

USER MANUAL

VX-HDMI-4KIP-TX, VX-HDMI-4KIP-RX

MEDIACENTO IPX 4K

24/7 TECHNICAL SUPPORT AT 1.877.877.2269 OR VISIT BLACKBOX.COM

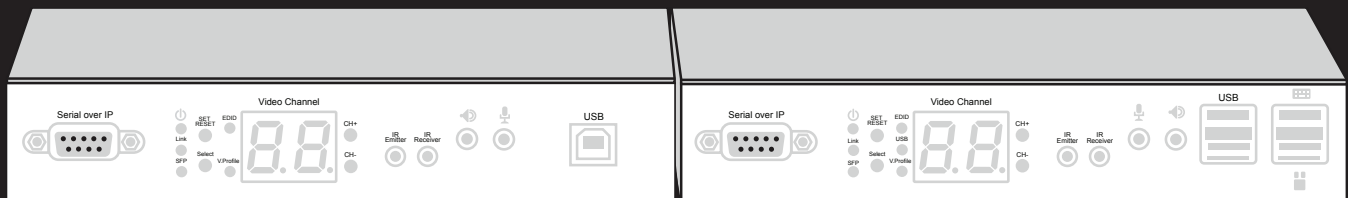


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CHAPTER 1: HEADLINE

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CHAPTER 1: SPECIFICATIONS

TABLE 1-1. SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Connectors	
Transmitter	Video Output: (1) HDMI female Serial Control Port (RS-232): (1) DB9 female Video Input: (1) HDMI female Network Port: RJ-45 Ethernet Audio + IR + RS-232 + USB Extension over IP) Fiber Port: SFP Ethernet USB interface: (1) USB Type B female Audio: 2-way analog audio, (1) Line IN, (1) Line OUT
Receiver	Console Connection: Video Output: (1) HDMI female Serial Control Port (RS-232): (1) DB9 male Network Port: RJ-45 Ethernet Audio + IR + RS-232 + USB Extension over IP) Fiber Port: SFP Ethernet USB interface: 2-way analog audio: (1) Mic IN, (1) Line OUT
Audio Support	
Transmitter and Receiver	Supports high-definition audio (HD) 5.1/6.1/7.1 surround sound: Dolby TrueHD, DTS-HD Master Audio LPCM channels up to 7.1 channels 192 kHz
User Controls	
Hardware Switches	Set/Reset: Pushbutton Function Selection: Pushbutton Video Channel: Pushbutton (CH+/CH-)
Infrared Remote	Bidirectional, through 20 to 60 kHz, two-way passthrough
Indicators	
Transmitter	Status LEDs: Power (blue), Link (blue) Function Selection LEDs: EDID Copy (blue) SFP Status (blue) Video Profile Selection (Video or graphic mode) (blue)
Receiver	Status LEDs: Power (blue), Link (blue) Function Selection LEDs: EDID Update (blue) SFP Status (blue) Video Profile Selection (Video or graphic mode) (blue) USB Link (upstream) (blue)



CHAPTER 1: SPECIFICATIONS

TABLE 1-1 (CONTINUED). SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Additional Specs	
DDC Supported	DDC, DDC2, DDC2B
Extension Cable Type and Length	Ethernet, CAT5e/6 up to 328 ft. (100 m) Fiber optic (SFP module), single-mode, up to 30 km
Maximum Video Resolution	Up to 4096 x 2160 @ 30 Hz
Power	
Power Supply	(1) 5-VDC, 3-A power supply
Power over Ethernet (PoE)	Complies with IEEE 802.3at standard, Class 4; Power: Normal input: 48 VDC; Input Range: 36 to 57 VDC; Consumption: 10.5 W, CAT6, 328 ft. (100 m)
Environmental	
Operating Temperature	32 to 122° F (0 to 50° C)
Storage Temperature	-4 to +140° F (-20 to +60° C)
Humidity	0 to 80% relative humidity
Mechanical	
Dimensions	1.25"H x 3.58"W x 7.34"D (3.2 x 9.8 x 18 cm)
Weight	Transmitter: 1.034 lb. (470 g) Receiver: 1.036 lb. (471 g)
Housing Material	Metal Chassis

TABLE 1-2. COMPATIBLE SFPS

PART NUMBER	DESCRIPTION
LFP411	SFP, 1250-Mbps Fiber with Extended Diagnostics, 850-nm Multimode, 550 m LC
LFP412	SFP, 1250-Mbps Fiber with Extended Diagnostics, 1310-nm Multimode, 2 km LC
LFP413	SFP, 1250-Mbps Fiber with Extended Diagnostics, 1310-nm Single-Mode, 10 km LC
LFP414	SFP, 1250-Mbps Fiber with Extended Diagnostics, 1310-nm Single-Mode, 30 km LC
LFP418	SFP, 1250-Mbps Fiber with Extended Diagnostics, 1550-nm Single-Mode, 80 km, LC

NOTE: Also should support most gigabit fiber SFP modules

CHAPTER 2: OVERVIEW

2.1 INTRODUCTION

The MediaCento IPX 4K extends HDMI, USB, Audio, RS-232, and IR over IP via CATx or single-mode fiberoptic cable. The extender consists of two units: one transmitter and one receiver.

NOTE: You can link the transmitter and receiver together via one CATx cable or one single-mode fiberoptic cable, but not both types of cable at the same time.

Multicasting supports multiple transmitters (TX) and receivers (RX) that can be arranged in a crosspoint matrix architecture.

The extender supports 7.1 CH audio, 3D video, and USB 2.0/1.1.

You can use the built-in web user interface (UI) for configuration and operation.

2.2 FEATURES

2.2.1 BASIC FEATURES

- ◆ Uses one UTP/STP CATx cable OR one single-mode fiberoptic cable between each transmitter/receiver link
- ◆ Supports a visually lossless compression algorithm
- ◆ Extends HDMI Digital Audio/Video up to 330 feet (100 meters) between Transmitter and Receiver (point-to-point) using CATx cable or up to 6.2 miles (10 kilometers) between Transmitter and Receiver over single-mode fiberoptic cable using a standard SFP (Small Form-factor Pluggable) module.
- ◆ Compatible SFPs include Black Box part numbers LFP411, LFP412, LFP413, LFP414, and LFP418. Also should support most gigabit fiber SFP modules
- ◆ Supports Ultra HD video 4096 x 2160 @ 30 Hz and 1920 x 1200 @ 60 Hz (reduced blanking)
- ◆ Supports all 3D image formats
- ◆ Provides repeating/distributing/matrix extension through a Gigabit Ethernet Switch with a transceiver installed that is compatible with both Transmitter and Receiver units and video wall
- ◆ Compatible with USB 2.0 devices at data rates up to 480 Mbps and backward with USB 1.1. The transmitter uses one USB Type B host interface and the receiver uses four USB Type A device interfaces.
- ◆ Can map different transmitter sources or create a grouping loop for each receiver that corresponds to a video channel
- ◆ Wall-mount housing design with rack mountable bracket enables easy and robust installation
- ◆ Audio supports 7.1CH LPCM, DTS, Dolby, analog LINE-IN/LINE-OUT
- ◆ Supports Interlaced and Progressive Display Modes
- ◆ Provides DDC/DDC2B, Hot-Plug Detection (HPD) and complies with HDCP standards
- ◆ Supports Default EDID and EDID copy function for optimal PC-to-Screen performance
- ◆ Uses a bidirectional Infrared Remote (IR) signal and RS-232 control communication (Transmitter and Receiver)
- ◆ Transmitter has a 4K HDMI local loopback output
- ◆ Uses a 7-segment LED display for video channel indication
- ◆ Includes IR remote control for video channel setting
- ◆ Operates as a PoE powered device (PD) using IEEE 802.3at PoE+



CHAPTER 2: OVERVIEW

2.2.2 ADVANCED FEATURES

- ◆ Web UI shows the linking connection status for all Transmitter (TX) and Receiver (RX) units
- ◆ Switches TX-RX connections via web UI, pushbuttons, IR remote control or keyboard hotkey
- ◆ Can upgrade firmware via web UI
- ◆ Visualizes video wall configuration
- ◆ Transmitter (TX) unit monitors HDMI-in and synchronizes HDMI-out
- ◆ If a firmware update fails, the MediaCentro IPX 4K recovers redundant Flash ROM
- ◆ Two-digit LED display indicates current transmitting and receiving channel
- ◆ Supports 99 selectable channels to transmit or receive

2.3 WHAT'S INCLUDED

Your package should include the following items. If anything is missing or damaged, contact Black Box Technical Support at 877-877-2269 or info@blackbox.com

MediaCentro IPX 4K Transmitter (VX-HDMI-4KIP-TX) includes:

- ◆ (1) MediaCentro IPX 4K Transmitter
- ◆ (1) 5-VDC, 3-A power supply
- ◆ (1) IR blaster cable
- ◆ (1) USB 2.0 cable
- ◆ (1) Audio/mic cable
- ◆ This user manual

MediaCentro IPX 4K Receiver (VX-HDMI-4KIP-RX) includes:

- ◆ (1) MediaCentro IPX 4K Receiver
- ◆ (1) 5-VDC, 3-A power supply
- ◆ (1) IR receiver cable
- ◆ (1) IR remote control
- ◆ This user manual

CHAPTER 2: OVERVIEW

2.4 HARDWARE DESCRIPTION

The MediaCento IPX 4K consists of a Transmitter unit and a Receiver unit.

2.4.1 TRANSMITTER

Figure 2-1 shows the front panel of the transmitter. Table 2-1 describes its components.



