



# SDV-CS8

SDV System Controller & Configurator

**/// 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	26/07/2019	First release (RDV1)

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## **1. INTRODUCTION**

This IP Master Controller is a powerful and flexible solution for controlling multiple SDVoE (Software Defined Video over Ethernet) based extenders within same network. The user only needs to install this unit into the same local network as the extenders (Transmitter and Receiver) to easily define and configure channel routing selections (including video, audio, and a variety of control interface types) using the WebGUI. Without the use of this centralised control unit, each Transmitter and Receiver pair would only be able to function in a point-to-point capacity.

Additionally, this unit supports controlling and configuring the matrix, video wall, and MultiViewer modes of connected SDVoE units. The settings of all connected Transmitter/Receiver units, including IP address, netmask and extender status are clearly displayed within the WebGUI. A trigger input interface is also provided to allow the easy addition of a remote control keypad, or other trigger-supporting products, which can be installed within a podium or within a table in a conference room or classroom. This interface can allow the user to activate stored presets with the simple press of a button. Standard control is available via WebGUI (remote or local), RS-232, Telnet and IR Remote.

## **2. APPLICATIONS**

-  Video/TV wall display and control
-  Security surveillance and control
-  Commercial advertising, display and control
-  Home Cinema with Smart Home Controls
-  Retail sales and demonstration

### 3. PACKAGE CONTENTS

- /// 1× IP Master Controller (SDVoE)
- /// 1× 5V/2.5A DC Power Adapter
- /// 1× Terminal Block (3-pin)
- /// 3× Terminal Block (5-pin)
- /// 1× IR Extender Cable
- /// 1× Remote Control (CR-183)
- /// 1× Shockproof Feet (Set of 4)
- /// 1× Operation Manual

### 4. SYSTEM REQUIREMENTS

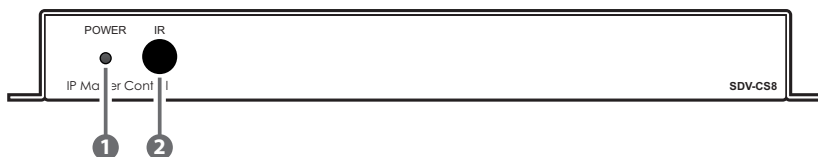
An active network connection from a switch or router for control of compatible Video over IP devices.

### 5. FEATURES

- /// Enables the management and configuration of multiple compatible SDVoE (Software Defined Video over Ethernet) extenders through a single WebGUI
- /// Provides control over the independent routing of video, audio and control signals between all local compatible transmitters and receivers
- /// Control over matrix, video wall, and MultiViewer modes using WebGUI presets
- /// WebGUI clearly displays the status of all connected Transmitters and Receivers, including IP address, channel selection, etc.
- /// Can generate serial commands to directly control an external serial-controllable device
- /// Can be powered by Ethernet switches supporting the IEEE 802.3af 2003 PoE standard (Optional)
- /// Trigger Control Keypad support for easy, single-button, preset activation (Optional, coming in the “Phase 2” update)
- /// Standard control is available via WebGUI (remote or local), RS-232, Telnet, and IR Remote

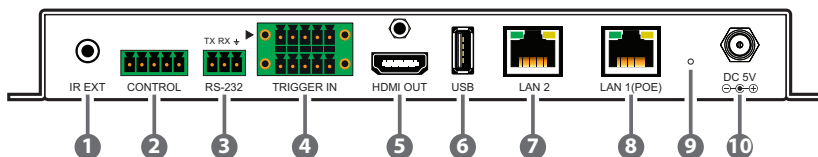
## 6. OPERATION CONTROLS AND FUNCTIONS

### 6.1 Front Panel



- 1 **POWER LED:** This LED will illuminate to indicate the unit is on and receiving power.
- 2 **IR Window:** Accepts IR signals from the included IR remote for control of this unit only.

### 6.2 Rear Panel



- 1 **IR EXT Port:** Connect to the provided IR Extender to extend the IR control range of the unit. Ensure that the remote being used is within direct line-of-sight of the IR Extender.
- 2 **CONTROL Terminal Block:** Connect to a serial controllable device for the transmission of RS-232 signals.
- 3 **RS-232 Terminal Block:** Connect to a PC, laptop or other serial control device with a 3-pin adapter cable to control the unit via RS-232.
- 4 **TRIGGER IN Terminal Block:** This functionality is not currently available and will be added in the "Phase 2" update.
- 5 **HDMI OUT Port:** This functionality is not currently available and will be added in the "Phase 2" update.
- 6 **USB Port:** This functionality is not currently available and will be added in the "Phase 2" update.
- 7 **LAN 2 Port:** Connect directly, or through a network switch, to your PC/ laptop to control the unit via WebGUI/Telnet.



- 8 LAN 1 (POE) Port:** This port is used to connect to the SDVoE devices to be controlled. Connect to the SDVoE units' private network through their dedicated network switch, to enable detection and control over those units.

*Note: If the connected network switch supports the IEEE 802.3af 2003 PoE (Power over Ethernet) standard, this unit can optionally be powered directly via this Ethernet port.*

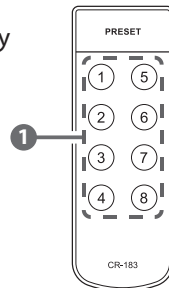
- 9 FACTORY RESET Pinhole:** Press and hold for 3 seconds to reset the unit to its factory defaults, including Ethernet settings.

*Note: While the reset is in process, the LEDs on the front of the unit will flash. Once the reset is complete, the unit will return to normal operation.*

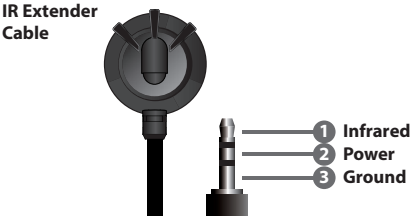
- 10 DC 5V Port:** Plug the 5V DC power adapter into the unit and connect it to an AC wall outlet for power. (Optional, not required if the unit is powered via PoE).

### 6.3 Remote Control

- 1 PRESET 1~8 Buttons:** This functionality is not currently available and will be added in the "Phase 2" update.



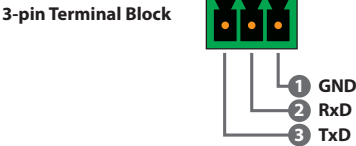
6.4 IR Cable Pinout



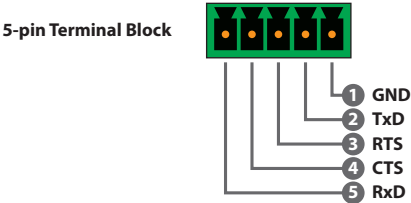
6.5 RS-232 Pinout and Defaults

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

Unit Control



Serial Output



## 6.6 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: This unit defaults to DHCP mode. The current IP address can be verified using the HDMI output (to be added in “Phase 2”) or RS-232 if the Device Discovery software is not available.*

