User's Manual

HX120T/R/W

HDMI AV Matrix Extender
&
Video Wall

Version : 1.12

Thanks for purchasing HDMI AV Matrix Extender (Transmitter, Receiver and Video Wall Receiver). With our highly reliable and quality product, you can enjoy countless benefits by using this KVM Extender.

Introduction

The HDMI AV Matrix Extender comprises three distinct units, the Transmitter, Receiver and Video Wall Receiver. It is a LAN based KVM Extender system and allowed accessing a computer from a remote console anywhere on your existing network infrastructure. Keyboard, mouse, USB 2.0 devices, audio and video can be extended away from your local PC or source by using single Cat5 cable transmission. For convenience of control, the IR is built-in and the connected AV device can be remote from either end of connection. In additional, RS232/UART extension is supported as well.

Note: In case of to extend another 100M range, it needs to install the Gigabit Network Switch.

Features

Support direct connection of 100M/330ft with Gigabit Ethernet Switch

2 x USB 2.0 port over IP extension

Support Digital Video resolution of 1920x1200 @60Hz

Bi-directional IR pass-through for added convenience

Complaint to HDMI 1.3 CEC specification

Support 7.1 audio channel

Support A/V Matrix up to 256x256 (HX120T/HX120R Combo)

Support RS232/UART Extension function

Support 8x8 Video Wall (HX120T/HX120W Combo)

Specification

Model No.	HX120T	HX120R	HX120W
Product Description	HDMI AV Matrix Extender & Video Wall - Transmitter	HDMI AV Matrix Extender - Receiver	HDMI AV Matrix Extender & Video Wall - Receiver
Console USB Hub Ports		2 x USB 2.0 Type A Female	2 x USB 2.0 Type A Female
PC USB Port	Type B Female		
IR support	Yes	Yes	Yes
Video Input Port	HDMI Female	via RJ45	via RJ45
Video Output Port	via RJ45	HDMI Female	HDMI Female
Audio Input Port	via HDMI	via RJ45	via RJ45
Audio Output Port	via RJ45	via HDMI	via HDMI
RS-232 Extension Support	Yes	Yes	Yes
Ethernet Connectors	Yes	Yes	Yes
Cable media	CAT5e/ CAT6	CAT5e/ CAT6	CAT5e/ CAT6
Power LED	1 (Red)	1 (Red)	1 (Red)
Video LED	1 (Green)	1 (Green)	1 (Green)
Device LED		1 (yellow)	1 (yellow)
Operation Temperature	0 ~ 40°C	0 ~ 40°C	0 ~ 40°C
Storage Temperature	-20 ~ 60°C	-20 ~ 60°C	-20 ~ 60°C
Humidity	0~90% RH, Non-Condensing	0~90% RH, Non-Condensing	0~90% RH, Non-Condensing
Safety / Emission	CE, FCC	CE, FCC	CE, FCC

Package contents

Transmitter Unit x 1

Receiver Unit x 1

Video Wall Unit (optional) x 1

Power Adapter (DC9V) x 3

CD-ROM (Driver & User's Manual) x 1

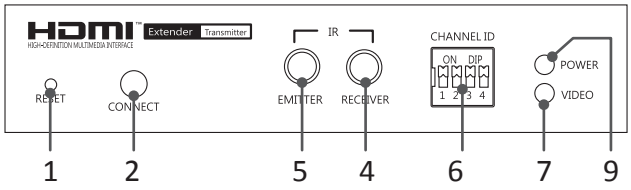
Remote Control (optional) x 1

IR Remote Control Unit Pack (Include: Wired Transmitter and Wired Receiver, Optional) x 1

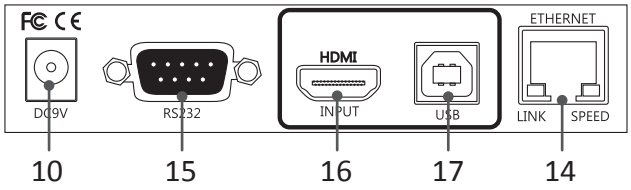
Product overview

Transmitter

Front panel

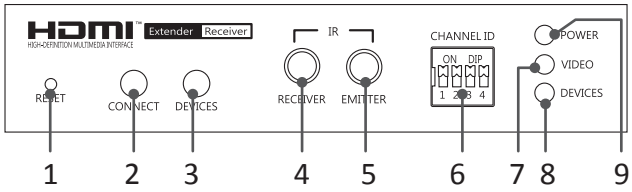


Rear panel

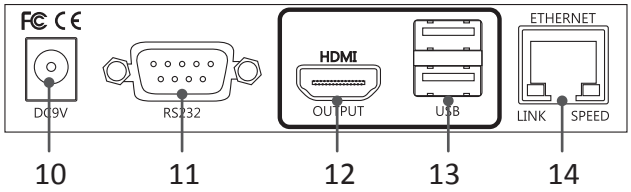


Receiver

Front panel

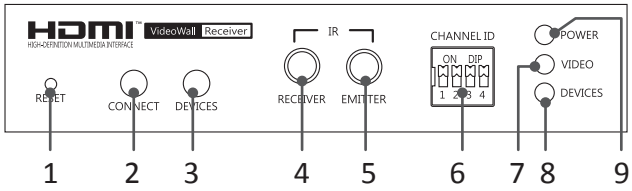


Rear panel

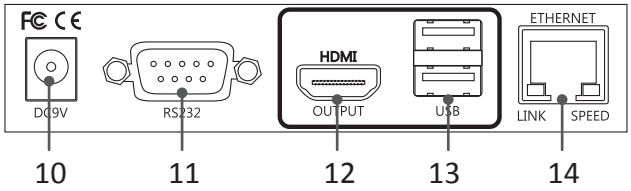


Video Wall

Front panel



Rear panel



No.	Item	Description
1	Reset	Press to re-start the unit.
2	Connect	Press to re-connect the Transmitter/Receiver if the DIP switch has been reset.
3	Devices	■ Press to connect the device which plugged into Receiver's USB port to console. **Note:** Please check the Devices indicator (No. 8) after USB device has been plugged in to the unit. No device will be found if the Device indicator (No. 8) lights off. If it happens, press this button to light it up and re-connect. **Note 2:** Skip this step if the device you have plugged is a USB keyboard or mouse. ■ Press to update the EDID of connected monitor. To update the EDID, remove the Receiver's power. Hold the device button and then power on the unit. Release the Device button when the Power indicator flashes.
4	IR receiver	Connect to a IR receiver.
5	IR Emitter	Connect to a IR emitter.
6	DIP switch	4-position dip switch for pairing with Transmitter and Receiver.
7	Video indicator	Lights when video is transferring.
8	Devices indicator	Lights when the device is connected to console (Devices button is pressed).
9	Power indicator	Lights when power is on.
10	Power jack	Connect to the power adapter.
11	RS232 male connector	Connect to RS232 device.
12	HDMI Output	Connect to a display device.
13	USB Type-A connector	Connect to USB devices.
14	RJ45 connector	Connect to Transmitter/Receiver.
15	RS232 female connector	Connect to a host PC.
16	HDMI input	Connect to a video source/PC.
17	USB Type-B connector	Connect to a host PC.

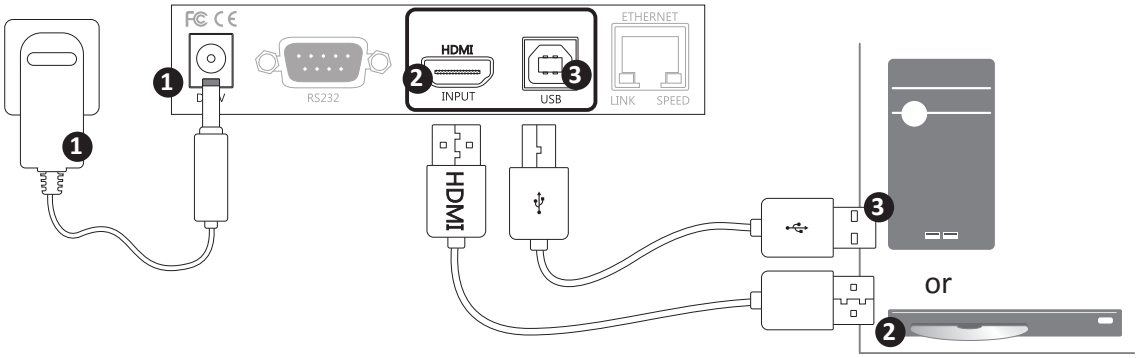
Connection

Before connecting the HDMI AV Matrix Extender with an Ethernet Hub/Switch, please read the notices mentioned below

1. When grouping the network of HDMI AV matrix Extender/Video wall, a Gigabit Ethernet Hub/Switch is necessary due to the requirement of bandwidth. The required bandwidth for each channel may up to 200mb/sec. To ensure the better quality of transmission, a reputable name brand hub/switch is recommended.
2. Gigabit Ethernet Switch/HUB with feature of **Jumbo Frame** is required, other specs like **IGMP Snooping**, **IGMP Querier**, **IGMP v2** and **IGMP Fast Leave** are strongly recommended. If more than one transmitter connects to the same network segment without support of IGMP Querier by Switch/Hub, the HDMI AV Matrix Extender may work incorrectly. For more setting details of these functions, refer to the Hub/Switch's instruction manual.

