



# Raritan AV-over-IP Distribution System

User Guide  
Release 1.0

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RAVIP-0A-E

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VCCI-A

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If a power cable is included with this product, it must be used exclusively for this product.



# Contents

<b>Chapter 1 Introduction</b>	<b>1</b>
<hr/>	
Encoder (Transmitter) Unit Front .....	1
Encoder (Transmitter) Unit Rear .....	2
Decoder (Receiver) Unit Front .....	3
Decoder (Receiver) Unit Rear .....	4
 <b>Chapter 2 Installation</b>	 <b>5</b>
<hr/>	
Installing a Wired Single Channel Extension System .....	5
Configuring a Single-Channel Extension System .....	5
Installing a Multi-Channel Video Distribution System .....	6
Supported Ethernet Switches .....	6
Configuring a Multi-Channel System .....	7
 <b>Chapter 3 Operation</b>	 <b>9</b>
<hr/>	
Web Interface .....	9
Web Interface Overview .....	10
System Tab .....	10
Network Tab .....	16
Functions Tab .....	8

USB Control for Computer Devices .....	26
Computer Audio Input and Output .....	26
Changing Channels .....	27
Show Channel Number, IP Address, and Details .....	28
 <b>Appendix A Mounting Options</b>	 <b>29</b>
<hr/>	
Bracket Mount Installation .....	29
Bracket Mount Kit Dimensions and Weight .....	30
VESA Mount Installation .....	30
VESA Mount Kit Dimension and Weight.....	32
 <b>Appendix B Features and Specifications</b>	 <b>33</b>
<hr/>	
Features .....	34
Specifications .....	35
SKUs and Package Contents .....	37
 <b>Index</b>	 <b>39</b>
<hr/>	



# Chapter 1 Introduction

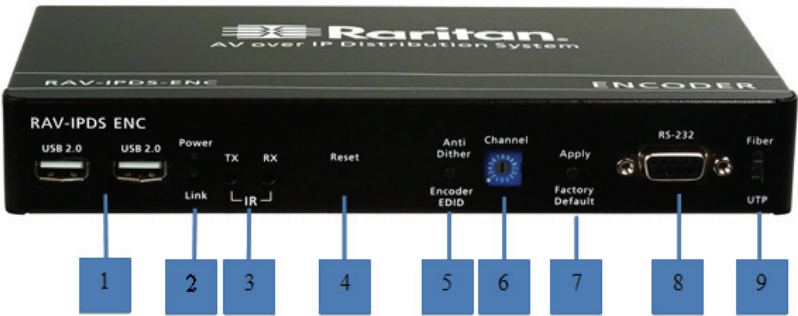
Raritan's AV-over-IP Distribution System (RAV-IP) is a low cost, high performance AV-over-IP system with:

- HDMI audio & video, USB Keyboard & Mouse, Infrared (IR) & Serial control
- Works with PC's, media players, screens and projectors
- Uses low cost Cat5 cable and Ethernet switches
- Optional fiber connections
- Installs out of the box with minimal setup
- Easy to expand - just add additional encoders and decoders
- Switches via channel switch or included remote control

## In This Chapter

Encoder (Transmitter) Unit Front .....	1
Encoder (Transmitter) Unit Rear .....	2
Decoder (Receiver) Unit Front .....	3
Decoder (Receiver) Unit Rear .....	4

## Encoder (Transmitter) Unit Front

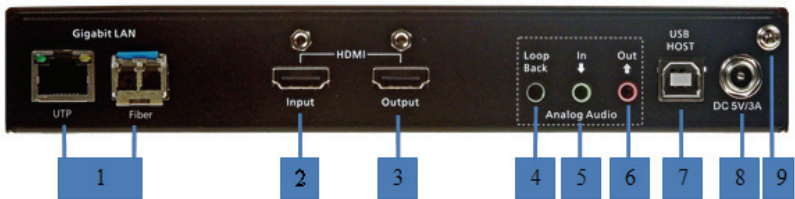


1. **Optional.** Two USB 2.0 Hub ports for local USB devices, such as keyboard and mouse.
2. Power LED glows blue when encoder unit is powered ON. Link LED shows network connection status:
  - Off: no connection
  - Blinking: trying to connect

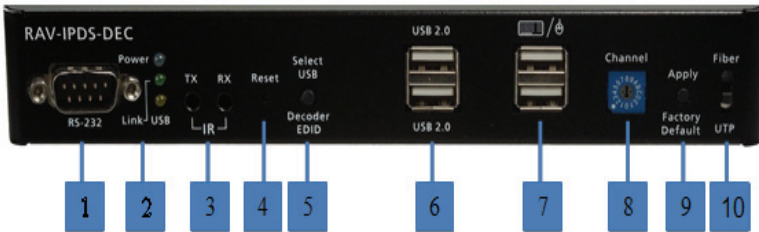
- On: connected
3. **Optional.** IR TX for connecting IR Emitter cable to control the source from the viewing location. IR RX for connecting IR Receiver cable to receive signals from an IR remote control device to control output connected to the Decoder.
  4. Reboot Encoder unit.
  5. Anti Dither button to switch video quality for certain video sources. When the unit is powered on, holding the Encoder EDID button sets the EDID of the encoder unit to the EDID of the Output Device connected to the HDMI Out (loopback) of the Encoder.
  6. Set the video channel (0-9, A-F, 16 channels in all) for the encoder unit.
  7. Apply button confirms the video channel setting for field operator or installer. When the unit is powered on, holding the Factory Default resets the unit to factory default setup.
  8. **Optional.** Connect to PC RS-232 port for serial control.
  9. Select Gigabit Ethernet connection via UTP cable or Fiber Optic cable. Default is UTP. Reboot if switching to Fiber.

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## Encoder (Transmitter) Unit Rear

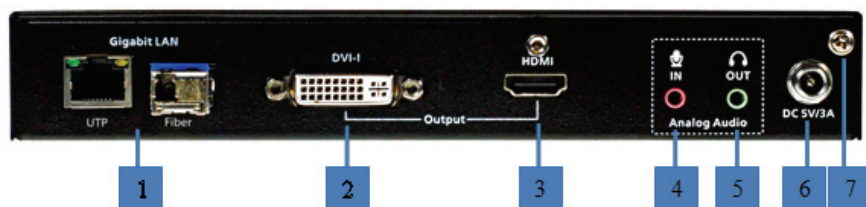


1. Connect UTP/CATx cable or Fiber Optic cable to the IP network Gigabit Switch, or connect directly to Decoder unit. Optional SFP Fiber Modules, available from Raritan, are required for fiber connections.
2. Connect to the source AV device or computer system's HDMI output.
3. **Optional.** Connect to a local HDMI display.
4. **Optional.** Loop Back output from Audio In to monitor the audio input.
5. **Optional.** IN => Audio Input (PC's output) and send to Decoder unit.
6. **Optional.** OUT => Audio Output (PC's input) sent from Decoder unit.
7. **Optional.** Connect from PC to USB HOST (USB-B to USB-A cable )
8. Connect the included, locking 5V DC power adapter.