FIGURE 2-1. TRANSMITTER FRONT PANEL

TABLE 2-1. TRANSMITTER FRONT PANEL COMPONENTS

NUMBER IN FIGURE 2-1	COMPONENT	DESCRIPTION
1	Serial over IP: RS-232 extension port	Connects to source device's RS-232 port
2a	Power On status LED	Lights steady when power on sequence is completed
2b	Link LED for LAN link status	<ul style="list-style-type: none"> • Goes out when LAN link between Transmitter and Receiver/Gigabit Ethernet Switch is off • Blinks when LAN link between Transmitter and Receiver/Gigabit Ethernet Switch is on and there is no image data stream on the LAN link • Lights steady ON when LAN link between Transmitter and Receiver/Gigabit Ethernet Switch is on and there is an image data stream on the LAN link
2c	SFP LED for fiber link status	<ul style="list-style-type: none"> • Lights steady ON when Transmitter is powered on • Blinks when there is an image data stream on the fiber link between Transmitter and Receiver
3a	Set/Reset button	<p>Press to set a function, reset system, or reset to default</p> <ul style="list-style-type: none"> • Short press for setting the following functions <ul style="list-style-type: none"> - EDID: Update EDID stored in Transmitter with EDID of display connecting to Transmitter - Video Profile: Configure video profile with video or graphic mode - Video Channel: Select video channel • Long press (3 sec) for System Reset when no above functions selected to be set • Longer press (6 sec) for Reset to Default when no above functions selected to be set

TABLE 2-1 (CONTINUED). TRANSMITTER FRONT PANEL COMPONENTS

NUMBER IN FIGURE 2-1	COMPONENT	DESCRIPTION
3b	Select button	<p>Select EDID, video profile, or video channel</p> <ul style="list-style-type: none"> • Press to cycle through setting EDID / Video Profile / Video Channel / Quit "Select" in sequence • Slow blink in the related LEDs when selecting EDID or Video Profile • Slow blink in 7-segment LED display when selecting Video Channel • Lights steady ON EDID LED indicator, Video Profile LED indicator and 7-segment LED display when quitting "Select"
4a	EDID LED	<p>Indicates EDID update status</p> <ul style="list-style-type: none"> • Blinks when EDID update is ready to be set • Press SET/RESET button to set/clear EDID update • Lights steady ON when EDID stored in Transmitter is updated with EDID of display connected to Transmitter • Not lit when EDID is not being updated
4b	V. Profile LED	<p>Indicates video/graphic mode</p> <ul style="list-style-type: none"> • Blinks when Video Profile is ready to be set • Press SET/RESET button to set Video Profile to video/graphic mode • The short OSD pops up on Receiver's display to show the setting result of video/graphic mode • Lights steady ON when Video Profile is set to video mode • Not lit when Video Profile is set to graphic mode
5	Video Channel LED	<p>7-segment LED display for Video Channel indication</p> <ul style="list-style-type: none"> • Blinks when Video Channel is ready to be set • Press CH+ or CH- button to change video channel • Press SET/RESET button to set the video channel change
6	CH+/CH- pushbuttons	Press to change video channel
7	IR Emitter	Connector used for emitting signal of IR extension over IP
8	IR Receiver	Connector used for receiving signal of IR extension over IP
9	Audio connector	Connector for analog audio output of audio extension over IP (speaker)
10	Audio connector	Connector for analog audio input of audio extension over IP (microphone)
11	USB Type B connector	Links to host source device for USB extension over IP

Figure 2-2 shows the back panel of the transmitter. Table 2-2 describes its components.



FIGURE 2-2. TRANSMITTER BACK PANEL

TABLE 2-2. TRANSMITTER BACK PANEL COMPONENTS

NUMBER IN FIGURE 2-2	COMPONENT	DESCRIPTION
1	SFP cage	Fiberoptic SFP module for link between transmitter and receiver installs here
2	RJ-45 connector	Used for LAN Link between transmitter and receiver/Gigabit Ethernet switch
3	HDMI In connector	Connects to HDMI source for the source signal of HDMI extension over IP
4	HDMI Out connector	Loops back the source signal to Transmitter's connected display
5	5-VDC jack	Links to 5-VDC power supply

CHAPTER 2: OVERVIEW

2.4.2 RECEIVER

Figure 2-3 shows the front panel of the receiver. Table 2-3 describes its components.



FIGURE 2-3. RECEIVER FRONT PANEL

TABLE 2-3. RECEIVER FRONT PANEL COMPONENTS

NUMBER IN FIGURE 2-3	COMPONENT	DESCRIPTION
1	Serial over IP: RS-232 extension port	Connects to sink device's RS-232 port
2a	Power On status LED	Lights steady when power on sequence is completed
2b	Link LED for LAN link status	<ul style="list-style-type: none"> • Goes out when LAN link between Transmitter and Receiver/Gigabit Ethernet Switch is off • Blinks when LAN link between Transmitter and Receiver/Gigabit Ethernet Switch is on and there is no image data stream on the LAN link • Lights steady ON when LAN link between Transmitter and Receiver/Gigabit Ethernet Switch is on and there is an image data stream on the LAN link
2c	SFP LED for fiber link status	<ul style="list-style-type: none"> • Lights steady ON when Transmitter is powered on • Blinks when there is an image data stream on the fiber link between Transmitter and Receiver
3a	Set/Reset button	<p>Press to set a function, reset system, or reset to default</p> <ul style="list-style-type: none"> • Short press for setting the following functions <ul style="list-style-type: none"> - EDID: Update EDID stored in Transmitter with EDID of display connecting to Receiver - USB: Link or unlink USB extension - Video Profile: Configure video profile with video or graphic mode - Video Channel: Select video channel • Long press (3 sec) for System Reset when no above functions selected to be set • Longer press (6 sec) for Reset to Default when no above functions selected to be set

TABLE 2-3 (CONTINUED). RECEIVER FRONT PANEL COMPONENTS

NUMBER IN FIGURE 2-3	COMPONENT	DESCRIPTION
3b	Select button	<p>Select EDID, video profile, or video channel</p> <ul style="list-style-type: none"> • Press to cycle through setting EDID / Video Profile / Video Channel / Quit "Select" in sequence • Slow blink in the related LEDs when selecting EDID or Video Profile • Slow blink in 7-segment LED display when selecting Video Channel • Lights steady ON EDID LED indicator, Video Profile LED indicator and 7-segment LED display when quitting "Select"
4a	EDID LED	<p>Indicates EDID update status</p> <ul style="list-style-type: none"> • Blinks when EDID update is ready to be set • Press SET/RESET button to set/clear EDID update • Lights steady ON when EDID stored in Transmitter is updated with EDID of display connected to Transmitter • Not lit when EDID is not being updated
4b	USB Link Status :LED	<p>Indicates USB link status</p> <ul style="list-style-type: none"> • Blinks when USB link is ready to be set • Press SET/RESET button to set USB link/unlink • The short OSD pops up on Receiver's display to show the setting result of USB link/unlink • Lights steady ON when USB link is set • Not lit when USB unlink is set
4c	V. Profile LED	<p>Indicates video/graphic mode</p> <ul style="list-style-type: none"> • Blinks when Video Profile is ready to be set • Press SET/RESET button to set Video Profile to video/graphic mode • The short OSD pops up on Receiver's display to show the setting result of video/graphic mode • Lights steady ON when Video Profile is set to video mode • Not lit when Video Profile is set to graphic mode
5	Video Channel LED	<p>7-segment LED display for Video Channel indication</p> <ul style="list-style-type: none"> • Blinks when Video Channel is ready to be set • Press CH+ or CH- button to change video channel • Press SET/RESET button to set the video channel change
6	CH+/CH- pushbuttons	Press to change video channel
7	IR Emitter	Connector used for emitting signal of IR extension over IP
8	IR Receiver	Connector used for receiving signal of IR extension over IP
9	Audio connector	Connector for analog audio input of audio extension over IP (microphone)
10	Audio connector	Connector for analog audio output of audio extension over IP (speaker)
11	(2) USB Type A connectors	Links to USB devices for USB extension over IP (USB 2.0)
12	(2) USB Type A connectors	Links to USB keyboard/mouse for USB extension over IP (USB HID)

Figure 2-4 shows the back panel of the receiver. Table 2-4 describes its components.



FIGURE 2-4. RECEIVER BACK PANEL

TABLE 2-4. RECEIVER BACK PANEL COMPONENTS

NUMBER IN FIGURE 2-4	COMPONENT	DESCRIPTION
1	SFP cage	Fiberoptic SFP module for link between transmitter and receiver installs here
2	RJ-45 connector	Used for LAN Link between transmitter and receiver/Gigabit Ethernet switch
3	HDMI Out connector	Connects to HDMI source for the sink signal of HDMI extension over IP
4	5-VDC jack	Links to 5-VDC power supply

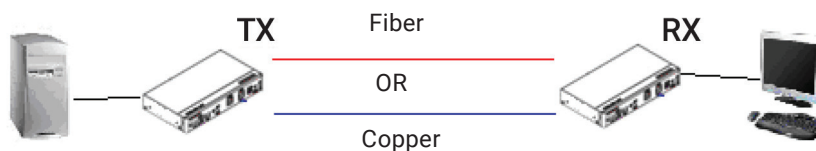
CHAPTER 3: CONNECTIONS

3.1 ONE-TO-ONE MAPPING EXTENSION



FIGURE 3-1. ONE-TO-ONE MAPPING EXTENSION

Use this to pair a single set of TX and RX. The default video channel on each unit is 1. This can also be adjusted on multiple RXs to match a single TX, then press the “SET/RESET” button on the RX unit(s).



NOTE: The TX-RX link can use fiber OR copper cable, but not both at the same time.

FIGURE 3-2. ONE-TO-ONE CONNECTION

3.2 MULTICASTING

Multicasting enables you to install a matrix of TX and RX units for use as an extender matrix system over an IP network. A multicasting application requires a Gigabit/1000-Mbps network switch.

For multicast-matrix installation, the Gigabit Managed Switch or Gigabit Smart Switch must support the IGMP V2 querier function and Jumbo Frame (at least 8K) is required.

For each Transmitter (TX), set a unique video channel number ranging from 01–99 to avoid channel conflict. Each Receiver’s (RX) video channel must correspond to the Transmitter’s (TX) video channel whose video content will be displayed on RX’s display. Press the “ SET/ RESET ” button of the RX unit to implement extension linking.

A multicasting application diagram is shown on the next page.