Find Devices on Network			
Product Name	Description	IP Address	MAC Address

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

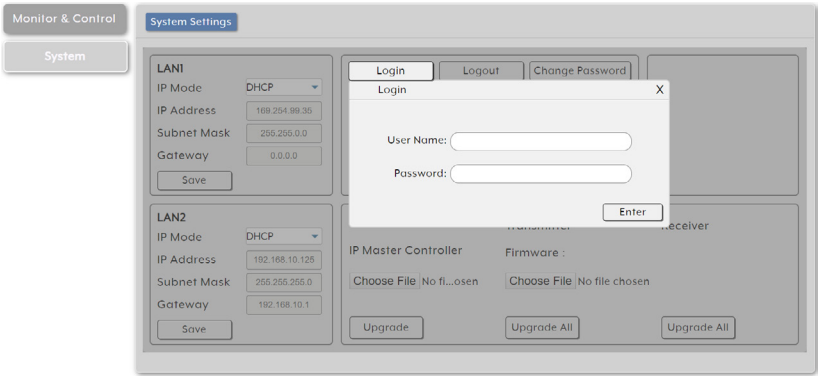
Product ID	
Product Name	
MAC Address	00:00:00:00:00:00
IP Address	<input type="text"/>
Subnet Mask	<input type="text"/>
Gateway IP	<input type="text"/>
DNS	<input type="text"/>
IP Mode	Static
Web GUI Port	Static
Telnet Port	0
S / N	
Firmware Version	
Hardware Version	
Description	
Web GUI	<a href="#">Web GUI</a>
Save	Reboot

- 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.

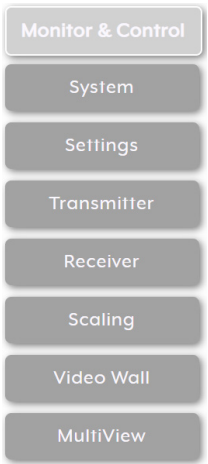
WebGUI Overview

After connecting to the WebGUI's address in a web browser, the WebGUI will load and display the System tab. Click "Login" to open the authentication window. Please enter the appropriate user name and password then click "Enter" to log in.

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



After logging in, 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.



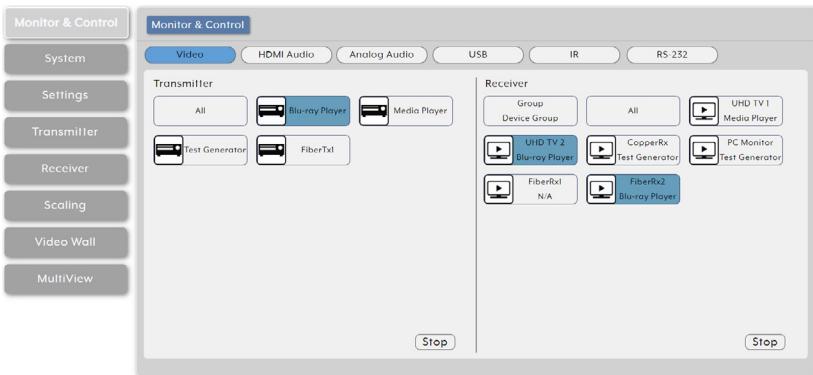
Clicking the “Logout” button within the “System” tab will automatically log the currently connected user out of the WebGUI and return to login page.

*Note: When not logged in, only the “Monitor & Control” and “System” tabs are available.*

### 6.6.1 Monitor & Control Tab

This tab provides easy to use drag-and-drop control over all basic routing functionality of the transmitters and receivers that have been detected within the local network. Transmitters are represented by the source icon (📺) and receivers are represented by the display icon (📺). Each of this tab's sections control the routing of a different type of interface that can be found on most compatible transmitters, receivers or transceivers. These interfaces are: Video routing, HDMI Audio routing, Analog Audio routing, USB routing, IR routing, and RS-232 routing. This tab's controls are available even when a user is not logged in, providing basic control over routing without exposing system critical configuration areas.

*Note: Units that were previously a part of the system, but are not currently detected will still be displayed, however they will have a disconnected icon (🔌) and cannot be used for routing.*



- 1) **Video Routing:** Provides drag-and-drop control over the video routing between all detected transmitters and receivers.
  - **Video Transmitter:** This section provides drag-and-drop buttons for all transmitters detected by the system as well as a button target to stop one or all video streams from being transmitted.

*Note: If a transmitter's streams require more bandwidth than is available, a warning icon (⚠) will be displayed instead of the normal source icon. Video output from a source displaying this icon may become visually unstable. It is recommended to either lower the resolution or framerate of the stream.*

**Source to Single Receiver Routing:** To route a source to a receiver, click and drag the source's button on the left to the preferred display on the right side, then release the mouse button. If the routing was completed successfully, the newly routed source's name will appear below the display's name within the button. Clicking on any source button will change the colour of itself, and all currently routed displays.

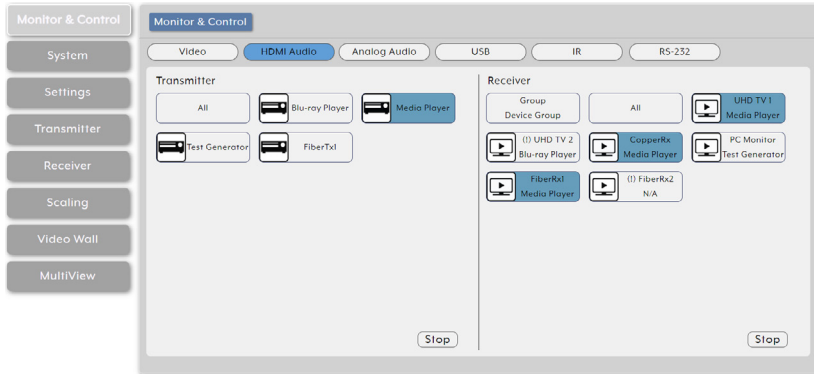
*Note: Receivers may also be drag and dropped onto sources to activate a new route.*

**Source to Multiple Receiver Routing:** To route a source to multiple receivers at the same time, click and drag the source's button on the left to the "All" button on the right side, then release the mouse button. If the routing was completed successfully, the source's name will appear within all appropriate buttons.

**Stop Stream:** To stop the video streams from a single source, drag the source down to the "Stop" button at the bottom of the window, then release the mouse button. To stop ALL video streams, drag the "All" button down to the "Stop" button.

- **Video Receiver:** This section provides drag-and-drop buttons for all receivers detected by the system as well as a button target to stop one or all output streams from being displayed.

**Stop Stream:** To stop the video stream on a single display, drag the display down to the "Stop" button at the bottom of the window, then release the mouse button. To stop ALL video outputs, drag the "All" button down to the "Stop" button.



- 2) **HDMI Audio Routing:** Provides drag-and-drop control over the independent HDMI audio routing of all detected transmitters and receivers.

*Note: Bitstream audio is only supported when the receiver's HDMI audio device setting is set to "HDMI Audio (Follow Video in Genlock Mode)".*

- **HDMI Audio Transmitter:** This section provides drag-and-drop buttons for all transmitters detected by the system as well as a button target to stop one or all independent HDMI audio streams from being transmitted.

**Source to Single Receiver Routing:** To route an HDMI audio source to a receiver, click and drag the source's button on the left to the preferred display on the right side, then release the mouse button. If the routing was completed successfully, the newly routed source's name will appear below the display's name within the button. Clicking on any source button will change the colour of itself, and all currently routed displays.

