



## PU-442PL-KIT

4x4 HDBaseT Lite Matrix with PoE, plus 2 Additional  
Independent HDMI Zone Outputs (total 4 x 6 Matrix)

**OPERATION MANUAL**



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## SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply.

Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.
- Do not attach the power supply cabling to building surfaces.
- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.
- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.
- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.

## REVISION HISTORY

VERSION NO.	DATE	SUMMARY OF CHANGE
v1.00	16/12/2013	First release
v1.01	17/12/2013	Corrected description/features
v1.02	13/01/2014	Added new image/description
v1.03	29/03/2014	Updated RS-232 Commands/Diagram

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## 1. INTRODUCTION

This 4 by 6 HDBaseT™ Lite Matrix utilises four HDMI inputs and four HDBaseT outputs over a single CAT5e/6/7 cable (up to 60m) for each output, plus two additional HDMI outputs. All six outputs are independent allowing any source to be distributed to any output. The HDBaseT outputs feature Power over Ethernet (PoE) functionality and allow the user to power the supplied PU-515PL-RX receivers without the need for a separate mains power supply.

The PU-442PL-KIT supports the transmission of video (resolutions up to 1080p Full HD and 1920x1200@60Hz), PoE, 2-way IR, multi-channel digital audio, and control via IR, RS-232, or Web GUI/Telnet IP. Use the IP control feature to enable users to access and control the matrix remotely and also allow additional options for integration of third-party control systems.

## 2. APPLICATIONS

- /// HDMI system controls
- /// Video/TV wall display and control
- /// Security surveillance and control
- /// Commercial advertising, displaying and control
- /// Lecture room display and control

## 3. PACKAGE CONTENTS

- /// 4 by 6 HDMI HDBaseT Lite Matrix
- /// 4xPU-515PL-RX Receivers
- /// 5xIR Receiver
- /// 5xIR Emitter
- /// 1x24V/3.75A DC Power Supply
- /// 1xRemote Control
- /// 1xOperation Manual

## 4. SYSTEM REQUIREMENTS

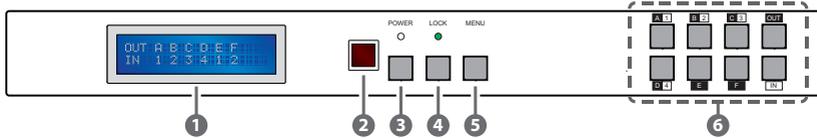
- /// Input source equipment with HDMI connection cables
- /// Industry Standard CAT5e/6/7 cables
- /// HDMI over CAT5e/6/7 Receivers with Industry Standard CAT5e/6/7 cables
- /// Output displays or AV receivers with HDMI connection cables

## 5. FEATURES

- /// Supports all v1.3 HDMI resolutions
- /// Supports uncompressed video/audio up to 10.2Gbps
- /// Common supported resolutions: HDTV: 480p, 576p, 720p, 1080i, 1080p, 1080p24; PC: VGA, SVGA, XGA, WXGA, SXGA, UXGA, WUXGA.
- /// HDMI, HDCP and DVI compliant
- /// High Definition Audio supported: Dolby TrueHD, Dolby Digital Plus and DTS-HD Master Audio plus LPCM (up to 192kHz)
- /// Uncompressed data transfer over single CAT cable (60m - CAT5e/6/7)
- /// Supports HDMI input up to 15m 1080p 8bit or 10m 1080p 12bit.
- /// Supports RS-232, 2-Way IR, Manual Selection Buttons, and HDMI CEC control pass through
- /// Selectable EDID settings - TV (downstream) and STD (fixed)
- /// Compact 1U Rack mount design
- /// Supports 3D signals
- /// Supports additional IR Control via a master (ALL) Input/Output
- /// Supports full IP control
- /// Supplied with 4x PU-515PL-RX receivers