CHAPTER 3: CONNECTIONS

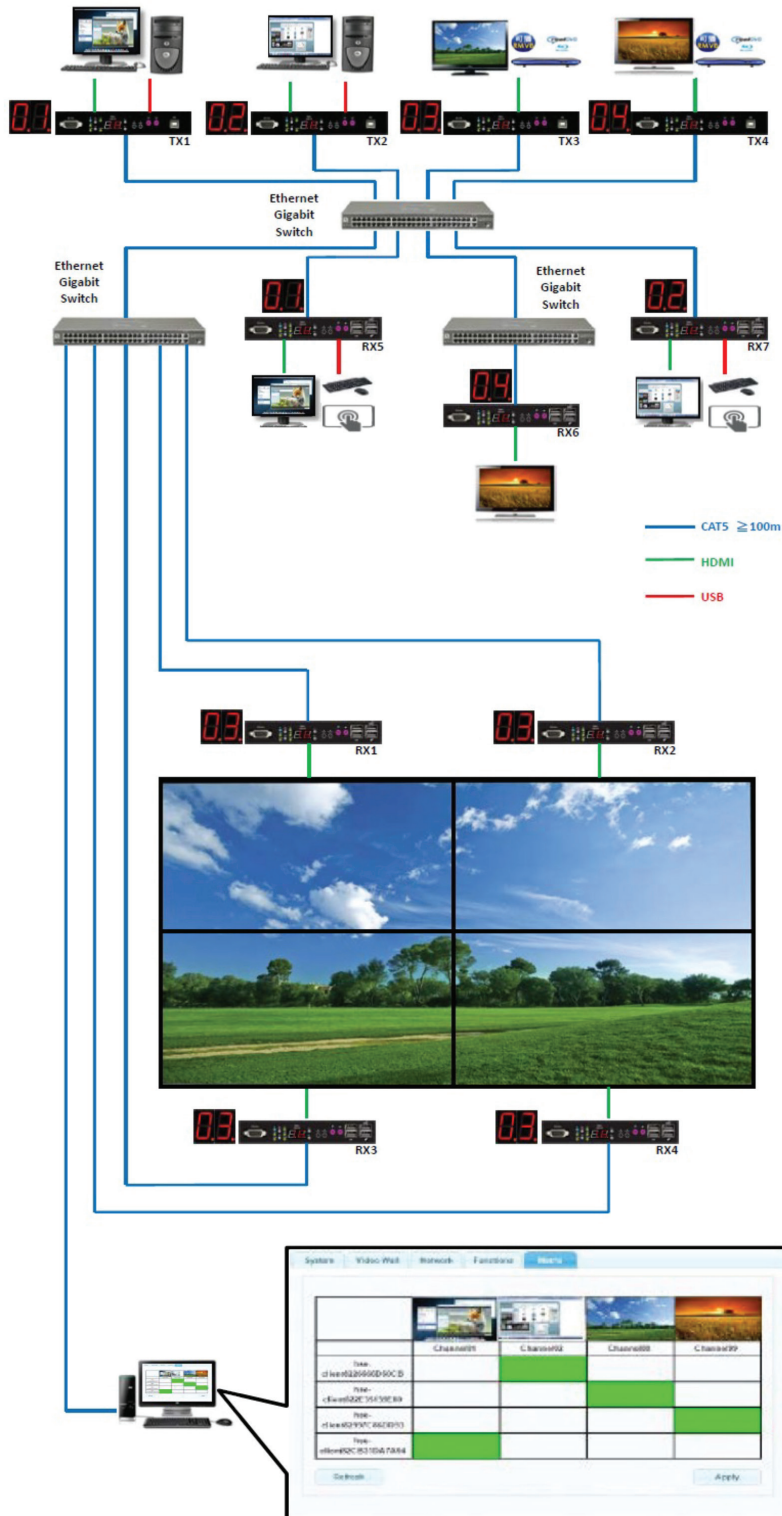


FIGURE 3-3. TYPICAL MULTICASTING APPLICATION

CHAPTER 4: NETWORK SETUP AND HARDWARE SWITCHING

1. Power on the Gigabit Switch and enable Jumbo Frame (8k) and IGMP v2.
2. Connect all transmitters and receivers to the Gigabit Switch using CATx cables.
3. Connect all transmitters with video sources, and all receivers with Display/TV using HDMI cables.
4. Connect an IR emitter cable to the transmitter's or receiver's IR Emitter Jack, and point the IR emitter to transmitter's or receiver's connected device's IR receiver window that you want to control.
5. Connect an IR Receiver cable to the transmitter's or receiver's IR Receiver Jack, and point the IR receiver to the transmitter's or receiver's connected device's IR remote.
6. Connect an RS-232 cable to the transmitter and receiver where a RS-232 controller or Display/TV/device can take RS-232 command.

NOTE: If the transmitter's or receiver's RS-232 port and the device's RS-232 port are different genders, use a gender changer.

7. Plug-in a DC power adapter to all transmitters and receivers. The units power on.
8. Power on all Video Sources and start playing video.
9. Power on all Displays/TVs and select HDMI input. All displays/TVs show video depending on the video channel selected.
10. To assign different video channels (sources), use an IR Receiver cable or the 99-channel IR remote controller on the receiver side to switch the source channel, or change the receiver's video channel by using pushbuttons on the receiver.
11. Select the video channel by using pushbuttons (CH+/CH-) on every transmitter/receiver based on the link mapping, and set it up by pressing the "Set/Reset" button. The 7-segment LED display (Video Channel) will stop blinking when the setting is completed.
12. To use the 99-channel IR remote controller, follow steps A through C below.
 - A. Press "CH+" or "CH-" to scroll to the next or previous available video channel.
 - B. Press the number key "1" – "0" and "ENTER" to directly change to the specific video channel.
 - C. Press "OSD" to show the status information of the transmitter and receiver in the same link on the top left corner of the display connected to the receiver. The status information includes:

- ◆ Transmitter's IP
- ◆ Receiver's IP and MAC address
- ◆ Firmware version of this receiver
- ◆ Device mode setting of this receiver (Extender or Matrix)
- ◆ Current receiving video channel
- ◆ Current video resolution

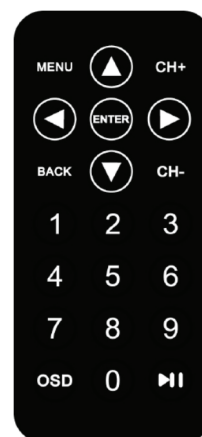


FIGURE 4-1. REMOTE CONTROL

CHAPTER 5: HARDWARE OPERATION

5.1 EDID UPDATE BY BUTTONS

The MediaCento IPX 4K features EDID Management. In each video link of a transmitter unit (TX) and a receiver unit (RX), before outputting the video (and/or audio) data, the source device connecting to the TX reads the EDID first to define the specification of the video data it should support to output. The EDID can be the factory default, the display connecting to the TX or the sink device (e.g. display, amplifier,...etc) connecting to RX, and be set up to one of these three types by pressing the “EDID Update” button based on the application.

By default, the internal HDMI EDID (stored in the transmitter unit) is used. However, the EDID of the receiver’s HDMI output connected device such as the display, amplifier,...etc, can be obtained and stored in the transmitter. It can support multi-channel audio and 3D function from the device connecting to the receiver.

5.1.1 “EDID UPDATE” FOR HDMI SINK DEVICE ON TX OR RX SIDE

1. Press the “Select” button to make “EDID” LED blink in order to select the EDID Update function.
2. Press the “SET/RESET” button to set up the EDID Update function.
3. The “EDID” LED lights steady on when the EDID Update is completed.
4. In Extender device mode for TX/RX link, EDID Update will automatically perform when the video connection is established every time or when the display connecting to Receiver unit is changed.

5.1.2 “EDID UPDATE” TO BE FACTORY DEFAULT

1. Make sure there is no function setting for “EDID”, “USB”, “V. profile” or “Video Channel” to be selected.
2. Press the button for 6 seconds to Reset to Default.
3. Do the above two steps for the transmitter and receiver of the same link.

5.2 AUDIO OVER IP EXTENSION

1. A computer has a Mic-In jack, as part of the sound card. To access this jack from the Receiver/RX unit, connect the microphone to the Mic-in jack on the Receiver/RX unit.
2. To get the audio from the microphone into the computer, connect a 3.5-mm-to-3.5-mm stereo cable from the Line out jack on the Transmitter unit to the Line in jack on the computer.

WARNING: DO NOT connect the cable from the Line out jack on the TX unit to the Mic In jack on the computer. Doing it will result in audio “clipping” and may cause damage to the sound card.

NOTE: HDMI audio will always be passed through to the HDMI out connector on the Receiver unit. However, if a 3.5mm stereo cable is connected to the Line in jack on the TX unit, the embedded HDMI audio is switched off. This allows the audio signal from Line in jack (TX unit) to be received on the Line out jack (Receiver/RX unit).



CHAPTER 5: HARDWARE OPERATION

When using a microphone, the audio behavior will differ between the device modes of Extender and Matrix,

- Matrix Mode: The Mic- in jack is disabled in matrix mode. However, if an audio source is connected to the Line in jack on a Transmitter/TX unit, the audio signal will be distributed to all Receiver/RX units that are set to the same video channel. Each Receiver/RX unit will have a separate pair of power speakers connected to the Line out jack.
- Extender Mode: In extender mode, separate microphones can be connected to each Receiver (RX) unit. The audio signal coming from the microphone will be sent to the Transmitter (TX) unit on the same channel as the Receiver (RX) unit.

5.3 VIDEO PROFILE

The MediaCento IPX 4K provides two video profiles: Video mode and Graphic mode.

1. On the transmitter or receiver unit, press the "Select" button to make the "V. Profile" LED blink in order to select the Video Profile function.
2. Press the "SET/RESET" button to set the Video Profile to Video/Graphic mode.
3. "V. Profile" LED lights steady ON when the Video Profile is set to Video mode.
4. "V. Profile" LED is not lit when the Video Profile is set to Graphic mode.

By default, the units are set in "Video Mode." If the High-Definition signal is a video source, it will be displayed in optimal quality.



FIGURE 5-1. VIDEO MODE

CHAPTER 5: HARDWARE OPERATION

If the High-Definition signal is a Graphic Source (e.g. images, pattern generator, etc.), press the Video Mode button on the rear panel of Receiver (RX) until "Graphic Mode" is displayed in the foreground on the graphic image. Set the MediaCento IPX 4K to Graphic Mode to maintain the sharpest possible image.

