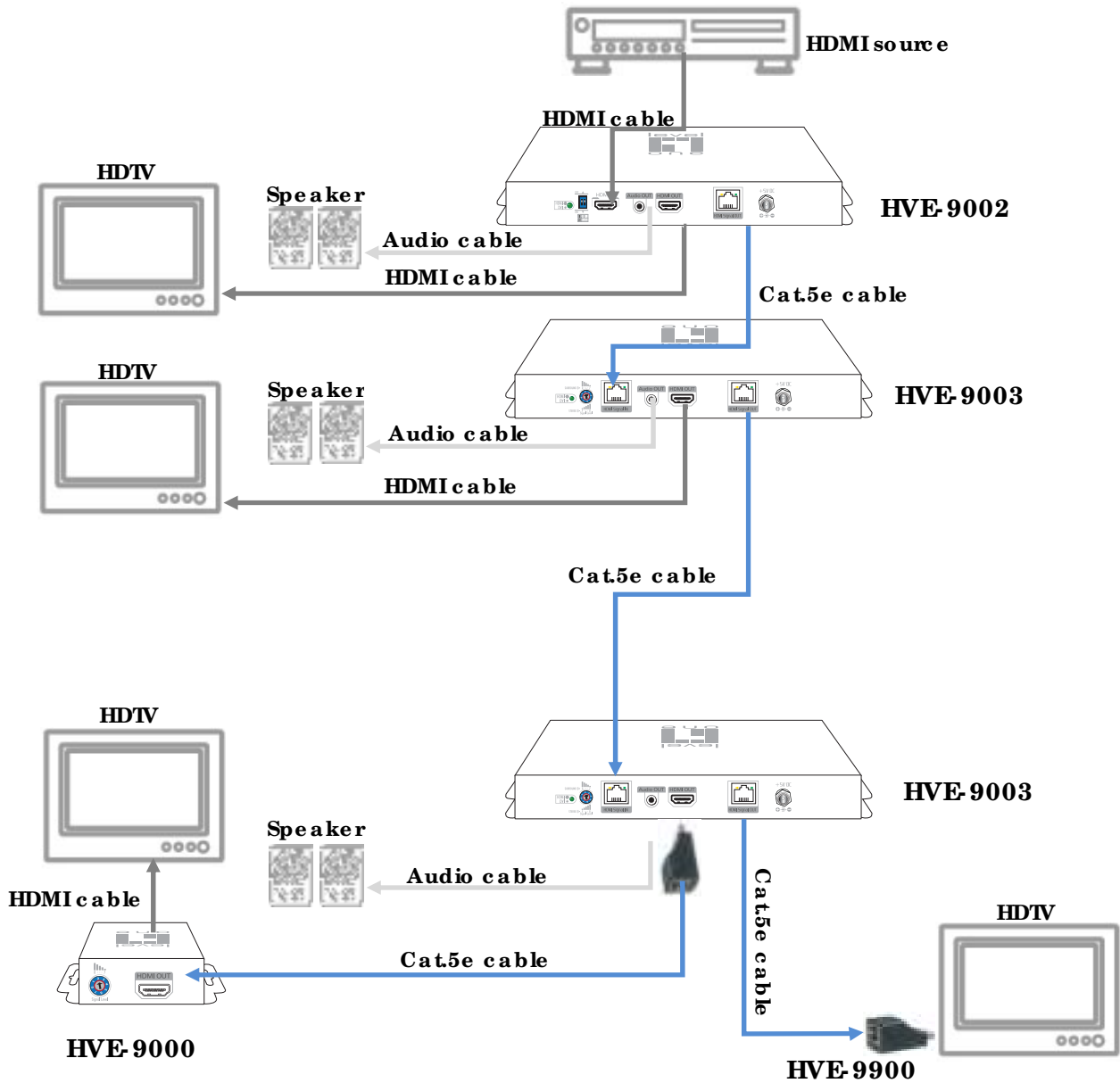
# FREQUENTLY ASKED QUESTIONS

| | |
|---|---|
| How does equalizer (EQ) work? | Equalizer is a built in electronic device used to fine tune picture quality. Please turn knob anticlockwise from 7 to 0 to get the optimal vision. If you find the display is not showing properly, please check your cable connection or it is out transmission limit. |
| What is the minimum requirement of Cat-X cable | Minimum cable requirement is Category 5 cable for HDSpider™ series products. Please ensure all cables are terminated with RJ-45 plug according to EIA/TIA568B definition. |
| What kind of Cat-X cable is recommended? | We recommend using Category 6 or 7 STP cable for best picture quality at maximum extension. For better result please use cable with minimum delay skew. |
| I want extension above specification, is that possible? | Yes. To extend HDMI signal above specification published please use high quality HDMI cable (24 gauges) and recommended Cat-X cable. On field test, it is possible using CAT.6 cable for 50m transmission under 1080p. If further extension is required, please set HDMI source at 480p resolution. |
| I am using HVE-9900 to receive HDMI signal, but there is no image on monitor. | HVE-9900 is only intended to use for shorter transmission length. The maximum transmission length is at 15m under 1080p or 25m under 720p/1080i resolution. If your application exceeds this transmission limit, please use HDSpider™ Long Range Cat.5 HDMI Receiver (HVE-9000) instead. |
| There is no image on display, what could be the problem? | First please check all cable is properly installed. Secondly check display source is functioning correctly. |
| It is still not working. | If problem persist, please try the EDID learning function on HVE-9001, HVE-9002, or HVE-9004. |

# SPECIFICATIONS

| Model Name | HVE-9001 | HVE-9004 | HVE-9008 |
|---|---|---|---|
