HDMI-IP-E/R
User Manual v1.3

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If the Product proves to be defective during the three (3) year warranty period, the purchaser's exclusive remedy and Apantac's sole obligation under this warranty is expressly limited, at Apantac's sole option, to:

(a) repair the defective Product without charge for parts and labor or,
(b) provide a replacement in exchange for the defective Product or,
(c) if after a reasonable time, is unable to correct the defect or provide a replacement Product in good working order, then the purchaser shall be entitled to recover damages subject to the limitation of liability set forth below.

Limitation of Liability

Apantac's liability under this warranty shall not exceed the purchase price paid for the defective product. In no event shall Apantac be liable for any incidental, special or consequential damages, including without limitation, loss of profits for any breach of this warranty.

If Apantac replaces the defective Product with a replacement Product as provided under the terms of this Warranty, in no event will the term of the warranty on the replacement Product exceed the number of months remaining on the warranty covering the defective Product.

Equipment manufactured by other suppliers and supplied by Apantac carries the respective manufacturer's warranty. Apantac assumes no warranty responsibility either expressed or implied for equipment manufactured by others and supplied by Apantac.

This hardware warranty shall not apply to any defect, failure or damage:

a) Caused by improper use of the Product or inadequate maintenance and care of the Product;

b) Resulting from attempts by those other than Apantac representatives to install, repair, or service the Product;

c) Caused by installation of the Product in a hostile operating environment or connection of the Product to incompatible equipment;

Table of Contents

1.0 WHAT'S IN THE BOX (When sold in pairs) 4
2.0 Key Features 5
2.1 Specifications 5
2.2 Front/Rear Views 7
3.0 DIP Switches 9
3.1 Baud Rate DIP Switch Settings 9
3.2 ID DIP Switch Settings 9
4.0 IR Blaster/Receiver Cables 10
5.0 RS-232 Serial Pinout 11
6.0 Installation and Quick Start Guide 11
6.1 Point to point connection 11
6.2 Point to multi-point connection 12
6.3 Multiple transmitters to multiple receivers 13
6.4 Monitoring the the HDMI-IP-E via VLC and other Software 14
7.0 OSD (On Screen Display) 15
8.0 Configuring the HDMI-IP-E via the web page 17
8.1 Down Scaling the output 18
8.2 Setting the streaming bitrate 18
8.3 Setting the Multicast ID and IP address 19
8.4 Change User Name and Password 21
8.5 Communication Firmware Upgrade on HDMI-IP-E 21
8.6 Set IP properties and DHCP 21
8.7 Set Baud Rate 22
8.8 Codec Firmware Upgrade on HDMI-IP-E 22
9.0 Configuring the HDMI-IP-R via the web page 23
9.1 Codec Firmware Upgrade on HDMI-IP-E 23
9.2 Set IP properties and DHCP 23
9.3 Setting the Multicast ID and IP address 24
9.4 Set Baud Rate 24
Appedix A – Using VLC to Decode the Stream from HDMI-IP-E 25

1.0 WHAT'S IN THE BOX (When sold in pairs)

Note: HDMI-IP-E and HDMI-IP-R can also be sold separately

QTY	Product	Description
1		HDMI-IP-E: HDMI to H.264 encoder/transmitter
1		HDMI-IP-R: HDMI to H.264 decoder/receiver
2		IR Emitter cables
2		12 V DC power supply with universal adapter

2.0 Key Features

- HDMI 1.4 (1080P) to H.264 encoder and decoder
- Supports one pair of HDMI embedded audio
- Supports both Unicast and Multicast
- Supports up to 1080P@60Hz at 18Mbps
- Supports point to point up to 100 meters
- Compatible with CAT 5/E/6 cables
- Supports RS-232
- HDMI and HDCP compliant
- Web interface for basic configuration

2.1 Specifications

Functions/Part#	HDMI-IP-E	HDMI-IP-R
HDMI Input Connector	1 (HDMI Type A)	None
HDMI Input Color Space	HDMI: RGB 8/10/12 bit, YCbCr 4:2:2/4:4:4 8/10/12 bit, DVI:RGB/YCbCr 4:2:2/4:4:4 8 bit	
HDMI Output Connector	1 (HDMI Type A)	
HDMI Output Color Space	YCbCr 4:4:4	RGB
HDMI Output Max. Resolution	1080P@60Hz (8 bit)	
LED Indicators	Power	
LINK	Rj-45	
IR In	None	3.5 mm jack
IR Out	3.5 mm jack	None
IR Carrier Frequency	20KHz ~ 60KHz	
Baud Rate Settings	3 PIN DIP Switch	
ID DIP Switch	8 PIN DIP Switch	
CAT 5E cable distance	100 meters maximum	
RS-232 connector	DB9 Female	
Baud Rate	2400 up to 115,200 bps; data bits, 1 stop bit, no parity	
Weight	338 g	
Dimension (LxW-H)	120x75x33 mm	

Supported Resolutions

Resolution	Frequency(Hz)
640x480	60
800x600	60
1024x768	60
1280x768	60
1280x800	60
1280x960	60
1280x1024	60
1360x768	60
1366x768	60
1440x900	60
1400x1050	60
1440x1050	60
1600x900	60
1680x1050	60
480i	59.94/60
480p	59.94/60
576i	50
576p	50
1080i	50/59.94/60
1080p	23.98/24/25/29.98/30/50/59.94/60
720p	50/59.94/60

2.2 Front/Rear Views

HDMI-IP-E (Encoder)

Figure 4-1 HDMI-IP-E front view

1. HDMI Loop out. (YCbCr 4:4:4)
2. HDMI Input
3. Multicast ID DIP Switch
4. Power (12 V DC 2A)

Figure 4-2 HDMI-IP-E rear view

1. LED power indicator
2. System reset
3. Baud rate setting DIP Switch
4. IR out
5. RS-232
6. LINK

HDMI-IP-R (Decoder)

Figure 4-3 HDMI-IP-R front view

1. HDMI Output
2. Multicast ID DIP Switch
3. Power (12 V DC 2A)

Figure 4-4 HDMI-IP-R rear view

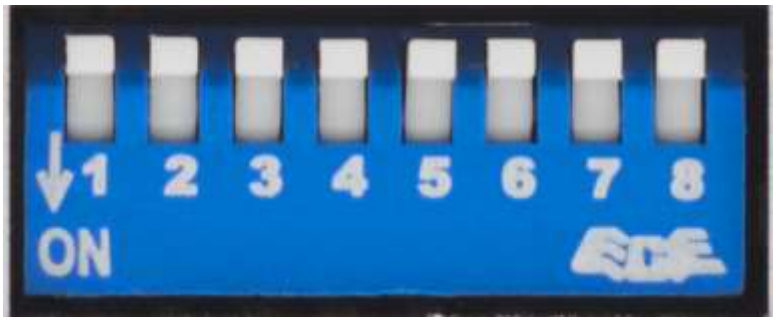
1. LED power indicator
2. System reset
3. Baud rate setting DIP Switch
4. IR out
5. RS-232
6. LINK

3.0 DIP Switches

3.1 Baud Rate DIP Switch Settings

Baud Rate	PIN 1	PIN 2	PIN3
2400	OFF	OFF	OFF
4800	ON	OFF	OFF
9600	OFF	ON	OFF
19200	ON	ON	OFF
28800	OFF	OFF	ON
38400	ON	OFF	ON
57600	OFF	ON	ON
115200	ON	ON	ON

3.2 ID DIP Switch Settings



ID	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8
0	OFF	OFF	OFF	OFF	OFF	OFF	Not Used	Reset OFF Wait 3 Sec. ON
1	ON	OFF	OFF	OFF	OFF	OFF		
	:	:	:	:	:	:		
7	ON	ON	ON	:	:	:		
:	:	:	:	:	:	:		
63	ON	ON	ON	ON	ON	ON		

4.0 IR Blaster/Receiver Cables

IR Receiver Cable

Plug it into the HDMI-IP-R's "IR IN" port and place the IR receiver in a convenient location for the remote control

IR Blaster Cable

Plug it into the HDMI-IP-E's "IR OUT" port and place the IR receiver in a convenient location for the remote control

5.0 RS-232 Serial Pinout

PIN1	N/C
PIN2	TxD (Data Out)
PIN3	RxD (Data In)
PIN4	N/C
PIN5	GND
PIN6	N/C
PIN7	N/C
PIN8	N/C
PIN9	N/C

6.0 Installation and Quick Start Guide

6.1 Point to point connection

1. Turn off the HDMI source and HDMI Display
2. Connect the cable between the source and the HDMI-IP-E via the HDMI in port
3. Connect the HDMI cables between the Displasy and the HDMi-IP-E and HDMI-IP-R
4. Connect the CATx cable between the HDMI-IP-E and HDMI-IP-R
5. Make sure the ID DIP Switch is set the same
6. Connect the power to both HDMI-IP-E and HDMI-IP-R
7. Turn on the the power for the HDMI Displays

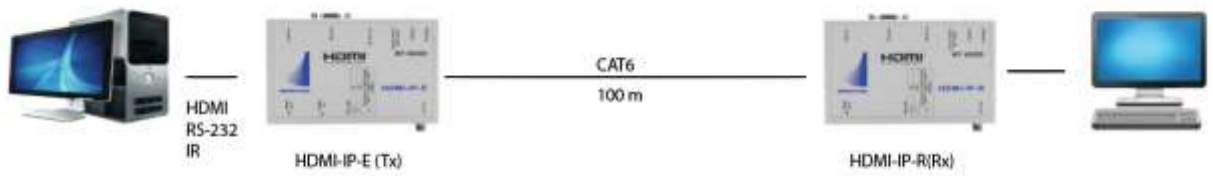


Illustration of Point to Point Connection

6.2 Point to multi-point connection

1. Turn off the HDMI source and HDMI Display
2. Connect the cable between the source and the HDMI-IP-E via the HDMI in port
3. Connect the HDMI cables between the Displasy and the HDMI-IP-E and HDMI-IP-R
4. Connect the CATx cables between the HDMI-IP-E and the switch
5. Connect the CATx cables between the HDMI-IP-R and the switch
6. Make sure the ID DIP Switch is set the same
7. Connect the power to both HDMI-IP-E and all the HDMI-IP-R's
8. Turn on the the power for the HDMI Displays