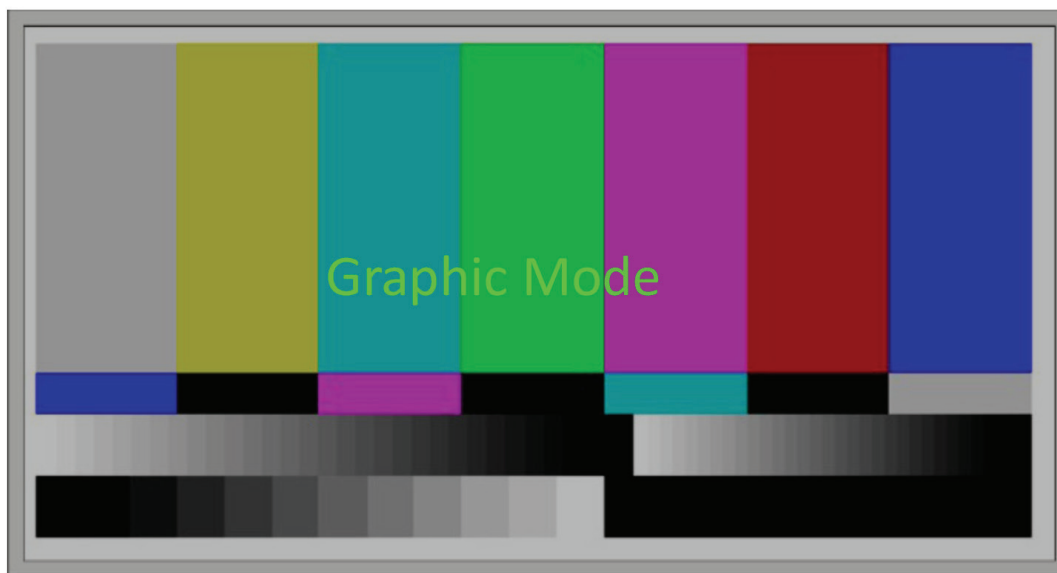


FIGURE 5-2. GRAPHIC MODE

5.4 HOTKEY VIDEO CHANNEL SWITCH ON RX SIDE

In addition to pushbutton, IR remote and Web UI, you can also use a keyboard connected to the receiver unit to switch the video channel in matrix mode.

Press "Scroll Lock" twice within 1 sec, and then type in the channel number to which you would like to switch the channel. The channel of RX is switched accordingly. For instance, press "Scroll Lock" twice within 1 sec, and then type in "99". The channel of RX is switched to channel 99.

NOTE: The keyboard MUST be connected to RX's USB port with keyboard/mouse symbol only.

NOTE: K/M over IP function of RX must be enabled.

CHAPTER 6: ACCESS TO WEB UI

1. Power on the Gigabit Switch and enable Jumbo Frame and IGMP.
2. Connect all Transmitter (TX) and Receiver (RX) units to the Gigabit Switch using CATx or fiberoptic cable to set up the matrix extension network.
3. Connect all Transmitters (TXs) with video sources, and all Receivers (RXs) with Display/TV/Monitor using HDMI cables.
4. Get a PC for executing the Web browser, and connect this control PC to the Gigabit Switch via CATx cable.
5. Connect an IR emitter cable to the transmitter's or receiver's IR Emitter Jack, and point the IR emitter to transmitter's or receiver's connected device's IR receiver window that you want to control.
6. Connect an IR Receiver cable to transmitter's or receiver's IR Receiver Jack, and point the IR receiver to transmitter's or receiver's connected device's IR remote.
7. Connect an RS-232 straight cable to the transmitter or receiver where an RS=232 controller or Display/TV/device can take RS-232 commands.

NOTE: If the transmitter's or receiver's RS-232 port and the device's RS-232 port are different gender, use a gender changer.

8. Plug-in a DC power adapter to all Transmitter (TX) and Receiver (RX). units, and power on the units.
9. Power on all Video Sources and start playing video.
10. Set the control PC's IP setting:
 - ♦ Select Internet Protocol Version 4 (TCP/IPv4)
 - ♦ IP address: 169.254.2.1 or the other IP address within 169.254.XXX.XXX
 - ♦ Netmask: 255.255.0.0

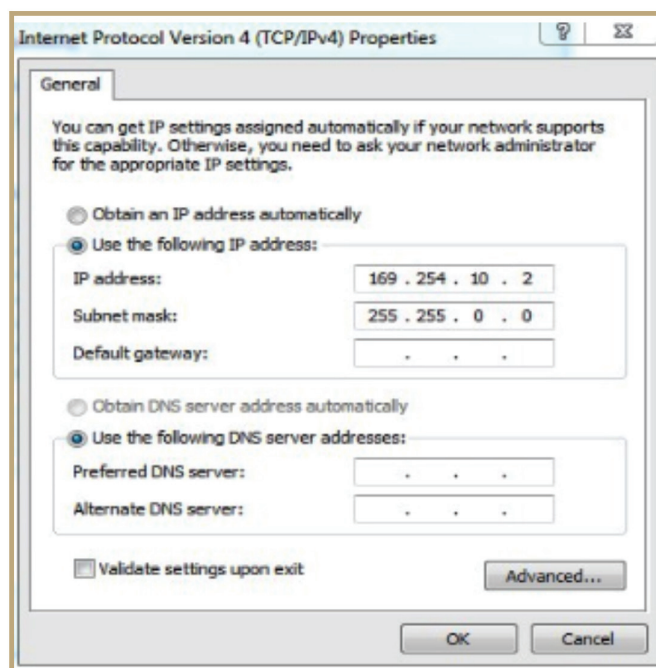


FIGURE 6-1. PROPERTIES SCREEN

CHAPTER 6: ACCESS TO WEB UI

11. Access the Web Interface Control Software.

A. Randomly select a receiver in the matrix extension network and unlink it

B. The OSD will immediately appear on the display connected to the selected receiver. The selected receiver's IP and MAC address are shown in the OSD.

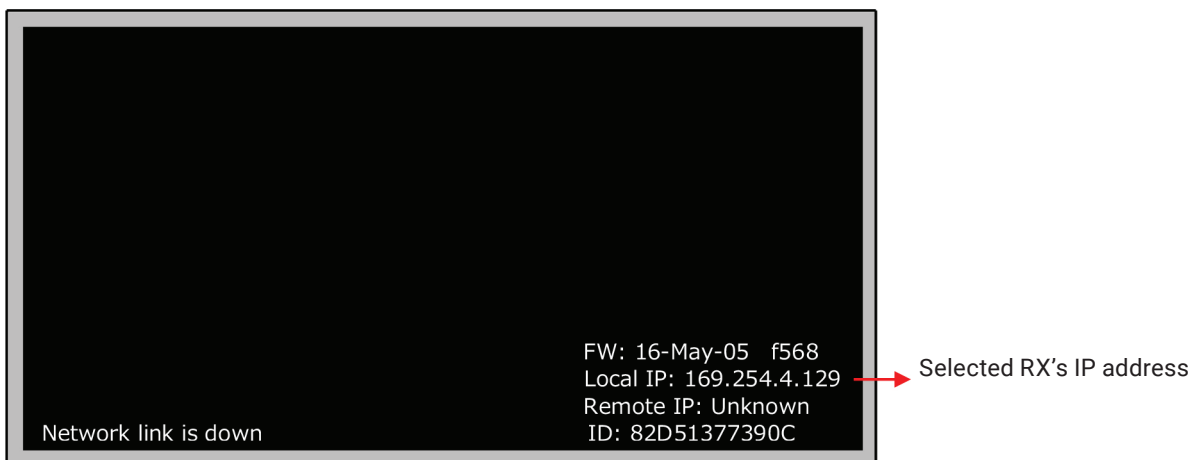


FIGURE 6-2. SELECTED RX'S IP ADDRESS

C. Re-link the selected receiver to matrix extension network by re-connecting the CATx or fiberoptic cable.

D. Access the Web browser via the control PC by using the selected RX's IP address shown in the OSD (<http://169.254.XXX.XXX/>).

E. When the access is done, the home page of Web Interface Control Software will appear.

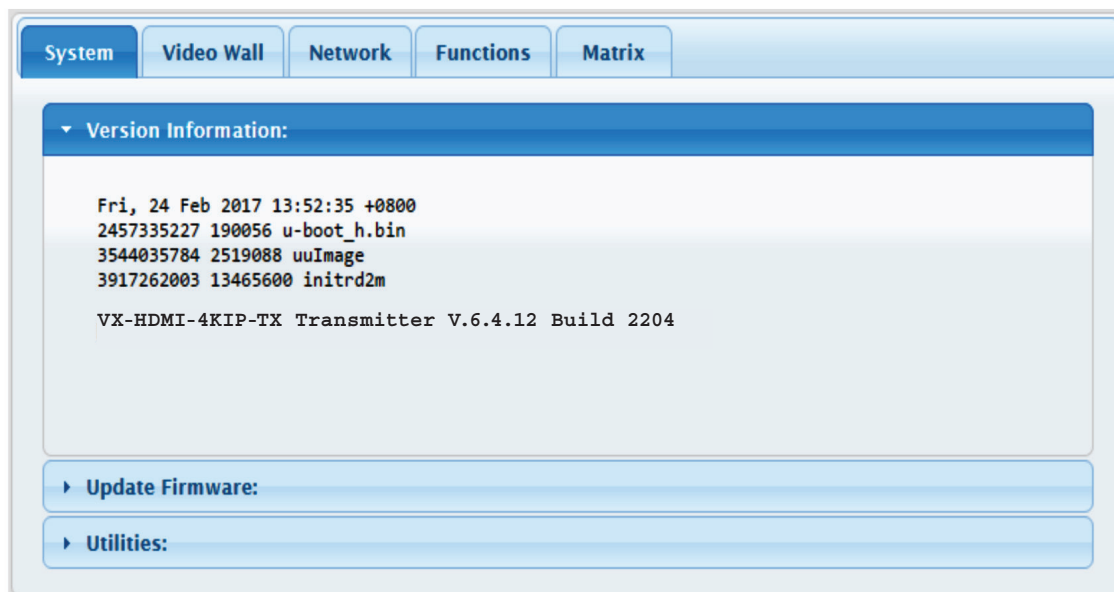


FIGURE 6-3. HOME PAGE

CHAPTER 7: OPERATION FOR WEB UI

7.1 CONFIGURING IP MODE

By default, the transmitter unit (TX) and the receiver unit (RX) are set to be in DHCP Mode, automatically showing the default IP and subnet mask. If a DHCP server is not available, the device will automatically use IP addresses at 169.254.xxx.xxx range with subnet mask 255.255.0.0.

You do not need to change it unless you know what IP address you can assign to this device.

To assign the static IP, all transmitters and receivers need to be at same IP domain and corresponding subnet mask.