*Note: Receivers may also be drag and dropped onto sources to activate a new route.*

**Source to Multiple Receiver Routing:** To route an HDMI audio source to multiple receivers at the same time, click and drag the source's button on the left to the "All" button on the right side, then release the mouse button. If the routing was completed successfully, the source's name will appear within all appropriate buttons.

**Stop Stream:** To stop the independent HDMI audio stream from a single source, drag the source down to the “Stop” button at the bottom of the window, then release the mouse button. To stop ALL independent HDMI audio streams, drag the “All” button down to the “Stop” button.

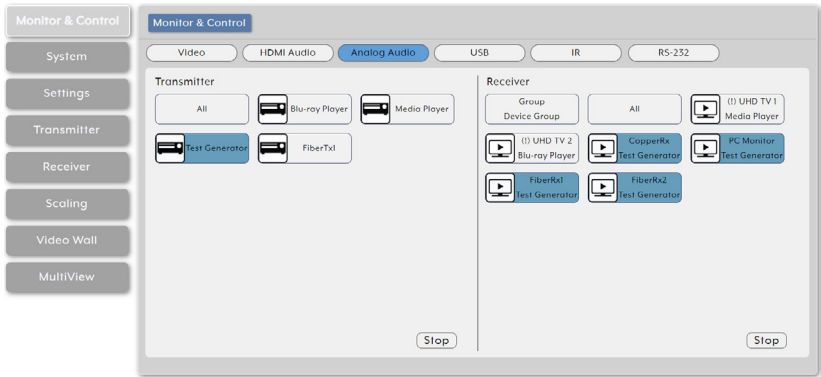
*Note: When a receiver’s HDMI Audio is set to “Follow Video in Genlock Mode”, and scaling on that output has been disabled, the audio output on that receiver will not be stopped.*

- **HDMI Audio Receiver:** This section provides drag-and-drop buttons for all receivers detected by the system as well as a button target to stop one or all independent HDMI audio streams.

*Note: When a receiver’s HDMI Audio is set to “Follow Video in Genlock Mode” and scaling on that output has been disabled, the HDMI audio setting is ignored and the audio embedded with the HDMI source will always be output. In these instances a (!) mark will be displayed.*

**Stop Stream:** To stop the HDMI audio stream on a single display, drag the display down to the “Stop” button at the bottom of the window, then release the mouse button. To stop ALL video outputs, drag the “All” button down to the “Stop” button.

*Note: When a receiver’s HDMI Audio is set to “Follow Video in Genlock Mode”, and scaling on that output has been disabled, the independent audio route will be stopped, however the HDMI embedded audio will continue to be output normally.*





**3) Analogue Audio Routing:** Provides drag-and-drop control over the routing of analogue audio input streams between all detected transmitters and receivers.

- **Analogue Audio Transmitter:** This section provides drag-and-drop buttons for all analogue input sources detected by the system as well as a button target to stop one or all analogue audio streams from being transmitted.

**Source to Single Receiver Routing:** To route an analogue audio source to a receiver, click and drag the source's button on the left to the preferred receiver on the right side, then release the mouse button. If the routing was completed successfully, the newly routed source's name will appear below the receiver's name within the button. Clicking on any source button will change the colour of itself, and all currently routed receivers.

*Note: Receivers may also be drag and dropped onto sources to activate a new route.*

**Source to Multiple Receiver Routing:** To route an analogue audio source to multiple receivers at the same time, click and drag the source's button on the left to the "All" button on the right side, then release the mouse button. If the routing was completed successfully, the source's name will appear within all appropriate buttons.

**Stop Stream:** To stop the analogue audio stream from a single source, drag the source down to the "Stop" button at the bottom of the window, then release the mouse button. To stop ALL analogue audio streams, drag the "All" button down to the "Stop" button.

- **Analogue Audio Receiver:** This section provides drag-and-drop buttons for all analogue audio outputs detected by the system as well as a button target to stop the output of one or all analogue audio streams.

*Note: If the selected audio source for an analogue output has been set to "HDMI Audio (Stereo Downmix)" that output will be marked with a (!) and the audio output will mirror the source set on the HDMI Audio routing page.*

**Stop Stream:** To stop the analogue audio output on a single receiver, drag the receiver down to the "Stop" button at the bottom of the window, then release the mouse button. To stop ALL video outputs, drag the "All" button down to the "Stop" button.

*Note: If the selected audio source for an analogue output has been set to “HDMI Audio (Stereo Downmix)” the audio output can only be stopped from the HDMI Audio page.*



- 4) USB Pairing:** Provides drag-and-drop control over the pairing of USB hosts (PC, laptop, etc.) and USB devices (keyboard, mouse, webcam, etc.) between the ports detected on all transmitters and receivers.

*Note: When a USB host port has enabled “Simultaneous Mode”, it can be paired with up to 7 device endpoints. If “Simultaneous Mode” is disabled, a USB host port can only be paired with a single USB device endpoint.*

- **USB Host:** This section provides drag-and-drop buttons for detected USB host ports as well as a button target to stop communication from a host.

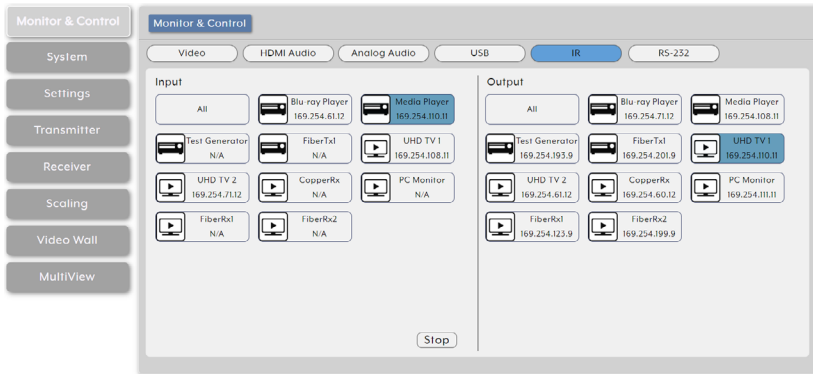
**Host to Device Pairing:** To pair a USB host with a USB device, click and drag the USB host’s button on the left to the preferred USB device on the right side, then release the mouse button. If the pairing was completed successfully, the active USB host’s name will appear below the USB device’s name within the button. Clicking on any USB host button will change the colour of itself, and all currently paired USB device endpoints.

*Note: USB devices may also be drag and dropped onto USB hosts to activate a new pairing.*

**Stop Host:** To stop communication from a USB host, drag the USB host down to the “Stop” button at the bottom of the window, then release the mouse button.

- **USB Device:** This section provides drag-and-drop buttons for all detected USB device endpoints as well as a button target to stop communication from a device.

**Stop Device:** To stop communication from a USB device, drag the USB device down to the “Stop” button at the bottom of the window, then release the mouse button.



- 5) IR Routing:** Provides drag-and-drop control over the routing of the IR inputs and outputs detected on all transmitters and receivers.

*Note: An IR output can be routed to by multiple IR inputs, however each IR input may only be directly routed to a single IR output. If an IR input needs to be sent to more than one output, the Global Broadcast option must be used.*

- **IR Input:** This section provides drag-and-drop buttons for all IR input ports detected by the system as well as a button target to stop one or all IR streams from being transmitted.