Note: The diagrams below are examples, the actual applications may vary.

Connecting the local unit (Transmitter)

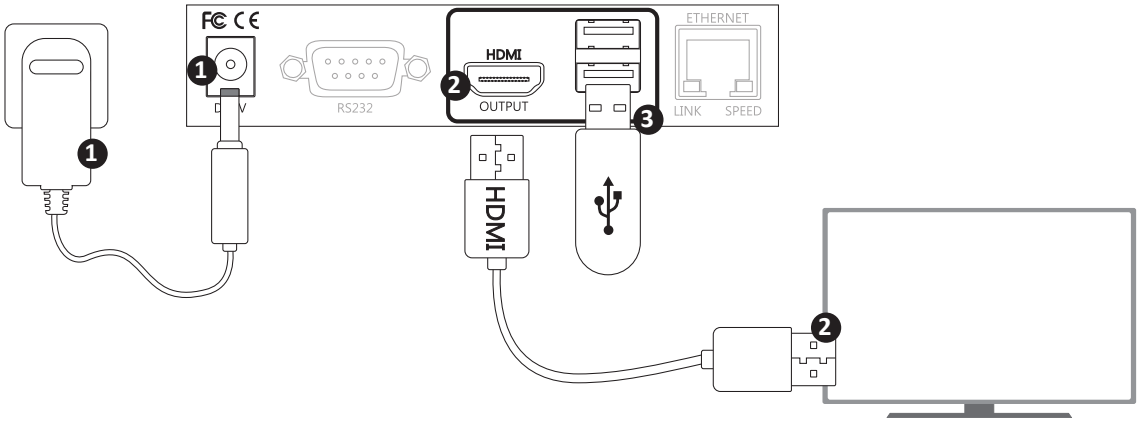


❶ Connect the power adapter to a wall outlet.

❷ Connect a video source to HDMI input of Transmitter using a HDMI cable.

❸ Connect a computer to USB type B connector of Transmitter using a USB cable.

Connecting the remote unit (Receiver)



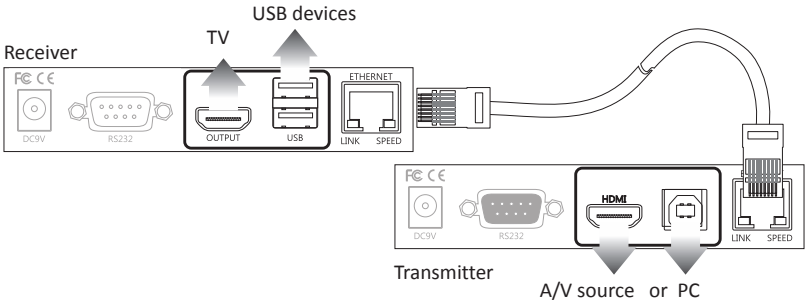
❶ Connect the power adapter to a wall outlet.

❷ Connect a display to HDMI output of Receiver using a HDMI cable.

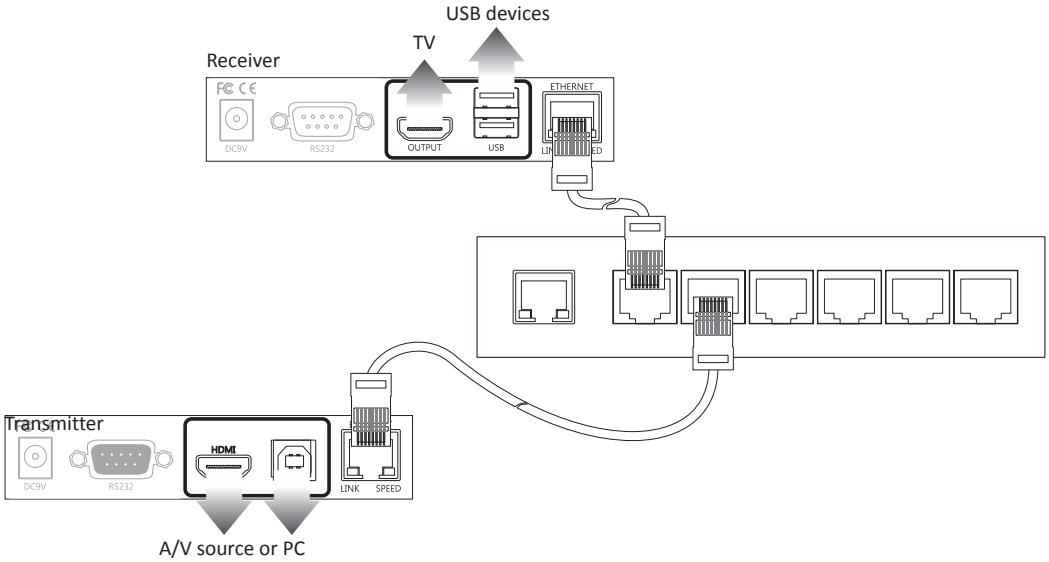
❸ Connect a USB device to USB type A connector of Receiver using a USB cable.

Connecting the local (Transmitter) and remote (Receiver) unit

Point to point

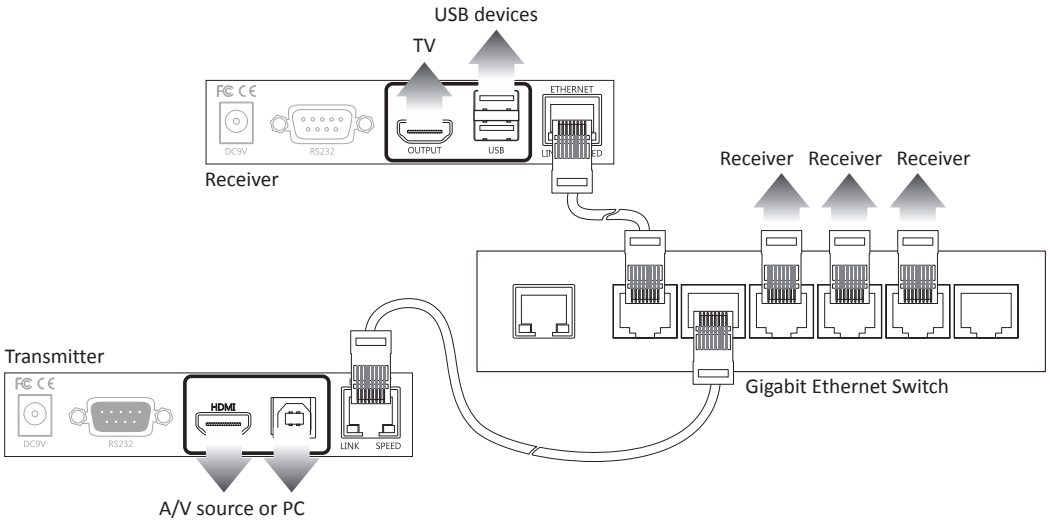


■ To connect the Transmitter and Receiver, simply connect both units using CATx cable directly and the distance can be extended up to 100m.



■ Alternatively, the Receiver can be extended another 100m using a Gigabit Ethernet hub (not included).

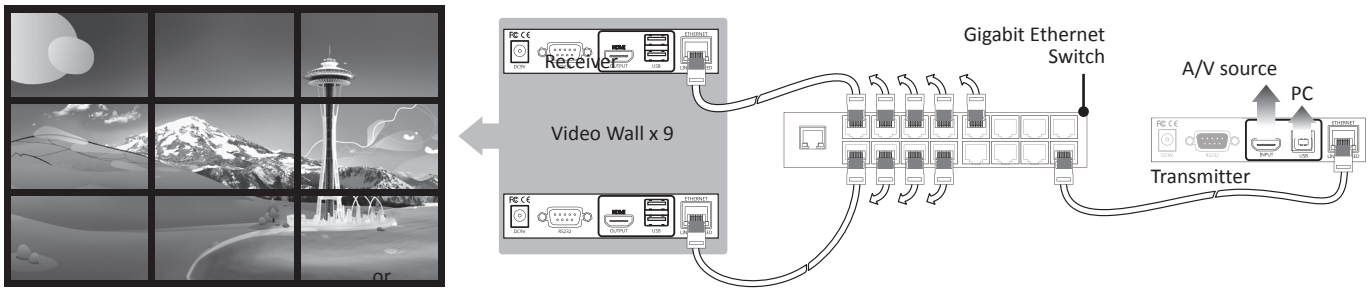
Point to multipoint



■ Except the point to point connection, the Transmitter can be extended to several Receivers using a gigabit Ethernet switch.