The screenshot displays the 'Network' configuration page. At the top, there are navigation tabs: 'System', 'Video Wall', 'Network' (selected), 'Functions', and 'Matrix'. Below the tabs, the 'IP Setup' section contains a radio button for 'DHCP' (selected) and a radio button for 'Static'. Below this, there are three input fields: 'IP Address' with the value '169.254.13.78', 'Subnet Mask' with '255.255.0.0', and 'Default Gateway' with '0.0.0.0'. An 'Apply' button is located at the bottom right of this section. The 'Device Mode' section below it has two radio buttons: 'Matrix' (selected) and 'Extender'. There is also a checked checkbox for 'Enable Jumbo Frame (recommended)'. An 'Apply' button is also present at the bottom right of the Device Mode section.

FIGURE 7-1. IP MODE SCREEN

When you apply new settings, reboot the unit to take effect. To reboot the TX unit or RX unit:

1. Press the "SET/RESET" button on the unit for 3 seconds.

OR

2. Click the Reboot button on the Web interface.

CHAPTER 7: OPERATION FOR WEB UI

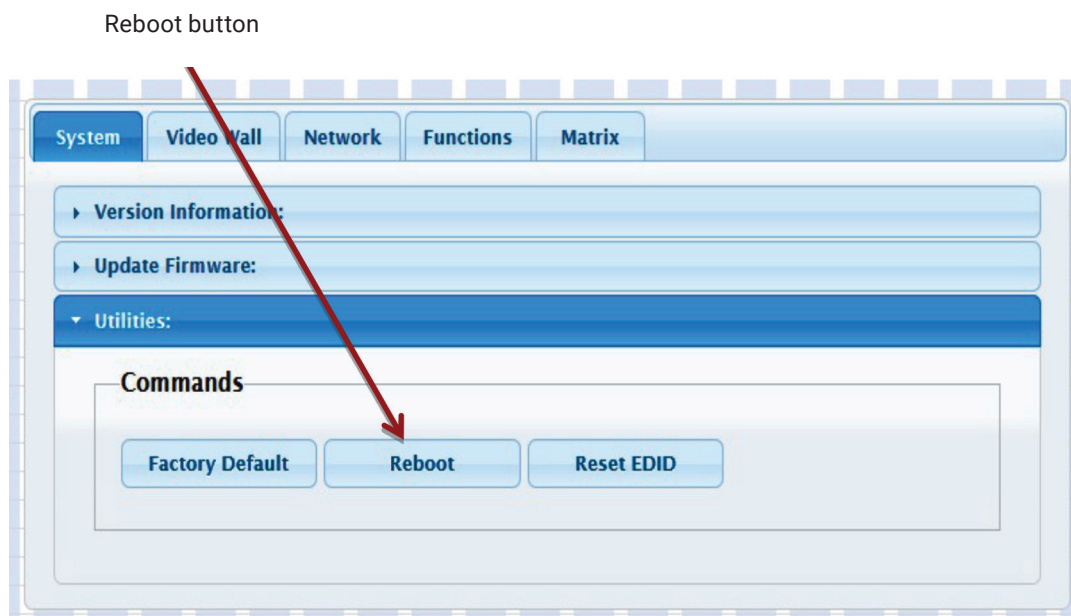


FIGURE 7-2. REBOOT BUTTON ON WEB UI

7.2 DEVICE MODE OF EXTENSION APPLICATION

The Extension application has two device modes: Matrix and Extender. In Matrix mode, multiple Receiver (RX) units can receive signals from multiple (or a single) Transmitter (TX) units in the same network. In Extender mode, only a single Receiver (RX) unit can receive signals from Transmitter (TX) unit with the same channel. By default, the Extension Application is configured to Matrix Mode.

7.2.1 HOW TO CHANGE TO EXTENDER MODE

1. By default, the Device Mode of TX and RX unit is Matrix Mode.
2. Click the Network tab and click Extender button. When selected, the Extender button will be highlighted in blue, and then click the Apply button.

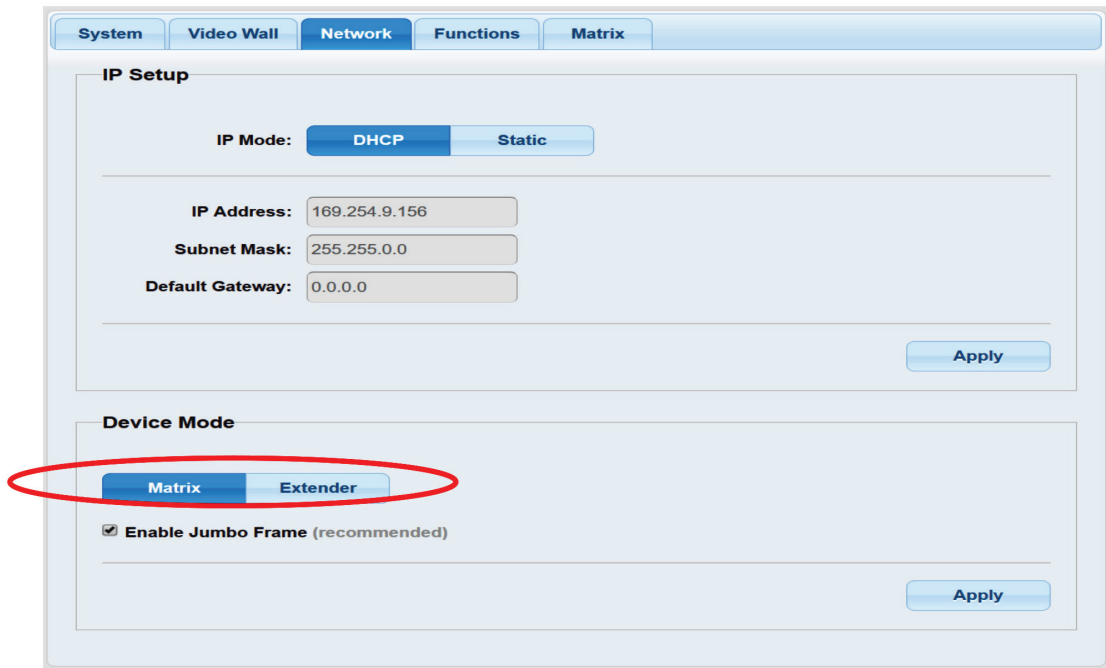


FIGURE 7-3. DEVICE MODE SCREEN

3. A message will be displayed, indicating that the casting mode has been applied to the TX unit.

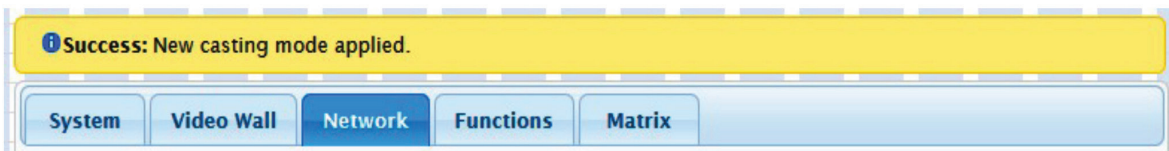


FIGURE 7-4. CASTING MODE MESSAGE

4. After a few seconds, another message will be displayed stating that the TX unit must be rebooted. Reboot the transmitter and the new setting will take effect.

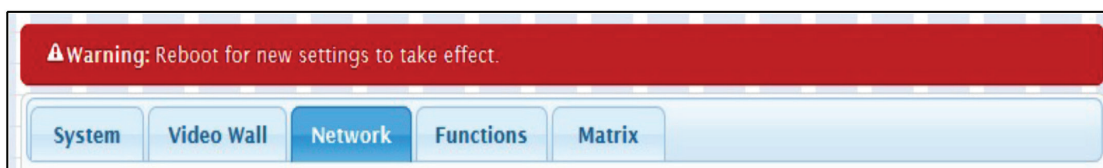


FIGURE 7-5. REBOOT MESSAGE

CHAPTER 7: OPERATION FOR WEB UI

5. Reboot the TX unit by one of these methods:

Press the "Set/Reset" on the TX unit for 3 seconds.

OR

Click the Reboot button on the Web interface.

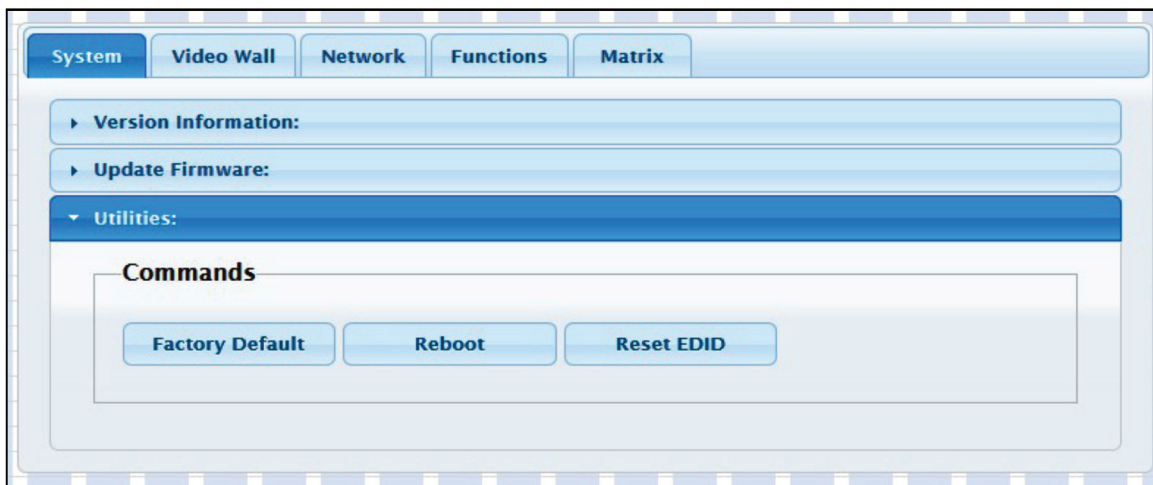


FIGURE 7-6. SET/RESET AND REBOOT BUTTON ON THE WEB UI

6. Repeat steps 1 through 5 in sequence for each TX and RX on the network.

7.2.2 HOW TO CHANGE TO MATRIX MODE

1. Click the Network tab and click Matrix button. When selected, the Matrix button will be highlighted in blue, and then click the Apply button.

