PUV-1250PL-TX

Multi-format 4K HDBaseT™ Transmitter with HDMI, USB-C, DisplayPort & VGA Inputs plus USB-C charging

OPERATION MANUAL

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Version 1.1

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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	30/04/2020	First release

CONTENTS

1. INTRODUCTION

This 4x1 Multi-Format to HDBaseT Switch is a 4K@60Hz (4:4:4) switcher featuring HDMI, DisplayPort, USB Type-C, and VGA with stereo inputs which are automatically converted to the standard HDBaseT format for use with a compatible receiver. The HDMI, DisplayPort and USB-C inputs support resolutions up to 4K@60Hz (4:4:4, 8-bit) and the VGA input supports resolutions up to WUXGA (RB). With the use of the 3.5mm audio input, stereo audio can be embedded with the VGA source as well. Despite HDBaseT's 10.2Gbps bandwidth limitation, high bandwidth 4K UHD HDMI video sources, up to and including 4K@60Hz (4:4:4, 8-bit), can be supported and will be automatically converted to 1080p when necessary.

Signal management features such as automatic switching based on input signal and hot plug detection enable convenient hands-free operation. Additional functionality such as EDID management, HDCP management and basic signal event automation (which can send customised CEC commands to the display automatically) is also available. The USB Type-C input can provide power (up to 60W) to any connected device and the HDBaseT output provides PoH (Power over HDBaseT) to power compatible receivers, providing greater flexibility in installations. Control is provided via a front panel button, WebGUI, Telnet, and RS-232.

2. APPLICATIONS

- Household entertainment sharing and control
- Lecture room display and control
- Showroom display and control
- Meeting room presentation and control
- Classroom display and control

3. PACKAGE CONTENTS

- 1×HDMI/DisplayPort/VGA/USB Type-C to HDBaseT Switcher
- 1×24V/3.75A DC Power Adapter
- 1×Power Cord
- 1×3.5mm to IR Blaster Cable
- 1×3-pin Terminal Block
- 1×Operation Manual

4. SYSTEM REQUIREMENTS

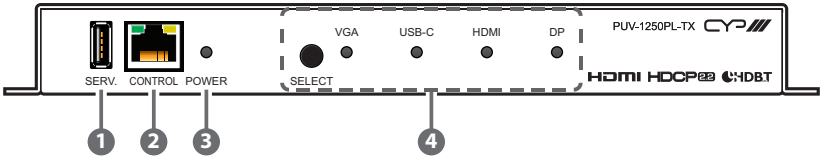
- Source equipment such as media players, video game consoles, PCs, or set-top boxes.
- A compatible HDBaseT receiver with PoH (PD) support is recommended.
- The use of Premium High Speed HDMI cables, and industry standard Cat.6, Cat.6a or Cat.7, is highly recommended.

5. FEATURES

- HDMI 2.0, DisplayPort 1.4, and DVI 1.0 compliant
- HDCP 1.x and 2.2 compliant
- Switchable HDMI, DisplayPort, VGA with analogue audio, and USB Type-C inputs
- 1 HDBaseT output
- Digital inputs support up to 4K UHD (18Gbps, 4K@60Hz 4:4:4, 8-bit)
- VGA input supports resolutions up to WUXGA (RB)
- Analogue stereo audio is automatically embedded with the video from the VGA input
- HDBaseT output supports resolutions up to 4K@60Hz (4:2:0, 8-bit) or 4K@30Hz (4:4:4, 8-bit). 4K@50/60Hz (4:4:4, 8-bit) or 4K@any (10/12-bit) sources will be automatically converted to 1080p.
- Supported HDBaseT feature set: HD Video & Audio, PoH, and Control Extension (Bi-directional IR/RS-232)
- HDBaseT output transmits video, audio and data over a single Cat.5e/6/7 cable and can reach distances up to 40m/131ft at 4K when using Cat.6a/7
- Supports pass-through of many audio formats including 8 channel LPCM, Bitstream, and HD Bitstream
- Supports standard PoH from the unit to connected HDBaseT Receivers (compatible Receivers only)
- Supports manual input selection or automatic input selection with hot plug detection and "Last Memory" feature
- Basic signal event automation using CEC commands
- Comprehensive EDID management
- USB Type-C port provides up to 60W to power or charge the connected device
- Controllable via a front panel button, WebGUI, Telnet, and RS-232

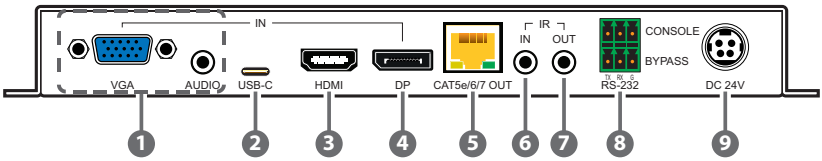
6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel



1. **SERV. Port:** This port is reserved for firmware update use only.
2. **CONTROL Port:** Connect directly, or through a network switch, to your PC/laptop to control the unit via Telnet/WebGUI.
3. **POWER LED:** This LED will illuminate to indicate the unit is on and receiving power.
4. **SELECT Button & VGA/USB-C/HDMI/DP LEDs:** Press the Select button to sequentially switch through the available inputs. The currently selected input's LED will illuminate green. The LEDs will illuminate red to indicate inputs that have live sources but are not currently selected.

6.2 Rear Panel



1. **VGA IN Port:** Connect to VGA source equipment such as a PC or laptop.

   AUDIO IN Port: Connect to the stereo analogue output of the device connected to the VGA input port.