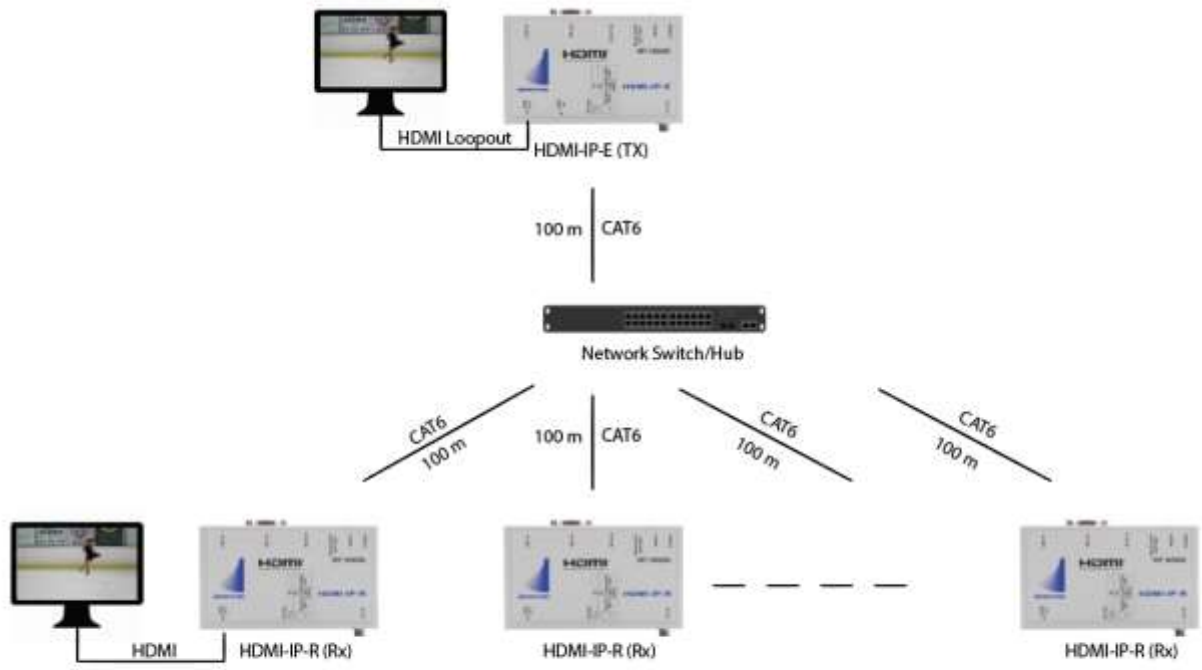


Illustration of one Transmitters to Multiple Receivers

6.3 Multiple transmitters to multiple receivers

1. Turn off the HDMI sources and HDMI Display
2. Connect the cable between the sources and all the HDMI-IP-E via their HDMI in ports
3. Connect the HDMI cables between the Display and all the HDMI-IP-E's and HDMI-IP-R's
4. Connect the CATx cables between all the HDMI-IP-E's and the switch
5. Connect the CATx cables between all the HDMI-IP-R's and the switch
6. Make sure the DIP Switch is set the same ID between the corresponding transmitter and receivers
7. Connect the powers to both HDMI-IP-E's and all the HDMI-IP-R's
8. Turn on the the powers for the HDMI Displays

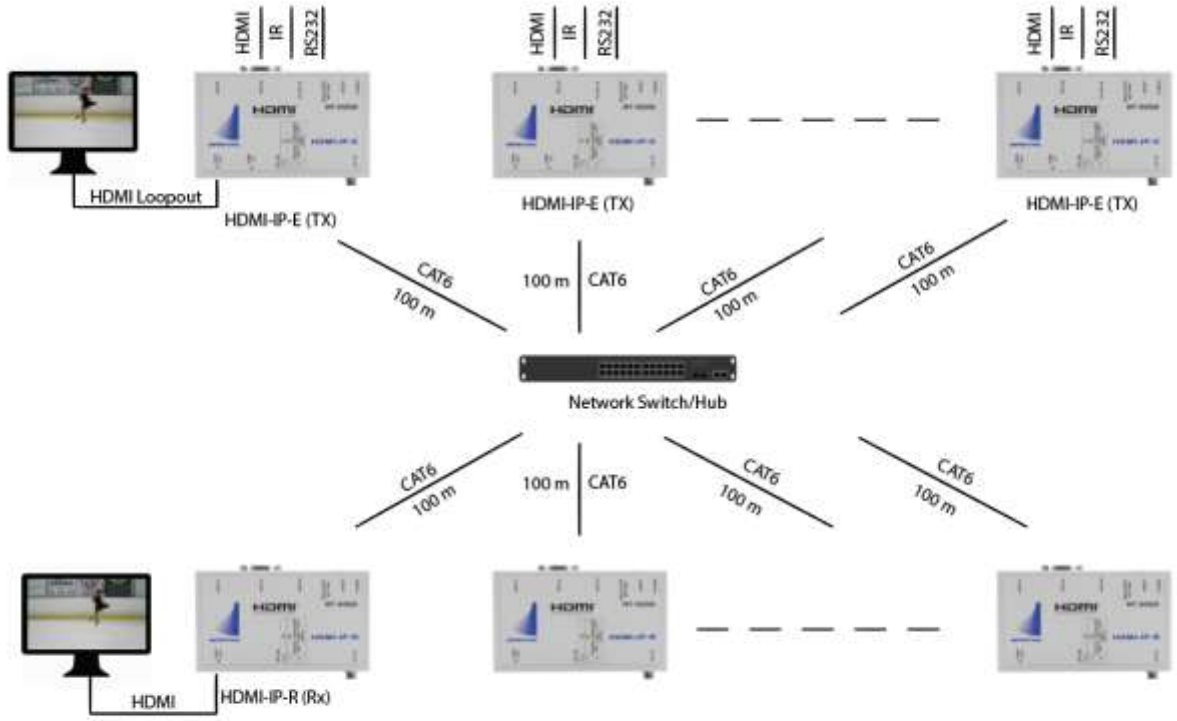


Illustration of Multiple Transmitters to Multiple Receivers

6.4 Monitoring the the HDMI-IP-E via VLC and other Software

Instead of using a HDMI-IP-R as the decoder of the the H.264 stream, software such as VLC can be used to decode the source and view it. Apantac does not gurantee the performances the above mentioned software. Please see Appendix A for examples on how to use VLC in the best of our knowledge.

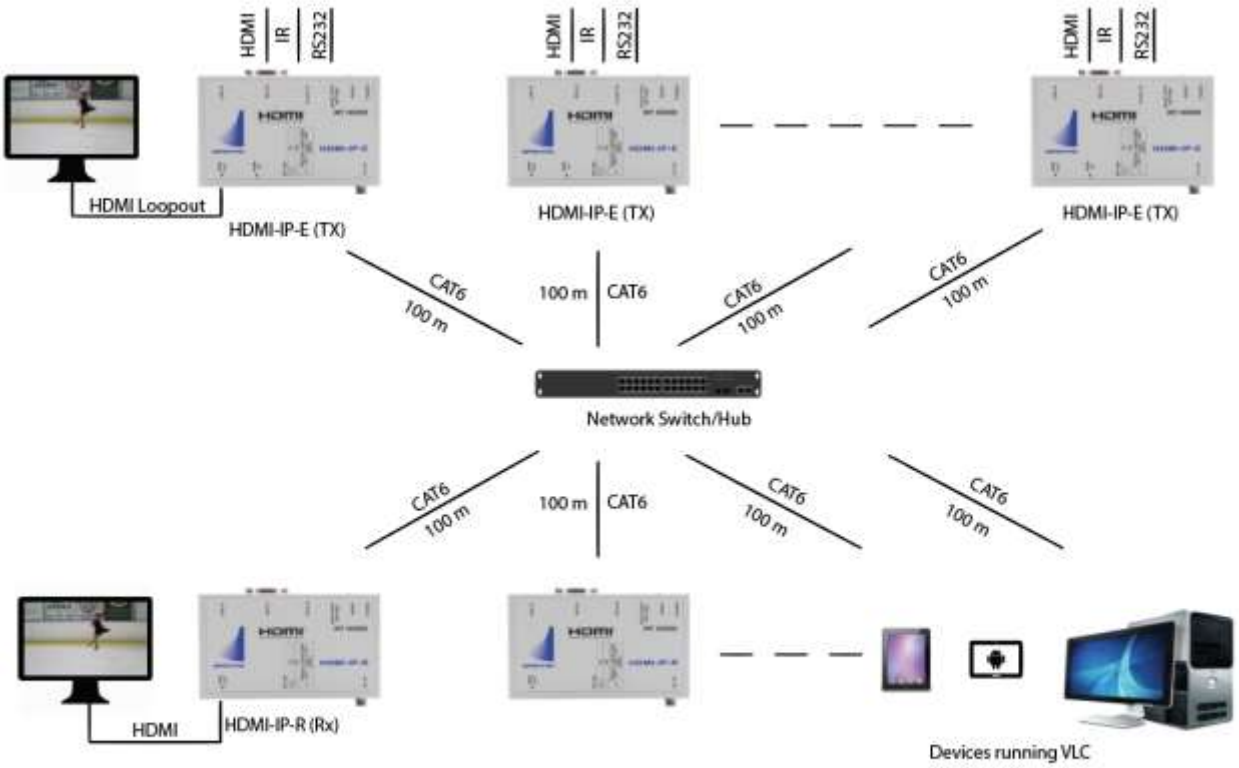


Illustration of Multiple Transmitters to Multiple Receivers and Decoding with VLC

7.0 OSD (On Screen Display)

There are built-in OSDs in the HDMI-IP-R's HDMI output that provides various important information for the setup. The default IP addresses for both the HDMI-IP-E (Tx) and HDMI-IP-R(Rx), can be obtained from the OSD by simply plugging the HDMI-IP(Rx) HDMI output to the monitor.