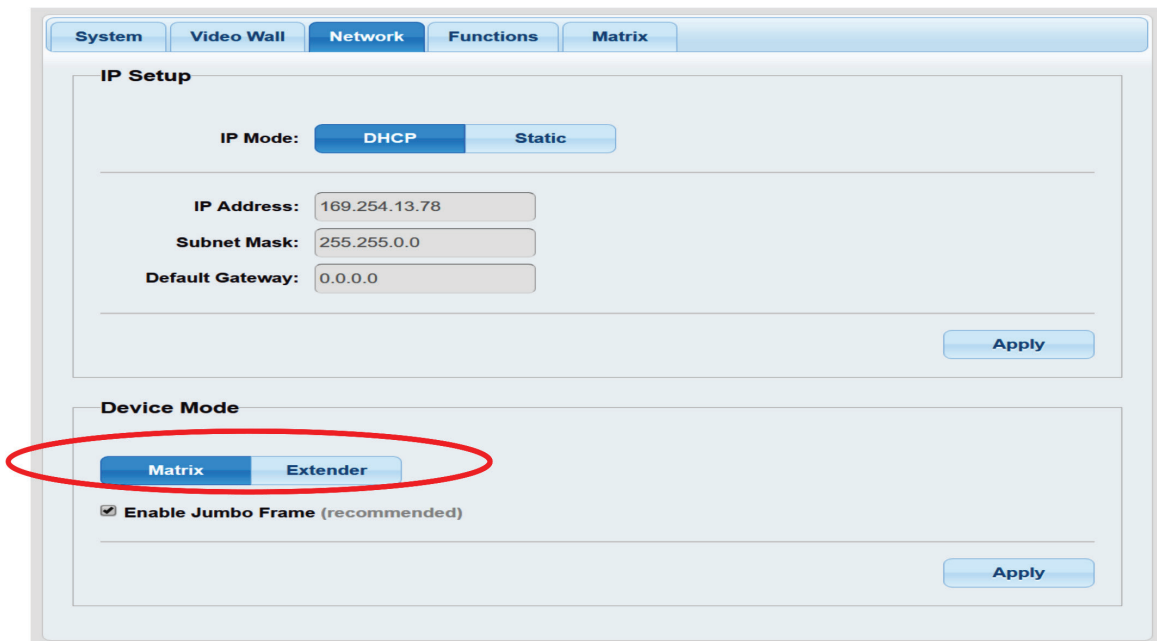


FIGURE 7-7. DEVICE MODE SCREEN, MATRIX MODE

2. The IP Mode has to be assigned to either DHCP or Static mode.

CAUTION: With any changes in device modes or channel setting changes, you **MUST REBOOT** each Transmitter (TX) and Receiver (RX) unit for the new settings to take effect.

CHAPTER 7: OPERATION FOR WEB UI

7.3 JUMBO FRAME REQUIREMENT FOR THE LINK BETWEEN TX AND RX

- ◆ Check “Enable Jumbo Frame (recommended)” and click “Apply” to add this requirement.
- ◆ Uncheck “Enable Jumbo Frame (recommended)” and click “Apply” to remove this requirement.
- ◆ Make all TXs and RXs in the network on the same status for this requirement.

The screenshot displays a web interface for network configuration. At the top, there are tabs for 'System', 'Video Wall', 'Network', 'Functions', and 'Matrix'. The 'Network' tab is selected. Below the tabs, there are two main sections: 'IP Setup' and 'Device Mode'. In the 'IP Setup' section, 'IP Mode' is set to 'DHCP'. Below this, there are input fields for 'IP Address' (169.254.13.78), 'Subnet Mask' (255.255.0.0), and 'Default Gateway' (0.0.0.0). An 'Apply' button is located at the bottom right of this section. In the 'Device Mode' section, there are two radio buttons: 'Matrix' (selected) and 'Extender'. Below these, the checkbox 'Enable Jumbo Frame (recommended)' is checked and circled in red. An 'Apply' button is also present at the bottom right of this section.

FIGURE 7-8. ENABLE JUMBO FRAMES

CHAPTER 7: OPERATION FOR WEB UI

7.4 AUTOMATICALLY COPY EDID OF RX'S DISPLAY

1. By default, in Matrix device mode for a TX/RX link, EDID copy doesn't automatically perform when an TX/RX link is established every time or the display connecting to RX is changed. This function allows EDID copy to automatically perform based on the specified RX's display in Matrix device mode.
2. Log in to the Web UI of the specified RX for which this function is to be enabled.
3. Check "Automatically Copy EDID from this Receiver Video Output" and click "Apply" to enable this function.

The screenshot displays the 'Functions' tab in the Web UI, which is divided into three sections: 'Video over IP', 'USB over IP', and 'Serial over IP'. The 'Automatically Copy EDID from this Receiver Video Output' checkbox is highlighted with a red circle. Below this, the 'Scaler Output Mode' is set to 'Auto Detect (Per EDID)', and the 'Timeout for Detecting Video Lost' is set to '10 seconds'. The 'Turn off screen on video lost' checkbox is unchecked. The 'Video Orientation' is set to 'Standard'. The 'USB over IP' section has 'Enable USB over IP' checked and 'K/M over IP' checked. The 'Serial over IP' section has 'Enable Serial over IP' checked, and the 'Baudrate Setting' is configured with Baudrate: 115200, Data bits: 8, Parity: None, and Stop bits: 1. Each section has an 'Apply' button.

Section	Option	Value
Video over IP	Enable Video over IP	Checked
	Enable Video Wall	Checked
	Automatically Copy EDID from this Receiver Video Output	Unchecked (highlighted)
	Scaler Output Mode	Auto Detect (Per EDID)
	Timeout for Detecting Video Lost	10 seconds
USB over IP	Enable USB over IP	Checked
	K/M over IP	Checked
Serial over IP	Enable Serial over IP	Checked
	Baudrate	115200
	Data bits	8
	Parity	None
	Stop bits	1

FIGURE 7-9. COPY EDID

CHAPTER 7: OPERATION FOR WEB UI

7.5 OUTPUT VIDEO SCALING IN RX

This function allows the specified RX scaling its output video based on the resolution settings. The default setting is “Auto Detect (Per EDID)” which means the RX’s output video is automatically scaled up/down based on the EDID of the display connecting to RX. “Pass-Through” mode means RX directly outputs the video without any scaling.

Select the needed setting and click “Apply” to activate it.

The screenshot displays the 'Functions' tab of the RX web interface. The 'Video over IP' section is active, showing several configuration options. The 'Scaler Output Mode' dropdown menu is open, with 'Auto Detect (Per EDID)' selected and circled in red. Other options in the dropdown include 'Pass-Through', 'Auto Detect (Per EDID)', 'Full HD 1080p60', 'Full HD 1080p50', 'Ultra HD 2160p30', 'Ultra HD 2160p25', and 'Customize'. Below the dropdown, there is a 'Timeout for Detecting' field and a 'Turn off screen on' checkbox. The 'Video Orientation' section shows 'Standard' selected, with buttons for '90°', '180°', and '270°'. The 'USB over IP' section has 'Enable USB over IP' checked and 'Compatibility Mode' set to 'K/M over IP'. The 'Serial over IP' section has 'Enable Serial over IP' checked and 'Baudrate Setting' fields for Baudrate (115200), Data bits (8), Parity (None), and Stop bits (1). Each section has an 'Apply' button.

FIGURE 7-10. OUTPUT VIDEO SCALING IN RX

CHAPTER 7: OPERATION FOR WEB UI

7.6 LAST IMAGE OUTPUT TIME FOR SOURCE CONTENT LOST

When the TX's source content is lost, the RX's video output will be frozen in the last image for a time period from 3 sec to 60 sec. Select the needed time and click "Apply" to activate it.

The screenshot shows the 'Functions' tab in the web UI. Under the 'Video over IP' section, the following settings are visible:

- Enable Video over IP
- Enable Video Wall
- Automatically Copy EDID from this Receiver Video Output
- Scaler Output Mode: Pass-Through
- Timeout for Detecting Video Lost: 3 seconds (dropdown menu is open with options: 3 seconds, 5 seconds, 10 seconds, 20 seconds, 30 seconds, 60 seconds, Never Timeout)
- Turn off screen on video lost
- Video Orientation: Standard, 90°, 180°, 270°

Below the Video over IP section, the 'USB over IP' section is also visible:

- Enable USB over IP
- Compatibility Mode:
 - K/M over IP (Uncheck when mouse/keyboard/touch panel not working as expected)

The 'Serial over IP' section is also visible:

- Enable Serial over IP
- Baudrate Setting:
 - Baudrate: 115200
 - Data bits: 8
 - Parity: None
 - Stop bits: 1

FIGURE 7-11 TIMEOUT FOR LOST CONTENT

CHAPTER 7: OPERATION FOR WEB UI

7.7 OUTPUT VIDEO ROTATION IN RX

The output video of the individual RX can rotate by 90°, 180° and 270°.

The screenshot displays the 'Functions' tab of a web interface. The 'Video over IP' section is active, showing several settings: 'Enable Video over IP' (checked), 'Enable Video Wall' (checked), 'Automatically Copy EDID from this Receiver Video Output' (unchecked), 'Scaler Output Mode' (Pass-Through), 'Timeout for Detecting Video Lost' (10 seconds), and 'Turn off screen on video lost' (unchecked). Below these settings, the 'Video Orientation' is set to 'Standard', with '90°', '180°', and '270°' options also visible. A red oval highlights the 'Video Orientation' section. Below this, the 'USB over IP' section shows 'Enable USB over IP' (checked) and 'Compatibility Mode' with 'K/M over IP' (checked). The 'Serial over IP' section shows 'Enable Serial over IP' (checked) and 'Baudrate Setting' with 'Baudrate' (115200), 'Data bits' (8), 'Parity' (None), and 'Stop bits' (1). Each section has an 'Apply' button.

FIGURE 7-12. VIDEO ORIENTATION

CHAPTER 7: OPERATION FOR WEB UI

7.8 SERIAL (RS-232) OVER IP EXTENSION

The MediaCento IPX 4K supports RS-232 passthrough, allowing the control of remote RS-232 devices (near the Receiver/RX unit) from the source (Transmitter/TX unit) 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 Transmitter/TX and Receiver/RX units that are being used to control the RS-232 client.