2. **USB-C IN Port:** Connect to USB Type-C video source equipment such as a PC or laptop.

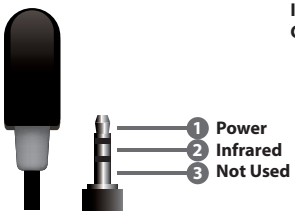
   Note: Not all devices with USB Type-C ports can support video output. Please verify that the device supports video output from the USB Type-C port before connecting it.

3. **HDMI IN Port:** Connect to HDMI source equipment such as a media player, game console, or set-top box.
4. **DP IN Port:** Connect to DisplayPort source equipment such as a PC or laptop.
5. **CAT.5e/6/7 OUT Port:** Connect to a compatible HDBaseT Receiver with a single Cat.5e/6/7 cable for transmission of all data signals. PoH will also be supplied to a connected compatible PD Receiver.
6. **IR EXTENDER Port:** Connect to an IR Extender to receive IR control signals and extend them to devices connected to the other end of the HDBaseT connection. Ensure that the remote being used is within direct line-of-sight of the IR Extender.
7. **IR BLASTER Port:** Connect to the provided IR Blaster to transmit IR signals from the other end of the HDBaseT connection to devices within direct line-of-sight of the IR Blaster.
8. **RS-232 CONSOLE Port:** Connect directly to a PC, laptop, or other serial control device with a 3-pin adapter cable to send RS-232 commands to control the unit.

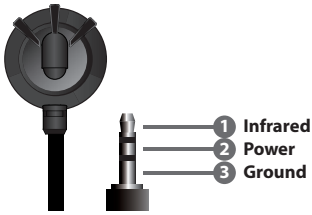
   RS-232 BYPASS Port: Connect to a PC, laptop, or other serial control device with a 3-pin adapter cable for the extension of RS-232 signals to the Receiver.
9. **DC 24V Port:** Plug the 24V DC power adapter into this port and connect it to an AC wall outlet for power.

6.3 IR Cable Pinouts

IR Blaster Cable



IR Extender Cable

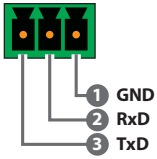


6.4 RS-232 Pinout and Defaults

Serial Port Default Settings	
Baud Rate	19200
Data Bits	8
Parity Bits	None
Stop Bits	1
Flow Control	None

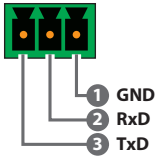
Console

3-pin Terminal Block



Bypass

3-pin Terminal Block



6.5 WebGUI Control

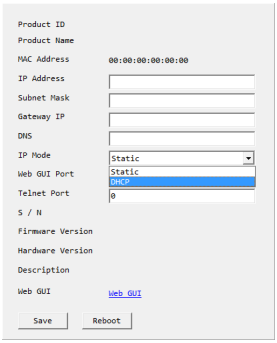
Device Discovery

Please obtain the "Device Discovery" software from your authorised dealer and save it in a directory where you can easily find it.

Connect the unit and your PC/Laptop to the same active network and execute the "Device Discovery" software. Click on "Find Devices on Network" and a list of devices connected to the local network will show up indicating their current IP address.

Note: The unit's default IP address is 192.168.1.50.

By clicking on one of the listed devices you will be presented with the network details of that particular device.



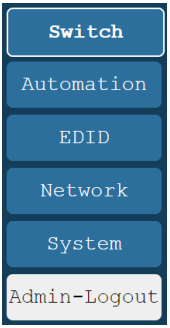
1) **IP Mode:** If you choose, you can alter the static IP network settings for the device, or switch the unit into DHCP mode to automatically obtain proper network settings from a local DHCP server. To switch to DHCP mode, please select DHCP from the IP mode drop-down, then click "Save" followed by "Reboot".
2) **WebGUI Hotkey:** Once you are satisfied with the network settings, you may use them to connect via Telnet or WebGUI. The network information window provides a convenient link to launch the WebGUI directly.

WebGUI Overview

After connecting to the WebGUI's address in a web browser, the login screen will appear. Please enter the appropriate user name and password then click "Submit" to log in.

Note: The default user name and password is "admin".

On the left side of the browser you will see the following menu tabs where all primary functions of the unit are controllable via the built in WebGUI. The individual functions will be introduced in the following sections.

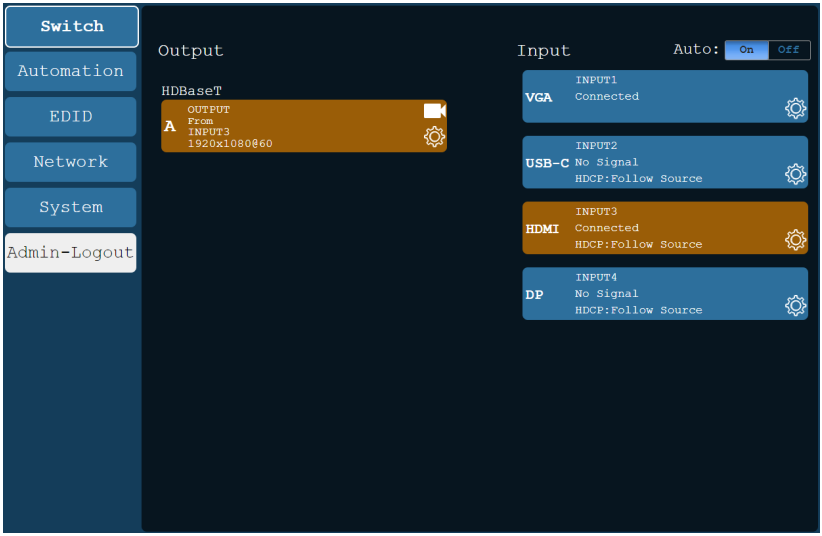


Clicking the red "Logout" tab will automatically log the currently connected user out of the WebGUI and return to login page.