9. **Optional.** Grounding screw.**Decoder (Receiver) Unit Front**

1. **Optional.** Connect to output device's RS-232 port for optional serial control.
2. Power LED shows power on and off. USB LED shows USB control is operational for this channel. Link LED shows IP network connection:
  - Off: no connection
  - Blinking: trying to connect
  - On: connected
3. **Optional.** Connect the IR Receiver cable to the RX port to receive IR signals from a remote control device to control the source connected to the Encoder. Or connect the IR Emitter cable to the TX port to control the output device connected to the Decoder.
4. Reboot Decoder unit.
5. Select USB button acquires USB control. Use this button if video is available, but the USB LED is not lit orange.
6. **Optional.** USB 2.0 Hub ports to connect USB drives to mount on a computer device connected to the encoder.
7. **Optional.** USB port for low-speed USB HID device such as keyboard, mouse or touchscreen.
8. Sets the video channel of the Decoder unit.
9. Apply button changes the video channel setting for field operator or installer.
10. Select Gigabit Ethernet media via UTP cable or Fiber Optic. Default is UTP. Reboot if switching to Fiber.

## Decoder (Receiver) Unit Rear



1. Connect either UTP/CATx cable or Fiber Optic cable to the IP network Gigabit Switch, or connect directly to Encoder unit. Optional SFP Fiber Modules, available from Raritan, are required for fiber connections.
2. **Optional.** DVI-I video output. DVI-I's analog output is for non-HDCP protection content only. For a VGA monitor, use a DVI to VGA adapter.
3. HDMI output to monitor or TV.
4. **Optional.** Microphone IN: Connect 3.5mm microphone jack to the Decoder. Works in Extender mode only. See **Device Mode** (on page 18).
5. **Optional.** Headphones OUT: Connect 3.5mm stereo cable to a headphone or pair of powered speakers.
6. DC 5v/3A: Connect the included, locking 5V DC power adapter.
7. **Optional.** Grounding screw.

## Chapter 2 Installation

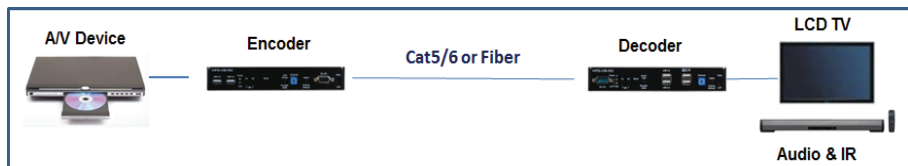
### In This Chapter

- Installing a Wired Single Channel Extension System ..... 5
- Installing a Multi-Channel Video Distribution System..... 6

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### Installing a Wired Single Channel Extension System

A wired one-to-one extension requires one Encoder unit and one Decoder unit.



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### Configuring a Single-Channel Extension System

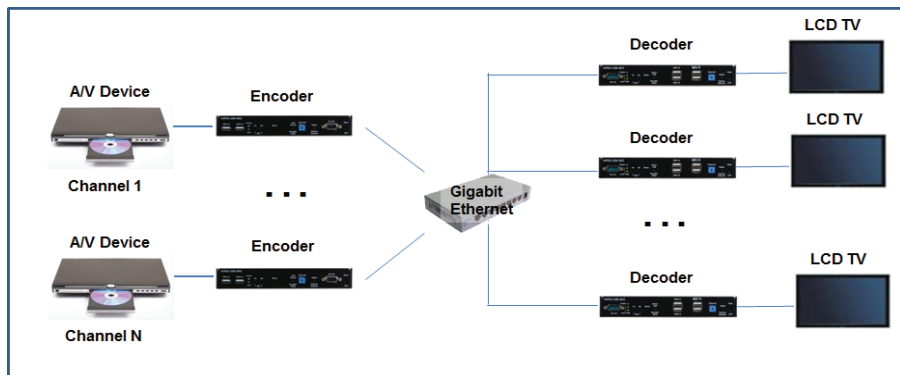
1. Ensure the same channel is set on the Encoder unit and the Decoder unit using the Channel rotary switches.
2. Connect the Encoder to a video source, and the Decoder with a Display/TV with HDMI or DVI cables.
3. Set the switch on the front of the encoder and decoder according to the type of cable connection – UTP cable or fiber optic cable.
4. **Optional.** To control the video source connected to the Encoder, connect the IR emitter (transmitter) cable to the Encoder's IR TX Jack, and point the IR emitter to the video source's IR input port you want to control.
5. **Optional.** Connect IR Receiver cable to the Decoder's IR RX Jack, and point toward the IR remote control.
6. **Optional.** Connect RS-232 cable to Encoder or Decoder where RS-232 controller or Display/TV/device can take RS-232 command.
  - If Encoder/Decoder's RS-232 port and device's RS-232 port are different gender, use straight RS-232 cable.
  - If Encoder/Decoder's RS-232 port and device's RS-232 port are different gender, use cross RS-232 cable (null modem).
  - The RS-232 Serial control must be enabled by the Web Interface and the Serial settings must be set consistently for the Encoder, Decoder and serial devices.

7. **Optional.** Connect USB cables to Encoder/Decoder for keyboard and mouse control or access of remote USB drives.
8. Plug-in the locking DC power adapter to the Encoder and Decoder. Power units on.
9. Power on the Video Source and start playing video.
10. Power on the display and select HDMI or DVI input.
11. If required, connect a PC to the Encoder and Decoder and use the web interface to configure your extension system. See **Web Interface** (on page 9).

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## Installing a Multi-Channel Video Distribution System

For a single- or multi-channel video distribution system installation, a Gigabit Managed Switch or Gigabit Smart Switch that supports IGMP and Jumbo Frames (at least 8K) is required.



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### Supported Ethernet Switches

- Cisco SG Series (SG300 or SG500) - Recommended
- Cisco Catalyst 2960 Gigabit
- Cisco Catalyst 3750 Gigabit
- Dell PowerConnect 5400 Series (5424, 5448)
- Dell PowerConnect 5500 Series (5524, 5524P, 5548, 5548P)
- Dell PowerConnect 6200 Series (6224, 6224P, 6248, 6248P)
- Netgear 7000 Series V2 (GSM7224, GSM7228PS, GSM7248, GSM7252PS)
- Packedge SW24-GBM, S24P

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## Configuring a Multi-Channel System

1. Power on the Gigabit Switch and enable Jumbo Frames (8k) and IGMP v2. IGMP Snooping should be set for the VLAN(s) being used.
2. Set a unique video channel on each Encoder unit using the Channel rotary switches.
3. Set a default video channel on each Decoder unit using the Channel rotary switches.

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*Note: The 16 channel IR remote control can be used to switch among different video channels after initial setup. When a unit reboots, the default video channel selected on the Channel rotary switch is used.*

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4. Connect all Encoder and Decoder units to the Gigabit switch via CATx cables or Fiber Optic cables. See Fiber Modules and Cables.
5. Connect all Encoders with video sources, and all Decoders with Display/TV HDMI cables to a monitor or display.
6. **Optional.** To control the video source connected to the Encoder, connect the IR emitter (transmitter) cable to the Encoder's IR TX Jack, and point the IR emitter to the video source's IR input port you want to control.
7. **Optional.** Connect IR Receiver cable to the Decoder's IR RX Jack, and point toward the IR remote control
8. **Optional.** Connect RS-232 cable to Encoder or Decoder where RS-232 controller or Display/TV/device can take RS-232 command.
  - If Encoder/Decoder's RS-232 port and device's RS-232 port are different gender, use straight RS-232 cable.
  - If Encoder/Decoder's RS-232 port and device's RS-232 port are different gender, use cross RS-232 cable (null modem).
  - The RS-232 Serial control must be enabled in the Web Interface and the Serial settings must be set appropriately.
9. **Optional.** Connect USB cables to Encoder/Decoder for keyboard and mouse control or remote USB drives.
10. Plug-in DC power adapter to all Encoders and Decoders. Power units on.
11. Power on all Video Sources and start playing video.
12. Power on all displays and select HDMI or DVI input. All displays will show video according to the video channels set on the encoders and decoders.
  - You can switch channels shown on the display connected to the Decoder using the blue channel switch, then press Apply button, or with the remote control included with the Decoder.