1. Access the Web Interface Control Software using the RX's IP address `http://169.254.XXX.XXX/`.
2. Click the Functions tab and locate the Serial over IP section.
3. Make sure that the Enabled Serial over IP box is checked as shown in the screen.

The screenshot displays the 'Functions' tab of the Web Interface Control Software. It is divided into three sections: 'Video over IP', 'USB over IP', and 'Serial over IP'. In the 'Serial over IP' section, the 'Enable Serial over IP' checkbox is checked and highlighted with a red circle. Below it, the 'Baudrate Setting' section includes dropdown menus for Baudrate (115200), Data bits (8), Parity (None), and Stop bits (1). Each section has an 'Apply' button.

FIGURE 7-13. ENABLE SERIAL OVER IP BOX CHECKED

CHAPTER 7: OPERATION FOR WEB UI

4. After selecting the needed value, click the Apply button.
5. Reboot to have the new setting take effect.
6. Repeat the above steps in the TX on the link.

The screenshot shows a web interface with a navigation bar at the top containing tabs for 'System', 'Video Wall', 'Network', 'Functions', and 'Matrix'. The 'Functions' tab is selected. Below the navigation bar, there are three main sections:

- Video over IP:** Contains a checked checkbox for 'Enable Video over IP', a checked checkbox for 'Enable Video Wall', a 'Maximum Bit Rate' dropdown menu set to 'Best Effort', and a 'Maximum Frame Rate' slider set to 'Capture up to 100% of frames'. An 'Apply' button is at the bottom right.
- USB over IP:** Contains a checked checkbox for 'Enable USB over IP', a 'Compatibility Mode' section with two options: 'Mouse not responding well (Check when USB mouse responding is slow and queer)' (unchecked) and 'K/M over IP (Uncheck when mouse/keyboard/touch panel not working as expected)' (checked). An 'Apply' button is at the bottom right.
- Serial over IP:** Contains a checked checkbox for 'Enable Serial over IP' (circled in red), a 'Baudrate Setting' section with four dropdown menus: 'Baudrate' (115200), 'Data bits' (8), 'Parity' (None), and 'Stop bits' (1). An 'Apply' button is at the bottom right.

FIGURE 7-14. REPEAT STEPS

CHAPTER 7: OPERATION FOR WEB UI

7.9 USB OVER IP EXTENSION

When connecting USB devices to the MediaCentro IPX 4K, the functionality is similar to video and RS-232.

1. Extender Mode: In Extender mode, only a single Receiver (RX) will be able to communicate with a Transmitter (TX).
The USB control is communication directly between Transmitter (TX) and Receiver (RX).
2. Matrix Mode: In Matrix mode, the USB host device can be controlled from one of multiple Receiver (RX) units at a time.
The USB link controls each Receiver/RX in order to enable USB on each RX. In matrix mode, the MediaCentro IPX 4K behaves like a USB hub.

7.10 MATRIX CONNECTION MANAGEMENT W/ DISPLAYING TX'S SOURCE CONTENT

1. Set up a matrix extension network by connecting all TXs and RXs to a Gigabit Switch Hub (supporting IGMP, 8K jumbo frame) with CATx cable.
2. Also connect a PC to the same Gigabit Switch Hub with CATx cable. Set this PC's IP domain and subnet mask to be 169.254.XXX.XXX and 255.255.0.0 under Internet Protocol Version 4 (TCP/IPv4).
3. Unlink an RX from the network and get this RX's IP and MAC address shown on the display connected to this RX as follows.
Use this RX's IP address <http://169.254.XXX.XXX/> to access the Web UI (Web Interface Control Software).
4. Re-link the RX to the network.

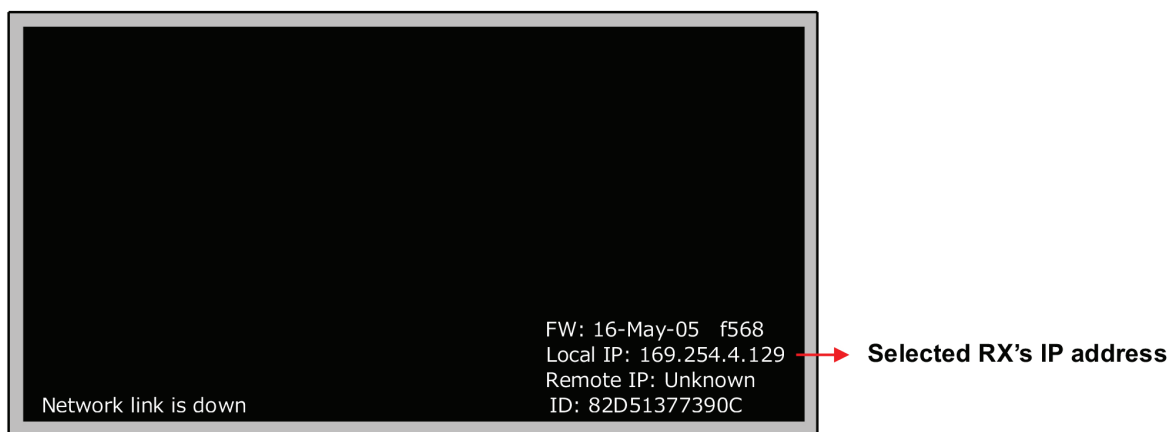


FIGURE 7-15. SELECTED RX'S IP ADDRESS

5. Make sure to set all TXs and RXs to be in Matrix mode (default setting is Matrix mode).
6. Click the "Matrix" Tab in Web UI, and then the matrix connection grid table appears.
7. In the grid table, click the blank space mapped to the coordinate of TX (horizontal row, named with Channel##) and RX (vertical column, named with Receiver: #) to which you will connect.
8. The blank space clicked for a connection will turn to green.
9. Click the "Apply" button to set the connection.
10. Click the "Refresh" button to display the updated status of all TXs and RXs in the matrix extension network.
11. Check "Show OSD" function to show the index number of the display connected to RX.
12. Uncheck "Show OSD" function to remove the index number of display connected to RX.

CHAPTER 7: OPERATION FOR WEB UI

13. In the grid table, there is a hyperlink to each TX's or RX's Web UI, which is embedded in "Channel##" (standing for TX in the matrix extension network) or "Receiver: #" (standing for RX in the matrix extension network). Point the mouse cursor to any "Channel##" or "Receiver: #" and click the right button of mouse to access the Web UI accordingly.

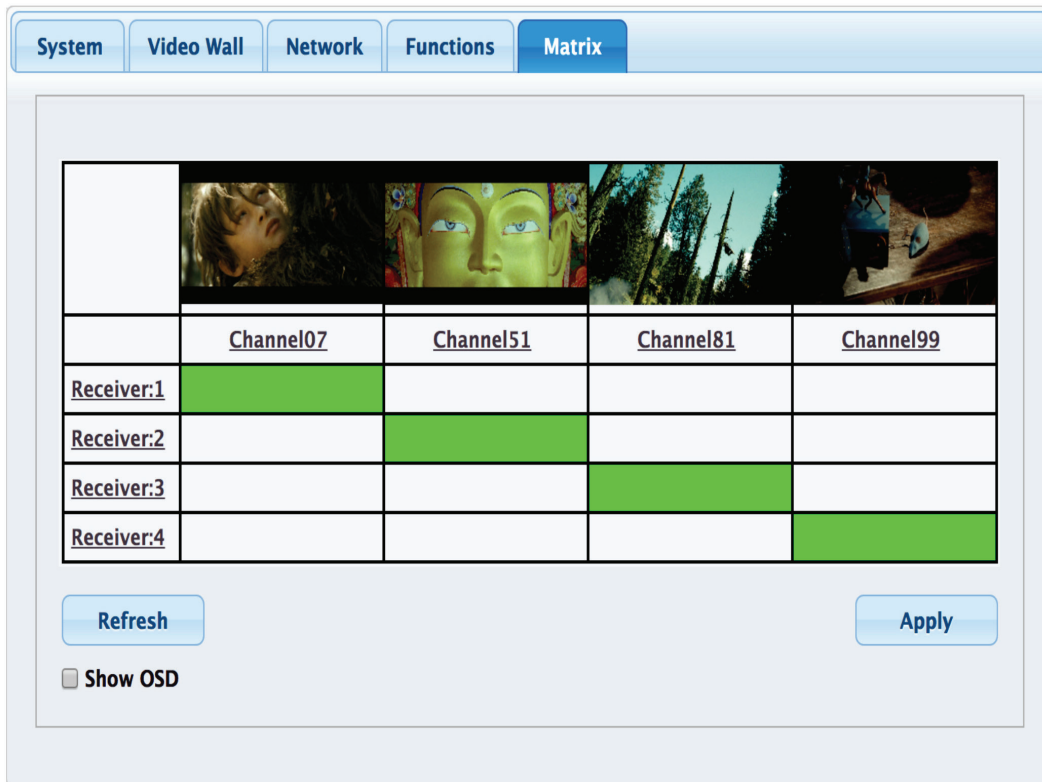


FIGURE 7-16. GRID TABLE

CHAPTER 7: OPERATION FOR WEB UI

7.11 VIDEO WALL

1. Set up a matrix extension network by connecting all TXs and RXs to a Gigabit Switch Hub (supporting IGMP, 8K jumbo frame) with CATx cable.
2. Connect a PC to the same Gigabit Switch Hub with CATx cable. Set this PC's IP domain and subnet mask to be 169.254.XXX.XXX and 255.255.0.0.
3. Make sure and set all TXs and RXs to be in Matrix mode (default setting is Matrix mode).
4. Click the "Video Wall" Tab in Web UI, and then the video wall control panel appears.

The screenshot shows the Video Wall Control Panel in a web UI. The panel has tabs for System, Video Wall, Network, Functions, and Matrix. The Video Wall tab is active. Under "Basic Setup", there is a "Bezel and Gap Compensation" section with input fields for OW, OH, VW, and VH, all set to 1. A diagram shows a monitor with dimensions OW, OH, VW, and VH. Below this is a "Preferences" section with a "Stretch Type" dropdown set to "Fit In". The "Wall Size and Position Layout" section has "Vertical Monitor Count" and "Horizontal Monitor Count" dropdowns both set to 1, a "Show OSD" checkbox, and a diagram of a single monitor.

