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**CHAPTER 1: SPECIFICATIONS**

### TABLE 1-1. SPECIFICATIONS

<table>
<thead>
<tr>
<th>SPECIFICATION</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Connectors</strong></td>
<td></td>
</tr>
</tbody>
</table>
| 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** | Supports high-definition audio (HD) 5.1/6.1/7.1 surround sound:  
| Transmitter and Receiver | 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

<table>
<thead>
<tr>
<th>SPECIFICATION</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Additonal Specs</strong></td>
<td></td>
</tr>
<tr>
<td>DDC Supported</td>
<td>DDC, DDC2, DDC2B</td>
</tr>
<tr>
<td>Extension Cable Type and Length</td>
<td>Ethernet, CAT5e/6 up to 328 ft. (100 m), Fiberoptic (SFP module), single-mode, up to 30 km</td>
</tr>
<tr>
<td>Maximum Video Resolution</td>
<td>Up to 4096 x 2160 @ 30 Hz</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td></td>
</tr>
<tr>
<td>Power Supply</td>
<td>(1) 5-VDC, 3-A power supply</td>
</tr>
<tr>
<td>Power over Ethernet (PoE)</td>
<td>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)</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32 to 122° F (0 to 50° C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-4 to +140° F (-20 to +60° C)</td>
</tr>
<tr>
<td>Humidity</td>
<td>0 to 80% relative humidity</td>
</tr>
<tr>
<td><strong>Mechanical</strong></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>1.25&quot;H x 3.58&quot;W x 7.34&quot;D (3.2 x 9.8 x 18 cm)</td>
</tr>
<tr>
<td>Weight</td>
<td>Transmitter: 1.034 lb. (470 g), Receiver: 1.036 lb. (471 g)</td>
</tr>
<tr>
<td>Housing Material</td>
<td>Metal Chassis</td>
</tr>
</tbody>
</table>

## TABLE 1-2. COMPATIBLE SFPS

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFP411</td>
<td>SFP, 1250-Mbps Fiber with Extended Diagnostics, 850-nm Multimode, 550 m LC</td>
</tr>
<tr>
<td>LFP412</td>
<td>SFP, 1250-Mbps Fiber with Extended Diagnostics, 1310-nm Multimode, 2 km LC</td>
</tr>
<tr>
<td>LFP413</td>
<td>SFP, 1250-Mbps Fiber with Extended Diagnostics, 1310-nm Single-Mode, 10 km LC</td>
</tr>
<tr>
<td>LFP414</td>
<td>SFP, 1250-Mbps Fiber with Extended Diagnostics, 1310-nm Single-Mode, 30 km LC</td>
</tr>
<tr>
<td>LFP418</td>
<td>SFP, 1250-Mbps Fiber with Extended Diagnostics, 1550-nm Single-Mode, 80 km, LC</td>
</tr>
</tbody>
</table>

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 MediaCento 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

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

MediaCento IPX 4K Receiver (VX-HDMI-4KIP-RX) includes:
- (1) MediaCento 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](image)

<table>
<thead>
<tr>
<th>NUMBER IN FIGURE 2-1</th>
<th>COMPONENT</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Serial over IP: RS-232 extension port</td>
<td>Connects to source device’s RS-232 port</td>
</tr>
<tr>
<td>2a</td>
<td>Power On status LED</td>
<td>Lights steady when power on sequence is completed</td>
</tr>
</tbody>
</table>
| 2b                   | Link LED for LAN link status | • 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 | • 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 | Press to set a function, reset system, or reset to default  
| | | • Short press for setting the following functions  
| | | - 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

<table>
<thead>
<tr>
<th>NUMBER IN FIGURE 2-1</th>
<th>COMPONENT</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| 3b                   | Select button | Select EDID, video profile, or video channel  
• 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   | Indicates EDID update status  
• 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 | Indicates video/graphic mode  
• 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 | 7-segment LED display for Video Channel indication  
• 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.

![Transmitter Back Panel](image)

**FIGURE 2-2. TRANSMITTER BACK PANEL**
### TABLE 2-2. TRANSMITTER BACK PANEL COMPONENTS

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

**TABLE 2-3. RECEIVER FRONT PANEL COMPONENTS**

<table>
<thead>
<tr>
<th>NUMBER IN FIGURE 2-3</th>
<th>COMPONENT</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Serial over IP: RS-232 extension port</td>
<td>Connects to sink device’s RS-232 port</td>
</tr>
<tr>
<td>2a</td>
<td>Power On status LED</td>
<td>Lights steady when power on sequence is completed</td>
</tr>
</tbody>
</table>
| 2b                   | Link LED for LAN link status | • 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 | • 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 | Press to set a function, reset system, or reset to default
  • Short press for setting the following functions
    - 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>
<thead>
<tr>
<th>NUMBER IN FIGURE 2-3</th>
<th>COMPONENT</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| 3b                   | Select button | Select EDID, video profile, or video channel  
• 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 | Indicates EDID update status  
• 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 | Indicates USB link status  
• 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 | Indicates video/graphic mode  
• 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 | 7-segment LED display for Video Channel indication  
• 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**

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

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).

![Diagram of one-to-one mapping extension](image)

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

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.

![Graphic Mode](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
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.

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.
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.

![IP Mode Screen](image)

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

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.
CHAPTER 7: OPERATION FOR WEB UI

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

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.
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.

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.

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.

FIGURE 7-8. ENABLE JUMBO FRAMES
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.
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.

FIGURE 7-10. OUTPUT VIDEO SCALING IN RX
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.

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°.

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.

![Image of Serial over IP section of the MediaCento IPX 4K Web Interface Control Software](image-url)

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.

FIGURE 7-14. REPEAT STEPS
7.9 USB OVER IP EXTENSION

When connecting USB devices to the MediaCento 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 MediaCento 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.

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.
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](image)
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.

FIGURE 7-17. VIDEO WALL CONTROL PANEL
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.

![Bezel and Gap Compensation Screen](image-url)
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.

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 bloquear 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 deberá 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 guizados 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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