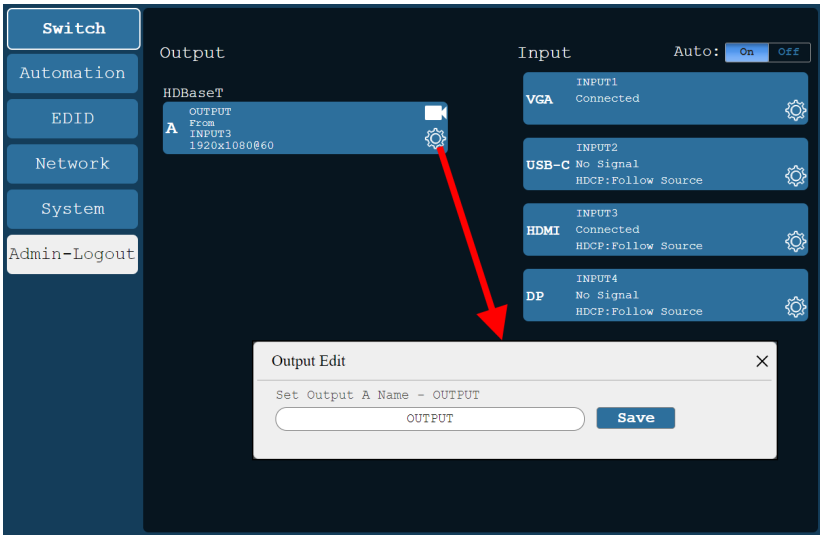
6.5.1 Switch Tab

This tab provides A/V routing control, HDCP management, auto switch control, A/V mask, and I/O renaming options.

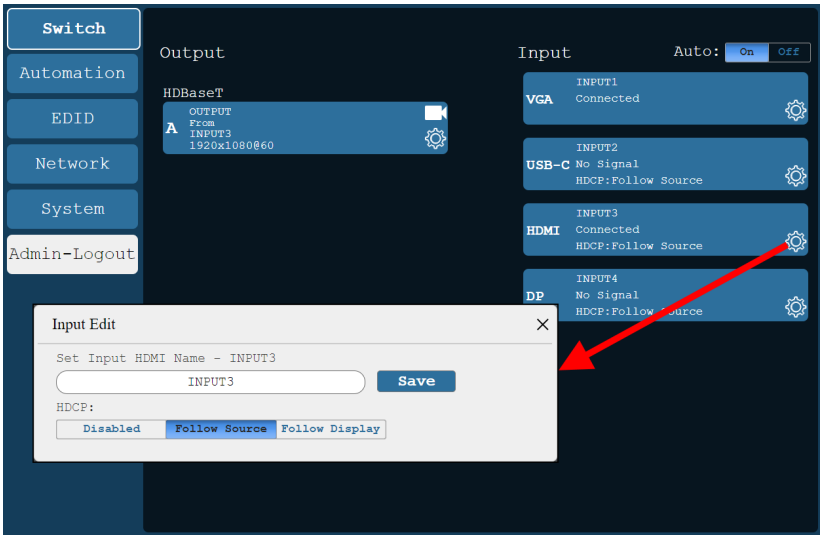
To assign a new A/V route, please click the Output button on the left and then click on the button of the preferred input port on the right. As each button is selected they will become highlighted. The new route will become active immediately and the routing information displayed on the buttons will change accordingly.



1) **Output:** This button selects the output to route A/V Inputs to. Details about the output name and currently selected Input are also displayed here. Clicking on the "Edit" icon (⚙) opens up the Output Edit window. Clicking on the "A/V Mask" icon (■) will mute or unmute the audio and video output.
2) **Auto:** Auto switching may be enabled or disabled by clicking on the On/Off slider to toggle the setting.
3) **Input VGA/USB-C/HDMI/DP:** Buttons for selecting the input (VGA, USB Type-C, HDMI, or DisplayPort) to route to the output. Details about the input names and current sync/HDCP status are also displayed here. Clicking on the "Edit" icon (⚙) opens up the Input Edit window.



4) **Output Edit:** Provides control over the name of the output.
   - **Set Output Name:** To rename the output, type the new name in the space provided in the Edit window. The name can be up to 8 characters long. Click the "Save Change" button to confirm the change.



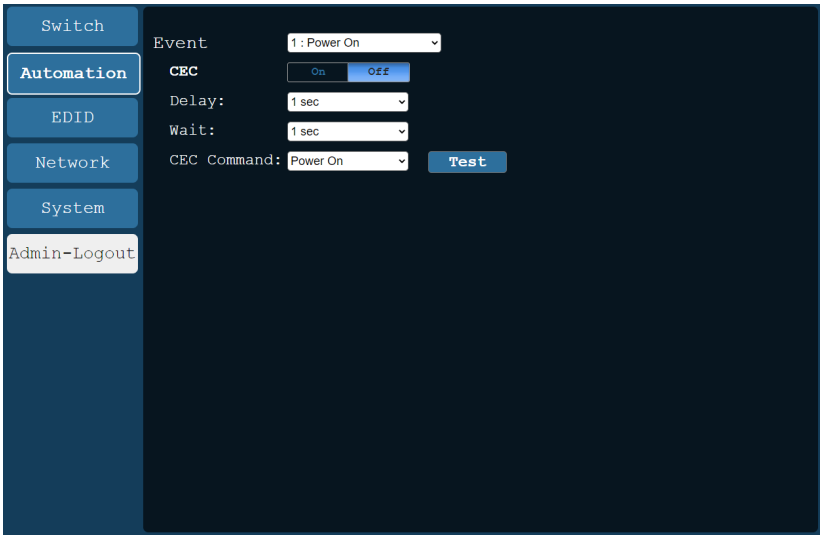
5) **Input Edit:** Provides Individual control over the name of each input and the behavior of HDCP on that input.