13. Login to the web interface to further configure your multi-channel system. See Web Interface.



## Chapter 3    Operation

The Encoder and Decoder units have a Web user interface to change settings and perform maintenance functions. You may need to adjust the default settings when using certain applications.

You can also perform some of these operations using the buttons on the units.

### In This Chapter

Web Interface .....	9
USB Control for Computer Devices .....	26
Computer Audio Input and Output .....	26
Changing Channels .....	27
Show Channel Number, IP Address, and Details .....	28

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### Web Interface

To connect to the web interface, you can connect your laptop directly to an encoder/decoder using a Cat5 cable, or follow this procedure to connect over the network for multi-channel setups.

- ▶ **To connect to the web interface for network-connected multi-channel setups:**
  1. Connect an Ethernet cable from a computer (laptop) to the network on which the RAV-IP encoder or decoder is connected.
  2. Set the IP Address of your laptop in the same IP subnet as the Encoders and Decoders.
  3. In a web browser, go to the IP address of the RAV-IP encoder or decoder.
    - You can find the Encoder/Decoder IP addresses on the RAV-IP display using several methods.
- ▶ **When video is displayed on the Decoder:**
  - Press the OSD button on the included remote control while the IR Receiver is connected to the Decoder. You will see the IP addresses of the Encoder and Decoder shown on the display
- ▶ **When no video is displayed:**
  - Set the Decoder rotary dial to an unused channel number and press the Apply button.

Or

- Turn off the video input to the currently connected Encoder.
- Look on the bottom right of the screen to see the IP addresses:
  - Encoder: Local IP
  - Decoder: Remote IP

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## Web Interface Overview

The web interface has three tabs. The selected tab or enabled setting is highlighted in white, while the tabs or settings not in use are blue.

### ► System tab:

Reboot the encoder or decoder, update firmware, and view version information.

### ► Network tab:

Configure the network settings, such as IP address and device mode.

### ► Functions tab:

Copy EDID, enable serial control, enable USB control, enable video, and select video modes. Note that the Encoder and Decoder have different options in the Functions tab.

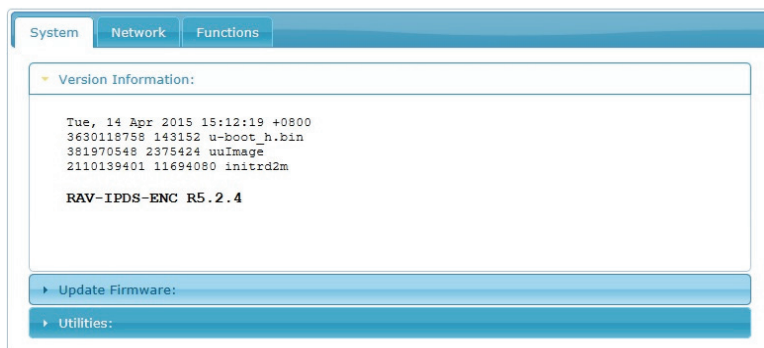
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## System Tab

The System tab displays RAV-IP version information, the Update Firmware tool, and the Utilities tools.



Raritan Master Control



## Update Firmware

New firmware versions can be found on [raritan.com](http://raritan.com) in the Support section.

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**Make sure the encoder and decoder to be updated are not processing audio or video during the update. The update may fail and damage the devices if they are processing audio or video during the update.**



**Do not power off the devices during the update. The firmware may not fully load and the device will not operate.**

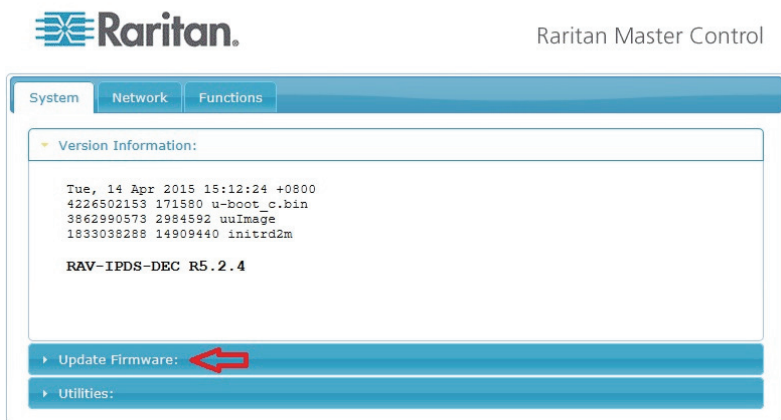
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### ► To update firmware:

1. Connect a PC or laptop to the Ethernet switch (or directly to the Encoder or Decoder), then configure its IP address to the same subnet as the Encoder or Decoder device. If these are using the self-configured, link-local IP Addresses, then you can use "169.254.1.1", netmask "255.255.0.0".
2. Connect the Encoder or Decoder device to the switch, then connect the video output of the RAV-IP to a monitor to see the IP addresses of the Encoder or Decoder.

### Chapter 3: Operation

3. Near the bottom right of the video screen, "Local IP" indicates the Decoder's IP address, and "Remote IP" indicates the Encoder's IP address.



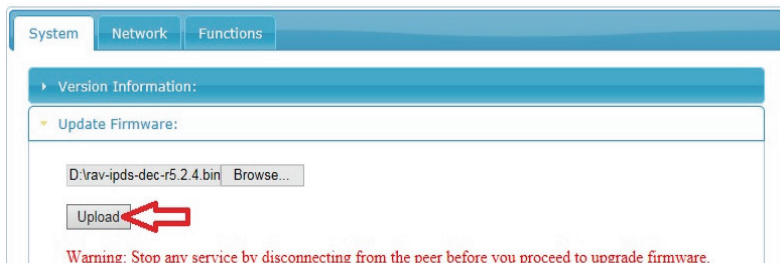
4. Open a web browser and type **http://[IP Address]** of Encoder or Decoder.
5. In the web interface, click Update Firmware.
6. Click Browse, then find and select the firmware file, and click OK. Note that there are two different firmware files: one for the Encoder and one for the Decoder.