**IR Input Global Broadcast:** To broadcast an IR input to all available IR outputs, click and drag the IR input’s button on the left to the “All” button on the right side, then release the mouse button. If the routing was completed successfully, the IP broadcast address (255.255.255.255) will appear within the appropriate IR input’s button.

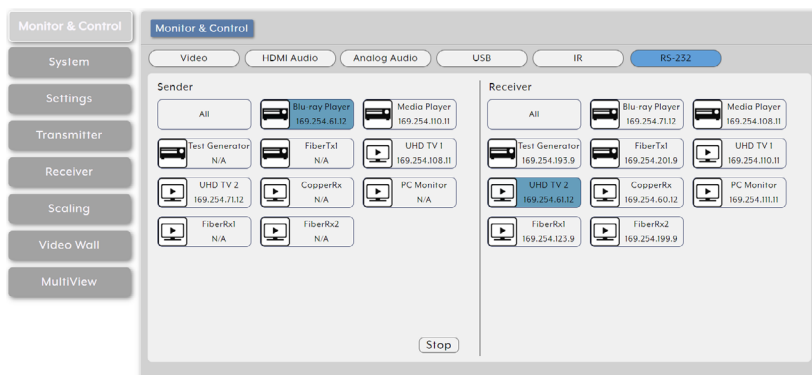
**Stop Stream:** To stop the broadcast of an IR signal from a single IR

input, drag the IR input down to the “Stop” button at the bottom of the window, then release the mouse button. To stop the transmission of ALL IR signals, drag the “All” button down to the “Stop” button.

- **IR Output:** This section provides drag-and-drop buttons for all IR output ports detected by the system. Each IR output has an automatically assigned IR stream IP address listed below the output’s name.

**IR Output to IR Input Routing:** To connect an IR output to an IR input, click and drag the IR output’s button on the right to the preferred IR input on the left side, then release the mouse button. If the routing was completed successfully, the newly routed IR output’s IR stream IP address will appear below the IR input’s name within its button. Clicking on any IR output button will change the colour of itself, and all IR inputs currently routed to it.

*Note: IR inputs may also be drag and dropped onto IR outputs to activate a new route.*



- RS-232 Routing:** Provides drag-and-drop control over the routing of the RS-232 senders and receivers detected on all transmitters and receivers. The RS-232 port on a standard extension unit contains one sender (Rx pin) and one receiver (Tx pin).

*Note: An RS-232 receiver can be routed to by multiple RS-232 senders, however each RS-232 sender may only be directly routed to a single RS-232 receiver. If an RS-232 sender needs to be sent to more than one receiver, the Global Broadcast option must be used.*

- **RS-232 Sender:** This section provides drag-and-drop buttons for all RS-232 senders detected by the system as well as a button target to stop one or all RS-232 streams from being transmitted.

**RS-232 Sender Global Broadcast:** To broadcast an RS-232 sender to all available RS-232 receivers, click and drag the RS-232 sender's button on the left to the "All" button on the right side, then release the mouse button. If the routing was completed successfully, the IP broadcast address (255.255.255.255) will appear within the appropriate RS-232 sender's button.

**Stop Stream:** To stop the broadcast of an RS-232 signal from a single RS-232 sender, drag the RS-232 sender down to the "Stop" button at the bottom of the window, then release the mouse button. To stop the transmission of ALL RS-232 signals, drag the "All" button down to the "Stop" button.

- **RS-232 Receiver:** This section provides drag-and-drop buttons for all RS-232 receivers detected by the system. Each RS-232 receiver has an automatically assigned RS-232 stream IP address listed below the receiver's name.

**RS-232 Receiver to RS-232 Sender Routing:** To connect an RS-232 receiver to an RS-232 sender, click and drag the RS-232 receiver's button on the right to the preferred RS-232 sender on the left side, then release the mouse button. If the routing was completed successfully, the newly routed RS-232 receiver's RS-232 stream IP address will appear below the RS-232 sender's name within its button. Clicking on any RS-232 receiver button will change the colour of itself, and all RS-232 senders currently routed to it.

*Note: RS-232 senders may also be drag and dropped onto RS-232 receivers to activate a new route.*

### 6.6.2 System Tab

This tab provides access to system configuration options including IP configuration for both LAN ports, login and user management, and firmware update functionality.

- LAN 1 & LAN 2:** The IP mode for each LAN port (DHCP or Static IP), IP address, netmask, and gateway can be set here. When a LAN port is set to “DHCP” mode, it will automatically attempt to obtain proper configuration information from the local DHCP server. If no DHCP server is available, it will automatically assign itself an APIPA address from the 169.254.xxx.xxx range. To configure the network settings manually, please set the LAN port to “Static IP” mode and enter the information as appropriate for the connected network. Press “Save” to activate the changes.

*Note: Both LAN ports default to “DHCP” mode. The current IP address can be verified using the HDMI output (to be added in “Phase 2”) or RS-232 if the Device Discovery software is not available.*

#### 2) System Commands:

- **Login:** Click these buttons to log into or out of the WebGUI interface.

*Note: When not logged in, only the “Monitor & Control” and “System” tabs are available.*

- **Change Password:** Click this button to change the WebGUI's administrator login password.
- **Factory Reset:** Reset the unit back to its factory default settings.

*Note: The Factory Reset does NOT clear the Tx and Rx history tables. To completely remove old Tx and Rx units from the system, use the "Remove" option on the Transmitter and Receiver pages.*

- **S/N:** Displays the unit's serial number.

**3) Firmware Upgrade:** Provides a method to remotely update the firmware of this unit as well as to update the firmware of detected transmitters and receivers.

*Note: The update process can take several minutes to complete, especially if there are a large number transmitters and receivers in the system. Please do not power off any units during the update process.*

- **IP Master Controller Firmware:** To update the unit's firmware click the "Choose File" button to open the file selection window and then select an appropriate firmware update file (\*.bin format) located on your local PC. After selecting the file, click the "Upgrade" button to begin the firmware update process. Once the firmware update process has completed the unit will reboot.
- **Transmitter/Receiver Firmware:** To update the firmware of all detected transmitters or receivers, click the "Choose File" button to open the file selection window and then select an appropriate firmware update file (\*.apz format) located on your local PC. After selecting the file, click the "Upgrade All" button to begin the firmware update process. Once the firmware update process has completed the unit will reboot.

*Note: The transmitter/receiver firmware is stored within the IP Master Controller after upload and will also be used when performing individual unit updates within the Transmitter and Receiver tabs.*

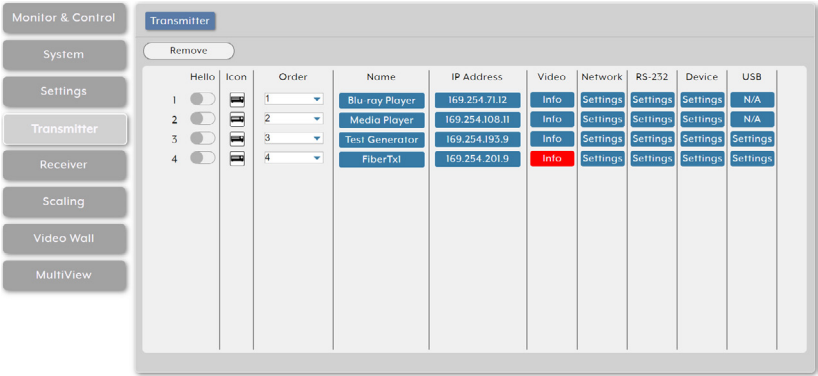
### 6.6.3 Settings Tab

This tab's functionality is not currently available and will be added in the "Phase 2" update.