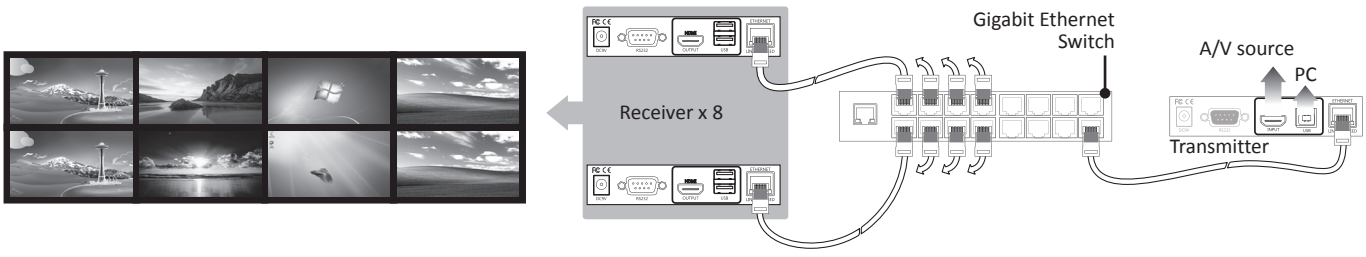
Video Wall

With the combination of Transmitter and Video Wall, the HDMI signal can be sent to one or multi HDMI display up to 8x8 using a single Cat5 cable.



Matrix connection

The HDMI AV Matrix Extender provides varied and flexible extension for diversity requirements.
The display of A/V sources or PC can be mixed with matrix switch function through the pair of the Transmitters and Receivers in the same channel. User can extend the matrix switch up to 16x16 works with a Ethernet Gigabit Switch/Hub. Please refer to the illustrations below for the connection diagram.

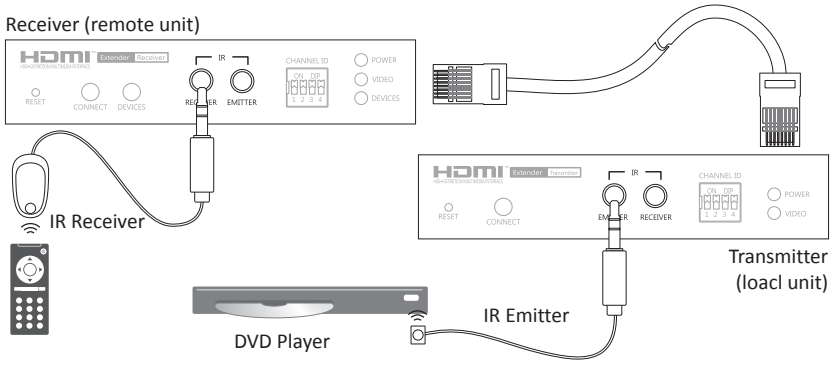


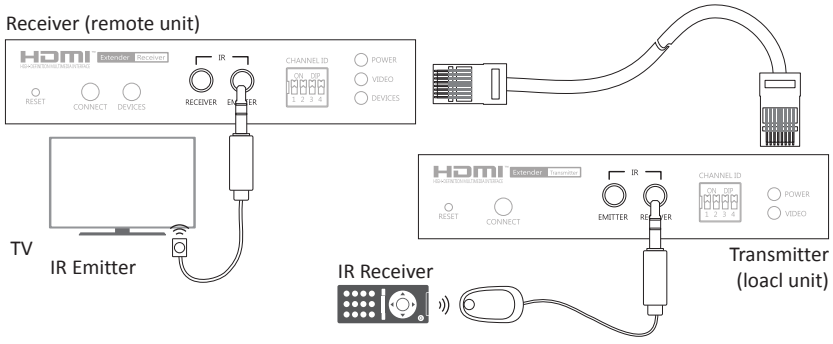
Note:

- For the better performance of video and matrix display, using the same brand, size and model monitors are strongly recommended.
- The lag of displays may occur sometimes. The image quality is depending on the speed of network or the equipments, such as the grade of hub.

Bi-directional IR connection

The HDMI AV Matrix Extender provides bi-directional IR extension between the transmitter and receiver over the CATx cable. Place the IR receiver near the sender unit, such as a remote control, and the other end to the jack of **IR RECEIVER** (remote or local unit of HDMI AV Matrix Extender). Place the IR Emitter to somewhere face the IR receiver of A/V source, and the other end to the jack of **IR EMITTER** (remote or local unit of HDMI AV Matrix Extender). The IR signal can be transmitted forward or backward. Refer to the illustration below to outline the connection of transmitter and receiver.



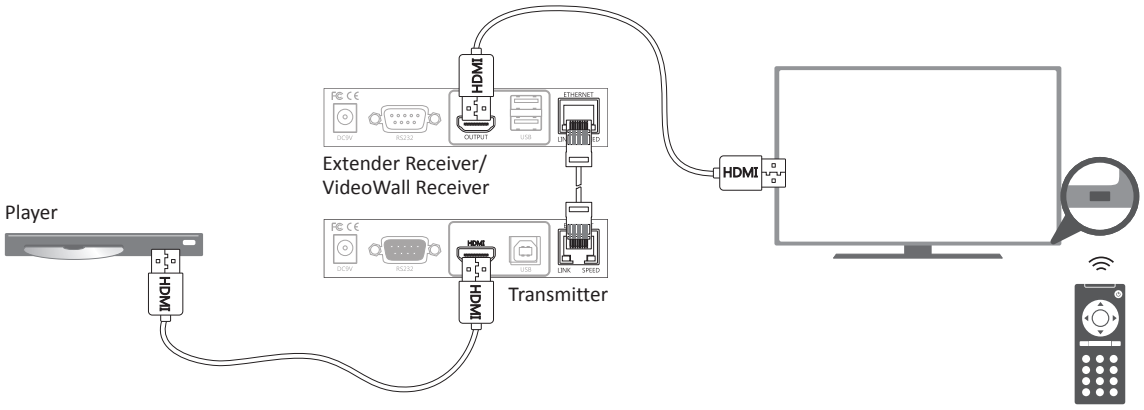


Caution: Plug the IR Receiver and IR Emitter into the respective jacks, otherwise the IR sensor on the IR Receiver and IR Emitter will be invalid.

Remote control

HDMI CEC remote

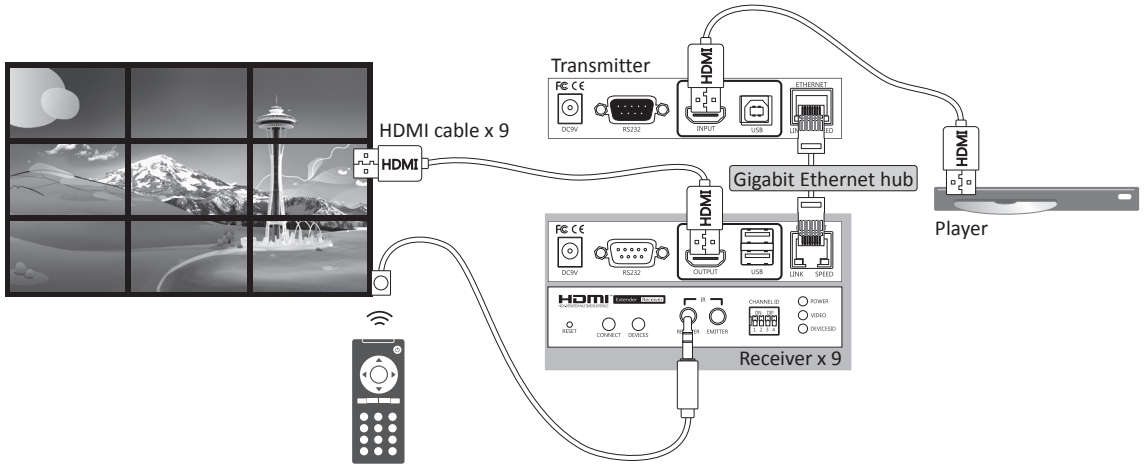
CEC (Consumer Electronics Control) is one of features of HDMI that allows HDMI devices to control each other using only one remote control. To achieve the HDMI CEC remote by the HDMI AV Matrix Extender, please refer to the notes below.



1. Make sure the connected AV equipments and TV/monitors are compatible with HDMI CEC.
2. The name of HDMI CEC (for example, Bravia sync control, VieraLink, Kuro Link, Aquos Link, etc.) and operating settings may vary depending on the brands of AV equipment. For more details, please refer to the corresponding instruction manual.
3. Connect to a Gigabit Ethernet hub (not included) between Transmitter and Extender Receiver/ VideoWall Receiver if extending the distance.