Here is an OSD screen capture when the HDMI-IP-R is plugged into the monitor without any network connection.

1. FW Version
2. RX IP address (HDMI-IP-R) is initially at 0.0.0.0
3. TX IP address (HDMI-IR-E) is initially at 0.0.0.0
4. Group ID: It reflects either the hardware Multicast ID DIP Switch (See Section 5) or the SW Muticast ID Setting (See Section XX)
5. Decice ID: IPTV
6. Status: Waiting for Connection …

Fig. 8-1: Initial OSD Screen shot after HDMI-IP-R's HDMI output is connected to the monitor without any network connection.

In order to get the default IP address of the HDMI-IP-R(Rx), the network (LINK) must be connected either directly to a HDMI-IP-E or a network switch. As you can see the IP address for the HDMI-IP-R (Rx) is now part of the OSD.

Fig. 8-2: OSD Screen capture after the HDMI-IP-R(Rx) is connected to a network switch

Connect the HDMI-IP-E(TX) either directly to the HDMI-IP-R(RX) or via a network switch, the IP address of the HDMI-IP-E(TX) will display on the OSD

Fig. 8-3: OSD Screen capture after the HDMI-IP-E(Tx) is connected to a network switch

8.0 Configuring the HDMI-IP-E via the web page

Connecting to HDMI-IP-E (TX) via the webpage by typing its IP address in a browser.

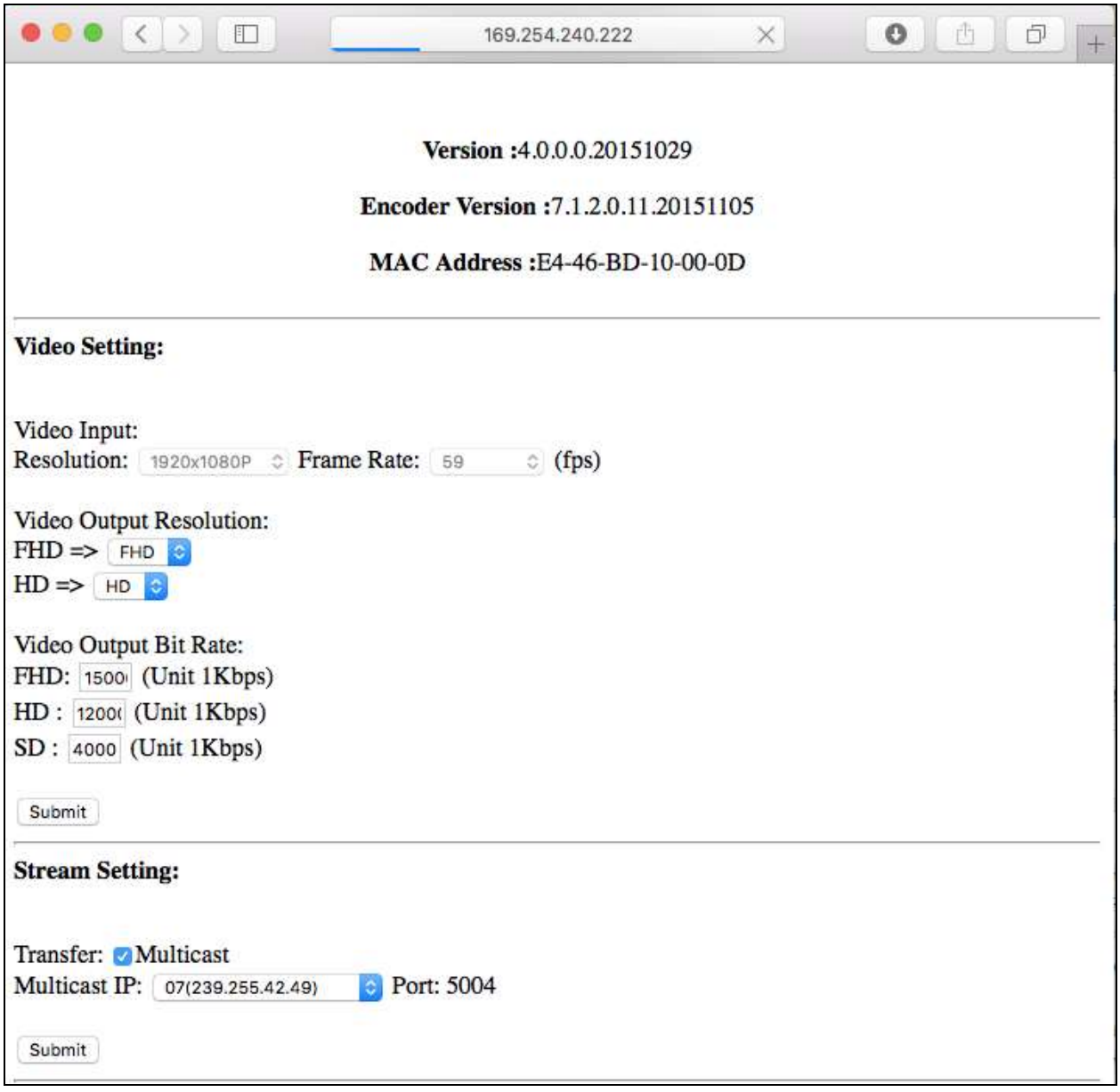


Fig 8-1: The first portion of the web interface

The video input information is not configurable, it is read directly from the HDMI-IP-E(Tx)

Fig 8-2: Video Input and resolution settings

The video Output Resolution can be configured.

FHD: 1080P/1080i
HD: 720P
SD: 480i/576i, 480P/576P

8.1 Down Scaling the output

The HDMI-IP-E has the capability of down scaling the input source to a lower resolution by setting the output with the pull down menu.

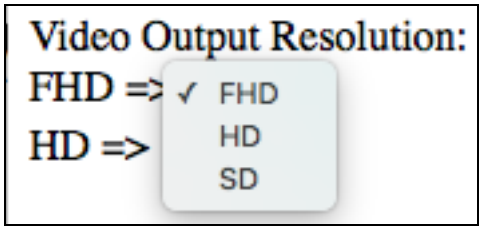


Fig 8-3: FHD (1080P/i) source can be down scaled to HD (720P) or SD

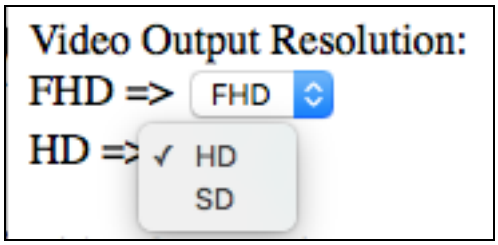


Figure 8-4: HD (720) source can be down scaled to SD

8.2 Setting the streaming bitrate

The HDMI-IP-E output bitrate can be set

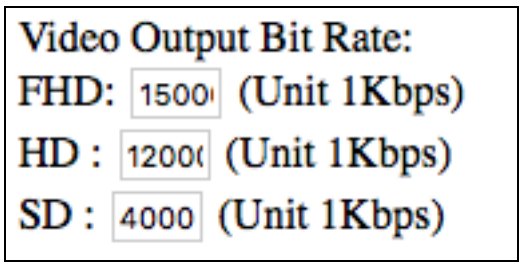


Figure 8-5: Output bitrate setting can be changed 1Kbps at a time

8.3 Setting the Multicast ID and IP address

The Streaming setting can be configured. There are 63 (0 to 63) multicast IP address that can be set.

Important Notes:

1. **In order for the HDMI-IP-E(TX) and HDMI-IP-R (RX) communicate and find each other, the Multicast IP address must be set to the same.**
2. **When the webpage is first launched, the Multicast IP address is read back from the HDMI-IP-E/R (Tx/Rx)'s Multicast ID Settings.**
3. **If the Multicast IP is set in the Webpage, then the webpage setting will overwrite the hardware DIP switch setting. If ID Dip Switches 1-6 are set to OFF Multicast IP set via webpage will persist after power cycle.**
4. **The OSD will reflect the last Unicast IP setting regardless it is done by webpage or DIP switch.**

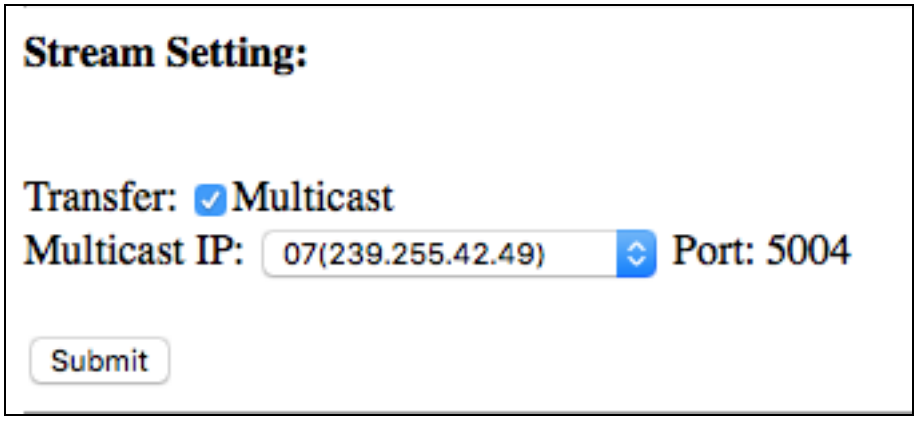


Fig 8-6: Multicast IP setting is read back from the HDMI-IP-E

Fig-8-7: The Multicast IP address can be set via the webpage via the pull down menu (0 – 63)