### 6.6.4 Transmitter Tab

This tab shows all transmitters that have been detected by the unit. Details about each transmitter's name, IP address, and video content, as well as options to configure the network, RS-232, USB, and general device settings are also provided.

*Note: Units that were previously a part of the system, but are not currently detected will still be displayed, however they will have a disconnected icon (🔌) and cannot be used for routing. These units may be removed from the list using the "Remove" button.*



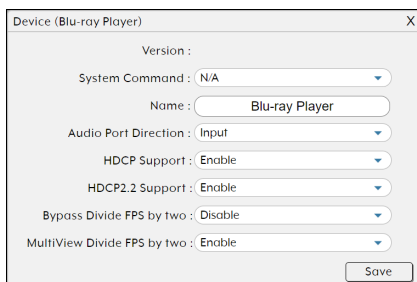
#### 1) Transmitter Configuration:

- **Remove:** Click on this button to remove any transmitter from the list that has the disconnected icon (🔌). The pop-up window provides a dropdown to select the unit to be removed. Once the selection has been made, click on "Confirm" to apply the change.  
*Note: Only disconnected transmitters can be removed.*
- **Hello:** Clicking on this switch will cause the selected unit to immediately begin flashing the power LED on the front of the unit to make it easy to find. Clicking it a second time returns the LED to its normal behavior.

*Note: The "Hello" function is not supported by all SDVoE units.*



- **Icon:** Displays the icon used to represent the unit.  
*Note: If a transmitter's streams require more bandwidth than is available, a warning icon (⚠) will be displayed instead of the normal source icon. Video output from a source displaying this icon may become visually unstable. It is recommended to either lower the resolution or framerate of the stream.*
- **Order:** Use the dropdown to reorder the units in the list. Changing the order here will also change the order the units are listed in other tabs.
- **Name:** Displays each unit's current assigned name.  
*Note: The name can be changed within "Device Settings".*
- **IP Address:** Displays each unit's current IP address.
- **Video Info:** Clicking this button will display a pop-up window containing detailed information about the current video source. When no live video is detected the button will be red.  
*Note: If no live source is detected the button will turn red.*
- **Network Settings:** Clicking this button will display a pop-up window containing detailed information about the unit's current network settings, including IP mode, and allow for those settings to be changed. To activate any changes made, please click on the "Save" button to close the window.
- **RS-232 Settings:** Clicking this button will display a pop-up window containing detailed information about the unit's current RS-232 settings, including baud rate, and allow for those settings to be changed. To activate any changes made, please click on the "Save" button to close the window.
- **USB Settings:** Clicking this button will display a pop-up window containing detailed information about the unit's current USB settings, including enabling or disabling simultaneous mode support. To activate any changes made, please click on the "Save" button to close the window.  
*Note: USB functionality is not supported by all SDVoE units.*



2) **Device Settings:** Clicking this button will display a pop-up window providing control over a number of important device settings and allow for those settings to be changed. To activate any changes made, please click on the “Save” button to close the window.

- **Version:** Display the unit’s current firmware version.
- **System Command:** Use the dropdown to select a system command to send to the unit. Available commands are:
  - **Factory Reset:** Reset the unit back to its factory default settings.
  - **Reboot:** Reboot the unit.
  - **Firmware Update:** Update the firmware of this unit using the currently uploaded firmware file.
  - **Transform (Transceivers only):** Switch the unit into receiver mode.
- **Name:** Change the unit’s name (19 character maximum).
- **Audio Port Direction:** Define the analogue audio port as an input or output.
- **HDCP Support:** Enable or disable support for HDCP 1.4 or lower sources.
- **HDCP 2.2 Support:** Enable or disable support for HDCP 2.2 sources.
- **Bypass Divide FPS by two:** Enable or disable the Divide FPS (Frames Per Second) by Two feature on the primary video stream generated by this unit. Enabling this mode will cut bandwidth usage of the unit nearly in half at the cost of a 50% framerate reduction.

*Note: When this mode is enabled, it is not recommended to use Bypass*

Mode from the scaling tab as most displays cannot properly handle the resulting output.

- **MultiView Divide FPS by two:** Enable or disable the Divide FPS (Frames Per Second) by Two feature on the secondary video stream generated by this unit which is used in MultiViewer mode. Enabling this mode will reduce bandwidth usage of the unit somewhat but only when MultiViewer mode has been activated.

## 6.6.5 Receiver Tab

This tab shows all receivers that have been detected by the unit. Details about each receiver's name, IP address, and video content, as well as options to configure the network, RS-232, USB and general device settings are also provided.

*Note: Units that were previously a part of the system, but are not currently detected will still be displayed, however they will have a disconnected icon (🔌) and cannot be used for routing. These units may be removed from the list using the "Remove" button.*

1	2	3	4	5	6
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6
UHD TV 1	UHD TV 2	CopperRx	PC Monitor	FiberRx1	FiberRx2
169.254.110.11	169.254.61.12	169.254.60.12	169.254.111.11	169.254.123.9	169.254.199.9
Info	Info	Info	Info	Info	Info
Settings	Settings	Settings	Settings	Settings	Settings
Settings	Settings	Settings	Settings	Settings	Settings
Settings	Settings	Settings	Settings	Settings	Settings
Settings	Settings	Settings	Settings	Settings	Settings
Settings	Settings	Settings	Settings	Settings	Settings

### 1) Receiver Configuration:

- **Remove:** Click on this button to remove any receiver from the list that has the disconnected icon (🔌). The pop-up window provides a dropdown to select the unit to be removed. Once the selection has been made, click on "Confirm" to apply the change.

*Note: Only disconnected receivers can be removed.*

- **Hello:** Clicking on this switch will cause the selected unit to immediately begin flashing the power LED on the front of the unit to make it easy to find. Clicking it a second time returns the LED to its normal behavior.

*Note: The "Hello" function is not supported by all SDVoE units.*

- **Icon:** Displays the icon used to represent the unit.
- **Order:** Use the dropdown to reorder the units in the list. Changing the order here will also change the order the units are listed in other tabs.
- **Name:** Displays each unit's current assigned name.

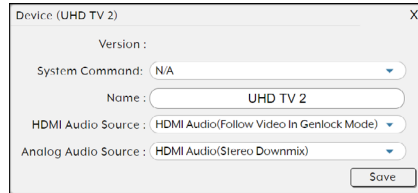
*Note: The name can be changed within "Device Settings".*

- **IP Address:** Displays each unit's current IP address.
- **Video Info:** Clicking this button will display a pop-up window containing detailed information about the current video output.

*Note: If no display is detected the button will turn red.*

- **Network Settings:** Clicking this button will display a pop-up window containing detailed information about the unit's current network settings, including IP mode, and allow for those settings to be changed. To activate any changes made, please click on the "Save" button to close the window.
- **RS-232 Settings:** Clicking this button will display a pop-up window containing detailed information about the unit's current RS-232 settings, including baud rate, and allow for those settings to be changed. To activate any changes made, please click on the "Save" button to close the window.
- **USB Settings:** Clicking this button will display a pop-up window containing detailed information about the unit's current USB settings, including enabling or disabling simultaneous mode support. To activate any changes made, please click on the "Save" button to close the window.