Remote control (optional)

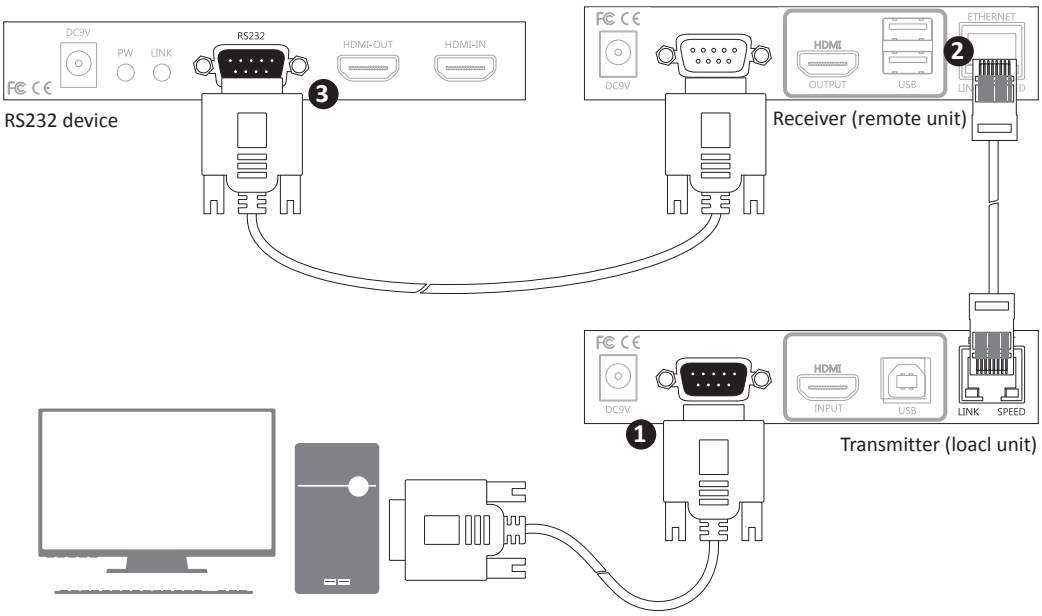
If CEC is not supported by the connected devices, please follow the steps below to remote.



1. Set a desired display mode (1 to 1, matrix or video wall).
2. Connect to a Gigabit Ethernet hub (not included) between Transmitter and Extender Receiver/ VideoWall Receiver if setting to matrix or video wall mode.
3. Place the IR Receiver to a desired location, and plug the other end of connector into **IR RECEIVER** jack of Extender Receiver/VideoWall Receiver.

RS-232 control

The HDMI AV Matrix Extender not only extends HDMI signal but also RS-232, and allows user to control from local PC remotely.



❶ Connect the RS232 connector to a PC, and plug the other end of connector into the female connector of Transmitter.

❷ Connect the Transmitter and Receiver using Cat5 cable. Alternatively, the Receiver can be extended another 100m using a Gigabit Ethernet hub (not included).

❸ Connect the RS-232 connector to a RS-232 device, and plug the other end of connector into the male connector of Receiver.

Operation

To operate the HDMI AV Matrix Extender, two ways are provided.

1. Operate by adjusting the DIP manually.
2. Setup from web user interface.

Control manually

With the convenient push button and DIP Switch on the front panel, user can quickly and easily to operate the HDMI AV Matrix Extender directly. Please follow the steps below to setup.

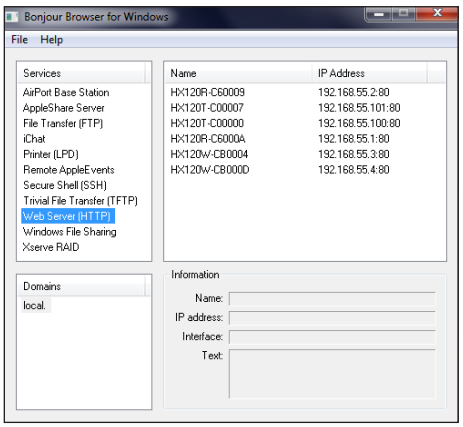
1. Follow the previous chapter (**Connection**) to connect all devices according to your desired mode.
2. Adjust the DIP switches of transmitter and receiver/Video to the same positions.
3. Power the transmitter, Extender Receiver/VideoWall Receiver and AV devices/computers to on.

Note: Press the **CONNECT** button on the front panel of unit once the DIP switch has been adjusted.

Setup from web user interface

IP detection

1. Adjust the DIP switch of Transmitter and Receiver to the same position.
2. Group the Transmitter and Extender Receiver/ VideoWall Receiver units to a network with a PC. The actual connection may vary depending on requirements. For more connection details, refer to the **Connection** chapter.
3. Turn on the power of all connected devices.
4. Insert the bundled CD/DVD into CD/DVD ROM, Find and double click the "Bonjour Browser" from the bundled CD/DVD after completing the steps above.
5. Click Web Server (HTTP) to detect all the connected Transmitter and Extender Receiver/ VideoWall Receiver units.
6. Enter the IP address which detected from Bonjour Browser into a web browser.



Alternatively, remove the Cat5 cable from the unit you wish to know the IP, and then re-connect to the unit. The screen will re-detect the input source and show the IP information before the image source appears.

Identify the unit

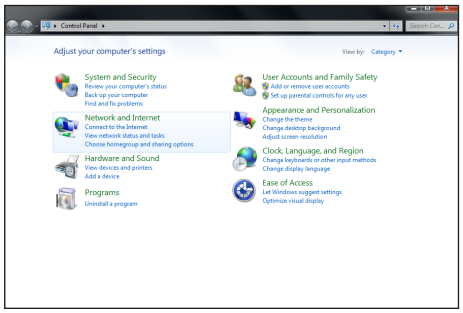
The naming rule of these units is based on the MAC address which labeled on the bottom of the devices. For example, if the MAC address of Transmitter is 00:11:AA:CB:00:01, the device will be named to HX120T-CB0001. T is for Transmitter, R is for Receiver and W is for Video Wall.

IP address assignment

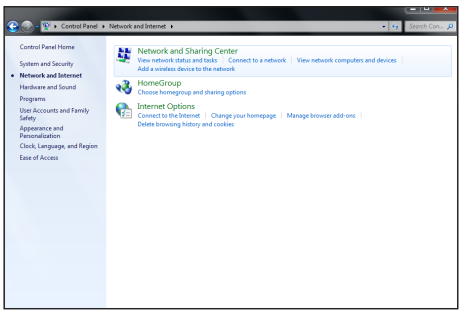
If the PC cannot access the Transmitter and Extender Receiver/VideoWall Receiver using web UI, please follow the steps below to join the PC to the network.

Note: The example shown here is using Windows 7. For other operating systems, please refer to the respective user guides.

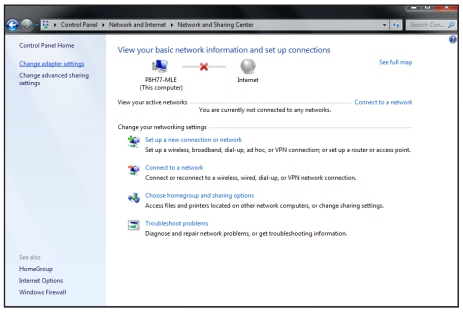
1. Click Control Panel to bring up Adjust your computer's settings window, and then click Network and Internet item.



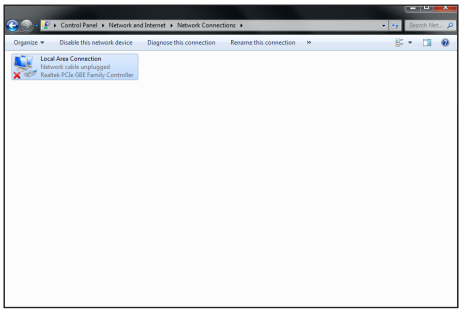
2. Click **Network and Sharing Center**.



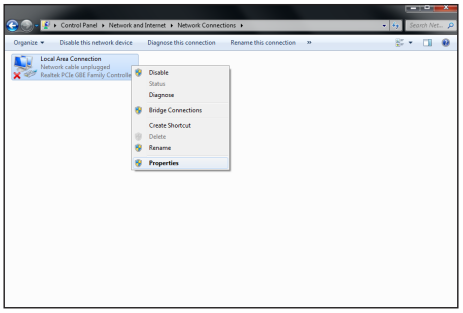
3. Click **Change adapter settings** from left side.



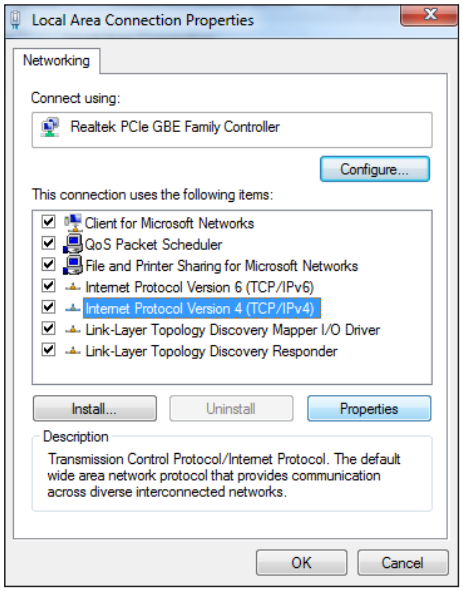
4. Click **Local Area Connection**.