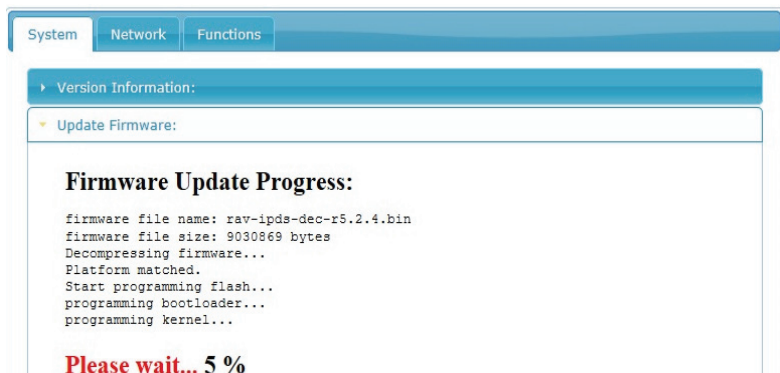
**IMPORTANT!** Risk of damage to the device. Make sure the devices are not processing audio or video before uploading the new firmware. Do not power off the devices during the update.



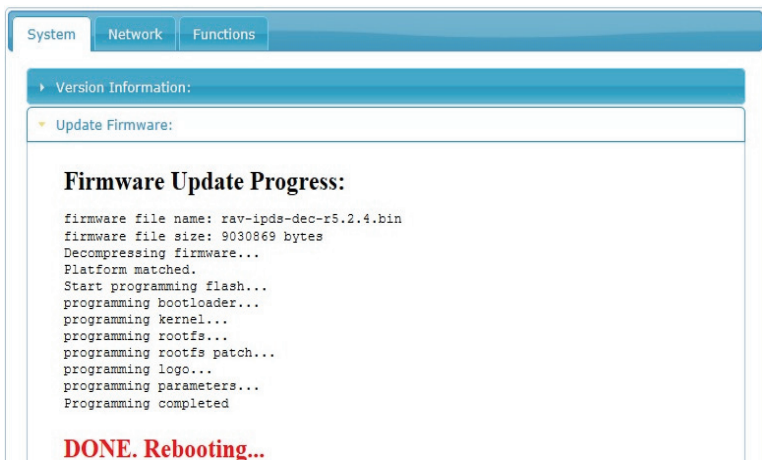
- Click Upload to upload the firmware file to the RAV-IP.



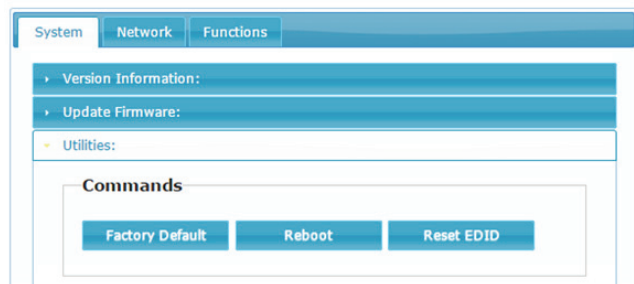
- The file upload to the RAV-IP device begins. Allow some time for the upload to begin. You will see the progress screen display when RAV-IP starts writing the firmware to the device.



9. After firmware is successfully written to the device, it will automatically reboot. When you see the Done: Rebooting message, you can close the browser.



## Utilities



The Utilities are:

- Reset to factory defaults
- Reboot the encoder or decoder device. Some setting changes require a reboot.
- Reset to the default EDID. Reset EDID is available only on the Encoder.

## ***Reset to Factory Default***

To reset the device back to the factory default settings, you can use the web interface, or the Factory Default button on the device. The device will reboot after the reset. Note that the IP address will likely change.

### **► To reset using the device button:**

1. Press and hold the Factory Default button while you power off and on the device. Hold the Factory Default button until the Power and Link LEDs are flashing.
2. Power cycle the device.

### **► To reset using the web interface:**

1. In the web interface, choose System > Utilities, then click Factory Default.

## ***Reset EDID***

The Reset EDID function resets the EDID back to the default EDID of the Encoder. This function is only available in the Encoder web interface.

### **► Default EDID:**

- 1920x1080 60fps, with 2 channel audio

### **► To reset EDID:**

- In the Encoder web interface, choose System > Utilities, then click Reset EDID.

## ***Reboot Encoder or Decoder***

There are two ways to reboot the encoder or decoder units.

1. Push in the Reset button on the unit  
or
2. In the web interface, choose System > Utilities, then click Reboot.

## Network Tab

The Network tab contains the network configuration functions, and the device mode settings.

There are two device modes: Extender and Matrix, which support a one-to-one connection between Encoder and Decoder and matrix connections between multiple Encoders and Decoders.

There are two IP Modes, DHCP addressing (default) and Static addressing, where an administrator assigns the IP address of the Encoder or Decoder.

The screenshot displays a web-based configuration interface for a device. At the top, there are three tabs: 'System', 'Network' (which is selected), and 'Functions'. Below the tabs, the interface is divided into two main sections: 'IP Setup' and 'Device Mode'.

**IP Setup Section:**

- IP Mode:** A dropdown menu with two options: 'DHCP' (selected) and 'Static'.
- IP Address:** A text input field containing '169.254.5.231'.
- Subnet Mask:** A text input field containing '255.255.0.0'.
- Default Gateway:** A text input field containing '0.0.0.0'.
- Apply:** A blue button located at the bottom right of the IP Setup section.

**Device Mode Section:**

- Matrix:** A blue button.
- Extender:** A white button with a blue border.
- Apply:** A blue button located at the bottom right of the Device Mode section.



## IP Setup

DHCP is the default IP Mode, where the Encoder or Decoder address is assigned automatically. If your network administrator connects a DHCP Server to the network, then the DHCP Server will assign the IP addresses to each Encoder or Decoder.

If a DHCP Server is not connected to the network (which is likely), then the Encoder and Decoders will dynamically self-assign Link Local IP addresses. These addresses will be in a special 169.254.xxx.yyy address range.

Link Local addresses are very convenient, require no configuration, and are a good choice for small networks separate from the corporate network, but they have some limitations. They cannot be routed with an outside network, and they can change when the device is rebooted or when the firmware is updated.

You can see these automatically assigned addresses (DHCP or Link-Local) on the monitor or TV connected to the Decoder. See **Web Interface** (on page 9).

Alternatively, you can assign a static IP address to each Encoder and Decoder. Contact your network administrator for these addresses. This is more work to configure, but these addresses will be permanent and can be connected to a larger network.

In the web interface, the default IP address and subnet mask show automatically. In Extender Mode, the Encoder and Decoder are in a one-to-one configuration that does not need to connect to an Ethernet switch. You do not need to change these settings if that is your configuration.

In Matrix Mode, the Encoder and Decoder units are connected to a Gigabit Ethernet switch that requires network configuration for good performance. Jumbo Frames (8k) and IGMP v2 should be enabled. IGMP Snooping should be set for the VLAN(s) being used.

If you are unfamiliar with IP addressing and networking, contact your network administrator or network vendor for help with the configuration.

### ► Supported IP addresses:

- IPv4 only. IPv6 is not currently supported.

## Device Mode

RAV-IP can be used in two modes: Extender Mode and Matrix Mode. Most changes in the Device Mode setting requires a reboot of each Encoder and Receiver unit for the new setting to take effect. Note that the IP address of the device may change after a reboot if using link-local addresses.

### ► Extender Mode:

Extender Mode is used when one Encoder is connected point-to-point to a single Decoder. You can tell your network administrator that Unicast addressing is used, which all networks support.

### ► Matrix Mode:

Matrix Mode is used in all other AV configurations when there are more than two Encoders and Decoders. This uses the Multicast IP networking protocols to efficiently transmit video to multiple Decoders. If you are using an existing network or a network using multiple switches and/or routers, you should tell your network administrator that Multicast is being used. The administrator may have to do some network configuration to support Multicast, that is IGMP protocols. VLANs can also be used to segregate AV traffic and to increase performance.