| **Technical** | | | |
| Role of usage | Extender | 1x4 splitter | 1x9 splitter |
| | Transmitter [TX] | | |
| HDMI compliance | HDMI 1.3c | | |
| HDCP compliance | Yes | | |
| Video bandwidth | Single-link 225MHz [6.75Gbps] | | |
| Video support | 480i / 480p / 720p / 1080i / 1080p60 up to 36-bit color depth | | |
| HDMI over UTP cable transmission (24-bit) | Full HD (1080p) — 40m (130ft) [CAT5e] / 50m (165ft) [CAT6]<br>HD (720p/1080i) — 50m (165ft) [CAT5e] / 60m (200ft) [CAT6] | | |
| Audio support | Surround sound (up to 7.1ch) or stereo digital audio | | |
| Signal equalization | None | | |
| Input TMDS signal | 1.2 Volts [peak-to-peak] | | |
| Input DDC signal | 5 Volts [peak-to-peak, TTL] | | |
| ESD protection | [1] Human body — ±19kV [air-gap discharge] & ±12kV [contact discharge]<br>[2] Core chipset — ±8kV | | |
| Input | 1x HDMI | 1x HDMI | 1x HDMI |
| Output | 1x RJ-45 | 4x RJ-45 | 1x HDMI<br>8x RJ-45 |
| HDMI connector | Type A [19-pin female] | | |
| RJ-45 connector | WE/SS 8P8C | | |
| DIP switch | None | 2-pin | None |
| Rotary control switch | Mode | None | Mode |
| **Mechanical** | | | |
| Housing | Metal enclosure | | |
| Dimensions [L x W x H] — Model | 93 x 60 x 25mm [3.7" x 2.4" x 1"] | 215 x 85 x 40mm [8.5" x 3.3" x 1.6"] | 438 x 158 x 44mm [1'5" x 6.2" x 1.7"] |
| Dimensions [L x W x H] — Package | 175 x 270 x 80mm [6.9" x 10.6" x 3.1"] | 330 x 200 x 95mm [1'1" x 7.9" x 3.7"] | 545 x 230 x 110mm [1'10" x 9.1" x 4.3"] |
| Weight — Model | 154g [5oz] | 525 [1.2 lbs] | 1.4kg [3.1 lbs] |
| Weight — Package | 455g [1 lb] | 985 [2.2 lbs] | 2.2kg [4.8 lbs] |
| Fixedness | Wall-mounting | 1RU rack-mounting | |
| Power supply | 5V 2A DC | 5V 4A DC | |
| Power consumption | 1 Watts [max] | 10 Watts [max] | 13 Watts [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 HVE-9001 / HVE-9004/ HVE-9008<br>1x 5V power supply unit<br>1x User manual | | |