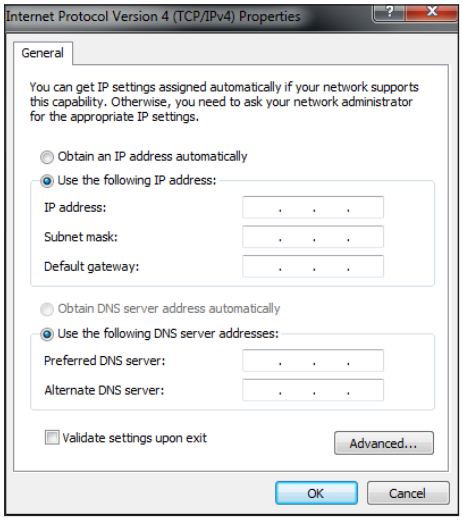
5. Mouse right click Local Area Connection to bring up a pop-up window, and then select **Properties**.



6. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click Properties.



7. Click **Use the following IP address** to specify an IP address that is on the same subnet as Transmitter/Extender Receiver/VideoWall Receiver.

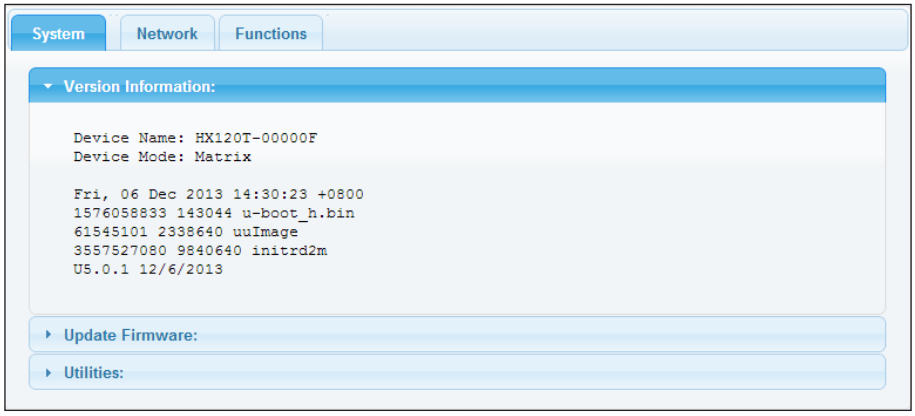


Web UI

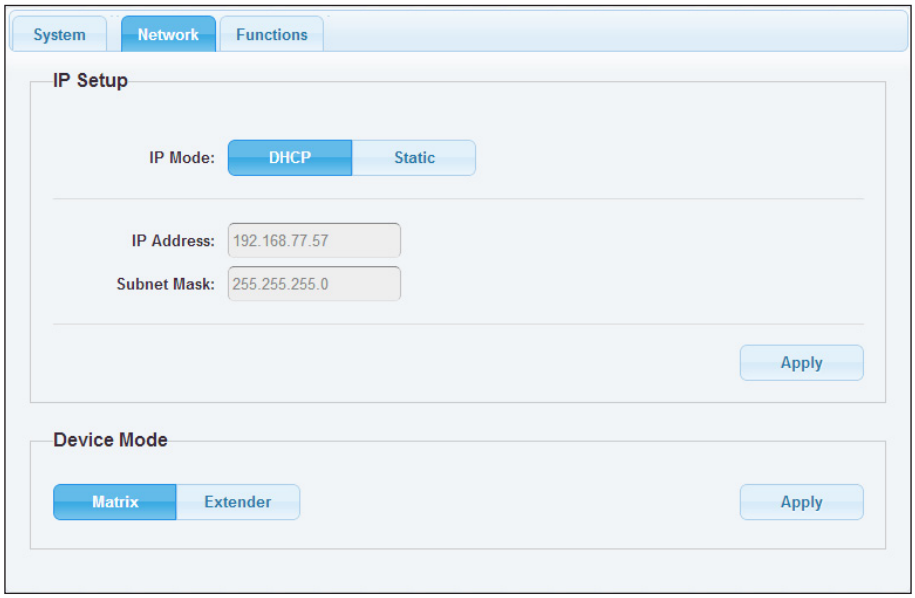
■ To configure each unit of HDMI AV Matrix AV Extender, open a browser and type the IP address which you got from **Bonjour Browser**. The corresponding web page will appear on the screen as following.

■ Click **Apply** once the settings have been changed.

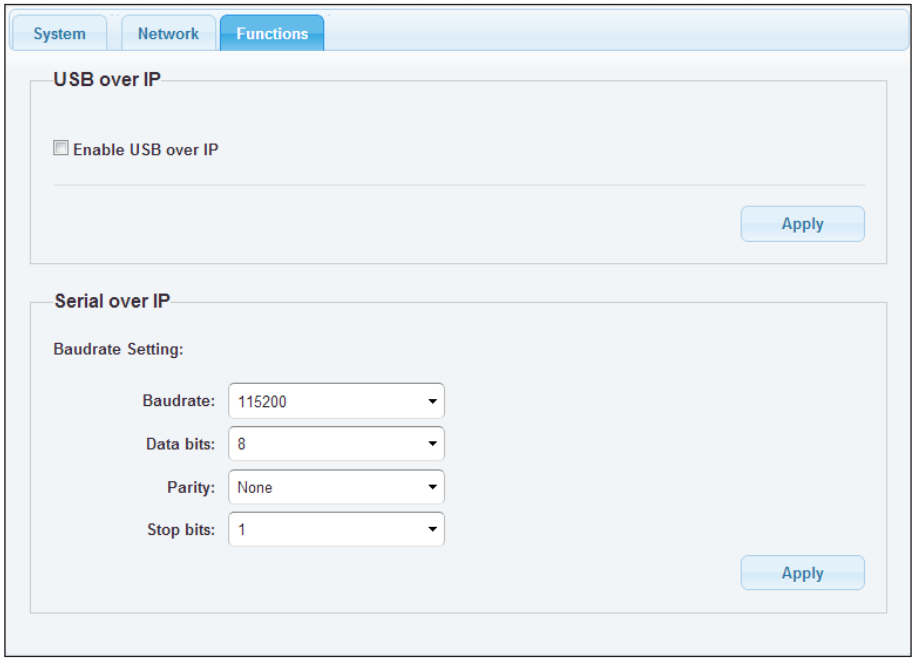
Transmitter



Item	Sub-item	Option	Description
System	Version information	Display the information of unit.	
	Update Firmware	Update the firmware. The browser will be reloaded after updating. Please contact the technical support if you have problem to upload.	
	Utilities	Factory Default	Restore to the factory default settings.
		Reboot	Restart the system.
		Reset EDID	Reset EDID to factory default setting.



Item	Sub-item	Option	Description
Network	IP Setup	DHCP/Static	Select **DHCP** to obtain IP address automatically or select **Static** to assign an IP manually.
	Device Mode	Matrix/Extender	Select the operation mode depending on the connection requirements.



Item	Sub-item	Option	Description
Function	USB over IP	Enable/disable the sharing of USB peripheral through Ethernet.	
	Serial over IP	Baudrate setting	Setup the baudrate settings.

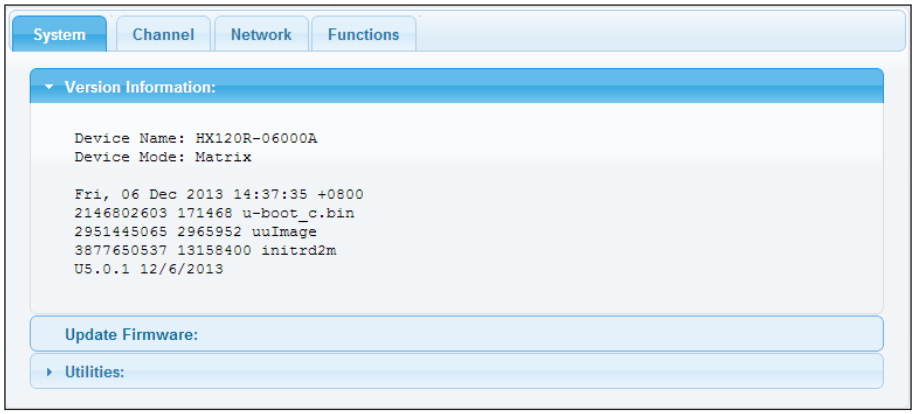
Baudrate settings

■ This option allows setting the baudrate of Transmitter, Extender Receiver/VideoWall Receiver manually. Make sure the settings must match with the RS-232 device you have connected. By default, the system settings are as following:

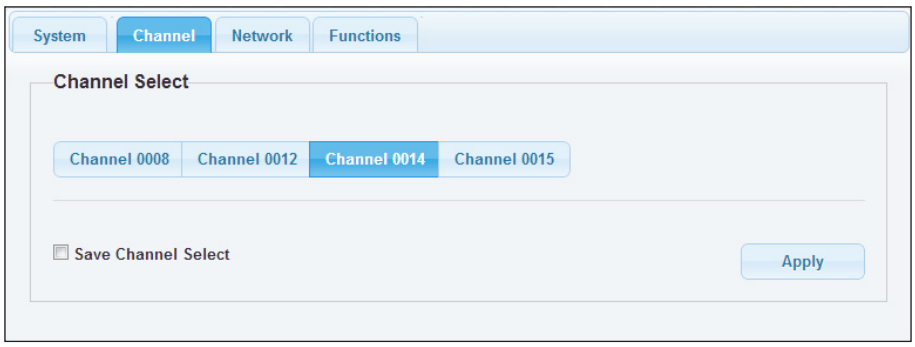
Baudrate: 115200 **Data bits:** 8 **Parity:** None **Stop bits:** 1

■ Click the **Apply** once the baudrate settings have been changed.