*Note: USB functionality is not supported by all SDVoE units.*



2) **Device Settings:** Clicking this button will display a pop-up window providing control over a number of important device settings and allow for those settings to be changed. To activate any changes made, please click on the “Save” button to close the window.

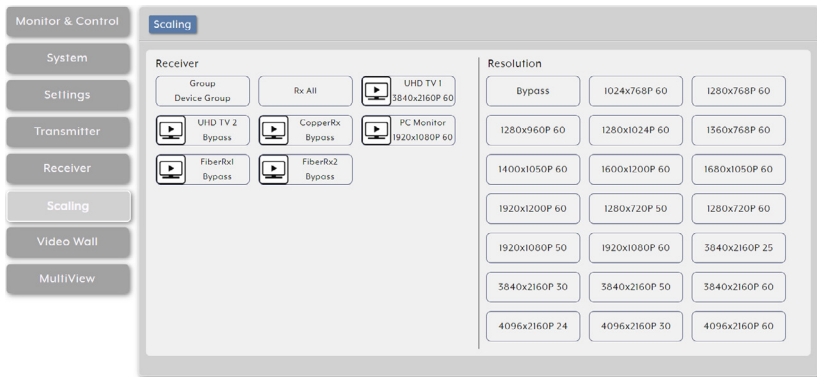
- **Version:** Display the unit’s current firmware version.
- **System Command:** Use the dropdown to select a system command to send to the unit. Available commands are:
  - **Factory Reset:** Reset the unit back to its factory default settings.
  - **Reboot:** Reboot the unit.
  - **Firmware Update:** Update the firmware of this unit using the currently uploaded firmware file.
  - **Transform (Transceivers only):** Switch the unit into transmitter mode.
- **Name:** Change the unit’s name (19 character maximum).
- **HDMI Audio Source:** Select the audio source type to embed with the HDMI video output of this unit. Available options are:
  - **HDMI Audio (Follow Video In Genlock):** Output the HDMI audio routed to this unit unless the receiver has been set to “Bypass Mode” in the scaling tab. When “Bypass mode” is active, only the native HDMI audio from the routed video source can be output.
  - **Analogue Audio:** Output the analogue audio routed to this unit.
  - **HDMI Audio (Stereo Downmix):** Output the HDMI audio routed to this unit after downmixing it to LPCM 2.0.  
*Note: This mode only supports HDMI sources with LPCM audio.*
  - **HDMI Audio (All Channel):** Output the HDMI audio routed to this unit.  
*Note: This mode only supports HDMI sources with LPCM audio.*

- **Analogue Audio Source:** Select the audio source type to output from the analogue audio output of this unit. Available options are:
  - **HDMI Audio (Stereo Downmix):** Output the HDMI audio routed to this unit after downmixing it to stereo.  
*Note: This mode only supports HDMI sources with LPCM audio.*
  - **Analogue Audio:** Output the analogue audio routed to this unit.

### 6.6.6 Scaling Tab

This tab provides drag-and-drop control over the video output resolution of each receiver in the system.

*Note: Due to this scaling occurring only on the receiver side, changes to resolutions here has no impact on bandwidth usage.*



- 1) **Resolution Selection:** To select an output resolution for a receiver, click and drag the receiver's button on the left to the preferred resolution on the right side, then release the mouse button. If the selection was completed successfully, the new resolution will be displayed below the receiver's name. To change all receivers to the same resolution, drag the "Rx All" button to the preferred resolution on the right side. Selecting "Bypass" will force that receiver to output all routed sources in their native resolutions.

*Note: Resolutions may also be drag and dropped onto receivers to change the output resolution.*

### 6.6.7 Video Wall Tab

This tab provides a way to configure or modify video walls using multiple receivers in a group. All aspects of the video wall can be configured here including dimensions (up to 8x8 displays), bezel compensation, output resolution, and source.

- 1) **Video Wall Setup:** The upper left section of this tab contains a list of all currently defined video walls in the system. To edit an existing video wall, select it from the list of "Video Wall Preset Names", to start work on a new video wall, click on the "+" symbol. To delete an existing video wall select the name and then click on the trash icon.

*Note: Deleting a video wall preset will not disable the video wall it described if it is currently active. To completely remove a video wall, new sources need to be routed to those displays, or the output needs to be disabled from the Monitor & Control Tab.*

- **Group Name:** Set the name of the video wall group here.
- **Transmitter:** Select the transmitter to use as the video source for the video wall.
- **Display Resolution:** Select the resolution for all receivers in the video wall to output to their connected displays.

- **Wall Size:** Select the size of the video wall, measured in number of monitors tall by number of monitors wide. The maximum number of displays in a single video wall is 64 (8x8).

*Note: The source will be stretched to fill the entire video wall. Selecting a non-square configuration of monitors may result in the image being distorted.*

- **Bezel Top/Bottom/Left/Right:** Set the size, in pixels, of the bezel surrounding the monitors used in the video wall.

*Note: It is strongly recommended to use the same make and model for all monitors within a video wall to avoid bezel and panel size discrepancies.*

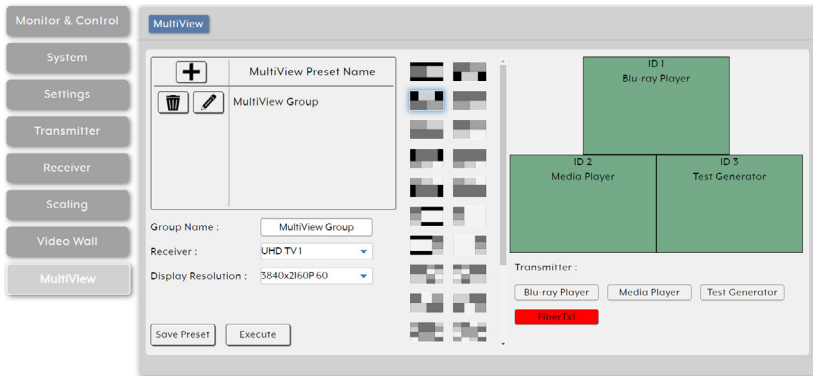
- **Receiver Selection:** This is a list of all available receivers in the system. Drag and drop each receiver to its correct position within the video wall grid to the right of the list. After placement, each receiver's name will be displayed within the selected location of the video wall and it will turn green. Blue panels within the video wall indicate that no display has been assigned to it yet, and red panels indicate that a display has been assigned, but is not in the correct mode.
- **Save Preset:** Click this button to save changes to the current video wall configuration without executing or activating it.
- **Execute:** Click this button to save changes to the current video wall configuration and then execute the changes. If the video wall was not already active, this will also activate it.



### 6.6.8 MultiView Tab

This tab provides a way to configure or modify the MultiViewer functionality of each receiver. All aspects of a MultiViewer output can be configured here including window number and arrangement, output resolution, and window sources.