- **Set Input Name:** To rename an input, type the new name in the space provided in the Edit window. The name can be up to 8 characters long. Click the "Save Change" button to confirm the change.
- **HDCP:** The HDCP mode of each input can be set to "Follow Source", "Follow Display", or "Disabled". Changes made to this setting occur immediately.

  Note: The VGA input cannot support HDCP.

6.5.2 Automation Tab

The Automation tab provides control over the unit's automatic control command broadcast behavior when any of the specified Automation Events occur. Automation commands are sent to the connected display device via standard CEC.



1) **Event:** Use the dropdown to select the Automation Event to configure. Available Automation Events are:
   - **Power On:** This unit is powered on.
   - **Out A Source Active:** The currently selected input changes from inactive to active.
   - **Out A Source Lost:** The currently selected input changes from active to inactive.

   ■ **CEC:** Enable or disable sending a CEC command when the currently selected Automation Event is activated.

   Note: CEC support must also be enabled on the connected HDMI display device.

   ■ **Delay:** Set the length of time, in seconds, that the specified Automation Event must continue to be true before sending the defined command.

- **Wait:** Set the length of time, in seconds, to wait after this Automation Event has been activated before ANY new Automation Event can be detected.
- **CEC Command:** Shows the CEC command, in ASCII hex pairs, that will be sent when the specified Automation Event is activated. Click the "Edit" button to modify the command. Click the "Test" button to send the command immediately.

6.5.3 EDID Tab

This tab provides the option of six standard EDIDs, four customer uploaded User EDIDs, and one sink sourced EDID that can be assigned to any or all of the applicable input ports. The contents of any of these EDIDs may also be downloaded from here.

1) User EDID

- **Upload:** To upload a User EDID, select the User EDID slot to upload into from the dropdown list and then click the "Upload" button. An EDID Upload window will appear, allowing you to locate and upload the preferred EDID file (*.bin format) from a local PC. Once the correct file has been selected, please click the "Upload" button in the window, and the file will be transferred to the unit.

- **Download:** To save an existing User EDID to your local PC, select the User EDID slot from the dropdown list and then press the "Download" button. Depending on your browser settings you will either be asked where to save the downloaded file, or the file will be transferred to the default download location on your PC.
- **Edit Name:** Click the "Edit Name" button to open a window that allows changing the name of the User EDID. Click the "Save Change" button within the window to confirm the change.

2) Output EDID

- **Download:** To save an EDID provided by the connected HDBaseT Receiver to your local PC, select the output from the dropdown list then press the "Download" button. Depending on your browser settings you will either be asked where to save the downloaded file, or the file will be transferred to the default download location on your PC.

3) Input EDID

- **Appoint/All:** The Input EDID section allows for the assignment of an EDID to each individual input port, or to all inputs at once. Click the selection bar to toggle between "Appoint" (individual assignment), or "All" inputs.
- **EDID Selection:** Click on one or more input buttons to open the EDID Table List window. Select the new EDID source to use, from the choices on the right, and the change will occur immediately across all selected Inputs.

This unit provides the following 6 default EDIDs:

EDID NAME	EDID CONTENT
1080P@60/PCM/2CH	1920×1080p@60Hz (148MHz), 8-bit Colour, LPCM 2.0
1080P@60/PCM/Bitstream/ MCH	1920×1080p@60Hz (148MHz), 8-bit Colour, LPCM 7.1 & Bitstream
4K@30/PCM/2CH	3840×2160p@30Hz (297MHz), Deep Colour (8/10/12-bit), LPCM 2.0
4K@30/PCM/Bitstream/MCH	3840×2160p@30Hz (297MHz), Deep Colour (8/10/12-bit), LPCM 7.1 & Bitstream
4K@60/PCM/MCH	3840×2160p@60Hz (594MHz), Deep Colour (8/10/12-bit), LPCM 2.0
4K@60/PCM/Bitstream/MCH	3840×2160p@60Hz (594MHz), Deep Colour (8/10/12-bit), LPCM 7.1 & Bitstream

Note: In most cases, assigning a new EDID to an input will cause the affected input to briefly blink out while the source adapts to the new information.

6.5.4 Network Tab

This tab provides network configuration options including changing the IP mode, viewing/setting the IP configuration, changing the admin login password, and changing the Web Login timeout.

1) **IP Configuration:** IP Mode may be switched between Static IP or DHCP. In Static IP Mode the IP, netmask and gateway addresses may be manually set. When in DHCP Mode, the unit will attempt to connect to a local DHCP server and obtain IP, netmask and gateway addresses automatically. Please press "Save" after making any changes to the IP configuration or mode.

   Note: If the IP address is changed then the IP address required for WebGUI/ Telnet access will also change accordingly.