Receiver



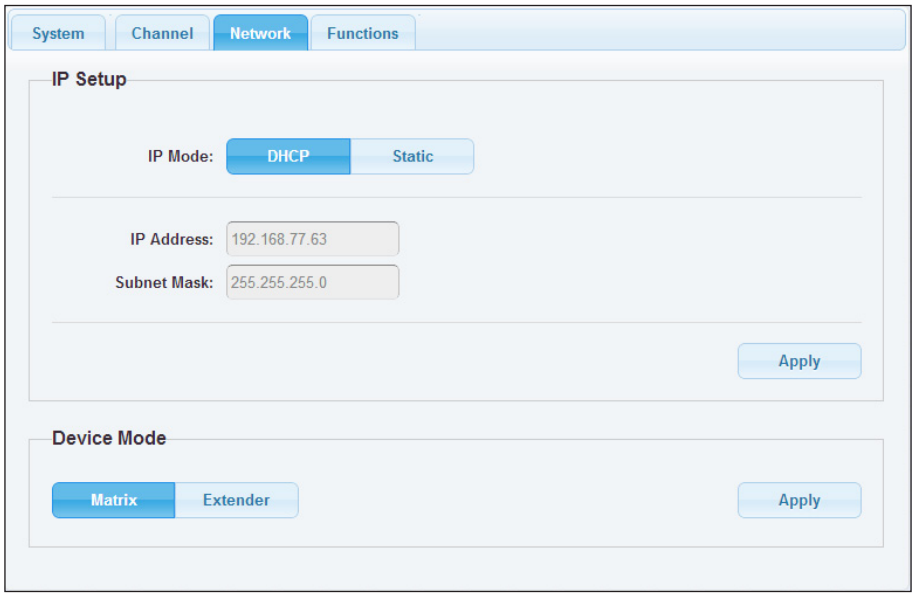
Item	Sub-item	Option	Description
System	Version information	Display the information of unit.	
	Update Firmware	Update the firmware. The browser will be reloaded after updating. Please contact the technical support if you have problem to upload.	
	Utilities	Factory Default	Restore to the factory default settings.
		Reboot	Restart the system.



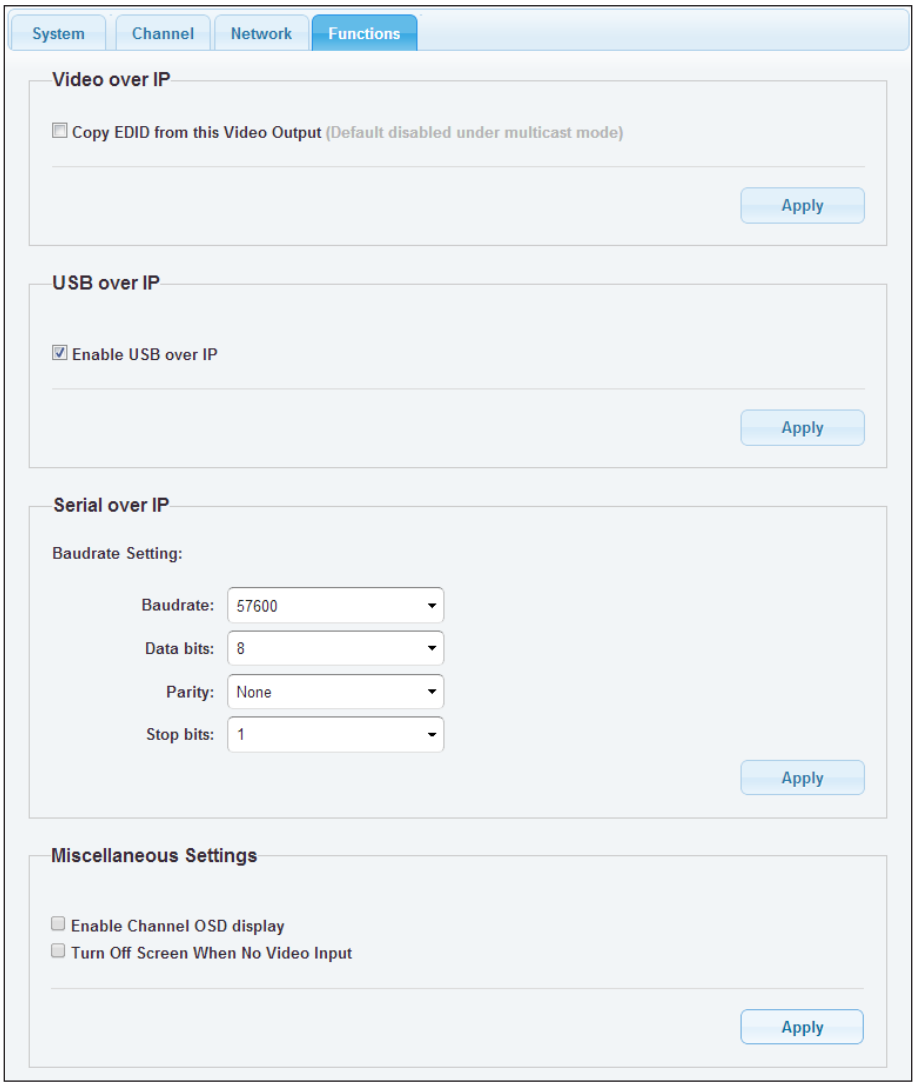
Item	Sub-item	Option	Description
Channel	Channel Select		Select a desired channel from the Transmitters.

Pairing the Transmitter and Receiver

- When grouping the network of HDMI AV Matrix Extender/Video Wall using multipoint to multipoint, the channel selections may be complicated. This option allows user to select the channel more intuitively. User can click the desired channel on the web oriented user interface directly.
- Click **Apply** after selecting the desired channel.
- The channels may vary, it depends on the number of connected Transmitters.
- If the option of **Save channel select** has been ticked, the channel will be saved and based on the selection of web page, even the settings of DIP switch are different between Transmitter and Receiver.
- If the option of **Save channel select** has not been ticked, the channel will be switched to the selection. Note that this selected channel will not be saved once the power is unplugged. The actual connected channel is depending on the DIP switch when the power is re-plugged.
- Reload the channels in the browser once the connection of Transmitter is changed.



Item	Sub-item	Option	Description
Network	IP Setup	DHCP/Static	Select **DHCP** to obtain IP address automatically or select **Static** to assign an IP manually.
	Device Mode	Matrix/Extender	Select the operation mode depending on the connection requirements.



Item	Sub-item	Option	Description
Function	Video over IP	Enable/disable the copy function from EDID compliant monitors automatically.	
	USB over IP	Enable/disable the sharing of USB peripheral through Ethernet. To enable this function, tick the option of **Enable USB over IP** both on the web pages of receiver and corresponding transmitter, then click **Apply**. Next, press the **DEVICES** button to light up the **DEVICE** LED on the receiver.	
	Serial over IP	Baudrate setting	Setup the baudrate settings.
	Miscellaneous Settings	Enable Channel OSD display	Enable the display of channel number after the video connection has been established. The channel number will be shown on the upper-left of screen for a few seconds.
		Turn Off Screen When No Video Input	Enable the monitor into standby mode. If there is no video input from transmitter to receiver, the receiver will trigger the monitor into standby mode.