| Model Name | HVE-9002 | HVE-9003 |
|---|---|---|
| **Technical** | | |
| Role of usage | 1x2 distribution amplifier (splitter) | |
| | Transmitter [TX] | Transceiver [TRX] |
| HDMI compliance | HDMI 1.3c | |
| HDCP compliance | Yes | |
| Video bandwidth | Single-link 225MHz [6.75Gbps] | |
| Video support | 480i / 480p / 720p / 1080i / 1080p60 up to 36-bit color depth | |
| HDMI over UTP cable 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 | None | 8-level digital rotary control |
| Input TMDS signal | 1.2 Volts [peak-to-peak] | |
| Input DDC signal | 5 Volts [peak-to-peak, TTL] | |
| ESD protection | [1] Human body — ±19kV [air-gap discharge] & ±12kV [contact discharge] [2] Core chipset — ±8kV | |
| Input | 1x HDMI | 1x RJ-45 |
| Output | 1x HDMI 1x RJ-45 1x 3.5mm audio socket | 1x HDMI 1x RJ-45 1x 3.5mm audio socket |
| HDMI connector | Type A [19-pin female] | |
| RJ-45 connector | WE/SS 8P8C with 2 LED indicators | |
| 3.5mm connector | Earphone jack for stereo audio | |
| DIP switch | 2-pin DIP | None |
| Rotary control switch | None | 8-level signal equalization |
| **Mechanical** | | |
| Housing | Metal enclosure | |
| Dimensions [L x W x H] — Model | 108 x 210 x 27mm [4.3" x 8.3" x 1.1"] | |
| Dimensions [L x W x H] — Package | 200 x 330 x 95mm [7.9" x 1'1" x 3.7"] | |
| Weight — Model | 525g [1.2 lbs] | 530g [1.2 lbs] |
| Weight — Package | 980g [2.2 lbs] | 985g [2.2 lbs] |
| Fixedness | Wall-mounting | |
| Power supply | 5V 4A DC | |
| Power consumption | 3 Watts [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 HVE-9002 or HVE-9003 1x 5V power supply unit 1x User manual | |

| Model Name | | HVE-9000 | HVE-9900 |
|---|---|---|---|
| **Technical** | | | |
| Role of usage | | Long range receiver [RX] | Short range receiver [RX] |
| HDMI compliance | | HDMI 1.3c | |
| HDCP compliance | | Yes | |
| Video bandwidth | | Single-link 225MHz [6.75Gbps] | |
| Video support | | 480i / 480p / 720p / 1080i / 1080p60 up to 36-bit color depth | |
| HDMI over UTP cable transmission (24-bit) | Full HD [1080p] | 40m [130ft] for CAT5e<br>50m [165ft] for CAT6 | 15m [50ft] for CAT5e<br>18m [65ft] for CAT6 |
| | HD [720p/1080i] | 50m [165ft] for CAT5e<br>60m [200ft] for CAT6 | 25m [80ft] for CAT5e<br>30m [100ft] for CAT6 |
| Audio support | | Surround sound (up to 7.1ch) or stereo digital audio | |
| Equalization | | 8-level digital rotary control | None |
| Input TMDS signal | | 1.2 Volts [peak-to-peak] | |
| Input DDC signal | | 5 Volts [peak-to-peak, TTL] | |
| ESD protection | | [1] Human body — ±19kV [air-gap discharge] & ±12kV [contact discharge]<br>[2] Core chipset — ±8kV | |
| Input | | 1x RJ-45 | 1x RJ-45 |
| Output | | 1x HDMI | 1x HDMI |
| HDMI connector | | Type A [19-pin female] | Type A [19-pin male] |
| RJ-45 connector | | WE/SS 8P8C with 2 LED indicators | |
| Rotary control switch | | 8-level signal equalization | None |
| **Mechanical** | | | |
| Housing | | Metal enclosure | Plastic molding |
| Dimensions [L x W x H] | Model | 93 x 60 x 25mm<br>[3.7" x 2.4" x 1"] | 45 x 25 x 20mm<br>[1.8"x1"x0.8"] |
| | Package | 175 x 270 x 80mm<br>[6.9" x 10.6" x 3.1"] | 115 x 170 x 40mm<br>[4.5"x 6.7"x1.6"] |
| Weight | Model | 154g [5oz] | 22g [0.8oz] |
| | Package | 455g [1 lb] | 90g [3.2oz] |
| Fixedness | | Wall-mounting | Direct plug-in |
| Power supply | | 5V 2A DC | None |
| Power consumption | | 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 HVE-9000<br>1x 5V power supply unit<br>1x User manual | 1x HVE-9900<br>1x User manual |

1. Please read user manual carefully before operating the device.

2. Please use the power supply unit accompanied with this product. Warranty does not cover for damages caused by pairing other power adaptor.

3. Please check all connecting devices are properly grounded to avoid electric failure.

4. This product has limited warranty for one year from defects in material and workmanship. Items that are physically damaged, misused, tempered with or altered are void of warranty. For further details please contact your distributor. In case warranty sticker is damaged or missing, warranty is void. For further details please contact your distributor.