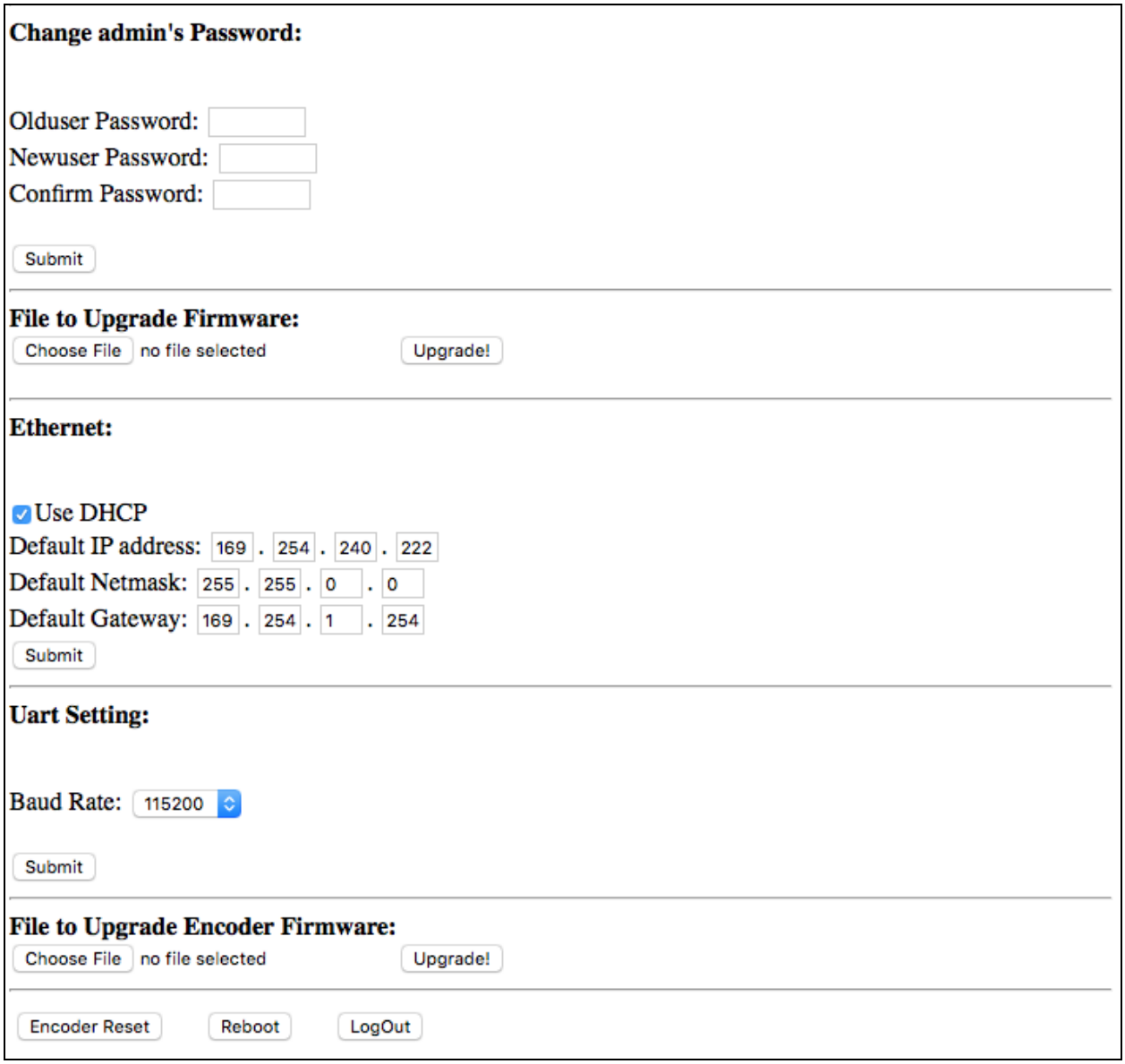


Fig 8-8: The second portion of the web interface

Change the User name and password from default the default username: "Admin" and password: "123456"

8.4 Change User Name and Password

Fig 8-9: Change user name and password

8.5 Communication Firmware Upgrade on HDMI-IP-E

There are two sets of firware in the HDMI-IP-E(Tx) communicaton firm upgrade can be upgraded via the webpage

8.6 Set IP properties and DHCP

The default IP address for the HDMI-IP-E(Tx) can be changed via the webpage. If the "Use DHCP" box is checked and a DHCP server is present, the IP address will be assigned by DHCP. If it is a point to point connection or a DHCP server is not present, then the static IP address will be used. **IP address properties are maintained through power cycles.**

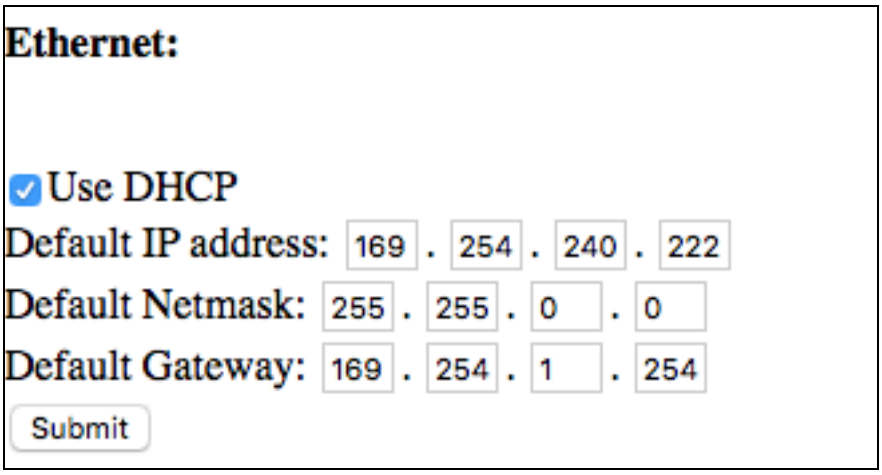


Fig 8-10: Change IP properties

8.7 Set Baud Rate

The Uart (RS-232) baud rate setting can be set by either the webpage or the DIP switch. The baud rate setting must be set the same for the HDMI-IP-E and HDMI-IP-R

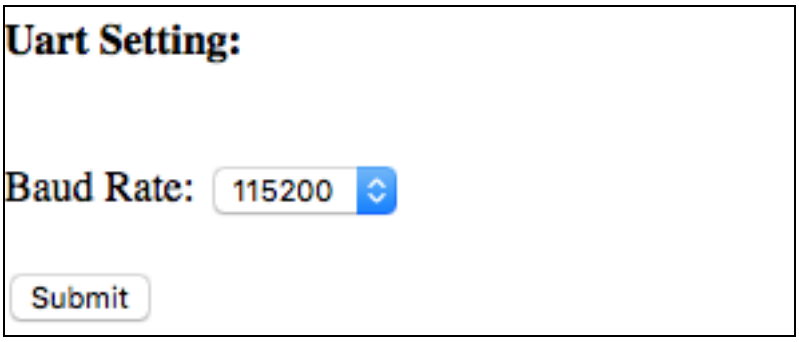


Fig 8-11: Set RS232 baud rate

Important Note: If the baud rate is set in the Webpage, then the webpage setting will overwrite the hardware DIP switch setting, until the Tx/Rx has been power cycled

8.8 Codec Firmware Upgrade on HDMI-IP-E

There are two sets of firware in the HDMI-IP-E(Tx), the Encoder firmware can be upgraded via the webpage

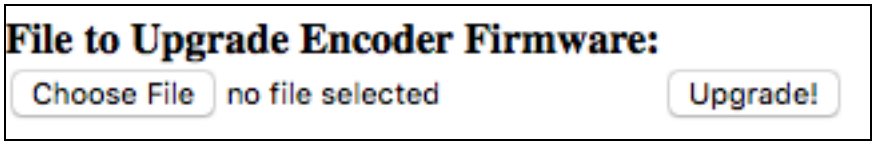


Fig 8-12: Codec firmware upgrade

9.0 Configuring the HDMI-IP-R via the web page

Connecting to HDMI-IP-R (RX) via the webpage by typing its IP address in a browser.