FIGURE 7-17. VIDEO WALL CONTROL PANEL

CHAPTER 7: OPERATION FOR WEB UI

5. The following is the setting procedure.

STEP 1: Set common values of all devices.

1A. Set Bezel and Gap Compensation

- ◆ This step is used to configure the bezel and gap compensation. If you do not need this, just set all values to 0.
- ◆ Follow the picture and input the size of the monitor used. Note that the unit is 0.1 mm and the value MUST be an integer.

The screenshot shows the 'Basic Setup' section of the web UI. It contains four input fields for OW, OH, VW, and VH, all set to 1. A diagram to the right shows a monitor with dimensions OW, OH, VW, and VH. The Preferences section has a Stretch Type dropdown set to Fit In. The Wall Size and Position Layout section has Vertical Monitor Count and Horizontal Monitor Count dropdowns set to 1, and a Show OSD checkbox. A red circle highlights the OW, OH, VW, and VH input fields.

FIGURE 7-18. BEZEL AND GAP COMPENSATION SCREEN

CHAPTER 7: OPERATION FOR WEB UI

1B. Set Wall Size

- ◆ Set "Vertical Monitor Count" from 1 to 8 based on the application
- ◆ Set "Horizontal Monitor Count" from 1 to 8 based on the application

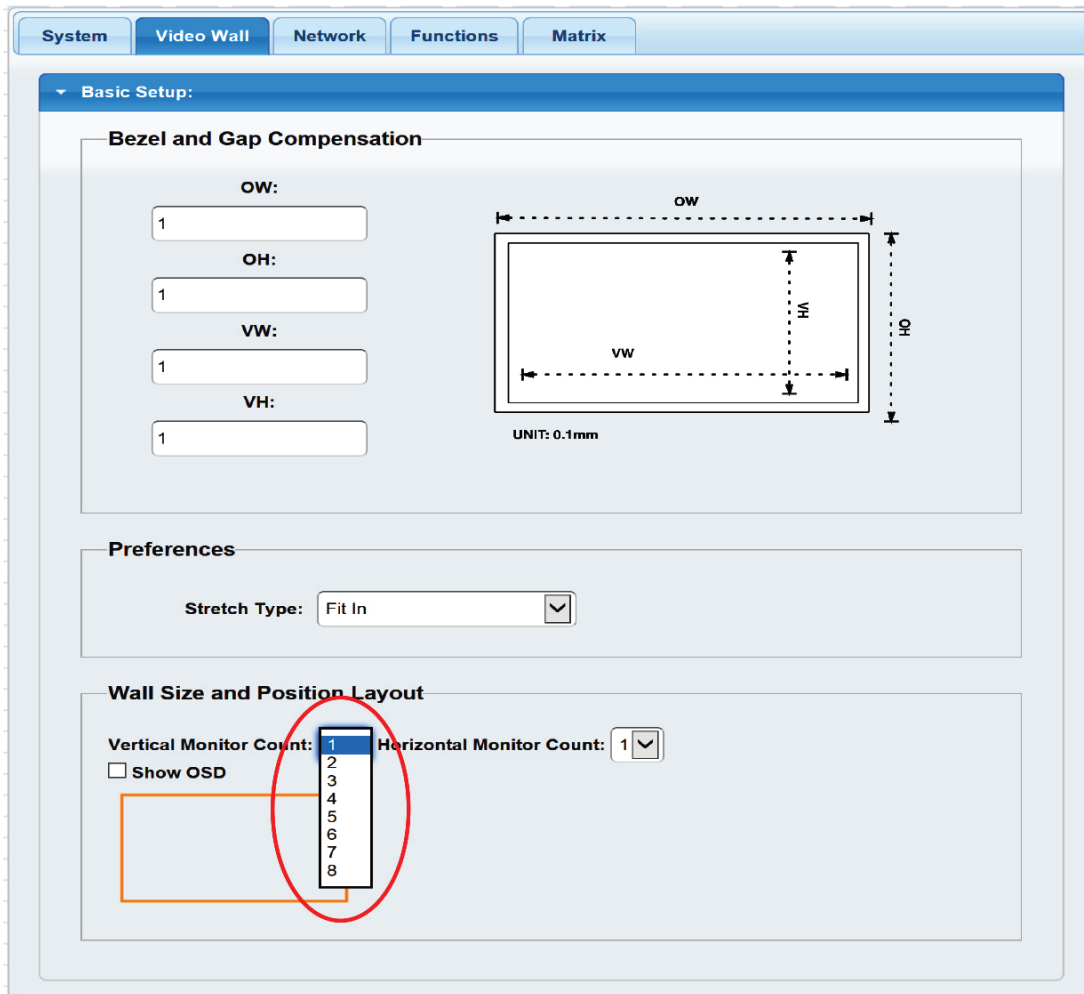


FIGURE 7-19. SET VERTICAL MONITOR COUNT SCREEN

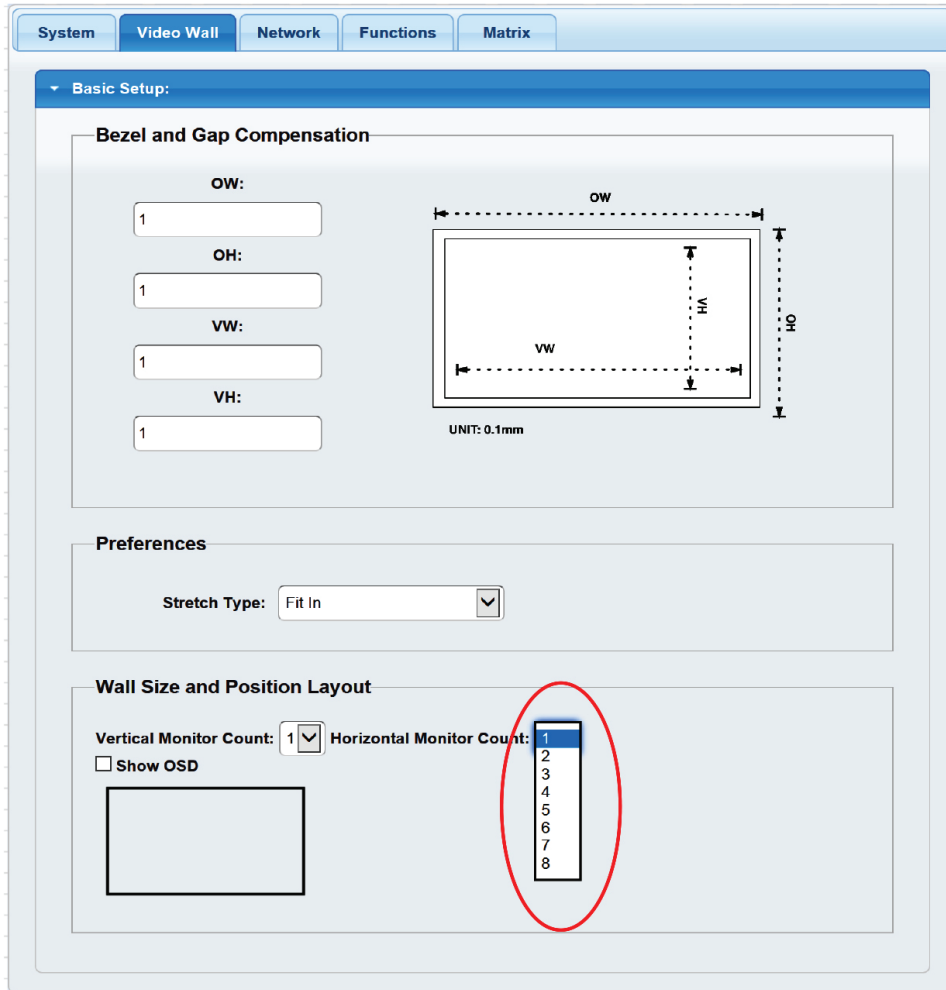


FIGURE 7-20. SET HORIZONTAL MONITOR COUNT SCREEN

CHAPTER 7: OPERATION FOR WEB UI

STEP 2: Setup Row and Column Position for Each Display attached to RX

2A. Check "Show OSD" to show the index number on each RX's display in order to identify each RX.

2B. After setting the video wall size, move the mouse cursor to each display diagram, and click the right button of the mouse to assign the RX mapped to the display's position in video wall.

The screenshot displays the 'Video Wall' configuration interface. At the top, there are tabs for 'System', 'Video Wall', 'Network', 'Functions', and 'Matrix'. The 'Basic Setup' section is expanded, showing three sub-sections:

- Bezel and Gap Compensation:** Contains four input fields for OW, OH, VW, and VH, each with the value '1'. To the right is a diagram of a video wall with dimensions OW (Overall Width), OH (Overall Height), VW (Video Width), and VH (Video Height). Below the diagram is the text 'UNIT: 0.1mm'.
- Preferences:** Contains a 'Stretch Type' dropdown menu set to 'Fit In'.
- Wall Size and Position Layout:** Contains two dropdown menus for 'Vertical Monitor Count' and 'Horizontal Monitor Count', both set to '1'. There is a checked checkbox for 'Show OSD' and a 'Select Receiver' dropdown menu highlighted with an orange box.

FIGURE 7-21. SET VIDEO WALL SIZE

2C. Go through all RXs one by one by following the above steps.

APPENDIX A. FIBER MODULES AND CABLES

A 1000-Mbps SFP fiber transceiver is used for high-speed connection expansion.

- ◆ 1000-Mbps LC, multimode SFP fiber transceiver
- ◆ 1000-Mbps LC, single-mode 10 km SFP fiber transceiver



APPENDIX B: REGULATORY INFORMATION

B.1 CE AND ROHS2

This product complies with CE and ROHS2 certifications.



APPENDIX B: REGULATORY INFORMATION

B.2 NOM STATEMENT

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
 - A: El cable de poder o el contacto ha sido dañado; u
 - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
 - C: El aparato ha sido expuesto a la lluvia; o
 - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
 - E: El aparato ha sido tirado o su cubierta ha sido dañada.



APPENDIX C: DISCLAIMER/TRADEMARKS

C.1 DISCLAIMER

Black Box Corporation shall not be liable for damages of any kind, including, but not limited to, punitive, consequential or cost of cover damages, resulting from any errors in the product information or specifications set forth in this document and Black Box Corporation may revise this document at any time without notice.

C.2 TRADEMARKS USED IN THIS MANUAL

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Any other trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.



NOTES

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NOTES

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