---

## Functions Tab

The Functions tab contains many settings that control how the Encoders and Decoders operate. The settings differ slightly in the Encoder and Decoder web interfaces.

## Encoder Functions tab

System	Network	Functions
<b>Video over IP</b>		
<input checked="" type="checkbox"/> Enable Video over IP		<input type="button" value="Apply"/>
Video Quality: <input type="button" value="Graphic Mode"/> <input checked="" type="button" value="Video Mode"/>		
Anti-Dither: <input type="button" value="Off"/> <input checked="" type="button" value="Level 1"/> <input type="button" value="Level 2"/>		
<b>USB over IP</b>		
<input checked="" type="checkbox"/> Enable USB over IP		<input type="button" value="Apply"/>
<b>Serial over IP</b>		
<input checked="" type="checkbox"/> Enable Serial over IP		
Baudrate Setting:		
Baudrate: <input type="text" value="115200"/>		<input type="button" value="v"/>
Data bits: <input type="text" value="8"/>		<input type="button" value="v"/>
Parity: <input type="text" value="None"/>		<input type="button" value="v"/>
Stop bits: <input type="text" value="1"/>		<input type="button" value="v"/>
		<input type="button" value="Apply"/>

## See:

- **Video Quality Modes** (on page 20)
- **Anti-Dither** (on page 22)
- **Enable USB over IP** (see "USB Control for Computer Devices" on page 26)
- **Serial over IP settings** (see "Using RS-232 - Enable Serial over IP" on page 22)

## Decoder Functions tab

The screenshot shows the 'Functions' tab of a web interface. It contains three main sections: 'Video over IP', 'USB over IP', and 'Serial over IP'. Each section has an 'Apply' button. The 'Video over IP' section has 'Enable Video over IP' checked and 'Automatically Copy EDID from this Decoder Video Output' unchecked. The 'USB over IP' section has 'Enable USB over IP' unchecked. The 'Serial over IP' section has 'Enable Serial over IP' checked and includes Baudrate Settings (Baudrate: 115200, Data bits: 8, Parity: None, Stop bits: 1). The 'Extra Setting' section has 'Enable DPMS' set to Yes and 'Enable Channel OSD' set to Yes.

See:

- **Automatically Copy EDID from this Decoder Video Output** (on page 24)
- **Enable USB over IP** (see "USB Control for Computer Devices" on page 26)
- **Serial over IP** (see "Using RS-232 - Enable Serial over IP" on page 22)
- **Enable DPMS for Monitor Power Saving** (on page 25)
- **Enable Channel OSD** (on page 25)

## Video Quality Modes

The RAV-IP provides two video modes: Video Mode (default) and Graphic Mode.

### ► To set Video Mode:

1. In the Encoder Functions tab, click Graphic Mode or Video Mode, then click Apply.
2. Reboot the Encoder.

▶ **Video Mode:**

By default, units are set to Video mode, which is best for movies and videos.



► **Graphic Mode:**

If the signal is a static, graphical source, such as an image, pattern generator, or similar, select Graphic Mode to maintain the sharpest image possible.



## Anti-Dither

Anti-Dithering Mode is designed to work with certain ATI graphic cards that provide dithering output. Dithering output is used to make color look better than its original color depth. This presents difficulty for Video Compression to maintain low bandwidth.

Currently, Dithering Output is only required with ATI graphic cards.

RAV-IP provides Anti-dithering for 1 bit, 2 bit, or off. Don't enable this mode unless it is specifically required.

### ► Anti-Dither Settings:

- Off is the default
- Level 1
- Level 2

## Using RS-232 - Enable Serial over IP

RAV-IP supports RS-232 pass-through, allowing the control of remote RS-232 devices near the Decoder unit from the Encoder's location. The RS-232 host (controller) and the device (client) must be set to the same baud rate. In addition, the correct baud rate must be set on the Encoder and Decoder units which are being used to control the RS-232 client.

Serial-over-IP is bi-directional. You can control the device connected to the encoder from the decoder side, or control the device connected to the decoder from the encoder side.

---

*Note: Disable the Serial-over-IP feature if you are not using it. Enabling Serial will generally slow down switching between channels.*

---

1. Login to the Encoder web interface by pointing a web browser to the Encoder's IP address.
2. In the Function tab, select the Enable Serial over IP checkbox, then click Apply.

3. Reboot the Encoder unit. See **Reboot Encoder or Decoder** (on page 15).

The screenshot shows a web-based configuration interface with three tabs: 'System', 'Network', and 'Functions'. The 'Functions' tab is active. It contains three sections: 'Video over IP', 'USB over IP', and 'Serial over IP'. Each section has a checkbox to enable the respective function and an 'Apply' button. The 'Serial over IP' section also includes a 'Baudrate Setting' with dropdown menus for Baudrate, Data bits, Parity, and Stop bits.

**System** **Network** **Functions**

**Video over IP**

☒ Enable Video over IP

☒ Copy EDID from this Video Output (Default disabled under multicast mode)

Apply

**USB over IP**

☒ Enable USB over IP

Apply

**Serial over IP**

☒ Enable Serial over IP

**Baudrate Setting:**

Baudrate: 115200 ▼

Data bits: 8 ▼

Parity: None ▼

Stop bits: 1 ▼

Apply

### **Automatically Copy EDID from this Decoder Video Output**

RAV-IP features EDID Management. Before the source can send video and audio data, the source device connected to each Encoder unit reads the EDID for the display connected to each Decoder unit. The EDID contains information about what type of audio and video data can be accepted from the source.

By default, the default HDMI EDID stored in the Encoder unit is used. The EDID from the Decoder's HDMI output connected device, such as display, amplifier, and so on, can be copied and stored in the Encoder unit. This enables support for multi-channel audio and 3D functions from the device connected to the Decoder unit.

If enabled by the RAV-IP Web interface, from the device connected to the decoder the EDID can be copied automatically every time the video channel is switched.

Follow one of these procedures to copy the EDID

#### **► Using the EDID Copy Button:**

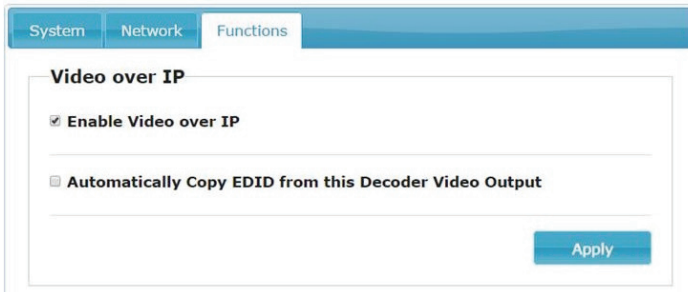
1. Establish Encoder and Decoder communication.
  - a. Unplug the HDMI cable from the Encoder.
  - b. Unplug the power supply from the Decoder, then press the Copy EDID button on the rear of the Decoder unit.
  - c. Power on the Decoder and long-press while booting until the Power LED starts blinking.
2. Plug the HDMI cable back into the Encoder unit.