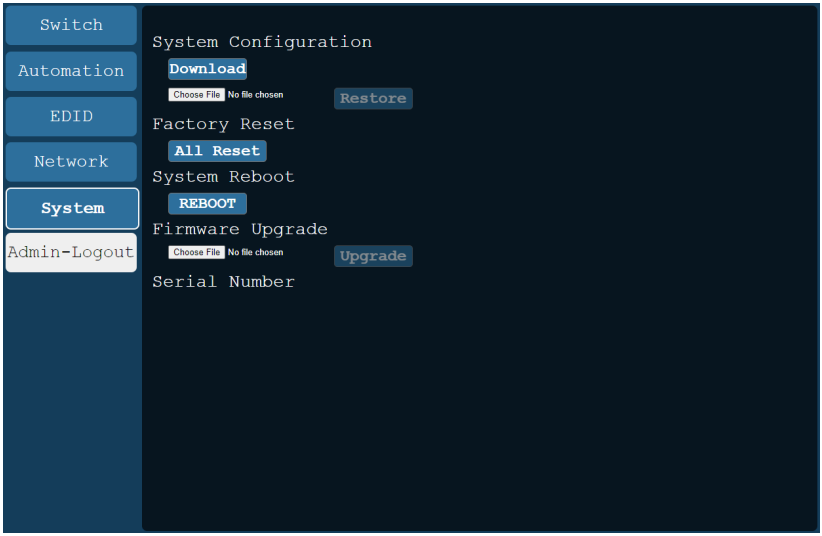
2) **Web Login Account:** The WebGUI admin password can be changed here. Please press "Save" after entering the old and new passwords to enact the change.

   Note: The default password is "admin".

3) **Web Login Timeout:** Select the length of time to wait before logging the user out of the WebGUI due to inactivity. Available range is from 0 to 35970 minutes. Setting it to 0 will disable the timeout function.

6.5.5 System Tab

This tab provides serial number information, system configuration backup/restore/reset, system reboot, and firmware update functions.



1) **System Configuration**
   - **Download:** The current system configuration, including routing and settings, may be saved as an XML file to a PC. Click the "Download" button to save the current system configuration to your local PC.
   - **Restore:** Previously saved system configurations may be restored from a saved XML file. Click the "Choose File" button to locate the saved XML file, then click the "Restore" button to upload and activate the selected configuration.
2) **Factory Reset:** Press the "ALL Reset" button to reset the unit to its factory default state. After the reset is complete, the unit will reboot automatically.
3) **System Reboot:** Click this button to reboot the unit.

4) **Firmware Upgrade:** To update the unit's firmware, click the "Choose File" button to open the file selection window and then select the firmware update file (*.bin format) located on your local PC. After selecting the file, click the "Upgrade" button to begin the firmware update process. After the upgrade is complete, the unit will reboot automatically.

5) **Serial Number:** Displays the unit's serial number.

6.6 Telnet Control

Before attempting to use Telnet control, please ensure that both the unit and the PC are connected to the same active networks.

To Access the Command Line Interface (CLI)	
Windows 7	Click **Start**, type "cmd" in the search field, and press **Enter**.
Windows XP	Click **Start** > **Run**, type "cmd", and press **Enter**.
Mac OS X	Click **Go** > **Applications** > **Utilities** > **Terminal**.

Once in the Command Line Interface (CLI) type "**telnet**" followed by the IP address of the unit (and the port number if it is non-standard) and then hit "**Enter**". This will connect us to the unit we wish to control.

```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Adminstrator\telnet 192.168.1.50 23
```

Note 1: If the IP address is changed then the IP address required for Telnet access will also change accordingly.

Note 2: The default IP address is 192.168.1.50.

6.7 RS-232 and Telnet Commands

COMMAND	DESCRIPTION AND PARAMETERS
?	Show the full command list.
help	Show the full command list.
set factory default	Reset the unit to the factory defaults.
set system reboot	Reboot the unit.
get fw ver	Show the unit's current firmware version.
set in N1 name N2	Set the name of the specified input. **N1** = 1 ~ 4 [Input port] **N2** = {Name} [8 characters max]
get in N1 name	Show the current name of the specified input. **N1** = 1 ~ 4 [Input port]
get in name list	List the names of all inputs on the unit.
set out A name N1	Set the name of the output. **N1** = {Name} [8 characters max]
get out A name	Show the current name of the output.
set out A route N1	Route the specified input to the output. **N1** = 1 ~ 4 [Input port]
get out A route	Show the current input routed to the output.
set out A mask N1	Enable or disable the A/V Mask setting on the output. Available values for **N1**: ON [Output muted] OFF [Normal output]

COMMAND	DESCRIPTION AND PARAMETERS
get out A mask	Display the current A/V Mask setting for the output.
set in N1 hdcp mode N2	Set the HDCP behavior of the specified input. **N1** = 1~4 [Input port] Available values for **N2**: 0 [Disabled] 1 [Follow source] 2 [Follow display]
get in N1 hdcp mode	Show the current HDCP behavior used by the specified input. **N1** = 1~4 [Input port]
set all in edid mode N1	Select the EDID management mode to use (All or Appoint) for all inputs. Available values for **N1**: ON [All mode] OFF [Appoint mode]
get all in edid mode	Show the current EDID management mode used by all inputs.