Baudrate settings

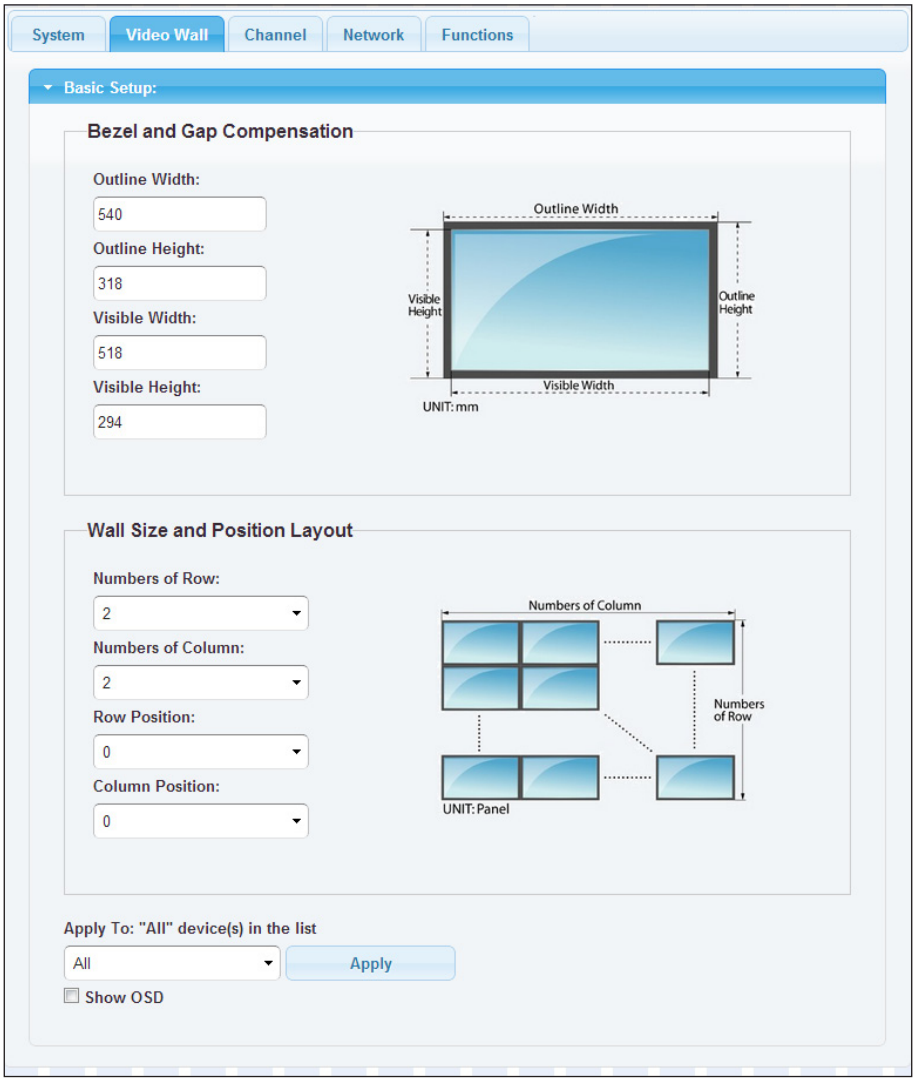
■ This option allows to set the baudrate of Transmitter, Extender Receiver/VideoWall Receiver manually. Make sure the settings must match with the RS-232 device you have connected. By default, the system settings are as following:

Baudrate: 115200 **Data bits:** 8 **Parity:** None **Stop bits:** 1

■ Click the **Apply** once the baudrate settings have been changed.

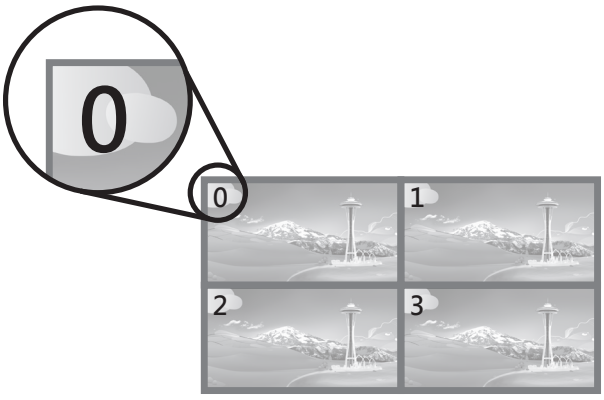
Video Wall

Item	Sub-item	Option	Description
System	Version information	Display the information of unit.	
	Update Firmware	Update the firmware. The browser will be reloaded after updating. Please contact the technical support if you have problem to upload.	
	Utilities	Factory Default	Restore to the factory default settings.
		Reboot	Restart the system.

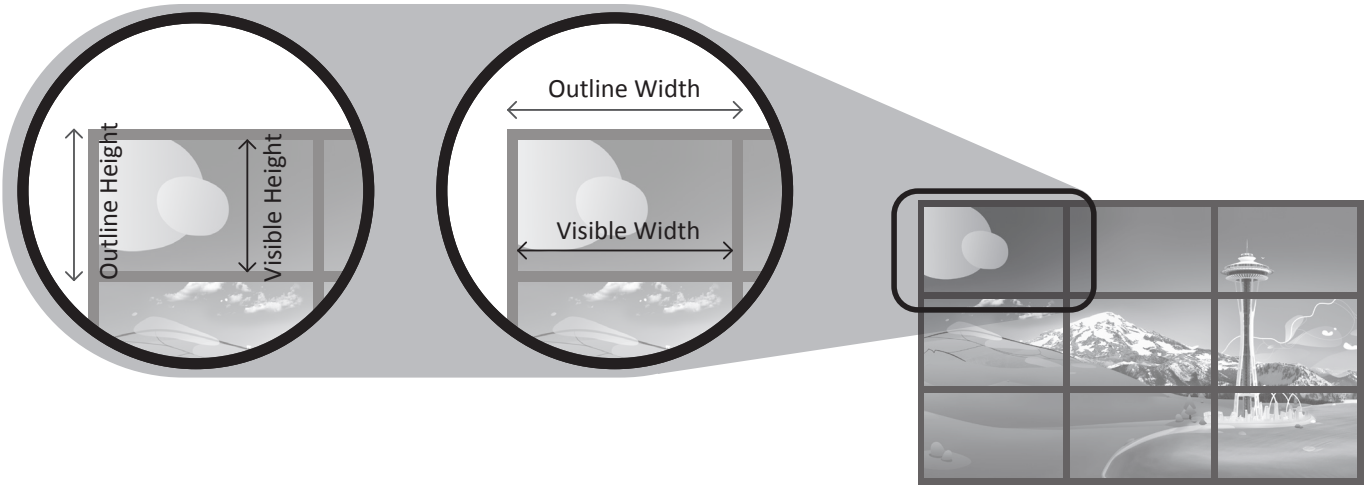


Item	Sub-item	Option	Description
Video Wall	Bezel and Gap Compensation		Adjust the compensation for bezel between panels.
	Wall Size and Position Layout		Setup the display quantities, and specify the positions for each display.
	Apply To "All" device(s) in the list		Apply the settings above to specify or all devices in the list. The screens will refresh after pressing **Apply** button.

* **Show OSD:** Enable/disable the display of number on each monitor. To sort the sequence of monitors, please configure the position of row and column.



Bezel and Gap Compensation

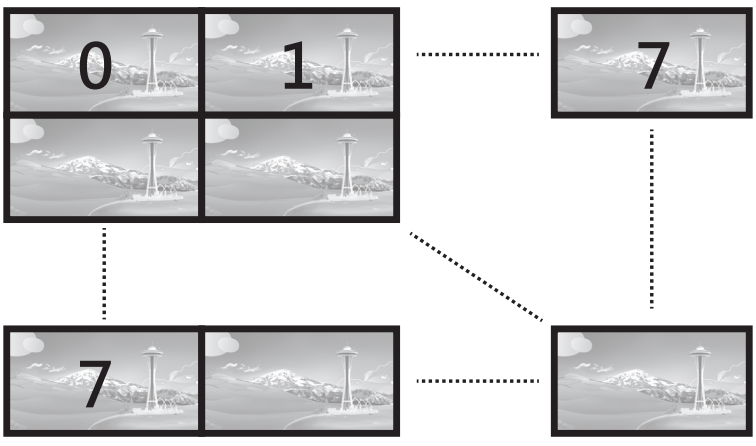


- Enter the values to the outline width, visible height, outline height and visible width respectively according to the bezels of monitors.
- Click the **Apply** once the values have been set.
- Note that the values should be integer.

Wall Size and Position Layout

- **Numbers of Row:** The monitor number of row and up to 8.
- **Numbers of Column:** The monitor number of column and up to 8.
- **Row Position:** Specify the row position of monitor. The row order from top to bottom is 0-7.
- **Column Position:** Specify the column position of monitor. The row order from left to right is 0-7.
- **Apply:** You can specify the monitor you wish to apply from this drop down menu or apply the settings to all monitors.

The Video Wall is built by multiple rows and column. The minimum matrix of Video Wall is 1x2. To setup the Video Wall, please refer to the examples below.