*Note: Using a source within a MultiViewer output will increase the bandwidth requirements of the associated transmitter. The increase in bandwidth usage depends on the pixel size of the window required by the MultiView output and the frame rate of the source. In order to minimise the bandwidth impact with 4K sources, it is strongly recommended to enable the “MultiView Divide FPS by two” feature of the transmitter.*



- MultiView Setup:** The upper left section of this tab contains a list of all currently defined MultiView groups in the system. To edit an existing MultiView group, select it from the list of “MultiView Preset Names”, to start work on a new MultiView group, click on the “+” symbol. To delete an existing MultiView group select the name and then click on the trash icon.

*Note: Deleting a MultiView group will not disable the MultiView output it described if it is currently active. To completely remove a MultiView output, a new source needs to be routed to the display, or the output needs to be disabled from the Monitor & Control Tab.*

- **Group Name:** Set the name of the MultiView group here.
- **Receiver:** Select the receiver to display the MultiView output.
- **Display Resolution:** Select the output resolution for the MultiView receiver.

- **MultiView Layout Selection:** This is a scrollable list of pre made MultiViewer layout designs. Click on the design that best matches your layout and source count requirements to place it in the layout window to the right.

*Note: Customised layouts are not currently supported.*

- **Transmitter Selection:** This is a list of all available transmitters in the system. Drag and drop each transmitter to its preferred position within the MultiView layout above the list. After placement, each transmitter's name will be displayed within the selected window in the MultiView layout and the window will turn green. Blue windows within the MultiView layout indicate that no source has been assigned to it yet, and red windows indicate that a source has been assigned, but the stream is not currently active.
- **Save Preset:** Click this button to save changes to the current MultiView configuration without executing or activating it.
- **Execute:** Click this button to save changes to the current MultiView configuration and then execute the changes. If the MultiView output was not already active on the selected receiver, this will also activate it.

## 6.7 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 <b>Start</b> , type "cmd" in the search field, and press <b>Enter</b> .
Windows XP	Click <b>Start &gt; Run</b> , type "cmd", and press <b>Enter</b> .
Mac OS X	Click <b>Go &gt; Applications &gt; Utilities &gt; Terminal</b> .

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\Administrator>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: This unit defaults to DHCP mode. The current IP address can be verified using the HDMI output (to be added in "Phase 2") or RS-232 if the Device Discovery software is not available.*

## 6.8 RS-232 and Telnet Commands

COMMAND
Description and Parameters
<b>help</b> ↵
Show the full command list.
<b>?↵</b>
Show the full command list.
<b>help N1</b> ↵
Show help details about command <b>N1</b> . <b>N1</b> = {Command name}
<b>set factory default</b> ↵
Reset the unit to the factory defaults.
<b>get model name</b> ↵
Show the unit's model name.
<b>get model type</b> ↵
Show the unit's product type.
<b>get fw ver</b> ↵
Show the unit's current firmware version.
<b>get command ver</b> ↵
Show the unit's current command version.
<b>get mac N1 addr</b> ↵
Show the MAC address of the specified LAN port. Available values for <b>N1</b> : 1        [LAN port 1] 2        [LAN port 2]
<b>set factory ipconfig default</b> ↵
Reset the unit's network settings to the factory defaults.

COMMAND
Description and Parameters
<b>set system reboot↵</b>
Reboot the unit.
<b>set lan N1 ip mode N2↵</b>
Set the IP address assignment mode of the specified LAN port.  Available values for <b>N1</b> : 1        [LAN port 1] 2        [LAN port 2]  Available values for <b>N2</b> : Static        [Static IP mode] DHCP        [DHCP mode]
<b>get lan N1 ip mode↵</b>
Show the current IP address assignment mode of the specified LAN port.  Available values for <b>N1</b> : 1        [LAN port 1] 2        [LAN port 2]
<b>get lan N1 ipconfig↵</b>
Show the specified LAN port's current IP configuration information.  Available values for <b>N1</b> : 1        [LAN port 1] 2        [LAN port 2]
<b>get lan N1 ipaddr↵</b>
Show the specified LAN port's current IP address.  Available values for <b>N1</b> : 1        [LAN port 1] 2        [LAN port 2]

COMMAND	
Description and Parameters	
<b>get lan N1 netmask</b> ↵	
Show the specified LAN port's current netmask.	
Available values for <b>N1</b> :	
1	[LAN port 1]
2	[LAN port 2]
<b>get lan N1 gateway</b> ↵	
Show the specified LAN port's current gateway address.	
Available values for <b>N1</b> :	
1	[LAN port 1]
2	[LAN port 2]
<b>set lan N1 static ipaddr N2</b> ↵	
Set the specified LAN port's static IP address.	
Available values for <b>N1</b> :	
1	[LAN port 1]
2	[LAN port 2]
<b>N2</b> = X.X.X.X [X = 0 ~ 255]	
<b>get lan N1 static ipaddr</b> ↵	
Show the specified LAN port's current static IP address.	
Available values for <b>N1</b> :	
1	[LAN port 1]
2	[LAN port 2]
<b>set lan N1 static netmask N2</b> ↵	
Set the specified LAN port's static netmask.	
Available values for <b>N1</b> :	
1	[LAN port 1]
2	[LAN port 2]
<b>N2</b> = X.X.X.X [X = 0 ~ 255]	

COMMAND	
Description and Parameters	
<b>get lan N1 static netmask</b> ↵	
<p>Show the specified LAN port's current static netmask.</p> <p>Available values for <b>N1</b>:</p> <p>1        [LAN port 1]</p> <p>2        [LAN port 2]</p>	
<b>set lan N1 static gateway N2</b> ↵	
<p>Set the specified LAN port's static gateway address.</p> <p>Available values for <b>N1</b>:</p> <p>1        [LAN port 1]</p> <p>2        [LAN port 2]</p> <p><b>N2</b> = X.X.X.X     [X = 0 ~ 255]</p>	
<b>get lan N1 static gateway</b> ↵	
<p>Show the specified LAN port's current static gateway address.</p> <p>Available values for <b>N1</b>:</p> <p>1        [LAN port 1]</p> <p>2        [LAN port 2]</p>	
<b>get uart list</b> ↵	
List all available serial ports.	
<b>set uart n1 reset</b> ↵	
<p>Reset the specified serial port's settings to the factory defaults.</p> <p>Available values for <b>N1</b>:</p> <p>1        [3-pin serial port]</p> <p>2        [5-pin serial port]</p>	

COMMAND	
Description and Parameters	
<b>set uart N1 baudrate N2↵</b>	
<p>Set the baud rate of the specified serial port.</p> <p>Available values for <b>N1</b>:</p> <p>1            [3-pin serial port]</p> <p>2            [5-pin serial port]</p> <p>Available values for <b>N2</b>:</p> <p>2400       [2400 baud]</p> <p>4800       [4800 baud]</p> <p>9600       [9600 baud]</p> <p>19200      [19200 baud]</p> <p>38400      [38400 baud]</p> <p>57600      [57600 baud]</p> <p>115200     [115200 baud]</p>	
<b>get uart N1 baudrate↵</b>	
<p>Show the current baud rate of the specified serial port.</p> <p>Available values for <b>N1</b>:</p> <p>1            [3-pin serial port]</p> <p>2            [5-pin serial port]</p>	
<b>set uart N1 stop bit N2↵</b>	
<p>Set the number of stop bits for the specified serial port.</p> <p>Available values for <b>N1</b>:</p> <p>1            [3-pin serial port]</p> <p>2            [5-pin serial port]</p> <p>Available values for <b>N2</b>:</p> <p>1            [1 stop bit]</p> <p>2            [2 stop bits]</p>	