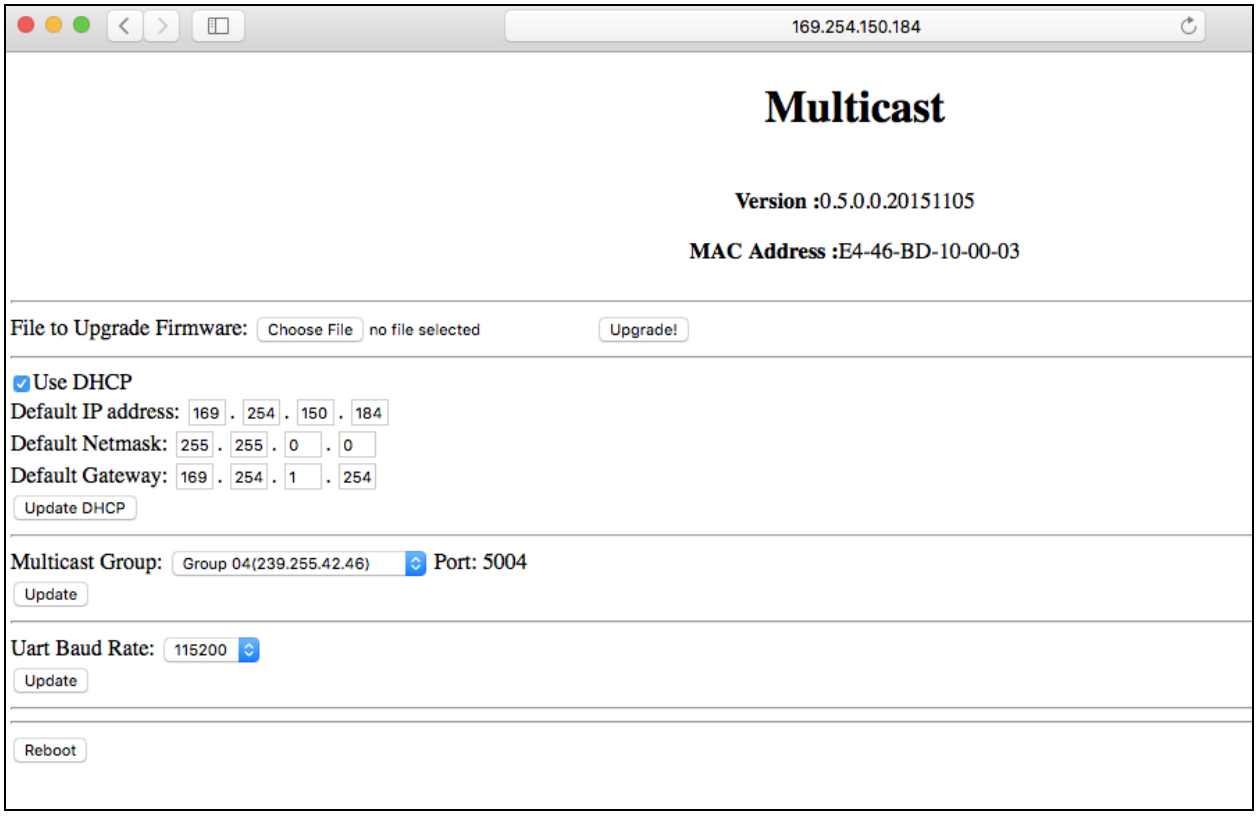


Fig 9-1: HDMI-IP-R web interface

The firwares in the HDMI-IP-R(Rx) firm upgrade can be upgraded via the webpage

9.1 Codec Firmware Upgrade on HDMI-IP-E

9.2 Set IP properties and DHCP

The default IP address for the HDMI-IP-R(Rx) can be changed via the webpage. If the "Use DHCP" box is checked and a DHCP server is present, the IP address will be assigned by DHCP. If it is a point to point connection or a DHCP server is not present, then the static IP address will be used. **IP address properties are maintained through power cycles.**

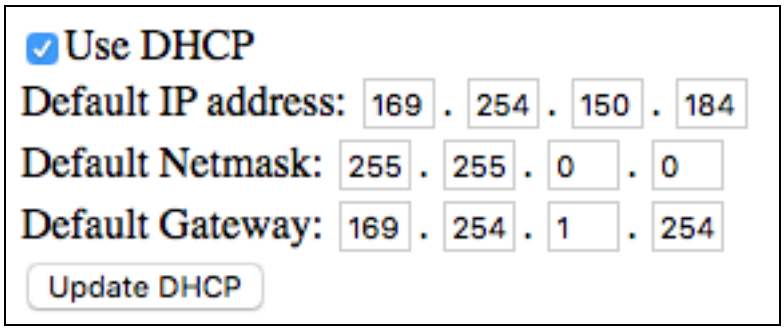


Fig 9-2: Set IP properties

9.3 Setting the Multicast ID and IP address

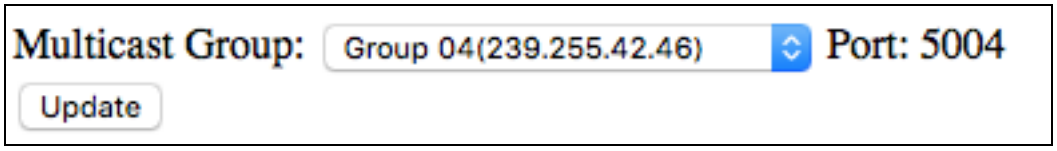


Fig 9-3: Multicast IP setting is read back from the HDMI-IP-R

Important Notes:

1. **In order for the HDMI-IP-E(TX) and HDMI-IP-R (RX) communicate and find each other, the Multicast IP address must be set to the same.**
2. **When the webpage is first launched, the Multicast IP address is read back from the HDMI-IP-E/R (Tx/Rx)'s Multicast ID Settings.**
3. **If the Multicast IP is set in the Webpage, then the webpage setting will overwrite the hardware DIP switch setting. If ID Dip Switches 1-6 are set to OFF Multicast IP set via webpage will persist after power cycle.**
4. **The OSD will reflect the last Unicast IP setting regardless it is done by webpage or DIP switch.**

9.4 Set Baud Rate

The Uart (RS-232) baud rate setting can be set by either the webpage or the DIP switch. The baud rate setting must be set the same for the HDMI-IP-E and HDMI-IP-R

Fig 9-4: Set RS232 baud rate

Appedix A – Using VLC to Decode the Stream from HDMI-IP-E

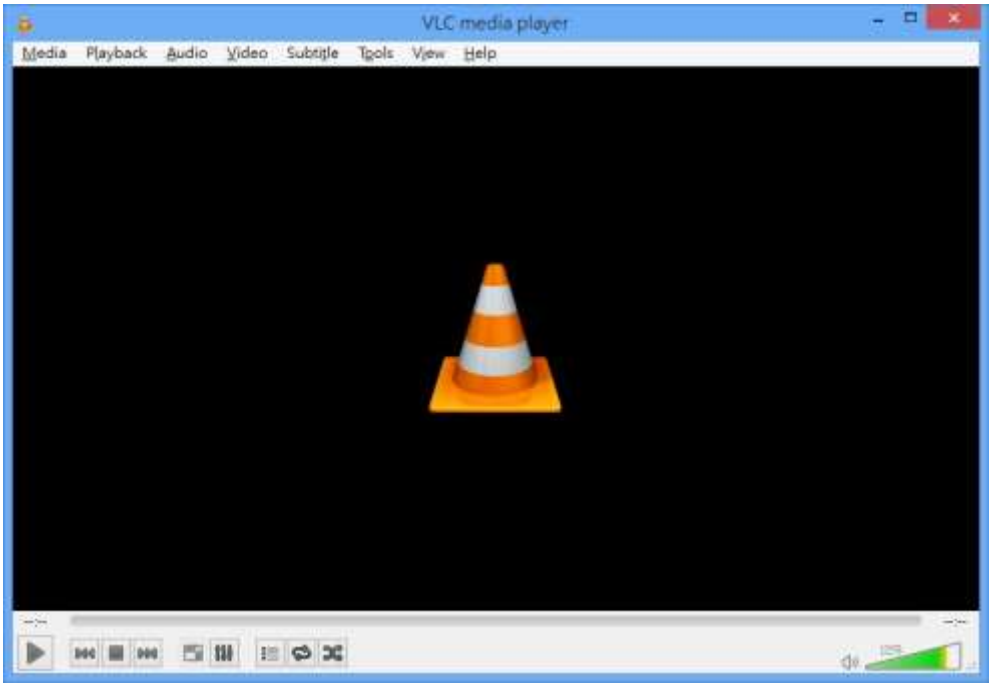
Disclaimer:

VLC is a free and open source cross-platform multimedia player and framework that plays most multimedia files as well as DVDs, Audio CDs, VCDs, and various streaming protocols. The software is from VideoLAN project that produces free software for multimedia, released under the General Public License. VLC runs on Windows, Windows phone, Mac OS X, Linux, Android, iOS and other systems. We will introduce VLC versions on Windows, Mac OS X, Android and iOS for HDMI-IP-E decoding in the following sections. The material below is for your references only. Apantac does not gurantee any of the contents.

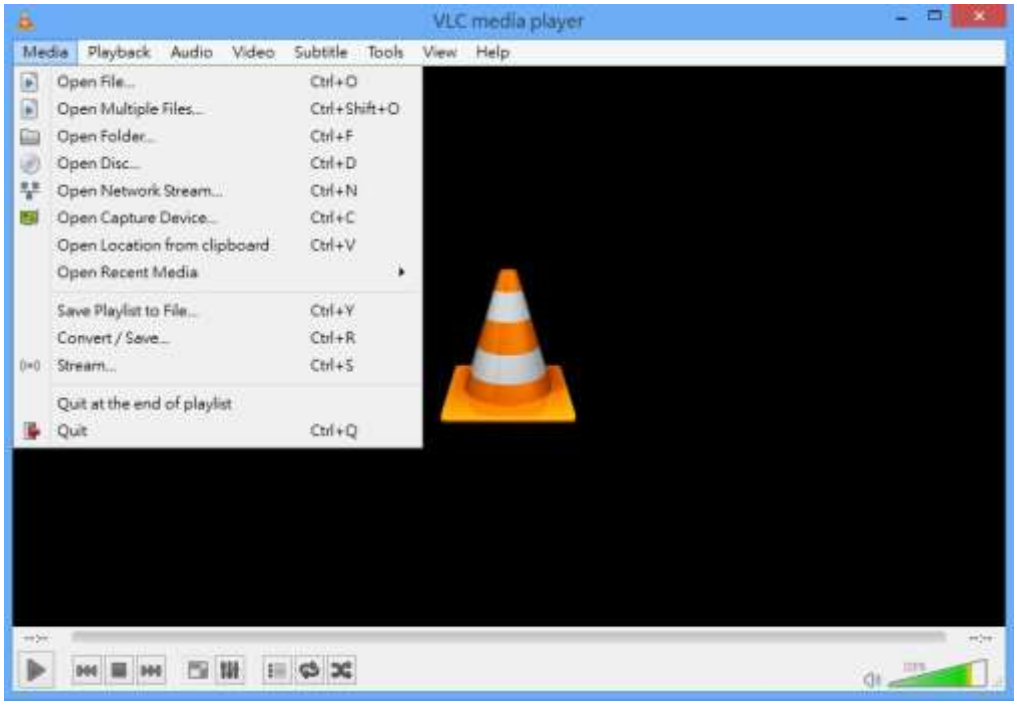
Windows OS

The Windows version of the VLC runs on all versions of Windows, from Windows XP SP3 to the last version of Windows 10. You can download and install VLC from http://www.videolan.org/vlc/download-windows.html. After successfully install VLC, please go through the following steps :