## 6. OPERATION CONTROLS AND FUNCTIONS

### 6.1 Front Panel



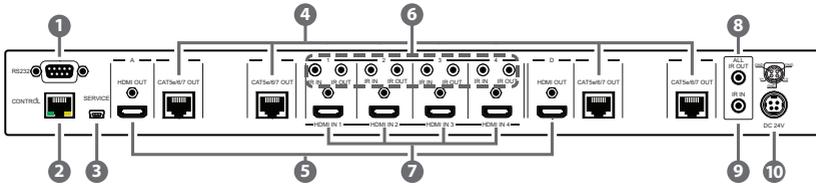
- 1 **LCM** : Displays the setting information of each input and output setting.
- 2 **IR**: IR receiver window (accepts the remote control signal of this device only).
- 3 **POWER Button and LED**: Press this button to power the device ON/ OFF. The LED will illuminate orange when the power is ON, red when it is in 'Standby' mode.
- 4 **LOCK**: Press this button to lock all the buttons on the front panel; press again to unlock. The LED will illuminate when locked.
- 5 **MENU**: Press once to select EDID setting from STD (internal) 1 or TV (external) 2 then press it again to confirm the selection. Press the the 'MENU' button to confirm the input or output selection.
- 6 **1~4/A~F and OUT/IN**: Press the OUT or IN button to select the output or input mode and then press the required number or letter button to change the selection.

For example, if outputs A~B need to be set to input 1 and outputs C~F need to be set to input 2, then the following sequence of button presses need to be performed:

Press: Out → A → B → In → 1 → Menu,  
and then press: Out → C → D → E → F → In → 2 → Menu.

*Note: If the menu button is not pressed the selection will not be changed.*

## 6.2 Rear Panel



- 1 RS-232:** Connect to a PC or RS-232 control system with a D-sub 9-pin cable for the transmission of RS-232 commands.

*Note: This unit has a routable RS-232 function that can route commands sent to the matrix to all receivers or accept matrix control commands from connected receivers. In order for the receivers to send commands to control the matrix, a null modern cable/adaptor is required.*

- 2 CONTROL:** Connect to an active network for Telnet/Web GUI control (refer to Sections 6.8 and 6.9).

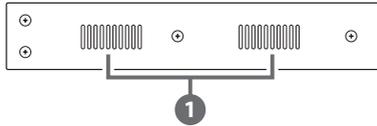
**Warning: Please do not connect this port directly to the PC/Laptop as the Telnet function will not work**

- 3 SERVICE:** Manufacturer use only.
- 4 CAT5e/6/7 OUT B/C/E/F:** Connect the CAT outputs to the CAT input port of compatible receiver units with a single CAT5e/6/7 cable for HDMI Audio/Video and IR/RS-232 control signal transmission (dependent on receiver capabilities).
- 5 HDMI OUT A/D:** Connect to HDMI displays for local monitoring of the HDMI signal or cascade to another Transmitter.
- 6 IR IN 1~4:** Connect the IR Extenders for IR signal reception. Ensure that the remote being used is within the direct line-of-sight of the IR extender.  
**IR OUT 1~4:** Connect to the IR Blasters for IR signal transmission. Place the IR blaster in direct line-of-sight of the equipment to be controlled. It will transmit the IR signal received from IR extenders connected to the matrix or receivers according to the selected input.
- 7 HDMI IN 1~4:** Connect to the HDMI input source devices such as a DVD players or a Set-top Boxes with HDMI cables or DVI to HDMI cables.
- 8 ALL IR OUT:** Connect an IR Blaster for IR signal transmission to the source/input location. Place the IR Blaster in direct line-of-sight of the

equipment to be controlled. It will transmit all IR signals received by any IR extenders connected to the matrix or receivers.

- 9 **ALL IR IN:** Connect an IR Extender for IR signal reception. Ensure that remote being used is within the direct line-of-sight of the IR extender. IR signals received will transmitted by all IR blasters connected to the matrix or receivers.
- 10 **DC24V:** Connect the 24V DC power supply to the unit and plug the adaptor into an AC outlet.