COMMAND	DESCRIPTION AND PARAMETERS
set all in edid N1	Set the EDID to use when the "All" EDID mode is active. Available values for **N1**: 1 [1080P, 2CH] 2 [1080P, MCH] 3 [4K@30, 2CH] 4 [4K@30, MCH] 5 [4K@60, 2CH] 6 [4K@60, MCH] 7 [User EDID 1] 8 [User EDID 2] 9 [User EDID 3] 10 [User EDID 4] 11 [Sink EDID]
get all in edid	Show the current EDID used by the "All" EDID mode.

COMMAND	DESCRIPTION AND PARAMETERS
set in N1 edid N2	Set the EDID to use on the specified input. **N1** = 1~4 [Input port] Available values for **N2**: 1 [1080P, 2CH] 2 [1080P, MCH] 3 [4K@30, 2CH] 4 [4K@30, MCH] 5 [4K@60, 2CH] 6 [4K@60, MCH] 7 [User EDID 1] 8 [User EDID 2] 9 [User EDID 3] 10 [User EDID 4] 11 [Sink EDID]
get in N1 edid	Show the EDID currently being used on the specified input. **N1** = 1~4 [Input port]
get in edid list	List all available EDID selections.

COMMAND	DESCRIPTION AND PARAMETERS
set edid N1 name N2	Set the name for the specified EDID. Available values for **N1**: 7 [User EDID 1] 8 [User EDID 2] 9 [User EDID 3] 10 [User EDID 4] **N2** = {Name} [16 characters max] *Note: Only User EDIDs may be renamed*
get edid N1 name	Show the current name of the specified EDID. Available values for **N1**: 7 [User EDID 1] 8 [User EDID 2] 9 [User EDID 3] 10 [User EDID 4]
set user N1 edid data N2	Upload a new EDID (in HEX format) for use as the specified User EDID. **N1** = 1 ~ 4 [User EDID] **N2** = {EDID data} [Comma delimited hex pairs]
get user N1 edid data	Show the current contents of the specified User EDID as HEX data. **N1** = 1 ~ 4 [User EDID]

COMMAND	DESCRIPTION AND PARAMETERS
set out auto mode N1	Set the auto switching behavior of the unit. Available values for **N1**: 0 [Disabled] 1 [Auto switch]
get out auto mode	Show the current auto switching mode of the unit.
get ipconfig	Show the unit's current IP configuration information.
set ip mode N1	Set the IP address assignment mode. Available values for **N1**: 0 [Static IP mode] 1 [DHCP mode]
get ip mode	Show the current IP address assignment mode.
set ipaddr N1	Set the unit's static IP address. **N1** = X.X.X.X [X = 0 ~ 255]
get ipaddr	Show the unit's current IP address.
set netmask N1	Set the unit's static netmask. **N1** = X.X.X.X [X = 0 ~ 255]
get netmask	Show the unit's current netmask.
set gateway N1	Set the unit's static gateway address. **N1** = X.X.X.X [X = 0 ~ 255]
get gateway	Show the unit's current gateway address.
set webgui password N1	Set the WebGUI login password. **N1** = {Password} [16 characters max]
get webgui password	Show the current WebGUI login password.

COMMAND	DESCRIPTION AND PARAMETERS
set webgui login timeout N1	Set the WebGUI inactivity timeout value. Available values for **N1**: 0 [No timeout] 1 ~ 35970 [Timeout in minutes]
get webgui login timeout	Show the current WebGUI inactivity timeout value.
set webgui port N1	Set the unit's WebGUI access port. **N1** = 1 ~ 65535 [TCP port]
get webgui port	Show the unit's current WebGUI access port.
set telnet port N1	Set the unit's Telnet access port. **N1** = 1 ~ 65535 [TCP port]
get telnet port	Show the unit's current Telnet access port.
set automation event N1 cec A N2	Enable or disable the specified Automation Event's CEC response. Available values for **N1**: 1 [Power on] 2 [Out A source active] 3 [Out A source lost] Available values for **N2**: ON [Event enabled] OFF [Event disabled]