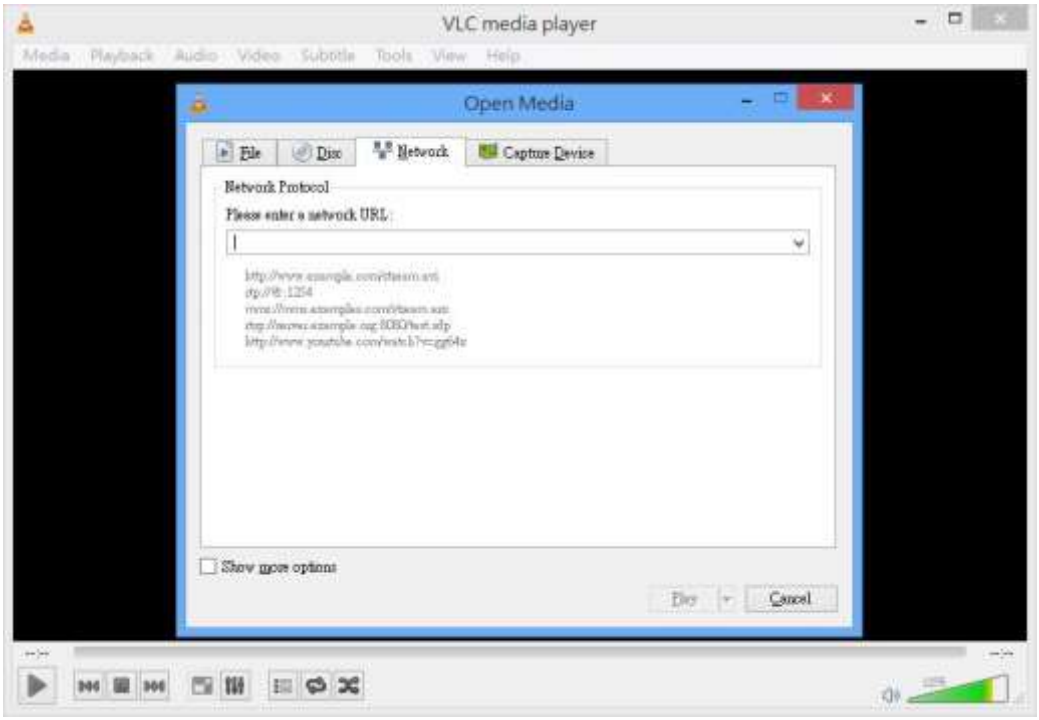
1. Make sure designated ethernet interface's IPv4 address and netmask settings are at the same subnet as HDMI-IP-E's. You should be able to reach HDMI-1P-E via "ping xxx.xxx.xxx.xxx" command.
2. Make sure your firewall is turned off or VLC is in exception list of your firewall.
3. Open VLC program



4. Click on "Media" from the top-level pull-down menu

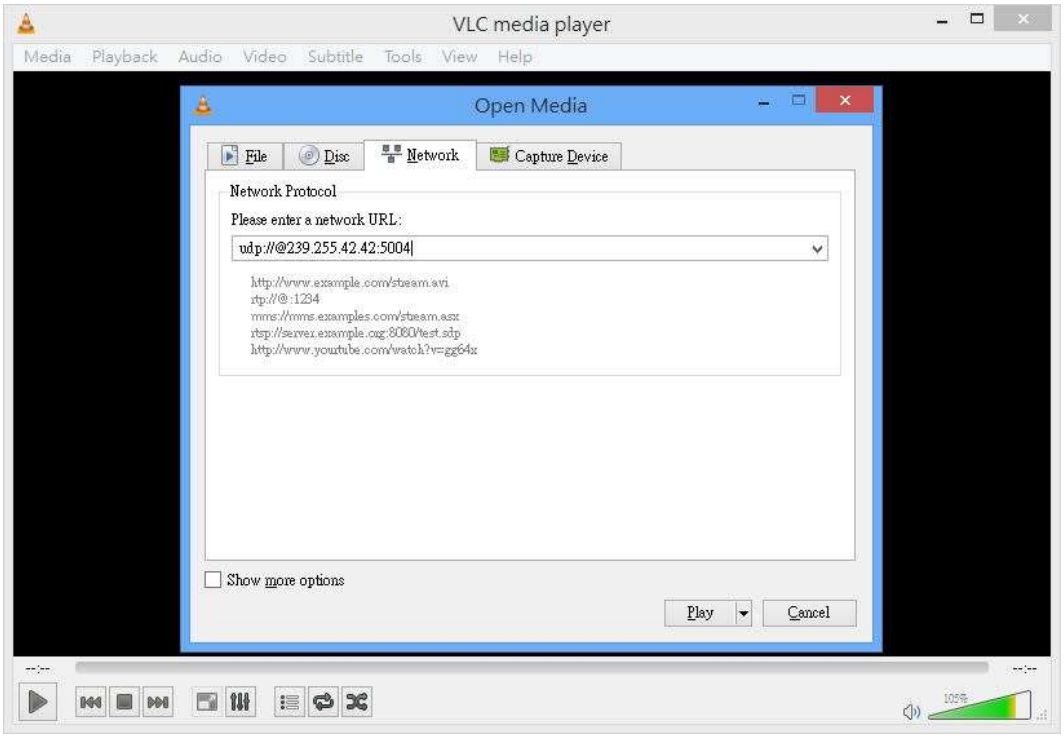


5. Click on "Open Network Stream" from "Media" sub menu

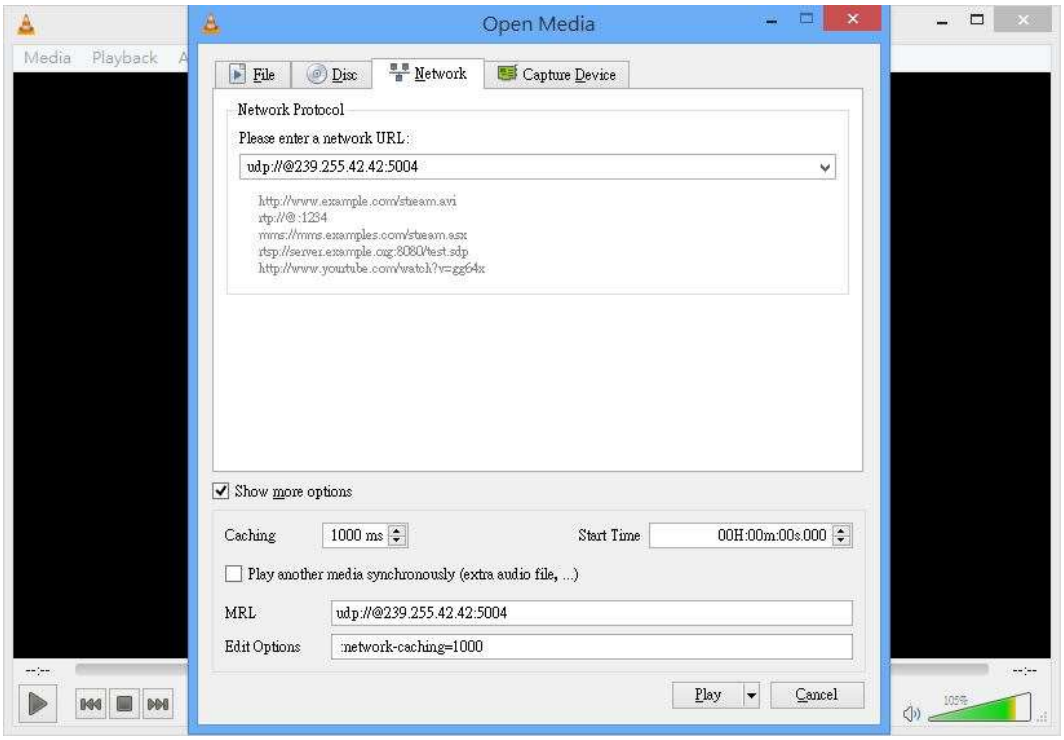


6. Enter the Multicast address and port number of the HDMI-IP-E's Multicast stream, please refer to section 8.3 for more information.