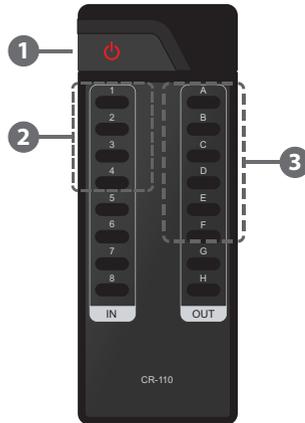
### 6.3 Side Panel



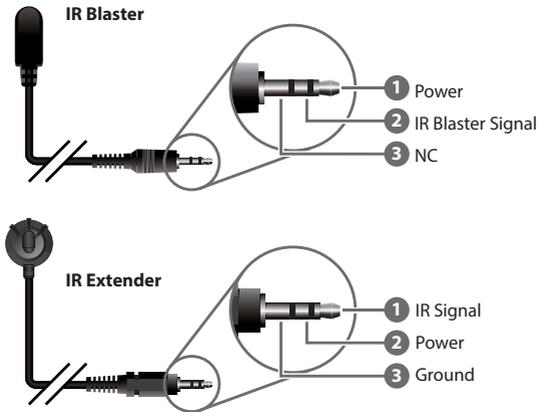
- 1 **Ventilator:** These are fan ventilator area, DO NOT block these area or cover it with any object.

### 6.4 Remote Control

- 1 **POWER:** Press this button to switch the unit ON or to put it into standby mode.
- 2 **IN:** Input selection 1~4. Press to select the required input setting.
- 3 **OUT:** Output selection A~F. Press to select the required output setting



## 6.5 IR Pin Assignment



## 6.6 RS-232 Protocols

MATRIX	
Pin	Assignment
1	NC
2	Tx
3	Rx
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC



REMOTE CONTROLLER	
Pin	Assignment
1	NC
2	Rx
3	Tx
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC

Baud Rate: 19,200bps  
 Data bit: 8 bits  
 Parity: None  
 Flow Control: None  
 Stop Bit: 1

## 6.7 RS-232 and Telnet Commands

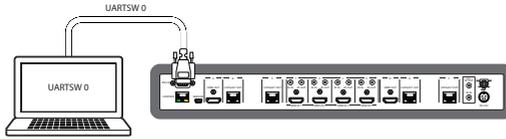
COMMAND	DESCRIPTION
<b>A1~A4</b>	Switch output A to input 1~4
<b>B1~B4</b>	Switch output B to input 1~4
<b>C1~C4</b>	Switch output C to input 1~4
<b>D1~D4</b>	Switch output D to input 1~4
<b>E1~E4</b>	Switch output E to input 1~4
<b>F1~F4</b>	Switch output F to input 1~4
<b>A0~F0</b>	Switch output A to F to mute
<b>ABCD...1~ABCD...4</b>	Switch output ABCD... to 1~4
<b>ABCD...0</b>	Mute output ABCD... at the same time
<b>SETIP&lt;IP&gt; &lt;SubNet&gt; &lt;GW&gt;</b>	Set IP. SubNet. GateWay (Static IP)
<b>RSTIP</b>	Reset IP Configuration to Defaults <DHCP>
<b>IPCONFIG</b>	Display the current IP configuration
<b>P0</b>	POWER OFF
<b>P1</b>	POWER ON
<b>I1~I4</b>	Switch all outputs to input 1~4
<b>STORE</b>	STORE current I/O position (01~06)
<b>RECALL</b>	RECALL the store I/O position (01~06)
<b>SHOW</b>	SHOW current port's I/O position (01~06)
<b>NAME</b>	NAME the stored port (01~06) no more than 8 charactors (ABCDEFGH)
<b>I0</b>	Mute all outputs
<b>ST</b>	Display the current matrix status and F/W version
<b>RS</b>	Reset System to A1, B1, C2, D3, E3, F4
<b>EM</b>	Setting EDID MODE. 1-STD 2-TV