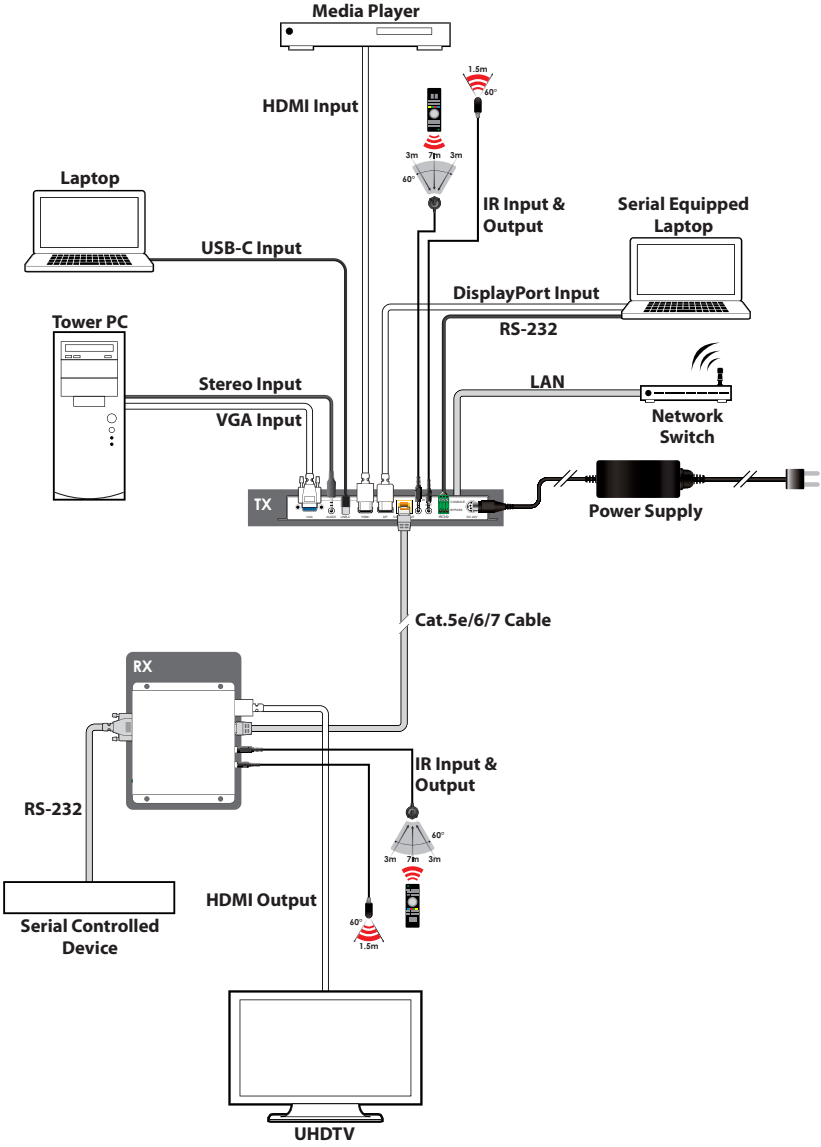
COMMAND	DESCRIPTION AND PARAMETERS
get automation event N1 cec A	Show the current state of the specified Automation Event's CEC response. Available values for **N1**: 1 [Power on] 2 [Out A source active] 3 [Out A source lost]
set automation event N1 cec A delay N2	Set the delay time that the specified Automation Event must continue to be true before sending the defined CEC command. Available values for **N1**: 1 [Power on] 2 [Out A source active] 3 [Out A source lost] **N2** = 0 ~ 240 [Delay time in seconds]
get automation event N1 cec A delay	Show the delay time for the specified Automation Event's CEC response. Available values for **N1**: 1 [Power on] 2 [Out A source active] 3 [Out A source lost]

COMMAND	DESCRIPTION AND PARAMETERS
set automation event N1 cec A wait N2	Set the length of time to wait after an Automation Event's CEC response has been activated before ANY other Automation Event can be detected. Available values for **N1**: 1 [Power on] 2 [Out A source active] 3 [Out A source lost] **N2** = 0 ~ 240 [Wait time in seconds]
get automation event N1 cec A wait	Show the wait time for the specified Automation Event's CEC response. Available values for **N1**: 1 [Power on] 2 [Out A source active] 3 [Out A source lost]
set automation event N1 cec A command N2	Set the CEC command to send when the specified Automation Event is activated. Available values for **N1**: 1 [Power on] 2 [Out A source active] 3 [Out A source lost] **N2** = {CEC data} [Comma delimited hex pairs]

COMMAND	DESCRIPTION AND PARAMETERS
get automation event N1 cec A command	Show the CEC command to be sent when the specified Automation Event is activated. Available values for **N1**: 1 [Power on] 2 [Out A source active] 3 [Out A source lost]

Note: Commands will not be executed unless followed by a carriage return. Commands are not case-sensitive.

7. CONNECTION DIAGRAM



8. SPECIFICATIONS

8.1 Technical Specifications

HDMI/DisplayPort/ USB-C Bandwidth	18Gbps
VGA Bandwidth	153MHz
HDBaseT Bandwidth	10.2Gbps
Input Ports	1×HDMI (Type-A) 1×DisplayPort 1×USB (Type-C) 1×VGA (HD-15) 1×Stereo Audio (3.5mm)
Output Port	1×HDBaseT (RJ-45)
Pass-through Ports	1×IR Extender (3.5mm) 1×IR Blaster (3.5mm) 1×RS-232 (3-pin Terminal Block)
Control Ports	1×RS-232 (3-pin Terminal Block) 1×Ethernet (RJ-45)
Service Port	1×USB 2.0 (Type A)
IR Frequency	30 – 50kHz (30 – 60kHz under ideal conditions)
Baud Rate	Up to 115200
Power Supply	24V/3.75A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection (HBM)	±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions (W×H×D)	231.5mm×25mm×108mm [Case Only] 231.5mm×25mm×116mm [All Inclusive]
Weight	657g
Chassis Material	Metal (Steel)

Chassis Colour	Black
Operating Temperature	0˚C – 40˚C/32˚F – 104˚F
Storage Temperature	-20˚C – 60˚C/-4˚F – 140˚F
Relative Humidity	20 – 90% RH (Non-condensing)
Power Consumption	82W

8.2 Video Specifications

Supported Resolutions (Hz)	In				Out
	HDMI	DP	USBC	VGA	HDBT
720×400p@70/85	✓	✓	×	70	✓
640×480p@60/72/75/85	✓	✓	✓	✓	✓
720×480i@60	✓	×	×	×	✓
720×480p@60	✓	✓	✓	×	✓
720×576i@50	✓	×	×	×	✓
720×576p@50	✓	✓	✓	×	✓
800×600p@56/60/72/75/85	✓	✓	✓	✓	✓
848×480p@60	✓	×	×	✓	✓
1024×768p@60/70/75/85	✓	✓	✓	✓	✓
1152×864p@75	✓	✓	✓	✓	✓
1280×720p@50/60	✓	✓	✓	×	✓
1280×768p@60/75/85	✓	✓	✓	✓	✓
1280×800p@60/75/85	✓	✓	✓	60	✓
1280×960p@60/85	✓	✓	✓	✓	✓
1280×1024p@60/75/85	✓	✓	✓	✓	✓
1360×768p@60	✓	✓	✓	✓	✓
1366×768p@60	✓	✓	✓	✓	✓
1400×1050p@60	✓	×	×	×	✓
1440×900p@60/75	✓	✓	✓	✓	✓
1600×900p@60RB	✓	✓	✓	×	✓
1600×1200p@60	✓	×	×	✓	✓
1680×1050p@60	✓	✓	✓	✓	✓
1920×1080i@50/60	✓	✓	✓	×	✓
1920×1080p@24/25/30	✓	✓	✓	×	✓