#### **► Using the Web Interface to Automatically Copy the EDID when Channels are Switched:**

1. Login to the Decoder's web interface by pointing a web browser to the Decoder's IP address.
2. In the Functions tab, select the Automatically Copy EDID from this Decoder Video Output checkbox, then click Apply.



3. Reboot the Decoder unit. See **Reboot Encoder or Decoder** (on page 15).



### Enable DPMS for Monitor Power Saving

DPMS is a standard for monitor power saving. The default setting is off.

When the DPMS setting is off, and there is no input from the Encoder, the Decoder will show "Waiting for video source - standby" on the bottom left of the display.

When DPMS is on and there is no video output from the Encoder, the Decoder will not output video. This will generally put the display into sleep mode. Turning off the source video connected to the Encoder will cause the remote displays connected to the Decoders to go to sleep. When the video signal are turned back on, the monitors will wake and display the video.

#### ► To enable or disable DPMS:

1. In the Decoder web interface, choose Functions > Extra Settings > Enable DPMS.
2. Click On or Off, then click Apply.

### Enable Channel OSD

The Enable Channel OSD setting allows you to show or hide the channel number on the display screen while switching channels.

1. In the Decoder web interface, choose Functions > Extra Settings > Enable Channel OSD.
2. Click On or Off, then click Apply.

## USB Control for Computer Devices

On the Decoder unit, there are 4 USB ports. Three USB 2.0 ports, and one USB 1.1 port, which should be used for low-speed USB devices such as a keyboard.

- Extender Mode: one Encoder unit and one Decoder

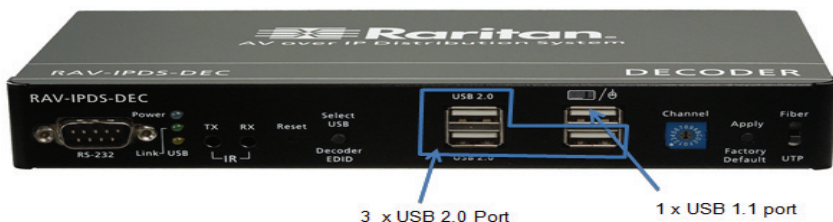
In Extender mode, only a single Decoder will be able to communicate with an Encoder. However, multiple USB devices can be connected to the Decoder unit.

- Matrix Mode

In Matrix mode, the USB host devices can only be controlled from one Decoder at the same time. If the USB LED is not lit orange, press the Select USB button to acquire USB control.

Connecting multiple mouse / keyboard devices to each Decoder unit makes little sense if multiple users are attempting to control the same computer. However, if the different USB devices are connected, only one remote station (Decoder unit) can use USB devices without interference.

Enable or disable USB control in the web interface in Functions > Enable USB over IP. For A/V type devices without USB control, you should disable USB to improve switching time.



## Computer Audio Input and Output

1. A computer typically has a Mic In jack, as part of its sound card. To access this jack from the Decoder unit, connect the microphone to the pink IN jack on the Decoder unit.
2. To get the audio from the microphone into the computer, connect a 3.5mm-to-3.5mm stereo cable from the pink Line out jack on the ENCODER unit to the Line in jack on the computer.

**Warning: DO NOT** connect the cable from the Line out jack on the Encoder unit to the Mic In jack on the computer. Doing so will result in audio "clipping" and may cause damage to the sound card.

---

**Note:** *HDMI audio is passed through to the HDMI Out connector on the Decoder unit. However, if a 3.5mm stereo cable is connected from a computer to the green Line In jack on the Encoder unit, the embedded HDMI audio is switched off. This allows the audio signal from Line In jack (Encoder unit) to be received on the green Line Out jack (Decoder unit)*

---

When using a microphone, the audio behavior differs between extender and matrix modes:

- **Matrix Mode**

The Mic In jack is disabled in multicast mode. If an audio source is connected to the Line In jack on an Encoder unit, the audio signal will be distributed to all Decoder units set to the same video channel. Each Decoder unit should have a separate pair of powered speakers connected to its Line Out jack.

- **Extender Mode**

In extender mode, a separate microphone can be connected to the Decoder unit. The audio signal coming from the microphone will be sent to the Encoder unit on the same channel as the Decoder unit.

---

## Changing Channels

You can change the Encoder that a Decoder is connected to, that is, "change channels", using the included remote control, or the channel rotary switch on the Decoder.

### ► Remote control:

Point the 16-channel IR remote control at the IR Receiver cable connected to the IR RX port on the Decoder.

1. On the remote control, press the CH + and – buttons to change to the next connected channel number.  
or
2. On the remote control, press the channel number, then press Enter. If the selected channel is not available, the channel stays the same.

► **Channel rotary switch:**

- Change the Decoder's rotary switch setting, then push the Apply button.
- If you change to a channel not connected to an Encoder, you will see the following screen:

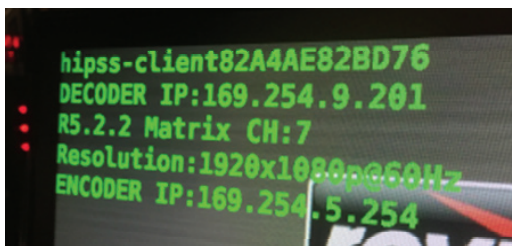


---

## Show Channel Number, IP Address, and Details

Point the 16-channel IR remote control at the IR Receiver cable connected to the IR RX port on the Decoder.

- Press the OSD button to show (from top to bottom) the MAC address of the device, Decoder IP Address, firmware version, IP Mode, current channel number, video resolution and Encoder IP address.



# Appendix A    Mounting Options

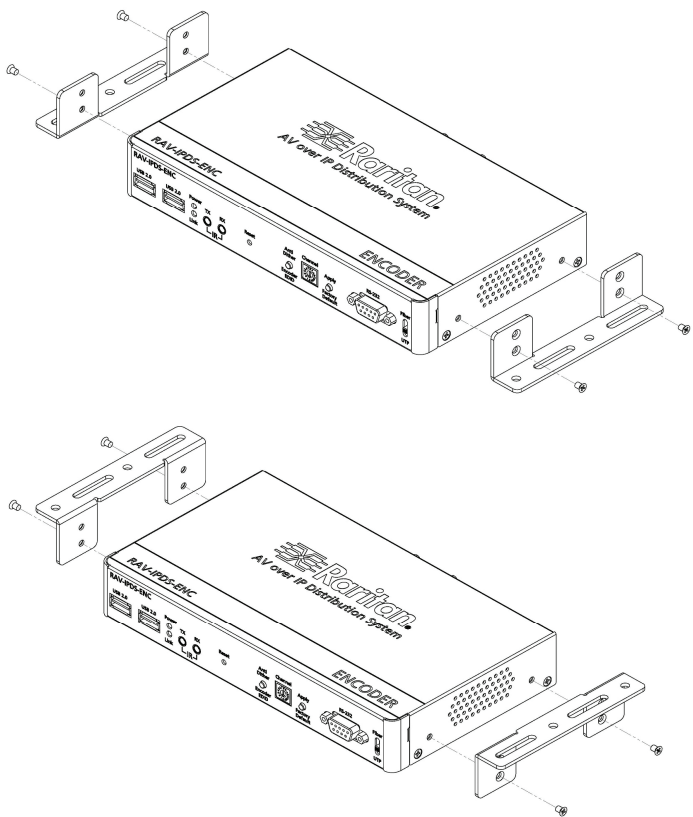
There are two mounting options for RAV-IP:

- **Bracket Mount Installation** (on page 29)
- **VESA Mount Installation** (on page 30)

## In This Chapter

Bracket Mount Installation.....	29
Bracket Mount Kit Dimensions and Weight .....	30
VESA Mount Installation .....	30
VESA Mount Kit Dimension and Weight.....	32

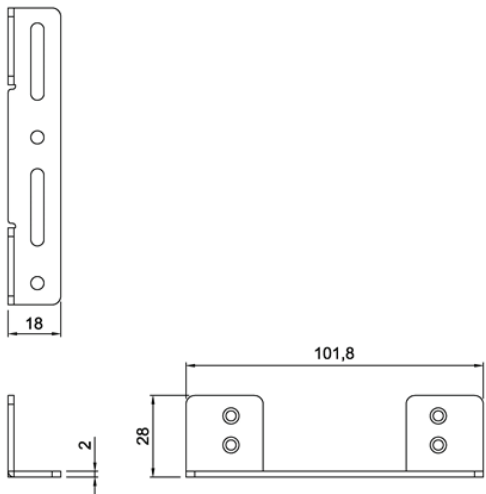
### Bracket Mount Installation



---

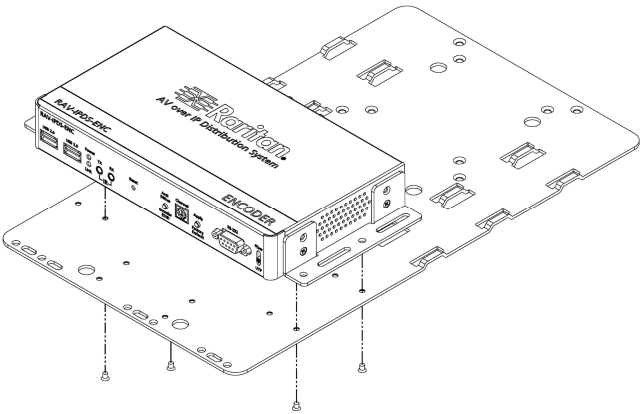
## Bracket Mount Kit Dimensions and Weight

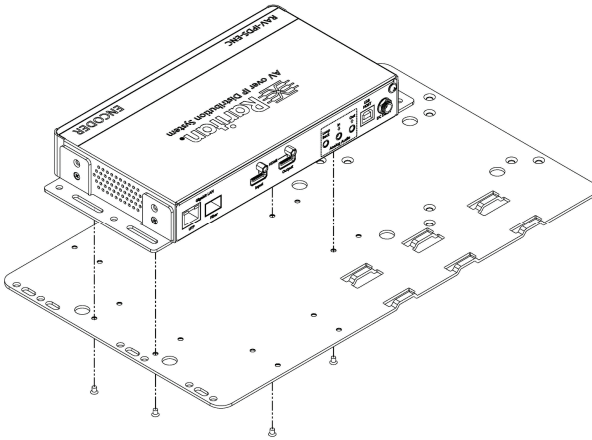
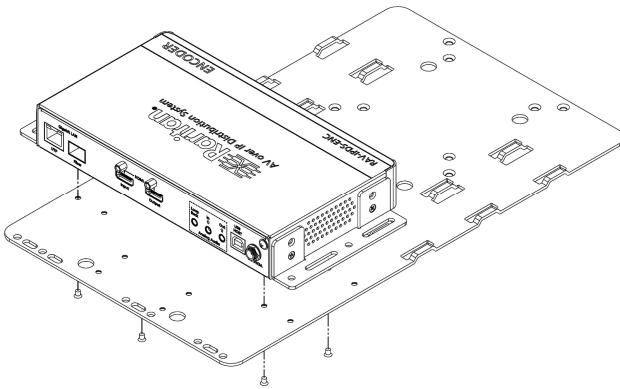
- Weight: 42 grams

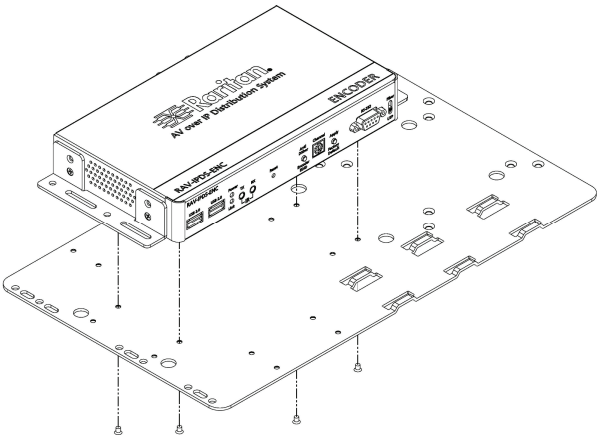


---

## VESA Mount Installation

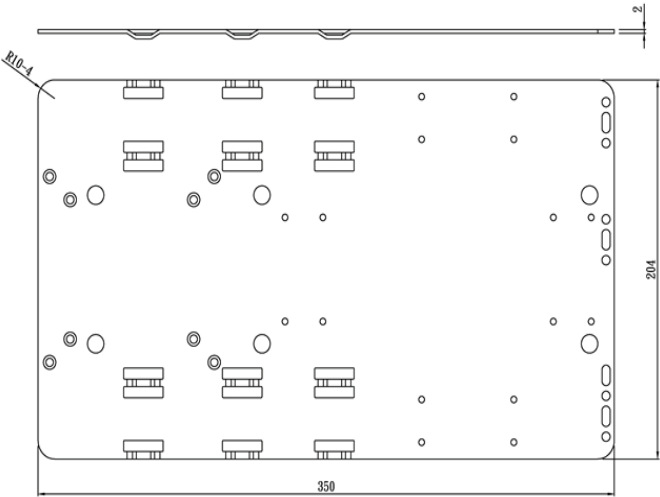






VESA Mount Kit Dimension and Weight

- Weight: 1040 grams





## Appendix B Features and Specifications

### In This Chapter

Features.....	34
Specifications .....	35
SKUs and Package Contents .....	37

---

## Features

- Matrix Switching
- Using a standard managed Ethernet switch, create a scalable and expandable custom KVM and video matrix. This technology runs on standard network infrastructure, enabling flexible distribution and matrix switching combinations. Share and access multiple displays, workstations, and USB 2.0 devices all over a separate or existing LAN (Local Area Network).
- Easily connect an HD source into a encoder (Tx unit). Then connect this Encoder to your Local Area Network switch. Video and KVM can all be shared anywhere over a LAN with just a Decoder unit (Rx unit) and display or number of Decoder units (Rx units).
- Extension Over IP Secure Remote Access
- Real hardware solution to remotely access a computer, over your existing CATx network or Fiber network. Share Video, audio, USB, RS-232, IR and more.
- Supports Multiple Video Formats
- HDMI, DVI and VGA can coexist on one network with resolution up to 1080p Full HD and 1920x1080.
- Full HD 1080
- Blu-ray quality Full HD 1080p Video and 2K.
- HDCP supported.
- Easily broadcast copy protected content such as from a Blu-ray or set-top box.
- USB 2.0 over IP
- High Speed, powered USB so you can easily share devices, such as keyboard, mouse, touch screen and other USB devices, across your network.
- RS-232 Control and Extension
- Have control of displays, switchers, lighting control or other connected RS-232 devices.
- IR Signals over IP
- Control power, input channel, volume, and more on sources and displays.