COMMAND	DESCRIPTION
<b>?</b>	Display all the available commands
<b>UARTBAUD?*</b>	Displays a numerical equivalent for the baud rate setting for each output 1~6 (1= 9600bps, 2=14400bps, 3= 19200bps, 4=38400bps, 5= 57600bps, 6=115200bps)
<b>UARTBAUD2*</b>	Set output B's baud rate from 1~6
<b>UARTBAUD3*</b>	Set output C's baud rate from 1~6
<b>UARTBAUD5*</b>	Set output E's baud rate from 1~6
<b>UARTBAUD6*</b>	Set output F's baud rate from 1~6
<b>UARTSW?*</b>	Display output's UART status.
<b>UARTSW0*</b>	Switch RS-232 control to the MCU. Restores RS-232 control of the Matrix and stops routing commands to the receiver
<b>UARTSW2*</b>	Switch RS-232 control to output B. Allows passthrough of RS-232 commands through the matrix to the device connected to the receiver's RS-232 output.
<b>UARTSW3*</b>	Switch RS-232 control to output C. Allows passthrough of RS-232 commands through the matrix to the device connected to the receiver's RS-232 output
<b>UARTSW5*</b>	Switch RS-232 control to output E. Allows passthrough of RS-232 commands through the matrix to the device connected to the receiver's RS-232 output
<b>UARTSW6*</b>	Switch RS-232 control to output F. Allows passthrough of RS-232 commands through the matrix to the device connected to the receiver's RS-232 output
<b>Quit</b>	Exit (for Telnet only)

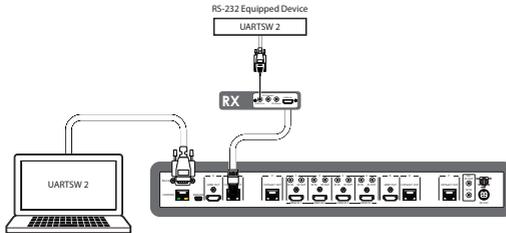
*Note:*

- 1. Commands will be not executed unless followed by a carriage return. Commands are not case-sensitive.*
- 2. Commands with an asterisk (\*) are RS-232 only and do not apply to Telnet*
- 3. Once the RS-232 control is switched to the receiver output, control will be RS-232 only and will not accept Telnet commands.*
- 4. The baud rate of the RS-232 capable device must be correctly set in order for the matrix to succesfully communicate with it.*

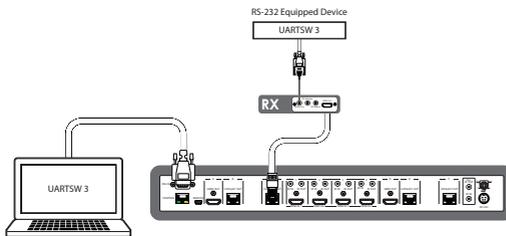
## 6.8 RS-232 UART Command Illustration Diagram



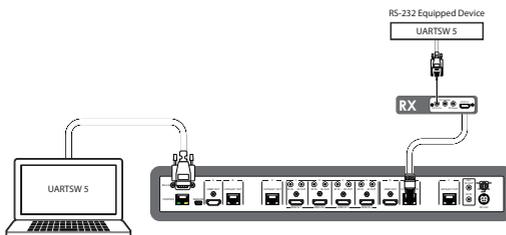
**Note:** This command allows RS-232 to control the Matrix.



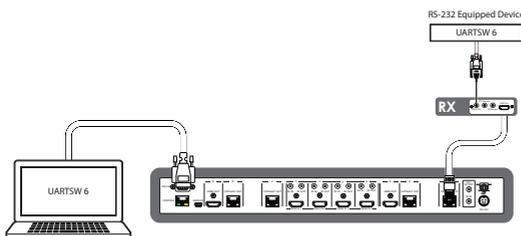
**Note:** This command allows RS-232 to control the RS-232 device connected to output B's Receiver.



**Note:** This command allows RS-232 to control the RS-232 device connected to output C's Receiver.



**Note:** This command allows RS-232 to control the RS-232 device connected to output E's Receiver.



**Note:** This command allows RS-232 to control the RS-232 device connected to output F's Receiver.

## 6.9 Telnet Control

Before attempting to use the telnet control, please ensure that both both the matrix (via the 'LAN /CONTROL' port) and the PC/Laptop are connected to the same active network.