Supported Resolutions (Hz)	In				Out
	HDMI	DP	USBC	VGA	HDBT
1920×1080p@50/60	✓	✓	✓	✓	✓
1920×1200p@60RB	✓	×	×	✓	✓
2048×1080p@24/25/30	✓	×	×	×	✓
2048×1080p@50/60	✓	×	×	×	✓
2560×1440p@60RB	✓	×	×	×	×
2560×1600p@60RB	✓	×	×	×	×
3840×2160p@24/25/30	✓	✓	✓	×	✓
3840×2160p@50/60 (4:2:0)	✓	✓	✓	×	✓
3840×2160p@24, HDR10	✓	✓	✓	×	×
3840×2160p@50/60 (4:2:0), HDR10	✓	✓	✓	×	×
3840×2160p@50/60	✓	✓	✓	×	×
4096×2160p@24/25/30	✓	✓	✓	×	✓
4096×2160p@50/60 (4:2:0)	✓	✓	✓	×	✓
4096×2160p@24, HDR10	✓	✓	✓	×	×
4096×2160p@50/60 (4:2:0), HDR10	✓	✓	✓	×	×
4096×2160p@50/60	✓	✓	✓	×	×

Note: Supported input resolutions with data rates higher than 10.2Gbps will be automatically scaled down to 1080p at the same refresh rate to fit within the 10.2Gbps transmission limit of HDBaseT.

8.3 Audio Specifications

8.3.1 Digital Audio

HDMI/DisplayPort/USB-C Input	
LPCM	
Max Channels	8 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	Standard & High-Definition

HDBaseT Output	
LPCM	
Max Channels	8 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	Standard & High-Definition

8.3.2 Analogue Audio

Analogue Input	
Max Audio Level	2Vrms
Impedance	36.9kΩ
Type	Unbalanced

8.4 Cable Specifications

Cable Length	1080p		4K30	4K60
	8-bit	12-bit	(4:4:4) 8-bit	(4:4:4) 8-bit
High Speed HDMI Cable				
HDMI Input	15m	10m	5m	3m
DisplayPort Cable				
DisplayPort Input	15m	10m	2m	2m
USB-C Cable				
USB-C Input	2m			
VGA Cable				
VGA Input	2m		×	
Ethernet Cable				
Cat.5e/6	60m		35m	
Cat.6a/7	70m		40m	

Bandwidth Category Examples:

1080p (FHD Video)

- Up to 1080p@60Hz, 12-bit Colour
- Data rates lower than 5.3Gbps or below 225MHz TMDS clock

4K30 (UHD Video)

- 4K@24/25/30Hz & 4K@50/60Hz (4:2:0), 8-bit Colour
- Data rates higher than 5.3Gbps or above 225MHz TMDS clock but below 10.2Gbps

4K60 (UHD+ Video)

- 4K@50/60Hz (4:4:4, 8-bit), conversion to 1080p will be performed when output over HDBaseT
- 4K@50/60Hz (4:2:0, 10-bit HDR), conversion to 1080p will be performed when output over HDBaseT
- Data rates higher than 10.2Gbps

8.5 HDBaseT Features

HDBaseT Feature Set	Transmitter
Video & Audio	Supported
LAN Extension	Unsupported
Send power to Receiver	Supported (PoH)
Accept power from Receiver	Unsupported
IR Extension	Supported
RS-232 Extension	Supported
USB 2.0 Extension	Unsupported

9. ACRONYMS

ACRONYM	COMPLETE TERM
ADC	Analogue-to-Digital Converter
ASCII	American Standard Code for Information Interchange
AV	Audio/Video
AVR	Audio/Video Receiver or Recorder
Cat.5e	Enhanced Category 5 cable
Cat.6	Category 6 cable
Cat.6a	Augmented Category 6 cable
Cat.7	Category 7 cable
CEC	Consumer Electronics Control
CLI	Command-Line Interface
DHCP	Dynamic Host Configuration Protocol
DP	DisplayPort
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
GUI	Graphical User Interface
HD	High-Definition
HDBT	HDBaseT
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDR	High Dynamic Range
HDTV	High-Definition Television
IP	Internet Protocol
IR	Infrared
LAN	Local Area Network
LED	Light-Emitting Diode

ACRONYM	COMPLETE TERM
LPCM	Linear Pulse-Code Modulation
MAC	Media Access Control
PC	Personal Computer
PD	Powered Device
PoH	Power over HDBaseT
PSE	Power Sourcing Equipment
SNR	Signal-to-Noise Ratio
TCP	Transmission Control Protocol
UHD	Ultra-High-Definition
UHD+	Ultra-High-Definition Plus
USB	Universal Serial Bus
VGA	Video Graphics Array
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
XGA	Extended Graphics Array

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