1x2 Video Wall (example)

To extend the display on the Video Wall, setup the **Wall Size and Position Layout** by following the table below:

Monitor 1

Numbers of Row	1
Numbers of Column	2
Row Position	0
Column Position	0

Monitor 2

Numbers of Row	1
Numbers of Column	2
Row Position	0
Column Position	1

2x1 Video Wall (example)

To duplicate the image on the Video Wall, setup the **Wall Size and Position Layout** by following the table below:

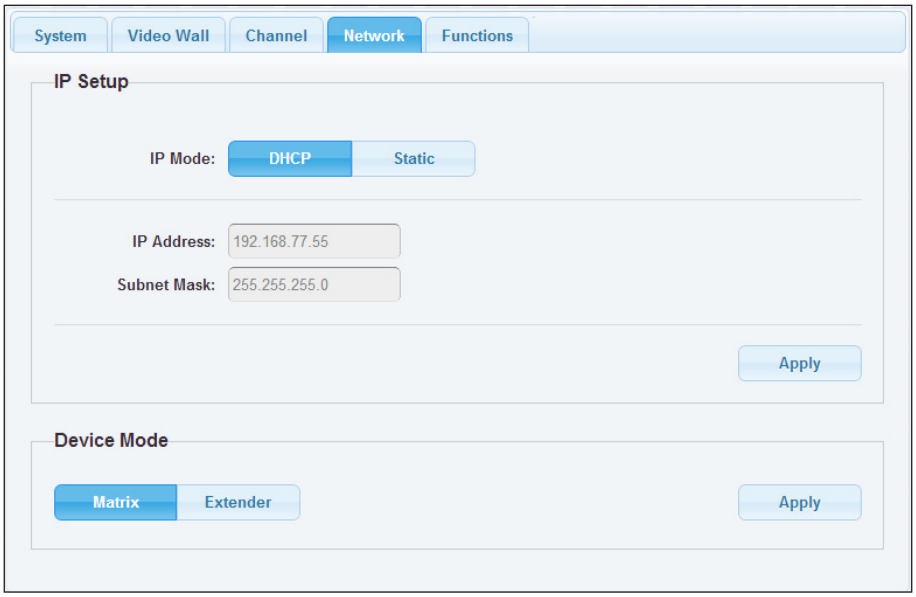
Monitor 1

Numbers of Row	2
Numbers of Column	1
Row Position	0
Column Position	0

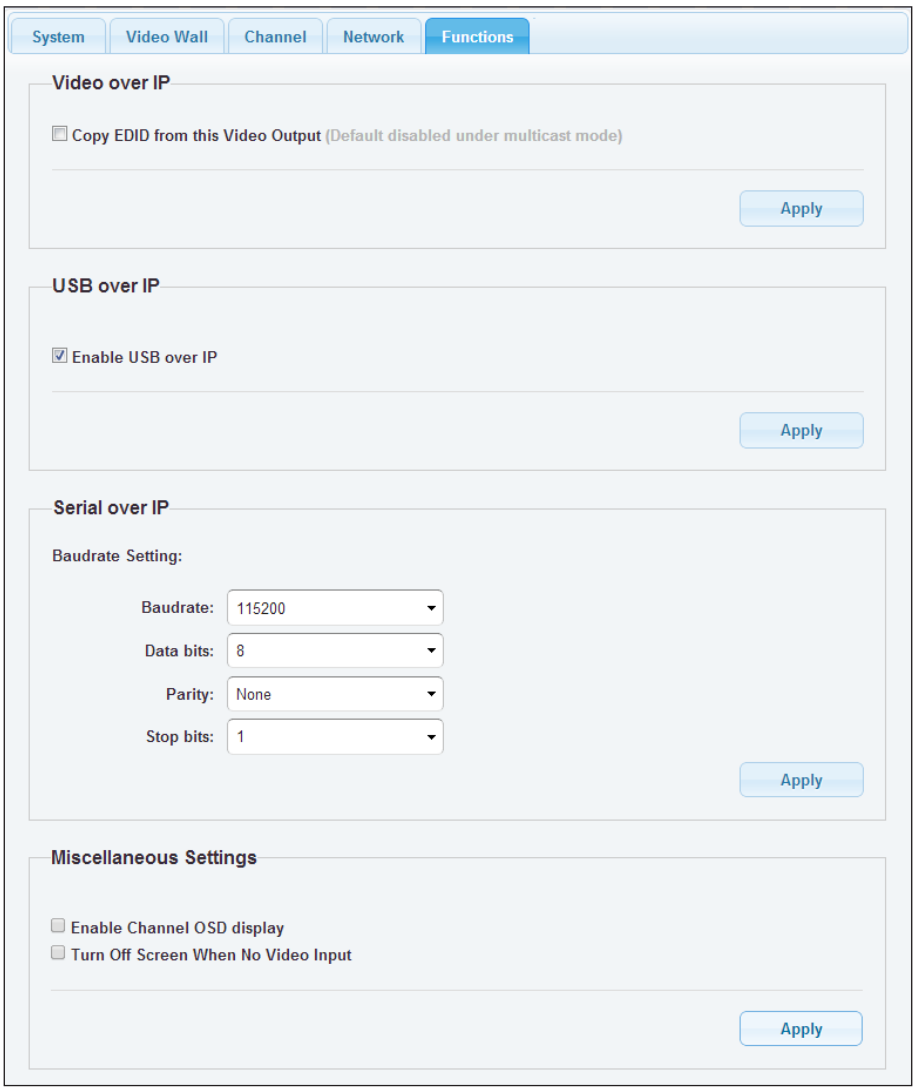
Monitor 2

Numbers of Row	2
Numbers of Column	1
Row Position	1
Column Position	0

Item	Sub-item	Option	Description
Channel	Channel Select		Select a desired channel from the Transmitters.



Item	Sub-item	Option	Description
Network	IP Setup	DHCP/Static	Select **DHCP** to obtain IP address automatically or select **Static** to assign an IP manually.
	Device Mode	Matrix/Extender	Select the operation mode depending on the connection requirements.



Item	Sub-item	Option	Description
Function	Video over IP	Enable/disable the copy function from EDID compliant monitors automatically.	
	USB over IP	Enable/disable the sharing of USB peripheral through Ethernet. To enable this function, tick the option of **Enable USB over IP** both on the web pages of receiver and corresponding transmitter, then click **Apply**. Next, press the **DEVICES** button to light up the **DEVICE** LED on the receiver.	
	Serial over IP	Baudrate setting	Setup the baudrate settings.
	Miscellaneous Settings	Enable Channel OSD display	Enable the display of channel number after the video connection has been established. The channel number will be shown on the upper-left of screen for a few seconds.
		Turn Off Screen When No Video Input	Enable the monitor into standby mode. If there is no video input from transmitter to receiver, the receiver will trigger the monitor into standby mode.

EDID configuration

■ To copy the EDID information, tick the option of **Copy EDID from this Video Output**. The EDID information will be copied each time power on the Receiver.

■ Click the **Apply** after ticking/unticking the **Copy EDID from this Video Output**.

Baudrate settings

■ This option allows to set the baudrate of Transmitter, Extender Receiver/VideoWall Receiver manually. Make sure the settings must match with the RS-232 device you have connected. By default, the system settings are as following:

Baudrate: 115200 **Data bits:** 8 **Parity:** None **Stop bits:** 1

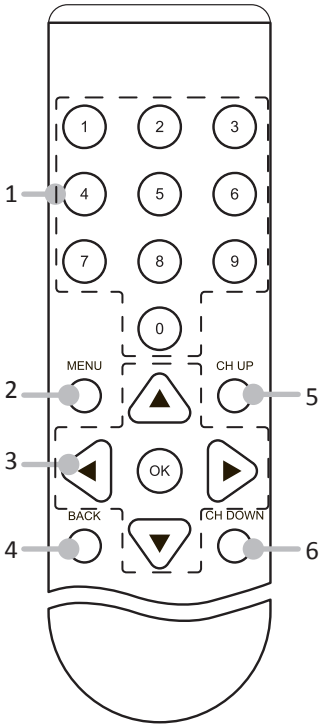
■ Click the **Apply** once the baudrate settings have been changed. OSD control

Two OSD control are provided, both operations are almost the same. One is using the remote control (optional), and the other is through HDMI CEC. For more operations, refer to the description below.

Remote control (optional)

The description below is an example for switching between different channels. The operation may vary depending on actual usage and connection. Before using the function of remote control, refer to the chapter of Connection - Remote control to set the desired display mode (1 to 1, matrix or video wall).

Remote controller



1. Numeric buttons*

2. MENU button

3. Cursor and OK buttons:
Cursor buttons: Move the cursor up, down, right, and left.
OK: Confirm the selection.

4. BACK button: Return to the upper page.

5. CH UP*: Tunes up one channel.

6. CH DOWN*: Tunes down one channel.

* These functions are available depending on the models.

Basic operation

1. Press **Menu** button to bring up the device ID.

2. The device ID will appear on the screen. To specify the desired device, press **Left** or **Right** button. Once the device has been confirmed, press **OK** to bring up more options.
3. Select **Select Channel**, and then press **OK**.
4. The available sources will be listed on the screen. Press **Up** or **Down** button to select the desired source, and then press **OK**.
5. The screen will display to the new source you have selected.

Additional options

■ Select **Scan node** to refresh if more devices have been connected.

■ Select **About** to show the firmware version.

HDMI CEC

Except the remote control (optional), remote the device through HDMI CEC is supported as well. The operation is similar with the remote control described above. Note that the definition of **Menu** button on the remote control and name of HDMI CEC may vary (for example, Bravia sync control, VieraLink, Kuro Link, Aquos Link, etc.). For more details, please refer to the corresponding instruction manual or manufacturer.

Technical support

Please contact with your local distributor for more information or technical support.

FCC / CE Statements

FCC Statement : This equipment has been tested and found to comply with the regulations for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this User Guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case, the user will be required to correct the interference at his/her own expense.

CE Statement : This is a Class B product in a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.