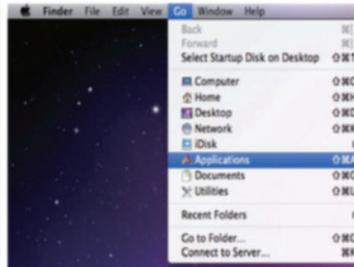
*Note: Please do not directly connect both the matrix and the PC/Laptop with a single CAT5e/6 cable as it will prevent access to the telnet function.*

To access the telnet control in Windows 7, click on the 'Start' menu and type 'cmd' in the Search field then press enter.

Under Windows XP go to the 'Start' menu and click on 'Run', type 'cmd' with then press enter.

Under Mac OS X, go to Go→Utilities and double click the Terminal application to open a terminal window

See below for reference..

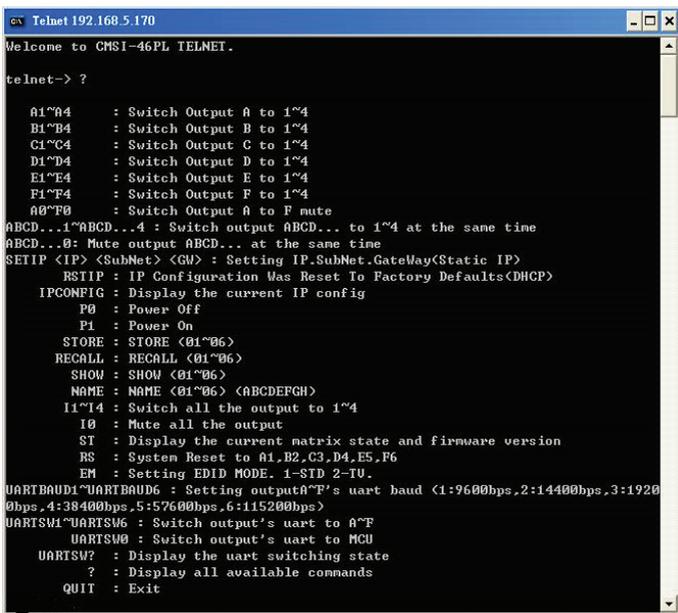


Once in the command line interface (CLI) type 'telnet', then the IP address of the unit and '23', then hit enter.

*Note: The IP address of the matrix can be displayed on the device's LCM monitor by pressing the Menu button twice.*



This will bring us into the interface of the device which we wish to control. Type 'HELP' to list the available commands.

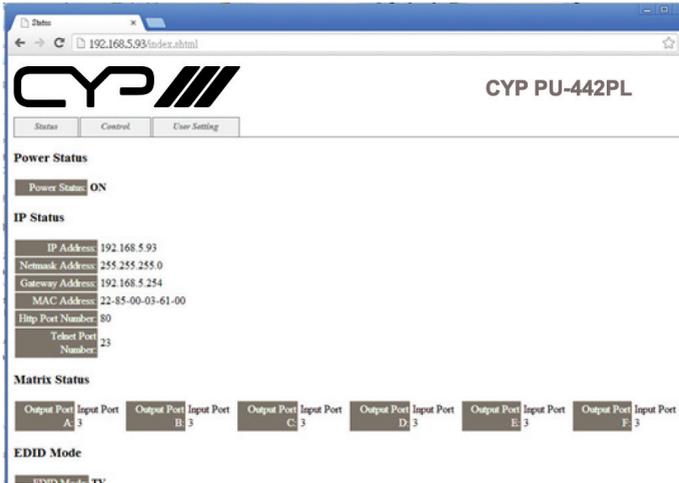


Type 'IPCONFIG' To show all IP configurations. To reset the IP, type 'RSTIP' and to use a set static IP, type 'SETIP' (For a full list of commands, see Section 6.7).