udp://@239.255.42.42:5004

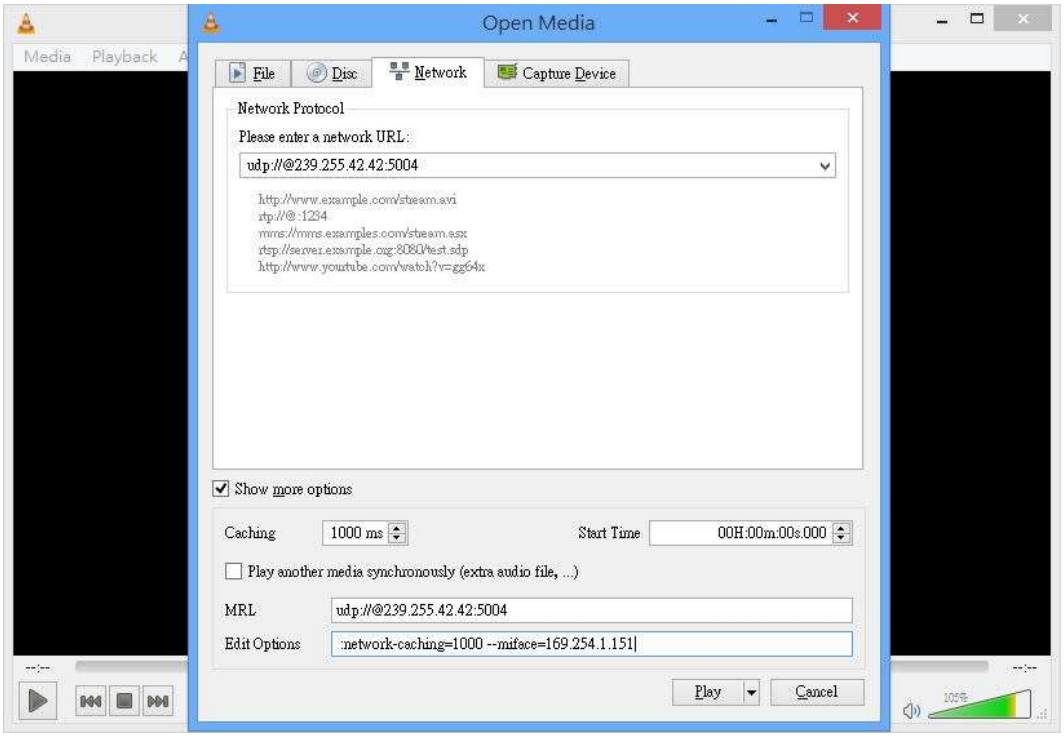


7. Select the checkbox "Show more options" at the lower part of "Open Media" diaglog

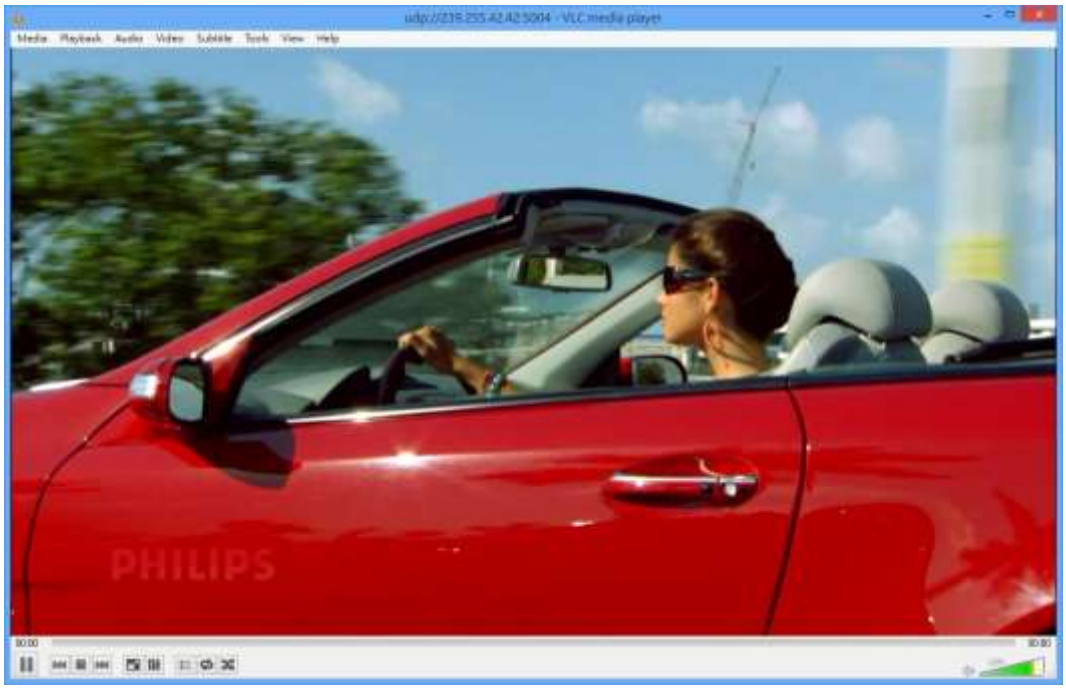


8. Enter your recipient IP address for Multicast in "Edit Options"

:network-caching=1000 --miface=169.254.1.151



9. Successfully decode the Multicast stream

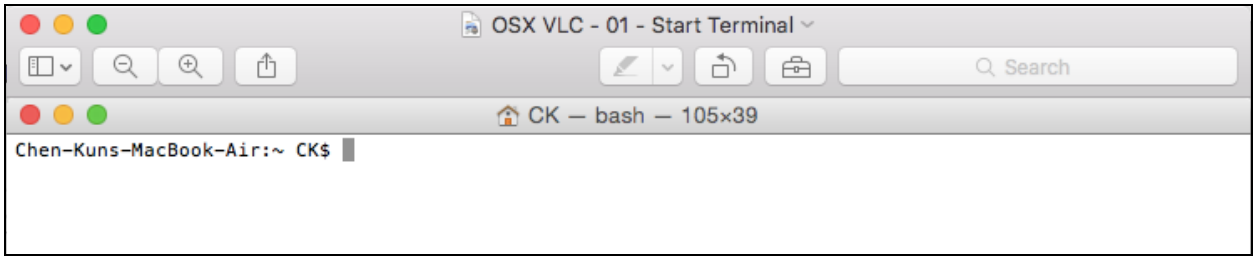


Apple OS X

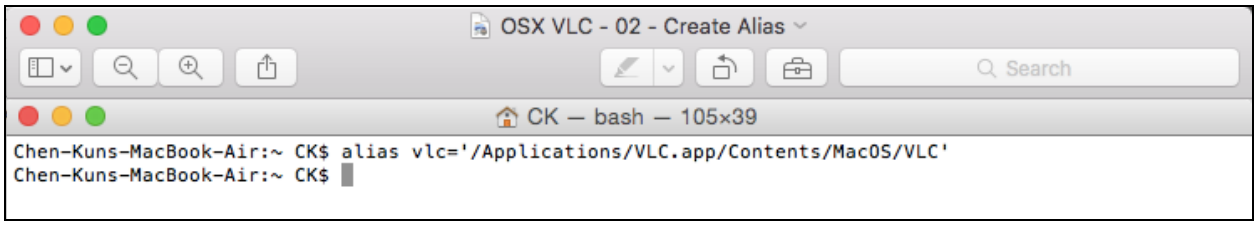
VLC media player requires Mac OS X 10.6 or later. It runs on any 64 bit Intel-based Mac. Previous devices are supported by older releases. Note that the first generation of Intel-based Macs equipped with Core Solo or Core Duo processors is no longer supported. Please use version 2.0.10.

The Mac version of the VLC does not support all the options via its user interface. You can choose to use VLC GUI to view Multicast stream by turning off all other unrelated ethernet interfaces except the one for Multicast stream. Otherwise, to keep multiple ethernet interfaces up and running at the same time, you must launch VLC in the command line shell with required options.

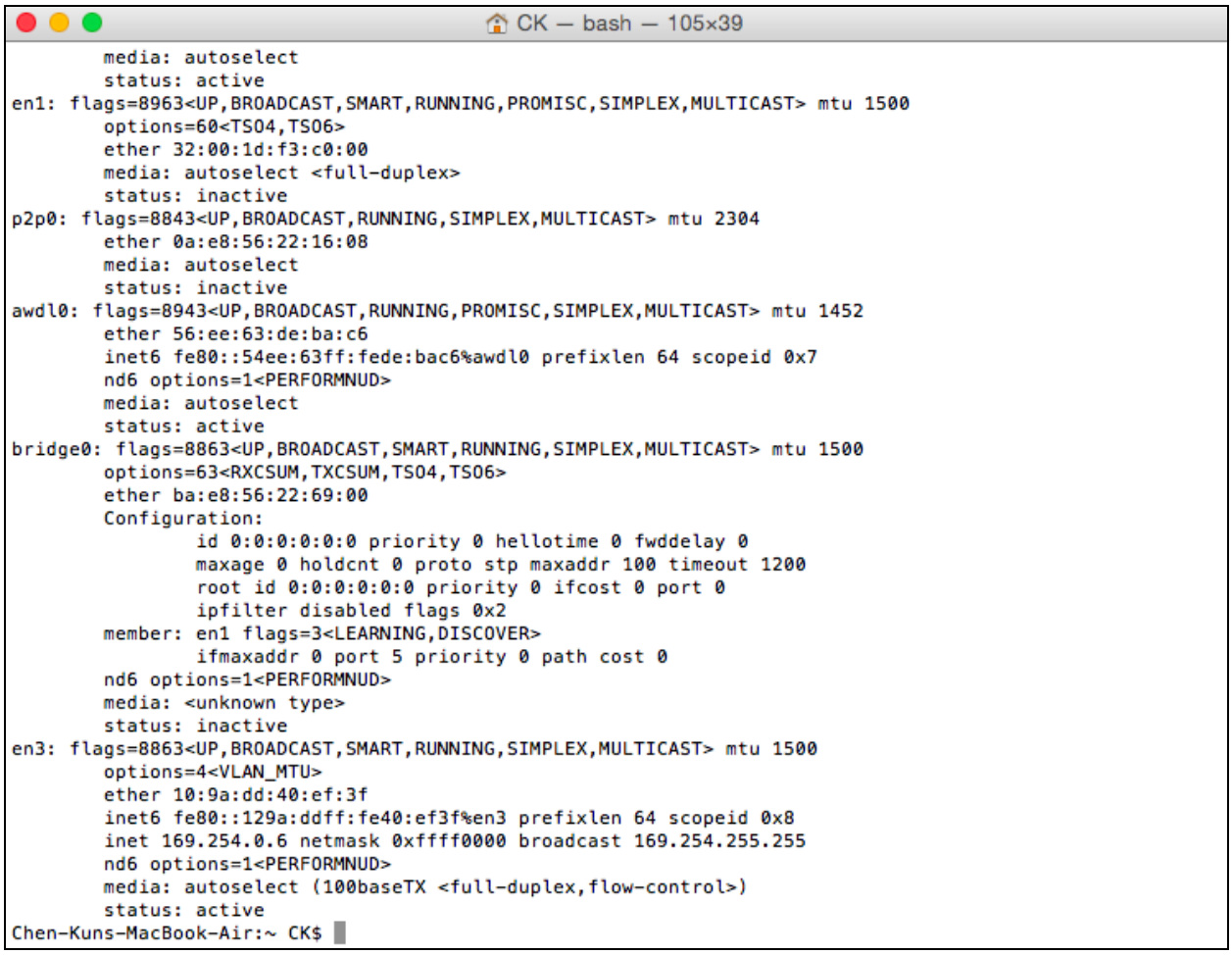
1. Open Terminal



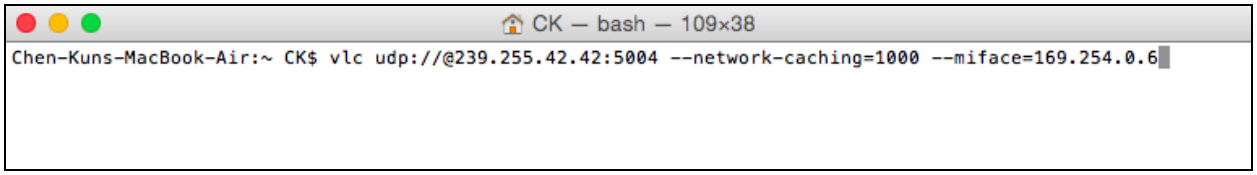
2. Then create an alias to the VLC program