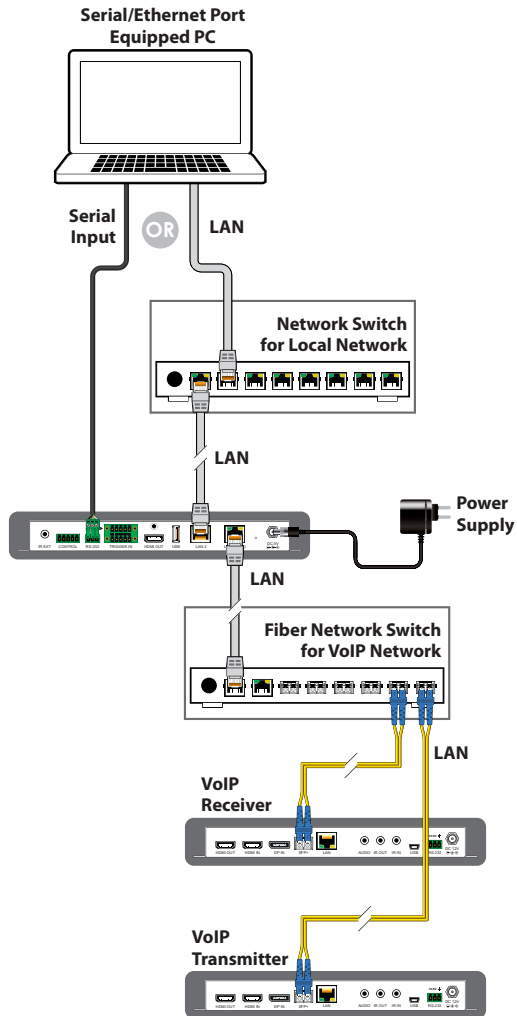


COMMAND	
Description and Parameters	
<b>get uart N1 stop bit↵</b>	
<p>Show the current number of stop bits for the specified serial port.</p> <p>Available values for <b>N1</b>:</p> <p>1            [3-pin serial port]</p> <p>2            [5-pin serial port]</p>	
<b>set uart N1 data bit N2↵</b>	
<p>Set the data bits used by the specified serial port.</p> <p>Available values for <b>N1</b>:</p> <p>1            [3-pin serial port]</p> <p>2            [5-pin serial port]</p> <p>Available values for <b>N2</b>:</p> <p>7            [7 data bits]</p> <p>8            [8 data bits]</p>	
<b>get uart N1 data bit↵</b>	
<p>Show the current number of data bits used by the specified serial port.</p> <p>Available values for <b>N1</b>:</p> <p>1            [3-pin serial port]</p> <p>2            [5-pin serial port]</p>	
<b>set uart N1 parity N2↵</b>	
<p>Set the parity of the specified serial port.</p> <p>Available values for <b>N1</b>:</p> <p>1            [3-pin serial port]</p> <p>2            [5-pin serial port]</p> <p>Available values for <b>N2</b>:</p> <p>0            [None]</p> <p>1            [Odd]</p> <p>2            [Even]</p>	

COMMAND	
Description and Parameters	
<b>get uart N1 parity↵</b>	
<p>Show the current parity setting of the specified serial port.</p> <p>Available values for <b>N1</b>:</p> <p>1            [3-pin serial port]</p> <p>2            [5-pin serial port]</p>	
<b>set uart 2 mode N1 ↵</b>	
<p>Set the operational mode of the Control Output (5-pin) serial port.</p> <p>Available values for <b>N1</b>:</p> <p>0            [Disabled]</p> <p>1            [RS-232 mode]</p> <p>2            [RS-422 mode]</p> <p>3            [RS-485 mode]</p>	
<b>get uart 2 mode ↵</b>	
<p>Show the current operational mode of the Control Output (5-pin) serial port.</p>	
<b>set uart 2 command [N1]↵</b>	
<p>Transmit the specified command data via the Control Output (5-pin) serial port.</p> <p><b>N1</b> = {Command data}</p>	

*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

<b>Output Ports</b>	1×RS-232 (5-pin Terminal Block)
<b>Control Ports</b>	1×RS-232 (3-pin Terminal Block) 2×LAN (RJ-45)
<b>Reserved Ports</b>	8×Trigger (10-pin Terminal Block) 1×HDMI (Type-A) 1×USB 2.0 (Type A) 1×IR Extender (3.5mm)
<b>IR Frequency</b>	30 – 50kHz (30 – 60kHz under ideal conditions)
<b>Baud Rate</b>	19200
<b>Power Supply</b>	5V/2.6A DC (US/EU standards, CE/FCC/UL certified)
<b>ESD Protection (HBM)</b>	±8kV (Air Discharge) ±4kV (Contact Discharge)
<b>Dimensions (W×H×D)</b>	231.5mm×25mm×108mm [Case Only] 231.5mm×25mm×117mm [All Inclusive]
<b>Weight</b>	250g
<b>Chassis Material</b>	Metal (Steel)
<b>Chassis 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 (Non-condensing)
<b>Power Consumption</b>	2.99W

## 9. ACRONYMS

ACRONYM	COMPLETE TERM
<b>10GbE</b>	10 Gigabit Ethernet
<b>ADC</b>	Analogue-to-Digital Converter
<b>ASCII</b>	American Standard Code for Information Interchange
<b>AVR</b>	Audio/Video Receiver or Recorder
<b>Cat.5e</b>	Enhanced Category 5 cable
<b>Cat.6</b>	Category 6 cable
<b>Cat.6a</b>	Augmented Category 6 cable
<b>Cat.7</b>	Category 7 cable
<b>CLI</b>	Command-Line Interface
<b>DAC</b>	Digital-to-Analogue Converter
<b>DHCP</b>	Dynamic Host Configuration Protocol
<b>DP</b>	DisplayPort
<b>EDID</b>	Extended Display Identification Data
<b>GbE</b>	Gigabit Ethernet
<b>GUI</b>	Graphical User Interface
<b>HDCP</b>	High-bandwidth Digital Content Protection
<b>HDMI</b>	High-Definition Multimedia Interface
<b>HDR</b>	High Dynamic Range
<b>HDTV</b>	High-Definition Television
<b>IGMP</b>	Internet Group Management Protocol
<b>IP</b>	Internet Protocol
<b>IR</b>	Infrared
<b>KVM</b>	Keyboard/Video/Mouse
<b>LAN</b>	Local Area Network
<b>LED</b>	Light-Emitting Diode

ACRONYM	COMPLETE TERM
LPCM	Linear Pulse-Code Modulation
MAC	Media Access Control
OSD	On-Screen Display
PD	Powered Device
SDVoE	Software Defined Video over Ethernet
TCP	Transmission Control Protocol
UHD	Ultra-High-Definition (10.2Gbps)
UHD+	Ultra-High-Definition Plus (18Gbps)
UHDTV	Ultra-High-Definition Television
USB	Universal Serial Bus
VLAN	Virtual LAN
VoIP	Video over IP
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
XGA	Extended Graphics Array





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