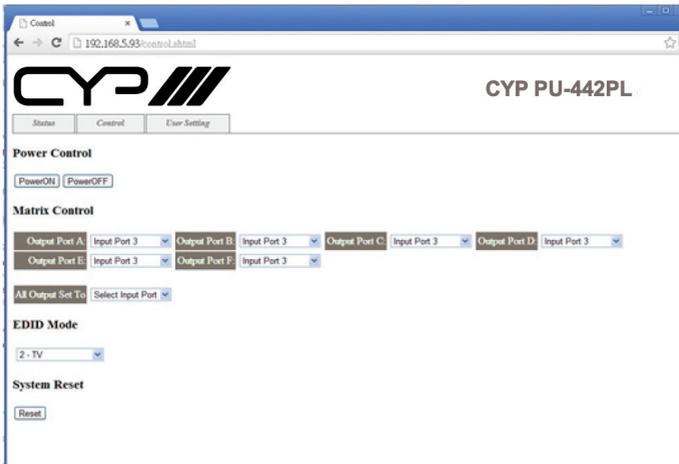
*Note: Commands will not be executed unless followed by a carriage return. Commands are not case-sensitive. If the IP address of the matrix changes then the IP Address required for Telnet access will also change accordingly.*

## 6.10 Web GUI Control

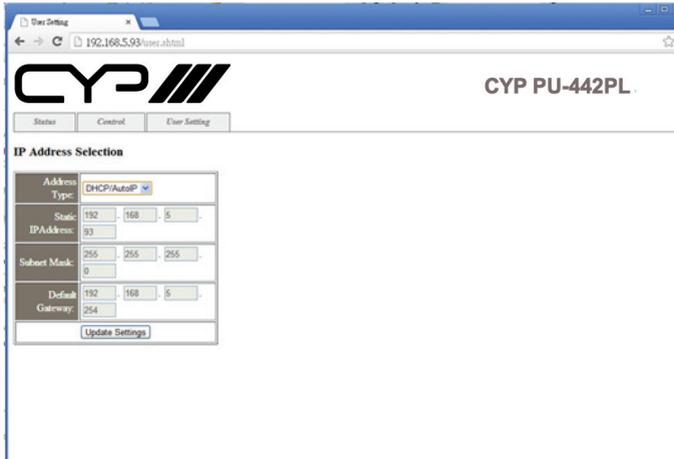
On a PC/Laptop that is connected to the same active network as the matrix, open a web browser (Internet Explorer Browser ver.9 and above is recommended) and type device's IP address on the web address entry bar. The browser will display the device's status, control and User setting pages.



Click on the 'Control' tab to control power, input/output ports, EDID and reset mode.



Click on the 'User Setting' tab allows you to reset the IP configuration. The system will ask for a reboot of the device every time any of the settings are changed.