5. All of the transmission distances are measured by using Belden Cat.5e 125MHz solid UTP cables and ASTRODESIGN Video Signal Generator VG-859C as the HDMI source.

6. When adjusting the signal level on the receiver unit, 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 issues that would shorten the product's life significantly!

7. 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 or 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 CAT5e cable shows longer transmission range than stranded STP CAT6 cable. For long extension applications, solid UTP/STP cables are the only viable choice.

8. EIA/TIA-568-B termination (T568B) is preferred for better performance.

9. To reduce the interference among the unshielded twisted pairs of wires in category cable, use double shielded STP cables to improve EMI problems, which is worse in long transmission.

10. Because the quality of the category cables has the major effects 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.5e/6 cables. For desired resolutions greater than 1080i or 1280x1024, a solid STP Cat.6 cable is recommended.

11. If your HDMI display has multiple HDMI inputs, the first HDMI input [HDMI input # 1] generally can produce better transmission performance among all HDMI inputs.

12. If the HDMI or DVI device requires EDID information, use an EDID Reader/Writer to retrieve and provide the EDID information of the DVI or HDMI display.



### Performance Guide for HDMI over Category Cable Transmission

| Performance rating | | Type of category cable | | |
|---|---|---|---|---|
| Wiring | Shielding | CAT5 | CAT5e | CAT6 |
| Solid | Unshielded (UTP) | ★★★ | ★★★★ | ★★★★★ |
| | Shielded (STP) | ★★★ | ★★★ | ★★★★ |
| Stranded | Unshielded (UTP) | ★ | ★★ | ★★ |
| | Shielded (STP) | ★ | ★ | ★★ |
| Termination | | Use **EIA/TIA-568-B** termination (**T568B**) at any time | | |
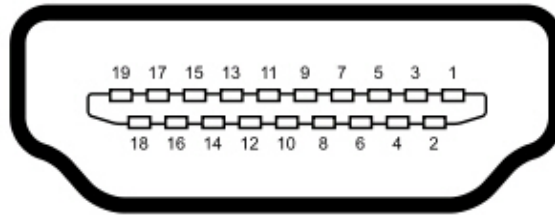
## HDMI



Type A (Receptacle) HDMI

| Pin 1 | TMDS Data 2+ | Pin 8 | TMDS Data 0 Shield | Pin 15 | SCL |
|---|---|---|---|---|---|
| Pin 2 | TMDS Data 2 Shield | Pin 9 | TMDS Data 0– | Pin 16 | SDA |
| Pin 3 | TMDS Data 2– | Pin 10 | TMDS Clock+ | Pin 17 | DDC/CEC Ground |
| Pin 4 | TMDS Data 1+ | Pin 11 | TMDS Clock Shield | Pin 18 | +5 V Power |
| Pin 5 | TMDS Data 1 Shield | Pin 12 | TMDS Clock– | Pin 19 | Hot Plug Detect |
| Pin 6 | TMDS Data 1– | Pin 13 | CEC | | |
| Pin 7 | TMDS Data 0+ | Pin 14 | Reserved (N.C. on device) | | |

## CAT5 [RJ-45]



T568A and T568B Wiring

| Pin | T568A Pair | T568B Pair | Wire | T568A Color | T568B Color | Pins on plug face (socket is reversed) |
|---|---|---|---|---|---|---|
| 1 | 3 | 2 | tip | white/green stripe | white/orange stripe | |
| 2 | 3 | 2 | ring | green solid | orange solid | |
| 3 | 2 | 3 | tip | white/orange stripe | white/green stripe | |
| 4 | 1 | 1 | ring | blue solid | blue solid | |
| 5 | 1 | 1 | tip | white/blue stripe | white/blue stripe | |
| 6 | 2 | 3 | ring | orange solid | green solid | |
| 7 | 4 | 4 | tip | white/brown stripe | white/brown stripe | |
| 8 | 4 | 4 | ring | brown solid | brown solid | |

| Pair of Cat-5/5e/6 Cable | | Definition |
|---|---|---|
| | White/orange stripe | TX0– |
| | Orange solid | TX0+ |
| | White/green stripe | TX1– |
| | Blue solid | TX2– |
| | White/blue stripe | TX2+ |
| | Green solid | TX1+ |
| | White/brown stripe | TXC– |
| | Brown solid | TXC+ |