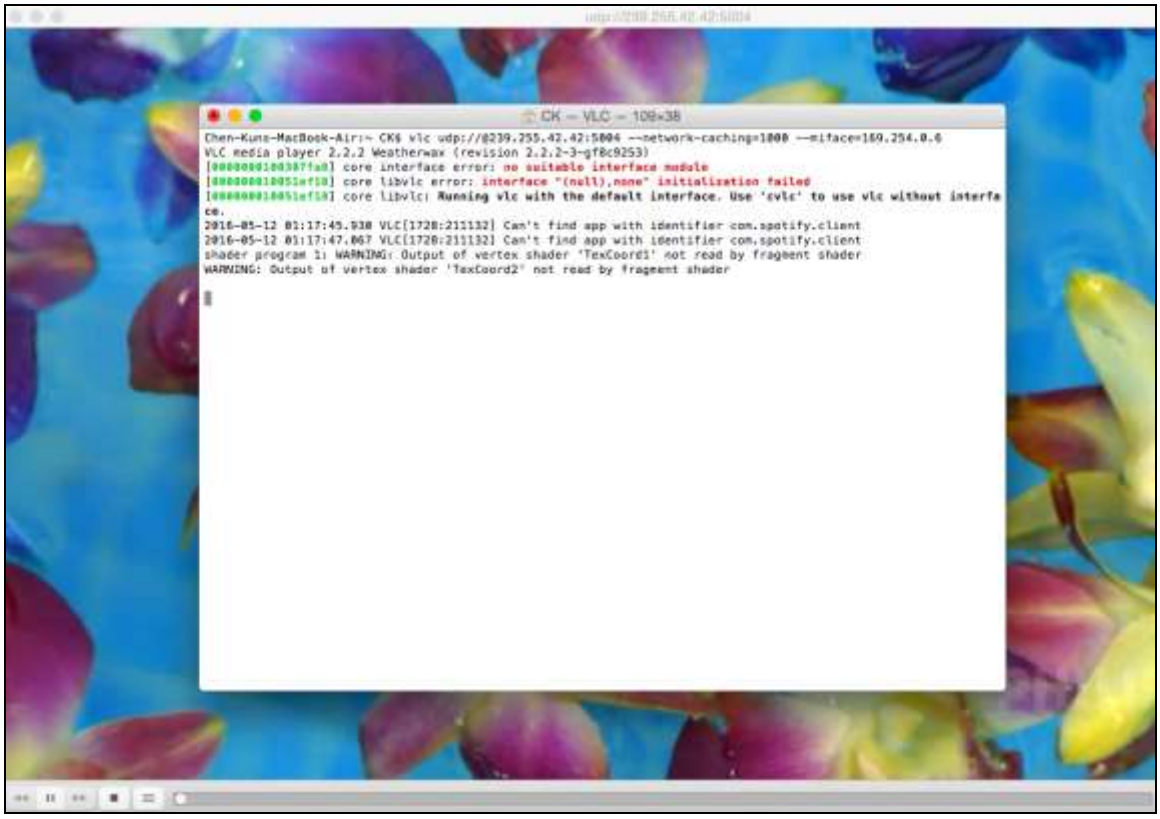
3. Run "ifconfig" command to get your IP address for Multicast



4. Enter VLC command with options



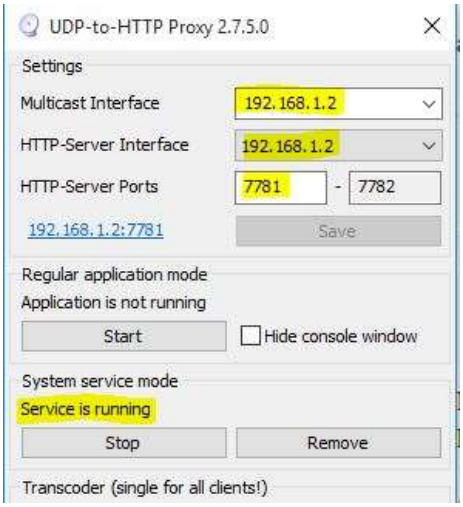
5. Successfully decode Multicast stream



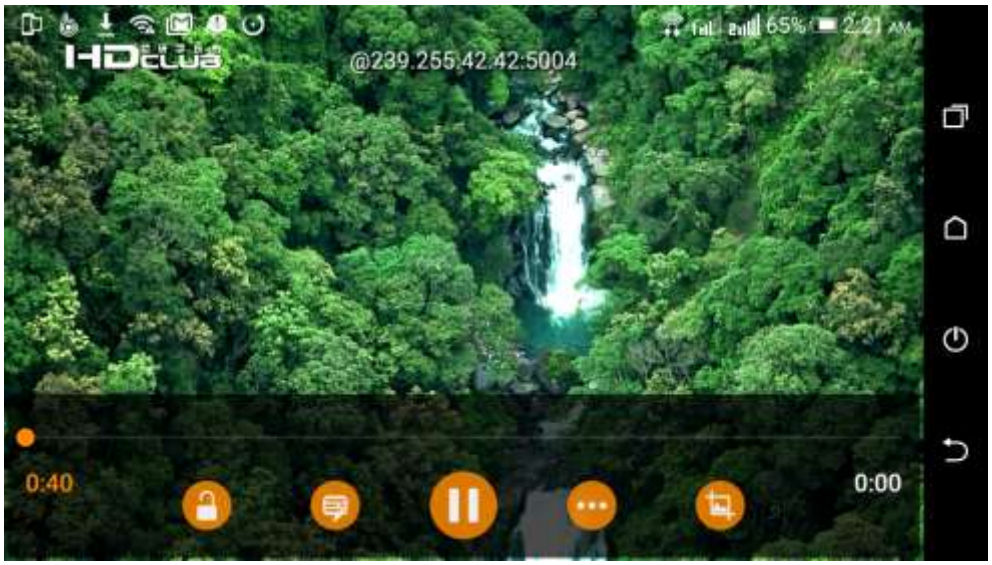
Android

In most Android devices, the Multicast option is disabled by default. Please check whether or not your Android device supports Multicast streaming and go through the following steps:

1. Download a File Manager app (for example, Root Browser) and check if **/proc/net/igmp** exists in your Android device. If yes, your device supports Multicast; otherwise, it doesn't.
2. If your device supports Multicast streaming then you can open Multicast streams directly from VLC on Android.
3. If not, you need to convert Multicast streams into Unicast by downloading UDP-to-HTTP Proxy from this link and install it in your PC.
4. From the first two drop down boxes, select your Local IP address (that you found above) and then from System Service mode, select **Start**.
5. Connect your Android device's Wifi to Wireless Lan that is at the same subnet as HDMI-IP-E.
6. Open VLC and select Network stream.
7. Key in http://192.169.1.2:7781/udp://@239.255.42.42:5004, please modify proxy interface address, proxy interface port number, multicast address and multicast port number to match your own settings.



8. Successfully receiving Multicast stream



9. Please note that after Proxy, Multicast streaming will become Unicast. When second connection has been established, the first one will be dropped.

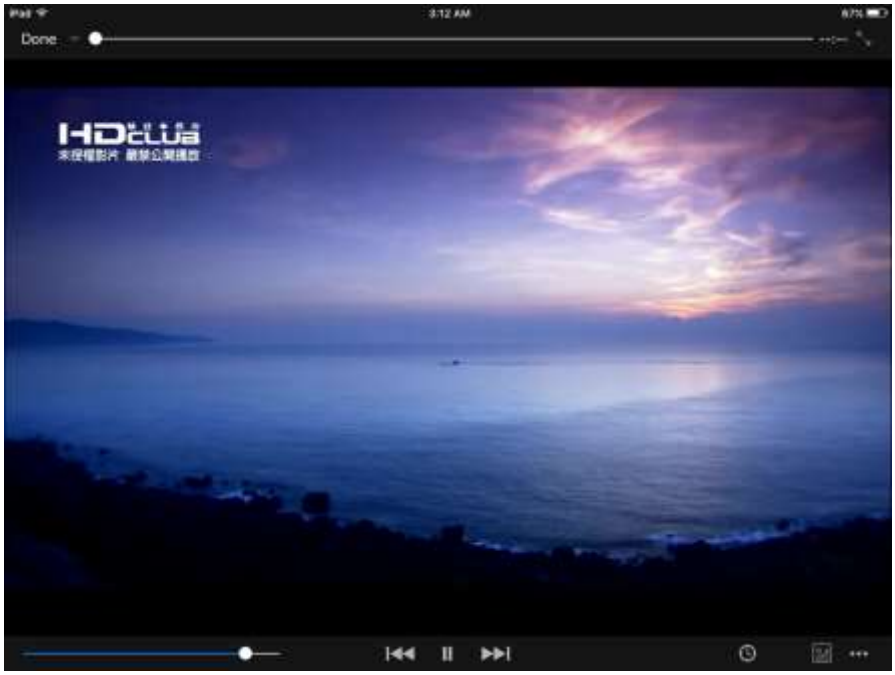
iOS

Just like Android devices, the Multicast option in iOS is disabled by default. Please follow step 3 to 5 to set up UDP to HTTP proxy and go through the following steps

1. Open VLC

2. Enter the network address : http://169.254.0.7:7781/udp://239.255.42.42:5004, please modify proxy interface address, proxy interface port number, multicast address and multicast port number to match your own settings.

3. Successfully receiving Multicast stream


Done