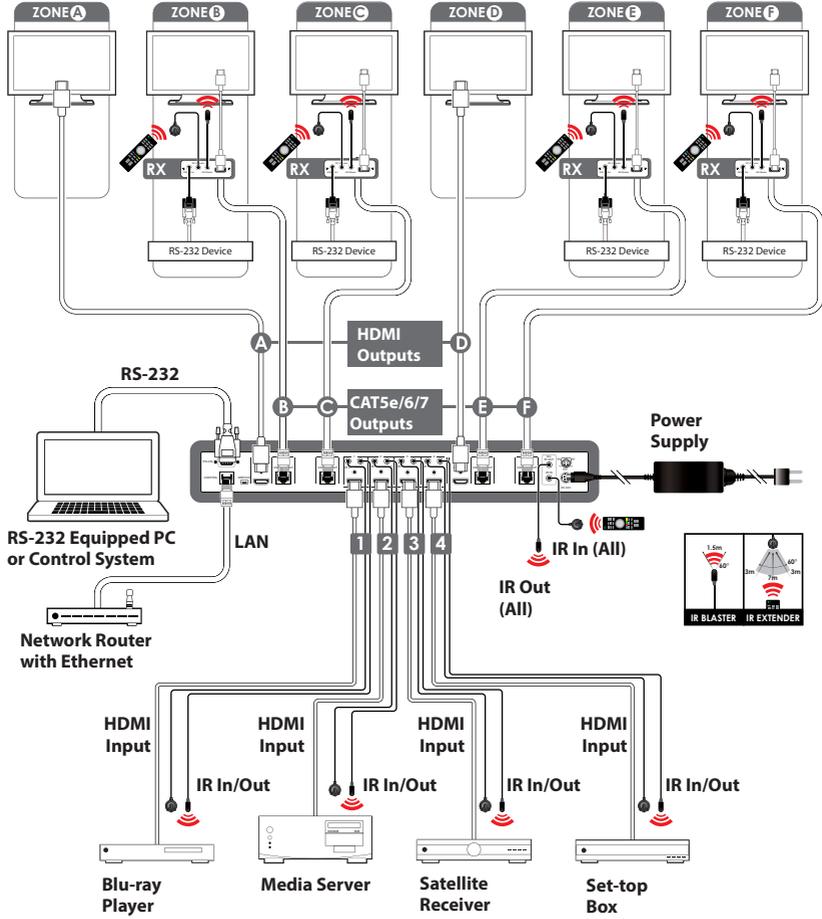


The screenshot shows a web browser window with the address bar displaying '192.168.5.93/user.shtml'. The page title is 'CYP PU-442PL'. Below the title are three tabs: 'Status', 'Control', and 'User Setting'. The 'User Setting' tab is active, showing the 'IP Address Selection' form.

IP Address Selection	
Address Type:	<input type="button" value="DHCP/AutoIP"/>
Static IP Address:	<input type="text" value="192"/> . <input type="text" value="168"/> . <input type="text" value="5"/>
Subnet Mask:	<input type="text" value="255"/> . <input type="text" value="255"/> . <input type="text" value="255"/>
Default Gateway:	<input type="text" value="192"/> . <input type="text" value="168"/> . <input type="text" value="5"/>
<input type="button" value="Update Settings"/>	

*Note: The IP address needed to access the WebGUI control will also need to be changed accordingly on the web address entry bar.*

# 7. CONNECTION DIAGRAM



## 8. SPECIFICATIONS

<b>Video Bandwidth</b>	225 MHz/6.75 Gbps
<b>Input Ports</b>	4×HDMI, 5×IR Extender, 1×RS-232, 1×RJ45 (Control Only), 1×USB Mini-B (Service Only)
<b>Output Ports</b>	2×HDMI, 4×CAT5e/6/7, 5×IR Blaster
<b>Power Supply</b>	24V/3.75 A DC (US/EU standards, CE/FCC/UL certified)
<b>ESD Protection</b>	Human Body model: ±8 kV (air-gap discharge) ±4 kV (contact discharge)
<b>Dimensions</b>	436 mm (W)×249 mm (D)×44 mm (H)/Jacks Excluded 436 mm (W)×255 mm (D)×48 mm (H)/Jacks Included
<b>Weight</b>	3334 g
<b>Chassis Material</b>	Metal
<b>Colour</b>	Black
<b>Operating Temperature</b>	0 °C~40 °C/32 °F~104 °F
<b>Storage temperature</b>	-20 °C~60 °C/-4 °F~140 °F
<b>Relative Humidity</b>	20~90 % RH (no condensation)
<b>Power Consumption</b>	40W

## 9. ACRONYMS

ACRONYM	COMPLETE TERM
<b>EDID</b>	Extended Display Identification Data
<b>HDCP</b>	High-bandwidth Digital Content Protection
<b>HDMI</b>	High-Definition multimedia Interface





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CYP (UK) Ltd., Unit 7, Shepperton Business Park, Govett Avenue, Shepperton,  
Middlesex, TW17 8BA

Tel: +44 (0) 20 3137 9180 | Fax: +44 (0) 20 3137 6279

Email: [sales@cypeurope.com](mailto:sales@cypeurope.com)

[www.cypeurope.com](http://www.cypeurope.com)

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