## Specifications

- HDMI compatible
- DVI Spec.:v1.0 compliant
- HDCP Spec.:v1.1/1.2 compliant
- HDMI Video Resolution: Up to 1080P@60Hz, 60 fps.
- PC DVI Input Resolution: Up to 1920x1200 @ 60Hz
- HDMI Audio In/ Out: Up to 7.1ch LPCM, DTS HD, Dolby® TrueHD
- Distance: Point to Point 100M/ unlimited within LAN for UTP/STP CATx wiring,
- Long distance: Point to Point up to 10 Kilometer/ 6.21 mile over Fiber cable
- RS-232 Baudrate: 300~230, 400bps, Default 115,200bps
- IR Control Pass Thru:20~60KHz, Two-way IR Pass- Thru
- Connectors/ parts:
  - Video Input Connector (Encoder): 1 x HDMI Type A 19-pin, female
  - Video Output Connector:
    - Encoder 1 x HDMI Type A 19-pin, female ( Loopback ), locking
    - Decoder 1 x HDMI Type A 19-pin, female, locking
    - Decoder 1 x DVI-I , female (for non-HDCP video only)
  - Line Input (Encoder): 1 x 3.5mm mini-stereo jack
  - Line Output (Encoder): 1 x 3.5mm mini-stereo jack
  - Mic Input (Decoder): 1 x 3.5mm mini-stereo jack
  - Line Output (Decoder): 1 x 3.5mm mini-stereo jack
  - USB Host Interface (Encoder): 1 x USB Type B, female
  - USB Device Connectors (Decoder): 4 x USB Type A, female
  - RS-232 Connector : 1 x DB-9, (female on Encoder, male on Decoder)
  - IR Emitter (Encoder & Decoder): 1 x 3.5mm mini-stereo jack
  - IR Extender (Encoder & Decoder): 1 x 3.5mm mini-stereo jack
  - Gigabit Ethernet connector (Encoder & Decoder): 1 x RJ-45, shielded, 1 x SFP slot for Fiber Modules (single mode / multimode).
  - Video Channel Rotary switch (Encoder & Decoder): 1x 16-channel Switch
  - Link Indicator (Encoder/Decoder): 1 x LED, green

## Appendix B: Features and Specifications

- Power Indicator (Encoder/Decoder): 1 x LED, blue
- Power Supply (Encoder / Decoder): 5V DC 3A
- Power Consumption (Encoder / Decoder):10W (max.)
- Operating Temperature:0-40°C
- Storage Temperature:-20~50°C
- Chassis Material :Metal
- Dimension (Encoder/Decoder) (W x H x D): 8.03" x 1.26" x 4.49"  
(204mm x 32mm x 114mm)

---

## SKUs and Package Contents

### SKU1: RAV-IPDS-CAT-EXT (Encoder+Decoder KIT package)

- 1 x RAV-IPDS-ENC (encoder unit)
- 1 x RAV-IPDS-DEC (Decoder unit)
- 2 x 5V DC power supply with locking plug
- 2 x Mounting Kit (WMK-02)
- 1 x Quick Guide
- 1 x IR emitter cable (IRE-100) and 1 x IR decoder cable
- 1 x 16 video channel IR remote control

### SKU2: RAV-IPDS-ENC (Tx/ Encoder unit package)

- 1 x RAV-IPDS-ENC (Tx/Encoder )
- 1 x 5V DC power supply with locking plug
- 1 x Mounting Kit (WMK-02)
- 1 x Quick Setup Guide
- 1 x IR emitter cable (IRE-100)

### SKU3: RAV-IPDS-DEC (Rx/ Decoder unit package)

- 1 x RAV-IPDS-DEC (Rx/Decoder)
- 1 x 5V DC power supply with locking plug
- 1 x Mounting Kit (WMK-02)
- 1 x Quick Setup Guide
- 1 x IR decoder cable (IRR-100)
- 1 x 16 video channel IR remote control

### SKU 4: RAV-IPDS-Fiber-MM-EXT (Multimode Fiber Extender package)

- 1 x RAV-IPDS-DEC Decoder package
- 1 x RAV-IPDS-ENC Encoder package
- 2 x multi-mode SFP transceivers

### SKU 5: RAV-IPDS-Fiber-SM-EXT (Single Mode Fiber Extender package)

- 1 x RAV-IPDS-DEC Decoder package
- 1 x RAV-IPDS-ENC Encoder package
- 2 x single mode SFP transceivers

### SKU 6: RAV-IPDS-MM-SFP-TRX

- Two, multi-mode, dual-fiber SFP transceivers for RAV-IP series

### SKU 7: RAV-IPDS-SM-SFP-TRX

- Two, single-mode, single-fiber SFP transceivers for RAV-IP series

► **Optional Accessories:**

RAV-IPDS-VESA: VESA mounting plate for RAV-IPDS-ENC or RAV-IPDS-DEC

- Can be mounted to both 100mm or 75mm VESA standard
- Special mounting plate designed for easy mounting to on the VESA-compatible mounting rack/stands with easy cable management
- Connected cables can be easily secured on the mounting plate

RAV-IPDS-REMOTE

- Infra red remote control for RAV-IP decoder

RAV-IPDS-PWR

- Power adapter with universal power plugs for RAV-IP encoder or decoder

# Index

## A

Anti-Dither • 19, 22  
Automatically Copy EDID from this Decoder  
Video Output • 20, 24

## B

Bracket Mount Installation • 29  
Bracket Mount Kit Dimensions and Weight •  
30

## C

Changing Channels • 27  
Computer Audio Input and Output • 26  
Configuring a Multi-Channel System • 7  
Configuring a Single-Channel Extension  
System • 5

## D

Decoder (Receiver) Unit Front • 3  
Decoder (Receiver) Unit Rear • 4  
Device Mode • 4, 18

## E

Enable Channel OSD • 20, 25  
Enable DPMS for Monitor Power Saving • 20,  
25  
Encoder (Transmitter) Unit Front • 1  
Encoder (Transmitter) Unit Rear • 2

## F

Features • 34  
Features and Specifications • 33  
Functions Tab • 18

## I

Installation • 5  
Installing a Multi-Channel Video Distribution  
System • 6  
Installing a Wired Single Channel Extension  
System • 5  
Introduction • 1  
IP Setup • 17

## M

Mounting Options • 29

## N

Network Tab • 16

## O

Operation • 9

## R

Reboot Encoder or Decoder • 15, 23, 25  
Reset EDID • 15  
Reset to Factory Default • 15

## S

Show Channel Number, IP Address, and  
Details • 28  
SKUs and Package Contents • 37  
Specifications • 35  
Supported Ethernet Switches • 6  
System Tab • 10

## U

Update Firmware • 11  
USB Control for Computer Devices • 19, 20,  
26  
Using RS-232 - Enable Serial over IP • 19, 20,  
22  
Utilities • 14

## V

VESA Mount Installation • 29, 30  
VESA Mount Kit Dimension and Weight • 32  
Video Quality Modes • 19, 20

## W

Web Interface • 6, 9, 17  
Web Interface Overview • 10

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